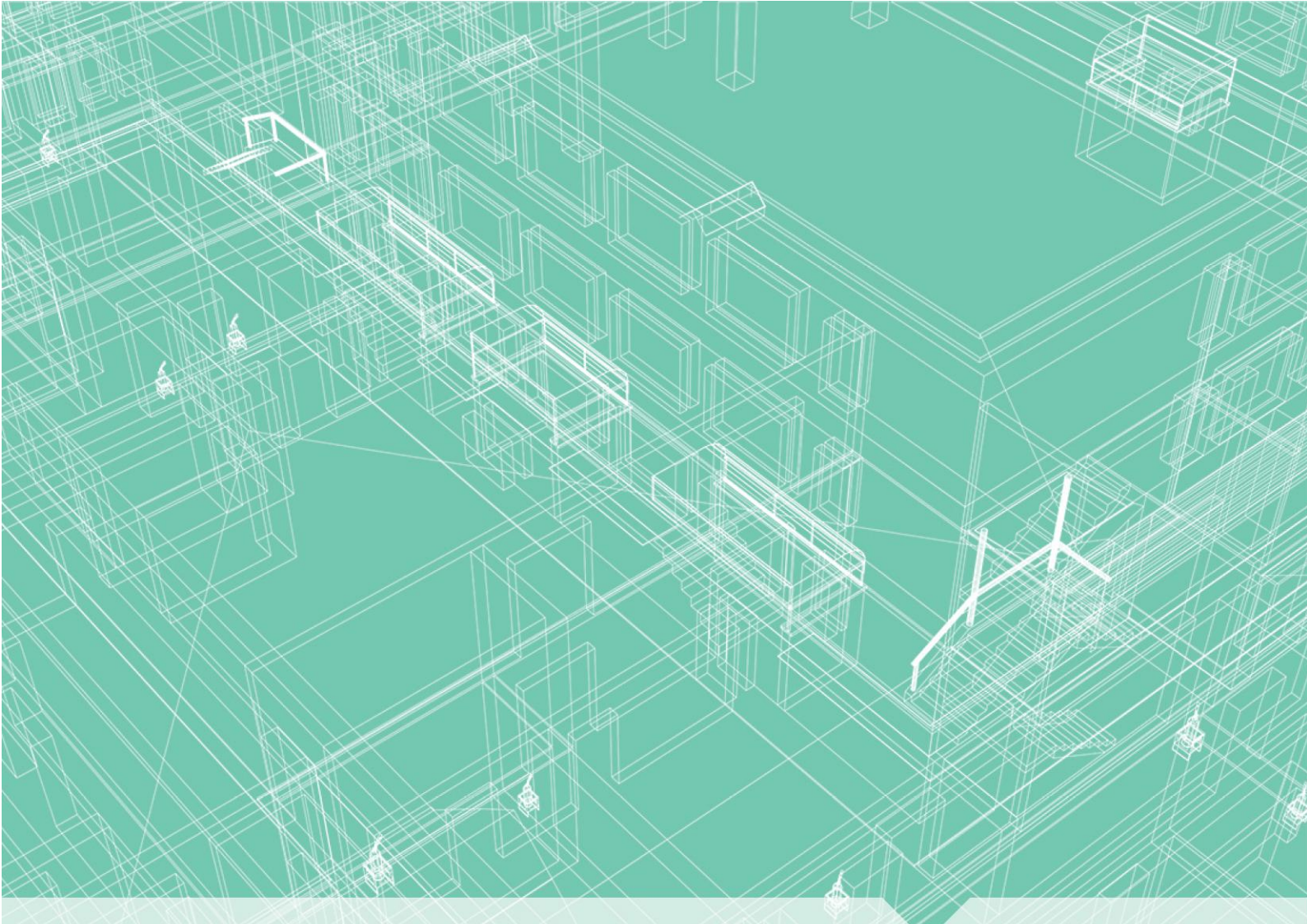
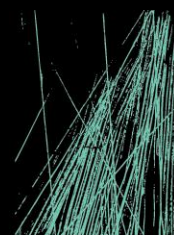




SSDA ESD REPORT

NOVUS ON VICTORIA, CHATSWOOD

ESD SERVICES



JHA

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DOCUMENT CONTROL SHEET

Project Number	240482
Project Name	Novus on Victoria, Chatswood
Description	SSDA ESD Report
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Revision History

Issued To	Revision and Date								
Solis Projects NOVUS	REV	Draft	Rev B						
	DATE	20/03/2025	07/04/2025						
	REV	Draft 2							
	DATE	31/03/2025							
	REV	Rev A							
	DATE	02/04/2025							

EXECUTIVE SUMMARY

This SSDA ESD Report has been prepared by JHA Consulting Engineers to identify and summarise the Ecologically Sustainable Design (ESD) initiatives that have been proposed in the design of the mixed-use development located at 410-416 Victoria Ave Chatswood NSW 2067 to demonstrate compliance with the following planning requirements:

- Item 15 Ecologically Sustainable Development within Industry Specific SEARs for SSD-63324208, including the ESD principles as defined in Section 193 of the EP&A Regulation
- State Environmental Planning Policy (Sustainable Buildings) 2022

This report should be read in conjunction with the architectural design drawings and other consultant's design reports submitted as part of the application.

The ESD objectives of this project are to encourage a balanced approach to designing new facilities for the project; to be resource-efficient, cost-effective in construction and operation; and to deliver enhanced sustainability benefits concerning impacts on the environment and well-being of residents, staff, and visitors whilst providing the best possible facilities for a constructive environment.

The proposed key ESD commitments for the development are listed below:

- Sufficient exposure to daylight
- Appropriate construction and glazing selection
- Energy-efficient air-conditioning systems with control strategy and thermal comfort tuning
- Energy-efficient lighting systems
- On-site photovoltaic system
- High WELS-rated water fixtures

CONTENTS

EXECUTIVE SUMMARY	3
1. INTRODUCTION	6
1.1 SITE DESCRIPTION AND LOCATION	6
1.2 BUILDING CLASSIFICATIONS	7
1.3 REFERENCE DOCUMENTS	7
2. PLANNING REQUIREMENTS	9
2.1 ESD PLANNING REQUIREMENTS	9
2.2 ITEM 15 ESD WITHIN INDUSTRY-SPECIFIC SEARS (SSD-63324208)	9
2.3 PRINCIPLES OF ECOLOGICALLY SUSTAINABLE DEVELOPMENT	9
2.3.1 THE PRECAUTIONARY PRINCIPLE	9
2.3.2 INTER-GENERATIONAL EQUITY	10
2.3.3 CONSERVATION OF BIOLOGICAL DIVERSITY AND ECOLOGICAL INTEGRITY	10
2.3.4 IMPROVED VALUATION, PRICING, AND INCENTIVE MECHANISMS	10
3. SUSTAINABLE BUILDING SEPP 2022	12
3.1 SUSTAINABILITY STANDARDS FOR RESIDENTIAL DEVELOPMENT [BASIX]	12
3.2 SUSTAINABILITY STANDARDS FOR NON-RESIDENTIAL DEVELOPMENT	12
3.2.1 Chapter 3.2 (1) – GENERAL SUSTAINABILITY PROVISIONS REQUIREMENTS	13
3.2.2 Chapter 3.2 (2) – EMBODIED EMISSIONS	14
4. SUSTAINABLE DESIGN FRAMEWORK	15
4.1.1 FRAMEWORK	15
4.1.2 BUILDING ENVELOPE	15
BUILDING ENVELOPE PERFORMANCE	15
BUILDING FABRIC	15
GLAZING	16
4.1.3 SHADING AND DAYLIGHTING	16
4.1.4 ENERGY EFFICIENCY	17
HEATING, COOLING AND VENTILATION SYSTEMS	17
LIGHTING	17
CONTROLS	17
ELECTRICITY METERING	17
PHOTOVOLTAICS	18
4.1.5 INDOOR AIR QUALITY (IAQ)	18
4.1.6 WATER CONSERVATION	18
FITTINGS AND FIXTURES	18
WATER-SENSITIVE URBAN DESIGN	18
4.1.7 SUSTAINABLE MATERIALS	18

	LOW VOC/LOW FORMALDEHYDE MATERIALS	18
	LOW-EMISSION VEHICLE INFRASTRUCTURE	18
	4.1.8 WASTE	18
5.	CONCLUSION	19
6.	APPENDIX A: ENVIRONMENTAL PRE-SCREENING CHECKLIST	20
7.	APPENDIX B: NABERS EMBODIED EMISSIONS MATERIALS FORM	21

1. INTRODUCTION

This SSDA ESD Report has been prepared by JHA Consulting Engineers on behalf of Novus for the construction and operation of a mixed-use retail and residential development located at 410-416 Victoria Ave Chatswood NSW 2067.

This report has been prepared to identify and summarise the project's Ecologically Sustainable Design (ESD) initiatives for the Department of Planning and Environment (DPE) in support of a State Significant Development Application (SSD-63324208) and in accordance with Item 15 of the SEARs issued by DPHI on 4 February 2025.

This report accompanies a State Significant Development Application that seeks approval for the demolition and construction of a mixed-use retail and residential development, which includes the following:

- Demolition of the existing buildings and structures on site.
- Erection of a 46-storey tower including:
 - **Basement Level:** Below ground storage, car parking containing 9 residential car spaces, and services.
 - **Ground Floor:** Retail uses, residential lobby, and single access point for loading and servicing.
 - **Level 1:** Retail uses connected to the Ground Floor and Basement through stairs and lifts.
 - **Level 2:** Communal resident amenity space including a gym area and an outdoor pool.
 - **Level 3-5:** Residential BTR units.
 - **Level 6:** Residential BTR units, as well as communal indoor and outdoor areas.
 - **Levels 7-43:** Residential BTR units, as well as a mid-rise plant floor and communal outdoor areas.
 - **Level 44:** Indoor communal resident amenity space.
 - Outdoor landscaping on several levels.

1.1 SITE DESCRIPTION AND LOCATION

The site is located at 410-416 Victoria Ave Chatswood NSW 2067, within the Willoughby City Council Local Government Area (LGA). The area is bounded by Victoria Avenue to the north, Victor Street to the east, and Post Office Lane to the south and within proximity to the train and metro station Chatswood. The site extends across approximately 1049.9m², comprising three (3) separate allotments Lot B in DP406105 (410 Victoria Avenue, Chatswood), Lot A in DP406105 (412-414 Victoria Avenue, Chatswood) & Lot 4 in DP82303 (416 Victoria Avenue, Chatswood).

The site location is identified in Figure 1.



Figure 1: Site area (Source: Nearmap, Ethos Urban)

1.2 BUILDING CLASSIFICATIONS

The development contains the following building classes.

Area	NCC class
<i>Basement levels</i>	Predominantly Class 7
<i>Ground: Bar/Bistro & Café</i>	Class 6
<i>Ground: Lobby</i>	Class 2 Common Area
<i>Level 1</i>	Class 6
<i>Level 2</i>	Class 2 Common Area
<i>Level 6: Private Dining & Media/Lounge</i>	Class 2 Common Area
<i>Level 44</i>	Class 2 Common Area
<i>All other</i>	Class 2

1.3 REFERENCE DOCUMENTS

Architectural Drawings: Fender Katsalidis
Project: 23115 – Novus on Victoria

Title	Drawing No	Revision	Date
SITE ANALYSIS + DESIGN PRINCIPLES	DA 002	A	31.03.25
BUILT FORM SEPARATION	DA 003	A	31.03.25
SITE SURVEY	DA 004	A	31.03.25
DEMOLITION PLAN	DA 005	A	31.03.25
DEVELOPMENT SUMMARY	DA 006	A	31.03.25
BASEMENT 03 FLOOR PLAN	DA 097	A	31.03.25
BASEMENT 02 FLOOR PLAN	DA 098	A	31.03.25
BASEMENT 01 FLOOR PLAN	DA 099	A	31.03.25
GROUND FLOOR PLAN	DA 100	A	31.03.25
LEVEL 01 FLOOR PLAN	DA 101	A	31.03.25
LEVEL 02 FLOOR PLAN	DA 102	A	31.03.25
LEVEL 03 - 04 FLOOR PLAN	DA 103	A	31.03.25
LEVEL 05 FLOOR PLAN	DA 105	A	31.03.25
LEVEL 06 FLOOR PLAN	DA 106	A	31.03.25
LEVEL 07-22 FLOOR PLAN	DA 107	A	31.03.25
LEVEL 23 FLOOR PLAN (MID RISE PLANT)	DA 123	A	31.03.25
LEVEL 24-43 FLOOR PLAN	DA 135	A	31.03.25
LEVEL 44 FLOOR PLAN	DA 144	A	31.03.25
LEVEL 45 FLOOR PLAN (PLANT)	DA 145	A	31.03.25
LEVEL 46 FLOOR PLAN (ROOF PLANT)	DA 146	A	31.03.25
ROOF PLANT	DA 147	A	31.03.25
NORTH ELEVATION - TOWER	DA 200	A	31.03.25
SOUTH ELEVATION - TOWER	DA 201	A	31.03.25
EAST ELEVATION - TOWER	DA 202	A	31.03.25
WEST ELEVATION - TOWER	DA 203	A	31.03.25
PODIUM ELEVATIONS - NORTH	DA 204	A	31.03.25
PODIUM ELEVATIONS - SOUTH	DA 205	A	31.03.25
PODIUM ELEVATIONS - EAST	DA 206	A	31.03.25
SECTIONS	DA 250	A	31.03.25

SECTIONS	DA 251	A	31.03.25
PODIUM SECTIONS	DA 252	A	31.03.25
PODIUM SECTIONS	DA 253	A	31.03.25

2. PLANNING REQUIREMENTS

2.1 ESD PLANNING REQUIREMENTS

This mixed-use development is required to demonstrate compliance with the following planning requirements:

- Item 15 Ecologically Sustainable Development within Industry Specific SEARs for SSD-63324208, including the ESD principles as defined in Section 193 of the EP&A Regulation
- State Environmental Planning Policy (Sustainable Buildings) 2022

To ensure alignment with the aforementioned planning requirements, the following ESD targets are proposed:

- National Construction Code (NCC) 2022 Section J – Energy Efficiency [overall development]
- Sustainability Standards for Residential Development (BASIX) [residential and associated spaces]
- Sustainability Standards for Non-Residential Development [non-residential and associated spaces]

2.2 ITEM 15 ESD WITHIN INDUSTRY-SPECIFIC SEARS (SSD-63324208)

In accordance with Part 8 of the Environmental Planning and Assessment Regulation 2021 (EP&A Regulation) and the State Significant Development Guidelines, the industry-specific Secretary's Environmental Assessment Requirements (SEARs) for SSD-63324208 were issued on 4 February 2025. Hence the project is required to address the following SEARs requirements:

- Item 15 Ecologically Sustainable Development within Industry Specific SEARs for SSD-63324208

The following table summarises the sections of this report that address each of the SEARs ESD requirements:

15. Ecologically Sustainable Development (ESD) SEARs Requirement	Relevant Section of Report
Identify how ESD principles (as defined in section 193 of the EP&A Regulation) are incorporated in the design and ongoing operation of the development.	<i>Section 2.3 Principles of Ecologically Sustainable Development</i> <i>Appendix A: Environmental Pre-screening Checklist</i>
Where relevant, provide an assessment of the development against the standards for non-residential development set out in Chapter 3 of <i>State Environmental Planning Policy (Sustainable Buildings) 2022</i> .	<i>For design responses, please refer to Section 3 Sustainable Building SEPP 2022.</i>

In accordance with the above industry-specific SEARs requirements, the development will implement a holistic and integrated approach to ESD, maximising passive design opportunities while selectively applying modern technology where appropriate.

2.3 PRINCIPLES OF ECOLOGICALLY SUSTAINABLE DEVELOPMENT

The ESD principles as defined in section 193 of the EP&A Regulation 2021 have been incorporated into the design and ongoing operation phases of the development as follows:

2.3.1 THE PRECAUTIONARY PRINCIPLE

The precautionary principle is that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In applying the precautionary principle, public and private decisions should be guided by

- (i) careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and.
- (ii) an assessment of the risk-weighted consequences of various options.

PROJECT RESPONSE:

This development is being designed in accordance with a wide range of ESD goals that pertain to the design, construction, and operational stages. The development team will ensure that the building minimises the impact on the environment in the areas of energy, water, and materials. The design will incorporate energy efficiency-favoured passive design features to minimise severe or irreversible environmental damage.

In addition to the above, an *Environmental Pre-screening Checklist* has been undertaken to include the assessment of natural and urban hazards (e.g., storms, heat waves, bushfires, extreme storms, and other weather events). Increasing resilience to natural hazards has been considered in the development so that associated costs are budgeted. Refer to the Appendix A – Environmental Pre-screening Checklist for the details of risks identified for this project and the relative responses, actions and responsibilities for high and extreme risks identified.

2.3.2 INTER-GENERATIONAL EQUITY

The principle of inter-generational equity is that the present generation should ensure the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.

PROJECT RESPONSE:

This development will not cause any significant impact on the health, diversity and productivity of the environment and will predominantly provide a community benefit in the form of increased housing supply. Employment opportunities are provided via the retail tenancies and leasing/building management/cleaning associated with the residential functions. This will be achieved by aligning the development with the following principles:

- Use of sustainable materials with low embodied emissions and low VOC values.
- Improving the biodiversity by incorporating native vegetation for landscaping.
- Incorporating water-efficient fixtures and systems to reduce water consumption and protect future water resources.
- Educating employees and occupants about sustainable practices and the importance of responsible resource use.

By following these principles and practices, the development will minimise its negative environmental impacts, reduce resource consumption, and enhance the health and productivity of the environment for the benefit of future generations.

2.3.3 CONSERVATION OF BIOLOGICAL DIVERSITY AND ECOLOGICAL INTEGRITY

The principle of the conservation of biological diversity and ecological integrity is that the conservation of biological diversity and ecological integrity should be a fundamental consideration.

PROJECT RESPONSE:

A Biodiversity Development Assessment Report (BDAR) waiver was issued by the Department of Planning and Environment. The waiver states that the development will not be likely to have any significant impacts on biodiversity values.

2.3.4 IMPROVED VALUATION, PRICING, AND INCENTIVE MECHANISMS

The principle of improved valuation, pricing and incentive mechanisms is that environmental factors should be included in the valuation of assets and services, such as

- (i) polluter pays, that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement, and,
- (ii) the users of goods and services should pay prices based on the full life cycle of the costs of providing the goods and services, including the use of natural resources and assets and the ultimate disposal of waste, and

- (iii) established environmental goals should be pursued in the most cost-effective way by establishing incentive structures, including market mechanisms, that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.

PROJECT RESPONSE:

The project team has assessed the project against the ESD frameworks that are discussed in Section 3 of this report. The construction material will be selected based on the outcomes of relative cost-benefit analysis with decisions being made based on the whole-of-life costs rather than capital expenditure only. Certified recycled and reused materials, as well as materials with low embodied energy, will be utilised where appropriate.

3. SUSTAINABLE BUILDING SEPP 2022

The NSW Government is committed to ensuring that new and renovated buildings are sustainable and resilient for future climate and bring NSW closer to net zero emissions. To achieve the goal a new State Environmental Planning Policy (Sustainable Buildings) 2022 (Sustainable Buildings SEPP) was published in August 2022 and was made effective from 1 October 2023. Based on the type of building (residential or non-residential) different sustainability standards apply as follows:

- Sustainability Standards for Residential Development (BASIX)
- Sustainability Standards for Non-Residential Development

3.1 SUSTAINABILITY STANDARDS FOR RESIDENTIAL DEVELOPMENT [BASIX]

As per the Environmental Planning and Assessment Regulation 2021, a **BASIX building** means a building that contains **at least 1 dwelling** but does not include the following:

- Hotel or motel accommodation,
- A boarding house, hostel or co-living housing that:
 - accommodates more than 12 residents, or
 - has a gross floor exceeding 300 square meters.

In accordance with Chapter 2.1 of Sustainable Building SEPP 2022, the SB SEPP is applicable to all **BASIX building** that involves:

- **development that involves the erection, but not the relocation, of a BASIX building,**
- development that involves a change of building use by which a building becomes a BASIX building,
- development that involves the alteration of a BASIX building, if the estimated development cost is \$50,000 or more,
- development for the purposes of a swimming pool or spa, or combination of swimming pools and spas, that:
 - services 1 dwelling only, and
 - has a capacity, or combined capacity, of 40,000 litres or more.

Hence the **Sustainability Standards for Residential Development (BASIX)** applies to Novus on Victoria. Please refer to the BASIX certificate provided separately for compliance.

3.2 SUSTAINABILITY STANDARDS FOR NON-RESIDENTIAL DEVELOPMENT

This section addresses item 15 of the industry-specific SEARs requirements to assess the development against the standards for non-residential development set out in Chapter 3 of *State Environmental Planning Policy (Sustainable Buildings) 2022*.

In accordance with Chapter 3.1 of the Sustainable Building SEPP 2022, the SB SEPP is applicable to all **non-residential development** that involves:

- **The erection of a new building, if the development has a capital investment value of \$5 million or more;** or
- Alterations, enlargement or extension of an existing building, if the development has a capital investment value of \$10 million or more.

The Sustainable Building SEPP 2022 is applicable to the project, and as such will incorporate practical sustainability measures applicable to the project type.

The following sections within Chapter 3 of the Sustainable Building SEPP 2022 are not applicable for this project:

- *Chapter 3.3 Other considerations for large commercial development* as the project does not meet the definition for a Large Commercial Development.
- *Chapter 3.4 Other considerations for certain State significant development* as the project does not meet the definitions for this section.

Therefore, neither a NABERS commitment agreement nor a Net Zero Statement are required.

3.2.1 CHAPTER 3.2 (1) – GENERAL SUSTAINABILITY PROVISIONS REQUIREMENTS

Chapter 3.2 (1) of Sustainable Building SEPP 2022 requires evidence that new development is designed to enable the following:

- The minimisation of waste from associated demolition and construction, including by the choice and reuse of building materials,
- a reduction in peak demand for electricity, including through the use of energy efficiency technology,
- a reduction in the reliance on artificial lighting and mechanical heating and cooling through passive design,
- the generation and storage of renewable energy,
- the metering and monitoring of energy consumption,
- the minimisation of consumption of potable water.

The following table summarises the project-specific ESD responses addressing the General Sustainability Provisions requirements:

General Sustainability Provisions	Project Specific Responses
a) The minimisation of waste from associated demolition and construction, including by the choice and reuse of building materials.	▪ A Construction Waste Management Plan will be prepared by the building contractor prior to the commencement of works on site which includes measures to maximise the diversion of construction and demolition waste from landfill.
b) A reduction in peak demand for electricity, including through the use of energy efficiency technology.	▪ A high-efficiency HVAC system (based on the minimum requirements of the NCC 2022 Section J Energy Efficiency Part J6). ▪ Energy-efficient LED lighting. ▪ Heat pump technology for domestic hot water.
c) A reduction in the reliance on artificial lighting and mechanical heating and cooling through passive design.	▪ Appropriate insulation and roof colour will be provided. ▪ High thermal performance glazing system. ▪ Appropriate building design elements to maximise natural daylight and winter heat gains while minimising unwanted heat gains in summer.
d) The generation and storage of renewable energy.	▪ Provision of a roof-mounted photovoltaic system (PV).
e) The metering and monitoring of energy consumption.	▪ Metering is to be provided to enable building energy/water monitoring or leak detection and recording of the on-site renewable energy equipment & on-site electric vehicle charging equipment. Accessible energy and water metering will be provided for all common uses, major uses and major sources.
f) The minimisation of consumption of potable water.	▪ Installed water-efficient fixtures and fittings meeting the minimum WELS Rating as nominated.

3.2.2 CHAPTER 3.2 (2) – EMBODIED EMISSIONS

NABERS embodied emissions materials form has been prepared for this development to disclose the amount of embodied emissions attributed to the development. Refer to Appendix B: NABERS Embodied Emissions Materials Form.

4. SUSTAINABLE DESIGN FRAMEWORK

4.1.1 FRAMEWORK

The sustainable design framework for this development aims to incorporate the best practice design initiatives and ESD principles into the development. The ESD initiatives and targets outlined within this framework have been compiled based on the following:

- National Construction Code (NCC) 2022 Section J – Energy Efficiency
- Sustainability Standards for Residential Development (BASIX)
- Sustainability Standards for Non-Residential Development

These ESD initiatives and targets are to be incorporated into the design of the project during the detailed design by the design team.

4.1.2 BUILDING ENVELOPE

Intelligent design and material selection ensure that thermal comfort is not entirely achieved by mechanical means. Passive design initiatives will reduce demand on mechanical air conditioning systems resulting in a reduction in energy consumption and greenhouse gas emissions.

BUILDING ENVELOPE PERFORMANCE

The building fabric will be designed to meet or exceed the NCC 2022 Section J and BASIX requirements for the building envelope. The indicative results on total construction R-value requirements demonstrating compliance with NCC 2022 Section J and BASIX are provided below.

BUILDING FABRIC

NON-RESIDENTIAL AREAS

The building fabric will be designed in accordance with the NCC 2022 Section J Part J4. The minimum performance requirements obtained under Section J Deemed-to-Satisfy provision for the development at the proposed location (Climate Zone 5) as per the NCC 2022 Section J - Energy Efficiency are listed below.

Building Elements		Indicative NCC 2022 Requirements
Envelope Roof/Ceiling		Total R-Value of 3.7 (Downwards, Light Colour Roof Solar absorptance of the upper surface of a roof must be not more than 0.45)
Envelope Walls		Total R-Value of 1.4
Envelope Floors		Total R-Value of 2.0 (Downwards)

Note: The impact of thermal bridging must be considered within the total R-value calculation under NCC2022.

RESIDENTIAL AREAS

Building Elements		Indicative BASIX Requirements
Envelope Roof/Ceiling	Ceiling with balcony or external above	Minimum of R4.0 Insulation
	Internal Ceiling	No insulation
Envelope Walls	External Walls	Minimum of R2.5 Insulation
	Party Walls	No Insulation
	Corridor Walls	Minimum of R2.0 Insulation
Envelope Floors	Exposed to outside air/unconditioned space	Minimum of R2.0 Insulation

Building Elements	Indicative BASIX Requirements
Apartment/common area/conditioned space below	No insulation

This will necessitate the use of insulation to reduce heat flow and consequent heat loss in winter and heat gain in summer. This minimises the heating and cooling load demand on the air conditioning systems. Light-coloured roof material with a low solar absorptance (SA) is recommended to be used to isolate more sunlight and reduce summer heat gain. It also has the effect of reducing elevated localised temperatures (the heat island effect) and potentially will improve the efficiency of solar PV panels as they perform more efficiently in reduced temperatures.

GLAZING

Glazing is a major source of unwanted heat gain in the summer and can cause significant heat loss in the winter due to its low insulation performance. It is thus recommended that windows be high-performance glazing systems. Performance glazing substantially reduces heat transmission. This particularly reduces heat loss in winter; therefore, internal heat gain from equipment, lighting and people are better contained. Also, performance glazing absorbs the infrared portion of sunlight and reduces the amount of heat transferred into the conditioned space. This will correspond to a reduction of both heating and cooling loads.

NON-RESIDENTIAL AREAS

The building will be designed to comply with NCC 2022 Section J Energy Efficiency. A preliminary Section J Part J4 DTS assessment has been carried out for the proposed development to identify the minimum requirements. Note these are not the proposed thermal specifications for the project; J1V3 assessment will be undertaken to further refine and optimise the thermal specifications in accordance with the objectives of this project during detail design.

Building Elements	Indicative NCC 2022 Requirements
All Vertical Envelope Glazing	Total U-Value=5.0 & Total SHGC=0.48 (SGU Neutral or the like)

Note: The project targets fixed glazing with a Total U-Value=3.0 & Total SHGC=0.27 and awning/casement windows with a Total U-Value=4.5 & Total SHGC=0.20 in the non-residential areas. These glazing thermal performance targets would comply with the minimum requirements coupled with 10% improvement.

RESIDENTIAL AREAS (CLASS 2 SOU)

For the Class 2 SOU areas the glazing will be proposed with the following minimum performance.

Building Elements	Location	Indicative BASIX Requirements
Vertical Envelope Glazing (Fixed)	L3-L5	Total U-Value=3.0 & Total SHGC=0.27 (DGU or the like)
	L6-L43	Total U-Value=2.8 & Total SHGC=0.29 (DGU or the like)
Vertical Envelope Glazing (Awning)	L3-L5	Total U-Value=4.5 & Total SHGC=0.20 (DGU or the like)
	L6-L43	Total U-Value=3.5 & Total SHGC=0.28 (DGU or the like)
Vertical Envelope Glazing (Sliding)	Apartments 707-2207 and 2406-4306	Total U-Value=3.0 & Total SHGC=0.52 (DGU or the like)
	All other apartments L3-L43	Total U-Value=3.2 & Total SHGC=0.24 (DGU or the like)

4.1.3 SHADING AND DAYLIGHTING

Solar access can enhance indoor environmental quality through access to daylighting and reduce lighting energy consumption. However, excessive solar access and hence, direct solar radiation heat can increase HVAC energy demand and can also cause thermal discomfort. The passive solar heating principle which aims to prevent solar heat gain in the summer and harvest it in the winter for a free source of heating, and the Passive cooling principle which prevents heat from entering the building during the summer months, are strategies that can conveniently take advantage of the site-

specific solar access for optimised indoor environmental quality and reduction of HVAC energy demand through the use of tailored shadings.

The proposed building is to be designed to make the best use of the sun by using passive design elements to prevent the high summer sun from entering the building whilst allowing the low winter sun to enter the building for passive heating.

These passive design features allow for enriched daylighting and greater access to external views for occupants. Additional daylighting reduces the reliance on artificial light and benefits alertness, mood, and productivity. External views provide a connection to nature and the building and help to create an environment encouraging constructive experience.

4.1.4 ENERGY EFFICIENCY

Each climate zone under the Building Code has different design and conditioning requirements to minimise energy use for heating and cooling. A good balance of heating and cooling reduction techniques is required to create an energy-efficient development.

HEATING, COOLING AND VENTILATION SYSTEMS

The air-conditioning and ventilation systems shall be designed to comply with the minimum requirements of NCC 2022 Section J6 requirement.

The occupied spaces will be having high-efficiency air conditioning as required. An air-cooled heat rejection system is to be used as this will help minimise the impacts associated with harmful microbes (e.g., Legionella impact).

All bathrooms/toilets, laundries (if any), and general exhaust are mechanically ventilated. The design will have a sufficient amount of exhaust fans to ensure liveability for the building users.

The control of the air conditioning system shall be designed to minimise energy consumption. Further, high-efficiency equipment for the HVAC system will be selected to assist with the energy conservation of the building.

Ductwork systems will be designed to reduce system pressure losses to reduce fan motor power. This includes the selection of equipment for reduced coil and fittings drops and being generous with ductwork sizes to reduce friction losses.

LIGHTING

Lighting is to be designed to comply with NCC 2022 Section J7. Also, the Lighting illumination density is to be according to NCC2022 Section J7D3. Fittings incorporating the latest lamp technologies to be installed to minimise energy use and provide efficient artificial lighting systems. The proposed development shall be illuminated using energy-efficient light fittings.

All the external luminaires proposed will be according to AS 4282:1997. This will make sure that the external luminaires do not emit light pollution to the night sky above a given benchmark.

CONTROLS

All HVAC installed shall be controlled by the HVAC group controller. Closed spaces such as storage rooms and cleaners' cupboards are to be provided with a wall switch. For BOH areas (not task-specific areas) PIR sensors are to be provided. Voltage control (dimming) should be provided where appropriate.

ELECTRICITY METERING

Electricity metering and sub-metering shall be specified in accordance with Section J to monitor and manage electricity consumption in the building. Sub-metering is to be provided to distinct locations (e.g., apartment usage, mech plant and PV generation).

PHOTOVOLTAICS

Collection of solar energy should be implemented, with a goal of reducing the building's energy consumption and greenhouse gas emissions from a renewable source via the provision of a roof-mounted photovoltaic system.

4.1.5 INDOOR AIR QUALITY (IAQ)

The quality of indoor air has a significant impact on our health and environment. Poor indoor air quality results in adverse health effects such as allergies, asthma, etc. The ventilation system shall be designed to minimise the entry of outdoor pollutants as per ASHRAE Standard 62.1:2013 and should comply with AS1668.2:2012.

4.1.6 WATER CONSERVATION

The following initiatives are proposed to ensure that significant water saving is achieved.

FITTINGS AND FIXTURES

Water consumption shall be reduced by incorporating water-efficient fixtures and fittings in accordance with the Australian Government's Water Efficiency Labelling Scheme (WELS). The fixtures and fittings to meet the minimum WELS Rating. Commercial appliances should perform at similar levels. The final WELS rating is subject to product selection and WHS requirements.

Water Fittings/Fixtures	Minimum WELS Rating
Showerhead rating	4 (>6.0, but ≤ 7.5L/min)
Toilet rating	4
Taps and flow controllers	5
Dishwashers (if any)	5
Washing machines (if any)	4

WATER-SENSITIVE URBAN DESIGN

The project is to implement best practices of water-sensitive design by decreasing the total suspended solids in stormwater and by not using water for heat rejection. Please refer to the stormwater management plan including water-sensitive urban design (WSUD).

4.1.7 SUSTAINABLE MATERIALS

LOW VOC/LOW FORMALDEHYDE MATERIALS

Adhesives, sealants, flooring and paint products selected to contain low or no Volatile Organic Compounds (VOCs) and all engineered timber used in exposed or concealed applications are specified to contain low or no formaldehyde to avoid harmful emissions that can cause illness and discomfort for the building users.

LOW-EMISSION VEHICLE INFRASTRUCTURE

The development is to provide a dedicated infrastructure to support the uptake of low-emission vehicles by provisioning for future EV parking spaces.

4.1.8 WASTE

Waste collection and disposal play an important role in the protection of the environment and the health of the population in the modern world. A waste management plan will be prepared to assess and monitor the waste management process during the construction and demolition, as well as a waste-produced during occupation within the development. The waste management plan shall incorporate how to minimise the amount of waste generated, maximise the reuse, recycling and reprocessing of construction waste materials and minimise the volume of materials disposed to landfill. Refer to the waste consultant report for details.

5. CONCLUSION

This ESD report has identified and summarised the project's Ecologically Sustainable Design (ESD) initiatives for the Department of Planning and Environment (DPE) in support of a State Significant Development Application (SSD-63324208) and in accordance with Item 15 of the SEARs issued by the Department of Planning, Housing and Infrastructure (DPHI) on 4 February 2025.

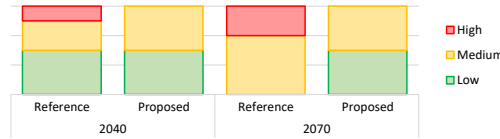
Through the inclusion of the sustainability initiatives outlined within this report, the project addresses the Industry Specific SEARs for SSD-63324208, the requirements of the State Environmental Planning Policy (Sustainable Buildings) 2022 and of the Environmental Planning and Assessment (EP&A) Regulation 2000.

To ensure alignment with the aforementioned planning requirements, the ESD targets followed the National Construction Code (NCC) 2022 Section J – Energy Efficiency (overall development), the Sustainability Standards for Residential Development (BASIX) (residential and associated spaces) and the Sustainability Standards for Non-Residential Development (non-residential and associated spaces).

6. APPENDIX A: ENVIRONMENTAL PRE-SCREENING CHECKLIST



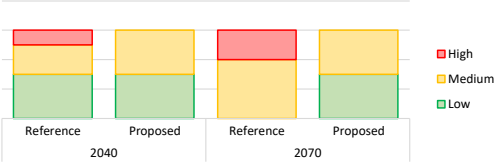
Novus on Victoria - Risk Profile



Climate Variables & Hazards	Climate Projections	Potential Climate Impacts	Consequence (2040)	Likelihood (2040)	Risk (2040)	Consequence (2070)	Likelihood (2070)	Risk (2070)	Responsible Parties	Adaptation Measures	Consequence (Residual 2040)	Likelihood (Residual 2040)	Risk (Residual 2040)	Consequence (Residual 2070)	Likelihood (Residual 2070)	Risk (Residual 2070)	Summary of how measures reduce risks
Hotter and dryer conditions result in higher frequency and/or severity of URBAN HEAT ISLAND effects	The projected climate scenarios indicate a summer that will be warmer and hotter in the near future. There is no strong consensus on whether rainfall will become wetter or drier in the near future, but the hotter temperature may increase the intensity of urban heat island effects.	DIRECT: Increased urban heat risk due to warmer to hotter conditions may cause a direct impact on the: - Energy efficiency of the building by increasing the cooling energy requirement, and; - Health and well-being of the building occupants.	Moderate	Likely	High	Major	Likely	High	Landscape Architect	Landscape: Improving the vegetation on site by planting more indigenous species. Providing water bodies. Ensure the building is well sealed to minimise risks of heat infiltration. Arch: Providing roofs with a light colour and providing landscaped areas.	Minor	Likely	Medium	Minor	Likely	Medium	The risk and impact of the urban heat island effect on the building and the building occupants will be reduced if strategies to improve the microclimate of the site are implemented.
Hotter and dryer conditions resulting in higher frequency and/or severity of BUSHFIRE events	On balance, the projected climate scenarios indicate summers that will be warmer in the near future and becoming hotter and possibly drier later. Under these projected scenarios, the likelihood and severity of bushfire events will be increased.	DIRECT: Increased bushfires risk due to warmer to hotter conditions may increase exposure to smoke and particulate for staff and visitors, impacting health. In addition, smoke and embers may damage the air conditioning system.	Minor	Possible	Medium	Moderate	Possible	Medium	Mechanical Developer	Mech: Filters and smoke isolation (facade) are as per minimum compliance (separating floor to floor etc.), more features can always be added to improve the system. Operation: Project may consider an emergency plan in case of smoke leading to low air quality, e.g. a resident guide and increased air filtration and cleaning frequency during periods of low air quality.	Minor	Possible	Medium	Minor	Possible	Medium	The risk and impact of smoke on occupants will be reduced by good management practice implemented. New building standards ensure buildings are well sealed. The impact of poor air quality will be reduced if less outside air is brought in during these periods. Increased filtration cleaning will mean the filters effectiveness is now limited during these periods.
Hotter and dryer conditions resulting in higher frequency and/or duration of HEATWAVES/ EXTREME HEAT (over 35 degree Celsius)	The projected climate scenarios indicate that the max daily temperature will be hotter and warmer in the near future and the humidity has no change or small decrease. In these projected scenarios, the risk of heat waves will be increased.	DIRECT: Heatwaves/Extreme heat will increase demand for the HVAC system and may impact the ability of the HVAC system to maintain the thermal comfort of occupants due to capacity constraints.	Moderate	Possible	Medium	Moderate	Likely	High	Architect ESD	Arch: Incorporate passive thermal design principles in the design and construction of the building such as appropriate levels of shading devices and thermal insulation. ESD: Building is targeting a reduction in energy use. Reduction will be achieved through efficiency systems, building fabric optimization and onsite PV array on roof. The solutions will help to reduce the peak load, and therefore the HVAC system strain.	Moderate	Possible	Medium	Moderate	Possible	Medium	The incorporation of passive thermal design principles will help mitigate extreme heat risks in the near future. Energy efficiency and an appropriate PV system will help ensure the HVAC system will be capable of handling more extreme temperatures in the far future.



Novus on Victoria - Risk Profile



			Pre-adaptation Actions						 Medium  Low				Post-adaptation Actions									
			2040			2070			Reference 2040		Proposed 2040		Reference 2070		Proposed 2070		2040			2070		
			Consequence (2040)	Likelihood (2040)	Risk (2040)	Consequence (2070)	Likelihood (2070)	Risk (2070)							Consequence (Residual 2040)	Likelihood (Residual 2040)	Risk (Residual 2040)	Consequence (Residual 2070)	Likelihood (Residual 2070)	Risk (Residual 2070)		
Climate Variables & Hazards	Climate Projections	Potential Climate Impacts							Responsible Parties	Adaptation Measures										Summary of how measures reduce risks		
Hotter and dryer conditions resulting in higher frequency and/or duration of HEATWAVES/ EXTREME HEAT (over 35 degree Celsius)	The projected climate scenarios indicate that the max daily temperature will be hotter and warmer in the near future and the humidity has no change or small decrease. In these projected scenarios, the risk of heat waves will be increased.	DIRECT: Heatwaves/Extreme heat may impact the operation of electrical equipment, finishes and infrastructures as temperature exceeds design limits.	Minor	Unlikely	Low	Minor	Possible	Medium	Electrical Civil Arch Landscape	Elec: In the near future, current temperature ratings for electrical equipment should be able to cope with projected temperature increases relevant to the component's design life. Civil: Ensure Civil design specifies paving/ hardscapes that can cope with increased temperatures to reduce cracking/ buckling. In the far future, equipment should be gradually upgraded as required to cope with more extreme conditions. Landscape/Arch: Providing dedicated “Cool outdoor areas” where the building occupants can take shelter during extremely hot days when the power fails should be explored by the design team. This cool area should utilise passive design principles to moderate temperature during extreme days. Secondly, this cool area should consider ways to harness the cooling power of water to provide additional cooling. For example, provide shaded outdoor areas with drinking fountains as cool shelters during an extreme heat event.	Minor	Unlikely	Low	Minor	Unlikely	Low	Appropriate upgrade of electrical equipment at their end of their service life will help ensure system will be capable of handling more extreme temperatures in the far future.					
Hotter and dryer conditions resulting in higher frequency and/or duration of HEATWAVES/ EXTREME HEAT (over 35 degree Celsius)	The projected climate scenarios indicate that the max daily temperature will be hotter and warmer in the near future and the humidity has no change or small decrease. In these projected scenarios, the risk of heat waves will be increased.	INDIRECT: Increased water demand from both landscaping and occupants.	Minor	Unlikely	Low	Minor	Possible	Medium	Architect Landscape	Arch: Fixtures will be low flow rated to reduce potable water demand. Landscape: Selection of planting from landscape architect to consider resilient indigenous plants that require less watering than other species.	Insignificant	Unlikely	Low	Insignificant	Possible	Low	Reduction in water demand reduces dependency on potable water.					
Hotter and wetter conditions increasing severity of extreme STORM/ WIND events (by providing more fuel to increase the wind speeds of storms)	There is no strong consensus whether it will become wetter or drier in the near future, but hotter temperature may impact on the severity of storm and wind events.	DIRECT: Extreme weather causing damage to external equipment/façade and roof finishes.	Minor	Unlikely	Low	Minor	Possible	Medium	Architect Façade	Arch: Plant rooms have their own skin w/ screen wall and will reduce particulates and protect from hail damage. Facade: External fabric is a durable finish.	Minor	Rare	Low	Minor	Unlikely	Low	Plant-room and finishes designed to account for extreme weather events.					

7. APPENDIX B: NABERS EMBODIED EMISSIONS MATERIALS FORM

Step 1: About the building

Fill out blue cells

Building location and site data	Value	Unit	Note	Comment
Building address	410-416 Victoria Avenue			
Postcode	2067		Required	
Town/city	CHATSWOOD + 2 other localities		Town/city/suburb/region automated from postcode (may not give exact town name)	
Distance to nearest major city/town		km	Enter for rural/regional locations only	
Project stage	Development Application		Required	
New build or major renovation?	New build		Required	
Brownfield or greenfield site?	Brownfield		Required	

Floor area by NCC building classification	Gross (GFA)	Net (NLA/NSA/UFA)	Unit	Note	
Please enter all floor areas relevant to your building. Leave areas blank if not applicable. Please enter Gross Floor Area (GFA) for all building classifications. Please also enter the corresponding net area (Net Lettable Area, Net Sellable Area or Usable Floor Area where it is commonly used for that building classification.					
Class 1a: Detached residential buildings			m²	Required for Class 1a: Detached residential houses, townhouses	
Class 1b: Boarding houses and hostels			m²	Required for Class 1b: Boarding house, guest house, hostel	
Class 2: Multi-unit residential buildings	26,603	17,161	m²	Required for Class 2: Multi-unit residential, including apartment buildings	All floors excluding: Basement Level 2, Basement Level 1, Ground, Level 1
Class 3: Other residential buildings			m²	Required for Class 3: Other residential buildings	
Class 4: Residential inside non-residential			m²	Required for Class 4: Residential building inside a non-residential building, e.g., caretaker residence	
Class 5: Office buildings			m²	Required for Class 5: Office building	
Class 6: Retail buildings	4,187	1,110	m²	Required for Class 6: Retail building, e.g., shop, restaurant, café	Basement Level 1, Ground, Level 1
Class 7a: Carparks	1,037	0	m²	Required for Class 7a: Carparks	Basement Level 2
Class 7b: Warehouse-type buildings			m²	Required for Class 7b: Warehouses, wholesalers and storage facilities	
Class 8: Industrial buildings			m²	Required for Class 8: Industrial buildings, e.g., factories and workshops	
Class 9a: Healthcare buildings			m²	Required for Class 9a: Healthcare, e.g., hospitals, clinics, day surgeries	
Class 9b: Civic buildings			m²	Required for Class 9b: Civic buildings, e.g., theatres, civic centres, train stations	
Class 9c: Aged care and personal care buildings			m²	Required for Class 9c: Aged care and personal care	
Class 10a: Non-habitable buildings			m²	Required for Class 10a: Non-habitable buildings including sheds, carports and private garages	
Class 10b: Miscellaneous structures			m²	Required for Class 10b: Miscellaneous structures, including fences, masts, antennas, retaining walls and swimming pools	
Class 10c: Bushfire shelters			m²	Required for Class 10c: Bushfire shelters not attached to a Class 1a building	
Total	31,827	18,271	m²	Required: Sum of m² inputs must be more than 0.	

Project information	Value	Unit	Note	
Total cost of project		AUD excl. GST	Required	Refer to WT EDC once complete
Building design life		50 years	Required	
Estimated envelope life		years	Optional	
Estimated replacement cycle for mechanical services		years	Optional	
Estimated replacement cycle for vertical transportation		years	Optional	

Dimensions of the building and the site	Value	Unit	Note	
Site area	1,049	m²	Required	
Shared services or infrastructure	Yes		Required	
Building footprint area	1,042	m²	Required	
Typical floor area (if different to building footprint area)	552	m²	Only needed if different to row above	Level 7 to 45 considered the typical floor
Typical floor perimeter	100	m	Required	
Area of external carpark (not included in GFA)	0	m²	Required. Enter 0 if not applicable.	
Area of external hardstand (not included in GFA)	0	m²	Required. Enter 0 if not applicable.	
Area of other hard landscaping (not included in GFA)	0	m²	Required. Enter 0 if not applicable.	Include all other impervious areas. For example, patios, paths and driveways (not already included in carparks and hardstands above).
Number of floors/storeys above ground, including ground floor	45	no.	Required	
Number of floors/storeys below ground	3	no.	Required. Enter 0 if not applicable.	
Number of floors/storeys of car parking	1	no.	Required. Enter 0 if not applicable.	
Total height above ground	152	m	Required	

Structural material choices	Value	Unit	Note	
Foundation type	Spot/pad footing		Required	
Frame type (dominant)	Reinforced concrete		Required	
Suspended floor type (typical)	Reinforced concrete		Only needed for multi-storey buildings	
Describe low carbon materials specified in your building (e.g. green concrete, low carbon bricks)	Potentially low carbon concrete and reinforcement steel pending final design		Required	
Describe recycled content specified in your building (e.g. recycled steel)			Required	

Step 2: Quantity of materials

Complete all blue cells that are applicable to the building. Leave items that aren't applicable blank.

Fill out blue cells

Material category	Sub-category 1	Sub-category 2	Sub-category 3	Value	Unit of measure	Comment	AIQS ACMM Code	ICMS3 (Level 3 Codes Construction)
Structure								
The structural parts of the building that are below ground (substructure) and above ground (superstructure). This includes fill below the substructure, foundations, basement levels, suspended floors, wall structure, roof structure, stairs, lift shafts and balconies. It excludes external areas such as hardstands, carparks, patios, etc.								
Coverage of structural material spend	-	-	-		%	Required. Coverage of <u>spend</u> for structural elements entered below. Minimum requirement = 80%. Exclude head contractor preliminaries and margins.		
Concrete in-situ	≤10 MPa	-	-		m³	Please enter reinforcing steel as part of "Reinforcing steel" below	01_SB or 02-11	02 or 03
Concrete in-situ	>10 MPa to ≤20 MPa	-	-		m³	Please enter reinforcing steel as part of "Reinforcing steel" below	01_SB or 02-11	02 or 03
Concrete in-situ	>20 MPa to ≤32 MPa	-	-		m³	Please enter reinforcing steel as part of "Reinforcing steel" below	01_SB or 02-11	02 or 03
Concrete in-situ	>32 MPa to ≤40 MPa	-	-		m³	Please enter reinforcing steel as part of "Reinforcing steel" below	01_SB or 02-11	02 or 03
Concrete in-situ	>40 MPa to ≤50 MPa	-	-	1,268.0	m³	Please enter reinforcing steel as part of "Reinforcing steel" below	01_SB or 02-11	02 or 03
Concrete in-situ	>50 MPa to ≤60 MPa	-	-		m³	Please enter reinforcing steel as part of "Reinforcing steel" below	01_SB or 02-11	02 or 03
Concrete in-situ	>60 MPa to ≤80 MPa	-	-	609.0	m³	Please enter reinforcing steel as part of "Reinforcing steel" below	01_SB or 02-11	02 or 03
Concrete in-situ	>80 MPa to ≤100 MPa	-	-		m³	Please enter reinforcing steel as part of "Reinforcing steel" below	01_SB or 02-11	02 or 03
Concrete in-situ	>100 MPa	-	-		m³	Please enter reinforcing steel as part of "Reinforcing steel" below	01_SB or 02-11	02 or 03
Concrete pre-cast panel	-	-	-		m³	Please enter reinforcing steel in relevant line items below. If not known at DA stage, please make your best estimate. If not known at CC stage, please ask your supplier.	01_SB or 02-11	02 or 03
Concrete block	Hollow core	-	-		m³	Enter as <u>cubic metres</u> , calculated as (area in m²) * (thickness in mm / 1000). Please include all block fill concrete and all reinforcing steel in relevant line items above/below.	01_SB	02 or 03
Concrete block/brick	Solid	-	-	225.0	m³	Enter as <u>cubic metres</u> , calculated as (area in m²) * (thickness in mm / 1000)	01_SB	02 or 03
Concrete block/brick	Solid AAC	-	-		m³	Solid Aerated Autoclaved Concrete (AAC) block. Enter as <u>cubic metres</u> , calculated as (area in m²) * (thickness in mm / 1000).	01_SB	02 or 03
Mortar	-	-	-		kg		01_SB	02 or 03
Reinforcing steel	Bar & mesh	-	-	216,310	kg	Include all reinforcing steel bar/mesh in the building's structure in this row. Usually this is calculated as kg/m² per concrete element and then summed. Example: 10 m³ of 40 MPa concrete @ 100 kg/m³ + 5 m³ of 50 MPa concrete @ 150 kg/m³ = 1,750 kg reinforcing steel.	01_SB or 02-11	02 or 03
Reinforcing steel	Fibre & strand	-	-	13,545	kg	Include all steel fibre reinforcing and steel strand in the building's structure in this row.	01_SB or 02-11	02 or 03
Structural steel	Hot rolled structural	-	-		t	Examples include universal beams, universal columns and welded beams	01_SB	02 or 03
Structural steel	Cold formed structural	-	-		t	Examples include C purlins, Z purlins and all light gauge steel framing	01_SB	02 or 03
Structural steel	Other welded structural	-	-		t		01_SB	02 or 03
Structural steel	Plate	-	-		t		01_SB	02 or 03
Structural steel	Sheet	-	-		t	Include any allowance for connections here	01_SB	02 or 03
Stainless steel	-	-	-		t	Primarily for engineered timber structure connections	02_11	02 or 03
Reinforced concrete piles	Concrete	-	-		m³	Please enter reinforcing steel in the line below. If not known at DA stage, please make your best estimate. If not known at CC stage, please ask your supplier.	01_SB	02 or 03
Reinforced concrete piles	Steel reinforcing				kg	If not known at DA stage, please make your best estimate. If not known at CC stage, please ask your supplier.	01_SB	02 or 03
Steel piles	-	-	-		t	Where concrete and reinforcing steel are also used, enter these in the rows above.	01_SB	02 or 03
Timber poles/piles	-	-	-		m³	Where concrete and reinforcing steel are also used, enter these in the rows above.	01_SB	02 or 03
Timber (solid)	Sawn softwood	-	-		m³		02_11	02 or 03
Timber (solid)	Sawn hardwood	-	-		m³		02_11	02 or 03
Timber (engineered)	CLT	-	-		m³		02_11	02 or 03
Timber (engineered)	Glulam	-	-		m³		02_11	02 or 03
Timber (engineered)	LVL	-	-		m³		02_11	02 or 03
Timber (engineered)	OSB	-	-		m³		02_11	02 or 03
Brick	Heat cured	-	-		m³	Enter as <u>cubic metres</u> , calculated as (area of wall in m²) * (thickness in mm / 1000)	02_11	02 or 03
Structural Insulated Panel (SIP)	Steel outer	-	-		m²	Enter as <u>cubic metres</u> , calculated as (area of wall in m²) * (thickness in mm / 1000)	01_SB	02 or 03
Structural Insulated Panel (SIP)	Aluminium outer	-	-		m²		01_SB	02 or 03
Structural Insulated Panel (SIP)	Engineered timber outer	-	-		m²		01_SB	02 or 03
Fill	-	-	-		t	Include purchased material only. Exclude site-won material.	01_SB	01
Sand & gravel	-	-	-		t	Include purchased material only. Exclude site-won material and sand/gravel in concrete.	01_SB	01
Waterproofing membrane	Bituminous	-	-		m²		01_SB	01 or 02 or 03
Waterproofing membrane	Polyethylene	-	-	2,175	m²		01_SB	01 or 02 or 03
Other structural (Describe and add unit >>)		-	-			Please enter a description for any structural material that does not fit a predefined classification		
Other structural (Describe and add unit >>)		-	-			Please enter a description for any structural material that does not fit a predefined classification		
Other structural (Describe and add unit >>)		-	-			Please enter a description for any structural material that does not fit a predefined classification		

Envelope

The skin of the building that separates the internal building from the external environment. This includes the roof cladding, wall cladding, windows, doors and internal/external shading. It also includes insulation and the internal wall lining of envelope walls.

Coverage of envelope material spend	-	-	-		%	Required. Coverage of <u>spend</u> for the envelope items you have entered below. Minimum requirement = 80%. Exclude head contractor preliminaries and margins.		
Roof cladding	Profiled steel	-	-		m²	Enter as m² of roof area. Exclude allowances for overlap in the roofing sheets. This row includes all metal-coated and pre-painted steel sheets where steel is the base metal. Examples include: galvanised steel, zinc-aluminium (zincalume) coated steel and zinc-aluminium-magnesium (ZAM) coated steel, whether painted or unpainted.	05_RF	03 or 04

Roof cladding	Profiled aluminium	-	-		m²	Enter as m² of roof area. Exclude allowances for overlap in the roofing sheets. This row also includes pre-painted aluminium sheets.	05_RF	03 or 04
Roof cladding	Profiled zinc	-	-		m²	Enter as m² of roof area. Exclude allowances for overlap in the roofing sheets. This row also includes pre-painted zinc sheets.	05_RF	03 or 04
Roof cladding	Membrane	-	-		m²	Enter as m² of roof area. Exclude allowances for overlap in the membrane sheets.	05_RF	03 or 04
Roof cladding	Tiles (traditional clay)	-	-		m²	Enter as m² of roof area. Exclude allowances for overlap between the tiles.	05_RF	03 or 04
Roof cladding	Tiles (concrete)	-	-		m²	Enter as m² of roof area. Exclude allowances for overlap between the tiles.	05_RF	03 or 04
Roof cladding	Other (Please describe >>)	Awnings	-	157	m²	Please enter a description for any roofing that does not fit a predefined classification	05_RF	03 or 04
Wall cladding	Bricks (heat cured)	-	-		m²	Enter as m² of wall area. Heat-cured bricks use a kiln or furnace to raise the brick temperature above ambient temperature during curing process.	06_EW	03 or 04
Wall cladding	Bricks (air dried)	-	-		m²	Enter as m² of wall area. Air-dried bricks are cured using ambient temperature.	06_EW	03 or 04
Wall cladding	Bricks (under fired)	-	-		m²	Enter as m² of wall area.	06_EW	03 or 04
Wall cladding	Bricks (concrete)	-	-		m²	Enter as m² of wall area	06_EW	03 or 04
Wall cladding	Mortar and render	-	-		kg		06_EW	03 or 04
Wall cladding	Profiled steel	-	-		m²	Enter as m² of wall area. Exclude allowances for overlap in the cladding sheets, offcuts, etc. This row includes all metal-coated and pre-painted steel sheets where steel is the base metal. Examples include: galvanised steel, zinc-aluminium (zincalume) coated steel and zinc-aluminium-magnesium (ZAM) coated steel, whether painted or unpainted.	06_EW	03 or 04
Wall cladding	Profiled aluminium	-	-	81	m²	Enter as m² of wall area. Exclude allowances for overlap in the cladding sheets, offcuts, etc. This row also includes pre-painted aluminium sheets.	06_EW	03 or 04
Wall cladding	Profiled zinc	-	-		m²	Enter as m² of wall area. Exclude allowances for overlap in the cladding sheets, offcuts, etc. This row also includes pre-painted zinc sheets.	06_EW	03 or 04
Wall cladding	GRC cladding	-	-		m²	Enter as m² of wall area. GRC = Glass Reinforced Concrete.	06_EW	03 or 04
Wall cladding	Timber weatherboards	-	-		m²	Enter as m² of wall area. Exclude allowances for overlap between weatherboards, offcuts, etc.	06_EW	03 or 04
Wall cladding	Fibre cement board	-	-		m²	Enter as m² of wall area. Exclude allowances for offcuts, etc.	06_EW	03 or 04
Wall cladding	Terracotta	-	-		m²	Enter as m² of wall area. Exclude allowances for offcuts, etc.	06_EW	03 or 04
Wall cladding	Brick tiles / veneers	-	-		m²	Enter as m² of wall area. Exclude allowances for offcuts, etc.	06_EW	03 or 04
Wall cladding	Plasterboard	-	-		m²	Enter as m² of wall area. Exclude allowances for offcuts, etc. Include both external wall linings and internal wall linings for envelope walls.	12_WF or 06_EW	03 or 04
Wall cladding	Plywood	-	-		m²	Enter as m² of wall area. Exclude allowances for offcuts, etc. Include both external wall linings and internal wall linings for envelope walls.	12_WF or 06_EW	03 or 04
Wall cladding	Other (Please describe >>)		-		m²	Please enter a description for any wall cladding that does not fit a predefined classification	06_EW or 12_WF	03 or 04
Windows & doors	Aluminium frame	Single glazed	-		m²	Include all single glazing, including standard, toughened, laminated and low-E	07_WW or 08_ED	03 or 04
Windows & doors	Aluminium frame	Double glazed	-	425	m²	Include all double glazing, including standard, toughened, laminated and low-E	07_WW or 08_ED	03 or 04
Windows & doors	Aluminium frame	Triple glazed	-		m²	Include all triple glazing, including standard, toughened, laminated and low-E	07_WW or 08_ED	03 or 04
Windows & doors	Timber frame	Single glazed	-		m²	Include all single glazing, including standard, toughened, laminated and low-E	07_WW or 08_ED	03 or 04
Windows & doors	Timber frame	Double glazed	-		m²	Include all double glazing, including standard, toughened, laminated and low-E	07_WW or 08_ED	03 or 04
Windows & doors	Timber frame	Triple glazed	-		m²	Include all triple glazing, including standard, toughened, laminated and low-E	07_WW or 08_ED	03 or 04
Windows & doors	uPVC frame	Single glazed	-		m²	Include all single glazing, including standard, toughened, laminated and low-E	07_WW or 08_ED	03 or 04
Windows & doors	uPVC frame	Double glazed	-		m²	Include all double glazing, including standard, toughened, laminated and low-E	07_WW or 08_ED	03 or 04
Windows & doors	uPVC frame	Triple glazed	-		m²	Include all triple glazing, including standard, toughened, laminated and low-E	07_WW or 08_ED	03 or 04
Windows & doors	Frameless	Single glazed	-		m²	Include all single glazing, including standard, toughened, laminated and low-E	07_WW or 08_ED	03 or 04
Windows & doors	Frameless	Double glazed	-		m²	Include all double glazing, including standard, toughened, laminated and low-E	07_WW or 08_ED	03 or 04
Windows & doors	Frameless	Triple glazed	-		m²	Include all triple glazing, including standard, toughened, laminated and low-E	07_WW or 08_ED	03 or 04
Windows & doors	Other (Please describe >>)		-		m²	Please enter a description for any windows or doors that do not fit a predefined classification	07_WW or 08_ED	03 or 04
Curtain wall	Single skin façade	Glazed panel	Single glazed		m²	Please declare all single-skin façade area in this section. All double-skin façade area should be entered in the next section. Include all single glazing, including standard, toughened, laminated and low-E	06_EW	03 or 04
Curtain wall	Single skin façade	Glazed panel	Double glazed		m²	Include all double glazing, including standard, toughened, laminated and low-E	06_EW	03 or 04
Curtain wall	Single skin façade	Glazed panel	Triple glazed		m²	Include all triple glazing, including standard, toughened, laminated and low-E	06_EW	03 or 04
Curtain wall	Single skin façade	Opaque panel	Aluminium cladding		m²		06_EW	03 or 04
Curtain wall	Single skin façade	Opaque panel	GRC cladding		m²	GRC = Glass-fibre Reinforced Concrete	06_EW	03 or 04
Curtain wall	Single skin façade	Opaque panel	Insulated shadow box		m²		06_EW	03 or 04
Curtain wall	Single skin façade	Opaque panel	Brick cladding		m²		06_EW	03 or 04
Curtain wall	Single skin façade	Opaque panel	Stone cladding		m²		06_EW	03 or 04
Curtain wall	Double skin façade	Glazed panel	Single glazed		m²	Please declare all double-skin façade area in this section. Please declare as the area of the curtain wall and do not enter the inner and outer skins twice. Include all single glazing, including standard, toughened, laminated and low-E.	06_EW	03 or 04
Curtain wall	Double skin façade	Glazed panel	Double glazed		m²	The type of glazing refers to the building's envelope wall, not including the outer skin	06_EW	03 or 04
Curtain wall	Double skin façade	Glazed panel	Triple glazed		m²	The type of glazing refers to the building's envelope wall, not including the outer skin	06_EW	03 or 04
Curtain wall	Double skin façade	Opaque panel	Aluminium cladding		m²		06_EW	03 or 04
Curtain wall	Double skin façade	Opaque panel	GRC cladding		m²	GRC = Glass-fibre Reinforced Concrete	06_EW	03 or 04
Curtain wall	Double skin façade	Opaque panel	Insulated shadow box		m²		06_EW	03 or 04
Curtain wall	Double skin façade	Opaque panel	Brick cladding		m²		06_EW	03 or 04
Curtain wall	Double skin façade	Opaque panel	Stone cladding		m²		06_EW	03 or 04
Curtain wall	Other (Please describe >>)		-		m²	Please enter a description for any curtain wall that does not fit a predefined classification	06_EW	03 or 04
Stick-framed wall system	Aluminium frame	Glazed section	Single glazed		m²	Include all single glazing, including standard, toughened, laminated and low-E	06_EW	03 or 04
Stick-framed wall system	Aluminium frame	Glazed section	Double glazed		m²	Include all double glazing, including standard, toughened, laminated and low-E	06_EW	03 or 04
Stick-framed wall system	Aluminium frame	Glazed section	Triple glazed		m²	Include all triple glazing, including standard, toughened, laminated and low-E	06_EW	03 or 04
Stick-framed wall system	Aluminium frame	Opaque section	Aluminium cladding		m²		06_EW	03 or 04
Stick-framed wall system	Aluminium frame	Opaque section	GRC cladding		m²	GRC = Glass-fibre Reinforced Concrete	06_EW	03 or 04

Stick-framed wall system	Aluminium frame	Opaque section	Insulated shadow box		m²		06_EW	03 or 04
Stick-framed wall system	Aluminium frame	Opaque section	Brick cladding		m²		06_EW	03 or 04
Stick-framed wall system	Aluminium frame	Opaque section	Stone cladding		m²		06_EW	03 or 04
Stick-framed wall system	Steel frame	Glazed section	Single glazed		m²	Include all single glazing, including standard, toughened, laminated and low-E	06_EW	03 or 04
Stick-framed wall system	Steel frame	Glazed section	Double glazed		m²		06_EW	03 or 04
Stick-framed wall system	Steel frame	Glazed section	Triple glazed		m²	Include all double glazing, including standard, toughened, laminated and low-E	06_EW	03 or 04
Stick-framed wall system	Steel frame	Opaque section	Aluminium cladding		m²		06_EW	03 or 04
Stick-framed wall system	Steel frame	Opaque section	GRC cladding		m²	GRC = Glass-fibre Reinforced Concrete	06_EW	03 or 04
Stick-framed wall system	Steel frame	Opaque section	Insulated shadow box		m²		06_EW	03 or 04
Stick-framed wall system	Steel frame	Opaque section	Brick cladding		m²		06_EW	03 or 04
Stick-framed wall system	Steel frame	Opaque section	Stone cladding		m²		06_EW	03 or 04
Stick-framed wall system	Other (Please describe >>)		-		m²	Please enter a description for any wall system that does not fit a predefined classification	06_EW	03 or 04
Wall louvre system	Aluminium	-	-		m²		06_EW	03 or 04
External shading system	Aluminium frame	Aluminium cladding	-		m²	Please enter as m² of shaded area = linear metres * (width in mm / 1000)	06_EW	03 or 04
External shading system	Aluminium frame	GRC cladding	-		m²	Please enter as m² of shaded area = linear metres * (width in mm / 1000). GRC = Glass-fibre Reinforced Concrete.	06_EW	03 or 04
External shading system	Aluminium frame	Terracotta cladding	-		m²	Please enter as m² of shaded area = linear metres * (width in mm / 1000)	06_EW	03 or 04
External shading system	Aluminium frame	Stone cladding	-		m²	Please enter as m² of shaded area = linear metres * (width in mm / 1000)	06_EW	03 or 04
External shading system	Aluminium frame	Pre-cast concrete	-		m²	Please enter as m² of shaded area = linear metres * (width in mm / 1000)	06_EW	03 or 04
External shading system	Aluminium frame	Timber	-		m²	Please enter as m² of shaded area = linear metres * (width in mm / 1000)	06_EW	03 or 04
External shading system	Aluminium frame	Glass (opaque)	-		m²	Please enter as m² of shaded area = linear metres * (width in mm / 1000)	06_EW	03 or 04
External shading system	Aluminium frame	Steel	-		m²	Please enter as m² of shaded area = linear metres * (width in mm / 1000)	06_EW	03 or 04
External shading system	Other (Please describe >>)		-		m²	Please enter as m² of shaded area = linear metres * (width in mm / 1000)	06_EW	03 or 04
Roller doors	Steel profile	-	-		m²	Please note unit is <u>square metres</u> , not quantity	08_ED	03 or 04
Roller doors	Hardwood over steel	-	-		m²	Please note unit is <u>square metres</u> , not quantity	08_ED	03 or 04
Roller doors	Softwood over steel	-	-		m²	Please note unit is <u>square metres</u> , not quantity	08_ED	03 or 04
Revolving doors	Glass/aluminium/steel	-	-		no.		08_ED	03 or 04
Fire-rated doors	Engineered timber	-	-		no.	Please enter as single-leaf equivalent. For double-leaf doors, multiply the quantity by 2.	08_ED	03 or 04
Fire-rated doors	Steel	-	-		no.	Please enter as single-leaf equivalent. For double-leaf doors, multiply the quantity by 2.	08_ED	03 or 04
Fire-rated doors	Aluminium/glass	-	-		no.	Please enter as single-leaf equivalent. For double-leaf doors, multiply the quantity by 2.	08_ED	03 or 04
Insulation	Glass wool / fibreglass	-	-		m²	Please include both wall and ceiling insulation	05_RF or 06_EW	03 or 04
Insulation	Stone wool	-	-		m²	Please include both wall and ceiling insulation	05_RF or 06_EW	03 or 04
Insulation	Polyester	-	-		m²	Please include both wall and ceiling insulation	05_RF or 06_EW	03 or 04
Insulation	Expanded polystyrene	-	-		m²	Please include both wall and ceiling insulation	05_RF or 06_EW	03 or 04
Insulation	Other (Please describe >>)		-		m²	Please include both wall and ceiling insulation	05_RF or 06_EW	03 or 04
Other (Please describe and add unit >>)		-	-			Please enter a description for any envelope material that does not fit a predefined classification		
Other (Please describe and add unit >>)		-	-			Please enter a description for any envelope material that does not fit a predefined classification		
Other (Please describe and add unit >>)		-	-			Please enter a description for any envelope material that does not fit a predefined classification		

Permanent internal walls and doors

Walls and doors within the building that are either structural or designed to be permanent.

Coverage of material spend on permanent internal walls and doors					%	Enter the % coverage of <u>spend</u> for the items you have entered below. There is no minimum requirement; enter what you know. This should include all structural walls. Exclude head contractor preliminaries and margins.		
Interior wall (permanent)	Steel (light framing)	-	-		t		09_NW	03 or 04
Interior wall (permanent)	Timber framing	-	-		m³		09_NW	03 or 04
Interior wall (permanent)	AAC panel (reinforced)	-	-		m²	Panels of autoclaved aerated concrete (AAC) with reinforcing steel. E.g., Hebel.	09_NW or 12_WF	03 or 04
Interior wall (permanent)	Concrete-filled steel panel	-	-		m²	Panels made from a steel sheet outer with an aerated concrete core. E.g., Speedpanel.	09_NW or 12_WF	03 or 04
Interior wall (permanent)	Plasterboard	-	-		m²	Enter as single-layer equivalent. If using 2 layers, multiply the area by 2.	09_NW or 12_WF	03 or 04
Interior wall (permanent)	Plywood	-	-		m²	Enter as single-layer equivalent. If using 2 layers, multiply the area by 2.	09_NW or 12_WF	03 or 04
Interior wall (permanent)	Fibre cement sheet	-	-		m²	Enter as single-layer equivalent. If using 2 layers, multiply the area by 2.	09_NW or 12_WF	03 or 04
Interior wall (permanent)	Insulation	-	-		m²		09_NW or 12_WF	03 or 04
Interior wall (permanent)	Glass	-	-		m²		09_NW or 12_WF	03 or 04
Interior wall (permanent)	Other (Please describe >>)		-		m²	Please enter a description for any internal wall that does not fit a predefined classification	09_NW or 12_WF	03 or 04
Internal door (permanent)	Aluminium/glass	-	-		no.	Please enter as single-leaf equivalent. For double-leaf doors, multiply the quantity by 2.	11_ND	03 or 04
Internal door (permanent)	Timber/glass	-	-		no.	Please enter as single-leaf equivalent. For double-leaf doors, multiply the quantity by 2.	11_ND	03 or 04
Internal door (permanent)	Timber solid lightweight	-	-		no.	Please enter as single-leaf equivalent. For double-leaf doors, multiply the quantity by 2.	11_ND	03 or 04
Internal door (permanent)	Fire resistant	-	-		no.	Please enter as single-leaf equivalent. For double-leaf doors, multiply the quantity by 2.	11_ND	03 or 04
Internal door (permanent)	Steel	-	-		no.	Please enter as single-leaf equivalent. For double-leaf doors, multiply the quantity by 2.	11_ND	03 or 04
Internal door (permanent)	Other (Please describe >>)		-		no.	Please enter a description for any internal door that does not fit a predefined classification	11_ND	03 or 04
Other (Please describe and add unit >>)		-	-			Please enter a description for any material that does not fit a predefined classification		
Other (Please describe and add unit >>)		-	-			Please enter a description for any material that does not fit a predefined classification		
Other (Please describe and add unit >>)		-	-			Please enter a description for any material that does not fit a predefined classification		

Services

Unit of measure

Building services included within the main building contract. If the building components that are the subject of the development application or the construction certificate are base building only, then only enter these items. If you cannot split services by type, please enter them all in the "Other services" category at the bottom. Enter all values as material costs in dollars.

Mechanical services	-	-	-		AUD excl. GST	Where possible, enter material costs excluding labour, plant, equipment, margins and taxes	28_SS	05
Vertical transportation	-	-	-		AUD excl. GST	Where possible, enter material costs excluding labour, plant, equipment, margins and taxes	28_SS	05
Electrical services	-	-	-		AUD excl. GST	Electrical services including the main power supply, backup generators, security and communications. Excluding solar installations.	26_LP	05
Solar photovoltaic installations	-	-	-		AUD excl. GST	Where possible, enter material costs excluding labour, plant, equipment, margins and taxes.	26_LP_LPGP	05
Plumbing/hydraulic services	-	-	-		AUD excl. GST	Where possible, enter material costs excluding labour, plant, equipment, margins and taxes	18_PD and 19_WS	05 or 06
Fire services					AUD excl. GST	Where possible, enter material costs excluding labour, plant, equipment, margins and taxes	25_FPSS04 or 39_XWAW_03 or 41_XF	05
Other services (Please describe)		-	-		AUD excl. GST	Please group all other services here, meaning that coverage will always be 100% for services. Enter only the material costs (excluding labour, plant, equipment, margins and taxes).	29_SS or multiple	

External works

The materials associated with hard landscaping and outbuildings on the site but outside the building envelope. This includes hardstands, carparks, driveways, covered walkways, decks, patios, awnings, fences, gates, etc. Soft landscaping should be excluded.

Coverage of spend on external works	-	-	-		%	Required. Coverage of spend for external works (excluding soft landscaping) entered below. Minimum requirement = 80%. Exclude head contractor preliminaries and margins.		
Asphalt	-	-	-		t		33_XR	07
Concrete in-situ	≤10 MPa	-	-		m³	Please enter reinforcing steel as part of "Reinforcing steel" below	33_XR or 34_XN or 35_XB or 36_XL	07
Concrete in-situ	>10 MPa to ≤20 MPa	-	-		m³	Please enter reinforcing steel as part of "Reinforcing steel" below	33_XR or 34_XN or 35_XB or 36_XL	07
Concrete in-situ	>20 MPa to ≤32 MPa	-	-		m³	Please enter reinforcing steel as part of "Reinforcing steel" below	33_XR or 34_XN or 35_XB or 36_XL	07
Concrete in-situ	>32 MPa to ≤40 MPa	-	-		m³	Please enter reinforcing steel as part of "Reinforcing steel" below	33_XR or 34_XN or 35_XB or 36_XL	07
Concrete in-situ	>40 MPa to ≤50 MPa	-	-		m³	Please enter reinforcing steel as part of "Reinforcing steel" below	33_XR or 34_XN or 35_XB or 36_XL	07
Concrete in-situ	>50 MPa	-	-		m³	Please enter reinforcing steel as part of "Reinforcing steel" below	33_XR or 34_XN or 35_XB or 36_XL	07
Pavers, bricks and blocks	Concrete	-	-		m²		33_XR	07
Pavers, bricks and blocks	Clay	-	-		m²		33_XR	07
Reinforcing steel	Bar & mesh	-	-		kg	Include all reinforcing steel bar/mesh in the external works in this row. Usually this is calculated as kg/m³ per concrete element and then summed. Example: 10 m³ of 40 MPa concrete @ 100 kg/m³ + 5 m³ of 50 MPa concrete @ 150 kg/m³ = 1,750 kg reinforcing steel.	33_XR or 34_XN or 35_XB or 36_XL	07
Reinforcing steel	Fibre & strand	-	-		kg	Include all steel fibre reinforcing and steel strand in the external works in this row.	33_XR or 34_XN or 35_XB or 36_XL	07
Structural steel	-	-	-		t		02_11	07
Structural aluminium	-	-	-		t	Includes structures, louvre systems, etc.	35_XB	07
External roof/wall cladding	Polycarbonate	-	-		m²	Enter as profiled polycarbonate sheet that would ordered, including allowance for overlap	35_XB	07
External roof/wall cladding	PVC	-	-		m²	Enter as profiled PVC sheet that would ordered, including allowance for overlap	35_XB	07
External roof/wall cladding	Bitumen sheet	-	-		m²	Enter as bituminous sheet that would ordered, including allowance for overlap	35_XB	07
External roof/wall cladding	Steel profile	-	-		m²	Enter as profiled steel sheet that would ordered, including allowance for overlap	35_XB	07
Fill	-	-	-		t	Include purchased material only. Exclude site-won material.	33_XR or 34_XN or 35_XB or 36_XL	07
Sand & gravel	-	-	-		t	Include purchased material only. Exclude site-won material and sand/gravel in concrete.	33_XR or 34_XN or 35_XB or 36_XL	07
Timber (solid)	Sawn softwood	-	-		m³		33_XR or 34_XN or 35_XB or 36_XL	07
Timber (solid)	Sawn hardwood	-	-		m³		33_XR or 34_XN or 35_XB or 36_XL	07
Timber (engineered)	CLT	-	-		m³		33_XR or 34_XN or 35_XB or 36_XL	07
Timber (engineered)	Glulam	-	-		m³		33_XR or 34_XN or 35_XB or 36_XL	07
Timber (engineered)	LVL	-	-		m³		33_XR or 34_XN or 35_XB or 36_XL	07
Timber (engineered)	OSB	-	-		m³		33_XR or 34_XN or 35_XB or 36_XL	07
Fabric (awning/sunshade)					m²		35_XB or 36_XL	07
Other (Please describe and add unit >>)		-	-			Please enter a description for any external works that does not fit a predefined classification		
Other (Please describe and add unit >>)		-	-			Please enter a description for any external works that does not fit a predefined classification		
Other (Please describe and add unit >>)		-	-			Please enter a description for any external works that does not fit a predefined classification		

Step 3: Certifier details

Fill out blue cells

The material quantities must be determined through an itemised list of building materials (such as a bill of quantities) and certified by a quantity surveyor, designer, engineer or NABERS Assessor.

Person that completed this form	Value	Note
Name	Brendan Browne	Required
Company	WT Partnership	Required
ABN		
Profession	Quantity Surveyor	Required
Qualification or registration	MAIQS	Required

Person that certified the details in this form	Value	Note
Name	Brendan Browne	Required
Company	WT Partnership	Required
ABN		
Profession	Quantity Surveyor	Required
Qualification or registration	MAIQS	Required

Confirmation of certification	Value	Note
Are 80% of material costs captured for the building's structure, envelope and external works?	No	Required
If no - why not?	Services and Interiors make up a greater than 20% of the overall costs.	

Additional comments from data provider

Additional comments of certifier

Attach this Excel spreadsheet to your development application or construction certificate application.