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BCCFW3001B Construct underpinning

Unit Descriptor

This unit specifies the competency required to prepare, set out and construct underpinning to strengthen concrete structures. It includes the minimum criteria for competency assessment.

This unit includes the extension of footings to bridges, buildings and other horizontal or vertical structures.

Employability Skills

The required outcomes described in this Unit of Competency contain applicable facets of employability skills. The Employability Skills Qualification Summary for the qualification in which this Unit of Competency is packaged will assist in identifying employability skill requirements.

Element Performance Criteria

Elements define the essential outcomes of a unit of competency.

1 Plan and prepare

1.1 Work instructions, including plans, specifications, quality requirements and operational details are obtained, confirmed and applied to the allotted task

1.2 Safety requirements are obtained from the site safety plan and organisational policies and procedures, confirmed and applied to the allotted task

1.3 Signage requirements are identified and obtained from the project traffic management plan and implemented

1.4 Plant, tools and equipment selected to carry out tasks are consistent with the requirements of the job, checked for serviceability and any faults are rectified or reported

1.5 Environmental protection requirements are identified from the project environmental management plan, confirmed and applied to the allotted task
<table>
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<tr>
<th>Step</th>
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<tr>
<td>2</td>
<td>Set out and prepare sections</td>
</tr>
<tr>
<td>2.1</td>
<td>Underpinning requirements for adjoining properties and roadways are identified from site drawings, survey of the surrounding construction and recorded</td>
</tr>
<tr>
<td>2.2</td>
<td>Sections and sequence of excavations are identified from the planned schedule for underpinning and implemented</td>
</tr>
<tr>
<td>2.3</td>
<td>Existing shoring system is checked for soundness and conformation to specifications and design requirements</td>
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<td>2.4</td>
<td>Sections for excavation are set out to underpinning specifications and schedule</td>
</tr>
<tr>
<td>2.5</td>
<td>Areas for excavation and surrounding working space requirements are identified and protected to provide safe working area</td>
</tr>
<tr>
<td>2.6</td>
<td>Barricades and signage are erected, where required, in accordance with the site safety plan</td>
</tr>
<tr>
<td>2.7</td>
<td>Plant and equipment is positioned for excavations</td>
</tr>
<tr>
<td>3</td>
<td>Excavate sections</td>
</tr>
<tr>
<td>3.1</td>
<td>Designated sections are excavated to the designed depth of footings</td>
</tr>
<tr>
<td>3.2</td>
<td>Trench and excavation support is installed in accordance with soil characteristics, safety considerations and the job safety analysis</td>
</tr>
<tr>
<td>4</td>
<td>Construct underpinning</td>
</tr>
<tr>
<td>4.1</td>
<td>Underpinning is constructed in accordance with job specifications</td>
</tr>
<tr>
<td>4.2</td>
<td>Excavated sections are backfilled to specifications</td>
</tr>
<tr>
<td>4.3</td>
<td>Alternate sections are underpinned in sequence according to underpinning schedule</td>
</tr>
<tr>
<td>5</td>
<td>Clean up</td>
</tr>
<tr>
<td>5.1</td>
<td>Work area is cleared and materials disposed of or recycled in accordance with project environmental management plan</td>
</tr>
<tr>
<td>5.2</td>
<td>Plant, tools and equipment are cleaned, checked, maintained and stored in accordance with manufacturers’ recommendations and standard work practices</td>
</tr>
</tbody>
</table>
Range Statement

The Range Statement provides advice to interpret the scope and context of this unit of competency allowing for differences between enterprises and workplaces. It relates to the unit as a whole and facilitates holistic assessment. The following variables relate to this particular unit:

Unit scope

- Types of underpinning are to include but not be limited to drilled and excavated
- Underpinning requirements may include but not be limited to land subsidence due to water ingress, to increase structural stability and the preparation for additions to structures
- Shoring systems may include but not be limited to sheet piling, trench shields and timber sets
- Soil types may include but not be limited to sand, rock, clay, shale, gravel and silt
- Traffic control signage may include but not be limited to escort vehicle, highway traffic signs, site safety signage, temporary signage for the benefit of motorists and pedestrians, barricades, and traffic conditions signage
- Planning and preparation is to include but not be limited to worksite inspection, equipment defect identification, assessment of conditions and hazards and determination of work requirements
- Traffic conditions may include but not be limited to congested urban environments, low traffic rural areas, off-road un-trafficked areas, buildings, parking sites and pedestrian areas

Safety (OH&S)

- OH&S requirements are to be in accordance with State or Territory legislation and regulations, organisational safety policies and procedures, and project safety plan. This may include protective clothing and equipment, use of tools and equipment, workplace environment and safety, handling of materials, use of fire fighting equipment, use of first aid equipment, hazard control and hazardous materials and substances
Safety (OH&S) (continued)

- Personal protective equipment is to include that prescribed under legislation, regulation and workplace policies and practices
- Hazards and risks may include but not be limited to uneven/unstable terrain, trees, fires, overhead and underground services, bridges, buildings, excavations, traffic, embankments, cuttings, structures and hazardous materials
- Emergency procedures related to this unit are to include but may not be limited to emergency shutdown and stopping, extinguishing fires, organisational first aid requirements and evacuation
- Safe operating procedures are to include but not be limited to recognising and preventing hazards associated with overhead and underground services, other machines, personnel, restricted access barriers, traffic control, working at heights, working in proximity to others, worksite visitors and the public

Environmental Requirements

- Environmental requirements are to include but are not limited to organisational/project environmental management plan, waste management, water quality protection noise vibration, dust and clean-up management

Quality Requirements

- Quality requirements may include but not limited to dimensions, tolerances, standards of work and material standards as detailed in the project drawings, specifications and project documentation to meet client satisfaction

Statutory/Regulatory Authorities

- Statutory/Regulatory Authorities may include Federal, State and Local Authorities

Tools and equipment

- Tools and equipment are to include but not limited to compressors, fittings and hoses, pneumatic picks and jack hammers, pumps and may include winches

Materials

- Materials may include but not limited to timber, reinforced concrete, concrete grout and select rock

Communications

- Communications are to include but not limited to verbal instructions and fault reporting and may include two way radio, hand signals, mobile phone, site specific instructions, written instructions or instructions related to job/task
Information

- Information sources may include but not be limited to verbal or written and graphical instructions, signage, work schedules/plans/specifications, work bulletins, charts and hand drawings, memos, maps, material safety data sheets (MSDS), diagrams or sketches and graphics
- Safe work procedures or equivalent related to the underpinning construction
- Regulatory/legislative requirements pertaining to the underpinning construction
- Manufacturers’ specifications and instructions
- Organisation work specifications and requirements.
- Instructions issued by authorised organisational or external personnel
- Relevant Australian Standards

Evidence Guide

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 of the Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

- Location, interpretation and application of relevant information, standards and specifications
- Compliance with site safety plan, OH&S regulations and State/Territory legislation applicable to workplace operations
- Compliance with organisational policies and procedures including quality requirements
- Construction of underpinning for a minimum of two projects, one using drilling techniques and one using excavation techniques to the required job specifications
- Safe and effective operational use of plant, tools and equipment
- Communication and working effectively and safely with others
Relationship to other units

- Pre-requisite units are:
  - BCCCM1001C Follow OH&S policies and procedures

  Competency in this unit may be assessed in conjunction with other functional units which together form part of the holistic work role.

Specific knowledge required to achieve the performance criteria

- A knowledge of
  - Site and equipment safety requirements
  - Foundation work
  - Civil construction terminology
  - Underpinning techniques
  - Construction principles
  - Processes for interpreting engineering drawings
  - Soil, sand, rock, clay, shale, gravel and silt types and characteristics
  - Water erosion
  - Equipment types, characteristics, technical capabilities and limitations
  - Operational, maintenance and basic diagnostic procedures
  - Site isolation and traffic control responsibilities and authorities
  - Materials Safety Data Sheets and materials handling methods
  - Project quality requirements
  - JSA’s/Safe work method statement

The context of assessment

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

Methods of assessment

- Assessment must satisfy the endorsed assessment guidelines of the Building and Construction industry’s Civil Construction Training Package
- Assessment methods must confirm consistency and
accuracy of performance together with application of underpinning knowledge

- Assessment must be by direct observation of tasks, with questioning on underpinning knowledge
- Assessment methods must confirm the ability to access and correctly interpret and apply the essential underpinning knowledge
- Assessment may be applied under project related conditions (real or simulated) and require evidence of process
- Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances
- Assessment may be in conjunction with assessment of other units of competency, including those listed above

Specific resource requirements for this unit
- The following resources should be made available:
  - workplace location or simulated workplace
  - materials relevant to construct underpinning
  - hand and power tools, plant and equipment appropriate to construct underpinning
  - specifications and work instructions

... End ...
BCCFW3002B Install temporary and permanent rock anchors

Unit Descriptor

This unit specifies the competency required to prepare and install temporary and permanent rock anchors to prevent wall and roof collapse. It includes the minimum criteria for competency assessment.

This unit includes the stabilisation of rock, clay and other unstable materials where a designed loading is imposed on the anchor.

Employability Skills

The required outcomes described in this Unit of Competency contain applicable facets of employability skills. The Employability Skills Qualification Summary for the qualification in which this Unit of Competency is packaged will assist in identifying employability skill requirements.

Element Performance Criteria

Elements define the essential outcomes of a unit of competency.

1 Plan and prepare

1.1 Work instructions, including plans, specifications, quality requirements and operational details are obtained, confirmed and applied to the allotted task

1.2 Safety requirements are obtained from the site safety plan and organisational policies and procedures, confirmed and applied to the allotted task

1.3 Signage requirements are identified and obtained from the project traffic management plan and implemented

1.4 Plant, tools and equipment selected to carry out tasks are consistent with the requirements of the job, checked for serviceability and any faults are rectified or reported

1.5 Environmental protection requirements are identified from the project environmental management plan, confirmed and applied to the allotted task

2 Set up and prepare anchor holes

2.1 Location, type and installation requirements of anchors are identified from site structural design drawings or visually

2.2 Work area is isolated from other site operations

2.3 Location of anchor holes are determined from surveyor’s set out

2.4 Drill rig is established in position and set to correct angle
<p>| | | |</p>
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</thead>
</table>
| 2 | Set up and prepare anchor holes (continued) | 2.5 Holes are drilled to specified diameter and depth  
|   |   | 2.6 Holes are cleaned through the water flushing process  
|   |   | 2.7 Bond length of holes for permanent anchors are water tested for leakage to specified rate and grouted, re-drilled and retested  
|   |   | 2.8 Holes are temporarily covered to prevent entry of foreign material  
| 3 | Install anchors to anchor holes | 3.1 Components are checked to verify conformity with job requirements  
|   |   | 3.2 Anchors are greased, sheathed and assembled to specifications  
|   |   | 3.3 Temporary anchors are prepared to specifications with spacers and grout tubes fitted  
|   |   | 3.4 Permanent anchors are prepared to specifications with spacers and grout tubes fitted and external polyethylene sheath prepared  
|   |   | 3.5 Anchors and sheaths are carefully installed to full depth, without damage to specifications  
|   |   | 3.6 Grouting plant and flow monitoring apparatus is set up to design requirements  
|   |   | 3.7 Grout is mixed and pumped into hole to specifications  
| 4 | Set up anchorage assembly and stress anchors | 4.1 Anchorage is placed correctly using packing materials as specified  
|   |   | 4.2 Anchors are stressed to nominated loads  
|   |   | 4.3 Anchors are locked off to nominated loads as designed  
|   |   | 4.4 Mesh is installed to job specification  
|   |   | 4.5 Shotcrete is applied to design depth and tolerance and job specification  
|   |   | 4.6 Permanent anchors are monitored at scheduled intervals to determine and record anchor’s residual load  
|   |   | 4.7 Anchors are cut where required and sealed to specification requirements  
| 5 | Clean up | 5.1 Work area is cleared and materials disposed of or recycled in accordance with project environmental management plan  
|   |   | 5.2 Plant, tools and equipment are cleaned, checked, maintained and stored in accordance with manufacturers’ recommendations and standard work practices  

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Range Statement

The Range Statement provides advice to interpret the scope and context of this unit of competency allowing for differences between enterprises and workplaces. It relates to the unit as a whole and facilitates holistic assessment. The following variables relate to this particular unit:

Unit scope

- Types of anchors are to include but not be limited to anchor bolts, cable anchoring, spiling bars and may include grouted anchors and bolts, mechanically anchored bolts and dowels
- Anchoring requirements are to include but not be limited to ground stabilisation, roof and wall support and may include stressing
- Temporary anchorages are to include but not be limited to construction processes, stability for temporary structures and stability to operating plant
- Soil types may include but not be limited to sand, rock, clay, shale, gravel and silt
- Traffic control signage may include but not be limited to escort vehicle, highway traffic signs, site safety signage, temporary signage for the benefit of motorists and pedestrians, barricades, and traffic conditions signage
- Planning and preparation is to include but not be limited to worksite inspection, equipment defect identification, assessment of conditions and hazards and determination of work requirements
- Traffic conditions may include but not be limited to congested urban environments, low traffic rural areas, off-road un-trafficked areas, buildings, parking sites and pedestrian areas
- Site locations may include but not be limited to cuttings, tunnels and embankments
Safety (OH&S)

- OH&S requirements are to be in accordance with State or Territory legislation and regulations, organisational safety policies and procedures, and project safety plan. This may include protective clothing and equipment, use of tools and equipment, workplace environment and safety, handling of materials, use of fire fighting equipment, use of first aid equipment, hazard control and hazardous materials and substances

- Personal protective equipment is to include that prescribed under legislation, regulation and workplace policies and practices

- Safe operating procedures are to include but not be limited to recognising and preventing hazards associated with overhead and underground services, other machines, personnel, traffic control, working in proximity to others, worksite visitors and the public

- Hazards and risks may include but not be limited to uneven/unstable terrain, trees, fires, overhead and underground services, bridges, buildings, excavations, traffic, embankments, cuttings, structures and hazardous materials

- Emergency procedures related to equipment operation are to include but may not be limited to emergency shutdown and stopping, extinguishing fires, organisational first aid requirements and evacuation

Environmental Requirements

- Environmental requirements are to include but not be limited to organisational/project environmental management plan, waste management, water quality protection, noise, vibration, dust and clean-up management

Quality Requirements

- Quality requirements may include but not limited to dimensions, tolerances, standards of work and material standards as detailed in the project drawings, specifications and project documentation to meet client satisfaction

Statutory/Regulatory Authorities

- Statutory/Regulatory Authorities may include Federal, State and Local Authorities

Tools and equipment

- Tools and equipment are to include but not limited to compressors, pneumatic tools, spanners, drilling rigs and attachments and grouting rigs
Materials
- Materials may include but not limited to anchor bolts, spiling bars, steel cables and ribbed steel bards

Communications
- Communications are to include but not limited to verbal instructions and fault reporting and may include two way radio, hand signals, mobile phone, site specific instructions, written instructions or instructions related to job/task

Information
- Information sources may include but not be limited to verbal or written and graphical instructions, signage, work schedules/plans/specifications, work bulletins, charts and hand drawings, memos, maps, material safety data sheets (MSDS) and diagrams or sketches
  - Safe work procedures or equivalent related to the installation of temporary and permanent rock anchors
  - Regulatory/legislative requirements pertaining to the installation of temporary and permanent rock anchors
  - Manufacturers’ specifications and instructions
  - Organisation work specifications and requirements.
  - Instructions issued by authorised organisational or external personnel
  - Relevant Australian Standards
Evidence Guide

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 of the Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

- Location, interpretation and application of relevant information, standards and specifications
- Compliance with site safety plan, OH&S regulations and State/Territory legislation applicable to workplace operations
- Compliance with organisational policies and procedures including quality requirements
- Installation of a minimum of ten permanent anchor bolts, finished with mesh and shotcrete
- Installation of a minimum of ten temporary anchor bolts
- Safe and effective operational use of tools, plant and equipment
- Communication and working effectively and safely with others

Relationship to other units

- Pre-requisite units are:
  - BCCCM1001C Follow OH&S policies and procedures

  Competency in this unit may be assessed in conjunction with other functional units which together form part of the holistic work role
Specific knowledge required to achieve the performance criteria

- A knowledge of
  - Site and equipment safety requirements
  - Foundation work
  - Temporary and permanent rock anchors and their installation techniques
  - Scaffolding and work platform installation
  - Construction principles
  - Processes for interpreting engineering drawings
  - Soil, sand, rock, clay, shale, gravel and silt types and characteristics
  - Water erosion
  - Equipment types, characteristics, technical capabilities and limitations
  - Operational, maintenance and basic diagnostic procedures
  - Site isolation and traffic control responsibilities and authorities
  - Materials Safety Data Sheets and materials handling methods
  - Project quality requirements
  - Civil construction terminology
  - JSA’s/Safe work method statements

The context of assessment

- The application of competency is to be assessed in the workplace or realistically simulated workplace

- Assessment is to occur under standard and authorised work practices, safety requirements and environmental constraints

- Assessment of essential underpinning knowledge, other than confirmatory questions, will usually be conducted in an off-site context

- Assessment is to comply with relevant regulatory or Australian Standards requirements
Methods of assessment

- Assessment must satisfy the endorsed assessment guidelines of the Building and Construction industry’s Civil Construction Training Package
- Assessment methods must confirm consistency and accuracy of performance together with application of underpinning knowledge
- Assessment must be by direct observation of tasks, with questioning on underpinning knowledge
- Assessment methods must confirm the ability to access and correctly interpret and apply the essential underpinning knowledge
- Assessment may be by direct observation of tasks, with questioning on underpinning knowledge
- Assessment methods must confirm the ability to access and correctly interpret and apply the essential underpinning knowledge
- Assessment may be applied under project related conditions (real or simulated) and require evidence of process
- Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances
- Assessment may be in conjunction with assessment of other units of competency, including those listed above

Specific resource requirements for this unit

- The following resources should be made available:
  - workplace location or simulated workplace
  - materials relevant to temporary and permanent rock anchor installation
  - hand and power tools, plant and equipment appropriate to temporary and permanent rock anchor installation
  - specifications and work instructions

... End ...
BCCFW3003B

Install primary ground support

Unit Descriptor

This unit specifies the competency required to prepare, set out, install and maintain primary ground support for the purpose of ground stabilisation. It includes the minimum criteria for competency assessment.

This unit includes the stabilisation of embankments, tunnels, access shafts and general ground environments.

Employability Skills

The required outcomes described in this Unit of Competency contain applicable facets of employability skills. The Employability Skills Qualification Summary for the qualification in which this Unit of Competency is packaged will assist in identifying employability skill requirements.

Element

Elements define the essential outcomes of a unit of competency.

Performance Criteria

Performance criteria specify the level of performance required to demonstrate achievement of the element.

1. Plan and prepare

1.1 Work instructions, including plans, specifications, quality requirements and operational details are obtained, confirmed and applied to the allotted task.

1.2 Safety requirements are obtained from the site safety plan and organisational policies and procedures, confirmed and applied to the allotted task.

1.3 Signage requirements are identified and obtained from the project traffic management plan and implemented.

1.4 Tools and equipment selected to carry out tasks are consistent with the requirements of the job, checked for serviceability and any faults are rectified or reported.

1.5 Environmental protection requirements are identified from the project environmental management plan, confirmed and applied to the allotted task.

2. Set out and prepare for primary ground support

2.1 Requirements for ground support construction are determined from ground conditions and engineer’s directions.

2.2 Method of installing ground support is identified and implemented in accordance with the excavation process.

2.3 Material requirements for primary ground support is obtained.

2.4 Primary ground support is installed in accordance with progressive development of the excavation process.
2 Set out and prepare for primary ground support (continued)  
   2.5 Position of sets/rings and points of support are set out to engineer’s specifications  
   2.6 Component parts of ground support are prepared to designed requirements  

3 Install primary ground support  
   3.1 Relevant primary ground support system is selected  
   3.2 Primary ground support system is installed in accordance with job specifications  

4 Maintain primary ground support  
   4.1 Daily inspection of primary ground support is carried out to ensure system is secure in accordance to specifications, particularly where explosives are in use  
   4.2 Faults are identified and adjustments made to ensure ground support maintained  
   4.3 Ground faults are identified and support rectifications determined and carried out to engineer’s design and specifications  

5 Clean up  
   5.1 Work area is cleared and materials disposed of or recycled in accordance with project environmental management plan  
   5.2 Tools and equipment are cleaned, checked, maintained and stored in accordance with manufacturers’ recommendations and standard work practices
Range Statement

The Range Statement provides advice to interpret the scope and context of this unit of competency allowing for differences between enterprises and workplaces. It relates to the unit as a whole and facilitates holistic assessment. The following variables relate to this particular unit:

Unit scope
- Types of primary ground support are to include but not be limited to steel sets/rings, timber sets, pre-cast concrete segmental sections, timber lagging sections, steel spilings, steel sheeting, dry mix concrete pads and reinforced concrete beams
- Installing primary ground support may include but not be limited to ground stabilisation to access shafts and tunnels and embankment stabilisation
- Soil types may include but not be limited to sand, rock, clay, shale, gravel and silt
- Traffic control signage may include but not be limited to escort vehicle, highway traffic signs, site safety signage, temporary signage for the benefit of motorists and pedestrians, barricades, and traffic conditions signage
- Planning and preparation is to include but not be limited to worksite inspection, equipment defect identification, assessment of conditions and hazards and determination of work requirements
- Traffic conditions may include but not be limited to congested urban environments, low traffic rural areas, off-road un-trafficked areas, buildings, parking sites and pedestrian areas
- Site locations may include but not be limited to cuttings, tunnels and embankments

Safety (OH&S)
- OH&S requirements are to be in accordance with State or Territory legislation and regulations, organisational safety policies and procedures, and project safety plan. This may include protective clothing and equipment, use of tools and equipment, workplace environment and safety, handling of materials, use of fire fighting equipment, use of first aid equipment, hazard control and hazardous materials and substances
- Personal protective equipment is to include that prescribed under legislation, regulation and workplace policies and practices
Safety (OH&S)
(continued)
- Safe operating procedures are to include but not be limited to recognising and preventing hazards associated with overhead and underground services, other machines, personnel, traffic control, working in proximity to others, worksite visitors and the public.
- Hazards and risks may include but not be limited to uneven/unstable terrain, fires, overhead and underground services, excavations, traffic, embankments, cuttings, structures and hazardous materials.
- Emergency procedures are to include but may not be limited to extinguishing fires, organisational first aid requirements and evacuation.

Environmental Requirements
- Environmental requirements are to include but not be limited to organisational/project environmental management plan, waste management, water quality protection, noise, vibration, dust and clean-up management.

Quality Requirements
- Quality requirements may include but not limited to dimensions, tolerances, standards of work and material standards as detailed in the project drawings, specifications and project documentation to meet client satisfaction.

Statutory/Regulatory Authorities
- Statutory/Regulatory Authorities may include Federal, State and Local Authorities.

Tools and equipment
- Tools and equipment are to include but not limited to shovels, crow bars, spanners, measuring tapes, picks, mattocks, sledge hammers, spirit levels and may include angle grinders, kanga hammers, tampers and oxy-acetylene equipment.

Materials
- Materials are to include but not limited to: Sets and rings – sole plates, posts/legs, headers/crowns, liner blocks and prefabricated lattice girders; Sheet pileings – lagging, sheeting, pile caps and wailers; Panel or box sets – longitudinal ties, sets and braces.

Communications
- Communications are to include but not limited to verbal instructions and fault reporting and may include two way radio, hand signals, mobile phone, site specific instructions, written instructions or instructions related to job/task.
Information

- Information sources may include but not be limited to verbal or written and graphical instructions, signage, work schedules/plans/specifications, work bulletins, charts and hand drawings, memos, maps, material safety data sheets (MSDS) and diagrams or sketches
- Safe work procedures or equivalent related to the installation of primary ground support
- Regulatory/legislative requirements pertaining to the installation of primary ground support
- Manufacturers’ specifications and instructions
- Organisation work specifications and requirements.
- Instructions issued by authorised organisational or external personnel
- Relevant Australian Standards
Evidence Guide

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 of the Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

- Location, interpretation and application of relevant information, standards and specifications
- Compliance with site safety plan, OH&S regulations and State/Territory legislation applicable to workplace operations
- Compliance with organisational policies and procedures including quality requirements
- Installation of at least one of the following primary ground support systems to specifications:
  - Sets and rings for two projects;
  - Sheet piling for one project; or
  - Panel and box sets for two projects
- Safe and effective operational use of tools and equipment
- Communication and working effectively and safely with others

Relationship to other units

- Pre-requisite units are:
  BCCCM1001C Follow OH&S policies and procedures

Competency in this unit may be assessed in conjunction with other functional units which together form part of the holistic work role.
Specific knowledge required to achieve the performance criteria

- A knowledge of
  - Site and equipment safety requirements
  - Foundation work
  - Primary ground support systems and their installation techniques
  - Scaffolding and work platform installation
  - Construction principles
  - Processes for interpreting engineering drawings
  - Soil, sand, rock, clay, shale, gravel and silt types and characteristics
  - Water erosion
  - Equipment types, characteristics, technical capabilities and limitations
  - Operational, maintenance and basic diagnostic procedures
  - Site isolation and traffic control responsibilities and authorities
  - Materials Safety Data Sheets and materials handling methods
  - Project quality requirements
  - Civil construction terminology
  - JSA’s/Safe work method statements

The context of assessment

- The application of competency is to be assessed in the workplace or realistically simulated workplace
- Assessment is to occur under standard and authorised work practices, safety requirements and environmental constraints
- Assessment of essential underpinning knowledge, other than confirmatory questions, will usually be conducted in an off-site context
- Assessment is to comply with relevant regulatory or Australian Standards requirements
Methods of assessment

- Assessment must satisfy the endorsed assessment guidelines of the Building and Construction industry’s Civil Construction Training Package
- Assessment methods must confirm consistency and accuracy of performance together with application of underpinning knowledge
- Assessment must be by direct observation of tasks, with questioning on underpinning knowledge
- Assessment methods must confirm the ability to access and correctly interpret and apply the essential underpinning knowledge
- Assessment may be applied under project related conditions (real or simulated) and require evidence of process
- Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances
- Assessment may be in conjunction with assessment of other units of competency, including those listed above

Specific resource requirements for this unit

- The following resources should be made available:
  - workplace location or simulated workplace
  - materials relevant to primary ground support installation
  - hand and power tools, plant and equipment appropriate to primary ground support installation
  - specifications and work instructions

... End ...
BCCFW3004B Drive piles

Unit Descriptor

This unit specifies the competency required to prepare and drive piles for foundations to bridges, structures and ground support situations. It includes the minimum criteria for competency assessment.

This unit includes the diesel hammer and static weight piling operations.

Employability Skills

The required outcomes described in this Unit of Competency contain applicable facets of employability skills. The Employability Skills Qualification Summary for the qualification in which this Unit of Competency is packaged will assist in identifying employability skill requirements.

Element

Elements define the essential outcomes of a unit of competency.

Performance Criteria

Performance criteria specify the level of performance required to demonstrate achievement of the element.

1 Plan and prepare

1.1 Work instructions, including plans, specifications, quality requirements and operational details are obtained, confirmed and applied to the allotted task

1.2 Safety requirements are obtained from the site safety plan and organisational policies and procedures, confirmed and applied to the allotted task

1.3 Signage requirements are identified and obtained from the project traffic management plan and implemented

1.4 Plant, tools and equipment selected to carry out tasks are consistent with the requirements of the job, checked for serviceability and any faults are rectified or reported

1.5 Environmental protection requirements are identified from the project environmental management plan, confirmed and applied to the allotted task

2 Locate pile positions and establish piling rig plant

2.1 Location for piles established from reference points and set out to requirements

2.2 Plant and related equipment is established in position and checked for operation in accordance with standard operating procedures

2.3 Pile is prepared and checked for conformity in accordance with job specifications

2.4 Area for pile driving and surrounding working space is identified and protected in accordance with safety requirements
3 Drive pile

3.1 Pile is lifted and maneuvered into position using the piling rig in accordance with standard operating procedures

3.2 Piling rig is set up and pile driven into place in accordance with specifications and standards

3.3 Splicing or jointing is carried out in accordance with engineer’s specifications

4 Remove piling rig

4.1 Plant and related equipment is dismantled in accordance with manufacturers’ manual and standard operating procedures

4.2 Piling rig is relocated in preparation for next piling installation procedure

5 Clean up

5.1 Work area is cleared and materials disposed of or recycled in accordance with project environmental management plan

5.2 Plant, tools and equipment are cleaned, checked, maintained and stored in accordance with manufacturers’ recommendations and standard work practices

Range Statement

The Range Statement provides advice to interpret the scope and context of this unit of competency allowing for differences between enterprises and workplaces. It relates to the unit as a whole and facilitates holistic assessment. The following variables relate to this particular unit:

Unit scope

- Types of driven piles are to include but not be limited to timber, pre-cast concrete and may include steel, mechanically jointed pre-cast concrete, temporary timber piles and temporary metal sheeting piles

- Pile hammer types may include but not be limited to static weight, diesel injection and hydraulic

- Soil types may include but not be limited to sand, rock, clay, shale, gravel and silt

- Traffic control signage may include but not be limited to escort vehicle, highway traffic signs, site safety signage, temporary signage for the benefit of motorists and pedestrians, barricades, and traffic conditions signage
Unit scope (continued)

- Planning and preparation is to include but not be limited to worksite inspection, equipment defect identification, assessment of conditions and hazards and determination of work requirements

- Traffic conditions may include but not be limited to congested urban environments, low traffic rural areas, off-road un-trafficked areas, buildings, parking sites and pedestrian areas

- Site locations may include but not be limited to new construction sites, existing structures being renovated or extended, existing structure subject to service restoration or maintenance, road works, earthworks, wharves, marine, bridges and foundation

Safety (OH&S)

- OH&S requirements are to be in accordance with State or Territory legislation and regulations and may include protective clothing and equipment, use of tools and equipment, workplace environment and safety, handling of materials, use of fire fighting equipment, use of first aid equipment, hazard control and hazardous materials and substances

- Personal protective equipment is to include that prescribed under legislation, regulation and workplace policies and practices

- Safe operating procedures are to include but not be limited to recognising and preventing hazards associated with overhead and underground services, other machines, personnel, traffic control, working at heights, working proximity to others, worksite visitors and the public

- Hazards and risks may include but not be limited to uneven/unstable terrain, trees, fires, overhead and underground services, excavations, traffic, embankments, cuttings, structures and hazardous materials

- 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 and evacuation

- Safe parking practices are to include but not be limited to ensuring access ways are clear, equipment/machinery is away from overhangs and refuelling sites, safe distance from excavations, and secured from unauthorised access or movement
<table>
<thead>
<tr>
<th>Environmental Requirements</th>
<th>Environmental requirements are to include but not be limited to organisational/project environmental management plan, waste management, water quality protection, noise, vibration, dust and clean-up management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality Requirements</td>
<td>Quality requirements may include but not limited to dimensions, tolerances, standards of work and material standards as detailed in the project drawings, specifications and project documentation to meet client satisfaction</td>
</tr>
<tr>
<td>Statutory/Regulatory Authorities</td>
<td>Statutory/Regulatory Authorities may include Federal, State and Local Authorities</td>
</tr>
<tr>
<td>Tools and equipment</td>
<td>Tools and equipment are to include but not limited to pile hammers, shovels, crow bars, measuring tapes, spirit levels and plumb bob and may include scaffolding</td>
</tr>
<tr>
<td>Materials</td>
<td>Materials are to include but not limited to piles (timber, concrete or steel)</td>
</tr>
<tr>
<td>Communications</td>
<td>Communications are to include but not limited to verbal instructions and fault reporting and may include two way radio, hand signals, mobile phone, site specific instructions, written instructions or instructions related to job/task</td>
</tr>
<tr>
<td>Information</td>
<td>Information sources may include but not be limited to verbal or written and graphical instructions, signage, work schedules/plans/specifications, work bulletins, charts and hand drawings, memos, maps, material safety data sheets (MSDS) and diagrams or sketches</td>
</tr>
<tr>
<td></td>
<td>Safe work procedures or equivalent related to the pile driving operations</td>
</tr>
<tr>
<td></td>
<td>Regulatory/legislative requirements pertaining to the pile driving operations</td>
</tr>
<tr>
<td></td>
<td>Manufacturers’ specifications and instructions</td>
</tr>
<tr>
<td></td>
<td>Organisation work specifications and requirements.</td>
</tr>
<tr>
<td></td>
<td>Instructions issued by authorised organisational or external personnel</td>
</tr>
<tr>
<td></td>
<td>Relevant Australian Standards</td>
</tr>
</tbody>
</table>
Evidence Guide

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 of the Training Package.

### Critical aspects of evidence required to demonstrate competency in this unit

- Location, interpretation and application of relevant information, standards and specifications
- Compliance with site safety plan, OH&S regulations and State/Territory legislation applicable to workplace operations
- Compliance with organisational policies and procedures including quality requirements
- A minimum of two timber piles or two pre-cast concrete piles are to be driven using at least one of the three pile hammering methods
- Safe and effective operational use of plant, tools and equipment
- Communication and working effectively and safely with others

### Relationship to other units

- Pre-requisite units are: BCCC1001C Follow OH&S policies and procedures

Competency in this unit may be assessed in conjunction with other functional units which together form part of the holistic work role

### Specific knowledge required to achieve the performance criteria

- A knowledge of
  - Site and equipment safety requirements
  - Foundation work
  - Piles and their installation techniques
  - Scaffolding and work platform installation
  - Construction principles
  - Processes for interpreting engineering drawings
  - Soil, sand, rock, clay, shale, gravel and silt types and characteristics
  - Water erosion
  - Processes for installing piles in water
  - Equipment types, characteristics, technical capabilities and limitations
Specific knowledge (continued)
- Operational, maintenance and basic diagnostic procedures
- Site isolation and traffic control responsibilities and authorities
- Materials Safety Data Sheets and materials handling methods
- Project quality requirements
- Civil construction terminology
- JSA’s/Safe work method statements

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

Methods of assessment
- Assessment must satisfy the endorsed assessment guidelines of the Building and Construction industry’s Civil Construction Training Package
- Assessment methods must confirm consistency and accuracy of performance together with application of underpinning knowledge
- Assessment must be by direct observation of tasks, with questioning on underpinning knowledge
- Assessment methods must confirm the ability to access and correctly interpret and apply the essential underpinning knowledge
- Assessment may be applied under project related conditions (real or simulated) and require evidence of process
- Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances
- Assessment may be in conjunction with assessment of other units of competency, including those listed above
Specific resource requirements for this unit

The following resources should be made available:
- workplace location or simulated workplace
- materials relevant to pile driving
- hand and power tools, plant and equipment appropriate to pile driving
- specifications and work instructions

... End ...
**BCCFW3005B Bore cast in-situ piles**

**Unit Descriptor**

This unit specifies the competency required to cast piles in-situ for foundations to bridges, structures and ground support. It includes the minimum criteria for competency assessment.

This unit includes installing caisson in preparation for the cast in-situ pile.

**Employability Skills**

The required outcomes described in this Unit of Competency contain applicable facets of employability skills. The Employability Skills Qualification Summary for the qualification in which this Unit of Competency is packaged will assist in identifying employability skill requirements.

**Element Performance Criteria**

Elements define the essential outcomes of a unit of competency.

Performance criteria specify the level of performance required to demonstrate achievement of the element.

1. **Plan and prepare**
   1.1 Work instructions, including plans, specifications, quality requirements and operational details are obtained, confirmed and applied to the allotted task
   1.2 Safety requirements are obtained from the site safety plan and organisational policies and procedures, confirmed and applied to the allotted task
   1.3 Signage requirements are identified and obtained from the project traffic management plan and implemented
   1.4 Plant, tools and equipment selected to carry out tasks are consistent with the requirements of the job, checked for serviceability and any faults are rectified or reported
   1.5 Environmental protection requirements are identified from the project environmental management plan, confirmed and applied to the allotted task
| 2 | Locate and prepare pile positions | 2.1 | Location for piles is established from reference points and set out to requirements |
|   |                                  | 2.2 | Plant and related equipment is positioned and checked for operation in accordance with standard operating procedures |
|   |                                  | 2.3 | Hole is bored to job specification |
|   |                                  | 2.4 | Caisson is checked for conformity with design specifications |
|   |                                  | 2.5 | Caisson is installed in the bored hole |
|   |                                  | 2.6 | Caisson is prepared to receive concrete in accordance with design specifications |
3 Place concrete

3.1 Concrete is placed into caisson

3.2 Concrete is vibrated, removing voids and air pockets to job specifications

4 Remove boring rig

4.1 Boring rig is relocated to next point of installation operation

4.2 Boring rig is removed from site on completion of work

5 Clean up

5.1 Work area is cleared and materials disposed of or recycled in accordance with project environmental management plan

5.2 Plant, tools and equipment are cleaned, checked, maintained and stored in accordance with manufacturers’ recommendations and standard work practices

Range Statement

The Range Statement provides advice to interpret the scope and context of this unit of competency allowing for differences between enterprises and workplaces. It relates to the unit as a whole and facilitates holistic assessment. The following variables relate to this particular unit:

Unit scope

- Types of formed piles are to include but not be limited to bored cast in-situ and may include compressed and grout crete piles

- Caisson preparation is to include but not be limited to the cleaning and installation of reinforcement

- Types of boring are to include but not be limited to auger and may include water jetting

- Soil types may include but not be limited to sand, rock, clay, shale, gravel and silt

- Traffic control signage may include but not be limited to escort vehicle, highway traffic signs, site safety signage, temporary signage for the benefit of motorists and pedestrians, barricades, and traffic conditions signage

- Planning and preparation is to include but not be limited to worksite inspection, equipment defect identification, assessment of conditions and hazards and determination of work requirements
Unit scope (continued)

- Traffic conditions may include but not be limited to congested urban environments, low traffic rural areas, off-road un-trafficked areas, buildings, parking sites and pedestrian areas

- Site locations may include but not be limited to new construction sites, existing structures being renovated or extended, existing structure subject to service restoration or maintenance, road works, earthworks, wharves, marine, bridges and foundation

Safety (OH&S)

- OH&S requirements are to be in accordance with State or Territory legislation and regulations, organisational safety policies and procedures, and project safety plan. This may include protective clothing and equipment, use of tools and equipment, workplace environment and safety, handling of materials, use of fire fighting equipment, use of first aid equipment, hazard control and hazardous materials and substances

- Personal protective equipment is to include that prescribed under legislation, regulation and workplace policies and practices

- Safe operating procedures are to include but not be limited to recognising and preventing hazards associated with overhead and underground services, other machines, personnel, traffic control, working in proximity to others, worksite visitors and the public

- Hazards and risks may include but not be limited to uneven/unstable terrain, fires, overhead and underground services, excavations, traffic, embankments, cuttings, structures and hazardous materials

- 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 and evacuation

- Safe parking practices are to include but not be limited to ensuring access ways are clear, equipment/machinery is away from overhangs and refuelling sites, safe distance from excavations, and secured from unauthorised access or movement
Environmental Requirements  • Environmental requirements are to include but not be limited to organisational/project environmental management plan, waste management, water quality protection, noise, vibration, dust and clean-up management

Quality Requirements  • Quality requirements may include but not limited to dimensions, tolerances, standards of work and material standards as detailed in the project drawings, specifications and project documentation to meet client satisfaction

Statutory/Regulatory Authorities  • Statutory/Regulatory Authorities may include Federal, State and Local Authorities

Tools and equipment  • Tools and equipment are to include but not limited to augers, shovels, crow bars, measuring tapes, spirit levels, plumb bobs, compressors, concrete vibrators and high pressure hoses and may include scaffolding

Materials  • Materials are to include but not limited to reinforced steel, caissons and concrete

Communications  • Communications are to include but not limited to verbal instructions and fault reporting and may include two way radio, hand signals, mobile phone, site specific instructions, written instructions or instructions related to job/task

Information  • Information sources may include but not be limited to verbal or written and graphical instructions, signage, work schedules/plans/specifications, work bulletins, charts and hand drawings, memos, maps, material safety data sheets (MSDS) and diagrams or sketches
  • Safe work procedures or equivalent related to casting piles in-situ
  • Regulatory/legislative requirements pertaining to casting piles in-situ
  • Manufacturers’ specifications and instructions
  • Organisation work specifications and requirements.
  • Instructions issued by authorised organisational or external personnel
  • Relevant Australian Standards
Evidence Guide

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 of the Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

- Location, interpretation and application of relevant information, standards and specifications
- Compliance with site safety plan, OH&S regulations and State/Territory legislation applicable to workplace operations
- Compliance with organisational assurance requirements
- Preparation and boring of a hole to install a minimum of one caisson, including reinforcement construction and placing concrete to that caisson
- Safe and effective operational use of tools, plant and equipment
- Communication and working effectively and safely with others

Relationship to other units

- Pre-requisite units are:
  
  BCCCM1001C Follow OH&S policies and procedures

  Competency in this unit may be assessed in conjunction with other functional units which together form part of the holistic work role
Specific knowledge required to achieve the performance criteria

- A knowledge of
  - Site and equipment safety requirements
  - Foundation work
  - Bored cast in-situ piles and their installation techniques
  - Scaffolding and work platform installation
  - Construction principles
  - Processes for interpreting engineering drawings
  - Soil, sand, rock, clay, shale, gravel and silt types and characteristics
  - Water erosion
  - Processes for installing piles in water
  - Equipment types, characteristics, technical capabilities and limitations
  - Operational, maintenance and basic diagnostic procedures
  - Site isolation and traffic control responsibilities and authorities
  - Materials Safety Data Sheets and materials handling methods
  - Project quality requirements
  - Civil construction terminology
  - JSA’s/Safe work method statements

The context of assessment

- The application of competency is to be assessed in the workplace or realistically simulated workplace
- Assessment is to occur under standard and authorised work practices, safety requirements and environmental constraints
- Assessment of essential underpinning knowledge, other than confirmatory questions, will usually be conducted in an off-site context
- Assessment is to comply with relevant regulatory or Australian Standards requirements
Methods of assessment

- Assessment must satisfy the endorsed assessment guidelines of the Building and Construction industry’s Civil Construction Training Package
- Assessment methods must confirm consistency and accuracy of performance together with application of underpinning knowledge
- Assessment must be by direct observation of tasks, with questioning on underpinning knowledge
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- Assessment may be applied under project related conditions (real or simulated) and require evidence of process
- Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances
- Assessment may be in conjunction with assessment of other units of competency, including those listed above

Specific resource requirements for this unit

- The following resources should be made available:
  - workplace location or simulated workplace
  - materials relevant to bore cast in-situ piles
  - hand and power tools, plant and equipment appropriate to bore cast in-situ piles
  - specifications and work instructions

... End ...