CPCCBC6016
ASSESS CONSTRUCTION FAULTS IN LARGE BUILDING PROJECTS
ASSESSMENT SUMMARY

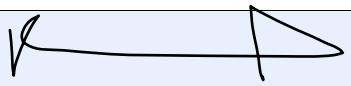
The assessment activities for *CPCCBC6016 Assess construction faults in large building projects* cover all aspects of the unit of competency. For Apprentices/Trainees, this includes supervisor completion of the Apprentice/Trainee Record (ATR).

Participants must read all the information given before starting any assessment task. The assessment tasks are intended to be fair, flexible, valid and reliable. If a Participant has any questions or requires alternative arrangements to be made such requests should be directed to their Trainer/Assessor, who should note such arrangements in the 'Assessor Comments' on the affected assessment. If a Participant feels they are not yet ready to be assessed, they should discuss their options with their Trainer/Assessor.

To satisfactorily complete the assessment, the Participant is required to answer all questions correctly and demonstrate their skills to industry standards. If a Participant does not answer all questions or perform all tasks, they will be deemed 'Not Satisfactory' for the task and 'Not Yet Competent' for the unit of competency.

The Trainer/Assessor can provide the Participant with additional information on interpreting the assessment outcomes and guide the Participant's options. If a Participant is still deemed 'Not Satisfactory' they will have the opportunity to undertake a supplementary assessment or appeal the result as per the process in the Student Handbook.

By signing below, the Participant acknowledges:
- They understand the assessment instructions and requirements, and consent to being assessed.
- The work submitted is to be their own work – with the work of/with others needing to be clearly acknowledged and documented.
- They consent to any photo/video recording of their work that occurs during assessment.

Participant name	Brett Eldred
Participant signature	

Pre-requisite unit(s) to be achieved and authenticated prior to undertaking assessment
☐ Not applicable

Task	**Date completed**	**Assessment Results**	
Theory Exam	Select Date.	☐ Satisfactory	☐ Not Satisfactory
Practical Assessment	Select Date.	☐ Satisfactory	☐ Not Satisfactory
Outcome for CPCCBC6016	Select Date.	☐ **Competent**	☐ **Not Yet Competent**

Evidence requirements checklist (ticked by assessor and evidence supplied to RTO)	
☐ Theory Exam	☐ Practical Assessment ☐ Rectification report with detailed sketches

Assessor name	
Assessor signature	

CPCCBC6016
ASSESS CONSTRUCTION FAULTS IN LARGE BUILDING PROJECTS

THEORY EXAM

Participant name	Brett Eldred

FOR THE PARTICIPANT
Instructions

• You will complete written questions as outlined on the following pages. You must attempt all questions and provide enough detail in your responses 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 but may refer to reference material as needed. All questions must be answered correctly for a 'Satisfactory' assessment outcome to be awarded.
  o An oral examination may be allowed under certain circumstances, whereby your answers will be documented by another party.
  o 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 the purpose of the Building Act 1975.**

Answer

The Building Act 1975 governs all building work in Queensland, empowering the regulation of certain aspects of buildings and structures.

Q2. **Explain the purpose of the Plumbing and Drainage Act 2018.**

Answer

Plumbing and Drainage Act 2018 – law about plumbing and drainage, and the licensing of plumbers and drainers. The main purpose of this Act is to regulate the carrying out of plumbing or drainage work in a way that reduces risks to public health and safety and the environment.

Q3. **a) What is the name of the Environmental Protection Act in your State/Territory?**
b) What is the purpose of this Act and its regulations?

Answer

a)

The *Environmental Protection Act 1994* (EP Act) is a key element of Queensland's environmental legal system. Its objective is to protect Queensland's environment while allowing for development that improves the total quality of life, both now and in the future, in a way that maintains ecological processes (ecologically sustainable development).

b)

Q4. **What are the requirements for compliance and conformance according to National Construction Code (NCC)?**

Answer

The NCC requires that evidence of suitability be established to demonstrate that a material, design or construction meets a Performance Requirement or Deemed-to-Satisfy (DTS) Provision.

Q5. **Discuss the purpose of Work Health and Safety 'Codes of Practice'.**

Answer

A code of practice provides practical guidance for your business on how to achieve health and safety standards required under the *Work Health and Safety Act 2011* (WHS Act). A code of practice also has effective ways to identify and manage risks

Q6. **The National Construction Code (NCC) Volume Two Amendment 1 – Part 3.0 Structural provisions discusses 'Resistance to actions'. Explain what is stated.**

Answer

3.0.2 Resistance to actions

The resistance of a building or structure must be greater than the most critical action effect resulting from different combinations of actions, where—

(a)

the most critical action effect on a building or structure must be determined in accordance with 3.0.3 and the general design procedures contained in AS/NZS 1170.0; and

(b)

the resistance of a building or structure is determined in accordance with 3.0.4.

Q7. **What is covered in AS/NZS 1170 series?**

Answer

This Standard specifies general procedures and criteria for the structural design of a building or structure in limit states format. It covers limit states design, actions, combinations of actions, methods of analysis, robustness and confirmation of design

Q8. **Explain why you should review project drawings, details and specifications when assessing construction faults in buildings.**

Answer

Before assessing construction flaws in large building projects, make sure you have accessed all job documentation. This will assist you in performing your duties safely and ensuring that all work is compliant
Compliance documentation is essential to all aspects of operations on every worksite. From work instructions to quality and environmental requirements, documentation sets out the type of work, the timeframe for construction, and the procedures for completing the task.
Statements containing the words "must", "shall", or "will" are often used within these documents to indicate that there are mandatory (legally must be applied) requirements. Each project site will have different compliance documentation that must be referred t

Q9. **Discuss the basic principles of structural design that must be considered in any building design.**

Answer

Stress:-

Compressive stress can change the shape of structural members and struts if it reaches a stress level that is too high for the member, which is commonly referred to as buckling. Buckling can cause a member to become unstable and deformed in shape when the stress from the load causes the member to move laterally and shorten.

Strain:-

Although strain can refer to processes involving pasta and muscles, structural strain is defined much more precisely. Strain in construction materials can readily lead to failure if applied stresses exceed expectations or dead loads abruptly become active loads.

Tension:-

Tension is a pulling force that attempts to lengthen the building material. During tension tests, enough force is applied to separate the material. Shear forces are used to cause building materials or structural components to slide past one another.

Compression:-

When the particles of a material are pushed against each other, simple compression occurs. It is the polar opposite of tension, in which particles are pulled apart. Simple compression is common in building structures because all loads and forces must eventually be directed into the ground.

Bending:-

A bending moment in solid mechanics is the reaction induced in a structural element when an external force or moment is applied to the element, causing it to bend. The beam is the most common or simplest structural element subjected to bending moments.

Structural principles:-

The overall strength and stability of a building and its components must be considered in any building design. This entails performing structural calculations to determine the effects of all forces acting on any building component and the building as a whole. To do so, we must first resolve the system's forces to determine what the overall effects are likely to be.

Dead load and live load

Gravity's downward pressure on a structure is referred to as a "dead load." Consider the structure's dead load and ensure that the support structure is adequate when considering a building's structural footings bearing on the site's foundations.

The weight added to the permanent structure is referred to as a live load. All unfixed items in a structure, such as people and furniture, cause a 'live' load. The maximum live load allowance will limit the amount of weight that can potentially be added to the existing structure.

Q10. Discuss compressive and tensile stresses on buildings.

Answer

Compression:-

When the particles of a material are pushed against each other, simple compression occurs. It is the polar opposite of tension, in which particles are pulled apart. Simple compression is common in building structures because all loads and forces must eventually be directed into the ground

Tension:-

Tension is a pulling force that attempts to lengthen the building material. During tension tests, enough force is applied to separate the material. Shear forces are used to cause building materials or structural components to slide past one another.

Q11. **Discuss the structural significance of building basements in tall buildings.**

Answer

Basements are built in tall buildings to assist with dealing with lateral loads in the superstructure

Furthermore, the compacted soil around the basement generates passive pressure when the building moves towards the soil. As a result, the effect of the basement walls could be taken into account in the structural analysis.

The spring elements are frequently used to model the soil beneath the foundation. Springs restrain the pile, and springs are placed beneath the footings to represent the behaviour of the soil.

Q12. **What is meant by the term the 'aesthetics' of a structural design?**

Answer

Aesthetics: -Construction work must proceed smoothly, and the finished product should portray cultural and artistic flavour

The combined effects of a building's shape, texture, size, colour, balance, emphasis, contrast, symmetry, unity, movement, proportion, alignment, pattern, space, decoration, culture, and context are referred to as its appeal.

Aesthetics can serve as a vital link between technological advancement, design, and architecture. As a result, it serves as a connecting and a separating element between the philosophy of technology and architecture and design.

Q13. **Explain economic factors and how these affect design.**

Answer

Economy: -Construction work must be done rationally with an inventive mind to overcome all constraints at the lowest cost

Q14. **'The function of a structure is to resist forces in equilibrium' - what does this mean?**

Answer

Equilibrium: - A structure is in equilibrium when all forces or moments acting upon it are balanced.
The function of a structure is to resist forces in equilibrium. Forces in equilibrium = a stable structure - the basis of design.

- Concrete has steel reinforcement placed in it to keep it together, prevent big cracks, and improve overall strength.
- Because of the reinforcement, longer, thinner cantilevered structures can be built, and slabs are less supported but more structurally sound.
    - Steel-reinforced concrete combines the compressive strength of concrete with the tensile strength

Q15. **Why is reinforced concrete commonly used for the construction of high-rise buildings?**

Answer

Steel's high tensile strength is paired with concrete's excellent compressive strength in traditional reinforced concrete to create a robust structural material in compression and tension

Q16. **Discuss why you might need to consult the structural engineer regarding the loads and forces acting on a beam or column.**

Answer

Structural components are the primary load-bearing components of a building, and each has its structural properties that must be taken into account. Foundation, Plinth, Wall and Pier in Superstructure, Shear wall, Column, Floor, Slab, Beam are examples of such components
After determining the load on the structure, structural analysis is used to determine forces such as bending moments, shear forces, torsional moments, etc. The idealisation of the actual structure is the most difficult component of structural analysis. This is the role of structural engineer in the design of structures.

Q17. **Determine the bending behaviour of a column under axial load.**

Answer

Columns are meant to handle Axial Loads and are hence built for compression. Other weights, such as snow, wind, or other horizontal forces, might cause the columns to bow. The columns must then be constructed to withstand Axial Load and Bending.
A axially loaded column is one in which the line of action of the compressive force corresponds with the centre of gravity of the cross-section of the column. (The entire load from the top acts on the column's centroid.)
The behaviour of columns under axial loads can be divided into two categories: short columns under axial loads and long (or slender, specific) columns under axial loads. A long column is distinguished from a short column by its height and thickness (least dimension).
Under axial and concentric loads, columns tend to become shorter in length. The term "length" refers to the height or dimension in the same direction as the loading axis in general. The columns tend to expand in a direction perpendicular to the loading directions. The shape of the column changes somewhat from cuboid to barrel as a result of this activity. Poisson's ratio is the ratio of the change in height to the change in lateral dimensions. It varies depending on the substance.

Q18. **Describe the performance characteristics of columns under eccentric load.**

Answer

Eccentrically loaded column (Uniaxial or Biaxial): An eccentrically loaded column is one in which the line of action of compressive force does not correspond with the centre of gravity of the cross-section of the column.
Under Eccentric load: -
It is generally known that when a load on a column is eccentric, the column's strength is significantly reduced compared to when the resultant line of pressure runs through the column's axis. Theoretically, this eccentricity is demonstrated using assumptions that may or may not be true in actuality.

Q19. **Discuss bending moments, shear forces, deflection and torsion of beams and slabs.**

Answer

Beams/Slabs	Response
Beams	Bending moments: - For beam, Bending Moment is the torque that keeps a beam together (anywhere along the beam). Shear force: For the beam, the applied loads and the support reaction produce vertical shear forces in a beam. While the burden pulls down, the reactions push up. Shear reaches its maximum magnitude near the supports in most circumstances Deflection: In a beam, the vertical movement of a spot on a loaded beam is known as deflection. Torsion: - For both beam Torsion is imparted to beams and slabs under various situations in addition to bending moment and shear force. Bending moment and shear force are produced by loads operating normally to the plane of bending. On the other hand, loads distant from the plane of bending will cause torsional moment and bending moment and shear.

Answer

Beams/Slabs	Response
Slabs	**Bending moments: -** For slab, the design bending moments are zero at discontinuous ends, negative at continuous ends and positive at midspans. **Shear force: -** For slab, the shear strength of a slab that resists flexural stresses in two orthogonal directions around a column (flat plates, footings, and pile caps) is measured using a prism placed half the slab depth d away from the column sides. **Deflection**: - In a slab, slabs bending or distortion over time due to shrinkage and temperature are long-term deflection. The state of the cracking and concrete creep can have an impact. **Torsion: -** For a slab Torsion is imparted to beams and slabs under various situations in addition to bending moment and shear force. Bending moment and shear force are produced by loads operating normally to the plane of bending. On the other hand, loads distant from the plane of bending will cause torsional moment and bending moment and shear

Q20. **Discuss how beams are connected to columns. Explain your answer.**

Answer

Connections: -No matter what material is utilised, connections are essential to all structures and construction. The function of a connection is to transmit loads, limit movement, and/or provide overall stability to a component or structure. As a result, one of the most important aspects of precast/prestressed concrete structure design and engineering is connection design

Q21. **Describe the slenderness ratio and its effect on columns.**

Answer

The slenderness ratio is the proportion of a column's length to its smallest radius of gyration. It's often used for calculating design loads and sorting columns into short, long, and intermediate categories. The column's slenderness ratio indicates whether or not the column is buckling. The higher the slenderness ratio, the more likely the column may fail due to buckling in the direction.

Q22. **Discuss the characteristics of dead loads and live loads. Include how each is calculated.**

Answer

Load	Characteristics and calculations
Dead load	**Dead Load: -**The term "dead loads" refers to structural loads that remain constant in magnitude over time. They include structural members such as walls, plasters, ceilings, floors, beams, columns, roofs, and their weight. Dead loads include the loads of fixtures that are permanently connected to the structure. Members are preliminarily scaled based on architectural drawings and other relevant documentation. Their weights are estimated using most codes and other civil engineering literature before studying and designing structures **Dead load = volume of member x unit weight of materials**

Answer

Load	Characteristics and calculations
Live load	Live loads can be moved around or are temporarily attached to a structure. They include the loads imposed on a structure by furniture and equipment storage, occupancy (people), and impact. The table below shows typical live load values. Maintenance loads, where fresh or old roof sheeting may be placed in concentrated regions, are the primary source of living (or imposed) loads acting on the roof of a portal frame building. The loading code AS/NZS 1170.1 specifies the live roof loads for cladding, purlins, and rafters, with the roofs of industrial buildings generally falling into the non-trafficable category. Roof cladding must withstand a concentrated force of 1.1 kN in any location. However, this is normally taken into account by the sheeting manufacturer, who specifies the maximum spans that can withstand this stress.

Q23. **What is the advantage of using composite floor systems consisting of steel beams, profiled metal decking, and reinforced concrete slabs?**

Answer

The advantages include easier construction, reduced foundation costs, faster installation, versatility, structural integrity, high strength to weight ratios, dimensional stability, minimised site storage requirements, non-contamination of other materials, easier stockpiling and cleaning, durable finishes, sound absorption and more. Steel and concrete composite slabs are lighter and stronger than most conventional slabs. The steel decking provides the tensile reinforcement while the compressive strength of the concrete makes for an all-round stronger slab.
The composite columns have large load carrying capabilities, small cross-sections and good fire protection properties. They are also known to possess high axial strength and flexural stiffness

Q24. **Discuss the characteristics of the following high performance structural elements.**

Answer

Structural element	Characteristics
Castellated beams	Standard hot-rolled I-H- or U-sections are used to construct Castellated beams. In a rack-shaped design, the web of the beam is divided longitudinally. The halves are then fused at the tops of the teeth after being moved a half-pitch in respect to one another. As a result, the body of the beam has a row of hexagonal perforations. The beam is significantly deeper than the original profile from which it was constructed, and its weight is (nearly) the same. Welding square or rectangular plates between the cut halves results in a castellated beam with octagonal holes in its body much deeper.
Laminated beams	A wood beam composed of a series of overlapping wood members glued together
Pre-stressed concrete beams	Because strain or stress was imparted to the concrete beam before it was set in place, this system became known as "prestressed" concrete. When the working stress is imparted to a concrete beam, it is "prestressed" because tension is produced before, or "pre," the actual usage of the beam. A correctly constructed prestressed-concrete beam may span greater lengths than a reinforced-concrete beam while also being thinner, lighter in weight, and using less concrete
Trusses	In engineering, a truss is a structural element made of straight pieces of metal or wood arranged in a single plane to produce a series of triangles. (Stress does not affect a triangle

Answer

Structural element	Characteristics
Waffle slabs	Waffle slabs, also known as two-way joist slabs, are reinforced concrete slabs having concrete ribs running in two directions on the underside. The waffle gets its name from the grid pattern created by the reinforcing ribs. For more than 40 feet (12.2 m), waffle slabs outperform flat slabs, flat slabs with drop panels, two-way slabs, one-way slabs, and one-way joist slabs (12 m)

Q25. **How does thermal impact affect a load on structure?**

Answer

Thermal Load: -
All building materials expand and compress as the temperature changes. Buildings that have been standing for a long time will grow, and the expansion strains must be considered.

Q26. **Describe the process associated with fabricating and installing tilt-up concrete panels.**

Answer

Tilt-up concrete panels

The process entails forming and pouring reinforced concrete wall panels horizontally on-site, usually on the final building floor slab, followed by 'tilting' the panel up into its final position with a large mobile crane

Q27. **What are the impacts of creep and shrinkage on concrete structures?**

Answer

Impact of creep and shrinkage:-

Creep and shrinkage can result in a significant loss of prestress. Excessive deflections, often with cracking, have resulted from an underestimation of multi-decade creep in many large-span prestressed segmentally erected box girder bridges (over 60 cases documented).

Q28. **Discuss considerations that must be made when using masonry in the construction of high-rise buildings.**

Answer

The thermal mass of a structure can be increased by using materials like bricks and stones.

Masonry is a non-combustible material that can help to keep a building safe from fire.
Masonry is a very long-lasting type of construction.

Projectiles such as hurricane or tornado debris are more resistant to masonry walls.
Under certain conditions, extreme weather can cause masonry to deteriorate due to the expansion and contraction pressures associated with freeze-thaw cycles.

Masonry is typically heavy, and to avoid settling and cracking, it must be erected on a solid foundation, such as reinforced concrete.
Masonry: - Unreinforced masonry is widely used in Australia as an architectural and structural material. It has high mass, lack of ductility and low tensile strength and is unsuitable for use in areas of high seismicity

Q29. **Explain the differences between structural steel and cold-formed steel.**

Answer

Cold-formed steel, also called light-gauge steel or metal stud framing, is made from structural quality sheet steel formed into C-sections and other shapes usually by rollforming the steel through a series of dies. No heat is required to form the shapes (unlike hot-rolled steel), hence the name cold-formed steel
Structural steel is hot-rolled, much thicker, and considerably stronger and heavier than CFS. “Hot-rolled” means the member is shaped while the steel is molten hot. Because it is thicker and much heavier than CFS, hot-rolled steel fastening methods employ welding, bolting and riveting.

Q30. **Discuss three (3) uses of aluminium in the construction industry and why it is used.**

Answer

1. An aluminium alloy is desirable (sites difficulty of access or with corrosive atmospheres)

2. aluminium alloy constructions may reduce installation costs,

3. Aluminium alloy constructions may have a lower installation cost when helicopters are used in difficult-to-reach regions, offsetting their higher prime cost

Q31. **Briefly discuss the use of the following temporary structures and components in the construction of large and complex buildings.**

Answer

Temporary structure	Use
Bracing	Cross bracing is a system used in construction to reinforce building structures where diagonal supports intersect. Bridge (side) supports and structural foundations are two common applications for cross bracing. This construction method maximises the weight of the load that a structure can support. Bracing's primary function is to provide stability and resist lateral loads, which can come from either diagonal steel members or a concrete 'core.' The bracing system should carry all lateral loads, bracing frames, beams, and columns only designed to support vertical loads. Different types of braces used in Australia:- • Plan bracing • Torsional bracing

Answer

Temporary structure	Use
	• U-frame bracing
Closed Sheeting	A continuous frame with vertical or horizontal sheathing planks is laid side by side to form a continuous retaining wall supporting the excavation face. When a building, vessel, structure, or trench is in danger of collapsing or during repairs or alterations, shores (props) temporarily support it. Shoring is provided by the shore, a timber or metal prop. Shoring can be vertical, angled, or horizontal.
Formwork props	Propping is a system of structural members used to support loads temporarily during construction. The forces generated by these loads must be fully resolved, with props or columns providing all of the support required for the work under construction, such as beams, formwork, etc
Pressure resistant formwork	The formwork, which resists pressure while the concrete is being poured into columns. It is used where pressure is too high, and the formwork bears the pressure, hence the name pressure resisting formwork
Scaffolding sole plates	A timber spreader is a device used to distribute the weight from a base plate to the ground. Tie Scaffold components, such as tie tubes attached to the scaffold, are installed to provide an anchor point for a scaffold to a building or structure. Used to give the scaffold lateral stability
Shields	The shield acts as a temporary support structure that prevents the surrounding soil from becoming unstable. ... The boring machine's cutting head advances the boring machine a short distance through the soil until the tunnel can be lined with a sturdy support system (typically concrete lining segments).
Shoring collar set	collars mount onto columns to support forms without the need for vertical shores. The two sides of the collar bolt tightly together around the column like a clamp.

Answer

Temporary structure	Use
Soldier set	A trench soldier set is a must-have in the construction industry. They are intended to provide support to trench walls and work around services such as electricity, water, and drainage when working in a trench.

Q32. **How do you determine which document to use when communicating construction problems to relevant personnel?**

Answer

You must ensure that you have accessed, interpreted, and applied all documentation for the job before communicating and document the technical resolution of identifying problems.
Compliance documentation is critical to all aspects of operations
The documentation specifies:

- The type of work
- The construction timeline
- The procedures for completing the task
- Quality measured against NCC, state and local requirements
- Environmental and safety compliance requirements.

Q33. **You are contracted to undertake refurbishment of an inner-city hotel. Explain how this is different from a restoration or renovation.**

Answer

Refurbishment involves improving building decor, cleaning, re-equipping, and retrofitting. Its purpose is to improve the building's sustainability and energy efficiency
Restoration involves returning a building to its former state. It's done to historical buildings to maintain their heritage and rich culture. The features of a building are recreated to match its appearance and function
Renovation involves restoring a building to an improved condition. This means replacing and upgrading present components to meet the required standards without altering the original design

Q34. **Discuss why you might suggest refurbishing using fire-resistant building materials where possible.**

Answer

For fire protection, the majority of flaws in the passive fire system are Missing fire collars, missing or incomplete fire separation at penetration, incorrect size of fire collars, damaged fire-rated walls, compromised fire barrier, lack of appropriate fire separation between units, and incorrect materials used for fire barrier were examples of defects.

Utilization of fire resistant building materials provides the user comfort that the spread of fire is reduce by the use of fire resistant building material s

Q35. **Complete the table below by identifying the type of fire-resisting construction (i.e. Type A, Type B, or Type C) given the following class of building and number of storeys each class of building has.**

Answer

Rise in Storeys	Class of building: 2,3,9	Class of building: 5,6,7,8
4 or more	A	A
3	A	B
2	B	C
1	C	C

Q36. **Describe how you would monitor alternative forms of construction to ensure compliance.**

Answer

Obtain verification of quality control measures from relevant agencies, architects and engineers, material testing laboratories, and qualified construction inspectors.

CPCCBC6016
ASSESS CONSTRUCTION FAULTS IN LARGE BUILDING PROJECTS

PRACTICAL ASSESSMENT

Participant name	Brett Eldred

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 unassisted 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 awarded.
    - For any 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	Select Date.	☐ 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**
1.1A.	Specify specific construction fault/s on Type A building requiring rectification. Insufficient or incorrectly installed passive fire protection systems – fire collars not installed in accordance with manufactures tested system or missing fire rating material between fire compartments
1.1A.	Specify (✓) construction faults associated with two (2) of: ☑ Structural ☑ Installation ☐ Refurbishment ☐ Renovation ☐ Restoration ☐ Other (please specify): Structural – insufficient reinforcement steel installed prior to concrete pour or insufficient coverage of concrete on reinforcement. Installation – inappropriate installation of passive fire rating system – insufficient layers of fire board at services penetration.
1.1C. 1.1D. 1.5A. 1.5B.	Specify workplace practices adhered to when documenting and communicating construction problems to relevant personnel and external professionals. Reference to Inspection Test Plans and structural specifications outlining engineering requirements
1.1E.	Specify problem-solving techniques applied: Identification of passive fire rating installation not in alignment with test system. Identify and took photos Check with certifier and fire rating professional for confirmation of defect. Issued to installing contractor responsible for passive fire ratings requirement. Confirmed correct method. Removed and reinstalled fire rating Recertified installation and updated Form 16 to reflect correct system
1.2A.	Specify existing or designed-in construction common/ not common problems identified. ☑ None ☐ Other (please specify): Insufficient separation of building services Separation of exhaust points from fresh air intakes points

ASSESSOR COMMENTS: PRACTICAL TASK 1	
	Stair compliance – height of stair riser tolerance
1.2B.	Specify alternative methods or materials suggested. Referenced in the Fire engineering report – methods included the removal of sprinklers from electrical rooms
1.2C.	Specify equipment and programs accessed to extract information: Program used included Aconex document management and Aconex field for defect management
1.4C. 1.5C.	Specify how alternative method of construction will be managed and monitored. The alternative method of construction was managed by referring to the Fire engineering report and in discussion with building certifier and QFES to ensure alignment of all parties and removal approved .

CPCCBC6016
ASSESS CONSTRUCTION FAULTS IN LARGE BUILDING PROJECTS

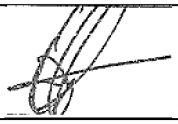
Practical Task 1

Description of task:
The participant must demonstrate the skills and ability to assess construction faults and determine remedial action for construction faults associated with at least two (2) of the following: structural; installation; refurbishment; renovation or restoration on a Type A building project. The assessor will be seeking evidence of:

- Identify and analyse construction faults.
  - Collect information relating to specific construction faults.
  - Analyse original construction project plans and specifications to identify potential causes of construction faults or problems. Use problem-solving techniques to identify typical faults and problems.
  - Adhere to workplace practices when documenting and communicating construction problems to relevant personnel.
  - Make contact with project team members and external professionals to elicit expert analysis and opinions.
  - Use problem-solving techniques to identify typical faults and problems.
  - Develop and document a rectification action that meets the Performance Requirements of the National Construction Code (NCC).
- Analyse construction techniques, methods and materials.
  - Analyse working drawings and specifications to identify any existing or designed-in construction problems.
  - Prepare alternative methods and materials to meet the project specification objectives and comply with the NCC and relevant building legislation.
  - Use equipment and programs to access, extract information and develop relevant documentation.
  - Use building terminology accurately in the communication of issues.
- Evaluate alternative construction solutions.
  - Consider and analyse commonly occurring on-site problems with building materials and their causes.
  - Prepare reports identifying available alternative methods and materials available to meet the construction aims and objectives of the specifications.
  - Prepare detailed sketches of available alternative methods and materials that meet the construction aims and objectives of the specification.
- Resolve construction faults using alternative construction methods.
  - Consider and document solutions and recommend suitable alternative methods to resolve the problem and meet project aims and objectives and organisational processes.
  - Integrate selected methods into the project construction works to align with construction schedules and timeframes.
  - Manage and monitor alternative forms of construction to ensure compliance.
- Communicate preferred solution to construction problem.
  - Use digital tools to document technical resolution in detail of identified problem.
  - Lodge appropriate documentation and communicate with appropriate project and other construction professionals.
  - Determine and implement strategies to monitor corrective action processes and procedures.

These tasks may be simulated or real. The Participant is to gather evidence of how they have completed each component of the Practical Task, which is to be submitted with this Practical Assessment sheet. The Observer is to provide detailed comments on the tasks completed by the Participant (on the Observer Comments, overleaf). The Assessor is to verify the Observer's comments, noting their findings in the Assessor Comments (on the back of the Practical Assessment cover page) and provide the assessment outcome.

Resources required:
Type A building project; access to equipment, technology and software to assess and remediate construction faults in large building projects and collaborate effectively with external professionals; access to relevant government building legislation codes and standards; access to environmental and sustainability requirements; access to manufacturer specifications and installation instructions; workplace policies, procedures and site safety requirements; project plans and specifications.

Practical Task 1	
Observer details	
Name of observer:	Llyod Evans
Role of observer (Confirm suitability to sign)	Project Manager
Email address of observer	llevans@besixwatpac.com
Signature of observer:	
Date:	21/6/24

When completing the task, did the Participant:		Tick if satisfactorily completed. Provide comments if left unticked.
1 Identify and analyse construction faults.		
1.1A.	Collect information relating to specific construction faults.	☑
1.1B.	Analyse original construction project plans and specifications to identify potential causes of construction faults or problems. Use problem-solving techniques to identify typical faults and problems.	☑
1.1C.	Adhere to workplace practices when documenting and communicating construction problems to relevant personnel.	☑
1.1D.	Make contact with project team members and external professionals to elicit expert analysis and opinions.	☑
1.1E.	Use problem-solving techniques to identify typical faults and problems.	☑
1.1F.	Develop and document a rectification action that meets the Performance Requirements of the National Construction Code (NCC).*(attach rectification request/ report)*	☑
2. Analyse construction techniques, methods and materials.		
1.2A.	Analyse working drawings and specifications to identify any existing or designed-in construction problems.	☑
1.2B.	Prepare alternative methods and materials to meet the project specification objectives and comply with the NCC and relevant building legislation.	☑
1.2C.	Use equipm ent and programs to access, extract information and develop relevant documentation.	☑
1.2D.	Use building terminology accurately in the communication of issues.	☐
3. Evaluate alternative construction solutions.		
1.3A.	Consider and analyse commonly occurring on-site problems with building materials and their causes.	☑
1.3B.	Prepare reports identifying available alternative methods and materials available to meet the construction schedule and objectives of the specifications.*(attach report/s)*	☑
1.3C.	Prepare detailed sketches of available alternative methods and materials that meet the construction aims and objectives of the specification.).*(attach detailed sketches)*	☑
4. Resolve construction faults using alternative construction methods		
1.4A.	Consider and document solutions and recommend suitable alternative methods to resolve the problem and meet project aims and objectives and organisational processes. *(attach report/s)*	☑
1.4B.	Integrate selected methods into the project construction works to align with construction schedules and timeframes.	☑

When completing the task, did the Participant:		Tick if satisfactorily completed. Provide comments if left unticked.
1.4C.	Manage and monitor alternative forms of construction to ensure compliance.	☑
5. Communicate preferred solution to construction problem.		
1.5A.	Use digital tools to document technical resolution in detail of identified problem.	☑
1.5B.	Lodge appropriate documentation and communicate with appropriate project and other construction professionals.	☑
1.5C.	Determine and implement strategies to monitor corrective action processes and procedures.	☑

Observer comments:

Brett demonstrated good understanding in the identification and management of building defects, particularly the area passive fire rating. The ability to access a live project to demonstrate faults and defects in large building was unavailable so the office which we reside was used, a building built Bretts employer.
Common faults during the construction and post construction periods were discussed and on floor inspection undertaken of areas typically identified in fault findings of buildings.
Brett was able to articulate correct manner in identifying and going about the appropriate method to communicate, rectify and resolve the building fault.

Supporting Evidence for Practical Assessment - CPCCBC6016 Assess construction faults in large building projects

Student : Brett Eldred

Practical Assessment item 1.1F

Extract from correspondence

It is surprising that this detector is going off as it is within the ceiling space above the kitchen and not within the kitchen space itself. No matter what we end up doing with the detector, I would recommend that the facility investigate whether the kitchen exhaust ductwork is leaking into the ceiling as this could be a bigger problem.

If it is an ongoing issue, then the detector is permitted to be removed under NCC provisions due to the ceiling space being sprinkler protected.

(c) **Class 9a *health-care buildings*** — The following applies in a Class 9a *health-care building*:

(i)

(A) Photoelectric type smoke detectors must be installed in *patient care areas* and in paths of travel to *exits* from *patient care areas*; and

(B) in areas other than *patient care areas* and paths of travel to *exits* from *patient care areas*, where the use of the area is likely to result in smoke detectors causing spurious signals, any other detector deemed suitable in accordance with AS 1670.1 may be installed in lieu of smoke detectors,

except where an area is protected with a sprinkler system complying with Specification E1.5, smoke detectors need not be installed where the use of the area is likely to result in spurious signals.

(ii) Manual call points must be installed in *evacuation routes* so that no point on a floor is more than 30 m from a manual call point.

Vic Spec E2.2a 4(d)

Removing the detector will solve the unwanted alarms issue however I believe there may be a larger issue at play here, with kitchen exhaust fumes leaking into the ceiling space, which should be investigated.

Regards

<u>Practical Assessment item 1.3B and Practical Assessment item 1.3C</u>

3.8 FIRE HYDRANT, HOSE REELS AND EXTINGUISHERS

pp. A fire hydrant system must be provided in accordance with the BCA DtS requirements and Fire Brigade requirements, except that:

i. Fire hydrant coverage need not be provided to the maintenance plenum located on Level 0 as shown in Figure 3.18.

ii. The Fire hydrant booster be located not within sight of the main entrance of the building.

iii. A copy of the Hydrant Block Plan indicating the location of the hydrant booster within the site must be provided at the FDCIE serving the ASB building.

iv. Internal fire hydrants are permitted to be located more than 4 m, but within 6 m from required non-fire-isolated exits, provided that:

– Additional internal fire hydrants must be provided for compliant floor coverage. These additional internal fire hydrants must be within 30 m of the DtS hydrant within the fire-isolated stair or adjoining fire compartment. Requirement subject to QFES approval.

– Fire Hydrants must be visible from the required exit.

qq. Fire hose reels must be provided in accordance with the BCA DtS requirements and Fire Brigade requirements, except that:

i. Fire hose reels need not be provided to following areas:

– Class 9a areas, contingent on the provision of portable fire extinguishers as per Item 'rr'.

– The maintenance plenum located on Level 0 as shown in Figure 3.18.

Figure 3.18 – Omission of hydrant and hose reel coverage to maintenance plenum on Level 0

rr. Portable fire extinguishers must be provided in accordance with the BCA DtS requirements, and the following:

   i. Portable fire extinguishers must be provided in accordance with AS 2444 where fire hose reels have been omitted.

ss. Fire Brigade tank suction points are permitted, in lieu of AS 2118.6 Clause 2.8.6 requirements.

Practical Assessment item 1.4A

3.9 FIRE SPRINKLER SYSTEM

tt. A fire sprinkler system must be provided throughout the building in accordance with BCA DtS Provision E1.5 and AS 2118.1, except that:

i. Fire sprinkler heads must be fast response type (i.e. RTI < 50 $m^{1/2}s^{1/2}$).

ii. Sprinklers may be omitted from the following areas:

- Specific Electrical, Communications, UPS and Generator Rooms, contingent on fire separation as per Item 'l'.
- The top of lift shafts subject to detection being provided as per Item 'yy.ii'.

uu. The Bulk, Sterile Stock and Clean Linen Storerooms on Level 0 as indicated in Figure 3.11, and the Sterile Stock and Equipment Store behind the Operating Theatres on Level 5 as indicated in Figure 3.12 is permitted to be provided with sprinklers to Ordinary Hazard 3 in lieu of High Hazard, contingent on fire separation of the rooms as per Item 'm'.

vv. Where wall-wetting fire sprinkler protection is required to protect glazing and glazed sliding doors forming part of fire rated construction, the following requirements must be met:

i. The glazing, including glazed sliding doors, must be protected by Specific Application Window Sprinklers that are UL listed to provide the required duration of fire protection as tested in accordance with ASTM E119.

ii. Where a window covering is proposed, the fire sprinkler head must be located between the window covering and the glass.

iii. The Specific Application Window Sprinklers must be quick response type with a K_1-factor of 8.0 LPM/$kPa^{0.5}$ and a temperature rating of 68°C if installed internally, and 93°C where sprinklers are installed externally.

iv. The design and installation of the wall-wetting sprinkler system are to be in accordance with the Specific Application Window Sprinklers manufacturer's technical datasheet; these include (not limited to) the type of glass, window construction and dimension, sprinkler location and spacing, hydraulic calculation and water supply, except that:

- The system is permitted to be hydraulically designed to allow for the simultaneous operation of all wall-wetting fire sprinkler heads on one side of the glazed openings and the associated normal sprinklers.
- The system is permitted to be installed to self-closing and auto-closing glazed doors.
- Water supply to be adequate to allow operation of the sprinklers for a period equivalent to the FRL of the fire separating element in which the glazing is installed.
- Be fed from the combined fire mains via separate connection to the floor sprinklers complete with flow switch, test connection and monitored isolation valve with signage stating 'WALL-WETTING FIRE SPRINKLER SYSTEM – DO NOT ISOLATE' in lettering at least 10 mm high in a colour contrasting with the background. The isolation valve must be located in an easily