HardieSmart™
AGED CARE WALL SYSTEM

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Design Guide

Australia | May 2021

SCOPE

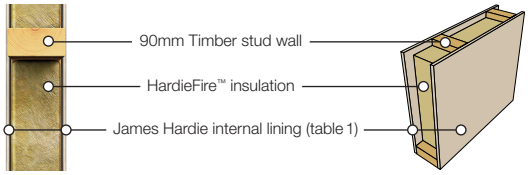
This design guide contains product information, technical specification, construction details and design considerations for HardieSmart™ Aged Care wall system when used in aged care buildings (building class 9c).

IMPORTANT NOTES

1. This design guide must be read in conjunction with the relevant and current James Hardie product install guides and relevant building code and regulations.
2. The specifier or other responsible party for a project must ensure the information in this guide is appropriate for the application you are planning and that you undertake specific design and detailing for areas which fall outside the scope of these specifications.
3. Failure to install, finish or maintain these products in accordance with applicable building codes, regulations, standards and James Hardie's written application instructions may lead to personal injury, affect system performance, violate local building codes, and void James Hardie's product warranty.
4. HardieFire™ Insulation must be used as the frame cavity infill and must be compressed 5mm at a minimum in both vertical and horizontal directions (I.e. Batt size must be at a minimum 5mm wider and longer than frame stud bay). **Ensure there are no gaps in the installation; please refer to design considerations section.**
5. Make sure your information is up to date. When specifying or installing James Hardie® products, ensure you have the current manual or guide. If in doubt, or you need more information, visit www.jameshardie.com.au or Ask James Hardie™ on 13 11 03

SYSTEM INFORMATION

HARDIESMART™ AGED CARE WALL SYSTEM



Designed for separating walls between sole occupancies in class 9c buildings; requiring a Fire Resistance Level (FRL) of up to 1 hour and an acoustic rating Rw ≤ 45**. This integrated solution will also provide you with excellent energy efficiency and bracing performance.

Please see design considerations section for suitable James Hardie internal lining products.

FRL (minutes)	Stud Size (mm)		Maximum stud spacing# (mm)	Min. Wall thickness (mm)	Max. Stud height* (mm)	Acoustic performance Rw	Thermal Performance (R-value)+	Bracing Performance^ (kN/m)
	Depth	Width						
60/60/60 -/60/60	90	35^^	450~	102	3,000	47**	2.7	4.0–10.0
	90	45	600		3,300			

TABLE NOTES:

* For increased heights, stud size may need to be increased. Please refer to James Hardie Fire and Acoustically Rated Walls Application Guide for more information.

\# Stud spacing is based on a load bearing capacity of 5 kN/stud. The stud spacing may need to be reduced in accordance to wind pressure installation requirements for the selected external cladding product, please refer to the relevant and respective literature for more information. The loadbearing capacities of the timber-framed walls must be determined in accordance with AS1684 'Residential timber-framed construction' and AS1720.1 'Timber structures'

\+ Thermal value is based on using a single reflective vapour permeable membrane (e.g. HardieWrap™ weather barrier) with an emissivity of 0.16. The total R-values for common systems are in accordance with AS4859.1:2002 and Amendment 1:2006 Materials for Thermal Insulation of Buildings. Note that the R-value will be reduced in cavities that are ventilated.

^ Additional fastener and design considerations may be required. Refer to James Hardie Structural Bracing Application guide for more information.

~ Stud spacing may be increased to 600mm centres with a reduced loadbearing capacity of 3.4 kN/stud. Please note that if specifying 600mm centres, cutting of HardieFire™ Insulation will be required as sizes have been optimised for 45mm studs at 600mm. It is recommended to install 560mm batts horizontally to minimise cutting. Ensure a 5mm compression throughout and no gaps.

^^ A larger minimum timber stud size may be required, Please refer to framing section under design considerations.

** Where discontinuous construction is required (e.g. a wall separating a sole-occupancy unit from a kitchen or laundry), a twin timber frame of 90mm with a discontinuous cavity of 25mm frame must be used in lieu of single 90mm timber frame.

ACCESSORIES

Please refer to the respective cladding and lining products for required accessories. In addition, the following components may be required.

PROVIDED BY JAMES HARDIE®

HardieFire™ Insulation

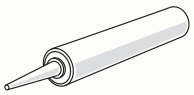
Mineral wool insulation specifically designed for use in fire applications with HardieSmart™ systems.

Batt Sizes:	1160 x 560 x 85 mm (for 600mm spaced studs, 45mm wide) 1160 x 420 x 85mm (for 450mm spaced studs, 35 or 45mm wide)
No. of pieces:	5 per pack
Pack weight:	22.1 Kg approx. (for 560 x 1160 x 85mm) 16.6 Kg approx. (for 420 x 1160 x 85mm)
Product Code:	305790 (for 560 x 1160 x 85mm) 305791 (for 420 x 1160 x 85mm)
Density:	80 Kg/m^3
R Value:	2.5 m^2.K/W

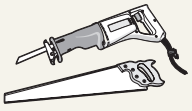
All dimensions and masses provided are approximate only and subject to manufacturing tolerances. Masses are based on equilibrium moisture content of product.

NOT PROVIDED BY JAMES HARDIE®

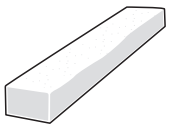
James Hardie recommends the following products for use in conjunction with HardieSmart™ Systems. James Hardie does not supply these products. Please contact the component manufacturer for information on their warranties and further information on their products.



Fire and Acoustically rated sealant:
Suitable and tested sealant for fire- and acoustically-rated construction and HardieSmart™ Systems. Used to fill control joints, penetrations and any wall gaps to maintain acoustic and fire integrity. The sealant may need to be water resistant if required in a wet area.



Reciprocating Saw or Hand Saw:
Used to cut HardieFIre™ Insulation when required. Refer to safety and handling section.



Fire Resisting Mineral Wool:
Used to maintain FRL of the selected wall system at junctions where relevant. Please see construction details for applications. It must be installed in accordance with manufacturer recommendations.

JamesHardie™

SYSTEM PERFORMANCE

1. **FIRE RESISTANCE LEVEL (FRL):** The fire resistance level (FRL) test reports and Letters of Opinion in this guide have been certified by the CSIRO Division of Building Construction and Engineering and the Building Research Association of New Zealand (BRANZ).

   Fire resistance testing to determine the FRL of a wall (in the form of a specimen) has been conducted to the Australian Standard AS 1530 Part 4: 'Fire Resistance Tests of Elements of Building Construction'. The standard follows the basic principles and provisions contained in ISO-834 'Fire Resistance Tests – Elements of Building Construction'. For more information on fire performance in buildings, please refer to James Hardie Fire and Acoustically rated walls Application Guide.

2. **ACOUSTIC PERFORMANCE:** The acoustic test reports in this manual have been certified by the RMIT. Systems used in building construction are tested under laboratory conditions to establish their sound insulation characteristics. The method of measurement is described in AS1191 'Acoustics – method for laboratory measurement of airborne sound transmission loss of building partitions'. 3.5.2 Acoustic modelling. Based on the test results indicated above, acoustic modelling for HardieSmart™ wall systems was undertaken by SLR Acoustics Pty Ltd. For more information on acoustic performance in buildings, please refer to James Hardie Fire and Acoustically rated walls Application Guide.

3. **THERMAL PERFORMANCE:** This guide outlines a range of certified modelled total R-values for HardieSmart™ wall systems. This information will assist in both satisfying the minimum deemed to satisfy Building Code of Australia (BCA) thermal resistance requirements or used with verification software tools across Australia.

4. **BRACING PERFORMANCE:** To achieve the necessary bracing requirements, this guide must be read in conjunction with James Hardie Structural Bracing Application Guide. It has been designed in accordance with AS 1684 'Residential Timber Framed Construction' ('the code'), and gives fixing details and bracing capacity for James Hardie products. All design capacities quoted are Ultimate Limit State (ULS) figures and have been certified by consulting engineers, Cardno (NSW) Pty Ltd.

DESIGN CONSIDERATIONS

1. **INTERNAL LINING:** Any James Hardie® internal lining 6mm or thicker listed in Table 1 may be used. Installation of the selected product must be in strict accordance with the respective and current installation manual.

   NOTE: If Architectural™ Invibe or Inraw™ panels are used, Villaboard® lining must be fixed behind these panels to maintain fire rating. Villaboard lining must be fixed in accordance with the installation guide current at the time of installation.

Table 1

James Hardie Product name
Villaboard® lining (6,9 or 12mm)
Versilux® lining (6 or 9mm)
HardieGroove™ lining

2. **HARDIEFIRE™ INSULATION:** It must be used as the frame cavity infill and must be compressed 5mm at a minimum in both vertical and horizontal directions (I.e. Batt size must be at a minimum 5mm wider and longer than frame stud bay). **Ensure there are no gaps in the installation.** Please refer to figure 1 for more information on installation. If cutting is required, it is recommended to cut outdoors. If indoors, please ensure that workspace is properly ventilated and a M class or higher vacuum/dust extractors are used.
   - **a.** Position cutting station so wind will blow dust away from the user or others in working area.
   - **b.** Use one of the following methods based on the required cutting rate:
     - **i.** Reciprocating Saw
     - **ii.** Mechanical Hand Saw

3. **FRAMING:**

- **Material type:** Dry seasoned dry timber only. 'Timber used for house construction must have the level of durability appropriate for the relevant climate and expected service life. Reference AS1684.2 'Residential Timber Framed Construction'. Steel frames are not suitable.
- **Minimum stud width:** Studs that are 35mm in width may be used in accordance to system information section; however, depending on the James Hardie internal lining product selected, where sheet jointing is required; the minimum stud width may need to be 45mm so as to properly accommodate the joint.
- **Stud spacing:** 600mm maximum. If tiling, check whether the selected internal lining manual requires closer stud spacing. It must be noted that HardieFire™ Insulation sizes have been optimised for 45mm studs at 600mm and 35mm studs at 450mm centres, cutting may be required otherwise.
- **Nogging:** 1350mm maximum centres.

4. **SLAB AND FOOTINGS:** The slab and footings on which the building is situated must comply with AS 2870 'Residential slabs and footings – Construction' and the requirements of the Building Code of Australia (BCA).

5. **GROUND CLEARANCES:** Install James Hardie external cladding with a minimum 150mm clearance to the earth on the exterior of the building or in accordance with local building codes if greater than 150mm is required. Maintain a minimum 50mm clearance between James Hardie external cladding and roofs, decks, paths, steps and driveways.

6. **FIRE AND ACOUSTICALLY RATED SEALANT:** Use a tested and warranted fire sealant in junctions and gaps as indicated in construction details to maintain fire and acoustic integrity of the system. E.g. Bostik FireBan One.

7. **FASTENER TYPE:** Brad nail and/or adhesive fixing are NOT recommended in fire and acoustically rated systems. Please refer to the respective James Hardie product technical literature for alternative fixing methods.

8. **PENETRATIONS:** All penetrations require careful and comprehensive treatment. They should be fire stopped, kept to a minimum, kept as small as possible and designed to cater for thermal movement and shrinkage. Generally, dealing with penetrations in fire and acoustically rated systems can be avoided by placing them in external non-fire rated systems, or by building false walls or box/bulkheads, creating pockets in the fire rated element.

   Plumbing and other penetrations may require discontinuous construction, please refer to Section F of the National Code of Construction (NCC) for more information.

9. **PAINT/TEXTURE:** Refer to the respective James Hardie internal lining installation manual for coating requirements. Please refer to coating manufacturer for suitability and specific requirements.

   When installing Villaboard® lining in areas that are not exposed and there is no concern of aesthetics such as roof cavities, James Hardie™ Top coat and finishing coatings are not required to maintain FRL and acoustic performance. However, the joints must be sealed with an appropriate fire and acoustically rated sealant or alternatively James Hardie™ Base Coat.

SAFETY AND HANDLING

For information refer to the respective products installation guide or data sheet and MSDS at www.jameshardie.com.au or www.accel.com.au; and the safe workplace government authority in your state.

DESIGN TOOLS

James Hardie has developed online tools for easy specification. Please refer to www.accel.com.au for more information on estimation tools, CAD details, system selector, site specific recommendations and more.

STANDARD CONSTRUCTION DETAILS

CONSTRUCTION DETAILS

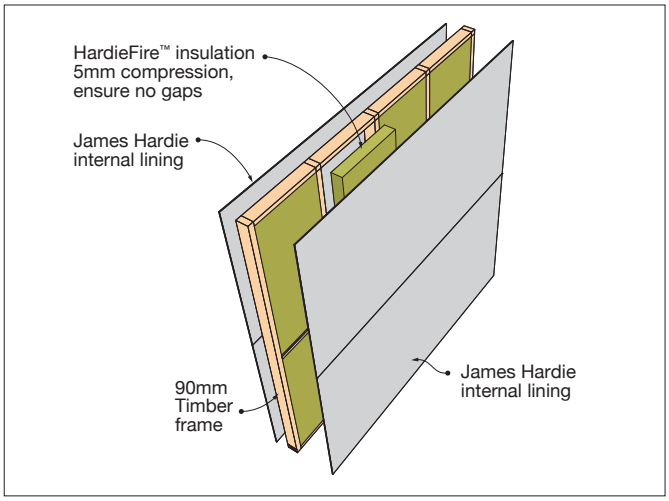


FIGURE 1 HARDIESMART™ AGED CARE WALL SYSTEM LAYOUT

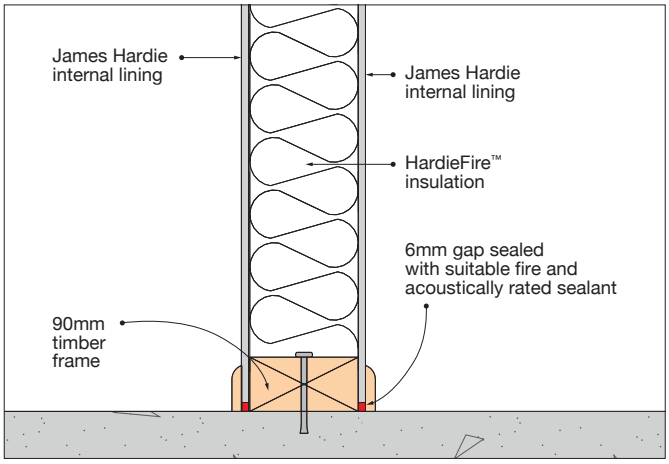


FIGURE 2 HARDIESMART™ AGED CARE WALL SYSTEM BASE TO SLAB

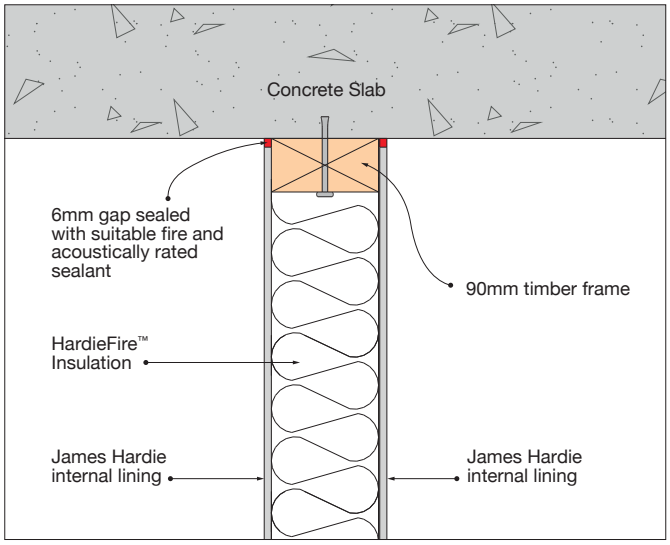


FIGURE 3 HARDIESMART™ AGED CARE WALL SYSTEM HEAD TO SLAB

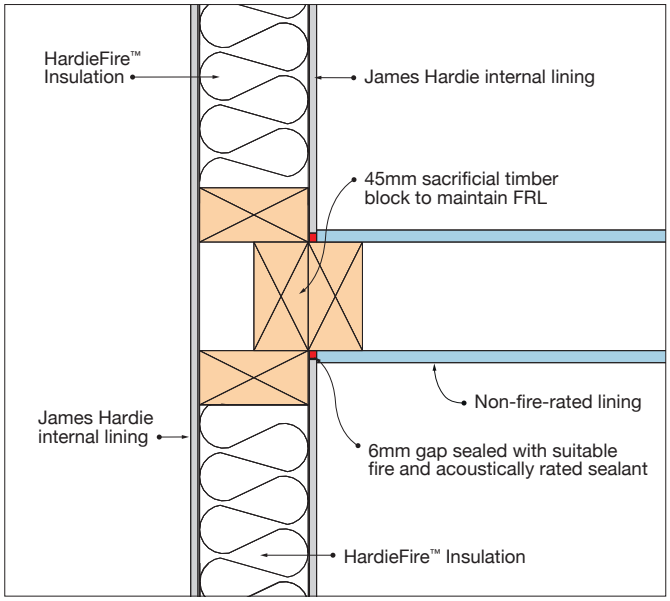


FIGURE 4 HARDIESMART™ AGED CARE WALL SYSTEM INTERSECTING NON-FIRE-RATED WALL

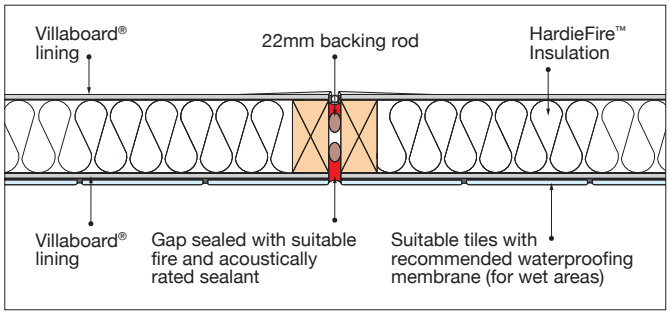


FIGURE 5 HARDIESMART™ AGED CARE WALL SYSTEM – VILLABOARD® LINING CONTROL JOINT

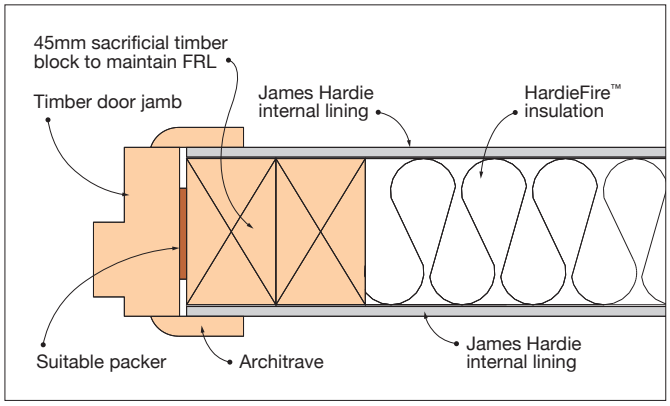


FIGURE 6 HARDIESMART™ AGED CARE WALL SYSTEM TIMBER DOOR JAMB

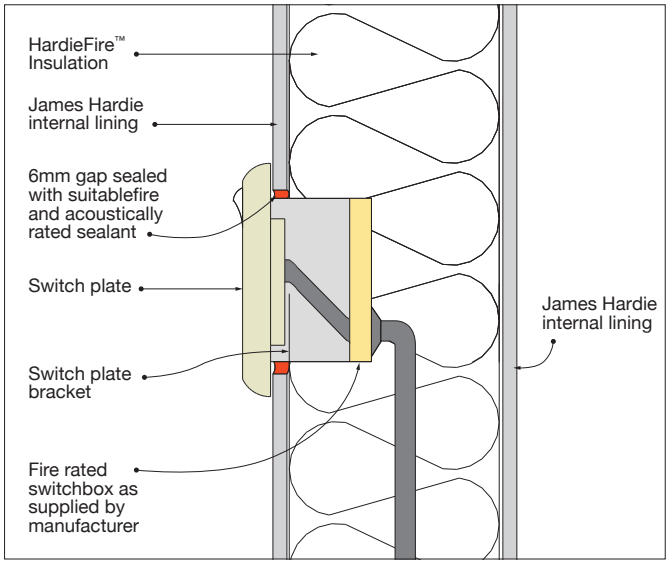


FIGURE 7 FIRE-RATED SWITCH PLATE OR GENERAL POWER OUTLET (GPO) ELEVATION

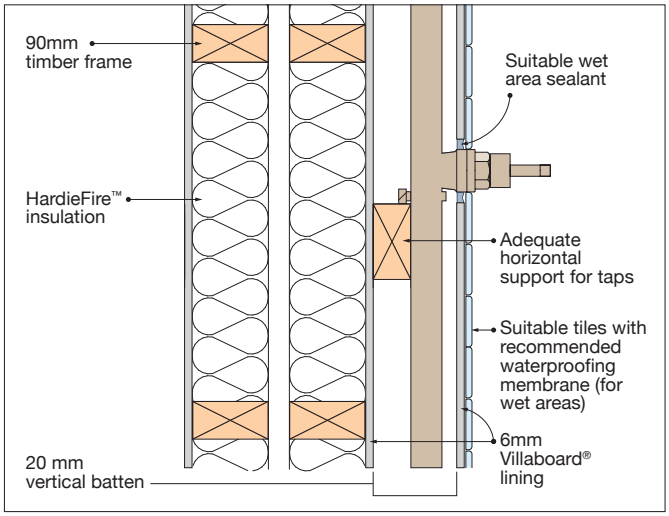


FIGURE 8 HARDIESMART™ AGED CARE WALL SYSTEM PLUMBING PIPE PENETRATION – SECTION

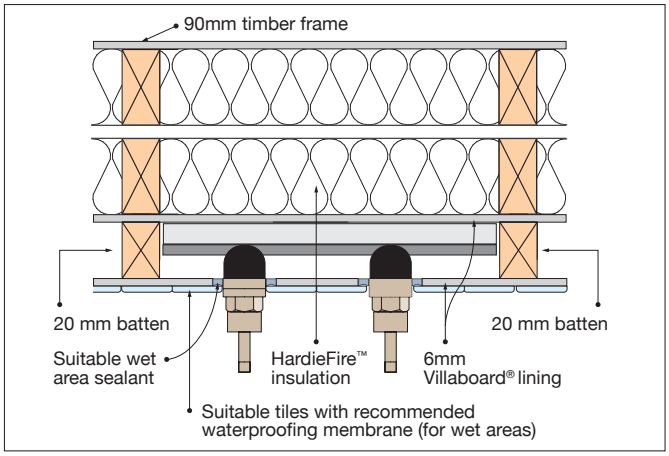


FIGURE 9 HARDIESMART™ AGED CARE WALL SYSTEM PLUMBING PIPE PENETRATION – PLAN

WARRANTY

HardieSmart™ Intertenancy wall system has a James Hardie product warranty. The period varies for the selected system components. For terms and conditions of product warranty, refer to www.jameshardie.com.au or www.accel.com.au

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