



**Australian Government**

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

# **CPCSFS5011A Provide design documentation and review and support fire system installation processes**

Release: 1

## **CPCSFS5011A Provide design documentation and review and support fire system installation processes**

### **Modification History**

Not Applicable

### **Unit Descriptor**

<b>Unit descriptor</b>	<p>This unit of competency specifies the outcomes required to develop detailed drawings and notes for the fire systems installation team from approved detailed fire systems design drawings. The unit also covers the outcomes required to assist and support the installation team when changes to detailed designs may be required owing to contingencies encountered on-site.</p> <p>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.</p>
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### **Application of the Unit**

<b>Application of the unit</b>	<p>This unit of competency supports the role of fire systems' designers whose work involves the preparation of detailed documentation to support the installation of fire systems and the provision of trouble-shooting advice and drawings for solutions to on-site issues.</p> <p>Fire systems designs 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.</p>
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### **Licensing/Regulatory Information**

Refer to Unit Descriptor

## Pre-Requisites

<b>Prerequisite units</b>	Nil
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## Employability Skills Information

<b>Employability skills</b>	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. Produce installation drawings and documentation.	1.1. Approved detailed design drawings of fire systems are checked to ensure that <i>installation implications</i> of required changes have been addressed. 1.2. Approved detailed design drawings of fire systems are used to create installation drawings. 1.3. Detailed design specifications of fire systems are used to notate the installation drawings with the location of specific components of the fire system.
2. Review drawings prior to installation.	2.1. Ongoing changes to detailed structural or other services' design drawings are regularly <i>monitored</i> and recorded. 2.2. The impact of structural and other services design changes on fire systems design and installation is considered and appropriate solutions are proposed and negotiated with relevant project team members, as required. 2.3. Fire systems installation drawings and documentation are amended to incorporate accepted solutions according to workplace and project procedures.
3. Resolve on-site installation problems.	3.1. Notifications of <i>on-site installation issues</i> are recorded, prioritised and considered in line with project timeframes. 3.2. Appropriate solutions are proposed and negotiated with relevant project team members, as required. 3.3. Fire systems installation drawings and documentation are amended to incorporate accepted solutions. 3.4. Solutions are communicated to on-site fire system installation team members and amended documentation is supplied according to workplace and project procedures.

## Required Skills and Knowledge

### REQUIRED SKILLS AND KNOWLEDGE

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

#### Required skills

## **REQUIRED SKILLS AND KNOWLEDGE**

- accurate measuring
- accurate naming and filing of drawings, including:
  - formal document control
  - formal amendments, including:
    - history
    - transmittal notices
- editing and creating drawings, including:
  - layout
  - section
  - detail
  - external references
  - freezing layers
- parametric modelling of services coordination using proprietary software, such as Navis-Works or MEP-REVIT
- fluent detailed hand-drawing and sketching ability to convey information to on-site workers
- numeracy skills for performing relevant system calculations
- language and literacy skills for:
  - listening to and communicating clearly with colleagues, installers, suppliers and contractors
  - participating in meetings, such as negotiations with fire engineering consultant, architect, builder or other service contractors
  - letter writing, especially to formalise:
  - recognition of conflicts and errors on drawings supplied by other service contractors
  - agreements with other services, for example whichever service is fitted last must fit around existing services
  - 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
- initiating and running meetings with lead contractor and other service contractors
- organising own work, including creating personal systems and checklists for planning, managing and checking work
- lateral thinking and problem solving

## **REQUIRED SKILLS AND KNOWLEDGE**

- 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
- fire science, including:
  - fire behaviour and dynamics
  - impact of fire on structures and materials
  - products of combustion
  - fire control strategies
  - fire retardants
  - fire detection technologies
  - fire suppression technologies
  - fire containment
- parametric modelling software, such as Navis-Works or MEP-REVIT
- computer software functions and operation, including:
  - word processing
  - spreadsheet
  - email
  - internet
  - proprietary project management software
- relevant current legislation, codes and standards, including:
  - 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, such as:
  - water-based systems, including:
    - wet pipe sprinkler systems
    - deluge and drencher systems
    - dry pipe sprinkler systems
    - pre-action sprinkler systems

## **REQUIRED SKILLS AND KNOWLEDGE**

- early suppression fast response (ESFR)
- hydrants, hose reels and monitors
- water supply tanks
- fire pump sets
- detection and warning systems, including:
  - emergency warning and intercommunications systems (EWIS)
  - fire detection and alarm systems
  - smoke control systems
  - emergency lighting systems
- 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
- passive fire safety elements:
  - identification of passive elements
  - impact of fire systems design on passive elements
  - specifications required to safeguard integrity of passive fire element performance where penetrations are necessitated by the fire systems design
- 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:
  - access requirements

## REQUIRED SKILLS AND KNOWLEDGE

- health and safety requirements
- sustainability requirements and ratings, including:
  - energy conservation
  - water conservation
- mathematic principles, equations and calculation methods relevant to the system type

## 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 preparation of accurate documentation and provision of ongoing support for the installation of fire systems in a range of projects and buildings.

#### 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:

- the ability to:
  - read and interpret a range of design drawings
  - create, manipulate, save, file and share design drawings
- an understanding of technical issues impacting on the installation of fire systems
- high-level communication skills to interact with on-site installers, and other service contractors and consultants



<b>EVIDENCE GUIDE</b>	
	<ul style="list-style-type: none"> <li>• an understanding of the relevant regulatory approval and fire systems design certification processes</li> <li>• the ability to problem-solve and negotiate to produce appropriate design solutions for issues and contingencies encountered at the installation phase of a range of fire systems in different buildings, including:                             <ul style="list-style-type: none"> <li>• low-rise buildings</li> <li>• medium-rise buildings</li> <li>• high-rise buildings (over 25 metres)</li> <li>• buildings over 45 metres in height.</li> </ul> </li> </ul>
<b>Context of and specific resources for assessment</b>	<p>Assessment of essential underpinning knowledge may be conducted in an off-site context. It is to comply with relevant regulatory or Australian standards' requirements.</p> <p>Resource implications for assessment include:</p> <ul style="list-style-type: none"> <li>• design briefs, drawings, plans and specifications</li> <li>• copies of codes, standards, legislation and regulatory requirements</li> <li>• access to information and communications technology - hardware and software</li> <li>• access to manufacturer's information regarding fittings and components.</li> </ul>
<b>Method of assessment</b>	<p>Assessment must:</p> <ul style="list-style-type: none"> <li>• satisfy the endorsed Assessment Guidelines of the Construction, Plumbing and Services Training Package</li> <li>• 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</li> <li>• reinforce the integration of employability skills with workplace tasks and job roles</li> <li>• confirm that competency is verified and able to be transferred to other circumstances and environments.</li> </ul>
<b>Guidance information for assessment</b>	<p>Reasonable adjustments for people with disabilities must be made to assessment processes</p>

<b>EVIDENCE GUIDE</b>	
	<p>where required. This could include access to modified equipment and other physical resources, and the provision of appropriate assessment support.</p> <p>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.</p>

## Range Statement

<b>RANGE STATEMENT</b>	
<p>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.</p>	
<p><b><i>Installation implications</i></b> may include:</p>	<ul style="list-style-type: none"> <li>• on-site health and safety risks, such as:                             <ul style="list-style-type: none"> <li>• manual handling</li> <li>• confined spaces</li> <li>• working at height</li> </ul> </li> <li>• constraints relating to access, such as:                             <ul style="list-style-type: none"> <li>• height of pipe</li> <li>• length of pipe</li> <li>• distance from beams</li> <li>• distance from walls.</li> </ul> </li> </ul>
<p><b><i>Monitoring</i></b> project drawings and documentation may involve:</p>	<ul style="list-style-type: none"> <li>• regular review of project management software tools and systems</li> <li>• regular review of emails</li> <li>• telephone communication with project team, including:                             <ul style="list-style-type: none"> <li>• architect</li> <li>• lead contractor</li> <li>• other service contractors.</li> </ul> </li> </ul>
<p><b><i>On-site installation issues</i></b> may include:</p>	<ul style="list-style-type: none"> <li>• discrepancies between designed and actual structure</li> <li>• discrepancies between designed and actual</li> </ul>

<b>RANGE STATEMENT</b>	
	systems for other services, including: <ul style="list-style-type: none"><li>• mechanical</li><li>• hydraulic</li><li>• electrical</li><li>• errors in supplied materials and components</li><li>• scheduling and sequencing changes</li><li>• problems with access to installation locations of fire system components.</li></ul>

### **Unit Sector(s)**

<b>Unit sector</b>	Fire systems design
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### **Co-requisite units**

<b>Co-requisite units</b>	Nil
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### **Competency field**

<b>Competency field</b>	
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