

CPCBC6001

APPLY BUILDING CODES AND STANDARDS TO THE CONSTRUCTION PROCESS FOR 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 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 unaided 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. - 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 understand references the NCC makes to Australian Standards.

Answer

Should reflect: Australian Standards referenced in the NCC usually form part of the Deemed-to-Satisfy (DtS) Provisions of the NCC. Compliance is achieved through meeting the requirements of the DtS solution. A DTS Solution follows a set recipe of what, when and how to do something. It uses the DTS Solutions from the NCC, which include materials, components, design factors and construction methods that, if used, are deemed to meet the Performance Requirements. It is important to determine which Australian Standards are referenced and adhere to these to achieve compliance.



Q2. You have been asked to develop a tender proposal for a large government building in your State/Territory. Discuss in depth any legislation and Codes your submission must comply with?

Answer

Should reflect but is not limited to: Knowledge of NCC classes and DTS requirements, Building Act and regulation for legal framework of building development approvals, building work, building classification, building certifiers; Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) and regulations which provide a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places. Local council requirements for buildings, building approval; Queensland Development Code; NCC compliance and relevant WHS legislation and Codes of Practice.



Q3. Describe the listed NCC compliance assessment methods used to determine compliance using a Performance Solution pathway.

Answer

Assessment method	Description
Evidence of suitability	e.g. Requires evidence, to support claims that a material, form of construction or design meets the Performance Requirements or DTS Provisions.
Verification methods	e.g. Tests, inspections, calculations or other methods, which determine whether a proposed building or plumbing and drainage solution complies with the relevant Performance Requirements. Verification Methods are not limited to using those in the NCC. Another Verification Method may be used if the appropriate regulatory authority is satisfied that it establishes compliance with the NCC.
Comparison with DTS Provisions	e.g. Demonstrated comparison between the DTS Provision and a proposed building or plumbing and drainage solution. It must demonstrate to the appropriate authority that the solution complies in an equivalent or superior way to the DTS Provisions, to be deemed to meet the relevant Performance Requirements.
Expert Judgement	e.g. The opinion of a technical expert may be accepted provided the person has the qualifications and experience necessary to determine whether a building or plumbing and drainage solution complies with the Performance Requirements. Applied when physical criteria are unable to be tested or modelled by calculation.



Q4. Discuss the importance of documenting quality assurance and quality control processes relevant to the build.

Answer

Should reflect but is not limited to: Quality assurance processes include the policies and procedures relevant to ensuring and outlining the quality requirements for the build. These include policies and procedures surrounding assessment of performance, processes and products. Quality Control Procedures, including assessment of materials for compliance, benchmarking inspections of work and so on. All of these procedures and policies ensure that quality requirements are met during work and not required to be dealt with on work completion.



Q5. Discuss the basic principles of structural design and how stress or strain occurs.

Answer

Should reflect but is not limited to: . A building must be designed to provide strength, stability, serviceability and durability and must be able to withstand loads efficiently. This involves structural calculations to work out the effects of all the forces acting on any component in the building and on the building overall. Stress occurs in any material which supports a load. Stress is the way a material transfers the load through its molecules. It's like an internal pressure resisting the external applied loads. Under loading, some deflection and deformation may occur, and if this movement is not allowed for then structural failure may be the result. Strain is the term applied to deformation (or change of shape) of an object when a load is placed on it. Therefore, a principle of structures is that they be designed to maintain a state of equilibrium; resisting external loads without moving.



Q6. Discuss compressive and tensile stresses on buildings?

Answer

Should reflect but is not limited to: Structural members such as columns, beams, slabs and trusses are influenced by various forces acting on each of them that cause development of stress like compressive stress and tensile stress. Compressive force acting on structural member resulting compressive stress which squeeze a member or compressed it and tension force acting on structural member is development of tensile stress which pull the structure members in tension. Tensile stress along with compressive stress causes bending moment. Loads of buildings are designed to transfer through the columns to the ground. All horizontal loads are uniformly distributed and transferred to the beam and all the horizontal load acting on beam transfer vertically to the column. thus vertical load acting on column in downward direction try to resulting compressed in downward direction and vis versa supporting strength of column and their internal force counter with vertical load and acting in upward direction which also try to compress structure member column in upward direction.



Q7. Describe considerations you make when writing workplace procedures.

Answer

Should reflect but is not limited to: consider the audience, write to be understood. As well as a description of how the task is done a procedure document should include:

- Title and date for identification and version control
- Employee responsible for seeing the operation/task is carried out
- Who does the task (position, not name)
- Objective; what the procedure is meant to achieve
- Records that need to be kept as part of the task



Q8. Discuss the listed levels found in the NCC Performance Hierarchy.**Answer**

Performance Hierarchy	Description
Objectives	e.g. describe the community expectations for buildings.
Functional statements	e.g. describe how buildings are to achieve the objectives.
Performance requirements	e.g. outline the mandatory performance level that needs to be met for a building to meet the Objectives and Functional Statements.
Building Solutions	e.g. to achieve compliance with the Performance Requirements by using a Performance Solution (Alternative Solution) or a Deemed-to-Satisfy (DTS) Solution or a combination of both.



Q9. Discuss two (2) properties, two (2) characteristics and two (2) limitations of concrete when used for buildings.

Answer

	Concrete
Properties	e.g. two (2) of: The compressive strength of concrete is considered one of the most important structural properties it has.
	Concrete should be workable, finishable, strong, durable, watertight, and wear-resistant.
Characteristics	e.g. two (2) of: Ease of workability, high durability, fire resistance,
	thermal insulation; acoustic insulation; impact resistant.
Limitations	e.g. two (2) of: Plain concrete has low tensile strength when compared to other building materials; Requires reinforcement;
	Low ductability. Low strength-to-weight ratio. It is susceptible to cracking. Requires time constraints around pour and curing.



Q10. Discuss three (3) benefits of using glass in buildings?

Answer

1. Should reflect but is not limited to three (3) of: aesthetically pleasing, enhances the ambience. Interiors appear larger and more open, with abundant natural lighting;
2. Various colours available; UV stable; weather, dust; and rust resistant; impact resistance against applied load. Transmits natural daylight. Can lower electricity costs, add light to rooms. durable against most chemicals
3. Recyclable/ reusable can be melted down to make new materials. Glass bricks are stronger than concrete and are capable of withstanding the force of a car crash.



Q11. Describe information you can determine from the working drawings and specifications when organising the excavation for the site of a three (3) storey unit block with underground parking.

Answer

Should reflect but is not limited to: Address, orientation of the build; levels; benchmarks; materials and the installation methods. They consist of precisely written documentation that describes a project to be constructed, supplementing drawings and forming part of the contract and describing qualities of materials, their methods of manufacture and installation into the project, workmanship and mode of construction, in addition to providing other information not shown in the drawings including description of the final result.



Q12. Who would you discuss materials and plans with to ensure compliance with NCC Performance Requirements and site safety. Provide two (2) examples and explain your answers.

Answer

Should reflect but is not limited to: Building architect to confirm structure and material compliance, material supplier to confirm technical information accompanying a building product and the standards that the product meets,; surveyors to confirm orientation and levels, certifiers to confirm requirements, trades contracted to the build to confirm their awareness of the NCC and application to their work; Project management; client; consultant.



Q13. Why may you need to use a combination of Performance Solutions and Deemed-to-Satisfy (DtS) solutions to comply with the Performance Requirements of the NCC.

Answer

Should reflect but is not limited to: Certain components of the build may not comply directly with the DtS solutions and may need to be constructed using expert advice that meets the requirements for performance solutions; this then allows for a combination of Performance solution and DtS solution across the build.



CPCBC6001

APPLY BUILDING CODES AND STANDARDS TO THE CONSTRUCTION PROCESS FOR LARGE BUILDING PROJECTS

WORKBOOK

Participant name	
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FOR THE PARTICIPANT

Instructions

- 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.
- The timeframe for these tasks will be established by your Assessor or Training Provider. Additional time may be allowed upon negotiation with the Assessor.
- You must complete all questions unless instructed by the Assessor or other personnel. You may refer to reference material as needed. All questions must be answered correctly for a 'Satisfactory' assessment outcome 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.

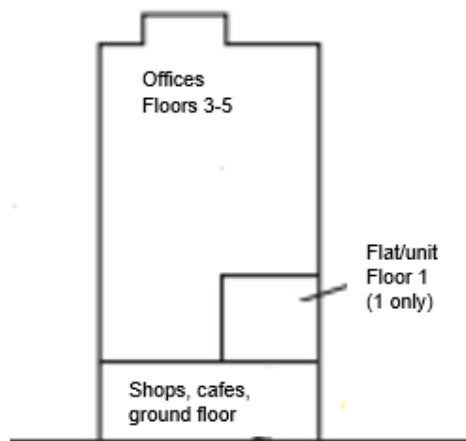
NOTE

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

Access the NCC via the internet to determine the Building Classification/s that apply to the building diagram below. The building is to contain offices in the upper floors, one caretaker flat on the first floor and shops and cafes on the ground floor. Explain your findings below.



Answer

Should reflect: Offices – class 5- An office building used for professional or commercial purposes, excluding buildings of Class 6, 7, 8 or 9. Flat/unit – Class 4 - A dwelling in a building that is Class 5, 6, 7, 8 or 9 if it is the only dwelling in the building. Shops – Class 6 - A shop or other building for the sale of goods by retail or the supply of services direct to the public. Example: café, restaurant, kiosk, hairdressers, showroom or service station Building is a combination of class 4, 5 and 6 classification. The building (and each part of the building) must comply with all the relevant requirements that apply to each of the classifications for the building (or part of a building)

**Satisfactory
Outcome**



ACTIVITY 2

Access the NCC via the internet to locate the requirements applicable to a building development in the Brisbane area, containing 6 sole-occupancy units, two (2) on each level, each being a separate dwelling.

This building includes one (1) basement level designated for car parking.

The proposed building structure requires reinforced concrete floors and columns.

Document your findings or where in the NCC the information can be located.

Building Description

Classification
Class 2 residential units Class 7a Car park
Rise in Storeys
The building has a rise of three (3) storeys.
Number of Storeys
The development will contain four (4) storeys.
Type of construction
Type A construction throughout
Climate Zone and description
Zone 2 - Warm humid summer, mild winter

Fire resistance and stability

Locate fire resistance information
Detailed in C2D2 of NCC Part C2 Fire resistance Where lightweight fire rated construction is proposed for walls, the system must comply with Specification 6 of NCC and the manufactures tested specification.

Compartmentation and fire separation

e.g. Each sole occupancy unit within the building must be separated by construction achieving an FRL of not less than 90/90/90 for load bearing or -/60/60 for non-load bearing.

The car parking areas must be separated from the residential portion of the building by construction having an FRL not less than 120/120/120.

The stair and lift shafts must be constructed with an FRL not less than 120/120/120 to the parking levels, and 90/90/90 to residential levels.

Fire hazard properties of materials, assemblies, fixtures and linings

e.g. Must comply with Section C DTS C2D11

Material requirements

Reinforced concrete requirements relative to Australian Standards

e.g. NCC Part 4.2

Concrete must be manufactured to comply with AS 3600 (4.2.10)

Materials used for reinforcing steel must comply with AS 2870 (4.2.11)

Glazing requirements specifically for windows, sliding doors with frames and balconies.

e.g. NCC Part 8- Glazing

Design and construction in accordance with AS 2047

glass is of a type recognised by AS 1288; and safety glazing is legibly marked in accordance with AS 1288; and

glazing used in barriers complies with AS 1288

building is located in an area with a design wind speed of not more than N3

**Satisfactory
Outcome**



ACTIVITY 3

The building discussed in ACTIVITY 2 includes one (1) basement level designated for car parking.

Provide information required for

- Bored piling to retain the soil and enable basement walls.
- Work Health and Safety
- Water proofing
- Water ingress

Document your findings or where the information can be located.

Bored piling to retain soil and enable basement walls

The construction of columns from subsoil to provide vertical support. Specialist contractors can be organised. Bored piles are cast into position and extremely secure. Results in less vibration when compared to other methods.

Access NCC part H1D4 footing and slab construction

Work Health and Safety

Must meet requirements of WHS Act

Information located in WorkSafe Qld website

Risk management processes and procedures in place including barriers and signs

Consultation requirements

Safe excavation procedures

Water proofing

Underground car park is exposed to water vapour penetration below. A suitable waterproofing membrane must be applied to make the concrete vapour-tight.

See Volume Two Amendment 1 Section 2 Performance Provisions – Part 2.2 Damp and weatherproofing

Water ingress

Part 3.1.3 Drainage

3.1.3.1 Application

Compliance with this acceptable construction practice satisfies Performance Requirement P2.2.1 for drainage of—

(c)

land adjoining and under buildings,

provided the stormwater drainage system otherwise complies with the acceptable construction manual.

**Satisfactory
Outcome**



CPCCBC6001

APPLY BUILDING CODES AND STANDARDS TO THE CONSTRUCTION PROCESS FOR 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
1.1A.	Specify how scope of work was determined: e.g. Read project plan and documents, discussion with project management and/or client
1.1A.	Specify how general requirements and prescriptive requirements of the NCC were determined and documented: e.g. accessed NCC website and read general requirements and prescriptive requirements relevant to the project. Documented requirements in Quality Assurance Template
1.1B.	How were relevant Australian Standards identified and located: e.g. Identified under prescriptive requirements in NCC such as Concrete as per AS3600. Standards located in workplace files (digital and hard-copy) or requests made for purchase from SAI Global.
1.2A. 1.2B. 1.3A. 1.3H. 1.5C. 1.5D.	Specify (✓) where building classifications, criteria requirements and performance solutions were documented: ☐ Workplace Quality document ☐ Quality Assurance Template ☐ Other (please specify): ☐ Document attached as evidence
1.3F.	Specify (✓) who was consulted regarding compliance options: ☐ Project management ☐ Relevant tradesperson ☐ Builder ☐ Supplier ☐ Other (please specify):
1.4A. 1.4B.	Specify (✓) where NCC requirements for passive and active fire protection and performance solutions were documented: ☐ Workplace Quality document ☐ Quality Assurance Template ☐ Other (please specify): ☐ Document attached as evidence

ASSESSOR COMMENTS: PRACTICAL TASK 1	
1.4C.	Specify existing buildings checked for compliance with active fire protection requirements: ☐ Is checklist used attached as evidence? e.g. checked two (2) recently completed buildings using created checklist.
1.5A. 1.5B.	Specify (✓) communication methods applied to manage construction and other trades compliance: ☐ Emails ☐ Schedule ☐ Memos ☐ Daily meetings ☐ Site induction ☐ Other (please specify):
1.5E.	Specify how non-confirming building materials and products were managed using evidence of suitability: e.g. documented in Quality Assurance Plan Template