Table of Contents

BCCBM2001B Strip pile heads

Unit Descriptor

This unit specifies the competency required to strip pile heads in preparation for the interlocking construction of footings/piles, caps/abutments used in bridge construction. It includes the minimum criteria for competency assessment.

This unit does not include performing dogging, rigging or operating a crane to place materials. It does, however, include working in conjunction with these operators.

This unit includes bridges supported by driven poles.

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 relevant to the tasks 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 Strip pile heads	2.1 Work platform and false work is checked where required
	2.2 Specified height of pile cut-off is determined and marked
	2.3 Horizontal groove is cut at the marked height around the pile to the specified depth to avoid spalling

		2.4	Pile excess is attached with a sling to a crane
		2.5	Concrete above the groove is stripped back from steel bars/stands without damage to the reinforcing
2	Strip pile heads (continued)	2.6	Steel reinforcing is cut to specified length, and bent to project drawings and specifications
3	Clean up	3.1	Work area is cleared and materials disposed of or recycled in accordance with project environmental management plan
		3.2	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

- Procedure for pile head stripping includes identifying the height to be cut, using a cut off saw to make an access cut to a specified depth around the pile, then using a jack hammer to remove the bulk of concrete from the pile, followed by using a scabbler to expose the reinforcement and finally bending the reinforcement to tie with the footing/pile cap/abutment reinforcement
- Pile head stripping is undertaken for but not limited to multi-span and single span bridges either over water or over land
- Traffic control signage may include but not be limited to 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 are to include but not be limited to any rural or urban bridge construction project

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 services, other machines, personnel, traffic control, working at heights, 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 equipment fires, organisational first aid requirements and evacuation
Environmental Requirements	• Environmental procedures are to include but may 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 be limited to cut off saws, jack hammers, scabblers, compressors, hoses, tape measures, marking equipment, crow bars, bending pipes and may include scaffolding, ladders, slings and a crane
Communications	• Communications are to include but not be 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, material safety data sheets (MSDS) and diagrams or sketches • Safe work procedures or equivalent related to stripping pile heads • Regulatory/legislative requirements pertaining to stripping pile heads • 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
- Completion of the set out and stripping of a minimum of six pile heads to design specifications
- 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
  - Bridge construction and sequencing
  - Pile head stripping
  - Steel reinforcement and stressing strands
  - Concrete
  - Pneumatic and electric jack hammers and scabblers
  - Processes for interpreting engineering drawings
  - Equipment types, characteristics, technical capabilities and limitations
  - Site isolation and traffic control responsibilities and authorities
  - Materials Safety Data Sheets and materials handling methods
  - Project quality requirements
  - Civil construction terminology
  - Slinging procedures for supporting pile off cut
  - 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 the stripping of pile heads
  - hand and power tools, plant and equipment appropriate to the stripping of pile heads
  - specifications and work instructions

… End …

BCCBM3001B Maintain concrete bridges

Unit Descriptor

This unit specifies the competency required to maintain concrete bridges to ensure safety standards are effective and to continue general upkeep. It includes the minimum criteria for competency assessment.

This unit does not include performing dogging, rigging or operating a crane to place materials. It does, however, include working in conjunction with these operators.

This unit includes concrete repairs, painting and anti-graffiti treatment.

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 relevant to the tasks 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	Maintain bridge	2.1	Works order/schedule of repairs and maintenance is followed to organisational requirements
		2.2	Bridge structure is inspected to confirm nature and extent of fault in accordance with standard workplace practices and procedures
		2.3	Significant deterioration of existing faults or new faults are reported in accordance with organisational requirements
		2.4	Repairs and maintenance of bridge structure are carried out in accordance with details from the schedule of repairs and maintenance documentation
		2.5	Completed repairs and maintenance is reported, noting any new faults and documented in accordance with organisational requirements
3	Clean up	3.1	Work area is cleared and materials disposed of or recycled in accordance with project environmental management plan
		3.2	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

- Maintenance and repair is to include bridges and may include wharves, piers and jetties
- Types of repairs are to include but not be limited to concrete repairs, restoration of metallic components, tightening and replacing fasteners and bolts, maintenance or replacement of bridge furniture and deck joints
- Types of maintenance may include but not be limited to painting and anti-graffiti treatment
- Traffic control signage may include but not be limited to 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
- 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 services, other machines, personnel, traffic control, working at heights, working in proximity to others, worksite visitors and the public
- 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
- 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 equipment fires, organisational first aid requirements and evacuation

Environmental Requirements

- Environmental procedures are to include but may not be limited to organisational/project environmental management plans, 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 may include but not be limited to fall arrestors, tag lines, drifts, spanners, pneumatic wrenches and drills, compressors and hoses, tape measures, marking equipment, ladders, winches, lifting equipment, power saws, paint brushes, rollers, jacks, mixing equipment, underbridge inspection unit, scaffolding and EWP
Materials	• Materials may include but not be limited to bearings, bolts, fasteners, paint, anti-graffiti treatments and concrete
Communications	• Communications are to include but not be 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 maintaining concrete bridges • Regulatory/legislative requirements pertaining to maintaining concrete bridges • 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
- Completion of a minimum of four different maintenance and repair activities on three separate bridges, including at least one deck joint repair, to specifications
- 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
  - Bridge components
  - Bridge faults and repair methods
  - Safety procedures for working at heights and over water
  - Processes for interpreting engineering drawings
  - Equipment types, characteristics, technical capabilities and limitations
  - 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 maintaining concrete bridges
  - hand and power tools, plant and equipment appropriate to maintaining concrete bridges
  - a crane and slings, underbridge inspection unit
  - specifications and work instructions

… End …

BCCBM3002B Install pre-cast girders

Unit Descriptor

This unit specifies the competency required to install pre-cast stressed concrete girders on bridges in preparation for the laying of bridge decks. It includes the minimum criteria for competency assessment.

This unit does not include performing dogging, rigging or operating a crane to place materials. It does, however, include working in conjunction with these operators.

This unit includes the installation of bridge bearings.

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 relevant to the tasks 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 Install bearings	2.1 Bearing types and position are determined from project drawings and specifications
	2.2 Bearing dimensions and material are quality checked against specifications
	2.3 Bearings are installed as required by project drawings and specifications
	2.4 Locating brackets/bolts are identified and installed in preparation for placement of girders as required

3	Install girders	3.1	Individual girder location is determined from project drawings and specifications
		3.2	Lifting sequence to install girders is determined in accordance with engineering instructions and the crane operator is advised
		3.3	Girders are checked for conformity to design prior to lifting in accordance with standard industry work practices
		3.4	Lifting points on girders are checked for serviceability and tag lines are attached and used to guide girder to its position
		3.5	Timber packing is placed to support the girder load
		3.6	Drift is used to align holes and locating bolts are inserted and tensioned to specification
		3.7	Bearings are adjusted to specification to provide support across the full face of the bearing to the girder
		3.8	Girder is braced to prevent lateral movement or rolling
		3.9	Tag lines are removed, rolled and stored
		3.10	Excess epoxy putty or mortar is removed
		3.11	Timber packing is removed at specified time
4	Clean up	4.1	Work area is cleared and materials disposed of or recycled in accordance with project environmental management plan
		4.2	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 pre-cast girders include 'I' girders and 'T' girders
- Lifting with cranes is to include but not be limited to over water, land or by launching truss
- Girders are secured with locating brackets and bolts
- Types of bracing are to include but not be limited to timber props, metal adjustable props and metal rods
- Types of bearings may include but not be limited to elastomeric, mortar pad, pot, stainless steel sliding plates, fixed rocker, rocker, roller, fixed plate and sliding
- Girder conformity of design tolerances include skew angle, variation for hog, lateral bow and twisting
- 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 are to include but not be limited to any rural or urban bridge construction project

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 services, other machines, personnel, traffic control, working at heights, working in proximity to others, worksite visitors and the public • 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 • 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 equipment fires, organisational first aid requirements and evacuation
Environmental Requirements	• Environmental procedures are to include but may not be limited to organisational/project environmental management plans, 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 be limited to fall arrestors, tag lines, drifts, spanners, pneumatic wrenches, tape measures, marking equipment, cranes and slings/launching gantry, ladders and may include spatulas, pointing trowels, buckets, spirit levels and scaffolding
Materials	• Materials are to include but not be limited to pre-cast girders, locating brackets and bolts, bearings, timber packing and may include mortar and/or epoxy
Communications	• Communications are to include but not be 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 installing pre-cast girders on concrete bridges • Regulatory/legislative requirements pertaining to installing pre-cast girders on concrete bridges • 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 all the pre-cast concrete girders on a multi-span bridge of not less than twenty metres in length to specifications. It is to include installing bearings, installing lateral bracing, installing locating brackets and bolts, identifying hog, checking direction of skew angle, lateral bow and twist prior to lifting
- 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
  - Bridge construction and sequencing
  - Pre-cast concrete girder installation
  - Bearing types and installation
  - Safe lifting techniques
  - Structural technology
  - Safe working procedures for working at heights and over water
  - Processes for interpreting engineering drawings
  - 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 undertaking installation of pre-cast girders on concrete bridges
  - hand and power tools, plant and equipment appropriate to installing pre-cast girders on concrete bridges
  - a crane and slings/launching gantry
  - specifications and work instructions

… End …

BCCBM3003B Install pre-cast parapets

Unit Descriptor

This unit specifies the competency required to install pre-cast parapets on bridges to provide a safety barrier for bridge traffic. It includes the minimum criteria for competency assessment.

This unit does not include performing dogging, rigging or operating a crane to place materials. It does, however, include working in conjunction with these operators.

This unit includes installation of individual units, services and fittings, and finishing of the installed parapet.

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 relevant to the tasks 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	Confirm installation details	2.1	Stirrup spacing is measured and compared with spacing of cast in ligatures and brackets to eliminate difficulties when positioning units
		2.2	Individual pre-cast parapet unit location is determined from project drawings and specifications
		2.3	Sequence of parapet installation is determined and carried out in accordance with workplace procedures
		2.4	Parapets are checked for conformity to design prior to lifting in accordance with standard industry work practices
		2.5	Lifting points on pre-cast units are checked for serviceability
3	Install precast parapet units	3.1	Precast parapet end unit is raised to allow fitting of bracket
		3.2	Pre-cast parapet unit is manouvered into the vertical position in accordance with installation procedures
		3.3	Pre-cast parapet unit is guided into approximate position and locating bolts are attached to cast in brackets
		3.4	Vertical and horizontal alignment of pre-cast parapet end units is correctly established and bolts tightened
		3.5	Intermediate pre-cast parapet units are installed in approximate positions
		3.6	Pre-cast end units are checked for correct height and alignment
		3.7	Intermediate pre-cast parapet units are adjusted to design alignment and locating bolts tightened
		3.8	Anchor cable is installed and ends are fixed to job specifications
4	Finish parapet	4.1	Services and fittings are installed to job specifications as required
		4.2	Joints are fitted with foam inserts and grouted to job specifications
		4.3	Cast in-situ infills of the pre-cast units are formed up and prepared
		4.4	Concrete is placed and finished to design
		4.5	Formwork is dismantled and removed from site

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

- Installation of parapets is to include but not be limited to lifting and placing of parapets, connecting end units, fitting and grouting joints, casting in-situ infills and installing services and fittings
- Lifting with cranes is to include but not be limited to over water and land
- Parapets are secured with locating bolts and anchor cables
- Services may include but not be limited to power and telecommunications
- Fittings may include but not be limited to lights, phones, bridge rail, signs and delineators
- Traffic control signage may include but not be limited to 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 are to include but not be limited to any rural or urban bridge construction project

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 • Safe operating procedures are to include but not be limited to recognising and preventing hazards associated with overhead services, other machines, personnel, traffic control, working at heights, working in proximity to others, worksite visitors and the public • 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 • 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 equipment fires, organisational first aid requirements and evacuation
Environmental Requirements	• Environmental procedures are to include but may not be limited to organisational/project environmental management plans, 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 be limited to fall arrestors, tag lines, drifts, spanners, pneumatic wrenches and drills, compressors and hoses, tape measures, marking equipment, ladders, winches, lifting equipment, trowels and may include slings, cranes and scaffolding
Materials	• Materials are to include but not be limited to pre-cast parapets, locating bolts, 'U' brackets, end units, anchor cables, foam inserts, grout and concrete
Communications	• Communications are to include but not be 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 installing pre-cast parapets on concrete bridges • 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
- Position, fix and finish the pre-cast parapet units, including the installation of end units, services and fittings for a multi-span bridge with a minimum length of twenty metres to specifications
- 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
  - Bridge construction and sequencing
  - Pre-cast concrete parapets and installation
  - Bridge barriers
  - Concrete and concreting
  - Service installation
  - Safe lifting techniques
  - Safe working procedures for working at heights and over water
  - Processes for interpreting engineering drawings
  - Equipment types, characteristics, technical capabilities and limitations
  - 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 undertaking installation of pre-cast parapets on concrete bridges
  - hand and power tools, plant and equipment appropriate to installing pre-cast parapets on concrete bridges
  - crane and slings
  - specifications and work instructions

… End …

BCCBM3004B Operate a bridge inspection unit

Unit Descriptor

This unit specifies the competency required to operate a bridge inspection unit to gain access to the outer sides and underside of bridges. It includes the minimum criteria for competency assessment.

This unit includes truck mounted or self propelled bridge inspection units.

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 relevant to the tasks 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	Check bridge inspection unit	2.1	Tyres and rollers are checked in accordance with operators manual
		2.2	Start up, park and shut down procedures are carried out in accordance with manufacturers' and/or site specific requirements
		2.3	Equipment controls and functions, including implements or other attachments, brakes and maneuverability are checked for serviceability and faults reported
		2.4	Emergency safety devices are checked to conform with instructions in operators' manual
3	Set up bridge inspection unit	3.1	Work activity is evaluated and the most productive operating technique is identified
		3.2	Bucket/platform is unfolded and prepared for use
		3.3	Bridge inspection unit is positioned for work application and stabilisers are engaged to set equipment base level into place
		3.4	Tools, equipment and materials are placed into the bucket/platform to job application requirements
		3.5	Bucket/platform is entered using the approved procedure
		3.6	Fall arrest device is correctly attached
4	Operate bridge inspection unit	4.1	Bridge inspection unit is manoeuvred to work location as per manufacturers' recommendation and platform is safely and effectively manoeuvred into position
		4.2	Performance of bridge inspection unit is carried out to instructions under varied site conditions in accordance with standard work practices
		4.3	Obstacles are safely avoided
		4.4	Location adjustment requirements are clearly communicated to driver
		4.5	Controls are operated to return bridge inspection unit to travel position and proceed with shut down sequence in accordance with operator's manual
5	Carry out operator maintenance	5.1	Inspection and fault finding are conducted in accordance with manufacturers' specifications and/or organisational requirements
		5.2	Regular programmed maintenance tasks are carried out and recorded in accordance with manufacturers' and/or organisational requirements

6	Clean up	6.1	Work area is cleared and materials disposed of or recycled in accordance with project environmental management plan
		6.2	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

- Bridge inspection units include truck mounted and self propelled
- Bridge inspection units may be used on bridges, wharves, piers and jetties
- Bridge inspection units may be operated on concrete or timber structures
- Traffic control signage may include but not be limited to 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
- 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 services, other machines, personnel, traffic control, working at heights, working in proximity to others, worksite visitors and the public

Safety (OH&S) (continued)	• 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 • 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 equipment fires, organisational first aid requirements and evacuation
Environmental Requirements	• Environmental procedures are to include but may not be limited to organisational/project environmental management plans, 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 may include but not be limited to fall arrestors, signage, under bridge inspection units, buckets or platforms and maintenance tools and equipment
Communications	• Communications are to include but not be 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 and graphics
- Safe work procedures or equivalent related to conducting under bridge inspection unit operations
- 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
- Operation of a self propelled or truck mounted under bridge inspection unit to inspect the underside and the outer sides of a whole bridge of at least twenty metres in length, for two bridges, wharves or jetties to specifications
- 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
  - Bridge construction
  - Bridge components
  - Under bridge inspection units and operation
  - Safe working procedures for working at heights and over water
  - Processes for interpreting engineering drawings
  - 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
  - under bridge inspection unit
  - materials relevant to conducting under bridge inspection unit maintenance
  - hand and power tools, plant and equipment appropriate to conducting under bridge inspection unit maintenance
  - specifications and work instructions

… End …

BCCBM3005B Install pre-cast concrete bridge decks

Unit Descriptor

This unit specifies the competency required to install pre-cast concrete bridge decks as part of the bridge construction process and to provide a pavement for road surfacing operations or direct use. It includes the minimum criteria for competency assessment.

This unit does not include performing dogging, rigging or operating a crane to place materials. It does, however, include working in conjunction with these operators.

This unit includes installation of bridge rails.

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 relevant to the tasks 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 Install bearings	2.1 Bearing types and position are determined from project drawings and specifications
	2.2 Bearing dimensions and material are quality checked against specifications
	2.3 Bearings are installed as required by project drawings and specifications
	2.4 Locating brackets/bolts are identified and installed in

			preparation for placement of girders as required
3	Install concrete bridge deck	3.1	Deck components are prepared for grouting prior to placement in accordance with deck design and specifications
		3.2	Deck components are placed
		3.3	Pre-fabricated concrete decking grouting is carried out and completed
		3.4	Prefabricated concrete decking transverse stressing bar is inserted and tensioned as specified
		3.5	Transverse stressing bar is grouted to specifications
		3.6	Anchor bolts are grouted to specifications
		3.7	Deck joints of pre-fabricated decking and scuppers are placed as specified
4	Fix bridge fittings	4.1	Posts and bridge rails are fitted as per project drawings and specifications
		4.2	Prefabricated stairs are assembled and installed to specifications where required
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

- Pre-cast bridge deck application is to include but not be limited to bridges, piers, wharves and jetties
- Deck attachments are to include but not be limited to bridge rails and may include pre-cast kerbing, stairs, posts, hand rails and deck joints
- Types of bearings are to include but not be limited to elastomeric and mortar pad
- Traffic control signage may include but not be limited to 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
- 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 services, other machines, personnel, traffic control, working at heights, working in proximity to others, worksite visitors and the public

Safety (OH&S) (continued)	• 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 • 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 equipment fires, organisational first aid requirements and evacuation
Environmental Requirements	• Environmental procedures are to include but may not be limited to organisational/project environmental management plans, 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 be limited to fall arrestors, tag lines, drifts, spanners, pneumatic wrenches and drills, compressors and hoses, tape measures, marking equipment, ladders, winches, lifting equipment, power saws and may include slings, cranes and scaffolding
Materials	• Materials are to include but not be limited to pre-cast concrete bridge deck units, bearings, bridge rails, bridge joints and may include mortar and epoxy
Communications	• Communications are to include but not be 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 installing pre-cast concrete deck units on bridges
- 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 pre-cast concrete deck units including installation of transverse stressing bars and bearings on a multi-span bridge with a minimum length of twenty metres to specifications
- 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
  - Bridge construction and sequencing
  - Pre-cast concrete bridge decks and installation
  - Bearing types and installation
  - Safe lifting techniques
  - Safe working procedures, working at heights and over water
  - Processes for interpreting engineering drawings
  - Equipment types, characteristics, technical capabilities and limitations
  - 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 undertaking installation of pre-cast concrete decks on bridges
  - hand and power tools, plant and equipment appropriate to installing pre-cast concrete decks on bridges
  - crane and slings
  - specifications and work instructions

… End …

BCCBM3006B Undertake concreting work on concrete bridges

Unit Descriptor

This unit specifies the competency required to undertake concreting work on bridge projects for the construction of all bridge components (superstructure and substructure). It includes the minimum criteria for competency assessment.

This unit includes concreting work for concrete decks, piers/headstocks, footings/piles/caps/abutments and cast in-situ girders.

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 relevant to the tasks 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 Place concrete	2.1 Location and design of concrete work is identified from site drawings, engineer's design and specifications
	2.2 Debris and waste is removed from pour area
	2.3 Release agent is applied where specified
	2.4 Concrete is poured in horizontal layers into location to levels as indicated by markers, level pegs or lines

2	Place concrete (continued)	2.5	Methods to avoid segregation are implemented
		2.6	Poured concrete is consolidated during process using approved compaction or vibration methods in accordance with standards
3	Finish concrete	3.1	Concrete is screeded to correct levels and/or grades using appropriate straight edged tool or formwork mounted screed
		3.2	Screeded concrete surface is floated
		3.3	Control/structural joints are defined and edges finished according to engineer's drawings and specifications
		3.4	Concrete surface is given a final finish to architect’s design and/or engineer’s specifications
4	Cure concrete	4.1	Concrete is cured to project specifications and in accordance with standards
		4.2	Curing agent/method maintained on concrete surface to project specifications
		4.3	Protection is provided to concrete during curing process by isolating and/or barricading the area
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

- Concreting work is to include but not be limited to cast in-situ concrete decks, piers/headstocks, footings/pile caps/abutments and may include cast in situ girders
- Superstructure includes the bridge deck and may include the girders, while substructure includes all other components
- Placing methods of concrete includes but is not limited to wheelbarrows, pumping equipment, kibble, tremmie, truck placed, shovelling and includes vibrating
- Finishing techniques for concrete are to include but not be limited to steel trowel, mechanical trowelling machine, broom finished, wood float, bull float and brushed
- Curing is to include but not be limited to flooding, coating with a membrane or plastic sheeting
- Methods to avoid segregation are to include but not be limited to minimising the height of a vertical drop and using a tremmie or the flexible hose of a concrete pump
- 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 are to include but not be limited to any rural or urban bridge construction project

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 services, other machines, personnel, traffic control, working at heights, 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 are to include but may not be limited to extinguishing fires, organisational first aid requirements and evacuation
Environmental Requirements	• Environmental procedures are to include but may not be limited to organisational/project environmental management plans, 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 be limited to floats, trowels, edging tools, screeds, wheelbarrows, tremmies, chutes, vibrators, rakes, short handle shovels, rods, hammers, hoses, buckets, sponges and brushes
Materials	• Materials are to include but not be limited to concrete, curing agents, plastic membranes, water and sand
Communications	• Communications are to include but not be 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 undertaking concreting on concrete bridges • 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
- Completion of concrete placing, finishing and curing for cast in situ decks, concrete footings/pile caps/abutments, piers and headstocks, to the finished form, on a concrete multi-span bridge with a minimum length of twenty metres, to design specifications
- 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
  - Bridge construction and sequencing
  - Steel reinforcement characteristics
  - Concrete characteristics and properties
  - Concreting principles
  - Structural technology
  - Working in confined spaces
  - Working at heights and over water
  - Processes for interpreting engineering drawings
  - 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 undertaking concreting work on concrete bridges
  - hand and power tools, plant and equipment appropriate to undertaking concreting work on concrete bridges
  - specifications and work instructions

… End …

BCCBM3007B Construct formwork and falsework on concrete bridges

Unit Descriptor

This unit specifies the competency required to erect and remove formwork and falsework for the preparation and placing of concrete components on bridge constructions. It includes the minimum criteria for competency assessment.

This unit includes erecting formwork and falsework for concrete decks, piers/headstocks, footings/piles/caps/abutments and cast in situ girders.

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 relevant to the tasks 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 Prepare for formwork erection	2.1 Location and design of formwork/falsework is identified from site drawings, engineer's design and specifications
	2.2 Key set out locations are placed accurately to requirements of job drawings
	2.3 Work area and materials are prepared for the erection of formwork/falsework

		2.4	Formwork shutters are assembled to design form requirements and specified dimensions
		2.5	Formwork support system (falsework) is sequentially erected according to initial set out and standards
		2.6	Scaffolding and/or hand railing is checked where required in accordance with job specification and standards
		2.7	Bracing of formwork support is placed to job requirements and design specifications to maintain rigidity and stability
		2.8	Support system is set to correct height level and line and to specified tolerance
3	Erect formwork	3.1	Formwork for beams, drop panels and cantilevers is fabricated, positioned and fixed into place, to specifications
		3.2	Formwork for walls is assembled, erected and fixed into place, plumbed and to specified tolerance
		3.3	Soffit formwork is fabricated, positioned and fixed into place to specifications
		3.4	Edge boxing to formwork is fixed in correct position and plumbed to alignment.
		3.5	Formwork is braced
		3.6	Cast-ins, inserts and penetration blocks are installed to locations to specified requirements
4	Inspect formwork	4.1	Erected formwork and the formwork support system is inspected for safety and quality of work in accordance with standards
		4.2	Loose dirt, sawdust and other waste material is removed safely with due care to welfare of site personnel and public
		4.3	Release agent is applied to formwork in accordance with specifications
		4.4	Formwork and support system is monitored during concrete pour
5	Stripping of formwork	5.1	Approval to remove formwork support system is obtained from appropriate site authority
		5.2	Edge boxing and braces are carefully removed, denailed, cleaned and stored/stacked
		5.3	Support system is backed off to appropriate height to loosen soffit decking

5	Stripping of formwork (continued)	5.4 Formwork is safely and sequentially removed, denailed and relocated or stored
		5.5 Appropriate back propping system, where applicable, is selected and installed according to standards and engineer's requirements
6	Clean up	6.1 Work area is cleared and materials disposed of or recycled in accordance with project environmental management plan
		6.2 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

- Formwork is erected to provide a moulded shape, structure and finish to dimension including but not limited to cast in situ concrete decks, piers/headstocks, footings/pile caps/abutments and may include cast in situ girders
- Falsework is a temporary support structure designed to carry the various loads imposed on the formwork during construction of bridge components
- Bracing includes adjustable props and timber
- Key set out locations include points, lines, profiles and grids
- Cast ins, inserts and penetration blocks include services, anchor bolts and other fixtures
- Soffits include flooring, decking or base work making up the underside of formwork
- 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 are to include but not be limited to any rural or urban bridge construction project
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 services, other machines, personnel, traffic control, working at heights, 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 are to include but may not be limited to extinguishing fires, organisational first aid requirements and evacuation
Environmental Requirements	• Environmental procedures are to include but may not be limited to organisational/project environmental management plans, 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 be limited to spanners, saws, power saws, nail guns, drills, string lines, levelling equipment, spirit levels, chisels, hammers, compressors, hoses, tape measures, rulers, marking equipment, crow bars, pinch bars and may include scaffolding and ladders
Materials	• Materials are to include but not be limited to screws, nails, plywood, structural timber, proprietary shutters, walers, soldiers, soldier sets, release agent, adjustable props, brackets, base plates, she bolts and clips
Communications	• Communications are to include but not be 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 constructing formwork and falsework on concrete bridges • Regulatory/legislative requirements pertaining to constructing formwork and falsework • 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
- Erection and dismantling of the formwork and falsework for cast in situ decks, concrete footings/pile caps/abutments, piers and headstocks on a concrete multi-span bridge with a minimum length of twenty metres, to design specifications
- 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
  - Bridge construction and sequencing
  - Formwork and falsework
  - Steel reinforcement
  - Concrete
  - Bracing and loading
  - Structural characteristics of reinforced concrete
  - Working in confined spaces
  - Working at heights and over water
  - Processes for interpreting engineering drawings
  - 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 the construction of formwork and falsework for concrete bridges
  - hand and power tools, plant and equipment appropriate to the construction of formwork and falsework for concrete bridges
  - specifications and work instructions

… End …