

Unit of Competency CPCSFS5008

Create detailed designs for fire detection and warning systems

Application

This unit specifies the skills and knowledge required to obtain, process and set up drawings for the detailed design of fire detection and warning systems low to high-rise buildings over 25 metres and 50 metres in height.

The unit involves assessing and selecting component requirements, setting out the locations of components and creating final notated drawings.

This unit of competency supports the role of fire systems' designers with responsibility for creating detailed designs for fire detection and warning systems.

The role may involve interaction with fire engineers, architects, builders, suppliers, clients and relevant planning authorities and requires a sound understanding of applicable legislation, standards and codes, including the National Construction Code (NCC).

Licensing, legislative, regulatory or certification requirements may apply to this unit, requirements should be confirmed with the relevant government body.

Prerequisite Unit

Nil.

Elements and Performance Criteria

1. Set up fire systems design drawings.	<ul style="list-style-type: none">1.1. Request and obtain project drawings and documentation and name and file according to workplace procedures.1.2. Clean drawings to leave minimal essential information.1.3. Import layers showing designs of other services into clean architectural or structural drawings.1.4. Add details from drawings of the floor level above, if these affect the design.1.5. Process detailed design drawings according to workplace procedures.
2. Lay out the fire systems design.	<ul style="list-style-type: none">2.2. Determine the exact location of the fire detection and warning system and notate on the drawing.2.3. Determine the most efficient and workable layout and location of fire detection and warning systems components and notate on the drawing.2.4. Calculate and check dimensions and notate on the drawing.
3. Specify component capacities and characteristics.	<ul style="list-style-type: none">3.1. Complete electrical calculations to assess requirements and confirm cable ranges.3.2. Specify components which are most suitable to the application.3.3. Design and specify electronic interfaces with other services.3.4. Prepare system performance requirements and commissioning procedures and specifications according to relevant codes and standards and component manufacturer's recommendations, workplace and project requirements.
4. Submit	<ul style="list-style-type: none">4.1. Submit fire detection and warning system design drawings to relevant

drawings for approval and finalise design process.	<p>personnel within the scheduled timeframe.</p> <p>4.2 Make or negotiate required amendments to design drawings as required.</p> <p>4.3 Process and distribute final approved design drawings according to project requirements.</p>
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Foundation skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Unit Mapping Information

Supersedes and is equivalent to CPCSF55008A Create detailed designs for fire detection and warning systems.

Links

Companion Volume Implementation Guide:

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

Assessment requirements for CPCSF5008 Create detailed designs for fire detection and warning systems

Performance Evidence

To demonstrate competency, a candidate must meet the performance criteria for this unit by:

- producing fully compliant designs for fire detection and warning systems for the following sites:
 - low-rise building
 - medium-rise building
 - high-rise building (over 25 metres)
 - building over 50 metres in height
 - building classifications in the National Construction Code (NCC).
- processing design drawings using parametric modelling software which include:
 - relevant standards, codes, workplace procedures, regulatory and manufacturer requirements within agreed project timeframes
 - relevant regulatory approval and fire systems design certification processes
 - technical issues impacting on fire detection and occupant warning system designs
 - fire engineer's designs for alternative solutions.

Knowledge Evidence

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

- workplace design tools and processes
- level of accuracy required in detailed design drawings
- naming conventions for design drawings and drawing register
- computer software functions and operation:
 - word processing
 - spreadsheet
 - email
 - internet
 - parametric modelling software
 - BASIC computer programming language
- current legislation, codes and standards:
 - building acts
 - building regulations
 - infrastructure supply regulations
 - Building Code of Australia (BCA)
 - National Construction Code (NCC)

- o Australian standards for fire systems
 - o international standards for fire systems
 - o jurisdictional authorities in addition to the BCA and NCC
 - o other fire system standards commonly required by building insurers
- protection requirements for different buildings
- purpose and operation of fire systems:
 - o layout
 - o special products and hazards
 - o system operation
 - o performance requirements
 - o maintenance standards
 - o system activation and operation
- characteristics and limitations of products and materials used in fire systems and issues relating to material compatibility
- construction industry terminology
- roles and responsibilities of relevant building project personnel:
 - o architect
 - o lead contractor
 - o mechanical engineer
 - o hydraulic engineer
 - o electrical engineer
- installation methods:
 - o access requirements
 - o work health and safety (WHS) requirements
- sustainability requirements and ratings relating to:
 - o energy conservation
- electrical and electronics theory:
 - o units used to measure current (alternating current (AC) and direct current (DC)), power, capacitance, inductance and sound attenuation
 - o definition of voltage ratings and requirements applicable to fire detection and warning systems as defined in communication and electrical safety regulations, including extra-low voltage (ELV), low voltage (LV) and hazardous voltages
 - o basic operation of common electronic and electrical components used in fire detection and warning systems including:
 - basic operation of communication protocols on addressable systems
 - peripheral devices (printers)
 - interfaces to other communication systems to high level or low level
- communication technologies:
 - o data transfer
 - o networking
 - o communication protocols
 - o radio frequency technologies
- acoustics and speech intelligibility for occupant warning systems
- financial management:

- o budgeting
 - o cost-effectiveness
- contractual processes
- project drawings and documentation:
 - o architectural
 - o structural
 - o mechanical
 - o electrical
 - o hydraulic
 - o water-based fire suppression systems
 - o fire engineer's or estimator's specifications
- efficient and workable layout and location relating to:
 - o penetrations
 - o conflict with other services
 - o interfaces with other services
 - o WHS risks
 - o access constraints
 - o installation problems
 - o aesthetic requirements
 - o efficiencies to facilitate work on site and reduce labour costing
 - o selection of cost-effective components and materials
- detection and warning system components:
 - o EWIS
 - o fire detection and alarm systems
 - o smoke control systems
 - o emergency lighting systems
 - o manual call buttons
 - o amplifiers
 - o speakers
 - o emergency lighting
 - o fire alarm and control panels:
 - conventional
 - addressable
 - o detectors:
 - heat
 - smoke
 - flame sensing
 - spot
 - projected beam
 - aspiration type
 - o power source
 - o batteries
 - o cabling

- o fireproof cable
- electrical calculations:
 - o the voltage drop in a wiring path given the required electrical parameters
 - o battery capacity requirements given the required performance parameters
 - o power supply and battery charge capacity requirements given the required performance parameters
 - o Cable Services Australia (CSA) cable size and cabling medium type given the required electrical performance parameters
 - o total power supply consumption requirements of field equipment in normal and active (alarm) state given the required electrical performance parameters of equipment installed
 - o the number of points, circuits and zones on a system given the required performance parameters of a wiring path
- negotiations regarding amendments to design drawings arising due to:
 - o non-compliance with applicable legislation, codes and standards
 - o impact on installation risks and constraints
 - o impact on cost-effectiveness.

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 using realistic workplace conditions, materials, activities, responsibilities, procedures, safety requirements and environmental considerations.

Links

Companion Volume Implementation Guide:

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