



Australian Government

MSS025022 Perform sampling and testing of soils

Release: 1

MSS025022 Perform sampling and testing of soils

Modification History

Release 1. Updated unit code. Changes to performance criteria. Range of conditions removed. Assessment requirements amended. Equivalent outcome.

Application

This unit describes the skills and knowledge to collect soil samples in accordance with a defined sampling plan, prepare the samples for testing, conduct in-field and laboratory testing of the samples and report the results. Personnel are required to check the validity and reliability of data, recognise atypical test data, and troubleshoot common test procedures and equipment problems.

This unit applies to environmental technicians in a range of industry sectors, including geotechnical services and civil engineering; site remediation or rehabilitation; solid and hazardous waste management; natural resource management; management of contaminated sites; environmental services (sampling and monitoring of air quality, water and soil); environmental compliance, auditing and inspection; groundwater and clean water (catchments, supply and environmental flows).

No licensing or certification requirements exist at the time of publication. Relevant legislation, industry standards and codes of practice within Australia must be applied.

Pre-requisite Unit

MSS024020 Recognise common geological landforms and samples

Competency Field

Sampling and testing

Unit Sector

Environmental

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 Confirm soil sampling and testing | 1.1 Read and interpret available site information, site plan, sampling and testing locations and history of sampling and testing |
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Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.
requirements with supervisor		
	1.2	Confirm the sampling locations, numbers and types of samples, timing and frequency of sampling from workplace or client's sampling plan
	1.3	Check that all sampling and testing procedures are in accordance with client or workplace requirements, standards and guidelines
2 Prepare for soil sampling	2.1	Identify site and sampling hazards and review workplace safety procedures
	2.2	Liaise with relevant personnel to arrange site access and obtain all clearances and permits
	2.3	Select sampling equipment and conditions to achieve representative samples and to preserve sample integrity during collection, storage and transit
	2.4	Select field test equipment and instruments and check operation and calibration in accordance with procedures and manufacturer instructions
	2.5	Assemble and check all sampling equipment, field test equipment, materials, containers and safety equipment
	2.6	Arrange suitable transport to, from and around site
3 Conduct sampling and log soil samples	3.1	Locate sampling points and any services at the site
	3.2	Work effectively with other site personnel during drilling and excavation operations to collect and log reliable samples
	3.3	Conduct representative sampling in accordance with sampling plan and defined procedures for field and laboratory testing
	3.4	Record all information and label samples in accordance with traceability requirements
	3.5	Record environment and any conditions or atypical observations made during sampling that may impact on

Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.	
			sample representativeness or integrity
		3.6	Transport all samples back to base according to workplace procedures and codes
4	Prepare soil samples for testing	4.1	Prepare sub-samples and back-up sub-samples that are representative of the source
		4.2	Label all sub-samples to ensure traceability and store in accordance with workplace procedures
		4.3	Follow defined preparation and safety procedures to limit hazards or contamination to samples, self, work area and environment
		4.4	Distribute sub-samples to required destinations for testing, maintaining sample integrity, traceability and chain of custody requirements
5	Conduct physical and chemical soil tests in the field	5.1	Obtain sample or sub-sample for designated field test
		5.2	Check that all equipment, instruments and reagents are fit for purpose
		5.3	Set up and calibrate instruments to ensure safe operation and valid results
		5.4	Operate equipment and instruments in accordance with test method requirements
		5.5	Perform tests, procedures and observations on all samples and standards in accordance with specified methods
		5.6	Record all field observations and results and ensure that they are accurately transferred to workplace information management system
6	Conduct physical and chemical soil	6.1	Obtain sample or sub-sample for designated laboratory test

Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.	
	tests in the laboratory	6.2	Check that all equipment, instruments and reagents are fit for purpose
		6.3	Set up and calibrate instruments to ensure safe operation and valid results
		6.4	Operate equipment and instruments in accordance with test method requirements
		6.5	Perform tests and procedures on all samples, blanks and standards in accordance with specified methods
		6.6	Record test data noting atypical observations
		6.7	Process the data for samples, standards and blanks in accordance with workplace procedures
		6.8	Enter approved information into workplace information management system
7	Review results and assess soil suitability for specific purposes	7.1	Read and interpret results in relation to legislative and client requirements
		7.2	Compare data with required, established and desired parameters to establish suitability for purpose
		7.3	Determine need for remedial action and report to client
8	Maintain a safe work environment	8.1	Rehabilitate sampling site to render it safe and to minimise environmental impact
		8.2	Clean all equipment, containers, work area and vehicles according to workplace procedures
		8.3	Check serviceability of all equipment before storage
		8.4	Use defined safe work practices and personal protective equipment (PPE) to ensure personal safety and that of others
		8.5	Minimise the generation of wastes and environment impacts

Elements describe the essential outcomes.

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

8.6 Ensure the safe collection of all hazardous wastes for disposal

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.

Unit Mapping Information

Release 1. Supersedes and is equivalent to MSS025007 Perform sampling and testing of soils.

Links

The MSS Sustainability Companion Volume implementation Guides are available from VETNet: -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=5b04f318-804f-4dc0-9463-c3fb9a3fe998>

Assessment Requirements for MSS025022 Perform sampling and testing of 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:

- collected, preserved and labelled a set of representative soil samples for at least 1 site in accordance with a given sampling plan
- prepared soil samples and conducted at least 1 chemical test and 1 physical test in the field using given test methods
- prepared soil samples and conducted at least 1 chemical test and 1 physical test in a laboratory using given test methods.

Knowledge Evidence

There must be evidence the candidate has knowledge of:

- scientific terminology used in job role covering soil sampling and testing
- fundamentals of soil morphology, including soil profiles, horizons, structure and texture, and mineralogy
- chemical and physical soil testing
- (Australian) soil classification system
- fundamentals of soil formation
- land use and soil systems (interactions and impacts), including plant-soil interactions, soil fertility, soil contamination and remediation
- fundamentals of geomorphology, including erosion and mass wasting; transportation and deposition, sedimentation; fluvial, aeolian, hillslope and weathering processes
- fundamentals of soil chemistry, soil salinity
- physical, engineering soil properties, including:
 - colour (Munsell chart)
 - liquid and plastic limits
 - linear shrinkage
 - soil particle density
 - particle size distribution
 - dispersion and Emerson class number
- fundamentals of sampling, including:
 - sampling plans and site selection

- principles of representative samples
- principles and procedures for random, systematic, stratified and composite sampling; consistency of sampling procedures
- preservation of the integrity of samples
- maintaining identification of samples relative to their source, workplace and legal traceability requirements
- cost-effectiveness of sampling
- characteristics of soils to be sampled and likely contaminants
- materials for sampling and different types of samples
- sampling tools and equipment
- testing equipment and instruments
- links between quality control, quality assurance, quality management systems and sampling procedures
- workplace procedures dealing with legislative requirements for the handling, labelling and transport of hazardous goods
- site hazards, links between safe work procedures and personal and environmental safety, particularly at high risk sites.

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 facilities, equipment and resources, including:
 - vehicle transport, soil sampling equipment, field test equipment, digital camera, containers, reagents, consumables
 - equipment and instruments for laboratory based soils testing
 - safe work procedures and safety equipment
 - workplace procedures, work program, maps, site plans, site sampling plans and test methods, and equipment manuals.

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

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