PARTIWAIlL®
Separating walls for Class 1a buildings
Timber framed
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Cover photo courtesy of Metricon Homes
Preface

USG Boral is a plasterboard and ceilings Joint Venture between USG Corporation and Boral Limited, and is one of the leading players in this field.

Operating throughout Asia, Australasia and in the Middle East, USG Boral combines USG’s innovative building products technologies with Boral’s extensive plasterboard manufacturing and distribution footprint in Asia and Australasia.

In Australia USG Boral operates plasterboard manufacturing plants in Queensland, New South Wales and Victoria; a specialty plasters and jointing compounds plant in Victoria and cornice plants in New South Wales and Victoria. The company’s products are supplied through a nation-wide distribution network of around 100 company-owned stores and specialised resellers as well as hundreds of hardware stores.

For more information on USG Boral refer to usgboral.com

Introduction

The Pioneering system of its kind in Australia, USG Boral Partiwall® has become one of the most widely used separating wall systems in attached villa units and townhouse construction.

Excellent acoustic performance, ease of construction and design flexibility makes Partiwall a system of choice on projects ranging from side-by-side duplexes to multi-unit developments.

Partiwall separating wall system is suitable for attached dwellings Class 1a and for top storeys of Class 2 and 3 buildings (subject to Certifier’s approval). Contact USG Boral TecASSIST™ for advice.

For multi-residential buildings Class 2, 3 and 9C USG Boral recommends Multiframe™ timber framed construction system (subject to NCC limitations) or IntRwall® separating wall system.

Description

Partiwall is essentially a twin stud wall system, which incorporates a single or double layer 25mm SHAFTLINER™ plasterboard fire barrier within the wall cavity.

Partiwall was developed to suit the normal pattern of framed construction and follow-up trades. SHAFTLINER panels are held in position by lightweight steel H- or I-section studs attached to timber or steel framing on both sides with aluminium clips. Installation of SHAFTLINER fire barrier is carried out during the framing stage and does not require plasterboard screw fixing, jointing or finishing. The internal wall linings are installed at the plastering stage using conventional installation methods as outlined in the USG Boral Plasterboard Installation Manual.

Note:
This manual covers timber framed Partiwall systems only. For details of steel framed Partiwall system refer to USG Boral Steel Framed Partiwall brochure.

Features and Benefits

• No wet trades are required.
• Panelised construction of SHAFTLINER fire barrier permits easy installation at framing stage – no additional trades are required.
• Permits easy inclusion of services and penetrations, such as switches, power points, light fittings and pipes within the wall.
• Internal wall linings are installed at the plastering stage as per normal construction sequence.

Design Options

USG Boral Partiwall has been tested and certified to meet Fire Resistance Levels (FRL) of 60/60/60 and 90/90/90 and acoustic performance equal to or exceeding $R_W + C_T = 50$ as required by the National Construction Code (NCC).

Partiwall systems are available in three basic types:

Table 1: Partiwall system types

<table>
<thead>
<tr>
<th>System Type</th>
<th>Fire Barrier</th>
<th>FRL</th>
</tr>
</thead>
<tbody>
<tr>
<td>PWT60.1</td>
<td>1x25mm SHAFTLINER</td>
<td>60/60/60</td>
</tr>
<tr>
<td>PWT90.1</td>
<td>1x25mm SHAFTLINER + 1x16mm FIRESTOP</td>
<td>90/90/90</td>
</tr>
<tr>
<td>PWT90.2*</td>
<td>2x25mm SHAFTLINER</td>
<td>90/90/90</td>
</tr>
</tbody>
</table>

* System PWT90.2 is not covered in this manual. For acoustic performance refer to USG Boral Systems+. For construction details contact TecASSIST.

All system types are available with a wide range of outer linings, including water and impact resistant linings on one or both sides of the wall.

Construction details are provided for aligned and offset floor configurations, internal-to-external wall transitions and various roof types.

All construction details contained in this manual have been certified by Exova.
A cantilever Partiwall option is also available for overhanging floors. Contact USG Boral for further information.

PARTIWALL® Design Concept

While in a conventional fire-rated wall system fire resistant outer linings provide protection to the wall substrate, in the Partiwall system the main fire barrier is located within the wall cavity and is designed to protect the structure on the side opposite to the fire. At the same time, the SHAFTLINER™ fire barrier relies on this structure for the support as the structure on the fire side loses stability or collapses.

In order to ensure that the SHAFTLINER fire barrier is not damaged by the collapse of the structure on the fire side, aluminium clips are utilised to attach the fire barrier to the timber frames on both sides. As the clips on the fire side melt, the SHAFTLINER fire barrier is disconnected from the collapsing structure and is supported by the clips and the structure on the protected side for the specified fire rating period.

Steel clips must not be used in the Partiwall system as their use will compromise the integrity of the SHAFTLINER fire barrier during the fire.
PARTIWALL® Construction Sequence

Figure 3: Partiwall Construction Sequence

Stage 1
- Ground Floor frame installed on one side
- Ground Floor fire barrier installed and clipped
- FIRESTOP® pbd is fixed at 1st Floor as required

Stage 2
- Ground Floor frame installed on opposite side
- Ground Floor fire barrier clipped on opposite side

Stage 3
- 1st Floor and Roof frame installed on one side
- 1st Floor and Roof fire barrier installed and clipped
- FIRESTOP pbd is fixed within the roof space

Stage 4
- 1st Floor and Roof frame installed on opposite side
- 1st Floor and Roof fire barrier clipped on opposite side
DESIGN CONSIDERATIONS

Fire Resistance
The Partiwall® system has been fire tested at CSIRO’s laboratory at North Ryde in Sydney. The performance of various system configurations has been assessed in CSIRO’s assessment number FSV 0381, FCO-2256, FCO-2713, FCO-1446 and FCO-2016. The Partiwall system provides Fire Resistance Levels (FRL) of 60/60/60 and 90/90/90. In the case of a fire, the structural adequacy and load bearing capacity is provided by the wall frame on the other side of SHAFTLINER™ fire barrier.

As the primary fire barrier (the SHAFTLINER panels) is located in the cavity between the frames, the system permits easy inclusion of services such as water and waste pipes, electrical and communications cables, as long as the primary barrier is not penetrated. Service penetrations are allowed through SHAFTLINER fire barrier in the roof space subject to Certifier’s approval (refer Installation Details).

The following penetrations, individually or in combinations, or back-to-back, are allowed in the outer linings and are not required to be fire rated:

- Normal residential electrical switches and power points
- Data, communications or electrical cables passing through the linings into the cavity
- Copper, galvanized steel, or plastic water or wastewater pipes of up to 50mm nominal diameter passing through the linings into the cavity
- Cabinets, baths, shower bases or vanities
- For other penetrations contact USG Boral TecASSIST® 1800 811 222

Acoustics
The Partiwall system has been the subject of extensive laboratory testing at the CSIRO Acoustic Laboratory at Highett, Victoria. Acoustical opinions have been determined by Renzo Tonin and Associates Pty Ltd in opinion number RT&A TE405-05F19.

Partiwall satisfies NCC acoustic provisions for Class 1a buildings of $R_W + C_V = 50\text{dB}$ for separating walls and $R_W + C_V = 25\text{dB}$ and $R_W + C_V = 40\text{dB}$ acoustic separation of adjoining soil and waste pipes within the cavity:

**Figure 4: Partiwall Services Separation**

The following requirements are essential to maintaining the fire-rating integrity and acoustic performance of the Partiwall system:

- Use only the specified Partiwall aluminium clips to attach the Partiwall H-studs to timber framing members. In the event of a fire, aluminium clips are designed to melt to allow the timber framing on the fire side to fall away leaving the SHAFTLINER fire barrier intact.
- Other than the clips, there should be no attachments to the SHAFTLINER fire barrier.
- There should be no penetrations through the SHAFTLINER fire barrier apart from approved penetrations in the roof space.
- SHAFTLINER fire barrier base must be sealed with an approved fire acoustic sealant.
- To maintain acoustic performance, service pipes must not be in contact with the SHAFTLINER fire barrier. All services should be run through the framing.
- The clear distance between the SHAFTLINER fire barrier and wall framing on both sides should not be less than 20mm nor more than 40mm.
- The 16mm FIRESTOP® plasterboard laminated to the SHAFTLINER fire barrier should not come into contact with wall or floor framing. It is recommended that the gap between SHAFTLINER fire barrier and timber framing be increased to a minimum 25mm on the FIRESTOP side to ensure adequate clearance.
Isolated Support for Stairs
In order to reduce the likelihood of stair footfall noise passing through the wall into the attached dwelling, it is recommended that stairs should be isolated from the separating wall as follows:

• Using the stringers to support the stairs, at each floor level, without intermediate support from the separating wall in between (i.e. free standing), or alternatively
• Using newel posts rather than the separating wall to support the stair structure
• Keeping the treads clear off the separating wall

Support Clip Separation
Clips on each side of the SHAFTLINER™ fire barrier must be spaced at no more than 3000mm vertically and 600mm horizontally unless noted otherwise.

Every Partiwall® stud and end track is to be fixed to timber frame on both sides with Partiwall aluminium clips.

Construction Joints
Where construction joints are necessary in Partiwall, contact USG Boral TecASSIST™ 1800 811 222 for construction details.

Wind Speed
Partiwall is suitable for wind classification N1 and N2 as determined by AS 4055 Wind loads for housing. For higher wind classifications USG Boral recommends temporary propping of SHAFTLINER fire barrier during construction until the building is enclosed. Propping details are to be designed by a suitably qualified Structural Engineer. Where Partiwall is proposed in cyclonic areas contact USG Boral for advice.

Framing
Timber framing to be designed by a suitably qualified Structural Engineer to meet NCC requirements, and in accordance with AS 1684 Timber Framed Construction and other relevant Australian Standards.

Wet Areas
Water resistant wall linings must be used in areas classified as Wet Areas in accordance with the NCC.

Partiwall systems are available with the following water resistant linings on one or both sides:

• 10mm and 13mm WETSTOP™ plasterboard
• 6mm Villaboard® fibre cement
• 10mm FIBEROCK® Aqua-Tough™ gypsum fibre board

For installation details of USG Boral Wet Area System refer to the USG Boral Plasterboard Installation Manual.
SHAFTLINER™ Fire Barrier

Materials used in construction of SHAFTLINER™ fire barrier are listed in the following table:

### Table 2: SHAFTLINER Fire Barrier Components

<table>
<thead>
<tr>
<th>Product Description</th>
<th>USG Boral Item Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>25mm SHAFTLINER 600 x 3000mm</td>
<td>25SW0630</td>
</tr>
<tr>
<td>25mm SHAFTLINER 600 x 3600mm</td>
<td>25SW0636</td>
</tr>
<tr>
<td>16mm FIRESTOP 1200 x 2400mm</td>
<td>16FS1224</td>
</tr>
<tr>
<td>Partiwall stud</td>
<td>R25HS3055</td>
</tr>
<tr>
<td>Partiwall stud x 3000mm</td>
<td>R25HS3655</td>
</tr>
<tr>
<td>Partiwall track</td>
<td>RO14030</td>
</tr>
<tr>
<td>Partiwall track x 3000mm</td>
<td>RO14036</td>
</tr>
<tr>
<td>Partiwall clip</td>
<td>RPWALLCLIP</td>
</tr>
<tr>
<td>Aluminium wall clip</td>
<td></td>
</tr>
<tr>
<td>Firesound® mastic, 450g tube</td>
<td>FBSOUND450</td>
</tr>
<tr>
<td>Firesound mastic, 600ml sausage</td>
<td>FBSOUND900</td>
</tr>
<tr>
<td>6g x 25mm Type ‘W’ Timber Screws</td>
<td>S625WB</td>
</tr>
<tr>
<td>10g x 40mm Type ‘L’ Laminating Screws Pkt 1000</td>
<td>S1040LB</td>
</tr>
<tr>
<td>10g x 16mm Type ‘D’ Drill Point Wafer Head Screws</td>
<td>S1016DBB</td>
</tr>
<tr>
<td>10g x 30mm Type ‘D’ Drill Point Wafer Head Screws</td>
<td>S1030DB</td>
</tr>
<tr>
<td>30mm Galvanized Nails</td>
<td>NC3028PO</td>
</tr>
<tr>
<td>USG Boral Firepack mineral wool packer 5m x 200 x 50mm, Pkt 3</td>
<td>IIPWBA TT</td>
</tr>
<tr>
<td>Powers Track-It® pins for hard concrete or other suitable all-steel masonry anchors</td>
<td>5S32HC-PWR</td>
</tr>
</tbody>
</table>

**Occupancy Linings**

The following linings can be used in occupancy areas:
- 10mm SHEETROCK® Wall Board
- 13mm SHEETROCK Standard
- 10mm STANDARD plasterboard
- 10mm FIBEROCK®
- 10mm/13mm SOUNDSTOP™ plasterboard
- 10mm/13mm WETSTOP™ plasterboard
- 6mm Villaboard fibre cement

**Note:**
Partiwall® performance values stated in this manual are based on the use of materials and components listed herein. Material substitution may affect the performance of Partiwall systems.
### Partiwall® Systems

**Acoustic Ratings** BASIS: RT&A TE405-05F19

<table>
<thead>
<tr>
<th>System</th>
<th>Lining Side 1</th>
<th>Lining Side 2</th>
<th>Nom Width mm</th>
<th>STUD Size (Gap)</th>
<th>70 (20)</th>
<th>70 (40) or 90 (20)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Rw</td>
<td>Rw+Ctr</td>
</tr>
<tr>
<td>PWT60.1A</td>
<td>1x10mm SOUNDSTOP</td>
<td>1x10mm SOUNDSTOP</td>
<td>265</td>
<td>R2.0 GW Wall Batt (both cavities)</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>PWT60.1B</td>
<td>1x13mm SOUNDSTOP</td>
<td>1x13mm SOUNDSTOP</td>
<td>231</td>
<td>R2.0 GW Wall Batt (both cavities)</td>
<td>62</td>
<td>52</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>271</td>
<td>R2.0 GW Wall Batt (both cavities)</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>110mm USG Boral PARTIWALL Acoustic Batt (one cavity only)</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>PWT60.1C</td>
<td>1x13mm WETSTOP</td>
<td>1x13mm WETSTOP</td>
<td>271</td>
<td>110mm USG Boral PARTIWALL Acoustic Batt (both cavities)</td>
<td>NA</td>
<td>NA</td>
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<tr>
<td>PWT60.1D</td>
<td>1x10mm SOUNDSTOP</td>
<td>1x10mm WETSTOP</td>
<td>265</td>
<td>110mm USG Boral PARTIWALL Acoustic Batt (both cavities)</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>PWT60.1E</td>
<td>1x13mm SOUNDSTOP</td>
<td>1x10mm WETSTOP</td>
<td>228</td>
<td>90G24 (both cavities)</td>
<td>60</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>268</td>
<td>R2.0 GW Wall Batt (both cavities)</td>
<td>NA</td>
<td>NA</td>
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<tr>
<td>PWT60.1F</td>
<td>1x10mm FIBEROCK</td>
<td>1x10mm FIBEROCK</td>
<td>265</td>
<td>R2.0 GW Wall Batt (both cavities)</td>
<td>NA</td>
<td>NA</td>
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<tr>
<td>PWT60.1G</td>
<td>1x10mm SOUNDSTOP</td>
<td>1x10mm FIBEROCK</td>
<td>265</td>
<td>R2.0 GW Wall Batt (both cavities)</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>PWT60.1H</td>
<td>1x13mm SOUNDSTOP</td>
<td>1x10mm FIBEROCK</td>
<td>228</td>
<td>R2.0 GW Wall Batt (both cavities)</td>
<td>60</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>268</td>
<td>R2.0 GW Wall Batt (both cavities)</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>110mm USG Boral PARTIWALL Acoustic Batt (one cavity only)</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>PWT60.1L</td>
<td>2x10mm STANDARD</td>
<td>2x10mm STANDARD</td>
<td>245</td>
<td>R2.0 GW Wall Batt (both cavities)</td>
<td>63</td>
<td>51</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>285</td>
<td>110mm USG Boral PARTIWALL Acoustic Batt (one cavity only)</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>PWT60.1M</td>
<td>2x10mm WETSTOP</td>
<td>2x10mm WETSTOP</td>
<td>245</td>
<td>R2.0 GW Wall Batt (both cavities)</td>
<td>66</td>
<td>54</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>285</td>
<td>110mm USG Boral PARTIWALL Acoustic Batt (one cavity only)</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>PWT60.1W</td>
<td>2x10mm SHEETROCK Wall Board</td>
<td>2x10mm SHEETROCK Wall Board</td>
<td>245</td>
<td>R2.0 GW Wall Batt (both cavities)</td>
<td>61</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>285</td>
<td>R2.0 GW Wall Batt (both cavities)</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

* R2.0 GW Wall Batt – R2.0 Wall Batt 90mm glasswool insulation.
90G24 – 90mm glasswool insulation 24kg/m3 density.

Blue text indicates moisture resistant lining.
# PARTIWALL® SYSTEMS

## Acoustic Ratings

**BASIS:** RT&A TE405-05F19

<table>
<thead>
<tr>
<th>System</th>
<th>Lining Side 1</th>
<th>Lining Side 2</th>
<th>Nom Width mm</th>
<th>Stud Size (Gap) mm</th>
<th>70 (20)</th>
<th>70 (40) or 90 (20)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Re</td>
<td>Re+Ctr</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Re</td>
<td>Re+Ctr</td>
</tr>
</tbody>
</table>

- **PWT90.1A**
  - 1x10mm STANDARD
  - 1x10mm STANDARD
  - Nom Width: 285 mm
  - Stud Size: 70 (20) 70 (40) or 90 (20)
  - Insulation: R2.0 GW Wall Batts (both cavities)
  - Acoustic Ratings: 63 50

- **PWT90.1B**
  - 1x10mm SOUNDSTOP
  - 1x10mm SOUNDSTOP
  - Nom Width: 245 mm
  - Stud Size: 70 (20) 70 (40) or 90 (20)
  - Insulation: R2.0 GW Wall Batts (both cavities)
  - Acoustic Ratings: 64 52 NA NA

- **PWT90.1C**
  - 1x13mm SOUNDSTOP
  - 1x13mm SOUNDSTOP
  - Nom Width: 290 mm
  - Stud Size: 70 (20) 70 (40) or 90 (20)
  - Insulation: R2.0 GW Wall Batts (one cavity only)
  - Acoustic Ratings: 64 52 NA NA

- **PWT90.1D**
  - 1x10mm WETSTOP
  - 1x10mm WETSTOP
  - Nom Width: 285 mm
  - Stud Size: 70 (20) 70 (40) or 90 (20)
  - Insulation: R2.0 GW Wall Batts (both cavities)
  - Acoustic Ratings: 64 51

- **PWT90.1E**
  - 1x10mm STANDARD
  - 1x10mm WETSTOP
  - Nom Width: 285 mm
  - Stud Size: 70 (20) 70 (40) or 90 (20)
  - Insulation: R2.0 GW Wall Batts (both cavities)
  - Acoustic Ratings: 64 51

- **PWT90.1F**
  - 1x10mm SOUNDSTOP
  - 1x10mm WETSTOP
  - Nom Width: 285 mm
  - Stud Size: 70 (20) 70 (40) or 90 (20)
  - Insulation: R2.0 GW Wall Batts (both cavities)
  - Acoustic Ratings: 64 51

- **PWT90.1G**
  - 1x13mm SOUNDSTOP
  - 1x10mm WETSTOP
  - Nom Width: 245 mm
  - Stud Size: 70 (20) 70 (40) or 90 (20)
  - Insulation: R2.0 GW Wall Batts (both cavities)
  - Acoustic Ratings: 63 53 NA NA

- **PWT90.1H**
  - 1x10mm FIBEROCK
  - 1x10mm FIBEROCK
  - Nom Width: 245 mm
  - Stud Size: 70 (20) 70 (40) or 90 (20)
  - Insulation: R2.0 GW Wall Batts (both cavities)
  - Acoustic Ratings: 64 52 NA NA

- **PWT90.1I**
  - 1x10mm STANDARD
  - 1x10mm FIBEROCK
  - Nom Width: 285 mm
  - Stud Size: 70 (20) 70 (40) or 90 (20)
  - Insulation: R2.0 GW Wall Batts (both cavities)
  - Acoustic Ratings: 64 51

- **PWT90.1J**
  - 1x10mm SOUNDSTOP
  - 1x10mm FIBEROCK
  - Nom Width: 245 mm
  - Stud Size: 70 (20) 70 (40) or 90 (20)
  - Insulation: R2.0 GW Wall Batts (both cavities)
  - Acoustic Ratings: 64 52 NA NA

- **PWT90.1K**
  - 1x13mm SOUNDSTOP
  - 1x10mm FIBEROCK
  - Nom Width: 285 mm
  - Stud Size: 70 (20) 70 (40) or 90 (20)
  - Insulation: R2.0 GW Wall Batts (both cavities)
  - Acoustic Ratings: 64 51

- **PWT90.1L**
  - 1x6mm VILLABOARD
  - 1x6mm VILLABOARD
  - Nom Width: 275 mm
  - Stud Size: 70 (20) 70 (40) or 90 (20)
  - Insulation: R2.0 GW Wall Batts (both cavities)
  - Acoustic Ratings: 66 53

- **PWT90.1M**
  - 1x10mm STANDARD
  - 1x6mm VILLABOARD
  - Nom Width: 280 mm
  - Stud Size: 70 (20) 70 (40) or 90 (20)
  - Insulation: R2.0 GW Wall Batts (both cavities)
  - Acoustic Ratings: 63 50

- **PWT90.1AA**
  - 1x13mm SHEETROCK
  - 1x13mm SHEETROCK
  - Nom Width: 290 mm
  - Stud Size: 70 (20) 70 (40) or 90 (20)
  - Insulation: R2.0 GW Wall Batts (both cavities)
  - Acoustic Ratings: 65 52

- **PWT90.1AB**
  - 1x13mm SHEETROCK
  - 1x13mm WETSTOP
  - Nom Width: 290 mm
  - Stud Size: 70 (20) 70 (40) or 90 (20)
  - Insulation: R2.0 GW Wall Batts (both cavities)
  - Acoustic Ratings: 67 54

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* R2.0 GW Wall Batts – R2.0 Wall Batts 90mm glasswool insulation.

**Blue text indicates moisture resistant lining.**
INSTALLATION OF SHAFTLINER™ FIRE BARRIER

Set Out and Fixing

Installation of the SHAFTLINER™ fire barrier requires the attachment of the Partiwall® H-studs and end tracks to timber framing members using aluminium clips. Set out timber framing to allow for the required clearances on both sides of the SHAFTLINER fire barrier and later fixing of the Partiwall clips to wall plates and roof frame.

After the timber framing on one side has been completed, the SHAFTLINER fire barrier is installed and attached to the completed frame with Partiwall aluminium clips. When framing on the other side is completed, the SHAFTLINER fire barrier is attached with Partiwall aluminium clips to that side.

The sequence of construction should be planned to accommodate progressive erection of the SHAFTLINER fire barrier.

Protection from Weather

To prevent damage from the weather, all materials must be suitably protected during construction.

USG Boral recommends that exposure of the SHAFTLINER fire barrier to the elements should be minimised, and that it should be protected if exposure is likely to exceed one month or when periods of intense inclement weather, such as heavy rain or high winds, are expected. Allow SHAFTLINER panels to dry out before lining the occupancy areas.

Temporary exposure of SHAFTLINER panels to moisture should not downgrade their fire resisting properties as long as there is no physical damage to the panels in a wet state.

USG Boral also recommends that concrete slabs on which the SHAFTLINER fire barrier is erected should be level, free draining and free of depressions where water can collect, removing the possibility of the panel standing in the water for any length of time. The specified 6mm gap between the adjacent bottom track sections will facilitate drainage of water from the track.

Note:
The base track of the SHAFTLINER fire barrier must be fixed with approved steel only anchors spaced at 600mm max centres. Plastic sleeved fasteners are not permitted.

Dos
• Do provide adequate clearance between SHAFTLINER fire barrier and timber framing on both sides.
• Do fix down Partiwall bottom track with approved steel only anchors.
• Do use aluminium clips at every Partiwall stud and end track and not more than 3000mm above lower clip line or base track.
• Do seal at Partiwall bottom track.
• Do install USG Boral Firepack at wall ends and top, as specified.
• Do cut Partiwall studs and SHAFTLINER panels to the same length.
• Do align Partiwall studs above and below horizontal joint in SHAFTLINER fire barrier.
• Do insert Partiwall studs and SHAFTLINER panels fully into the Partiwall base track.
• Do insert SHAFTLINER panels fully into the Partiwall studs.
• Do use the specified fasteners for aluminium Partiwall clips.

Don’ts
• Don’t use damaged materials.
• Don’t penetrate the SHAFTLINER other than in the roof space as per Boral’s details.
• Don’t exceed specified clip spacing.
• Don’t use steel clips.
• Don’t use Partiwall H-studs in lieu of Partiwall track as edge tracks nor at horizontal joint in SHAFTLINER fire barrier.
• Don’t cut tracks between Partiwall studs. Tracks should be used in full lengths.
• Don’t run services in the gap between SHAFTLINER fire barrier and framework.
INSTALLATION OF SHAFTLINER™ FIRE BARRIER

Installation Procedure (PW60.1)

• Ensure that SHAFTLINER™ panels, Partiwall® studs and end tracks are the same length. Cut to length if required.
• In a multi-level SHAFTLINER fire barrier, Partiwall studs at upper levels must align with the studs below.
• Partiwall aluminium clips must be installed progressively as SHAFTLINER fire barrier is erected.
• Partiwall aluminium clips must be spaced at maximum 600mm horizontally and 3000mm vertically.
• For aligned floors Partiwall aluminium clips must be directly opposite on both sides of the Partiwall studs.
• For offset floors Partiwall aluminium clips can be staggered in line with floors on each side of the wall (refer Figure 7).
• Fix Partiwall aluminium clips to Partiwall studs with 2 x 10g x 16mm Type ‘D’ drill point wafer head screws (2 x 10g x 30mm Type ‘D’ drill point wafer head screws if fixing through 16mm FIRESTOP® plasterboard).
• Fix Partiwall aluminium clip to timber frame with 2 x 6g x 25mm Type ‘W’ timber screws or 2 x 2mm x 30mm galvanised nails.
• SHAFTLINER fire barrier must be adequately braced against wind forces until the building is enclosed.

Step 1: Install base track
- Use full track lengths, spaced 6mm apart.
- Position Partiwall track at min 20mm clearance along full length of the timber frame, starting and ending in line with the timber frame.
- Fix each track length to foundation with approved all-steel fasteners at 600mm maximum spacing and at both ends.

Step 2: Install first SHAFTLINER panel
- To enable fixing of aluminium clip, cut the first SHAFTLINER panel to width so that its edge falls not less than 50mm from timber stud.
- Fit SHAFTLINER panel fully down into the Partiwall base track and align with end of track.
- Fit Partiwall end track tightly over outer edge of SHAFTLINER panel and screw fix end and base tracks junction with 10g x 16mm Type ‘D’ drill point wafer head screws.
- Fix Partiwall end track to timber frame with Partiwall aluminium clip.

Step 3: Install first Partiwall stud and clip
- Fit Partiwall stud fully down into the Partiwall base track and move tight over the edge of SHAFTLINER panel. Tap lightly to give a snug fit.
- Fit second SHAFTLINER panel into Partiwall base track and push tight into the Partiwall stud.
- Fix Partiwall stud to timber frame top plate with Partiwall aluminium clip.

Step 4: Continue installing SHAFTLINER panels and Partiwall studs
- Continue to install SHAFTLINER panels and Partiwall studs until reaching end of wall.
- As framing progresses fix Partiwall studs to timber framing with Partiwall aluminium clips.
- Cut the last SHAFTLINER panel in line with the end of Partiwall base track.
  - Fit Partiwall end track tightly over the edge of the panel and screw fix end and base tracks junction with 10g x 16mm drill point wafer head screws both sides.
  - Fix end track to timber frame with Partiwall aluminium clip.
Step 5: Seal base track
- Apply continuous Firesound™ sealant along Partiwall® base track/floor junction on one side only

Step 6: At mid-floors
- Screw laminate 16mm FIRESTOP® to one side of SHAFTLINER™ fire barrier with 10g x 40mm Type ‘L’ laminating screws at max 400mm centres (both directions) and nom 10mm from the edges. Ensure minimum 150mm overlap above floor and below ceiling level. Plasterboard joints do not need to be set with compounds. Ensure joints are tight.
- Screw fix Partiwall aluminium clips through 16mm FIRESTOP into Partiwall studs and end tracks and fix Partiwall aluminium clips to timber frame.

Step 7: Install top rail
- Using full track lengths, fit Partiwall top track over the installed SHAFTLINER panels and Partiwall studs.
- Push top track fully down over the top of Partiwall studs.
- Screw fix top and end track junctions with 10g x 16mm Type ‘D’ drill point wafer head screws.

Step 8: Next level of SHAFTLINER fire barrier
- Using full track lengths, install Partiwall bottom track for the upper level of SHAFTLINER fire barrier back-to-back with the top track below and leaving 6mm gap between track lengths. Screw fix each track length with 10g x 16mm wafer head screws at 600mm maximum centres and at each end.
- Install SHAFTLINER panels, Partiwall studs and clips as per level below. Partiwall studs must align with studs below.

Step 9: At roof
- Measure and cut SHAFTLINER panels and Partiwall studs to pitch of roof.
- Allow 25mm gap at top of SHAFTLINER panels for frame shrinkage and roof movement in pitched roof, flat metal roof, parapet and box gutter applications.
- Fix Partiwall track on rake and fix Partiwall studs to roof frame on one side with Partiwall aluminium clips.
- Screw fix top and end track junctions with 10g x 16mm Type ‘D’ drill point wafer head screws.
- Screw-laminate 16mm FIRESTOP to one side of SHAFTLINER with 10g x 40mm Type ‘L’ laminating screws at 400mm max centres (both directions) and nom 10mm from edges. Plasterboard joints do not need to be set with compounds. Ensure joints are tight.
- Screw fix Partiwall aluminium clips through 16mm FIRESTOP into Partiwall studs and end tracks and fix Partiwall aluminium clips to timber frame.

Step 10: Seal for fire
- Install continuous USG Boral Firepack® mineral fibre packer at external wall junctions (brick veneer construction only) and under roofing.
- Fill cavities between roof battens with compressed USG Boral Firepack mineral fibre packer.
**INSTALLATION DETAILS**

**Figure 6: Concrete/Masonry Base Details – FRL 60/60/60**

- Concrete slab
- Timber studs
- SHAFTLINER fire barrier
- USG Boral wall linings as specified both sides
- Insulation as specified
- Skirting as required
- 20-40mm gap both sides (typical)
- Seal Partiwall track with Firesound sealant one side only
- Partiwall track fastened to slab or masonry @ 600mm max ctrs with all-metal fasteners
- Seal Partiwall track with Firesound sealant one side only
- FRL of brickwork to match FRL of Partiwall
- Concrete or masonry wall. Place top bricks frog down and fill/parge all hollows under Partiwall track.

**Figure 7: Step in Slab Details – FRL 60/60/60**

- 20-40mm gap both sides
- Partiwall clips required if vertical support of SHAFTLINER fire barrier exceeds 3000mm
- USG Boral wall linings as specified
- Skirting as required - Typical
- Insulation as specified
- SHAFTLINER fire barrier
- Seal Partiwall track with Firesound sealant one side only
- Concrete slab to Engineer’s design
- Partiwall track fastened to slab @ 600mm ctrs with all-metal fasteners. Ensure fasteners have adequate edge distance.

**Note:**
Vertical support of SHAFTLINER™ fire barrier must not exceed 3000mm in any case.
**Figure 8: Pitched Roof – Wall/Roof Junction Detail – FRL 60/60/60**

- Non combustible roofing
- Roof battens with max dimension of 75mm x 50mm (NCC Vol 2 Cl 3.7.1.8d)
- Roof framing
- Allow gap at top of SHAFTLINER for frame shrinkage and roof movement
- Continuous Partiwall top track
- 20-40mm gap each side.
- Provide timber packing where distance of truss face to SHAFTLINER fire barrier does not allow adequate fixing of aluminium clip.
- Metal battens shown
- 600mm min Insulation
- Insulation to one/both sides as specified to achieve acoustic rating
- Insulation to extend min 600mm both sides of Partiwall if average height of roof space above ceiling is 600mm or less. Insulation must satisfy thermal insulation requirements (if thermal insulation not required, use insulation specified for Partiwall system).
- Additional layer of 16mm USG Boral FIRESTOP laminated to SHAFTLINER with 10g x 40mm Type ‘L’ screws @ 400mm max ctrs in both directions (roof space only).
- Plasterboard joints do not need to be set with compounds. Ensure joints are tight.
- Sarking to continue over Partiwall
- 2 layers continuous compressed USG Boral Firepack between battens and over top track
- SHAFTLINER fire barrier
- Partiwall aluminium clips both sides of each Partiwall stud
- USG Boral wall linings as specified both sides
- Insulation as specified

**Figure 9: Floor/Wall Junction Detail 1 - FRL 60/60/60**

- Continuous Partiwall top and bottom track. Fasten together with 10g x 16mm wafer head screws @ 600mm max ctrs.
- Skirting as required
- Flooring
- Floor joist
- USG Boral plasterboard ceiling
- Partiwall aluminium clips at each Partiwall stud
- USG Boral wall linings as specified both sides
- Horizontal joint
- Insulation as specified
- Timber studs
- 150mm min
- 150mm min

**Note:**
1. Floors may be staggered to meet design requirements (refer Figure 10 for details).
2. Floor joists can be of any type and can run parallel or perpendicular to SHAFTLINER™ fire barrier.
Figure 10: **Staggered Floors – SHAFTLINER™ Horizontal Joint Treatment – FRL 60/60/60**

- **SHAFTLINER fire barrier**
- **USG Boral wall linings as specified both sides**
- **Insulation as specified**
- **Additional 16mm USG Boral FIRESTOP at floor/roof junction. Plasterboard joints do not need to be set with compounds. Ensure joints are tight.**
- **Partiwall top and bottom tracks fastened together with 10g x 16mm wafer head screws @ 600mm ctrs in both directions.**
- **Aluminium clips**
- **Additional 16mm USG Boral FIRESTOP at floor junction laminated to SHAFTLINER barrier with 10g x 40mm Type ‘L’ screws @ 400mm max ctrs in both directions. Plasterboard joints do not need to be set with compounds. Ensure joints are tight.**
- **Position of floor is for illustrative purposes only**
- **Timber studs**

Where SHAFTLINER horizontal joint exceeds 600mm and no greater than 1500mm vertically from a Partiwall clip, laminate additional 16mm FIRESTOP with 10g x 40mm Type ‘L’ screws as indicated @ 400mm max ctrs in both directions. Plasterboard joints do not need to be set with compounds. Ensure joints are tight.

Horizontal joint in SHAFTLINER fire barrier

Partiwall top and bottom tracks fastened together with 10g x 16mm wafer head screws @ 600mm ctrs

Additional 16mm USG Boral FIRESTOP at floor/roof junction. Plasterboard joints do not need to be set with compounds. Ensure joints are tight.

Roof or floor (floor shown for illustrative purposes)
**Figure 11: Roof Parapet Junction Detail – FRL 60/60/60**

- Continuous compressed USG Boral Firepack mineral wool packer
- Corrosion resistant metal parapet capping
- Non combustible roofing
- Box gutter
- Roof parapet height as required by NCC
- 50mm min overlap
- Partiwall® track
- Partiwall aluminium clips both sides of each Partiwall stud
- Non combustible roofing
- External cladding as required
- Roof framing
- Insulation to extend min 600mm both sides of Partiwall if average height of roof space above ceiling is 600mm or less. Insulation must satisfy thermal insulation requirements (if thermal insulation not required, use insulation specified for Partiwall system).

**Figure 12: Box Gutter Detail – FRL 60/60/60**

- Continuous Partiwall track
- 25mm nom gap between underside of valley board and SHAFTLINER
- Continuous compressed USG Boral Firepack mineral wool packer
- Non combustible roofing
- Roof framing
- Insulation to extend min 600mm both sides of Partiwall if average height of roof space above ceiling is 600mm or less. Insulation must satisfy thermal insulation requirements (if thermal insulation not required, use insulation specified for Partiwall system).
INSTALLATION DETAILS

Figure 13: Outerwall Vertical Transition Detail – FRL 60/60/60

- Vertical battens to suit external cladding
- Min 10mm plasterboard
- External cladding to Architect's details
- 16mm FIRE WETSTOP plasterboard
- Timber studs @ max 600mm ctrs
- Skirting as required

Note:
FRL 60/60/60 for upper storey external wall is from outside only.

Figure 14: Flat Roof – Wall/Roof Junction Detail – FRL 60/60/60

- Continuous compressed Firepack mineral wool packer
- Partiwall clips both sides
- USG Boral plasterboard ceiling as specified both sides
- 20-40mm gap each side
- Insulation to one/both sides as specified to achieve acoustic rating

Note:
FRL 60/60/60 for upper storey external wall is from outside only.
Figure 15: Staggered Roof Detail – Metal Roof – FRL 60/60/60

- Cladding on vertical battens to manufacturer’s specifications
- Extend stud to top of battens to support roof. Structural Engineer to check and ensure Partiwall clips are not subject to compression due to wind forces.
- Partiwall clips as required
- Additional layer of 16mm USG Boral FIRESTOP laminated to SHAFTLINER with 10g x 40mm Type ‘L’ screws @ 400mm max ctrs in both directions. Plasterboard joints do not need to be set with compounds. Ensure joints are tight.
- USG Boral plasterboard ceiling
- 25mm gap for frame shrinkage and roof movement
- Allow 25mm gap for frame shrinkage and roof movement
- Continuous Partiwall track
- Thermal insulation as required
- USG Boral plasterboard ceiling
- 20-40mm gap both sides
- Insulation as specified
- Max 75mm x 50mm battens (NCC Vol. 2 Cl 3.7.1.8d)
- 2 layers compressed USG Boral Firepack between battens and continuous over top track
- Non combustible roofing
- High roof truss
- Partiwall clips as required
- Additional layer of 16mm USG Boral FIRESTOP laminated to SHAFTLINER
- USG Boral wall linings as specified both sides
- SHAFTLINER fire barrier
- USG Boral plasterboard ceiling
- 25mm min Fire top overlap
**Figure 16: Eave Closure Detail – FRL 60/60/60**

- SHAFTLINER fire barrier and one layer 16mm FIRESTOP laminated together in eave space @ 400mm max ctrs in both directions.
- USG Boral Firepack mineral wool packer
- Continuous Partiwall track min 1200mm back span
- Timber fascia
- Partiwall track
- Partiwall clip
- Eave lining. Provide control joint at Partiwall location
- For metal fascia pack gap between fascia and SHAFTLINER with compressed Firepack
- 800mm max

**Figure 17: Horizontal SHAFTLINER™ Under Roof**

- Topmost SHAFTLINER panels can be installed horizontally provided they do not exceed 600mm in height
- Partiwall studs at butt joints between SHAFTLINER panels
- Additional Partiwall clips required at top of Partiwall studs if top of stud is more than 100mm above Partiwall clips below. Provide noggings as required to permit clip fixing.
- 16mm FIRESTOP not shown for clarity. Refer to roof cross-sections for extent of additional layer of 16mm FIRESTOP in roof space.
- Partiwall clips at 600mm ctrs screw fixed into Partiwall top track
- Continuous Partiwall top track. Refer to Partiwall/roof junction details for treatment under roof
- Back-to-back continuous Partiwall tracks fastened together with 10g x 16mm wafer head screws at 600mm ctrs
- 600mm max spacing typical
- 100mm max
Figure 18: *Typical Corner – Plan Detail – FRL 60/60/60*

- Partiwall aluminium clips at floor levels both sides of each Partiwall stud
- 20-40mm gap both sides typical
- Screw Partiwall tracks together with 10g x 16mm wafer head Type 'D' screws @ 600mm max ctrs and 150mm max from ends
- Insulation as specified
- SHAFTLINER fire barrier
- Timber studs
- USG Boral wall linings as specified

Figure 19: *4-Way Intersecting Wall – Plan Detail – FRL 60/60/60*

- Partiwall aluminium clips at floor levels both sides of each Partiwall stud
- 20-40mm gap both sides typical
- Screw Partiwall tracks together with 10g x 40mm wafer head Type 'D' screws @ 600mm max ctrs and 150mm max from ends
- Insulation as specified
- SHAFTLINER fire barrier
- Timber studs
- USG Boral wall linings as specified
INSTALLATION DETAILS

Figure 20: Internal Wall/Partition Junction Detail – FRL 60/60/60

- SHAFTLINER fire barrier
- Non fire rated wall
- Partiwall aluminium clips at floor levels both sides of each Partiwall stud
- 20-40mm gap both sides typical
- Insulation as specified
- USG Boral wall linings as specified

Figure 21: External to Internal Partiwall® Detail – FRL 60/60/60

- Additional layer of 16mm FIRESTOP laminated to SHAFTLINER using 10g x 40mm Type ‘L’ screws @ 400mm max clrs in both directions. Plasterboard joints do not need to be set with compounds. Ensure joints are tight.
- Overlap 16mm FIRESTOP 200mm into building interior
- USG Boral wall linings as specified both sides
- Insulation as specified
- SHAFTLINER fire barrier
- Partiwall aluminium clips at floor levels both sides of each Partiwall stud
- Cladding and Tyvek® Homewrap to manufacturer’s details
- Engineer to check end clips for compression due to wind forces
- Continuous Partiwall track

Insulation as specified
Figure 22: Clad Wall Junction Detail – FRL 60/60/60

- SHAFTLINER fire barrier
- Continuous bead of acoustic sealant or closed cell acoustic foam to capping track (seal all gaps)
- Exterior sealant
- Continuous Partiwall track to end of SHAFTLINER panel
- External cladding system
- Sarking as required

External cladding system with sarking as required

- Insulation to extend min 600mm both sides of Partiwall. Insulation must satisfy thermal insulation requirements (if thermal insulation not required, use insulation specified for Partiwall system).
- Insulation to one/both sides as specified to achieve required acoustic rating
- 600mm min insulation
- 20-40mm gap each side
- Continuous Partiwall track to end of SHAFTLINER panel
- USG Boral OutRwall 1 x 16mm FIRE WETSTOP externally min 1 x 10mm plasterboard internally. To achieve FRL 60/60/60 from outside only.
- Continuous compressed USG Boral Firepack mineral wool packer.
- 50-150mm
- Steel angle and weather sealant in the corner by cladding installer
- Tyvek Homewrap membrane over FIRE WETSTOP. External cladding on battens.

Insulation as specified

USG Boral wall linings as specified

Partiwall stud

Partiwall aluminium clips at floor levels both sides of each Partiwall stud

SHAFTLINER fire barrier

Figure 23: Partiwall® to OutRwall® Plan Detail – FRL 60/60/60

- USG Boral wall linings as specified both sides
- Partiwall stud
- Partiwall aluminium clips at floor levels both sides of each Partiwall stud

Continuous compressed USG Boral Firepack mineral wool packer.

USG Boral OutRwall 1 x 16mm FIRE WETSTOP externally min 1 x 10mm plasterboard internally. To achieve FRL 60/60/60 from outside only.
Figure 24: Brick Veneer Wall Junction Detail 1 – FRL 60/60/60

- Insulation to extend min 600mm both sides of Partiwall. Insulation must satisfy thermal insulation requirements (if thermal insulation not required, use insulation specified for Partiwall system).
- Sisilation covers USG Boral Firepack.
- Maximum 40mm gap between brickwork and end track.
- Control joint opposite SHAFTLINER fire barrier.
- Continuous Partiwall track fastened at top and bottom.
- Continuous compressed USG Boral Firepack mineral wool packer 200mm wide.
- Brick veneer.
- 600mm min insulation.
- Partiwall stud.
- Insulation to one/both sides as specified to achieve required acoustic rating.
- SHAFTLINER fire barrier.
- 20-40mm gap each side.
- Timber studs.
- USG Boral wall linings as specified both sides.
- Partiwall aluminium clips at floor levels both sides of each Partiwall stud.
Figure 25: Brick Veneer Wall Junction Detail 2 – FRL 60/60/60

- Timber studs
- USG Boral wall linings as specified both sides
- SHAFTLINER fire barrier
- 600mm min insulation. Insulation must satisfy thermal insulation requirements (if thermal insulation not required, use insulation specified for Partiwall system)
- Partiwall stud
- Insulation to one/both sides as specified to achieve required acoustic rating
- 200mm min USG Boral Firepack
- Continuous Partiwall track
- Articulation joint fire sealant with backing
- Brick veneer
- 20-40mm gap each side
- Partiwall aluminium clips at floor levels both sides of each Partiwall stud
- 600mm min insulation. Insulation must satisfy thermal insulation requirements (if thermal insulation not required, use insulation specified for Partiwall system).
INSTALLATION DETAILS

Figure 26: Wall Penetrations - Plan Detail – FRL 60/60/60

- Provide trimmers as required for services
- Wet area sealant around all plumbing penetrations
- Insulation as specified one or both sides (see Notes on the left)
- 20-40mm gap each side

**Note:**
1. All penetrations can be back-to-back.
2. To achieve $R_w+C_{tr}=40$ services separation insulation is required in the wall cavity on the opposite side of the soil/waste/water supply pipe.

Figure 27: uPVC Pipe Penetration at Roof Space – FRL 60/60/60

- USG Boral wall linings as specified both sides
- Non fire-rated power point (GPO)
- Stud bracket for power point (GPO)
- Insulation as specified one or both sides (see Notes on the left)
- Wet Area Sealant around PVC pipe (max 65mm dia) in wet areas
- USG Boral 25mm SHAFTLINER fire barrier
- Pyropanel Multiflex sealant
- Pyropanel Pyrosleeve
- RF100 fire collar
- uPVC pipe max 100mm diameter
- 150mm min to framing

**Note:**
Services penetrations through SHAFTLINER fire barrier should be approved by Building Surveyor/Certifier prior to installation.
**Note:**
Services penetrations through SHAFTLINER fire barrier should be approved by Building Surveyor/Certifier prior to installation.
PRODUCT INFORMATION
See USGBoral.com for the most up-to-date product information.

SALES ENQUIRIES
1800 003 377

TECHNICAL ASSISTANCE
TecASSIST™ – 1800 811 222

There are many variables that can influence construction projects, which affect whether a particular construction technique is appropriate. Before proceeding with any project, we recommend you obtain professional advice to ascertain the appropriate construction techniques to suit the particular circumstances of your project. We recommend you use qualified tradespersons to install this system.

The technical information contained in this manual was correct at the time of printing. Building systems, details and product availability are, however, subject to change. To ensure the information you are using is current, USG Boral recommends you review the latest building information available on the USG Boral website.

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