



CPCBC4053

Apply building codes and standards to the construction process for Class 2 to 9 Type C buildings

Assessment 4 of 4

Project 2

Assessor Guide



Assessment Instructions

Task overview

This assessment task requires you to complete **nine (9) tasks** in the context of a fictitious workplace, UP Building and Construction Pty Ltd.

This Project consists of **nine (9)** tasks as it follows:

- Task 1: Classification and type of building
- Task 2: Structure analysis
- Task 3: Fire Safety analysis
- Task 4: Access and egress
- Task 5: Services and equipment
- Task 6: Health and amenity
- Task 7: Ancillary provisions
- Task 8: Energy efficiency
- Task 9: Communication with stakeholders.

Read the scenario provided, review the plan included, then complete the project tasks by typing your response in the spaces provided.

To complete this assessment, you will need to access NCC 2019 Volume One and Two that is explained in the learning and is available upon free registration on [ABCB's website](#). Information regarding site classification can be found in NCC Volume Two.



Assessment Information

Submission

You are entitled to three (3) attempts to complete this assessment satisfactorily. Incomplete assessments will not be marked and will count as one of your three attempts.



All questions must be responded to correctly to be assessed as satisfactory for this assessment.

Answers must be typed into the space provided and submitted electronically via the LMS. Hand-written assessments will not be accepted unless previously arranged with your assessor.

Reasonable adjustment

Students may request a reasonable adjustment for assessment tasks.

Reasonable adjustment usually involves varying:

- the processes for conducting the assessment [e.g. allowing additional time]
- the evidence gathering techniques [e.g. oral rather than written questioning, use of a scribe, modifications to equipment]

However, the evidence collected must allow the student to demonstrate all requirements of the unit.

Refer to the Student Handbook or contact your Trainer for further information.



Please consider the environment before printing this assessment.

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SCENARIO: FURNITURE PRODUCTION FACILITY

You have been asked by UP Building and Construction Pty Ltd to assess a set of plans to ensure they comply with relevant building codes and standards. Based on the set of plans provided you need to work through the following documentation that is specifically structured and designed to ensure the proposed construction covers the relevant building codes and standards.

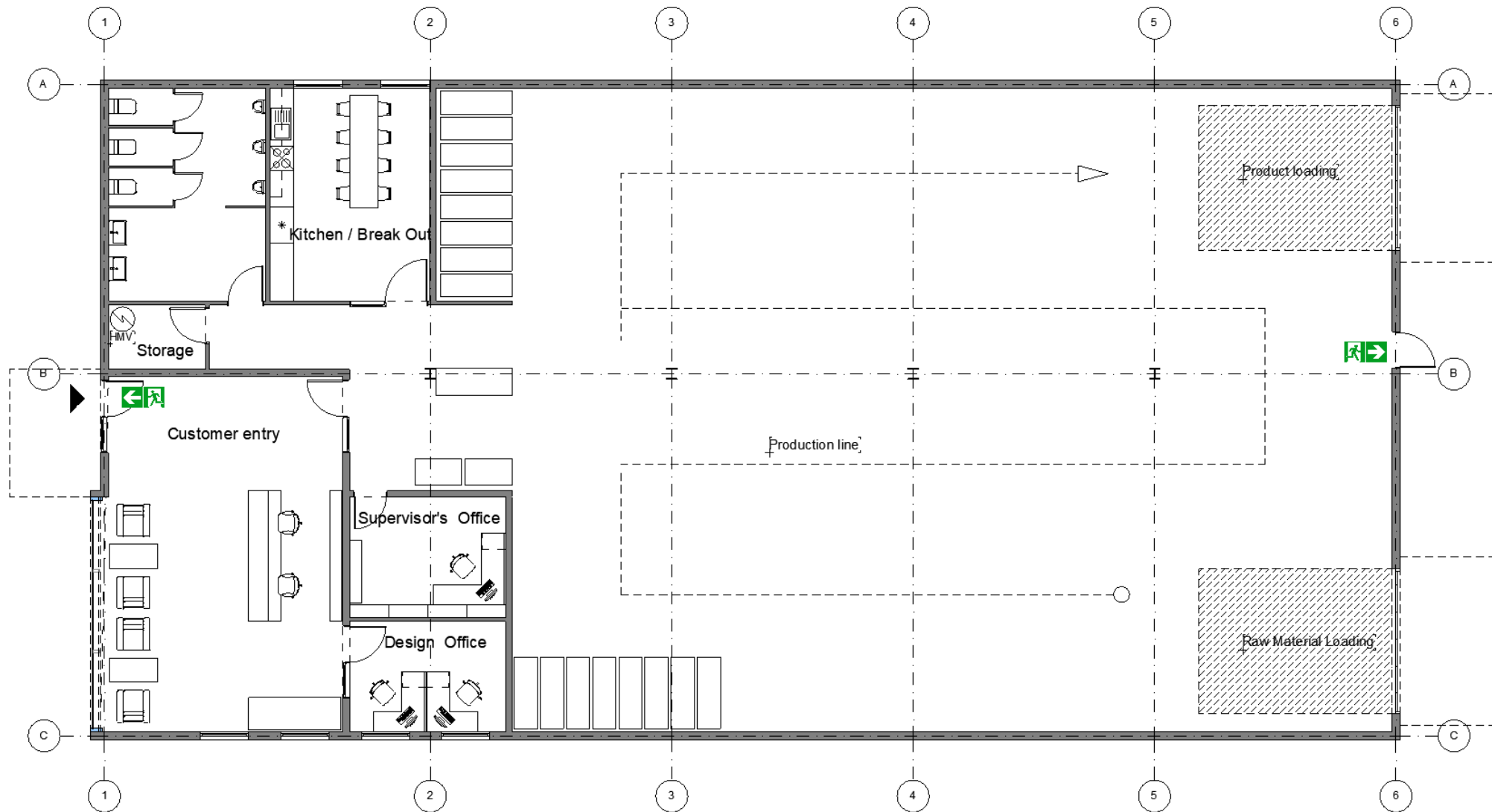
In circumstances where you find the plans and specifications do not meet the minimum requirements, you will need to provide solutions to overcome these issues. You will also need to provide other sources of information to assist in supporting the advice you have provided.

Project brief:

- Client: Comfy Furniture
- The proposed construction is to occur in Lot 1 Endeavour drive, Port Macquarie New South Wales
- The proposed construction will be used to produce various pieces of furniture and at any one time for various commercial outlets across NSW
- There may be up to 15 employees working in the building at any one time.
- One of the employees in the design team has a physical disability and requires a wheelchair.
- There may be up to another 6 people in the building at any one time, these people may be other trades or members of the public visiting the factory.
- Pieces of furniture are supplied to furniture shops across NSW for sale to the public.
- It is a large-wide span shed with toilet facilities, a desk for administration staff to greet people entering the building and an office for the supervisor and design team which overlooks the workshop floor.
- The site is classified as commercial by the local council.
- The site is on a large block and has 20m of grassed area around the building and carpark area with 15 parking spaces.
- The soil is mostly sand and rock with little or no ground movement from moisture changes.
- The construction engineer has confirmed that a slab on ground will be suitable due to the soil type,
- All external windows are laminated and made from laminated glass that meets the requirements of AS 2047.
- The toilet and lunchroom areas will be tiled.

Note: Proposed floor plan is provided below.

Proposed Floor Plan:



Task 1: Classification and type of building

Based on the plans and specifications provided as part of the scenario, complete the following table with relevant supporting information. Supporting information may come from the specifications provided or from the NCC.

Instructions to the assessor:

This is an example of a competent response:

PROJECT INFORMATION		SUPPORTING EVIDENCE (5-25 WORDS)
Project name (3-5 words)	Comfy Furniture's furniture production facility	As provided in the project brief
Project location (2-7 words)	Lot 1 Endeavour drive, Port Macquarie New South Wales	As provided in the project brief
NCC building class and subclass (1-2 words)	Class 8	As per the guidance provided in the NCC Volume 1 A6.8
Types of building construction (1-2 words)	Type C, the building is a single - level construction and a Class 8	As per the guidance provided in the NCC Volume 1 C1.5 and table C1.1
Class of soil (1-2 words)	Class A	Based on the description provided in the project brief and the NCC Volume 2 Part 3.2.4.1 Site classification and Table 3.2.4.1
Type of concrete slab (3-5 words)	Slab on ground	As provided in the project brief, (recommended by NCC to source professional advice)
Nature of the building (2-10 words)	Single storey factory building producing furniture products	As provided in the project brief
Is there a change in level throughout the construction? (2-5 words)	One level throughout construction	As provided in the elevation plans

Task 2: Structure analysis

The client is questioning the costs around the structure. The client was looking to save costs by opting for a wide span steel shed construction opposed to a concrete tilt slab (tilt-up wall) construction. He is asking if it is possible to reduce the size of several supporting columns within the structure.

Respond to these questions listed in the table below and provide the relevant information regarding how UP Building and Construction Pty Ltd has met the Performance Requirements through the construction process. In your answer, where possible, you will need refer to the relevant Australian Standard. To support your answer, copy the relevant clause from NCC where applicable.

Instructions to the assessor:

This is an example of a competent response:

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QUESTIONS RAISED	ANSWER [4-35 WORDS]	SUPPORTING CLAUSE FROM THE NCC [40-50 WORDS]
<p>The steel construction currently meets the relevant Deemed-to-Satisfy Solutions. Considering this, what Australian Standards have been complied with through the design?</p>	<ul style="list-style-type: none"> ● Steel structure AS 4100 ● Cold formed steel structures: AS/NZS 4600 ● Residential and low-rise steel framing: NASH Standard – Residential and Low-Rise Steel Framing Part 1 or Part 2 	<p>NCC Volume 1: B1.4 Determination of structural resistance of materials and forms of construction c) steel construction:</p> <p>Steel construction:</p> <p>(i) Steel structures: AS 4100.</p> <p>(ii) Cold-formed steel structures: AS/NZS 4600.</p> <p>(iii) Residential and low-rise steel framing: NASH Standard – Residential and Low-Rise Steel Framing Part 1 or Part 2.</p>
<p>The client has asked if there was another way around using the columns that are stipulated in the Australian Standards. What document provides guideline to determine the applicable structural reliability and capability reduction factors?</p>	<p>NCC Structural Reliability Verification Method Handbook</p>	<p>N/A</p>

Task 3: Fire safety analysis

The local regulator has raised questions around the class of building as there are office components buildings located in this construction.

Answer the stakeholder’s questions listed in the table below. To support your answer, copy the relevant clause from NCC where applicable.

Instructions to the assessor:

This is an example of a competent response:

Student Name: [Click or tap here to enter text.](#)
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QUESTIONS RAISED	ANSWER (10-60 WORDS)	SUPPORTING CLAUSE FROM THE NCC (35-80 WORDS)
<p>Should the construction be classed as mixed? Briefly explain your answer.</p>	<ul style="list-style-type: none"> No, the office area does not take up more than 10% of the entire floor space. 	<p>NCC Volume One, A6.0 determining a building classification, Exemption 1, 'For A6.0(1) where a part of a building has been designed, constructed or adapted for a different purpose and is less than 10% of the floor area of the storey it is situated on, the classification of the other part of the storey may apply to the whole storey.'</p>
<p>Volume One of the NCC details three (3) properties that indicate how they behave in specific fire conditions. What are these three (3) properties?</p>	<ol style="list-style-type: none"> Average specific extinction area, critical radiant flux and Flammability Index, determined as defined in Schedule 3 Smoke-Developed Index, smoke development rate and Spread-of-Flame Index, determined in accordance with Schedule 6. material's group number or smoke growth rate index Group number and smoke growth rate index [SMOGRARC], determined in accordance with Specification C1.10 of Volume One. 	<p>Volume One A5.5 Fire hazard properties Where a Deemed-to-Satisfy Provision requires a building component or assembly to have a fire hazard property it must be determined as follows: (1) For average specific extinction area, critical radiant flux and Flammability Index, as defined in Schedule 3. (2) For Smoke-Developed Index and Spread-of-Flame Index, in accordance with Schedule 6. (3) For a material's group number or smoke growth rate index [SMOGRARC], in accordance with Clause 4(b) of Specification C1.10.</p>
<p>There are various air handling (ridged and flexible) ducts that will be used in the workshop to ensure air quality is maintained during work. In relation to NCC Volume One, Specification C1.10 Fire hazard properties, what Australian Standard must be complied with to meet the Deemed-to-Satisfy Solutions outlined in NCC Volume One?</p>	<p>AS 4254.2 Ductwork for air-handling systems in buildings, Part 2: Rigid duct</p>	<p>Volume One, Specification C1.10 Fire hazard properties Section 5: Air-handling ductwork Rigid and flexible ductwork in a Class 2 to 9 building must comply with the fire hazard properties set out in: <ul style="list-style-type: none"> AS 4254.1 and AS 4254.2. </p>

Task 4: Access and egress

The client has various questions in relation to access and egress for disabled persons as one of the employees working in the design team is a person with disability and will require access via wheelchair to facilities and parking. Answer the client's questions listed in the table below. To support your answer, copy the relevant clause from NCC where applicable.

Instructions to the assessor:

This is an example of a competent response:

QUESTIONS RAISED	ANSWER (15-50 WORDS)	SUPPORTING CLAUSE FROM THE NCC (5-20 WORDS)
Are there any special requirements in relation to access and egress based on the location of this construction? If so, please list these clauses that apply from the NCC Volume One.	Yes, the following: NSW D1.6 Dimensions of exits NSW D1.10 Discharge from exits NSW D2.1 Application of Part NSW D2.13 Treads and risers NSW D2.15 Thresholds NSW D2.16 Barriers NSW D2.19 Doorways and doors NSW D2.21 Operation of latch NSW D2.101 Doors in path of travel in an entertainment venue	As per Section D specifically for NSW
Are there any areas that a person with disability would find challenging to access?	A person with disability should be able to access all areas used by the occupants.	NCC Volume One D3.1 General building access requirements and Table D3.1 Requirements for access for people with a disability
The car park is planned to have 15 spaces. No disabled space is designed. Does this design comply in relation to number of disabled spaces?	No, it does not. There needs to be at least 1 disabled space for every 100 car spaces as per NCC Volume One Table D3.5	Table D3.5 1 space for every 100 carparking spaces or part thereof.

Task 5: Services and equipment

The client has asked about the need for a fire sprinkler system. There are significant costs associated with this installation and the client is asking if there are any ways this could be avoided. Answer the client's question listed in the table below. To support your answer, copy the relevant clause from NCC where applicable.

Instructions to the assessor:

This is an example of a competent response:

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QUESTIONS RAISED	ANSWER [15-20 WORDS]	SUPPORTING CLAUSE FROM THE NCC [160-165 WORDS]
<p>Considering the class and size of the building, does the building need to have fire sprinklers installed?</p>	<p>No, the construction does not require a fire sprinkler system if building doesn't exceed 18 000 m² in floor area.</p>	<p>NCC Volume One E2.3 Provision for special hazard</p> <p>Table E2.2a General provisions</p> <p>Large isolated buildings subject to C2.3</p> <p>In a Class 7 or 8 building, which does not exceed 18 000 m² in floor area nor exceed 108 000 m³ in volume, the building must be provided with—</p> <ul style="list-style-type: none"> (i) a sprinkler system complying with Specification E1.5, and provided with perimeter vehicular access complying with C2.4(b); or (ii) an automatic fire detection and alarm system complying with AS 1670.1 and monitored in accordance with Clause 8 of Specification E2.2a; or (iii) an automatic smoke exhaust system in accordance with Specification E2.2b; or (iv) automatic smoke-and-heat vents in accordance with Specification E2.2c; or (v) natural smoke venting, with ventilation openings distributed as evenly as practicable and comprising permanent openings at roof level with a free area not less than 1.5% of floor area and low level openings which may be permanent or readily openable with a free area not less than 1.5% of floor area.

Task 6: Health and amenity

The client has asked a number of questions in relation to the toilets and sanitary fixtures required in the building. Answer the client's questions listed in the table below. To support your answer, copy the relevant clause from NCC where applicable.

Instructions to the assessor:

This is an example of a competent response:

QUESTIONS RAISED	ANSWER (15-30 WORDS)	SUPPORTING CLAUSE FROM THE NCC (2-45 WORDS)
Considering the brief provided by the client, what is the design occupancy when determining the sanitary facilities required for the construction?	<ul style="list-style-type: none"> • between 1-20 > 1x toilet pan • between 1-10 > 0x urinal, 11-25 > 1 urinal = 1 urinal and >20 for males between > 1 toilet pan for females 	Table F2.3 Sanitary facilities in Class 3, 5, 6, 7, 8 or 9 buildings: F2.3a. [...] separate sanitary facilities for males and females must be provided for Class 3, 5, 6, 7, 8 or 9 buildings in accordance with Table F2.3.
Of the 15 employees currently working for the client, 13 are male and 2 females. The 6 other people that may be in the building is always changing. Is the current arrangement toilet facility suitable for these numbers?	No, because more, than ten people employed, plus the other people that may be in the building at any one time, you need separate male and female toilets	F2.3 Facilities in Class 3 to 9 buildings (b) If not more than 10 people are employed, a unisex facility may be provided instead of separate facilities for each sex.
Does the current plan meet the requirements for people with a disability?	No, there is currently no disabled toilets provided, at least one unisex accessible toilet needs to be provided	Table F2.4(a) Accessible unisex sanitary compartments
Do we still need to provide accessible adult change facility even if none of employees have any physical disabilities?'	Yes, it is likely that at some stage a person, employee or customer, with a disability will require an accessible adult change facility.	Specification F2.9
Acknowledging that the current plan for sanitary facilities is incorrect, what alterations would be required in the toilet area to bring the installation to code?	A female toilet is installed so there was a male and female option. An accessible adult change facility to be provided.	Part F2 Sanitary and other facilities

Task 7: Ancillary provisions

You are meeting with the hydraulic engineer in relation to the changes to the sanitary facilities in the building. She has the following questions and concerns that need to be addressed.

Answer to the questions listed in the table below to clarify the hydraulic engineer concerns. To support your answer, copy the relevant clause from NCC where applicable.

Instructions to the assessor:

This is an example of a competent response:

QUESTIONS RAISED	ANSWER [2-3 WORDS]	SUPPORTING CLAUSE FROM THE NCC [30-35 WORDS]
What volume of the NCC would you use to find specific information in relation to plumbing and drainage?	NCC Volume Three	NCC Volume One: A1.0 Interpretation: The following components of the NCC are non-mandatory and informative: [c]: For Volume Three, the "Introduction to this Section" information, located at the beginning of each Section.

Task 8: Energy efficiency

The client has several questions related to the energy efficiency of the building. Answer to the questions listed in the table below to clarify the client's concerns.

Instructions to the assessor:

This is an example of a competent response:

QUESTIONS RAISED	ANSWER [20-35 WORDS]	SUPPORTING CLAUSE FROM THE NCC [80-90 WORDS]
Being a shed construction, the metal roof sheets will be fixed to the metal battens running across the rafters. In regard to the thermal break, what is required?	A material with an R-Value of not less than R0.2 needed to be installed at all points of contact between the metal sheet roofing and its supporting metal purlins, metal rafters or metal battens.	NCC Volume One: J0.4 Roof thermal breaks: For compliance with J0.2(c), a roof that— [a] has metal sheet roofing fixed to metal purlins, metal rafters or metal battens; and [b] does not have a ceiling lining or has a ceiling lining fixed directly to those metal purlins, metal rafters

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		<p>or metal battens, must have a thermal break, consisting of a material with an R-Value of not less than R0.2, installed at all points of contact between the metal sheet roofing and its supporting metal purlins, metal rafters or metal battens.</p>
<p>In your recommendation, how are the requirements of the thermal break achieved in the roofing installation?</p>	<p>Installation of sisalation [foil] paper with the R rating of at least R0.2 Roof Raiser also assists to comply Section J requirements</p>	<p>NCC Volume One: J0.4 Roof thermal breaks: For compliance with J0.2(c), a roof that— (a) has metal sheet roofing fixed to metal purlins, metal rafters or metal battens; and (b) does not have a ceiling lining or has a ceiling lining fixed directly to those metal purlins, metal rafters or metal battens, must have a thermal break, consisting of a material with an R-Value of not less than R0.2, installed at all points of contact between the metal sheet roofing and its supporting metal purlins, metal rafters or metal battens.</p>

Task 9: Communication with stakeholders

An important part of any construction project is to formally document discussions that have occurred between stakeholders during the design and construction process.

Draft an email for the following stakeholders in the project as follows:

- **To the roofing contractor:** In relation to the sisalation paper required for the installation
- **To the plumber:** in relation to the various changes made to the toilet facilities
- **To the estimator:** in relation to the various changes made to the toilet facilities,

Through Tasks 1-8 you have already found the required information. This information needs to be put into a formal email. The following templates can be used for this purpose

Ensure that your communication is effective, concrete, clear and courteous, using a professional language.

Instructions to the assessor:

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A competent answer must include relevant subject. This is an example of a competent response:

Email 1 (Approximate word count: 70-80 words)
To: Roofing contractor
Subject: Type of sisalation paper used for roof install
Draft email must have: <ul style="list-style-type: none">• an appropriate greeting [for example: 'Good morning Mr Smith']• The aspects identified relating to the installation• an appropriate closure and signature [for example: Looking forward to hearing back from you. Kind regards, John Citizen.] This is an example of an email: <p><i>Hi John,</i></p> <p><i>In relation to the roof install at the "Comfy Furniture production facility" located at Lot 1 Endeavour drive, Port Macquarie New South Wales.</i></p> <p><i>I wanted to check the sisalation paper being installed is at least a R0.2 value to meet the requirements laid on in the NCC. If you are not sure the manufacturer will be able to provide this information to you.</i></p> <p><i>If you have any concerns, please let me know.</i></p> <p><i>Thanks</i></p>

Email 2 (Approximate word count: 100-110 words)
To: Plumber
Subject: Changes to toilet facilities
Draft email must have: <ul style="list-style-type: none">• an appropriate greeting [for example: 'Good morning Mr Smith']• The aspects identified relating to the installation• an appropriate closure and signature [for example: Looking forward to hearing back from you. Kind regards, John Citizen.] This is an example of a draft email: <p><i>Hi John,</i></p> <p><i>In relation to the toilet facilities at the "Comfy Furniture production facility" located at Lot 1 Endeavour drive, Port Macquarie New South Wales.</i></p> <p><i>There have been some mistakes identified in the design of the toilet facilities at this location. Due to the number of employees and requirements for accessible toilet facilities for</i></p>

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handicapped persons we have needed to move away from the unisex option in the original plans.

Can you please review the plans with the required alterations and amend your estimate accordingly?

We apologize for the rework this design change has led to,

Please let me know if you have any worries or questions,

Thanks

Email 3 [Approximate word count: 100-110 words]

To: The estimator

Subject: Change in design

Draft email must have:

- an appropriate greeting [for example: 'Good morning Mr Smith']
- The aspects identified relating to the installation
- an appropriate closure and signature [for example: Looking forward to hearing back from you. Kind regards, John Citizen.]

This is an example of a draft email:

Hi John,

In relation to the estimation of materials and timelines for the "Comfy Furniture production facility" at Lot 1 Endeavour drive, Port Macquarie New South Wales.

We have discovered a few mistakes in the layout of the sanitary fixtures, and this has led to some major design changes needed to comply with the NCC. The plans with the required alterations are attached for your review

I have spoken to the plumber already in regards to the changes and they are amending their quote, you will need to speak to the others trades this may effect.

Apologies for the rework, if you have any concerns, please let me know.

Thanks

Assessment checklist

Students must have completed all tasks and questions within the assessment before submitting. This includes:

Project tasks	
Task 1: Classification and type of building	
Completed table	<input type="checkbox"/>
Task 2: Structure analysis	
Completed table	<input type="checkbox"/>
Task 3: Fire Safety analysis	
Completed table	<input type="checkbox"/>
Task 4: Access and egress	
Completed table	<input type="checkbox"/>
Task 5: Services and equipment	
Completed table	<input type="checkbox"/>
Task 6: Health and amenity	
Completed table	<input type="checkbox"/>
Task 7: Ancillary provisions	
Completed table	<input type="checkbox"/>
Task 8: Energy efficiency	
Completed table	<input type="checkbox"/>
Task 9: Communication with stakeholders	
Drafted 3 emails	<input type="checkbox"/>

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Congratulations, you have reached the end of Assessment 4!

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