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BASIX GUIDE :

Certifying Thermal Comfort

NSW GOVERNMENT Planning & Infrastructure

Version 1.0 \\ 10 May 2013

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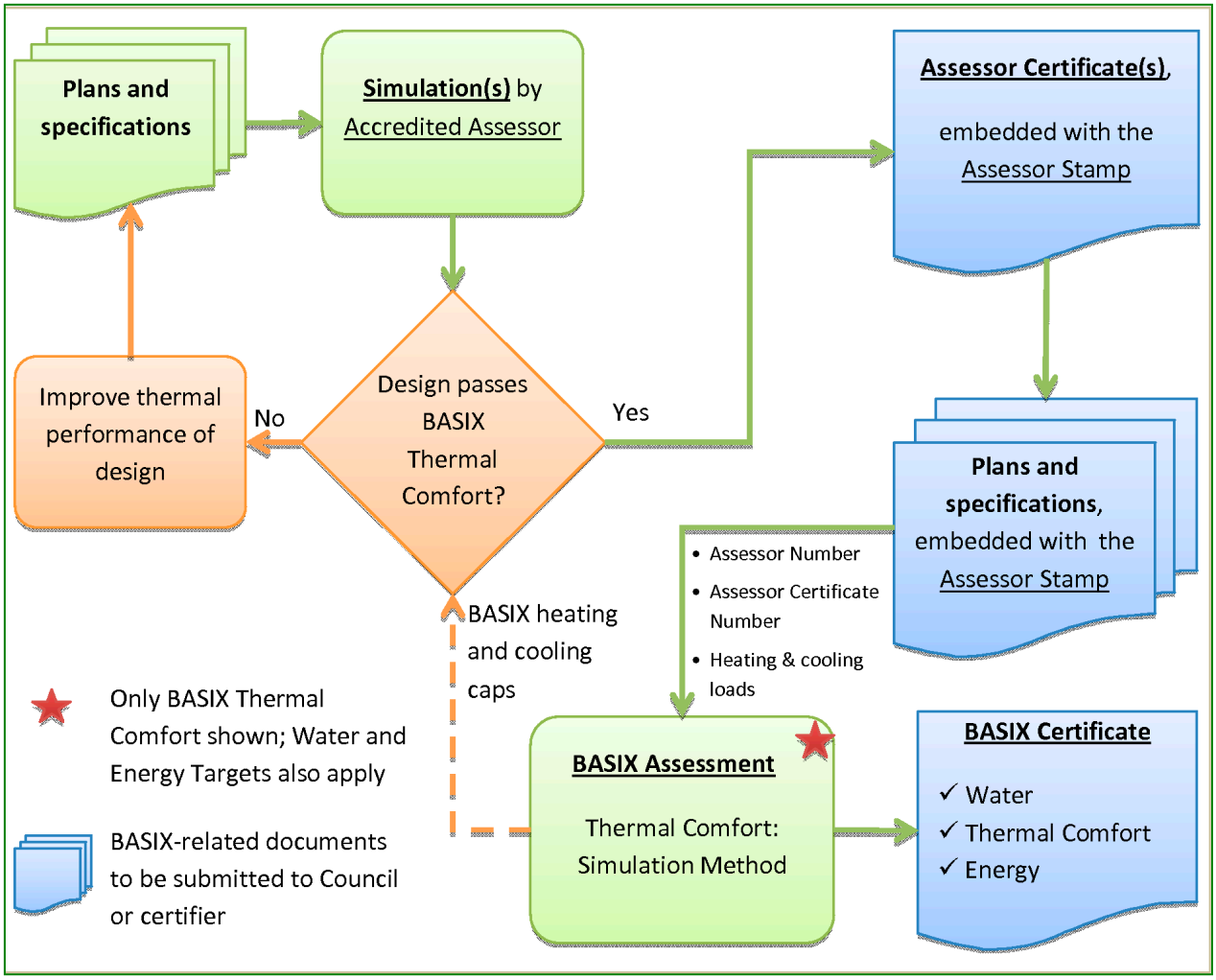
Introduction

This Guide describes how councils and certifiers can check that the information submitted in the Thermal Comfort section of BASIX using the Simulation Method is valid. Accredited Assessors may also find it useful to understand what documents must be prepared when using Simulation.

The diagram below shows the process of completing the Thermal Comfort section of BASIX using the Simulation Method, beginning with the original plans. Simulation means the modelling of a new dwelling using Approved Software for the purposes of demonstrating compliance with the BASIX Thermal Comfort Index.



There are four elements that must be checked by the consent authority at approval stage, and by the certifying authority during construction, to ensure the validity of the assessment:

1. the development details;
2. the Accredited Assessor details;
3. the Assessor Certificate details; and
4. the heating and cooling loads.

This document describes how and why to check these elements. If these elements are inconsistent or invalid, then the application should be returned to the proponent to resolve.

1. Checking the Development Details

BASIX Certificate: means a certificate issued by the Director-General of the Department of Planning & Infrastructure in relation to the sustainability of a proposed development. See clause 164A of the Environmental Planning and Assessment Regulation 2000.

Sample BASIX Certificates are shown in Section 4: Checking the Heating and Cooling Loads.

Check that the address or lot details shown on the plans, the Assessor Certificate and the BASIX Certificate all match the details in the development application, or the application for a complying development certificate, construction certificate or occupation certificate.

2. Checking the Accredited Assessor Details

Accredited Assessor: means a person accredited by an Accrediting Organisation to conduct Simulations for the Thermal Comfort Index of BASIX.

Accrediting Organisation: means an organisation approved by the Department of Planning & Infrastructure to accredit assessors for the purposes of conducting Simulations.

Currently, the Association of Building Sustainability Assessors (ABSA) and the Building Designers Association of Victoria (BDAV) are Accrediting Organisations.

Assessor Number: means the unique number assigned to that Accredited Assessor by the relevant Accrediting Organisation (ABSA or BDAV).

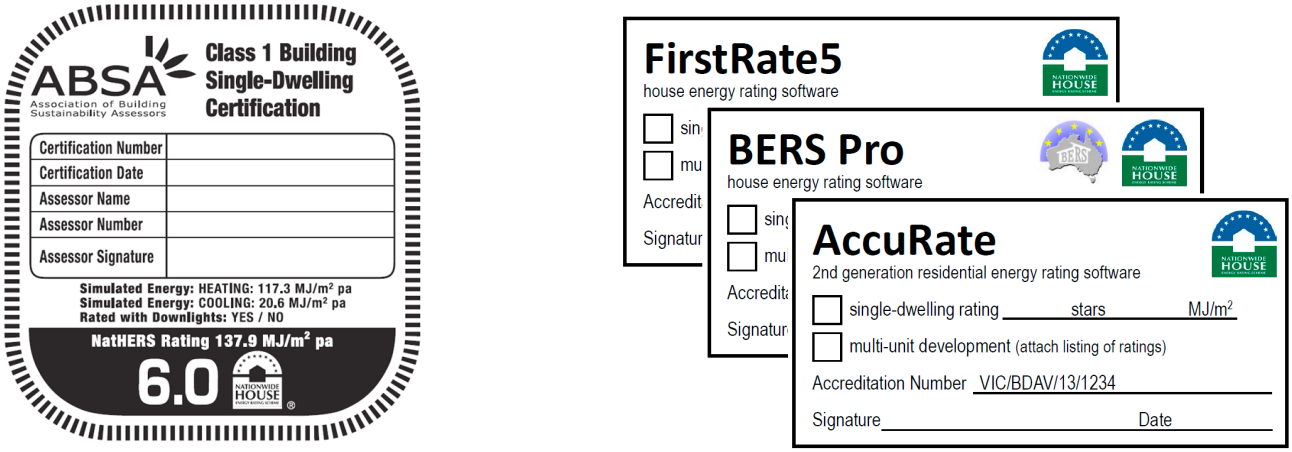
Assessor Stamp: means the unique stamp, issued by the Accrediting Organisation, that is used by the Accredited Assessor to endorse the Simulation inputs and outputs for the building project.

It is a requirement that the Simulation for BASIX Thermal Comfort is conducted by an Accredited Assessor. Every Accredited Assessor is issued with an Assessor Number, assist with their identification. As an Accredited Assessor, they must:

- have completed relevant training and examination, and stay up-to-date with Continuing Professional Development;
- conduct Simulation using Approved Software in a manner consistent with accepted standard procedures; and
- act in a professional manner consistent with the requirements of their accrediting organisation, including quality assurance and holding relevant insurance.

The Accredited Assessor will attach an Assessor Stamp to certain documents at the completion of the Simulation process. The stamp will either be digitally embedded or permanently affixed to every page of:

- information relied on to conduct the Simulation, including site plans, floor plans, elevations, sections, details, schedules and specifications; and
- the Assessor Certificate, as described in Section 3: Checking the Assessor Certificate Details.



Samples of Assessor Stamps for ABSA assessors (left) and BDAV assessors (right). The Assessor Certificate Number or downlight indicator may be written immediately adjacent to the Assessor Stamp, but only if there is no space for these details on the stamp.

The Assessor Stamp is referred to as the "Digital Stamp" in the ABSA Rating Certification System User Guide. The Assessor Stamp includes, at a minimum:

- the Assessor Number (also referred to as the "Accreditation Number");
- the Assessor Certificate Number (also referred to as the "Certification Number")
- the date of endorsement;
- the signature of the Accredited Assessor;
- indication of whether the dwelling was rated with or without downlights; and
- the heating and cooling loads for the dwelling or multi-dwelling project, as described in the Checking the Heating and Cooling Loads section.

Check that all of the Assessor Stamps are complete, signed and consistent. Check that the Assessor Number shown on the BASIX Certificate matches the details on the Assessor Certificate and the Assessor Stamps. Also check that if downlights are present then this is also indicated in the Assessor Stamp.

Sample BASIX certificates are shown in Section 4: checking the heating and cooling loads.

3. Checking the assessor certificate details

Assessor Certificate: means the set of documents consisting of, for each dwelling in that building project, the NatHERS Certificate (1 page) and the Building Thermal Performance feature report (3 5 pages) generated by the Approved Software, with every page showing the Assessor Stamp.

The NatHERS Certificate (1 page) may also referred to as the "Summary Report" or "Rating Tool Report".

The Building Thermal Performance feature report refers to the "Construction Details" sections (typically 3 5 pages) in the AccuRate "Building Data Report", the "Summary" section (typically 1 page) in the BERSPro "Building Element Details Report", or the "Feature Report" (typically 2 pages) in FirstRate5.

Assessor Certificate Number: means the number issued by the Accrediting Organisation for the Simulations conducted by an Accredited Assessor on the building's thermal performance.

The Assessor Certificate Number may also be referred to as the "Certification Number".

The Assessor Certificate shows:

- the location of the project;
- the version of Approved Software used;
- the Accredited Assessor who generated the certificate;
- the conditioned floor area and unconditioned floor area of the dwelling; and
- the adjusted heating and cooling loads (total load may also be included).

Each page of the Assessor Certificate must be stamped with the Assessor Stamp.

Check that all of the Assessor Stamps are complete, signed and consistent. Check that the Assessor Certificate Number shown on the BASIX Certificate matches the details on the Assessor Stamps.

Sample BASIX Certificates are shown in Section 4: Checking the Heating and Cooling Loads.

It is possible to further verify the validity of an Assessor Certificate by contacting the Accrediting Organisation of the Assessor who carried out the assessment.

For ABSA assessors: www.absa.net.au
For BDAV assessors: www.bdav.org.au

Below is a sample NatHERS Certificate generated from AccuRate. Note that it is not valid for BASIX without the Assessor stamp.

AccuRate V2.0.2.13 SP1

Nationwide House Energy Rating Scheme

Project Details	
Project Name: Sample	
File Name: D:\Temp\Test drive.PRO	
Postcode: 2000	**Climate Zone:** 17
Design Option: Zone 8,9,56	
Description: As drawn	

Client Details		
Client Name:		
Phone:	**Fax:**	**Email:**
Postal Address:		
Site Address: Test drive, Sydney		
Exposure: Suburban		
Council submitted to (if known by assessor):		

Assessor Details			
Assessor Name: BASIX			**Assessor No.**
Phone:	**Fax:**	**Email:** basix@planning.nsw.gov.au	
Assessment Date: 24/04/2013			**Time:** 10:29
Project Code:			
Assessor Signature:			

CALCULATED ENERGY REQUIREMENTS*				
Heating	**Cooling (sensible)**	**Cooling (latent)**	**Total Energy**	**Units**
24.9	14.7	6.8	46.4	MJ/m².annum

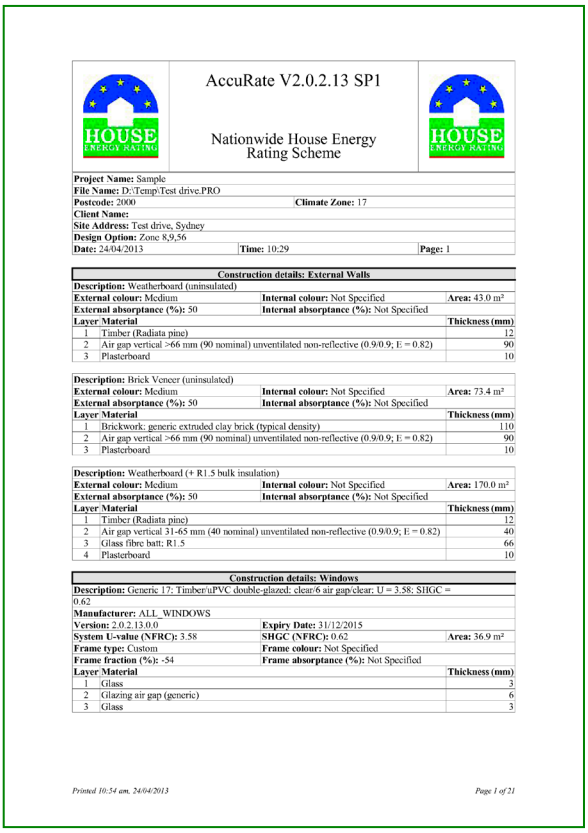
* These energy requirements have been calculated using a standard set of occupant behaviours and so do not necessarily represent the usage pattern or lifestyle of the intended occupants. They should be used solely for the purposes of rating the building. They should not be used to infer actual energy consumption or running costs. The settings used for the simulation are shown in the building data report.

AREA-ADJUSTED ENERGY REQUIREMENTS				
Heating	**Cooling (sensible)**	**Cooling (latent)**	**Total Energy**	**Units**
26.1	15.4	7.1	48.6	MJ/m².annum
Conditioned floor area		223.6 m²		

Star Rating

★★★★★ **5.1 STARS**

Area-adjusted star band score thresholds									
1 Star	**2 Stars**	**3 Stars**	**4 Stars**	**5 Stars**	**6 Stars**	**7 Stars**	**8 Stars**	**9 Stars**	**10 Stars**
230	148	98	68	50	39	30	22	13	6



AccuRate V2.0.2.13 SP1

Nationwide House Energy Rating Scheme

Project Name: Sample
File Name: D:\Temp\Test drive.PRO
Postcode: 2000 **Climate Zone:** 17
Client Name:
Site Address: Test drive, Sydney
Design Option: Zone 8,9,56
Date: 24/04/2013 **Time:** 10:29 **Page:** 1

Construction details: External Walls

Description: Weatherboard (uninsulated)
External colour: Medium **Internal colour:** Not Specified **Area:** 43.0 m²
External absorptance (%): 50 **Internal absorptance (%):** Not Specified

Layer	Material	Thickness (mm)
1	Timber (Radiata pine)	12
2	Air gap vertical >66 mm (90 nominal) unventilated non-reflective (0.9/0.9; E = 0.82)	90
3	Plasterboard	10

Description: Brick Veneer (uninsulated)
External colour: Medium **Internal colour:** Not Specified **Area:** 73.4 m²
External absorptance (%): 50 **Internal absorptance (%):** Not Specified

Layer	Material	Thickness (mm)
1	Brickwork: generic extruded clay brick (typical density)	110
2	Air gap vertical >66 mm (90 nominal) unventilated non-reflective (0.9/0.9; E = 0.82)	90
3	Plasterboard	10

Description: Weatherboard (+ R1.5 bulk insulation)
External colour: Medium **Internal colour:** Not Specified **Area:** 170.0 m²
External absorptance (%): 50 **Internal absorptance (%):** Not Specified

Layer	Material	Thickness (mm)
1	Timber (Radiata pine)	12
2	Air gap vertical 31-65 mm (40 nominal) unventilated non-reflective (0.9/0.9; E = 0.82)	40
3	Glass fibre batt; R1.5	66
4	Plasterboard	10

Construction details: Windows

Description: Generic 17: Timber\uPVC double-glazed: clear/6 air gap/clear: U = 3.58; SHGC = 0.62
Manufacturer: ALL_WINDOWS
Version: 2.0.2.13.0.0 **Expiry Date:** 31/12/2015
System U-value (NFRC): 3.58 **SHGC (NFRC):** 0.62 **Area:** 36.9 m²
Frame type: Custom **Frame colour:** Not Specified
Frame fraction (%): 45 **Frame absorptance (%):** Not Specified

Layer	Material	Thickness (mm)
1	Glass	3
2	Glazing air gap (generic)	6
3	Glass	3

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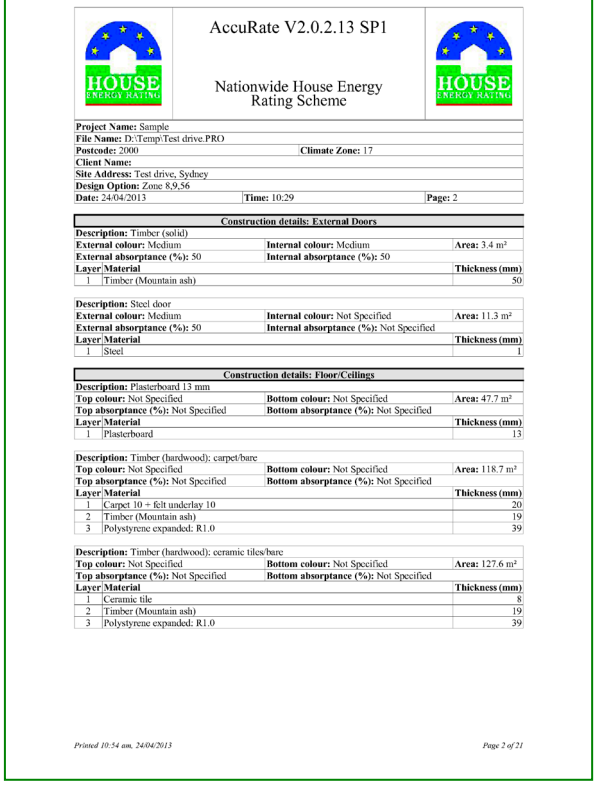

AccuRate V2.0.2.13 SP1

Nationwide House Energy Rating Scheme

Project Name: Sample
File Name: D:\Temp\Test drive.PRO
Postcode: 2000 **Climate Zone:** 17
Client Name:
Site Address: Test drive, Sydney
Design Option: Zone 8,9,56
Date: 24/04/2013 **Time:** 10:29 **Page:** 2

Construction details: External Doors

Description: Timber (solid)
External colour: Medium **Internal colour:** Medium **Area:** 3.4 m²
External absorptance (%): 50 **Internal absorptance (%):** 50

Layer	Material	Thickness (mm)
1	Timber (Mountain ash)	50

Description: Steel door
External colour: Medium **Internal colour:** Not Specified **Area:** 11.3 m²
External absorptance (%): 50 **Internal absorptance (%):** Not Specified

Layer	Material	Thickness (mm)
1	Steel	1

Construction details: Floor/Ceilings

Description: Plasterboard 13 mm
Top colour: Not Specified **Bottom colour:** Not Specified **Area:** 47.7 m²
Top absorptance (%): Not Specified **Bottom absorptance (%):** Not Specified

Layer	Material	Thickness (mm)
1	Plasterboard	13

Description: Timber (hardwood): carpet/bare
Top colour: Not Specified **Bottom colour:** Not Specified **Area:** 118.7 m²
Top absorptance (%): Not Specified **Bottom absorptance (%):** Not Specified

Layer	Material	Thickness (mm)
1	Carpet 10 + felt underlay 10	20
2	Timber (Mountain ash)	19
3	Polystyrene expanded: R1.0	39

Description: Timber (hardwood): ceramic tiles/bare
Top colour: Not Specified **Bottom colour:** Not Specified **Area:** 127.6 m²
Top absorptance (%): Not Specified **Bottom absorptance (%):** Not Specified

Layer	Material	Thickness (mm)
1	Ceramic tile	8
2	Timber (Mountain ash)	19
3	Polystyrene expanded: R1.0	39

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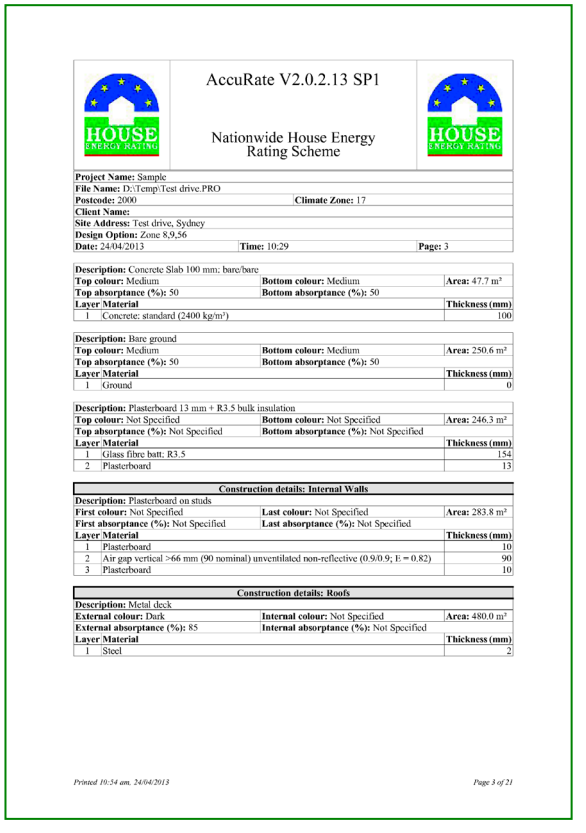

AccuRate V2.0.2.13 SP1

Nationwide House Energy Rating Scheme

Project Name: Sample
File Name: D:\Temp\Test drive.PRO
Postcode: 2000 **Climate Zone:** 17
Client Name:
Site Address: Test drive, Sydney
Design Option: Zone 8,9,56
Date: 24/04/2013 **Time:** 10:29 **Page:** 3

Description: Concrete Slab 100 mm; bare/bare
Top colour: Medium **Bottom colour:** Medium **Area:** 47.7 m²
Top absorptance (%): 50 **Bottom absorptance (%):** 50

Layer	Material	Thickness (mm)
1	Concrete: standard (2400 kg/m³)	100

Description: Bare ground
Top colour: Medium **Bottom colour:** Medium **Area:** 250.6 m²
Top absorptance (%): 50 **Bottom absorptance (%):** 50

Layer	Material	Thickness (mm)
1	Ground	0

Description: Plasterboard 13 mm + R3.5 bulk insulation
Top colour: Not Specified **Bottom colour:** Not Specified **Area:** 246.3 m²
Top absorptance (%): Not Specified **Bottom absorptance (%):** Not Specified

Layer	Material	Thickness (mm)
1	Glass fibre batt; R3.5	154
2	Plasterboard	13

Construction details: Internal Walls

Description: Plasterboard on studs
First colour: Not Specified **Last colour:** Not Specified **Area:** 283.8 m²
First absorptance (%): Not Specified **Last absorptance (%):** Not Specified

Layer	Material	Thickness (mm)
1	Plasterboard	10
2	Air gap vertical >66 mm (90 nominal) unventilated non-reflective (0.9/0.9; E = 0.82)	90
3	Plasterboard	10

Construction details: Roofs

Description: Metal deck
External colour: Dark **Internal colour:** Not Specified **Area:** 480.0 m²
External absorptance (%): 85 **Internal absorptance (%):** Not Specified

Layer	Material	Thickness (mm)
1	Steel	2

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Above and left is a sample Building Thermal Performance feature report (3 pages) generated from AccuRate. Note that it is not valid for BASIX without the Assessor Stamp on every page.

4. Checking the heating and cooling loads

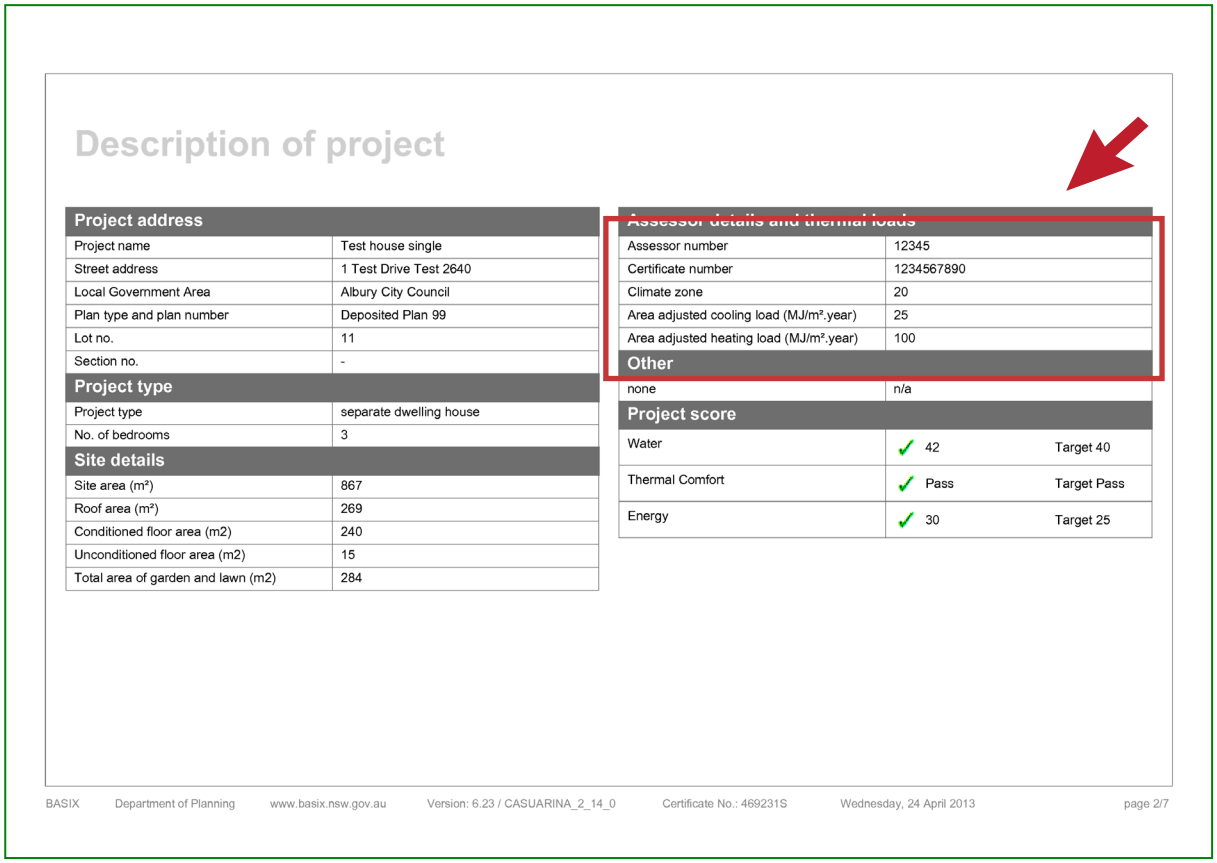
Simulation is used by the Accredited Assessor to calculate the heating and cooling loads for each dwelling in the project.

For Single dwellings

CHECK

For single dwelling projects, check that the heating and cooling loads shown in the BASIX Certificate are the same as on the Assessor Stamps and the Assessor Certificate.

The following BASIX Certificate extract shows the position on page 2 of the Assessor Number, the Assessor Certificate Number, and the heating and cooling loads for a single dwelling project.



Description of project

Project address	
Project name	Test house single
Street address	1 Test Drive Test 2640
Local Government Area	Albury City Council
Plan type and plan number	Deposited Plan 99
Lot no.	11
Section no.	-
Project type	
Project type	separate dwelling house
No. of bedrooms	3
Site details	
Site area (m²)	867
Roof area (m²)	269
Conditioned floor area (m2)	240
Unconditioned floor area (m2)	15
Total area of garden and lawn (m2)	284

Assessor details and thermal loads	
Assessor number	12345
Certificate number	1234567890
Climate zone	20
Area adjusted cooling load (MJ/m².year)	25
Area adjusted heating load (MJ/m².year)	100
Other	
none	n/a

Project score		
Water	✓ 42	Target 40
Thermal Comfort	✓ Pass	Target Pass
Energy	✓ 30	Target 25

BASIX Department of Planning www.basix.nsw.gov.au Version: 6.23 / CASUARINA_2_14_0 Certificate No.: 469231S Wednesday, 24 April 2013 page 2/7

For Multi dwellings

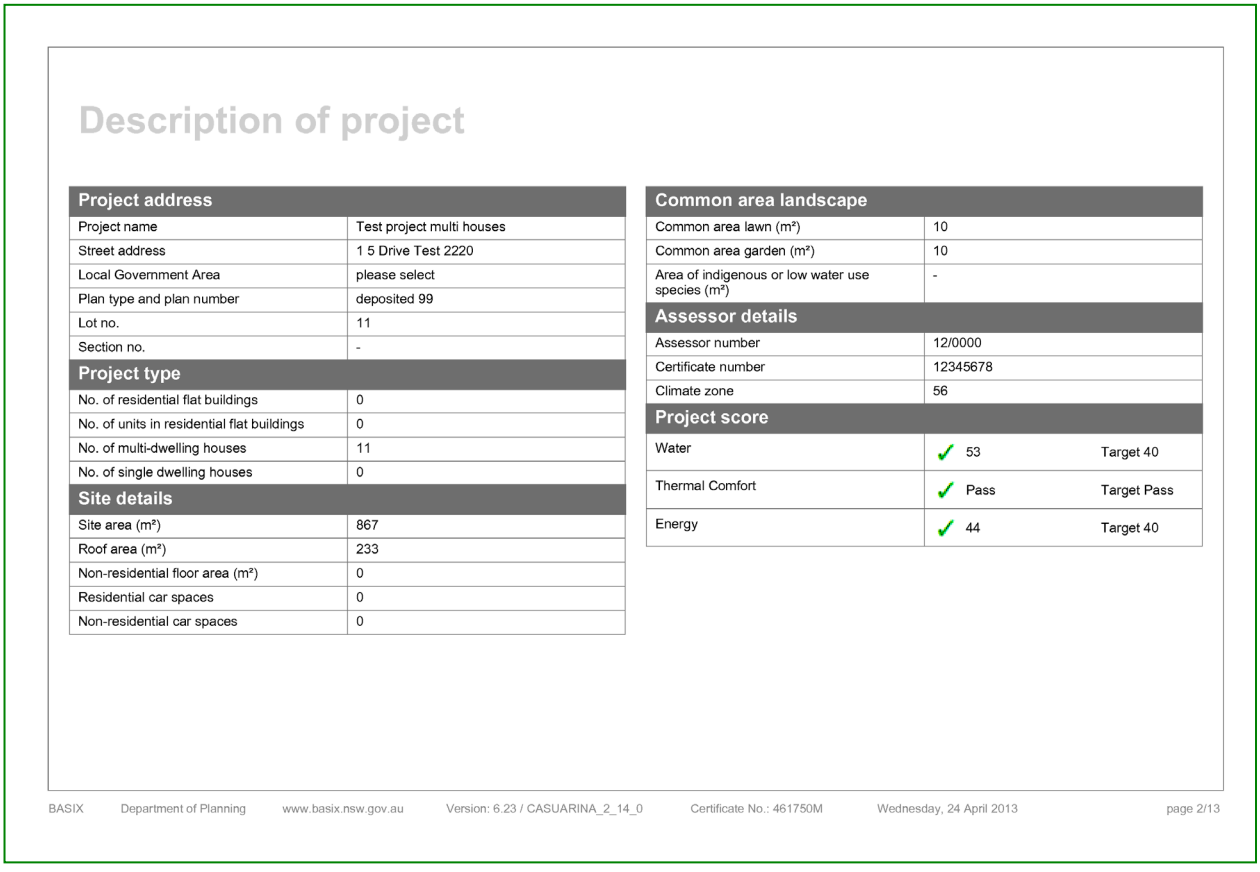
Although not required, an Accredited Assessor may provide a schedule that summarises the individual heating and cooling loads for each dwelling in a multi-dwelling project.

CHECK

For multi dwelling projects, check that the heating and cooling loads shown for each individual dwelling in the Thermal Comfort section of the BASIX Certificate are the same as in the relevant NatHERS Certificate or as listed in the load summary schedule.

The BASIX Thermal Comfort Protocol allows Assessors to use the results of one Simulation for multiple similar unit dwellings in a multi-dwelling unit building where the variation in certain attributes is not more than 2.5%; see the BASIX thermal comfort protocol for further details.

The following BASIX Certificate extracts show the position on page 2 of the Assessor Number and the Assessor Certificate Number, and the position on a later page of the heating and cooling loads for each dwelling in a multi-dwelling project.



Description of project

Project address	
Project name	Test project multi houses
Street address	1 5 Drive Test 2220
Local Government Area	please select
Plan type and plan number	deposited 99
Lot no.	11
Section no.	-
Project type	
No. of residential flat buildings	0
No. of units in residential flat buildings	0
No. of multi-dwelling houses	11
No. of single dwelling houses	0
Site details	
Site area (m²)	867
Roof area (m²)	233
Non-residential floor area (m²)	0
Residential car spaces	0
Non-residential car spaces	0

Common area landscape		
Common area lawn (m²)	10	
Common area garden (m²)	10	
Area of indigenous or low water use species (m²)	-	
Assessor details		
Assessor number	12/0000	
Certificate number	12345678	
Climate zone	56	
Project score		
Water	✓ 53	Target 40
Thermal Comfort	✓ Pass	Target Pass
Energy	✓ 44	Target 40

(iii) Thermal Comfort	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(f) The applicant must construct the development in accordance with all thermal performance specifications set out in the Assessor Certificate, and in accordance with those aspects of the development application or application for a complying development certificate which were used to calculate those specifications.		✓	✓
(g) Where there is an in-slab heating or cooling system, the applicant must: (aa) Install insulation with an R-value of not less than 1.0 around the vertical edges of the perimeter of the slab; or (bb) On a suspended floor, install insulation with an R-value of not less than 1.0 underneath the slab and around the vertical edges of the perimeter of the slab.	✓	✓	✓
(h) The applicant must construct the floors and walls of the development in accordance with the specifications listed in the table below.	✓	✓	✓

	Thermal loads	
Dwelling no.	Area adjusted heating load (in mJ/m²/yr)	Area adjusted cooling load (in mJ/m²/yr)
1	27	14
2	39	20
3	48	19
4	46	16
5	45	20
6	41	34
7	32	24
8	62	18
9	62	19
10	66	21
All other dwellings	56	28

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