

Kingspan rethinking the limits of design



KS1000 RW roof and wall design guide

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Introduction

Suitable for a wide range of developments such as commercial, retail and industrial, amongst others, the Kingspan **KS1000 RW** systems are suitable for both **roof** and **wall** applications.

KS1000 RW roof is a through fixed roof system which can be used for building applications with roof slopes of roof slopes of 4 degrees or more after deflection.

KS1000 RW wall is a through fixed system which can be laid vertically or horizontally.

The KS1000 roof and wall systems provide guaranteed thermal performance.

Equally they provide insurer approved **FIREsafe** solutions allowing simple and fast site installation with options of valley or crown fixings using matching colour headed fasteners.

The systems provide good economics, superior thermal and air leakage performance with long term lifecycle durability and are available in lengths up to 11.8m maximum.

Benefits

Kingspan KS1000 RW system offers a range of solutions for demanding specifiers.

If you insist on constantly reducing overheads, KS1000 RW has been designed for accelerated build speed. It is pre-engineered for single-component/ single-fix installation which reduces site time by as much as 50%.

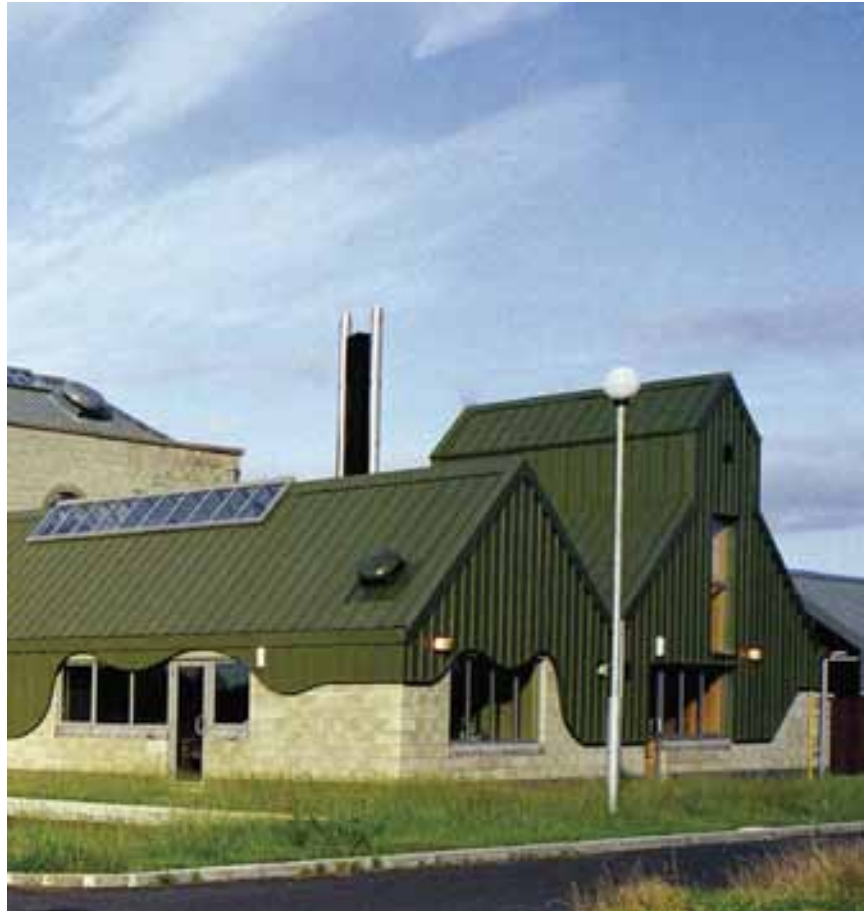
If you insist on a high quality finish, this system offers 100% reliable thermal performance and

insulation continuity: with no cavities, no gaps, no cold bridges or interstitial condensation risk.

If you insist on fire safety, this system is approved by Factory Mutual, the toughest test any building component can face.

If you insist on durability, KS1000 RW has an overall lifecycle expectancy of 40 years.

If you insist on the best, you've got it.



Key features


- Compliant with NZBC
- Insurer approved – FM-approved
- Lifetime insulation continuity, thermal performance and airtightness
- Accelerated build speed through pre-engineered, single component, single-fix installation, reduces site time by up to 50%
- Environmentally sustainable system – Zero ODP and non-deleterious
- Energy efficient performance reduces plant and lifetime operating costs by up to 40%
- Environmentally sustainable solutions reduce lifetime Carbon Dioxide (CO₂) emissions by up to 40%
- Lifetime durability and overall life expectancy in excess of 40 years
- Can incorporate safety and fall arrest systems
- Quality approved to ISO 9001: 2000
- Made in Australia (approximately 5 weeks delivery time to NZ)
- 3 year history of successful projects around NZ

Roof application

The KS1000 RW Roof system is suitable for building applications with roof slopes of 3° and above. Contact Technical Services for specifications.

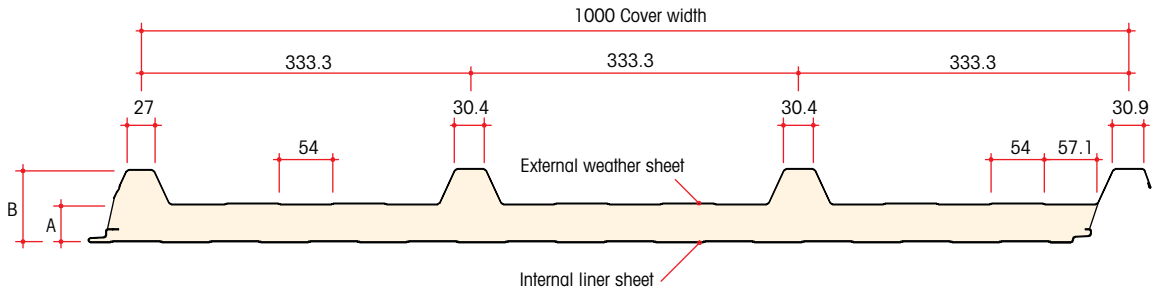
Wall application

The KS1000 RW Wall system is suitable for all building applications and can be laid horizontally or vertically.

Product reference	Application description
KS1000 RW	Standard trapezoidal roof and wall panel
 KS1000 RW-FM	Trapezoidal roof and wall panel with Factory Mutual (FM) approval

Insurer Approved **FIREsafe** System

Dimensions and weight



A – Core thickness (mm)	30	40	60	100
B – Overall dimension (mm)	65	75	95	135
Weight kg/m² 0.5/0.4 steel	9.5	9.9	10.7	12.3

Performance

Thermal insulation

Panel thickness (mm)	'R' value m ² k/W
30	1.82
40	2.33
60	3.35
100	5.34

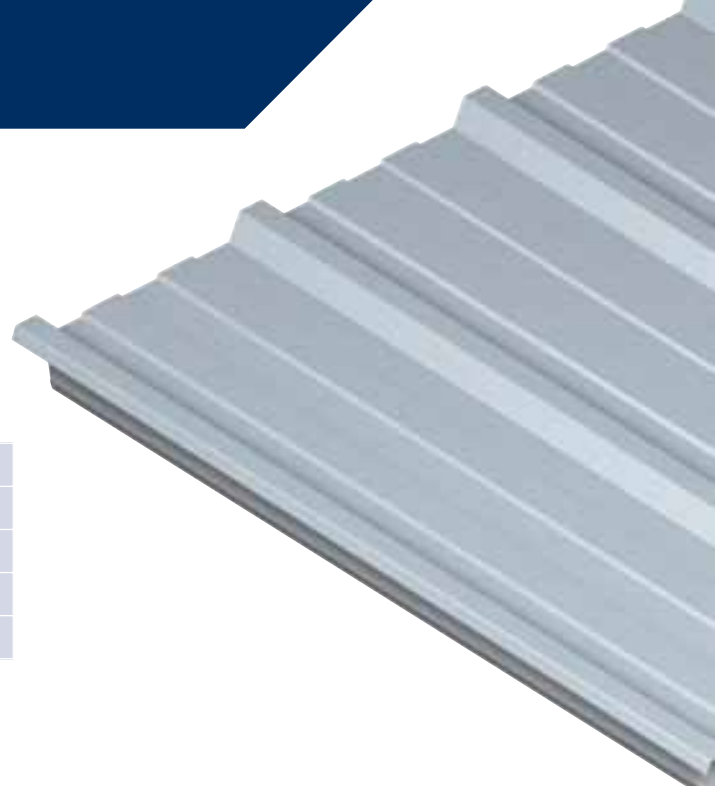
Calculated at k=0.020 W/m²

Biological Kingspan panels are normally immune to attack from mould, fungi, mildew and vermin. No urea formaldehyde is used in the construction, and the panels are not considered deleterious. No ozone depleting substances are used in the manufacture of these panels.

Fire Insurer approved **FIREsafe** panels are available with FM certification.

Acoustics All KS1000 RW panels have a single figure weighted sound reduction $R_w = 25\text{dB}$.

Sound Reduction Index (SRI) tested						
Frequency (Hz)	125	250	500	1k	2k	4k
SRI (dB)	17.2	20.0	23.2	23.4	23.2	40.5



Product tolerance

Cut to length	-0.05%	+0.1%
Liner sheet length	-0.1%	+0.1%
Cover width	-1mm	+1mm
Thickness	-5mm	+1mm
End square	-2mm	+2mm

Panel cut back

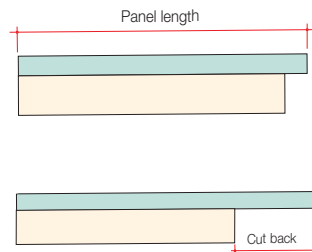
All panels can be produced with the following options:

- square
- 50mm
- 75mm
- 150mm

The recommended cut back for panel end lapping is 150mm.

Available lengths

Standard lengths 1.8 to 11.8m long. Panels less than 1.8m long which require a cut back can be provided, but will be charged at full 1.8m price, plus cutting cost.



Quality and durability

Kingspan Insulated Panels are manufactured from the highest quality materials, using state of the art production equipment to rigorous quality control standards, complying with ISO 9001: 2000 standard, ensuring long term reliability and service life.

Guarantees

Kingspan will provide external coating and product guarantees on an individual project basis.

Packing

KS1000 RW panels are stacked weather sheet to weather sheet (to minimise pack height).

The number of panels in each pack depends on panel thickness and length. Quantities are reduced for exceptionally long panels. Maximum pack height is 1200mm.

Delivery

All deliveries (unless indicated otherwise) are by road transport to project site. Off loading is the responsibility of the client.

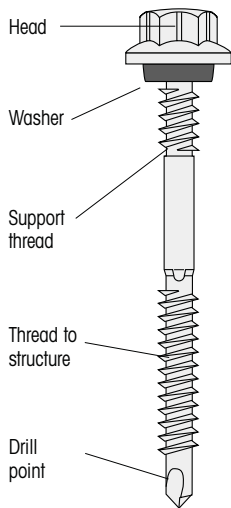
Site installation procedure

Site assembly instructions are available from the Kingspan Technical Services.

Introduction

Primary fasteners hold the insulated panels to the building frame, and secondary fasteners join panels to each other, and to flashings etc. The fasteners are therefore an integral part of the building, and their strength, weatherproofing, durability, and appearance must be carefully considered as part of the overall design.

The following general notes explain the various fasteners which are used with Kingspan Insulated Panels. Specific references from ITW Buildex fasteners are within this document. These are sourced from Ramset in NZ.



Primary fasteners

These fasteners are specially designed to drill through the panel, self tap into the framework, and finally seal the outer sheet. This is achieved in one fast operation using a screwgun with a depth sensing nose piece. Various accessories for these tools are available from the fastener manufacturer.

Fasteners are manufactured to suit the many materials and constructions in common use.

The variations include:

- They may be made from high quality carbon steel or austenitic stainless steel.
- The drill point alters for drilling into different materials and thicknesses.
- The self tapping thread can vary with the type and thickness of material.

- The overall fastener length will vary depending on the thickness of the panel being fixed.
- For through fixed panels some fasteners have a secondary support thread directly under the head to withstand superimposed loads caused by foot traffic. This also draws the outer skin tightly up to the washer, thus ensuring a weatherproof seal.
- The fastener head may be coated to match the roof and wall panel colour (contact Ramset for further information).

Secondary fasteners

These are the fasteners which join sheet to sheet, flashing to sheet, or flashing to flashing. The main types used are stitching screws or rivets.

Stitching screws self drill and tap, draw the sheets together and seal in one operation, in the same way as the primary fasteners. They are available in high quality carbon steel and austenitic stainless steel, and in several head forms to suit the various materials being fastened.

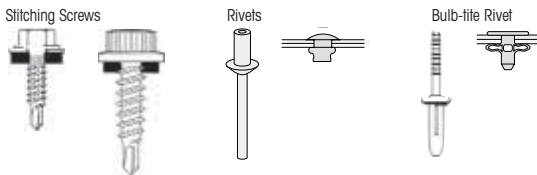
Rivets are made from aluminium alloy and are installed in a two stage operation which involves drilling a hole through the two components, pushing the rivet into the hole and setting it with a rivetting tool. This tool draws the mandrel through the rivet body and deforms it so that it grips the materials together – until it finally breaks.

Other blind fasteners are used for special applications, such as the side laps of rooflights, where normal pop rivets and stitchers are unsuitable. These larger fasteners come in several forms, some require a rivetting tool and others use a bolt to pull an EPDM grommet up to the underside of the sheet.

Installation and weathering

Self drilling/tapping fasteners are supplied with a bonded washer which is designed to prevent water ingress into the building through the fixing point. To be sure of optimum performance it is important to install the fasteners correctly.

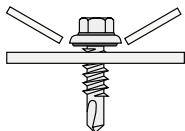
The fasteners and washers are designed to be driven so that the washer is compressed evenly, giving the appearance shown. The screwgun is fitted with an adjustable, depth sensitive nosepiece which can be



set to disengage the clutch when the fastener has been installed correctly.

Strength

The Primary fasteners hold the panels in place on the building and must be strong enough to resist the applied loads. In practice the most important load for fasteners is often wind suction which is trying to pull the panels off the building frame. In these circumstances ultimate failure of the fixing can happen in three possible ways:



1. Pull over

The outer skin of the panel deforms around the head and washer of the fastener until the hole is large enough for the panel to pull over, leaving the entire fastener in place.

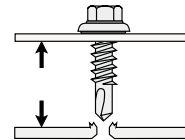
Permissible Loads (Pull Over) kN

Panel	Steel thickness	Fixing position	Pull over 16 ϕ washer	Load kN 19 ϕ washer
Roofs KS1000 RW	0.5	Crown valley	-	1.2
			-	1.8
	0.63	Crown valley	-	1.7
			-	2.5
Walls KS1000 RW	0.5	Valley	1.2	-
	0.63		2.5	-

2. Pull out

The fastener pulls out of the purlin/rail due to wind suction.

For purlin/rail thickness greater than 6mm the limiting strength is the tensile strength of the fasteners.



Permissible Loads
Ultimate average pull out loads

	Hi Teks	1.0mm	1.2mm	1.5mm	1.9mm	2.4mm	3.2mm
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Pull out data for G450 Steel (kN)

Carbon steel	12-14	2.8	3.1	4.2	5.5	7.3	9.4
	14-10	3.0	3.4	4.6	6.4	8.3	9.8
	14-20	2.6	3.2	4.2	5.5	7.7	11

Pull out data for G250/G300 Steel (kN)

Carbon steel	12-14	2.8	3.1	4.2	5.5	7.3	9.4
	14-10	3.0	3.4	4.6	6.4	8.3	9.8
	14-20	2.6	3.2	4.2	5.5	7.7	11

Mechanical properties

	Hi Teks	Single shear	Single	Torsional
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Shear (kN), tensile (kN) and torsional strengths (Nm)

Carbon steel	12-14	8.8	15.3	13.2
	14-10	10.9	19.7	18.5
	14-20	11.2	21.2	20.4

3. Fastener tensile failure

The fastener breaks in tension, part way down its length, leaving part of the thread in the frame. Permissible tensile load on a 5.5mm diameter carbon or stainless steel fastener is 6.0kN.

Durability and appearance

The ultimate life expectancy of the fasteners depends on their corrosion rate which can be affected by their material specification, the internal and external environments, and the construction of the building. However, there may be appearance or performance problems long before ultimate failure occurs. These may be due to leakage at washers, rust staining, or faded/missing colour caps.

Corrosion can occur if there is moisture on the fastener. The rate of corrosion will depend on the fastener material, its coating, the materials being fixed, how long the moisture is present, corrosive elements and the ambient temperature of the environment.

From the above it is clearly difficult to make general predictions about the life expectancy of fasteners, although a number of statements can be made:

1. Coated carbon steel fasteners have performed exceptionally well in Australian and New Zealand

conditions on roofs and walls of insulated buildings. For warranties contact Ramset.

2. Separate snap-on plastic colour caps may come off over time, but integral colour heads will not.

The fastener recommendations for ITW Buildex/Ramset products have been tabulated below.

In situations where there is industrial or marine pollution, or internally there are chemical or wet processes (ie. swimming pools), the fastener manufacturer should be consulted.

For further information about any of the fasteners described here, please contact:
 ITW Buildex Australia – **1300 368 101** Ramset New Zealand – **0800 726 738**

ITW Buildex fastener selector guide

Introduction

ITW Buildex manufacture large ranges of fasteners and it is important, but sometimes quite difficult, to select the correct type for a particular application. To assist designers, a Fastener

Selector Guide is shown below, which clearly identify ITW Buildex fastener suggested for various building applications and panel types. These codes are recognised by Ramset.

KS1000 RW carbon steel with washer face, epdm seal and class 4 to AS3566-2

Description	Panel thickness (mm)	Crown fix	Valley fix
Fix to steel 1.2mm-4mm Teks® Cold rolled	30	6-310-3335-2c4	6-310-0350-4cs*
	40	6-310-3335-2c4	6-310-3326-6z4*
	60	6-310-3433-7c4	6-310-3580-1z4*
	100	-	6-310-3433-7c4
Fix to steel 4mm-6.4mm Teks® Hot rolled	30	6-310-3335-2c4	6-310-3035-4c4
	40	6-310-3362-5c4	6-310-3035-4c4
	60	6-310-3433-7c4	6-310-3362-5c4
	100	-	6-310-3433-7c4
Fix to timber Type 17	30	6-030-3038-2c4	6-030-3008-2c4
	40	6-030-3213-8c4	6-030-3009-4c4
	60	6-030-3200-9c4	6-030-3038-2c4
	100	-	6-030-3200-9c4

Stitching screw for side lap and flashings

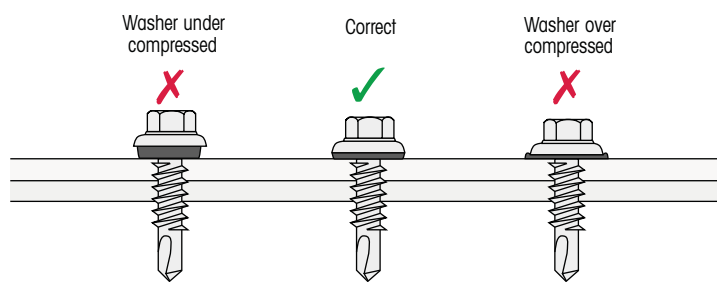
Stitching	10-16 x 16	6-310-0117-9cs
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For stainless fixings please contact Kingspan Technical or Ramset.

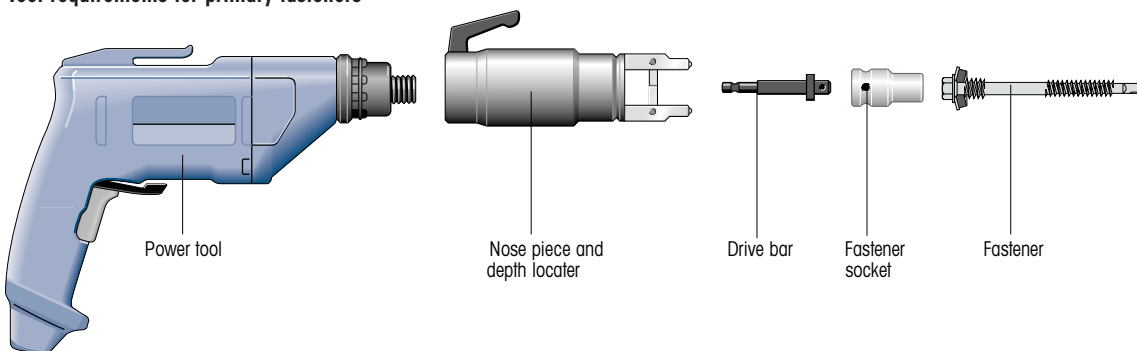
To be sure of optimum performance it is important that purpose designed tooling is used to install the fasteners correctly.

The fasteners and washers are designed to be driven so that the washer is compressed evenly, thus ensuring a weather tight seal. The screwgun must be fitted with an adjustable, depth sensitive nose piece which can be set to disengage the clutch when the fastener has been installed correctly.

Correct installation for primary and secondary fasteners

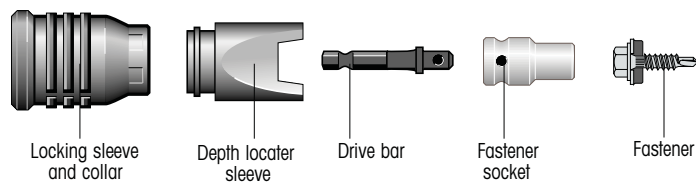


Tool requirements for primary fasteners

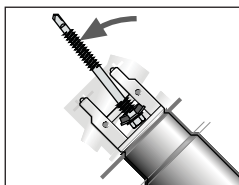


Tool requirements for secondary fasteners

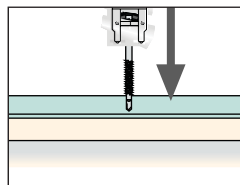
The following accessories can also be used with the standard power tool as above



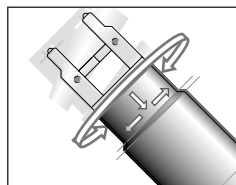
Faster installation method



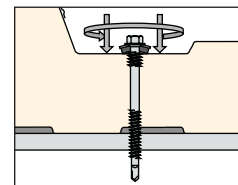
Insert fastener into socket



Insert fastener through panel



Adjust depth stop to ensure the correct compression of the washer (this only needs to be done on the first fastener to achieve the correct setting)



Correct washer compression

Introduction

Sealants are a fundamental part of roof and wall cladding specification and installation. They make an important contribution to satisfactory weathering, building physics and durability performance of the cladding envelope. It is therefore vital to specify the correct external and internal sealants and fillers at the design stage.

Sealants

Sealants used with Kingspan Insulated Panels can be supplied by Bostik Australia and are available through their distributors (Kingspan NZ can also supply).

Preformed mastic tape

Bostik 5250 preformed mastic tapes are non-hardening, permanently flexible, synthetic butyl rubber sealants with adhesive properties. They can withstand extreme heat and cold conditions from -40° to +100°C, still retaining their sealance, adhesion and resilience.

These tapes are supplied on rolls with a release paper. The length on the roll is 12m.

Tape Thickness mm Approx Roll Length metres

Tape thickness (mm)	Approximate roll length (m)
6 x 4	12
4 dia.	12

Gun grade sealants

Silicone sealant is used exclusively with Kingspan Insulated Panels. Kingspan recommends the following grades:

Neutral cure – This low modulus silicone does not release any acid during cure, is softer than alternatives, and can accommodate + or -35% joint movement.

Non-settling – Non-settling, non-skinning synthetic elastomers and plasticisers reinforced with inert pigments.

The sealants have a life of more than 20 years in external applications and joints are normally designed to allow the seal to be removed and renewed, thus extending joint life almost indefinitely.

Sealant applications

The following table shows which materials to use in a variety of normal building applications.

Detail	Sealant type	Size/shape (mm)
Side lap	5250	6 x 4
Internal side lap	5250	6 x 4
End lap	5250	6 x 4
Flashing/trim	5250	6 x 4 or 4 dia. bead

See Model Specification and construction drawings in this document.

Contact Kingspan technical services for your local supplier.

Installation of sealants

Tape sealants: 5250

On side and end laps the location of sealant tape is as indicated. On shallow roof pitches a double line of sealant should be used or alternatively a U section sealant can be supplied.

All tapes are applied from the roll leaving the backing paper in place to avoid stretching the tape. The paper is removed after the tape is in position. It is important that the tape is fitted properly down the valley sides and across the troughs without stretching. If this procedure is not followed a good seal is unlikely to be made.

When placing the panels care should be taken to avoid displacing the tape. When fixing the sheets, fasteners must not be over tightened as this could force the sealant out of the joint. In buildings where the internal air has a high humidity or low temperature, eg. swimming pools or chill stores, the liner side of the panel joint must also be sealed to form a vapour barrier.

When it is not possible to make a butt joint, a backing tape or gap filling foam should first be inserted into the joint, and the sealant is then applied so that it has an adequate bond area on both sides of the joint. Generally this should be at least 4mm, but in some

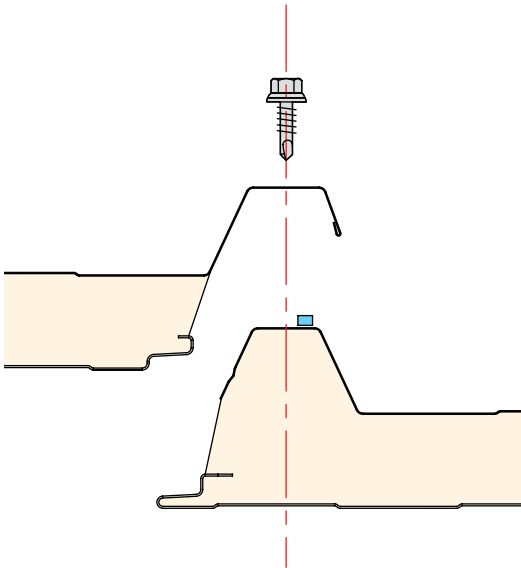
instances it may have to be varied to accommodate surface profiles etc.

All surfaces must be firm, clean, dry and free from dust, dirt, grease and water to enable the sealant to adhere to them.

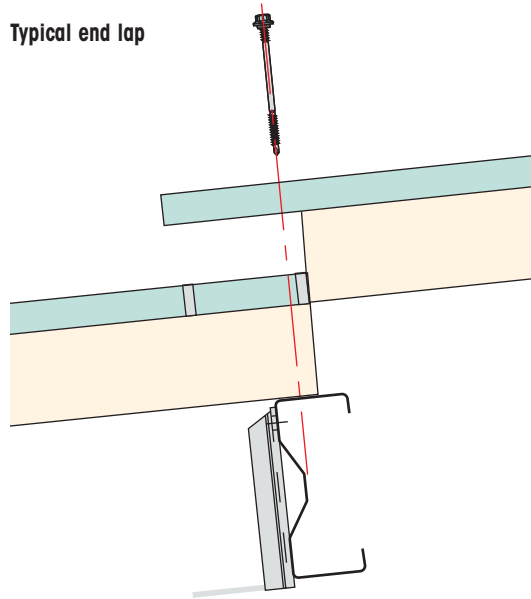
The surfaces should preferably be reasonably warm and never below 4°C.



Typical side lap



Typical end lap



Typical ridge filler



Profile fillers

Where any flashings, such as at a ridge or hip are fixed to profiled roofing or cladding panels a series of gaps are created. To prevent wind, rain and wildlife entering the construction these gaps need to be closed with profile fillers. The following material specification of profile filler is available:

TESA 97498, is 20mm thick and cut from closed cell polyethylene foam. This grade is available in black or white and is suitable for general use in non critical applications with a minimum life of 10 years. It should not be used in exposed applications near the coast as it may be subjected to damage by seabirds.

Application

The following specification is for the KS1000 RW/FM Trapezoidal Insulated Roof Panel used for a normal factory or warehouse type of building, with a roof slope greater than 4° and where the occupants or processes do not add significant quantities of water vapour to the air and a Factory Mutual Certified System is required.

Materials and coatings

External weather sheet

Substrate to be 0.50mm thick Zincolume G300S AZ150 coated steel to AS1397. Coating to be Colorbond Steel (Colours as per Bluescope Colorbond Chart).

Insulation core

To consist of 30,40,60 or 100mm thick, closed cell, Zero ODP, FM certified polyisocyanurate (PIR) insulation.

The auto adhesive properties of the core bond the external and internal sheets together, and control the panel thickness achieved during manufacture.

Internal liner sheet

Substrate to be 0.40mm thick Zincolume G300S AZ100 coated steel to AS1397. Coating to be a Standard Bluescope White lining – 10-15 microns thick.

Performance

Thermal insulation

The panel will have a Thermal Resistance (R Value) of (see below), based on an aged thermal conductivity of 0.020 W/mK.

Panel thickness (mm)	'R' value m ² k/W
30	1.82
40	2.33
60	3.35
100	5.34

Fire

The System has the following FM test results
ASTM E-180 Spread of Flame Test-Pass Class A,
Class 1 Test-Pass (Calorimeter) Class 1, Wind uplift
Test-Pass 1-90.

Seals and fillers

Side lap

All external side laps to be weather sealed along the full length by an unbroken bead of 6 x 4mm butyl rubber sealant tape. (Bostik 5250).

End lap

All external end laps to be 150mm long, and weather sealed along the full width using two unbroken runs of 6 x 4mm butyl rubber sealant tape. (Bostik 5250).

Fillers

Where flashings are fixed across the profile of the insulated panel, closed cell polyethylene foam fillers should be used to seal and close the profile.

Seal the top, bottom and sides of each profiled filler with non-curing gun-grade sealant.

Junctions

Junctions between the roof panel system and walls / penetrations filled with a FR fire rated gun applied canister urethane insulation eg Alfas Bond.

Internal face of panel to be air sealed along the full length by an unbroken 6 x 4mm butyl rubber sealant tape. (Bostik 5250)

Fasteners

Primary

All primary fasteners must be the high threaded type manufactured from carbon steel, anti-corrosion coated and fitted with a 16 (or 25mm) diameter bonded stainless steel (or aluminium) washer and colour matched head (if required).

All fasteners to be located through every valley or every crown of the profile.

To comply with local windload requirements, and those of Factory Mutual it may be necessary to provide additional fixings in areas of high local suction.

Secondary

Side laps and flashings to be stitched at 450mm centres (maximum) with carbon steel stitching screws, complete with 14.5mm diameter carbon steel washers.

Construction details

Flashings

All external flashings to be made from 0.50mm thick coated steel to the same specification as the outer sheet of the panel.

All flashings to be weather sealed at laps and along the full length by an unbroken bead of 6 x 4mm thick butyl rubber sealant tape ref: Bostik 5250.

All internal flashings to be made from 0.50mm thick steel substrate, to the same specification as the liner sheet of the panel.

All internal flashings to be air sealed at laps and along the full length by an unbroken bead of 4mm diameter butyl rubber sealant tape. End laps to be air sealed with gun grade sealant.

Panel lengths

Exact lengths to be determined by the cladding contractor from the steelwork drawing.

Maximum length 11.8m.

Safety

The contractor is to determine and use a safe method of working throughout the installation and construction period, which complies with OHS requirements.

Purlin centres

The Maximum Purlin Centres for FM certification is 2000mm, for all panel thickness.

Note: Only if FM-Approval is required. For non-FM installations refer to load span tables.

Rooflights

Rooflights to be specified to suit project requirements. If FM approval is required seek approval from FM Project Engineer.

Construction requirements

Steelwork tolerance

The steel frame must be made and assembled to an accuracy of L/600 between fixing planes of adjacent purlins, where L. is the purlin spacing. See note above for Maximum Purlin Centres.

Installation

Panels to be laid with side lap joints away from prevailing wind unless otherwise shown on drawings.

All fasteners, seals and fillers to be of correct specification and installed as indicated on the project construction drawings.

Site cut panels must provide accurate, true lines with no distortion. Panels to be cut with powered reciprocating type saw and all exposed site cut panels to be treated with a suitable edge protection lacquer.

Cut openings for outlets, vents, flues etc. to be the minimum size necessary. Any penetration over 300mm must be structurally supported.

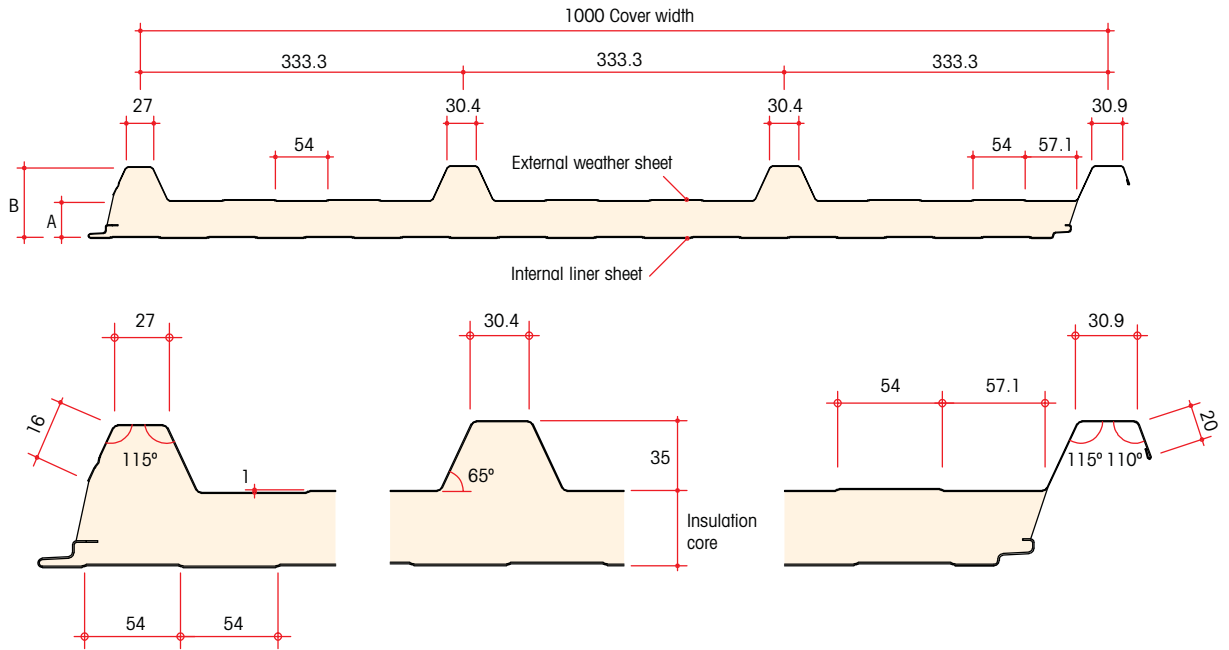
Remove all swarf and any foreign matter immediately from the external surface of panels.

Fasteners to be checked and adjusted if necessary to ensure they are weather tight and external panel facing is not distorted.

Typical construction details – KS1000 RW roof

For non standard applications contact Kingspan Technical Services

KS1000 RW roof panel dimensions

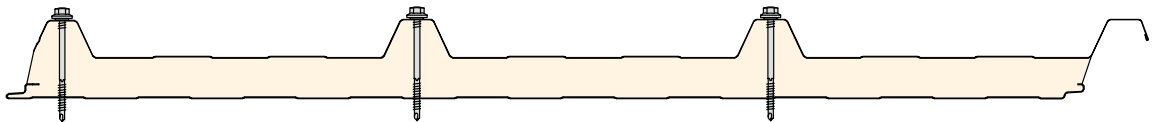


Available panel thicknesses	
Insulation core	Overall panel thickness
30	65
40	75
60	95
100	135

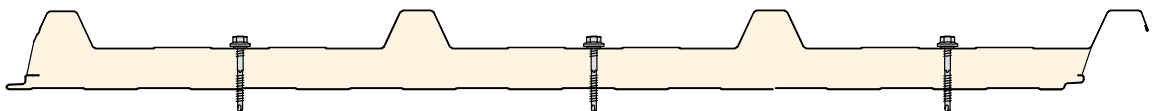
NOTE: Above dimensions are nominal, actual dimensions will vary due to manufacturing tolerances. Exactly precise dimensions must always be measured from actual samples. All dimensions are in millimetres.

Recommended fastener locations

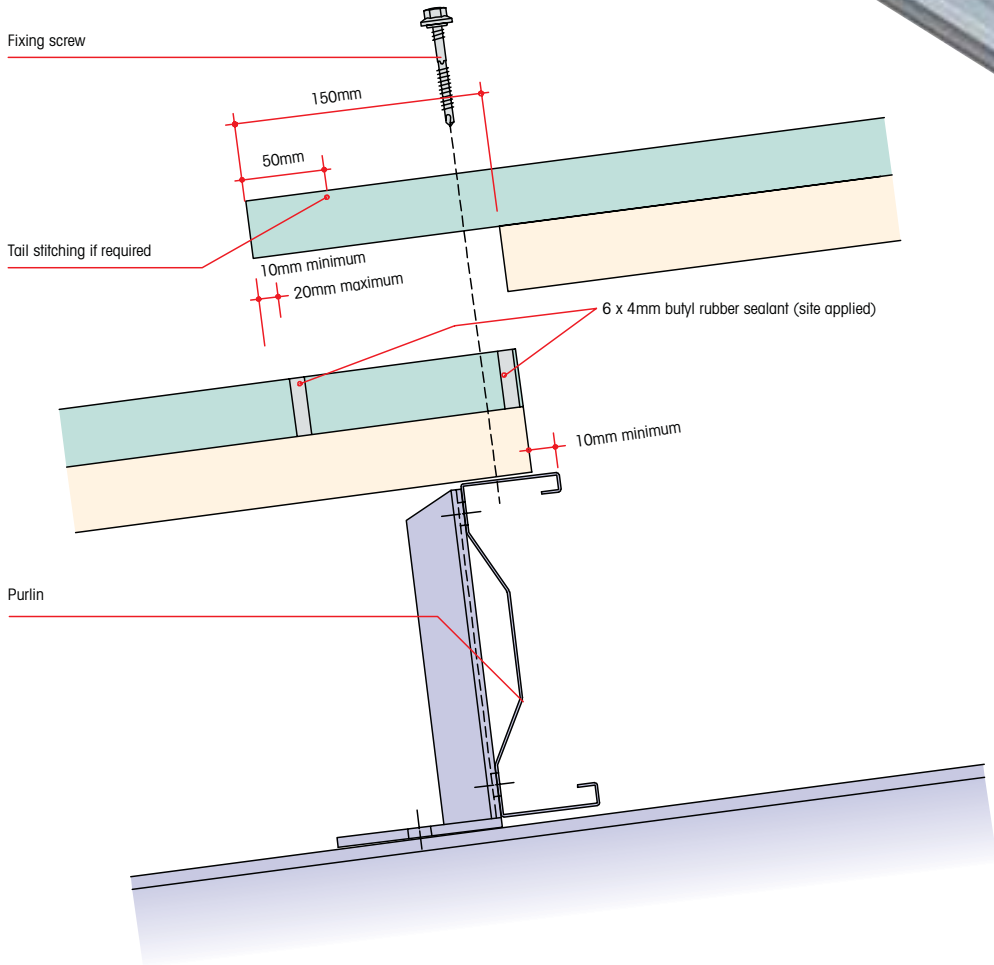
KS1000 RW roof ridge and wall panel Crown positions (typical)



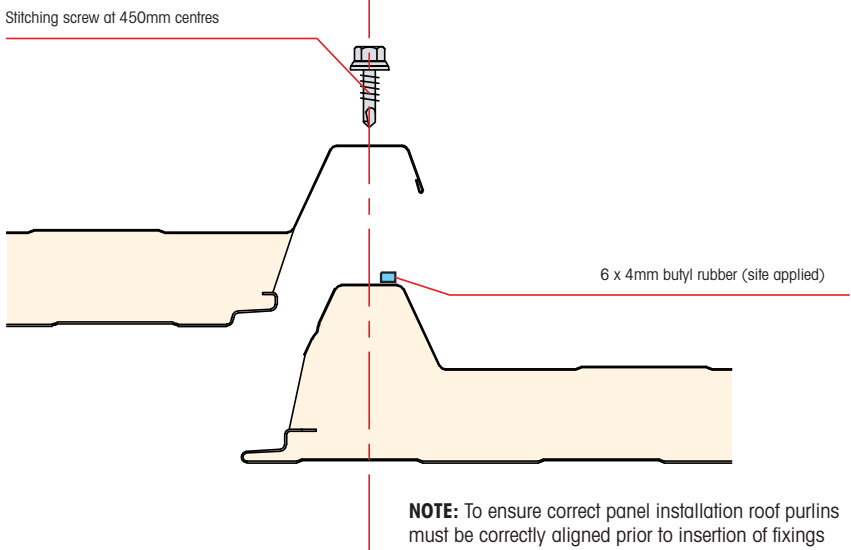
KS1000 RW roof and wall panel Valley fix and ridge positions (typical)



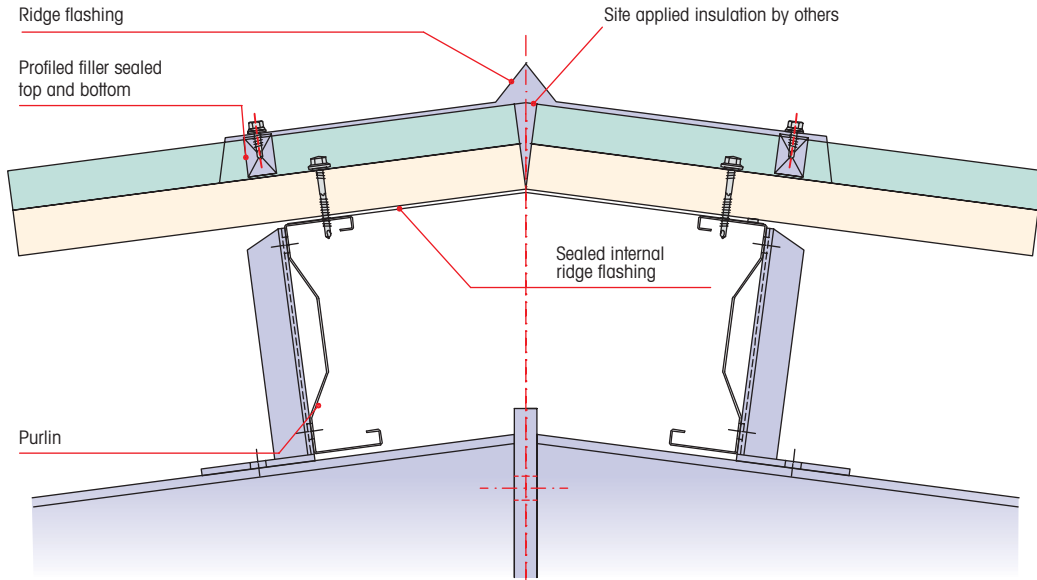
KS1000 RW roof panel
Panel end lap (standard)



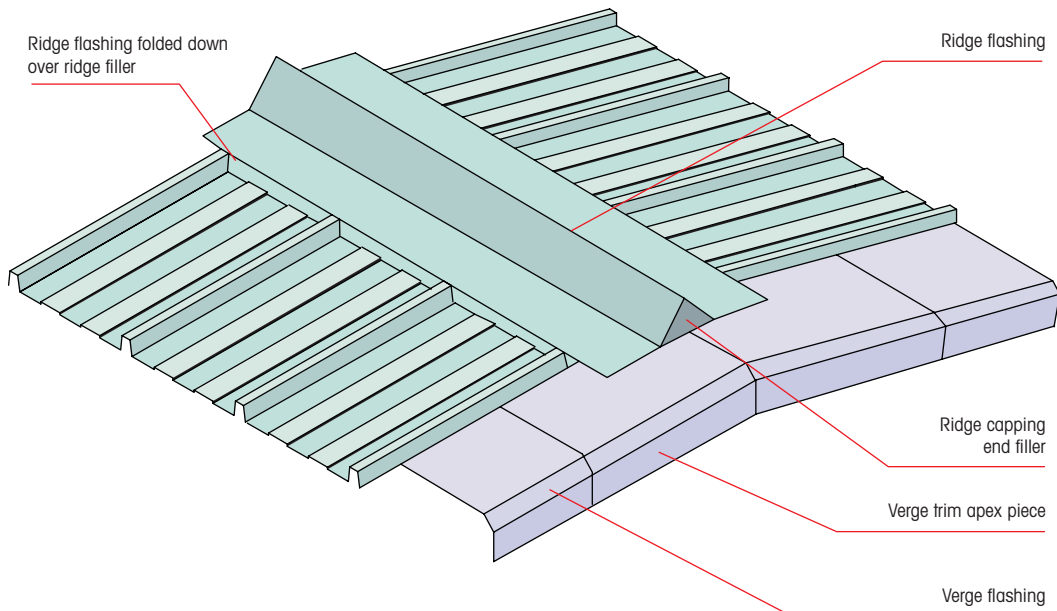
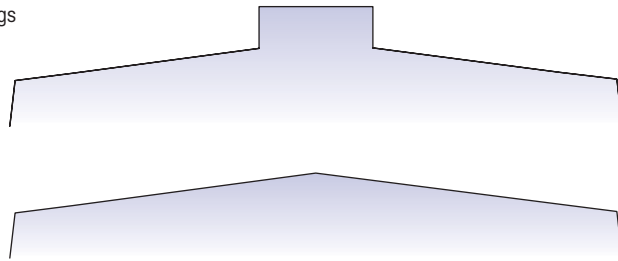
KS1000 RW roof panel
Panel side lap



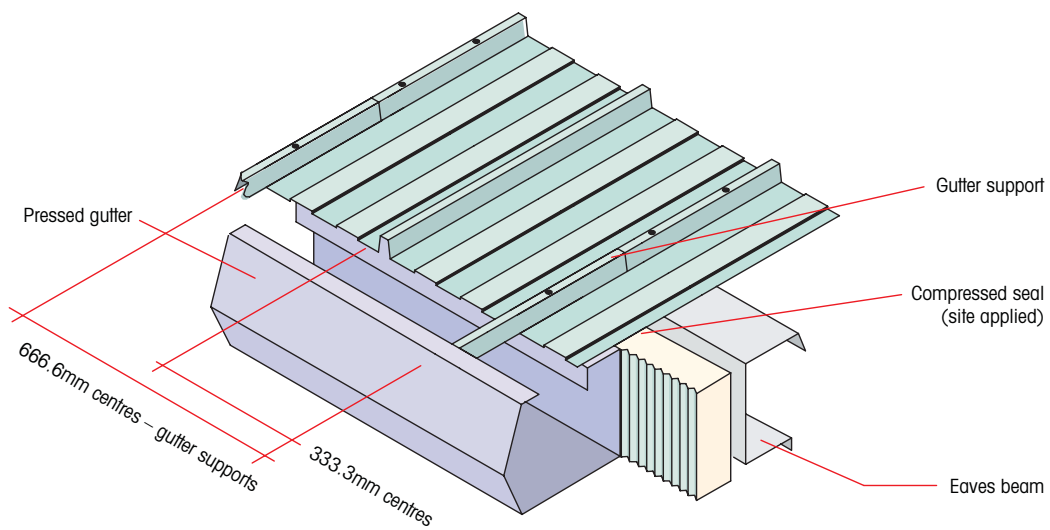
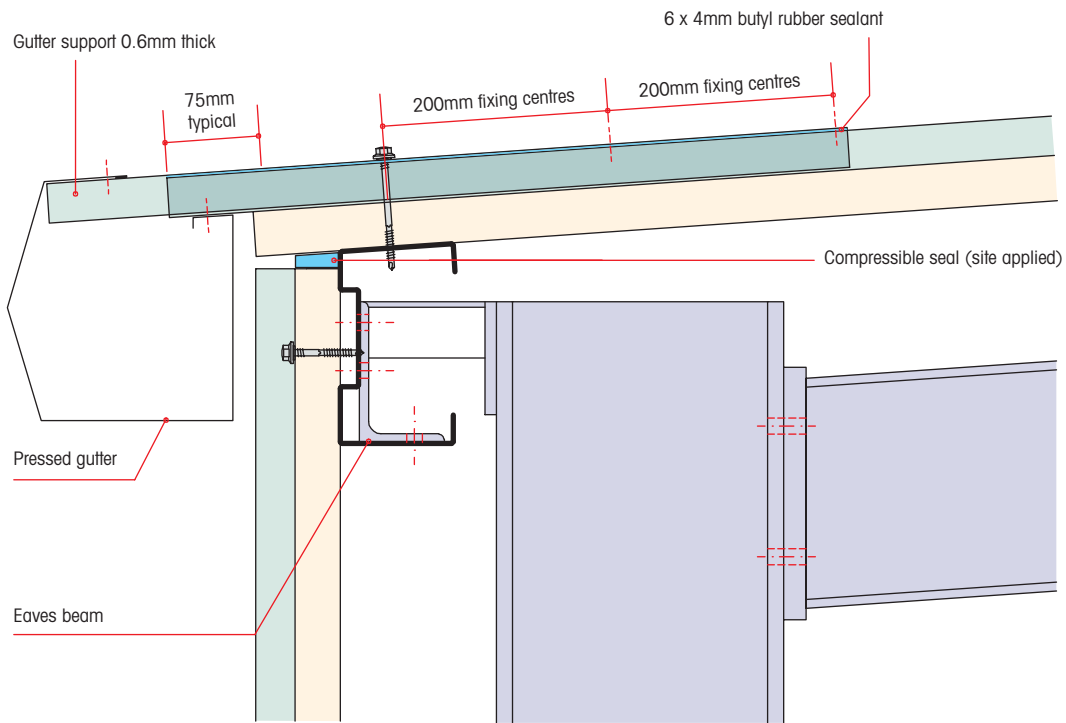
KS1000 RW roof panel
Ridge detail



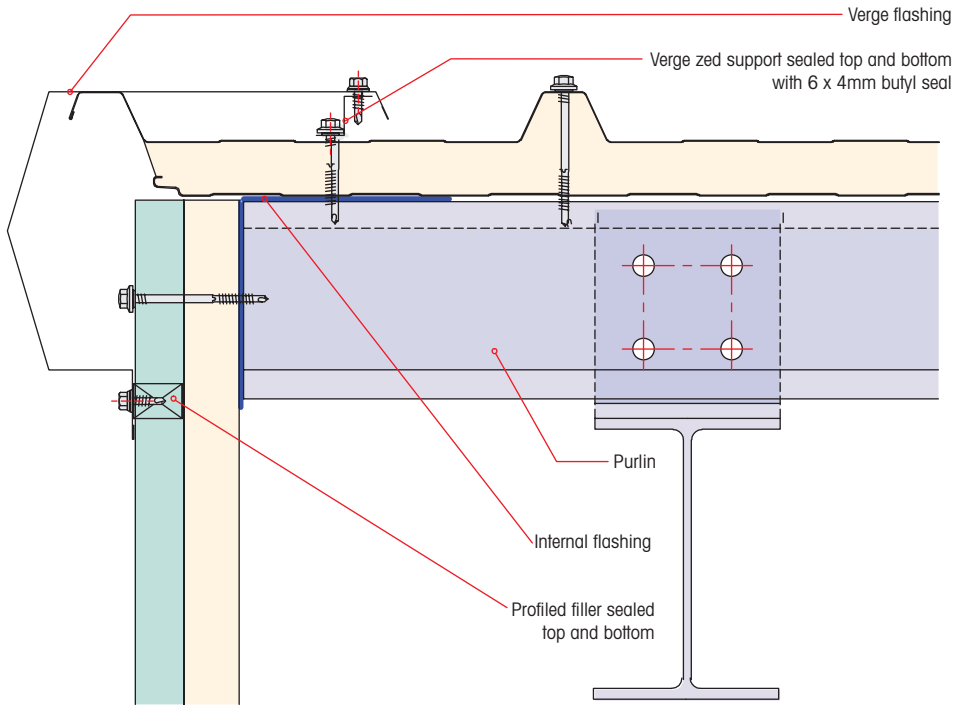
Alternative ridge flashings



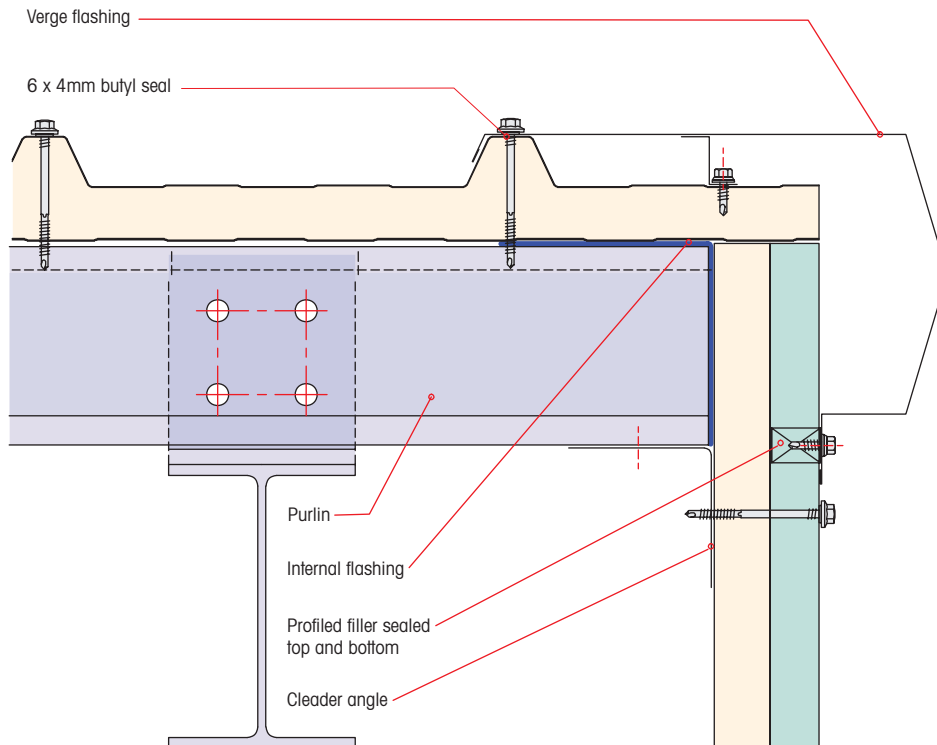
KS1000 RW roof panel
Eaves detail – external gutter

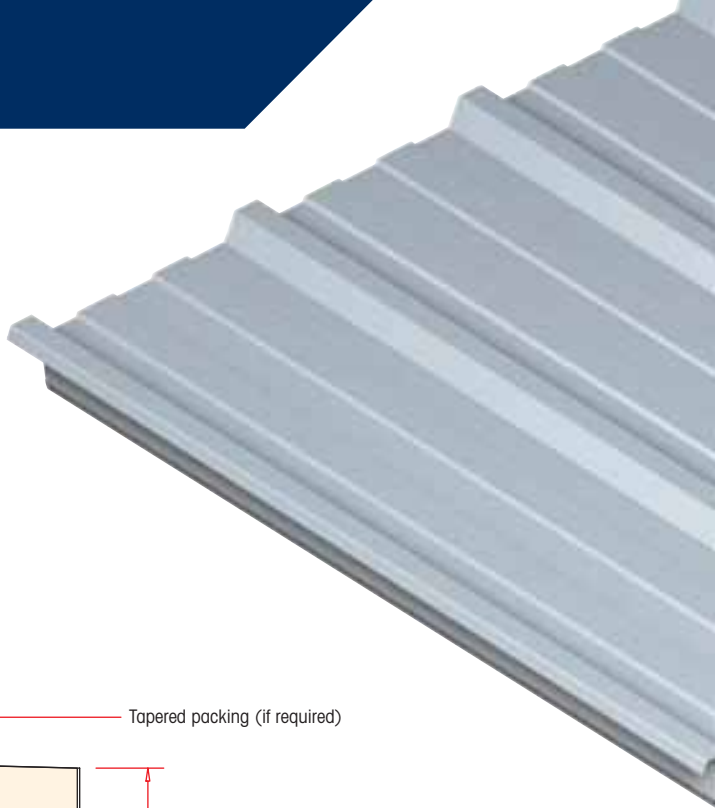


KS1000 RW roof panel
 Verges detail – wall cladding (start of roof sheeting)

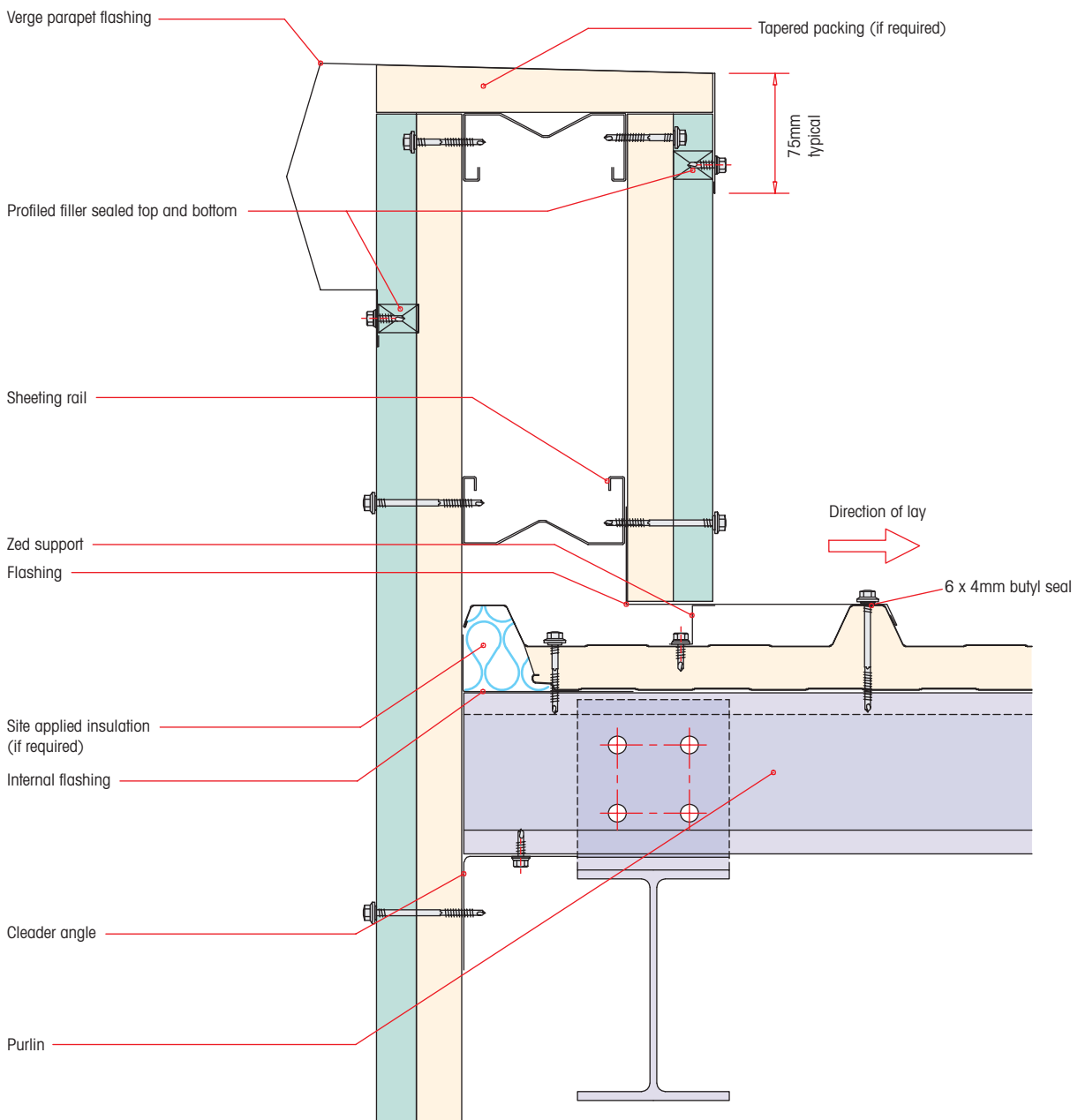


KS1000 RW roof panel
 Verges detail – wall cladding (end of roof sheeting)

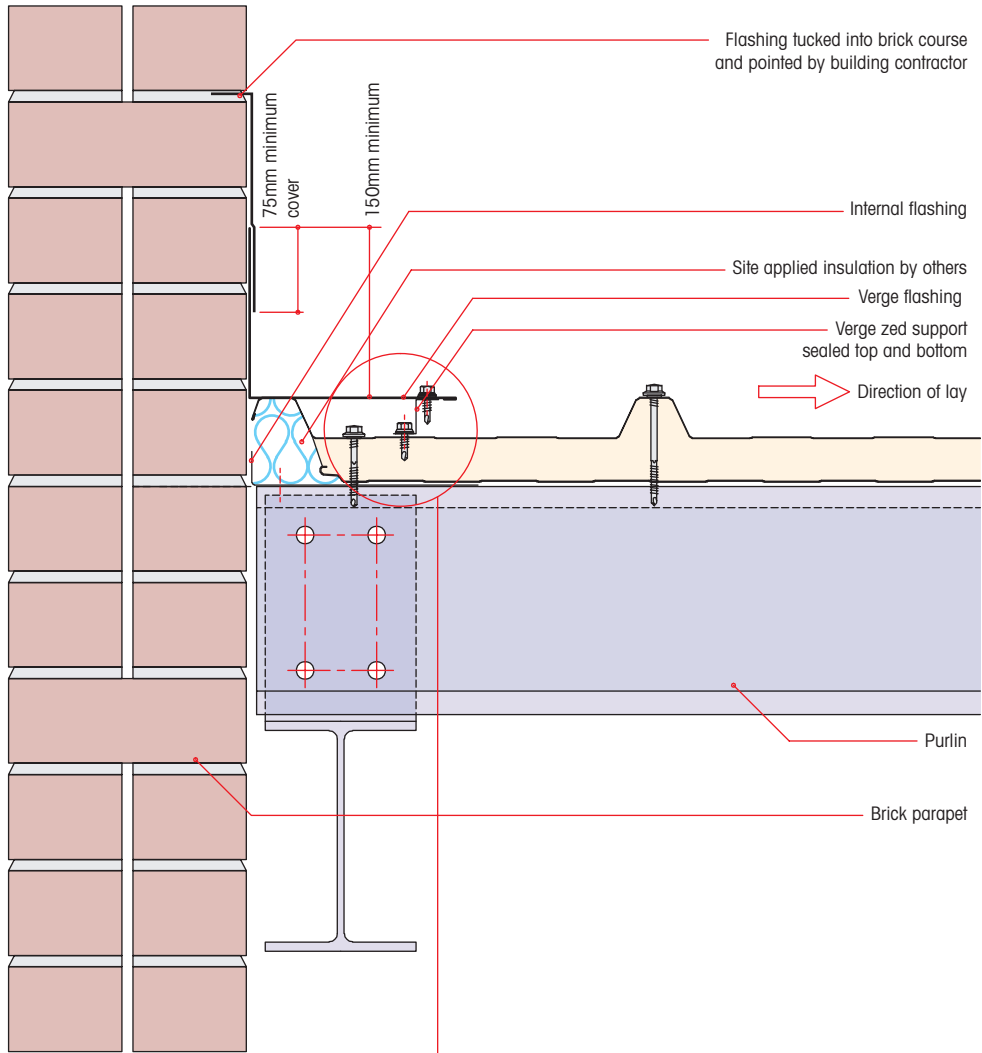




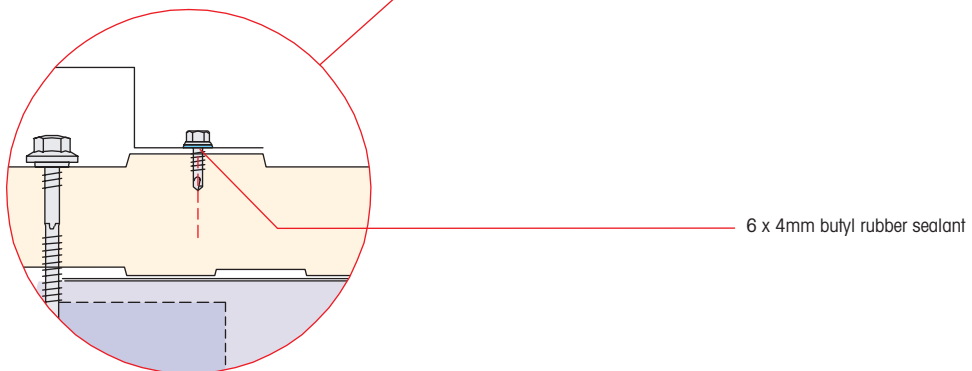
KS1000 RW roof panel
 Vergé detail – parapet cladding (start of roof sheathing)



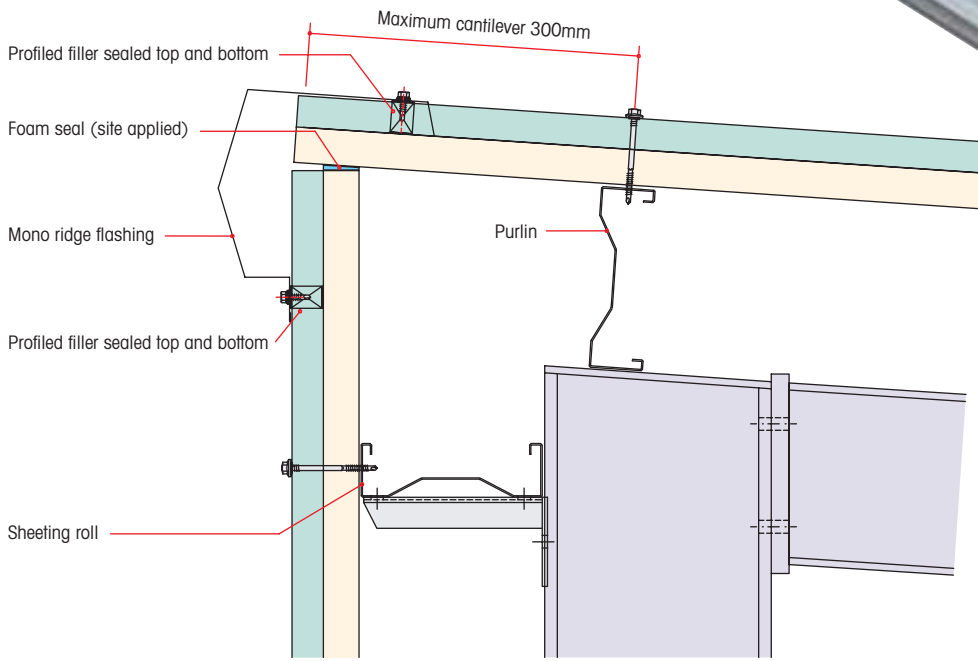
KS1000 RW roof panel
Verge detail – brick parapet (start of roof)



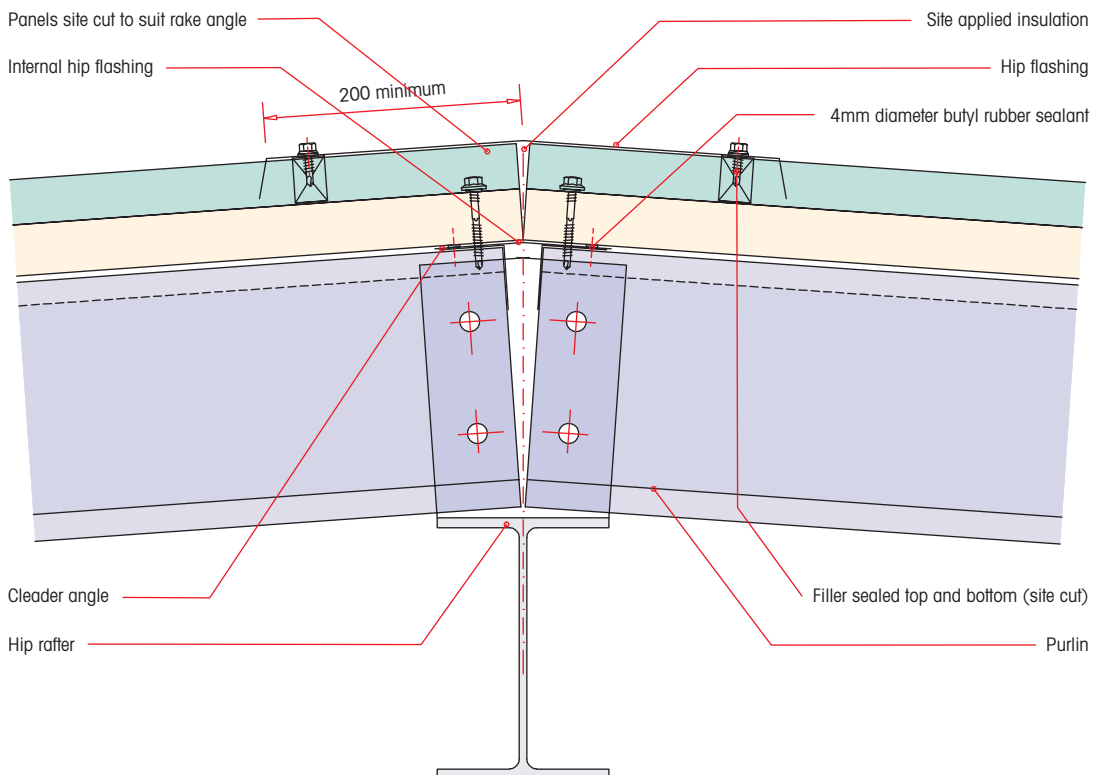
Alternative detail



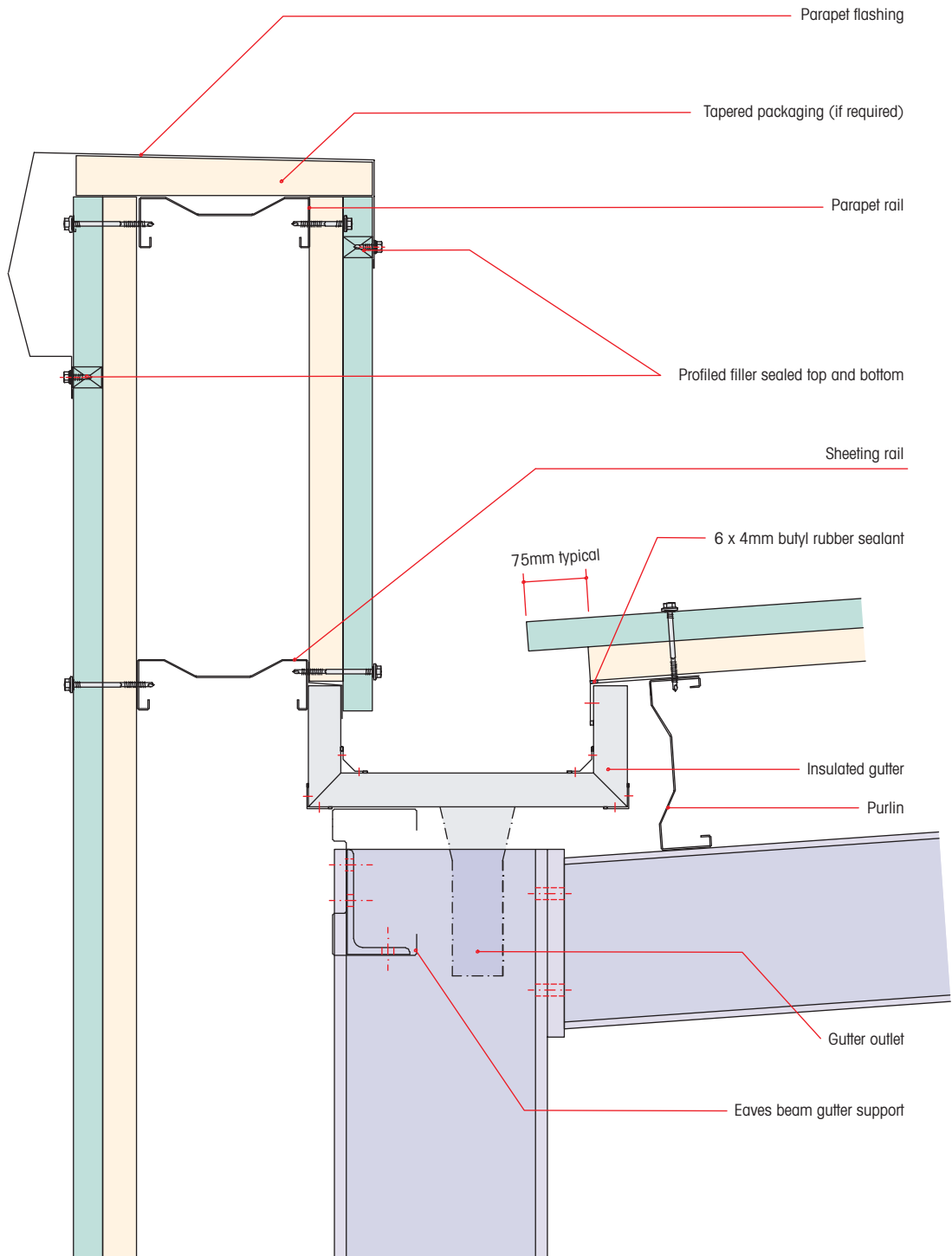
KS1000 RW roof panel
Mono ridge detail – insulated panel roof to wall



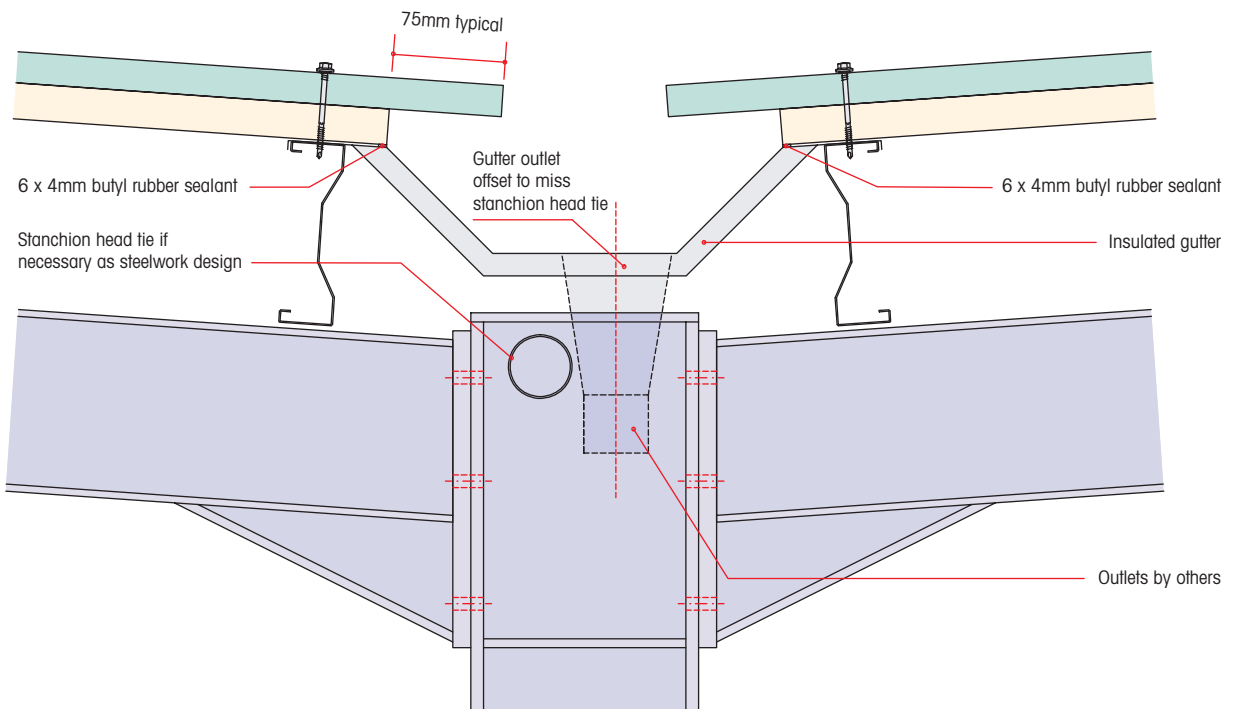
KS1000 RW roof panel
Hip detail



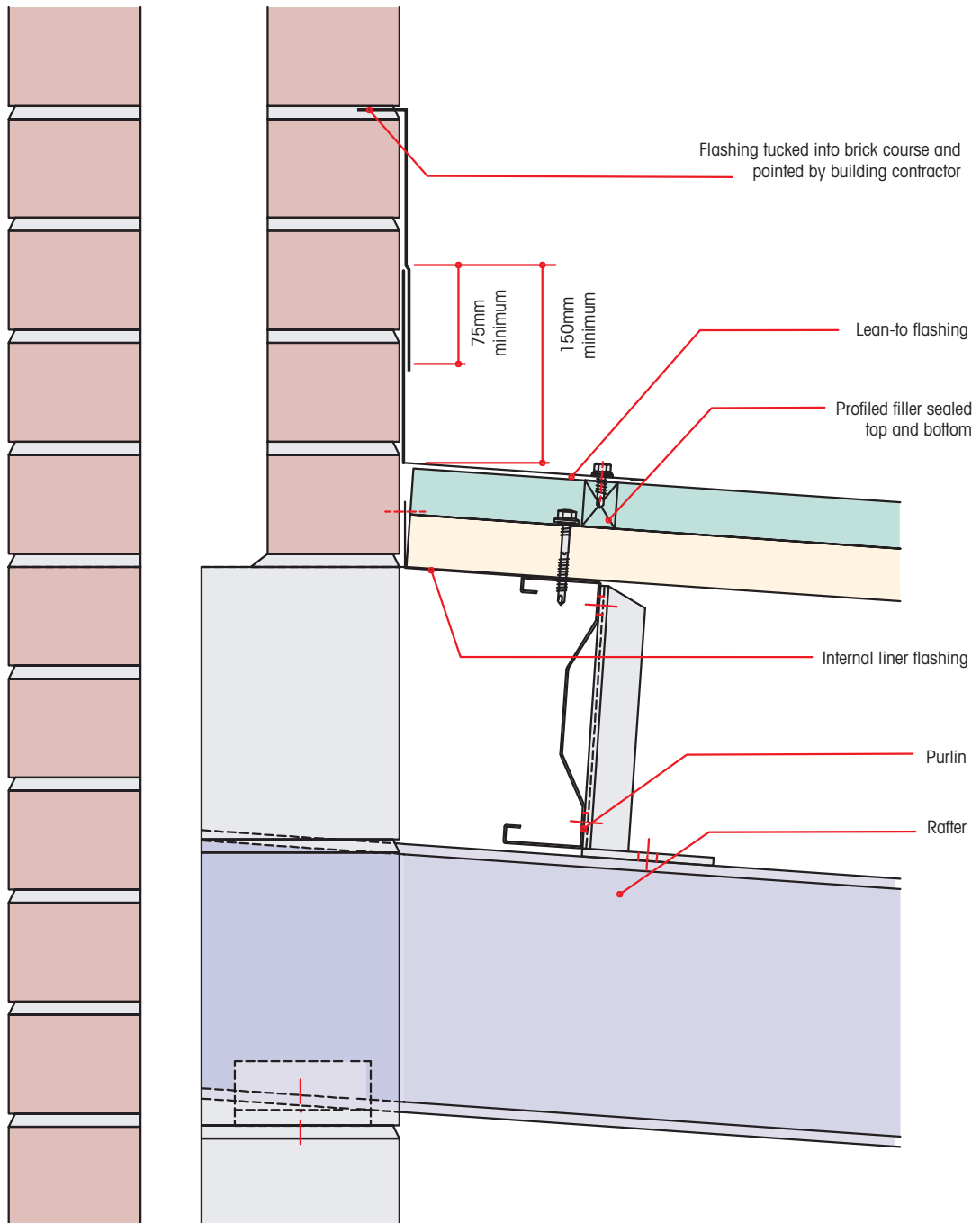
KS1000 RW roof panel
Eaves detail – boundary wall gutter



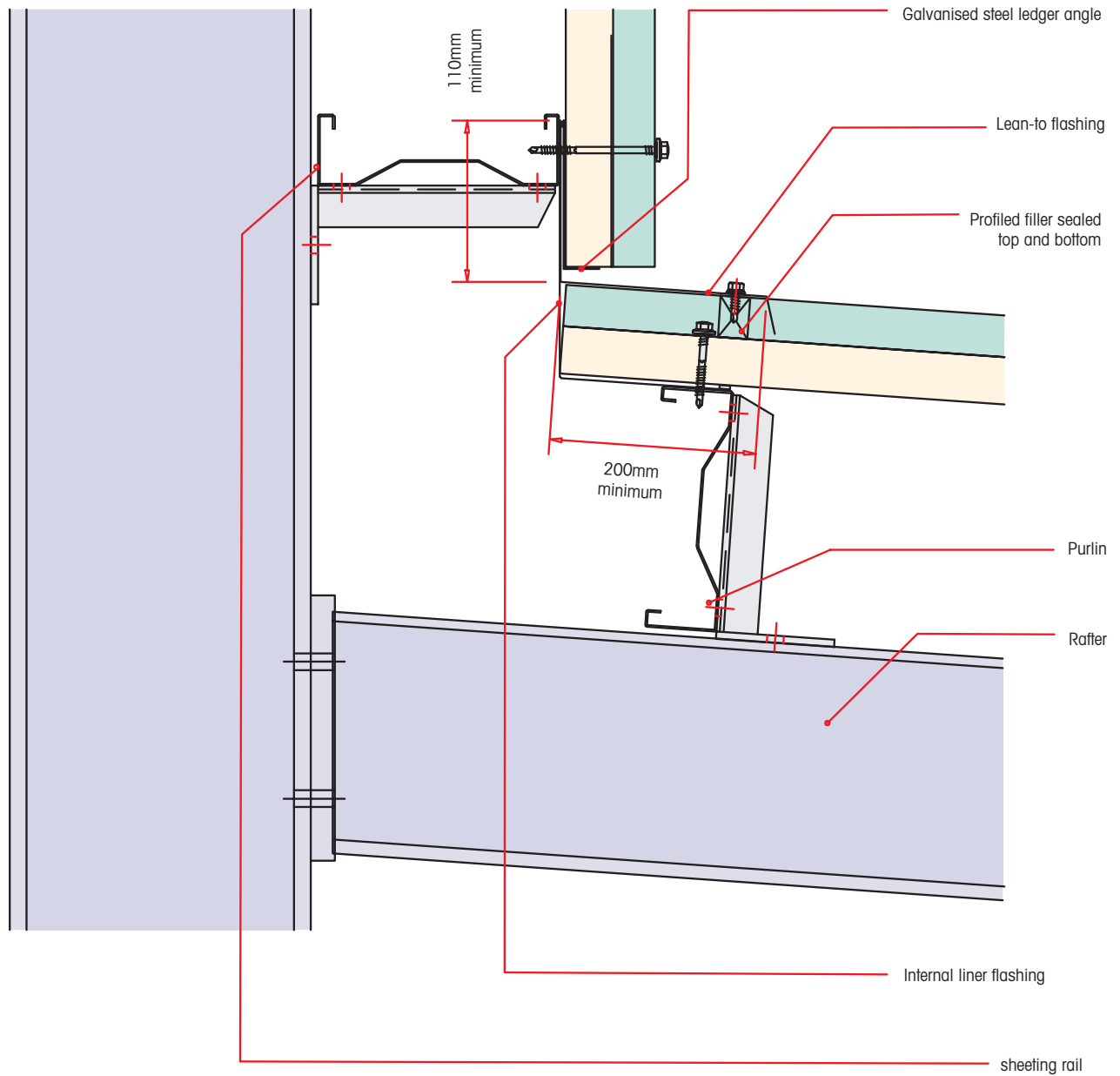
KS1000 RW roof panel
Valley detail



KS1000 RW roof panel
Lean-to roof detail – wall



KS1000 RW roof panel
Lean-to roof detail – vertical cladding



Application

The following specification is for the KS1000RW/FM Insulated Wall Panel laid vertically on a normal factory or warehouse type of building, and where the occupants or processes do not add significant quantities of water vapour to the air and where a Factory Mutual (FM) approved panel system to Unlimited Height is required.

Materials and coatings

External weather sheet

Substrate to be 0.50mm thick Zinalume G300S AZ150 coated steel to AS1397. Coating to be Colorbond Steel (Colours as per Bluescope Colorbond Chart).

Insulation core

To consist of 30,40,60 or 100mm thick, closed cell, Zero ODP, FM certified polyisocyanurate (PIR) insulation. The auto adhesive properties of the core bond the external and internal sheets together, and control the panel thickness achieved during manufacture.

Internal liner sheet

Substrate to be 0.40mm thick Zinalume G300S AZ100 coated steel to AS1397. Coating to be the following standard Bluescope white lining – 10-15 microns thick.

Performance

Thermal insulation

The panel will have a thermal resistance (R Value) of (see below), based on an aged thermal conductivity of 0.020 W/mK.

Panel thickness (mm)	'R' value m ² k/W
30	1.82
40	2.33
60	3.35
100	5.34

Fire

The System has the following FM test results ASTM E-180 Spread of Flame Test-Pass Class A, Class 1 Test-Pass (Calorimeter) Class 1, Wind uplift Test-Pass 1-90.

Seals and fillers

Side lap

All external side laps to be weather sealed along the full length by an unbroken bead of 6 x 4mm butyl rubber sealant tape (Bostik 5250).

End lap

All external end laps to be 150mm long, and weather sealed along the full width using two unbroken runs of 6 x 4mm butyl rubber sealant tape (Bostik 5250).

Fillers

Where flashings are fixed across the profile of the insulated panel, closed cell polyethylene foam fillers should be used to seal and close the profile. Seal the top, bottom and sides of each profiled filler with non-curing gun-grade sealant.

Fasteners

Primary

All primary fasteners must be the high threaded type manufactured from carbon steel, anti-corrosion coated, and fitted with a 16mm diameter bonded stainless steel washer and colour matched plastic cap.

All fasteners to be located through every valley (or every crown) of the profile.

To comply with local windload requirements, and those of Factory Mutual it may be necessary to provide additional fixings in areas of high local suction (See fixing chart for correct ITW Buildex fastener).

Secondary

Side laps and flashings to be stitched at 450mm centres (maximum) with carbon steel stitching screws, complete with 14.5mm diameter carbon steel washers.

Construction details

Flashings

All external flashings to be made from 0.50mm thick coated steel to the same specification as the outer sheet of the panel.

All flashings to be weather sealed at laps and along the full length by an unbroken bead of 6 x 4mm thick butyl rubber sealant tape ref: Bostik 5250.

All internal flashings to be made from 0.50mm thick steel substrate, to the same specification as the liner sheet of the panel.

All internal flashings to be air sealed at laps and along the full length by an unbroken bead of 4mm diameter butyl rubber sealant tape. End laps to be air sealed with gun grade sealant.

Panel lengths

Exact lengths to be determined by the cladding contractor from the steelwork drawing, but typically using 6000mm lengths.

Construction requirements

Steelwork tolerance

The steel frame must be made and assembled to an accuracy of $L/600$ between fixing planes of adjacent rails, where L is the rail spacing, and generally to BS5950: Part 2: 1992.

Installation

Panels to be laid with side lap joints away from prevailing wind unless otherwise shown on drawings.

All fasteners, seals and fillers to be of correct specification and installed as indicated on the project construction drawings.

Site cut panels must provide accurate, true lines with no distortion. Panels to be cut with powered reciprocating type saw and all exposed site cut panels to be treated with a suitable edge protection lacquer. Cut openings for outlets, vents, flues etc. to be the minimum size necessary.

Remove all swarf and any foreign matter immediately from the external surface of panels.

Fasteners to be checked and adjusted if necessary to ensure they are weather tight and external panel facing is not distorted.

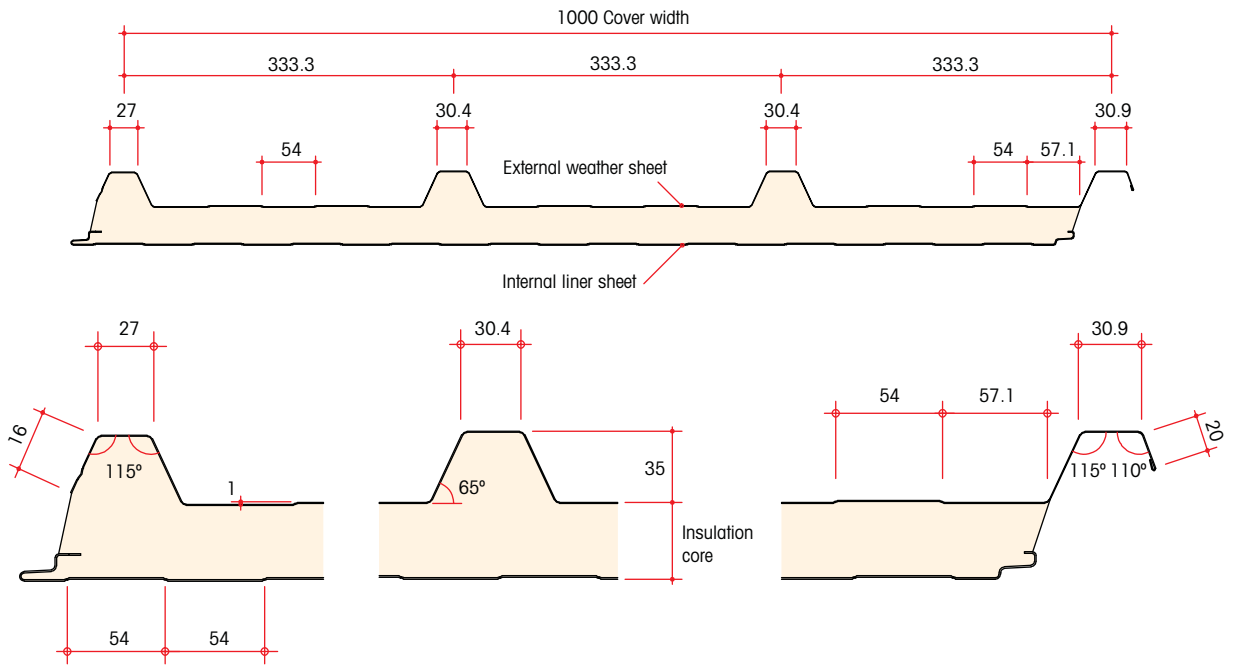
Safety

The contractor is to determine and use a safe method of working throughout the installation and construction period which complies with OHS requirements.



Typical construction details – wall (vertically laid)

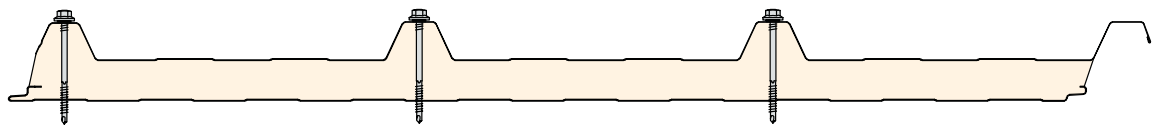
KS1000 RW wall panel dimensions



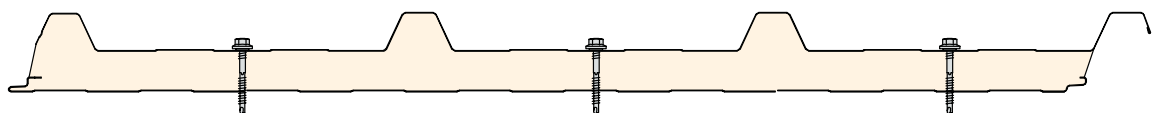
Available panel thicknesses	
Insulation core	Overall panel thickness
30	65
40	75
60	95
100	135

NOTE: Above dimensions are nominal, actual dimensions will vary due to manufacturing tolerances. Exactly precise dimensions must always be measured from actual samples. All dimensions are in millimetres.

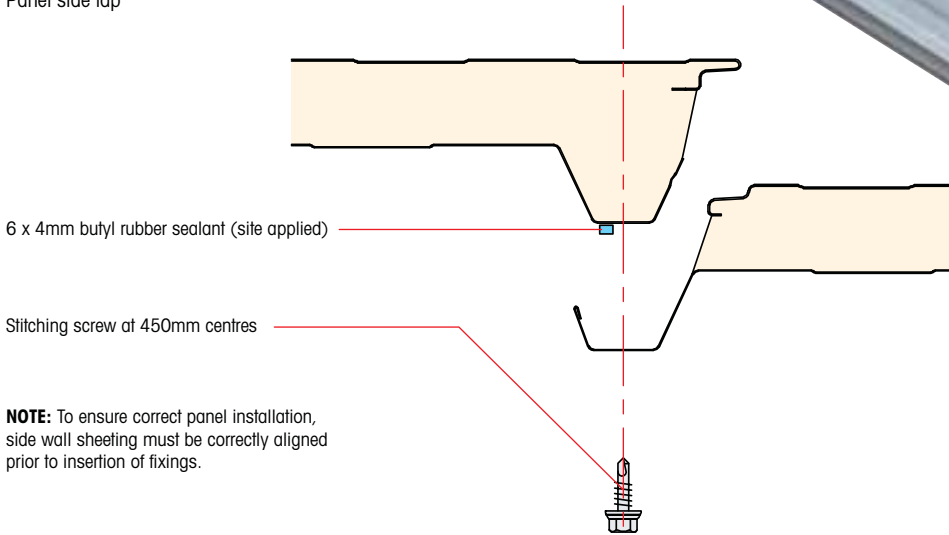
KS1000 RW wall panel
Crown positions



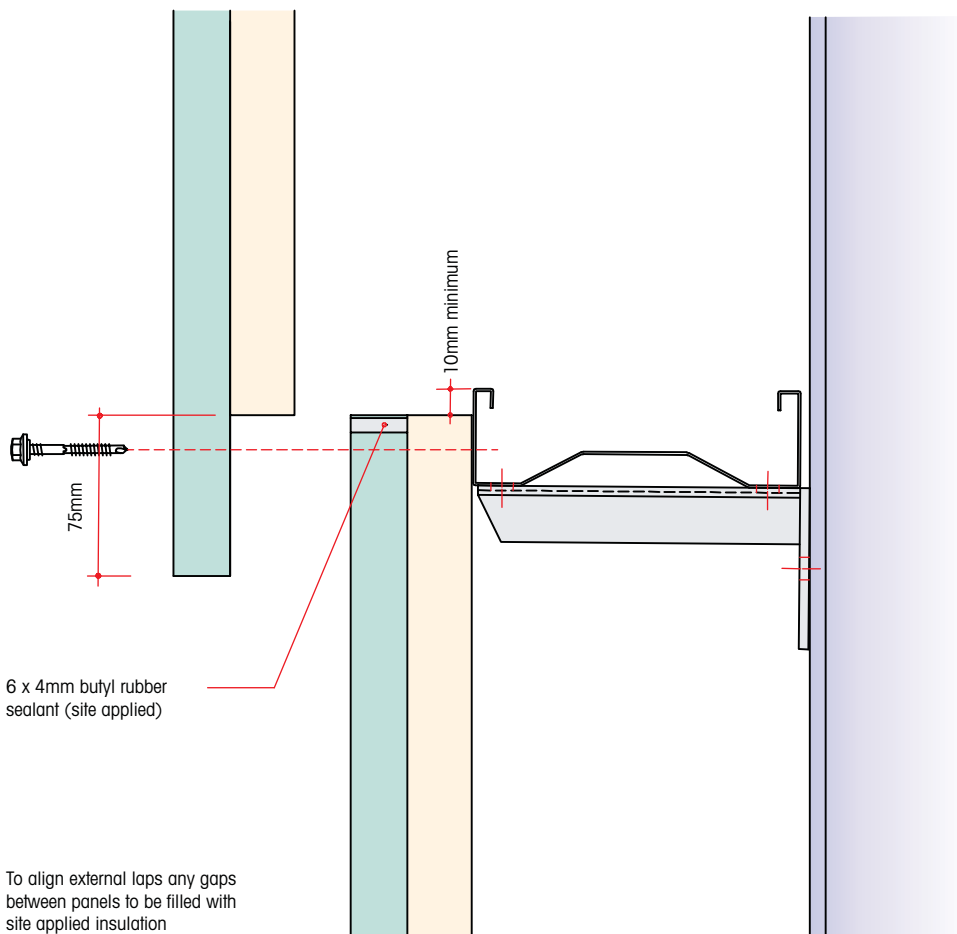
KS1000 RW wall panel
Valley fix



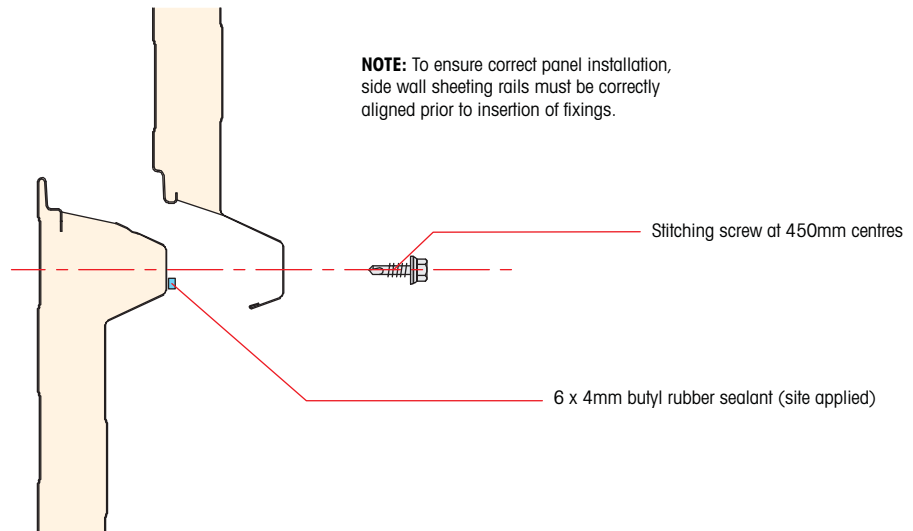
KS1000 RW wall panel – vertically laid
Panel side lap



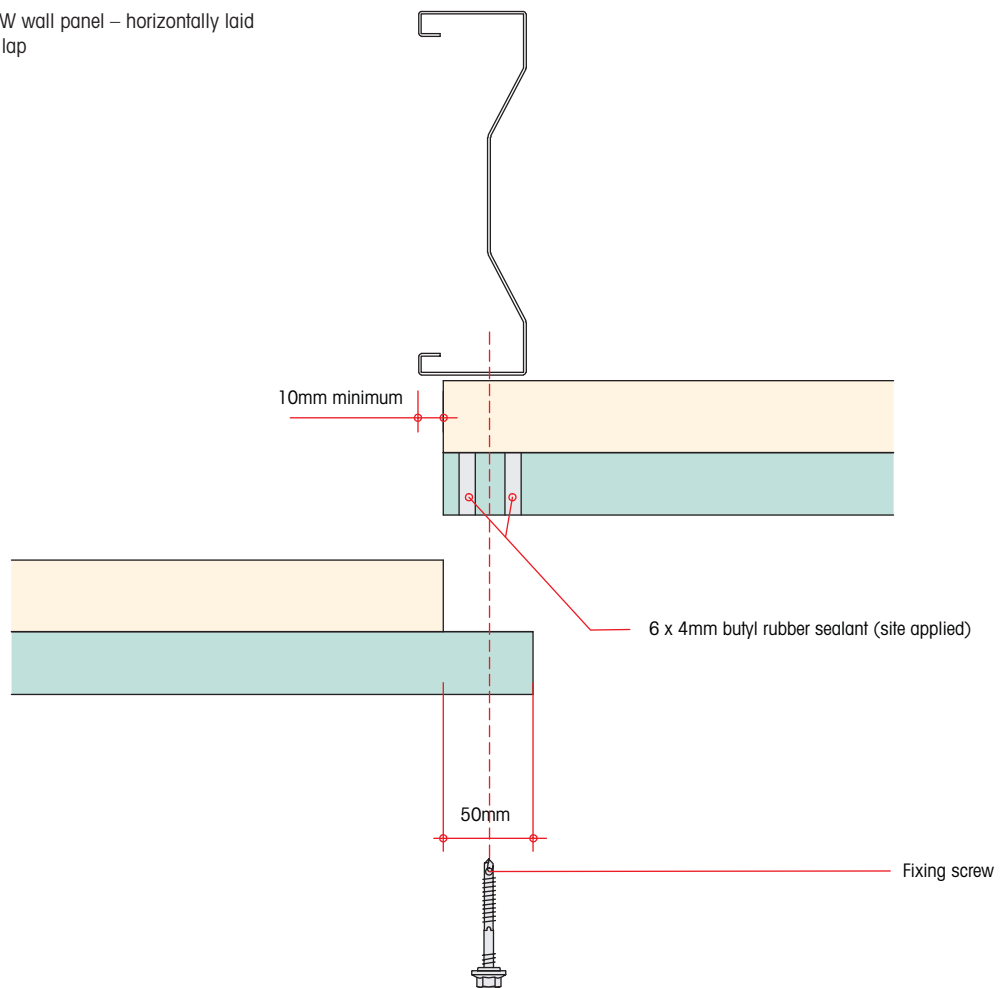
KS1000 RW wall panel – vertically laid
Panel end lap (standard)



KS1000 RW wall panel – horizontally laid
Panel side lap



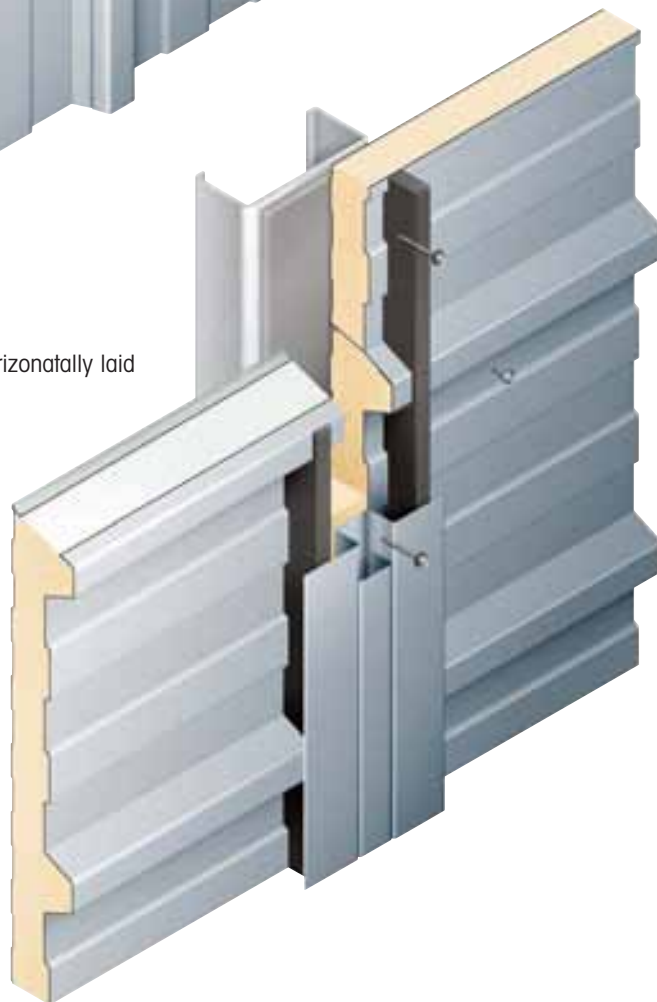
KS1000 RW wall panel – horizontally laid
Panel end lap



Vertically laid



Horizontally laid





KS1000 RW/SF/TS roof systems

Deflection ratio: Downwards = span/200

Suction = span/150

Unfactored load/span table (use calculated design windload values unfactored)



SPAN CONDITION	Core thickness (mm)	Load type	Uniformly distributed loads (kN/m ²) Span L in metres						
			1.0	1.5	2.0	2.5	3.0	3.5	4.0
SINGLE SPAN Outer sheet 0.5mm steel Inner sheet 0.4mm steel 	30	Downwards	4.61	2.48	1.47	0.92	0.61	0.42	-
		Suction	6.15	3.31	1.96	1.23	0.81	0.56	-
	40	Downwards	6.66	3.66	2.21	1.41	0.94	0.65	0.47
		Suction	8.87	4.88	2.94	1.88	1.26	0.87	0.63
	60	Downwards	7.68	4.57	2.98	2.04	1.45	1.05	0.79
		Suction	10.22	6.09	3.97	2.72	1.93	1.41	1.05
	100	Downwards	10.76	6.68	4.57	3.28	2.42	1.83	1.39
		Suction	14.62	9.19	6.38	4.66	3.52	2.72	2.14
DOUBLE SPAN Outer sheet 0.5mm steel Inner sheet 0.4mm steel 	30	Downwards	3.53	2.07	1.36	0.94	0.68	0.50	0.38
		Suction	4.71	2.77	1.81	1.26	0.91	0.67	0.51
	40	Downwards	5.05	3.00	1.99	1.39	1.01	0.76	0.58
		Suction	6.74	4.00	2.65	1.86	1.35	1.01	0.77
	60	Downwards	5.68	3.50	2.41	1.77	1.34	1.05	0.83
		Suction	7.57	4.67	3.22	2.36	1.79	1.40	1.11
	100	Downwards	7.85	4.93	3.46	2.58	1.99	1.58	1.27
		Suction	10.75	6.86	4.90	3.72	2.94	2.38	1.97

KS1000 RW wall panel

Deflection ratio: Pressure = span/100

Suction = span/100

Unfactored load/span table (use calculated design windload values unfactored)

SPAN CONDITION	Core thickness (mm)	Load type	Uniformly distributed loads (kPa) Span L in metres						
			1.0	1.5	2.0	2.5	3.0	3.5	4.0
SINGLE SPAN Outer sheet 0.5mm steel Inner sheet 0.4mm steel 	30	Pressure	9.22	4.97	2.94	1.84	1.22	0.84	0.60
		Suction	9.22	4.97	2.94	1.84	1.22	0.84	0.60
	40	Pressure	9.41	5.46	3.46	2.31	1.60	1.14	0.84
		Suction	9.41	5.46	3.46	2.31	1.60	1.14	0.84
	60	Pressure	12.17	7.41	4.95	3.48	2.52	1.87	1.42
		Suction	12.17	7.41	4.95	3.48	2.52	1.87	1.42
	100	Pressure	21.79	13.62	9.39	6.81	5.09	3.89	3.03
		Suction	21.79	13.62	9.39	6.81	5.09	3.89	3.03
DOUBLE SPAN Outer sheet 0.5mm steel Inner sheet 0.4mm steel 	30	Pressure	7.06	4.15	2.72	1.89	1.36	1.00	0.76
		Suction	7.06	4.15	2.72	1.89	1.36	1.00	0.76
	40	Pressure	7.01	4.27	2.90	2.10	1.57	1.20	0.94
		Suction	7.01	4.27	2.90	2.10	1.57	1.20	0.94
	60	Pressure	8.95	5.59	3.90	2.89	2.23	1.76	1.41
		Suction	8.96	5.59	3.90	2.89	2.23	1.76	1.42
	100	Pressure	15.96	10.12	7.17	5.40	4.22	3.39	2.78
		Suction	15.96	10.12	7.17	5.40	4.23	3.40	2.78

Notes:

- The table is for medium and light coloured panels, as recommended by Kingspan for roofs and walls.
- The following deflection limits have been used:

Downward loading	Roof	Wall
	1/200	1/100
Suction loading	1/150	1/100
- For intermediate values linear interpolation may be used.
- The standard fastener pattern is shown in the construction details.
- The allowable steelwork tolerance between bearing planes of adjacent purlins is $\sqrt[3]{600}$, where L is the purlin spacing.
- Load span tables for panel specifications not shown are available from the Kingspan Technical Department.
- FM approved panels spans must be limited to a maximum of 2 metres in single or double span conditions.



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