

BASIX THERMAL COMFORT PROTOCOL

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1 Introduction

1.1 What is BASIX?

BASIX is the Building Sustainability Index. It is a web-based planning tool designed to assess the potential performance of new homes against a range of sustainability indices: Water, Thermal Comfort and Energy. BASIX aims to reduce the environmental impact of new development and to produce homes that are more comfortable and cheaper to run than most existing homes.

BASIX was introduced into the development approval process in NSW on 1 July 2004 under the *Environmental Planning and Assessment Act 1979*.

More information about BASIX, including the requirements for completing a BASIX assessment, is available on the BASIX website, www.basix.nsw.gov.au.

1.2 About the Thermal Comfort Index of the BASIX tool

The Thermal Comfort Index of the BASIX tool assesses the heating and cooling loads placed on a dwelling by its fabric. It does not assess the heating and cooling appliance or fuel type – these are assessed in the Energy Index. The Thermal Comfort Index of BASIX aims to:

1. To ensure thermal comfort for a dwelling's occupants appropriate to the climate and season.
2. To provide the potential to reduce greenhouse gas emissions from artificial cooling and heating through good building design and use of appropriate construction materials.
3. To reduce the demand for new, or upgraded, energy infrastructure by managing peak demand for energy required for cooling and heating.

1.3 About this Protocol

To complete the Thermal Comfort Index of a BASIX assessment, applicants can choose between a Rapid method which sets simple non-flexible standards for the dwelling, a DIY method which has minimum insulation and a flexible glazing assessment, or the 'Simulation' method for a more detailed assessment.

The Rapid and DIY methods are completed within the BASIX assessment framework, whereas the Simulation method involves the assessment of the thermal performance of a proposal by an Accredited Assessor.

This Protocol applies to the Simulation method for the Thermal Comfort Index of BASIX, and ensures that thermal performance assessments under the Simulation method are carried out consistently and accurately. This Protocol establishes requirements for:

- the accreditation of organisations that may accredit assessors to conduct Simulations, and the accreditation of assessors by such organisations;
- the software which can be used by Accredited Assessors to conduct Simulations; and
- the manner in which Simulations are to be conducted by Accredited Assessors.

1.4 Definitions

Terms used in this document have the meaning given to them below.

Accredited Assessor means a person accredited by the Association of Building Sustainability Assessors (ABSA) or by another organisation accredited by DoP to issue certificates in relation to a building's thermal performance.

Accrediting Organisation means an organisation approved by DoP to accredit assessors for the purposes of conducting Simulations.

Approved Software means software that has been approved by DoP for conducting Simulations.

Assessor Certificate means a certificate issued by an Accredited Assessor.

Attached dwelling house means a dwelling which is attached to, or less than 0.5m from, any other dwelling or building (excluding a garage or carpark), but which does not have another dwelling or building (excluding a garage or carpark) above or below it, such as a semi-detached house, terrace house, row house or townhouse.

DoP means the NSW Department of Planning.

Conditioned floor area in relation to a dwelling, means the total floor area of the dwelling, excluding:

- a) floor area that is not fully enclosed;
- b) bathrooms (but not ensuites) and laundries, with a ventilation opening; and
- c) voids, store rooms, garages and carparks.

Separate dwelling house means a dwelling which is separated from all other dwellings and other buildings (excluding a garage or carpark) by at least 0.5m.

Simulation means the modelling of a dwelling using Approved Software for the purposes of demonstrating compliance with the BASIX Thermal Comfort Index.

Software Provider means a provider and/or distributor of thermal modelling software.

Unconditioned floor area in relation to a dwelling, means the total floor area of all bathrooms (not including ensuites) and laundries, with a ventilation opening.

2 Accreditation of organisations and Assessors

2.1 Aim

The aim of this section of the Protocol is to establish requirements for the accreditation of organisations that may accredit assessors to conduct Simulations, and the accreditation of assessors by such organisations.

2.2 Scope

This section only applies to activities of Accrediting Organisations and Accredited Assessors that relate to conducting Simulations for the purposes of compliance with the Thermal Comfort Index of BASIX.

2.3 Application to be an Accrediting Organisation

Organisations must apply to DoP for accreditation to accredit assessors to conduct thermal performance Simulations for BASIX. Only organisations can apply: DoP will not directly accredit individual assessors.

Applications to DoP by an organisation seeking accreditation must include the following information (additional information may be requested):

- an outline of the processes that will be undertaken by the organisation in accrediting, training, supporting and auditing Accredited Assessors in relation to conducting Simulations;
- a list of Accredited Assessors considered eligible to conduct Simulations at the time of application (access to an up-to-date list must be provided to DoP as requested). Accredited Assessors with part or limited accreditation must be identified to DoP;
- explanatory material provided to Accredited Assessors such as guidelines and procedures for conducting Simulations;
- material used to train Accredited Assessors, including a description of the learning outcomes;
- examination material used in the accreditation of assessors to conduct Simulations;
- details of referral systems available for circumstances beyond the capability of the Approved Software, for example an expert referral system.
- the criteria by which accreditation of assessors may be withdrawn.

DoP will assess applications for the accreditation of an Accrediting Organisation and determine whether an organisation will be accredited. DoP may rely on expert advice when assessing applications. Following determination, DoP will notify the applying organisation in writing of the outcome of the application.

The contact details of approved Accrediting Organisations will be listed on the BASIX website, www.basix.nsw.gov.au.

2.4 Accreditation of assessors by Accrediting Organisations

An Accrediting Organisation may accredit qualified individuals as Accredited Assessors for the purposes of conducting Simulations to determine the heating and cooling loads of buildings for use in BASIX assessments.

2.5 Training to be provided

An Accrediting Organisation is responsible for ensuring that prospective assessors hold the national qualification Short Course in Building Performance (Residential). Training may be provided by the Accrediting Organisation or other registered training providers.

An Accrediting Organisation must examine Accredited Assessors in the use of the Approved Software and their understanding of the training material. The examination must cover the types of dwellings, construction systems and materials that the Accredited Assessors is likely to simulate for the purposes of demonstrating compliance with BASIX.

An Accrediting Organisation must provide Accredited Assessors with training in BASIX in relation to the following:

- understanding how a Simulation relates to the completion of a BASIX assessment;
- understanding the way Approved Software outputs are handled by BASIX;
- determining whether a Simulation concession is applicable and adequately documenting evidence to support the concession;
- issuing Assessor Certificates in an appropriate form;
- ongoing training to ensure Accredited Assessors have an up-to-date understanding in relation to the above.

2.6 Auditing

An Accrediting Organisation must have a system in place for auditing Accredited Assessors in their role of conducting Simulations. An auditing report must be provided to DoP at suitable intervals. Accrediting Organisations must take steps to resolve serious and recurring issues that arise as a result of auditing.

2.7 Quality assurance

An Accrediting Organisation must have a quality assurance system in place (such as a code of practice and/or standardised procedures) to ensure Simulations are conducted in a uniform manner.

2.8 Accredited Assessor support

An Accrediting Organisation must provide Accredited Assessors with sufficient support in relation to their role of conducting Simulations and obligations under this Protocol. Accrediting Organisations must provide assistance to Accredited Assessors in their role of advising clients on compliance with the BASIX Thermal Comfort requirements.

2.9 Expert Referral system for circumstances outside software limitations

An Accrediting Organisation must have a system for referring dwellings, design strategies, construction systems and materials that are deemed by the Accrediting Organisation and/or the Software Provider to be beyond the capability of the Approved Software. These projects must be referred to an expert or experts appointed by the Accrediting Organisation.

The expert is to consider equivalence to the level thermal performance required by BASIX and may not include any concessions other than those defined by BASIX.

The expert must clearly identify the circumstances in which referral will be required, and it must be mandatory for Accredited Assessors to refer in these circumstances. The system must require a response to the applicant to be provided within 21 days of receipt of an application.

Accrediting Organisations must appoint persons to assess dwellings within the referral system. The credentials and expertise of persons to which developments are referred must be made available to the public, Accredited Assessors and DoP.

The referral system must consider the requirements of this Protocol, including Simulation procedures, and the aims and requirements of the BASIX Thermal Comfort Index (e.g., required shading for cross ventilated dwellings) when assessing the dwelling.

Where other software simulation results or calculations are submitted as evidence, the software must have appropriate credentials (eg meets the requirements of BESTEST) and settings used in those simulations or calculations must be equivalent to the settings used in the Approved Software unless evidence is provided to support an alternative setting.

2.9.1 Expert Reporting

The expert considering the development must provide a Referral Report to the Accredited Assessor for submission with the development application or application for a complying development certificate. The Accrediting Organisation must be provided with a copy for record keeping.

This Referral Report must outline:

- the reason for the referral,
- the features of the development which were assessed,
- the method of alternative assessment,
- the features which ensure equivalent thermal performance to those required by BASIX.

The Referral Report must not be issued until those aspects of the dwelling that support the result are reflected on the drawings and documentation.

2.10 Other Rules and Guidelines

Accrediting Organisations may have other rules and guidelines relating to the conduct and activities of an Accredited Assessor. The Accrediting Organisation is responsible for ensuring these are consistent with this Protocol.

2.11 Notification of operational changes

An Accrediting Organisation must inform DoP of changes to its operations that may affect its status as an Accrediting Organisation.

Note: The Association of Building Sustainability Assessors (ABSA) is considered an Accrediting Organisation.

3 Software used to conduct Simulations

3.1 Aim

The aim of this section of the Protocol is to establish a common and appropriate benchmark for all software used to conduct Simulations to demonstrate compliance with the Thermal Comfort Index of BASIX.

3.2 Applications to have software approved

Software Providers must apply to DoP for software to be approved for the purpose of conducting thermal performance Simulations for the Thermal Comfort Index of BASIX.

These applications must include information demonstrating that the software meets the criteria listed in section 3.5 of this Protocol.

DoP will assess applications and determine whether approval will be given. DoP may rely on expert advice when assessing applications. Following determination, DoP will notify the Software Provider in writing of the outcome of the application.

3.3 Support for Approved Software

Software Providers must provide sufficient support for Accredited Assessors to enable them to conduct Simulations using Approved Software. Details of support measures, including response times and communication methods (e.g. via email), must be provided to DoP. Joint support mechanisms between Software Providers and Accrediting Organisations are permissible.

3.4 Updates to Approved Software

Software Providers must abide by the following procedures when updating software:

Minor Updates (including new construction element options in the Approved Software tool or changes to thermal performance assumptions relating to existing construction elements):

Software Providers must notify DoP and Accrediting Organisations prior to the change being released when minor updates to Approved Software tools are made. The changes must be verified by a suitably qualified person. Approval by DoP to make these changes is not required.

Major Updates (including updates to the version number of Approved Software tools, changes to settings and assumptions in Approved Software tools, and any changes that may impact on compliance with section 3.5 below):

Software Providers must submit proposed updates to DoP for approval and notify Accrediting Organisations of the changes following approval by DoP and prior to the update.

3.5 Criteria for Approved Software

Software must meet the following criteria before it can be used for conducting Simulations:

- It must comply with the Australian Building Codes Board Protocol for House Energy Rating Software as updated from time to time available at www.abcb.gov.au.
- Comparisons between the software submitted for approval and AccuRate Australian Edition v1.1.4.1 must indicate that the submitted software has heating and cooling loads that are, on average, within 6% of AccuRate Australian Edition v1.1.4.1 loads for a sample of dwellings. Greater variation may be acceptable in certain circumstances where the difference is a result of greater accuracy using the proposed software. The sample of dwellings for comparison will be provided by DoP.
- Limitations of the software must be clearly documented and made available to Accrediting Organisations, Accredited Assessors and DoP.

3.6 Current list of Approved Software

Approved Software at the date of this Protocol is listed in Table 1. This table will be updated when new versions or software packages are approved by DoP.

Note: Approved Software applies only to the version numbers shown.

Software that is Provisionally Approved may be used until further notice from DoP.

'First generation' software tools such as NatHERS, First Rate 4 and BERS 3.2 are no longer Approved Software under this Protocol.

Table 1: Approved Software as at date of this Protocol

	Application
Approved Software	
AccuRate Australian Edition v1.1.4.1	All dwellings
Provisionally Approved Software	
First Rate5 - version 5.0.215	Separate dwelling houses and attached dwelling houses only
BERS Pro - version current at 27/03/09	All dwellings

4 Conducting Simulations

4.1 Aim

The aim of this section of the Protocol is to establish procedures to be followed by Accredited Assessors when conducting Simulations of dwellings using Approved Software to demonstrate compliance with the Thermal Comfort Index of BASIX.

4.2 Accredited Assessors eligible to conduct Simulations

Accredited Assessors are only eligible to conduct Simulations if they are accredited to do so with an Accrediting Organisation under this Protocol.

Accredited Assessors must only conduct Simulations for those dwelling types or circumstances allowed by their accreditation.

4.3 Simulation procedures

When conducting Simulations, Accredited Assessors may only use Approved Software under this Protocol.

Accredited Assessors must follow the Accrediting Organisation's rules and guidelines in addition to the rules set out below.

Accredited Assessors must abide by the following procedures when conducting Simulations.

4.4 Software use

Software must be operated in accordance with:

- a. these Assessment Procedures (which prevail over other procedures);
- b. the user manual or help files provided with the software;
- c. any training material received while completing the required qualification; and
- d. other procedures issued by an Accrediting Organisation.

Software must only be used within any declared limitations. The Expert Referral system must be used where the dwelling is beyond the limitations of the software.

4.5 Spaces to be included in conditioned and unconditioned zones

The Approved Software definitions for conditioned and unconditioned zones may differ from the BASIX definitions for conditioned and unconditioned floor areas. When conducting Simulations:

- All spaces that fall under the **BASIX definition** of conditioned floor area must be included in a conditioned zone. Ensuites must be included in a conditioned zone whether or not they have a ventilation opening.
- All spaces that fall under the **BASIX definition** of unconditioned floor area must be included in an unconditioned zone.

Spaces that cannot be fully enclosed such as balconies, or rooms with mesh or open screens, are considered external space and should not be included in either a conditioned or unconditioned zone.

BASIX Definition - Conditioned floor area, in relation to a dwelling, means the total floor area of the dwelling, excluding:

- a) floor area that is not fully enclosed;
- b) bathrooms (but not ensuites) and laundries, with a ventilation opening; and
- c) voids, store rooms, garages and car parks.

BASIX Definition - Unconditioned floor area, in relation to a dwelling, means the total floor area of all bathrooms (not including ensuites) and laundries, with a ventilation opening.

These definitions have the following effects:

- Separate bathrooms and toilets and laundries with a ventilation opening (e.g. operable window) must be included in an unconditioned zone.
- Separate bathrooms and toilets and laundries **without** a ventilation opening (e.g. operable window) must be included in a conditioned zone as they will be required to have mechanical ventilation which will generally draw conditioned air in from an adjacent conditioned zone.

4.6 Modification of Approved Software outputs

Only where directed to do so through the Expert Referral System described in the Thermal Comfort Protocol are modifications to the loads calculated by the Approved Software permitted.

4.7 Climate zone

Assessors must use the correct postcode for the site. If the Approved Software lists more than two climate zones for a postcode, the Assessor must use the first climate zone. Alternative climate zones for a postcode can only be used with the permission of the DoP.

4.8 Multi-Unit Dwellings

Results for a given dwelling may be used for another similar dwelling where there is less than 5% variation in any of the following:

- Orientation (azimuth, not orientation sector)
- Areas of any external wall, glazing, floor or ceiling
- Areas of any wall, floor or ceiling adjacent to a neighbouring building or dwelling
- Areas of roof colour/solar absorptance
- Dimensions of adjacent buildings or structures

4.9 Ground reflectance

The default setting in the Approved Software for ground reflectance must be used regardless of the surfaces surrounding of the building.

4.10 Construction

4.10.1 General

Construction of the assessed building must be modelled as indicated on the drawings and specifications produced for the building control authority. Unusual construction systems must be clearly described with details.

4.10.2 Construction materials and systems

Assessors must only model construction systems (i.e. combinations of construction materials) that are embedded into Approved Software or have been issued by the software provider (or its support agency). When developing construction systems, software providers (or their support agencies) must give consideration to installation practices.

4.10.3 Sub-floor ventilation

Sub-floor spaces must be modelled as shown on the drawings. Enclosed sub-floor spaces include those with enclosing walls with the minimum ventilation openings required by the BCA.

4.10.4 Floor coverings

Floor coverings must be modelled as shown on the drawings and specifications. If no floor covering or finish is specified, wet areas and kitchens are to be modelled with tiles and all other habitable rooms modelled with carpet.

Where a floor covering is nominated on the drawings and specifications, the floor covering must be nominated on the Assessor Certificate. If no floor covering or finish is specified on the drawings and specifications, the Assessor Certificate must nominate 'not specified' for the relevant floor covering.

4.10.5 Curtains, pelmets and other internal window/glazed door treatments

Regardless of the internal window or glazed door treatments nominated on the drawings and specifications, all windows must be modelled as having low performance Holland blinds. Internal window treatments must not be listed on the Assessor Certificate.

Insect screens must be modelled if nominated on the drawings or specifications.

4.10.6 External shading

External shading devices must not be modelled unless they are of exterior grade construction materials.

4.11 Colours

4.11.1 Roof colours

The external roof colour or shade (e.g. light) must be modelled as nominated on the drawings and specifications. If a specific colour is to be modelled, its solar absorptance must be nominated, otherwise the solar absorptance in Table 2 must be modelled. If the external roof colour is not specified, 'medium' must be modelled and nominated on the Assessor Certificate.

The internal roof colour must be set to 'not specified' regardless of the colour nominated.

Table 2: Roof colour/shade and corresponding solar absorptance

Roof colour/shade	Solar absorptance
Light	< 0.475
Medium	0.475 to 0.70
Dark	> 0.70

4.11.2 Wall colours

The external wall colour or shade must be modelled as nominated on the drawings and specifications or set to 'not specified' if not specified.

The internal wall colour must be set to 'not specified' regardless of the colour nominated.

4.11.3 External window and door frames

The colour of external window and door frames must be set to 'not specified' regardless of the colour nominated.

4.12 Insulation

Insulation must be nominated as either:

- a. Specifically nominate bulk insulation as being used and the R-value of the insulation only nominated on the Assessor Certificate and on the drawings and specifications, or
- b. Specifically nominate foil insulation:
 - I. in walls and nominate either the total system R-value of the wall including the product, or a clear description that identifies product or type including emissivities of foil surfaces and air gaps.
 - II. in ceilings and the total system R-value in both directions of heat flow, or a clear description that identifies product or type including emissivities of foil surfaces and air gaps.
 - III. In roofs and the total system R-value in both directions of heat flow, or a clear description that identifies product or type including emissivities of foil surfaces and air gaps.

Note that insulation installation must comply with 3.12.1.1 of the Building Code of Australia. Assessors must ensure that the insulation type and thickness specified is appropriate for installation with the specified wall type.

4.13 Glazing

4.13.1 General

Windows, glazed doors, skylights and glazed roofs must be modelled according to the drawings and specifications. The drawings and specifications must have the detail required by Table 6.

4.13.2 Openable proportion of windows

The openable proportion of windows, doors and other openings entered into the Approved Software must not exceed the software recommended values unless the openable panes are clearly detailed on the drawings.

Any window not clearly identified as being openable with either a label or showing openable panes must be modelled with 0% openable area. Garage doors, windows in garages and windows and doors to storage rooms must be modelled with 0% openable area.

4.14 Zoning

4.14.1 General

All parts of the building capable of being fully enclosed, including storage spaces, must be included in a zone. This includes spaces with openings required for the safe operation of a gas appliance.

All spaces are to be included in separate zones, except for spaces which do not have an operable window/door or skylight (e.g. bathroom, storeroom). These spaces must be included in the zone from which they are accessed.

Spaces with different usage patterns must be modelled as separate zones even if there is no physical separation e.g. bedsits or open plan studio apartments.

Adjoining spaces separated by apertures that are not capable of being controlled, such as an open doorway or the like, must be modelled as different zones if the aperture is less than 3 m². For larger apertures, the adjoining spaces must be separately zoned if it means that the heat flows and ventilation flows will be modelled more accurately.

Open spaces, such as courtyards, verandahs, gazebos and the like, are not required to be included in a zone, except where it would improve the modelling of ventilation flows.

4.14.2 Spaces, zoning and heating/cooling

Table 3 sets out the requirements for zoning each part of a dwelling. It also details the circumstances in which they are to be nominated as ‘heated’ or ‘cooled’. Zone types are based on AccuRate and BERS software labels, however, for other software, an equivalent zone type should be selected.

Table 3: Space names, zoning and nomination of heated and cooled

Space Name	Zone Type - Accurate	Zone Type – BERS Pro	Zone Type- FirstRate5	Heated & Cooled*
Living, rumpus, family rooms etc.	Maximum of two living spaces (usually the two largest) described as Living zone, subsequent described as Other (daytime)	Living	Two largest living spaces described as Living zone, subsequent spaces described as Other (day cond)	Yes
Bedrooms	Bedroom	Sleeping	Bedroom	Yes
Kitchens	Living/kitchen. Either a separate kitchen or a combined living/kitchen zone with assumed kitchen loads. (There must be only one of these zones)	Living/kitchen. Either a separate kitchen or a combined living/kitchen zone with assumed kitchen loads. (There must be only one of these zones)	Kitchen. Either a separate kitchen or a combined living/kitchen zone with assumed kitchen loads. (There must be only one of these zones)	Yes
Hallways accessed from living spaces	Other (daytime usage)	Corridor	Other (day cond)	Yes if they cannot be completely closed off from heated and cooled zones. Either Yes or No if closed off.
Hallways accessed only from bedroom spaces	Other (night-time usage)	Corridor	Other (night-cond)	Yes if they cannot be completely closed off from heated and cooled zones. Either Yes or No if closed off.
Bathrooms, laundries, WC with natural ventilation opening	Other (daytime usage)	Wet Area	Other (day cond)	No if no heating or cooling. Yes if heated or cooled.
Bathrooms, laundries, WC without natural ventilation opening	Other (daytime usage)	Wet Area	Other (day cond)	Yes
Store rooms, large pantries, ensuites etc with natural ventilation opening	Other (daytime usage) or Other (night-time usage) dependent on zoning of space from which accessed	Depending on zone adjacency: Living, Living/Kitchen, Sleeping, Corridor, Wet Area	Other (day cond) or Other (night cond) dependent on zoning of space from which accessed	No
Store rooms, large pantries, ensuites etc without natural ventilation opening	Other (daytime usage) or Other (night-time usage) dependent on zoning of space from which accessed	Include in zone from which accessed	Other (day cond) or Other (night cond) dependent on zoning of space from which accessed	Dependent on heating
Walk-in wardrobes access from bedrooms	Other (night-time usage)	Sleeping	Other (night-cond)	No if isolated from Bedroom Yes if not isolated from bedroom
Spaces containing a pool	Other (daytime usage)	Living	Other (day cond)	Yes or No depending on the system to be installed.
Garage	Garage	Garage	Garage	No
Sub-floor	Sub-floor zone	Defined by software	Defined by software	No
Roof space (other than skillion, raked or flat roofs)	Roof space zone	Defined by software	Defined by software	Defined by software

*If ‘Yes’ note that both heating and cooling boxes **must** be checked.

4.15 Adjacent buildings

Walls shared with adjoining conditioned buildings shall be described as internal walls adjacent to 'neighbours'.

Walls, floors and ceiling/roof shared with adjoining non-conditioned buildings (e.g. enclosed car parks, plant rooms) shall be described as external walls, floors and ceiling/roof with zero solar absorptance and an additional R0.5 insulation.

Where adjacent structures are existing or have development approval as indicated on the drawings, they must be modelled.

4.16 Trees and vegetation

Only existing trees and vegetation protected by a planning instrument may be considered in a Simulation. Such trees (including canopy) and vegetation must be indicated on the drawings to scale or dimensioned. Vines or other vegetation intended to be grown over time cannot be modelled.

4.17 Building sealing

Assessors must model the dwelling in accordance with the NSW BCA Deemed-to-Satisfy Provisions for building sealing.

4.18 Heating and cooling appliances

Mechanical heating and cooling appliances or systems (e.g. ceiling fans, air-conditioning systems and the like) cannot be considered in an Assessment. Systems that form part of the building fabric and provide some heating and cooling benefit (e.g. trombe walls and the like) may be considered through the Expert Referral System.

4.19 Building Code of Australia Energy Efficiency requirements

Accredited Assessors should note that BASIX Thermal Comfort (Simulation) does not replace all of the Building Code of Australia Part 3.12, Energy Efficiency.

Accredited Assessors must ensure that the Simulated dwelling design allows for insulation to be installed in compliance with the Building Code of Australia Part 3.12.1.1.

Accredited Assessors must ensure that the Simulated dwelling design meets the Building Code of Australia Part 3.12.5 for the design, location and insulation of services.

5 Limitations of Approved Software

5.1 General

Assessors must conduct Assessments within any published limitations of the Approved Software used.

5.2 Circumstances outside software limitations

For dwellings, design strategies, construction systems or materials that are beyond the capabilities of the Approved Software, Assessors must refer to the Accrediting Organisation for advice. The Accrediting Organisation may initiate an expert referral process for the assessment (see 2.10 of the Protocol).

6 Documentation required for Assessments

6.1 Assessor Certificate

The Assessor Certificate must indicate the thermal loads derived from the Simulation as described previously.

Accredited assessors must not issue an Assessor Certificate unless:

- The assessor certificate and the plans accompanying the DA or application for a CDC have been endorsed by the Accredited Assessor. **The specification block must be fixed permanently to the front of one page of the plans, and over stamped with the Accredited Assessor’s stamp;**
- The information on the Assessor Certificate is consistent with information entered in the Approved Software for the purposes of conducting the Simulation, and the details of the DA or application for a CDC.

Only one Assessor Certificate per DA or CDC is to be issued. The information in Table 3 relating to each dwelling must be clearly identified.

6.2 Information required on drawings and specifications

Completed Assessments must be accompanied with drawings and specifications, which define all features of the building that the Assessment was based on, unless stated otherwise in this appendix.

The information in Table 6 must be included on drawings and/or specifications, unless stated otherwise. Terms used in Table 6 have the meaning given to them in the BASIX Definitions, available on the BASIX website at www.basix.nsw.gov.au.

Table 4: Information required on drawings and specifications and Assessor Certificates

Element	Detail required on drawings and/or specifications	Detail required on Assessor Certificate
General drawing quality	a. Must be to scale. b. Must clearly show intended construction with labels or industry standard drawing conventions.	n/a
Specification quality	Must clearly identify relevant material types and any relevant standards.	n/a
Project details	Yes	Yes
Orientation	a. True north. b. Relationship of building to true north.	Yes
Site exposure	Wind exposure conditions.	Yes
Topography	Site contours and/or relative levels of site and floors.	n/a
Overshadowing	Location and height of forms which may be either part of the assessed building or adjoining the assessed building. These may include: a. existing buildings;	Yes

Element	Detail required on drawings and/or specifications	Detail required on Assessor Certificate
	<ul style="list-style-type: none"> b. approved buildings; c. fences and screens; d. landforms; e. protected trees. 	
Zones / Room identification	<ul style="list-style-type: none"> a. Names of rooms or spaces shown on drawings to identify use, e.g. living, kitchen, bath, etc. b. Connecting doors, openings, stair voids, etc. 	n/a
Typical construction	May be indicated with industry standard	Types to be listed as described below.
Unusual construction	Must be specifically detailed.	Types to be listed as described below.
External walls	<ul style="list-style-type: none"> a. Drawing to scale. b. Material. c. Insulation type, R-value and location. d. Colour and/or solar absorptance where a specific colour is modelled. 	<ul style="list-style-type: none"> a. Construction types used. b. For bulk insulation, specify the R-value. c. For reflective insulation, specify total system R-value, emissivity or clear description that identifies product or type.
Internal walls	<ul style="list-style-type: none"> a. Drawing to scale. b. Material. c. Insulation type, R-value and location. 	<ul style="list-style-type: none"> a. Construction types used. b. For bulk insulation, specify the R-value. <p>For reflective insulation, specify total system R-value, emissivity or clear description that identifies product or type.</p>
Windows (and other glazed elements)	<ul style="list-style-type: none"> a. Location and orientation. b. Drawing to scale. c. Insect screens if modelled. d. Shading. e. Glass type (including films). f. Frame material and type. g. Type (e.g. sliding, double hung) or openable panes clearly drawn to determine openable proportions. h. Where glass is single clear – description of glass and frame. i. Where glass is not single clear - NFRC Solar Heat Gain Coefficient (SHGC) and U-value of complete glazing unit (glass and frame combined). These may be based on generic values. 	<ul style="list-style-type: none"> a. Where glass is single clear – description of glass and frame. b. Where glass is not single clear - NFRC Solar Heat Gain Coefficient (SHGC) and U-value of complete glazing unit (glass and frame combined). These may be based on generic values. c. Total area of windows and glazed doors.
Window internal covering	n/a	n/a

Element	Detail required on drawings and/or specifications	Detail required on Assessor Certificate
Fixed or adjustable external shading (eaves, pergolas, verandahs, awnings, skylight shading devices)	<ul style="list-style-type: none"> a. Location, type and dimensions shown on drawings. b. Sufficient detail to enable sun blocking factor of all external shading structures to be assessed. c. A detail for pergolas including structure and any battens if they are to be considered as a shading device. d. Whether the device is fixed or adjustable. e. Material properties such as shading coefficient for polycarbonate sheeting or shading factor for sail cloth. 	List all shading types used with description and projection if horizontal such as eaves.
Skylights, glazed roofs and polycarbonate roofs above an enclosed space.	<ul style="list-style-type: none"> a. Location, type and dimensions shown on drawings. b. Where constructed of moulded plastic – description of the construction. c. Where glass is single clear – description of glass and frame. d. Where glass is not single clear - NFRC Solar Heat Gain Coefficient (SHGC) and U-value of complete glazing unit (glass and frame combined). These may be based on generic values. e. Shaft type, insulation and length. f. Sufficient information or detail to determine openable proportions. 	<ul style="list-style-type: none"> a. Where glass is single clear – description of glass and frame. b. Where glass is not single clear - NFRC Solar Heat Gain Coefficient (SHGC) and U-value of complete glazing unit (glass and frame combined). These may be based on generic values. c. Total area of skylights and glazed roofs. Total area of polycarbonate roof.
Roof	<ul style="list-style-type: none"> a. Pitch. b. Ventilation openings (passive and mechanical) c. Material. d. Insulation type, location and thermal properties e. Specific external colour or shade (light, medium or dark) and solar absorptance. 	<ul style="list-style-type: none"> a. Colour or shade and solar absorptance. b. Construction types used. c. For bulk insulation, specify the R-value. <p>For reflective insulation, specify total system R-value in both directions of heat flow, OR a clear description that identifies product or type including emissivities of foil surfaces and air gaps.</p>
Ceilings	<ul style="list-style-type: none"> a. Material. <p>Insulation type, location and thermal properties.</p>	<ul style="list-style-type: none"> a. Construction types used. b. For bulk insulation, specify the R-value. c. For reflective insulation, specify total system R-value in both directions of heat flow, OR a clear description that identifies product or type including emissivities of foil surfaces and air gaps.

Element	Detail required on drawings and/or specifications	Detail required on Assessor Certificate
Floors	<ul style="list-style-type: none"> a. Material. b. Covering (optional). c. Insulation type, location and thermal properties d. Sub-floor ventilation openings. 	<ul style="list-style-type: none"> a. Construction types used. b. For bulk insulation, specify the R-value. <p>For reflective insulation, specify total system R-value in both directions of heat flow, OR a clear description that identifies product or type including emissivities of foil surfaces and air gaps.</p>
Cross and stack ventilation	Dimensions and location of internal and ventilation openings that create air movement paths.	n/a

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Appendix: 2nd Generation Software Maximum Loads

Table A contains the maximum loads for single dwellings. These maximum loads are also used as the maximum average loads allowed in the BASIX multiunit tool. Table B contains the maximum individual loads for each dwelling in a multi dwelling development.

Note: There is no floor type delineation for units. The mud brick values may be used for any dwelling with primarily (at least 50%) mud brick or rammed earth walls, regardless of the floor type.

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Table A: Maximum loads for single dwellings and average all dwellings in multi dwelling developments.

zone	Region	heating			
		Slab on ground	Suspended Floor, enclosed subfloor	Suspended Floor, open subfloor / mudbrick walls	Unit
8	Moree	68	75	80	68
9	Amberley	39.6	43.4	48.7	39.6
10	Byron	33.2	36.8	39.2	33.2
11	Coffs Harbour	37	41	47.5	37
14	Armidale	180	192	212.4	180
15	Newcastle	76	81	90	76
17	Sydney CBD	40	43	46	40
18	Nowra	105	112	118	105
19	Charleville	39.6	43.4	48.7	39.6
20	Wagga	150	165	177	150
24	Canberra	240	255	265	240
25	Cabramurra	580	638	684	580
27	Mildura	95	105	112	95
28	West Sydney	74	82	80	74
46	Cobar	60	66	71	60
48	Dubbo	100	110	118	100
50	Oakey	60	66	71	60
56	East Sydney	51	58	63	51
65	Orange	290	319	342	290
66	Ballarat	240	255	265	240
69	Thredbo	499	549	589	499

cooling			
Slab on ground	Suspended Floor, enclosed subfloor	Suspended Floor, open subfloor / mudbrick walls	Unit
87	96	103	87
73.5	80.6	90.4	73.5
49.8	55.2	58.8	49.8
37	41	47.5	37
25	28	30	25
37	40	43	37
32	35	38	32
30	33	37	30
73.5	80.6	90.4	73.5
50	55	59	50
30	35	39	30
No Max.	No Max	No Max	No Max
68	75	81	68
70	77	83	70
76	84	90	76
50	55	59	50
76	84	90	76
45	49	53	45
16	17.6	19	16
30	35	39	30
No Max	No Max	No Max	No Max

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Table B: Maximum loads for individual dwellings in multi dwelling developments.

zone	Region	heating			
		Slab on ground	Suspended Floor, enclosed subfloor	Suspended Floor, open subfloor / mudbrick walls	Unit
8	Moree	90.7	100	106.7	88
9	Amberley	47.8	52.3	58.7	51.5
10	Byron	37.9	42.1	44.8	43.6
11	Coffs Harbour	50.7	56.2	65.1	48
14	Armidale	213.6	227.8	252.1	234
15	Newcastle	104.1	110.9	123.3	99
17	Sydney CBD	56.6	60.8	65	50
18	Nowra	142.1	151.5	159.7	137
19	Charleville	47.8	52.3	58.7	51.5
20	Wagga	180	198	212.4	195
24	Canberra	284.8	302.6	314.5	312
25	Cabramurra	842.6	926.9	993.7	754
27	Mildura	116.8	129.1	137.7	124
28	West Sydney	92.5	102.5	100	88
46	Cobar	72	79.2	85.2	78
48	Dubbo	120	132	141.6	130
50	Oakey	72	79.2	85.2	78
56	East Sydney	72.1	82	89.1	66
65	Orange	348	382.8	410.4	377
66	Ballarat	284.8	302.6	314.5	312
69	Thredbo	724.9	797.6	855.7	649

cooling			
Slab on ground	Suspended Floor, enclosed subfloor	Suspended Floor, open subfloor / mudbrick walls	Unit
119.8	132.1	141.8	113
94.8	103.9	116.6	95.6
70.6	78.3	83.4	65.4
48.7	54	62.5	48
28.6	32.1	34.4	33
47.4	51.2	55	47
45.2	49.5	53.7	41
38.3	42.2	47.3	39
94.8	103.9	116.6	95.6
59.5	65.4	70.2	65
34.4	40.1	44.7	39
No Max	No Max	No Max	No Max
81.9	90.4	97.6	88
87.5	96.3	103.8	91
90.4	99.9	107	101
59.5	65.4	70.2	65
90.4	99.9	107	101
63.6	69.3	74.9	59
19.0	20.9	22.6	21
34.4	40.1	44.7	39
No Max	No Max	No Max	No Max