NABERS

The Rules

Embodied Carbon

Version 1.0 — November 2024

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1 Introduction

1.1 General

The National Australian Built Environment Rating System (NABERS) is a performance-based rating system managed by the **National Administrator**.

NABERS ratings are expressed as a number of stars, as follows:

NABERS rating	Performance comparison
6 stars ★★★★★★	Market-leading building performance
5 stars ★★★★★	Excellent building performance
3 stars ★★★	Market-average building performance

V1.0: Due to data availability at the time of rating tool creation, a star rating may not be available for some building types. These buildings can still be certified with a verified measure of emissions intensity. An updated version of these **Rules**, released in the first quarter of 2025, will confirm the building types for which a star rating is available.

An accredited NABERS Embodied Carbon rating is awarded when the **National Administrator** certifies a rating completed by an **Assessor**. The **National Administrator** may independently audit the rating and assist in resolving complex technical issues.

This document contains **Rules** for **Assessors** conducting a NABERS Embodied Carbon rating as follows:

a) **Rated area**, see Chapter 4.
b) Building attributes, see Chapter 5.
c) **Land use and land use change**, see Chapter 6.
d) Minimum material coverage, see Chapter 7.
e) Material quantities, see Chapter 8.
f) **Emission factors**, see Chapter 9.
g) **Carbon removals**, see Chapter 10.
h) Transport emissions, see Chapter 11.
i) Construction and commissioning emissions, see Chapter 12.
j) Rating data completeness check, see Chapter 13.
k) Documentation requirements for accredited ratings, see Chapter 14.

1.2 Interpretation of the Rules and Rulings

These **Rules** are to be read in conjunction with the respective NABERS **Rulings** as they apply to the specific building type. **Rulings** are used to address specific issues that may arise after the publication of the **Rules**.

Note: **Rules** texts are amended as required by additional **Rulings** which are published on the NABERS website at www.nabers.gov.au

Where a conflict between these **Rules** and existing **Rulings** is present, the requirements of the **Rulings** take precedence over the **Rules**.

Assessments for an accredited rating must comply with the version of the **Rules** and any relevant **Rulings** current on the day the rating application is lodged to NABERS, unless—

a) the **National Administrator** has specifically approved otherwise in writing; or

b) the assessment is conducted under the terms of a NABERS Commitment Agreement which specifies an earlier version of the **Rules**.

1.3 Situations not covered by the Rules

Assessors must comply with these **Rules** unless prior approval has been sought and approved by the National Administrator.

Where appropriate, **Assessors** may contact the **National Administrator** to propose an alternative methodology, outlining the circumstances and rationale. Prior approval for use is required and may be granted conditionally, on a case-by-case basis and at the **National Administrator**'s discretion.

Procedures not contained within these **Rules** may only be used for a particular rating with prior written approval from the **National Administrator**. Approval to use the same procedure must be sought from the **National Administrator** each time it is proposed to be used. Approval is entirely at the discretion of the **National Administrator**. All written correspondence is required as evidence and should be collected prior to lodging the rating.

1.4 How to use this document

The term "**Rules**" refers to a body of works produced by NABERS that specify what must be examined, tested and documented when an **Assessor** conducts a rating. Wherever the term is used in this document from Chapter 3 onwards, it refers to this document, *NABERS The Rules — Embodied Carbon*. Other **Rules** documents mentioned in the text are distinguished from the present document by the inclusion of their title.

Text appearing **teal** and **bold** is a defined term. Defined terms can be found in Chapter 2 of these **Rules** or in the terms and definitions chapter of the respective **Rules** document.

The following formatting conventions may appear in this text:

V1.0: An updated version of *NABERS The Rules — Embodied Carbon* will be released in the first quarter of 2025, following the completion of the benchmarking process. Text appearing with a blue background explains where changes or clarifications are expected.

⚠ Important requirements and/or instructions are highlighted by an information callout box.

Note: Text appearing with a grey background is explanatory text only and is not to be read as part of the **Rules**.

Example: Text appearing with a green background is intended to demonstrate a worked example of the respective **Rules** section or **Ruling** section.

This is a documentation requirement callout box.

1.5 What is new in this version

This is a first version.

1.6 Related documents

The following documents have been referenced within these **Rules**:

a) CEN (2011). EN 15978:2011: Sustainability of construction works – Assessment of environmental performance of buildings – Calculation method. Brussels: European Committee for Standardization.

b) CEN (2019). EN 15804:2012+A2:2019: Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products. Brussels: European Committee for Standardization.

c) CEN (2013) EN 15804+A1:2013: Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products. Brussels: European Committee for Standardization.

d) CEN (2014) EN 16485: Round and sawn timber – Environmental Product Declarations – Product category rules for wood and wood-based products for use in construction.

e) ISO (2018). ISO 14067:2018: Greenhouse gases – Carbon footprint of products – Requirements and guidelines for quantification. Geneva: International Organization for Standardization.

f) ISO (2019). ISO 21930:2017: Sustainability in buildings and civil engineering works – Core rules for environmental product declarations of construction products and services. Geneva: International Organization for Standardization.

g) NABERS (2024): National emission factors database v1.0: NABERS https://www.nabers.gov.au/ratings/our-ratings/nabers-embodied-carbon

h) NABERS The Rules — Metering and Consumption v2.3 (2024).

Assessors must use the latest version of NABERS Rules and **Rulings** that have been referenced within this document.

2 Terms and definitions

This chapter lists the key terms, and their definitions, that are integral to the proper use of this document.

Term	Definition
acceptable data	Data which meets the applicable accuracy and validity requirements of these **Rules**.
acceptable estimate	A project-specific estimate in accordance with a method allowed by these **Rules** and accompanied by a list of assumptions and references. **Note:** This is different to the definition of **acceptable estimate** used in other NABERS Rules.
Assessor	An accredited person authorised by the **National Administrator** to conduct NABERS ratings.
Auditor	A person employed by or contracted to the **National Administrator** to perform audits of NABERS rating applications.
Bill of Quantities (BoQ)	Provides detailed information of quantities of materials and description of materials that are used in the construction of a building. Will typically list materials, services and extras associated with the build. It may be created in a project at one or more of the below stages of a build: a) Pre-tender, typically within bid packages and during contractor selection. b) Post-tender, after the construction contract is awarded and during design alterations and the construction phase. c) As-built, after construction is complete. A cost plan may be sufficient as a **Bill of Quantities** for the purpose of a NABERS Embodied Carbon rating if it contains accurate material quantities in appropriate units of measure (not just dollar values).

Term	Definition
	A Bill of Materials is a version of a **Bill of Quantities** that focuses on material quantities only, excluding services. A Bill of Materials may be sufficient as a **Bill of Quantities** for the purpose of a NABERS Embodied Carbon rating if it contains accurate material quantities.
biodiesel	Liquid fuel derived from vegetable oils or animal fats. It has physical properties similar to those of petroleum diesel, but it is a cleaner-burning renewable alternative. **Biodiesel** can be blended with traditional fossil fuel diesel (e.g. 10% **biodiesel** and 90% fossil diesel), or be pure **biodiesel**.
biogenic carbon	Carbon that originates from biological sources (plants, trees, soil). It can represent a **carbon removal** from the atmosphere (such as in photosynthesis) or a carbon addition (such as in decomposition or combustion).
brownfield	Land that is reasonably classified as settlement. That is, it has already been developed and therefore has existing urban infrastructure.
cadastral land parcel boundary	The area defined by any of the following authorities: a) Government of Western Australia – Landgate. b) Queensland Government – Queensland Globe. c) Northern Territory Government – Integrated Land Information System (ILIS). d) ACT Government – Environment, Planning and Sustainable Development Directorate. e) South Australian Government – Land Services SA. f) NSW Government – Spatial Services. g) Victorian Government – Vicmap Property. h) Tasmanian Government – Department of Natural Resources and Environment Tasmania. **Note:** In Australian Territories, this may refer to the right to use boundaries under a Crown lease.
carbon dioxide equivalent (CO_2e)	A unit of measurement used to standardise the global warming effects of various greenhouse gases, in terms of the amount of carbon dioxide that would deliver the same global warming effect. Also see **Global Warming Potential (GWP)**.

Term	Definition
carbon emissions	Emissions of greenhouse gases to the atmosphere, such as from combustion of fossil or biogenic fuels. The NABERS Embodied Carbon rating tool refers to the greenhouse gas emissions covered by the UNFCCC/Kyoto Protocol, as referenced in the GHG Protocol amendment 1a.
carbon footprint	The total greenhouse gas emissions associated with a defined scope in a given time frame, expressed as **carbon dioxide equivalent (CO_2e)**.
carbon neutral certified product	A third party-certified product that has demonstrated that it has reduced emissions and compensated for all the remaining emissions associated with the product in accordance with the rules of the certification scheme.
carbon offsets	An action intended to compensate for the emission of **CO_2e** into the atmosphere, where the emission is a result of industrial or other human activity. Offsets are achieved by buying verified carbon credits from emissions reduction products or carbon trading schemes.
carbon removal	The process of removal and storage of carbon dioxide from the atmosphere in carbon sinks (such as forests, woody plants, algae, kelp, mangroves or soils) or through carbon mineralisation. Also referred to as carbon sequestration.
carbon storage	The storage of carbon captured from the atmosphere for a period of time, resulting in a temporary reduction in the concentration of greenhouse gases in the atmosphere.
Climate Active Product Certification	An Australian Government accredited scheme that certifies that a product is carbon neutral in accordance with its rules. It provides certifications beyond the product level, however these other certifications are not considered within these **Rules**.
development scope	The scope of development for the rating – either **new building** or **partial rebuild**.
embodied carbon	**Carbon emissions** across a building's life cycle, excluding **operational carbon**. This includes **upfront embodied carbon**, **use stage embodied carbon** and **end of life carbon**, measured as **CO_2e**. These emissions stem from the materials and products the building is made from and how they are constructed and installed.

Term	Definition
emission factor	A factor that specifies the kilograms of greenhouse gas emissions (**CO_2e**) per unit (e.g. kg, tonne, m^2 or m^3) of product or material. It is used to calculate the greenhouse gas emissions associated with a product, service or activity.
end of life carbon	The **carbon emissions** associated with deconstruction/demolition (C1), transport from site (C2), waste processing (C3) and disposal (C4) phases of a building, infrastructure, product, or material's life cycle which occur after its use. Also see definition of building lifecycle **modules**.
envelope	Includes materials that in whole or as part of a system separate the building's interior from exterior (e.g. windows, doors, roof, exterior walls, exterior cladding and curtain wall).
Environmental Product Declaration (EPD)	A third party-verified and registered document that communicates transparent and comparable information about the life-cycle environmental impact of a product or service. **EPDs** are developed in accordance with international standards ISO 14025 and either EN 15804 or ISO 21930.
external works	Includes carparks, living areas (e.g. outdoor dining, patios, balconies), trafficable hardstands and surfaces (e.g. pathways, overflow carpark, bike cages), kerbs, concrete islands, and retaining walls. Excludes soft landscaping (e.g. gardens, lawns, fields, swales), drainage and stormwater piping.
formwork	A temporary structure that is used to support wet concrete or other building materials until they are formed into a final shape.
formwork (permanent)	**Permanent formwork** remains in place after the concrete or other building material has gained adequate strength. It may contribute to the load-carrying capacity of the structure or simply contain the concrete while it is being cast and gaining strength.
Fully Enclosed Covered Area (FECA)	The sum of all such areas at all building floor levels, including basements (except unexcavated portions), floored roof spaces and attics, garages, penthouses, enclosed porches and attached enclosed covered ways alongside buildings, equipment rooms, lift shafts, vertical ducts, staircases and any other fully enclosed spaces and usable areas of the building, computed by measuring from the normal inside face of exterior walls but ignoring any projections such as plinths, columns, piers and the like which project from the normal inside face of exterior walls.

Term	Definition
	It shall not include open courts, light wells, connecting or isolated covered ways and net open areas of upper portions of rooms, lobbies, halls, interstitial spaces and the like which extend through the storey being computed. Unit of Measurement: Square Metres (m^2). (extracted from AIQS, Australian Cost Management Manual, Volume One, 2022)
Global Warming Potential (GWP)	As defined by the IPCC, **GWP** is a measure of how much heat a greenhouse gas traps in the atmosphere, measured as **carbon dioxide equivalent (CO_2e)**. It has been developed to compare the global warming impact of different gases. The **GWP** depends on how effective the gas is at trapping heat and how long it stays in the atmosphere before it breaks down. This document uses the International Organization for Standardization and **EPD** community definition of **GWP**, whereby **GWP** is the sum of the IPCC **GWP** of all individual gases directly associated with the production of a product or asset (for further information, see the US Environmental Protection Agency). **GWP** is often broken down into the following: a) GWP-fossil (GWP-f or GWPF): **carbon emissions** related to non-biogenic sources. b) GWP-biogenic (GWP-b or GWPB): **carbon emissions** related to biogenic sources. c) GWP-luluc (GWP-l or GWPL): **carbon emissions** related to **land use and land use change (LULUC)**. d) GWP-stored (GWP-s or GWPS): **carbon removals** related to biomass from all sources. e) GWP-total (GWP-t or GWPT): the sum of GWP-fossil, GWP-biogenic and GWP-luluc.
greenfield	Land on which no urban development has previously taken place and the land is reasonably classified as cropland, grassland, forest land or wetland.
Gross Floor Area (GFA)	**Gross Floor Area** is the sum measured in square metres (m^2) of the **Fully Enclosed Covered Area** and **Unenclosed Covered Area.** (extracted from AIQS, Australian Cost Management Manual, Volume One, 2022)

Term	Definition
Life Cycle Assessment (LCA)	An analysis of the environmental impacts of a product, process or a service for its entire life cycle, considering the raw material extraction, production, manufacture, distribution, use and disposal of a product.
land use and land use change (LULUC)	**Land use** refers to the total arrangements, activities and inputs undertaken in a certain land cover type (human actions). Used in the sense of the social and economic purposes for which land is managed (e.g. grazing, timber extraction and conservation). **Land use change** refers to a change in the use or management of land by humans, which may lead to a change in land cover.
measurement standard for rated area	The standard used for determining the **Gross Floor Area (GFA)** of a **rated premises**. For the purposes of the NABERS Embodied Carbon tool, **GFA** is measured according to the AIQS definition, as per the Australian Cost Management Manual, Volume One, 2022.
modules **(also known as building life cycle modules)**	European standards (EN 15804+A2:2019) and international standards (ISO 21930:2017) divide the life cycle of a building into **modules**: a) A1 – Extracting and processing raw materials. That is, mining and refining includes processing recycled materials. b) A2 – The transport of above materials to the manufacturer. c) A3 – The process of manufacturing, including all materials, energy, and product inputs and manufacturing waste generation and waste processing up to the point of disposal or recycling (end-of-waste state). d) A4 – Transport from the manufacturer to the building site. e) A5 – Installation at the building site, including all materials, energy, and product inputs and manufacturing waste generation and waste processing up to the point of disposal or recycling (end-of-waste state). f) B1 to B5 – Use, maintenance, repair, replacement and refurbishment of the building. This is excluded from the rating. g) B6 – Operational energy of the building. This is excluded from the rating.

Term	Definition
	h) B7 – Operational water use of the building. This is excluded from the rating. i) C1 to C4 – End-of-life stages of deconstruction/demolition, transport, waste processing and disposal. This is excluded from the rating. Noting that C1-C4 is embedded in A1-A5 where waste is generated. j) D – Benefits beyond the system boundary associated with reuse recovery and recycling potentials. This is excluded from the rating.
NABERS rating input form	The rating input form provided by NABERS for use by **Assessors** in the calculation of accredited ratings.
National Administrator	The body responsible for administering NABERS, in particular the following areas: a) Establishing and maintaining the standards and procedures to be followed in all aspects of the operation of the system. b) Determining issues that arise during the operation of the system and the making of ratings. c) Accrediting **Assessors** and awarding accredited ratings in accordance with NABERS standards and procedures. The functions of the **National Administrator** are undertaken by the NSW Government.
new building	A building which has reached **practical completion** within the last two years and has achieved its **Occupancy Certificate**.
Occupancy Certificate	An **Occupancy Certificate** or Occupancy Permit is administered by a licenced Building Certifier when it is deemed that the building complies with various regulatory standards and codes and is safe for occupancy.
Occupancy Certificate date	The date of issue of the **Occupancy Certificate** for the building.
operational carbon	The greenhouse gas emissions associated with energy used to operate a building or infrastructure. Often considered as part of energy efficiency measures and the subject of the NABERS Energy rating.
partial rebuild	A construction exercise of major significance that is comparable to prolonging a building's structural life or expanding its **GFA**.

Term	Definition
permanent formwork	See definition for **formwork (permanent)**.
practical completion	Achieved when all necessary construction work is complete, defined by the **Occupancy Certificate date**.
rated area	The final area determined by following the process described in these **Rules**.
rated premises	The building to be rated.
Rules	Authoritative document produced by the **National Administrator** that specifies what must be covered by an **Assessor** in order to produce a rating.
Ruling	An authoritative decision by the **National Administrator** which acts as an addition or amendment to the **Rules**.
stored biogenic carbon	Carbon dioxide which is stored as **biogenic carbon** within an asset (building) for a minimum of 20 years.
substructure	The foundational support system constructed beneath ground level. Its main function is to transfer loads from the building to the underlying soil, through direct contact with the supporting terrain.
superstructure	The component of a building erected above ground level, as the primary supporting structure of the building. This does not include the **envelope**.
Unenclosed Covered Area (UCA)	The sum of all such areas at all building floor levels, including roofed balconies, open verandahs, porches and porticos, attached open covered ways alongside buildings, undercrofts and usable space under buildings, unenclosed access galleries (including ground floor) and any other trafficable covered areas of the building which are not totally enclosed by full height walls, computed by measuring the areas between the enclosing walls or balustrade (i.e. from the inside face of the **UCA** excluding the wall or balustrade thickness). When the covering element (i.e. roof or upper floor) is supported by columns, is cantilevered or is suspended, or any combination of these, the measurements shall be taken to the edge of the paving or to the edge of the cover, whichever is the lesser.

Term	Definition
	UCA shall not include eaves overhangs, sun shading, awnings and the like where these do not relate to clearly defined trafficable covered areas, nor shall it include connecting or isolated covered ways. Unit of Measurement: Square Metres (m²). (extracted from AIQS, Australian Cost Management Manual, Volume One, 2022)
upfront embodied carbon	The **carbon emissions** associated with the materials production and construction phases (**modules** A1-A5) of the life cycle before the building begins to be used. Also known as '**upfront carbon**'. These emissions have already been released into the atmosphere before the building is occupied or the infrastructure begins operation.
use stage embodied carbon	**Carbon emissions** associated with materials and processes needed to maintain the building or infrastructure during use, such as for refurbishments (**modules** B1-B5).

3 Key concepts and procedures

3.1 General

As part of a NABERS rating system, **Rules** provide requirements within the specific rating tools. These **Rules** apply to any building type eligible for a NABERS rating using the NABERS Embodied Carbon rating tools.

After submitting a rating for certification, the **Assessor** must respond to all questions from the **National Administrator** within 10 working days. This is to avoid impacting the certification process.

3.2 Eligibility criteria

3.2.1 General

A building is considered eligible for a NABERS rating if all of the following eligibility criteria are met:

a) *Building type*: must be one of the building types in Section 5.3.1.

V1.0: If a building has multiple uses, each building type may need to be entered separately into the **NABERS rating input form** and weighted by floor area. This will be confirmed once benchmarking is complete, and this section will be updated accordingly. Where a building type within a mixed-use building is not normally rated under the NABERS scheme, clarification must be sought from the **National Administrator**.

b) ***New buildings*** *and* ***partial rebuilds***: **new buildings** or buildings undertaking **partial rebuilds** are eligible for a NABERS rating as soon as **practical completion** is achieved.

c) *Material coverage of the premises*: the minimum material coverage for the **rating scope** and typology must be met, as described in Chapter 7.

d) *Submission deadline*: the rating submission must occur within two years after **practical completion**.

3.2.2 Partial rebuild

An important strategy for reducing **embodied carbon** is to avoid building something. That is, to reuse something that already exists and is fit for purpose.

Partial rebuild is a different **development scope** to a **new building**, to enable a distinction between a building that will reuse, at least in part, an existing building.

A certain amount of construction activity is required to be considered a **partial rebuild** project. The project must be approved as a **partial rebuild** by the **National Administrator** prior to an assessment being undertaken.

When seeking approval for a **partial rebuild** certification process, the **Assessor** must provide evidence that demonstrates the extent of the construction work. This may include information such as one or more of the following:

a) The total **Gross Floor Area (GFA)** of the building being retained and the total **GFA** of any new construction.

b) The percentage of total facade area to be replaced.

c) Description of any added structural elements, such as new columns, beams, slabs, or suspended floors to the building as a whole.

d) Some evidence that the project team considered demolishing and/or building a completely **new building**, instead of adapting the building they would like to certify.

A **partial rebuild** is not a refurbishment or a project that only undertakes a scheduled fit-out replacement, because the building materials associated with such projects (i.e. fixtures, fittings, appliances, finishes, temporary partitions) are not within the material inclusions of a **new building** or **partial rebuild** certification. NABERS will investigate fit-out or refurbishment certifications as a separate assessment scope, at a later date.

Example: Construction extents that may indicate a project can be considered a **partial rebuild** include the following examples:

a) A building replaces at least 50% of its facade by area.

b) A building undertakes significant structural alterations to expand its **GFA** by at least 25%.

c) A fire damaged building undergoes structural shoring up and replacement of at least 50% of its facade or damaged interior by area.

3.2.3 Multi-building rating

It is sometimes appropriate to certify several separate buildings together, as part of one assessment. If a **rated premises** has multiple buildings in one precinct, these buildings can be rated as part of one certification process, provided that—

a) the buildings are on the same site and of similar typologies;

b) all buildings within the assessment complete construction within a two-year period of each other (noting the submission deadline requirements in Section 3.2.1);

c) the buildings have the same building owner; and

d) all buildings within the rating are designed by the same design team and constructed by the same construction team.

3.3 Rating validity

A NABERS Embodied Carbon rating defines the achievement of a building at a certain point in time, determined by the certification date. Unlike other NABERS ratings, there is no identified validity period or expiry date.

3.4 Standards for acceptable data and estimates

3.4.1 General

An assessment for an accredited NABERS Embodied Carbon rating must be based on the **acceptable data** or **acceptable estimates** specified in the **Rules** (including applicable **Rulings**) or as directed by the **National Administrator**.

Data and estimates must be of an acceptable standard. The decision process for determining **acceptable data** in Section 3.4.2 must be followed, except where another process is specifically allowed by a provision of these **Rules**.

Note: Specific procedures related to standards for **acceptable data** and **acceptable estimates** in individual sections of these **Rules** take precedence over the standards in Section 3.4.2. Where specific procedures are followed, the requirement for compliance with Section 3.4.2 is deemed to be satisfied.

3.4.2 Acceptable data

If accurate and verifiable **acceptable data** is available, it must be used. Where a section of the **Rules** allows more than one type of data source to be used and no particular priority is given, the following order of preference applies:

a) *As-built information:* As-built information is the highest quality level. This is information gathered or validated after construction of the building. It must be verifiable against documents, such as invoices from building product suppliers, contracts, or legal documents.
b) ***Acceptable estimate**:* An estimate must be specific to the project. The estimate can be made by any appropriate building professional but must be accompanied by a list of assumptions and references. Estimates are only acceptable in certain cases, which are detailed in the relevant chapters.

For both of the above data sources, one of the below data quality conditions must be met:

1) Data obtained directly by the **Assessor** (for example, if the **Assessor** has taken pictures or measurements from the site or completed building plans).
2) Documents or other records provided by a party to an agreement or transaction which can be verified by another party to the same agreement or transaction. For example, contracts or other legal agreements, invoices and delivery dockets.
3) Documents or other records which cannot be independently verified but their authenticity and accuracy is attested to by a credible and responsible person without a conflict of interest.

4) Written information provided by a credible and responsible person, which includes the full name, position and contact details of the person giving the information.

5) Verbal information provided by a credible and responsible person, recorded in writing by the **Assessor** with the full name, position, and contact details of the person giving the information.

3.5 Documentation and record-keeping

3.5.1 Required documentation

An assessment may be based on copies of original documents such as **bills of quantities**, invoices and other records, as long as the **Assessor** is satisfied that they are, or can be verified to be, true and complete records of the original documents or files. Access to original documents is preferred if they are available. Partial copies of original documents must be sufficient to identify the original document including date, title and file name. Monetary values may be redacted from documentation.

3.5.2 Record-keeping for auditing purposes

Assessors must keep all records on which an assessment is based.

The records kept by **Assessors** must be to such a standard that it would be possible for another **Assessor** or an **Auditor** to accurately repeat the rating using only the documents provided. This includes records of assumptions and all information and calculations used as the basis for **acceptable estimates**. The records kept must be the actual documents used for the assessment or verifiable copies. Summaries or other derivative documents that quote the original source documents are not acceptable, even if prepared by the **Assessor** from original documents.

Digital copies of documents are considered acceptable in all cases.

Records must be kept for seven years from the date the rating application was lodged and be made available for audit on request.

Note: **Assessors** remain responsible for ratings they have conducted, even if they move companies.

A list of the usual documentation for a rating is presented in Chapter 14, however, additional documentation may also be required to permit an **Auditor** to accurately repeat the rating using only the documents provided.

3.6 Alternative methodologies

Assessors may be required to use alternative methodology for obtaining or interpreting data for an assessment where standard methods outlined in the NABERS **Rules** cannot be applied. At a minimum, the alternative methodology must be equivalent to the preferred method in terms of its results, accuracy and validity.

All alternative methodologies must be approved by the **National Administrator** prior to use. For further information, please contact the **National Administrator**.

4 Rated area

4.1 General

In NABERS Embodied Carbon ratings, the **rated area** is used to provide a meaningful comparison of **embodied carbon** among buildings of different sizes.

⚠ The **rated area** for a NABERS Embodied Carbon rating is based on **Gross Floor Area (GFA)** as defined by the AIQS Australian Cost Management Manual, Volume One, 2022. Other methods of measuring or defining **GFA** are not acceptable.

4.2 Process overview

The process for determining the **rated area** is shown in Table 4.2.

Table 4.2: Determining rated area

Step		Reference
1	Determine the **Gross Floor Area (GFA)** of the **rated premises**.	4.3
2	Allocate any **GFA** shared with other buildings.	4.4
3	Calculate the **rated area**.	4.5
4	Determine the **GFA** of any internal car park(s).	4.6

V1.0: The benchmarking process will confirm whether the **GFA** of any internal car park is required. Step 4 may be removed from the next version of the **Rules** if benchmarking determines that internal car park **GFA** is not required.

4.3 Determining Gross Floor Area

4.3.1 Standard for acceptable data

⚠ The **rated area** for a NABERS Embodied Carbon rating is based on **Gross Floor Area (GFA)** as defined by the AIQS Australian Cost Management Manual, Volume One, 2022. Other methods of measuring or defining **GFA** are not acceptable.

The **Assessor** must verify that the **GFA** of the **rated premises** has been determined in accordance with the **measurement standard for rated area**, using one of the following methods (listed in order of preference):

a) Official as-built documentation such as a Building Code of Australia report.

b) Reference to a third-party survey or to lease documentation that is explicitly based on the **measurement standard for rated area**.

c) Architectural schedules, in accordance with the **measurement standard for rated area**.

d) Direct measurement from current site plans or scaled prints, measured to the **measurement standard for rated area**.

e) Site measurements verified by the **Assessor** to have been done to the **measurement standard for rated area**.

For documentation requirements, see Section 14.2.1.

4.3.2 Direct measurement

If the available evidence does not show **GFA** has been measured in accordance with the **measurement standard for rated area**, the **Assessor** may carry out direct measurement from current site plans or scaled prints, or the site itself. This must be measured according to the **measurement standard for rated area**, including **Fully Enclosed Covered Area (FECA)** and **Unenclosed Covered Area (UCA)**.

Refer to the definitions of **Fully Enclosed Covered Area (FECA)**, **Gross Floor Area (GFA)** and **Unenclosed Covered Area (UCA)** in Chapter 2 for guidance on measuring **GFA** in accordance with the **measurement standard for rated area**.

4.3.3 Mixed-use buildings

V1.0: If a building has multiple building types, the **GFA** for each building type may need to be entered separately into the **NABERS rating input form**. This will be confirmed once benchmarking is complete, and this section will be updated accordingly.

Should this be the case, for shared areas such as car parks and lobbies, the **GFA** of these areas are allocated to each building type based on an area-weighted approach.

Example:

A 30,000 m^2 building with equal area (50%) devoted to office and accommodation spaces would be entered as an office building of 15,000 m^2 and an accommodation building of 15,000 m^2.

4.4 Allocating shared GFA

Where a **rated premises** shares part of its **GFA** with another building that is not part of the **rated premises**, such as a shared basement, the following process must be followed to allocate the shared **GFA**:

a) Identify all **GFA** which is shared with one or more buildings that are not part of the **rated premises**.

b) Determine **GFA** of the **rated premises,** excluding any shared areas, as per Section 4.3.

c) Determine **GFA** of the other building(s) with which the **rated premises** shares **GFA**, excluding any shared areas, as per Section 4.3.

d) Calculate the ratio of the **rated premises** to the other building(s).

e) Determine **GFA** of the shared area, as per Section 4.3.

f) Multiply the ratio by the **GFA** of the shared area. This is the portion of the shared **GFA** that is allocated to the **rated premises**.

For documentation requirements, see Section 14.2.1.

4.5 Calculate the rated area

The **Assessor** must determine the **rated area**.

If the **rated premises** does not share any **GFA** with other buildings, the **rated area** is the **GFA** determined in Section 4.3. Otherwise, the **rated area** is the sum of the **GFA** calculated in Section 4.4 b) and the **GFA** calculated in Section 4.4 f).

4.6 Determining GFA of internal car parks

V1.0: If required, methods for determining the **GFA** of internal car parks will be updated in this section following the completion of benchmarking. The revised content will be available by the first quarter of 2025.

For documentation requirements, see Section 14.2.1.

5 Building attributes

5.1 General

In NABERS Embodied Carbon ratings, the site location is used to calculate the transport emissions involved in transporting materials to the building site. The building type and soil conditions are used to customise the benchmark to enable fair comparison between different buildings.

The building dimensions, hard surface areas, structural methods and material are used by the **NABERS rating input form** to calculate expected material quantities and compare them to the provided inputs. This contributes to the completeness check outlined in Chapter 13.

The **Assessor** must determine the following building attributes:

a) Site location and distance from nearest major city/town.

b) Building type.

c) Soil conditions.

V1.0: The benchmarking process will confirm whether soil conditions are required. Section 5.1 c) may be removed from the next version of the **Rules** if benchmarking determines that soil conditions are not required.

d) Building dimensions.

e) Area of external carpark, hardstand, pavement or other hard surface.

f) Structural methods and material.

V1.0: One or more of the building dimensions, hard surface areas, or structural methods and material may not be required depending on the outcome of the benchmarking process. Section 5.1 d) to f) may be changed in the next version of the **Rules** if benchmarking determines any of these are not required for the completeness check outlined in Chapter 13.

5.2 Site location

For NABERS Embodied Carbon ratings, the site location is used to locate the building and determine transport emissions. The **Assessor** must verify the site address and enter it into the **NABERS rating input form**.

The **Assessor** must identify the major city nearest to the **rated premises** by road and determine the distance of the shortest road route from the building site to the city's General Post Office.

A major city is a town that has a population above 100,000 people. A list of major cities is provided in the **NABERS rating input form**. The **Assessor** does not need to determine the population of nearby cities.

The location of the **rated premises** must be verified by the **Assessor** using the **Occupancy Certificate**, land titles, development or planning documentation.

For documentation requirements, see Section 14.3.1.

5.3 Building type

5.3.1 General

The building type is used to determine the minimum material coverage for the rating. The **Assessor** must select the building type that represents the majority of the **rated premises**.

The building type of the **rated premises** must be verified by the **Assessor** using the **Occupancy Certificate**, land titles, development approval or planning documentation.

The **Assessor** must select the building type from the following list:

a) Residential, including—
   1) apartment buildings;
   2) hotels; and
   3) student accommodation.
b) Offices.
c) Hospitals.
d) Retail, including—
   1) retail stores, such as standalone and big box retail;
   2) shopping centres; and
   3) supermarkets.
e) Industrial, including—
   1) warehouses;
   2) storage;
   3) cold stores; and
   4) manufacturing.
f) Public buildings, including—
   1) schools;
   2) universities;
   3) art galleries and museums;
   4) sports centres; and
   5) libraries.
g) Residential aged care.
h) Retirement living.

⚠ Residential aged care and retirement living building types may or may not be suitable for a NABERS Embodied Carbon rating, depending on the design and layout of the premises. Please contact the **National Administrator** prior to rating a residential aged care or retirement living facility.

If the building type of the **rated premises** is not on this list, please contact the **National Administrator**.

For documentation requirements, see Section 14.3.1.

5.3.2 Mixed-use buildings

V1.0: If a building has multiple uses, each building type may need to be entered separately into the **NABERS rating input form** along with the corresponding **rated area**. This will be confirmed once benchmarking is complete, and this section will be updated accordingly.

5.4 Soil conditions

V1.0: If required, criteria for soil conditions will be updated in this section following the completion of benchmarking. The revised content will be available by the first quarter of 2025.

For documentation requirements, see Section 14.3.2.

5.5 Building dimensions

5.5.1 General

The **Assessor** must enter the following information for the **rated premises**:

a) Building height.

b) Number of floors above ground.

c) Total **GFA** for each of—

   1) all floors above ground;

   2) the ground floor; and

   3) all floors below ground.

This information is required for the **NABERS rating input form** to calculate a minimum facade area and a facade to **GFA** ratio. This enables the **NABERS rating input form** to check whether the quantities entered for facade materials are likely to be complete (see Chapter 13 for more information on this process).

5.5.2 Building height

Building height must be measured from the grade line to the top of the uppermost floor's roof.

5.5.3 Number of floors

The **Assessor** must enter the number of floors above ground, not including the floor at ground level.

Intermediate floors that do not extend over the whole ground level floor, and which are partly open and encompassed by the wider building, must not be included in the number of floors above ground. This includes mezzanine floors, and floors such as side offices for warehouses that cover only a portion of the building.

5.5.4 GFA

The total **GFA** of all above ground floors must be calculated by summing the **GFA** of each individual floor above ground. The **Assessor** must exclude the ground floor and include any mezzanine floors, and floors such as side offices for warehouses that cover only a portion of the building.

The total **GFA** of the ground floor must be entered for the ground floor only.

The total **GFA** of all below ground floors (excluding the ground floor) must be calculated by summing the **GFA** of each individual floor below ground.

Where there is a sloping site, a floor may be some combination of above, at or below ground. In this case, the **Assessor** must multiply the **GFA** of the floor by a decimal that corresponds to the percentage of **GFA** above, at or below ground.

Example: By **GFA**, a floor is 20% at ground level and 80% below ground. This equates to 0.2 floors at ground and 0.8 floors below ground. If the total **GFA** for the floor was 500 m^2, the **Assessor** would complete the following calculations:

a) 0.2 × 500 m^2 = 100 m^2 would be the **GFA** of the ground floor.

b) 0.8 × 500 m^2 = 400 m^2 would be added to the total **GFA** of all below ground floors.

5.5.5 Standard for acceptable data

The following are acceptable sources of evidence for the building dimensions of the **rated premises**, listed in order of preference:

a) Land titles, development or planning documentation.

b) Reference to a third-party survey or lease documentation.

c) Architectural schedules.

d) Direct measurement from current site plans or scaled prints.

e) Site measurements verified by the **Assessor**.

The **Assessor** should use the highest priority source available to verify each of the building height, number of floors and **GFA** of the floors. The **Assessor** may use different sources to verify each item as appropriate.

For documentation requirements, see Section 14.3.3.

5.6 Area of external carpark, hardstand and pavement

The area of external carpark, hardstand, pavement or other hard surface must be measured for all building types which have “External uncovered pathways, access roads, hardstands and retaining walls” included in their minimum material coverage (see Table 7.3).

This area measurement must include all hard areas, such as paved or gravelled carpark, access roads, paved areas and footpaths, even if they are not connected to each other. It must be measured from the outer extent of each hard area.

Hard areas already included in the **GFA** measurement, such as enclosed carparks, must not be included in this measurement.

The acceptable sources of evidence are the same as the acceptable sources of evidence for building dimensions outlined in Section 5.5.5.

For documentation requirements, see Section 14.3.3.

5.7 Structural method and materials

The **Assessor** must determine the following, for the project:

a) Predominant frame type.

b) Predominant suspended floor type.

This information should be sought from the project’s structural engineer, civil engineer, or main contractor.

The **NABERS rating input form** uses the information about the structural method and materials to determine an expected quantity range for key materials such as concrete, reinforcing steel, structural steel and timber.

For documentation requirements, see Section 14.3.4.

6 Land use and land use change

6.1 General

If a building site was a **greenfield** site when the site was acquired for construction, then a calculation is required to determine the emissions associated with **land use and land use change (LULUC)**.

6.2 Process overview

The process for determining the **land use and land use change (LULUC)** is shown in Table 6.2.

Table 6.2: Determining land use and land use change

Step		Reference
1	Determine whether the site condition at purchase was **greenfield** or **brownfield**.	6.3
2	If the site condition was **greenfield**, identify the landscape type and associated area.	6.4
3	If the site condition was **brownfield**, no further evidence is required.	6.5

6.3 Determining site condition before construction

The site condition when the site was purchased must be verified by one of the following methods, listed in order of preference:

a) Reference to a third-party survey or state land title registry with description of the land use, or satellite photographic evidence of the site, the year directly prior to the land being acquired.

b) Satellite imagery software showing the extent of the site within the **cadastral land parcel boundary**.

c) Reference to a national database such as the Australian Government's Land use of Australia Web Map 2015-16 Australian Land Use and Management (ALUM) Classification v8 dataset.

Note: The Australian Government Land use of Australia Web Map uses data from 2015-16 and may be updated from time to time. Due to the data being from 2015-16 (at the time of publishing these **Rules**), it may not always be representative of the land-use directly prior to the land being acquired. However, because potential data sources are limited, this database is considered to be fit-for-purpose despite this known limitation.

On the basis of the above sources, the **Assessor** must determine whether the site was **greenfield** or **brownfield**.

If the site contained any cropland, forest, grassland, or wetland land types prior to site purchase, it must be declared to be **greenfield**.

If the site contained only settlement land, and no cropland, forest, grassland, or wetland at the time of site purchase, the site condition is **brownfield**.

For documentation requirements, see Section 14.4.1.

6.4 Greenfield land

6.4.1 General

Impacts from **land use and land use change** must be included if construction takes place on any **greenfield** land.

The area of transformed land must be confirmed. Any land that remains in its original form is excluded from the **greenfield** area.

The **Assessor** must ensure that the information accurately reflects the current configuration of the **rated premises** and its land type at the time of site purchase.

6.4.2 Confirming the land type

The **Assessor** must confirm what land types were present within the **cadastral land parcel boundary** at the time of site purchase. One or more of the following land types must be selected:

a) *Cropland:* arable and tillage land. Includes annual croplands, dry cropland, dry horticulture, irrigated cropping, intensive horticulture and animal production, perennial croplands. Subsistence agriculture, and shifting cultivation also fall within the cropland category. Mixed systems of cropland and pastureland are also typically included as cropland, as the land's use for forage crops or grazing is temporary.

b) *Forestland:* land area with woody vegetation. Broadly speaking, managed lands in this category include plantation forest, native forest, managed resource protection for various reasons including forest fire management and timber extraction. Natural forests are primary forests, and secondary forests following natural regrowth due to land abandonment or afforestation/reforestation.

c) *Grassland:* generally defined by perennial grasses and vegetation structures below the forest land threshold. Systems most commonly used for grazing of native vegetation, grazing modified pastures, irrigated pastures, and withstand regular perturbation from both grazing and fire. Land areas in this category further include rangeland, pastureland, silvopasture, native grasslands and savannahs.

d) *Wetland:* includes perennial lakes, reservoirs, swamps and major water course areas.

e) *Settlement:* developed land including urban intensive areas of residential and industrial infrastructure, including cities, towns and transport networks. Also manufacturing, industry, commercial and communications including airports. Other areas of minimal use, in transition or mining and waste and not classified as cropland, forestland, grassland or wetland, as above, is also included.

6.4.3 Calculating the area

Determine the area of each land type, based on the **cadastral land parcel boundary** area of the **rated premises**.

If there is more than one land type, the **Assessor** must enter the area for each of them.

The area of each land type must be measured by one of the following methods (listed in order of preference):

a) Reference to a third-party survey, State land title registry, deposited plan or registered plan.

b) Direct measurement of the area from current plans, scaled prints or using satellite imagery software within the **cadastral land parcel boundary**.

The **Assessor** must ensure that the information accurately reflects the configuration of the site at the time of purchase.

For documentation requirements, see Section 14.4.1.

6.5 Brownfield land

Brownfield sites do not need to include **LULUC** impacts.

If any portion of the site is identified as **greenfield**, the site must be treated as **greenfield** and the method outlined in Section 6.4 must be applied.

7 Minimum material coverage

7.1 General

In NABERS Embodied Carbon ratings, the **Assessor** must confirm the key materials that make up the building. This chapter defines the minimum material coverage that is required for each building type.

The material coverage requirements ensure a standardised, fair, and comparable measurement of buildings of the same type.

7.2 Process overview

The **Assessor** must enter the minimum material inclusions that are required for their building type into the **NABERS rating input form**.

The **Assessor** must also allocate each material to the section of the building that it was used in, such as **substructure**, **superstructure** or **envelope**.

7.3 Material coverage for each building type

The materials that must be included for each building type are outlined in Table 7.3.

If the building type of the **rated premises** is not on this list, please contact the **National Administrator**.

Table 7.3: Material inclusions and exclusions by building type

Material	Residential, offices	Hospitals	Residential aged care, retirement living, public buildings	Retail	Industrial
Aggregate, fill, asphalt, concrete kerb	×	✓	✓	✓	✓
Concrete/masonry	✓	✓	✓	✓	✓
Reinforcement	✓	✓	✓	✓	✓
Structural framing	✓	✓	✓	✓	✓

Material	Residential, offices	Hospitals	Residential aged care, retirement living, public buildings	Retail	Industrial
Structural bearing fasteners (i.e. shear plates)	✓	✓	✓	✓	✓
Roofing works	✓	✓	✓	✓	✓
External walls and cladding	✓	✓	✓	✓	✓
External shading, louvres, walkway coverings	✓	✓	✓	✓	✓
Internal walls including framing, wall lining	✓	✓	✓	×	×
Internal balustrades (i.e. to stairs and internal balconies)	×	×	×	✓	×
Stairs	✓	✓	✓	✓	✓
Windows/curtain wall	✓	✓	✓	✓	✓
Flooring (carpet, tiles, access flooring)	✓	✓	✓	✓	×
Ceiling works	✓	✓	✓	✓	×
External pools, patios, recreational areas	✓	✓	✓	✓	✓
External uncovered pathways, access roads, hardstands and retaining walls	×	✓	✓	✓	✓
External fencing railings	×	×	×	×	✓
Vertical transportation services	✓	✓	✓	✓	✓

Material	Residential, offices	Hospitals	Residential aged care, retirement living, public buildings	Retail	Industrial
Building services (single rate applied based on m^2 of **rated area** as per Section 9.6)	✓	✓	✓	✓	✓
Permanent formwork	✓	✓	✓	✓	✓
External doors	✓	×	✓	×	✓
Non-permanent **formwork** (temporary scaffolding, concrete forming)	×	×	×	×	×
Fixtures/fittings	×	×	×	×	×
Minor fastener nails, bolts, screws	×	×	×	×	×
Internal doors – including fire doors	×	×	×	×	×
Insulation (see **Note**)	×	×	×	×	×
Waterproofing membrane	×	×	×	×	×
Door/window hardware	×	×	×	×	×
Adhesives and sealants	×	×	×	×	×
Mortar	×	×	×	×	×
Signs	×	×	×	×	×
Appliances, furniture	×	×	×	×	×
Decorative painting, and applied finishes	×	×	×	×	×
External fixtures, drainage services	×	×	×	×	×
Soft landscaping	×	×	×	×	×
Shade cloth or fabric	×	×	×	×	×

Note: Insulation is included in the material coverage by default if the insulation forms part of a structural insulated panel or plasterboard, or is embedded in some other structural component. This is because in these cases, it is not practical to separate out structural materials from insulation, and the inclusion of this integrated insulation makes a very minor difference to the rating overall. Insulation batts, boards and similar, which only serve the purpose of insulation, are not included in the minimum material coverage.

7.4 Allocating materials to building sections

The **Assessor** must allocate all building materials to the building section or activity that it is used for. The building sections and activities are as follows:

a) *Site preparation:* imported fill materials associated with preparing the site prior to the build, such as aggregate, engineered fill, sand, concrete for levelling (non-structural). This does not include the demolition of former buildings.

b) ***Substructure**:* the foundational support system constructed beneath ground level. Its main function is to transfer loads from the building to the underlying soil, through direct contact with the supporting terrain.

c) ***Superstructure:*** the components of a building erected above ground level as the primary supporting structure of the building, not including the **envelope**.

d) ***Envelope**:* the components that separate the inside from the outside of the building. This includes external walls, curtain wall, windows, doors, and roof. Where an **envelope** component is also required for primary support, it must be allocated to the **envelope**.

e) *Internal:* items including stairs, floors, ceilings and internal walls (whether structural or non-structural). Fixtures and fittings, furniture, kitchenettes and items covered by building services are excluded from this section.

f) ***External works**:* areas outside the **rated area** that may have a material impact on **upfront carbon** and are directly associated with the building. This includes car parks, hardstands, external walls and fences, and access roads.

g) *Building services:* components related to delivering electrical, mechanical, plumbing and vertical transportation services. Material coverage for most building services is calculated by the **NABERS rating input form**, using the building type and **rated area** of the building (see Section 8.6). Material coverage for vertical transport is calculated by the **NABERS rating input form** using the number of lift cars and individual escalators. Individual materials for building services do not need to be entered by the **Assessor**.

7.5 Repurposed materials

Building materials may be repurposed from a previous structure at the same site or transported from another site.

Building materials that are reused onsite in their original state can be considered materials with zero **embodied carbon** and do not need to be reported in the **NABERS rating input form**. Original state includes 'making good'.

Building materials that are reused after being reclaimed from another site can also be considered to have zero **embodied carbon**. However, they must have transport emissions added. Therefore, the **Assessor** must enter these materials into the **NABERS rating input form** with zero emissions for the material itself, but with the required transport inputs, so that transport emissions can be calculated.

Where repurposed building materials are not used in their original state, there may be emissions involved in shoring up or other activities. These emissions are typically insignificant to a building's rating, and will therefore usually be considered out of scope. Where an **Assessor** believes that such activities may be significant, that is, greater than 1 % of total **upfront carbon** for the **rated premises**, the **Assessor** must contact the **National Administrator** prior to submitting the rating. The **Assessor** must provide draft calculations and reasoning for review by the **National Administrator**.

For documentation requirements, see Section 14.5.1.

7.6 Demolition impacts

Emissions from the demolition of any buildings or structures that existed previously are not included in the **embodied carbon** calculation.

The material coverage for the **rated premises** begins from when all the previous structures are demolished, and all rubble is cleared from the site.

7.7 Partial rebuild

For the rating of a **partial rebuild**, all materials in the minimum material coverage for that building type as per Table 7.3 must be included. Materials that remain unchanged from their original state do not need to be entered as per Section 7.5.

The **Assessor** must enter a brief description of the scope of works for the **partial rebuild**, outlining the key components that have been retained from the existing building. The **Assessor** must retain supporting evidence such as a planning report, Owner's Project Requirements (OPR) or written confirmation from the developer or builder.

For documentation requirements, see Section 14.5.2.

7.8 Mixed-use buildings

V1.0: If the **rated premises** is a mixed-use building comprised of different building types that have different material coverage requirements, the **Assessor** may need to include those materials on a proportional basis. This will be confirmed once the benchmarking process is complete, and this section will be updated accordingly.

7.9 Shared elements between buildings

Where a **rated premises** shares elements with another building that is not part of the **rated premises**, the shared elements must be proportionally allocated to the **rated premises**.

A shared element may be part of the **GFA** (e.g. a shared basement), or it might not be part of the **GFA** (e.g. a shared outdoor car park).

The method is as follows:

a) Identify all elements which are shared with one or more buildings that are not part of the **rated premises**.

b) Determine **GFA** of **rated premises,** excluding shared elements, as per Section 4.3.

c) Determine **GFA** of the other building(s) the infrastructure is shared with, excluding the shared elements, as per Section 4.3.

d) Calculate the ratio of the **rated premises** to the other building(s).

e) Apply the ratio to the quantity of all materials associated with the shared element. This forms part of the minimum material coverage for the **rated premises**.

Example 1: The **rated premises** shares an internal car park with its wider precinct. The **rated premises** has a **Gross Floor Area (GFA)** of 10,000 m², excluding the car park. The other buildings in the precinct have a total **GFA** of 100,000 m², excluding the car park. As a result, 10 % of the quantity of all relevant materials associated with the construction of the car park should be allocated to the **rated premises**.

In most cases where there is a shared element, the shared element will be part of the **GFA** of the **rated premises**, and the **Assessor** will already have the **GFA** of all buildings involved, because that is required to calculate the total **rated area**.

However, if the shared element is not part of the **GFA** of the **rated premises**, for example, it is an external area such as hardstand, the **Assessor** may not already have the **GFA** of all the other buildings that share the element. In this case, if the **Assessor** has another type of area measurement such as Gross Lettable Area (GLA), which has been carried out consistently for all of the buildings, they can use that area measurement to define what proportion of the shared element is part of the **rated premises**.

Note: The purpose of this option is to help the **Assessor** avoid an impractical requirement for additional area measurement work.

Example 2: The **rated premises**, a warehouse, shares an external car park with another warehouse. Because the car park is external, it is not part of the **GFA** of either warehouse. While the other warehouse does not have a **Gross Floor Area (GFA)** available, its Gross Lettable Area (GLA) is 5,000 m². The **rated premises** also has a GLA measurement, conducted using the same method, which totals 8,000 m². As a result, the **rated premises** should be allocated 61.5 % of the relevant materials associated with the construction of the shared car park, based on the proportion of its GLA to the total GLA (8,000 m² out of 13,000 m²).

If the **Assessor** cannot source a consistently measured area type for all buildings involved, they must contact the **National Administrator**. The **National Administrator** may accept an estimate instead of requiring the **Assessor** to conduct an area measurement for additional buildings.

Where allocating by building areas is not possible, such as in cases where the precinct was delivered over multiple years and data is not available, the **Assessor** must contact the **National Administrator** with a proposal for an alternative method prior to submitting the rating.

For documentation requirements, see Section 14.5.3.

7.10 Materials of likely significance

A building may have a unique or uncommon component that is not included in the minimum material coverage for that building type, such as a large metal artwork or architectural feature. If it is plausible that this component makes a significant (greater than 1 %) contribution to the total **upfront embodied carbon** of the building, the **Assessor** must contact the **National Administrator** for a **Ruling** prior to submitting the rating.

The **Assessor** should provide draft calculations and reasoning for review by the **National Administrator**.

Example:

The roof of the **rated premises** has a decorative 20 m tall steel spire. The spire is not considered structural and does not fit in any other category in the minimum material coverage listed in Table 7.3. However, based on the size of the spire, the **Assessor** believes it may make a significant contribution to the **upfront embodied carbon**. The **Assessor** undertakes an individual calculation assuming the spire is 23 tonnes and made from Company A Galvanised steel **EPD**.

The calculation suggests the steel spire has an **upfront embodied carbon** value of 71,300 kg of **CO_2e**. The **rated premises** as a whole has an **upfront embodied carbon** rating of 4,000,000 kg of **CO_2e** without the spire. The spire therefore makes a contribution of 1.75 % (71,300 ÷ (71,300 + 4,000,000) of the total **embodied carbon**.

The **Assessor** advises the **National Administrator**. The **National Administrator** approves the **Assessor**'s calculation method and rules that the spire must be included in the rating.

For documentation requirements, see Section 14.5.4.

7.11 Exclusions

7.11.1 General

This section gives some context on items that are excluded from the scope of a NABERS Embodied Carbon rating. They are explained here for context because they are managed in different ways by other **life cycle assessment**-based rating tools.

7.11.2 Construction equipment

Items temporarily used during construction such as **formwork**, scaffolding and hoardings, are excluded, unless they are left in place permanently. This is because these items are commonly re-used, and if allocated proportionately to a single rating are unlikely to have much impact on the overall rating. Therefore, NABERS Embodied Carbon ratings only include **permanent formwork**.

Construction equipment that is custom built for the project is excluded. This is because evidence of the material quantities that custom equipment is built from is not readily available, and the end use of custom equipment is typically unknown. For example, it may be disassembled and re-used.

7.11.3 Corporate functions

Capital goods such as site offices, company offices, company vehicles and IT equipment are excluded. This is because these items are not part of the **rated premises**, will likely be re-used, and are unlikely to have much impact on the overall rating.

7.11.4 Non-physical items

Indirect and non-material emissions such as some Scope 3 emissions categories are excluded, for example—

a) professional services for design, engineering, administration, marketing, and insurance;

b) employee commuting, business travel, use of company resources; and

c) capital goods, land assets, and investments.

These items are excluded because information is not readily available, there are many variables involved in trying to measure them, and they are unlikely to have much impact on the overall rating.

8 Material quantities

8.1 General

This chapter outlines the method the **Assessor** must use to determine the quantities of materials included in a NABERS Embodied Carbon rating.

The **Assessor** may need to carry out quantity unit conversions. This is because materials must be converted to appropriate units to enable multiplication by the relevant **emission factor**.

8.2 Process overview

The process for determining the material quantities shown in Table 8.2.

Table 8.2: Determining material quantities

Step		Reference
1	Obtain **acceptable data** for the quantity of each material included in the minimum material coverage for the **rated premises**, as specified in Chapter 7.	8.3
2	Allocate each material to the appropriate material type and category.	8.4
3	Check the units that the material quantities are measured in and apply an appropriate conversion factor where needed.	8.5
4	Enter information on building services, as applicable.	8.6
5	Specify whether material quantities include waste.	8.7

8.3 Acceptable data for material quantities

8.3.1 General

To calculate the **carbon footprint** of the materials in the building, the quantity of each material must be determined. At a minimum, a **BoQ** must be provided as per Section 8.3.3, supplemented with as-built evidence as per Section 8.3.4. **Acceptable estimates** according to Section 8.3.5 are permitted as an alternative for certain materials until 1 January 2027.

⚠ Some **BoQs** may not include all materials used in the **rated premises**. This may be due to exclusions in the building contract, or the quantity surveyor preparing separate **BoQs** for different part-owners or to reflect different funding arrangements within the project. The **Assessor** must ensure they have the full set of evidence for material quantities for the entire **rated premises**.

8.3.2 Key materials

Although the **Assessor** must obtain quantities for all materials included in the minimum material coverage, key building materials are critical to an accurate rating and thus require the highest standard of evidence. For NABERS Embodied Carbon ratings, key materials are defined as the following:

a) **Substructure**: all concrete, reinforcing steel, structural steel, and structural timber in components including slabs, columns, footings and anchors in the **substructure**.

b) **Superstructure**: all concrete, reinforcing steel, structural steel, structural timber, and aluminium, in components including framing, suspended floors, columns, beams, rafters and lift shafts.

c) **Envelope**: all cladding, roof, curtain wall, windows and brickwork/blockwork.

d) **External works**: all concrete and reinforcing steel, blockwork associated with a carpark hardstand, and retaining walls or hard landscaping.

e) Any material that uses a product-specific **emission factor** (see Section 9.4).

Acceptable design estimates are allowed for non-key materials. See Section 8.3.5.

8.3.3 Bill of Quantities (BoQ)

The **Assessor** must obtain an overall summary of total quantities used in the building. This must be in the form of a **Bill of Quantities (BoQ)**, and the data must represent the constructed building.

A **BoQ** must be a full schedule of material quantities prepared by a costing specialist such as a quantity surveyor, or an estimator within a construction firm. At a minimum, it must include all key materials specified in Section 8.3.2.

BoQs are developed and updated at various times throughout the design and construction process. The **Assessor** must use the latest version of the **BoQ** and must confirm the date and stage of development that the **BoQ** is from:

a) *As-built **BoQ***: The quantities are representative of final constructed materials, based on as-built drawings and/or models.

b) *Design stage **BoQ***: The quantities have been developed based on design-stage drawings and/or models.

For design stage **BoQs**, supplementary information may be available to outline any changes that have been tracked since the **BoQ** was created. If these changes have been thoroughly tracked by a quantity surveyor or estimator and accurately represent the building after **practical completion**, the design stage **BoQ** will be considered an as-built **BoQ**.

If the **Assessor** is unable to source a **BoQ** for the project, they must contact the **National Administrator** prior to submitting a rating.

For documentation requirements, see Section 14.6.1.

8.3.4 As-built evidence for key materials

The **BoQ** outlines what materials were expected to be used in the building but does not provide evidence that those materials are what was delivered to site. Therefore, proof of what actual materials were delivered to site and used in the building must be obtained for all key materials specified in Section 8.3.2.

The following are examples of **acceptable data** sources that can be used to prove which materials were used in the building:

a) Invoices.

b) Delivery dockets.

c) Purchase orders.

d) Returnable schedules. These must include the name, letterhead, or logo of the contractor, and the name of the author of the document. A date of data entry must also be included.

Each form of evidence must be dated and state the specific products used, the quantities in a unit of measurement other than cost, the name of the manufacturer, the product grade or specification and the project reference, name or site address.

Note: Financial information, such as the cost of products, does not need to be submitted to NABERS. Costs can be redacted from the above documents.

For documentation requirements, see Section 14.6.2.

8.3.5 Acceptable design estimates

Investigation has shown it is currently difficult for **Assessors** to consistently collect as-built evidence for all materials. Therefore, NABERS is allowing design estimates for materials that have a smaller impact on the overall rating, so that industry has some time to work on solving this issue.

⚠ Design estimates will be accepted for building materials that are not listed in Section 8.3.2, until 1 January 2027.

The following types of evidence are acceptable for materials not listed in Section 8.3.2:

a) *Data from **BoQ**:* The latest version of the **BoQ** must be used as per Section 8.3.3, including any variations or changes that have been tracked during the construction process.

b) *Data from Building Information Modelling (BIM):* Models can be based on any stage of design and construction, but the latest model available must be used. Data must be accompanied by a signed, dated and company branded document from the modeller that states compliance with Chapter 8 of the **Rules**.

⚠ BIM data can yield both highly accurate and less accurate material quantities, depending on how consistently building materials have been coded throughout the building model. The **Assessor** must ensure the model is reasonably accurate. This means that the BIM model must include all areas and/or elements that contain the building materials for which the BIM model is being used as evidence. If there are known potential inaccuracies in the BIM model, the **Assessor** must keep a written record of these.

c) *Direct measurement from drawings:* The **Assessor** may determine quantities based on measuring directly from the latest drawing set. Details of these measurements, including workings and calculations, must be retained by the **Assessor** for auditing purposes.

The **Assessor** must retain all data sources in the rating documentation, which show how estimates are determined (e.g. calculations, references, assumptions). Data from the above sources must include the constructed quantities of materials, but not any allowances for waste. Waste is accounted for separately where acceptable design estimates are used. See Section 12.4.1.3 for further information.

For documentation requirements, see Section 14.6.3.

8.4 Matching materials to the right material categories

As the **Assessor** enters material quantities into the **NABERS rating input form**, they must ensure the quantities are allocated to the appropriate preset material type and material category.

Material type is a high-level category of materials, for example, concrete. Material category specifies material type further, for example, >10 to 20 MPa concrete.

The **Assessor** must allocate the correct material types and categories because—

a) if the material does not have a product-specific **emission factor**, the **NABERS rating input form** will automatically assign the correct default **emission factor** for the material, based on the category the **Assessor** has categorised it as; and

b) it ensures the **National Administrator** can audit ratings effectively.

Where the **Assessor** believes an appropriate material type and material category does not exist for the material they need to enter, ‘other’ must be selected. See Section 9.5 for further information.

8.5 Units and conversions

The **Assessor** may need to carry out quantity unit conversions. This is because materials must be converted to appropriate units to enable multiplication by the relevant **emission factor**.

When adding a material to the **NABERS rating input form**, there will be at least one preset unit of measurement.

There will always be a unit of mass (kg or tonnes). Some materials will have an additional unit of measurement option (e.g. m^3). These additional units for materials have been added because they are common practice measurements for the specific material. Where one of these additional units of measurement exists in the **NABERS rating input form**, the unit conversions into a common unit of measure will be automatically applied. In this case, the **Assessor** does not need to carry out additional conversions.

Example 1:

In the **NABERS rating input form**, the **Assessor** can choose whether to enter concrete quantities in kg, tonnes, or m^3.

The **emission factor** for concrete is in the units kg**CO_2e**/m^3.

All quantities the **Assessor** enters in kg and tonnes will be converted automatically into m^3, to calculate the **carbon footprint** of the concrete.

Where the **Assessor** has a material quantity that is not in the same unit as one of the default preset options for that material type in the **NABERS rating input form**, the **Assessor** must do one of the following, in order of preference:

a) Where clear conversion parameters are provided for that specific material in the source data the **Assessor** has access to, they must be used to convert the material to one of the preset units of mass in the **NABERS rating input form**.

b) Where the source data does not have any conversion parameters, the **Assessor** must use the common conversions list that is provided in the **NABERS rating input form**.

c) Where the source data doesn't have any conversion parameters, and the **NABERS rating input form** does not have a common conversion option for the material type, the **Assessor** must make a conservative and reasonable estimate and keep a record of what parameters and assumptions they used.

Example 2:

The **Assessor** has concrete quantities as 450 m^2 of a 180 mm thick suspended slab.

The preset units of measure in the **NABERS rating input form** are kg, tonnes or m^3.

Option a) above is used. The **Assessor** converts 450 m^2 of concrete into m^3 using the slab thickness (450 m^2 × 0.18 m = 81 m^3). The **Assessor** enters 81 into the **NABERS rating input form** and selects m^3 as the unit.

Example 3:

The **Assessor** has reinforcing steel bar and mesh quantities as 105 m^2 of SL92 mesh.

The preset units of measure in the **NABERS rating input form** are kg or tonnes.

Option b) above is used. SL92 steel reinforcing mesh is in the common conversions list in the **NABERS rating input form** as 0.0046 tonne/m^2. The **Assessor** calculates 105 m^2 × 0.0046 tonne/m^2 = 0.48 tonnes. The **Assessor** enters 0.48 into the **NABERS rating input form** and selects tonnes as the unit.

Example 4:

The **Assessor** has plasterboard for internal walls as a quantity of 12 units, with no further information.

The preset units of measure in the **NABERS rating input form** are kg, tonnes or m^2 (using an assumed thickness).

Option c) above is used. The **Assessor** finds plasterboard from a common supplier on the market is supplied in the dimensions of 2,400 mm by 1,200 mm per individual wall sheet, and calculates 2,400 mm by 1,200 mm = 2.88 m^2, multiplied by 12 units = 34.56 m^2. The **Assessor** enters 34.56 into the **NABERS rating input form** and selects m^2 as the unit.

For documentation requirements, see Section 14.6.4.

8.6 Building services

The **NABERS rating input form** uses standard default assumptions to estimate the emissions associated with electrical, mechanical and plumbing services. This is calculated based on the building type and the **rated area** of the building.

Individual materials that are part of delivering electrical, mechanical or plumbing services to the building, such as conduit, air conditioning units and ductwork, are not included in the minimum material coverage. These must not be entered into the **NABERS rating input form**.

Vertical services are also calculated by the **NABERS rating input form**, using standard default assumptions. The **Assessor** must enter the number of lift cars, and the number of individual escalators. For escalators, one escalator from floor A to floor B is considered one unit.

Individual materials for vertical services must not be entered separately unless the **Assessor** has suitable evidence to override the default calculation, as explained in Section 9.6.

For documentation requirements, see Section 14.6.5.

8.7 As-built quantities and construction waste

Any as-built material quantities entered into the **NABERS rating input form** are assumed to be the total quantities of material delivered to site. This includes both the amount of material used in the building, and any waste generated onsite.

Some forms of acceptable evidence for material quantities may not include waste amounts. For example, a design-stage **BoQ** may only state the quantity of material required to build the building, and no extra allowance for waste. Therefore, the **Assessor** must verify whether their material quantity evidence covers the full amount delivered to site, including waste.

When the **Assessor** enters material quantities into the **NABERS rating input form**, they must select ‘as-built evidence’ for each material that does represent the complete total delivered to site.

For any materials where ‘as-built evidence’ is not selected, the **NABERS rating input form** will apply an additional default waste rate. See Section 12.4 for more information on waste rates.

9 Emission factors

9.1 General

A NABERS Embodied Carbon rating calculates the carbon intensity of a **new building** or **partial rebuild**. To calculate the carbon intensity, the quantity of each included material is multiplied by the **emission factor** for that material.

If the **Assessor** does not have a product-specific **emission factor** for a material, the **NABERS rating input form** will apply a default **emission factor**.

The **Assessor** may use a product-specific **emission factor** for a material used in the building when—

a) they have appropriate evidence of the **emission factor** for that product (e.g. an **Environmental Product Declaration**); and

b) they have evidence that that specific product was actually used in the building (e.g. a delivery docket).

9.2 Process overview

The **Assessor** must check whether they have the evidence required to use a product-specific **emission factor** for any of the included materials. If so, they can enter those product-specific **emission factors**. If not, default **emission factors** will be used.

Note: It is in the interests of the **rated premises** to use product-specific **emission factors** wherever possible because they give a more accurate representation. However, NABERS anticipates that the default **emission factors** will be used frequently, especially during the first couple of years after the rating tool is launched. This should change as more **EPDs** for specific products are published, and as project teams implement systemic processes to collect evidence of specific product use during the construction process.

9.3 Default emission factors

The **Assessor** must choose the appropriate type and category for each material they enter into the **NABERS rating input form** as per Section 8.4. The **Assessor** must ensure they choose the material category that is the nearest possible representation of each included material.

The **NABERS rating input form** applies default **emission factors** based on the type and category the **Assessor** selects for each included material.

Note: The default **emission factors**, along with information on how they were developed and how often they are updated, are available on the NABERS website.

9.4 Product-specific emission factors

9.4.1 General

Assessors can enter a product-specific **emission factor**, which will override the default **emission factor** for that material.

Assessors must only use a product-specific **emission factor** when it can be shown that the specific material was used in the building.

Product-specific **emission factors** cannot be used generally to refer to materials that have similar characteristics.

Example:

A 20 MPa concrete with 20 % supplementary cementitious material (SCM) purchased from Concrete Manufacturer A, cannot be used as a product-specific **emission factor** for 20 MPa concrete with 20 % SCM from Concrete Manufacturer B.

9.4.2 Standard for acceptable data

The following are acceptable sources of evidence for a product-specific **emission factor**, listed in order of preference:

a) **Emission factor** data for the specific material, derived from a third party-verified process **LCA**. This can be an **EPD** (see Section 9.4.3.1), a **carbon footprint** declaration (see Section 9.4.4) or a **Climate Active Product Certification** (see Sections 9.4.5 and 10.4 for further conditions).

b) Published emissions data from a Climate Active Public Disclosure Statement associated with a carbon neutral product certification (see Section 10.3 for further conditions).

c) Industry average **emission factor** data. This is an average of multiple products similar to the selected material, derived from industry average process **LCAs** such as **EPDs** and **Climate Active Product Certification**. The worst-case scenario **emission factor** must be selected (see Section 9.4.3.3).

d) A NABERS **Ruling**. An **Assessor** can seek a NABERS **Ruling** if product-specific **emission factor** data is provided by a source other than options a) to c) above, if all of the following conditions are met:

   1) It must be a process-based **LCA** or hybrid **LCA**.

   2) It must be third-party verified.

   3) It must consider uncertainty.

   4) The **Assessor** must seek a **Ruling** from the **National Administrator** before submitting the rating.

When using a product-specific **emission factor**, the **Assessor** must provide the following information:

1) As-built data (see Section 8.3.4) showing that this specific material has been used in the building. The evidence must confirm the quantity of the material. The material name must be unique and identify both the material and manufacturer.

2) Upfront **carbon emissions** per unit of material (process detailed in Section 9.4.3.2, 9.4.3.3, 9.4.4.2 and 9.4.5.2).
3) Carbon neutral certifications, if applicable (see Section 10.3).
4) Upfront stored carbon per unit of material, if applicable (see Section 10.4).
5) Where a waste rate is available, this must be entered, otherwise a default waste rate will be applied (see Section 12.4). The waste rate is the percentage of material ordered and brought to site, but not used in the building.

For documentation requirements, see Section 14.7.1.

9.4.3 Environmental Product Declarations (EPDs)

9.4.3.1 Conforming EPDs

An **EPD** can be used as evidence if all of the following conditions are met:

a) It must clearly state in its declaration that it is compliant with ISO 14025 and either EN 15804 or ISO 21930.
b) It must be independently verified. This is sometimes referred to as third-party verified.
c) It must have a valid registration number and validity date. It must be valid at the **Occupancy Certificate date**.
d) It must be published online by an **EPD** programme.
e) An **EPD** for a specific material (i.e. not an industry average **EPD**) must refer directly to the material either by unique product name or code.
f) An industry average **EPD** must additionally comply with Section 9.4.3.3.

9.4.3.2 Using emission factors from EPDs

In an **EPD**, the unit of measurement for the results must either match the unit selected in the **NABERS rating input form** or be convertible using conversion factors specific to the product and detailed in the **EPD** (see Section 8.5). This is commonly referred to as the declared unit in **EPDs.**

The **Assessor** must enter GWP-total (kg**CO_2e**/unit of measure) for **modules** A1-A3 into the **NABERS rating input form**.

Emission factors for **modules** A1-A3 for the following indicators, if available, must also be taken from the **EPD**:

a) GWP-fossil (kg**CO_2e**/unit of measure).
b) GWP-biogenic (kg**CO_2e**/unit of measure).
c) GWP-luluc (kg**CO_2e**/unit of measure).
d) GWP-stored: see Section 10.4 for detailed instructions on how to enter GWP-stored into the **NABERS rating input form**.

9.4.3.3 Industry average EPDs

An industry average **EPD** can only be used if the material used in the **rated premises** is from a manufacturer that has contributed data to the industry average **EPD**. The material needs to match the description of the specific product category covered in the industry average **EPD**.

⚠ Manufacturing data for that manufacturer's materials must have been included in the **EPD**. If the manufacturer has only contributed financially to the development of the industry average **EPD**, that **EPD** must not be used as evidence for the material.

If an **Assessor** is using an industry average **EPD,** the **emission factor** used must be the worst-case **emission factor** in the **EPD**. This may require an additional calculation, multiplying the maximum variation by the average **emission factor**.

If it is unclear to the **Assessor** whether the maximum **emission factor** is reported in the **EPD**, they must contact the **National Administrator** prior to submitting the rating.

Example:

The **rated premises** contains a treated sawn softwood timber from a manufacturer that is included in an Australian industry **EPD** for sawn softwood.

The industry average **EPD** states that treated sawn softwood timber has an industry average GWP-total of 205 kg**CO_2e**/m^3 of product.

The **EPD** notes that the GWP-total variation across sites of the sawn softwood product is a maximum of 16 % above the average.

The GWP-total to be entered is calculated as 205 multiplied by 1 + 0.16 = 237.8 kg**CO_2e**/m^3.

9.4.3.4 Versions of EN 15804 and ISO 21930, and managing differences in data, especially stored carbon data

Standards are updated and amended at times. EN 15804 has two current versions. These are EN 15804+A1 CEN (2013) and the revised version EN 15804+A2 CEN (2019).

The two versions are predominantly the same but differ in several important ways: in the choice of environmental indicators, and in how the **carbon footprint** of bio-based materials such as wood are accounted for. **EPDs** compliant with either version are valid as long as they conform to the requirements laid out in Section 9.4.3.1.

EN 15804+A1 and ISO 21930 may or may not include the stored carbon of a material in GWP-total and GWP-biogenic. This potential data gap, and how to calculate stored carbon, is discussed in Section 10.4.6.

9.4.4 Carbon footprint declarations

9.4.4.1 Conforming carbon footprint declarations

A **carbon footprint** declaration can be used as evidence if all the following conditions are met:

a) It must be compliant with ISO 14067 or PAS 2050.

b) It must be equivalent in system boundary to EN 15804 or ISO 21930.

c) It must refer directly to the material either by unique product name or code.

d) It must be independently verified. This is sometimes referred to as third-party verified.

e) It must be dated within five years before the building reached **practical completion**.

9.4.4.2 Using emission factors from carbon footprints

The unit of measurement for the results in the **carbon footprint** must match the unit selected in the **NABERS rating input form**.

The **Assessor** must enter GHG total emissions (kg**CO_2e**/unit), equivalent to **modules** A1-A3, for the material into the **NABERS rating input form**.

The **Assessor** must also enter the following indicators (equivalent to **modules** A1-A3), if they are available:

a) GHG net fossil (kg**CO_2e**/unit).

b) GHG net biogenic (kg**CO_2e**/unit). The **Assessor** may need to calculate this, by subtracting biogenic GHG removals from total biogenic GHG emissions.

c) GHG stored (kg**CO_2e**/unit). This is the biogenic GHG removals figure in the **carbon footprint**.

d) GHG net land use change (kg**CO_2e**/unit). The **Assessor** may need to calculate this, by subtracting GHG land use change removals from total GHG land use change emitted.

9.4.5 Climate Active Public Disclosure Statements

9.4.5.1 Conforming Climate Active Public Disclosure Statements

A Climate Active Public Disclosure Statement can be used as evidence if all the following conditions are met:

a) It must be a product certification, specific to the material.

b) It must be certified and published by Climate Active.

c) It must be valid with a technical assessment date within five years before the building reached **practical completion**.

d) It must refer directly to the material, either by unique product name or code.

9.4.5.2 Using emission factors from Climate Active Public Disclosure Statements

The unit of measurement for the results in the Public Disclosure Statement must match the unit selected in the **NABERS rating input form**. This may require conversion from a different unit. The **Assessor** must only use the conversion values that are within the Climate Active document.

The **emission factor** for the product life cycle (equivalent to **modules** A1-A3), GHG total emissions (kg**CO_2e**/unit), must be entered into the **NABERS rating input form**.

A Climate Active Public Disclosure Statement may not contain data in a form that enables the **Assessor** to break it down into the equivalent **modules** A1-A3. In this case, the **Assessor** must take a conservative approach and include the undivided **emission factor**, which includes transport and end-of-life emissions.

9.4.6 Other emissions data sources

Where an **Assessor** believes that data from a source, not covered elsewhere in this chapter, is an appropriate form of emissions evidence, they must seek a **Ruling** from the **National Administrator** before lodging the rating.

Note that a product-specific **emission factor** must—

a) be proven to be a process-based **LCA** or hybrid **LCA**;

b) be third-party verified;

c) consider uncertainty; and

d) cover **modules** A1-A3.

9.5 Materials that don't match any of the emission factor types

If the **Assessor** needs to enter a material which cannot be matched to one of the default types or sub-types in the **NABERS rating input form**, and it does not have a product-specific **emission factor**, the **Assessor** must use the default **emission factor** for the material type 'other'. The 'other' **emission factor** is a conservative average of all other default **emission factors**. This must be used where there is no appropriate source of emissions data for an unusual material. This may be the case if a new, uncommon, or innovative material has been used in the building.

If the sum of materials categorised as 'other' contributes greater than 1 % of the total **embodied carbon** of the **rated premises**, the **Assessor** must contact the **National Administrator** to determine a **Ruling** on whether the use of the 'other' **emission factor** is appropriate.

9.6 Building services

9.6.1 General

Emissions associated with building services, including electrical, mechanical and plumbing services, are calculated automatically by the **NABERS rating input form** as described in Section 8.6.

Instead of entering **emission factors** or material categories for individual materials associated with building services, the **Assessor** must select the most appropriate building services rate from the options provided in the **NABERS rating input form**. If the **Assessor** believes there is no appropriate building services rate in the **NABERS rating input form**, they must contact the **National Administrator** prior to submitting the rating.

Note: Refrigerant leakage is not included in the building services data, as it is considered in the use phase of a building. This is outside of the life cycle **modules** considered in this tool.

9.6.2 Vertical transport

Emissions associated with vertical transport services are also calculated automatically by the **NABERS rating input form** as described in Section 8.6. If the **Assessor** has product-specific **emission factors** as per Section 9.4 for all materials associated with the vertical transport services (e.g. conforming **EPDs** for the lifts), these may be used instead of the default calculation.

Some lift **EPDs** report **emission factors** with a functional unit of tonne-kilometre (tkm). To calculate the corresponding **emission factor** for the lift as a whole, the **emission factor** per tkm must be multiplied by the total expected tkm for the lift over its service life.

The total tkm for the lift over its service life is also referred to as the transportation performance (TP) and is calculated by the lift manufacturer according to ISO 25745-2. The **EPD** may publish a single value for tkm, or it may publish different values for different usage categories as defined in ISO 25745-2. If multiple values are published, the **Assessor** must select the usage category most appropriate to the lift installation, as confirmed by the lift manufacturer or developer.

Example:

A lift **EPD** provides **emission factors** with a functional unit of tkm. Different **emission factors** are provided for different usage categories.

The A1-A3 **emission factor** for the lift under usage category 3 (UC3) is 9.5 kgCO_2e/tkm.
The A1-A3 **emission factor** for the lift under usage category 4 (UC4) is 3.2 kgCO_2e/tkm.

The **EPD** also specifies a total transportation performance of 1,280 tkm under UC3, and 3,810 tkm under UC4. UC4 would reflect higher intensity usage.

The A1-A3 **emission factor** for the lift under UC3 would be calculated as:

$$9.5\ kgCO_2e/tkm \times 1{,}280\ tkm/lift = 12{,}160\ kgCO_2e/lift$$

The A1-**A3 emission factor** for the lift under UC4 would be calculated as:

$$3.2\ kgCO_2e/tkm \times 3{,}810\ tkm/lift = 12{,}192\ kgCO_2e/lift$$

9.7 Custom glazed facades and doors

The **NABERS rating input form** contains generic facade, window and glazed door options, with accompanying default **emission factors**. The **Assessor** may choose the most appropriate of these.

If the **Assessor** believes the default options do not match the materials used in the building and they have appropriate evidence outlined in this section, they may instead create a custom facade, window or door using the facade calculator.

When creating a custom facade, the **Assessor** must enter all key material components into the facade calculator in the **NABERS rating input form** on a per square metre basis. The key materials are framing, glazing and cladding.

The **Assessor** must provide evidence of the material make-up of the custom facade. The following are examples of **acceptable data** sources:

a) A signed bill of materials provided by the manufacturer that—

1) identifies the quantity of materials per square metre of facade; and
2) identifies the name and address of the building where the facade will be installed.

b) A signed bill of materials provided by the manufacturer that—
1) identifies the total quantity of materials used in the facade;
2) identifies the name and address of the building where the facade will be installed; and
3) is accompanied by a separate written confirmation from the builder or subcontractor showing the total square metres covered by the facade.

c) Invoices, purchase orders, delivery dockets or similar for all key material inputs into the facade, accompanied by written confirmation from the builder or subcontractor showing the total square metres covered by the facade.

If the **Assessor** is claiming a product-specific **emission factor** in the custom facade, evidence must be provided of that material being used in the custom facade by the manufacturer, through chain-of-custody documentation specifically for the **rated premises**.

For documentation requirements, see Section 14.7.2.

9.8 Transport to site

The **NABERS rating input form** uses default **emission factors** to calculate the emissions associated with truck, train and shipping transport.

The **Assessor** cannot alter these **emission factors** because suitable evidence is difficult to acquire and there is not typically much variation in expected emissions. If the **Assessor** believes they are dealing with a special case, such as transportation by electric vehicles, they must contact the **National Administrator** prior to lodging the rating.

Chapter 11 contains information on how transport distances are calculated.

9.9 Construction

9.9.1 Construction energy

The **NABERS rating input form** uses a default construction and commissioning energy rate to calculate construction emissions. The default rate is based on the **rated area**.

If the **Assessor** has complete records of energy use onsite, this can replace the default construction and commissioning energy rate (further information in Chapter 12).

Electricity **emission factors** are market-based by default and are applied automatically in the **NABERS rating input form**. Where renewable electricity is being claimed (see Section 12.3.3), the **emission factor** associated with its use is zero.

Diesel, petrol, and natural gas **emission factors** are also applied automatically and cannot be changed by the **Assessor**.

Note: Emissions for the non-renewable portion of grid electricity are calculated using the national market-based residual mix factor. There is currently no appropriate published source of state market-based residual mix factors. State market-based factors may be used in the future when there is a published source.

9.9.2 Construction waste

The **emission factors** for construction waste include the emissions generated during construction, transport to a waste processor, preparing or treating the waste, and disposal of the waste. The **NABERS rating input form** provides the **emission factors** for individual waste types (see Section 12.4). The **Assessor** cannot change these **emission factors**.

10 Carbon removals

10.1 General

The NABERS Embodied Carbon rating certificate includes a Carbon Removal Indicator. The Carbon Removal Indicator shows the amount of carbon removed from the atmosphere due to materials used in the **rated premises**. The purpose of this is to recognise that the use of some materials inherently removes carbon from the atmosphere, either directly through the inherent properties of the material, or indirectly through verified carbon credit schemes.

The indicator displays two types of **carbon removals**. These are—

a) **carbon offsets** associated with materials that have been certified as carbon neutral products; and

b) carbon stored in specific materials.

The Carbon Removal Indicator is a standalone indicator. **Carbon removals** are reported separately to the total **embodied carbon** result in the NABERS rating report and certificate. **Carbon removal** does not impact the NABERS Embodied Carbon star rating or the reported emissions intensity.

This chapter outlines how the emissions data entered into the **NABERS rating input form** determines the result shown in the Carbon Removal Indicator.

10.2 Process overview

For **carbon offsets** and **stored biogenic carbon** to be included in the Carbon Removal Indicator, the **Assessor** must enter the correct carbon neutral and stored carbon data into the **NABERS rating input form**.

10.3 Claiming carbon neutral materials

A material will only be recognised as carbon neutral in the NABERS Embodied Carbon rating if the **Assessor** has used a product-specific **emission factor** for a Climate Active certified product as per Section 9.4.5.

Climate Active is the only carbon neutral certification scheme that the NABERS Embodied Carbon tool currently accepts. If the **Assessor** believes any other carbon neutral certification scheme should be allowed for a material in the **rated premises**, they must contact the **National Administrator** prior to lodging the rating.

Carbon neutral certified products can only be claimed for individual building materials.

For documentation requirements, see Section 14.8.1.

10.4 Claiming carbon storage in materials

10.4.1 General

Carbon storage is an inherent property linked to the amount of **biogenic carbon** in timber, biomass and paper materials.

The **Assessor** can only claim **carbon storage** if the material is sourced from a sustainably managed forest, certified by one of the following schemes:

a) Forest Stewardship Council (FSC).

b) Responsible Wood as part of the Programme for the Endorsement of Forest Certification (PEFC).

If the **Assessor** believes another forest management scheme should be accepted by NABERS, they must contact the **National Administrator** prior to submitting the rating.

Note: The requirement for materials to be sourced from an established sustainable forest management certification scheme is in line with EN 15804 CEN (2019) and its sub-product category rules EN 16485:2014.

For documentation requirements, see Section 14.8.2.

10.4.2 Claiming carbon storage when a product-specific emission factor has been used

Carbon storage can be claimed for a material when the **Assessor** has entered a product-specific **emission factor** as per Section 9.4.3, using acceptable **EPD** data that includes a **carbon storage** value (i.e. GWPS). The **EPD** must confirm the material is sourced from a sustainably managed forest.

10.4.3 Claiming carbon storage when a NABERS default emission factor has been used

If a NABERS default **emission factor** has been used for a material, then **carbon storage** can only be claimed for that material if the **Assessor** has evidence that it is sourced from a sustainably managed forest as per Section 10.4.1.

If the **Assessor** does not have evidence that the material is sourced from a sustainably managed forest, they must assume that the **stored biogenic carbon** value is zero.

10.4.4 Material longevity

Carbon storage can only be claimed when the material is to be installed and remain in the building for more than 20 years.

For this reason, **carbon storage** must not be claimed for timber flooring such as laminate, hybrid, and hardwood floors, because flooring is likely to be replaced within 20 years.

10.4.5 Calculating stored carbon

The amount of **stored biogenic carbon** (GWPS) in a material must be entered as kg**CO_2e**/unit of measure. The **biogenic carbon** content in the product must be used. **Biogenic carbon** content in packaging must not be included.

If the amount of **biogenic carbon** in the product is given in units of kg of carbon, the **Assessor** must convert this to kg**CO_2e**. To do the conversion, the **Assessor** must use the amount of **biogenic carbon** in the product, in kg, and multiply it by 44/12, the molar ratio of carbon dioxide to carbon.

Example:

A specific cross laminated timber (CLT) beam is being used in the **rated premises**. It has an acceptable **EPD** stating a **biogenic carbon** content of 0.4 kg of carbon per kg of CLT beam.

The **EPD** clearly identifies the timber is from a sustainably managed source.

The GWPS is calculated multiplying 0.4 kg of carbon by the molar ratio 44/12 = 1.47 kg of **CO_2e**.

1.47 kg of **CO_2e**/kg of product is allocated to the 12 tonnes of CLT beam in the **NABERS input rating form**.

The overall **carbon storage** for the CLT beam material is 12 tonnes × 1000 kg/tonne × 1.47 kg**CO_2e**/kg = 17,640 kg**CO_2e**.

10.4.6 Unknown carbon storage

Where the **Assessor** has an **EPD** for a timber product that is sourced from a sustainably managed forest, but the GWPS is unknown (i.e. not published in the **EPD**), the **Assessor** may calculate an **acceptable estimate** for GWPS and enter it into the **NABERS rating input form**.

The calculation for the estimated carbon content in kg**CO_2e** per kg of timber product is given by Formula 10.4.6. This value can then be multiplied by the timber product density to calculate an **acceptable estimate** for GWPS.

Formula 10.4.6

$$Estimated\ carbon\ content\ (kg\ \boldsymbol{CO_2e}/kg) = (1 - water\ content) \times biogenic\ carbon\ content\ of\ dry\ matter \times \frac{44}{12}$$

Where the water content is published in the **EPD**, this must be used. If the water content is not published in the **EPD**, an assumed water content of 10 % can be used.

If the **EPD** does not state the **biogenic carbon** content of the absolutely dry wood, an assumed value of 50 % must be used.

Where the assumed values are used, the carbon stored in a timber product is (1 – 0.1) × 0.5 × 44/12 = 1.65 kg of **CO_2e**/kg of timber product, multiplied by the timber product density.

Example 1:

15 m^3 of softwood timber is used in the **rated premises** and entered into the **NABERS rating input form**.

It has an **EPD** confirming it is from a sustainable source. The **EPD** includes a value for GWPT, GWPF, GWPB and GWPL, but does not have a GWPS value.

The **EPD** notes that the moisture content of the softwood timber is 12 % (0.12) and its density is 450 kg/m^3.

According to Formula 10.4.6, the carbon content value is calculated as (1 – 0.12) × 0.5 × (44/12) = 1.61 kg**CO^2e**/kg.

The carbon content per m^3 of timber is 1.61 kg**CO^2e**/kg × 450 kg/m^3 = 726 kg**CO^2e**/kg/m^3.

This value is entered into the calculator as GWPS.

Example 2:

20 m^3 of a timber product is used in the **rated premises** and entered into the **NABERS rating input form**.

It has an **EPD** confirming it is from a sustainable source and that its density is 400 kg/m^3. The **EPD** does not include the moisture content or GWPS of the timber product.

Since assumed water content and **biogenic carbon** content values will be used, Formula 10.4.6 simplifies to 1.65 kg**CO_2e**/kg of product.

The carbon content per m^3 of this timber is 1.65 kg**CO^2e**/kg × 400 kg/m^3 = 660 kg**CO^2e**/kg /m^3.

This value is entered into the calculator as GWPS.

10.4.7 Cement re-carbonation

Cement re-carbonation is excluded from **carbon storage** and the Carbon Removal Indicator because it is considered in the use phase of a building. It is therefore outside the life cycle **modules** considered in this tool.

11 Transport emissions

11.1 General

Transport emissions are the emissions associated with transporting building materials from their place of manufacture to the building site. The **Assessor** may use the NABERS default transport model to calculate transport emissions or enter specific transport data.

Note: Section 5.2 contains information on how the **Assessor** defines the location of the **rated premises**.

11.2 Process overview

By default, the **NABERS rating input form** uses a transport model specific to each material type, to automatically calculate transport distances.

The **Assessor** may enter specific location data to replace the default transport model if they have appropriate evidence.

The **NABERS rating input form** applies default transport **emission factors** to the default transport model or specific location data to calculate the associated transport emissions.

11.3 Default transport data

In the **NABERS rating input form**, all materials are assigned with a default transport model, which automatically calculates the transport distance for the material to reach the **rated premises** based on the site location data entered as per Section 5.2.

The default transport **emission factors** (see Section 9.8) are then applied to these distances to calculate the transport emissions for each material.

11.4 Project-specific transport data

11.4.1 General

If the **Assessor** has appropriate evidence of the source location for a material, they may use this instead of the default transport model for the material. Default transport **emission factors** are applied to the distances travelled from the actual source location as per Section 9.8.

For materials that are sourced from within Australia, if the **Assessor** has evidence of the source location by major city, the source location may be entered into the **NABERS rating input form**.

For materials that are sourced internationally, if the **Assessor** has evidence of the source location by geographical region, the source location may be entered into the **NABERS rating input form**.

If entering a source location, the **Assessor** must select from the Australian major cities and international regions listed in the **NABERS rating input form**. The location options in the **NABERS rating input form** are based on where manufacturing typically takes place within Australia, and the location of major international ports. If the **Assessor** believes that a source location they need to use is not listed in the **NABERS rating input form**, they must contact the **National Administrator** before lodging the rating.

The following are acceptable sources of evidence for the source location of a material:

a) Invoices, receipts, or chain of custody documentation clearly showing source location.

b) A signed letter from the supplier, with supplier letterhead, clearly showing the source location.

For documentation requirements, see Section 14.9.1.

11.4.2 Assemblies

In the case of assemblies (e.g. curtain wall, windows and doors), a source location cannot be entered, and the default transport model must be used. This is because assemblies are made up of multiple materials, with a variety of source locations.

11.4.3 Source location when there is downstream processing

Source location is defined as the location of the exit gate of the manufacturing facility where the material is ready for distribution to a downstream fabricator or processor, intermediary party, or direct to the building site.

In the case of all treated steel and aluminium based materials, such as powder coated extruded aluminium and galvanised steel, this means that the source location is the manufacturer of the raw steel or aluminium input. The source location is not the facility where extrusion, powder coating or galvanising occurs.

11.4.4 Source location as defined by an EPD

Where the **Assessor** has entered a material that has an **EPD** into the **NABERS rating input form**, the source location is defined as the exit gate of the manufacturing facility according to the **EPD**. In the case of an **EPD**, the source location may be a fabricator, galvaniser, sheet metal works facility or other processor.

If an **EPD** has multiple sites of production, the closest site to the **rated premises** must be used, unless the **Assessor** knows that another production facility in the **EPD** was used for this specific material. In that case, the actual production facility location must be used.

12 Construction and commissioning emissions

12.1 General

Construction and commissioning emissions are the emissions associated with building the **rated premises** and ensuring its systems are operable and fit-for-purpose. This includes the energy use during construction, emissions associated with waste generated on-site and emissions associated with how that waste is managed to its end-of-life.

12.2 Process overview

The **NABERS rating input form** calculates a default construction and commissioning energy rate based on the **rated area** as per Section 12.3.1.

If the **Assessor** has complete records and evidence of energy use on-site as per Section 12.3.2, they may use this data instead of the default construction and commissioning energy rate.

Renewable energy purchased from off-site sources such as GreenPower can be entered as per Section 12.3.3.

The **NABERS rating input form** provides a default waste rate for each material type, as outlined in Section 12.4.1. This captures the amount of material which is brought to site but not used in the building, because it is an offcut, out of specification, or in excess.

The **NABERS rating input form** also provides a default end-of-life scenario for each material type, as outlined in Section 12.4.3. This takes into account the breakdown of waste being recycled, reused, used for energy recovery or disposed to landfill.

If the **Assessor** has a complete record for the actual waste quantity or end-of-life scenario for an individual material as per Sections 12.4.2 and 12.4.3.2, they may use this data for the material instead of the default waste rate and default end-of-life scenario respectively.

12.3 Energy

12.3.1 Default construction and commissioning energy

12.3.1.1 New buildings

If the **Assessor** does not have complete evidence for construction and commissioning energy use, the **NABERS rating input form** multiplies the **rated area** by a default construction and commissioning energy **emission factor**.

12.3.1.2 Partial rebuilds

The default construction and commissioning energy **emission factor**, based on the **rated area** of the premises, does not apply to **partial rebuild** ratings.

If the **Assessor** has complete records of energy used on-site, covering the entire construction period, this can be used as per Section 12.3.2.

If a default rate is required, the **Assessor** must contact the **National Administrator** for a determination on how to estimate construction and commissioning energy, prior to submitting the rating.

12.3.2 Project specific construction and commissioning energy

12.3.2.1 General

If the **Assessor** has complete records of energy used on-site, covering the entire construction period, this data may be used instead of the default rate.

The construction period starts when all previous structures are demolished, and all rubble is cleared from the site. The date that demolition ended must be determined by the **Assessor** through a letter provided by the construction contractor or an independent party such as a government works approval office. The construction period ends when the building reaches **practical completion.** The date of **practical completion** is determined by the **Occupancy Certificate date**.

Complete records of energy consumption must be obtained for all the following energy sources, if they were used on-site during the construction period:

a) Diesel.

b) Petrol.

c) Electricity (grid).

d) Off-site renewable electricity (i.e. GreenPower or other grid-sourced renewables).

e) Natural gas.

f) LPG.

Biodiesel is not included in the minimum energy coverage. If **biodiesel** is used on-site, the **Assessor** must contact the **National Administrator** for a **Ruling** prior to lodging the rating.

12.3.2.2 Standard for acceptable data

The following are acceptable sources of evidence for site-specific construction and commissioning energy:

a) Energy bills that cover all energy use during the period in which construction and commissioning occurred.

b) Other records that clearly show the amount of energy use and the date of sale such as—

1) purchase orders;

2) invoices;

3) receipts of sale; or

4) Climate Active Public Disclosure Statements.

For documentation requirements, see Section 14.10.1.

12.3.3 Renewable energy

12.3.3.1 Off-site renewable electricity purchasing

Renewable electricity from the following sources can be used in a NABERS Embodied Carbon rating:

a) Accredited GreenPower.

b) Voluntarily surrendered Large-scale Generation Certificates (LGCs) from electricity generated from renewable off-site generators.

Note 1: Refer to Section 10.4 of *NABERS The Rules — Metering and Consumption* for more information on off-site renewable electricity purchasing options.

The following are acceptable sources of evidence for off-site renewable electricity purchasing:

1) GreenPower included on electricity bills for on-site energy consumption.

2) Separate purchases of GreenPower, also referred to as de-coupled GreenPower, accompanied by written confirmation that the GreenPower purchase was used for the project.

3) Evidence from the Renewable Energy Certificate (REC) Registry that LGCs have been voluntarily surrendered for the project.

4) LGCs included on electricity bills for on-site energy consumption, clearly marked as voluntary surrender.

Note 2: Renewable Energy Certificates and LGCs often appear under the 'environmental charges' section of an electricity bill. These are surrendered by the utility as part of their regulatory obligations and are not considered voluntarily surrendered.

Renewable electricity incurs an **emission factor** of zero while any remaining grid electricity uses the national market-based residual mix factor. The amount of renewable electricity claimed must not exceed the amount of grid electricity consumed.

Note 3: State market-based residual mix factors are not currently available. They may be incorporated into the NABERS Embodied Carbon tool in the future.

For documentation requirements, see Section 14.10.2.

12.3.3.2 On-site renewable energy generation

Renewable energy generated on-site and consumed on-site (e.g. solar lights) is not entered into the **NABERS rating input form**. Use of on-site renewable energy improves the NABERS Embodied Carbon rating indirectly by reducing the amount of grid consumption.

12.4 Waste

12.4.1 Default material waste rates

12.4.1.1 General

If the **Assessor** does not have complete evidence of the actual waste rate of a material, the **NABERS rating input form** applies default waste rates as a percentage of the constructed quantity for each material type. For example, concrete in-situ has a default waste rate of 2 %, reinforcing steel has a default waste rate of 5 % and plasterboard has a default waste rate of 15 %.

12.4.1.2 As-built material quantities

If the **Assessor** uses as-built evidence for a material, such as a delivery docket or returnable schedule, the **NABERS rating input form** uses the default material waste rate to assign a portion of the delivered material as waste. This is because the as-built evidence already includes waste, since it reflects the full amount of material delivered to the site.

Example:

The **Assessor** has invoices showing 105 tonnes of bar reinforcing steel was delivered to site.

The **Assessor** enters 105 tonnes of bar reinforcing steel into the **NABERS rating input form** and selects the option noting that this quantity already includes waste.

The **NABERS rating input form** uses 105 tonnes of bar reinforcing steel as the total amount of material brought to site. It automatically assigns 5 tonnes of the 105 tonnes as waste, because the default material waste rate for reinforcing steel is 5 % of the constructed mass.

12.4.1.3 Design estimate material quantities

If the **Assessor** uses data that is not the total delivered material quantity, the **NABERS rating input form** uses the default material waste rate to add the waste amount to the entered material quantity. This is because the material quantity does not reflect the full amount of material delivered to the site.

Example:

The **Assessor** enters 15 tonnes of stone pavers into the **NABERS rating input form**.

The **Assessor** has used the **BoQ** as acceptable design estimate evidence. Therefore, the material quantity is not as-built.

The default material waste rate for stone pavers is 10 %. The **NABERS rating input form** calculates that 16.5 tonnes of stone pavers were delivered to site (15 tonnes × 1.1). It automatically assigns 1.5 tonnes of the stone pavers as waste.

12.4.2 Project specific waste rates

If the **Assessor** has complete evidence of the actual waste quantity of a material, this may be used instead of the default waste rate.

The following are acceptable sources of evidence for waste quantities:

a) Purchasing records such as purchase orders, invoices, and receipts of sale that clearly show the amount of material brought to site and the amount of material identified by the same name/type sent offsite as waste or for recycling.

> **Example:** A purchase order might show 115 tonnes of plasterboard brought to site and 10 tonnes taken away by a waste management company. The waste rate for this material is therefore entered as 9.5 % (10 divided by 105). The material quantity entered for the plasterboard is 115 tonnes.

b) Site construction waste reports or compiled waste records, including all waste collected during the construction period. This must be completed by a waste contractor, or by another person for government compliance requirements.

For documentation requirements, see Section 14.10.3.

12.4.3 End-of-life rates

12.4.3.1 Default end-of-life rates

NABERS uses a default end-of-life scenario for each material type. The end-of-life scenarios are—

a) reuse;

b) recycle;

c) energy recovery; and

d) landfill.

12.4.3.2 Project-specific end-of-life rates

If the **Assessor** has a record of the end-of-life scenario for an individual material, they may use this instead of the default scenario for that material.

When entering an end-of-life scenario for a material, the **Assessor** must ensure that the different rates for that material total to 100 % (i.e. reuse rate + recycle rate + energy recovery rate + landfill rate = 100 %). If the documented end-of-life scenario rates do not sum to 100 %, the **Assessor** must take a conservative approach and enter the remaining percentage as a landfill rate.

> **Example 1:**
>
> If the **Assessor** has evidence that 70 % of glass waste is sent for recycling, but no further information is available, they must assume the remaining 30 % goes to landfill.

The following are acceptable sources of evidence for end-of-life scenarios:

a) Gate/tipping weighbridge receipts.

b) Purchasing records (e.g. purchase orders, invoices, receipts of sale).

c) Signed letter from waste contractor/waste facility/recycling facility detailing the end-of-life breakdown of materials they receive from site. These can be facility-wide

values from the waste contractors (i.e. they recycle 80 % of inert concrete at a facility level) but must be broken up into an identifiable waste type that matches the material type (as per the examples below).

The evidence must clearly show the waste type that corresponds to the specific material quantity and its end-of-life scenario.

Example 2:

10 tonnes of waste plasterboard are discarded into an inert waste skip, removed by a contractor, and sent to landfill. The contractor provides tipping weighbridge dockets indicating that the inert waste from the site was sent to landfill. Consequently, 100 % to landfill must be entered into the **NABERS rating input form**.

Example 3:

10 tonnes of waste plasterboard are discarded into a separate 'plasterboard and plaster' bulk bag, and are then removed by a contractor. The contractor provides tipping weighbridge dockets showing a discrete line item for 8 tonnes of plasterboard being sent from the site to a gypsum recycling plant. As a result, 80 % can be recorded in the **NABERS rating input form** as recycled, while the remaining 20 % must be entered as landfill.

Example 4:

10 tonnes of waste plasterboard mixed in with other 'construction waste' is being removed by a contractor and sent to a transfer station. The transfer station operator provides a signed letter that says 60 % of its construction waste is recovered and 40 % is sent to landfill, noting that plasterboard is considered recyclable and contributes to the facility's 60 % inert rubble recycling rate. 60 % can therefore be entered as recycled and 40 % entered as landfill.

For documentation requirements, see Section 14.10.4.

13 Rating data completeness check

13.1 General

When the **Assessor** has finished entering data into the **NABERS rating input form**, a completeness check takes place automatically. The completeness check shows the **Assessor** if there are any inputs that that are outside the normal expected range, so that the **Assessor** can double-check whether they have entered all the rating data correctly.

This chapter outlines the process of the completeness check. The purpose of the check is to help ensure the **Assessor** enters complete and accurate data.

13.2 Material completeness check

A material completeness check is automatically done by the **NABERS rating input form**. It checks the material quantities and other completeness check information added by the **Assessor** against the expected ranges of material quantities for a similar building. The expected ranges of material quantities are calculated from the following building attributes:

a) Building dimensions (Section 5.5).

b) Area of external carpark, hardstand, pavement or other hard surface (Section 5.6).

c) Structural methods and materials (Section 5.7).

13.3 Justification of failed completeness check

The purpose of the completeness check is to help the **Assessor** ensure their data is accurate and complete.

Where the completeness check indicates that data does not meet the expected range or value, the **Assessor** must enter a brief description detailing why they believe this is the case, or why a result outside the expected range is reasonable for this building.

For documentation requirements, see Section 14.11.1.

14 Documentation requirements for accredited ratings

14.1 General

The **Assessor** must keep all records on which an assessment is based, including any specific guidance or approvals given by the **National Administrator**. Data retained for audit must be in a form which facilitates reviews and makes anomalies easily apparent.

Access to original documents is preferred if they are available. Copies of original documents may be used as evidence as long as the **Assessor** is satisfied that they are, or can be verified to be, true and complete records of the original documents or files.

Information may be contained in many different formats. The purpose of the documentation is to provide an acceptable, credible source of the required information. In some instances, specific document types may be unnecessary for an individual rating. However, under different rating circumstances, the specific document types may carry multiple items of information required for the rating. The qualifying factor is that the documentation contains the required information from an acceptable source.

The information in Sections 14.2 to 14.11 is required for a rating. It is organised based on the divisions of previous chapters (see Chapters 4 to 13). All the required information should be obtained from the building owner or main contractor.

Individual ratings may require additional information or documentation depending on the individual circumstances of the **rated premises**.

All evidence must clearly link to the project, with details of the project's name and/or address, and must be dated.

14.2 Documentation required for Chapter 4: Rated area

Topic	Requirements	Documentation
14.2.1 Gross Floor Area	Section 4.3 Section 4.4 Section 4.6	*Required information* The **Assessor** must retain evidence of the **Gross Floor Area (GFA)** determined to the **measurement standard for rated area** for the following: a) The **rated premises**. b) Individual building types for mixed-use buildings, if applicable. c) **GFA** shared with other buildings, if applicable. d) Other buildings which share **GFA** with the **rated premises**, if applicable. e) Internal car parks, if applicable. *Documentation examples* Documentation that can be used as evidence includes the following, in order of preference: 1) Official as-built documentation such as a Building Code of Australia report. 2) Third-party surveys or lease documentation. 3) Architectural schedules. 4) Direct measurement from current site plans or scaled prints. 5) Site measurements verified by the **Assessor**. All of the documentation listed above must be made to/based on the **measurement standard for rated area**.

14.3 Documentation required for Chapter 5: Building attributes

Topic	Requirements	Documentation
14.3.1 Site location and building type	Section 5.2 Section 5.3	*Required information* The **Assessor** must retain evidence of the site address and the building type. *Documentation examples* Documentation that can be used as evidence includes the following: a) **Occupancy Certificate**. b) Land titles. c) Development approval or planning documentation.
14.3.2 Soil conditions	Section 5.4	**V1.0:** If required, documentation for soil conditions will be updated in this section following the completion of benchmarking. The revised content will be available by the first quarter of 2025.
14.3.3 Building dimensions and external areas	Section 5.5 Section 5.6	*Required information* The **Assessor** must retain evidence for the following: a) Building height. b) Number of floors above ground. c) **GFA** for floors (below ground, on grade and above ground separately). d) Total area of all carparks, pavements and hardstands, if applicable. *Documentation examples* Documentation that can be used as evidence includes the following, in order of preference: 1) Land titles, development approval or planning documentation. 2) Third-party surveys or lease documentation. 3) Architectural schedules. 4) Direct measurement from current site plans or scaled prints. 5) Site measurements verified by the **Assessor**.

		Documentation for **GFA** must be made to/based on the **measurement standard for rated area**.
14.3.4 Structural methods and materials	Section 5.7	*Required information* The **Assessor** must retain evidence detailing the predominant frame type and predominant suspended floor type. *Documentation examples* Documentation that can be used as evidence includes correspondence with the project's structural engineer, civil engineer or main contractor.

14.4 Documentation required for Chapter 6: Land use and land use change

Topic	Requirements	Documentation
14.4.1 Land use and land use change	Section 6.3 Section 6.4	*Required information* The **Assessor** must retain evidence for the following: a) Whether a site is **brownfield** or **greenfield**. b) The pre-construction land type(s), if the site is **greenfield**. c) The site area for each land type, if the site is **greenfield**. *Documentation examples* Documentation that can be used as evidence for the site condition and land type includes the following, in order of preference: 1) Third-party survey or state land title registry with description of the land use or satellite photographic evidence, the year directly prior to the land being acquired. 2) Satellite imagery software showing the extent of the site within the **cadastral land parcel boundary**. 3) National database such as the Australian Government's Land use of Australia Web Map. Documentation that can be used as evidence for the site area includes the following, in order of preference: i) Third-party survey, State land title registry, deposited plan or registered plan. ii) Direct measurement from current plans, scaled prints or using satellite imagery software within the **cadastral land parcel boundary**.

14.5 Documentation required for Chapter 7: Minimum material coverage

Topic	Requirements	Documentation
14.5.1 Repurposed materials	Section 7.5	*Required information* The **Assessor** must retain evidence of all material quantities that have been reused from another site. *Documentation examples* Documentation that can be used as evidence includes the following: a) Invoices. b) Delivery dockets. c) Purchase orders. d) Returnable schedules, that must include name of letterhead or logo of the contractor, author (must be appropriate sub-contractor representative), and date of data entry. Documentation must identify the specific products used, material quantity, unit of measure and the building section it was used in.
14.5.2 Partial rebuild	Section 7.7	*Required information* The **Assessor** must retain evidence supporting the scope of the **partial rebuild** and their summary of the reused components. *Documentation examples* Documentation that can be used as evidence includes the following: a) Planning report. b) Owner's Project Requirements (OPR). c) Written confirmation from the developer or builder.
14.5.3 Shared elements	Section 7.9	*Required information* The **Assessor** must retain evidence of the **Gross Floor Area (GFA)** or other consistent area measurement for the following, if applicable:

		a) The **rated premises**, excluding shared elements. b) Other buildings which share elements with the **rated premises**, excluding shared elements. *Documentation examples* Documentation that can be used as evidence includes the following, in order of preference: 1) Official as-built documentation such as a Building Code of Australia report. 2) Third-party surveys or lease documentation. 3) Architectural schedules. 4) Direct measurement from current site plans or scaled prints. 5) Site measurements verified by the **Assessor**. Documentation for **GFA** must be made to/based on the **measurement standard for rated area**.
14.5.4 Materials of likely significance	Section 7.10	*Required information* Any material that is not included in the minimum material coverage, but the **Assessor** expects may have a significant impact, must be approved by the **National Administrator** prior to submitting the rating. *Documentation examples* Documentation that can be used as evidence must include— a) the **Assessor**'s calculations and supporting evidence; and b) written approval from the **National Administrator**.

14.6 Documentation required for Chapter 8: Material quantities

Topic	Requirements	Documentation
14.6.1 Bill of Quantities (BoQ)	Section 8.3.3	*Required information* The **Assessor** must retain evidence of all material quantities used in the **rated premises**. The document must identify accurate material quantities in appropriate units of measure (not just dollar values). It must be prepared by a costing specialist such as— a) a quantity surveyor; or b) an estimator within a construction firm. *Documentation examples* Documentation that can be used as evidence includes the following: 1) As-built **BoQ**. 2) Design stage **BoQ**. 3) Design stage **BoQ** with sufficient tracked changes to be considered as-built.
14.6.2 As-built evidence for key materials	Section 8.3.4	*Required information* The **Assessor** must retain evidence of delivery for all key as-built materials. *Documentation examples* Documentation that can be used as evidence includes the following: a) Invoices. b) Delivery dockets. c) Purchase orders. d) Returnable schedules, including name of letterhead or logo of the contractor, author (must be appropriate sub-contractor representative), and date of data entry. Documentation must be dated and state the specific products used, the quantities in a unit of measurement other than cost, the name of the manufacturer, the product grade or specification, and the project reference, name or site address.

14.6.3 Acceptable design estimates	Section 8.3.5	*Required information* The **Assessor** must retain evidence of all design estimates, including how they were calculated, or the reference used to determine them. *Documentation examples* Documentation that can be used as evidence includes the following: a) **BoQ**. b) Building information modelling accompanied by a signed, dated and company branded document stating compliance with Chapter 8 of the **Rules**. c) Direct measurement from drawings including workings, calculations, and any assumptions.
14.6.4 Conversion calculations	Section 8.5	*Required information* The **Assessor** must retain evidence of all conversions and parameter assumptions as they relate to any material quantity being converted manually by the **Assessor**. *Documentation examples* Documentation that can be used as evidence includes **Assessor** notes.
14.6.5 Building services	Section 8.6	*Required information* The **Assessor** must retain evidence of the number of lift cars and individual escalators, unless product-specific **emission factors** are used for vertical transport services. *Documentation examples* Documentation that can be used as evidence includes the following: a) **BoQ**. b) Floor plans. c) Purchase orders.

14.7 Documentation required for Chapter 9: Emission factors

Topic	Requirements	Documentation
14.7.1 Product-specific emission factors	Section 9.4	*Required information* For all materials using product-specific **emission factors**, the **Assessor** must retain evidence of— a) the product-specific **emission factor**; and b) the claimed material being used in the **rated premises**. *Documentation examples* Documentation that can be used as evidence includes the following: 1) Compliant **EPD**, **carbon footprint** or Climate Active documentation. 2) As-built evidence as per Section 14.6.2.
14.7.2 Custom facades	Section 9.7	*Required information* If creating a custom facade in the **NABERS rating input form**, the **Assessor** must retain evidence of the material make-up of the custom facade. If claiming product-specific **emission factors** for facade material, the **Assessor** must also retain evidence of— a) the product-specific **emission factor**; b) the claimed material being used in the **rated premises**; and either— 1) the quantity of materials per square metre of facade; or 2) the total quantity of materials used in the facade and the total square metres covered by the facade. *Documentation examples* Documentation that can be used as evidence includes the following: 1) Compliant **EPD**, **carbon footprint** or Climate Active documentation. 2) As-built evidence as per Section 14.6.2. 3) A signed bill of materials provided by the manufacturer.

		4) Invoices, purchase orders, delivery dockets or similar for all key material inputs into the facade. 5) Written confirmation from the builder or subcontractor of the total square metres covered by the facade.

14.8 Documentation required for Chapter 10: Carbon removals

Topic	Requirements	Documentation
14.8.1 Claiming carbon neutral materials	Section 10.3	*Required information* The **Assessor** must retain evidence showing that the specific material was used in the building and was a **carbon neutral certified product** at the time of construction. *Documentation examples* Documentation that can be used as evidence includes the following: a) Climate Active Public Disclosure Statement for a carbon neutral product certification. b) As-built evidence as per Section 14.6.2.
14.8.2 Claiming carbon storage in materials	Section 10.4	*Required information* The **Assessor** must retain evidence showing that the specific material used in the building was a product sourced from a sustainable managed forest. *Documentation examples* Documentation that can be used as evidence includes the following: a) Compliant **EPD**. b) FSC or PEFC certification details, including license number. c) As-built evidence as per Section 14.6.2. d) A record of any calculations the **Assessor** has carried out as per Section 10.4.5 or Section 10.4.6.

14.9 Documentation required for Chapter 11: Transport emissions

Topic	Requirements	Documentation
14.9.1 Source location	Section 11.4	*Required information* If overriding default transport distances for a material, the **Assessor** must retain evidence of the source location of the material. The source location must be defined as per Section 11.4. *Documentation examples* Documentation that can be used as evidence includes the following: a) Invoices, receipts, or chain of custody documentation clearly showing source location. b) A signed letter from the supplier, with supplier letterhead, clearly showing the source location. c) **EPD** showing source location.

14.10 Documentation required for Chapter 12: Construction and commissioning emissions

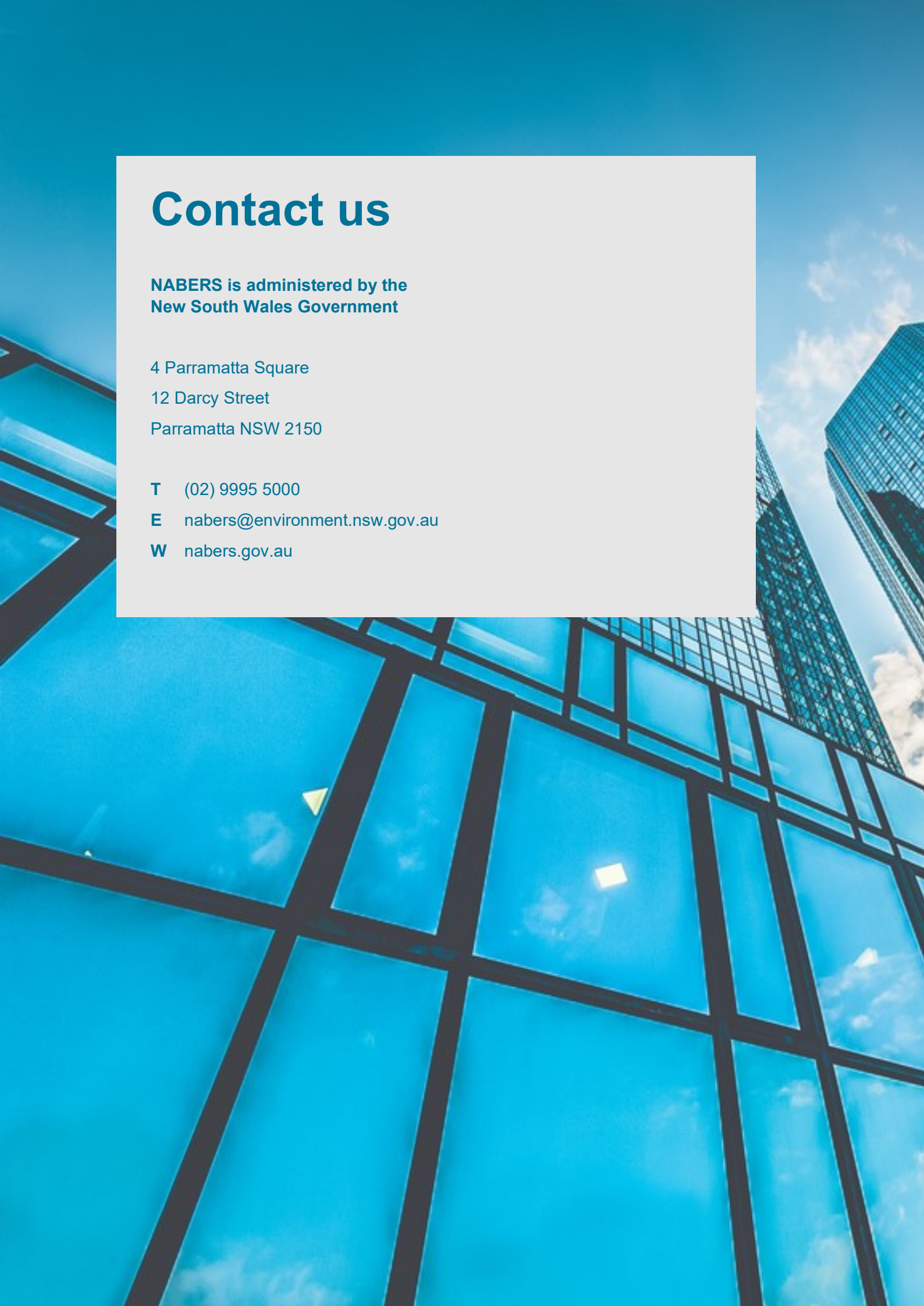
Topic	Requirements	Documentation
14.10.1 Project-specific construction and commissioning energy	Section 12.3.2	*Required information* If overriding the default construction and commissioning energy emissions, the **Assessor** must retain evidence that details— a) the total quantity of energy used; and b) the dates for the start and end of the construction period. *Documentation examples* Documentation that can be used as evidence includes the following: 1) Energy bills that cover all energy use during the period in which construction and commissioning occurred. 2) Other records from a third party that clearly show the quantity of energy use and the time period of use or sale (e.g. purchase orders, invoices, receipts of sale, Climate Active Public Disclosure Statements). 3) A letter provided by the construction contractor or an independent party such as a government works approval office, showing the date the construction period started. 4) **Occupancy Certificate**.
14.10.2 Off-site renewable electricity purchasing	Section 12.3.3.1	*Required information* The **Assessor** must retain evidence of any off-site renewable energy purchases, and evidence that the renewable electricity was allocated to the **rated premises** for the period in which construction and commissioning occurred. *Documentation examples* Documentation that can be used as evidence includes the following: a) Electricity bills for the site address during the construction period, clearly indicating a

		quantity of accredited GreenPower or voluntary surrender of LGCs. b) For separate GreenPower purchases— 1) proof of the GreenPower purchase; 2) invoice(s) that clearly document GreenPower accredited energy, or other documentation from the GreenPower Provider confirming that the energy is accredited through the GreenPower program; and 3) written confirmation from the developer or construction company that the GreenPower purchase was used for the **rated premises** for the period in which construction and commissioning occurred. c) For separate voluntary surrender of LGCs for a single site, evidence from the REC Registry of confirmed LGC surrender including— 1) date of purchase; 2) date of LGC creation; 3) volume of LGCs surrendered; 4) LGC certificate numbers (or range); 5) site address; and 6) period of electricity consumption for which the LGCs have been surrendered. d) For LGCs surrendered in bulk for multiple premises or periods— 1) evidence from the REC Registry of confirmed LGC surrender including date of purchase, date of LGC creation, volume of LGCs surrendered and LGC certificate numbers (or range); and 2) evidence that an independent third-party audit has been conducted to confirm the allocation of LGCs to different sites or periods. **Note:** The address of the building and period of electricity consumption can be entered in the 'surrender note' field of the REC Registry.

14.10.3 Project-specific waste rates	Section 12.4.2	*Required information* If overriding default construction waste rates, the **Assessor** must retain evidence that details the quantity of material brought to site and the quantity of material leaving site as waste. *Documentation examples* Documentation that can be used as evidence includes the following: a) Purchasing records (e.g. purchase orders, invoices, receipts of sale) that clearly show the amount of material brought to site and the amount of material identified by the same name/type sent offsite. b) Construction waste reports or compiled waste records completed by a waste contractor or for government compliance.
14.10.4 Project-specific end-of-life rates	Section 12.4.3.2	*Required information* If overriding default end-of-life scenarios for a material, the **Assessor** must retain evidence of the end-of-life pathways taken by the individual material and the percentage of each scenario rate. *Documentation examples* Documentation that can be used as evidence includes the following: a) Gate/tipping weighbridge receipts. b) Purchasing records (e.g. purchase orders, invoices, receipts of sale for waste tipping/management). c) Signed letter from waste contractor/waste facility/recycling facility detailing the end-of-life breakdown of materials they receive from site.

14.11 Documentation required for Chapter 13: Rating data completeness check

Topic	Requirements	Documentation
14.11.1 Justification of failed completeness check	Section 13.3	*Required information* The **Assessor** must retain evidence that supports their explanation for the failed completeness check. *Documentation examples* Any documentation that has been provided as part of evidence in Sections 14.2 to 14.10 can be included, such as— a) as-built **BoQ**; b) drawings; c) schedules, receipts, etc.



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