



Australian Government

Department of Education, Employment and Workplace Relations

CPCSFS5010A Provide documentation and support for fabrication of fire sprinkler systems

Release: 1

CPCSFS5010A Provide documentation and support for fabrication of fire sprinkler systems

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit of competency specifies the outcomes required to assess issues relating to on-site installation of pipework for sprinkler systems. The unit also involves producing specifications and supporting documentation for the cost-effective fabrication of manageable pipework sections. Licensing, legislative, regulatory or certification requirements may apply to this unit and so the varying state or territory requirements should be confirmed with the relevant body.
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Application of the Unit

Application of the unit	This unit of competency supports the role of fire systems' designers with responsibility for creating specifications and drawings for the fabrication of pipework sections for fire sprinkler systems. Fire systems are limited to those within the deemed-to-satisfy provisions of the Building Code of Australia or detailed fire systems designs for alternative solutions designed by fire engineers. This unit does not apply to fire systems for special hazard locations.
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Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

Prerequisite units	Nil
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Employability Skills Information

Employability skills	This unit contains employability skills.
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Elements and Performance Criteria Pre-Content

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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Determine the impact on fabrication plans of installation risks and constraints.	1.1. On-site health and safety risks relating to the installation of sprinkler systems are identified. 1.2. Constraints relating to access to on-site installation locations for sprinkler system pipes and components are identified. 1.3. Impact of installation risks and constraints on fabrication plans for fire sprinkler system pipes and components is considered and cost-effective and manageable solutions are determined.
2. Plan and specify pipes, fittings and components.	2.1. Current accurate drawings and documentation are obtained and analysed, and measurements are taken on-site during construction if possible to confirm the accuracy of building dimensions. 2.2. The dimensions and design drawing locations of the selected fittings and components are checked and confirmed. 2.3. Fittings and components are planned and specified for ease and safety of installation and to provide cost-effective solutions. 2.4. Pipe lengths are calculated, specified and numbered on relevant drawings.
3. Produce fabrication documentation.	3.1. Appropriate pipe materials and features are confirmed and specified. 3.2. Supplier is consulted as necessary to discuss and negotiate efficient and cost-effective pipe fabrication options. 3.3. Individual pipe specifications are numbered and detailed on fabrication lists. 3.4. Drawings are supplied to support fabrication specifications, as required.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
- accurate measuring - accurate naming and filing of drawings, including:

REQUIRED SKILLS AND KNOWLEDGE

- formal document control
- formal amendments, including:
 - history
 - transmittal notices
- editing and creating drawings, including:
 - layout
 - section
 - detail
 - external references
 - freezing layers
- fluent, detailed hand-drawing and sketching ability to convey information to on-site workers
- numeracy skills for:
 - calculating dimensions, pipe lengths and piping friction loss
 - performing fluid mechanic calculations
- language and literacy skills for:
 - listening to and communicating clearly with colleagues, installers, suppliers and contractors
 - reading and interpreting drawings, plans and specifications, including:
 - architectural
 - structural
 - mechanical
 - hydraulic
 - electrical
- developing constructive and cooperative working relationships with project team members, workplace colleagues, suppliers, installers and clients
- negotiation and conflict management
- organising own work, including creating personal systems and checklists for planning, managing and checking work
- lateral thinking and problem solving
- maintaining concentration, focus and attention to detail for long periods
- managing detailed input to concurrent fire systems design projects at different stages of the process and with diverse sets of regulatory requirements

Required knowledge

- workplace design tools and processes
- level of accuracy required in detailed design drawings
- naming conventions for design drawings and drawing register
- relevant current legislation, codes and standards, including:

REQUIRED SKILLS AND KNOWLEDGE

- building Acts
- building regulations
- infrastructure supply regulations
- the Building Code of Australia
- Australian standards for fire systems
- international standards for fire systems
- other fire system standards commonly required by building insurers
- protection requirements for different buildings
- fire systems' technology and components, including water-based systems, such as:
 - wet pipe sprinkler systems
 - deluge and drencher systems
 - dry pipe sprinkler systems
 - pre-action sprinkler systems
 - early suppression fast response (ESFR)
- purpose and operation of fire systems, including:
 - layout
 - special products and hazards
 - system operation
 - performance requirements
 - maintenance standards
 - system activation and operation
- characteristics and limitations of products and materials used in fire systems and issues relating to material compatibility
- interconnection of fire systems, including:
 - cause and effect matrix
 - interface with other services
- basic principles of structural engineering
- characteristics of building materials
- construction industry terminology
- roles and responsibilities of relevant building project personnel, including:
 - architect
 - lead contractor
 - mechanical engineer
 - hydraulic engineer
 - electrical engineer
- on-site issues that can arise during the construction phase and impose changes to the designs of fire systems and other services
- installation methods, including:

REQUIRED SKILLS AND KNOWLEDGE

- access requirements
- health and safety requirements
- water supplies, including:
 - common water sources
 - conservation requirements
 - in-ground reticulation
 - booster configurations
- fluid mechanics and hydraulics relating to pipe range
- sustainability requirements and ratings, including:
 - energy conservation
 - water conservation
- pipe fabrication methods and constraints
- mathematic principles, equations and calculation methods, including:
 - financial calculations, for example to assess cost-effectiveness of fire systems
 - trigonometry, for example to amend dimensions of pipe allowing for fittings

Evidence Guide

EVIDENCE GUIDE

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 the simulated or project-based assessment fully replicates workplace conditions, materials, activities, responsibilities and procedures. This unit could be assessed as an activity involving the production of pipe fabrication documentation for a range of fire sprinkler system design projects.
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 required skills and knowledge specified within this unit. In particular the person should demonstrate:

EVIDENCE GUIDE

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| | <ul style="list-style-type: none"> • the ability to: <ul style="list-style-type: none"> • read and interpret a range of design drawings • create, manipulate, save, file and share design drawings • an understanding of technical issues impacting on fire sprinkler systems designs • an understanding of installation risks and constraints impacting on pipe fabrication specifications for fire sprinkler systems • the ability to produce safe, efficient and cost-effective solutions and accurate drawings and documentation for pipe fabrication work for fire sprinkler systems, including: <ul style="list-style-type: none"> • wet pipe • deluge and drencher • dry pipe • pre-action • early suppression fast response (ESFR) • combination systems • the ability to produce safe, efficient and cost-effective solutions and accurate drawings and documentation for pipe fabrication work for fire sprinkler systems in a range of project types, including: <ul style="list-style-type: none"> • low-rise buildings • medium-rise buildings • high-rise buildings (over 25 metres) • buildings over 45 metres in height. |
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EVIDENCE GUIDE	
Context of and specific resources for assessment	Assessment of essential underpinning knowledge may be conducted in an off-site context. It is to comply with relevant regulatory or Australian standards' requirements. Resource implications for assessment include: • design briefs, drawings, plans and specifications • copies of codes, standards, legislation and regulatory requirements • access to information and communications technology - hardware and software • access to manufacturer's information.
Method of assessment	Assessment 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.
Guidance information for assessment	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. 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.

Range Statement

RANGE STATEMENT

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.

<i>On-site health and safety risks</i> may include:	• manual handling • confined spaces • working at height.
<i>Constraints relating to access</i> may include:	• height of pipe • length of pipe • distance from beams • distance from walls.
<i>On-site installation locations</i> may include:	• ceiling space • roof space • under-floor • under-soffit.
<i>Current accurate drawings and documentation</i> must be obtained from consultants, lead contractor and other service contractors and should include:	• architectural • structural • mechanical • electrical • hydraulic • fire engineer's or estimator's specifications if available.
<i>Fittings and components</i> may include:	• hangers • sprinkler heads • elbows • tees • pumps • tanks.
<i>Pipe specifications</i> may include:	• length • dimension • pap size • thread • material, including: • black steel • galvanised • hot dip galvanised • flange.

Unit Sector(s)

Unit sector	Fire systems design
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Co-requisite units

Co-requisite units	Nil
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Competency field

Competency field	
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