

CPCCBC6017

EVALUATE SERVICES LAYOUT AND CONNECTION METHODS FOR THE PLANNING OF LARGE BUILDING PROJECTS

THEORY EXAM

Participant name	
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FOR THE PARTICIPANT

Instructions

- You will complete written questions as outlined on the following page. You must attempt all questions and provide enough detail in your response to demonstrate your knowledge.
- It is anticipated that you should complete this assessment within two (2) hours, but additional time may be allowed upon negotiation with the Assessor.
- You must complete all questions unassisted by the Assessor or other personnel. You may refer to reference material as needed. All questions must be answered correctly for a 'Satisfactory' assessment to be awarded.
- An oral examination may be allowed under certain circumstances, whereby your answers will be documented by another party.
- Any written questions that are incomplete, or not answered satisfactorily will need to be completed again after further training support.
- If you answer a question incorrectly but modify your response, put your initials next to the written change (or the Assessor must initial a verbal change).

Resources required

Pen

FOR THE ASSESSOR

Instructions

- Where oral examination has occurred, ensure that this is acknowledged in writing (e.g. FT001 and Assessor Comments).
- All questions must be satisfactorily demonstrated by the Participant for a Satisfactory determination (indicated by an Assessor tick to the right of the question).
- Assessors are to complete marking in pen of a different colour to the Participant.
- If the Participant verbally modifies their response, write in the modified response verbatim and put your initials next to the written change.

ASSESSOR COMMENTS

As necessary, outline:

- Details on reattempts, alternative arrangements or reasonable adjustments made.
- Where a Participant is deemed 'Not Satisfactory', provide recommendations for future training.

Q1. Explain why it is important to evaluate and record the specified water supply layout and connection in project plans and specifications.

Answer

Should reflect but is not limited to: These documents may be read and information recorded for various reasons, including obtaining statutory approvals, To determine connection and layout requirements from asset owner; For communication when liaising with Asset owners for connection requirements; to determine and control hazards; when determining material and other resources; for assisting contractors in planning construction projects, providing on-site instructions, when procuring components, preparing shop drawings, and appointing sub-contractors..



Q2. Describe the compliance requirement of NCC for evidence of sustainability.

Answer

Should reflect but is not limited to: Part A5 of each Volume of the NCC contains the documentation of design and construction provisions. This Part contains options that can be used as evidence to support that the use of materials, products, forms of construction or designs meet the requirements of the NCC. The most appropriate form of evidence of suitability to be used will vary depending on the specific circumstance. The forms of evidence have been arranged in a framework to reflect a hierarchy of rigour, with the options listed higher providing stronger forms of evidence. Some examples include: Certification schemes, such as CodeMark, CodeMark Australia and WaterMark, A current Certificate of Accreditation, A Certificate issued by a certification body; A report issued by an Accredited Testing Laboratory to show that a building component has been subjected to particular tests, and sets out the results of those tests including any other relevant information that demonstrates its suitability for use.



Q3. **What should you check when recording the installation requirements of water services supplying fire hydrants, fire hose reels and fire sprinkler systems.**

Answer

Should reflect that the manufacturer requirements meet the NCC, Qld Development Code and specific requirements for the related Australian Standards and local council.



Q4. **What is service installation in building?**

Answer

Should reflect an understanding of construction work such as plumbing and drainage installation and repair, air conditioning and heating installation and fire and security alarm testing and electrical services such as:

Plumbing Services provides general plumbing or drainage services, including installing and repairing water supply, sewer lines, septic tanks, drainage and gas systems, however it does not construct large-scale sewerage or storm water drainage systems. Fire and Security Alarm installs and repairs security systems and fire protection, detection and control systems. Electrical Services installs electrical wiring and fittings, as well as repairs and maintains existing electrical equipment and fixtures.

Air Conditioning and Heating specialises in installing household, industrial and commercial heating equipment, as well as refrigeration and air conditioning equipment.



Q5. Discuss the design concepts and principles in relation to service installations.

Answer

Should reflect an understanding of the general concept design principles of service design which may include: Services should always be designed with input from the users of the service; Service design should be designed based on a genuine comprehension of the purpose of the service, the demand for the service and the ability of the service provider to deliver that service; Services should be designed based on customer needs; Services should be designed to deliver a unified and efficient system rather than component-by-component which can lead to poor overall service performance; Services should be designed to be as efficient as possible. Services should be designed on the understanding that special events will be treated as common events (and processes designed to accommodate them)



Q6. Discuss how you evaluate results of the water supply layout and interconnected and non-return water tanks for fire services in Queensland.

Answer

Should reflect: Review plans and specifications against Chapter 3 and 4 of the Building Act and Regulation; The fire safety standard; The fire safety standard (RCB); The NCC; The Queensland Development Code; (QDC) Local Government (Council) local law and planning scheme provision



Q7. Describe how town water is distributed in your Australian State.

Answer



Should reflect an understanding of town planning and mains water distribution in the participants State. e.g. Utilities owned by local governments provide services in most parts of Queensland. Water storage, treatment and bulk supply for Brisbane is handled by SEQ Water, which sells on to Brisbane Water for distribution to the Greater Brisbane area. Water for the area is stored in three major dams; Wivenhoe, Somerset and North Pine Dams. Water is also provided by a number of smaller dams that are connected via the SEQ Water Grid. Water supply and regulation is the responsibility of the State For example, in Queensland under the Water Act 2000 water policy is the responsibility of the Queensland Water Commission. three state-owned authorities (Seqwater, LinkWater and the SEQ Water Grid Manager) are in charge of bulk water supply:

Seqwater supplies water from conventional sources such as dams, weirs and treatment plants as well as water from non-conventional sources such as the Gold Coast Desalination Plant and the Western Corridor Recycled Water Project. LinkWater owns the transport infrastructure, and the SEQ Water Grid Manager operates the transport infrastructure.

Retail utilities, owned by a group of local governments, distribute water in council regions.

Q8. What are the basic principles of tank storage supply relative to the public water supply?

Answer



Should reflect but is not limited to: Storage tanks serve two major purposes.

One is to provide storage volume and the other is to provide pressure to the distribution system. A particular tank can serve one or both purposes depending on its location within the system and its type of configuration.

There are a variety of tank types or configurations

Public supply refers to water withdrawn by public and private water suppliers that provide water to at least 25 people or have a minimum of 15 connections. Public-supply water is delivered to users for domestic, commercial, and industrial purposes

The quality of water should not get deteriorated in the distribution pipes.

Supply system should be capable of supplying water at all the intentional places with sufficient pressure heads.

It should be capable of supplying the needful amount of water during fire-fighting.

The pipe layout should be such that no consumer would be without a water supply, during the repair of any section of the system.

All the pipes in the distribution system should be preferably laid one meter away or above the sewer lines.

The system of pipes should be fairly water-tight to keep losses due to leakage to the minimum

Q9. Describe the difference between single and two-stage pumping for multi-function and single function connected services.

Answer

Should reflect knowledge of the difference between single and two-stage pumping for multi-function and single function connected services. e.g. A single-stage pump only uses one stage to pressurise the fluid. This pump, for example, only has one stage. As a result, only one impeller and diffuser are used to pressurise the fluids. The pump's impeller is attached to a shaft that is operated by an engine or an electric motor. It can lift water up to 125 metres. A single-stage pump has a straightforward design with consistent performance and operates at a high rate. It has a smaller volume and is lighter than a multistage pump.

A multistage pump is a centrifugal pump that uses multiple stages to pressurise the fluid (two or more stages). This pump is referred to as a multistage pump since it has more than one stage. A multistage pump is used in a variety of applications. The most typical uses for multistage pumps include circulation of water, air conditioning (cooling/heating), Irrigation for firefighting.



Q10. What must be considered regarding pressure down systems for water supply in high rise buildings?

Answer

Should reflect knowledge of: A pressure down system involves a roof tank, a solution that was created as taller buildings were built, resulting in a requirement for more water for both domestic use and fire-fighting and provides water even if the power is out. There are greater structural requirements for installing water storage tanks on a roof. The demand for space, the restrictions it will impose in terms of extending the height of a building. Roof top tanks have the disadvantages of higher initial costs for piping, valves and tank, high operating costs and lack of pressure control



Q11. Which local authority is responsible for sewerage and drainage systems in your work area?

Answer

Should reflect the appropriate local council or water service for the area of work e.g. Urban Utilities manages and maintains the sewer network in the Brisbane City Council area. Brisbane city council is responsible for stormwater drainage outside of private property.

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Q12. Why is it important to check the approval documentation from the sewerage and drainage authority for any conditions related to the project?

Answer

Should reflect an understanding of reading conditions and keeping up-to-date with regulatory requirements as noncompliance could result in criminal charges or a loss of reputation. There may be significant project delays as a result of failing to comply with approvals processes. Regulators may put deadlines on projects and approval processes. You must stay updated on new or revised standards, guidelines, and norms to ensure "best practice" implementation and minimise risk.

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Q13. Describe what a septic system is.

Answer

Should reflect but is not limited to: Traditionally used in rural areas with no access to council sewerage systems, septic systems consist of an underground tank which collects and stores the buildings wastewater before distributing it through a drain field. While stored the waste separates allowing the waste water to drain out while the sludge sits on the bottom and the scum on the top.

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Q14. Describe the bio-chemical treatment of sewerage effluents.

Answer

Should reflect but is not limited to: The biological treatment of sewerage treatment is basically an oxidation and reduction process and is generally the second phase within a sewerage plant,. It is dependent on whether the treatment is aerobic or anaerobic. In the aerobic process, nitrogenous organic matter is converted into NH_3 by oxidation process. In anaerobic process, nitrogenous organic matter is converted into acids, alcohols gases by a reduction process. A septic system where solid waste settles in the septic tank, demonstrates the anaerobic process where the sludge is progressively broken down by naturally occurring anaerobic bacteria.



Q15. What should you review and check regarding the stormwater, sewerage and drainage to ensure compliance?

Answer

Should reflect: Review the planned stormwater and sewerage layout and connections against NCC, all relevant Australian Standards, State and local council requirements. Check specifications for materials used to ensure these meet all requirements. Review and document connection methods of main drains to local authority sewers and the disposal of sewerage from fixtures situated below the level of local authority sewer mains. Review stormwater disposal and drainage systems. Review stack and pipe sizing provided in AS/NZS 3500.2:2021 and maximum stack heights in single stack (and modified) systems and maximum developed stack vent and relief vent lengths in fully vented (and modified) systems. Ensure the separation between any underground drain and any other service other than electrical supply cables, consumer gas piping, communication service or water service shall be at least 100 mm or 300 mm from a stormwater drain exceeding DN 100.



Q16. Describe the impact of high rise drain and vent plans in relation to the build.

Answer

Should reflect but is not limited to: Vertical piping uses fewer supports, hangers, inserts, etc. and requires less horizontal space in ceiling plenums for sloping to achieve drainage and is generally preferred in high rise buildings. Considerations must be made regarding vertical piping multiple penetrations through structural slabs. Each penetration must be sealed or protected to prevent vertical migration of fire and smoke. The location of multiple penetrations is critical to the integrity of the structure and the function of the fixtures. Higher buildings require more robust structures, further limiting the allowable spaces for penetrations. Other structural practices, such as post-tensioned beams and slabs, which serve to lighten the overall building structure, can limit even further the available locations for slab penetrations.



Q17. Explain the use of soakage pits.

Answer

Should reflect but is not limited to Soak Pits, which have a vast permeable porous walled chamber, are after a stormwater drainage system, making them the lowest-lying point, buried underground and out of sight. The soak pits catch and store incoming storm water, which then gently percolates into the surrounding soil via an infiltration process. In layman's terms, water is diverted away from the surface, where it causes problems and kept below, where it slowly seeps into the ground



Q18. What are on-site water detection systems?

Answer

Should reflect but is not limited to: There are three main types of sensor-based water leak detection building uses to protect from water leaks. Flood sensors, which are mostly installed next to hot water tanks, dishwashers, or washing machines. Printed sensors which can be placed above ceilings along the edges of a room or full areas so can protect buildings with large rooms and In-line sensors which monitor flow rate and water pressure inside water inlet pipes to deduce if there is a water leak happening.



Q19. How do you determine the size, location and construction requirements for eaves and box gutters?

Answer

Should reflect but is not limited to: Located on the roof catchment area, The NCC specifies two types of eave gutters: rectangular and D (quad) gutters. The size and shape of the gutters are then classified into six different gutter kinds. They are labelled A through F. Type A gutters are medium rectangular gutters with a cross-sectional area of at least 6,500 mm².

Type B gutters are large rectangular gutters with a cross-sectional area of at least 7,900 mm². Gutter type C is a 115 mm D gutter with a minimum cross-sectional area of 5,200 mm² and a minimum cross-sectional area of 115 mm². Gutter type D is a 125 mm D gutter with a minimum cross-sectional area of 6,300 mm² and a cross-sectional area of 125 mm².

A box gutter must be constructed in compliance with AS/NZS 3500.3 and installed with a fall of not less than 1:100.



Q20. What are the compliance requirements related to downpipes and underground or concealed piping??

Answer

Should reflect but is not limited to: One downpipe must serve no more than a 12 m length of gutter and must be located as close as possible to valley gutters. The Housing Provisions cover 4 downpipe types. They are- 75 mm diameter (round), 90 mm diameter (round), 100 mm x 50 mm (rectangular), 100 mm x 75 mm (rectangular). All of these types of downpipes can be used with all eave gutter types, except for 75 mm diameter (round) downpipes which are not suitable for use with Type E 150 mm D gutters. Most minor storm drainage is managed by piped drainage systems. In many council areas it is a requirement that all new roof water downpipes are ultimately connected to a formal drainage system. Some councils do allow stormwater to be released onto grassed areas or garden beds to help reduce the rate of run-off and to help filter the stormwater. Check the relevant council for stormwater drainage requirements



Q21. Explain the importance of inspection shafts and overflow relief gullies.

Answer

Should reflect but is not limited to: An Inspection shaft is a shaft constructed in the line of a sanitary drain for the purpose of inspection and future access for locating and clearing the drain. All properties in Australia require an Overflow Relief Gully (ORG). It's simply a grated drain that acts like a relief valve, to prevent a blocked sewer emptying its contents into a building. Usually the ORG is at least 100mm (although Queensland Urban Utilities state 75mm) lower than the lowest waste outlet in your home (e.g. basin, shower or toilet) and at least 150mm above the surrounding ground to prevent storm water flowing into it.



Q22. Discuss the mechanical ventilation requirements for enclosed car parks?

Answer

Should reflect but is not limited to: Ventilation systems consist of exhaust and supply fans. Many car park ventilation systems are either running at full speed, are turned off, or operating on timers during perceived “peak periods” According to the NCC all enclosed car parks require natural or mechanical ventilation. Adhere to Mechanical Ventilation Design Guide for Car Parks: (AS1668.2). However, because only supply and exhaust fans are particularly listed in AS1668.1:1998 Section 5.5, jet fans should be considered a fire and smoke control option to the NCC. As a result, the project's fire engineer would need to include jet fans in their fire engineering report and confirm that they meet the applicable NCC performance criteria.



Q23. What is air filtration? Explain air filters, ducting and main filter types.

Answer

Should reflect but is not limited to: Air filters are devices that remove particles from the air, such as dust and debris, and they come in a variety of sizes and shapes. Air filters are commonly used in applications that need good air quality or are sensitive to air. Air filtering types include ionic filters, HEPA filters and Fiberglass filters. When installed in buildings these are often incorporated into ducted systems filtering as part of a ducted air-conditioning system.



Q24. What is 'air intake systems' in building?

Answer

Should reflect but is not limited to: A filtered fresh air intake system adds fresh air to a home heating and cooling system. This improves indoor air quality by diluting polluted or stale indoor air and also pressurizes the area to help keep pollutants out.

These fresh air vents are commonly installed for fireplaces, gas dryers, or even gas heaters. They work by allowing a passageway for air from the inside air to the exterior air through a vent and flue. Without fresh air intake vents, gas appliances might solely use the oxygen in the area as fuel.



Q25. What are fire dampers and how do they work?

Answer

Should reflect but is not limited to: Fire dampers are mechanical devices installed in ventilation systems that respond to elevated temperatures or smoke, automatically closing to prevent the spread of fire and its byproduct. They help prevent the spread of fire and smoke by blocking access through the facility's ventilation systems. Fire dampers are often installed in ceilings, walls, or floors to prevent the spread of fire from one area to another. They can be helpful in the event of a fire in a building's structure or in its furnishings and equipment. In general, fire dampers are effective at containing fires and preventing injuries or damage to people or property.



Q26. Where can you locate NCC specifications for smoke detection and alarm systems?

Answer

Should reflect: NCC 2022 Volume One - Building Code of Australia Class 2 to 9 buildings Section E Services and equipment



Q27. Explain the purpose and workings of a cooling tower.

Answer



Should reflect but is not limited to: A cooling tower is a device that removes heat from a process by transferring it to the atmosphere through the use of water. All cooling towers, including commercial and industrial cooling towers, work by evaporating a tiny amount of water that is recirculated through the unit to remove heat from the water. The latent heat of vaporisation is released when warm water and cooler air are mixed, causing the water to cool.

A water cooling tower is a massive heat exchanger that expels building heat into the atmosphere while returning colder water to the chiller. A chiller sends heated water to a water cooling tower. Because it absorbs heat in the chiller's condenser, this warm water is referred to as condenser water. A chiller is usually located on a lower level, such as in a basement. The cooling tower's job is to cool the water down enough for it to return to the chiller and absorb more heat

Q28. Describe factors that influence the selection of hot water systems.

Answer



Should reflect but is not limited to: The area serviced by the hot water system, size and height of installation, energy sources available and number of outlets the system should service.

Q29. Describe the types of energy sources available for hot water systems?

Answer

Should reflect but is not limited to: the most common types of hot water systems include storage-based — water is maintained hot in a tank and is available at all times. These systems are electric, solar or gas Instantaneous — water is heated just when it is needed, rather than being held in a tank, generally provided with gas installation. Gas systems are generally placed outdoors due to the need for venting. Heat pump water heaters are extremely energy-efficient, using only 30% of the energy used by a traditional electric hot water system. To heat the water, these systems use a refrigeration cycle to extract heat from the air. There are two distinct types, Integrated with both the tank and the compressor Or The tank and compressor are separated.



Q30. Explain the intent of using natural and artificial lighting in buildings.

Answer

Should reflect but is not limited to: Natural lighting, is achieved using exterior glazing (windows, skylights, etc.), thereby reducing artificial lighting requirements. Natural light helps to support a good mental state to the occupants and saves energy by reducing the number of artificial lights needed during the day. Buildings are often designed to optimise the capture of natural light. In contrast, artificial light is human-made and can emanate from sources including fire, candlelight, gaslight, electric lamps and so on. Artificial Light is a necessity in our everyday lives. It helps us to work during hours of poor lighting and illuminate our night. In addition to efficiency intent, artificial lighting is used for aesthetic appeal and can create 'mood' in a room.



Q31. How do you determine the luminance requirements for areas of the building?

Answer

Should reflect but is not limited to: Compare the appropriate sections of the NCC and Australian Standards, AS/NZS 1680.1: 2006 sets out general principles and recommendations for the lighting of interiors of buildings for performance and comfort. Recommendations for the lighting of particular interiors or activities are provided in the Standards which comprise AS(/NZS)1680.2. Refer also to AS/NZS1680.0 for basic requirements for safe movement. AS(/NZS)2293 series of Standards sets out requirements for the lighting necessary to permit safe evacuation of the building occupants. NCC provides a calculator for use.



Q32. Provide a suitable situation and location for each of the following lighting types and sources.

Answer

Lighting type/source	Suitable situation
Incandescent lamp/bulb	General lighting throughout a residential situation range from 40 – 100W (being phased out)
Compact fluorescent lamp (CFL)	General lighting, these were designed as a more efficient replacement for incandescent lamp
Fluorescent tubes	Used for task lighting in kitchens, garages, offices and commercial applications
Light emitting Diode (LED)	Used for task lighting in kitchens, bathrooms, outdoor area lighting, walkways, garages. Also available for general lighting in residential and commercial situations



Q33. Provide a definition for each of the following terms used planning and installation of lighting systems.

Answer

Term	Definition
Brightness	e.g. The aspect of visual perception in which a surface appears to emit more or less light. It's now known as brightness
Control of glare	e.g. Glare is controlled by adjusting the light source or the surface reflecting it and by filtering light before it reaches the eyes
Install fire stopping	e.g. The process of sealing gaps in fire compartmentation to prevent fire and smoke from spreading to other parts of a structure in the event of a fire. Use of materials to keep walls, floors, and ceilings fire-rated.
Intensity	e.g. the strength or amount of light produced by a specific lamp source. It is the measure of the wavelength-weighted power emitted by a light source
Reflections	e.g. When a ray of light approaches a smooth polished surface and the light ray bounces back, it is called the reflection of light. The incident light ray which lands upon the surface is said to be reflected off the surface
Lifespan	e.g. The average length of life of a kind of a material object especially in a particular environment or under specified circumstances
Installation location	e.g. position on a plan and specification showing where a product is to be installed



Q34. What should you check regarding emergency lighting and exit signage for a high rise building to ensure compliance?

Answer

Should reflect but is not limited to: A working emergency evacuation and lighting system must be installed on every storey with a floor space of 300m² or greater to fulfil Australian Standards for emergency lighting and comply with the NCC. Exit signage and emergency lighting, unlike typical light fixtures, should feature an inbuilt battery that allows illumination even if the power is gone. Exit signage and emergency lighting must be illuminated for a minimum of 90 minutes, according to AS2293. A separate lighting circuit ensures that the evacuation lights work in the event of a power outage. All entrances with direct exits must have exit lights placed, indicating all stairways, tunnels, or ramps to all levels and out of the building.



Q35. Discuss the three (3) key Australian Standards relevant to fire detection and alarm system compliance.

Answer

1. Should reflect: AS 1603.4 which specifies functional requirements and performance criteria for control and indicating equipment (CIE) used in automatic fire detection and alarm systems within buildings.
 2. AS4428 suite - a suite of standards that cover the requirements and performance criteria for control and indicating equipment used for fire detection, warning, control and intercom systems.
 3. AS 7240.2 which specifies requirements, test methods and performance criteria for fire detection control and indicating equipment (FDCIE) for use in fire detection and fire alarm systems installed in buildings.
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Q36. Specify where sprinklers are required for the following building classes and occupancy types:

Answer

Class/Occupancy	Where sprinklers are required
All classes— a. including an open-deck carpark within a multi-classified building b. excluding— i. an open-deck carpark that is a separate building ii. a Class 8 electricity network substation with a floor area of less than 200 m² that is placed within a multi-classified building	e.g. If any section of the building has an effective height of more than 25 m, this applies to the entire structure.
Class 2 or 3 building (other than a residential care building) and any other class of building (other than a residential care building), including a Class 2 or 3 portion	e.g. Throughout the entire building, including any section of another class, if any part of the structure has a four-story rise and an effective height of no more than twenty-five metres.
Class 3 structure used as a residential care facility	e.g. Throughout the building and in any fire compartment containing a Class 3 component used in residential care.



Q37. Specify the purpose and use of a fire hydrant system in a building.

Answer



Should reflect but is not limited to: A hydrant system is a water reticulation system used to transmit water to reduce the length of hose that firemen must lay and speed up the firefighting operation.

Only trained firemen are allowed to utilise fire hydrants (which includes factory fire, fighting teams).

Pumps, tanks, and fire service booster connections are sometimes included in fire hydrant systems since they are necessary for proper operation

Q38. Discuss where fire reels must be provided.

Answer



Should reflect: Where one or more internal fire hydrants are installed, a fire hose reel system must be provided to serve the entire structure. Fire hose reels must be placed in line with AS 2441 in the fire hose reel system with restrictions. Fire hose reels must be situated adjacent to an internal fire hydrant (other than one within a fire-isolated exit), except that they do not have to be adjacent to every fire hydrant if system coverage can be accomplished. Fire hose reels must be within 4 metres of an exit, except they do not have to be adjacent to every exit if system coverage can be accomplished. If compliance with the previous points does not provide system coverage, extra fire hose reels may be placed in courses of travel to an exit to obtain the required coverage

Q39. What should you check when reviewing the electrical plans for the design. Discuss three (3) points.

Answer

1. Should reflect an understanding of electrical plans and design requirements
e.g. Sufficient number of power points placed in easy to reach locations that
meet zone wiring regulations. (particularly in wet areas)
2. Lights are positioned to meet lamination requirements, breakers for safety,
ventilation, cooling and heating systems. Outdoor lighting and power.
Access and location for communication cabling
3. Energy efficiency such as solar panels, LED lighting, Plans comply with
Electrical safety Act 2002

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Q40. Describe steps you take to organise electrical supply to the site.

Answer

Should reflect but is not limited to: Confirm selected retailer with the client.
Contact retailer and organise connection via on-line form or telephone.
Adhere to retailer requirements regarding offers and approval to secure the
connection.

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Q41. Describe the purpose of switch rooms and substations for electrical supply and distribution.

Answer

Should reflect but is not limited to: The Switch room. Is an area containing
an assembly of electrical equipment for controlling and protection of
electrical circuits. A substation is a high-voltage electrical system belonging
to the electrical network that can be used to regulate apparatus, generators,
and electrical circuits, among other things. The main function of substations
is to convert AC (alternating current) to DC (direct current).

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Q42. Describe how you confirm compliance in materials for the build.

Answer

Should reflect but is not limited to: Check that the product or material supplied and installed is what is nominated in the approved plans and specifications and that appropriate evidence of conformity and compliance is provided. If not provided, sufficient checks should be made to ensure the material meets NCC requirements or the material should not be used.



Q43. Explain the importance of version control and revision of plans and construction documents.

Answer

Should reflect but is not limited to: In construction projects, there is always the requirement to maintain a history of all drawings to see what has changed over the evolution of each drawing and why it was changed. Maintaining the history of the drawing provides the ability to go back to a previous version when something was changed inadvertently. In some instances, the project team may want to go back to a previous revision to be able to work on the exact drawing or document that was provided to the project owner, contractor, or vendor.

For most construction projects, versions will be limited to drawing and document deliverables before they are formally approved. Those usually include the issued for construction (IFC) drawings and documents, shop drawings, and as-built drawings. Any changes to those deliverables after they are formally approved will be considered revisions.



Q44. What are the objectives of workplace health and safety requirements on construction workplaces?

Answer

Should reflect but is not limited to: All on site must implement health and safety procedures. Under Australian WHS legislation, your company must guarantee the health and safety of its employees while also avoiding endangering the health and safety of others. To accomplish this, you must: ensure that machinery, structures, and substances are used, handled, and stored in a safe manner, create a safe work environment provide and maintain safe machinery and structures give safe ways of working ensure safe use, handling, and storage of machinery, structures, and substances maintain and offer adequate amenities, provide any safety-related information, training, guidance, or supervision to ensure all adhere to their duty of care in regards to workplace health and safety.



CPCBC6017

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WORKBOOK

Participant name	
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FOR THE PARTICIPANT

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- You will complete written activities as outlined on the following pages. You must attempt all questions and provide enough detail in your responses to demonstrate your knowledge.
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ASSESSOR COMMENTS

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- Details on reattempts, alternative arrangements or reasonable adjustments made.
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NOTE

At times, you will be provided with a specific business context to which you must respond, otherwise it is anticipated that you will use a workplace of your choosing (your own, or hypothetical) to provide the context to the task.

At all times, the responses in your assessment must reference **Australian** (Queensland or Federal) documentation, including legislation, regulations, codes of practice, standards and guidance publications.

ACTIVITY 1

Review the [key changes to plumbing and drainage for NCC 2022](#) and respond to the following:

- a) Changes to plumbing products containing copper alloy and intended for use in contact with drinking water.
- b) Changes to water service in Volume Three – Section B.
- c) Changes to Sanitary plumbing and drainage (Volume Three – Section C)

a) Changes to plumbing products containing copper alloy and intended for use in contact with drinking water.

The 2022 edition of the National Construction Code (NCC) introduced a new limit for the allowable level of lead in plumbing products used for drinking water. This requirement will come into effect on 1 September 2025.

From this date, copper alloy plumbing products containing more than 0.25% lead will no longer be authorised for installation in a plumbing system used to convey drinking water.

During the transition period between 1 September 2022 and 1 September 2025 plumbing practitioners may continue to install existing products as well as those with a reduced level of lead, providing the products are all certified in accordance with the WaterMark Certification Scheme. However, from 1 September 2025 only products that are compliant with the lead requirements of the NCC will be authorised for use.

b) Changes to water service in Volume Three – Section B.

e.g. Measurable compliance criteria are added to the Performance Requirements for:

- i. water services velocity and pressure;
- ii. heated water pressure relief and temperature limitation;
- iii. fire-fighting water service flow rates and pressures; legionella control; and
- iv. water efficiency (based on WELS rating standards).

These allow more consistent verification of Performance Solutions for water services.

c) Changes to Sanitary plumbing and drainage (Volume Three – Section C)

e.g. Measurable compliance criteria are added to the Performance Requirements for ventilation and pressure of sanitary plumbing and drainage services. These provide more consistent verification of Performance Solutions for these aspects.

New Verification Methods are in Parts C1 and C2 for determination of wastewater flowrates. These enable more efficient pipe sizing to be used for specific buildings.

A new Part C3 provides a nationally consistent set of requirements for on-site wastewater management and disposal.

**Satisfactory
Outcome**



ACTIVITY 2

Review the [NCC 2022 provisions to further decrease health risks associated with condensation in new homes](#) and respond to the following:

- a) Where can you locate verification methods for condensation management?
- b) What are the three (3) new exhaust system DTS provisions?

a) Where can you locate verification methods for condensation management?

e.g. (F8V1 of Volume One and H4V5 of Volume Two)

b) What are the three (3) new exhaust system DTS provisions?

e.g.

1. Many exhaust systems commonly used in homes must be discharged to the outside of a building (e.g. instead of discharging into a roof space).
2. Exhaust systems installed in bathrooms or sanitary compartments, which don't have sufficient access to outdoor air (e.g. via windows), must be controlled to turn on when the lights in the room are turned on. They are also required to continue to operate for 10 minutes after the lights are turned off.
3. Exhaust systems installed in bathrooms or sanitary compartments that don't have sufficient access to outdoor air must be provided with make-up air from an adjacent room, like having an undercut to a separating door.

**Satisfactory
Outcome**



ACTIVITY 3

Access the [Queensland Development Code MP6.1 Commissioning and maintenance of fire safety installations](#) and respond to the following:

- a) Which class of buildings does MP6.1 apply to?
- b) List additional legislation that is applicable when determining compliance with MP6.1?

a) Which class of buildings does MP6.1 apply to?

e.g. MP 6.1 applies to Class 1b and Class 2–9 buildings, including existing buildings.

b) List additional legislation that is applicable when determining compliance with MP6.1?

e.g.
Building Act 1975
National Construction Code (NCC)
Building Fire Safety Regulation
Building Regulation
Fire and Emergency Services Act
Queensland Building and Construction Commission Act
Sustainable Planning Regulation

**Satisfactory
Outcome**



CPCBC6017

EVALUATE SERVICES LAYOUT AND CONNECTION METHODS FOR THE PLANNING OF LARGE BUILDING PROJECTS

PRACTICAL ASSESSMENT

Participant name	
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FOR THE PARTICIPANT

Instructions

- The tasks outlined on the following pages will require performance of normal workplace activities, as a result of a structured activity set by an Observer in the workplace or a simulated activity set by your Assessor/Observer.
- The timeframe for these tasks will be established by your Assessor/Observer, in consideration of location conditions and industry requirements.
- You must complete all tasks assisted by the Assessor or other personnel, unless the steps note this assistance.
- You must attempt all tasks (and itemised steps) for a 'Satisfactory' assessment outcome to be achieved.
 - For an observation conducted that is incomplete, or without satisfactory performance, the observation will need to be completed again after further training support.

FOR THE ASSESSOR/OBSERVER

Instructions

- The following observation record should be used to judge and record your observations of the Participant as they complete the task(s) set. You must record your observations of the Participant's performance.
 - For each occasion, indicate the task performed and whether it was a simulation or workplace-based task.
 - Any simulated assessment must ensure the Participant still performs under workplace conditions which reflect industry standards.
 - In the comments, provide clear detail regarding the task that the Participant was required to do (e.g. PPE used, materials handled, attachments connected, plant types).
- All steps must be satisfactorily demonstrated by the Participant for a 'Satisfactory' determination (indicated by an Assessor tick to the right of each itemised step, or an Observer tick to the right of each itemised step, and confirmation by an Assessor in the Assessor Comments).
 - Where you have determined that one or more task steps have not been satisfactorily demonstrated, provide the Participant with additional support and outline details of such assistance in the Assessor/Observer Comments. Allow the Participant two (2) further opportunities to demonstrate the task again to allow an opportunity for a 'Satisfactory' assessment outcome to be achieved.
 - If after three (3) attempts the Assessor determines that the Participant cannot demonstrate the required steps, a 'Not Satisfactory' outcome is to be determined.

TASK OUTCOME					
Task	Date	Task Type (Tick)	Location	Task outcome (Tick)	
				Satisfactory	Not Satisfactory
Task 1		☐ Workplace ☐ Simulation		☐	☐

ASSESSOR COMMENTS: GENERAL

As necessary, outline:

- Details on reattempts, alternative arrangements or reasonable adjustments made.
- Where a Participant is deemed 'Not Satisfactory', provide recommendations for future training.

ASSESSOR COMMENTS: PRACTICAL TASK 1	
☐ Individual student (as named on cover page) ☐ Multiple students [☐ All from Attendance Report, ☐ Specific students involved – identify students]	
Task	Provide detail
1.8A.	Specify large building project being evaluated: e.g. 4 story unit block
1.1B.	Specify water connection approvals assessed: e.g. Approval from local council water authority
1.1C.	Specify NCC performance requirements accessed for review of supply layout: e.g. NCC 2022 Section B
1.2A.	Specify sewerage and drainage approval document reviewed for conditions: e.g. local council conditions to be entered here
1.2B.	Specify local authority for sewerage and drainage: e.g. Brisbane City Council / Unity Water
1.4B.	Specify hot water system type selected: e.g. electric hot water system to fit required location Was the selected hot water system suited to height of installation, area to be serviced, number of outlets and energy sources? ☐ Yes ☐ No
1.6A.	Specify authorities responsible for fire safety regulations and inspection according to building classification: e.g. local authority
1.8B.	Specify professionals consulted for advice: e.g. building assessor/ inspector