Australian Government

Department of Education, Employment and Workplace Relations

MSL973006A Prepare trial batches for evaluation

Revision Number: 1

MSL973006A Prepare trial batches for evaluation

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the ability to prepare trial batches of materials for evaluation. Materials can include soil, minerals and manufactured products, such as concrete, asphalt, food, plastics, paint and other industrial chemicals.

Application of the Unit

Application of the unit	This unit of competency is applicable to laboratory assistants working in all industry sectors. It describes work conducted by laboratory assistants, generally working under the guidance of a senior technician or laboratory supervisor/manager. Industry representatives have provided case studies to illustrate the practical application of this unit of competency and to show its relevance in a workplace setting. These are found at the end of this unit of competency under the section 'This competency in practice'.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for trial batch mixing	1.1. Identify the job, materials, appropriate procedures and safety requirements 1.2. Record description of the job to be undertaken, compare with specification and report any variations 1.3. Select and prepare tools, equipment and materials in accordance with job requirements 1.4. Confirm the properties and quantities of materials to be used 1.5. Confirm that the required materials are available and ready for use
2. Mix trial batch for evaluation	2.1. Measure out quantities of materials ready for mixing 2.2. Mix the materials according to established procedures 2.3. Discharge the mixture ready for inspection and testing according to established procedures 2.4. Record details of the mix and any observations according to established procedures
3. Evaluate properties of the mixture by inspection and standard test methods	3.1. Obtain representative samples of the mix for testing 3.2. Perform specified tests according to established procedures 3.3. Handle and transport samples in accordance with established procedures 3.4. Label samples and record details in accordance with established procedures
4. Clean equipment and dispose of materials	4.1. Clean mixing, measuring, sampling and testing equipment after use 4.2. Return unused materials to storage 4.3. Dispose of excess materials safely and ethically
5. Maintain records	5.1. Record data in accordance with established procedures 5.2. Maintain equipment records in accordance with established procedures 5.3. Maintain confidentiality of enterprise information
6. Maintain a safe work environment	6.1. Use established safe work practices and personal protective equipment to ensure personal safety and that of other laboratory personnel 6.2. Minimise the generation of wastes and environmental impacts

ELEMENT	PERFORMANCE CRITERIA
	6.3. Ensure safe disposal of laboratory and hazardous wastes 6.4. Clean, care for and store equipment and reagents as required

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Required skills include: • performing simple calculations • making accuratemeasurements of volume and mass • representative sampling • working safely with equipment and hazardous materials • working safely in laboratory and field conditions • setting up and maintaining tools and equipment • using tools and equipment to perform basic sampling and testing techniques • observing and recording information on testing and sampling • handling, transporting and storing materials • observing interpreting and reporting atypical situations
Required knowledge
Required knowledge includes: • the international system of units (SI) • concepts of metrology • the properties of mixing materials and how they affect the properties of the final product • hazards involved with materials and equipment involved • representative sampling • uses of various materials/enterprise products • basic testing methods for relevant materials • enterprise traceability requirements • relevant health, safety and environment requirements

Evidence Guide

EVIDENCE GUIDE	
The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors should ensure that candidates can: • perform operations in accordance with laboratory and/or enterprise procedures, and appropriate legislative requirements • accurately measure, calculate and record batch quantities, concentrations and other relevant parameters • evaluate properties of the mixture by inspection and standard test methods • recognise and report problems and atypical situations to relevant personnel.
Context of and specific resources for assessment	This unit of competency is to be assessed in the workplace or simulated workplace environment. This unit of competency may be assessed with: • *MSL952002A Handle and transport samples or equipment* • *MSL954001A Obtain representative samples in accordance with sampling plan* • *MSL973001A Perform basic tests*. Resources may include: • standard facility with appropriate tools, equipment and materials • enterprise procedures, MSDS and product formulation/specifications.
Method of assessment	The following assessment methods are suggested: • analysis of trial batches prepared by the candidate over a period of time to ensure accurate and consistent work is obtained within required timelines • inspection of workplace documentation completed by the candidate • feedback from peers and supervisors • use of suitable simulation and/or a range of case studies/scenarios.

EVIDENCE GUIDE	
	In all cases, practical assessment should be supported by questions to assess underpinning knowledge and those aspects of competency which are difficult to assess directly. Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability. Access must be provided to appropriate learning and/or assessment support when required. The language, literacy and numeracy demands of assessment should not be greater than those required to undertake the unit of competency in a work like environment.
This competency in practice	Industry representatives have provided the case study below to illustrate the practical application of this unit of competency and show its relevance in a workplace setting. **Construction materials** A laboratory assistant works for a concrete manufacturer. A client requires concrete for a specific project that cannot be supplied using existing standard mixes. The manufacturer must use special aggregates and cement to meet the durability and strength specifications for the project. The laboratory manager obtains quantities of the materials for evaluation purposes. The assistant tests the aggregates to determine their grading properties. From these results, he/she designs a mix to satisfy the project specifications using a standard design method. The mix requires the use of pozzolanic materials and admixtures that were obtained from the suppliers. The manager provides the assistant with the batch quantities required to produce one cubic metre of concrete. To test the mix design, the assistant will produce a 20litre batch in the laboratory. He/she calculates that this quantity will provide sufficient material for the required tests, without undue waste. He/she calculates the quantity of each material required for the trial batch. The assistant selects and prepares the tools and equipment she needs to mix, sample and test the concrete. He/she wears overalls, safety boots and glasses, and uses a barrier cream. He/she measures out

EVIDENCE GUIDE	
	the quantities required for the trial batch, charges the mixer and allows it to mix for the specified time. He/she then discharges the concrete onto a suitable surface. He/she checks its slump, cohesiveness and air content, recording the data on standard enterprise forms. The manager inspects the concrete, and decides that it is over-sanded and has excessive slump. He/she adjusts the batch quantities and draws up amended values. He/she disposes of the excess concrete and cleans the equipment and tools. He/she then mixes a new batch using the amended figures. This process continues until the manager is satisfied with the concrete quality. He/she then mixes a larger batch so that he/she can prepare specimens for testing its hardened-state properties.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Codes of practice	Where reference is made to industry codes of practice, and/or Australian/international standards, it is expected the latest version will be used
Standards, **codes**, **procedures and/or enterprise requirements**	Standards, codes, procedures and/or enterprise requirements may include: • Australian and international standards such as: • AS ISO 1000-1998 The international system of units (SI) and its application • enterprise recording and reporting procedures • enterprise sampling procedures for specific samples, sites and clients • equipment manuals • equipment startup, operation and shutdown procedures • maps and site plans • material safety data sheets (MSDS) • material, production and product/formulation specifications • national measurement regulations and guidelines • production and laboratory schedules • safety procedures • standard operating procedures (SOPs)
Materials, **tools and equipment**	Materials, tools and equipment may include: • soils, concrete, asphalt, aggregates, polymers, ceramics, metals, foodstuffs and solvents • ovens, sieves, balances, volumetric measures and mixers • hand tools, including shovels, scoops and spatulas • consumables, including sample bags and labels • documentation, including specifications,

RANGE STATEMENT	
	manufacturers' handbooks and worksheets • test equipment appropriate to the various materials
Simple calculations	Simple calculations may include: • proportion, ratio and percentage for batch quantities • concentrations • other relevant parameters
Concepts of metrology	Concepts of metrology may include: • that all measurements are estimates • measurements belong to a population of measurements of the measured parameters • repeatability • precision • accuracy • significant figures • sources of error • uncertainty • traceability
Typical problems	Typical problems may include: • not following SOPs • measurement errors • calculation errors • materials of unreliable quality • insufficient mixing • poor sampling procedures • equipment breakdown and breakage
Hazards	Hazards may include: • electric shock • biohazards, such as microbiological organisms and agents associated with soil, air and water • solar radiation, dust and noise • chemicals • sharps, broken glassware and hand tools • flammable liquids and gases • fluids under pressure • manual handling heavy objects • crushing, entanglement and cuts associated

RANGE STATEMENT	
	with moving machinery or falling objects
Safety procedures	Safety procedures may include: • recognising hazard warnings and safety signs • use of personal protective equipment, such as hard hats, hearing protection, sunscreen lotion, gloves, safety glasses, goggles, face guards, coveralls and safety boots • use of MSDS • following established manual handling procedures • regular cleaning and/or decontaminating of equipment and work areas • ensuring access to service shut-off points • identifying and reporting operating problems or equipment malfunctions
Occupational health and safety (OHS) and environmental management requirements	OHS and environmental management requirements • all operations must comply with enterprise OHS and environmental management requirements, which may be imposed through state/territory or federal legislation - these requirements must not be compromised at any time • all operations assume the potentially hazardous nature of samples and require standard precautions to be applied • where relevant, users should access and apply current industry understanding of infection control issued by the National Health and Medical Research Council (NHMRC) and State and Territory Departments of Health

Unit Sector(s)

Unit sector	Testing

Competency field

Competency field	

Co-requisite units

Co-requisite units		