

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 costs 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 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

[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&3 Careel Head Road Avalon Beach NSW | | | |
| Postcode | 2107 | | Required | Postcode of building |
| Town/city | AVALON + 10 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? | Brownfield | | Required | |

| Floor area by NCC building classification | Gross (GFA) | Net (NL/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 | | | m ² | Required for Class 1a: Detached residential houses, townhouses |
| Class 1b: Boarding houses and hostels | | | m ² | Required for Class 1b: Boarding house, guest house, hostel |
| Class 2: Multi-unit residential buildings | | | m ² | Required for Class 2: Multi-unit residential, including apartment buildings |
| Class 3: Other residential buildings | | | m ² | Required for Class 3: Other residential buildings |
| Class 4: Residential inside non-residential | | | m ² | Required for Class 4: Residential building inside a non-residential building, e.g., caretaker residence |
| Class 5: Office buildings | | | m ² | Required for Class 5: Office building |
| Class 6: Retail buildings | 682 | 658 | m ² | Required for Class 6: Retail building, e.g., shop, restaurant, café |
| Class 7a: Carparks | | | m ² | Required for Class 7a: Carparks |
| Class 7b: Warehouse-type buildings | | | m ² | Required for Class 7b: Warehouses, wholesalers and storage facilities |
| Class 8: Industrial buildings | | | m ² | Required for Class 8: Industrial buildings, e.g., factories and workshops |
| Class 9a: Healthcare buildings | | | m ² | Required for Class 9a: Healthcare, e.g., hospitals, clinics, day surgeries |
| Class 9b: Civic buildings | 353 | 353 | m ² | Required for Class 9b: Civic buildings, e.g., theatres, civic centres, train stations |
| Class 9c: Aged care and personal care buildings | | | m ² | Required for Class 9c: Aged care and personal care |
| Class 10a: Non-habitable buildings | | | m ² | Required for Class 10a: Non-habitable buildings including sheds, carports and private garages |
| Class 10b: Miscellaneous structures | | | m ² | Required for Class 10b: Miscellaneous structures, including fences, masts, antennas, retaining walls and swimming pools |
| Class 10c: Bushfire shelters | | | m ² | Required for Class 10c: Bushfire shelters not attached to a Class 1a building |
| Total | 1,035 | 1,011 | m ² | Required: Sum of m ² inputs must be more than 0. |

| Project information | Value | Unit | Note |
|---|-----------|---------------|----------|
| Total cost of project | 6,588,080 | AUD excl. GST | Required |
| 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 | 1,770 | m ² | Required |
| Shared services or infrastructure | No | | Required |
| Building footprint area | 1,528 | m ² | Required |
| Typical floor area (if different to building footprint area) | | m ² | Only needed if different to row above |
| Typical floor perimeter | 170 | m | Required |
| Area of external carpark (not included in GFA) | 148 | m ² | Required. Enter 0 if not applicable. |
| Area of external hardstand (not included in GFA) | 612 | m ² | Required. Enter 0 if not applicable. |
| Area of other hard landscaping (not included in GFA) | 176 | m ² | Required. Enter 0 if not applicable. |
| Number of floors/storeys above ground, including ground floor | 2 | no. | Required |
| Number of floors/storeys below ground | 1 | 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 | 8 | m | Required |

| Structural material choices | Value | Unit | Note |
|---|--|------|--|
| Foundation type | Slab-on-ground | | 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) | The project intend to be constructed using post tensioned slab structure there by reducing concrete volume and steel mass in comparison with a conventional reinforced slab structure. | | Required |
| Describe recycled content specified in your building (e.g. recycled steel) | Wherever required reinforcing Bar and Mesh products shall have a minimum of 90% recycled content. | | Required |

| | | | | | | | |
|---|----------------------------|---------------------|----------------------|-------|----------------|--|----------------|
| Stick-framed wall system | Steel frame | Opaque section | Insulated shadow box | | m ² | 06_EW | 03 or 04 |
| Stick-framed wall system | Steel frame | Opaque section | Brick cladding | | m ² | 06_EW | 03 or 04 |
| Stick-framed wall system | Steel frame | Opaque section | Stone cladding | | m ² | 06_EW | 03 or 04 |
| Stick-framed wall system | Other (Please describe >>) | | | | m ² | Please enter a description for any wall system that does not fit a predefined classification | 06_EW |
| Wall louvre system | Aluminium | - | - | | m ² | | 06_EW |
| External shading system | Aluminium frame | Aluminium cladding | - | | m ² | Please enter as m ² of shaded area = linear metres * (width in mm / 1000) | 06_EW |
| External shading system | Aluminium frame | GRC cladding | - | | m ² | Please enter as m ² of shaded area = linear metres * (width in mm / 1000). GRC = Glass-fibre Reinforced Concrete. | 06_EW |
| External shading system | Aluminium frame | Terracotta cladding | - | | m ² | Please enter as m ² of shaded area = linear metres * (width in mm / 1000) | 06_EW |
| External shading system | Aluminium frame | Stone cladding | - | | m ² | Please enter as m ² of shaded area = linear metres * (width in mm / 1000) | 06_EW |
| External shading system | Aluminium frame | Pre-cast concrete | - | | m ² | Please enter as m ² of shaded area = linear metres * (width in mm / 1000) | 06_EW |
| External shading system | Aluminium frame | Timber | - | | m ² | Please enter as m ² of shaded area = linear metres * (width in mm / 1000) | 06_EW |
| External shading system | Aluminium frame | Glass (opaque) | - | | m ² | Please enter as m ² of shaded area = linear metres * (width in mm / 1000) | 06_EW |
| External shading system | Aluminium frame | Steel | - | | m ² | Please enter as m ² of shaded area = linear metres * (width in mm / 1000) | 06_EW |
| External shading system | Other (Please describe >>) | | | | m ² | Please enter as m ² of shaded area = linear metres * (width in mm / 1000) | 06_EW |
| Roller doors | Steel profile | - | - | | m ² | Please note unit is <u>square metres</u> , not quantity | 08_ED |
| Roller doors | Hardwood over steel | - | - | | m ² | Please note unit is <u>square metres</u> , not quantity | 08_ED |
| Roller doors | Softwood over steel | - | - | | m ² | Please note unit is <u>square metres</u> , not quantity | 08_ED |
| Revolving doors | Glass/aluminium/steel | - | - | | no. | | 08_ED |
| Fire-rated doors | Engineered timber | - | - | | 3 no. | Please enter as single-leaf equivalent. For double-leaf doors, multiply the quantity by 2. | 08_ED |
| Fire-rated doors | Steel | - | - | | no. | Please enter as single-leaf equivalent. For double-leaf doors, multiply the quantity by 2. | 08_ED |
| Fire-rated doors | Aluminium/glass | - | - | | no. | Please enter as single-leaf equivalent. For double-leaf doors, multiply the quantity by 2. | 08_ED |
| Insulation | Glass wool / fibreglass | - | - | 439.0 | m ² | Please include both wall and ceiling insulation | 05_RF or 06_EW |
| Insulation | Stone wool | - | - | | m ² | Please include both wall and ceiling insulation | 05_RF or 06_EW |
| Insulation | Polyester | - | - | | m ² | Please include both wall and ceiling insulation | 05_RF or 06_EW |
| Insulation | Expanded polystyrene | - | - | | m ² | Please include both wall and ceiling insulation | 05_RF or 06_EW |
| Insulation | Other (Please describe >>) | | | | m ² | Please include both wall and ceiling insulation | 05_RF or 06_EW |
| 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 | | | | 60 | % | 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 |
| Interior wall (permanent) | Timber framing | - | - | | m ³ | | 09_NW |
| Interior wall (permanent) | AAC panel (reinforced) | - | - | 200.0 | m ² | Panels of autoclaved aerated concrete (AAC) with reinforcing steel. E.g., Hebel. | 09_NW or 12_WF |
| Interior wall (permanent) | Concrete-filled steel panel | - | - | | m ² | Panels made from a steel sheet outer with an aerated concrete core. E.g., Speedpanel. | 09_NW or 12_WF |
| Interior wall (permanent) | Plasterboard | - | - | 155 | m ² | Enter as single-layer equivalent. If using 2 layers, multiply the area by 2. | 09_NW or 12_WF |
| Interior wall (permanent) | Plywood | - | - | | m ² | Enter as single-layer equivalent. If using 2 layers, multiply the area by 2. | 09_NW or 12_WF |
| Interior wall (permanent) | Fibre cement sheet | - | - | | m ² | Enter as single-layer equivalent. If using 2 layers, multiply the area by 2. | 09_NW or 12_WF |
| Interior wall (permanent) | Insulation | - | - | 355.0 | m ² | | 09_NW or 12_WF |
| Interior wall (permanent) | Glass | - | - | | m ² | | 09_NW or 12_WF |
| Interior wall (permanent) | Other (Please describe >>) | | | | m ² | Please enter a description for any internal wall that does not fit a predefined classification | 09_NW or 12_WF |
| Internal door (permanent) | Aluminium/glass | - | - | 12 | no. | Please enter as single-leaf equivalent. For double-leaf doors, multiply the quantity by 2. | 11_ND |
| Internal door (permanent) | Timber/glass | - | - | | no. | Please enter as single-leaf equivalent. For double-leaf doors, multiply the quantity by 2. | 11_ND |
| Internal door (permanent) | Timber solid lightweight | - | - | 25 | no. | Please enter as single-leaf equivalent. For double-leaf doors, multiply the quantity by 2. | 11_ND |
| Internal door (permanent) | Fire resistant | - | - | 4 | no. | Please enter as single-leaf equivalent. For double-leaf doors, multiply the quantity by 2. | 11_ND |
| Internal door (permanent) | Steel | - | - | | no. | Please enter as single-leaf equivalent. For double-leaf doors, multiply the quantity by 2. | 11_ND |
| Internal door (permanent) | Other (Please describe >>) | | | | no. | Please enter a description for any internal door that does not fit a predefined classification | 11_ND |
| 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 <u>within the main building contract</u> . 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 | - | - | - | 265,000 | AUD excl. GST | Where possible, enter material costs excluding labour, plant, equipment, margins and taxes | 28_SS |
| Vertical transportation | - | - | - | 100,000 | AUD excl. GST | Where possible, enter material costs excluding labour, plant, equipment, margins and taxes | 28_SS |
| Electrical services | - | - | - | 150,000 | AUD excl. GST | Electrical services including the main power supply, backup generators, security and communications. Excluding solar installations. | 26_LP |
| Solar photovoltaic installations | - | - | - | 24,000 | AUD excl. GST | Where possible, enter material costs excluding labour, plant, equipment, margins and taxes. | 26_LP_LPGP |
| Plumbing/hydraulic services | - | - | - | 55,000 | AUD excl. GST | Where possible, enter material costs excluding labour, plant, equipment, margins and taxes | 18_PD and 19_WW |
| Fire services | - | - | - | 60,000 | AUD excl. GST | Where possible, enter material costs excluding labour, plant, equipment, margins and taxes | 25_FPSS04 or 39_XAW_03 or 41_XF |
| 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 <u>spend</u> for external works (excluding soft landscaping) entered below. Minimum requirement = 80%. Exclude head contractor preliminaries and margins. | |
| Asphalt | - | - | - | | t | | 33_XR |
| Concrete in-situ | ≤10 MPa | - | - | 48.0 | m ³ | Please enter reinforcing steel as part of "Reinforcing steel" below | 33_XR or 34_XN or 35_XB or 36_XL |
| Concrete in-situ | >10 MPa to ≤20 MPa | - | - | | m ³ | Please enter reinforcing steel as part of "Reinforcing steel" below | 33_XR or 34_XN or 35_XB or 36_XL |
| Concrete in-situ | >20 MPa to ≤32 MPa | - | - | | m ³ | Please enter reinforcing steel as part of "Reinforcing steel" below | 33_XR or 34_XN or 35_XB or 36_XL |
| Concrete in-situ | >32 MPa to ≤40 MPa | - | - | | m ³ | Please enter reinforcing steel as part of "Reinforcing steel" below | 33_XR or 34_XN or 35_XB or 36_XL |
| Concrete in-situ | >40 MPa to ≤50 MPa | - | - | | m ³ | Please enter reinforcing steel as part of "Reinforcing steel" below | 33_XR or 34_XN or 35_XB or 36_XL |
| Concrete in-situ | >50 MPa | - | - | | m ³ | Please enter reinforcing steel as part of "Reinforcing steel" below | 33_XR or 34_XN or 35_XB or 36_XL |
| Pavers, bricks and blocks | Concrete | - | - | | m ² | | 33_XR |
| Pavers, bricks and blocks | Clay | - | - | 123 | m ² | | 33_XR |
| Reinforcing steel | Bar & mesh | - | - | 960 | kg | Include all reinforcing steel bar/mesh in the external works in this row. Usually this is calculated as kg/m ³ per concrete element and then summed. Example: 10 m ³ of 40 MPa concrete @ 100 kg/m ³ + 5 m ³ of 50 MPa concrete @ 150 kg/m ³ = 1,750 kg reinforcing steel. | 33_XR or 34_XN or 35_XB or 36_XL |
| 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 |
| Structural steel | - | - | - | | t | | 02_11 |
| Structural aluminium | - | - | - | | t | Includes structures, louvre systems, etc. | 35_XB |
| External roof/wall cladding | Polycarbonate | - | - | | m ² | Enter as profiled polycarbonate sheet that would ordered, including allowance for overlap | 35_XB |
| External roof/wall cladding | PVC | - | - | | m ² | Enter as profiled PVC sheet that would ordered, including allowance for overlap | 35_XB |
| External roof/wall cladding | Bitumen sheet | - | - | | m ² | Enter as bituminous sheet that would ordered, including allowance for overlap | 35_XB |
| External roof/wall cladding | Steel profile | - | - | | m ² | Enter as profiled steel sheet that would ordered, including allowance for overlap | 35_XB |
| Fill | - | - | - | | t | Include purchased material only. Exclude site-won material. | 33_XR or 34_XN or 35_XB or 36_XL |
| 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 |
| Timber (solid) | Sawn softwood | - | - | | m ³ | | 33_XR or 34_XN or 35_XB or 36_XL |
| Timber (solid) | Sawn hardwood | - | - | | m ³ | | 33_XR or 34_XN or 35_XB or 36_XL |
| Timber (engineered) | CLT | - | - | | m ³ | | 33_XR or 34_XN or 35_XB or 36_XL |
| Timber (engineered) | Glulam | - | - | | m ³ | | 33_XR or 34_XN or 35_XB or 36_XL |
| Timber (engineered) | LVL | - | - | | m ³ | | 33_XR or 34_XN or 35_XB or 36_XL |
| Timber (engineered) | OSB | - | - | | m ³ | | 33_XR or 34_XN or 35_XB or 36_XL |
| Fabric (awning/sunshade) | - | - | - | | m ² | | 35_XB or 36_XL |
| Other (Please describe and add unit >>) | | | | 154.8 | m ³ | Acoustic Barrier of 1.8m high on roof for separating kids outdoor play area from building facade. | |
| 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 | UPKAR AGARWAL | Required |
| Company | DYNAMIC OPTIMUM | Required |
| ABN | 13525711386 | |
| Profession | NABERS ASSESSOR | Required |
| Qualification or registration | MECHANICAL ENGINEER | Required |

| Person that certified the details in this form | Value | Note |
|--|---------------------|----------|
| Name | UPKAR AGARWAL | Required |
| Company | DYNAMIC OPTIMUM | Required |
| ABN | 13525711386 | |
| Profession | NABERS ASSESSOR | Required |
| Qualification or registration | MECHANICAL ENGINEER | Required |

| Confirmation of certification | Value | Note |
|---|-------|----------|
| Are 80% of material costs captured for the building's structure, envelope and external works? | Yes | Required |
| If no - why not? | | |

| Additional comments from data provider |
|--|
| Cost of construction & services involved has been arrived from Qunaity Surveyor report (draft) from RICQS dated 12/07/2024 |

| Additional comments of certifier |
|--|
| Material specification and quantities have been calculated from arhitectural layout drawing nos. DA1005, 1100, 1101,1102,1103, 2001 , 2002, 2003, 3001, 3002, 4001, 8001& 8003 all rev A dated June 2024 |

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