

Operate an excavator

Code OHSCER205A

Workplace Health and Safety Queensland is moving to a new learning and assessment system for certificates to work in prescribed occupations. Learning and assessment will now be conducted in the Vocational Education and Training (VET) sector in which units of competency set out the knowledge and skills needed to demonstrate competent performance in a prescribed occupation.

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Unit of Competency

CODE: OHSCER205A

TITLE: Operate an excavator

DESCRIPTOR: This unit of competency covers the functions required to prepare and operate an excavator to meet minimum training and assessment standards for the purposes of certification. This unit has been developed in accordance with the licensing and assessment requirements of NOHSC:7019 [1992].

This unit involves planning the work for the prevailing working conditions, using the controls and operating systems to manage the operation of the equipment, locating the load and identifying the load characteristics, safely moving the load, monitoring the controls and stopping, shutting down and securing the equipment after the completion of operations.

ELEMENT	PERFORMANCE CRITERIA
1.0 Assess and secure equipment and work area	
1.1 Conduct routine checks	1.1.1 External check of vehicle/equipment is conducted in accordance with manufacturer's specifications or equivalent. 1.1.2 <i>Attachments</i> are inspected to ensure security.
1.2 Plan work	1.2.1 <i>Work area</i> is inspected to identify hazards and appropriate prevention/control measures are implemented to avoid hazards. 1.2.2 <i>Site/non-site personnel</i> are safeguarded (protected) by a variety of measures including the erection of barricades and posting of signs consistent with principles of the hierarchy of prevention/control. 1.2.3 <i>Work area</i> is inspected to determine appropriate path of movement for loads and equipment/vehicles. 1.2.4 <i>Permits</i> required to carry out job are obtained from authorised personnel. 1.2.5 <i>Job requirements</i> are confirmed with relevant site personnel.
1.3 Check controls and equipment	1.3.1 <i>Pre-operational</i> and <i>post start up</i> equipment checks are carried out in accordance with manufacturer's specifications and/or operating manual. 1.3.2 Defects and damage are reported according to site procedures.

Unit of Competency

ELEMENT	PERFORMANCE CRITERIA
2.0 Shift load	
2.1 Shift load	<p>2.1.1 Material is shifted using appropriate <i>equipment</i>.</p> <p>2.1.2 Weight of load is assessed to ensure compliance with <i>equipment</i> load plate specifications.</p> <p>2.1.3 Controls and levers are applied to ensure <i>safe</i> and effective operation of equipment.</p> <p>2.1.4 Speeds of vehicles/equipment are maintained to <i>safe</i> operating limits.</p> <p>2.1.5 Communications are correctly given and interpreted with co-workers and other relevant persons to ensure the application of the principles of the hierarchy of control in the co-ordination of work activity.</p> <p>2.1.6 Loads are placed to ensure stability of material and the avoidance of <i>hazards</i> on site.</p> <p>2.1.7 Emergency procedures are carried out minimising risk to <i>personnel</i>.</p>
3.0 Secure site	
3.1 Shut down equipment	<p>3.1.1 Machinery is parked avoiding equipment <i>hazards</i>.</p> <p>3.1.2 <i>Shut down</i> is conducted in accordance with manufacturer's specification to isolate vehicles.</p> <p>3.1.3 Post operational check is completed in accordance with operational procedures.</p>
3.2 Secure site	<p>3.2.1 Machinery is parked avoiding site <i>hazards</i>.</p>

Unit of Competency

RANGE STATEMENT

The range of variables explains the range of contexts within which the performance and knowledge requirements of this standard may be assessed. The assessment must determine that there is sufficient skill and knowledge for the operator to take the licence and operate in a new workplace. The assessment must be adjustable but prescriptive to ensure transferability.

What may be involved in routine *pre-operational checks* of an excavator?

Pre-operational checks must include, but are not limited to:

- safety devices/alarms
- operating motions
- appropriate lifting gear
- safe working load/working load limit
- log book
- evidence of damage
- visual evidence of structural weaknesses
 - paint separation
 - stressed welds
- approved modifications and/or attachments fitted in accordance with manufacturer's specifications.
- check for adaptations/modifications outside manufacture's specifications.

What range of *attachments* may be used?

Attachments and ancillary equipment may include but are not limited to:

- buckets
- trench excavators
- rock breakers
- lifting attachments
- fork arms
- compacting wheels
- other lifting gear.

What range of excavators may be operated?

Definition of a excavator as explained in the NOHSC:7019 Guideline:

Self-propelled crawler or wheeled machine with an upper structure capable of minimum of 360° rotation which excavates, swings and discharges material by the action of a bucket fitted to the boom and arm or telescoping boom without moving the chassis or undercarriage during any part of the working cycle of the machine.

Enterprise requirements may include but are not limited to:

- standard operating procedures
- industry standards
- production schedules
- material safety data sheets
- work notes and plans
- product labels
- manufacturers specifications
- operators manuals
- enterprise policies and procedures (Including waste disposal, recycling guidelines)

Unit of Competency

- supervisors oral and written instructions
- current state/territory occupational health and safety legislation
- other relevant legislation to operate an excavator (eg. to operate equipment on a public road requires complying with transport legislation in the state operating).
- standards, codes of practice or advisory standards.

What *hazards* may be encountered in the workplace?

Hazards may include, but are not limited to:

- exposure to chemicals
- dangerous or hazardous substances
- movements of equipment
- goods
- electrical service lines
- materials and vehicular traffic.

Operating environment may include but are not limited:

- uneven/unstable terrain
- excavations
- trees
- overhead service lines
- bridges/walkways
- surrounding buildings
- obstructions
- structures
- facilities
- other equipment
- dangerous materials
- hazardous zones
- underground services
- recently filled trenches
- personnel/pedestrians
- lifting equipment
- suspended walkways

What occupational health and safety requirements may be relevant to this standard?

Safe systems and procedures for:

- operation and maintenance of an excavator
- ensuring loads are secure and within working specifications
- identification and avoidance of obstacles during loadshifting operation
- hazard and risk control
- operator position to maintain unobstructed view of load
- handling including lifting and carrying
- manual handling
- the application of emergency/defensive action and techniques for controlling load
- handling, application and storage of hazardous substances
- outdoor work including protection from solar radiation, noise, dust, rubbish
- the protection of people in the workplace
- the appropriate use and maintenance of personal protective equipment
- calculating loads
- using lifting equipment and associated gear to manufacturer's specifications

Unit of Competency

- extreme environment temperatures (hot/cold)
- use of high visibility clothing/reflective vests
- Excavating and moving loads.
- Australian Standard 2550.1 2002 Cranes, hoists and winches – safe use – general requirements

What *permits* may be relevant to this standard?

Any permits required to carry out job activity are obtained from the relevant authorised personnel for example confined spaces, service/utilities providers, chemical or dangerous goods storage, explosives, road/rail.

What *work area* may be relevant to this standard?

Work areas may include but are not limited to:

- wharfs
- ships
- building sites
- road construction
- demolition sites
- quarries and mine sites

What personal protective *equipment* may be relevant to this standard?

This may include but are not limited to:

- boots
- hat/hard hat
- overalls
- gloves
- protective eyewear
- hearing protection
- respirator or face mask
- sun protection
- task specific personal protective equipment
- high visibility clothing.

Unit of Competency

What *job requirements* need to be considered when setting up the excavator?

Job requirements are confirmed with relevant site personnel, ensuring:

- determination of appropriate equipment for operating and lifting requirements
- compliance of job with occupational health and safety practices and site instructions.

What needs to be considered when conducting *post start up* checks?

Post start up checks will be in accordance with manufacturer's specifications and operating instructions/requirements.

Checks may include but are not limited to:

- hazards warning systems, for example lights and horns are functional, audible reversing alarms
- attachments, movements and control functions are smooth and comply with operating requirements
- the operating and emergency controls and safety devices are located, identified and tested in accordance with manufacturers specifications
- communication signals to be confirmed with appropriate personnel
- defects and damage are reported according to site procedures.

How might the operation of a excavator be demonstrated in a *safe*, controlled and correct manner?

- appropriate selection and use of equipment controls
- features
- settings and operational techniques for the specific terrain and weather conditions in the day or night on varying infield terrain without causing damage to machinery
- equipment
- load
- person
- property or environment (including soils and property structures).

Correct operation includes using appropriate methods to loadshifting enterprise standards so that corrective actions, including defensive techniques are implemented.

To operate a excavator the person must be competent/qualified in accordance with regulatory requirements.

Who are *site/non-site personnel*?

Non site personnel may include but are not limited to:

- members of the public
- visitors to the site
- delivery driver.

Site personnel may include but are not limited to:

- employees
- contractors
- management
- students.

Unit of Competency

What types of *equipment* may be associated with excavator?

- wire slings
- chain slings
- synthetic slings
- shackles

Equipment may include but is not limited to that specified in the current version of Australian Standard 2359.1 1995 Powered Industrial Trucks – General Requirements and 1666.1 1995 Wire-Rope Slings – Product Specifications.

What procedures will be included in the *shut-down* of a excavator and securing of site and will include but not limited to securing the plant:

The excavator is shut down in accordance with manufacturers' instructions ensuring:

- park in suitable location from danger areas
- motion locks and brakes are applied
- defective equipment is identified and segregated and reported to supervisor
- equipment is correctly stowed
- lower bucket/attachments to ground
- secure against unauthorised operation
- secure site in accordance with workplace procedures

What *records* may need to be kept or updated?

Record may include but not limited to:

- log books
- maintenance and repair records
- records of faults and potential faults.

Unit of Competency

Evidence Guide

What evidence is required to demonstrate competence for this standard as a whole?

The evidence guide identifies the critical aspects, knowledge and skills to be demonstrated to confirm competency for this unit. This is an integral part of the assessment of competency and should be read in conjunction with the performance criteria, the range statement and the assessment guidelines.

Competence in this standard requires evidence of the ability to utilise the components and controls of an excavator to carry out operations without damage to the excavator, vehicles, loads, property or injury to people. It requires the ability to conduct pre-start and shut-down procedures to ensure mechanical reliability, communicate and cooperate with other personnel such as co-workers, general public, prevent spillage of load, demonstrate emergency operating procedures and maintain operating records.

What **critical aspects** of evidence are required to demonstrate competency in this unit?

- Location, interpretation and application of relevant information, standards and specifications.
- Compliance with the site safety plan and occupational health and safety legislation/regulations/codes of practice applicable to workplace operations.
- Compliance with organisational policies and procedures including quality requirements.
- Safe and effective operational use of tools, plant and equipment.
- Communication and working effectively and safely with others.

What **specific knowledge** is needed to achieve the performance criteria?

- Components, controls and features of excavators and their functions.
- Operating principles and operating methods.
- Legislative requirements with regard to licensing.
- Loadshifting processes and procedures.
- Principles of the safe removal of obstacles and hazards from the workplace.
- The hierarchy of hazard control measures with elimination of substitution, isolation and engineering control measures being selected before safe work practices and personal protective equipment.
- Workplace communication procedures.
- Obtain licences and permits eg. if equipment is to be driven on a public road.
- Demonstrate safe and environmentally responsible workplace practices.
- Electrical hazards

What **specific skills** are needed to achieve the performance criteria?

- Readily familiarise self with local conditions.
- Perform routine safety, basic service and maintenance procedures on excavators.
- Demonstrate emergency operating procedures.
- Read and interpret site planning, operators' manuals, manufacturers' specifications, work and maintenance plans and material safety data sheets.
- Communicate faults, malfunctions and workplace hazards, reports and maintain operational records.
- Comprehend and apply task instructions.
- This work may include deciding on a method to move loads and communicating these ideas to supervisor.
- Working with other plant operators and personnel to move and place loads.
- Emergency situations
- Able to listen and understand job requirement.

Unit of Competency

- Understand written documents for job processes.
- Understand tables and figures for job procedures.
- Understand interrelationship among workplace processes and procedures in the English language.
- Understand and interpret signals and instructions in the English language.
- Hand/eye co-ordination.

What **methods of** assessment should apply?

- Assessment methods must confirm consistency and accuracy of performance together with application of underpinning knowledge.
- Assessment must include as a minimum the achievement of competence to the standard established in the NOHSC assessment instrument. Additional requirements may need to be achieved to comply with the AQTF including key competencies.
- Assessment methods must confirm the ability to access and correctly interpret and apply the essential underpinning knowledge.
- Assessment must be applied in a real work environment or replicated industrial workplace.

In what **context** should the assessment occur?

- The application of competency is to be assessed in the workplace or replicated industrial workplace.
- Assessment is to occur using standard and authorised work practices including safety equipment and environmental constraints.
- Assessment of essential underpinning knowledge, other than the confirmatory questions, will usually be conducted in an off-site context.
- Assessment is to comply with relevant regulatory requirements including specific Australian Standards.

What are the **specific resource requirements** for this unit?

- Workplace location or replicated work facility in accordance with the OHS instrument relating to the OHS jurisdiction.
- Tools and equipment appropriate to loadshifting
- Specifications and work instructions
- Appropriate excavator
- Communication equipment (radios) (where applicable)
- Occupational Health and Safety Certification Training and Assessment Delivery Guide
- Occupational health and safety assessment instruments
- Occupational health and safety authority learner guide
- Occupational health and safety authority trainer guide.

Unit of Competency

How should key competencies be applied to this unit of competency?

There are a number of processes that are learnt throughout work and life which are required in all jobs. They are fundamental processes and generally transferable to other work functions. Some of these are covered by the **key competencies**, although others may be added. The questions below highlight how these processes are applied in this competency standard. Following each question a number in brackets indicates the performance level to which they key competency needs to be demonstrated where:

0 = not required

1 = perform the process

2 = perform and administer the process

3 = perform, administer and design the process

1. How can communication of ideas and information be applied?	This may involve the application of communication and co-operation between operator and other relevant persons to ensure the application of the hierarchy of control in the co-ordination of work activity. Level 1
2. How can information be collected, analysed, and organised ?	Information with regard to performance, faults and maintenance may be observed and monitored for analysis and organised by records, maintenance logs, logbooks and reports. Level 1
3. How can activities be planned and organised ?	Activities involving planning the work and hazard identification may be planned or coordinated around work schedules, or sequenced as required. Planning required in working with operators and operators of associated equipment. Level 1
4. How can team work be applied?	Team work may be applied in communication methods and procedures to work cooperatively with maintenance officers, vehicle drivers, operators and operators of associated loadshifting equipment. Level 1
5. How can the use of mathematical ideas and techniques be applied?	Mathematics may be applied in the calculation of load masses to ensure a excavator is operated within safe working load/working load limit. Level 1
6. How can problem solving skills be applied?	Contingencies for changed or difficult operating conditions or to control spillage/damage. Level 1
7. How can the use of technology be applied?	To access, communicate, measure and record information with regard to maintenance, usage and performance of loadshifting job requirements. Level 1

Are there any other competency standards that could be assessed with this one?

This competency standard could be assessed on its own or in combination with the other units of competency relevant to the job function.

There is essential information about assessing this competency standard for the consistent performance and where and how it may be assessed in the Assessment Guideline developed by the National Occupational Health and Safety Commission. All users of this competency standard must have access to this guideline.