

## FLOOR: SmartJOIST Supporting Offset Load Bearing Wall Details

**RA1 Joist/Beam Connection details Supporting offset load bearing walls**

\*\*\*Maximum roof area supported\*\*\*  
As per table below

Joist Spacing (mm)	Maximum Roof Area Supported (m <sup>2</sup> )					
	300	400	450	600	300	450
3500	21.7	15.0	12.9	8.2	9.8	5.7
4000	21.1	14.5	12.3	6.9	9.4	5.5
4500	20.5	13.9	11.7	5.7	9.1	5.2
5000	20.0	13.4	11.0	4.4	8.9	4.8
5500	19.4	12.1	9.1	3.2	8.6	4.1

UB, UC or Channel section

Joist span

Joist hanger to match joist size

Load bearing wall

Brick or masonry wall

\*\*\*Maximum roof area supported\*\*\*  
As per table below

RA1

**RA2 Joist/Beam Connection details Supporting offset load bearing walls**

\*\*\*Maximum roof area supported\*\*\*  
As per table below

Joist Spacing (mm)	Maximum Roof Area Supported (m <sup>2</sup> )					
	300	400	450	600	300	450
3500	6.9	6.4	6.2	5.3	3.1	2.9
4000	6.7	6.2	6.0	4.8	3.0	2.7
4500	6.6	6.0	5.7	3.9	2.9	2.5
5000	6.4	5.8	5.1	3.1	2.9	2.3
5500	5.3	5.3	4.8	2.4	2.6	2.0

UB, UC or Channel Section

Web-Stiffener as per detail F13

Small Gap (3mm ±)

Nails, 4 of 3.15x65 Clinched

Tight Fit

Rebate of 12 mm Max

Min bearing length of 35 mm

Joist span

Load bearing wall

\*\*\*Maximum roof area supported\*\*\*  
As per table below

RA2

**RA3 Joist/Beam Connection details Supporting offset load bearing walls \*\*\*Concentrated Loads\*\*\***

\*\*\*Concentrated Loads\*\*\*

Stud or posts supporting truncated girder truss or other concentrated roof loads

Skew nail 2 of 3.15 x 75mm nails through to lower plate

70 x 35 F5 nailed to underside of top flange of adjacent joists with 3.15 x 60 nails.

90 x 45 F5 strut under concentrated load. Number of struts to match number of members in jamb stud or post

Rebate of 12 mm Max

Min bearing length 38 mm

Web stiffener as per detail F13

UB, UC or Channel Section

Small Gap (3mm ±)

Nails, 4 of 3.15x65 Clinched

Tight Fit

RA3

## FLOOR: SmartJOIST Supporting Load Bearing Cantilever Details

**C1 SmartJoist Load bearing cantilever details 1**

SmartJoist blocking panel

Web stiffeners required each side of ALL joists with reinforced cantilevers See detail F13

\*\*\*Tight Fit\*\*\*

Cantilever Span

Small Gap (3mm ±)

Nails, 4 of 3.15x65 Clinched

Tight Fit

Refer to detail F15

Equal to cantilever span but MINIMUM of 600mm

NOTE:  
Block together full length with filler blocks as per detail F15 of the SmartJoist Design Guide

C1

**C2 SmartJoist Load bearing cantilever details 2**

SmartJoist blocking panel

Attach web-stiffeners to each side of joist over support

17mm plywood or SmartRim closure

Cantilever Span

Small Gap (3mm ±)

Nails, 4 of 3.15x65 Clinched

Tight Fit

Face grain of ply reinforcement parallel to the span

Equal to cantilever span but MINIMUM of 600mm

NOTE:  
15mm F11 structural ply is required on one or both sides of the joist (See Tables). Depth shall match the full height of the Smartjoist. Nail with 3.15 x 65 nails at 100mm ctrs in a staggered pattern.

C2

**C3 SmartJoist Load Bearing Cantilever Detail (With INVERTED Face-Mount Hanger)**

INVERTED (Upside-down) Face-Mount Joist Hanger

SmartJoist blocking panel

SmartJoist shall be designed to support load bearing wall sections when not stacked over wall below

25x10mm G.I. strap with 7/32x15 dia. nails each end

Solid timber or LVL beam

Web-stiffener to be installed See detail F13

LVL Trimmer Beam

25x10mm G.I. strap with 7/32x15 dia. nails each end

3 rows of 3.75 dia x 40 mm nails into the web-stiffener each side

Cantilevered SmartJoist

Web Stiffener Nail with 4 of 3.15 dia x 65mm nails and clinched See detail F13

25x10mm G.I. strap with 7/32x15 dia. nails each end

Inverted Face-Mount Hanger

C3

## FLOOR: SmartJOIST Supporting Non-Load Bearing Cantilever Details

**F9 SmartJoist Non load bearing cantilever details**

Protected deck to be installed As per detail PD1

Non Load bearing wall to a maximum height of 2400 mm

SmartJoist blocking

200 x 50 mm Min. Nail to backer block & joist with 2 rows of 3.15 dia x 75 mm at 150 mm centres and clinch

Backer block - Nail with 2 rows of 3.75 dia x 65 mm nails at 150 centres and clinch

Section A-A

Min Fill - Suitable or Insulated timber (ENF CMR Class CEN 17)

1200 mm MAX

1200 mm MIN

1.5 x L

SmartJoist blocking

Non Load bearing wall to a maximum height of 2400 mm

SmartJoist may be cantilevered up to 1/3 of their back span

L/3 MAX

Example: 3600 mm

L

FOR CANTILEVERS SUPPORTING LOAD BEARING WALLS SEE DETAILS C1 or C2

F9

**FLOOR: SmartJOIST Brick Ledge Cantilever Details**

**F22 SmartJoist Brick ledge cantilevers details**

**NOTE:** THIS DETAIL NEEDS TO BE READ IN CONJUNCTION WITH DETAIL F23

**F22A SmartJoist Brick ledge cantilevers details**

**NOTE:** THIS DETAIL NEEDS TO BE READ IN CONJUNCTION WITH DETAIL F23

**F23 SmartJoist Brick ledge cantilevers details**

**NOTE:** Refer to SmartJoist Design Guide For The Maximum Roof Area Supported For Different Joist Size/Type\*\*\*

**FLOOR: SmartJOIST Brick Ledge Cantilever Details (Cont')**

**F24 SmartJoist Brick ledge cantilevers details**

**NOTE:** Refer to SmartJoist Design Guide For The Maximum Roof Area Supported For Different Joist Size/Type\*\*\*

**F25 SmartJoist Brick ledge cantilevers details**

**NOTE:** THIS DETAIL NEEDS TO BE READ IN CONJUNCTION WITH DETAIL F23

**FLOOR: SmartJOIST to Solid Timber Fixing Details**

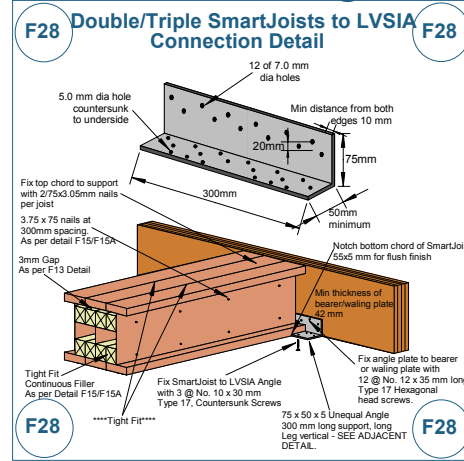
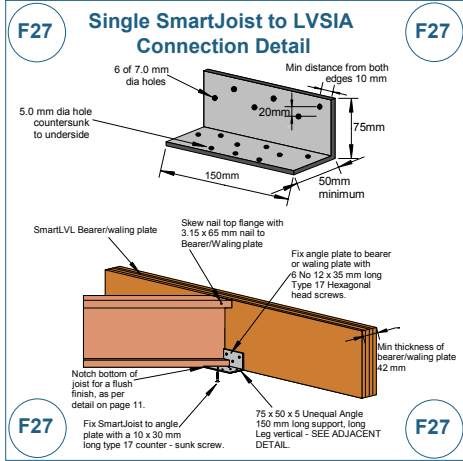
**F11 SmartJoist to LVL/Solid timber Face/Top mount connection details**

**F11A SmartJoist to LVL/GL Beams Face-mount connection detail**

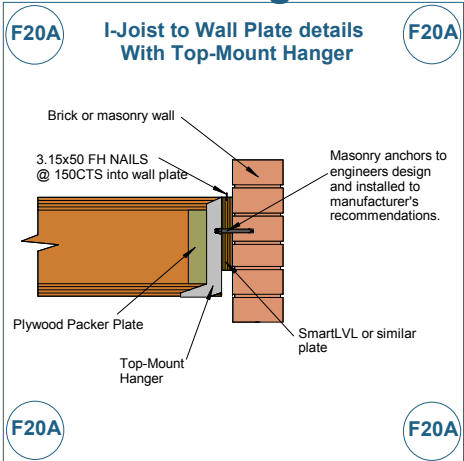
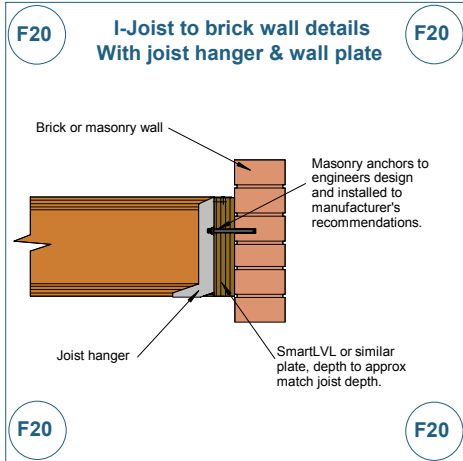
**F13A SmartJoist to LVL/GL Beams Face-mount connection detail**

**Install web-stiffener & fix the face-mount hanger to the web-stiffener with 3 rows of 3.75dia x 40mm nails to achieve greater uplift capacity**

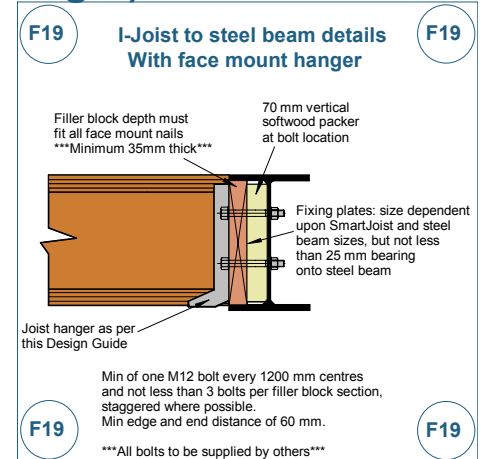
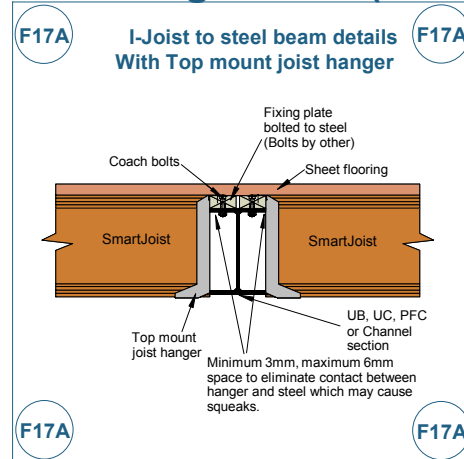
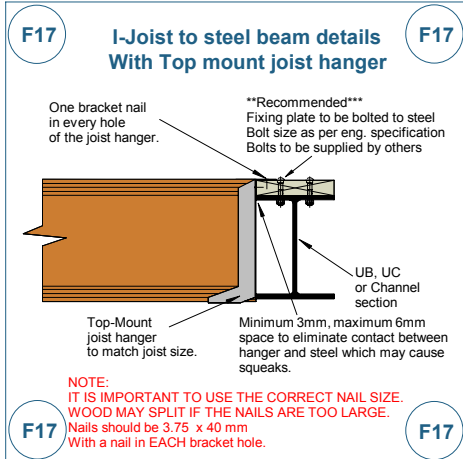
**FLOOR: SmartJOIST to Solid Timber Fixing Details (Cont')**



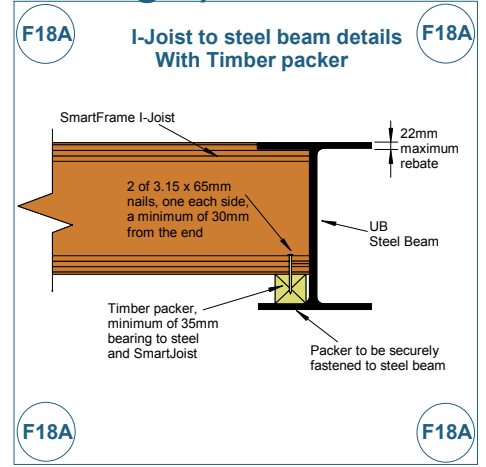
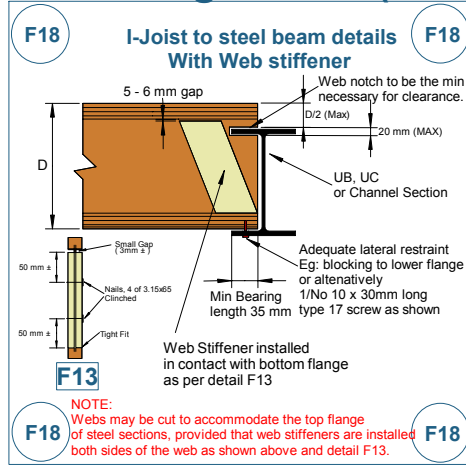
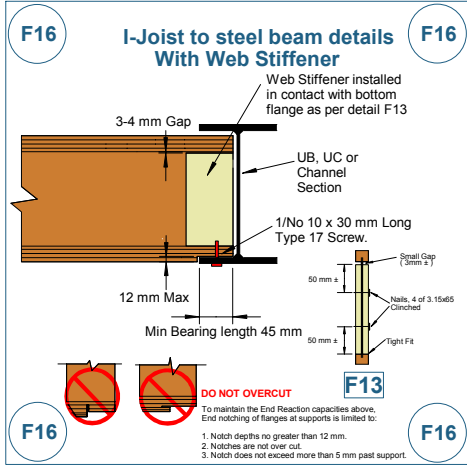
**FLOOR: SmartJOIST to Brickwall Fixing Details**



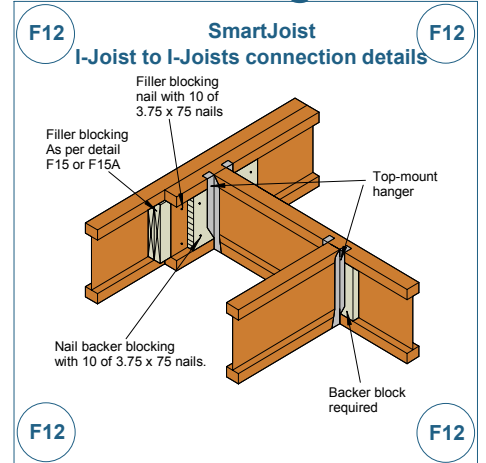
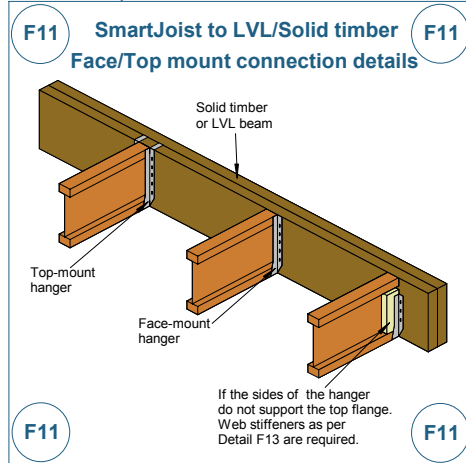
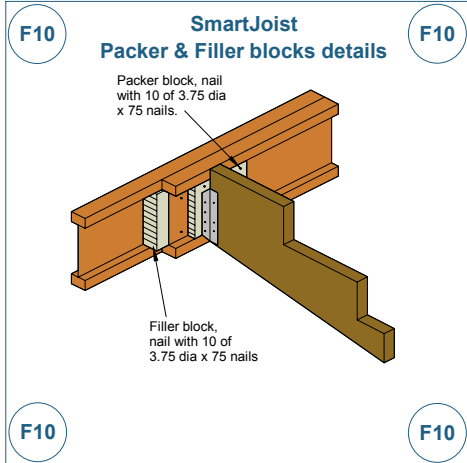
**FLOOR: SmartJOIST to Steel Fixing Details (With Hanger)**



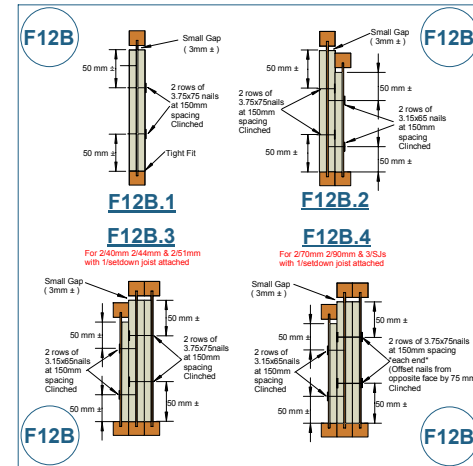
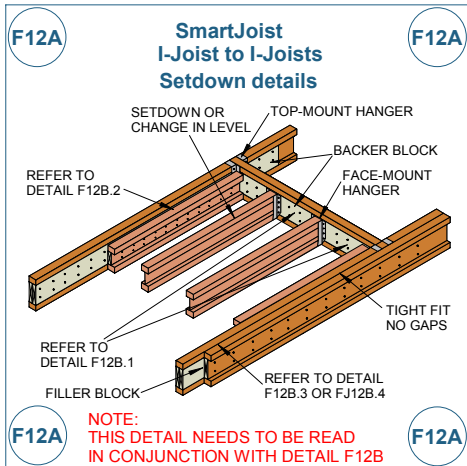
## FLOOR: SmartJOIST to Steel Fixing Details (Without Hanger)



## FLOOR: SJ Packer/Filler Block, SmartJOIST to SmartJOIST Fixing Details



## FLOOR: SmartJOIST Set-Down Detail





## FLOOR: Web Stiffeners, Bevel Cut Details

**F13 SmartJoist Web Stiffener attachment details**

**NOTE:**  
1. Web stiffeners are NOT required at end bearing supports when span length are taken from the SmartFrame I-Joist Design Guide  
2. Web stiffeners may be required at inner supports. Consult the appropriate tables.  
3. Web stiffeners ARE required where the joist hanger does not support the top flange.

**WEB STIFFENERS:**  
SJ20044: 15x60mm ply  
SJ24040: 15x60mm ply  
SJ24051: 19x60mm ply  
SJ24070: 2/15x60mm ply  
SJ24090: 2/19x60mm ply  
SJ30040: 15x60mm ply  
SJ30051: 19x60mm ply  
SJ30070: 2/15x60mm ply  
SJ30090: 2/19x60mm ply  
SJ36058: 2/12x60mm ply  
SJ36090: 2/19x60mm ply  
SJ40090: 2/19x60mm ply

**F14 SmartJoist Bevel cut details**

**NOTE:**  
SmartJoist blocking or timber X-bracing required at bearing for lateral support.

## FLOOR: Multiple SmartJOIST Details

**F15 SmartJoist Multiple SmartJoist details 1**

**NOTE:**  
For 240mm 244mm & 251mm  
For 270mm 290mm & 3SJs

**F15A SmartJoist Multiple SmartJoist details 2**

**NOTE:**  
For 240mm 244mm & 251mm  
For 270mm 290mm & 3SJs

## FLOOR: Multiple LVLs/GLs Laminating Detail & Protectadeck Detail

**LB1 Bolting of SmartLVL/SmartLam 2/58mm in width or greater**

Maximum Floor Load Width Supported By Either Outside Member (mm)		
12mm dia. Bolts		
2 rows at 800mm ctrs	2 rows at 300mm ctrs	3 rows at 800mm ctrs
500mm	1100mm	1000mm

**LB2 Multiple member of SmartLVL Laminating details (2/45mm in width or less)**

Multiple members laminating of TOP loaded beams

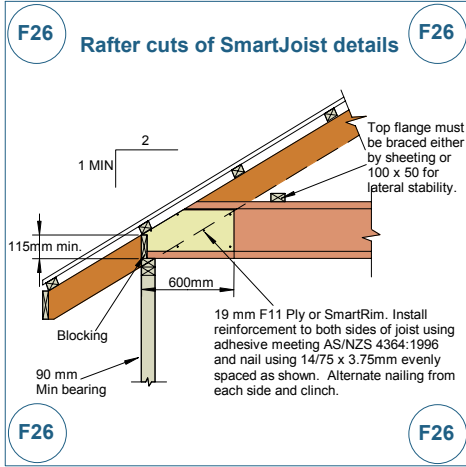
Nails driven on alternate sides

Maximum Floor Load Width Supported By Either Outside Member (mm)	
3.75 dia x 90mm nails	
2 rows at 300mm ctrs	3 rows at 300mm ctrs
3400mm	5100mm

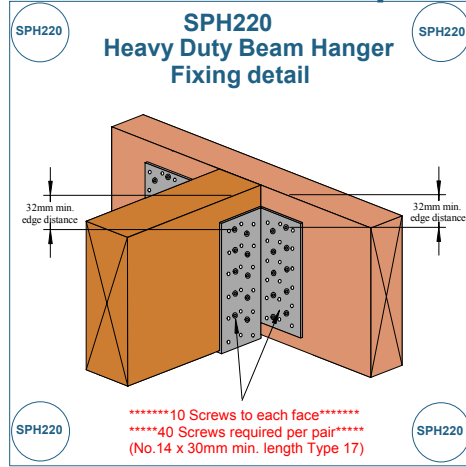
**PD1 SmartLVL Protectadeck details**

**NOTE:**  
Deck/Balcony members to be sealed before & after installation.

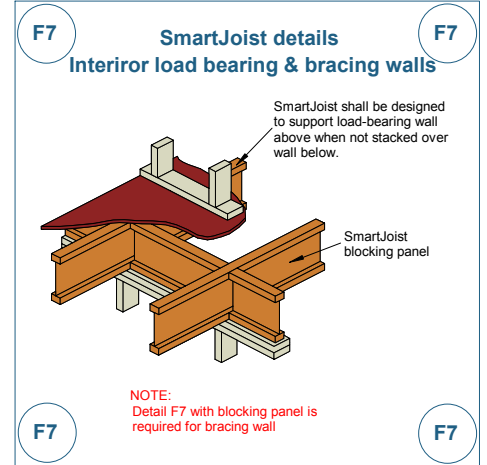
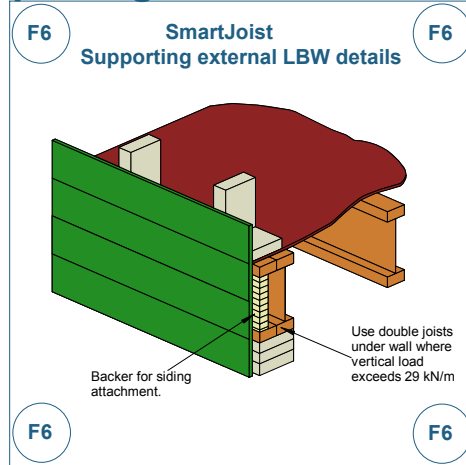
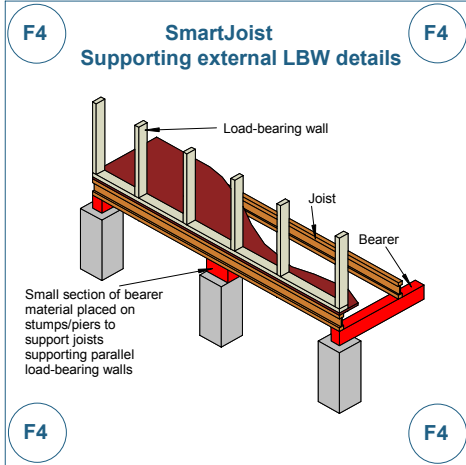
**FLOOR: SJ Rafter Cut**



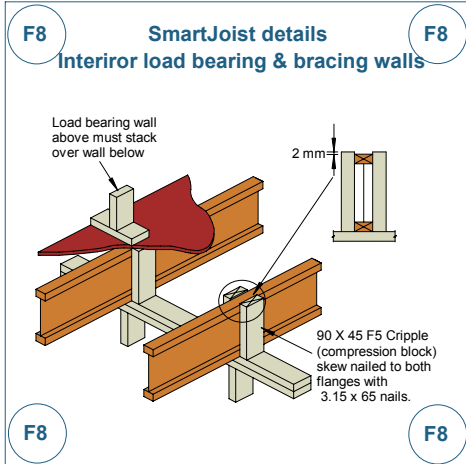
**FLOOR: SPH220 Split Hanger Fixing Detail**



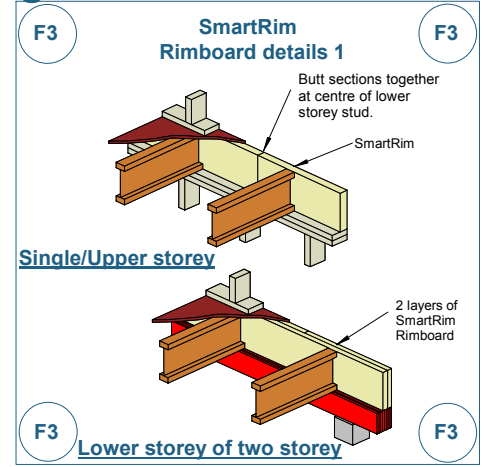
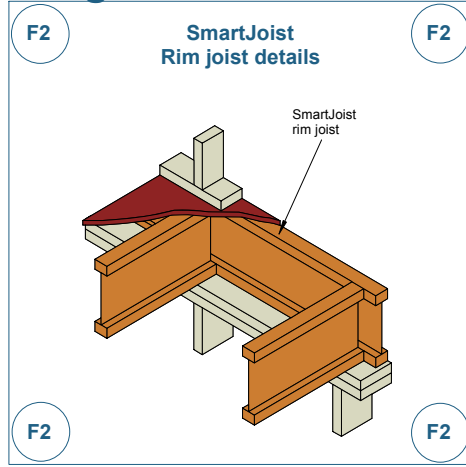
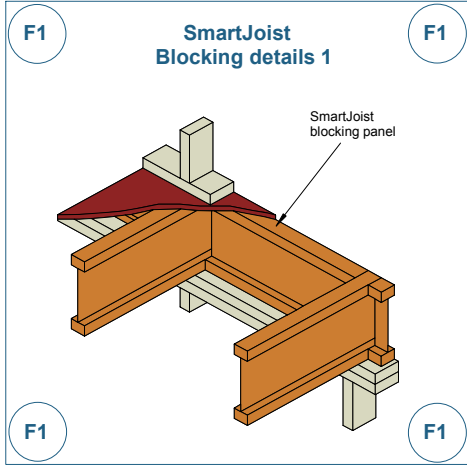
**FLOOR: SmartJOIST Supporting External/Internal LBW Details**



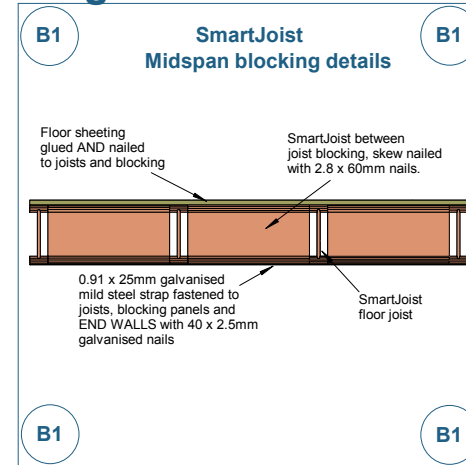
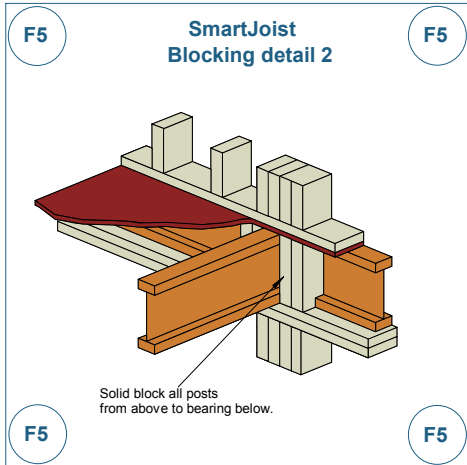
**FLOOR: SmartJOIST Supporting External/Internal LBW Details (Cont')**



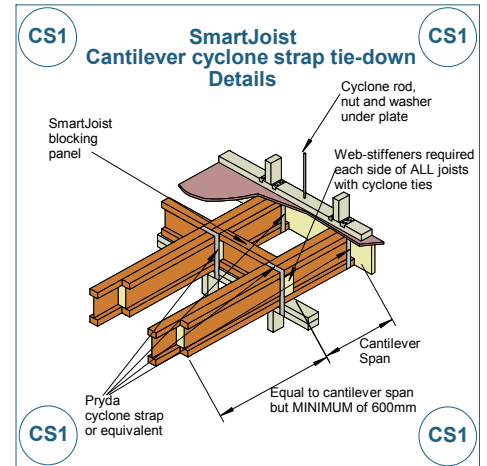
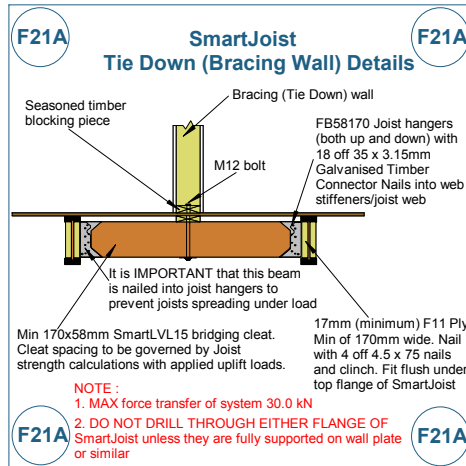
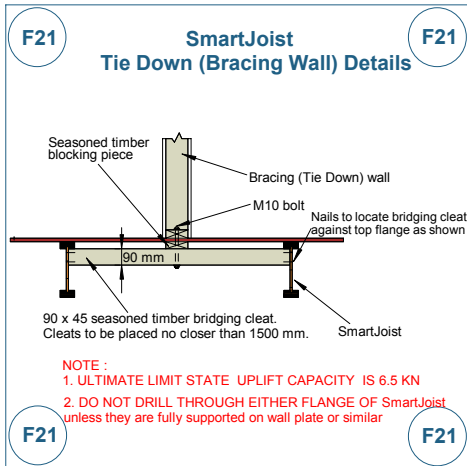
**FLOOR: SmartJOIST Blocking & Rimboard Blocking Details**



**FLOOR: SmartJOIST Blocking & Rimboard Blocking Details (Cont')**



**FLOOR: SmartJOIST Tie-Down Details**





**SmartFRAME "DO" / "DO NOT" details**

**-DO NOT CUT OR NOTCH FLANGE**  
**-DO NOT OVER-CUT HOLES IN WEB**

**-RAFTER CUTS ARE REQUIRED TO HAVE MIN. OF D/3 REMAINING AT THE OUTER FACE & A MAX. SLOPE DISTANCE OF 3xD.**

**-HOLES WITH SHARP CORNER NOT ALLOWED**

**FOR BEARERS & JOISTS ONLY:**  
**-MAX. HOLE DIMENSIONS & LOCATIONS WITHIN THE SPAN TO CONFORM TO Fig 4.1 OF AS1684.2**

**-MAX. NOTCH (TENSION & COMPRESSION EDGE) DIMENSIONS & LOCATIONS WITHIN THE SPAN TO CONFORM TO Fig 4.1 OF AS1684.2**

**-DON'T MAKE HOLES WITH HAMMER OTHER THAN PRE-PUNCHED KNOCKOUTS**

**MAXIMUM NAIL DIAMETER 3.15mm**

**DO NOT START TOE NAIL INTO THE CORNER OF THE FLANGE OR THE TOP OF THE FLANGE**

**START TOE NAIL APPROXIMATELY 2/3 OF THE SIDE OF THE FLANGE**

**NAILS SHOULD BE AS FAR AS PRACTICAL FROM THE END OF THE JOIST**

**NOTCHES IN THE ENDS OF I-JOISTS**

**DO NOT OVERCUT FLANGES. SUBSTANTIAL REDUCTIONS IN CAPACITY MAY OCCUR IF FLANGE ARE OVERCUT.**

To maintain the End Reaction capacities above, End notching of flanges at supports is limited to:

1. Notch depths no greater than 12 mm.
2. Notches are not over cut.
3. Notch does not exceed more than 5 mm past support.

**SmartFRAME "DO" / "DO NOT" Details (Cont')**

**CORRECT NAILING**

**NAIL AT WRONG ANGLE**

**NAIL TOO LONG**

**WEB-STIFFENER REQUIRED**

**WEB-STIFFENER NOT REQUIRED**

**WEB-STIFFENER REQUIRED**

**NO WEB RESISTANCE RESULTS IN ROTATION**

**HANGER SIDE FLANGE SUPPORT'S JOIST TOP FLANGE**

**HANGER SIDE FLANGE SHOULD BE AT LEAST 60% OF JOIST DEPTH.**

**I-JOIST TO I-JOIST CONNECTION**

**WITH FACE-MOUNT HANGER**

**BOTTOM FLANGE PULLING OFF WHEN BACKER BLOCK ON ONE SIDE ONLY**

**BACKER BLOCKING EACH SIDE. HANGER NAILS MUST EXTEND PAST THE SUPPORTING JOIST'S WEB MEMBER INTO THE BACKER BLOCKING.**

**WITH TOP-MOUNT HANGER**

**BACKER BLOCKS REQUIRED**

**THE TOP FLANGE OF THE SUPPORTING JOIST MUST BE SUPPORTED BY BACKER BLOCKS TO PREVENT CROSS GRAIN BENDING AND ROTATION**

**SmartFRAME Notches, Cuts & Holes In Beams, Bearer, Joists & Rafters**

**NOTCHES, CUTS & HOLES IN BEAMS, BEARERS, JOISTS & RAFTERS For SmartLVL products ONLY**

**NOTCHES, CUTS & HOLES IN BEAMS, BEARERS, JOISTS & RAFTERS For SmartLVL products ONLY**

**NOTCHES, CUTS & HOLES IN BEAMS, BEARERS, JOISTS & RAFTERS For SmartLVL products ONLY**

**NOTE: Not more than 3 holes per 1800 mm of span**

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**TYPICAL ROOF DETAILS**

Birdsmouth Detail

R1

Bevel Cut Detail

R2

*Rafter Fixed To Ridge Beam*

R7B

R7A

R3B

R3A

*Rafter Supported On Beveled Plate*

R8

R10A

R10B

*Roof Opening*

R11

*Lateral Restraint At Support*

R9A

R9B

R9C

R4

*Outriggers to SJ rafter*

Rafter Cut Detail

F26

Box Gutter Detail

BG1 BG2

R5A

R5B

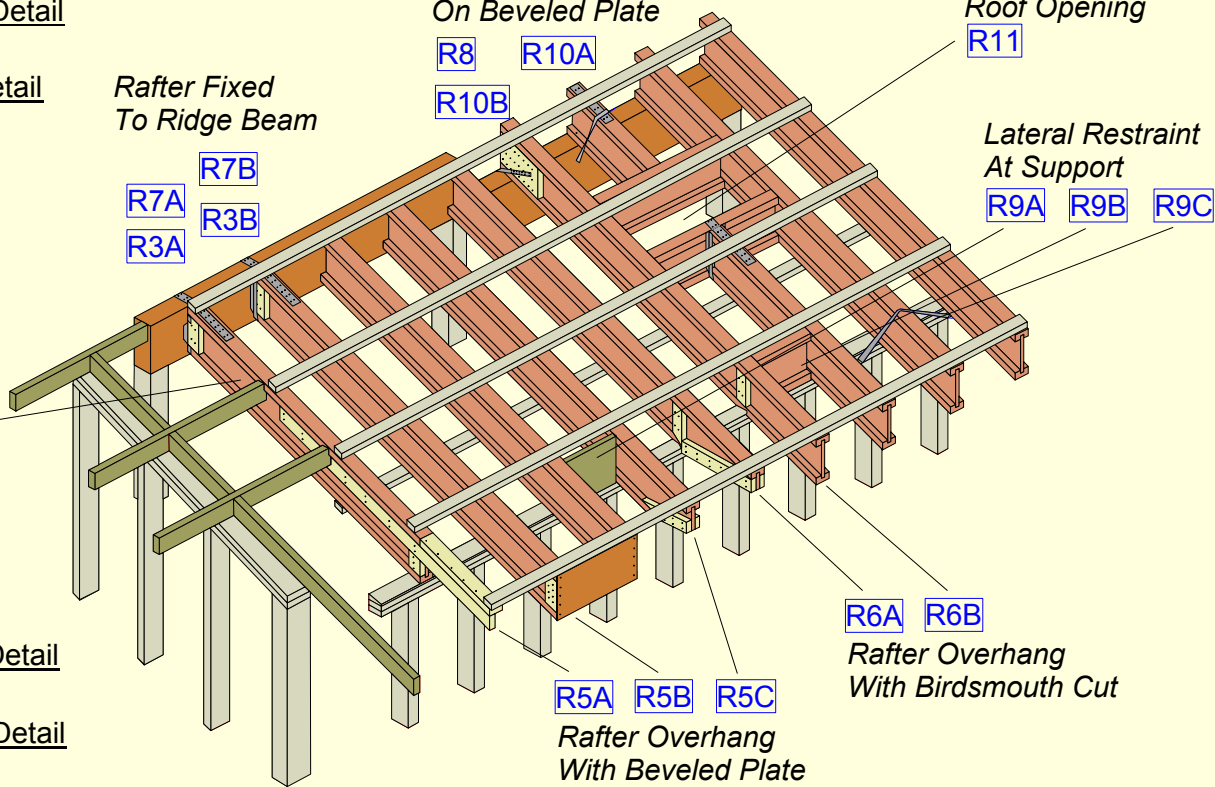
R5C

*Rafter Overhang With Beveled Plate*

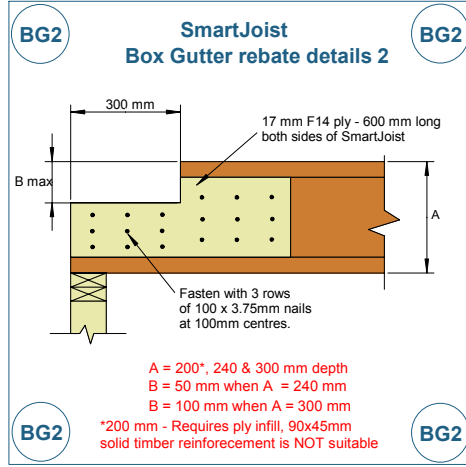
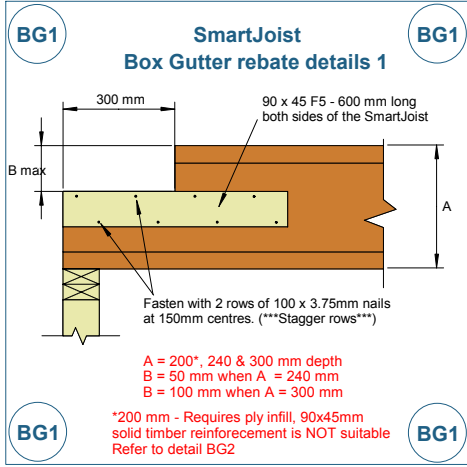
R6A

R6B

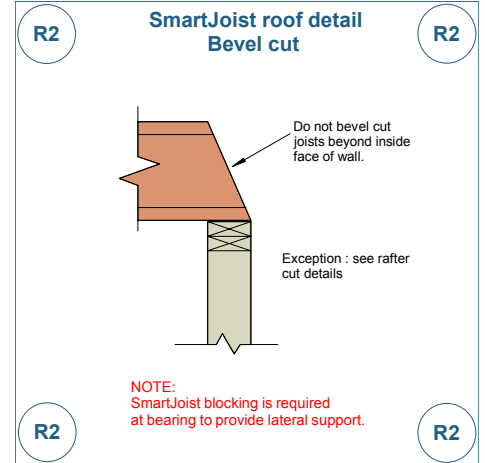
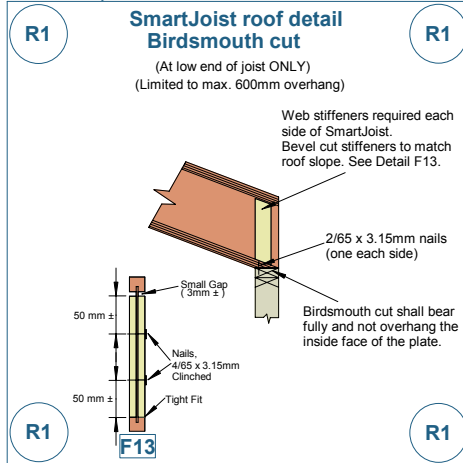
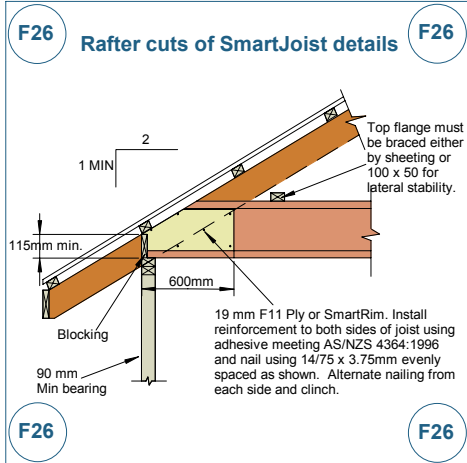
*Rafter Overhang With Birdsmouth Cut*



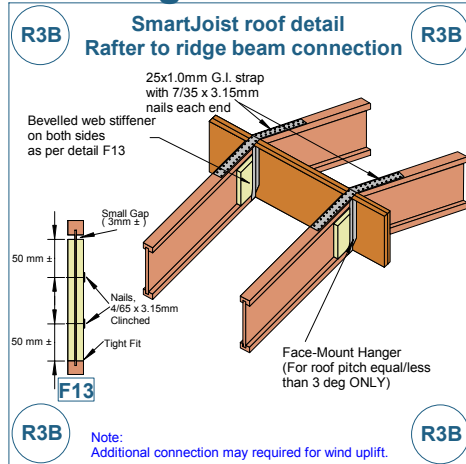
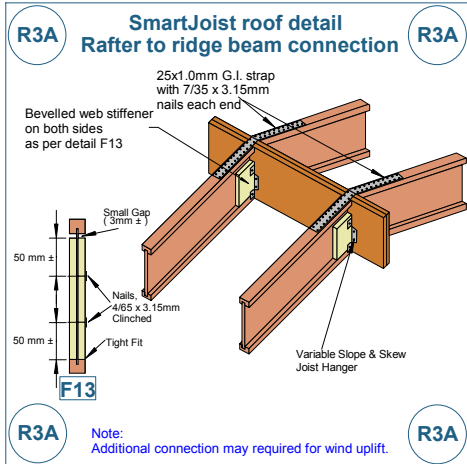
**ROOF: SmartJOIST Box-Gutter Details**



**ROOF: SmartJOIST Rafter Cut, Birdsmouth cut & Bevel Cut Details**



**ROOF: SmartJOIST Rafter to Ridge Beam Details**



## ROOF: Pine Outriggers to SmartJOIST Rafter Detail

**R4 SmartJoist roof detail Outriggers to rafter connection R4**

Joist shall be designed using design properties when "L" exceeds joist spacing.

50mm width overhang rafters. Notch around SmartJoist top flange.

Blocking between outriggers

**R4 Note:** Additional connection may required for wind uplift. **R4**

## ROOF: SmartJOIST Rafter Overhang With Beveled Plate Details

**R5A SmartJoist roof detail Lumber overhang with beveled plate R5A**

50mm width cripple, cut under 90 x 45 rafter extension (Web stiffener other side)

Use 2 rows of 65 x 3.15mm nails at 200 mm centres

600mm max. overhang 1200mm min. backspan 600mm max. rafter spacing

600 mm MAX.

1200 mm

Beveled plate at bearing

**R5A Note:** Additional connection may required for wind uplift. **R5A**

**R5B SmartJoist roof detail Rafter overhang with beveled plate R5B**

minigrrips as per manufacturer specification

Fix rafters to beveled plate with 1/75 x 3.15mm nail (one on each side)

tie-down as per manufacturer specification

Web-stiffener as per detail F13

Fascia fixed to end of rafters with nail into web-stiffener, top flange & bottom flange

600 mm max.

50 mm beveled plate for slopes greater than 1 degree.

**R5B Note:** Additional connection may required for wind uplift. **R5B**

**R5C SmartJoist roof detail Rafter overhang with beveled plate R5C**

Trim & add blocking (one each side) as desired for fascia support (cut to fit)

Use 2 rows of 75 x 3.15mm nails at 100 mm centres

50 mm beveled plate for slopes greater than 1 degree.

**R5C Note:** Additional connection may required for wind uplift. **R5C**

## ROOF: SJ Rafter Overhang With Birdsmouth Cut

**R6A SmartJoist roof detail Rafter overhang with birdsmouth cut R6A**

Web stiffeners required each side

tie-down as per manufacturer specification

Birdsmouth cut at bearing

600 mm MAX.

Extension rafter on both sides for fascia support (cut to fit)

Use 2 rows of 75 x 3.15mm nails at 100 mm centres

**R6A Note:** Additional connection may required for wind uplift. **R6A**

**R6B SmartJoist roof detail Rafter overhang with birdsmouth cut R6B**

tie-down as per manufacturer specification

Birdsmouth cut at bearing

Small Gap (3mm ±)

50 mm ±

Nails, 4/65 x 3.15mm Clinched

Tight Fit

600 mm MAX.

Web stiffener required both sides See detail F13

**R6B Note:** Additional connection may required for wind uplift. **R6B**

**ROOF: SmartJOIST Rafter - Peak Connection Details**

**R7A SmartJoist roof detail Peak connection**

25x1.0mm G.I. strap with 7/35 x 3.15mm nails each end

Bevelled web stiffener on both sides as per detail F13

Variable Slope & Skew Joist Hanger

Small Gap (3mm ±)

50 mm ±

Nails 4/65 x 3.15mm Clinched

Tight Fit

F13

**R7A** Note: Additional connection may be required for wind uplift. **R7A**

**R7B SmartJoist roof detail Peak connection**

25x1.0mm G.I. strap with 7/35 x 3.15mm nails each end

Bevelled web stiffener on both sides as per detail F13

Face-Mount Hanger (For roof pitch equal/less than 3 deg ONLY)

Small Gap (3mm ±)

50 mm ±

Nails 4/65 x 3.15mm Clinched

Tight Fit

F13

**R7B** Note: Additional connection may be required for wind uplift. **R7B**

**R8 SmartJoist roof detail Peak connection**

Panel backer block on both sides (With 18 nails)

Bevelled plate \*\*\*Birdsmouth cut not permitted\*\*\*

Twist Strap on both sides  
No. of nails & nail size as per manufacturer specification

30 degrees max. angle

**R8** Note: Additional connection may be required for wind uplift. **R8**

**ROOF: SmartJOIST Rafter - Lateral Restraint At Support**

**R9A SmartJoist roof detail Lateral support (rimboard blocking panel)**

Rim Board Blocking. (Toe nail to top plate at 150mm on center.) Install as joists are set.

Bevelled web stiffener on both sides as per detail F13

Bevelled plate or Birdsmouth cut at bearing

Small Gap (3mm ±)

50 mm ±

Nails 4/65 x 3.15mm Clinched

Tight Fit

F13

**R9A** Note: Additional connection may be required for wind uplift. **R9A**

**R9B SmartJoist roof detail Lateral support (I-Joist blocking panel)**

Fix roof batten to rafter with 2/35 x 3.15mm nails

Fix roof batten to blocking with 2/35 x 3.15mm nails

Fix cut-to-length blocking to support with 4/65 x 3.15mm nail per each blocking

Bevelled plate or Birdsmouth cut at bearing

**R9B** Note: Additional connection may be required for wind uplift. **R9B**

**R9C SmartJoist roof detail Lateral support (Metal straps)**

Roof batten

Metal strap over rafter

Nail metal strap to rafters and supports with 3/35 x 3.15mm nails

Bevelled plate or Birdsmouth cut at bearing

**R9C** Note: Additional connection may be required for wind uplift. **R9C**

**ROOF: SJ Rafters On Beveled Plate Details**

**R10A SmartJoist roof detail Rafter supported on beveled plate**

Fix rafters to support with 1/75 x 3.15mm nail (one on each side)

25x1.0mm G.I. strap with 7/35 x 3.15mm nails each end

Blocking panel

Double-bevelled plate on beam or wall

Tie-down as per manufacturer specification

**R10A** Note: Additional blocking may be required for shear transfer. **R10A**

**R10B SmartJoist roof detail Rafter supported on beveled plate**

Fix rafters to support with 1/75 x 3.15mm nail (one on each side)

600mm

Blocking panel

RimBoard or filler block on both sides. (With 12 nails on each side of ridge)

Double-bevelled plate on beam or wall

**R10B** Note: Additional connection may be required for wind uplift. **R10B**

**ROOF: Roof Opening**

**R11 SmartJoist roof detail Roof Opening**

Nail backer blocking with 75 x 3.15mm nails. Refer to table below for no. of nails required

Filler blocking As per detail F15 or F15A

Strap

Face-Mount Hanger

Backer block on both sides

Side Load (kg)	No. of backer nails Required
227	8
340	12
454	16
567	20
680	24
794	28
907	32

**R11** **R11**