

Operate concrete placing booms

Code OHSCER236A

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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CODE: OHSCER236A

TITLE: Operate concrete placing booms

DESCRIPTOR: This unit of competency covers the functions required to operate concrete placing booms 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:1006 [2001].

This unit involves assessing and securing equipment and work area, pumping concrete and setting up and dismantling boom.

| Element | Performance Criteria |
|--|---|
| 1.0 Assess and secure equipment and work area | |
| 1.1 Conduct routine checks | <p>1.1.1 Routine pre-operational equipment <i>checks</i> are carried out in accordance with the checklist provided for the boom.</p> <p>1.1.2 The service log book for the crane is checked to ensure all service requirements have been met and action taken as required.</p> <p>1.1.3 Prior to operation, <i>equipment</i> and <i>site</i> area are visually checked for any evidence of damage, structural weakness or interference, and any faults reported to an authorised person for corrective action.</p> |
| 1.2 Plan Work | <p>1.2.1 A <i>workplace</i> operations plan is developed in consultation with the relevant authorised workplace personnel. The plan takes into account job requirements, priorities, workplace rules and procedures, identified hazards and hazard control measures.</p> <p>1.2.2 <i>Site</i> hazards including are identified and correct hazard control strategies developed in accordance with the appropriate Australian Standard</p> <p>1.2.3 Plans for emergency <i>procedures</i> take into account the location of first aid and fire fighting equipment, amenities and access/egress points in the workplace.</p> <p>1.2.4 Precautions are taken to accommodate the effects of weather conditions in accordance with the appropriate Australian Standard. This includes, where necessary, deciding to abort crane operation where weather conditions exceed acceptable limits.</p> <p>1.2.5 The operations plan ensures that the <i>work area</i> is correctly illuminated.</p> <p>1.2.6 The boom's load chart is located and information on permissible loads, radii, weights, boom and jib configurations noted and taken into account in operational plans.</p> <p>1.2.7 The signals and signalling systems to be used are confirmed with associated personnel.</p> |

| Element | Performance Criteria |
|----------------------------------|--|
| 1.2 Plan Work (cont'd) | 1.2.8 The use of safety tags on electrical switches/isolators (where relevant) is noted and correct <i>hazard</i> control procedures developed in consultation with authorised personnel. |
| 1.3 Check controls and equipment | 1.3.1 The boom is started in accordance with equipment <i>procedures</i> and checks made for any abnormal noise or movement. Any abnormal operation is reported to an authorised person for corrective action. 1.3.2 The operating and emergency controls and safety devices are located and identified and their correct operation tested in accordance with prescribed procedures. 1.3.3 All communication <i>equipment</i> , lighting and alarm systems are checked for correct operation. 1.3.4 Defective controls, communication equipment, safety devices, lighting, or alarms are reported to authorised personnel for corrective action and the defects entered into the crane's service log book. 1.3.5 All <i>equipment</i> components are checked. Defective equipment is identified and segregated and reported to an authorised person for disposal, repair and/or replacement. 1.3.6 All pumping lines are checked to ensure that they are properly secured to the boom and structures and appropriate corrective action taken as required. 1.3.7 Planned <i>hazard</i> control strategies are implemented including the securing of the safety chain to the placing hose. |
| 1.4 Shut down boom | 1.4.1 The boom is <i>shut down</i> using the correct sequence of procedures in accordance with manufacturer's instructions. 1.4.2 Routine pre-operational equipment <i>checks</i> are carried out in accordance with the checklist provided for the boom. 1.4.3 Pumping lines and <i>equipment</i> are cleaned using sponges, compressed air and water. 1.4.4 All <i>equipment</i> is checked in consultation with associated personnel for any signs of wear or damage. 1.4.5 All defective <i>equipment</i> is segregated and reported to an authorised person for corrective action and/or replacement. 1.4.6 The boom and <i>equipment</i> are correctly stowed and secured in accordance with manufacturer's instructions. |

| Element | Performance Criteria |
|--------------------------|--|
| 1.4 Shut down boom | 1.4.7 Planned <i>hazard</i> control strategies are implemented, particularly communication procedures during the cleaning of pumping lines and equipment. |
| 2.0 Pump concrete | |
| 2.1 Prepare boom | 2.1.1 Boom is configured so that it can adequately cover the job while avoiding obstructions. 2.1.2 Supports are placed under boom arms while working on pressure valves, cylinders or hydraulic lines. 2.1.3 Concrete is checked to ensure that it meets job specifications and appropriate corrective action taken where it fails to meet specifications. 2.1.4 Planned <i>hazard</i> control strategies are implemented particularly the securing of pumping lines to boom and structures and the use of a safety chain on the placing hose. |
| 2.2 Operate boom | 2.2.1 The boom is pumped in accordance with manufacturers' instructions and relevant statutory regulations. 2.2.2 All required signals are correctly given and interpreted as planned. 2.2.3 Blockages are identified and cleared in accordance with manufacturers specifications and accepted industry practice. 2.2.4 Fault conditions are identified and appropriate corrective action taken in accordance with established procedures. 2.2.5 Before maintenance or repairs are undertaken, the engine (or driver) is switched off and made safe and the line system relieved of pressure. 2.2.6 Planned <i>hazard</i> control strategies are implemented. |

| Element | Performance Criteria |
|--------------------------------------|--|
| 3.0 Set up and dismantle boom | |
| 3.1 Plan assembly/dismantling | 3.1.1 A suitable unobstructed level workplace site with firm and level standing is selected for the locations of the boom. 3.1.2 The qualifications of person(s) authorised to supervise the boom erection/dismantling are checked to verify they hold the required certificates of competency. 3.1.3 Planned procedures for both the assembly and dismantling of the boom are developed. |
| 3.2 Set up boom | 3.2.1 The planned procedures for the assembly of the boom are carried out in accordance with manufacturer's instructions, and relevant parts of relevant statutory regulations. 3.2.2 Any outriggers and stabilisers are correctly deployed in accordance with manufacturer's instructions. 3.2.3 Plates or packing are correctly used under the footplates, as required, to adequately distribute the loading to ensure that the bearing capacity of the crane standing is not exceeded. 3.2.4 In the case of climbing tower-type booms, manufacturer's instructions for assembly are implemented and the structure confirmed as ready for climbing against manufacturer's specifications. |
| 3.3 Dismantle boom | 3.3.1 The planned <i>procedures</i> for the dismantling of the boom are carried out in accordance with manufacturer's instructions and relevant statutory regulations. 3.3.2 Any outrigger and stabilisers are secured and stowed in accordance with manufacturer's instructions. 3.3.3 Planned <i>hazard</i> control measures are implemented. |

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 *checks* of concrete placing booms?

Plan and prepare

Planning and preparation is to include but not be limited to:

- worksite inspection
- equipment defect identification
- assessment of conditioning
- hazards
- determination of work requirements.

The concrete placing boom is subject to erection and commissioning documentation prior to operation.

Operations may include but not be limited to:

- extending boom in and out
- slew left and right
- operate outriggers
- boom up and down
- operate attachments.

Pre-start

- Pre start checks must follow manufacturer's recommendations, Australian Standards and guidelines.
- Inspect concrete placing boom and lifting gear for defects
- Ensure written documents are completed.
- Establish exclusion zones with barricades if necessary.
- Ensure relevant permits, authority to work are obtained.

Post-start

- Follow manufacturers' specifications and operating equipment.
- Checks may include but not limited to hazards warning systems, for example lights and horns are functional.
- Attachments, movement and control functions are smooth and comply with operating requirements.
- The operating, emergency controls and safety devices are located and identified and correctly tested in accordance with manufacturers' specifications.
- Communication signals to be confirmed with appropriate personnel.
- Defects and damage are reported according to site procedures.

Workplace 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
- enterprise policies and procedures (Including waste disposal, recycling guidelines)
- supervisors oral and written instructions
- current state/territory occupational health and safety legislation
- Australian standards
- codes of practice or advisory standards.

What *hazards* may be encountered in the workplace?

Hazards may include but not limited to:

- exposure to chemicals
- dangerous or hazardous substances
- explosive materials
- movements of equipment
- goods
- materials
- vehicular traffic.

Operating moving may include but not be limited to:

- overhead power lines
- trees
- overhead service lines such as steam, gas, water, telephone
- underground services
- uneven and/or unstable ground
- allowable floor loading as appropriate
- other workers and persons
- surrounding buildings
- vessels/structures equipment
- hazardous materials
- corrosive substances
- barricades
- explosive materials
- inadequate lighting
- radio interference
- inclement weather.

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

Site/occupational health and safety requirements are to include but not be limited to:

- safe systems and procedures within working specifications
- identification and avoidance of obstacles during operation
- hazard and risk control
- operator position to maintain unobstructed view
- handling including lifting of concrete boom
- manual handling
- the application of emergency/defensive action and techniques for controlling loads
- application and storage of hazardous substances
- outdoor work including protection from solar radiation
- noise
- dust
- rubbish
- protection of people in the workplace
- appropriate use and maintenance of personal protective equipment
- using lifting boom and associated gear to manufacturers specifications
- extreme environment temperatures (hot/cold)
- use of high visibility clothing/reflective vests
- traffic management
- barricades.

Safe operating *procedures* are to include but not be limited to:

- conduct of operational risk assessment and treatments associated with power cables (including overhead service trays, cables and conduits)
- lighting
- trip hazards
- working with dangerous materials
- working in confined spaces
- surrounding structures
- restricted access barriers.

Emergency procedures related to equipment operation are to include but may not be limited to:

- emergency shutdown and stopping
- extinguishing equipment fires
- organisational first aid requirements
- evacuations.

What permits may be relevant to this standard?

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

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

Work areas may include but not be limited to:

- factories
- wharfs
- ships
- warehouses
- manufacturing plants
- building sites
- road construction
- demolition sites
- quarries
- mine sites

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

This may include but not be limited to:

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

What needs to be considered for personal/public safety?

Site/non site *personnel* are safeguarded (protected) by a variety of measures including:

- the erection of barricades
- posting of signs
- traffic control consistent with principles of the hierarchy of control.
- appropriate equipment is selected to ensure personnel safety and protection.

Who are site/non site *personnel*?

Non site personnel may include but not limited to:

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

Site *personnel* may include but not limited to:

- employees
- contractors
- management or students.

How might the operation of a concrete placing boom be demonstrated in a safe, controlled and correct manner?

Appropriate selection and use of:

- boom
- features
- settings and operational techniques for the specific settings, 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 load-shifting enterprise standards so that corrective actions including defensive techniques are implemented.

What procedures may be included in the *shut down* of a concrete placing and securing of site?

The concrete placing boom is shut down in accordance with manufacturers' instructions including:

- boom is correctly stored in accordance with manufacturer's requirements
- inspect, stow and secure all relevant equipment – attachments
- defective equipment is identified and segregated and reported to supervisor and logged and tagged
- lock equipment and remove key.

What records may need to be kept or updated?

- log books
- maintenance records
- records of faults and potential faults
- repairs carried out according to manufacturers specifications and operating procedures.

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 operate a concrete placing boom without damage or injury to property or people. It requires the ability to plan job, select and inspect material and tools and move loads.

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/advisory standards 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.
- The exercising of judgment in relation to the suitability and condition of boom and associated equipment.

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

- Operating principles and operating methods
- Legislative requirements with regard to licensing.
- General construction terminology
- Concrete placing boom 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.
- Demonstrate safe and environmentally responsible workplace practices.
- Processes for the calculation of material requirements.
- Understanding limitations of equipment
- Designs and functions of concrete placing boom
- Safe working load tags.
- Obtain licenses and permits.
- Demonstrate safe and environmentally responsible workplace practices.

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

- Readily familiarise self with local conditions.
- Demonstrate emergency operating procedures.
- Read and interpret site planning, manufacturers' specifications, work and maintenance plans and material safety data sheets.
- Comprehend and apply task instructions.
- Working with other plant operators.
- Emergency situations
- Able to listen and understand job requirement.
- 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.
- Identify and eliminate defective equipment and/or gear.

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 concrete placing boom
- Specifications and work instructions
- Appropriate concrete placing boom
- 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.

What key competencies should 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 covered by the key competencies, although other may be added. The questions below highlight how these processes are applied in this competency standard. Following each question is the number in brackets indicates the level to which the key competency needs to be demonstrated where:

0 = not required

1 = perform the process

2 = perform and administer the process

3 = performance, administer and design the process

| | |
|---|---|
| 1. How can communication of ideas and information be applied) | Communicate ideas and information orally and in writing in simple English to enable confirmation of work requirements, passage of information and requests to other workers during operations and the reporting and recording of work outcomes. <p style="text-align: right;">Level 1</p> |
| 2. How can information be collected, analysed and organised? | Collect, organize, interpret and understand the information required for operating a concrete placing boom including work instructions, plans, sketches, diagrams, safety instructions, labels, quality procedures, manufacturers instructions, material safety data sheets and equipment instructions <p style="text-align: right;">Level 1</p> |
| 3. How can activities be planned and organised? | Conduct activities associated with operating a concrete placing boom including the coordination and use of equipment, materials and tools to avoid back tracking and rework. <p style="text-align: right;">Level 1</p> |
| 4. How can team work be applied? | Work with others and in a team by recognizing dependencies and using co-operative approaches to optimize satisfaction and productivity. <p style="text-align: right;">Level 1</p> |
| 5. How can the use of mathematical ideas and techniques be applied? | Use mathematical ideas and techniques to correctly calculate time to complete tasks, estimate measurements, distances and levels, calculate material requirements and establish quality checks. <p style="text-align: right;">Level 1</p> |
| 6. How can problem solving skills be applied? | Establish safe and effective work processes which anticipate likely problems and blockages and systematically work around those to avoid or minimize reworking and avoid wastage. <p style="text-align: right;">Level 1</p> |
| 7. How can the use of technology be applied | Use workplace technology related to operating a crane including the use of calculators, the use of communication devices and the reporting and/or recording of results. <p style="text-align: right;">Level 1</p> |

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.

It is strongly recommended people wishing to undertake this unit possesses dogging competencies and relevant current industry experience. This may be demonstrated through a log book or record of training.

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.