



# Technical Note 1

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## **Nationwide House Energy Rating Scheme (NatHERS) Principles for Ratings in Regulation Mode Version 1.2 – 2014**

**Effective from 1 October 2014 (for use with software using Chenath engine V3.13)**

### **1. Introduction**

- 1.1 This Technical note is for use with Chenath engine V3.13 only and replaces Discussion document, NatHERS Software Modelling Principles version 4.1 (2012), Technical Note Version 1.0, Version 1.1 2013 and Addendum 1.2013. NatHERS Technical Note 2 Version1.0-2012 and Addendum 1.2012.
- 1.2 The principles are to be used by all assessors accredited under the Nationwide House Energy Rating Scheme, unless other state or territory regulatory obligations apply. Where there is an inconsistency between a regulatory requirement for carrying out a thermal performance assessment or preparing a house energy rating on a new dwelling, the regulatory requirement prevails to the extent of the inconsistency.
- 1.3 In New South Wales also refer to the BASIX thermal comfort protocol. In Western Australia, assessments must also be conducted in accordance with the Government's NatHERS technical requirements. These principles do not apply to assessments undertaken by licensed building assessors under the ACT Building Act unless adopted by regulation or a code of practice.
- 1.4 There may be some complex modelling situations that do not seem to be covered by this document. Assessors should use this guidance and their own professional judgement where a situation is NOT covered by this document. All supporting information that informs their decision must be kept with the plans and documentation. The plans and documentation are to be retained for seven years and produced if audited or quality assured. All supporting information that informs the assessor's decision must also be provided to the person that commissioned the assessment and rating so that it may be provided to the relevant building authority if required.
- 1.5 Each dwelling must have its own individual rating even if it is a design that is regularly repeated on the same or different projects. The assessment and rating of each individual dwelling must reflect the individual characteristics of that dwelling modelled in accordance with this note.
- 1.6 The terms 'design documentation' and 'drawing sets' are used interchangeably in this document and include plans, specifications, schedules and addendums that may relate to the rating.
- 1.7 The terms 'residential buildings, dwelling or building' refers to the relevant building classifications as defined in the Building Code of Australia (BCA) Volumes One and Two of the National Construction Code (NCC), namely Class 1 buildings, certain Class 10 buildings and sole-occupancy units of Class 2 buildings or Class 4 parts of a building.

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- 1.8 As part of an effort to harmonise the terminology used in the various NatHERS accredited software, the 'zone type' names have been revised and will become uniform across all accredited NatHERS software. These revised zone names are used throughout this document. Refer to Table 2.
  - 1.9 NatHERS software tools must not be used to rate only a part of a dwelling. An addition of any kind cannot be rated in isolation; it must be incorporated in a new rating for the entire dwelling.
  - 1.10 Each jurisdiction may have alternate modelling methods to meet the requirement for the NCC energy efficiency requirements of additions. Refer to the NCC for jurisdictional variations and/or local council for requirements in your area.
  - 1.11 This Technical Note prevails in all matters covered by specific software training manuals, help files, technical support, Assessor Accrediting Organisation (AAO) technical support, Registered Training Organisations (RTO) and software trainers' advice.
  - 1.12 This Note is designed to be a living document to ensure consistent thermal performance assessments of drawing sets for new residential buildings and major additions to existing residential buildings when using NatHERS software for regulatory purposes. This document will be updated from time to time, and it is the responsibility of assessors to ensure they are using the current version. Notification of updates will be forwarded to assessors through their AAO and jurisdictional building authorities.

## 2. Software tools

- 2.1 Only software tools accredited by the NatHERS National Administrator and authorised for use for the type of dwelling in the jurisdiction the dwelling is located, may be used to rate residential buildings.
- 2.2 Software support is provided by the software providers.
- 2.3 Software support is NOT provided by the Assessor Accrediting Organisations (AAOs), however; they may issue additional modelling guidance and practice notes that support this document. Where there is a perceived contradiction in AAO NatHERS guidelines, this document prevails.
- 2.4 Accredited NatHERS software in "regulation" mode is solely for proposed new dwellings or alterations and additions to class 1, 2 or 4 buildings and attached class 10a buildings. Software can be used where a regulatory requirement or verification method prescribes assessment and rating of the entire dwelling as proposed to be constructed or altered.

## 3. Orientation of buildings

- 3.1 Building orientation is based on rotation of the dwelling with respect to True North, **not** Magnetic North.

## 4. Modelling of buildings

- 4.1 The building must be modelled using information on the drawing sets. Only details that appear on the drawing sets should be included except where defaults will apply after seeking clarification (Section 10). Where there is inconsistency between the specifications and the drawing sets - the inconsistency needs to be highlighted to the client and the client needs to get the revisions made before a certificate can be issued.
- 4.2 Information should not be assumed if it is not present on the design documentation. Written information from the client should be requested if the design documentation set is considered incomplete (See also Section 10 - Default settings). The Assessor should also state that where information is not provided, the worst case default values will be applied. This request for information and the reply from the client should be kept with the Assessor's records for the individual project for seven years.
- 4.3 The minimum design documentation required when modelling a dwelling includes:
- Site plan. This should include details of adjacent buildings. If adjacent buildings are not shown on any plan, assume defaults - see Section 10
  - Floor plan including floor coverings
  - Elevations
  - Sections
  - Lighting plan including details on the use of recessed luminaires (if there is no lighting plan the certificate will state clearly that the dwelling has been rated without downlights and clients need to know that the dwelling will need to be rated again if these features are present – assessors should price return jobs accordingly)
  - Location and type (operable or not) of exhaust fans
  - Construction material details
  - Window schedule including window types (e.g. sliding, awning or specialist glass)
  - A clear north point. If a surveyor bearing is present then it should be used in conjunction with the north point.
- Note: Ratings can still be completed if information such as a lighting plan has been requested but not received. In this case, the defaults in Section 10 will apply.
- 4.4 Assessors must use the exposure category best suited to the terrain surrounding the house or unit (see Table 1). Allowance should be made for the increased exposure of high-rise units, provided the elevation is associated with a reduction in obstructions.

**Table 1: Terrain Exposure Categories**

Terrain	Description	Examples
Category 1	<b>Exposed</b> open terrain; few or no obstructions.	Flat grazing land, lake-side, ocean-frontage, desert. Exposed high-rise unit above 10 floors.
Category 2	<b>Open</b> terrain; grasslands with few well scattered obstructions below 10 m.	Farmland with scattered sheds, lightly vegetated bush blocks. Medium-rise unit above 3 floors.
Category 3	<b>Suburban</b> terrain; numerous closely spaced obstructions below 10 m.	Suburban housing, heavily vegetated bushland areas.
Category 4	<b>Protected</b> terrain; numerous closely spaced obstructions over 10 m.	City and industrial areas.

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- 4.5 **Climate Zone selection:** The 'principal climate zone' allocated to the subject postcode by the software should usually be selected. Assessor judgement is required where an alternate climate is given for a subject postcode and the assessor decides to use this alternative. Any change would most logically be based on the elevation of the location in question, that is, that the subject site is in an elevated part of the postcode area not typical of the principal elevation of the given climate zone and the subject dwelling is located in an area more in line with the alternate climate zone.
- 4.5.1 No assessor discretion is allowed where there is no alternate climate zone for the subject location – the principal climate zone must always be used.
- 4.5.2 No regulatory assessment can be carried out with a 'dummy' postcode.
- 4.5.3 Where a newly developed suburb or town postcode has not been allocated a climate zone the nearest existing suburb or town postcode within the applicable climate zone should be used as an interim measure.
- 4.5.4 The NatHERS online Climate Zone Map is for assessor reference only and the software selection of climate zone has precedence.

## 5. Modelling neighbouring buildings and sun obstructions

- 5.1 Only model neighbouring buildings and other surrounding topographical features if they will cause a sun obstruction. Do not model neighbouring fences and single storey buildings if they are greater than 10m away, double storey buildings greater than 20m away, or high rise/topographical features that are located to the south (the Bearing 'South' in the meaning of this clause commences at the midpoint between SSE and S and finishes at the midpoint between S and SSW or within the degree range of 168° 45' 0" to 191° 15' 0").
- 5.1.1 The requirement in Clause 5.1 is to be ignored in the Tropics where southern neighbours/fences/topographical features may impact on shading.
- 5.1.2 Where a feature is outside the limits set by Clause 5.1 but because of topography it may still cause a sun obstruction – it must be modelled.
- 5.1.3 The features noted in Clause 5.1 may sometimes impact on a dwelling depending on the topography, building site levels and the siting of the dwelling. In these instances assessor judgement is required.
- 5.2 Neighbouring buildings and features detailed on the design documentation must be modelled according to the information on the respective drawing, including the impact of level changes and retaining walls. If no information is provided, apply Default Clause 10.12 and include any impact of level changes.
- 5.3 If modelling on a **new** development site and no neighbouring houses are present or indicated on the drawing set (but may be developed in the future) follow the directions for default values in section 10.12.

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## 6. Modelling of additions to existing dwellings

- 6.1 Any rating of an existing house/apartment and an addition to an existing house/apartment must treat the project as a complete dwelling and rate both the existing and proposed as one dwelling. All component zones of a dwelling must be included in the rating (Refer Section 7: Zoning).
- 6.2 Rating just an addition gives an inaccurate result in NatHERS software. For a jurisdiction to allow this to happen it would require a specific jurisdictional imposed statute.

## 7. Zoning

- 7.1 All spaces to be modelled as conditioned or unconditioned 'zones' must be capable of being fully enclosed by the building envelope, there must be walls, floors and a roof enclosing the space. Assessor discretion is required in some instances where the name of a space given by a designer or client may be very different from the way an assessor would categorise the space for modelling purposes.
- 7.2 A zone is defined as a space or group of spaces within a building that are expected to be at a uniform temperature and are defined by permanent boundaries. For example a living area cannot be split into two zones with different occupancies by artificially including an internal wall with or without openings as the boundary between the two areas.
- 7.3 The only exceptions to Clause 7.2 are for bed sits and open plan studios as detailed in Clause 7.8.
- 7.4 Hallways and corridors are circulation areas that allow access to other zones, they are modelled as a "daytime" zone - see Table 2. Class 2 building common area corridors are defined and detailed in Table 4.

### 7.4 Zoning - Whole of Dwelling

- 7.4.1 All dwellings must contain multiple zones, for example, a kitchen or kitchen/living, living, bedroom and an unconditioned zone.
- 7.4.2 All dwellings to be modelled **must** contain at least one unconditioned zone **excluding** the garage. This would normally be a bathroom, laundry or WC. If the laundry, WC and bathroom do NOT have an external window or door and only have internal walls and doors, then the smallest of them **must** still be selected as the unconditioned area.
  - 7.4.2.1 If all these zones/rooms are clearly marked on the plans and specifications as having a fixed heating and/or cooling appliance included (or branch outlet from a central system), then the smallest can be selected to be the one unconditioned zone.
  - 7.4.2.2 Note that an electrical resistance heater such as a heat globe or fan heater unit does not qualify as a fixed heating feature/appliance for this clause.

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- 7.4.3 All dwellings to be modelled must contain one main kitchen area. There can only be **one** main kitchen.
  - 7.4.4 All other smaller kitchens/kitchenettes within the building must be zoned 'Day-time'.
  - 7.4.5 There can only be a maximum of two living areas – these are to be the two largest logical living areas. Others are to be zoned 'Day-time' (see Table 2).
  - 7.4.6 Open outdoor living areas not fully enclosed are not modelled as a zone but included in the modelling as shade features. Enclosed or semi-enclosed 'outdoor living areas' that shade any windows are treated as shade; they are not modelled as a zone (also refer to 9.3). The NCC contains requirements for 'outdoor living areas' and assessor discretion may be needed. In cases where the area is clearly noted as being mechanically heated and cooled, then it is to be included as an internal zone.
  - 7.4.7 All parts of a building capable of being fully enclosed must be included within a zone except outdoor living areas and semi open 'alfresco' spaces. This includes storage spaces within the dwelling and spaces with openings required for the safe operation of a gas appliance. Ignore separated garages that are not attached unless they are a sun obstruction.
  - 7.4.8 Ensure that roof volumes are modelled correctly; consult your software support or software training material if in doubt.
  - 7.4.9 Each zone must have a ceiling or a roof.

## **7.5 Zoning - Conditioning of spaces**

- 7.5.1 Most spaces within the building envelope are considered to be conditioned, with the exception of the bathrooms, WC, laundry and garages. Ensuites accessed only from a bedroom are considered a 'night-time' zone and not a bathroom, see Table 2 for more details.
- 7.5.2 An area normally considered unconditioned is to be treated as a conditioned zone only where design documentation specifically indicate central heating/cooling outlets or in-floor hydronic heating in these spaces and where another space can be considered the one unconditioned space (refer to Clause 7.4.2).
- 7.5.3 Car parks and common basements below Class 2 dwellings cannot be treated as sub-floor zones or garages. See Table 3 for details on how to model dwellings above a range of car parks and public spaces.
- 7.5.4 See Table 4 for modelling guidance on apartment walls shared with common corridors.

**Table 2: Software zone types conditioning status**

<b>Zone type</b>	<b>Room</b>
Living	Living, dining, family, rumpus, media, home theatre etc. If more than 2 living areas, the 2 largest living areas are classified as "living". The other areas are classified as "Day time".
Kitchen/Living	A kitchen or a kitchen combined with one or more living areas. Must include the main kitchen area and may include a combined kitchen/lounge/meals or dining area.
Day-time	This is the default zoning for internal zones not covered by LIVING, KITCHEN/LIVING, UNCONDITIONED, BEDROOM, NIGHT-TIME, GARAGE OR GARAGE CONDITIONED - Such as; Home theatre, media (if third or other largest sized living area), Study (without built-in wardrobe), gymnasiums, Internal domestic lift, indoor pool rooms, saunas, wine cellars, walk in pantries, corridors and hallways (either fully enclosable by doors or open to other zones), internal storage areas with operable windows. Also selected when a Laundry, WC, bathroom or powder-room is <b>not</b> ventilated externally by a door or window on an external wall (Note: 7.4.2 still applies).
Unconditioned	Laundry, WC, bathroom and powder-room, when they include an external wall with one or more ventilation openings i.e. windows or doors. NOTE: 7.4.2 still applies but if the laundry, WC and bathroom do NOT have an external window or door then the smallest of them <b>must</b> still be selected to be the unconditioned area. Air Locks (see 7.10).
Bedroom	Bedroom. Study with a built-in wardrobe, walk-in wardrobe or attached ensuite. The 'study' becomes a bedroom zone and the attached built-in or walk-in wardrobe OR ensuite becomes a 'night-time' zone (as below)
Night-time	Areas which can only be accessed from a bedroom or through a zone accessed only from a bedroom. For example ensuites, WIR's, parents retreats, WC's accessed from an ensuite etc.
Garage	Garage.
Garage Conditioned	Garage in which heating ducts, Hydronic heating elements or air conditioners are clearly shown on the plans



**Table 3: Floors in Class 2 and 4 buildings**

<b>Floor type</b>	<b>How to model</b>
Floors above a shared car park*, common basement, highly ventilated common public areas.	Treat dwelling as above outdoor air.
Floors above commercial premises, minimum or partially ventilated common public areas.	Treat dwelling as above a neighbour.
Any Class 2 or 4 car park that is different from a fully enclosed space with one or more entrance points (i.e. an open car park with minimum or no external walls).	Treat dwelling as above outdoor air.
A Class 2 or 4 dwelling that has a fully enclosed garage for its exclusive use, where it is accessed from and shares floors walls or ceilings with the dwelling and has a separate vehicular access door.	Treat the other side of the dwellings wall or floor, as applicable, as adjacent to a 'Garage' and include the garage in the rating of the apartment.

**\*Car parks and common basements cannot be treated as sub-floor zones or garages.**



**Table 4: Apartment walls shared with common public areas**

<b>Wall type</b>	<b>How to model</b>
Apartment walls shared with minimum ventilated corridors (i.e. corridors publicly accessed by lifts, stairwells or with an airlock between the corridor and external air, or with apartments on the opposite side of the internal corridor).	Treat the internal space as adjacent to a neighbour.
Apartment walls shared with ventilated corridors (i.e. corridors which are open to external air by operable doors or windows).	Treat as external wall with eaves the same length and width as the corridor, and an external shading scheme the same length as the apartment wall.
Apartment walls shared with highly ventilated corridors (i.e. corridors with permanent openings to external air).	Treat as external wall with eaves the same length and width as the corridor, and an external shading scheme the same length as the apartment wall.
Apartment walls shared with corridors with fully glazed external walls (i.e. corridors with the major wall being fully glazed).	Model the external corridor as an unconditioned zone. Where the corridor zone is longer than the apartment wall, it is to have an external wall the same length as the apartment wall and internal walls to a neighbour at either end. Note: this is an interim measure until a number of new corridor zones are created and included in a subsequent software release.
Apartment walls shared with lifts and enclosed stairwells.	Treat the shared wall as adjacent to a neighbour.

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## **7.6 Zoning – Small air spaces**

- 7.6.1 Small air spaces such as small pantries, built in robes, plumbing voids, wall voids, return air ducts and other small non-habitable areas are included in the zone that they are attached to or located in. A small pantry is one that cannot be walked into.
- 7.6.2 Small air spaces such as storage areas, powder rooms and WC's located under a stair case and for all practicable purposes the stairs from the ceiling, are included in the same zone as the stair case.

## **7.7 Zoning – Combining Zones**

- 7.7.1 The accuracy of a rating improves as the number of zones increase; however there are circumstances when the assessor may feel there is a benefit to combine zones with the same conditioning into 1 zone. Clause 7.7.2 covers all ratings, Clause 7.7.3 can only be used if the rating will exceed the maximum 50 zones and combining bedrooms on the same orientation assists in completing the project within the allowable maximum zone allocation.
- 7.7.2 Garage 'workshops' and laundries (that are within the garage) with no internal door to the dwelling but with a window or external door that are only accessed directly from the garage are to be combined with the garage.
- 7.7.3 Multiple adjacent bedroom zones, **may** only be combined if they have external windows/doors to the same orientation, are the same zone type and conditioning and open to the same internal zone (i.e. an internal hallway). This methodology can **only** be used when the zones need to be combined to keep the project file to under a maximum of 50 zones. Note: if the proposed combined zone has external ventilation to more than one orientation it **cannot be combined**, as this would cause the software to model cross-flow ventilation effects that would not exist in reality.

## **7.8 Zoning – Special conditions for bedsits and open plan studio apartments**

- 7.8.1 Bedsits and open-plan apartments must be modelled with separate zones for the separate usage patterns, even if there is no physical separation, assume that there are plasterboard on stud internal walls with permanent openings no greater than 60% of the wall area as boundaries for each zone, The assessment must contain a minimum of 3 zones being: a kitchen/living zone, a bedroom zone and an unconditioned zone.
- 7.8.2 When there are no obvious features by which to zone the open plan studio or bedsit, the following **minimum** zone areas must apply:
- kitchen/living zone area(s) = minimum of 30%
  - bedroom zone area = minimum of 20%
  - bathroom/toilet/laundry zone area = minimum of 10%

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## **7.9 Zoning – Spaces with physical separation**

- 7.9.1 Physical separation of a space is considered to occur when a wall separates one air space from another and contains either: no openings, a controlled opening such as a door, or a permanent opening of any size.
- 7.9.2 Spaces with physical separation are zoned as separate zones unless one of the spaces is considered a small air space, in which case it may be combined with the zone from which it is entered (Clause 7.6).

## **7.10 Airlocks**

- 7.10.1 An airlock at a dwelling entrance way is defined as being a small, relatively airtight space, that is not a hallway and as having:
- one or more external walls with or without windows
  - one or more internal walls
  - an external door
  - one or more internal doors, of which one only opens to a conditioned zone
  - a floor
  - a ceiling or a combined ceiling/roof.
- 7.10.2 Air locks are treated as 'Unconditioned' zones.
- 7.10.3 Some airlocks on plans are not genuine airlocks (i.e. airtight spaces) but only spaces that reduce airflow from the outside of the building to the inside. If an assessor is in doubt then the default position would be to deem the space a conditioned zone.

## **8. Windows, Glazing and Insect Screens**

- 8.1 Windows and glazed doors must be modelled in accordance with the sizes noted on the Window Schedule or design documentation and include accurate modelling of:
- glass and frame type
  - openable percentage
  - default or custom values
  - size, location and offset
- 8.2 If a client has a preferred window supplier and that window supplier's codes and sizes are shown on the drawing sets then the assessor may specify custom windows (if their chosen software has this function) and use that manufacturer's ventilation charts to determine the openability of the window and/or door. If that information is not available then the default values apply (refer Clause 10.10).
- 8.3 Where the window manufacturer is not nominated, as in Clause 8.2, the default openable percentage figures should always apply (refer Clause 10.10). Where a window has both fixed and openable components, assessors are to calculate the total opening area based on the entire unit.

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- 8.4 The new default windows performance values (U and SHGC) are defined by their operating type. If the type of window including opening style, is not clearly indicated on the design documentation, for example, sliding (Group B) or awning (Group A) then the drawing sets need to be referred back to the client and the drawing set is NOT to be rated.
- 8.5 Windows include fully or partially-glazed hinged doors and sliding doors.
- 8.6 Glazed verandahs, loggias, wintergardens, porticos or balconies are not internal zones. They are external areas which are treated as balconies which are partially or fully enclosed by glass.
- 8.6.1 If the balcony has solid or glazed walls to either side of the parent wall they are to be treated as wing walls. If the balcony wall directly in front of the parent wall contains a solid building element, the solid portion is treated as an external screen with 100% shading and the glazed portion is treated as an external screen with 10% shading. The living area/bedroom area would end at the bedroom or living area window/sliding doors – where they interact with the verandah.
- 8.6.2 See clause 7.4.6 for examples where the space may meet the NCC definition of an outdoor living area.

## 9. Shading and Eaves

- 9.1 Fixed external window shading devices shown on the design documentation must be included in the rating.
- 9.2 Protected trees with an existing preservation order or heritage protection are the ONLY type of vegetation that may be modelled. Protected or 'regulated' trees (including canopy) must be indicated on drawings to scale. Supporting information showing the existing preservation order or heritage listing, and a species shading schedule, MUST be provided to the assessor otherwise they must not be modelled.
- 9.3 Outdoor living areas (as defined in the NCC) attached to the dwelling must always be rated as shade features.
- 9.4 Exterior shading devices must not be modelled unless they are shown on the design documentation. If these are suggested by an assessor to improve a rating then the documentation must be updated with their inclusion before the rating documentation is completed.
- 9.5 The width of a shading device is measured from the face of the external wall to the outer-most protrusion, including gutters. If the gutter width is not specified, then assume 100 mm width.
- 9.6 If the gutter is on a deep fascia board where the board will cast a greater shadow than the gutter, then the measurements (projection and offset) are to be taken from the bottom of the fascia.
- 9.7 The thickness of the construction elements are to be taken into account when modelling shading (for example, the thickness of timber slats in a solar pergola).
- 9.8 Shading from the width of eaves is the horizontal distance from the wall to the furthest point on the building envelope on the vertical plane at right angles to the wall.

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## 10. Default Settings (for new dwellings)

- 10.1 Where there is insufficient information on the design documentation and a request for further information has been made but not received, an assessment can still be undertaken but default values (shown below) are to be used. The client must be advised accordingly and told that **some** defaults are worst case and the rating may be adversely affected. This clause does not apply to details on window size and opening types which must be known. If no electrical schedule is available then ceiling penetrations and subsequent loss on ceiling insulation cannot be modelled and the NatHERS certificate will clearly show this. Assessors need to consider this when quoting on jobs as two assessments may need to be completed.
- 10.2 The correct identification of the worst case defaults may require multiple simulations. This is to ensure that the rating provided from the drawing set is the minimum that should be achieved. Selection of differing materials after the rating process should then not compromise the rating.
- 10.3 **Roof Colour:** If the roof colour or roof solar absorptance is not nominated on the design documentation, then the worst case default is used. For example, in tropical areas a 'dark' roof would be selected; conversely in a temperate or cool climate a 'light' roof would be selected.
- 10.4 **Wall Colour:** For walls, the default colour is 'medium', if not shown otherwise on the drawing set.
- 10.5 **Floor Covering:** If no floor coverings are specified, then the default settings are:
- garages have concrete floors
  - wet areas and kitchens have ceramic tiles
  - all other areas have carpets and rubber underlay
- 10.6 **Internal colours:** Internal ceiling and internal wall colour must be modelled as 'not specified' or 'medium' where the software has this option.
- 10.7 **Ground Reflectance:** The ground reflectance default setting of 0.2 must be modelled at all times.
- 10.8 **Ceiling penetrations:** All vents and penetrations (including exhaust fans and recessed downlights) are to be treated as unsealed/worst performance if not shown otherwise.

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- 10.9 **Loss of ceiling insulation due to ceiling penetrations:** All recessed downlights, vents, exhaust fans or anything that requires a penetration through the ceiling with a subsequent loss of required ceiling insulation are to be modelled. The NatHERS certificate will show all sealed and unsealed ceiling penetrations. All ceiling penetrations to uninsulated spaces, whether to the external envelope or to an intermediate floor above are also modelled.
- 10.9.1 Unless otherwise stated by the manufacturer, the loss of insulation allowance for each ceiling penetration must also include a minimum 50mm clearance from any bulk insulation.
- 10.9.2 Unless clearly specified on the plans and/or any accompanying specification documentation, assessors are not to assume that a ceiling penetration will not result in a loss of required ceiling insulation.
- 10.9.3 Ductwork: Where an open vent (for the ventilation of a gas cooker) is required and it is shown with ductwork in the ceiling space - treat as a 'sealed exhaust fan'.
- 10.9.4 Where no ductwork is shown - treat as 'an unsealed exhaust fan'. Permanent openings for unflued gas heaters need to be treated as permanent openings in the building fabric.
- 10.9.5 A sealed luminaire (meaning the complete downlight or electric light unit), can be treated as 'sealed' when the design of the luminaire is such that it prevents the complete movement of air between a zone and an attic or roof space.
- 10.9.6 In Class 2 and 4 buildings where there is a downlight or ceiling penetration to a ceiling space that is not an 'attic space' and there is a floor above this ceiling space and there is no insulation shown on the drawings, model as a ceiling penetration. This also applies to two storey Class 1 dwellings between floors.
- 10.9.7 Note that the universal software certificate clearly itemises if sealed and unsealed ceiling penetrations have been modelled, the rating and certificate only apply to the dwelling with the specifications noted.
- 10.10 **Window Openability:** If opening percentages for window types are not specified by the window manufacturer, then the default percentages built into the software must be used.
- 10.10.1 It is not feasible to list every possible permutation of window sashes available. Subsequently window and door units containing multiple sashes (the portion of the window or door that opens) must be calculated accurately according to the proportion of each.
- 10.10.2 The openability of awning windows is calculated from the area of the frame that the sash or sashes occupy and stated as a percentage of the overall window size.

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10.10.3 Indicative opening areas for windows without transoms are given below.

**Table 5: Sample default window opening percentages**

	Single pane window	Double pane window. (1 fixed, 1 operable)
Awning	90%	45%
Casement	90%	45%
Double hung	45%	22%
Louvre	90%	45%
Sliding	45%	45%

Note: These are default values where the manufacturer has not provided other information and the plans do not specify a value.

10.11 Windows with **restricted openings and no complying security screen**: windows complying with the height safety rules in the NCC, need to have a restricted openings. If no information is noted on the plans or elevations the default setting of 10% opening is to be used for all window types. If there is doubt as to when the height safety rules apply, the assessor should refer back to the designer or client for the required information.

10.12 **Neighbour and sun obstruction defaults**: If neighbouring buildings are not identified on the drawing sets and cannot be readily gathered from internet sources or the client, then presume all distances and heights given in this clause as default values and also include the offset described.

10.12.1 If modelling on a **new** development site and no neighbouring houses are present or indicated on the drawing set (but may be developed in the future), presume that the neighbouring building(s) will fit into a square or rectangle having the same floor starting height, wall and roof height, length and width as the one being modelled, no other allowance is to be made for courtyards or building offsets existing in the one being modelled, as per the following:

10.12.1.1 Presume a straight building line for the neighbour, the same set back from the street and common boundary as the dwelling being rated (ignore dwellings to the south – except in the tropics), see 5.1 for south definition.

10.12.1.2 If a two storey house is being modelled, presume two storey neighbours are present on all sides. For a single storey presume single storey neighbours.

10.12.1.3 Presume a 1.8 m high side and rear fence if local planning requirements are unknown. If these are known or are noted on the plan then rate as known or noted.

10.12.1.4 Include all level changes between lots, both ground level and dwelling level, that will impact on the rating.

10.12.2 The same principles as listed in this section for future neighbours to the side are to be applied to future neighbours to the rear of the property. This may also apply to obstructions to the front of the dwelling in certain circumstances such as a battle-axe block; assessors may need to model the feature to determine if it should be included in the assessment.



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- 10.12.3 Neighbouring building offset: The building line for the presumed neighbour (offset) must be taken as a straight line - equidistant from the dividing fence line – at a distance equal to the shortest measurement between the rated house and that fence line. This rule still applies if the boundary of the building structure does not represent a straight line. The offset is to be calculated independently for each boundary where a presumed neighbour is required to be modelled.

## 11. Modelling Waffle Pods

- 11.1 The following values should be followed by assessors in all accredited software products when modelling waffle pods, no higher values can ever be used:
- For waffle pods of 175mm thickness – use R0.6
  - For waffle pods of 225mm thickness – use R0.7
  - For waffle pods of 300mm thickness – use R0.8
  - For waffle pods of 375mm thickness – use R0.9
- 11.2 Assessors can only use these values for the 175 - 375mm pods when the thickness of the pod is shown on the plans and the direction to use pods is clearly notated. When another thickness is given that is not shown above, round down to the nearest available thickness shown.
- 11.3 Where the thickness of the pod is **not** indicated, but their use is – the lower R-value (i.e. R0.6) should always be used as the default value.
- 11.4 The above values are for Expanded Polystyrene (EPS) waffle pods (with or without air cavities) only and cannot be used for other underfloor insulation types.

## 12. Minimum drawing set stamping requirements

- 12.1 Before stamping drawing sets at the completion of the rating process with the NatHERS QR code stamp and producing a final certificate, the assessor is to confirm:
- 12.1.1 The full details of the construction materials are detailed on the drawing sets, and are in accordance with the assessment.
- 12.1.2 The window specification details are complete including;
- 12.1.2.1 Either an individual window and door size schedule or clearly noted floor plans or elevations showing window type, operating type, window height, width and frame type.
- 12.1.2.2 Skylight and roof window details.
- 12.1.3 Ceiling and wall penetrations are noted.
- 12.2 If the above details are not present on the drawing sets, or differ from the rating assessment, the drawing sets are to be returned to the architect or building designer for completion (except where defaults apply). Details on the drawing sets and relevant schedules/addendums/ specifications, must align with the assessment and vice versa.

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## 13. Stamping of Design Documentation

- 13.1 Drawing sets are not to have the NatHERS 'stamp' added or a certificate completed if the information on the drawing sets and specifications does not align with the information on the NatHERS certificate. Drawing sets are to be returned to the designer or client to be amended before a final certificate can be issued by a NatHERS assessor.
- 13.2 For all dwellings the unique NatHERS QR code stamp linking the certificate to the drawing set is to be electronically added to every **principal page** of the plans/drawing set that relate to the assessment (i.e. the cover sheet, floor plans, elevations and specifications). The stamp should not obscure any information on the plans or the mark of any other practitioner.
- 13.3 Accredited Assessors need to follow directions from their AAO and include their AAO stamp when required generally below the NatHERS stamp to verify their membership currency. The stamp cannot be a larger size than the NatHERS stamp.
- 13.4 For Class 2 dwellings all the above requirements apply and a Class 2 Summary sheet also needs to be provided. The NatHERS stamp needs to show the average building rating.

## 14. Final Documentation – NatHERS Certificate

- 14.1 For ratings completed in 'regulatory' mode: The assessor will supply the client with the stamped plans including the NatHERS QR code and the AAO stamp (if required) and a hard copy or electronic format (PDF) of the NatHERS software certificate.
- 14.2 For Class 2 dwellings each individual unit must have a certificate. Where a number of Class 2 multi-unit buildings are located in close physical proximity – as part of the same development, or where the strata plan identifies separate lots, the heating/cooling load and documentation must be completed for each building/lot separately.
  - 14.2.1 Assessors need to prepare a document for each building that will separately comply with the BCA that identifies the rating of all individual sole occupancy units in the building and the average rating of all units in the building. The documentation required and the separation of buildings must be confirmed with the client, particularly where buildings are connected e.g. via a bridge, an enclosed walkway or underground carpark.
  - 14.2.2 The NCC allows for united buildings - buildings are united if they are connected through openings in the walls dividing them (e.g. by a bridge between buildings or a joint underground carpark) and together comply with all the requirements of the BCA as though they are a single building. This means separate averages would not need to be calculated for each building. This example is different to whether a building crosses a lot boundary or not. The assessor needs to confirm with the client how they are intending to comply and what documentation they require – the assessor should not assume the requirements.

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### Feedback on these principles

All enquiries and comments about the principles should be referred to your accredited assessor organisation (ABSA or BDAV) in the first instance, or your state and territory building regulator if accreditation or licencing is not required in your jurisdiction. Where necessary, these organisations will then refer the matter to the NatHERS National Administrator for advice, who may then issue an amended document.

### Disclaimer

The material in this document is to be followed by accredited assessors and is made available for assessors who use NatHERS accredited software in 'regulatory' mode only and on the understanding that the NatHERS National Administrator, the state and territory governments, and the Commonwealth (the Participating Bodies) are not providing professional advice, nor indicating a commitment by the Participating Bodies to a particular course of action. While reasonable efforts have been made to ensure the information is accurate, correct and reliable, the Participating Bodies, and all persons acting for the Participating Bodies preparing this publication, accept no liability for the accuracy of, or inferences from, the material contained in this publication, and expressly disclaim liability for any person's loss arising directly or indirectly from the use of, inferences drawn, deductions made, or acts done in reliance on this document. The material in this document may include the views or recommendations of third parties, which do not necessarily reflect the views of the Participating Bodies, or indicate their commitment to a particular course of action.

NatHERS supports improvements to the thermal performance (energy efficiency) of Australia's residential buildings by providing a standardised approach and guidelines for energy rating software tools used to assess dwellings across Australia.

NatHERS is administered by the Department of Industry on behalf of the Commonwealth, state and territory governments.

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