UNIT CODE	CPCCST3017
UNIT TITLE	Construct stone arches
APPLICATION	This unit specifies the skills and knowledge required to build different types of stonemasonry arches using regular and irregular stone. This unit applies to stonemasons who work independently or in a team to construct arches on a new or existing structure. A person working at this level would be expected to take responsibility for organising and completing tasks assigned to them without needing close supervision. Completion of the general construction induction training program specified by the model Code of Practice for Construction Work is required for any person who is to carry out construction work. Achievement of *CPCCWHS1001 Prepare to work safely in the construction industry* meets this requirement. No licensing, legislative or certification requirements apply to this unit at the time of publication.
PREREQUISITE UNIT	CPCCWHS2001 Apply WHS requirements, policies and procedures in the construction industry
ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe what needs to be done to demonstrate achievement of the element.
1. Plan and prepare.	1.1 Read, interpret and apply stone arch construction requirements from current plans, specifications, standards and codes. 1.2 Follow relevant information from workplace procedures, workplace safety and environmental documentation. 1.3 Calculate material quantities required for the task. 1.4 Determine job priorities and sequence job tasks in consultation with others on site. 1.5 Identify potential hazards and determine and implement control measures. 1.6 Select and check condition of plant, equipment and tools and report damage or faults to relevant person.

	1.7 Check conformity of materials against the specifications and place materials in preparation for the work.
2. Set out arch.	2.1 Select, fit correctly and use personal protective equipment (PPE) appropriate for job. 2.2 Measure width and height of arch and transfer dimensions to arch support material. 2.3 Mark striking point and create arch. 2.4 Cut and assemble arch support allowing for ease of release on completion without jarring stonework. 2.5 Mark central keystone and voussoirs onto arch support. 2.6 Set out base, bond and gauge of stone arch.
3. Construct arch with regularly cut stone.	3.1 Mix mortar to colour and consistency to meet job requirements. 3.2 Construct arch columns level and plumb, and maintain gauge to springing line of arch. 3.3 Raise arch support and brace level across springing line and crown. 3.4 Cut keystone and voussoirs to pattern with even joints. 3.5 Lay stones with even joints maintaining bond and alignment with stone face. 3.6 Rake joints to specified style and depth.
4. Construct arch with irregular stones.	4.1 Set out and mark keystone to crown of arch. 4.2 Construct arch using random rubble or random squared ashlar to match curved extrados. 4.3 Match stones to abutting stones and lay selected stones using mortar joints maintaining alignment and plumb. 4.4 Remove excess mortar, finish joints to specified profile and depth. 4.5 Clean and brush stone face work.
5. Construct an arch with irregular voussoirs forming stepped extrados.	5.1 Check delivered pre-cut voussoirs/wedges for conformity to design and order. 5.2 Position keystone of archway centrally and lay voussoirs around centre to form arch. 5.3 Lay regular stones where voussoirs are designed to correspond with courses.

	5.4 Lay random regular stones where voussoirs are not designed to correspond with courses.
6. Clean up.	6.1 Clear the work area, and dispose of, reuse or recycle following workplace and environmental requirements. 6.2 Clean tools and equipment, check for serviceability and report damage or faults. 6.3 Store and secure tools and equipment following workplace procedures.
FOUNDATION SKILLS Candidates require: • numeracy skills to: o use measurements and geometry to accurately set curves of arches o use measurements and formulas to calculate material quantities.	
UNIT MAPPING INFORMATION	Supersedes and is equivalent to CPCCST3017A Construct stone arches
LINKS	Companion volumes to this training package are available at the VETNet website: https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=7e15fa6a-68b8-4097-b099-030a5569b1ad

TITLE	Assessment requirements for CPCCST3017 Construct stone arches

PERFORMANCE EVIDENCE

To demonstrate competency in this unit, a candidate must meet the performance criteria of this unit by building two different types of stone arches using regular stone for one and irregular stone for the other.

In doing this, the candidate must:

- set out and assemble arch support
- cut regular keystone and voussoirs with even joints
- remove arch support without damage to stonework.

KNOWLEDGE EVIDENCE

To be competent in this unit, a person must demonstrate knowledge of:

- characteristics, application and limitations of specified materials used for building stone arches
- methods and techniques for constructing stonemasonry arches
- arch design:
    - regular gauge
    - random regular
    - random rubble
- types of natural and manufactured stone
- processes and techniques for building various types of stone arches
- construction terminology relating to stone arches
- mortar ingredients and consistency
- types and safe use of lifting equipment
- functional and operational features of plant, equipment and tools:
    - wet cut saws
    - angle grinders
    - cement mixers
    - power saws
    - battery operated tools
- workplace processes and procedures
- workplace safety:
    - exposure to silica
    - exposure to excessive noise
    - working at heights
    - hazardous manual tasks
    - job safety and environmental analysis (JSEA)

• features of working drawings and specifications • environmental requirements for workplace processes and waste disposal • Australian Standards and codes • key requirements of National Construction Code (NCC) relating to stone arch construction • digital technology and use of devices to source information and communicate with others.
ASSESSMENT CONDITIONS
Assessors must meet the requirements for assessors contained in the Standards for Registered Training Organisations. This unit must be assessed in the workplace or a close simulation reflecting workplace conditions and standards, materials, equipment, activities, responsibilities, procedures, safety requirements and environmental considerations.

LINKS	Companion volumes to this training package are available at the VETNet website: https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=7e15fa6a-68b8-4097-b099-030a5569b1ad