



**Australian Government**

**Department of Education, Employment and Workplace Relations**

# **CPCCPA3001A Prepare subgrade, base and bedding course for segmental paving**

**Release: 1**

## **CPCCPA3001A Prepare subgrade, base and bedding course for segmental paving**

### **Modification History**

Not Applicable

### **Unit Descriptor**

#### **Unit descriptor**

This unit of competency specifies the outcomes required to prepare the subgrade, base and bedding courses in preparation for laying pavers. It includes identifying soil type, drainage and materials for the base; calculating quantities of base material; compacting base; and screeding to determined levels.

### **Application of the Unit**

#### **Application of the unit**

This unit of competency supports the attainment of skills and knowledge to safely and effectively prepare subgrade, base and bedding course for segmental paving while working with others and in teams.

### **Licensing/Regulatory Information**

Not Applicable

### **Pre-Requisites**

#### **Prerequisite units**

CPCCOHS2001A

Apply OHS requirements, policies and procedures in the construction industry

## Employability Skills Information

**Employability skills**      This unit contains employability skills.

## Elements and Performance Criteria Pre-Content

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Elements describe the essential outcomes of a unit of competency.

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

## Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Plan and prepare.	<p>1.1. Work instructions and operational details are obtained using relevant <i>information</i>, confirmed and applied for <i>planning and preparation</i> purposes.</p> <p>1.2. <i>Safety (OHS)</i> requirements are followed in accordance with safety plans and policies.</p> <p>1.3. Signage and barricade requirements are identified and implemented.</p> <p>1.4. <i>Tools and equipment</i> selected to carry out tasks are consistent with the requirements of the job, checked for serviceability and any faults are rectified or reported prior to commencement.</p> <p>1.5. <i>Materials</i> quantity requirements are calculated in accordance with plans and specifications and <i>quality requirements</i>.</p> <p>1.6. Materials appropriate to the work application are identified, obtained, prepared, <i>safely handled</i> and located ready for use.</p> <p>1.7. <i>Environmental requirements</i> are identified for the project in accordance with environmental plans and statutory and regulatory authority requirements and applied.</p> <p>1.8. Importance of the design and installation of the base, bedding and surface layers in the performance of the paving project are identified.</p>
2. Identify soil type.	<p>2.1. Class of soil is identified using soil class charts.</p> <p>2.2. Soil is assessed to determine its properties.</p> <p>2.3. Results of penetration tests are used to determine subgrade requirements.</p>
3. Prepare subgrade.	<p>3.1. Drainage and other features are identified within the area to be paved.</p> <p>3.2. <i>Remedial actions</i> are used where required.</p> <p>3.3. Drainage needs are identified and drains put in place where required.</p> <p>3.4. Services are identified in work area.</p> <p>3.5. Termite barriers are identified and not breached, or remedial action is taken if needed to ensure barrier integrity is maintained.</p> <p>3.6. Damp proof courses are identified and paving is constructed so that it does not compromise them.</p> <p>3.7. Components are cleaned, stacked and stored for reuse or bundled for removal.</p>
4. Excavate the site.	<p>4.1. Site is excavated in preparation for paving to remove top soil, weeds and their root systems.</p>

ELEMENT	PERFORMANCE CRITERIA
5. Install base course materials.	<p>4.2. Factors that determine amount of excavation are identified.</p> <p>4.3. Bulking factor for different soil types is calculated.</p> <p>5.1. Quantity of base course materials is calculated based upon the subgrade type and purpose of the paved area.</p> <p>5.2. Material is distributed over area, allowing for compaction.</p> <p>5.3. Area is compacted, taking care not to over-compact base materials.</p> <p>5.4. Compacting machinery is handled correctly.</p>
6. Install bedding course materials.	<p>6.1. Bedding course material is selected, ensuring that it is suitable for the purpose.</p> <p>6.2. Need for geotextile materials as drainage or separation layers is determined.</p> <p>6.3. Quantity of layer course materials is calculated.</p> <p>6.4. Bedding course is stabilised for paths with slopes of greater than 1:15.</p> <p>6.5. Transverse concrete supports are installed for driveways with a sloping pavement of greater than 5 metres.</p> <p>6.6. Material is distributed over the area to be paved within tolerances stipulated by relevant standards.</p> <p>6.7. If using bedding sand, area is compacted to Australian standards taking care not to over-compact base materials, and allowance is made for compaction.</p> <p>6.8. Compacting machinery is handled correctly.</p> <p>6.9. If using concrete, area to be paved is framed and concrete is mixed to manufacturer's directions and spread to required depth.</p>
7. Screed base materials.	<p>7.1. Base materials are screeded to levels as determined, and set out by stringlines or other mechanisms.</p> <p>7.2. Excess base materials are screeded to a specified area.</p>
8. Clean up.	<p>8.1. Work area is cleared and materials disposed of, reused or recycled in accordance with legislation, regulations, codes of practice and job specification.</p> <p>8.2. Plant, tools and equipment are cleaned, checked, maintained and stored in accordance with manufacturer recommendations and standard work practices.</p>

## Required Skills and Knowledge

### REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

#### Required skills

Required skills for this unit are:

- communication skills to:
  - follow instructions
  - read and interpret:
    - documentation from a variety of sources
    - drawings and specifications
  - recognise procedures
  - report faults
  - enable clear and direct communication, using questioning to identify and confirm requirements, share information, listen and understand
  - use language and concepts appropriate to cultural differences
  - use and interpret non-verbal communication, such as hand signals
  - written skills to record results of checks and tests and relevant work completion procedures
- evaluate own actions and make judgments about performance and necessary improvements
- identifying and accurately reporting to appropriate personnel any faults in tools, equipment or materials
- organisational skills, including the ability to plan and set out work
- respond to change and contribute to workplace responsibilities, such as current work site environmental and sustainability frameworks and management systems
- teamwork skills to work with others to action tasks and relate to people from a range of cultural and ethnic backgrounds and with varying physical and mental abilities
- technological skills to:
  - use a range of mobile technology, such as two-way radio and mobile phones
  - voice and hand signals to access and understand site-specific instructions.

#### Required knowledge

Required knowledge for this unit is:

- principles of California bearing ratio (CBR)
- properties of bedding course materials
- properties of geotextile materials
- relevant Australian standards
- stabilising bedding sand.

# Evidence Guide

## EVIDENCE GUIDE

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The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

### Overview of assessment

This unit of competency could be assessed in the workplace or a close simulation of the workplace environment, provided that simulated or project-based assessment techniques fully replicate construction workplace conditions, materials, activities, responsibilities and procedures.

### Critical aspects for assessment and evidence required to demonstrate competency in this unit

A person who demonstrates competency in this unit must be able to provide evidence of the ability to:

- locate, interpret and apply relevant information, standards and specifications
- comply with site safety plan and OHS legislation, regulations and codes of practice applicable to workplace operations
- comply with organisational policies and procedures including quality requirements
- safely and effectively operate and use tools, plant and equipment
- communicate and work effectively and safely with others.

### Context of and specific resources for assessment

This competency is to be assessed using standard and authorised work practices, safety requirements and environmental constraints.

Assessment of essential underpinning knowledge will usually be conducted in an off-site context. Assessment is to comply with relevant regulatory or Australian standards' requirements.

Resource implications for assessment include:

- an induction procedure and requirement
- realistic tasks or simulated tasks covering the mandatory task requirements
- relevant specifications and work instructions
- tools and equipment appropriate to applying safe work practices

## EVIDENCE GUIDE

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- support materials appropriate to activity
- workplace instructions relating to safe work practices and addressing hazards and emergencies
- material safety data sheets
- research resources, including industry-related systems information.

Assessment of this unit of competency may be in conjunction with assessment of other units commonly performed at the same time in normal job roles.

Reasonable adjustments for people with disabilities must be made to assessment processes where required. This could include access to modified equipment and other physical resources, and the provision of appropriate assessment support.

### Method of assessment

Assessment methods must:

- satisfy the endorsed Assessment Guidelines of the Construction, Plumbing and Services Training Package
- include direct observation of tasks in real or simulated work conditions, with questioning to confirm the ability to consistently identify and correctly interpret the essential underpinning knowledge required for practical application
- reinforce the integration of employability skills with workplace tasks and job roles
- confirm that competency is verified and able to be transferred to other circumstances and environments.

Validity and sufficiency of evidence requires that:

- competency will need to be demonstrated over a period of time reflecting the scope of the role and the practical requirements of the workplace
- where the assessment is part of a structured learning experience the evidence collected must relate to a number of performances assessed at different points in time and separated by further learning and practice, with a decision on competency only taken at the point when the assessor has complete



## EVIDENCE GUIDE

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confidence in the person's demonstrated ability and applied knowledge

- all assessment that is part of a structured learning experience must include a combination of direct, indirect and supplementary evidence.

Assessment processes and techniques should as far as is practical take into account the language, literacy and numeracy capacity of the candidate in relation to the competency being assessed.

Supplementary evidence of competency may be obtained from relevant authenticated documentation from third parties, such as existing supervisors, team leaders or specialist training staff.

## Range Statement

### RANGE STATEMENT

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The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

***Information*** includes:

- diagrams or sketches
- instructions issued by authorised organisational or external personnel
- manufacturer specifications and instructions, where specified
- material safety data sheets (MSDS)
- memos
- regulatory and legislative requirements pertaining to paving and concreting materials
- relevant Australian standards
- safe work procedures relating to handling concreting materials
- signage
- verbal, written and graphical instructions
- work bulletins

## **RANGE STATEMENT**

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- work schedules, plans and specifications.

## RANGE STATEMENT

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***Planning and preparation*** include:

- assessment of conditions and hazards
- determination of work requirements and safety plans and policies
- equipment defect identification
- work site inspection.

***Safety (OHS)*** is to be in accordance with state and territory legislation and regulations and project safety plan and may include:

- emergency procedures, including extinguishing fires, organisational first aid requirements and evacuation
- handling activities that may require the assistance of others or the use of manual or mechanical lifting devices where size, weight or other issues, such as a disability are a factor
- hazard control
- hazardous materials and substances, including cement and curing agents
- organisational first aid
- PPE prescribed under legislation, regulations and workplace policies and practices
- safe operating procedures, including the conduct of operational risk assessment and treatments associated with:
  - earth leakage boxes
  - lighting
  - power cables, including overhead service trays, cables and conduits
  - restricted access barriers
  - surrounding structures
  - traffic control
  - trip hazards
  - work site visitors and the public
  - working at heights
  - working in confined spaces
  - working in proximity to others
- use of firefighting equipment
- use of tools and equipment
- workplace environmental requirements and safety.

***Tools and equipment*** include:

- compactors
- concrete mixer
- levelling devices
- rakes

## RANGE STATEMENT

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**Materials** include:

- screed
- shovels
- stringlines
- wheelbarrows.
- aggregates
- bedding sand
- cement
- concrete
- crushed rock
- road base
- sand.

**Quality requirements** include relevant regulations, including:

- Australian standards
- internal company quality policy and standards
- manufacturer specifications
- workplace operations and procedures.

**Safely handled** includes:

- correct calculation of quantities
- manual handling, including:
  - using pallets
  - carrying materials using correct lifting techniques
  - control of waste
- MSDS
- protection of materials
- stacking and storing of materials.

**Environmental requirements** include:

- clean-up management
- dust and noise
- dust suppression, which includes keeping dust in the air to a minimum and may include spraying with water
- vibration
- waste management.

**Remedial actions** include:

- soil stabilisation
- installing a capping layer
- making drainage improvements.

**Factors determining amount of excavation** include:

- compaction measurements
- achieving a consistent subgrade
- cost factors.

**Quantity of layer course materials** is based upon:

- purpose of the paved area (pedestrian or vehicle access)
- subgrade type

## **RANGE STATEMENT**

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- type of paver.

## **Unit Sector(s)**

**Unit sector**                      Construction

## **Functional area**

**Functional area**