NABERSNZ Energy and Water for Offices

Rules for collecting and using data

VERSION 1.1 – March 2014

ADMINISTRATOR NZGBC NEW ZEALAND GREEN BUILDING COUNCIL

LICENSEE OF NABERSNZ IN NEW ZEALAND EECA BUSINESS PUTTING ENERGY TO WORK

Formatting conventions used in this document

Note: Text appearing with a grey tint in the background is explanatory text only. It is not part of the Rules.

Text appearing **dark green and bold** is a defined term, as explained in Section 2.2. Only the first occurrence under each heading is emphasised in this way.

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Level 8, 44 The Terrace, Wellington 6011,

PO Box 388, Wellington 6140

Phone: +64 4 470 2200 Fax: +64 4 499 5330

Email: nabersnz@nzgbc.org.nz
Website: www.nabersnz.govt.nz

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1. Introduction

The National Australian Built Environment Rating System (NABERS) is a performance-based rating system for buildings. It has been adapted for use in New Zealand with changes reflecting the energy use and practice norms of the New Zealand office market. This document is intended for use by NABERSNZ Accredited Assessors and Auditors while conducting and reviewing assessments in New Zealand.

A NABERSNZ rating for a building is based on a methodical assessment of the actual environmental impact of operating it. For a rating to be certified by NABERSNZ, the assessment on which it is based must be performed by a NABERSNZ **Accredited Assessor** and comply with a quality standard that sets out principles and rules for gathering, interpreting and using **data**. Assessments may be audited for compliance.

The quality standard for an assessment is defined in the *Rules for collecting and using data*. The Rules are amended as required by additional rulings, published on the NABERSNZ website, which apply the principles in the Rules to specific issues raised since the document was published.

These Rules are for assessing **office** buildings for certified NABERSNZ Energy and Water for offices performance ratings.

1.1. About NABERSNZ Energy and Water for offices ratings

NABERSNZ ratings are expressed as a number of stars, for example:

NABERSNZ rating		Performance comparison
6 stars	★★★★★★	Aspirational performance
5 stars	★★★★★	Market Leading performance
3 stars	★★★	Good performance

1.1.1. NABERSNZ Energy for offices

The more stars in a NABERSNZ Energy rating, the lower the energy use of the rated premises.

To determine the star rating, the total energy use of the office, based on 12 months of actual data (indexed by greenhouse gas intensity relative to electricity), is compared to the predicted average energy use for an office with the same attributes, such as **Rentable Area**, hours of use, climate and equipment density. The star rating is awarded based on how far the office's performance differs from its predicted average performance.

Three types of NABERSNZ Energy for offices ratings are available:

Tenancy rating	Assesses energy consumed by the occupant in the premises to be rated during the **Rating Period**, including: • lighting to all areas within the Rentable Area, including lift lobbies and amenities (**Service Areas**) • power to all equipment within the Rentable Area, including computer servers, lift lobbies and amenities (Service Areas) • tenant-installed signage within or on the building • tenant-controlled supplementary air conditioning to meet a **special tenant requirement** • generator fuel for tenant usage A tenancy rating does not cover lighting or power allocated to Service Areas that are allocated on a pro-rata basis to more than one tenant.

Base building rating	Assesses energy consumed in supplying building central services to office rentable and common spaces during the Rating Period, including: • common-area lighting and power (for example foyers, plant rooms and those lift lobbies and amenities (Service Areas) that are assigned as Rentable Areas on a pro-rata basis to more than one tenant). • lifts and escalators • air conditioning and ventilation, including: – base building services to meet normal requirements – centralised supplementary services provided for tenants – see Section 6.2.5 *Allocating energy use for services* – supplementary services provided to ensure the premises are **safe, lit and comfortable for office work**, where there is no special tenant requirement • exterior lighting • exterior signage provided by the building owner for the benefit of office tenants • generator fuel where it serves central services • car park ventilation and lighting, where internal or external car parks within the legal boundaries of the site are provided for tenant use.
Whole building rating	Assesses energy used by office tenancies and base building services to office rentable (including all Service Areas) and common spaces during the Rating Period. This should include all energy supplied to the building for the operation of the building and the occupants of the office space.

1.1.2. NABERSNZ Water for offices

The more stars in a NABERSNZ Water rating, the less water used by the rated building.

To determine the star rating, the total water use of the office, based on 12 months of actual data, is compared to the predicted average water use for an office with the same attributes, such as Rentable Area, hours of use, climate and equipment density. The star rating is awarded based on how far the office's performance differs from its predicted average performance.

A NABERSNZ Water for offices rating does not count consumption of internally or externally supplied recycled water or water from on-site **sources** such as rainwater tanks. However, externally supplied recycled water source data is collected by **Accredited Assessors** because it displaces potable water, and the data allows the building owner to understand the total water consumption of the building.

NABERSNZ Water for offices ratings are for whole buildings only. They can be conducted at the same time as a NABERSNZ Energy for offices base building or whole building rating.

1.2. About this document

1.2.1. Who the Rules are for

This document is intended for use by NABERSNZ Accredited Assessors and Auditors while conducting and reviewing assessments in New Zealand.

1.2.2. What's new in this version

The **Rules** are updated based on feedback from New Zealand and Australian Accredited Assessors, Auditors and Trainers over time, firstly via Rulings and secondly via new Rules editions.

This version of the Rules has mainly been revised and updated based on updates to the Australian NABERS **Rules** which were also applicable for New Zealand.

This version incorporates the rulings:

• 'Minimum occupancy for new buildings or buildings undertaking a major refurbishment' issued November 2012. This ruling replaces Section 3.6.1 Adjusting for unoccupied spaces – Part 3 Fitout and refurbishment of the NABERSNZ Energy and Water for offices, Rules for collecting and using data Version 1.0 November 2012 (the Rules). In particular, this ruling deals with moving some part of the explanatory text in the 'Notes' box under Part 3 of Section 3.6.1 to form part of the Rules and to clarify the minimum occupancy requirement for new buildings or buildings undertaking a major refurbishment.

• ‘Treatment of Rentable Area in office buildings used as medical practices or education facilities’ issued November 2012. This ruling extends the definition of ‘office’ and ‘office support facility’ in some circumstances to include spaces used as medical or educational facilities for the purposes of base building ratings only. The Ruling does not apply to tenancy or whole building ratings. This ruling is intended to apply to medical and educational facilities located within the Rentable Area of general purpose office buildings. It does not apply to purpose-built educational or medical facilities such as schools, universities, and hospitals.

There are also new or significantly changed provisions dealing with the following topics:

Topic	Description	Reference
Rating Assessment Form	References removed throughout the document or revised to Online Rating Calculator.	Section 2.1: *The Assessment Process*
Measurement Standard For Rated Area	Definition revised and clarified.	Section 2.2 *Definitions: Measurement Standard For Rated Area*
Potential Error	Definition revised and clarified.	Section 2.2 *Definitions: Potential Error*
Rating Period	Definition revised and clarified.	Section 2.2 Definitions: *Rating Period*
Supplementary equipment	Definition revised and clarified.	Section 2.2 *Definitions*: *Equipment*
Utility	Definition revised and clarified.	Section 2.2 *Definitions*: *Utility*
Hours of Occupancy	Definition revised and clarified to cover the scenario where there is more than one shift operating in a Functional Space.	Section 2.2 *Definitions*: *Hours of Occupancy*
Medical Office Facility	Definition added.	Section 2.2 *Definitions*: **Error! Reference source not found.**
Educational Office Facility	Definition added.	Section 2.2 *Definitions*: **Error! Reference source not found.**
Adjusting consumption data to rating period	Wording revised as Online Rating Calculator automates this function.	Section 2.6: *The Data Period*

Topic	Description	Reference
Medical Office Facilities	New section added detailing how these facilities are to be treated for the purposes of a NABERSNZ base building rating.	Section **Error! Reference source not found. Error! Reference source not found.**
Educational Office Facilities	New section added detailing how these facilities are to be treated for the purposes of a NABERSNZ base building rating.	Section **Error! Reference source not found. Error! Reference source not found.**
Minimum size for a Functional Space	Minimum size requirement of 5% of the total floor area removed.	Section 3.5 *Dividing the Rentable Area into Functional Spaces*
Computer server rooms	New figure added clarifying treatment of computer server rooms.	**Error! Reference source not found.**
Fitout and Refurbishment	Clarification made to the minimum occupancy requirements for new buildings or buildings undertaking major refurbishment.	Section 3.6.1 *Adjusting for unoccupied spaces – Part 3* ***Error! Reference source not found.***
Total Hours of Service	New figure added to clarify how to determine total Hours of Service for a Functional Space.	**Error! Reference source not found.**
Core hours	Figure amended to clarify how to determine core hours for a Functional Space.	Figure 11: *Determining total Hours of Service for a* ***Functional Space***

Topic	Description	Reference
Determining core hours	Order of priority of the methods for determining core hours for a Functional Space have been corrected and clarified.	Section 4.4.2 *Determining core hours* The core hours for a **Functional Space** are determined through one of the following methods, listed in order of preference: **1.2.2.1. Priority 1 – Written evidence** If there is clear and complete written evidence of the normal hours for which the space will be **safe, lit and comfortable for office work** (for example, in the lease conditions or documentation of subsequent negotiations and changes), then the core hours for the space must be based on these hours. Where the core hours

Topic	Description	Reference
Estimating number of computers	Clarification made of how the computer count is to be applied for vacant spaces.	Section 5.2.4 *Estimating numbers of computers* If an Assessor cannot access a space to physically count all the computers in a **Functional Space**, then the **Accredited Assessor** may discount or estimate the number of computers for that Functional Space as follows: 1) For small spaces within the Functional Space with a combined area of less than 1% of the total **Rated Area**, assume that there were zero computers in each space. 2) For other spaces, it is acceptable to ask staff familiar with the space or

Topic	Description	Reference
On-site generation	Clarification made as to how a grid feed system affects the rating.	Section 6.3 *On-site generation*
Estimated small un-metered End Uses	Guidance updated and expanded.	Section 9.4.3 *Estimating small un-metered end uses*
Missing or utility-estimated data	New section added to clarify the process to be used when one or more consecutive meter readings are missing, or estimated by the utility.	Section **Error! Reference source not found. Error! Reference source not found.**

1.2.3. Related documents

These **Rules** are part of the set of documents that govern how assessments are to be carried out and audited for NABERSNZ Energy and Water for offices ratings. Other documents in the set cover:

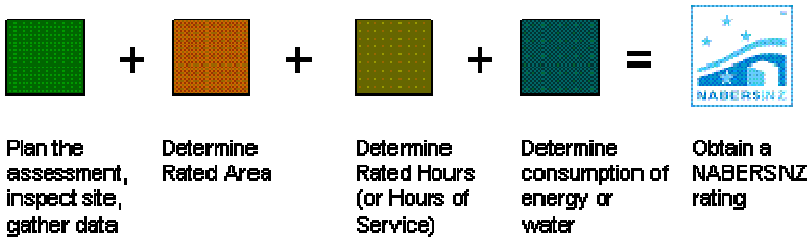
- additional rulings on specific issues
- auditing procedures for performance ratings
- a Code of Practice for **Accredited Assessors**.

2. Key concepts

2.1. The assessment process

A certified NABERSNZ rating is awarded after an assessment by an **Accredited Assessor** and after the rating application has been checked by NABERSNZ. The checks may include an independent audit of the assessment, and the resolution of any technical issues raised during the assessment.

Figure 1: Overview of the assessment process



The main documents and tools used in preparing a rating application are:

Document or tool	Description
Rules for collecting and using data (including additional rulings)	The quality standard for certified ratings, specifying what information is required and how it is to be treated in preparing a rating application.
Online Rating Calculator	A software tool on the NABERSNZ website which calculates an actual rating score based on the data collected during the assessment.

2.2. Definitions

This section lists the terms with particular meanings which must be used when interpreting this document.

Defined terms appear **dark green and bold** the first time they occur under each heading. Some defined terms with special meanings can also be identified by the use of initial capitalisation (for example, **Functional Space**). Other defined terms are not capitalised because the defined meaning is one of their common meanings.

For convenience, the definitions of many key terms are repeated at the start of the relevant chapter of the **Rules**.

Term	Definition
Acceptable data	**Data** which meets the applicable accuracy and validity requirements of these Rules. Acceptable data does not include **estimates**.
Acceptable estimate	Values derived from an estimation method specified in or permitted by these Rules, which may be used in place of acceptable data but only in accordance with Section 2.7 *Acceptable data and estimates*.
Accredited Assessor	An Accredited Assessor of the NABERSNZ scheme, authorised by the **Administrator** to conduct assessments for certified ratings in accordance with these Rules and the NABERSNZ processes and procedures.
Administrator	The body responsible for administering the NABERSNZ scheme, in particular for: • establishing and maintaining the standards and procedures to be followed in all aspects of the operation of the scheme, and • determining issues that arise during the operation of the scheme and the making of ratings, and • accrediting Assessors and awarding certified ratings in accordance with NABERSNZ standards and procedures. The New Zealand Government through the Energy Efficiency and Conservation Authority (EECA) as licensee[1] of NABERSNZ has engaged the New Zealand Green Building Council (NZGBC) to act on their behalf as the Administrator.

[1] The New South Wales Government through the Office of Environment and Heritage (OEH) has licensed EECA to modify and administer NABERS energy and water for offices in New Zealand.

Term	Definition
Alternative Method	A method for obtaining or interpreting data for an assessment which is not the preferred method, but which has been approved by the Administrator as either: • equivalent to the preferred method in terms of its results, accuracy and validity, or acceptable in place of the preferred method, subject to the data resulting from the Alternative Method being treated as an estimate in accordance with Section 2.7.2 *Standards for acceptable data and estimates*, or other specified conditions on the use of the data.
Assumption	A hypothetical value used in place of missing data in a procedure (such as a calculation) to produce a conditional result.
Auditor	A person contracted to the Administrator to perform audits of NABERSNZ rating applications.
Average	Arithmetical mean.
Data	Information which depends for its accuracy on: • measurements to a known standard of accuracy, or • verified specifications with a given tolerance for accuracy, or • other objective evidence.
Data type	A category of data used in a rating assessment. Data types for NABERSNZ Energy and Water for offices ratings are: • area • hours • number of computers • energy consumption: – electricity – gas – fuel oil • water consumption: – externally supplied potable water – externally supplied recycled water – water from on-site **sources**.

Term	Definition
Educational office facility	An educational facility, such as an English college or business college, which occupies a tenancy within a commercial office building that is fit for office use and is serviced by the base building air conditioning and ventilation system. This may include classrooms, seminar rooms, break-out spaces, meeting rooms, student computer labs, administration areas and store rooms. The definition of educational office facilities specifically excludes classrooms used as workshops, laboratories, art studios, teaching kitchens, as well as associated prep areas. The definition is not intended to include purpose-built educational facilities, such as buildings on university campuses or schools. The Administrator should be contacted if there is any doubt as to whether a facility or part of a facility can be included.
End use	A purpose or activity (or a group of related purposes and activities) that water or energy is used for. Where several instances of very similar individual end uses occur together so as to form a single collection (for example, luminaires in a lighting grid, taps in a washroom, or emergency lighting in a stairwell) then the collection is to be regarded as a single end use.
Estimate	Information relying on an **Accredited Assessor's** subjective judgement of the values to be used in place of incomplete or uncertain data.
Exclusively for the use of office tenants	Where public access is not generally allowed by the **office** owner or leaseholder, except for receiving visitors to the office.
External user	A user of an IT or communication service provided from a facility sited in the premises to be rated, who is not an occupant of the premises. An occupant who uses the service internally from the premises and who may also access the network or system remotely (such as from home or another work location) is not an external user.
Fit for office use	Fit for continuous occupation as an office, with adequate lighting and with suitable ventilation (such as air conditioning, natural ventilation or mixed-mode operation) of a similar or higher standard of service to the bulk of the office.
Fitout works	Construction activity undertaken to install, remodel, replace or remove an office fitout.

Term	Definition
Functional Space	A space identified by an Accredited Assessor as a distinct space in accordance with Section 3.5 *Dividing the Rentable Area into Functional Spaces*.
Hours of Occupancy	The number of hours per week when 20% or more of the usual occupants of a **Functional Space** are present in the space, as determined in Section 4.3 *Tenancy and whole building Rated Hours*. Where a space is used for two or more shifts, the 20% minimum occupancy must be determined based on the shift with the largest number of occupants.
Hours of Service (NABERSNZ Energy for offices base building ratings)	The number of hours per week for which a tenant has requested that a Functional Space be **safe, lit and comfortable for office work**. They are the total of: • core hours: hours agreed in writing by the building owner and the tenant during which the space will be safe, lit and comfortable for office work, subject to the agreement being reasonable and the hours reasonably reflecting the actual use of the space, and • after-hours air conditioning hours: hours, in addition to the core hours, that the tenant has requested air conditioning to operate to service occupancy.
Measurement Standard for Rated Area	The standard used for determining the **Rentable Area** of premises to be rated, as set out in the Property Council of New Zealand Incorporated/ Property Institute of New Zealand Incorporated 2013 *Guide for the Measurement of Rentable Areas*. Previous accepted versions of the 2013 PCNZ/PINZ *Guide for the Measurement of Rentable Areas* include: - The 2006 PCNZ/PINZ *Guide for the Measurement of Rentable Areas* - The 1996 BOMA/PLEINZ *Guide for the Measurement of Rentable Areas* - The 1987 BOMA/PMI *Guide for the Measurement of Rentable Areas.*

Term	Definition
Medical office facility	A doctor's surgery, dentist's surgery or other facility operated by a health professional (for example, physiotherapist) that occupies a tenancy within a commercial office building that is fit for office use and is serviced by the base building air conditioning and ventilation system. This may include consulting rooms, patient reception areas, break-out spaces, meeting rooms, medical administration areas, and associated store rooms for medical equipment, supplies or records. The definition excludes hospitals, operating theatres, specialist medical imaging practices, laboratories, day-stay treatment areas, wards, specialist emergency medicine facilities, pharmacies and specialist pathology collection rooms. The Administrator should be contacted if there is any doubt as to whether a facility or part of a facility is included.
Metering system	A metering system for an individual measurement includes: • the meter, and • the processes that convert the initial meter signal into an energy reading (for example, current transformers and K factors for electricity meters, pressure correction factors for gas meters), and • the interface through which the meter reading is taken (for example, manual readings, **utility** software or a Building Management System).
Metering systems requiring validation	Non-utility **metering systems** providing measurements for a rating assessment which include: • an electricity meter using a current transformer (CT), or • a gas meter, or • a Remote Meter Reading System (RMRS).
Non-utility meter	A meter measuring distribution of energy or water in a building, not operated by a utility supplier.

Term	Definition
Occupied	A space within the Rentable Area of a building is occupied when: • for base building ratings – it is **ready for occupation** • for tenancy ratings – it is ready for occupation and being actively used as an office, including use as an **office support facility** • for whole building ratings – it is ready for occupation and either being actively used as an office (this includes use as an office support facility) or undergoing **fitout works**.
Office	A workplace primarily used for administrative, clerical and similar information-based activities, including the use of office support facilities.
Office support facility	A facility which is not itself dedicated to administrative, clerical or similar information-based activities but which: • is an adjunct to an office used primarily to provide supporting facilities or services to the office or its occupants, and • is **exclusively for the use of office tenants** (not for use by the public), and • occupies a space which is **fit for office use**.
Potential Error	The total of all estimates (including **assumptions**, approximations, and un-verified data) for a **data type.**
Rated Area	The area measurement used in calculating a NABERSNZ Energy or Water for offices rating, derived from the Rentable Area of the premises to be rated by excluding the floor area of spaces not used as offices during the **Rating Period**. This is done according to the process and criteria in Section 3.6 *Exclusions from the Rated Area calculation*.
Rated Hours: NABERSNZ Energy for offices base building ratings	The area-weighted average duration of the **Hours of Service** for all Functional Spaces in the building, as determined in Section 4.4 *Base building Rated Hours*.
Rated Hours: NABERSNZ Energy for offices tenancy and whole building ratings	The area-weighted **average** duration of the **Hours of Occupancy** for all Functional Spaces in the premises to be rated, as determined in Section 4.3 *Tenancy and whole building Rated Hours*.

Term	Definition
Rated Hours: NABERSNZ Water for offices ratings	For a stand-alone NABERSNZ Water for offices rating and one in conjunction with a NABERSNZ Energy for offices base building rating: the same as the **Rated Hours** for a base building rating, as determined in Section 4.4 *Base building Rated Hours*. For a NABERSNZ Water for offices rating in conjunction with a NABERSNZ Energy for offices whole building rating: the same as the Rated Hours for the whole building rating, as determined in Section 4.3 *Tenancy and whole building Rated Hours*.
Rating Period	The continuous 12-month period covered by the data used for NABERSNZ Energy and Water ratings. Some allowances and adjustments are possible for data that does not exactly coincide with the Rating Period. See Section 9.7 *Periods covered by utility data*.
Ready for occupation	A space within the Rentable Area of a building is ready for occupation when a person or organisation: • is entitled to exclusive use of the space (for example, through ownership or a lease or other agreement), and • requires normal base building services, such as access, air conditioning, lighting and power to be provided to the space.
Rentable Area	The floor area, determined in accordance with the **Measurement Standard for Rated Area**, of spaces that can be used as offices within the premises to be rated.
Rules	NABERSNZ Energy and Water for offices *Rules for collecting and using data* (including rulings).
Safe, lit and comfortable for office work	Where the conditions in a space (for example, in terms of lighting, temperature, air quality and safety systems) are suitable for reasonable, normal use as an office.
Service Area	Rentable Area that is outside the areas typically occupied by the tenant (i.e. outside the tenancy), including lift lobbies, toilets, kitchens, cleaners cupboards and the associated access ways as defined in the **Measurement Standard for Rated Area.** Note: Service Areas can be apportioned to Rentable Area on a pro-rata basis in the instance of multiple tenancies on a single floor sharing services.

Term	Definition
Source	For NABERSNZ Energy ratings: an individual fuel or energy source type such as gas, electricity or diesel fuel. For NABERSNZ Water ratings: an individual water source type such as mains water, bore water, externally reticulated grey water or river water.
Special tenant requirement	An unusual usage of office space, resulting in an increased intensity of service (for example, a 'trading floor' within an office), or where office support facilities require additional services to achieve comfort conditions.
Supplementary equipment	Equipment that supplements the general capacity provided by the base building system.
Tenant Occupancy Survey	A survey of the staff managers or supervisors responsible for the Functional Spaces in the premises to be rated, conducted according to Section 4.3.3 *Conducting a Tenant Occupancy Survey* and Section 10.2 Appendix *B – Tenant Occupancy Survey*.
Un-validated metering systems	**Metering systems requiring validation** without current evidence of **validation**.
Use by the tenants	Occupation by, and activities performed by or for, holders of a lease or other agreement for use of office space. This may involve access by a variety of employees, contractors, suppliers, business visitors and others.
Utility	A company recognised and regulated under legislation for the supply of energy or water to a building and its occupants.
Utility meter	A meter measuring supplies of energy or water to a building, operated by a utility as the basis for billing its customer.
Validation	When a metering system is checked, and if necessary adjusted and re-checked, to ensure its measurements of consumption are correct.
Verification	Confirmation by examination and objective evidence that specified requirements have been met (usually, that data is accurate and correct), for example by: • comparison of independent measurements or observations, or of measurements and specifications, or • logical or statistical analysis of data for consistency with known requirements.

2.3. Interpretation

2.3.1. Current version

These *Rules for collecting and using data* are revised from time to time. Rulings on specific cases are published as addenda when necessary, and periodically the Rules document will be revised to incorporate the rulings.

Assessments for a certified rating must comply with the version of the *Rules for collecting and using data* (including rulings) current on the day the rating application is submitted to NABERSNZ, unless:

- the assessment is conducted under the terms of a NABERSNZ Commitment Agreement which specifies an earlier version of the Rules, or
- the **Administrator** in consultation with the Energy Efficiency and Conservation Authority (EECA) and the Office of Environment and Heritage (OEH)[2] has specifically approved otherwise.

All rulings and new versions of the Rules are published on the NABERSNZ website www.nabersnz.govt.nz in the secure section for registered users.

2.3.2. Rulings

These **Rules** are intended to cover most **office** buildings in New Zealand. However, it is always possible that some aspect of a building's design or operation raises a new issue that is not clearly covered by the existing rules.

Whenever **Accredited Assessors** are unsure how to apply the Rules to a particular issue or situation, they must contact the **Administrator** for technical advice or to request a specific ruling on the case.

Once a ruling is published on the NABERSNZ website it is effective from that date and becomes part of these Rules.

2.3.3. Precedence

2.3.3.1. Rulings

A published ruling always takes precedence if there is any conflict with any other provision of these **Rules**. If there is a conflict between rulings, the most recent takes precedence.

2.3.3.2. Determining applicable requirements

Specific requirements of these Rules take precedence over any other general requirements.

[2] The New South Wales Government through the Office of Environment and Heritage has licensed EECA to modify and administer NABERSNZ energy and water for offices in New Zealand.

2.3.3.3. Secondary material

These Rules include some material which is secondary to the substantive provisions, including:

- introductions and explanations (such as summaries, flowcharts, diagrams, notes, examples and glossaries) intended only to help readers understand its substantive provisions
- forms and notices intended only to assist in conducting an assessment.

The substantive provisions of these Rules (including rulings) always take precedence if there is any misunderstanding or conflict[3] with:

- any other material contained in these Rules, or
- any other documentation, forms or calculators for NABERSNZ Energy and Water ratings.

Note: The diagrams in this document are intended to provide an overview and introduction to the processes they describe. They do not describe individual steps or decision criteria in detail. Refer to the relevant substantive provisions in the text when seeking guidance or making determinations in relation to any individual assessment.

2.4. Proposed new methods

Accredited Assessors may find they need to use a new method for obtaining or interpreting **data** for an assessment. For example, they may encounter a new technology or system design such as on-site generation; or they may need to develop a new **Alternative Method** to acceptably use available data.

Accredited Assessors who wish to use a new method must contact the **Administrator** to request approval beforehand. The request should include:

- a complete explanation of the circumstances, including the reason why an existing method cannot be used, and
- a complete explanation of the method proposed and all calculations required, and
- an analysis of the possible error involved in use of the method.

2.4.1. Standard for acceptable data

The standard for **acceptable data** for a new method will be specified when the method is approved by the **Administrator** in consultation with EECA and OEH. In general, **data** must be derived from measurements or records which have been independently verified and are of a known degree of accuracy.

[3] Contact the **Administrator** if you believe that a section of these Rules is inconsistent with another section or with other documentation, forms or calculators for NABERSNZ Energy and Water ratings. See www.nabersnz.govt.nz for contact details.

Note: Methods of estimation where the possible error is unknown are unlikely to be approved.

2.4.2. Documentation required

The documentation required for a new method will be specified when the method is approved by the **Administrator** in consultation with EECA and OEH. In general, it must include copies of the original records which the method requires for **data**, and documentation of all calculations, **assumptions**, and interpretations involved.

2.5. Summary of data and documentation needed

The following information may be needed for a rating. Individual ratings may also require additional information or documentation depending on the particular circumstances of the premises.

A more detailed checklist is included as Section 10.1 *Appendix A – Information checklist for certified ratings*.

Topic	Data and documentation needed
Information about the rating application	Information about: • the premises to be rated • the person or organisation obtaining the rating, and • the purpose of the rating, such as a sustainability scheme or NABERSNZ Commitment Agreement.
Rated Area Rentable Area of the premises to be rated, less any exclusions.	Lease documents, or documentation of subsequent negotiations and changes, showing tenancy types, hours of operation, and information relating to occupancy (including the start and end dates for leases, occupation and construction works).
	Survey, lease or third-party **data** (in that order of preference) validating the **Rentable Area** of the premises to be rated, to the **Measurement Standard for Rated Area**.
	Calculations or documentation confirming the area of all **Functional Spaces** in the premises to be rated, and any spaces to be excluded from the rating.
	Documentation substantiating the grounds for any exclusion from the **Rated Area** calculation.

Topic	Data and documentation needed
Rated Hours: base building ratings The amount of time that the building is required to provide comfort conditions to tenants.	Documentation notifying the building manager of agreed hours of service for normal and after-hours operation.
	After-hours air conditioning request logs.
	Any documentation required to verify hours of occupancy over 60 hours a week.
Rated Hours: tenancy and whole building ratings The amount of time that the premises have at least 20% of normal peak occupancy.	Permission from any affected third parties to survey staff managers or supervisors to determine hours of occupation; and the survey itself.
	Security logs, time sheets or other records, if survey responses cannot be obtained for some spaces.
Number of computers (tenancy and whole building ratings only) The number of computers in regular use in the premises to be rated.	Permission from all affected third parties for access during a site visit to count computers.
	Marked-up desk layouts for all spaces in the premises to be rated, if available.
	Where necessary, evidence of regular use of computers such as: • a report by a manager or other authoritative source that a system is in regular use • for computers in training rooms, etc., booking or attendance records showing how many computers were used and how long for.
Energy and water usage Information on sources and allocations to different end uses in the premises to be rated; and 12 months of consumption data covering the Rating Period.	Single-line diagrams, electrical circuit schedules and water reticulation diagrams to ensure all energy and water **sources** are included.
	Evidence of accuracy and **validation** of high-voltage electricity meters and all other **non-utility meters**, and records of readings of non-utility meters. This will include certificates of currency or other written evidence to confirm that every **metering system** requiring validation has been checked.
	Documentation of any agreements between tenants or between building owner and tenants to allocate costs or responsibility for consumption (for example, for shared facilities or supplies).

Topic	Data and documentation needed
	Calculations or documentation confirming any consumption to be excluded from the rating, and substantiating the grounds for the exclusion. A wide variety of specific documentation may be required.
	Utility billing data (bills or a consolidated electronic record showing consumption) covering the full 12 months of the **Rating Period** for each energy or water source (as appropriate) used in the rated premises.
	Where bills are not available, permission from any affected third parties to obtain energy or water consumption data for the premises.
	Bills for deliveries of any discrete (batch) supplies, showing quantities delivered and how they were measured. If the data does not include enough separate deliveries, then regular records of storage capacity readings are used.
Climate	The region/city that the building is located in.

2.6. The Rating Period

2.6.1. Definitions

Rating Period	The continuous 12-month period covered by the **data** used for NABERSNZ Energy and Water ratings. Some allowances and adjustments are possible for data that does not exactly coincide with the Rating Period. See Section 9.7 *Periods covered by utility data*.

2.6.2. Data must cover the same period

All **data** from all sources used in assessing **office** premises for a NABERSNZ Energy or Water rating must either:

- cover the same **Rating Period**, or
- meet the requirements specified in Section 9.7 *Periods covered by utility data*.

Note: Section 9.7 *Periods covered by utility data* allows for a rating to proceed although some **utility** billing periods may not coincide with the Rating Period. Essentially, data for up to 20% of the total consumption may apply to a period up to two months outside the Rating Period, and data for water consumption may also apply to periods up to two months or four months (depending on the billing period) outside the Rating Period.

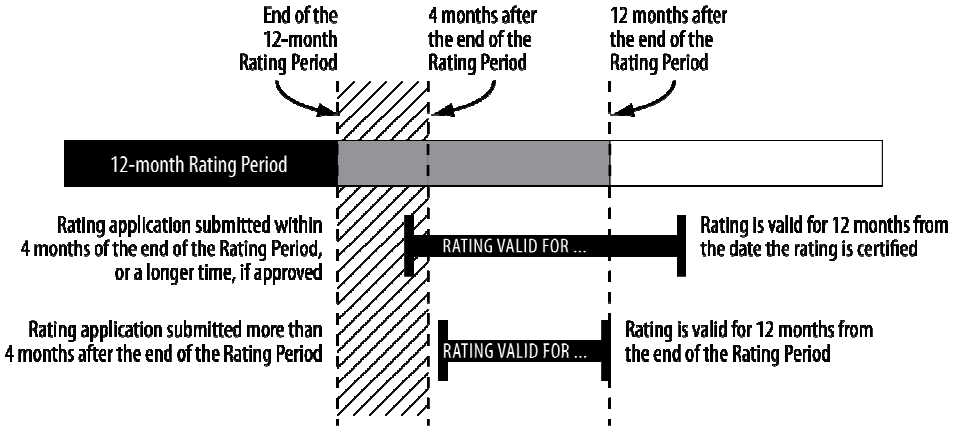
2.6.3. Time allowed for assessment

An application for an certified NABERSNZ rating must be submitted within four months of the end of the **Rating Period** unless:

- the rating is to be an 'old' rating as described in Section 2.6.4 below, or
- the **Administrator** allows extra time to compensate for time taken to issue technical advice or rulings before the application could be submitted.

Where a rating application is submitted within four months of the end of the Rating Period, or a longer period approved by the **Administrator** as above, the NABERSNZ rating certificate based on the assessment will be valid for twelve months from the date the rating is certified by the **Administrator**.

Figure 2: Currency of ratings lodged before and after end of time allowed



2.6.4. Older Rating Periods

Ratings may be undertaken using **Rating Periods** which ended more than four months before the date the rating application was lodged, but only for benchmarking purposes and only if adequate information is available for all input **data** to cover the relevant Rating Period.

Where a rating application is submitted more than four months after the end of the Rating Period, and the **Administrator** has not approved an extension of time to compensate for delay, the NABERSNZ rating certificate based on the assessment will be valid for twelve months from the end of the rating period.

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2.7. Acceptable data and estimates

2.7.1. Principles

2.7.1.1. Data and estimates must be as specified

An assessment for an certified NABERSNZ Energy or Water for offices rating must be based on the **data** or **estimates** specified in:

- the relevant provisions of these **Rules** (including applicable rulings), and then
- the relevant sections of the Online Rating Calculator.

2.7.1.2. Data and estimates must be of acceptable standard

The decision process for determining **acceptable data** and estimates in Section 2.7.2 *Standards for acceptable data and estimates* must be followed, except where another process is specifically allowed by a provision of these Rules.

Note: Some sections of these Rules provide that, if specific procedures are followed for some input data, the requirement for compliance with Section 2.7.2 *Standards for acceptable data and estimates* is then deemed to be satisfied.

2.7.2. Standards for acceptable data and estimates

2.7.2.1. Data

If accurate and verifiable **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, subject to any specific requirements applied in relevant provisions of these **Rules**:

3) data obtained directly by the **Accredited Assessor**

4) data provided by a third party without a significant interest in the operation or performance of the building or its equipment (such as a **utility** or a consultant engaged to provide independent advice):
   a) documents or other records provided by a third party which can be verified by the source (for example, utility bills) or by the Accredited Assessor (for example, building plans showing **Rentable Area**)
   b) documents or other records which cannot be independently verified (for example, plant operation data) but whose authenticity and accuracy is attested to by a credible and responsible person, or
   c) verbal information provided by a credible and responsible person, recorded in writing by the Accredited Assessor with the full name, position, and contact details of the person giving the information.

5) data provided by the building owner or tenant commissioning the rating, or a third party with a significant interest in the operation or performance of the building or its equipment (such as a facility manager, technical contractor or equipment supplier):
   a) 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, leases)
   b) documents or other records which cannot be independently verified (for example, plant operation data) but whose authenticity and accuracy is attested to by a credible and responsible person, or
   c) verbal information provided by a credible and responsible person, recorded in writing by the Accredited Assessor with the full name, position, and contact details of the person giving the information.

2.7.2.2. Estimates

If **acceptable data** is not available, or where these Rules permit otherwise, **estimates** (including **assumptions**, approximations and un-validated data) can be used – but only if:

- the estimates satisfy any specific requirements applied in relevant provisions of these Rules, and
- the combined effect of all estimates is within ± 5% of the overall rating, as calculated by the Online Rating Calculator.

2.7.2.3. Unacceptable data and estimates

If information is required for a rating but none of the requirements above in this Section 2.7.2 can be satisfied, the premises cannot be rated.

2.8. Site inspection

Accredited Assessors are expected to inspect the premises to be rated during their assessment, in order to:

- become familiar with the layout, services and features of the premises
- confirm that documentation provided for the assessment is accurate, complete and up-to-date
- check that all required spaces have been included in the **Rentable Area**
- check for inclusions in and exclusions from the **Rated Area** calculation and energy and water coverage (as appropriate)
- count computers (for tenancy and whole building ratings)
- visit plant rooms to ensure that all relevant equipment is covered under the meters included in the rating, and
- resolve any other issues that arise.

An Accredited Assessor's inspection of the premises is expected to include a physical check of all **Functional Spaces**.

However, there may be limited circumstances where access to all or part of the premises is refused on safety or security grounds. In this event the Accredited Assessor must explain why they could not access these spaces, and fully document the reasons on the rating application. If there are known impacts on the quality of the information obtained for the assessment (for example, an **estimate** must be used in the absence of verified **data**) then these must also be fully described.

2.9. Documentation and record-keeping

2.9.1. Documentation required

It is not essential that the records that contain **data** used for an assessment are the original documents, such as signed leases or original **utility** invoices.

While access to original documents is highly desirable, there may be practical difficulties or delays in obtaining them. An assessment may therefore be based on copies of utility bills, leases and other records as long as the **Accredited Assessor** is satisfied that they are, or can be verified to be, true and complete records of the original documents or files.

Note that summaries, or other derivative documents that quote the original source documents, are not the same as verifiable copies of the originals.

2.9.2. Records to be kept seven years for audit

Accredited Assessors must keep for audit all records on which an assessment is based, including records of **assumptions** made and all information and calculations used as the basis for **estimates**, for seven years from the date the rating application was lodged.

2.9.3. Records to be kept by Accredited Assessors

The records kept must be the actual documents used for the assessment, or verifiable copies. Summaries are not acceptable.

The records kept by **Accredited Assessors** must be to such a standard that it would be possible for another Accredited Assessor or an **auditor** to 'reverse engineer' or accurately repeat the rating from only the documents provided.

3. Rated Area

3.1. Summary

In NABERSNZ Energy and Water for offices ratings, the size of a tenancy or building is measured through its **Rated Area**. This figure is used (along with other factors such as **Rated Hours** and climate) to adjust the figures for energy and water consumption so that a fair comparison can be made between spaces or buildings of different size.

The Rated Area is determined through a process which:

- divides the Rentable Area of the premises to be rated into **Functional Spaces**
- adjusts the floor area measurement of each Functional Space to account for any exclusions (vacant spaces, non-office spaces, public access space over 10% of the total Rated Area, and spaces of uncertain classification), and
- adds together the resulting floor areas for all the Functional Spaces.

The Rated Area for a base building or whole building rating is effectively the sum of the Rated Area calculations for all **office** tenancies in the building.

3.2. Definitions

Term	Definition
Exclusively for the use of office tenants	Where public access is not generally allowed by the **office** owner or leaseholder, except for receiving visitors to the office.
External user	A user of an IT or communication service provided from a facility sited in the premises to be rated, who is not an occupant of the premises. An occupant who uses the service internally from the premises and who may also access the network or system remotely (such as from home or another work location) is not an external user.
Fit for office use	Fit for continuous occupation as an office, with adequate lighting and with suitable ventilation (such as air conditioning, natural ventilation or mixed-mode operation) of a similar or higher standard of service to the bulk of the office. Note: It is irrelevant whether the air conditioning or

	ventilation is provided by base building or supplementary systems.
Fitout works	Construction activity undertaken to install, remodel, replace or remove an office fitout.
Functional Space	A space identified by an **Accredited Assessor** as a distinct space in accordance with Section 3.5 *Dividing the Rentable Area into Functional Spaces*.
Measurement Standard for Rated Area	The standard used for determining the **Rentable Area** of premises to be rated, as set out in the Property Council of New Zealand Incorporated/ Property Institute of New Zealand Incorporated 2013 *Guide for the Measurement of Rentable Areas*.
	Previous accepted versions of the 2013 PCNZ/PINZ *Guide for the Measurement of Rentable Areas* include: - The 2006 PCNZ/PINZ *Guide for the Measurement of Rentable Areas* - The 1996 BOMA/PLEINZ *Guide for the Measurement of Rentable Areas* - The 1987 BOMA/PMI *Guide for the Measurement of Rentable Areas.*
Occupied	A space within the Rentable Area of a building is occupied when: • for base building ratings – it is **ready for occupation** • for tenancy ratings – it is ready for occupation and being actively used as an office, including use as an **office support facility** • for whole building ratings – it is ready for occupation and either being actively used as an office (this includes use as an office support facility) or undergoing **fitout works**.
Office	A workplace primarily used for administrative, clerical and similar information-based activities, including the use of office support facilities.
Office support facility	A facility which is not itself dedicated to administrative, clerical or similar information-based activities but which: • is an adjunct to an office used primarily to provide supporting facilities or services to the office or its occupants, and • is **exclusively for the use of office tenants** (not for use by the public), and • occupies a space which is **fit for office use**.
	Note: This includes facilities for reception, meetings, training, filing and storage, IT and other office

	equipment, tenant-installed kitchenettes and staff amenities. It can also include child care, refreshment, recreation, and exercise facilities, as long as they are only open to people who are occupants of offices in the premises to be rated.
Rated Area	The area measurement used in calculating a NABERSNZ Energy or Water for offices rating, derived from the Rentable Area of the premises to be rated by excluding the floor area of spaces not used as offices during the **Rating Period**. This is done according to the process and criteria in Section 3.6 *Exclusions from the Rated Area calculation*.
Ready for occupation	A space within the Rentable Area of a building is ready for occupation when a person or organisation: • is entitled to exclusive use of the space (for example, through ownership or a lease or other agreement), and • requires normal base building services, such as access, air conditioning, lighting and power to be provided to the space.
Rentable Area	The floor area, determined in accordance with the **Measurement Standard for Rated Area**, of spaces that can be used as offices within the premises to be rated. Note: This is essentially the space within the permanent walls of the building, including **Service Areas**, but excluding spaces for: • public access and use (including stairs, escalators, lifts and the ground floor foyer) • building mechanical, air conditioning, electrical and other **utility** services which are not part of a tenant's fitout.
Service Area	Rentable Area that is outside the areas typically occupied by the tenant (i.e. outside the tenancy), including lift lobbies, toilets, kitchens, cleaners cupboards and the associated access ways as defined in the **Measurement Standard for Rated Area.** Note: Service Areas can be apportioned to Rentable Area on a pro-rata basis in the instance of multiple tenancies on a single floor sharing services.
Use by the tenants	Occupation by, and activities performed by or for, holders of a lease or other agreement for use of office space. This may involve access by a variety of employees, contractors, suppliers, business visitors and

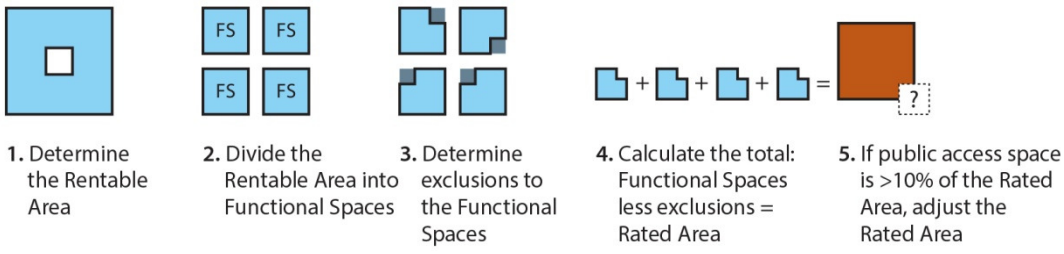
others.

3.3. Process overview

The **Rentable Area** is the starting point for calculating the **Rated Area**. The **Accredited Assessor** must then divide the Rentable Area into **Functional Spaces**, assess vacancies, and determine exclusions. This will require copies of plans, leases and usually site investigation.

	Step	Reference
1	Determine the Rentable Area.	Section 3.4 Determining office Rentable Area
2	Divide the Rentable Area into easily workable Functional Spaces with separate spaces, vacancies and hours of operation.	Section 3.5 Dividing the Rentable Area into Functional Spaces
3	For each Functional Space, determine exclusions for areas not used for **office** activities during the **Rating Period**.	Section 3.6 *Exclusions from the Rated Area calculation*
4	Calculate and add up the resulting included floor areas to find the **Rated Area**.	
5	If public access space is more than 10% of the Rated Area, adjust the Rated Area to include a maximum of 10%.	Section 3.6.4 *Limiting the proportion of public access space*

Figure 3: Determining Rated Area



3.3.1. Calculating the Rated Area

The method for calculating the **Rated Area** for different rating types is as follows:

Rating type	Calculation method
NABERSNZ Energy for offices tenancy rating	**Rentable Area** for the total of all spaces in the tenancy being rated (based on the **Measurement Standard for Rated Area**), less the exclusions detailed in Section 3.6 *Exclusions from the Rated Area calculation*.
NABERSNZ Energy for offices base building or whole building rating	Rentable Area for the total of all spaces in the building being rated that are leased or available for lease for **office** tenancies (based on the Measurement Standard for Rated Area), less the exclusions detailed in Section 3.6 *Exclusions from the Rated Area calculation*.
NABERSNZ Water for offices rating	When assessments for both a NABERSNZ Water for offices rating and a NABERSNZ Energy for offices base building or whole building rating are performed together for the same site and for the same **Rating Period**, use the Rated Area from the NABERSNZ Energy assessment. For an assessment for a stand-alone NABERSNZ Water for offices rating, follow the area calculation process for a NABERSNZ Energy for offices base building rating.

3.4. Determining office Rentable Area

The office **Rentable Area** of the premises to be rated must be verified by the **Accredited Assessor** to have been measured in compliance with the **Measurement Standard for Rated Area**, by one of the following methods (listed in order of preference):

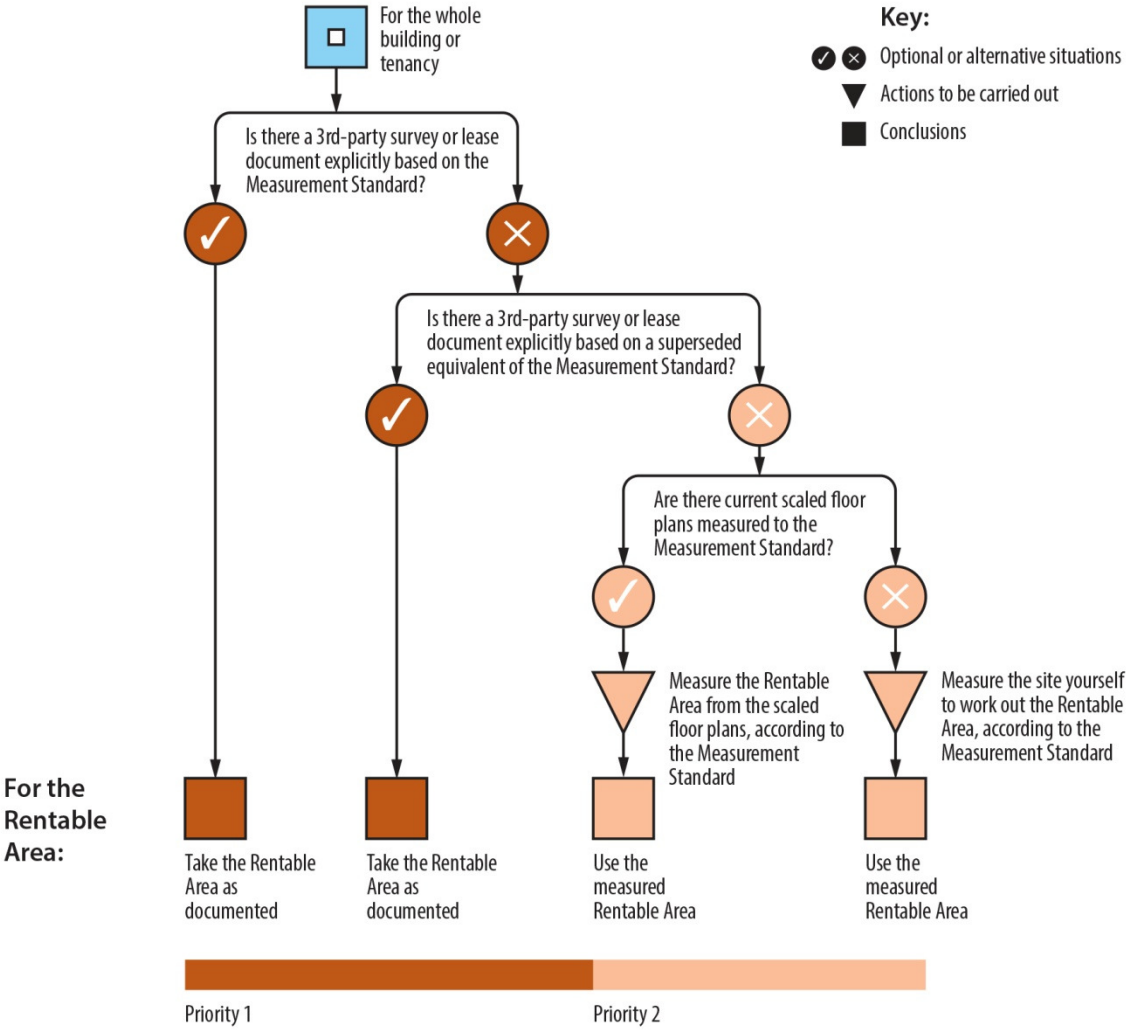
1) reference to a third-party survey or to lease documentation that is explicitly based on the Measurement Standard for Rated Area, or, if not available

2) reference to a third-party survey or to lease documentation that is explicitly based on an earlier version of the Measurement Standard for Rated Area where, for the purposes of a NABERSNZ rating, it is equivalent to the Measurement Standard for Rated Area, or, if not available

3) direct measurement from current plans or scaled prints, measured to the Measurement Standard for Rated Area, or, if not available

4) site measurements verified by the Accredited Assessor to have been done to the Measurement Standard for Rated Area.

Figure 4: Determining Rentable Area



3.4.1. Standard for acceptable data

3.4.1.1. Area measurement estimates

If the area measurement for a space cannot be verified by the **Accredited Assessor** in accordance with Section 3.4, then the **estimated** area of that space must be added to the **Potential Error** for area.

Note: Subdivision of spaces is not as critical as overall areas. For example, a floor might be verified to the **Measurement Standard for Rated Area**, butfor convenience of hours calculations might have several **Functional Spaces** measured from not-to-scale layouts. Since the overall area is verified there is no need to add the Functional Space floor areas to the Potential Error for area.

3.4.1.2. Currency of information

Regardless of the method used to determine the **Rentable Area**, the Accredited Assessor must ensure that the information accurately reflects the configuration of the building and its uses during the **Rating Period**. Survey information must be checked through a site inspection to ensure the space has not been altered, for example by the introduction of corridors to serve multiple tenancies.

The Accredited Assessor must check whether the Rentable Area includes spaces, such as tenant-occupied security and reception desks on the ground floor (whether separate spaces or part of the building entrance or lobby), which may not be shown on survey drawings.

Note: An unverified tenancy schedule is not a suitable document on which to base the Rentable Area assessment.

3.4.2. Complete tenancy

For tenancy ratings, the Rentable Area must include all **office** spaces (including **office support facilities**) in the building that are used together by the tenant as an interrelated group of facilities to accommodate its business, no matter if they are on one or more floors and regardless of whether:

- the spaces are **occupied** on the basis of one or more leases or other agreements, and
- those leases or agreements are nominally held by one or more associated entities on behalf of the tenant.

Facilities are not included in such an interrelated group if they are:

- physically distinct, and
- managed independently, and
- presented or branded distinctly, and
- independent of one another for services.

3.4.3. Medical and educational office facilities

Medical office facilities and educational office facilities are to be treated as if they are office for the purposes of a NABERSNZ base building rating; with the caveat that a Tenant Occupancy Survey is not deemed an acceptable method for determining the hours of occupancy for these spaces.

The inclusion of medical and educational office facilities is capped to a maximum of 25% of the total Rated Area of the building. Any additional amount must be excluded form the Rated Area calculation.

Note: Public reception or patient waiting rooms within medical or educational office facilities must be included with the assessment of public access space, which is capped to a maximum of 10% of the total Rated Area in accordance with Section 3.6.4 *Limiting the proportion of public access space.*

3.5. Dividing the Rentable Area into Functional Spaces

The premises to be rated must be divided into **Functional Spaces** in order to calculate the effects of vacancies and differing operational hours across the total area. These spaces should be based on existing functional distinctions such as physical boundaries, leases, or operational divisions.

Functional Spaces must be the smaller of:

1) each individual contiguous floor of the building (for buildings with multiple units or towers, each floor of each unit or tower), or

2) each individual and distinct tenancy, regardless of its size, or

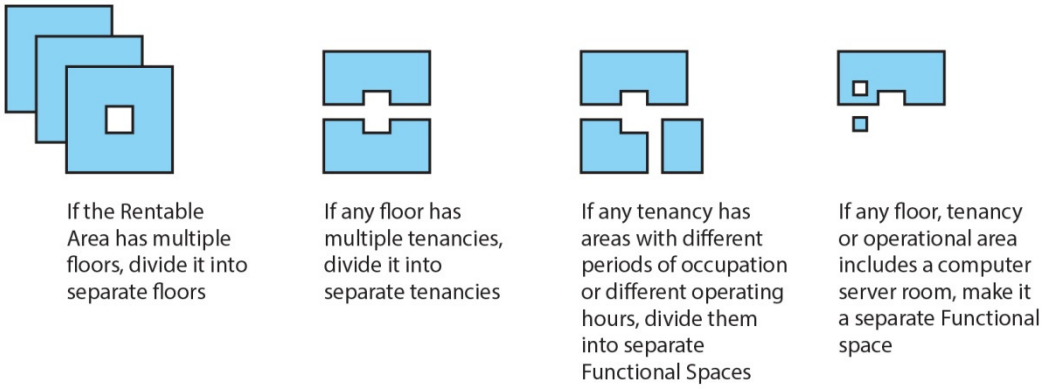
3) any computer server room, or

4) within any tenancy, any section that must be treated as distinct because of a significant difference in period of occupation or operating hours. This does not include **office support facilities** whose operating hours depend on the spaces nearby. It does include spaces in which significant construction activity has taken place for fitting out or remodelling during the **Rating Period**.

Service Areas are not treated as separate Functional Spaces. The Rentable Area associated with spaces is included with the associated Functional Space and is subject to the same rules applicable to that space, unless otherwise noted.

Note: This section is intended to make it easier for the **Accredited Assessor** to separate independent spaces and record the necessary **data**, not to fragment the **Rentable Area** into multiple similar spaces for no real benefit.

Figure 5: Dividing the Rentable Area into Functional Spaces



3.5.1.1. Example – meeting rooms

If a meeting room is large enough to be a Functional Space in its own right (in some cases a Functional Space can be an entire floor of meeting rooms) then the hours of operation for that space must be separately determined by interviewing a manager or reviewing booking records, as appropriate.

If a small meeting room is used as a normal part of the activities of the **office** spaces around it, and it does not have distinct operating hours, then it should be treated as an integrated component of the surrounding office space.

3.6. Exclusions from the Rated Area calculation

Spaces within the base **Rentable Area** that have not been used as **offices** (as defined in these **Rules**) during the **Rating Period** must be excluded from the **Rated Area** calculation. This ensures that ratings are consistently based on office usage of buildings, and provide a fair comparison between different offices.

Notes:

- 'Use as an office' includes use as an **office support facility**.
- Exclusions are only considered *after* calculating the office Rentable Area. The criteria in this section cannot be applied to areas that are not within the office Rentable Area, as these are never included in the Rated Area calculation.
- The energy or water consumption associated with an excluded space may still need to be included in the assessment, in accordance with Sections 6 *Energy coverage* and 7 *Water coverage*.
- For a graphical example of these rules see Figure 7: *Examples of Rentable Area and rateable area inclusions and exclusions*

In the course of an assessment the **Accredited Assessor** must determine the nature of the individual spaces and include or exclude them as required, and ensure that accuracy is treated in accordance with Section 2.7.2 *Standards for acceptable data and estimates.*

Figure 6: Overview – excluding spaces from the Rentable Area

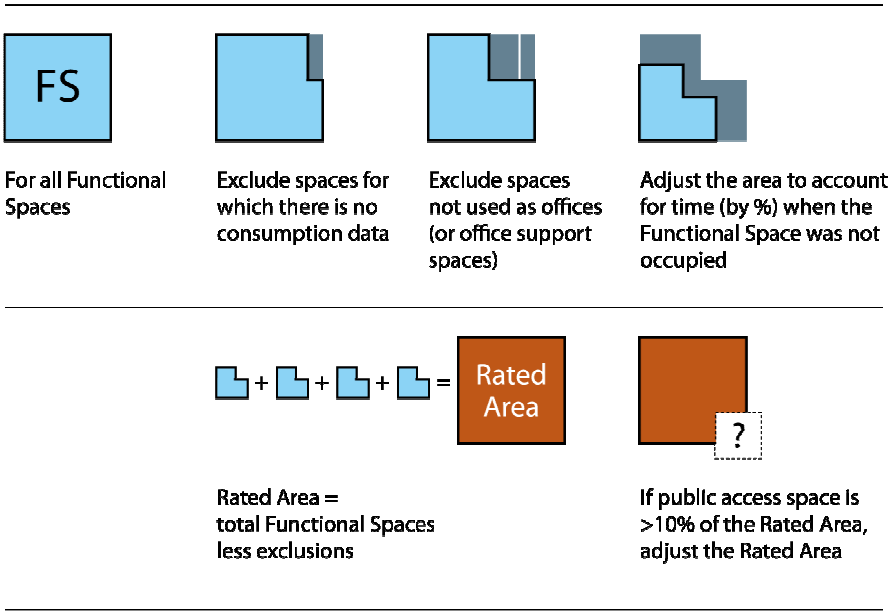
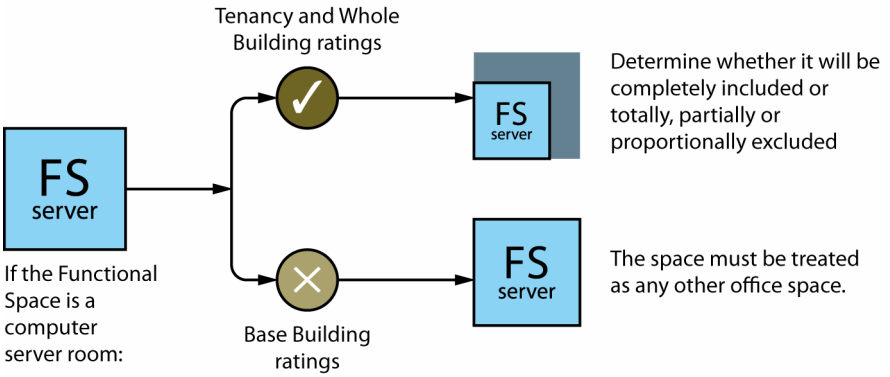


Figure 7: Overview – treatment of computer server rooms



3.6.1. Adjusting for unoccupied spaces

The **Accredited Assessor** must check for how much of the **Rating Period** each **Functional Space** was **occupied** or **fitout works** were taking place. The proportion of the Rating Period during which each space was occupied is used as an adjustment factor in calculating the **Rated Area**.

3.6.1.1. Readiness for use

For each part of the premises to be rated, the Accredited Assessor must obtain documentation that shows for how much of the Rating Period:

- the occupiers had the right to exclusive use of that part of the premises (for example, leases or similar agreements), and
- the occupiers required services to be supplied to that part of the premises (for example, copies of requests to the building owner for service, or a statement by the building owner or facility manager).

If there was a period when the space was not in active use as an **office**, such as during fitout works, and there is no clear evidence whether or not normal base building services were required by the occupiers during that period, then the Accredited Assessor must assume that the services were not required.

3.6.1.2. Active use

For whole building and tenancy ratings, the Accredited Assessor must also obtain documentation that shows for how much of the Rating Period the occupiers were actively using the space as an office (for example, **Tenant Occupancy Survey** forms).

The Accredited Assessor should undertake a visual check that the space is occupied and being actively used as an office.

3.6.1.3. Fitout and refurbishment

For base building and whole building ratings, the Accredited Assessor must also obtain documentation that shows for how much of the Rating Period any Functional Space was being refurbished or fitted out.

The total must not include periods while the base building was under construction or being extensively renovated and was not suitable for normal occupation. Any period during which it is not possible to clearly distinguish between fitout works and other construction activity must not be included.

Up to a maximum of 30 days can be entered into the Online Rating Calculator for each Functional Space where documented evidence is provided that base building services were required. For whole building ratings the period for fitout works is discounted by 50%.

New buildings or buildings subject to major refurbishment are eligible for a NABERSNZ rating when one of the following requirements is met (whichever occurs first):

- the entire building is fit for occupation and is 75% occupied, or
- it has been two years since the Code Compliance Certificate was issued.

Notes:

- Where a space was not being used as an office while fitout works were taking place, the hours of occupation are deemed to be the same as the **average** hours of occupation for that space for the Rating Period.

- Where a space was being used as an office during business hours and fitout works were taking place outside the normal business hours, then any additional hours of occupation (i.e. while the space was provided with base building services) should be added to the **Rated Hours** calculation.

3.6.1.4. Documentation

Documentation of readiness for occupation, and periods of occupation and periods for fitout works, with their start and end dates, must comply with Section 2.7.2 *Standards for acceptable data and estimates*. Verbal information alone is not acceptable.

3.6.2. Excluding spaces with no consumption data

A **Functional Space** cannot be included in an assessment for an certified rating if **acceptable data** or **acceptable estimates** of the energy or water consumption (as relevant) for that space are not available for the **Rating Period**. This particularly applies to unoccupied or partly-occupied spaces.

Note: The full range of consumption **data** required for a space is specified in Sections 6 *Energy coverage* and 7 *Water coverage*. The data must cover the Rating Period, subject to the procedures in Section 9.7 *Periods covered by utility data*. Incomplete data is not acceptable.

A space for which acceptable consumption data or **estimates** are not available may be excluded from the assessment if the reason the data or estimates are not available is beyond the control of the building owner or tenant responsible for the space. Examples include recent occupation of the space, or the inability of a **utility** or similar third party to provide the necessary data.

If only part of a Functional Space is affected, then the Functional Spaces must be redefined to separate that part for which acceptable consumption data or estimates are not available.

If a space may be excluded from the assessment on these grounds, then:

- the space must be excluded from calculation of the **Rated Area** and **Rated Hours**, and
- computers in the space must not be counted, and
- the **Accredited Assessor** must provide full documentation of the space and the reason why acceptable consumption data or estimates are not available for the Rating Period.

If the space cannot be excluded from the assessment, then the premises cannot be rated.

A Service Area with no consumption data can be excluded, independently of the treatment of the associated Functional Space.

3.6.3. Excluding computer server rooms in tenancy and whole building ratings

Computer server rooms are considered part of an **office** tenant's core business, and in general the energy consumption and floor area must be included in a NABERS Energy for offices tenancy or whole building rating[4]. However, services for **external users** (those who never connect from inside the premises) may be excluded from the rating so long as the energy consumption for those services is sub-metered, or the total server room energy consumption is sub-metered and the number of external users can be documented.

Note: The inclusion or exclusion of both the energy consumption and the floor area of computer server rooms are determined in the same way; see Section 6.2.4 *Computer server room energy coverage*.

The floor area of a computer server room must be treated as follows in a tenancy or whole building rating:

1) **completely included** in the calculation of the **Rated Area**, where:
   - the total energy consumption of the server room is not sub-metered, or
   - the server room is used entirely by internal users.

2) **totally excluded** from the calculation of the Rated Area, where:
   - the total energy consumption of the server room is sub-metered, and
   - the server room is used entirely for external users, or as a disaster recovery site for another external **data** centre, or
   - it is too difficult to determine the number of external users.

   The **Accredited Assessor** must obtain written documentation from the tenant that confirms that the server room is either used entirely for external users or as a disaster recovery site for another external data centre.

3) **partially excluded** from the calculation of the Rated Area, where:
   - the server room has a mix of internal and external users, and
   - the externally used IT equipment and/or facility services[5] are separately sub-metered.

   The floor area that may be excluded is determined by measuring the area covered by the externally used IT equipment.

[4] In base building ratings, the floor area of computer server rooms is always included in the Rated Area.

[5] Facility services include lighting, power, UPS, air conditioning and dehumidification.

The Accredited Assessor must obtain written documentation from the tenant that confirms that the IT equipment in the excluded area is either used entirely for external users or as a disaster recovery site for another external data centre.

4) **proportionately excluded** from the calculation of the Rated Area, where:
   - the server room has a mix of internal and external users, and
   - the total energy consumption of the server room is sub-metered, and
   - the externally used IT equipment and/or facility services are not separately sub-metered, and
   - it is possible to determine the numbers of internal and external users of the IT equipment.

   No proportionate exclusions are available for external users of public web servers because of the difficulty in accurately counting the number of users.

   The floor area that may be excluded is determined by:
   - determining the number of internal IT users, based on the computer count, and
   - determining the number of external IT users (for example, by analysing system usage logs to establish the number of unique users, and then finding the location of each from asset tracking, phone records or similar data); to avoid double counting, staff who access the systems from home but also work in the office being assessed must not be included in the number of external users, and
   - calculating the area allocated for external use, based on the proportion of external users to total users.

For example, if the floor area of a computer server room is 50 m^2 and there are 100 internal users and 400 external users, the area to be excluded from the Rated Area is calculated as:

$$50 \times \frac{400}{(400 + 100)} = 40 \text{ m}$$

The Accredited Assessor must obtain credible written documentation from the tenant, completed and signed by an appropriate person, that either:
- states the number of external users of the computer server room, or
- contains records which allow the Accredited Assessor to accurately calculate (not **estimate**) the number of external users.

When a computer server room can be totally excluded from the Rated Area calculation, Service Areas associated with the space can also be excluded. Partial or proportional exclusions are not permitted for Service Areas associated with computer server rooms.

3.6.3.1. Documentation required

The Accredited Assessor must include with the rating application full details of all documentation, measurements and calculations used to partly or wholly exclude the floor area of a server room from the calculation of the Rated Area.

3.6.4. Limiting the proportion of public access space

Offices may have some space for public access, such as inquiry desks, courier counters and reception areas, included in the **Rentable Area**. The primary purpose of these spaces is to accommodate arrivals, deliveries and despatches associated with office activities.

These spaces are distinct from non-Rentable Area public spaces in building foyers which are never included in the **Rated Area** calculation.

In calculating the Rated Area of premises, the allowable total floor area of such public access space is capped to a maximum of 10% of the total Rated Area, and any additional amount must be excluded from the Rated Area calculation.

The 10% ratio applies to the aggregate area of the premises to be rated. It is not calculated separately for individual **Functional Spaces**, floors or (for base building and whole building ratings) individual tenancies.

Example 1

A tenancy with a total Rentable Area of 600 m^2 has a large reception space that measures 6 m x 12 m (72 m^2). This includes 20m^2 of lift lobby (Service Area) but does not include other amenities within the Service Area that are not connected to reception.

As the reception space would be more than 10% of the Rated Area, the **Accredited Assessor** must calculate the maximum area that can be included.

The other spaces in the office cover an area of 600 – 72 = 528 m^2 which must represent at least 90% of the total Rated Area. The 10% allowed for the reception space is therefore one-ninth of this, or 58.6 m^2. The rest of the reception space (13.4 m^2) must be excluded. The adjusted Rated Area of the tenancy will therefore be 586.6 m^2 (600 – 13.4).

In making this exclusion, Service Areas are treated identically to the balance of the office i.e. the public areas are part of the area exclusion, and thus included in the consideration of area excluded, and the non-public areas are not part of the potential area exclusion, and thus fall within the 90% non-public component of the final Rated Area.

Example 2

Another tenancy in the same building has an identical reception space but the tenancy occupies two floors of the building. In this case the reception space is only 72 / 1200 = 8.3% of the Rated Area of the tenancy, and no adjustment is required.

3.6.5. Excluding other spaces

The **Rated Area** calculation excludes spaces, whether or not they were intended as **office** accommodation, which are primarily used for other activities or (if not **occupied**) intended to be primarily used for other activities.

Whether to include or exclude a space in the Rated Area calculation is determined as follows:

Exclusions from the Rated Area calculation	
Usage	A space is excluded if it is not either used for, or available to be used for, accommodating an office or an **office support facility**.
Services	With the exception of Service Area and any toilets, showers and change rooms within the tenancy, a space is excluded if it is not **fit for office use**.
Size	It is not necessary to exclude a space with a floor area less than 5 m² unless it is a well-defined separate facility (surrounded by walls, for example). However, where several similar excludable spaces or facilities are located next to each other they must be considered as a single group and not as individual items.

In all cases the Accredited Assessor must clearly document the justification for including or excluding a space.

For example, a space originally designed for office accommodation might be used as a suite of training rooms for hire, a commercial art gallery, or a medical centre. None of these are office uses, so these spaces must not be included in the Rated Area for an office rating.

3.6.6. Examples of area exclusions

Purpose-built retail facilities are not part of **office** Rentable Area. In addition, spaces originally designed as office accommodation but used primarily for providing services to the public (such as showrooms, information centres or consulting rooms) are retail outlets rather than offices, and must be excluded.

Note: Such primary use is quite distinct from the operation of **office support facilities**, which are exclusively for the use of the tenants.

Example	Interpretation
Commercial cafeterias and cafés	
Exclusively for the use of office tenants (and their visitors)	**Included.** They are office support facilities.
With public access (but can also be used by tenants)	**Excluded.** They are retail outlets.
Gymnasiums, child minding centres, treatment rooms and similar	
Exclusively for the use of office tenants (and their visitors)	**Included.** They are office support facilities.
With public access (but can also be used by tenants)	**Excluded.** They are retail outlets.
Call centres and trading rooms	**Included.** They are high-density office spaces.
Breakout spaces, meeting rooms, eating areas or tea rooms and kitchenettes built as part of the tenant fitout	**Included.** They are office support facilities.
Lift Lobbies	**Included.** As a Service Area, exclusion of these spaces separately from the associated Functional Space is not permitted.
Toilets, showers and change rooms	
Tenant fitted toilets, showers and change rooms	**Included.** They are office support facilities, and located in spaces fit for office use.
Toilets, showers and change rooms in Service Areas	**Included.** No exclusion of Service Area is permitted even though these areas are not fit for office use.
Storage spaces	
A chain-wire enclosed store in the basement	**Excluded.** This space is not (and cannot become) fit for office use.
A similar enclosed space within the fitted-out tenancy floor	**Included.** This is an office support facility and is fit for office use.
An archival store with lighting, temperature and humidity settings for preserving paper, not for comfort	**Excluded.** This space is not fit for office use.
A compactus file storage facility within the fitted-out tenancy floor	**Included.** This is an office support facility and is in space fit for office use.
Other spaces	

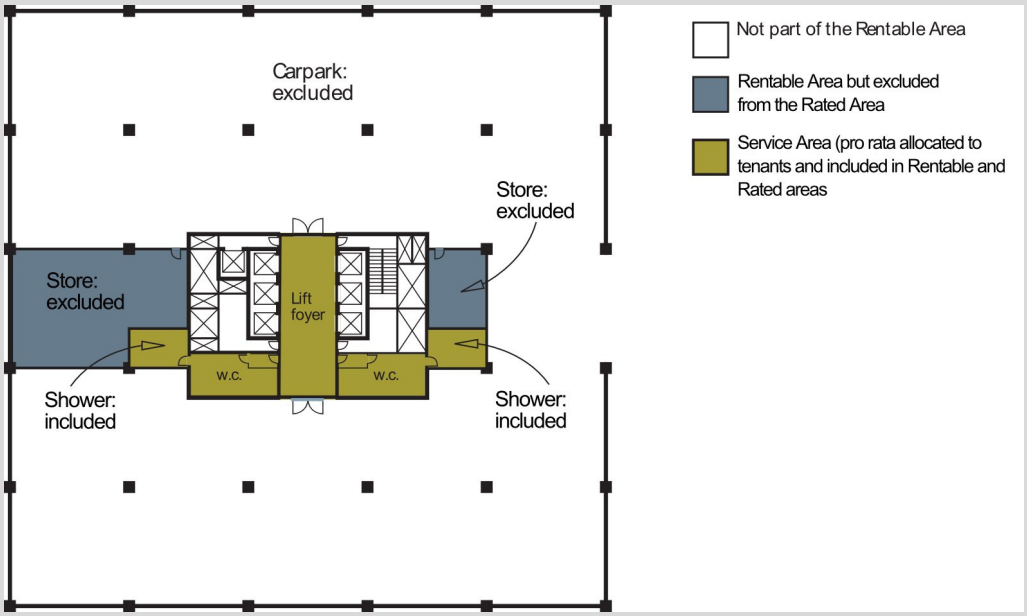
Example	Interpretation
A professional library in a lawyer's or consultant's office	**Included.** This is an office support facility for professional work.
A public library in an office building	**Excluded.** This is a facility for the general public and is not an office.
A large vault designed as a secure store (such as for paper or gold) and not for continual occupation by people	**Excluded.** Even if empty, this store is not fit for office use.
The same vault converted to office space with air conditioning and lighting	**Included.** Although originally a store, the space is now fit for office use.

Exclusion of **Service Areas**

- The Rentable Area associated with Service Areas in a Functional Space are subject to the same rules applicable to that space, unless otherwise noted.
- A Service Area can be excluded if it has no consumption data.
- Partial or proportional exclusions are not permitted for Service Areas associated with computer server rooms.

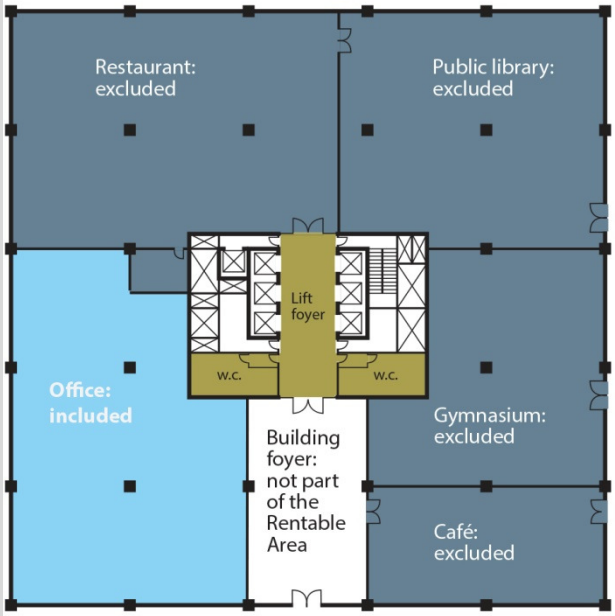
Figure 8: Examples of Rentable Area and rateable area inclusions and exclusions

The following diagrams represent an office building over three levels and show how the areas are to be treated.



Basement level

- The car park is excluded from the Rentable Area
- The small store is not serviced and cannot become part of the office so it is excluded from the Rated Area
- The larger store has lighting and air-conditioning but it is used as a commercial storage facility and is not associated with an office, so it is excluded from the Rated Area
- The lift foyer, WCs and showers are Rentable Area which are allocated pro rata to multiple tenants in the building. As these count as Service Area they are included in the Rated Area insofar as the associated tenancies are included within the Rated Area.



Not part of the Rentable Area

Rentable Area and included in the Rated Area

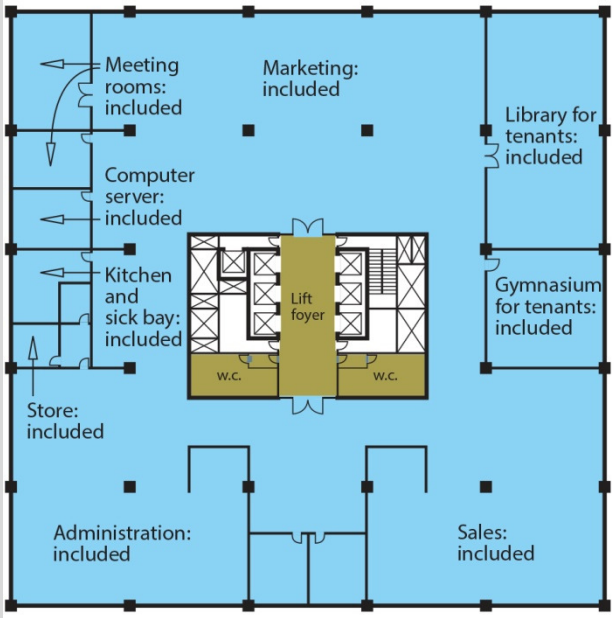
Rentable Area but excluded from the Rated Area

Service Area (Rentable Area pro rata allocated to tenants and included in Rated Areas)

Ground level

The café, library, gymnasium and restaurant on the ground level are not office spaces or office support facilities and not exclusively for use by the tenants, so they are excluded from the Rated Area.

The lift foyer and WCs are Service Areas which are included insofar as they are allocated pro-rata to the office tenancy Rentable Area.



Not part of the Rentable Area

Rentable Area and included in the Rated Area

Service Area (Rentable Area allocated wholly to tenant on this floor)

Level 1

Spaces for public access and use (e.g. lifts, stairs, risers and plant rooms) are not part of the Rentable Area.

The library, gymnasium and sick bay on Level 1 are office support facilities exclusively for use by the tenants, therefore they are included in the Rated Area.

The Lift Foyer and WCs are Service Areas and are thus included in the Rentable Area and the Rated Area.

It can be seen that the two gymnasiums (Level 1 and ground level) are treated differently depending on their use, so the defining criteria is not so much the actual function of the space but the way it is used by the occupants in the context of a typical office.

The toilets and lift lobby on Ground Level and Level 1 are Rentable Area. Although they are not fit for office use, they are part of the Service Area and are therefore included. On Ground Level they are allocated pro-rata to multiple tenants. On Level 1 they are included in their entirety as it is a single tenant floor.

3.6.7. Standard for acceptable data

If after checking these **Rules** (including rulings) the use of a space is still uncertain, or its inclusion or exclusion from the **Rated Area** is uncertain, then:

1) its floor area may be excluded from the Rated Area calculation, but only if the total floor area of all such exclusions does not exceed 5% of the Rated Area. The **Accredited Assessor** must document the exclusion, the reasons for uncertainty and the area calculation, or

1) if the space cannot be excluded as in option 1 above, contact the **Administrator** for technical advice or a specific ruling on the case.

Note: The energy or water consumption associated with an excluded space may still need to be included in the assessment, in accordance with Sections 6 *Energy coverage* and 7 *Water coverage*.

3.7. Documentation required

The **Accredited Assessor** must provide the following documentation, complying with Section 2.7 *Acceptable data and estimates*, to validate the area **data**:

- data validating the assessed area:
  - surveys, leases, or other third-party documentation (in that order or preference) identifying the premises to be rated, made to the **Measurement Standard for Rated Area**, or
  - Accredited Assessor's calculations based on plans or site measurements identifying the premises to be rated, made to the Measurement Standard for Rated Area
- written information relating to occupancy, confirming the start and end dates for leases, occupation and construction works
- calculations or written information confirming the floor area of all **Functional Spaces** in the premises to be rated, and
- written information and Accredited Assessor's notes relating to the usage of spaces and the services provided to them, and the grounds for their inclusion in or exclusion from the **Rated Area** calculation.

4. Rated Hours

4.1. Summary

In NABERSNZ Energy and Water for offices ratings, the hours of occupation of a tenancy or building are measured through **Rated Hours**. These are used (along with other factors such as **Rated Area** and climate) to adjust the figures for energy and water consumption so that a fair comparison can be made, even when different spaces or buildings are **occupied** for different amounts of time.

4.2. Definitions

The definitions of **Rated Hours** for tenancy and whole building ratings and for base building ratings are slightly different, to allow for the different measurement methods necessary in each case.

Term	Definition
Alternative Method	A method for obtaining or interpreting **data** for an assessment which is not the preferred method, but which has been approved by the **Administrator** as either: • equivalent to the preferred method in terms of its results, accuracy and validity, or • acceptable in place of the preferred method, subject to the data resulting from the Alternative Method being treated as an **estimate** in accordance with Section 2.7.2 *Standards for acceptable data and estimates*, or other specified conditions on the use of the data.
Hours of Occupancy	The number of hours per week when 20% or more of the usual occupants of a **Functional Space** are present in the space, as determined in Section 4.3 *Tenancy and whole building Rated Hours*.

Term	Definition
Hours of Service (NABERSNZ Energy for offices base building ratings)	The number of hours per week for which a tenant has requested that a Functional Space be **safe, lit and comfortable for office work**. They are the total of: • core hours: hours agreed in writing by the building owner and the tenant during which the space will be safe, lit and comfortable for office work, subject to the agreement being reasonable and the hours reasonably reflecting the actual use of the space, and • after-hours air conditioning hours: hours, in addition to the core hours, that the tenant has requested air conditioning to operate to service occupancy. Note: The Hours of Service are determined through the documented requests for service by tenants to the building owner. If Functional Spaces have Hours of Service above 60 hours a week, the hours must be independently verified.
Rated Hours: NABERSNZ Energy for offices tenancy and whole building ratings	The area-weighted **average** duration of the **Hours of Occupancy** for all Functional Spaces in the premises to be rated, as determined in Section 4.3 *Tenancy and whole building Rated Hours*. Note: The preferred method for obtaining these hours is to conduct a survey of the staff managers or supervisors of all Functional Spaces in the tenancy or building. If full results are not obtainable this way, **Alternative Methods** or estimated averages may be acceptable as long as the overall accuracy of the rating is within defined limits.
Rated Hours: NABERSNZ Energy for offices base building ratings	The area-weighted average duration of the **Hours of Service** for all Functional Spaces in the building, as determined in Section 4.4 *Base building Rated Hours*.

Term	Definition
Rated Hours: NABERSNZ Water ratings	Note: How to determine the Rated Hours for a NABERSNZ Water for offices rating depends on whether the rating is stand-alone, or conducted at the same time and for the same **Rating Period** as a NABERSNZ Energy for offices rating.
	For a stand-alone NABERSNZ Water for offices rating and one in conjunction with a NABERSNZ Energy for offices base building rating: the same as the Rated Hours for the NABERSNZ Energy for offices base building rating, as determined in Section 4.4 *Base building Rated Hours*. For a NABERSNZ Water for offices rating in conjunction with a NABERSNZ Energy for offices whole building rating: the same as the Rated Hours for the NABERSNZ Energy for offices whole building rating, as determined in Section 4.3 *Tenancy and whole building Rated Hours*.
Safe, lit and comfortable for office work	Where the conditions in a space (for example, in terms of lighting, temperature and air quality and safety systems) are suitable for reasonable, normal use as an office.
Tenant Occupancy Survey	A survey of the staff managers or supervisors responsible for the Functional Spaces in the premises to be rated, conducted according to Section 4.3.3 *Conducting a Tenant Occupancy Survey* and Section 10.2 *Appendix B – Tenant Occupancy Survey*.

4.3. Tenancy and whole building Rated Hours

4.3.1. Process overview

	Step	Reference
1	Use the breakdown of the premises being rated into **Functional Spaces**.	Section 3.5 *Dividing the Rentable Area into Functional Spaces*
2	If any of the Functional Spaces are computer server rooms, determine the hours of operation of the air conditioning in that space.	Section 4.3.2 *Hours for computer server rooms*
3	If possible, conduct a **Tenant Occupancy Survey** for all other Functional Spaces.	Section 4.3.3 *Conducting a Tenant Occupancy Survey*

	Step	Reference
4	If acceptable Tenant Occupancy Survey **data** cannot be obtained for some Functional Spaces, but a suitable **Alternative Method** may be used to determine the hours for those spaces, then use the Alternative Method for those spaces.	Section 4.3.5 *Using Alternative Methods to obtain Hours of Occupancy*
5	If no **acceptable data** from either a Tenant Occupancy Survey or a suitable Alternative Method is available for a Functional Space, then estimate the hours for the space and add the **estimate** to the **Potential Error** for hours.	Section 4.3.7 *Estimating hours of occupation*
6	If no acceptable data from either a Tenant Occupancy Survey or any suitable Alternative Method is available for several Functional Spaces making up a significant proportion of the premises being rated, but a suitable Alternative Method (such as a random survey) may be used to determine the hours for the entire premises to be rated, then use that Alternative Method.	Section 4.3.5 *Using Alternative Methods to obtain Hours of Occupancy*
7	If no acceptable data from a Tenant Occupancy Survey or a suitable Alternative Method is available for a Functional Space, and an **acceptable estimate** is not possible, then the premises cannot be rated.	Section 2.7 *Acceptable data and estimates*
8	If a rating is possible, use the Online Rating Calculator to determine the **Rated Hours** for the premises being rated, expressed in hours per week.	

Figure 9: Determining Rated Hours for a tenancy or whole building rating

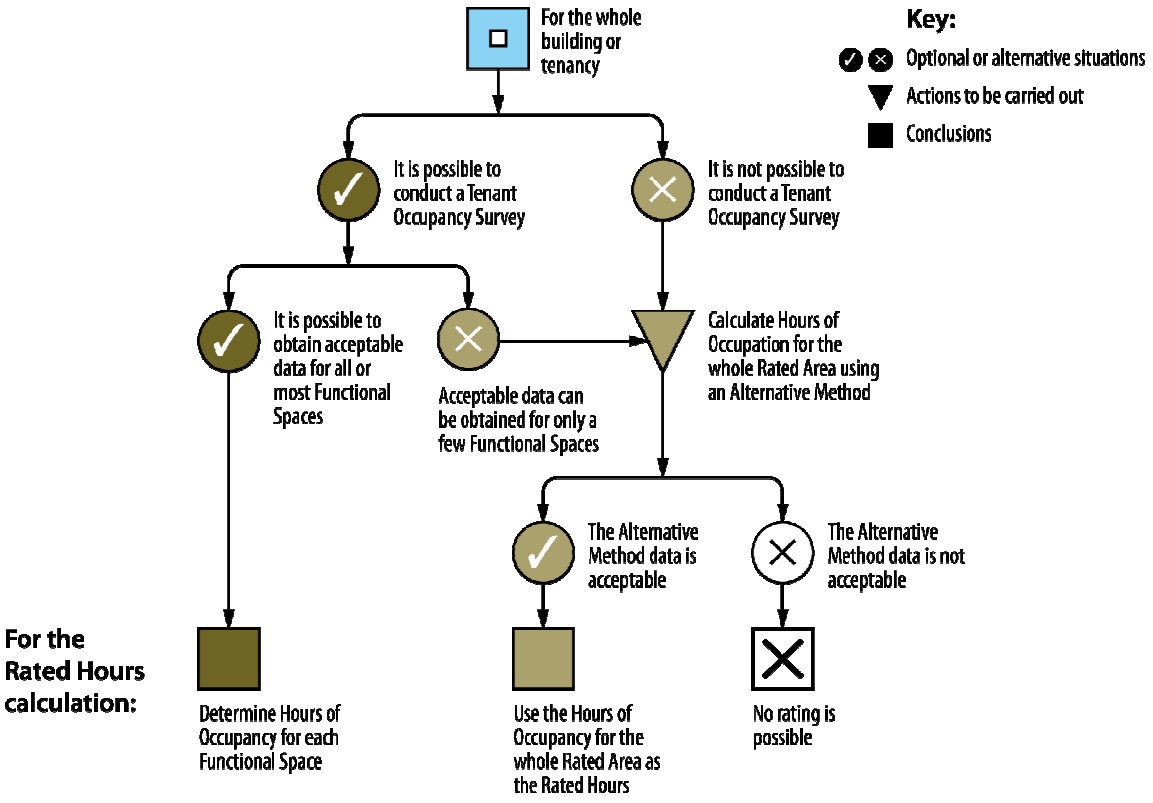
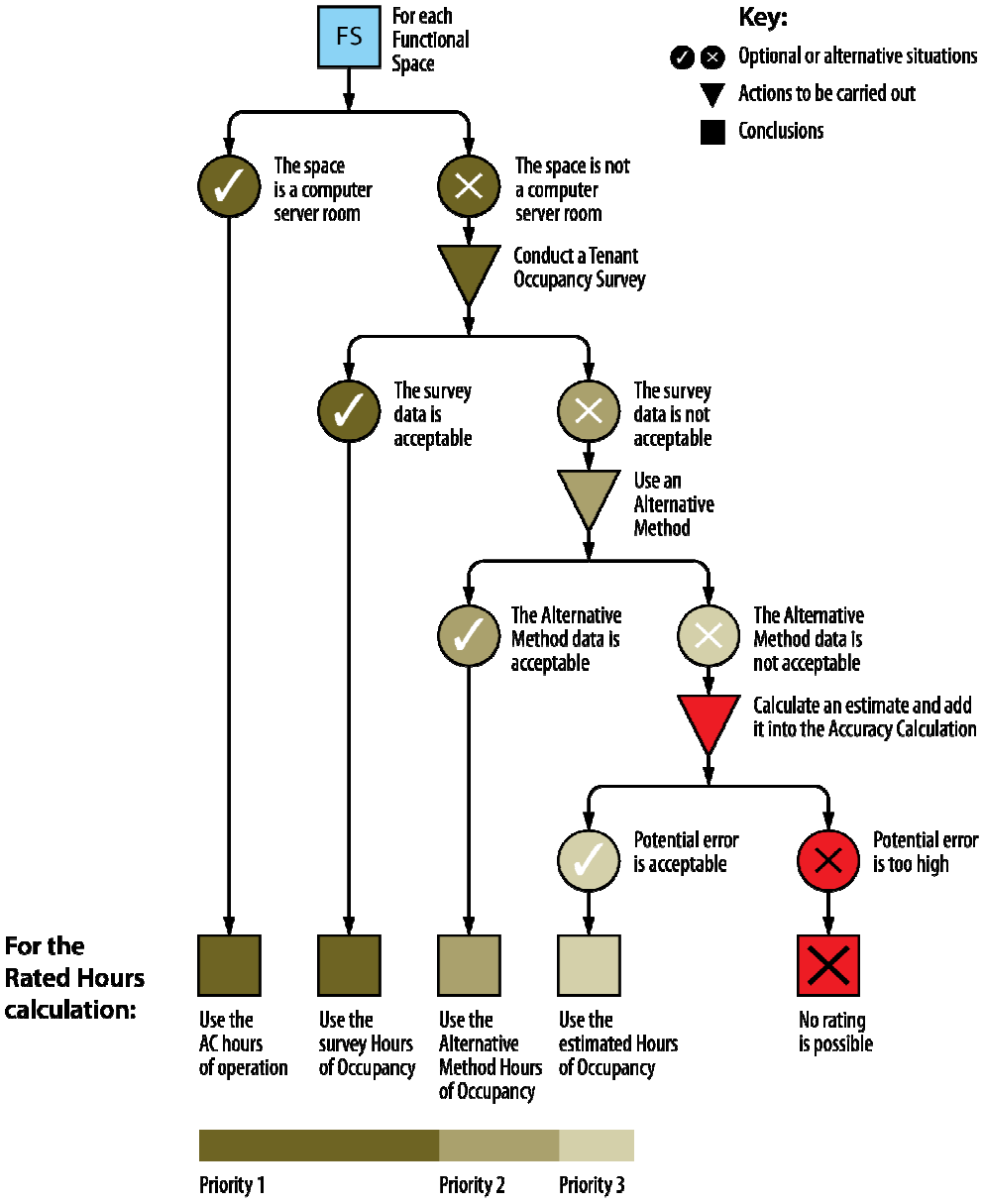


Figure 10: Determining Hours of Occupancy for a Functional Space in a tenancy or whole building rating



4.3.2. Hours for computer server rooms

For all NABERSNZ Energy for offices ratings, the hours for a computer server room are based on the hours the ventilation or air conditioning is provided, rather than the hours of occupancy.

For example, where documentation or a site inspection for a server room shows that air conditioning is provided for 24 hours, 7 days a week, the hours for the server room will be 168 hours a week.

4.3.3. Conducting a Tenant Occupancy Survey

Using the form in Section 10.2 *B – Tenant Occupancy* Survey, conduct a survey of the staff managers or supervisors responsible for all **Functional Spaces** (other than computer server rooms) in the premises being rated, so that a response is obtained:

- for each Functional Space, as a minimum, and
- where more than one shift has been worked in a Functional Space, then for each shift, and
- where the hours of occupation or the numbers of shifts in a Functional Space changed during the **Rating Period**, then for each distinct period of operation during the Rating Period[6].

Where an individual staff manager or supervisor is only able to provide information about occupation of a Functional Space that covers part of the Rating Period, then the managers or supervisors responsible for the other parts of the Rating Period must also be surveyed if possible.

Note: Do not include any periods when the premises are not **occupied** when assessing hours of operation, as these have already been accounted for in the **Rated Area**.

4.3.3.1. Standard for acceptable data

The survey forms should be functionally identical to those specified in Section 10.2 *Appendix B – Tenant Occupancy Survey*.

Preference is given to survey forms completed and signed by the staff manager. Forms completed by the **Accredited Assessor** on the basis of a phone interview with a staff manager are acceptable only if the name, position and contact number of the staff manager who provided the information are recorded on the survey form.

An unusable response must be recorded for a Functional Space (or for a shift or a period of operation in the space, if more than one) if:

- the completed form for that space, shift and period does not verify that the source of the information is a staff manager or supervisor responsible for the space, or
- it is not possible to obtain a fully completed form (or the information to fully complete a form) from a staff manager or supervisor responsible for the space, shift and period.

[6] This may include periods when the space was used as an office during business hours, but fitout works were taking place outside normal business hours.

Note: A **Tenant Occupancy Survey** with unusable responses is insufficient for determining the hours of occupation for a tenancy or whole building rating. In accordance with the rules in Section 4.3.1 *Process overview*, acceptable **data** from an **Alternative Method** or an **acceptable estimate** must be obtained for each shift, space and period for which an unusable response has been recorded; or the entire survey must be put aside and an Alternative Method used for the entire tenancy or the whole building being rated. If neither of these are possible then the premises cannot be rated.

4.3.4. Documentation required

The documentation required for a **Tenant Occupancy Survey** is the completed Tenant Occupancy Survey forms.

4.3.5. Using Alternative Methods to obtain Hours of Occupancy

It may not be practical to use the **Tenant Occupancy Survey** method on some sites or in some **Functional Spaces**. In such cases the **Accredited Assessor** may use an **Alternative Method** permitted by the **Administrator** to obtain occupation **data**.

Examples of permitted Alternative Methods	
A random survey of building occupants	This should include at least one respondent from every Functional Space with independent hours of occupancy[7], and must be designed to allow for the presence of different shifts operating in the premises being rated. Care must be taken to ask for both normal hours and after-hours use, and to ensure that a representative sample of the population is taken.
Security records	Hours derived from security records are acceptable as long as the records provide a sufficiently detailed record of the entries and exits to be able to determine the times over which 20% occupancy is present for each Functional Space. Records which only show first-in and last-out times, or which aggregate several Functional Spaces so that the actual occupancy of each cannot be separately determined[8], are not acceptable.
Records from booking systems for meeting rooms	Hours derived from booking system records may only be used if the Accredited Assessor is satisfied the records correspond to the actual occupancy of the meeting rooms.

[7] See Section 4.3.7/1 *Estimation for office support spaces*

[8] However, it is acceptable to aggregate ancillary spaces with the primary spaces that determine their hours of occupation – see Section 4.3.7/1 *Estimation for office support spaces*.

Records of construction activity	Hours derived from a building manager's documentation of periods of construction activity, where the construction activity was purely for **fitout works** and the works took place outside normal business hours.

Refer to Section 2.4 *Proposed new methods* for information on submitting a new Alternative Method for approval.

Note: Each Alternative Method will include its own **acceptable estimate** standard.

4.3.6. Hours of occupation during fitout works

Where a space was not being used as an **office** while **fitout works** were taking place, the hours of occupation are deemed to be the same as the **average** hours of occupation for that space for the **Rating Period**.

This means that the **Accredited Assessor** does not need to collect additional evidence of the hours of occupation.

4.3.7. Estimating hours of occupation

If an unusable response is obtained for a **Functional Space** in a **Tenant Occupancy Survey**, and a permitted **Alternative Method** is not available for the space, then an Accredited Assessor may estimate the **average** hours for that space as described in this section.

4.3.7.1. Estimation for office support spaces

Some Functional Spaces may consist of **office** support spaces in general use, without independent hours of occupancy (for example, suites of meeting rooms without acceptable booking records). If an unusable response to a Tenant Occupancy Survey is recorded for such a space, then the hours to be used for the space are as follows:

- the hours of the primary Functional Space/s which govern the usage of the office support space, if clearly defined and based on **acceptable data** from a Tenant Occupancy Survey or a suitable Alternative Method. In this case the hours are not an **estimate** and should not be added to the **Potential Error** for hours.
- otherwise, the average hours of all Functional Spaces which contribute to the usage of the office support space. This figure is an estimate and must be added to the Potential Error for hours.

4.3.7.2. Estimation for other office spaces

The average hours for a Functional Space which is not wholly an office support space must be estimated as follows:

- in proportion to the known hours, if acceptable **data** is only available for some shifts or some periods of operation in a Functional Space where several took place during the **Rating Period**, or

- the average of the hours of similar nearby spaces, if similar spaces exist nearby and acceptable data from a Tenant Occupancy Survey or a suitable Alternative Method is available for them, or
- otherwise, the average of the hours for the remainder of the premises being rated for which acceptable data is available.

4.3.7.3. Acceptable estimate standard

The **Accredited Assessor** must add estimated hours for Functional Spaces to the Potential Error for hours.

4.4. Base building Rated Hours

4.4.1. Process overview

	Step	Reference
1.	Use the breakdown of the premises being rated into **Functional Spaces**.	Section 3.5 Dividing the Rentable Area into Functional Spaces
2.	For each Functional Space, if acceptable current **data** from a **Tenant Occupancy Survey** is already available and can be used to determine the hours of occupation (as for a tenancy or whole building rating), then take this value as the **Hours of Service** for the space.	Section 4.4.2 Determining core hours
3.	If there is no existing Tenant Occupancy Survey data, but written evidence exists of the agreed hours during which the space must be safe, lit and comfortable for office work, use it to determine core hours.	Section 4.4.2 Determining core hours
4.	If there is no written evidence of the hours for which the space must be safe, lit and comfortable for office work, but there is evidence of the hours of plant operation, use this value but subtract 2 hours/day for spaces which are not computer server rooms.	Section 4.4.2 Determining core hours
5.	If written evidence is not available, but it is possible to use the procedure for determining **Hours of Occupancy** (as for a tenancy or whole building rating), then do so and take this value as the Hours of Service for the space.	Section 4.4.2 Determining core hours Section 4.3 Tenancy and whole building Rated Hours

6.	If it is not possible to use the procedure for determining Hours of Occupancy, take the core hours for the space as 50 hours a week (or less).	Section 4.4.2 Determining core hours
7.	If a value was found for core hours (from Steps 3, 4 or 6 above), determine any after-hours air conditioning (AHAC) hours, and add them to the core hours to give the Hours of Service for that space.	Sections 4.4.2 Determining core hours and 4.4.4 Determining after-hours air conditioning requests
8.	If the Hours of Service for a Functional Space (from Step 7 above) are greater than 60 hours a week, obtain independent **verification**.	Section 4.4.5 *Verifying long hours*
9.	Use the Online Rating Calculator to calculate the **Rated Hours** (the area-weighted **average** duration of the Hours of Service of all the Functional Spaces) expressed in hours per week.	

Figure 11: Determining total Hours of Service for a Functional Space

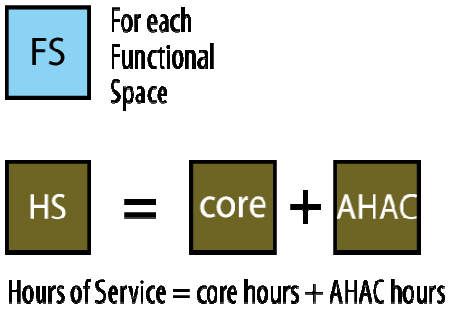
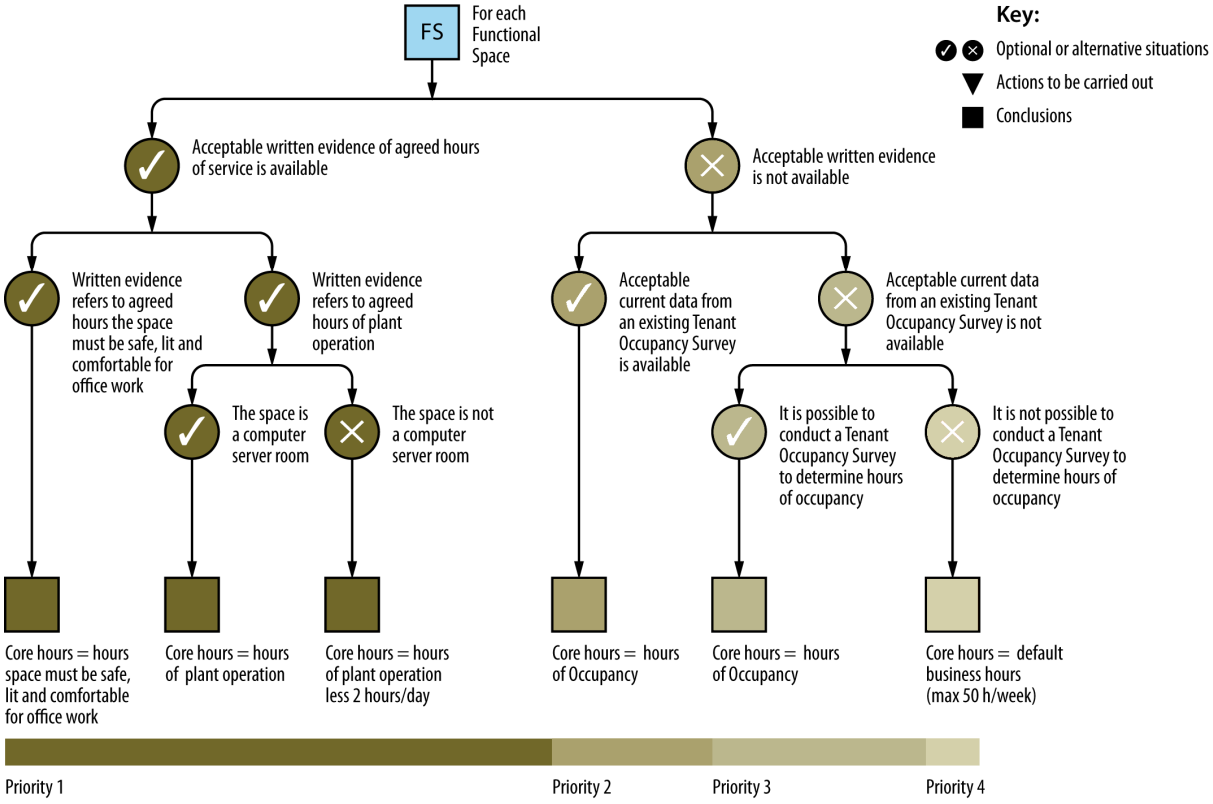


Figure 12: Determining core hours for a Functional Space



4.4.2. Determining core hours

The core hours for a **Functional Space** are determined through one of the following methods, listed in order of preference:

4.4.2.1. Priority 1 – Written evidence

If there is clear and complete written evidence of the normal hours for which the space will be **safe, lit and comfortable for office work** (for example, in the lease conditions or documentation of subsequent negotiations and changes), then the core hours for the space must be based on these hours.

Where the core hours set out in the documentation relate to the operation of the plant and not to the normal hours for which the space will be safe, lit and comfortable for office work, then for spaces other than computer server rooms these hours may only be used if 2 hours for each day the premises are **occupied** are deducted from the total[9].

Note: Plant operating hours not specifically set out in an agreement between the tenant and building owner (for example, plant operating hours recorded by a BMS) cannot be used as written evidence as it is not clear whether the tenant has actually requested these hours of service.

[9] This is an allowance for plant warm-up and run-down time.

4.4.2.2. Priority 2 – Existing Hours of Occupancy data

If acceptable current **data** from a **Tenant Occupancy Survey** is already available and can be used to determine the **Hours of Occupancy** (as for a tenancy or whole building rating in Section 4.3 *Tenancy and whole building Rated Hours*), then the **Accredited Assessor** must take this value as the **Hours of Service** for the space.

4.4.2.3. Priority 3 – New Hours of Occupancy data

If there is no acceptable written evidence of core hours as in Priority 1 above, then the Accredited Assessor must use the procedure for determining Hours of Occupancy (as for a tenancy or whole building rating) in Section 4.3 *Tenancy and whole building Rated Hours*, and take this value as the Hours of Service for the space.

4.4.2.4. Priority 4 – Default business hours

If neither acceptable written evidence nor Hours of Occupancy are available as in Priorities 1, 2 and 3 above for a Functional Space, then its maximum core hours are taken as being from 8am to 6pm Monday – Friday (50 hours per week). The Accredited Assessor may estimate hours less than this, but must document the reasons for doing so.

If the hours are assessed using this method, then:

- the Accredited Assessor must document why the methods in Priorities 1, 2 and 3 could not be used, and
- the Accredited Assessor must add the hours to the **Potential Error** for hours.
- the Assessor must not include any after-hours air conditioning hours when determining the Hours of Service.

Note: This effectively means that Priority 4 can only be used for a few spaces, and not for the entire premises to be rated.

4.4.3. Interpreting core hours information

This section does not apply to computer server rooms.

4.4.3.1. Principle

An assessment of core hours for a **Functional Space** is based on the hours agreed in writing by the building owner and the tenant for which the space will be **safe, lit and comfortable for office work** but also depends on:

- the agreement being reasonable, and
- the hours reasonably reflecting the actual use of the space.

This is to ensure that the rating provides a fair comparison to other buildings.

Therefore:

- the **data** required must be the core hours as stated in the lease documentation or subsequent amendments, or as confirmed by tenants (see the *Standard for acceptable data* below); and
- if the overall **Hours of Service** of a Functional Space are over 60 hours a week, or if written evidence is not available, independent **verification** of actual occupation is required (see Section 4.4.5 *Verifying long hours*).

4.4.3.2. Standard for acceptable data

The critical test to apply in determining core hours is whether the tenants have requested that a space is safe, lit and comfortable for office work. This is not the same as the operating hours of the plant servicing the space, as that plant will need 'warm-up' time before it is able to provide comfort conditions to the space.

The wording in leases must therefore be interpreted carefully to distinguish between references to the operating hours of the **plant** and the **space**.

Wording in leases that is acceptable evidence of the core hours for the space includes 'hours of comfort conditions' and 'hours of occupation'.

Wording that is *not* acceptable evidence on its own includes:

- 'air conditioning hours' – these may be plant operating hours
- 'hours of access' or 'building availability' – these may be when security doors are open
- 'hours of restricted access' – these may be when security doors are closed.

However, it is possible to use a combination of the above or other external data to match the intention of the **Rules**. For example, if a lease uses the words 'air conditioning hours' but the **Accredited Assessor** has independently verified that the air conditioning starts one or two hours before the lease times every day, this would be sufficient to know that the words 'air conditioning hours' have in this case been interpreted by the building owner and tenant to mean 'hours comfortable for office work'.

4.4.3.3. Dealing with conflict in core hours information

An Accredited Assessor may be faced with conflicting information on core hours. For example, the Accredited Assessor may know that the air conditioning plant shuts down before the agreed end time as written in the lease.

By definition, core hours are the regular hours for which tenants have requested that a space is safe, lit and comfortable for office work. Although the building owner is obliged to provide services during these hours, in some cases the owner knows that all the tenants have gone home by the end of the agreed hours and so will turn the air conditioning off early – until the tenant complains. This is an efficient and effective strategy so the building owner should not be penalised, and therefore the hours must remain as those stated in the lease.

If the opposite is true and the plant runs on for longer than requested, this is not an efficient use of the plant and so the core hours must also be based on the lease.

4.4.4. Determining after-hours air conditioning requests

After-hours air conditioning (AHAC) requests to service occupation of the premises outside core hours must be included in the calculation of **Hours of Service** for a **Functional Space** if adequate supporting evidence is available.

4.4.4.1. Standard for acceptable data

Logs of AHAC requests by tenants, showing the date and time of each request and the space to which it applied or the source of the request, are **acceptable data**.

Air conditioning operation records that do not show the date, time and source of requests are not acceptable, even if supported by evidence of after-hours occupation of the space. Similarly, records which only show the total 'hours run' or 'after-hours run' for the air conditioning plant are not acceptable.

The determining factor is the tenant's request to the building owner for service outside core hours, not the presence of occupants in the space or the operation of the plant.

4.4.4.2. Requests related to core hours comfort conditions

The **Accredited Assessor** must verify any AHAC requests which are apparently intended to affect comfort conditions during core hours rather than to genuinely service occupation outside core hours. This includes any requests for service to begin in the hour before the start of core hours.

Evidence of actual occupation (such as a statement by a responsible manager in the tenancy in question) must be sought.

If the Accredited Assessor cannot verify that an AHAC request is genuinely to service occupation outside core hours, it must be disregarded.

4.4.4.3. Maximum duration of individual requests

If tenant request **data** or associated documentation does not include the duration for which a request was made, the maximum duration for each such request must be taken as one hour. This is to limit possible overestimation of AHAC hours.

Note: The determining factor is the tenant's request for a given period of additional service. Evidence of standard run times per push-button request is inadequate if it does not also show that the tenant requested that run time, or agreed to it in a lease or subsequent agreement with the building owner.

4.4.4.4. Spaces that individual requests apply to

An individual AHAC request, unless otherwise specified by the tenant, applies only to the Functional Space from which the request was made. Where a single request applies to more than one Functional Space, then it is taken to apply only to the smallest of those Functional Spaces. For example:

Example	Interpretation
A written tenant request for AHAC to 20% of the building	The request applies to all the Functional Spaces making up the 20%, as this was specifically requested.
A tenancy that occupies 5% of the building requests AHAC, but 20% of the building is operated to service this request	The request applies to the smaller space (5% of the building in this case).
Push-button request for AHAC from a tenancy that occupies 20% of the building, with more than one Functional Space	The request applies only to the smallest Functional Space serviced by that push-button request.

Note: This rule means that, in a multi-floored or multi-tenanted building, a push-button request cannot apply to more than one Functional Space unless written confirmation from the tenant is available that the request was for a larger number of spaces.

The rule minimises the effect of each AHAC request in the area-weighted calculation of **Rated Hours**.

4.4.5. Verifying long hours

The intent of independent **verification** of long hours is to prevent the situation where building services are being operated 'just in case' they are needed, or for a lease that is no longer appropriate for current conditions. For most ratings verification should not be an onerous condition but a matter of simply double-checking hours that are outside a typical range.

If the total of core hours and AHAC hours for any **Functional Space** is greater than 60 hours per week, then:

1) The **Accredited Assessor** must first determine whether or not the total hours are obviously as expected and reasonable for the space. If they are, then the Accredited Assessor must document the reasons for this decision.

2) If the hours are not obviously as expected and reasonable, the Accredited Assessor must request the tenant to provide written documentation that

the **Hours of Service** for the relevant Functional Space are as expected and reasonable for the space, and the reasons why they are considered so. The documentation must be in writing and be signed by people with appropriate responsibility.

3) If the tenant does not agree that the hours are as expected and reasonable or cannot provide independent documentation of this, the Accredited Assessor must use the procedure for determining hours of occupation (as for a tenancy or whole building rating) in Section 4.3 *Tenancy and whole building Rated Hours*. Hours of occupation within 10% of the Hours of Service value are considered acceptable and the Hours of Service value must then be used. If the hours of occupation are not within 10% of the Hours of Service value, the lower of the two values must be used.

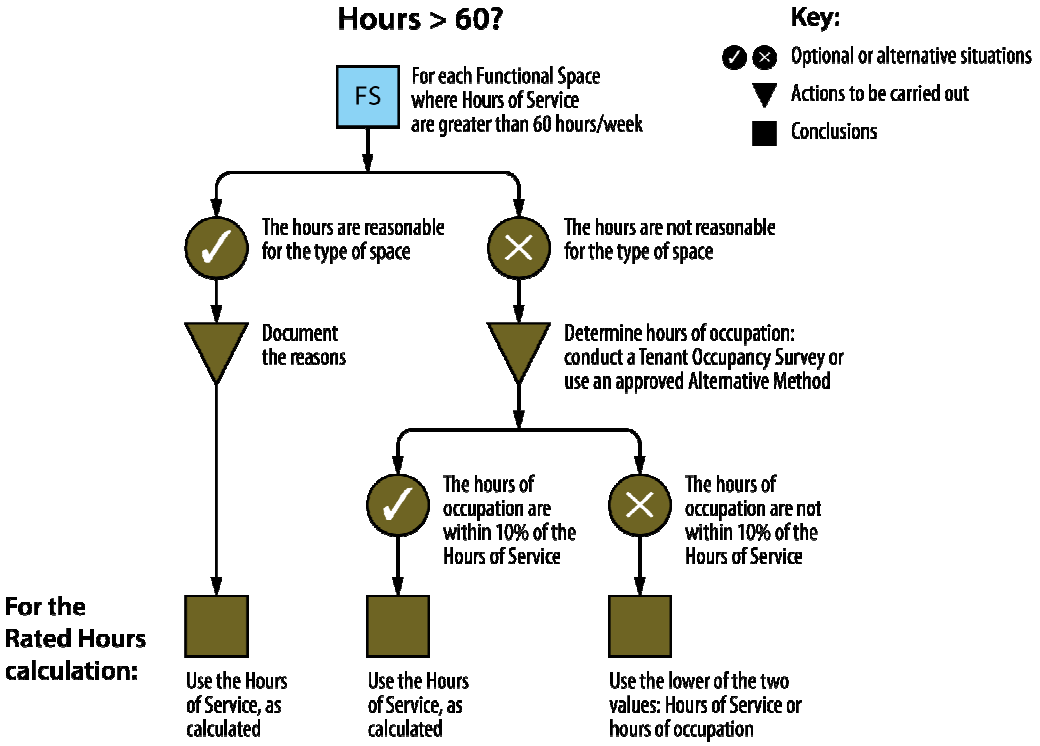
4) If the tenant cannot be contacted to verify the Hours of Service as in options 2 and 3 above, a permitted **Alternative Method** as described in Section 4.3.5 *Using Alternative Methods to obtain Hours of Occupancy* may be used for verification.

4.4.5.1. Standard for acceptable data

Assumptions and **estimates** used for verification of long hours are not added to the **Potential Error** for hours, as they do not alter the values actually used to calculate the **Rated Hours**.

However, all such assumptions and estimates must be fully documented in the Assumptions section of the Online Rating Calculator.

Figure 13: Verifying long hours for a base building rating



4.4.5.2. Examples and interpretation

The first level of verification is a common-sense check by the Accredited Assessor to determine if the hours are 'as expected and reasonable for the space'. For example:

- 24-hour service for a call centre operating three shifts is reasonable, but not for a call centre operating 1 or 2 shifts
- 24-hour operation for a computer server room is reasonable
- core hours of 60 plus an additional 20 AHAC hours requested by the floors as needed (such as by push-button requests) is reasonable and based on demand by the tenants
- core hours of 60 plus an additional 20 AHAC hours requested using a long-standing order written at the start of the lease three years ago may *not* be reasonable, if the recent actual occupancy of the space is low outside the core hours.

4.4.6. Documentation required

The documentation required to confirm the **Rated Hours** for a base building rating includes:

- copies of leases or other written documentation of core hours
- copies of AHAC request **data** (including duration data if available)
- **Tenant Occupancy Survey** forms used for determining hours of occupation or for verifying **Hours of Service** over 60 hours a week, and

- any other documentation used to verify Hours of Service over 60 hours a week.

5. Counting computers and occupants

5.1. Summary

For NABERSNZ Energy for offices tenancy and whole building ratings, the number of computers in use is required, and the number of occupants is an optional input to the calculator. Because the methods used for counting computers and occupants are essentially the same, and a physical count on site is required, it is efficient to count the occupants at the same time as the computers.

The number of **computers** is used, along with other factors such as **Rated Area** and climate, to normalise the figures for energy consumption. This ensures that fair comparisons can be made between ratings even though the level of computer use may vary between different types of business and tenants.

The number of **occupants** is only used in the final report generated by the rating calculator, to show energy consumption per building occupant. This is optional and does not alter the rating itself.

5.1.1. Data required

Rating type	Computers	Occupants
NABERSNZ Energy for offices tenancy	Count of computers	Optional
NABERSNZ Energy for offices base building	Not required	Not required
NABERSNZ Energy for offices whole building	Count of computers	Optional
NABERSNZ Water for offices	Not required	Not required

5.2. Counting computers

5.2.1. Principle and definitions

A computer is counted if it is a complete 'personal computer system' in regular use.

'Personal computer systems' include networked 'thin client' systems used to provide access to software and services comparable to personal computers with autonomous processors and system memory.

No count can be made for servers and other equipment mounted in racks other than the number of identifiable personal computer systems in the installation, as identified by monitors in use. Larger stand-alone computer installations with no monitor can be counted as a single computer for each installation.

5.2.1.1. Personal computer system configurations

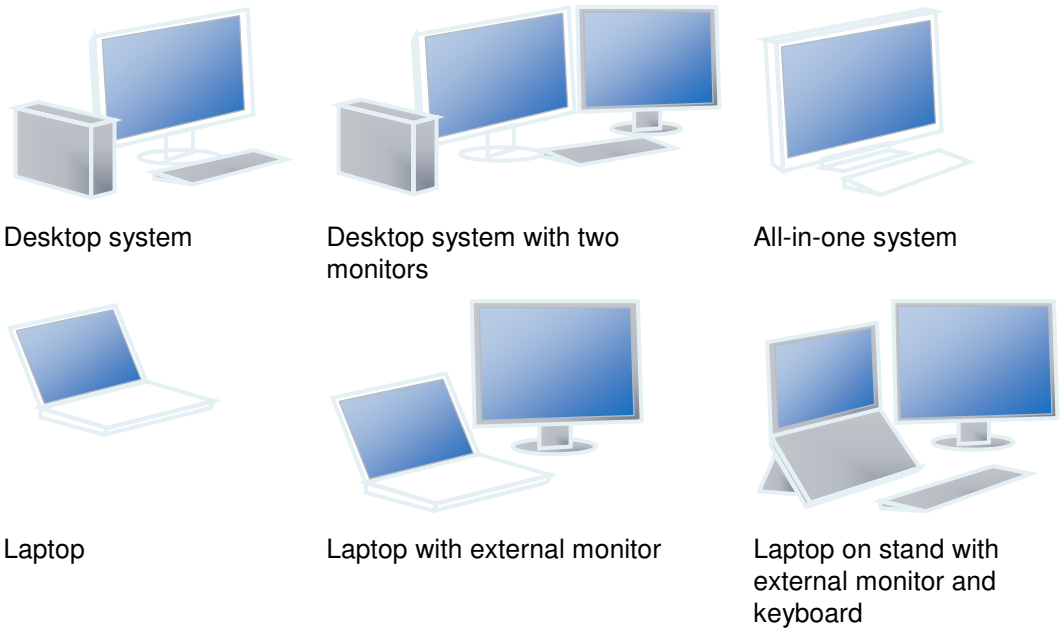
A 'personal computer system' consists of a 'system unit' and at least one screen and one keyboard. There are three basic types of 'personal computer system' in common use:

Desktop system	A distinct system unit with an external monitor and external keyboard attached
Laptop (or notebook)	System unit, screen and keyboard in the one unit
All-in-one system	System unit and screen in one unit, but with an external keyboard attached

These configurations are equivalent and acceptable.

Adding additional monitors or keyboards to these basic configurations does not change the number of 'personal computer systems' involved. For example, a laptop with a separate monitor attached to it and/or a separate keyboard is still one personal computer system; as is a desktop computer with multiple monitors.

Figure 14: Personal computer system configurations



Each of these configurations is equivalent to one computer.

If there is any confusion as to how many computers are at a desk then the number of monitors apparently set up for use is the defining factor. Monitors that are obviously not connected to a computer system must be disregarded.

5.2.1.2. Completeness

A personal computer system must not be counted if some components are missing (for example a desktop system unit with no monitor, a monitor with no system unit visible and no image on it, or a docking station with no laptop attached) – both because it is not a complete system and because the incompleteness indicates lack of regular use.

Seeing an image on a monitor is evidence that it is attached to a system unit – even if the unit isn't visible – and is therefore complete. The image is evidence of use.

5.2.1.3. Regular use

To be counted, a personal computer system must be in regular use in the premises being rated. Generally, a computer must be set up at a desk and there must be some evidence of regular use, such as:

- a person using the computer system at the time of the count
- indirect evidence (such as personal effects or files and in-trays on the desk, or the computer system being on) that a person uses the system, even if not there at the time of the count
- a report by a manager or other authoritative source that the system is in regular use

- for computers in training rooms, etc., booking or attendance records that the **Accredited Assessor** has verified are accurate and which show both the number of computers used and the amount of time they were used for.

A computer must **not** be counted if there is evidence that it is not in regular use, such as:

- not being set up for use at a desk (for example in storage or packed up, or with cables not connected)
- being obviously inoperable or too obsolete for productive use
- being located or set up for occasional use only (or approximately less than 50% of the time), such as in a low-use training room for which there are no acceptable booking or attendance records, or a boardroom, meeting room or store.

5.2.1.4. Examples

Example	Count	Notes
A desk with one complete desktop computer or a laptop, with a person at the desk	1	One system with evidence of use – the person
A desk with one computer, with no person at the desk but with papers and in-trays as if it is normally occupied	1	One system with evidence of use – the papers and in-trays
A desk with one computer, with no person at the desk and with no papers and no obvious sign that it is being used	0	One system, but no evidence of regular use
The same desk as above, but with a report from the manager that the person is on leave	1	One system with evidence of use (the manager's report)
A desk with a laptop stand or docking station, but no laptop and no evidence of use 	0	No complete system, and no evidence of regular use
A desk in use with a laptop and a stand or docking station, with a separate monitor and keyboard attached	1	One system with evidence of use
A desk with evidence of use, with a laptop stand with external monitor and keyboard attached, but no laptop	0	No complete system (the laptop may be counted elsewhere)

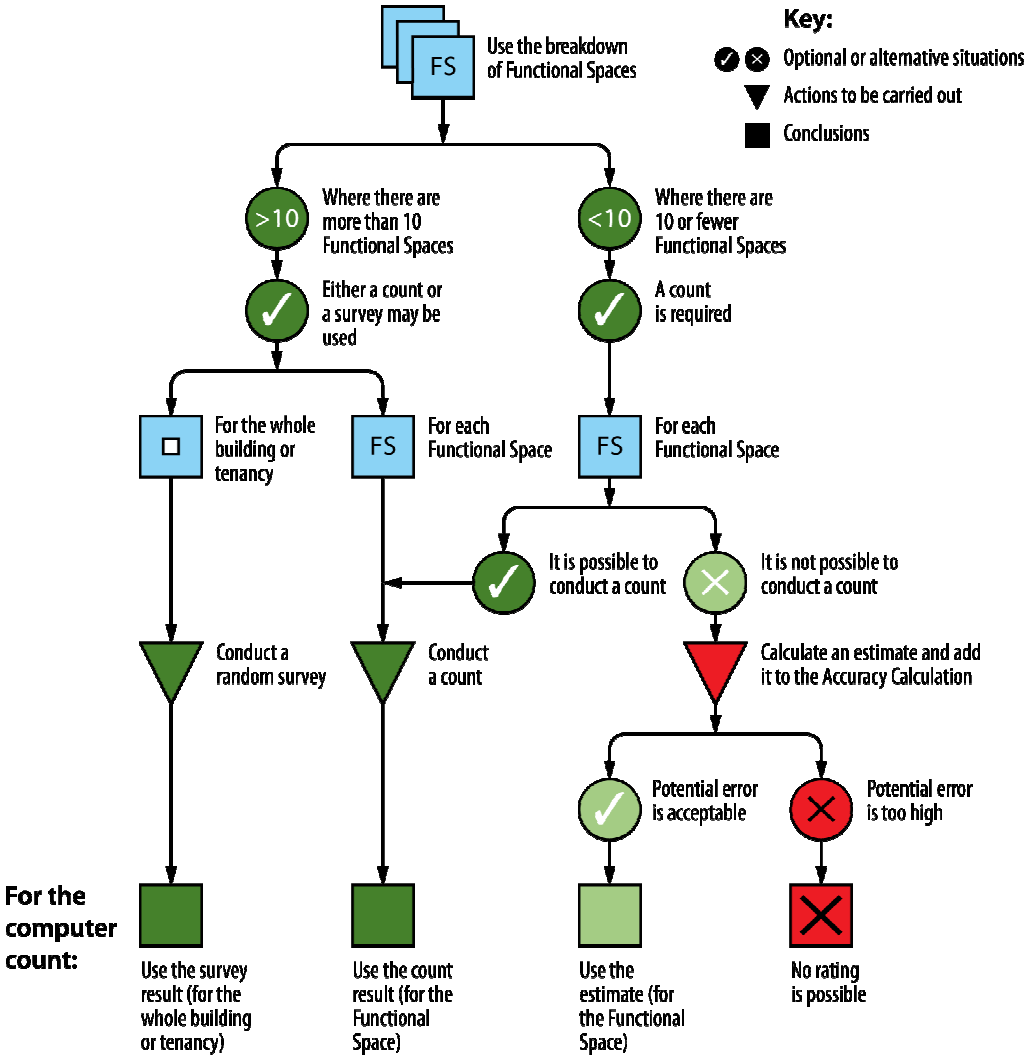
Example	Count	Notes
The same desk as above, but with a report from the manager saying the person is out of the office with the laptop	1	One system with evidence of use (the manager's report means the laptop will not be counted separately)
A desk in use with both a laptop and a desktop computer with monitor and keyboard	2	Two systems with evidence of use
A desk in use with one computer (or laptop), and two monitors used	1	One system with evidence of use
A desk with no computer visible, with two monitors being used 	2	Two systems (two monitors, no other data) with evidence of use
Eight desks in a training room used no more than two days a week, each with one computer	0	These systems are used less than 50% of the time and are therefore not in regular use

5.2.2. Process overview

	Step	Reference
1	Use the breakdown of the premises being rated into **Functional Spaces**.	Section 3.5 *Dividing the Rentable Area into Functional Spaces*
2	If there are no more than 10 Functional Spaces, conduct a count.	Section 5.2.3 *Conducting a count*
3	If there are more than 10 Functional Spaces, either conduct a count or a random site survey.	Section 5.2.5 *Conducting a survey*
4	If it is not possible to conduct a count in a Functional Space where a count is required, then estimate the count for the space if an **estimate** is acceptable.	Section 5.2.4 *Estimating numbers of computers*
5	If it is not possible to conduct a count in a Functional Space where a count is required, and an **acceptable estimate** is not possible, then the premises cannot be rated.	Section 2.7.2 *Standards for acceptable data and estimates*

	Step	Reference
6	If a rating is possible, enter the number of computers for the premises being rated into the Online Rating Calculator.	
7	If the number of occupants has been obtained, enter it into the Online Rating Calculator.	

Figure 15: Counting computers and occupants



5.2.3. Conducting a count

5.2.3.1. Standard for acceptable data

The number of computers must be based on an actual site count of computers in each **Functional Space**. Asset inventory information is not acceptable because it does not differentiate low-use machines and may include old machines no longer in use. Local server counts of computers online at any point in time are not acceptable.

5.2.3.2. Documentation required

The documentation required for a computer count is:

- marked-up desk layouts completed by the **Accredited Assessor** and showing the computer count, or
- if desk layouts are not available, copies of the Accredited Assessor's site notes taken during the count.

5.2.4. Estimating numbers of computers

If an Assessor cannot access a space to physically count all the computers in a **Functional Space**, then the **Accredited Assessor** may discount or estimate the number of computers for that Functional Space as follows:

2) For small spaces within the Functional Space with a combined area of less than 1% of the total **Rated Area**, assume that there were zero computers in each space.

3) For other spaces, it is acceptable to ask staff familiar with the space, or to estimate the number of computers based on **average** computer densities for nearby similar spaces.

Note. This section does not apply to unoccupied spaces. If a Functional Space is unoccupied at the time of the count and there is no acceptable evidence of number of computers, completeness or regular use, then the computer count must be zero.

5.2.4.1. Acceptable estimate standard

For small spaces as determined above, the **estimate** of zero is deemed to satisfy the accuracy requirements of these **Rules**.

Otherwise, the Accredited Assessor must add the estimate to the **Potential Error** for computers.

5.2.4.2. Documentation required

For each Functional Space for which an estimate of computer numbers is made, the Accredited Assessor must:

- document the reason why the estimate had to be made, and

- document the calculation of the figure used (including all **assumptions**, estimates and interpretations involved).

5.2.5. Conducting a survey

For buildings with 10 or more **Functional Spaces**, a permitted **Alternative Method** is to conduct a random site survey in accordance with this section.

5.2.5.1. Process

1) Identify any Functional Spaces likely to have either a significantly higher density of computers (such as call centres) or lower density of computers (such as computer rooms, meeting or conference rooms) than **average**. Count the number of computers in regular use in these spaces. The spaces will not be included in the sampling.

2) List the remaining Functional Spaces in random order[10].

3) Take the first five Functional Spaces from the random list as the sample, and count the number of computers in regular use in each of these spaces.

4) Enter the computer count **data** for the sample's Functional Spaces into the Occupancy (Computers) page of the Online Rating Calculator (make sure 'Statistical Validity' is chosen from the Computer Count Methodology drop-down menu).

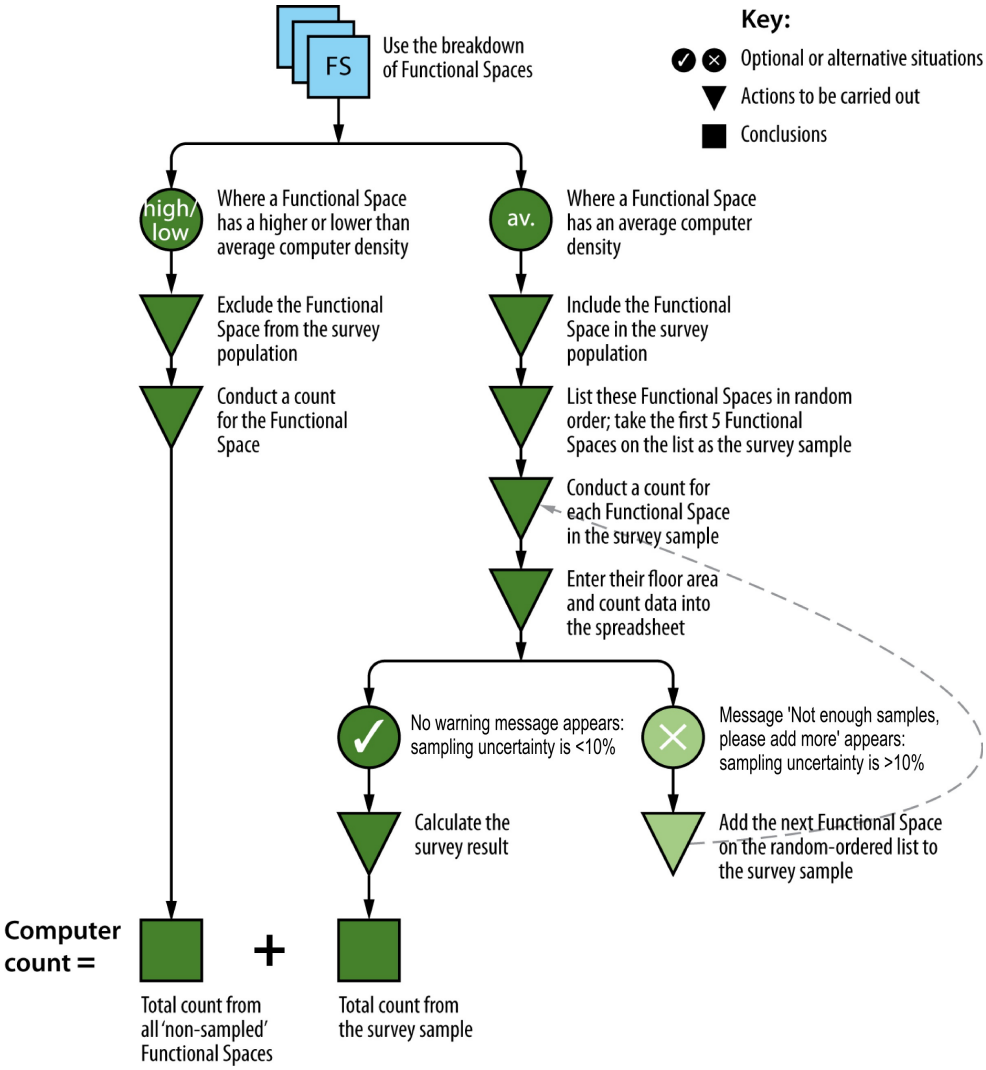
   If the message 'Not enough samples, please enter more' appears at the bottom of the page, then the sampling uncertainty for the Functional Spaces is above 10% and the sample is too small. Take the next Functional Space from the random list, count the number of computers in regular use in that space, and add this data to the data already collected.

5) Keep adding data for additional spaces until the page is saved without a warning message at the bottom. The statistical uncertainty is now less than 10%, and the 'calculated number of computers' figure can be used. However, if you have collected more data than essential it is better to use the extra data to improve the reliability of the **estimate**.

6) Add the 'calculated number of computers' figure to the separately counted number of computers from the first step, to give the total number of computers to be used in the rating.

[10] A good random sampling method is to draw numbers from a hat, or to ask people on site to provide random numbers between 1 and the number of storeys in the building (without providing an explanation for how these numbers will be used). Some scientific calculators have a random number generator. For buildings with 26 or fewer storeys, taking a name and identifying the position of each letter in the alphabet also provides sufficiently random numbers.

Figure 16: Conducting a random survey to estimate computer numbers



5.2.5.2. Standard for acceptable data

The statistical uncertainty for the figure resulting from the survey, as calculated above, must be less than 10%. This is indicated by the lack of a warning message at the bottom of the Occupancy (Computers) page of the Online Rating Calculator.

If for any reason it is not possible to physically count all the computers in a Functional Space to be sampled, then:

- for small spaces within the Functional Space with a combined area of less than 1% of the total **Rated Area**, the **Accredited Assessor** may assume that there were zero computers in each space, or

- for other cases where the Functional Space cannot be included in the sample, it is *not* acceptable to use an estimate of the number of computers in the random survey. Instead, the Accredited Assessor may remove the Functional Space from the sample and replace it with the next Functional Space from the random list – but only if no more than 10% of the sample in total is replaced in this way.

If it is not possible to count the computers in enough of the Functional Spaces on the random list to achieve a statistical uncertainty under 10%, then the premises cannot be rated.

Use of the Online Rating Calculator so that the survey complies with the statistical methodology specified in Section 10.3.4 *Sampling uncertainty for estimated computer counts* of Appendix C – *Calculations* is deemed to satisfy the accuracy requirements of these **Rules**.

5.2.5.3. Documentation required

Document the sampling method used, and mark on a copy of the random list which Functional Spaces were selected.

For each Functional Space in which a computer count was conducted, keep:

- marked-up desk layouts completed by the Accredited Assessor and showing the computer count, or
- if desk layouts are not available, copies of the Accredited Assessor's site notes taken during the count.

5.3. Counting occupants

5.3.1. Data required

The number of occupants is optional data, not compulsory for certified ratings.

The only time that this figure is used is in the final report generated by the Online Rating Calculator for tenancy and whole building ratings. It is used for self assessments to show the emissions and energy consumption per building occupants and does not alter the rating itself. For Certified Assessments, number of computers is used instead.

5.3.2. Process

The number of occupants should be counted or surveyed using the same method used to count the number of computers.

Typically, an **Accredited Assessor** would count desks with chairs that are clearly occupied during the day as being used by one occupant each.

5.3.3. Standard for acceptable data

A count or survey is needed to properly account for actual staff numbers present in the building. This is taken as indicative of the numbers normally present, and therefore the count or survey should take place on a usual business day without factors that may make it unrepresentative.

There may be reasons why the actual number could differ from nominal occupation levels, such as a high off-site component to the **office** activities, sharing of desks, significant numbers of part-time workers, or shift work. Staff numbers determined from records are therefore not acceptable.

5.3.4. Documentation required

The number of occupants is not audited, and therefore no documentation need be kept on file.

6. Energy coverage

Correctly interpreting the scope of energy supply and consumption **data** is essential to the accuracy of a NABERSNZ Energy for offices rating. The key principles are:

- An assessment for an certified rating must include all **sources** of external energy supplied to the rated premises, and must cover all of the energy **end uses** specified for the rating type in Section 6.2.1 *Required minimum energy coverage*.
- **Utility** and **non-utility meters** that meet the requirements of Section 8 *Metering systems* may be used in any combination to achieve the required coverage, subject to the accuracy requirements of Section *2.7.2 Standards for acceptable data and estimates*.

This section also covers some special conditions governing exclusions and inclusions of small, unmetered end uses.

6.1. Definitions

Term	Definition
Supplementary equipment	Equipment that provides additional capacity to service a space beyond the typical capacity provided by the base building system.
Special tenant requirement	An unusual usage of **office** space, resulting in an increased intensity of service (for example a 'trading floor' within an office), or where **office support facilities** require additional services to achieve comfort conditions.

6.2. Interpretation of scope

Accredited Assessors must ensure that an assessment for an certified rating covers, within the scope of the rating type:

- the consumption of every external energy **source** supplied to the rated premises, and
- every **end use** of energy, including as a minimum the services listed in Section 6.2.1 *Required minimum energy coverage*.

The scope is not necessarily restricted to spaces included in the **Rated Area** calculation.

The Accredited Assessor must examine available single-line diagrams and electrical circuit schedules, and visit the plant rooms to ensure that all relevant equipment is covered under the meters included in the rating.

Any exclusion must only cover the specific item being excluded. This means that every item to be excluded must be assessed separately, and the justification for its exclusion included in the documentation.

6.2.1. Required minimum energy coverage

6.2.1.1. Tenancy ratings

Energy consumed in the premises to be rated by the occupant during the **Rating Period**, including:

- lighting to all areas within the Rentable Area, including Service Areas within the Rentable Area that are wholly allocated to the tenant.
- power to all equipment within the Rentable Area, including computer servers, and Service Areas within the Rentable Area.
- tenant-installed signage within or on the building.
- tenant-controlled supplementary air conditioning to meet a **special tenant requirement**
- generator fuel for tenant usage.

A tenancy rating does not cover lighting or power allocated to Service Areas that are allocated on a pro-rata basis to more than one tenant. The lighting and power for these spaces is allocated to the base building.

6.2.1.2. Base building ratings

Energy consumed in supplying building central services to **office** rentable and common spaces during the Rating Period, including:

- common-area lighting and power (for example foyers, plant rooms and Service Areas that are assigned as Rentable Areas on a pro-rata basis to more than one tenant).
- lifts and escalators
- air conditioning and ventilation, including:
  - base building services to meet normal requirements
  - centralised supplementary services provided for tenants (such as supplementary tenant condenser water loops) – see Section 6.2.5 *Allocating energy use for services*
  - supplementary services provided to ensure the premises are **safe, lit and comfortable for office work**, where there is no special tenant requirement
- exterior lighting
- exterior signage provided by the building owner for the benefit of office tenants
- generator fuel where it serves central services
- car park ventilation and lighting, where internal or external car parks within the legal boundaries of the site are provided for tenant use.

6.2.1.3. Whole building ratings

All energy used by office tenancies and by base building services to office rentable (including all Service Areas) and common spaces during the Rating Period.

6.2.2. Exclusions

Energy use may only be excluded from a rating if permitted by a provision of these **Rules** and either:

- quantified by a method or measurement or estimation specified in that provision, or
- separately metered (or otherwise measured in the case of batch deliveries) from all energy uses to be included in the rating.

6.2.3. Unoccupied spaces

The energy use of unoccupied **office** spaces must always be **included**, even though the space may have been excluded from or discounted in the **Rated Area** calculation under Section 3.6 *Exclusions from the Rated Area calculation*.

6.2.4. Computer server room energy coverage

Note: The inclusion or exclusion of computer server room energy consumption and floor area are determined in the same way; see Section 3.6.3 *Excluding computer server rooms in tenancy and whole building ratings*.

The energy consumption of a computer server room may be partially or wholly excluded from tenancy and whole building ratings[11] on the grounds of external usage of the equipment, but only by using the same methods and criteria used to exclude the floor area of the same server room from the **Rated Area** calculation under Section 3.6.3 *Excluding computer server rooms*. Specifically:

1) If the floor area of the server room has been **completely included** in the calculation of the Rated Area, then the energy consumption must be completely **included** in the assessment.

2) If the floor area of the server room has been **totally excluded** from the calculation of the Rated Area, then the energy consumption should be completely **excluded** from the assessment.

3) If the floor area of the server room has been **partially excluded** from the calculation of the Rated Area, where the externally used IT equipment and/or facility services[12] are separately sub-metered, then the energy

[11] If the consumption of IT equipment and/or facility services to the space are separately metered.

[12] Facility services include lighting, power, UPS, air conditioning and dehumidification.

consumption of the externally used IT equipment and/or facility services should be **excluded** from the assessment.

4) If the floor area of the server room has been **proportionately excluded** from the calculation of the Rated Area, where the externally used IT equipment and/or facility services are **not** separately sub-metered but it is possible to determine the number of **external users** of the IT equipment, then the energy consumption of the IT equipment and/or facility services may be **excluded** from the assessment **in the same proportion** as the floor area exclusion.

For example, if the energy consumption over 12 months of a computer server room is 25 megawatt hours (MWh) and there are 100 internal users and 400 external users, the energy consumption for the external users is calculated as:

$$25 \text{ x } \frac{400}{(400 + 100)} = 20 \text{ MWh}$$

The documentation required for energy consumption exclusions for computer server rooms is the same as the documentation required for exclusions from the Rated Area calculation under Section 3.6.3 *Excluding computer server rooms in tenancy and whole building ratings*.

6.2.5. Allocating energy use for services

Energy used to provide services to **office** tenants, other than tenant lighting and power, must be allocated according to the rules in this section.

6.2.5.1. Supplementary air conditioning in open plan and cell office spaces

Energy used for supplementary air conditioning services to open plan or cell office spaces in office tenancies (including any space with one or more desk/workstation for normal use, or associated circulation spaces) is allocated to the base building unless a **special tenant requirement** exists, in which case it is allocated to the tenant.

To determine whether or not a special tenant requirement exists, the **Accredited Assessor** must conduct site inspections or obtain documentary evidence to establish that an unusual usage of the space has resulted in an increased intensity of the service required.

The following procedure may be used to determine the allocation of supplementary air conditioning in open plan and cell office spaces:

	Step	Notes
1	Check whether the **supplementary equipment** is operated intermittently in response to a tenant-specific requirement, rather than continuously while the space is **occupied**. If it is operated intermittently in response to a tenant-specific requirement, the energy used for the equipment is allocated to the tenant. If not, go to Step 2.	A special tenant requirement may result from overloading due to unusually dense occupation or intense energy use in the space.
2	Check whether the need for supplementary equipment is localised to the tenancy. If supplementary equipment is common in spaces elsewhere in the building without a special tenant requirement, the energy used for the equipment in question is allocated to the base building. If there are other spaces in the building with similar usage but which do not have supplementary equipment, or if a comparison is inconclusive or not possible, go to Step 3.	A special tenant requirement will be limited to spaces where the tenant's unusual usage has resulted in an increased intensity of service required.
3	Check the current tenant load conditions in the space against documented specifications for the base building system (for example, a consultant's 'Building performance criteria' document, or information provided to assess the grade of building in terms of the PCA building quality matrix) to determine whether the tenant's unusual usage of the space is outside the system's intended conditions and performance. If the conditions in the space are clearly based on an unusual usage of the space that is outside that intended, the equipment's energy use is allocated to the tenant. If not, or if there is no documented specification, go to Step 4.	A check against specifications may show that the tenant's unusual usage of the space has resulted in an increased intensity of service that is higher than the base building system was intended to accommodate.

	Step	Notes
4	If the energy used by the supplementary equipment is connected to a base building power board, or separately metered, and acceptable evidence of the consumption during the **Rating Period** can be obtained by the Accredited Assessor, it must be allocated to the base building. Otherwise, the floor area of the space serviced by the supplementary equipment must be excluded from the **Rated Area** calculation.	The energy used for base building services to spaces serviced by supplementary equipment must always be included in the base building energy coverage, whether or not the floor area is included in the Rated Area calculation.

6.2.5.2. Other services to office tenants

Energy used to provide services to office tenants, other than tenant lighting, power and supplementary air conditioning in open plan and cell office spaces, must be allocated according to the following rules. The rules apply in the order listed.

Rule	Tenant allocations
	Energy used for the following is always allocated to tenants and must be excluded from an assessment for a base building rating.
T1	Supplementary equipment installed to meet a special tenant requirement in **office support facilities**. Examples might include packaged air conditioners (water or air cooled) in meeting rooms, tea rooms, computer server rooms or tenant-only cafés. Note: The cooling tower and pump for a water-cooled packaged air conditioner is allocated to the base building, except where it has also been installed by the tenant.
T2	Stand-alone domestic hot water units in tenant-only kitchens, tea rooms or toilets, unless accessible from a common space or car park without passing through **Rentable Area**.
T3	Any other system which serves the premises being rated and is not specifically allocated to the base building through the rules listed under *Base building allocations* below.
T4	Light and power to Service Areas that are wholly allocated to a single tenant

Rule	Base building allocations
	Energy used for the following, when associated with offices rather than other uses, is always allocated to the base building and must be excluded from an assessment for a tenancy rating.
B1	Components added or changed to reconfigure the base building air conditioning system for office fitout requirements (for example, reheats and other additional terminal components).
B2	Centrally provided services that are: • sized and located to provide a generic service for occupant **end uses** in different parts of the building, rather than a custom service for a designated set of applications, and • available (whether or not they are used) to at least 30% of the office tenants in the building or 30% of the office Rentable Area. Examples may include: • supplementary tenant condenser water, and chilled and heating water • supplementary outdoor air, tempered or otherwise • domestic hot water.
B3	Services whose main characteristics (for example, temperature, speed or flow volume) are managed by a base building control system (other than a master switch for enabling or disabling the service overall).
B4	Services to: • non-Rentable Area spaces such as the ground floor foyer, and • Service Areas for which the Rentable Area has been allocated on a pro-rata basis to more than one tenant.

6.2.5.3. Documentation required

The Accredited Assessor must obtain documentary evidence or conduct site inspections as the basis for all energy allocation determinations, and keep the records for audit.

6.2.6. Examples of energy use allocations

Example	Allocation	Reasons
Supplementary chilled water loop with blanked or in-use connection on each floor (i.e. more than 30% of the floor area) serving a range of fan coils throughout the building	Base building	Rule B2
Supplementary condenser or chilled water application designed to service a computer room for a single tenant, not generally available to other tenancies	Tenant	Rules T1 & B2
Supplementary chiller and associated equipment (for example, pumps and cooling towers) sized to serve a set of fan coils and computer cooling room units affecting less than 30% of the tenants or total office Rentable Area, without blanked connections available to other applications	Tenant	Rules T1 & B2
Packaged air conditioners under base building control	Base building unless Rule T1 applies	Rules T1 & B3
Air conditioning services to meeting rooms, operating from the primary base building system	Base building	Rule B1
Outdoor unit for an air-cooled package unit that is allocated to the tenancy under Rule T1	Tenant	Rule T1
Separate supplementary air conditioning for a leased cafe that is exclusively for the use of office tenants	Tenant	Rule T1
A lift that connects areas leased by a tenant, installed in addition to existing base building lifts, and serving less than 30% of the total office Rentable Area	Tenant	Rules T3 & B2
Domestic hot water serving common areas and some tenant-specific applications	Base building	Rule B2
Hot water for a shower block wholly within a single tenant's leased space, with no access from common areas, and under tenant control	Tenant	Rules T2 & B1
Light and power to Service Areas on a multi tenant floor	Base building	Rule B4

Example	Allocation	Reasons
Light and power to Service Areas on a single tenant floor	Tenant	Rule T2
General HVAC to Service Areas	Base Building	Rule B2

6.2.7. Energy consumption in included and excluded spaces

6.2.7.1. Spaces for the exclusive use of tenants

Any space that is for the exclusive use of **office** tenants is considered part of office premises, and the energy used must be included if it is in the scope of the rating (for example, a tenancy or whole building rating). This is regardless of whether that space is included or excluded from the **Rated Area** calculation.

6.2.7.2. Other spaces

Energy use associated with spaces that are *not* for the exclusive use of office tenants and which are not included in the Rated Area calculation may be excluded from energy coverage if this energy consumption:

- is not included in the minimum energy coverage for this type of rating, and
- is properly metered, and the metering meets the requirements of Section 8 *Metering systems*, and
- the exclusions meet the requirements of Section 9 *Consumption Data* or, for thermal exclusions only, the NABERSNZ publication *Ruling for Thermal Energy Exclusions*.

6.2.8. Exterior signage

Energy use for exterior signage must be included in base building and whole building ratings if it is:

- primarily used for identifying or advertising the building owners
- displaying the building name, even if unrelated to a tenant or building owner, or
- provided to a tenant by the building owner as a condition of lease[13].

Energy use for exterior signage is excluded from the rating if the signage does not advertise the building itself or the owners or tenants of the building.

Energy use for exterior signage for a tenant that is not provided by the building owner as a condition of lease is excluded from a base building assessment, but must be included in tenancy and whole building ratings.

[13] This requirement covers the *provision* of signage rather than permission to erect signage.

6.2.9. Car parks

Car parks are only considered for base building and whole building ratings, not for tenancy ratings.

For these ratings, the energy use of lighting and ventilation in car parks in the premises to be rated must be included in the rating to the extent that parking is provided to **office** tenants as a benefit of their tenancy (for example, as part of an agreement associated with a lease). This applies whether the energy use is separately metered or not.

Note: Where parking is provided to a tenant as a result of a separate agreement (for example, a standard contract with a public car park operator) then it is not a benefit of the tenancy and is not included.

6.2.9.1. Total exclusion

The energy use of lighting and ventilation in car parks provided for office use may be totally excluded from the rating where:

- the car park is not located on the site of the rated premises, or
- both:
  - the ownership and management of the car park are independent of the ownership and management of the premises to be rated, and
  - there is a separate meter (or group of meters) that covers the entire energy use associated with the car park, but does not cover any other aspect of the building's central services energy use that must be included in the assessment.

Note: There is no exclusion simply on the grounds that the car park is leased to, or otherwise operated by, a manager separate from the building owner and building facilities manager.

6.2.9.2. Proportional exclusion of energy use

Where building office tenants have use of part but not all of the building's car park, then a proportion of the energy use associated with these car parks may be excluded from the rating in accordance with the following rules:

1) Proportional exclusion of car park energy use is only permitted where there is a separate meter (or group of meters) that covers the entire energy use associated with the car park, but does not cover any other aspect of the building's central services energy use that must be included in the assessment.

   For example, it is not uncommon for car park metering to include other basement services such as hydraulic pumping. In such cases proportioning is not permitted.

2) Where lease documents assign a proportion of the measured car park energy use, then the share(s) specified in the documentation must be used in the assessment.

3) If no specific allocation of the energy use is given in lease documentation, the relevant proportion is calculated by dividing the number of parking spaces allocated to office tenants by the total number of parking spaces.

   Where pass cards or keys have been issued to tenants, the number of parking spaces allocated to office tenants is the greater of:

   – the number of physically dedicated parking spaces, and
   – the number of pass cards or keys issued (to a limit of the total number of parking spaces).

   Dedicated parking space, pass or key allocation **data** must be sourced from the lease documentation.

4) If there is no lease documentation available, then it is acceptable to determine the proportions by obtaining documentation signed by tenants that identifies the proportion of allocation.

5) If there is no documentation and tenants are unable to identify proportions, then all of the energy use associated with the car park must be included in the assessment.

6) Regardless of the method used to proportion the energy use, the maximum that can be excluded is 100% of the measured car park energy usage.

The **Accredited Assessor** must fully document both the method and all data used to proportion car park energy usage.

6.2.9.3. Standard for acceptable data

Compliance with this Section 6.2.8 on car parks is deemed to satisfy the accuracy requirements of Section 2.7.2 *Standards for acceptable data and estimates*.

6.3. On-site generation

6.3.1. Cogeneration and trigeneration systems

Please refer to the separate NABERSNZ Cogeneration advice available from the www.nabernz.govt.nz website.

6.3.2. Other onsite generation systems

Where energy is generated for use in the rated premises to be rated and is either:

- connected on the user side of the consumption meter which records the relevant external energy supply to the premises, or
- used on site independently of utility-supplied systems

then it will reduce the amount of utility-supplied energy required.

By definition such on-site generation is not included in the external **sources** covered by a NABERSNZ Energy for offices rating, and will therefore improve the rating when low-emission or renewable energy technologies are used. This is permitted.

No adjustment is required. In effect this means that energy **utility** billing **data** must be used without modification.

Externally supplied energy sources (such as gas, fuel oil, or electricity used by heat pumps) used to generate on-site energy must be included within the energy assessment.

Electricity generated inside the rated premises but exported to an external user (such as a nearby building or the electricity grid) does not improve the energy performance of the rated premises. The exported energy cannot be subtracted from the utility-supplied consumption as it has no impact on the energy consumption of the premises being rated.

6.4. Documentation required

6.4.1. Evidence of coverage

6.4.1.1. Utility metering

Where the **data** for an energy **source** is based on **utility** metering **only**, the **Accredited Assessor** must:

- check to ensure that the utility metering covers each of the required **end uses** for the rating type as specified in Sections 6.2.1 *Required minimum energy coverage*, and
- retain evidence of these checks for audit.

6.4.1.2. Non-utility metering

Where the data for an energy source includes data from **non-utility metering**, the Accredited Assessor must obtain current single-line diagrams or electrical circuit schedules for the source that show:

- the location and identifier (meter number) of:
  - each non-utility meter used for an inclusion in the rating, and
  - each **utility meter** used in the rating, and
- the location of each of the major uses identified in Sections 6.2.1 *Required minimum energy coverage* and 7.1.2 *Required minimum water coverage*.

Where no current single-line diagram is available for a source, the Accredited Assessor must document, to the best of their knowledge, the different energy sources under the various meters to ensure all energy sources are covered in the rating assessment. The basis of this understanding must be documented, and the documentation retained as a record for audit.

Note: It is recommended that building owners update their single-line diagrams as part of the Non-utility Meter Management Plan under Section 8.5.2

6.4.2. Evidence of classification and allocation

Where applicable, the **Accredited Assessor** must obtain documentation of:

- any agreements by the builder owner and tenants, or between tenants, concerning:
  - car park usage
  - apportionment of **utility** costs for common or shared facilities.

7. Water coverage

Correctly interpreting the scope of water supply and consumption **data** is essential to the accuracy of a NABERSNZ Water for offices rating. The key principles are:

- An assessment for an certified rating must include all **sources** of external water supplied to the rated premises, and must cover all of the water **end uses** specified in Section 7.1.2 *Required minimum water coverage.* This includes externally supplied recycled water sources, whether potable or not.
- Externally supplied recycled water sources are excluded from the calculation of the NABERSNZ Water for offices rating, as they would bias the assessment towards a more favourable result. However, they are included in the site's reported total consumption data to help understanding of the site's end-use efficiency (as opposed to its source efficiency).
- **Utility** and **non-utility meters** that meet the requirements of Section 8 *Metering systems* may be used in any combination to achieve the required coverage, subject to the accuracy requirements of Section 2.7.2 *Standards for acceptable data and estimates*.

7.1. Interpretation of scope

Accredited Assessors must ensure that an assessment for an certified rating covers:

- the consumption of every external water **source** supplied to the premises to be rated, including ground water from the site, external surface water (not internal rainwater capture), and externally supplied recycled water sources whether potable or not, and
- every **end use** of water, including as a minimum the services listed in Section 7.1.2 *Required minimum water coverage*.

The Accredited Assessor must examine reticulation diagrams or visit plant rooms to ensure that all relevant equipment is covered under the meters included in the rating.

Any exclusion must only cover the specific item being excluded. This means that every item to be excluded must be assessed separately, and the justification for its exclusion included in the documentation.

7.1.1. Unmetered supplies

Premises with consumption of water from un-metered **sources** (for example, river, bore or well water) for **end uses** other than fire systems cannot be rated until metering compliant with the **Rules** has been installed and 12 months of **acceptable data** obtained.

7.1.2. Required minimum water coverage

All water uses within the building used to support the **office** during the **Rating Period**, including use in:

- taps and sinks
- air conditioning and other base building services (for example, general cleaning, façade cleaning, etc.)
- all services supplied exclusively to office occupants, such as showers, swimming pools, etc.
- fire services
- water features and irrigation associated with the office building (including areas outside the building not considered **Rentable Area**, but within site boundaries), unless primarily associated with non-office facilities such as retail spaces, and
- toilets and washing facilities serving office areas.

7.1.3. Water consumption in excluded spaces

7.1.3.1. Spaces for the exclusive use of tenants

Any space for the exclusive use of **office** tenants is considered part of office premises, and the water used must be included in the rating. This is regardless of whether that space is included in or excluded from the **Rated Area** calculation.

7.1.3.2. Other spaces

Water use associated with spaces that are *not* for the exclusive use of office tenants and which are not included in the Rated Area calculation may be excluded from water coverage if the exclusions meet the requirements of Section 8 *Metering systems*.

7.1.4. Unoccupied spaces

The water use of unoccupied spaces must always be included, even though the space may have been excluded from or discounted in the **Rated Area** calculation under Section 3.6 *Exclusions from the Rated Area calculation*.

7.1.5. Fire system consumption

Water consumption from the operation of a building's fire system, whether consumed in an emergency or during testing, is considered a cost of operating a building and must be included in the calculation of water consumption if it is metered. If it is not metered, fire system consumption need not be included.

Note: Metered fire system consumption that is re-used within the building will tend to improve the rating.

7.1.6. On-site capture and recycling

Where water is collected or recycled at the premises to be rated (for example, by rainwater harvesting or treatment of on-site waste water) and is either:

- connected on the user side of the meter which records the relevant external water supply to the premises, or
- used on site independently of utility-supplied systems

then it will reduce the amount of externally supplied water needed.

By definition such on-site collection and recycling are not included in the external **sources** covered by a NABERSNZ Water for offices rating, and will therefore improve the rating. This is permitted.

No adjustment is required. In effect this means that supplier billing **data** must be used without modification.

No discount of on-site water use is allowed against water exported from the site, under any circumstances.

7.2. Documentation required

- Evidence of coverage, water consumption **data** and associated documentation as required under Section 9.9 *Documentation required*.
- Documentation of the **source**, quantities and any non-recycled component of externally supplied recycled water.
- Documentation of any agreements by the builder owner and tenants, or between tenants, to apportion water costs for common or shared facilities.

8. Metering systems

8.1. Summary

This section deals with ensuring the accuracy and correctness of **metering systems** which provide **data** to be used in rating assessments.

8.2. Definitions

Term	Definition
Metering system	A metering system for an individual measurement includes: • the meter • the processes that convert the initial meter signal into an energy reading (for example current transformers and k factors for electricity meters, pressure correction factors for gas meters), and • the interface through which the meter reading is taken (for example manual readings, **utility** software or a Building Management System). Note: **Accredited Assessors** must ensure that the accuracy of each overall metering system is within the allowable accuracy limits. The most common errors with metering systems occur with manual misreading, incorrect conversion factors, and failures between the meter and meter reading system.
Metering systems requiring validation	Non-utility **metering systems** providing measurements for a rating assessment which include: • an electricity meter using a current transformer (CT), or • a gas meter, or • a Remote Meter Reading System (RMRS).
Un-validated metering systems	**Metering systems requiring validation** without current evidence of **validation**

Term	Definition
Validation	When a metering system is checked, and if necessary adjusted and re-checked, to ensure its measurements of consumption are correct.
	Note: Validation requirements for **non-utility meters** are specified in Section 8.5.5 *Validation checks* and Appendix D – *Guide to non-utility metering system validation*.

8.3. High-voltage electricity metering

NABERSNZ Energy for offices ratings are based on low-voltage metering. If a building's main electricity **utility meters** are situated on the high voltage (HV) side of the transformers for the site, it is acceptable to use **non-utility meters** on the low voltage (LV) side as the basis for the energy use measurements, provided that:

- those meters satisfy the documentation requirements of Sections 9.3 *Measuring consumption* and 8.4 *Non-utility meter records*, and the accuracy and **validation** requirements of Sections 8.4 *Non-utility meter records* and 8.5 *Non-utility metering system validation*, and
- there are no connections to energy uses within the building between the transformer and the LV meters that will bypass these meters – i.e. the meters must cover 100% of building electricity **end uses**.

In addition, the **Accredited Assessor** must reconcile the LV metering against the HV metering to ensure that no meters are missing or reading incorrectly. As a guideline, transformer losses are expected to be less than 10%. Any apparent losses above this figure should be re-investigated to find the source of the discrepancy.

If these requirements cannot be met then the premises cannot be rated.

8.4. Non-utility meter records

8.4.1. Minimum frequency of readings

All **non-utility meters** used to provide **data** for energy or water consumption inclusions or exclusions must have a record of readings that is:

- at least as frequent as the **utility meter** under which the non-utility meter lies, and
- at least quarterly (i.e. four readings with an **average** gap between readings of at least 10 weeks).

The **Accredited Assessor** must retain this record of readings for audit.

8.4.2. Measurements and formats required

The following non-utility meter **data** must be recorded and retained for audit:

Data required	Acceptable record or format	Examples of unacceptable records
All meters		
Date of reading	Day/month/year	Month/year; day/month; month
Meter identification	Meter number or label that can be directly cross-referenced to the single-line diagram	No identification; label not clearly identifiable on single-line diagram
Meter reading	Meter reading, either direct from the meter or from the metering interface	No meter reading; 'units used' without the actual meter reading
Electricity meters		
K factor	Meter K factor	No K factor
Calculated electricity reading	Calculated consumption figure in kWh, based on meter readings and k-factor	Any figure that cannot be derived from the meter reading and k-factor; any figure without units
Gas meters		
Meter pressure	Meter pressure, with units	No meter pressure; no units
Meter pressure correction factor	Meter pressure correction factor	No meter pressure correction factor
Monthly energy density	Energy density of gas (MJ/m^3) from **utility** bill	No energy density data; no units on energy density data; energy density data not supported by evidence from utility
Calculated gas reading	Calculated gas consumption figure in MJ	Any figure that cannot be derived from the gas meter reading, pressure correction factor and monthly energy density; any figure without units
Water meters		
Meter multiplier	Meter multiplier to convert readings to kL or m^3	No meter multiplier

Data required	Acceptable record or format	Examples of unacceptable records
Calculated water reading	Calculated water consumption figure in kL or m^3	Any figure that cannot be derived from a meter reading or meter multiplier; any figure without units

8.5. Non-utility metering system validation

This section deals with **non-utility meter** reliability, especially electricity meters with current transformers (CTs), and the correctness of Remote Meter Reading Systems (RMRS).

Non-utility electricity meters can vary significantly in their ability to correctly measure energy consumption, especially due to incorrect wiring of the meter and incorrect meter multipliers (CT ratios). Remote Meter Reading Systems, such as a Building Management System (BMS), can vary significantly in how they interpret the measured consumption of a non-utility meter.

8.5.1. Metering systems requiring validation

All non-utility **metering systems** require **validation** if they include:

- a meter with a current transformer (CT), or
- a gas meter, or
- a Remote Meter Reading System (including an interface to a Building Management System (BMS) used to transmit meter **data**).

Note: Direct connect meters with no RMRS, and pulse meters with an on-board counting device and no RMRS, are exempt from these requirements.

8.5.1.1. Pulse meters

Consumption measurements from a pulse meter can only be used in a NABERSNZ rating assessment if the pulse meter has an on-board counting mechanism which provides an absolute count (rather than a pulse to an external device) and is then read manually or remotely.

Where a Remote Meter Reading System is used to record the pulse meter reading, this must be validated in accordance with the **non-utility meter** validation requirements in this section to ensure it is recording the measured consumption correctly.

Note: Validation is not required for non-CT pulse meters that are manually read.

8.5.2. Non-utility Meter Management Plans

Where a rating assessment uses readings from non-utility **metering systems requiring validation**, the owner or tenant (as appropriate) of the premises to be rated must implement a Non-utility Meter Management Plan to ensure that these **metering systems** correctly record consumption.

There are two possible stages in a Non-utility Meter Management Plan, as described below:

Initial validation stage	This is a program to validate all **un-validated metering systems** for the premises. The time allowed to complete this stage depends on meter type and on whether any of the metering systems included in a random sample under Section 8.5.4 *Validating a random sample of metering systems* are found to require correction. • If any corrections are required, this stage must be completed as soon as possible so that 12 months of correct **data** can be made available for the next rating. • If no corrections are required, then this stage must be completed within three years. If there are no un-validated metering systems for the premises to be rated, this stage of the Plan is not required.
Ongoing re-validation stage	This is a rolling program to re-validate all non-utility **metering systems requiring validation** for the premises. This program must ensure that every non-utility metering system requiring **validation** is re-validated whenever it is altered, or otherwise at least every 10 years. As part of this validation, it is recommended that the manager responsible for the premises should have all single-line diagrams verified and updated to reflect the current meter coverage and locations. All validation checks undertaken as part of a Non-utility Meter Management Plan must, as a minimum, comply with the requirements specified in Section 8.5.5 *Validation checks.*

1 Standard for acceptable data

The **Accredited Assessor** may only accept evidence of validation of a non-utility metering system in the form of a certificate of currency or other written evidence that:

- confirms that a metering system requiring validation has been checked in accordance with Section 8.5.5 *Validation checks* and Appendix D – *Guide to non-utility metering system validation*, and found to be correctly recording consumption, and

- confirms that the check took place within the last 10 years, and
- applies to the present condition and configuration of the metering system without any alteration (for example, for a new tenancy fitout or where a tenancy is split into two smaller tenancies).

2 Documentation required

As a minimum, a Non-utility Meter Management Plan must:

- uniquely identify each applicable metering system, and
- show the details of the last validation check for that metering system, if any, and
- nominate the date by which the next regular validation check for that metering system must be completed, and
- record the validation of any altered non-utility metering systems.

As part of this validation, it is recommended that the manager responsible for the premises should have all single-line diagrams updated and verified to reflect the current meter coverage locations.

8.5.3. Checking meter system validation

Where **data** used in a rating assessment includes readings from non-utility **metering systems** covered by the **validation** requirements, the **Accredited Assessor** must ensure that the applicable validation requirements have been met.

8.5.3.1. Checking compliance with a Non-utility Meter Management Plan

If the premises to be rated are already covered by a Non-utility Meter Management Plan as specified in Section 8.5.2 *Non-utility Meter Management Plans*, then the Accredited Assessor must:

- seek evidence of validation for all metering systems that, under the Plan, were due to be validated since the last rating assessment, and
- identify any metering systems that have been altered since the previous rating assessment, and seek evidence of validation for them, and
- for each meter that required adjustment as a result of the validation checks, follow the procedure in Section 9.8 *Correcting non-utility meter readings* to obtain acceptable corrected data or **estimates** where possible. If this is not possible, the rating cannot proceed.

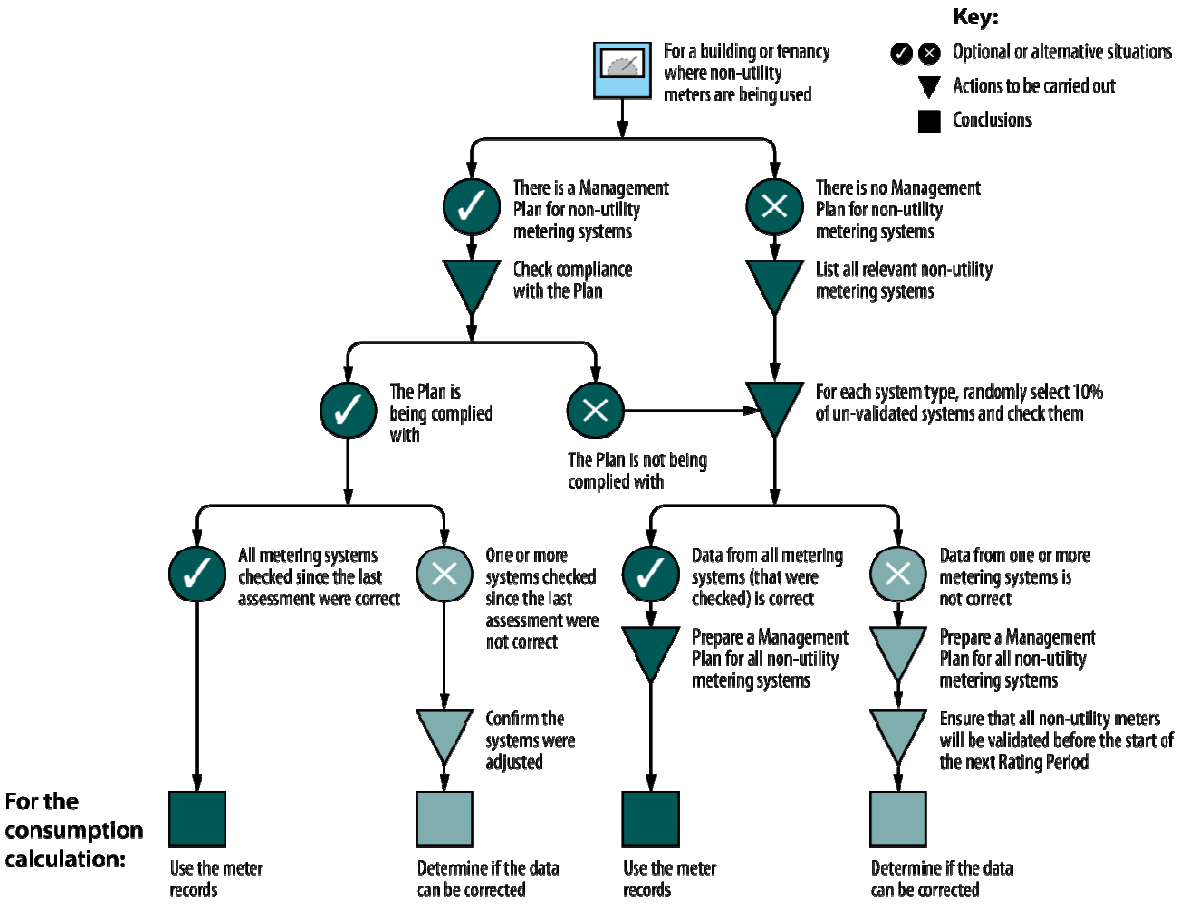
Note: The Accredited Assessor must also check that 12 months of **acceptable data** is available for the spaces covered by any altered non-utility metering systems.

8.5.3.2. Instituting a Non-utility Meter Management Plan

If there is no Non-utility Meter Management Plan for the premises to be rated, or if a Plan exists but the Accredited Assessor has not been provided with acceptable evidence of compliance, then:

- the procedure for validating a random sample of non-utility metering systems as specified in Section 8.5.4 *Validating a random sample of metering systems* must be followed, and
- a new Non-utility Meter Management Plan as specified in Section 8.5.2 *Non-utility Meter Management Plans* must be prepared and put into effect for the premises to be rated.

Figure 17: Validating non-utility metering systems



Note: Examples of acceptable certificates of currency are included in Appendix D – *Guide to non-utility metering system validation*.

8.5.4. Validating a random sample of metering systems

8.5.4.1. Selecting a random sample

All **metering systems** covered by the rating that require **validation** but do not have evidence of validation ('**un-validated metering systems**') must be comprehensively listed and categorised by meter type (such as pulse water meter, CT electrical meter, or gas meter).

A random sample of at least 10% of each listed meter type must then be chosen from the list, and the selected metering systems validated as specified in Section 8.5.5 *Validation checks*.

The **Accredited Assessor** must oversee or review the selection process and ensure that the sample was randomly chosen. The Accredited Assessor must document for audit:

- the list of **non-utility meters** from which the sample was chosen, and
- the sampling method used, and
- which metering systems were selected, and
- the results of the validation checks for each meter checked.

8.5.4.2. Results of validation

Where all the randomly selected non-utility metering systems meet the validation requirements, then:

- the rating can proceed, and
- the building owner or tenant applying for the rating must implement a program to validate (and correct if necessary) the remaining un-validated metering systems within the next three years, as part of a Non-utility Meter Management Plan as specified in Section 8.5.2 *Non-utility Meter Management Plans*.

However, where one or more of the randomly selected non-utility metering systems are found to require adjustment before they can meet the validation requirements, then:

- all un-validated metering systems for the premises covered by the rating must be validated so as to ensure that correct **data** is collected in the 12-month period before the next NABERSNZ Energy or Water for offices rating (as appropriate), and
- the Accredited Assessor must determine any correction to be applied to the data collected from the metering systems found to be incorrect, as specified in Section 9.8 *Correcting non-utility meter readings*.

8.5.5. Validation checks

All **metering systems requiring validation** must be checked, and if necessary adjusted and then checked again, as specified in this section and in Appendix D – *Guide to non-utility metering system validation*.

If a metering system requires adjustment then this must be done by appropriately qualified and licensed persons according to the applicable standards and procedures for the equipment.

8.5.5.1. Remote Meter Reading Systems

All Remote Meter Reading Systems (RMRS) used to record the measurements from **non-utility meters** require **validation** by a competent person[14] with an understanding of the meters and the RMRS, to ensure that they interpret the meter **data** correctly.

The competent person must validate that a unit of consumption shown on the Remote Meter Reading System corresponds to a unit of consumption as measured at the meter. At least two readings of the non-utility meter and corresponding Remote Meter Reading System should be undertaken at the same two time periods, and the results documented.

8.5.5.2. Non-utility electricity meters

All non-utility meters with CTs require validation, and adjustment if necessary, by a licensed electrician or electrical engineer to ensure that the CT ratio (meter multiplication factor) and wiring are correctly configured.

8.5.5.3. Non-utility gas meters

All non-utility gas meters require validation, and adjustment if necessary, by a competent person with an understanding of gas meters to ensure that the pressure correction factor corrects the measured volume of the non-utility meter to the same pressure conditions used by the **utility meter**.

Note: When processing gas data, the **Accredited Assessor** must also correct for variations in the energy content of gas by multiplying the pressure-corrected gas volume by the gas utility's energy per unit volume for each reading period. The relevant energy per unit volume figures must be obtained from the utility if not documented on the gas invoices.

[14] A 'competent person' could be an Accredited Assessor with an understanding of the meter in question.

9. Consumption data

9.1. Summary

This section deals with the measurement, processing and use of **data** on energy and water consumption. It includes provisions to allow **estimates** to be made and used in limited circumstances when actual measurements are not available.

9.2. Definitions

Term	Definition
End use	A purpose or activity (or a group of related purposes or activities) that water or energy is used for.
Source	For NABERSNZ Energy ratings: an individual fuel or energy source type such as gas, electricity or diesel fuel. For NABERSNZ Water ratings: an individual water source type such as mains water, bore water, externally reticulated grey water or river water.

9.3. Measuring consumption

9.3.1. Process overviews

Accredited Assessors must comply with the following processes:

9.3.1.1. NABERSNZ Energy for offices ratings

	Step	Reference
1	Confirm all energy **sources** entering the site.	Section 9.3.2 *Confirm all sources*
2	Assess the accuracy of the **assumptions** for each source.	Section 9.3.3 *Assess the accuracy of the assumptions for each source*
3	Determine energy consumption.	Section 9.3.4 *Determine energy consumption*

9.3.1.2. NABERSNZ Water for offices ratings

	Step	Reference
1	Confirm all water sources entering the site.	Section 9.3.2 *Confirm all sources*
2	Assess the accuracy of the assumptions for each source.	Section 9.3.3 *Assess the accuracy of the assumptions for each source*
3	Determine water consumption.	Section 9.3.5 *Determine water consumption*
4	Determine the characteristics of externally supplied recycled sources.	Section 9.3.6 *Determine recycled water characteristics*

9.3.2. Confirm all sources

1) Ask the building manager to identify all the energy/water supplies for the site, including batch-delivered supplies.

2) Review service drawings, where available, to identify all supply points.

2) Review the site to check for equipment requiring different types of energy/water.

3) Review metering arrangements to ensure that all relevant **utility** and **non-utility meters** have been included in the assessment.

Where a **utility meter** and non-utility meter could be used interchangeably, the utility meter must be used in preference. However, if utility meter readings require adjustment but are too infrequent to provide **acceptable estimates** (such as six-monthly readings that do not coincide with the **Rating Period**), monthly readings from non-utility meters that comply with all requirements of these **Rules** may be used instead. Ensure that consumption **data** sufficient to cover the Rating Period has been provided for each separate meter for each identified **source**.

9.3.3. Assess the accuracy of the assumptions for each source

1) Check if any of the bills for that **source** were **estimated**.

The total of all estimated bills used in NABERSNZ Energy for offices ratings must be added to the Potential Error for energy. Estimated bills may not be used for NABERSNZ Water for offices ratings.

2) Check whether the source includes any **non-utility meters** for inclusion or exclusion of energy or water.

If non-utility meters are used in the assessment, the **Accredited Assessor** must check that all necessary **validation** (and correction of **data**, if applicable) has been carried out as specified in Sections 8.5 *Non-utility metering system validation* and 9.8 *Correcting non-utility meter readings*.

Note: If a non-utility meter has been found to require adjustment and acceptable corrected data or estimates cannot be obtained for the relevant consumption over the entire **Rating Period**, then the rating cannot proceed.

3) Check if any other **assumptions** were made about consumption.

   If they were, the Accredited Assessor must calculate the total amount of consumption affected by each assumption, and add it to the relevant **Potential Error**.

4) For the rating to be permitted, the total Potential Error must not exceed the limits given in Section 2.7 *Acceptable data and estimates*.

9.3.4. Determine energy consumption (NABERSNZ Energy ratings)

1) Check the data format and units for each energy **source**, and if necessary convert to units compatible with NABERSNZ Energy for offices input formats as specified in Sections 9.6.1 *Utility units* and 9.6.2 *Energy bill formats*.

2) Check whether any fuel was batch-delivered.

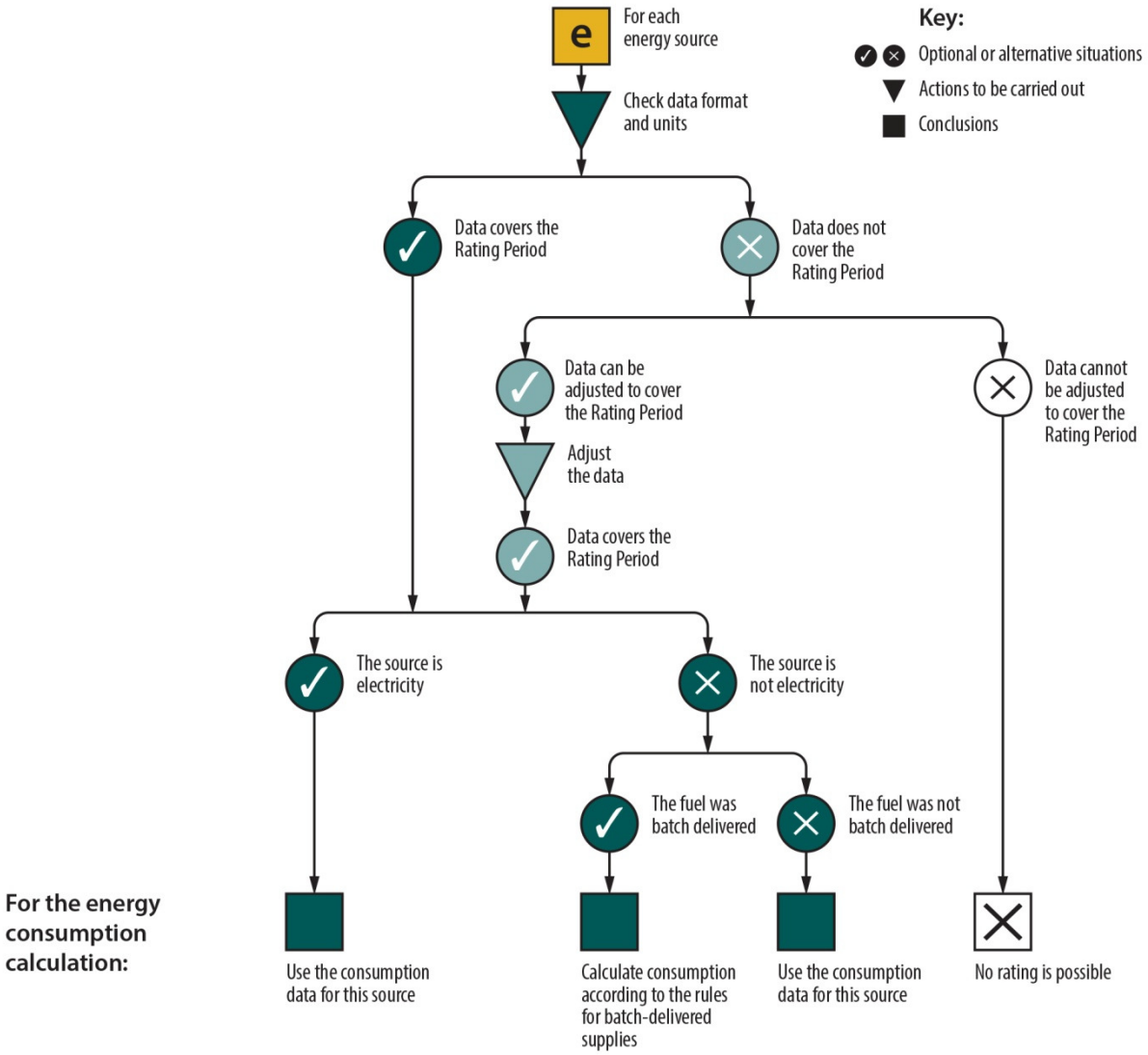
   Where fuel was batch-delivered, calculate the energy consumption using the method specified in Section 9.5 *Batch-delivered supplies*.

3) For each source, ensure that acceptable energy use **data** is available to cover the 12 months of the **Rating Period**, as specified in Section 9.7 *Periods covered by utility data*.

   a) If necessary, allow for missing data as specified in Sections 9.7.2 *Adjusting for gaps at the start or end of the Rating Period* and 9.7.3 *Estimating unrecorded consumption*.

   b) If **acceptable data** is not available to cover the Rating Period, the premises cannot be rated.

Figure 18: Determining the energy use for each energy source



9.3.5. Determine water consumption (NABERSNZ Water ratings)

1) Confirm the data format and units for each water **source**, and if necessary convert to units compatible with NABERSNZ Water input formats as specified in Section 9.6.1 *Utility units*.

3) Check that the data is from meter readings or capacity measurements for batch deliveries, and does not rely on **estimates** by the supplier.

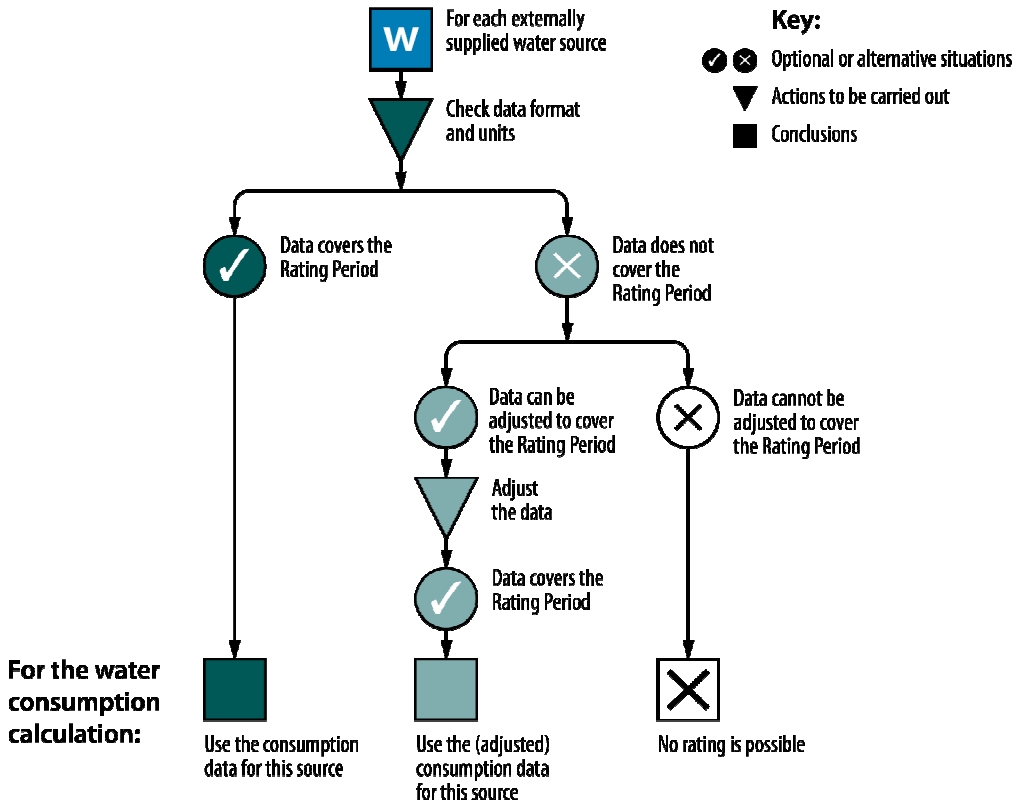
   If the bill is not based on actual measurements, they must be sought. Estimated consumption figures are unacceptable.

4) For each source, ensure that acceptable water use **data** is available to cover the 12-months of the **Rating Period**, as specified in Section 9.7 *Periods covered by utility data*.

a) If necessary, allow for missing data as specified in Sections 9.7.2 *Adjusting for gaps at the start or end of the Rating Period* and 9.7.3 *Estimating unrecorded consumption*.

b) If **acceptable data** is not available to cover the Rating Period, the premises cannot be rated.

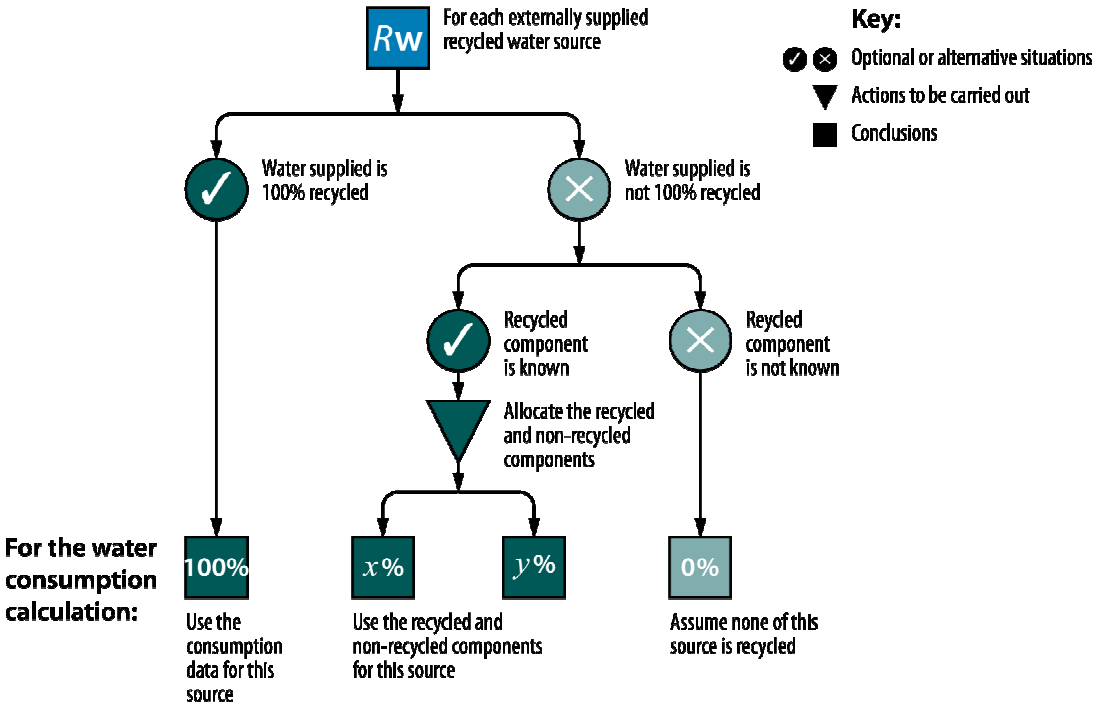
Figure 19: Determining consumption for each externally supplied water source



9.3.6. Determine recycled water characteristics (NABERSNZ Water ratings)

1) Check whether the **source** contains any non-recycled components.
   - If it does not, the entire source can be counted as recycled.
   - If there is a known non-recycled component, only the remainder may be treated as being recycled.
   - If there is an unknown non-recycled component, the entire source must be treated as non-recycled.

Figure 20: Determining the characteristics of externally supplied recycled water sources



9.4. Including or excluding consumption

The energy or water consumption measured for an assessment must include the relevant minimum **end uses** identified in Sections 6.2.1 *Required minimum energy coverage* and 7.1.2 *Required minimum water coverage*.

In achieving this, only the following methods of measurement for inclusion and exclusion are permitted:

- use of a **utility meter**
- use of a **non-utility meter** meeting the requirements of Section 8.5 *Non-utility metering system validation*
- batch delivery supply bills in which the supplier states the quantity supplied
- any combination of inclusion or exclusion of the above three items
- exclusions as described in Section 9.4.1 *Exclusions based on financially reconciled utility costs*
- energy exclusions as described in Section 9.4.2 *Energy exclusions based on area weighting* (not permitted for NABERSNZ Water for offices ratings)
- **estimates** as described in Section 9.4.3 *Estimating small un-metered end uses*
- **data** and estimates as described in Section 9.5 *Batch-delivered supplies*

- data and estimates as described in Section 9.4.4 *Thermal energy measurements*.

9.4.1. Exclusions based on financially reconciled utility costs

Where:

- a **utility meter** measures the aggregate consumption for a variety of water or energy **end uses**, some inside the coverage of a rating but others outside it, and
- there is no **non-utility meter** which only measures those end uses inside or those outside the scope of coverage, and
- the **utility** costs associated with the meter are allocated to the various end uses according to a fixed proportion of the meter readings, as specified under *Determining the fixed proportion* below

then the **Accredited Assessor** may estimate the consumption for the end uses outside the coverage by applying the fixed proportion to the metered consumption. The estimated consumption may be excluded from the assessment if it is added to the relevant **Potential Error**.

Where necessary, the **estimate** may be *reduced* so that the accuracy requirements of Section 2.7.2 *Standards for acceptable data and estimates* are still met. However, under no circumstances is it ever permissible to *increase* an estimate to these limits.

9.4.1.1. Determining the fixed proportion

If lease documentation allocates a proportion of the relevant energy or water use, then this proportion must be used in calculating the exclusion. Otherwise, it is acceptable to determine the proportion from documentation, signed by the tenants affected by the end uses in question, that identifies the end uses and the proportion of allocation.

If the fixed proportion cannot be determined from acceptable documentation, then no exclusion is allowed and the entire consumption measured by the meter covering the end uses in question must be included in the assessment.

9.4.2. Energy exclusions based on area weighting

If an energy **end use** within a space could be excluded but is not adequately sub-metered, the **Accredited Assessor** may estimate the consumption within that space by:

- taking the ratio of the floor area of the excludable space to the total floor area served by the relevant meter (ignoring all spaces not included in office **Rentable Area**), and
- applying the ratio to the total consumption measured by the meter.

The Accredited Assessor may then exclude the **estimated** consumption, provided that:

- the Accredited Assessor clearly explains the calculation method used and **assumptions** made in the submitted documentation, and
- the Accredited Assessor adds the estimated consumption to the relevant **Potential Error**.

If these requirements are not met then the energy end use within the space cannot be excluded.

This method is not permitted for NABERSNZ Water for offices ratings.

9.4.3. Estimating small un-metered end uses

Note: The following methodology is intended to allow Accredited Assessors to estimate and include a small amount of un-metered end use to enable a rating to proceed. Where large end uses or a high number of small end uses are included through this methodology, the rating may not comply with the accuracy requirements of Section 2.7.2 Standards for acceptable data and estimates. In such cases the rating cannot proceed until appropriate metering is installed and 12 months of acceptable consumption data is available to cover the Rating Period.

This rule does not apply to exclusions, or where acceptable metered **data** is available for the **end uses** concerned.

If no metered measurement is available, end use[15], the **Accredited Assessor** may estimate the energy consumption for that end use by applying the following methodology:

1) Identify all equipment or plant involved in the consumption to be estimated.

2) Determine the power consumption at maximum capacity from nameplate data or equipment specifications, for example 10 kW for an air conditioner.

3) Determine an appropriate duty cycle for the plant (as a percentage) from equipment specifications, records of use, or records of availability (for example, manually operated equipment such as washroom hand dryers cannot be used when a space is unoccupied). If there are no suitable specifications or records, use 100%.

Note: it is not permissible to simply estimate a duty cycle without reference to verifiable specifications or records.

If the small end use cannot operate when there are no occupants in the building, then calculate the annual hours as the **Rated Hours** of the building multiplied by 52 weeks (e.g. 50 hours a week x 52 weeks = 2600 hours a year). Otherwise, assume 8760 hours a year (24/7 operation).

[15] Note that where several instances of very similar individual end uses occur together so as to form a single collection (for example, luminaires in a lighting grid, taps in a washroom, or emergency lighting in a stairwell) then the collection is regarded as a single end use.

Estimate the annual consumption as:

consumption = name plate power x duty cycle x annual hours.

The Accredited Assessor must add the estimated consumption to the relevant **Potential Error**.

For example, a 2 kW hand dryer is un-metered and no suitable specifications or records are available to determine the duty cycle however it is reasonable to assume that it will only operate while the building is occupied. The Rated Hours for the building are 45 hours a week. The estimated annual consumption would be:

Consumption = 2 x 100% x (45 x 52) = 4680 [kWh]

9.4.3.1. Documentation required

The Online Rating Calculator and the documentation retained for audit must include a clear explanation of the method used to calculate the duty cycle, justification for the hours used and the consumption for the end use, including documentation of the values used.

9.4.4. Thermal energy measurements

Some buildings export or import energy by means such as thermal-energy-in-water systems. An example is chilled water being pumped from one building to another.

These systems are complex, and it is difficult to measure the thermal energy in the water, relate that back to energy input to the thermal plant, and then calculate the benchmarking score[16].

Due to this complexity and because such systems are uncommon, they are treated in a separate document to these **Rules** entitled *Ruling for Thermal Energy Exclusions*.

9.5. Batch-delivered supplies

Energy or water supplies delivered in batches, such as diesel fuel, bottled gas, coal, or tank-delivered water, must be included within an assessment if they are within the scope defined in Sections 6 *Energy coverage* or 7 *Water coverage*, as appropriate.

[16] The benchmarking score is calculated by the NABERSNZ calculator and is the energy intensity of the rated space that has been corrected for the greenhouse gas emission intensity of the energy, relative to electricity.

9.5.1. Measurement and estimation

In general, quantity **data** for batch deliveries must be taken from supplier invoices or similar documentation, or from measurement systems (such as meters, scales or unit counting) at the point of delivery. The documentation required for batch-delivered supplies includes details of measurement methods.

To ensure that all applicable deliveries during the **Rating Period** are included in the assessment for a rating, the **Accredited Assessor** must identify the supervisors or managers responsible for each batch-delivered **source** and obtain from them:

- a written statement of what deliveries were received during the Rating Period, and
- copies of the bills from suppliers, showing the details of the deliveries, and
- descriptions of the measurement or estimation methods used.

9.5.1.1. Estimating from a sample of bills

It is acceptable to estimate delivered quantities of batch-delivered supplies from a sample of bills. A suitable person must be asked if there were deliveries, and a written response received from them together with bills for each batch-supplied source.

The minimum number of bills acceptable as evidence of delivered quantities depends on what proportion the batch-delivered supply represents of the total benchmarking score or water consumption for the premises to be rated. These numbers are shown in the following table:

% of benchmarking score or water consumption	Minimum number of bills required
0–5%	2
6–15%	4
16–25%	8
26–50%	12
51–75%	18
76–100%	24

If insufficient bills from the Rating Period are available to satisfy the minimum requirements above, then:

- the Accredited Assessor may also gather all of the billing data for the 12 months preceding the Rating Period, and if there are then sufficient bills an **estimate** can be made
- otherwise, an estimate from capacity measurements must be made as specified below.

The delivery quantities shown on the bills must be converted to an annual consumption estimate: either by averaging, for non-seasonal uses, or by use of a climate-based correlation of deliveries against relevant climate data for the Rating Period.

If a climate-based correlation is used, the Accredited Assessor must provide details of the correlation method and the climate data used, and explain why the correlation method was chosen.

9.5.1.2. Estimating from capacity measurements

It is acceptable to estimate the quantity of a batch-delivered supply from capacity measurements of on-site storage tanks if:

- there have been no recorded deliveries, or the minimum number of bills specified in Section 9.5.1/1 above is not available, and
- the batch-delivered supply represents less than 5% of the benchmarking score or water consumption for the premises to be rated.

Acceptable methods are, in order of preference:

1) the use of regular capacity readings to determine consumption, or
2) if there are no regular readings, then one reading may be taken (by dip-stick or sight gauges or other method) and the entire consumption (from full tank to current level) is then allocated to the Rating Period, or
3) if a reading cannot be taken, the consumption for the Rating Period must be taken as the total capacity of the tanks.

The Accredited Assessor must ensure that all tanks used for the source in the premises to be rated are included in the capacity measurements (for example, ready-use, bulk and reserve tanks).

If there have been any deliveries during the year then these must be added to the estimate derived from the capacity readings or tank capacity.

9.5.1.3. Batch-delivered recycled water (NABERSNZ Water ratings only)

Where recycled water is delivered to on-site storage tanks, the quantity of water must be measured at the delivery to the on-site tank and not at discharge from it, as otherwise the top-up water will be potentially be double-counted in the rating. The Accredited Assessor must ensure that only delivered recycled water has been counted.

9.5.1.4. Batch-delivered water for direct uses (NABERSNZ Water ratings only)

Where batch-delivered water is used on site without being stored in a storage tank (for example, applied directly to landscaping or used for testing or direct filling of sprinkler systems, cooling systems etc.) then all such water deliveries to the site during the Rating Period must be included without averaging.

9.5.2. Standard for acceptable data

If the method of measurement or estimation complies with the requirements of this section then the consumption measurement for the **source** will be deemed to comply with the accuracy requirements of these **Rules**.

Otherwise, the **Accredited Assessor** must add the entire consumption to the **Potential Error** for water as an **estimate**.

9.5.3. Documentation required

When an assessment includes batch-delivered supplies, the **Accredited Assessor** must make a note of the method of measurement or estimation for each **source** in the Online Rating calculator.

The documentation to be retained for audit must include for each source:

- the statements of what deliveries occurred during the **Rating Period**, including contact details for the responsible person who supplied the information
- a description of the measurement or estimation method(s) used
- all **data** used to calculate the measurements or **estimates**, and
- details of all calculations.

9.5.3.1. Batch-delivered recycled water (NABERSNZ Water ratings only)

Where some or all of the batch-delivered water is from a recycled or reclaimed source, whether potable or not, the following documentation is also required:

- written confirmation from the supplier that states:
  - that the water supplied is recycled or reused, including the percentage of recycled or reclaimed water within the supply, and
  - the source of the water (such as the location of the supplier), and
  - that the identified supply has been delivered to the rated site, and
- written confirmation of delivered quantities to the site being rated (i.e. bills) and the measurement methods used to determine these quantities.

9.6. Utility bill units and formats

9.6.1. Utility units

The units of consumption that **Accredited Assessors** should seek on **utility** bills are:

Utility	Units
NABERSNZ Energy for offices ratings:	

Utility	Units
Electricity	kWh (kilowatt hours) or MWh (megawatt hours); GJ (Gigajoules)
Coal	t (tonnes);
Wood	t (tonnes);
Natural Gas	m^3 (cubic metres) at standard temperature and pressure; MJ (Megajoules) or GJ (Gigajoules)
LPG	kg (kilograms),
Fuel oil (diesel, heating oil, etc.)	L (litres);
NABERSNZ Water for offices ratings:	
Water, all sources	kL (kilolitres) (=m^3)

9.6.2. Energy bill formats

Some electrical energy bills are presented in the following format:

Total Energy = Energy (kWh) + Losses (%)

In this case the losses are actually the equivalent of network distribution charges expressed as an additional consumption instead of an additional cost. The amount of energy to be used in the rating is the energy **excluding** losses, which is in effect the raw energy consumption.

9.7. Periods covered by utility data

9.7.1. Standard for acceptable data

Utility consumption figures must cover one complete and continuous year, allowing for missing **data** as specified in Sections 9.7.2 *Adjusting for gaps at the start or end of the Rating Period* and 9.7.3 *Estimating unrecorded consumption*.

9.7.1.1. Stand-alone NABERSNZ Energy or Water for offices ratings

Where it is not possible to gather data for exactly the same period for different utility supplies, the following provisions apply:

- The utility bills that account for at least 80% of the rating result (in kg/m^2 or kL/m^2) must be adjusted to exactly match the **Rating Period**, and
- The utility bills that account for the balance of a NABERSNZ Energy rating must together cover one continuous 12-month period that is displaced from the Rating Period by no more than two months, and

- The utility bills that account for the balance of a NABERSNZ Water for offices rating must, for each **source** of supply, cover a continuous 12-month period that is displaced from the Rating Period by no more than:
  - two months for water supplies that are billed monthly or quarterly (three monthly), and
  - four months for water supplies that are billed biannually (six monthly) and
- The last date of the most recent bill for each water source must be no more than four months before the date the application for a NABERSNZ rating is submitted.

9.7.1.2. Combined NABERSNZ Energy and Water for offices ratings

When an assessment is being undertaken for both NABERSNZ Energy and Water for offices ratings, the same Rating Period must apply to both ratings. If it is not possible to gather utility data for exactly the same period for both ratings, the Rating Period should be the data-gathering period for the NABERSNZ Energy rating. The following provisions apply:

- The energy utility data must meet the same criteria as given above for a stand-alone NABERSNZ Energy rating, and
- The utility data for each water source must cover a continuous 12-month period that is displaced from the Rating Period by no more than:
  - two months for water supplies that are billed monthly or quarterly (three monthly), and
  - four months for water supplies that are billed biannually (six monthly) and
- The last date of the most recent bill for each water source must be no more than four months before the date the application for a NABERSNZ rating is submitted.

9.7.2. Adjusting for gaps at the start or end of the Rating Period

If an energy or water **source** is missing a meter reading by the **utility** at the start or end of the **Rating Period**, the consumption for the full Rating Period cannot be calculated from the utility billing **data** alone.

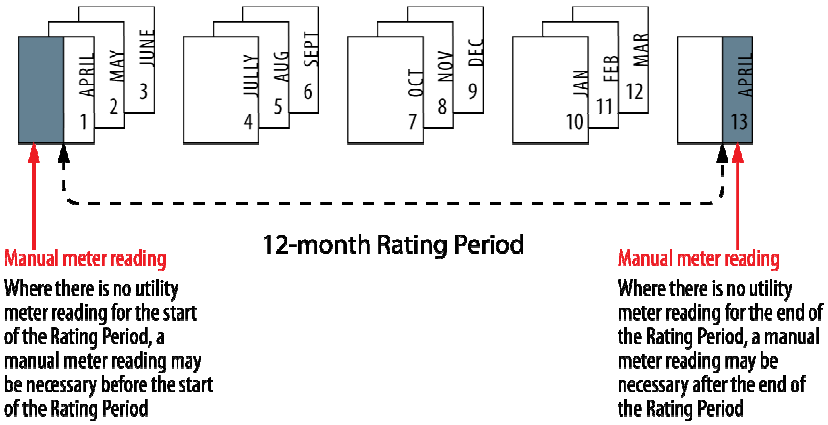
If this occurs the **Accredited Assessor** may use a manual meter reading from before or after the Rating Period to calculate consumption – but only if all of the following conditions apply:

- The Accredited Assessor is able to reconcile the manual meter reading with a history of meter readings that measure the consumption to a date after the end of the Rating Period, either as meter readings from utility bills or as manual readings meeting the frequency and data recording requirements of Section 8.4 *Non-utility meter records* where applicable.

- The reading must be treated as if it was taken on the first or last day (as appropriate) of the Rating Period, regardless of the actual period of time between the day of the reading and the start or end (as appropriate) of the Rating Period.[17]
- The reading must clearly align with the consumption history for the meter.

If these requirements are met, the manual meter reading can be used in the assessment without it being included as an error for the purposes of Section 2.7.2 *Standards for acceptable data and estimates*. If these requirements *cannot* be met, the manual meter reading is not **acceptable data**.

Figure 21: Adjusting for gaps at the start or end of the Rating Period



9.7.3. Estimating unrecorded consumption

The purpose of this section is to enable a rating to proceed if the record of bills throughout the **Rating Period** is not continuous.

Where there is an unresolvable gap in the primary billing **data** (for example, caused by a change of supplier or meter) the **Accredited Assessor** may estimate the unrecorded consumption by interpolating between adjacent bills – but only under the following conditions:

- If the consumption of the relevant **source** is climate-independent, the interpolation must be based on the **average** daily consumption figures of the adjacent bills.
- If the **utility** consumption is climate-dependent, then the interpolation must use a climate-based correlation.

Full details of the associated calculations must be included in the Online Rating calculator. If a climate-based correlation is used, the Accredited Assessor must provide details of the correlation method and the climate data used, and explain why the correlation method was chosen.

[17] This means that the reading will always tend to err on the side of overstating the consumption for the Rating Period.

Regardless of the interpolation method used, the Accredited Assessor must add the entire **estimate** of unrecorded consumption to the relevant **Potential Error**.

Under no circumstances is it permissible to extrapolate outside available data. If the bills do not cover a full 12-month period the premises cannot be rated.

9.7.4. Adjusting consumption data to match the Rating Period

Where utility bills or meter recording periods for an energy or water **source** do not precisely match the start and end of the **Rating Period**, the **Accredited Assessor** must use the following procedure to adjust the consumption **data**:

1) Gather all the meter records from the source needed to cover the entire Rating Period. For **utility meters**, these records will be the utility bills.

2) Order the meter records chronologically and number them from 1 to N, discarding any records that fall completely outside the Rating Period.

3) In the relevant section of the Online Rating Calculator, select the meter record for the source and enter the identifying data. The online Rating calculator will automatically account for usage during the Rating period.

4) .

Refer to Section 10.3.5 *Adjusting consumption data to match the Rating Period* in Appendix C – *Calculations* for details of the calculations performed.

9.7.5. Using valid meter readings before and after missing data

If an energy or water source is missing a utility bill, a utility bill has been estimated, or valid meter readings are not available, special consideration must be taken.

When one or more consecutive meter readings are missing or estimated by the utility and valid meter readings are available for the period immediately before and immediately after the missing or estimated readings, the total consumption for the period can be accurately determined using the method described in this section.

The calculated consumption is considered to be **acceptable data** and may be used in the assessment without being added to the relevant **Potential Error**.

1 Energy sources other than natural gas

1) Calculate the total metered consumption in the period by using the meter readings before and after the missing or estimated reading(s), and

2) obtain any relevant factor required to convert the metered consumption to actual consumption and use the actual consumption as the total consumption for the period.

Accredited Assessors are to exercise care when performing these calculations, and to obtain written documentation to confirm the use of any conversion factors if not documented on the relevant utility bills.

2 Natural gas

Missing gas consumption can also be determined using meter readings; however, additional guidance is required due to the complexities of converting gas meter readings to energy consumption.

In the case where a bill or a valid gas meter reading is missing or estimated, but valid meter readings are available before and after the missing period, the gas consumption can be determined by using the following methodology:

1) Calculate the total metered gas flow in the period by using the readings before and after the missing or estimated reading(s).

2) Obtain the correction factor (CF) for the gas meter from:

– the estimated bill for the period (if available), or

– the utility bills before or after the missing period, or

– written documentation provided by the utility.

Note. The correction factor is used to convert the metered consumption from the meter pressure to standard atmospheric pressure. It can be found in the utility bills under alternative names, such as pressure correction factor and conversion factor.

3) Obtain the Heating Value (HV) at atmospheric pressure for the gas during the period between the valid readings. This value must be obtained from one of the following sources, listed in order of preference:

a) written documentation provided by the utility for the period between the two readings, or, if not available

b) the average heating value for the period between the two readings, in the case there are utility bills (estimated or actual) fully covering such period, or, if not available

c) the New Zealand weighted average for natural gas (38.5)

4) Calculate the gas consumption by using the following formula:

$$Gas\ Consumption = (R_E - R_B) \times CF \times HV$$

where:

R_B and R_E = the meter reading at the beginning and end of the period, respectively

CF = the correction factor, and

HV = the heating value (MJ/m3).

Example

Two consecutive monthly bills have been estimated by the utility. Estimated readings were taken on 31 March and 30 April. Valid meter readings for the period immediately before and immediately after the estimated readings were available in adjacent utility bills. The reading for 1 March was ‘10,000’ and the reading for 31 May was ‘12,150’.

The pressure correction factor was obtained from the utility bills and was equal to 1.1. The average heating value for all the bills between the two accurate readings (this includes the two estimated bills) was 39 MJ/m3.

The total gas consumption between 1 March and 31 May can be calculated as:

(12,150 -10,000) x 1.1 x 39 = 92,235 MJ

9.8. Correcting non-utility meter readings

This section covers the steps to be followed if a non-utility **metering system** has been found to give incorrect measurements of consumption when validated as specified in Section 8.5 *Non-utility metering system validation*.

Where a non-utility metering system has been found to require adjustment as a result of **validation** checks, the **Accredited Assessor** must investigate the type of fault found and the consumption **data** available, and determine whether or not it is possible to accurately calculate (not estimate) the correct values for the consumption data from the metering system.

9.8.1. Assessments where corrections can be made

The rating can proceed where the **Accredited Assessor** can calculate the correct values for the consumption **data**. The rating application must include full documentation of the error found, the incorrect records from the **metering system**, and the calculations used to correct the data.

In the absence of any other evidence, a correction must be based on the **assumption** that the error in the metering system is applied to all data collected for the current rating assessment.

For example, if the CT ratio for an electricity meter was out by a factor of +20%, the overall electricity consumption data for that meter can be corrected by -20%. Similarly, if the CT wiring of an electricity meter was incorrect but the consumption for each phase was recorded by the meter, this can be used to reconstruct the actual consumption and the reconstructed data can be used as **acceptable data**.

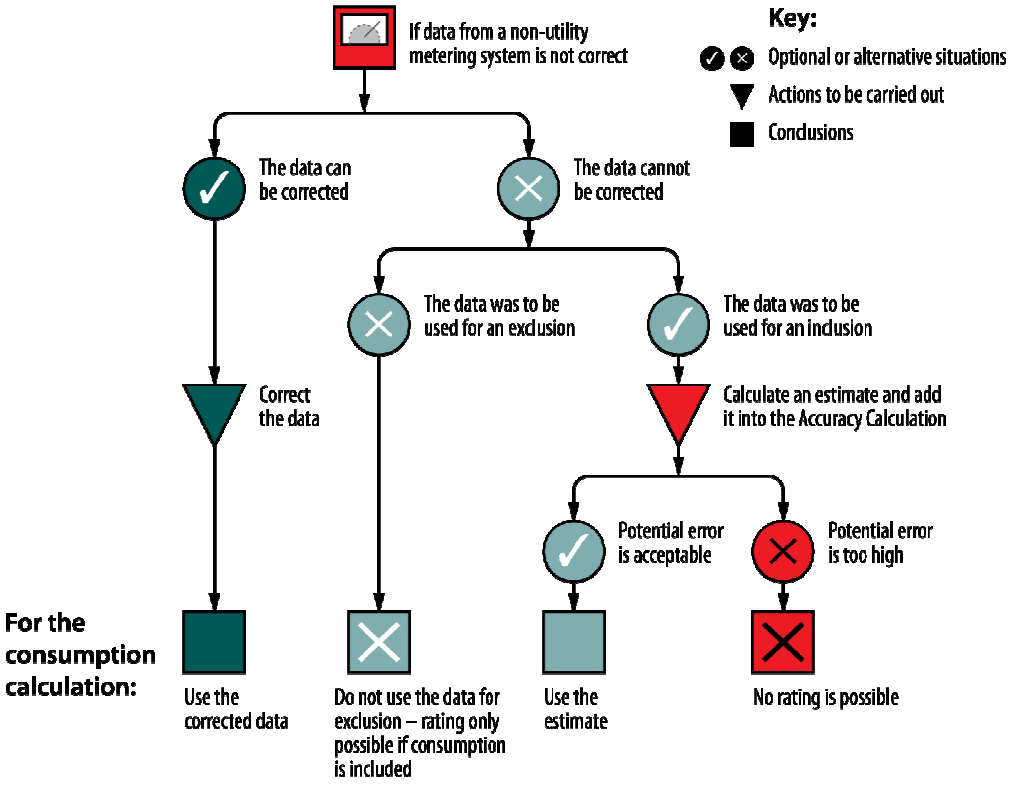
However, consumption data cannot be reconstructed if the CT wiring of an electricity meter was incorrect and the meter also did not record the energy consumption for each phase.

9.8.2. Assessments where corrections cannot be made

Where it is not possible to calculate the correct values from incorrect **metering system** data, then:

- If the consumption measured by the incorrect metering system was to be **excluded** from the assessment, the rating can proceed but the consumption must be included in the rating (to ensure a conservative result).
- If the consumption measured by the incorrect metering system was to be **included** in the assessment, then the procedure in Section 9.4.3 *Estimating small un-metered end uses* may be used to estimate the worst-case consumption for the **end uses** covered by the incorrect metering system. However, if the **estimate** does not comply with the requirements of Section 2.7.2 *Standards for acceptable data and estimates*, the rating cannot proceed and the premises cannot be rated until 12 months of accurate data has been obtained.

Figure 22: Correcting non-utility metering system data



9.9. Documentation required

9.9.1. Utility metering

Where **utility** metering **data** is included in an assessment, the following documentation must be obtained by the **Accredited Assessor**, used in the assessment, and retained for audit:

- utility bills showing consumption records for the **Rating Period**, or
- a spreadsheet or other electronic record from the utility showing consumption for the Rating Period, with a clear indication of the meter identification and reading, and at least one utility bill that can be shown to reconcile against the electronic data.

9.9.2. Non-utility metering

Where non-utility metering **data** is used for inclusions or exclusions, the following documentation must be obtained by the **Accredited Assessor**, used in the assessment, and retained for audit:

- records of meter readings and associated factors as specified in Section 8.4 *Non-utility meter records*, and
- evidence of non-utility **metering system** validation as specified in Section 8.5 *Non-utility metering system validation*.

9.9.3. Batch deliveries

Where any energy or water supplies are batch-delivered, the documentation must include bills showing the quantities delivered and how they were measured. If the **data** does not include enough separate deliveries, then the documentation must include any records of storage capacity readings used to **estimate** consumption.

10. Appendices

Summary

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Appendix B – Tenant Occupancy Survey Page 136
Appendix C– Calculations Page 137
Appendix D – Guide to non-utility metering system validation Page 141

10.1. Appendix A – Information checklist for Certified Ratings

The following information may be required for a rating. It should be obtained from the building owner/manager before a site visit, and then confirmed during the site visit and subsequent assessment.

This checklist covers most of the information needed, but individual ratings may require additional information or documentation depending on the individual circumstances of the premises.

	Information checklist	
Rated Area Rentable Area as measured to the Measurement Standard for Rated Area, less exclusions.	❑ Lease documents, or documentation of subsequent negotiations and changes, showing tenancy types, hours of operation, and information relating to occupancy.	
	❑ **Data** validating the **Rentable** of the premises to be rated, to the **Measurement Standard for Rated Area**. In order of preference, the source of the data may be: • a third-party survey or lease documentation that is explicitly based on the Measurement Standard for Rated Area, or superseded documents considered to be the equivalent of the Measurement Standard for Rated Area, or, if not available • direct measurement from current plans or scaled prints, measured to the Measurement Standard for Rated Area.	Section 3.4 *Determining office Rentable Area*
	❑ Calculations or documentation confirming the area of all **Functional Spaces** in the premises to be rated, and any spaces to be excluded from the rating.	Section 3.7 *Documentation required*
	❑ Documentation substantiating the grounds for any exclusion from the **Rated Area** calculation for the rating.	Section 3.6 *Exclusions from the Rated Area calculation*

	Information checklist	
Rated Hours: base building rating The amount of time that the building is required to provide comfort conditions to tenants.	❑ Documentation notifying the building manager of agreed **Hours of Service** for normal and after-hours operation.	Section 4.4 *Base building Rated Hours*
	❑ After-hours air conditioning request logs.	Section 4.4.4 *Determining after-hours air conditioning requests*
	❑ Any documentation required to verify hours of occupancy over 60 hours a week.	Section 4.4.5 *Verifying long hours*
Rated Hours: tenancy and whole building ratings The amount of time that the premises have at least 20% of normal peak occupancy.	❑ Permission from any affected third parties to survey staff managers or supervisors responsible for the Functional Spaces in the premises to be rated to determine hours of occupation; and the survey itself	Section 4.3.3 *Conducting a Tenant Occupancy Survey* Section 10.2 *Appendix B – Tenant Occupancy Survey*
	❑ Security logs, time sheets or other records, if survey responses cannot be obtained for some spaces.	Section 4.3.5 *Using Alternative Methods to obtain Hours of Occupancy*
Number of computers (tenancy and whole building ratings only)	❑ Permission from all affected third parties for access during a site visit to count computers.	Section 5.2.3 *Conducting a count*
	❑ Marked-up desk layouts for all spaces in the premises to be rated, if available.	Section 5.2.3 *Conducting a count*
	❑ Where necessary, evidence of regular use of computers such as: • a report by a manager or other authoritative source that a system is in regular use, and • for computers in training rooms, etc., booking or attendance records that the **Accredited Assessor** has verified are accurate and which show both the number of computers used and the amount of time they were used for.	Section 5.2.1/3 *Regular use*

		Information checklist	
Energy and water usage Information on sources and allocations to different end uses in the premises to be rated; and 12 months of consumption data covering the Rating Period.	❑	Single-line diagrams, electrical circuit schedules and water reticulation diagrams to ensure all energy and water **sources** are included.	Section 6 *Energy coverage* Section 7 *Water coverage*
	❑	Evidence of accuracy and **validation** of high-voltage electricity meters and all other **non-utility meters**, and records of readings of non-utility meters.	Section 8.3 *High-voltage electricity metering* Section 8.4 *Non-utility meter records* Section 8.5 *Non-utility metering system validation*
	❑	Calculations or documentation confirming any consumption to be excluded from the rating, and substantiating the grounds for the exclusion. A wide variety of documentation may be required, for example: • For supplementary air conditioning in open plan or call centre **office** spaces, this may include documented specifications for the base building system (for example, a consultant's 'Building performance criteria' document, or information provided to assess the grade of building in terms of the PCA building quality matrix). • Documentation of the source, quantities and any non-recycled component of externally supplied recycled water.	Section 6 *Energy coverage* Section 7 *Water coverage*
	❑	**Utility** billing data covering the full 12 months of the **Rating Period** for each energy or water source (as appropriate) used in the rated premises. This must be either: • utility bills showing consumption records for the Rating Period, or • a spreadsheet or other electronic record from the utility showing consumption for the Rating Period, with a clear indication of the meter identification and reading, and at least one utility bill that can be shown to reconcile against the electronic data.	Section 9.7 *Periods covered by utility data* Section 9.9 *Documentation required*
	❑	Where bills are not available, permission from any affected third parties to obtain energy or water consumption data for the premises.	

		Information checklist	
	❑	Bills for deliveries of any discrete (batch) supplies, showing quantities delivered and how they were measured. If the data does not include enough separate deliveries, then obtain any regular records of storage capacity readings.	Section 9.5 *Batch-delivered supplies*
Climate	❑	The region/city that the building is located in	Section 2.5 *Summary of data and documentation needed*

It will almost always be necessary for a site inspection to confirm that the information provided is accurate, current and complete. A site visit is compulsory to count computers and to inspect plant rooms.

10.2. Appendix B – Tenant Occupancy Survey

The following form must be completed by a staff manager or supervisor responsible for the nominated **Functional Space**. At least one form must be printed and completed for every shift operating in each Functional Space, and kept on file for auditing purposes.

Introduction

The questions in this survey are aimed at finding, for the Rating Period shown below, the average number of hours per week that at least 20% (1 in 5) of people who work in the space described were present. This information is only used to assess the energy and water consumption of the building relative to how many hours it is used.

Functional Space:	
Rating Period: From to	
(to be completed by the Accredited Assessor)	

Please answer the following questions with respect to the space and period shown above.

Name of manager/supervisor:	
Position:	
Location of staff under your supervision:	
What are the typical days of work within the area you manage?	
By what time at the start of the typical day have approximately 20% (1 in 5) people arrived within the area you manage?	
By what time at the end of the typical day have most people gone except for approximately 20% (1 in 5) people who are still in the area you manage?	
Describe any periods where more than 20% of people would be present outside these typical hours: (For example, '4 hours one Saturday each month', or, 'a total of 50 hours at the end of financial year'.)	
Do all the answers above apply for the whole Rating Period (shown at top)?	
If not, what period do the answers apply to? Please give alternative responses for the rest of the Rating Period (ignoring periods when the space was vacant):	
Signature of manager/supervisor:	
Date:	

10.3. Appendix C– Calculations

10.3.1. Rated Area calculation

1) Identify the **Functional Spaces** according to the rules in Section 3.5 *Dividing the Rentable Area into Functional Spaces.*

5) For each Functional Space determine the proportion of time the space is **occupied** (not vacant).

6) For each Functional Space determine the time-weighted area by multiplying the floor area of the space by the proportion of time the area was occupied.

7) Determine the **Rated Area** by adding all the time-weighted areas for each of the Functional Spaces.

This calculation is expressed as:

$$A = \sum_{i=1}^{N} o_i a_i$$

where:

A = Rated Area (m^2)

i = each Functional Space

$\mathbf{a_i}$ = floor area of each Functional Space (m^2)

$\mathbf{o_i}$ = the proportion of the Rated Period that the space was occupied.

Example

A building has two 1000 m² functional spaces, but one of them has been vacant for 3 months during the **Rating Period**. The Rated Area is assessed as:

A = 1000 + (9/12)*1000 = 1000 + 750 = 1750

10.3.2. Tenancy and whole building Rated Hours calculation

The **Rated Hours** for tenancies and whole buildings are calculated through the Online Rating Calculator using the **Tenant Occupancy Survey** data, and should not be calculated by other means.

10.3.2.1. Calculating the Rated Hours

1) For each **Functional Space** determined in Section 3.5 *Dividing the Rentable Area into Functional Spaces*, calculate the occupation-weighted area as follows:

- For each distinct period during the **Rating Period** in which the space was **occupied** and the hours of occupation were constant, multiply its hours per week by the proportion of the 12-month Rating Period that the distinct period represents.
- Add the hours for each such distinct period.
- Multiply the area of the Functional Space by the total number of hours per week.

8) Add the occupation-weighted areas of all the Functional Spaces together and then divide by the total **Rated Area** to calculate the area-weighted **average** hours per week for the premises to be rated.

This method applies equally to normal and after-hours operation. This calculation is expressed in the equation below:

$$H = \frac{\sum_{i=1}^{N} h_i o_i a_i}{A}$$

where:

H = Rated Hours (hours/week)

A = Rated Area (m^2)

i = each Functional Space

$\mathbf{h_i}$ = hours allocated to each Functional Space (hours/week)

$\mathbf{a_i}$ = area of each Functional Space (m^2)

$\mathbf{o_i}$ = the proportion of the Rated Period that the space is occupied

Example

A building has two 1000 m² functional spaces, one with no vacancy and operating 50 hours a week, the other has been vacant for 3 months and operates 55 hours a week; the rated hours are assessed as:

$$H = \frac{(50*1000) + (55*(9/12)*1000)}{1000 + ((9/12)*1000)} = 52.1$$

10.3.3. Base building Rated Hours calculation

Calculate the core hours $\mathbf{H_c}$ according to the calculation method described above and as shown in the following equation:

$$H_c = \frac{\sum_{i=1}^{N} h_{c,i} o_i a_i}{A}$$

Determine the after-hours times $\mathbf{H_a}$ using the calculation method described below:

1) For each **Functional Space**, determine the after-hours air conditioning (AHAC) hours in equivalent hours per week. For instance, if you have

a total amount of after-hours service for the year, divide this amount by 52 to obtain the AHAC hours for the space in hours per week.

9) Apply the formula below to determine the equivalent AHAC hours for the rated premises Ha:

$$H_a = \frac{\sum_{i=1}^{N} h_{a,i} o_i a_i}{A}$$

where:

H_a = equivalent AHAC hours for the premises to be rated

$h_{a,i}$ = equivalent AHAC hours for each Functional Space (hours/week)

10) Add this figure to the core hours **H_c** to calculate the total **Rated Hours H**:

$$H = H_c + H_a$$

10.3.4. Sampling uncertainty for estimated computer counts

1) Analyse the sample **data** to determine an **estimate** of the total number of computers, as follows:

- Calculate the computer density (**average** number of computers per unit floor area) for each individual **Functional Space**, **x**; and the sample mean (average over the whole sample of spaces) **X** = total computers divided by total floor area of the sampled Functional Spaces.
- Calculate the sample standard deviation, **S**, of the individual computer density figures, **x**, using the formula:

$$S = \sqrt{\frac{\sum_{j} \left[(x_j - X)^2 a_j \right]}{a - 0.05A}}$$

where:

j is the number of spaces surveyed to date

A is the total area subject to the sampling methodology, and

$$a = \sum_{j} a_j$$

- Calculate the sampling uncertainty, **U**, in the Functional Spaces you have sampled, as follows:

$$U = 0.44 S \sqrt{\frac{A}{a} - 1}$$

If **U** ≥ 0.1**X** then the sampling uncertainty is 10% or more, and the sample is too small. Take the next Functional Space from the random list, count the number of computers in regular use, add this data to the data already collected, and repeat the estimation of the sampling uncertainty. Repeat adding data for additional spaces while **U** ≥ 0.1**X**.

When **U** < 0.1**X** the statistical uncertainty in your figure is now less than 10%, and the figure can be used. If you have collected more data than essential it is better to use the extra data to improve the uncertainty.

11) Multiply the sample mean, **X**, by the total area subject to the sampling methodology, **A**. This is the **Rated Area** excluding any Functional Spaces in which you counted computers separately in the first step of this process.

ment.

10.3.5. Accuracy calculation procedure

The Online Rating Calculator automatically calculates the error associated with a rating assessment. It is important that the degree of error is minimised and is kept within limits so that NABERSNZ ratings can be relied upon for comparison.

10.3.5.1. Potential Error – area, computer count, energy and water consumption

For all **data types** except hours, the **Potential Error** is the total of all **estimates** (including assumptions, approximations, and un-verified data) used in place of **acceptable data** for that data type.

10.3.5.2. Potential Error – hours

Potential Error is calculated differently for hours because potential inaccuracy in the area-weighted **average** is not readily apparent from the raw occupancy data. The calculations are based on the following procedure:

1) Calculate the **Rated Hours** as specified in Section 4 and record the result.

12) Set the hours for all **Functional Spaces** with uncertain hours to zero and record the value for Rated Hours that would result. This is the worst-case figure. Return the hours to their 'rated' values.

13) The overall Potential Error in hours is then the Rated Hours from step 1 above minus the worst-case total calculated in step 2.

10.3.5.3. Total rating accuracy

The combined effect of all assumptions, estimates, and un-verified data on a rating is calculated as follows:

1) Calculate a 'case A' rating using all the assumptions, estimates, and un-verified data intended to be used in the assessment.

14) Calculate the Potential Error for each data type.

15) Calculate a 'case B' rating in which the Potential Errors are:
   - (for **Rated Area**, Rated Hours and computer count data) added to the 'case A' inputs, or
   - (for energy and water consumption data) subtracted from the 'case A' inputs.

16) The 'case A' rating meets the accuracy requirements of this section if the results from the rating calculator for the 'case A' and 'case B' ratings differ by no more than 5% (in $kgCO_2/m^2$ or kL/m^2, as appropriate).

10.4. Appendix D – Guide to non-utility metering system validation

Section 10.4.1 should be used as a guide by a competent person[18], licensed electrician or electrical engineer to ensure that the Remote Meter Reading System (RMRS) is interpreting the **non-utility meter** data correctly.

Section 10.4.2 should be used as a guide by the licensed electrician or electrical engineer for non-utility electricity meters with current transformers (CTs) to ensure they are properly installed, functioning correctly and interpreted correctly.

Section 10.4.3 should be used as a guide by a competent person to verify that the pressure correction factor corrects the measured volume of the non-utility gas meter to the same pressure conditions used by the **utility** gas meter.

Where errors with a non-utility **metering system** are identified it is expected that the non-utility meter or RMRS will be adjusted and re-tested as part of the **validation**, and the adjustment documented.

If a metering system requires adjustment then this must be done by appropriately qualified and licensed persons according to the applicable standards and procedures for the equipment.

[18] A 'competent person' could be an Accredited Assessor with an understanding of the meter in question.

10.4.1.Remote Meter Reading Systems

RMRS are used to read the meters from a remote location. They are used to simplify the reading process or because of accessibility issues with manually reading a meter. RMRS are common for both electricity and water metering.

The RMRS can record the consumption of the meter through a pulse output or through a protocol that directly reads the meter register. The connection to the meter can be through a hard-wired, wireless or radio frequency connection.

Most remote water reading systems use pulse output type meters, either hard-wired or via radio frequency transmitters. Electricity meters use a combination of pulse output and direct reading of the meter consumption.

The RMRS can be part of an existing Building Management System (BMS) or a dedicated system.

To ensure that a RMRS is interpreting the meter **data** correctly, confirm that a unit of consumption on the RMRS corresponds to a unit of consumption as measured at the meter.

At least two readings of the **non-utility meter** and corresponding RMRS must be undertaken at the same two time periods, and the results documented. Where the results identify a discrepancy between the non-utility meter and RMRS, the RMRS must be adjusted and at least two more readings taken to confirm it is accurately measuring consumption. All readings and any adjustments must be documented.

10.4.2.Electricity meters

Electricity meters can be single-phase, commonly used for residential or small tenancies, or three-phase used for larger tenancies. They can be basic electro-mechanical meters or fully electronic with analog (dial) or digital displays.

They are either ‘whole current’ (direct connect) where all the electricity flows through the meter, or current transformer (CT) meters where the transformer reduces the current flow through the meter by a defined ratio.

A whole current meter is typically used for loads up to 100 amps and CT meters for larger loads. The more recent exception to this is where small panel-mounted electronic meters are installed that use CTs regardless of the current flow.

CT ratios are expressed as a ratio of the primary current to the secondary current. For example, a ratio of 300:5 means that when 300 amps flows through the CT then 5 amps flows through the meter. If the meter does not have the ability to program this ratio through some configuration, then the meter reading would need to be multiplied by this ratio to arrive at the actual consumption recorded by the meter.

This ratio is also known as the meter multiplier, meter factor or K factor. In the case of a CT ratio of 300:5, the multiplier or K factor would be 60. As a note all CTs have a ratio of the 'value':5 with the 'value' generally indicating the maximum current for the circuit that is metered.

Analog electromechanical meter available in either whole current (direct connect) or CT type meters.

Typical three-phase electronic meters available in either whole current (direct connect) or CT type meters with little to distinguish them other than the labelling on the meter, unless the cover has been removed. CT type meters have 10 connections, while whole current meters have 7 connections.

Panel-mounted electronic meter using CTs

10.4.2.1. Exemption for manually read whole current meters

Whole current (direct connect) meters without CTs that are manually read, with no interpretation by a RMRS, are excluded from these rules.

10.4.2.2. Checking the Current Transformer (CT) ratio and meter wiring

Record the CT ratio and verify, where appropriate, that the meter is correctly configured to this ratio. Where the CT ratio is not programmed into the meter, verify that the CT ratio has been correctly applied to the meter readings to arrive at the actual consumption.

Cross check the wiring of the meter and the CTs for:

- CTs not connected
- reverse CT connection errors, which will significantly reduce the recorded consumption
- cross phase CT connection errors, where CTs are not matched to the same phase voltage
- phase sequence connection errors
- faulty or missing potential fuses, which can significantly reduce the recorded consumption and may cause failure of the meter.

Record the CT ratio or multiplier that is required to convert the meter reading to kWh.

Where it is not possible to identify the CT ratio, a qualified electrician can use a power meter to confirm the reading by measuring the actual current flow through the circuit being metered and the corresponding phase to the meter. The following calculation would then apply to determine the CT ratio:

$$\text{The CT ratio ('value':}\mathbf{5}\text{)} = \frac{\text{measured circuit amps (e.g. 120 amps)}}{\text{measured meter amps (e.g. 2 amps)}} \times 5\mathbf{:5}$$

$$= 300\mathbf{:5}$$

10.4.2.3. Checking meters in place to avoid shutdown

If wiring and CTs associated with **non-utility meters** cannot be safely accessed and visually checked without a partial or total shutdown of the building, the following methods can be used to confirm that each non-utility meter is properly installed, functioning correctly and interpreted correctly.

If a meter checked by these methods is found to require adjustment, then the check after adjustment must fully comply with Section 10.4.2/2 above.

Note: A shutdown to allow safe access may then be unavoidable.

Verification using a power meter	A qualified electrician can verify the operation and accuracy of the non-utility meter using a portable power meter to record the consumption of the metered circuit over a period. This is achieved by taking meter readings at the start and end of that period and comparing the

	measured consumption over the same time period on the power meter. Where the difference in the power meter and non-utility meter readings is greater than 10% this indicates a problem with the non-utility meter wiring or CTs, which requires correcting.
Verification from measured current	A qualified electrician can identify the average current in the circuit being metered using a clamp-on ammeter or similar device. At the time of the measurement the consumption being measured must be indicative of the average usage in the metered circuit, and must be relatively constant in the usage at that time. For each phase, select a test period of at least one hour and read the non-utility meter at the start and end of this period. The readings taken by the electrician within this period can be converted to an average kilowatt (kW) value: • divide the average amps by 1.4 for three-phase supply • multiply the average amps by 0.24 for a single-phase supply. The kW reading is converted to kilowatt per hour (kWh) based on the time of the period and compared to the non-utility meter consumption for that same period. Where the difference between the value derived from the clamp-on ammeter readings and the non-utility meter reading is greater than 10% this indicates a problem with the non-utility meter wiring or CTs, which requires correcting.

Where either of these methods are used for **validation**, the CT ratio and meter multiplier programmed in the non-utility meter must be recorded.

Example

A three-phase circuit with a non-utility meter was measured for one hour and the amps were recorded at an average of 14 amps per phase. This reading was converted to 10 kW i.e. 14 amps divided by 1.4 for three-phase supply. The difference between this figure and the non-utility meter readings should therefore be 1 kWh (i.e. 10%) or less over that one hour period. Any greater difference in the meter readings would indicate that the meter must be corrected.

10.4.3.Gas meters

Record the meter pressure and the correction factor required to adjust the reading to m^3 under standard pressure. This **data** can be collected from the **non-utility meter** and compared with the **utility meter**, or obtained from the gas supplier.

10.4.4.Example of a validation record for electrical non-utility meters

Building name: Building address:

Name of person undertaking validation: Qualification and/or certified licence number:

Date of validation:

Non-utility meter ID (meter no. or tenancy / unit no.)	**Non-utility meter description** (meter brand and type)	**Meter wiring checked***	**Remote meter reading** Confirmation of the accurate interpretation of system reading the non-utility meter at the same two time periods (where applicable)				**CT ratio** (only applicable for CT type meters)	**Meter multiplier; K factor; or meter factor** (only applicable for CT type meters)	**Power meter check (kWh)** (only required where it is not possible to identify the CT ratio)
			Time A		**Time B**				
			Remote Metering Reading System readings	Corresponding manual non-utility meter readings from meter face	Remote Metering Reading System readings	Corresponding manual non-utility meter readings from meter face			
Example	Example	Yes	Time A: 12:25		Time B: 12:32		300:5	60	1600 kWh
			12357.90	12357.90	18256.31	18256.31			
			Time A:		Time B:				
			Time A:		Time B:				

*The meter wiring check for CT type meters should check for: reverse CT connection errors; cross phase CT connection errors; phase sequence connection errors; and faulty or missing potential fuses.

Signed to record that the above non-utility meters
are correctly configured and have been validated: .....……..

10.4.5.Example of a validation record for gas non-utility meters

Building name: Building address:

Date of validation: Name of person undertaking validation:

Non-utility meter ID (meter no. or tenancy / unit no.)	**Non-utility meter description** (meter brand and type)	**Remote meter reading** Confirmation of the accurate interpretation of system reading the non-utility meter at the same two time periods (where applicable)				**Meter pressure (kPa)**	**Correction factor**
		Time A		**Time B**			
		Remote Metering Reading System readings	Corresponding manual non-utility meter readings from meter face	Remote Metering Reading System readings	Corresponding manual non-utility meter readings from meter face		
Example	Example	Time A: 12:25		Time B: 12:32		116.372	1.1485
		12357.90	12357.90	18256.31	18256.31		
		Time A:		Time B:			
		Time A:		Time B:			
		Time A:		Time B:			

Signed to record that the above non-utility meters
are correctly configured and have been validated: .....……..

10.4.6.Example of a validation record for water non-utility meters

Building name: Building address:

Date of validation: Name of person undertaking validation:

Non-utility meter ID (Meter no. or tenancy / unit no.)	**Non-utility meter description** (Meter brand and type)	**Remote meter reading** Confirmation of the accurate interpretation of system reading the non-utility meter at the same two time periods (where applicable)			
		Time A		**Time B**	
		Remote Metering Reading System readings	Corresponding manual non-utility meter readings from meter face	Remote Metering Reading System readings	Corresponding manual non-utility meter readings from meter face
Example	Example	Time A: 12:25		Time B: 12:32	
		12357.90	12357.90	18256.31	18256.31
		Time A:		Time B:	
		Time A:		Time B:	
		Time A:		Time B:	

Signed to record that the above non-utility meters
are correctly configured and have been validated: .....