



Australian Government

Department of Education, Employment and Workplace Relations

CPCCSV6005A Evaluate services layout and connection methods for residential and commercial buildings up to three storeys

Release: 1

CPCCSV6005A Evaluate services layout and connection methods for residential and commercial buildings up to three storeys

Modification History

Not Applicable

Unit Descriptor

Unit descriptor This unit of competency specifies the outcomes required to evaluate the layout of services and connection methods for residential and commercial buildings up to three storeys and not exceeding a maximum floor area of 2000 square metres.

It includes the evaluation of cold and hot water supply, sewerage layout, electric and electronic installation requirements, smoke and fire preventative systems. It requires compliance with relevant legislation, Australian standards and the Building Code of Australia (BCA).

Application of the Unit

Application of the unit This unit of competency supports the attainment of the understanding and skills to evaluate services layout and connection methods for residential and commercial buildings up to three storeys.

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units Nil

Employability Skills Information

Employability skills This unit contains employability skills.

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.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Evaluate layouts of water supply for general and fire fighting use.	<p>1.1. Water supply, connection and layout are identified, evaluated and recorded for <i>residential and commercial building projects requiring evaluation of services layout</i> connected to a town supply or a tank storage supply in accordance with BCA, relevant legislation and Australian standards and the <i>application of evaluative and corrective methods for services' layout</i>.</p> <p>1.2. Installation of water <i>services</i> supplying fire hydrants, fire hose reels and fire sprinkler systems is identified, evaluated and recorded in accordance with BCA, relevant legislation and Australian standards and <i>adherence to legislative requirements</i>.</p> <p>1.3. Interconnection of water tanks for fire services is emulated in the intent of non-return to original tanks and the results are evaluated.</p>
2. Evaluate sewerage and drainage disposal methods and their layouts.	<p>2.1. Sewerage connection and layout are identified, evaluated and recorded in accordance with the BCA, relevant legislation and Australian standards.</p> <p>2.2. Connection methods of main drains to local authority sewers for open ground, and within buildings taking up the whole site, are identified, evaluated and recorded.</p> <p>2.3. Disposal of sewerage from fixtures situated below the level of the local authority sewer for both domestic and commercial buildings are evaluated in accordance with BCA, relevant legislation and Australian standards.</p> <p>2.4. Methods for disposing of stormwater drainage systems are evaluated and documented in accordance with the BCA, relevant legislation and Australian standards.</p> <p>2.5. Design and installation of stormwater drainage systems are evaluated and documented in accordance with BCA, relevant legislation and Australian standards.</p>
3. Evaluate commonly used methods for smoke hazard management, mechanical ventilation and air-conditioning, methods of air	<p>3.1. Terms used in mechanical ventilation are clearly recorded stating how ventilation, volume, velocity and content may be controlled.</p> <p>3.2. Methods of mechanical ventilation, air distribution and smoke hazard management are identified, evaluated and recorded in accordance with BCA, relevant legislation and Australian standards.</p> <p>3.3. Air conditioning and mechanical ventilation and</p>

ELEMENT	PERFORMANCE CRITERIA
filtration and system layout.	basic elements of air conditioning are identified, evaluated and documented, including the function of air conditioning and applications for various types of occupancy in buildings.
4. Evaluate hot water systems and factors affecting selection.	4.1. Hot water systems are identified and evaluated according to design factors, types of system, height of installation, area to be serviced, number of outlets and available energy sources. 4.2. Operating principles of various types of hot water systems are evaluated and documented.
5. Identify natural lighting for varying situations and evaluate suitable lighting fixtures for a range of operations.	5.1. Natural lighting and general aims of design are identified in accordance with authorities and governing regulation requirements. 5.2. Artificial lighting and types of light sources are compared to recommended service luminance for various service situations in accordance with BCA, relevant legislation and Australian standards.
6. Evaluate fire fighting and fire detection services.	6.1. Authorities involved in plan perusal and site inspection for the various building classifications and their roles and functions are identified. 6.2. Requirements for sprinkler systems, fire hydrants and fire hoses for the various building classifications are identified and evaluated in accordance with BCA, relevant legislation and Australian standards. 6.3. Fire detection and alarm systems are identified and evaluated in accordance with BCA, relevant legislation and Australian standards.
7. Determine the requirements for general electrical and electronic service installation.	7.1. Electrical supply authorities and the relevant legislation are identified and recorded. 7.2. Procedures for electrical supply and connection to site are documented. 7.3. Electrical design and provision for services and electronic cabling are identified, evaluated and recorded. 7.4. Design and installation of emergency warning systems, emergency lighting and exit signage systems are evaluated and recorded in accordance with the BCA and relevant Australian standards.
8. Evaluate methods for vertical transportation and layout.	8.1. Methods of vertical transportation are identified, evaluated, recorded and sketched in accordance with BCA, relevant legislation and Australian standards.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills for this unit are:

- ability to recognise procedures, follow instructions, respond to change and contribute to workplace responsibilities, such as current work site environmental and sustainability frameworks or management systems
- communication skills to:
 - enable clear and direct communication, using questioning to identify and confirm requirements, share information, listen and understand
 - evaluate own actions to make judgements about performance and necessary improvements
 - read and interpret:
 - Australian standards
 - BCA
 - legislation
 - specifications
 - working drawings
 - use language and concepts appropriate to cultural differences
 - use and interpret non-verbal communication
 - written skills to report evaluations and record requirements
- numeracy skills to calculate workplace requirements
- teamwork skills to work effectively with others.

Required knowledge

Required knowledge for this unit is:

- design concepts and principles in relation to service installations
- general services installation terminology, definitions, installation methods and hazards
- nature of materials and effect on performance
- processes for the interpretation of working drawings and specifications
- processes for the preparation of documentation
- relevant federal, state or territory legislation and local government policy and procedures
- research methods
- terminology and methods of roof construction used for daylight transmission
- terminology and methods used in artificial lighting
- terminology with reference to items and services that may be used in plumbing,

REQUIRED SKILLS AND KNOWLEDGE

sewerage and drainage systems

- terminology with reference to vertical transportation.

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 simulated or project-based assessment techniques fully replicate construction workplace conditions, materials, activities, responsibilities and procedures.

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 ability to:

- comply with OHS regulations applicable to workplace operations
- apply organisational management policies and procedures, including quality assurance requirements where applicable
- evaluate the services layout, connection methods and rectification actions for at least one residential and one commercial building project or equivalent, which includes advice on hot and cold water supply, sewerage layout, electrical and electronic installation lighting systems, vertical transportation requirements, and smoke and fire detection and prevention systems
- provide reports to appropriate body/individual as determined by the project brief.

Context of and specific resources for assessment

This competency is to be assessed using standard and authorised work practices, safety requirements and environmental constraints.

Assessment of essential underpinning knowledge will usually be conducted in an off-site context.

Assessment is to comply with relevant regulatory or Australian standards' requirements.

Resource implications for assessment include:

- an induction procedure and requirement
- realistic tasks or simulated tasks covering the mandatory task requirements
- relevant specifications and work instructions

EVIDENCE GUIDE

- tools and equipment appropriate to applying safe work practices
- support materials appropriate to activity
- workplace instructions relating to safe work practices and addressing hazards and emergencies
- material safety data sheets
- research resources, including industry related systems information.

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.

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.

Validity and sufficiency of evidence requires that:

- competency will need to be demonstrated over a period of time reflecting the scope of the role and the practical requirements of the workplace
- where the assessment is part of a structured learning experience the evidence collected must relate to a number of performances assessed at different points in time and separated by further learning and practice, with a decision on competency only taken at the point when the assessor has complete confidence in the person's demonstrated ability

EVIDENCE GUIDE

and applied knowledge

- all assessment that is part of a structured learning experience must include a combination of direct, indirect and supplementary evidence.

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.

Supplementary evidence of competency may be obtained from relevant authenticated documentation from third parties, such as existing supervisors, team leaders or specialist training staff.

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.

Residential and commercial building projects requiring evaluation of services layout include:

- processing of applications
- project milestones
- provision of site access/facilities
- work schedules.

Application of evaluative and corrective methods for services' layout includes:

- electric and electronic installations
- hot and cold water supply
- natural lighting options
- sewerage layout
- smoke and fire preventative systems
- smoke hazard management
- ventilation and air conditioning
- vertical transportation.

Services include:

- firefighting services, such as:
 - fire and smoke detection and alarm systems (BCA deemed-to-satisfy [DTS] provisions)

RANGE STATEMENT

- fire hose reels and fire extinguishers
- fire hydrants
- installation of fire stopping and fire collars
- sprinkler systems (BCA DTS provisions)
- general electric and electronic service systems, including:
 - electrical supply authorities connection to site and distribution facilities (switch room and sub-stations)
 - type of service (emergency power and alternative power sources)
- categories of cabling:
 - computers
 - data
 - emergency lighting and exit signage systems
 - emergency warning and intercommunication systems
 - fire stopping
 - layout of equipment for telephones
 - lift controls and power supplies
 - repair and extension
 - service system safeguards
 - service systems access for maintenance
 - telecommunications connection to site and distribution facilities
- hot water systems, covering:
 - area to be serviced
 - height of installation
 - number of outlets and energy sources available
 - type of occupancy
 - type of system
- lighting systems, covering:
 - brightness
 - emergency and exit signage systems
 - intensity
 - lifespan and installation of fire stopping
 - locations for installation

RANGE STATEMENT

- natural and artificial lighting
- reflections
- terms, including control of glare
- mechanical ventilation
- air-conditioning and air filtration, such as:
 - air conditioning applications
 - air distribution, including mechanical ventilation requirements for enclosed car parks
 - air filtration, including air filters
 - air intake systems
 - ducting and main filter types
 - fire dampers
 - fume discharge systems
 - installation of fire stopping
 - smoke control and exhaust systems
 - warm water and cooling towers
- sewerage connection, such as:
 - graded or vertical discharge pipes
 - inspection shafts and overflow relief gullies (ORGs)
 - local authority sewerage drainage system
 - septic or biochemical treatment unit
- specialised services for:
 - hospitals
 - laboratories
 - smart buildings
- stormwater, covering:
 - connection to local government water drains
 - design
 - downpipes and unground or concealed piping
 - installation and disposal
 - location and construction requirements for eaves and box gutters
 - size
 - use of soakage pits and on-site water detection systems
- vertical transportation systems, such as:

RANGE STATEMENT

- escalators
 - hoists and pedestrian movers
 - lifts
 - water supply, such as:
 - single and two stage pumping for multi-function and single function connected services
 - tank storage supply relative to the public water supply and reservoir heights
 - town supply.
 - is limited to residential and commercial buildings up to three storeys and not exceeding a maximum floor area of 2000 square metres
 - BCA requirements for Class 2 and 9 buildings.
- Adherence to legislative requirements:*

Unit Sector(s)

Unit sector Construction

Co-requisite units

Co-requisite units Nil

Functional area

Functional area