



Australian Government

Department of Education, Employment and Workplace Relations

CPCSF7003A Develop and submit tenders for fire systems design solutions

Release: 1

CPCSFS7003A Develop and submit tenders for fire systems design solutions

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit of competency specifies the outcomes required to research, plan and prepare tenders for the design and implementation of cost-effective fire systems design solutions. The design and implementation of fire systems design projects occur in a competitive commercial environment. It is not sufficient to design effective and technically compliant fire systems design solutions for clients. It is also essential that the solutions are cost-effective and can be commercially competitive. Client requirements may specify use of the U.S. National Fire Protection Association (NFPA) standards. 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 attainment of skills and knowledge necessary to research, plan, cost and tender for the design, fabrication and installation of efficient, effective and compliant fire suppression and detection systems.
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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. Research fire system component capacities and costs.	1.1. Industry networks and mechanisms are used to maintain current understanding of developments in fire system technology. 1.2. Research is conducted into changes to the relevant legislation, codes and standards for the fire systems design sector to maintain currency of knowledge. 1.3. Research is conducted to identify the capacity, performance characteristics and cost of alternative components of the range of appropriate fire suppression and detection solutions. 1.4. A cost-benefit and efficiency analysis of the range of fire suppression and detection systems is conducted. 1.5. The proposed project's documentation and drawings are fully scrutinised and assessed.
2. Prepare estimate of labour costs.	2.1. The skill profile and number of personnel required to design and install the proposed fire system are identified. 2.2. Options for securing the required personnel are analysed. 2.3. The types and numbers of appropriate on-site personnel are identified and the time required on site is estimated. 2.4. Labour costs are calculated with allowance for the full range of on-costs and cost changes during the life of the project.
3. Prepare estimate of material costs.	3.1. The quantities of selected fittings and materials are calculated. 3.2. Cost estimates for the purchase and fabrication of the project's fittings and materials from internal and external suppliers are negotiated, secured and analysed. 3.3. Cost estimates for the use, purchase or hire of required plant or equipment to support the design and installation process are negotiated, secured and analysed.
4. Prepare estimate of other project costs and margins.	4.1. Cost estimates of overhead costs are identified and estimated for the project. 4.2. The required profit margin is identified in line with the company's strategic requirements and policies.
5. Prepare business proposal or tender.	5.1. Total project resource requirements and costs are analysed and synthesised for inclusion in the business proposal or tender.

ELEMENT	PERFORMANCE CRITERIA
	5.2. The business proposal or tender requirements are analysed and applied in the development of the tender. 5.3. Legal, financial or accounting expertise is sought as required in the preparation of the business proposal or tender and in line with company policies and procedures. 5.4. The business proposal or tender is finalised in line with company policies and procedures and the requirements of the project brief.

ELEMENT	PERFORMANCE CRITERIA
6. Finalise and support the bid process.	6.1. The business proposal or tender is submitted within required timeframe. 6.2. Responses are provided to the potential client in response to queries in a professional manner and in line with company policies and procedures. 6.3. Negotiations regarding proposed services, timelines or price are conducted as required and in a professional manner and in line with company policies and procedures. 6.4. The business proposal or tender bid process is finalised in a professional manner and in line with company policies and procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- accurate measuring
- numeracy skills for:
 - financial calculations:
 - labour costs
 - overhead costs
 - profit margins
 - water-based system calculations:
 - dimensions
 - pipe lengths
 - piping friction loss
 - pump capacity
 - motor output
 - electrical system calculations:
 - dimensions
 - voltage drops
 - battery capacity
 - battery back-up
 - power supplies
- language and literacy skills for:

REQUIRED SKILLS AND KNOWLEDGE

- participating in meetings, such as negotiations with client, fire engineering consultant, architect, builder or other service contractor
- researching, accessing, reading, interpreting and applying current relevant legislation, codes and standards
- preparing documentation, including to formalise tender responses and contracts
- updating knowledge of products, software systems and technology
- reading and interpreting drawings, plans and specifications, including:
 - architectural
 - structural
 - mechanical
 - hydraulic
 - electrical
- computer skills for:
 - word processing
 - spreadsheets
 - estimating and costing
- researching and evaluating competing technologies in new products and systems
- negotiation and conflict management
- lateral thinking and problem solving

Required knowledge

- computer software functions and operation, including relevant proprietary 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
- 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
- fire systems' technology and components, including:
 - water-based systems, including:
 - wet pipe sprinkler systems

REQUIRED SKILLS AND KNOWLEDGE

- deluge and drencher systems
- dry pipe sprinkler systems
- pre-action sprinkler systems
- 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
- special hazard fire systems, including:
 - foam systems (low expansion, medium expansion and high expansion)
 - gaseous agent systems (carbon dioxide, inert gas and halocarbon gases)
 - water spray systems (deluge, medium/high velocity water spray and high speed deluge)
- chemical systems, including:
 - powder
 - wet chemical
- characteristics and limitations of products and materials used in fire systems and issues relating to material capability
- interconnection of fire systems, including:
 - cause and effect matrix
 - interface with other services
- tendering processes, including:
 - interpretation of bid requirements
 - interpretation of contractual requirements

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

EVIDENCE GUIDE

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 development and submission of tenders for fire systems design projects. This entails researching the capacities of a range of fire system components, preparing detailed schedules of costs for labour and materials, identifying and applying profit margins, and preparing the business proposal or tender response. Integral to the process is the capacity to work with the potential client, build relationships and conduct negotiations leading up to the finalisation of the tender or bid process.

EVIDENCE GUIDE	
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: • knowledge of tendering, bid and contractual processes • numeracy skills sufficient to ensure accurate calculations of system capacities and performance and their costs • the ability to read and interpret a range of design documents, including concept briefs, design briefs, drawings, plans and specifications • an understanding of and ability to apply legislation, codes, standards, regulatory and insurance requirements that may apply to fire systems design projects, including U.S. NFPA standards • the ability to research appropriate fire detection and warning systems • the ability to prepare tender or bid documentation that meets the bid specification requirements • the ability to build relationships with potential clients and conduct business negotiations.
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: • access to relevant Australian and international codes and standards • access to legislation relevant to the jurisdiction • project documentation, including tender or bid specification, design brief, design drawings, construction schedules and other supporting documents • research resources, including product information and data • theoretical texts and other information to support the assessment of the unit's required skills and knowledge

EVIDENCE GUIDE

- relevant computer software packages and suitable hardware.

EVIDENCE GUIDE	
Method of assessment	Assessment methods 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>Industry networks and mechanisms</i> include:	• participation in professional associations • reviewing industry websites • subscribing to and reading professional journals

RANGE STATEMENT	
	• attendance at industry workshops and conferences • attendance at vendor presentations and displays of new fittings and components.

RANGE STATEMENT	
<i>Relevant legislation, codes and standards</i> include:	• 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, including the U.S. NFPA standards.
<i>Fire suppression and detection solutions</i> include:	• water-based systems, including: • wet pipe sprinkler systems • deluge and drencher systems • dry pipe sprinkler systems • pre-action sprinkler systems • 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 • special hazard fire systems, including: • foam systems (low expansion, medium expansion and high expansion) • gaseous agent systems (carbon dioxide, inert gas and halocarbon gases) • water spray systems (deluge, medium/high velocity water spray and high speed deluge) • chemical systems, including: • powder • wet chemical.
<i>Documentation and drawings</i> include:	• architectural • structural • mechanical • electrical

RANGE STATEMENT	
	• hydraulic • fire engineer's or estimator's specifications.
Options for securing personnel may include:	• selecting existing team members • recruiting new personnel • contracting external personnel.
Overhead costs apportioned to the project include:	• WorkCover costs • environmental protection agency fees • waste management site fees • professional indemnity insurance • other business insurances • travel costs • cost of financing the project • cost of seeking approvals and lodging designs • external consulting costs.

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	Senior management
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