Prepared for
Ausgrid
ABN: 78208211731

Technical Note

Embodied Emissions Assessment

28-Mar-2025
Steel River East

Technical Note

Embodied Emissions Assessment

Client: Ausgrid

ABN: 78208211731

Prepared by

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1.0 Project Overview

Ausgrid is seeking development consent to construct, operate and maintain a battery energy storage facility (BESS) with a peak capacity of up to 200 megawatts (MW) at its Steel River East site (the Project). The Project is located to the to the east of the existing Ausgrid 132 kV Mayfield West Zone Substation at 1 McIntosh Drive, Mayfield West NSW 2304. The BESS would be in the eastern part of the same lot as the substation, being Lot 16, of Deposited Plan (DP) 270249.

AECOM has been engaged to prepare an Embodied Carbon Assessment that provides an estimate for embodied emissions in accordance with *State Environment Planning Policy* (*Sustainable Buildings*) *2022* (Sustainable Buildings SEPP). In accordance with that policy, this report estimates of the Project's A1-A3 embodied carbon emissions.

2.0 Project scope

The Project includes the following key elements:

- Construction of a 14,300 square metre bench including allowance to cut and fill up to three metres, import and compact up to 4,500 cubic metres of clean fill. Once the bench is established, facilities including earth grid, access and internal roads, drainage, drainage outfall control and cable trenches
- Construction of a BESS with a 200 MW maximum power output capacity with 2-hour duration (i.e. 400 MWh)
- Supply and installation of containerised battery units (112 Megapacks) and associated infrastructure, including inverters and 56 medium voltage transformers
- 33kV underground cable connection from the battery units to Mayfield West zone substation infrastructure
- Combined switch room and control room building
- Eight Ring Main Units (RMUs)
- Onsite workshop facility
- Two auxiliary transformers
- Backup diesel generator
- Two spaces for onsite car parking
- Other ancillary infrastructure including fire suppression, 2.4m high boundary security chain wire fencing, lighting and CCTV

3.0 Purpose of this report

The Sustainable Buildings SEPP aims to improve the overall sustainability of buildings in NSW, including through the recording and monitoring of relevant metrics and the implementation of improved techniques to improve energy, greenhouse gas, water and thermal performance.

Section 3.2 (2) of this policy states the following requirement for non-residential development:

> *Development consent must not be granted to non-residential development unless the consent authority is satisfied the embodied emissions attributable to the development have been quantified.*

Emissions in this context refer to greenhouse gas emissions, which have a global warming potential and are measured in mass of Carbon Dioxide Equivalent (CO_2e). Examples of greenhouse gases are carbon dioxide, methane, nitrous oxide, and sulphur hexafluoride.

An embodied carbon assessment was undertaken utilising the NABERS Embodied Emissions Materials Form, to satisfy the above requirement. According to the Department of Planning and Environment

Embodied Emissions Technical Note[1], the NABERS Embodied Emissions Tool will be the required format for non-residential reporting when the NABERS framework is released. In the interim, a NABERS Embodied Emissions Materials Form must be completed.

The tool was used only for reporting under this policy and as the project is not seeking to pursue a NABERS Embodied Carbon rating (nor would it likely be eligible for this rating system), the project has not strictly aligned with the NABERS Embodied Carbon rating rules in the use of the NABERS Embodied Emissions Materials Form.

This technical note outlines the scope, methodology and results of the embodied carbon assessment undertaken for the Project.

4.0 Scope of the embodied carbon assessment

4.1 Assessment boundary

The embodied carbon assessment undertaken for the Project is limited to modules A1 to A3, as defined in *EN 17472:2022, Sustainability of Construction works – Sustainability assessment of civil engineering works – Calculation methods*. Embodied emissions are defined in the Sustainable Buildings SEPP as:

> *the greenhouse gas emissions resulting from the materials used to construct a building that forms part of the development, including emissions from the following—*
>
> *(a) The extraction of raw materials that are used to construct the building,*
>
> *(b) Transporting materials to be manufactured,*
>
> (c) *The manufacture of the materials used to construct the building*.

As such, carbon emissions related to the transport of materials used in the construction of the Project are omitted from this assessment. A visual representation of the system boundary of this assessment is provided in Table 1.

Table 1 EN17472:2022 system boundary of preliminary carbon estimate

	A – Production						B – Use								C – End of life				D – Beyond Life
	Pre-construction activities	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational Energy	Operational Water	User carbon	Deconstruction/Demolition	Transport	Waste Processing	Disposal	Reuse/recovery/recycle potential
Module	A0	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	B8	C1	C2	C3	C4	D
Declared	-	✓	✓	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
✓ *denotes included in embodied emissions estimate* - *denotes not included in embodied emissions estimate*																			

Only materials required for the construction of the Project and outlined in Section 2.0 of this report have been included in this assessment. Materials that are anticipated to have an insignificant (<5%) cumulative impact on the overall embodied carbon quantum have been excluded from the assessment.

[1] Embodied Emissions Technical Note

This assessment makes no allowances for emissions at other lifecycle stages, such as the replacement of any materials required during the operation of the Project, operation of construction equipment required to construct the Project, or any sulphur hexafluoride released by electrical equipment during the operation; as these are not required under Section 3.2(2) of the Sustainable Buildings SEPP.

5.0 Methodology

5.1 Calculation methodology

Calculation of the embodied carbon emissions related to the construction of the Project was undertaken using the following methodology:

1. Material quantity estimates (MQE) were provided by the project quantity surveyors. The following procedure was followed to convert the material data from the MQE into a format compatible with the NABERS Embodied Emissions Materials Form.
    a. The following filters were used to exclude items from the assessment:
        i. Filter 1: Exclusion items that are not a physical material, and are not included in A1-A3 emissions, such as:
            1. Installation/construction-only items, i.e. activity-based items
            2. Demolition/excavation items
            3. Provisional items.
        ii. Filter 2: Exclusion of items or subcomponents where quantities were not able to be estimated due to lack of available data, and/or too insignificant to calculate. Generally, items with complex shapes and/or very small or small quantity items (such as CCTV systems, electrical outlets, insulation in transformers, or epoxy resin in ring main units)
        iii. Filter 3: A cut-off for materiality was applied. Materials expected to be the largest emissions sources were processed first. Subsequent items with an anticipated impact of less than 5% were excluded.
    b. Where applicable, items were separated into individual materials. E.g., concrete into concrete and reinforcing steel.
    c. Each material was categorised to correspond with the categories provided in the NABERS Embodied Emissions Materials Form.
    d. Units were converted from original estimates to the functional units provided by the NABERS Embodied Emissions Materials Form for each material.
2. Material quantities were input into the NABERS Embodied Emissions Materials Form.
3. Emissions factors were assigned to each material quantity input into the NABERS Embodied Emissions Materials Form. Emissions factors were sourced from the NABERS *National emission factors database - v1.0*[2]. In some cases, the material types contained in the NABERS National Emission Factors Database do not exactly match the material types in the NABERS Embodied Emissions Materials Form. In these instances, an emission factor from the closest representative material was used. For items not covered by the existing NABERS database, e.g. the BESS units, emissions factors were adopted from the following sources:
    a. Published, peer-reviewed life cycle assessments[3].

[2] National emission factors database | NABERS
[3] Notably, Hao, et al., 2017, which was used to derive the emissions factors for the battery units: Hao, H, Mu, Z, Jiang, S, Liu, Z & Zhao, F 2017, 'GHG emissions from the production of lithium-ion batteries for electric vehicles in China', *Sustainability*, vol. 9, no. 4, pp. 9

4. Calculate embodied carbon emissions using the NABERS Embodied Emissions Materials Form to provide a total carbon footprint in tonnes CO_2e.

5.2 Assumptions, exclusions, and limitations

Due to the early stage of design, assumptions were required to be made to estimate the material quantities and embodied emissions of the Project. Efforts were made to adopt a conservative approach in the assumptions used for calculating the embodied emissions. Consequently, the estimated emissions may be imprecise and could differ from the actual carbon emissions associated with the construction of the final Project.

The following assumptions and exclusions were used to calculate the embodied emissions from construction materials:

- Items in the MQE that met the criteria described in Section 5.1 step 1 a. were filtered out of the final materials list.
- Items in the MQE that were not provided in the nominated reference units, or required breakdown into raw materials, were estimated using the following set of assumptions:
    - Items that were not provided in the nominated reference units were estimated using available resources. E.g. representative equipment datasheets, previous project data, and approximate measurements from site plans.
    - Items that were able to be broken down into material sub-components were estimated using available literature (predominately lifecycle analysis studies or representative datasheets).

The NABERS Embodied Emissions Materials Form includes an input for the percentage of spend for structural elements, building envelope, and external works that are covered by the material quantities input into the form. This requirement is aimed at buildings seeking formal certification to ensure consistent coverage and fair comparisons between buildings with NABERS ratings, rather than a being a fixed requirement to comply with the Sustainable Buildings SEPP.

At the current stage of design, a detailed breakdown of costs by individual raw material is not available. As such, a specific percentage is not able to be calculated. Based on the methodology outlined above, we would expect that the coverage proportion entered for external works (80%, the minimum requirement) to be a conservative estimate. No percentage coverage was nominated for the building structures or envelopes, as these elements were deemed insignificant in proportion to the embodied emissions of the whole Project.

6.0 Results

The estimated embodied carbon emissions that relate to the materials used in the construction of the Project is 46,111 tonnes CO_2e. These emissions represent only the embodied carbon as defined by the Sustainable Buildings SEPP, being that arising from:

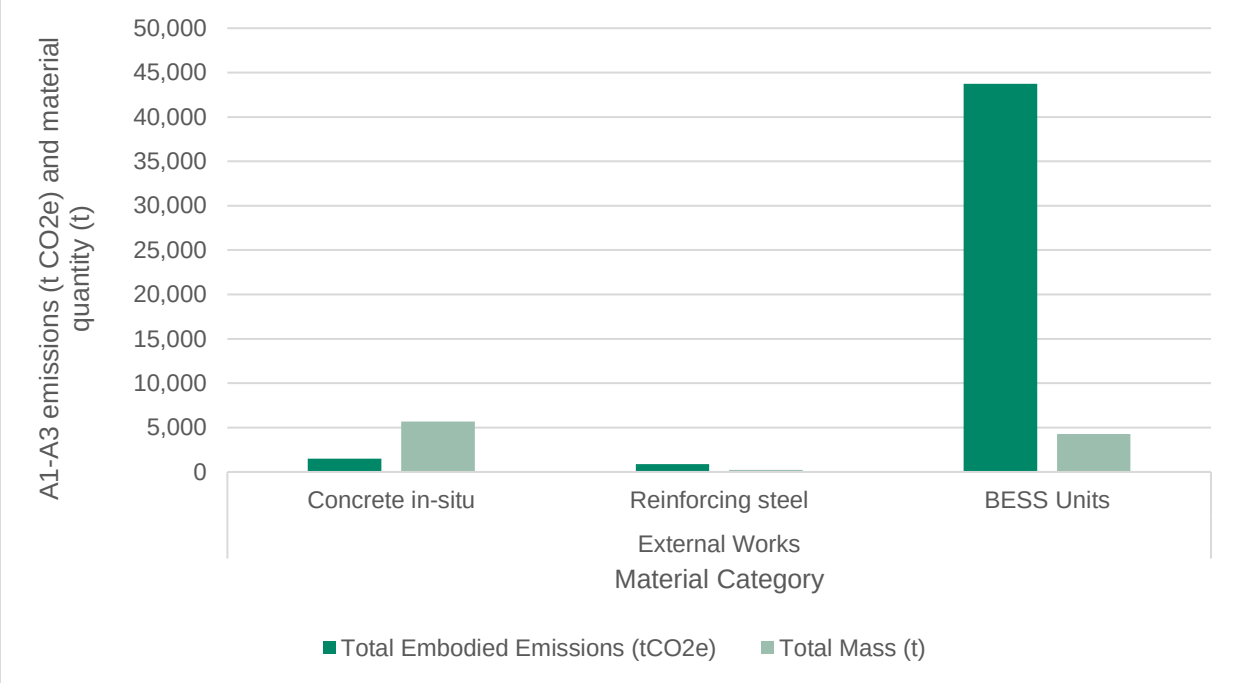
(a) The extraction of raw materials that are used to construct the building,

(b) Transporting materials to be manufactured,

(c) The manufacture of the materials used to construct the building.

Figure 1 shows a breakdown of embodied carbon footprint by material for the Project.

Figure 1 Breakdown of material quantities and embodied emissions



Preliminary estimates suggested that approximately 95% of the embodied carbon emissions associated with the Project would be related to the BESS units, associated concrete, and reinforcing steel. As such, all other materials were excluded from the calculations, as they are anticipated to make up less than 5% of the total embodied carbon emissions of the Project, and were therefore deemed negligible.

The top three contributors to embodied emissions are estimated to be the BESS units, concrete, and reinforcing steel. Emissions factors for steel and concrete are well documented in the NABERS database. However, an emissions factor for the BESS units needed to be sourced from a generic lifecycle assessment with the same battery chemistry as the Megapacks noted in the MQE. As such, a high level of uncertainty is associated with the emissions factor selected for the BESS units.

The BESS units represent 43,720 tonnes CO_2e alone, which is 95% of the total quantified emissions for the Project and by far the largest contributor to the overall embodied carbon assessment. While the lifecycle assessment (Hao, et al. 2017) provided an emissions factor of 109 kg CO_2e/kWh, the lowest and highest emissions factors reported in the literature review were 39 and 246 kg CO_2e/kWh, respectively. This represents a potential 67% decrease, or 125% increase in the carbon emissions associated with the BESS units.

Ausgrid do not have control over the materials used in the BESS units. However, measures related to the use of materials in supporting infrastructure could be taken during detailed design and construction to reduce the embodied emissions of the Project. For example, selecting lower-carbon materials such as concrete mixes with reduced Portland cement content, optimisation of steel design, selection of higher strength per mass components such as reinforcing steel.

Appendix A

Material Quantity Estimates

DESCRIPTION		QTY	UNITS
200MW, 400MWh BESS			
BESS UNITS			
Supply and installation of containerised battery units (112 Megapacks) and associated infrastructure, including inverters and 56 medium voltage transformers		112	no
Footings - total		112	no
Piers, assume DN750		1189.44	m3
Slab - Excavate, form, pour and finish 200mm thick slab incl strip footings (/m2)		1030.848	m3
Add conduits, assume 4 x 150, 8 m each		3584	no
100t crane		448	h
Cables install			
Cable cu 630mm2 , 10m, 2000kW connections, assume 600VAC		112	no
Add fibre cable in conduit (average 15m)		112	no
Add aux cables, 1 x 4c6mm2 + 2 x 4c2.5mm2		112	no
PCUs, COLLECTOR CABLES & AUX POWER			
Collector Cables			
Eight-off 33kV 630mm2 single core XLPE cables, in concrete ducts, 80m		8	no
Cable - RMU to Step-up Transformer, Average 35m 33kV 300mm2 single core Cu XLPE Cables		56	no
Power Conversion Units, Skid Mounted Units, tested complete ready for external conductors			
Supply 8-off RMUs, 7CBs		8	no
Supply MV Step Up Units, 33kV, 4.8MW		56	each
BESS Auxiliary Power			
Supply and install kiosk type auxiliary transformer		8	no
Kiosk Transformer, 750kVA, 33/0.4kV Ring Main type			
ENCLOSURE		1	no
Footing		21.6	m3
Aux Ring Main Cables, 120mm2 3 core Cu, 13 MVA, Trench in Soft Rock, Trenching L X 1.0 X 0.6m		400	m
Aux Ring Main Cables, close loop 120mm2 3 core Cu, 13 MVA, Trench in Soft Rock,Trenching L X 1.0 X 0.6m		40	m
BESS LV Cable to BESS Units, 90A, Use 35mm2 4 core cable, trenching 1m x 0.3m		2800	m
COLLECTOR STATION			
33kV Outdoor Equipment			
33kV Bus Section, incl footings earthing structures and primary connections		6	no
33kV HV Connections, 3 Phase Set		6	Set
33KV INDOOR BAYS, incl equipment supply Installation, secondary cables and testing			
1. 33kV Indoor Switchgear, Feeder 630A		10	each
33kV Indoor Switchgear, Transformer, 2500A		2	each
33kV Indoor Switchgear, Bustie, 2500A		1	each
Metering Cubicle, 2500A		1	each
132/33kV Transformers			
33kV Transformer Cable 1.2m deep- 33kV, 3 Sets of 3 Cables of 630mm2, 1 Core, Cu Conductor Underground Cable, 120m, Installed in Conduit, 0m Bored in Clay, 10% Soft Rock		2	no
SECONDARY WORKS			
3. HV Feeder Protection, 1 Feeder on one panel		10	no
3. HV Bus Zone Duplicate Protection & Control Scheme, X-High Impedance, Y-Distance		2	no
4. HV CB Management, Add Scheme to Existing Panel		2	no
Master & Back-up Earth Fault Schemes		1	no
Metering & Instrumentation			
Metering, New Panel with 1 x Revenue Metering + Check Meter		1	no

Local Alarm Panel		2	no
1. PQ Meter, Schneider ION 7650, install on existing panel		2	no
Yard Infrastructure			
Switchyard Power Supplies (1x3p + 1x1p Outlet)		11	no
External Fibre Marshalling Cubicle		2	No
2. Outdoor Lighting, Including Lighting Tower		1	no
Additional Cabling			
2. Fibre Optic Cabling, 48 Core, Installed in Existing Conduit, incl termination, based on 50m, per m		800	m
AUXILIARY POWER SUPPLIES			
Station Auxiliary AC Supplies			
Station Auxiliary Supply 22/0.4kV, 3 Phase, 300kVA		2	ea
Diesel Generator 400V, 200kVA installed and cabled		1	ea
AC Changeover Board, 300kVA		1	ea
AC Main Switchboard, 300kVA		2	ea
DC Supplies			
Batteries, Chargers & Isolator Cubicles, 200Ah, X or Y		1	
DC Distribution Boards		2	
SITE CIVIL INFRASTRUCTURE			
Earth Grid			
Earth Grid, per m2		14300	m2
made up of:			
General Earthworks			
Establish a Level, Drained Surface (m2)		17900	m2
Dress Surface, Subsurface Unprepared, per m2		14300	m2
Import and compact soil, assume fill half area with avergae 0.5 m of fill		4500	m3
Allow compaction in 0.4m layers		9000	m2
Vegetation clearing, Allow clearing of scrub and medium trees for 5000m2		5000	m2
1. Spoil Disposal, Load, Cart 10km & Dispose, Spoil contains rock / concrete, per m3		80	m3
Construction hardstand		800	m2
Roadworks			
1. Sealed Transformer Road Rate (Linear metre)		250	m
Water Drainage / Separation			
Surface Drainage		390	m
Underground 300mm Stormwater Drain - fibre reinforced class 2		195	m
Cable Trench Drainage, 150mm pipe, buried direct in ground		98	m
Drainage Pit, Cast in Situ, 900 x 900 x 900 with grated cover		8	no
Stormwater Holding Facilities		1	no
Cable Trenches / Conduits			
Secondary Cable Trenches, per m		160	m
Cable Trench Road Crossings, per m		10	m
HV Cable Trenches, assume backfill with sand, per m		340	m
Cable Pit - Cast in Situ - 1200 x 1200 x 900 with trafficable cover		8	no
Fire Service			
Fire Suppression - No of Hydrants (Urban)		6	no
Fences & Security			
1. Security Fence, Palisade, 2.4m incl Razor Top & Plinth, /m		480	m
3. Palisade Gates, 2.4m high, 6m wide, double leaf		2	no
Auto, double leaf gate, 2.4m high		2	no
CCTV System		1	no
Buildings			
2. Control Building, Pre-fabricated, per m2		0	m2
Pre-fabricated Control Building, complete with support steel & stairs, etc delivered to metro area only		180	m2
Building Support, Wall, Piers, Platforms & Stairs		180	m2
1. Add Amenities to Admin Building		1	No
Allow to relocate 2 x 11kV cables		2	no
Laydown		225	m2
Workshop / storage		60	m2

Water Supply		1	no
Sewerage Connection, Septic Tank		1	no
SCADA AND COMMUNICATIONS			
SCADA System including configuration and test, Three Racks, 200 Digital Inputs, 60 IEDs		1	no
COMMUNICATIONS			
Allowance for Operator Desk, Chair, Noticeboard, Telephone, Fax, etc		1	no
Digital Communications Cabinet		1	no
Data Interface Cubicle (DIC), IEC 61850 Compliant, Supply & Install		1	no
Add 2 x 48-core fibres in conduit to Ausgrid control building		300	m

Appendix B

Embodied Emissions Materials Form

NSW Government
4 Parramatta Square
Parramatta NSW 2150
nabers.gov.au

NABERS Embodied emissions materials form

New non-residential developments must complete this form

From 1 October 2023, all new non-residential developments must report on embodied emissions using this form in NSW, where the NSW government's State Environmental Planning Policy (Sustainable Buildings SEPP) 2022 applies. You must disclose the amounts of key materials at the development application and construction certificate stages.

More on the Sustainable Buildings SEPP

Embodied carbon emissions are generated across the full life cycle of a building from "cradle to grave". Embodied carbon made up 16% of the whole-of-life carbon footprint of Australia's buildings in 2019 [1]. The purpose of this form is to report on material quantities only, to support project team discussions about potential reduction in emissions from key materials. The form does not include embodied emissions factors. This reporting form will be updated to reflect the NABERS Embodied Carbon tool when it's available in 2024.

Step 1: About the building

In the 'About the building' tab, you will add the location, function, and type of building you are planning to construct. You will also need to add information that describes the building, including gross floor area, number of floors, area of carpark, and more. Collecting this information will allow the NSW Government to compare similar buildings.

Step 2: Quantity of materials

In the 'Quantity of materials' tab, you will add the amounts of materials that you will use to construct your building. You only need to complete those fields relevant to your building. Leave fields that aren't relevant to your building blank. We recognise that there will be uncertainty, particularly at DA stage, so please use your best estimates where information is unknown (e.g., based on past projects).

How much do I need to include?

You must include all parts of the building delivered by the main contractor, covering at least 80% of the total materials bill. For example, if you spent $100,000 on materials, you need to include the material amounts of at least $80,000 of those materials in this form.

Wherever possible, consider materials costs only, not labour, plant or equipment. However, where you cannot split out the materials costs, please simply be consistent in the way the costs are reported throughout the spreadsheet.

Enter the **quantity of materials** (excluding labour, plant, equipment, margins and taxes) for:

(1) Structure (substructure and superstructure) within the envelope of the building. Also include any ancillary buildings that are necessary for the main building to function (for example, plant that is in a separate building).

(2) Envelope (cladding, curtain walls, roofing, windows, doors etc.)

(3) Permanent internal walls and doors. At minimum, this should include all structural walls.

(4) External works (hard landscaping, carparks, etc.) outside of the building envelope.

Enter the **cost of materials** (excluding labour, plant, equipment, margins and taxes) for:

(5) Building services (mechanical, electrical, plumbing, vertical transport, etc.) required to run the core of the building. Exclude special equipment required by a particular tenant.

You must enter the amounts of materials in SI units (commonly known as the metric system). These are generally consistent across the various products on the market. However, you might need to convert the units of some materials (for example, convert volume to kg).

Step 3: Certifier details

In the ‘Certifier’ tab you will add the details of the person who has entered data, and the person who has certified the accuracy of the data. The certifier must be a quantity surveyor, designer, engineer or NABERS assessor.

Step 4: Attach to approval

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

The data collected in this form will be used by the NSW Government to inform future policy development.

Help!

If you have general questions about reporting on the embodied emissions of your building, you should contact your local council or consent authority.

If you have technical questions about this spreadsheet, please contact NABERS:
nabers@environment.nsw.gov.au

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[1] Green Building Council of Australia, 2021, https://new.gbca.org.au/news/gbca-news/gbca-and-thinkstep-release-embodied-carbon-report/

Step 1: About the building

Fill out blue cells

Building location and site data	Value	Unit	Note	Comment
Building address	1 McIntosh Drive, Mayfield West			
Postcode	2304		Required	Postcode of building
Town/city	KOORAGANG + 8 other localities		Town/city/suburb/region automated from postcode (may not give exact town name)	Town/city/suburb/region of the building site.
Distance to nearest major city/town		km	Enter for rural/regional locations only	Declare the shortest route by road to your site from the centre of your nearest major city (>100,000 people). The route must be traversable by a semitrailer truck.
Project stage	Development Application		Required	Stage of development
New build or major renovation?	New build		Required	
Brownfield or greenfield site?	Greenfield		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	Gross Floor Area (GFA), as defined by the AIQS Australian Cost Management Manual
Class 1b: Boarding houses and hostels			m²	Required for Class 1b: Boarding house, guest house, hostel	Net area (Net Lettable Area, Net Sellable Area, Usable Floor Area), as defined by the PCA's Method of Measurement
Class 2: Multi-unit residential buildings			m²	Required for Class 2: Multi-unit residential, including apartment buildings	
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			m²	Required for Class 6: Retail building, e.g., shop, restaurant, café	
Class 7a: Carparks			m²	Required for Class 7a: Carparks	
Class 7b: Warehouse-type buildings			m²	Required for Class 7b: Warehouses, wholesalers and storage facilities	
Class 8: Industrial buildings	240	240	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	240	240	m²	Required: Sum of m² inputs must be more than 0.	

Project information	Value	Unit	Note	
Total cost of project	280,980,000	AUD excl. GST	Required	Include labour, materials, transport, plant, equipment and professional fees. Exclude GST, land, finance, escalation and other costs.
Building design life	50	years	Required	If uncertain, enter 50 years
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	50,600	m²	Required	Total area of site to external boundary.
Shared services or infrastructure	No		Required	Indicate if there are shared services that the building utilises, or shared foundations, basement or podium
Building footprint area	240	m²	Required	Total floor area of the ground floor measured to the outside edge of the floorplate.
Typical floor area (if different to building footprint area)		m²	Only needed if different to row above	
Typical floor perimeter	72	m	Required	
Area of external carpark (not included in GFA)	0	m^2	Required. Enter 0 if not applicable.	
Area of external hardstand (not included in GFA)	800	m^2	Required. Enter 0 if not applicable.	
Area of other hard landscaping (not included in GFA)		m^2	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	1	no.	Required	
Number of floors/storeys below ground	0	no.	Required. Enter 0 if not applicable.	
Number of floors/storeys of car parking	0	no.	Required. Enter 0 if not applicable.	
Total height above ground	4	m	Required	Measured from the average finished grade to the highest point of the building, excluding protrusions (lighting rods, masts, chimneys, etc.)

Structural material choices	Value	Unit	Note	
Foundation type	Spot/pad footing		Required	
Frame type (dominant)	Steel		Required	
Suspended floor type (typical)			Only needed for multi-storey buildings	
Describe low carbon materials specified in your building (e.g. green concrete, low carbon bricks)	None prescribed at preliminary/concept design. Opportunity to specify supplementary cementitious materials in concrete at future design stages.		Required	
Describe recycled content specified in your building (e.g. recycled steel)	None prescribed at preliminary/concept design. Opportunity to specify recycled materials in aggregates and asphalt at future design stages.		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 spend 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	-	-		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	-	-		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 cubic metres, 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	-	-		m³	Enter as cubic metres, 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 cubic metres, 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	-	-		kg	**Include all reinforcing steel bar/mesh in the building's structure 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.	01_SB or 02-11	02 or 03
Reinforcing steel	Fibre & strand	-	-		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	Include any allowance for connections here	01_SB	02 or 03
Structural steel	Sheet	-	-		t		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	Enter as cubic metres, calculated as (area of wall in m²) * (thickness in mm / 1000)	02_11	02 or 03
Brick	Heat cured	-	-		m³	Enter as cubic metres, calculated as (area of wall in m²) * (thickness in mm / 1000)	02_11	02 or 03
Structural Insulated Panel (SIP)	Steel outer	-	-		m²		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	-	-		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 spend 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 >>)		-		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	-	-		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	-		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	Include all double glazing, including standard, toughened, laminated and low-E	06_EW	03 or 04
Stick-framed wall system	Steel 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	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 (opague)	-		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 square metres, not quantity	08_ED	03 or 04
Roller doors	Hardwood over steel	-	-		m²	Please note unit is square metres, not quantity	08_ED	03 or 04
Roller doors	Softwood over steel	-	-		m²	Please note unit is square metres, 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 spend 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

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.

					Unit of measure			
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. Where possible, enter material costs excluding labour, plant, equipment, margins and taxes.	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	-	-	-	80	%	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	-	-	18	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	-	-	1161	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	-	-	1189	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	-	-	245778	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 >>)	Battery	-	-	112	no.	BESS units (Megapacks)		
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	Timothy Lee Fenwick	Required
Company	AECOM	Required
ABN		
Profession	Sustainability Engineer	Required
Qualification or registration	Infructure Sustainability Accredited Professional	Required

Person that certified the details in this form (only on the quantities for the BESS units and its associated in situ concrete and steel reinforcement for the calculation of emissions only)	**Value**	**Note**
Name	Kim Chia	Required
Company	AECOM	Required
ABN		
Profession	Quantity Surveyor	Required
Qualification or registration	RICS	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?	The buildings's structure and envelope are insignificant compared to the external works, so quantities have not been included for these sections. The project is not seeking a NABERS rating, so this requirement is not applicable.	

Additional comments from data provider

Additional comments of certifier

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