0471P CSR BRADFORD IN THERMAL INSULATION AND PLIABLE MEMBRANES

Branded worksection

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Worksection abstract

This branded worksection *Template* is applicable to CSR Bradford insulation and pliable membranes for roofs and condensation control. It generally relies on AS 3999, AS/NZS 4200.1, AS/NZS 4200.2 and AS/NZS 4859.1. A pliable building membrane may be installed to act as a sarking membrane, vapour barrier, thermal insulation or any combination of the three. This worksection does not cover insulation for services (e.g. for ductwork, use the *0744 Ductwork insulation* worksection).

Background

See the NATSPEC TECHnote DES 004 and the non-mandatory *ABCB Condensation in buildings handbook* for information relating to the use of insulation and vapour barriers to reduce condensation and moisture flow. See NATSPEC TECHnote DES 015 for information on the BCA energy efficiency provisions.

***Guidance* text**

All text within these boxes is provided as guidance for developing this worksection and should not form part of the final specification. This *Guidance* text may be hidden or deleted from the document using the NATSPEC Toolbar or the hidden text *Hide* and *Delete* functions of your word processing system. For additional information visit FAQs at www.natspec.com.au.

***Optional* style text**

Text in this font (blue with a grey background) covers items specified less frequently. It is provided for incorporation into *Normal* style text where it is applicable to a project.

Related material located elsewhere in NATSPEC

If a listed worksection is not part of your subscription package and you wish to purchase it, contact NATSPEC.

Related material may be found in other worksections. See for example:

- *0411 Waterproofing – external and tanking*.
- *0421 Roofing – combined*.
- *0431 Cladding – combined*.
- *0472p CSR BRADFORD in acoustic insulation*.
- *0522 Partitions – framed and lined*.
- *0531 Suspended ceilings – combined*.
- *0531p CSR Ceilector in suspended ceilings - combined*.
- *0621 Waterproofing – wet areas*.
- *0744 Ductwork insulation* for thermal insulation and sheathing of ductwork.

Material not provided by CSR Bradford

This branded worksection includes generic material which may not be provided by the Product Partner including:

- Cellulosic fibre (loose fill).
- Polyisocyanurate (rigid cellular RC/PIR).
- Polystyrene (extruded rigid cellular RC/PS-E).
- Polystyrene (moulded rigid cellular RC/PS-M).
- Polyurethane (rigid cellular RC/PUR).
- Wet processed fibreboard (including softboard).
- Wool.

Documenting this and related work

You may document this and related work as follows:

- Document purlin spacing to suit the BRADFORD™ Ashgrid Roof Spacer system and the BRADFORD™ Safebridge® Roof Purlin System.
- Show on the drawings the extent, type, location, arrangement, fixing and support details of all insulation and pliable membranes.

- Insulation and pliable membranes may be integral to other worksections. Cross reference from related worksections to this worksection or take relevant text from here for inclusion in those worksections.

The *Normal* style text of this worksection may refer to items as being documented elsewhere in the contract documentation. Make sure they are documented.

Search acumen.architecture.com.au, the Australian Institute of Architects' practice advisory subscription service, for notes on the following:

- Guarantees and warranties.

Specifying ESD

The following may be specified by retaining default text:

- Framed wall thermal break strips.
- Natural wool.

The following may be specified using included options:

- Thermal performance to reduce heating/cooling load by specifying the required R-Value for roof/ceiling, walls and floors.

The following may be specified by including additional text:

- Recycled material content, e.g. recycled waste glass in glass wool insulation.
- Other natural materials such as cellulose insulation, perlite, agricultural fibres and cementitious foam.
- Cellulose insulation: Manufactured from recycled paper.
- Perlite: Volcanic minerals, e.g. used as loose fill insulation in concrete block cavities.
- Agricultural fibres: Manufactured from mill waste, low grade and recycled cotton treated with non-toxic fire retardant.
- Cementitious foam insulation: Made from magnesium from sea water.

Refer to the NATSPEC TECHreport TR 01 on specifying ESD.

1 GENERAL

CSR Bradford, a division of CSR Building Products Limited, is a leading manufacturer and distributor of premium energy efficiency products and services including insulation, construction fabrics, ventilation products, solar PV systems, hot water systems, Tesla batteries and associated energy efficiency products. Established in 1934, CSR Bradford includes Edmonds ventilation products and Martini decorative and commercial acoustic polyester insulation products. The CSR Bradford range includes thermal and acoustic solutions for residential, commercial and industrial applications including glasswool and rockwool insulation, reflective foil laminates, as well as specialty commercial products.

1.1 RESPONSIBILITIES

General

Requirement: Provide CSR BRADFORD insulation and pliable building membrane systems, as documented.

Documented is defined in *0171 General requirements* as meaning contained in the contract documents.

It is the responsibility of the designer to nominate and detail insulation and pliable membranes conforming to the requirements of the BCA.

Performance

Requirement:

- Complete for their function.
- Conforming to the detail and location drawings.
- Firmly fixed in position.

1.2 COMPANY CONTACTS

CSR BRADFORD technical contacts

Website: www.bradfordinsulation.com.au

1.3 CROSS REFERENCES

General

Requirement: Conform to the following:

- *0171 General requirements*.

0171 General requirements contains umbrella requirements for all building and services worksections.

List the worksections cross referenced by this worksection. *0171 General requirements* references the *018 Common requirements* subgroup of worksections. It is not necessary to repeat them here. However, you may also wish to direct the contractor to other worksections where there may be work that is closely associated with this work.

NATSPEC uses generic worksection titles, whether or not there are branded equivalents. If you use a branded worksection, change the cross reference here.

1.4 MANUFACTURER'S DOCUMENTS

Technical manuals
Design guides, product data sheets and safety data sheets: www.bradfordinsulation.com.au

1.5 INTERPRETATION

Definitions
General: For the purposes of this worksection the following definitions apply:

- FBS-1 (fibre-bio-soluble) mineral wool: Insulation composed of bio-soluble glass or rock fibres.
- Fibre batts: Flexible insulation supplied as factory cut pieces and composed of mineral wool (glass and rock fibre) or polyester fibre.

Fibre blankets
Flexible insulation supplied as factory cut rolls and composed of mineral wool (glass and rock fibre) or polyester fibre, and may be combined with reflective facings.

- Fire hazard properties: To BCA A2.4.

- This includes the Average specific extinction area, Critical radiant flux, Flammability Index, Smoke-Developed Index, Smoke growth rate index, Smoke development rate or Spread-of-Flame Index of a material or assembly as applicable.
- See NATSPEC TECHnote DES 003 for more information on fire hazard properties of insulation and pliable membranes.

This includes the Flammability Index, Smoke-Developed Index and the Spread-of-Flame Index of a material or assembly as applicable.

See NATSPEC TECHnote DES 003 for more information on fire hazard properties of insulation and pliable membranes and NATSPEC TECHnote DES 020 for fire behaviour of building materials and assemblies.

- Pliable building membrane: To AS/NZS 4200.1 and equivalent to sarking-type materials as defined in the BCA.

A pliable building membrane may be installed to act as a sarking membrane, vapour barrier, thermal insulation or any combination of the three.

Thermal insulation terminology
To AS/NZS 4859.1

AS/NZS 4859.1 relies on ASTM C168 for definitions with some qualifications and some additional definitions and in the NOTE to AS/NZS 4859.1 clause 1.5.1 offers ISO 9229 for additional information.

- Vapour permeable (breathable) membrane: A flexible membrane material, normally used for secondary waterproofing that allows for the transmission of water vapour.

Edit the **Definitions** subclause to suit the project or delete, if not required. List alphabetically.

1.6 SUBMISSIONS

Certification
Requirement: Submit evidence of conformance to PRODUCTS, **INSULATION AND PLIABLE MEMBRANE**, **Insulation**.

Certification provider: An organisation accredited by the Joint Accreditation System of Australia and New Zealand (JAS-ANZ).

Execution details
Requirement: Submit the following:

- Handling and installation instructions: All glass wool insulation only, excludes Ashgrid and construction fabrics.
- Safety data sheets: Available by request or can be downloaded from website.

Fire hazard properties
General: Submit evidence of conformance to **INSULATION AND PLIABLE MEMBRANE MATERIALS**, **Fire hazard properties**.

Products and materials

Thermal insulation properties: Submit evidence of conformance to AS/NZS 4859.1.

This is primarily to verify claimed total R-Value for BCA compliance. For calculated values it is important that the calculations conform to AS/NZS 4859.1 including de-rating in Normative Appendix K. See NATSPEC TECHnote DES 031 for information on specifying R-Values.

Technical data sheets: Submit data sheets covering material composition and characteristics such as volatility, flash point, light fastness, colour and pattern. These are available by request or can be downloaded from website.

1.7 INSPECTION

Notice

Inspection: Give notice so that inspection may be made of the pliable membrane and insulation before they are covered up or concealed.

Amend to suit the project adding critical stage inspections required.

Hold points, if required, should be inserted here.

2 PRODUCTS

BCA J1.2 and BCA 3.12.1 nominate the minimum R-values for roof, wall and floor construction in all climate zones.

2.1 GENERAL

Product substitution

Other products: Conform to **PRODUCTS**, **GENERAL**, **Substitutions** in *0171 General requirements*.

The *0171 General requirements* clause sets out the submissions required if the contractor proposes alternative products. Refer also to NATSPEC TECHnote GEN 006 for more information on proprietary specification.

Marking

Identification: Mark to show the following:

- Manufacturer's identification.
- Product brand name.
- Product type.
- Quantity.
- Product reference code.
- Batch number: All glass wool insulation only, excludes Ashgrid.
- Date of manufacture: All glass wool insulation only, excludes Ashgrid and construction fabrics.

Mineral wool products: Deliver mineral wool products to site in packaging labelled FBS-1 BIO-SOLUBLE INSULATION.

See the NATSPEC TECHnote PRO 002 for more information on FBS-1 labelling.

2.2 INSULATION AND PLIABLE MEMBRANE MATERIALS

Fire hazard properties

See NATSPEC TECHnote DES 003 for more information on the fire hazard properties of insulation materials and NATSPEC TECHnote DES 020 on fire behaviour of building materials and assemblies. See also BCA Spec C1.10 Table 4.

Insulation fire hazard indices: Conform to the following for all materials, tested to AS/NZS 1530.3:

- Spread-of-Flame Index: ≤ 9.
- Smoke-Developed Index: ≤ 8 if Spread-of-Flame Index > 5.
- Materials with reflective facing: Test to AS/NZS 1530.3 and the recommendations of Appendix A6.

AS/NZS 1530.3 Informative Appendix clause A6 recommends that reflective surfaces of test specimens (which would otherwise generally pass this test) be blackened and diagonally scored in order to simulate soot deposition onto reflective surfaces in a real fire situation. Note that AS/NZS 1530.3 clause 4.12.2(c) requires insulation materials faced with reflective surface materials to incorporate a representative vertical joint in three test specimens.

Pliable membranes Flammability Index tested to AS 1530.2: ≤ 5.

Flammability Index is determined under AS 1530.2. There has been some debate about the adequacy of the test procedure in predicting performance of material in real fire situations. Pliable membranes are tested to AS 1530.2 as they are not suitable for testing to AS/NZS 1530.3.

Non-combustible construction required: [complete/delete]

List any parts of the project that the BCA requires to be non-combustible. Delete if none. Construction required to be non-combustible by the BCA (e.g. fire walls and spandrels with a specific FRL) must be constructed wholly of materials that are not deemed combustible. In other situations the BCA does not prohibit the use of combustible insulation materials, provided they meet the other fire properties.

Insulation

Cellulosic fibre (loose fill): To AS/NZS 4859.1 Section 5.

Mineral wool blankets and cut pieces: To AS/NZS 4859.1 Section 8.

Polyester: To AS/NZS 4859.1 Section 7.

Polyisocyanurate (rigid cellular RC/PIR): To AS 1366.2.

Polystyrene (extruded rigid cellular RC/PS-E): To AS 1366.4.

Polystyrene (moulded rigid cellular RC/PS-M): To AS 1366.3.

Polyurethane (rigid cellular RC/PUR): To AS 1366.1.

The rigid cellular sheets listed exhibit high combustibility (as do most of the organic fibre materials) and release various toxic products of combustion (e.g. hydrogen cyanide from polyurethane foam). Other alternatives include strawboard and woodwool.

Polyurethane (sprayed): To AS 1366.1 Table 2.

Wet processed fibreboard (including softboard): To AS/NZS 1859.4.

Wool: To AS/NZS 4859.1 Section 6.

Reflective thermal insulation: To AS/NZS 4859.1 Section 9.

AS/NZS 4859.1 Normative Appendix K sets out the assumptions to be used when calculating the system and Total R-Values of building construction that incorporates reflective surfaces. It sets out the indoor and outdoor temperatures to be used and requires de-rating of the insulation effect of reflective surfaces to compensate for dust, labelling ink and so on. The effect of the de-rating may be significant and in situations where reflective foil is used in combination with bulk insulation, a conservative approach would be to ignore the reflective surface effect, i.e. treat the surface as high emittance.

Pliable membranes

Standard: To AS/NZS 4200.1.

AS/NZS 4200.1 does not set a value for the resistance to water vapour transmission for vapour permeable (breathable) membranes. BS 5250 has a range from 0.1 to 0.6 MN.s/g. A breathable membrane for walls with a vapour resistance of 0.5 MN.s/g is available.

Fasteners and supports

General: Metallic-coated steel.

CSR BRADFORD fasteners and supports: In conformance with CSR BRADFORD recommendations.

Consider nominating stainless steel in areas of high corrosivity.

Mesh support to roof insulation

Welded safety mesh: To AS/NZS 4389.

Welded safety mesh may be used for fall arrest if required by WHS authorities. Coordinate with the *Roofing – combined worksection* which also cites AS/NZS 4389. Mesh support for roof insulation may not be required where fall arrest sarking is used.

Product: Safebridge® Safety Mesh to AS/NZS 4389, cut to widths to suit Safebridge® purlin spacing.

Safebridge® purlin spacings are 610 mm, 910 mm, 1210 mm and 1360 mm.

2.3 CSR BRADFORD INSULATION PRODUCTS

BRADFORD™ Optimo™ Underfloor

Description: Rigid high density underfloor insulation manufactured from glass fibre.

Application: Bradford Optimo underfloor insulation is sized to fit between floor joists in homes built with suspended floors. Optimo reduces heat transfer through suspended floors, helps stop draughts and reduces external noise entering through the sub-floor.

Support:

- Retrofit installations: Optimo Stay-fast™ brackets.

- New construction: Optimo Saddles™.

BRADFORD Gold™ and BRADFORD Gold™ Hi Performance (HP)

Description: Glass fibre thermal insulation wall and ceiling batts to AS/NZS 4859.1.

Application: Bradford Gold and Gold Hi Performance (HP) insulation is designed to reduce heat transfers within the home, improving the home's comfort and energy efficiency. Wall batts are specifically made for external walls with a high density glass wool insulation to suit the cavity space. The batts are specially stiffened to stand up in wall cavities and are water repellent.

Ceiling batts:

- R-Values: R2.0 to R7.0.
- Widths supplied: A range to suit different joist spacings.

Wall batts:

- R-Values: R1.5 to R4.0.

BRADFORD™ EzyCAV™ Residential Cavity Wall Blanket

Bradford EzyCAV™ Cavity Wall Blanket is specifically designed for use in double brick cavity walls to provide a consistent material R-Value of RM0.45 in addition to a reflective air-gap R-Value when positioned adjacent to a still cavity.

Description: A pliable, composite insulation membrane comprising a flexible 15mm high density glass wool insulation core with polymeric woven facings and anti-glare reflective foil to one side.

BRADFORD™ Ashgrid Roof Spacer system

Description: A modular system of galvanized bars and supporting brackets pre-assembled in 1.2 m sections

The Ashgrid Roof Spacer System elevates the roof sheet and creates the required cavity space between the top of the purlin and the roof sheet, to allow the insulation to recover. The spacers are adaptable, to suit most projects, including applications in cyclonic regions.

Bracket heights are available in 60 mm, 80 mm, 110 mm, 120 mm and 150 mm with corresponding Anticon™ roof insulation blankets to match height. The Ashgrid system is designed to meet BCA Section J requirements when specified in conjunction with a specific thickness Anticon insulation blanket.

BRADFORD™ Safebridge® Roof Purlin System

Description: A roof purlin system which integrates Metroll Safebridge purlins and bridge bars, Bradford SafeBridge Anticon insulation with centre bonded facing, SafeBridge safety mesh, thermal break tape and roof sheeting to maintain the insulation position and thickness within the depth of the purlins, conforming to AS/NZS 4859.1 and BCA Section J.

Safebridge® Roof Purlin System uses the depth of the purlins to provide a cavity for the insulation to recover to its design thickness without raising the height of the roof.

Purlin spacings available: 610 mm, 910 mm, 1210 mm and 1360 mm with corresponding Anticon™ roof insulation blankets with centre bonded facing.

BRADFORD™ Anticon™

Description: Glass fibre thermal and acoustic insulation blanket laminated to an impermeable reinforced reflective foil facing.

Application: Bradford™ Anticon™ is a lightweight insulation blanket specifically designed to provide efficient acoustic and thermal insulation, as well as condensation control under metal deck, fibre cement and concrete roofs in residential or commercial applications. The name Anticon™reflects the anti-condensation properties of this product.

As referenced in the US EPA list of ozone depleting substances (Class 1 and Class 2), no ozone depleting substances are involved in either the manufacture or composition of this product and therefore has an ozone depletion potential of zero. It is also CFC/HCFC free.

Facings: Standard facings available are Light duty foil, Medium duty foil, Heavy duty foil, Anticon Antiglare, Anticon Tuff, Perforated foil.

Other facing options are available by request.

Thickness: Range from 60 mm to 145 mm.

Standard roll size: 1200 mm wide x 7.5 m to 20 m long pending max weight handling restrictions. Cut to length sizes are available upon request subject to minimum order quantities.

R-Value (at 23°C): R1.3 to R3.6 based on material R-Value only.

Total system R-Value will depend on climate zone and application etc.

2.4 CSR BRADFORD VAPOUR PERMEABLE CONSTRUCTION FABRICS

BRADFORD™ Enviroseal™ ProctorWrap

Suitable for commercial and residential applications including open and closed rain screen facades, timber and metal framed wall wraps, roof sarking for use with concrete, terracotta and slate roof tiles as well as metal deck roofs.

This product is recommended for use in colder climates where the risk of condensation formation increases as the temperature of the outside environment falls, while the inside of the home is heated. High temperature, UV stable applications can also be managed for wall membranes.

Description: Highly vapour permeable pliable membrane for roof sarking and wall wrap.

Permeability (µg/Ns): To AS/NZS 4200.1, as follows:

- Enviroseal™ ProctorWrap BL: 2.8 µg/N.s.

A black commercial grade wall wrap with a functional UV and high temperature coating suitable for open joint wall facades with open joins up to 30% of total area.

- Enviroseal™ ProctorWrap HT/R: 4.0 µg/N.s.

A medium duty, reinforced sarking or high strength wall wrap suitable for commercial and residential metal, tile and slate roofs or lightweight clad wall applications.

- Enviroseal™ ProctorWrap CW: 4.2 µg/N.s.

A light duty commercial and residential wall wrap suitable for timber and steel frame, brick veneer and lightweight clad walls.

- Enviroseal™ ProctorWrap RW: 4.5 µg/N.s.

A light duty residential wall wrap suitable for timber and steel frame, brick veneer and lightweight clad walls.

Vapour resistance when tested to AS/NZS 4200.1 (ASTM E96/E96M) as follows:

- Enviroseal™ ProctorWrap BL: 0.36 MN.s/g.
- Enviroseal™ ProctorWrap HT/R: 0.25 MN.s/g.
- Enviroseal™ ProctorWrap CW: 0.24 MN.s/g.
- Enviroseal™ ProctorWrap RW: 0.22 MN.s/g.

Note that the term breathable or breather is misused by the market and is not the same as vapour permeable as it has traditionally been a barrier product with holes punched in it.

Water barrier classification: High for all products.

2.5 CSR BRADFORD VAPOUR BARRIER CONSTRUCTION FABRICS

BRADFORD™ Thermoseal™ residential and commercial roof sarking products

The Thermoseal™ roof sarking membranes range comprises low emissivity and decorative foil laminates designed specifically for residential and commercial metal and tiled roof applications. The range includes reinforced paper laminates for use directly under metal deck roofs and tough polymer laminates for use under tiled roofs of varying rafter length. Decorative white and black finishes are also available for commercial applications with exposed ceilings and most products are supplier with outward facing antiglare finishes for ease of install.

These products are recommended for use in warmer climates where they provide insulation against radiant heat and reduce the flow of water vapour from the outside environment into the building.

Description: Reflective foil, non-permeable vapour barrier roof sarking:

- Thermoseal™ Roof Tile: Heavy-duty single-sided low emissivity (inward facing) roof sarking.
- Thermoseal™ Roof Tile Plus: Extra heavy duty, heavier weight, single sided low emissivity (inward facing) roof sarking with paper insert for a smoother finish.
- Thermoseal™ Roof Tile Pro: Extra heavy-duty single sided low emissivity (inward facing) roof sarking with a paper insert for a smoother finish.
- Thermoseal™ Roof Tile Safety: Extra heavy-duty fall arrest single sided low emissivity (inward facing) roof sarking.
- Thermoseal™ ResiWrap: Extra heavy-duty polyweave laminate, single sided inward facing low emissivity extra tough residential metal roof sarking.
- Thermoseal™ 733MD: Medium-duty paper laminate, single sided low emissivity metal roof sarking with antiglare coating.

Suitable for use under commercial metal deck roofs.

- Thermoseal™ 753MD: Heavy-duty paper laminate, single sided low emissivity metal roof sarking with antiglare coating.

Suitable for use under commercial metal deck roofs and suitable for hot climates.

BRADFORD™ Thermoseal™ residential and commercial wall wrap products

Description: The Thermoseal wall wrap membrane range includes low emissivity, functional antiglare (low emissivity) and 'breather' products suitable for residential and commercial construction, including lightweight clad, battened block and brick veneer wall types. Most products are constructed from tough polymer laminates to provide a combination of lightweight handling and strength. Reinforced paper laminate construction is available for use behind metal cladding, as well as perforated breather products which allow air and vapour exchange.

These products are recommended for use in warmer climates where the risk of condensation formation exists as the temperature of the outside environment rises, while the inside of the building is cooled.

Description: Reflective foil, non-permeable vapour barrier wall wrap:

- Thermoseal™ Wall Wrap: Medium-duty polyweave laminate, single sided inward facing low emissivity wall wrap.
- Thermoseal™Wall Wrap XP: Medium-duty polyweave laminate, single sided outward facing low emissivity wall wrap.
- Thermoseal™ResiWrap: Extra heavy-duty polyweave laminate, single sided inward facing low emissivity extra tough residential or commercial wall wrap.
- Thermoseal™Roof Metal Wall: Light-duty paper laminate, single sided low emissivity wall wrap with antiglare.
- Thermoseal™Wall Breather: Light-duty polyweave laminate, single sided low emissivity wall wrap punched with tiny holes that allows air and vapour exchange.

3 EXECUTION

3.1 GENERAL

Bulk insulation

Installation: To AS 3999 and BCA J1.2.

AS 3999 includes vapour barriers used in conjunction with bulk insulation.

General: Firmly butt together fibre blankets or batts, with no gaps except as follows:

- Access openings and vents: Do not obstruct.
- Light fittings: To AS/NZS 3000 clause 4.5.
- Electrical cables: To AS 3999 clause 2.6.

The flow of electric current in cables generates heat which needs to dissipate to the surroundings. The insulation should not be installed to completely surround the cable.

Glass Wool and Rock Wool insulation: Conform to the
ICANZ Industry code of practice for the safe use of glass wool and rock wool insulation*Industry Code of Practice for safe use of Glass Wool and Rock Wool insulation*.

The ICANZ Industry code of practice for the safe use of glass wool and rock wool insulation*Industry Code of Practice for the Safe Use of Glass Wool and Rock Wool Insulation* has been jointly developed by AMWU, CFMEU, CEPU, and ICANZ (formerly FARIMA). Copies of the code are available from the respective unions, insulation manufacturers and ICANZ.

Pliable membrane

Installation: To AS/NZS 4200.2 and BCA J1.2 or BCA 3.12.1.1, as applicable.

General:

- Lap joins 150 mm and cascade so that water flows to gutter or building cavity.
- Continuously seal all penetrations, discontinuities and joints to achieve a vapour barrier.

Refer to AS/NZS 4200.2 Table 1 for duty classification, maximum spans and additional support. Refer to the ABCB Condensation in buildings handbook for information on condensation and use of vapour barriers, vapour permeable membranes and sarking.

3.2 FLOOR INSULATION

The following covers general applications for floor insulation. Delete applications not required and add other applications, as appropriate.

Under suspended framed floors – bulk insulation

Product type: Fibre batts.

Installation: Fit insulation tightly between framing members.

Existing homes: For extra support use Bradford Optimo Stayfast brackets, applied to the joist at 500 mm centres to help hold the batt in place.

New homes: Place Bradford Optimo Saddles over the joists before the floor is installed. If support is not otherwise provided, staple nylon twine to the framing and stretch tight.

AS 3999includes directives on fixing of insulation, often deferring to the manufacturer's recommendations on the type and spacing of fixing devices. Preferably show fixing details on the drawings.

Under suspended framed floors – rigid insulation

Product type: Rigid cellular extruded sheets.

Installation: [complete/delete]

Select from:

- To the underside of timber strip flooring butted tightly to joists.
- To the underside of timber joists butted tightly to bearers.

Check the selected product for fire hazard properties if the insulation is exposed.

Fixing: [complete/delete]

Select adhesive or mechanical fasteners.

Over suspended framed floors

Product type: Rigid cellular extruded sheets.

Installation: [complete/delete]

Select from:

- Over sheet flooring and between battens supporting a final flooring finish.
- Over sheet flooring with battens supporting a final flooring finish at door thresholds only. Provide cross references to the flooring and adhesive system.

Below concrete slab on ground

Product type: Rigid cellular extruded sheets.

Preparation: [complete/delete]

Sand blinding or working slab.

Laying pattern: Stretcher bond, with edges tightly butted.

Damp proof membrane: Lay over insulation.

Over concrete slab on ground

Product type: Rigid cellular extruded sheets.

Substrate preparation: Prepare substrates as follows:

- Clean and remove of any deposit or finish which may impair adhesion or location of insulation.
- Remove excessive projections.
- Voids and hollows > 10 mm with abrupt edges: Fill with a cement:sand mix not stronger than the substrate or weaker than the bedding.

Laying pattern: Stretcher bond, with edges tightly butted.

Fixing: Adhesive fixed directly to the concrete floor slab.

Subsequent finishes: [complete/delete]

Note separation strip, screed and finish, as appropriate.

Under suspended concrete slab – rigid insulation

Use where slab incorporates in-slab heating or the slab separates a conditioned space from an unconditioned space.

Product type: Fibre batts.

Fixing: Mechanical fasteners and support mesh or nylon twine.

Soffit finish: [complete/delete]

Select a finish to provide the desired appearance if exposed to view or if fire hazard properties are required.

Under suspended concrete slab – bulk insulation

Use where slab incorporates in-slab heating or the slab separates a conditioned space from an unconditioned space.

Product type: Fibre batts.

Fixing: Mechanical fasteners and support mesh or nylon twine.

Soffit finish: [complete/delete]

Select a finish to provide the desired appearance if exposed to view or if fire hazard properties are required.

3.3 WALL INSULATION

The following covers general applications for wall insulation. Delete applications not required and add other applications, as appropriate.

Framed wall thermal break strips

Product type: Proprietary item.

Application: To steel framing with lightweight external cladding.

R-Value: ≥ 0.2.

See BCA J1.5(c) and BCA 3.12.1.4(b).

Screw fixing: Button head screws at 1 m centres.

Adhesive fixing: Wallboard adhesive walnuts at 1 m centres.

Framed walls – bulk insulation

Product type: Fibre batts.

Installation: Friction fit between framing members. If other support is not provided, staple nylon twine to the framing and stretch tight.

AS 3999 includes directives on fixing of insulation often deferring to the manufacturer's recommendations on the type and spacing of fixing devices. Preferably show fixing details on the drawings.

Masonry veneer cavity walls

Product: Rigid cellular insulation board.

Application: To steel or timber framing.

Installation: Horizontally with the tongue to the top edge, pushed over prefixed wall ties and held firmly against the wall frame. Keep boards clean and dry and free from mortar and grout. Do not bridge the cavity.

Fixing: Hex head screws at 450 mm centres.

Flashings: Install flashings before installing insulation panels. Prevent entry of water behind the insulation boards.

If construction is required to be non-combustible check BCA Spec C1.10.

Masonry veneer cavity walls – pliable building membrane

Product: Enviroseal™ ProctorWrap vapour permeable pliable building membrane.

Application: Provide a vapour permeable membrane behind external facing material which may be subject to condensation forming on the internal face.

The primary function of the membrane is to direct any water that may penetrate the cladding, masonry veneer or exterior finish to the outside of the structure and act as barrier to draughts, wind driven rain and dust. There must be adequate provision for the draining, absorption or diffusion of moisture so that moisture is not left trapped between the membrane and the external cladding.

If used as reflective thermal insulation, an air space adjacent to the reflective (low emittance) face is required.

Refer to the ABCB Condensation in buildings handbook for information on condensation and use of vapour barriers, vapour permeable membranes and sarking.

Vapour permeable membranes provide long term high water holdout once installed behind cladding, but are not intended as a long term cladding during construction. Applications include:

- Boards fixed vertically or diagonally.
- Boards or planks fixed in exposed locations where wind driven rain can penetrate the joints.
- Unpainted or unsealed cladding.
- Masonry veneer.

Installation: Run the vapour permeable pliable building membrane horizontally on the outer face of external wall framing, over the flashing, from the bottom plate up. Pull taught (not tight) over the framing and fix to framing members. Seal across the wall cavity at the top.

Horizontal laps: At least 150 mm wide, lapped to make sure water is shed to the outer face of the membrane. End or vertical overlaps laps: At least 150 mm wide made over framing.

Openings: Run the vapour permeable pliable building membrane over the openings and leave covered until windows and doors are installed. Cut the membrane on a 45° diagonal from each corner of the opening, fold the flaps inside and fix to the inside frame of the opening. If the membrane is used to provide a continuous air tight layer, seal all joints with pressure sensitive adhesive tape compatible with the vapour permeable material.

A complete water tight seal that maintains vapour permeability is achieved at penetrations by installation of a proprietary fabricated corner piece.

Fixing: Install fasteners spaced at 300 mm intervals as follows, unless prevailing or expected wind conditions require additional fasteners to adequately secure the product prior to cladding:

Consider nominating stainless steel in areas of high corrosivity.

- Timber frames: Metallic-coated clouts, 20 mm long 6 to 8 mm staples or punched multi-point metallic-coated steel brads.
- Steel or aluminium frames: Hex head screws, with either 20 mm diameter washers or through hardboard strips.
- Plywood: Alternatives:
  . Metallic-coated clouts, 20 mm long 6 to 8 mm staples or punched multi-point metallic-coated steel brads at minimum 300 mm centres.

Product: Thermoseal™ reflective foil vapour barrier pliable building membrane.

Application: Provide a thermal contribution to the building system and restrict the flow of water vapour into the building when the internal environment is air conditioned.

Installation: Run the membrane horizontally on the outer face of external wall framing, over the flashing, from the bottom plate up. Pull taught (not tight) over the framing and fix to framing members. Seal across the wall cavity at the top.

Horizontal laps: At least 150 mm wide, lapped to make sure water is shed to the outer face of the membrane. End or vertical overlaps laps: At least 150 mm wide made over framing.

Openings: Run the membrane over the openings and leave covered until windows and doors are installed. Cut the membrane on a 45° diagonal from each corner of the opening, fold the flaps inside and fix to the inside frame of the opening. If the membrane is used to provide a continuous air tight layer, seal all joints with pressure sensitive adhesive tape compatible with the material.

Fixing: Install fasteners spaced at 300 mm intervals as follows, unless prevailing or expected wind conditions require additional fasteners to adequately secure the product prior to cladding:

Consider nominating stainless steel in areas of high corrosivity.

- Timber frames: Metallic-coated clouts, 20 mm long 6 to 8 mm staples or punched multi-point metallic-coated steel brads.
- Steel or aluminium frames: Hex head screws, with either 20 mm diameter washers or through hardboard strips.
- Plywood: Alternatives:
  . Metallic-coated clouts, 20 mm long 6 to 8 mm staples or punched multi-point metallic-coated steel brads at minimum 300 mm centres.

Full masonry – cavity wall blanket

Product: BRADFORD™ EzyCAV™ Residential Cavity Wall Blanket.

Application: To the inner masonry skin.

Installation: Install horizontally to the inner masonry skin with no spacers. Overlap sheet by 150 mm to cascade any water to the building cavity.

Fixing: Cut membrane at pre-installed brick ties and insert over brick tie to locate in position. Tape as required to retain against the inner masonry skin.

Full masonry – cavity walls

Product: Rigid cellular insulation board.

Application: To the inner masonry skin.

Installation: Horizontally with the tongue to the top edge and firmly against the inner masonry skin. Keep boards clean and dry and free from mortar and grout. Do not bridge the cavity.

Fixing: Proprietary plastic clips on pre-installed wall ties.

Flashings: Install flashings before installing insulation panels. Prevent entry of water behind the insulation boards.

Full masonry walls – internal face

Insulation fixed to the inner face of masonry walls may also be used for retrofitting of insulation to existing walls.

Product type: Rigid cellular extruded boards.

Preparation of substrates: Conform to the following:

- Remove any deposit or finish which may impair adhesion.
- Remove excessive projections and fill voids and hollows with plaster.
- Maximum surface deviation from a 2400 mm straightedge: 6 mm.

Substrate correction: Skim plaster.

Installation: Apply boards horizontally with staggered vertical joints, all close butted and without crushing.

Fixing: Proprietary adhesive compatible with the insulation. Apply sufficient pressure to evenly distribute adhesive.

If the construction is required to be non-combustible, see BCA Spec C1.10.

3.4 ROOF INSULATION

The following covers general applications for roof insulation. Delete applications not required and add other applications, as appropriate.

General

Location: The whole of the roof area including skylight shaft walls, except the following:

- Eaves, overhangs, skylights, vents and openings.
- Roofs to outbuildings, garages, and semi-enclosed spaces such as verandahs, porches and carports.

Amend if insulation is required in semi-enclosed spaces (balconies, verandahs) or ancillary buildings (garages, workshops, carports etc.).

Mesh support to roof insulation

Welded safety mesh may be required by WHS authorities for fall arrest. AS/NZS 4389, on welded safety mesh, is called up in the *0421 Roofing – combined* worksection. Coordinate.

Locations: Provide support to the following:

- Sarking, reflective thermal vapour barrier and vapour permeable pliable building membrane laid over roof framing members, as required by AS/NZS 4200.2 and the application, and the BCA.
- Blanket type thermal insulation laid over roof framing members and blanket type thermal insulation laid as sound insulation to metal roofing.

Wire safety mesh: Lay over the roof framing allowing only natural mesh sag between members to suit the application. Staple to timber frame, wire to steel frame.

Welded safety mesh: To AS/NZS 4389.

Metal roofs - pliable building membrane

Product: Enviroseal™ ProctorWrap vapour permeable pliable building membrane.

Recommended for colder climates where these membranes allow the escape of water vapour which can help reduce the risk of condensation forming inside the building and prevent the entry of liquid water.

Product: Thermoseal™ reflective foil vapour barrier pliable building membrane.

Recommended for warmer climates where these membranes can provide additional thermal performance as well as vapour barrier properties to reduce the entry of water vapour.

Installation: Lay sarking vertically over battens, perpendicular to the gutters with the reflective foil facing inwards toward the attic space (or green face outwards for vapour permeable building membranes), starting at one of the fascia boards and make sure 25 mm is draped into the gutter to facilitate drainage. Lay the sarking sagged slightly between battens to keep it away from the underside

of the roof sheet, but no more than 40 mm or what is required to facilitate drainage. Locate the sarking in position with staples and then install the roof sheet directly over the sarking. Tape overlaps between adjoining runs of sarking to prevent spillage of any water captured due to condensation or rain.

Any separate bulk thermal insulation should be placed on the cold side of the vapour barrier. AS 3999 clause 4.3 requires a vapour retarder (barrier) to be placed under blanket insulation installed over roof battens or purlins under metal roofing.

Tile roofs - pliable building membrane

Product: Enviroseal™ ProctorWrap vapour permeable pliable building membrane.

Recommended for colder climates where these membranes allow the escape of water vapour which can help reduce the risk of condensation forming inside the building and prevent the entry of liquid water.

Product: Thermoseal™ reflective foil vapour barrier pliable building membrane.

Recommended for warmer climates where these membranes can provide additional thermal performance as well as vapour barrier properties to reduce the entry of water vapour.

Installation: Lay sarking horizontally over rafters, parallel to the gutters with the reflective foil facing inwards toward the attic space (or green face outwards for vapour permeable building membranes), commencing at the gutter line with 25 mm draped into the gutter to facilitate drainage. Temporarily locate the sarking in position with a nail or screw prior to securing in place with the roof battens. Cascade subsequent layers of sarking by overlapping by 150 mm to shed water to the gutter and overlap the ridge by 150 mm each side.

Metal roofs – bulk insulation

Product: BRADFORD™ Anticon™.

Application: Suitable for metal roof deck or corrugated roof sheeting using Ashgrid or Safebridge® Roof Purlin system. Refer to Ashgrid or Safebridge® Roof Purlin system installation guides.

Installation: As follows:

- Fascia and gutter: Trim Anticon blanket flush at the edge of the external side of fascia where the gutter's back wall starts. Do not allow the blanket to drape into the gutter. This location is where the cladding will pinch the Anticon down onto the fascia top edge and close off the corrugated profile openings.

If the Anticon blanket is too long and allowed to drape into the gutter, rain/moisture may be drawn back onto the bulk insulation in the roof cavity. Moisture laden insulation may cause corrosion to the cladding and damage to the roof structure may occur – this will void the Product Warranty.

- Ridges: Install an Anticon blanket from opposing sizes over ridge. Extend the Anticon blanket over the ridge and abut an existing Anticon blanket on the other side. Make sure the foil portion of the blanket extends 150 mm crossing over a support member. Peel 150 mm of bulk insulation from existing blanket and trim off. Flap foil end to end laps in a cascading manner whilst ensuring bulk insulation abuts.
- Tears and penetrations: Seal with a contact pressure sensitive adhesive tape (such as PPC 493 72 mm wide tape) applied using a "squeegee" applicator tool to the underside of the foil. Provide additional cleaning of the foil membrane surface if sealing the tape from above when access is limited from below
- Hot flue penetrations: Provide 25 mm clearance between the Anticon blanket and any hot surface. Do not adhere tapes around a hot flue.

Waterproof membrane roofs – IRMA/PMR types

Roofs with insulating membrane protection are also known as IRMA (inverted roof membrane assembly) or PMR (protective membrane roof). Delete if specified in the *0411 Waterproofing – external and tanking* worksection.

Product type: Rigid cellular extruded sheets.

Preparation: Make sure membrane is clean and free of loose material.

Separation layer: Lay over membrane with edges lapped 300 mm and turned up at upstands and penetrations.

Specify separation layer in the *0411 Waterproofing – external and tanking* worksection, or delete if not required.

Installation: Lay insulation boards in brick pattern with shiplap edges pushed together firmly, cut neatly around penetrations and extend up upstands.

Finish: [complete/delete]

Specify a filter layer with 150 mm laps at right angles to the slope above the insulation boards, stone drainage layer, soil and planting in the appropriate worksections and nominate them in **CROSS REFERENCES**, **General**.

Cathedral ceiling insulation – metal roofing and roofing tiles

Product type: Roof sarking with bulk insulation batts.

Membrane installation: To AS/NZS 4200.2. Install the membrane with a sag sufficient to facilitate drainage (but not more than 40 mm), 150 mm lapped joins between sheets and over the ridge, and 25 mm draped over fascia board.

Bulk insulation installation: To AS 3999. Install the glass wool insulation batts between rafters avoiding contact with the underside of the sarking.

Alternatively detail cathedral ceiling construction to use Bradford bulk insulation and sarking products,

Ceiling insulation – bulk insulation

Product type:

- Framed ceilings: Fibre batts.
- Suspended ceiling: Fibre blanket.

Application: Over ceiling lining.

Installation:

- Batts: Fit tightly between framing members.
- Blankets: Butt joint and lay over ceiling panels or lining.

3.5 INDUSTRIAL ROOFING SYSTEMS

Spacers and support

Products: BRADFORD™ Ashgrid Roof Spacer system.

Installation: As follows:

- Install safety mesh before commencing.
- Lay Bradford Anticon roofing blanket (foil face down) onto the safety mesh. Avoid creasing or folding the blanket during installation so the foil appears smooth from within the building.
- Establish the start position for the bar based upon the roof design criteria and roof sheet manufacturer's specifications. Make sure that the first bar is orientated correctly, and that the first bracket is within 100 mm of the start of the bar.
- Position the Ashgrid Bar over the Anticon blanket directly over the centre line of each purlin below, compressing the Anticon blanket.
- Fix the Ashgrid brackets using screws specified for roofing. Cut bars as required to match the length of roof and coat cut edges with cold gal paint.
- When connecting the next Ashgrid bar make sure that the Safe-Loc bar connection tab fully engages with the square cut-out in the receiving bar before positioning the bar.

Products: BRADFORD™ Safebridge® Roof Purlin System.

Installation as follows:

- Install the bridging. Telescopic bridge bars fit all purlin spacing and the punched Safebridge® Roof Purlin System keyway accepts bridge bars from each side.
- Screw off the bridging. Bridge bar fixing uses a standard Metal-Tek screw through both bars, and final screw in centre of bridge bar secures the system.
- Attach wire to bridging. Tie safety mesh to the bridge with no side lap joints.

This reduces installation time as well as the overall amount of material required as the mesh does not need to cover the purlin and overlap by 150 mm.

- Pull wire on wire pulley.

Improved safety is achieved by utilising a unique 'trolley system' to lay the safety mesh between the purlins. This allows workers to remain safely secured below the roof surface, rather than above it on the open roof.

- Attach wire to bridging.

The area is now safe with fall protection installed.

- Roll thermal breath tape along the purlin to prevent thermal bridging.
- Roll out insulation.

Safety wire and insulation components are cradled within the purlins, leaving the purlins visible as a working surface/footing area.

Insulation

Product: BRADFORD™ Anticon™

Installation: Refer to **ROOF INSULATION**.

3.6 COMPLETION

Warranties

Insulation and pliable membranes: Submit the CSR BRADFORD published product warranties.

Use only where warranties extending beyond the defects liability period are available for the particular system. Insert the required warranty period and terms, which should be negotiated beforehand. If the warranty is in the form of separate material and installation warranties, require the signatures of both manufacturer and installer. If specifying other warranties add as required.

Warranty: Provide the following warranties:

- Ashgrid: Bradford Spacer Warranty Ashgrid Issue B.
- Anticon: Bradford Commercial Class 2 to 9 Product Warranty v2.
- Form of warranty: [complete/delete]

The form(s) required should be provided as part of the contract documentation.

4 SELECTIONS

Schedules are a way of documenting a selection of proprietary or generic products or systems by their properties. Indicate their locations here and/or on the drawings. Refer to NATSPEC TECHnote GEN 024 for guidance on using and editing schedules.

4.1 FLOOR INSULATION

Under framed suspended floors

Product: BRADFORD™ Optimo™ Underfloor

R-value: [complete/delete]

Refer BRADFORD design guide for information on thermal performance and select R-value for open or enclosed floor space.

Application: Between floor joists.

Location: [complete/delete]

Describe the location or refer to drawings.

Concrete slabs

Property	**A**	**B**	**C**
Application			
Type/Product			
Location			
R-Value			
Thickness (mm)			
R_w rating			
Compressive strength (kPa)			
Rigid cellular sheet class			

A, B, C: These designate each instance or type of the item scheduled. Edit to align with the project's codes or tags.

Edit codes in the **Schedule** to match those on drawings.

Application: Select from the following:

- Over suspended framed floor.
- Below concrete slab on ground.

- Over concrete slab on ground.
- Under suspended concrete slab.

Type/Product: Nominate product or select from the following types:

- Bulk insulation.
- Semi rigid sheets with heavy duty pliable membrane.
- Pliable membrane (foil) faced blanket.
- Rigid cellular extruded sheets. Check the selected product for fire hazard properties if the insulation is exposed.

Location: Describe location or show on the drawings, e.g. Under the entire slab or 1200 mm to the perimeter at two board widths wide.

Thickness (mm): Nominate insulation thickness required to achieve the R-Value.

R_w rating: If the insulation is required to contain or exclude noise. For weighted sound reduction index (R_w) rating, see AS/NZS ISO 717.1. Refer to NATSPEC TECHnote DES 032 for information on airborne sound insulation. The BCA cites ISO 717-1:1996 and AS/NZS 1276.1 for testing of construction required to have a certain R_w rating.

Compressive strength (kPa): Refer to structural engineer and product manufacturer for advice.

Rigid cellular sheet class: Refer to AS 1366 series for information on the classification of rigid cellular sheet insulation, e.g. for rigid (moulded and extruded) cellular polystyrene AS 1366.3 Class SL (marked with a yellow colour stripe), or AS 1366.4 Class I (marked on each board).

4.2 WALL INSULATION AND PLIABLE MEMBRANES

Framed walls with cladding

Product: BRADFORD™ Gold Insulation.

R-Value: [complete/delete]

Refer BRADFORD design guide for information on thermal performance and select R-Value for open or enclosed floor space.

Thickness: [complete/delete]

Application: Between wall studs.

Location: [complete/delete]

Describe the location or refer to drawings.

Masonry veneer cavity walls

Product: BRADFORD™ Gold Insulation.

R-Value: [complete/delete]

Refer BRADFORD design guide for information on thermal performance and select R-Value for open or enclosed floor space.

Thickness: [complete/delete]

Application: [complete/delete]

Location:[complete/delete]

Describe the location or refer to drawings.

Full masonry walls

Product: BRADFORD™ EzyCAV™ Residential Cavity Wall Blanket.

R-Value: [complete/delete]

R_M is 0.45. R_T can be calculated when air space is defined.

Refer BRADFORD design guide for information on thermal performance and select R-Value for open or enclosed floor space.

Thickness: 15 mm.

Application: To manufacturer's recommendations.

Location: [complete/delete]

Describe the location or refer to drawings.

Vapour permeable pliable building membrane

Product: Enviroseal™ ProctorWrap.

Duty to AS/NZS 4200.1: [complete/delete]

Refer to BRADFORD design guide.

Vapour barrier classification to AS/NZS 4200.1: [complete/delete]

For vapour permeable membranes, select a low classification.

Water barrier classification to AS/NZS 4200.1: High.

Location: [complete/delete]

Describe in relation to other building elements or refer to details. A vapour barrier should be placed on the warm side of bulk insulation.

Vapour barrier pliable building membrane

Product:BRADFORD™ Thermoseal™.

Duty to AS/NZS 4200.1: [complete/delete]

Refer to BRADFORD design guide.

Water barrier classification to AS/NZS 4200.1: [complete/delete]

Select high or unclassified.

Emittance classification to AS/NZS 4200.1:[complete/delete]

Select from Double sided reflective, Reflective or Non-reflective.

Location:[complete/delete]

4.3 CEILING INSULATION

Cathedral ceilings

Product: BRADFORD™ Gold Insulation.

R-Value: [complete/delete]

Refer to BRADFORD design guide for information on thermal performance.

Thickness: [complete/delete]

Application: [complete/delete]

Location:[complete/delete]

Describe the location or refer to drawings.

Suspended ceilings

Product: BRADFORD™ Gold Insulation.

R-Value:[complete/delete]

Refer to BRADFORD design guide for information on thermal performance.

Thickness:[complete/delete]

Application:[complete/delete]

Location:[complete/delete]

Describe the location or refer to drawings.

4.4 ROOF INSULATION AND PLIABLE MEMBRANES

Industrial roofing systems

Roof spacers: BRADFORD™ Ashgrid Roof Spacer system.

Roof purlin system: BRADFORD™ Safebridge® Roof Purlin System.

SafeBridge® Roof Purlin System is a unique, patented system that combines roof safety with BCA Section J compliance without the use of roof spacers. Delete roof spacers if specifying SafeBridge® Roof Purlin System.

Insulation: BRADFORD™ Anticon™.

R-Value:[complete/delete]

Refer BRADFORD design guide for information on thermal performance.

Thickness: [complete/delete]

Refer BRADFORD design guide for information on thermal performance.

Facing: [complete/delete]

Refer BRADFORD design guide for information on thermal performance. Select from Heavy-duty, medium duty, light-duty, antiglare and perforated foil.

Location:[complete/delete]

Describe the location or refer to drawings.

Concrete roof slabs

Property	A	B	C
Application			
Type/Product			
Location			
R-Value			
Thickness (mm)			
R_w rating			
Rigid cellular sheet class			

A, B, C: These designate each instance or type of the item scheduled. Edit to align with the project's codes or tags.

Edit codes in the **Schedule** to match those on drawings.

Application: Select from the following:

- Waterproof membrane roofs.
- Under suspended concrete slab.

Type/Product: Nominate product or select from the following types:

- Rigid cellular extruded sheets. Check the selected product for fire hazard properties if the insulation is exposed.

Location: Describe location or show on the drawings.

Thickness (mm): Nominate insulation thickness required to achieve the R-Value.

R_w rating: If the insulation is required to contain or exclude noise. For weighted sound reduction index (R_w) rating, see AS/NZS ISO 717.1.Refer to NATSPEC TECHnote DES 032 for information on airborne sound insulation.

Rigid cellular sheet class: Refer to AS 1366.3 series for information on the classification of rigid cellular sheet insulation, e.g. for rigid (moulded and extruded) cellular polystyrene AS 1366.3 Class SL (marked with a yellow colour stripe), or AS 1366.4 Class I (marked on each board).

Vapour permeable pliable building membranes

Product: Type: BRADFORD™ Enviroseal™.

Duty to AS/NZS 4200.1: [complete/delete]

Refer to BRADFORD design guide.

Vapour barrier classification to AS/NZS 4200.1: [complete/delete]

For vapour permeable membranes, select a low classification.

Water barrier classification to AS/NZS 4200.1: High.

Location:[complete/delete]

Describe in relation to other building elements or refer to details. A vapour barrier should be placed on the warm side of bulk insulation.

Vapour barrier pliable building membranes

Product:BRADFORD™ Thermoseal™.

Duty to AS/NZS 4200.1: [complete/delete]

Refer to BRADFORD design guide.

Water barrier classification to AS/NZS 4200.1: [complete/delete]

Select high or unclassified.

Emittance classification to AS/NZS 4200.1: [complete/delete]

Select from Double sided reflective, Reflective or Non-reflective.

Location:[complete/delete]

Describe the location or refer to drawings.

REFERENCED DOCUMENTS

The following documents are incorporated into this worksection by reference:

AS 1366		Rigid cellular plastics sheets for thermal insulation
AS 1366.1	1992	Rigid cellular polyurethane (RC/PUR)
AS 1366.2	1992	Rigid cellular polyisocyanurate (RC/PIR)
AS 1366.3	1992	Rigid cellular polystyrene - Moulded (RC/PS - M)
AS 1366.4	1989	Rigid cellular polystyrene - Extruded (RC/PS-E)
AS 1530		Methods for fire tests on building materials, components and structures
AS 1530.2	1993	Test for flammability of materials
AS/NZS 1530.3	1999	Simultaneous determination of ignitability, flame propagation, heat release and smoke release
AS/NZS 1859		Reconstituted wood-based panels - Specifications
AS/NZS 1859.4	2004	Wet-processed fibreboard
AS/NZS 3000	2007	Electrical installations (known as the Australian/New Zealand Wiring Rules)
AS 3999	2015	Bulk thermal insulation - Installation
AS/NZS 4200		Pliable building membranes and underlays
AS/NZS 4200.1	1994	Materials
AS/NZS 4200.2	1994	Installation requirements
AS/NZS 4389	2015	Safety mesh
AS/NZS 4859		Materials for the thermal insulation of buildings
AS/NZS 4859.1	2002	General criteria and technical provisions
BCA 3.12.1.1	2016	Acceptable construction - Energy efficiency - Building fabric - Building fabric thermal insulation
BCA A2.4	2016	General Provisions - Acceptance of design and construction - Fire hazard properties
BCA Section J	2016	Energy efficiency
BCA J1.2	2016	Energy efficiency - Building fabric - Thermal construction - General
ICANZ	2003	Industry code of practice for the safe use of glass wool and rock wool insulation
ASTM E96/E96M	2016	Standard Test Methods for Water Vapor Transmission of Materials

The following documents are mentioned only in the *Guidance* text:

AS ISO 717		Acoustics - Rating of sound insulation in buildings and of building elements
AS/NZS ISO 717.1	2004	Airborne sound insulation
AS/NZS 1276		Acoustics - Rating of sound insulation in buildings and of building element
AS/NZS 1276.1	1999	Airborne sound insulation
AS 1366		Rigid cellular plastics sheets for thermal insulation
ABCB Condensation	2014	Condensation in buildings handbook
BCA 3.12.1	2016	Acceptable construction - Energy efficiency - Building fabric
BCA 3.12.1.4	2016	Acceptable construction - Energy efficiency - Building fabric - External walls
BCA Spec C1.10	2016	Fire resistance - Fire hazard properties
BCA J1.5	2016	Energy efficiency - Building fabric - Walls
NATSPEC DES 003	2006	Fire hazard properties of insulation and pliable membranes
NATSPEC DES 004	2005	Air, moisture and condensation
NATSPEC DES 015	2007	BCA - NCC Volume One Energy efficiency provisions
NATSPEC DES 020	2011	Fire behaviour of building materials and assemblies
NATSPEC DES 031	2014	Specifying R-Values
NATSPEC DES 032	2014	Airborne sound insulation
NATSPEC GEN 006	2007	Product specifying and substitution
NATSPEC GEN 024	2015	Using NATSPEC selections schedules
NATSPEC PRO 002	2006	Mineral wool
NATSPEC TR 01	2016	Specifying ESD
BS 5250	2011	Code of practice for control of condensation in buildings
ASTM C168	2015	Standard Terminology Relating to Thermal Insulation
ISO 717		Acoustics - Rating of sound insulation in buildings and of building elements
ISO 717-1	1996	Airborne sound insulation
ISO 9229	2007	Thermal insulation - Vocabulary