CPCCST4007 Construct a fire brick wall and arch using refractory materials

Application

This unit of competency specifies the skills and knowledge required to construct a brick wall and arch using refractory materials, including castables, bricks and insulation. It covers the application of the unique skills and knowledge relevant to refractory work.

The unit of competency supports specialist and advanced tradespersons working in refractory bricklaying. It may be applied in the construction or repair of various fire resistant structures, including boilers, kilns and industrial furnaces.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Prerequisite Unit

Nil.

Unit Sector

Construction.

Elements and Performance Criteria

1. Set out and prepare the base location of work.	1.1	Set out location of the brickwork to position in accordance with job specifications and drawings.
	1.2	Prepare base location so that the surface is dry, horizontal, clean and flat, and in accordance with job specifications.
2. Lay brickwork.	2.1	Apply fire clay to bricks to maintain joints at the specified thickness.
	2.2	Ensure bricks are in the required bond and set out, method and line, level and plumb in accordance with job specifications and drawings.
	2.3	Cut bricks to the correct length to maintain the required bond in accordance with manufacturer recommendations and job specifications.
	2.4	Complete brickwork and remove surplus fire clay to specification requirements.
3. Form a segmental arch.	3.1	Identify span and rise of the arch and locate in accordance with job plans and specifications.
	3.2	Place adjustable props appropriately to support the timber arch centre and adjust as necessary.
	3.3	Establish and mark position of the central key brick for easy identification.
4. Cut and lay bricks to position around the arch.	4.1	Cut and lay bricks on the centre to form an arch to specifications.
	4.2	Maintain same sized wedge shape brick throughout the construction of the arch.
	4.3	Monitor and adjust measurements and placement of bricks accordingly to

		ensure accurate application of job requirements.
5. Complete and review finished work.	5.1	Remove props and other support materials.
	5.2	Finish and clean construction to meet job requirements and professional expectations.
	5.3	Clean intrados of the arch and repoint with mortar as necessary.

Foundation Skills

As well as the foundation skills explicit in the performance criteria of this unit, candidates require:

- communication skills to:
  - enable clear and direct communication, using questioning to identify and confirm requirements, share information, listen and understand
  - communicate technical issues
  - communicate with the team
  - consult with architect and stakeholder
  - read and interpret:
    - documentation from a variety of sources
    - plans, specifications and drawings
  - use and interpret non-verbal communication
  - use language and concepts appropriate to cultural differences
- numeracy skills to:
  - apply measurements and calculations
- organisational skills to:
  - plan for and set out work
- teamwork skills and the ability to work with others to:
  - ensure coordination and cooperation between self and others

Unit Mapping Information

Supersedes and equivalent to CPCCBC4042A Construct a fire brick wall and arch using refractory materials.

Links

Companion Volume Implementation Guide:

https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=7e15fa6a-68b8-4097-b099-030a5569b1ad

Assessment Requirements for CPCCST4007
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Performance Evidence

To demonstrate competency, a candidate must meet the performance criteria of this unit by constructing a fire brick wall and arch. This work may include a 230mm fire brick wall to incorporate an opening (600mm x 600mm) with a segmental arch above, a minimum of 1.5m long and 1.2m high to the top of the arch.

In doing this, the candidate must:

- demonstrate understanding of the purpose and application of refractory bricklaying
- comply with Work Health and Safety (WHS) regulations applicable to workplace operations
- use safe and effective procedures to handle hazardous materials
- read and interpret two-dimensional refractory plans and specifications
- select and use processes, tools and equipment appropriate to the job requirements
- prepare materials and samples in accordance with job requirements
- identify typical faults and problems with materials and equipment that occur and take necessary action to rectify
- communicate effectively with others to ensure safe work site operations.

Knowledge Evidence

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

- Building Code of Australia (BCA) and other Australian standards relevant to the nature of work and materials being used
- characteristics and applications of different materials used in refractory brick work:
    - required bond:
        - header bond
        - stretch bond
    - adjustable props:
        - metal props
        - packers
        - timber toms
        - timber wedges
    - wedge shape bricks include the following common sizes:
        - 51mm
        - 63mm
        - 69mm
- methods and processes relating to the use of refractory bricks and insulation materials for the construction of fire resistant structures:
    - measurements and placements:

        - accurate positioning and maintenance of the centreline of the key brick is through the vertical centre line of the arch ensuring:
            - all bricks are cut and laid to maintain even joints
            - even joint thickness around the extrados
- organisational procedures for the acquisition and storage of materials
- workplace and equipment safety requirements, including relevant statutory regulations, codes and standards.

Assessment Conditions

Assessors must meet the requirements for assessors contained in the Standards for Registered Training Organisations.

Assessment of performance must be undertaken in the workplace or in a simulated workplace environment. Tasks are to be performed to the level of proficiency and within the time limits expected in a workplace.

Assessors are responsible for ensuring that the person demonstrating competency has access to:

- materials appropriate to refractory brickwork
- plant, tools and equipment relevant to refractory brickwork.

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