

4201HM JAMES HARDIE MONOLITHIC CLADDING

Masterspec sections must be customised to suit the project being specified, by removing irrelevant information and adding project-specific information and selections.

1. GENERAL

This section relates to the supply and fixing of fibre cement flush finish cladding:

- James Hardie Monotek[®] Sheet for textured coating systems
- James Hardie HardiBacker[®] Substrate for plaster systems
- James Hardie Villaboard[®] soffit lining
- James Hardie selected soffit lining

Modify or extend the above description to suit the project being specified.

Where the cladding manufacturer prepares bracing schedules for their products, these lists should be used in preference to preparing your own bracing schedules. Include them either in the specification or on the drawings. This approach ensures the industry becomes familiar with one set of terminology for bracing elements.

While flush jointing is included here, cross-reference to either PAINTING or to DECORATIVE COATINGS, when joint finishing is being applied as part of an exterior coating system.

1.1 DOCUMENTS REFERRED TO

Documents referred to in this section are:

NZBC E2/AS1	External moisture, 9.0 Wall claddings
AS/NZS 1170.2	Structural design actions - Wind actions
AS/NZS 2908.2	Cellulose-cement products - Flat sheet
NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber framed buildings
NZS 4203	General structural design and design loadings for buildings

Documents listed above and cited in the clauses that follow are part of this specification. However, this specification takes precedence in the event of it being at variance with the cited document.

Delete from the DOCUMENTS clause any document not cited. List any additional cited documents.

RELATED DOCUMENTS:

Refer to the following related documents when preparing this section:

- NZBC E2/AS1 External moisture*
- BRANZ Bulletin 353 Ground clearances*
- BRANZ Bulletin 393 Powder-actuated and mechanically powered fasteners*
- BRANZ Bulletin 407 Walls on exposed sites*
- BRANZ Bulletin 424 Measuring moisture on building sites*
- BRANZ Bulletin 448 Domestic flashing installation*
- BRANZ Bulletin 449 Keeping water out – Timber-framed walls*
- BRANZ Bulletin 453 Fasteners selection*
- BRANZ Bulletin 467 Principles of flashing design*
- BRANZ publication Selecting wall claddings*
- BRANZ publication Good texture-coated fibre cement practice*

1.2 MANUFACTURER'S DOCUMENTS

James Hardie documents relating to work in this section are:

- Monotek[®] Sheet technical specification
- HardiBacker[®] Substrate technical specification
- Eaves and Soffit Linings installation manual
- BRANZ Appraisal certificate No. 466 (2005) Monotek[®] sheet - cavity construction

Copies of the above literature are available at

Web: www.jameshardie.co.nz

Telephone: Ask James Hardie[™] on 0800 808 868.

It is important to ensure that all personnel on site have access to accurate, up to date technical information on the many products, materials and equipment used on a project. In most cases individual products are not used in isolation, but form part of a building process. Also a particular manufacturer's and/or supplier's requirements for handling, storage, preparation, installation, finishing and protection of their product can vary from what might be considered the norm. Access to technical information can help overcome this potential problem.

Requirements

- 1.3 NO SUBSTITUTIONS
Substitutions are not permitted to any specified system, or associated components and products.

Performance

Note that in using the next clause you are setting a standard of performance for the contractor to meet. Specifiers should therefore consider adding some means of confirming (say by testing or certification) that the performance criteria will be or have been met.

- 1.4 FIXINGS, WIND
Design and use the fixings appropriate for the wind zone (R) and topographical classification (T) of this site and building height; as required by NZS 3604 and the wind loads on various wall areas as given by NZS 4203 or AS/NZS 1170.
Modify this clause depending on whether NZS 3604 AS/NZS 1170 or NZS 4203 is being used as a design basis for the project.

2. PRODUCTS

Materials

- 2.1 BUILDING WRAP
Breather type to NZBC E2/AS1, Table 23: Properties of roof underlays and building wraps.
Building wraps are only suitable to withstand low wind pressures. Check the design wind pressures for the project and make the appropriate selection.
- 2.2 EXTERIOR CAVITY BATTENS
Radiata pine battens, minimum 45 mm wide x 18 mm thick, H3.1 treated, height to match timber framing studs. To NZS 3602, Table 1, reference 1D.10, Requirements for wood-based building components to achieve a 50-year durability performance.
- 2.3 EXTERIOR CAVITY VERMIN-PROOFING
Perforated uPVC, with upstands.
Vermin-proofing to NZBC E2/AS1: clause 9.1.8.3 and figure 66.
- 2.4 MONOTEK SHEET
James Hardie Monotek[®] Sheet, resistant to damage from water and moisture, manufactured from treated cellulose fibre, Portland cement, sand and water and cured by high pressure autoclaving manufactured to AS/NZS 2908.2.
- 2.5 HARDIBACKER SUBSTRATE SHEET
James Hardie HardiBacker[®] Substrate, 4.5 mm thick manufactured from treated cellulose fibre, Portland cement, sand and water and cured by high pressure autoclaving manufactured to AS/NZS 2908.2.
- 2.6 FLUSH JOINTED SOFFIT LINING
James Hardie Villaboard[®] Lining 6 mm and 9 mm thick manufactured from treated cellulose fibre, Portland cement, sand and water, cured by high pressure autoclaving and manufactured to AS/NZS 2908.2.
Refer to Eaves and Soffit Linings installation manual for further details.
- 2.7 SOFFIT LINING
James Hardie 4.5 mm Hardisoffit[®] Lining, HardiFlex[®] Eaves Lining, Silkline[®] Soffit Lining Eclipsa[™] Eaves Lining and 6mm HardiFlex[®] Lining soffit manufactured from treated cellulose fibre, Portland cement, sand and water and cured by high pressure autoclaving manufactured to AS/NZS 2908.2.
Refer to Eaves and Soffit Linings installation manual for further details.

Components

- 2.8 FASTENER TYPE
Fasteners to minimum durability requirements of the NZBC. Refer to NZS 3604, section 4 Durability, for requirements for fixing's material to be used in relation to the exposure conditions.

Exposure conditions & nail selection prescribed by NZS 3604, section 4, table 4.3 Steel items such as nails and screws used for framing and cladding.

Sea Spray Zones*	Zone 1 outside sea spray zone and Zones 2 - 4 & Geothermal hot spots	Bracing - All zones
Grade 316 Stainless	Hot-dipped galvanized or 316 stainless	Grade 316 Stainless

* Zone 1 areas where local knowledge dictates that increased durability is required, appropriate selection shall be made

Refer to NZBC E2/AS1, Table 20, Material selection, and Table 21, Compatibility of materials in contact, for selection of suitable fixing materials and their compatibility with other materials.

- 2.9 GALVANIZED NAILS
Hot dip galvanized HardiFlex® nails:
60 mm x 3.15 mm diameter or 40 mm x 2.8 mm diameter.
Select galvanized or stainless steel depending on exposure conditions.
- 2.10 STAINLESS STEEL NAILS
316 stainless steel HardiFlex® nails:
60 mm x 3.15 mm diameter or 40 mm x 2.8 mm diameter.
Select galvanized or stainless steel depending on exposure conditions.
- 2.11 SOFFIT JOINTERS AND CAPPING MOULDS
Extruded PVC jointer, 2 way jointer, capping and scotia mould.

Accessories

- 2.12 SEALING STRIPS
Inseal® 3259, 1.5 mm thick black compressible medium density closed cell foam tape.
Inseal® 3109, 10 mm x 19 mm
Polypropylene DPC
Butyl rubber flashing tape 50 mm x 1 mm
- 2.13 SEALANT
Fosroc MS sealant or similar. Refer to the sheet manufacturer's technical literature for selection and use requirements.

3. EXECUTION

Conditions

- 3.1 GENERAL
Keep sheets dry and under cover whilst in storage or during the installation. Framing moisture must not exceed maximum 24% prior to sheet installation. Keep framing dry once sheet fixing commences.
- 3.2 STORAGE
Take delivery of sheets dry and undamaged in pallets and lay horizontally on a smooth level surface. Protect edges and corners from damage and cover to keep dry until fixed.
- 3.3 HANDLING
Avoid distortion and contact with potentially damaging surfaces. Do not drag sheets across each other, or across other materials. Protect edges, corner and surface finish from damage.

- 3.4 SUBSTRATE
Do not commence work until the substrate is of the standard required by the sheet manufacturer for the specified finish; plumb, level and in true alignment. Moisture content of timber framing must not exceed the requirements specified by NZS 3602 to minimise shrinkage and movement after sheets are fixed.

Application – Monotek® Sheet

- 3.5 PENETRATIONS AND FLASHINGS
Confirm that exterior wall openings have been prepared ready for the installation of all window and door frames and other penetrations through the cladding. Required preparatory work includes the following:
- Building wrap appropriately incorporated with penetration and junction flashings.
 - Materials lapped in a way that water tracks down to the exterior face of the building wrap.
 - Wall cladding underlay/building wrap to openings finished and dressed off ready for the installation of window and door frames and other penetrations
 - Claddings neatly finished off to all sides of openings
 - Installation of flashings (those required to be installed prior to installation of penetrating elements).

Refer to James Hardie technical specification for information on window details. Also refer to the Windows Association of New Zealand website (www.wanz.org.nz) for information on the WANZ WIS Window Installation System. This covers the WANZ recommendations on the preparation of window/door openings, minimum clearances between rough openings and the window/door frame, dressing of the wall wrap into the prepared opening, application of flexible flashing tape to the sill and top corners of the opening, installation of window/door frames and flashings, sealing of the window/door frame into the opening to create a pressure equalisation cavity, installation of flashings and the maintenance of appropriate clearances between the frame and the surrounding construction.

- 3.6 INSTALL CAVITY BATTENS
Install 18 mm minimum thick cavity battens to NZBC E2/AS1: 9.0 Wall claddings, where required. Fix vertical cavity battens to wall framing studs. The battens are fixed by the cladding fixings which will penetrate the wall framing studs over the building wrap. Seal the top of the cavity and install vermin-proofing at base.
Do not use horizontal cavity battens. Use cavity spacers where fixing is required between cavity battens.
- Note that it is important that the openings in the vermin proofing are kept clean and unobstructed in order to maintain drainage and venting of the cavity.*

- 3.7 SHEET LAYOUT
Check framing layout to facilitate the construction of control joints prior to sheet installation.
- All sheet edges must be supported by the framing.
 - All sheets must be fixed vertically.

- 3.8 GENERAL
The Monotek® Sheets are supplied with 2 recessed edges. When the sheets are cut on site to suit the site requirements, the sheet edge cut on site must be recessed for flush jointing. Control joints are formed with square sheet edges.

- 3.9 SEAL CUT EDGES
Seal site cut sheet edges prior to installation. Seal sheet edges around window and door openings, meter boxes and at other penetrations.

- 3.10 FASTENER - SIZE & LAYOUT
Fix Monotek® Sheets to framing using the fixings as specified below and in accordance with the following:
- Nails must have a minimum clearance of 12 mm from sheet edges and a minimum of 75 mm vertically and 150 mm horizontally from sheet corners.
 - The sheets must have a gap of 1-2 mm at all flush finished joints.
 - Nails must finish flush with the sheet surface.

- 3.11 SHEET FIXING
 Direct fixed to frame: 40 mm x 2.8 mm HardiFlex® nails
 Fix Sheet @150 mm centres at all sheet edges as well as all intermediate framing.
 Cavity construction: 60 mm x 3.15 mm HardiFlex® nails
 Fix sheet @ 200 mm centres at all studs. Fix sheet @ 150 mm centres at top plate and bottom plate.
Special fixing arrangements are required for bracing and fire-resistance rated wall systems. For more information Ask James Hardie™ on 0800 808 868.

- 3.12 GUN NAILING
 Monotek® Sheet can be fixed using nail guns. The gun nails used must have a full round head to provide the required holding power. The length and gauge of nails must at a minimum be as specified in the James Hardie Monotek® Sheet technical specification.
Check with nail gun manufacturer for more information. Note: Do not use D Head nails. Do not use gun nailing for bracing applications.

Application - particular installations

- 3.13 FIRE RESISTANCE RATING, FIBRE CEMENT
 Install mineral fibre insulation or glass fibre insulation fitted tightly in the timber framing cavity. Apply fire retardant building paper to the exterior face of the framing and fix fibre cement cladding and lining sheets, direct or on cavity. Refer to James Hardie Fire and Acoustic technical specification.

- 3.14 BRACING SYSTEM
 Fix sheets in accordance with James Hardie technical information.
Refer to James Hardie technical data for further information and guidance. Refer also to any bracing schedules or drawings.

Application - generally

- 3.15 FIX BUILDING WRAP
 Run and fix building wrap in full height rolls to wall framing, with fixing and end laps to NZS 3604 and the wrap manufacturer's requirements and with the wrap not damaged in any way.

- 3.16 FLUSH JOINTS
 Monotek® Sheets must have a gap of 1 - 2 mm when joining them together for the flush joints.
- Flush joint Monotek® Sheets with a proprietary flush jointing plaster system.
 - Where a flush horizontal joint and a vertical control joint coincide on the wall, the vertical control joint must extend to full height of the wall.
 - Do not locate flush joints on the corners of openings or at other high stress locations. Set flush joint off from the corners of opening by 200 mm minimum.
 - Do not locate flush joints along floor joists.
 - For direct fixed applications use a flashing tape, 50 mm x 1.0 mm butyl rubber or polypropylene DPC under the flush joint.

- 3.17 CONTROL JOINTS
 Control joints are required as detailed below. Flush finish joints are not control joints. Control joints are necessary to accommodate the minimal differential movement between framing and sheets due to normal cyclic changes in the environment.

Vertical: 5.4 metre centres maximum and at all internal corners.
 (standard detail is a control joint)
 Horizontal: At all floor joist locations
 (Standard details are control joints); and
 5.4 metre centres maximum.
 (Full height, continuous studs noggged at flush joint)

3.18 VERTICAL CONTROL JOINT
Provide vertical control joints at a maximum spacing of 5.4 metres from other control joints, the edge of the cladding, expansion joints or internal and external corners. Vertical control joints may occur at the edge of window or door openings. Vertical control joints may be staggered across horizontal control joints.

3.19 HORIZONTAL CONTROL JOINT
At floor joist level, in addition to the movements outlined above, provide horizontal control joints to accommodate the movement resulting from timber joist shrinkage. Horizontal control joints must be provided at all solid timber floor joists. Elsewhere horizontal control joints are required at a maximum spacing of 5.4 metres where the studs are running full height.

Provide expansion joints to accommodate structural movement. They are generally only required for larger commercial buildings, and such buildings are outside the scope of this literature. Appropriate joint design shall be undertaken for the application.

3.20 OPENINGS
Flash openings in the cladding to prevent moisture ingress in to the wall. Do not locate horizontal and vertical flush joints along the sides of windows and doors. Locate these minimum of 200 mm from the corner of an opening or change in the height of the wall when required.

Finishing

3.21 PREPARATION FOR FINISHING
Keep Monotek® Sheets dry and free from dirt before jointing and texture coating. Monotek® Sheets must be texture coated within 90 days of installation.

Protective texture coating of Monotek® Sheet is required in order to meet the durability requirements of the New Zealand Building Code. All sealants must be demonstrated to meet the relevant requirements of the NZBC.

3.22 SEALANTS
Check with sealant manufacturer prior to coating over sealants that sealants are compatible with coating system
All sealants must be demonstrated to meet the relevant requirements of the NZBC. Application and use of sealants must comply with manufacturer's instructions and be compatible with texture coating. Some sealant manufacturers do not recommend coating over their product.

3.23 JOINTING & TEXTURE COATING
Refer to SELECTIONS for coating.
The light reflectance value (LVR) for coatings used with Monotek® Sheet cladding must be 40% minimum or higher. Jointing and cladding systems must comply with EM4 and meet the requirements of the NZBC acceptable solution E2/AS1.

Application – HardiBacker® Substrate

3.24 PENETRATIONS AND FLASHINGS
Confirm that exterior wall openings have been prepared ready for the installation of all window and door frames and other penetrations through the cladding. Required preparatory work includes the following:

- Building wrap appropriately incorporated with penetration and junction flashings.
- Materials lapped in a way that water tracks down to the exterior face of the building wrap.
- Wall cladding underlay/building wrap to openings finished and dressed off ready for the installation of window and door frames and other penetrations
- Claddings neatly finished off to all sides of openings
- Installation of flashings (those required to be installed prior to installation of penetrating elements).

Refer to James Hardie technical specification for information on window details. Also refer to the Windows Association of New Zealand website (www.wanz.org.nz) for information on the WANZ WIS Window Installation System. This covers the WANZ recommendations on the preparation of window/door openings, minimum clearances between rough openings and the window/door frame, dressing of the wall wrap into the prepared opening, application of flexible flashing tape to the sill and top corners of the opening, installation of window/door frames and flashings, sealing of the window/door frame into the opening to create a pressure equalisation cavity, installation of flashings

and the maintenance of appropriate clearances between the frame and the surrounding construction.

3.25 INSTALL CAVITY BATTENS

Install 18 mm minimum thick cavity battens to NZBC E2/AS1: 9.0 Wall claddings, where required. Fix vertical cavity battens to wall framing studs. The battens are fixed by the cladding fixings which will penetrate the wall framing studs over the building wrap. Seal the top of the cavity and install vermin-proofing at base.

Do not use horizontal cavity battens. Use cavity spacers where fixing is required between cavity battens.

Note that it is important that the openings in the vermin proofing are kept clean and unobstructed in order to maintain drainage and venting of the cavity.

3.26 SHEET LAYOUT

- Support all sheet edges by the framing.
- Fix HardiBacker[®] Substrate vertically.

3.27 BRACING SYSTEM

Fix sheets in accordance with James Hardie technical information.

Refer to James Hardie technical data for further information and guidance. Refer also to any bracing schedules or drawings.

3.28 VERTICAL SHEET JOINT

Provide 3 mm gap between HardiBacker[®] Substrate sheets at vertical sheet joints, or internal and external corners.

3.29 STUCCO VERTICAL CONTROL JOINT

Provide control joints to take up any shrinkage or movement of the stucco plaster finish. Refer HardiBacker Substrate technical specification, Figure 6, Vertical stucco control joint

Provide a vertical control joint at a maximum of 4 metres to NZS 4251.1 clause 2.1.9

Control joints:

- At all internal and external corners the mesh and plaster is to be continuous around the corners, control joints are not required.
- Locate control joints at 4 metre maximum from the corners.
- Control joints may be located in the vicinity of window or door opening.
- Position the control joints so they are hidden by the building features where possible.
- Vertical sheet joints do not need to coincide with plaster control joints.

Refer to BRANZ 'Weathertight Solution Volume 2' (2004) for further information.

3.30 HORIZONTAL CONTROL JOINT

Provide horizontal control joints at floor joist levels to accommodate the movements resulting due to timber joist shrinkage or settlement.

Locate horizontal control joints at 4 metres maximum to NZS 4251.1 clause 2.1.9 Control joints.

Provide a cavity drained out to the exterior after every two floor levels to NZBC E2/AS1 clause 9.1.9.4 Inter-storey junctions. Use a purpose made stainless steel, powder-coated aluminium, powder-coated hot dipped galvanized steel or hot dipped galvanized steel 'Z' flashing to form a horizontal joint. Refer HardiBacker[®] Substrate technical specification, figure 13, Horizontal drainage joint.

Where draining to the exterior is not required the James Hardie uPVC 'h' mould is used to form a horizontal joint. Refer HardiBacker[®] Substrate technical specification, figure 14, Horizontal control joint.

Zinc/aluminium uncoated steel is not suitable as it deteriorates in contact with Portland cement.

3.31 EXPANSION JOINT

Provide expansion joints to accommodate or allow structural movements.

Provide vertical structural expansion joints at maximum 12 metres.

They are generally required for larger commercial buildings only, and such buildings are outside the scope of this literature. Appropriate joint design shall be undertaken for this situation.

- 3.32 FASTENER - SIZE & LAYOUT
Nail fix HardiBacker® Substrate to timber as follows:
- Use 60 mm x 3.15 mm HardiFlex® fibre cement nails.
 - Nail at 200 mm centres on studs.
 - Nail at 150 mm centres on top plate and bottom plate.
 - Drive nails minimum of 12 mm from the sheet edges and 75 mm minimum from corners.
 - Nails must finish flush with the sheet surface.
- The special fixing arrangements are required for bracing systems – For more information Ask James Hardie™ on 0800 808 868.*

Application - soffits

- 3.33 INSTALL SOFFIT SHEETS
Cut sheets dry and scribe fit to fully support all edges and joints. Nail and insert PVC fasteners to James Hardie requirements. Fit complete with colour matched jointers and capping moulds. Refer to Eaves and Soffit Linings installation manual.
- 3.34 INSTALL FLUSH JOINTED SOFFIT SHEETS
Cut sheets dry, and scribe fit to fully support all edges and joints. Fit expansion joints to limit finished areas to 9 metre x 6 metres for large soffits or 7.2 metres for narrow soffits. Flush joints with James Hardie Base coat, paper reinforcing tape and James Hardie Top Coat to flush width of 150 mm. Refer to Eaves and Soffit Linings installation manual.

Completion

- 3.35 REPLACE
Replace all damaged or marked elements.
- 3.36 LEAVE
Leave work to the standard required for following procedures.
- 3.37 REMOVE
Remove debris, unused materials and elements from the site.

4. SELECTIONS

- 4.1 CLADDING SYSTEM
- Brand/type: James Hardie Monotek® Sheet
Thickness: ~ mm
Fixing system: ~
Fastener type: ~
Finish type: Refer to ~ for details
Thickness options: 7.5 mm, 9 mm
Fixing systems: Direct fix, Cavity construction
Fastener types: Screw, Nail Stainless steel, Galvanized
- 4.2 SUBSTRATE SYSTEM
- Brand/type: James Hardie HardiBacker® Substrate
Thickness: 4.5 mm
Fixing system: Cavity construction
Fastener type: ~
Plaster finish: Refer to ~ for details
Fastener types: Stainless steel nail, Galvanized nail
- 4.3 CAVITY BATTENS
- Timber species: Radiata pine
Treatment: H3.1
- 4.4 FLUSH JOINTED SOFFIT SHEETS
- Brand/type: James Hardie Villaboard® Lining
Thickness: ~ mm
Available in both 6 mm and 9 mm thicknesses.

4.5

SOFFIT SHEETS

Brand/type: ~

Type: ~

Jointer type: ~

Type options: *Hardisoffit™ Lining*
HardiFlex® Eaves Lining
Silkline™ Soffit Lining (prepainted)
Villaboard® Lining
Eclipsa® Eaves Lining (prepainted)

Also available in 6 mm HardiFlex® Lining.