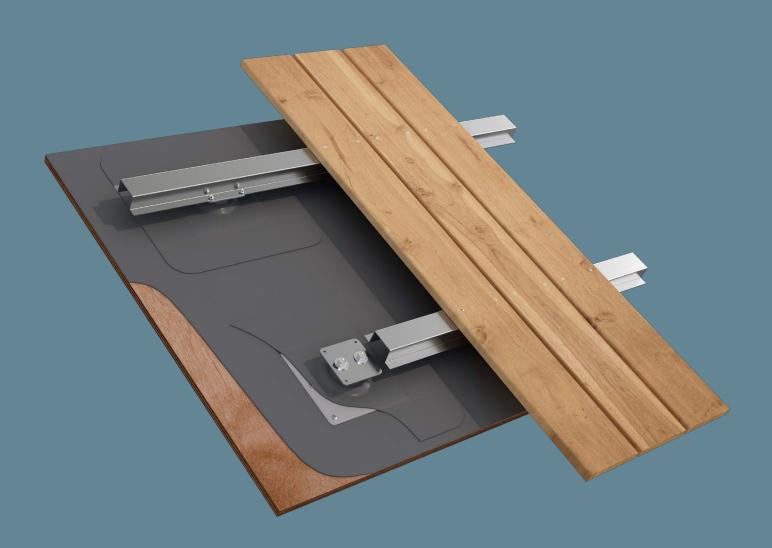
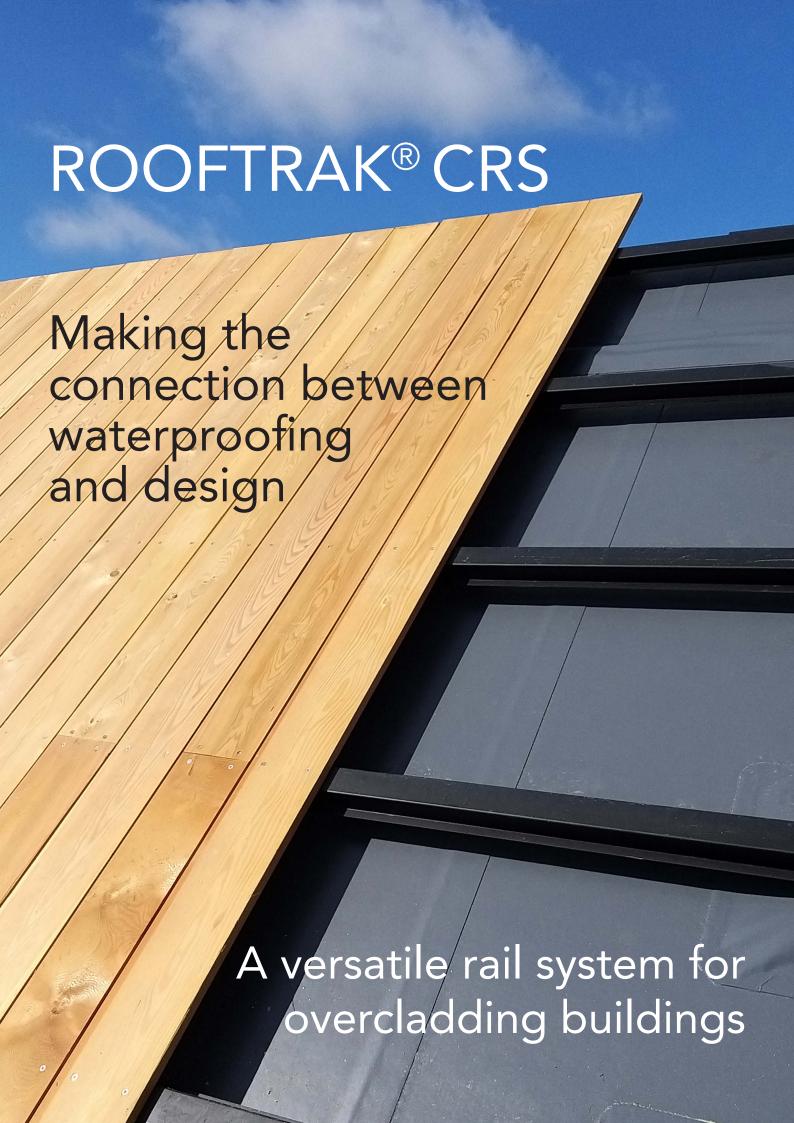
# ROOFTRAK® CRS cladding rail system







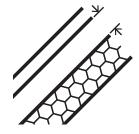
## ROOFTRAK® CRS system - Key features

### Versatile



Compatible with all mechanically fixed and fully bonded roof membranes. Can be used on any roof pitch from 0°-90°.

## Low profile



The CRS system is designed to support the cladding medium very close to the building form, reflecting the architectural value of the chosen design more closely.

## Structural performance



An engineered and structurally approved system providing adequate resistance to wind loads throughout the UK. Please see pages 24/25 for more information on wind load resistance.

## Enables design creativity



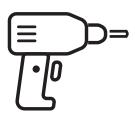
When you need freedom to create an external façade design whilst maintaining the integrity of the all important waterproofing layer.

## Peace of mind



The CRS system will not invalidate the warranty attached to the chosen roof covering.

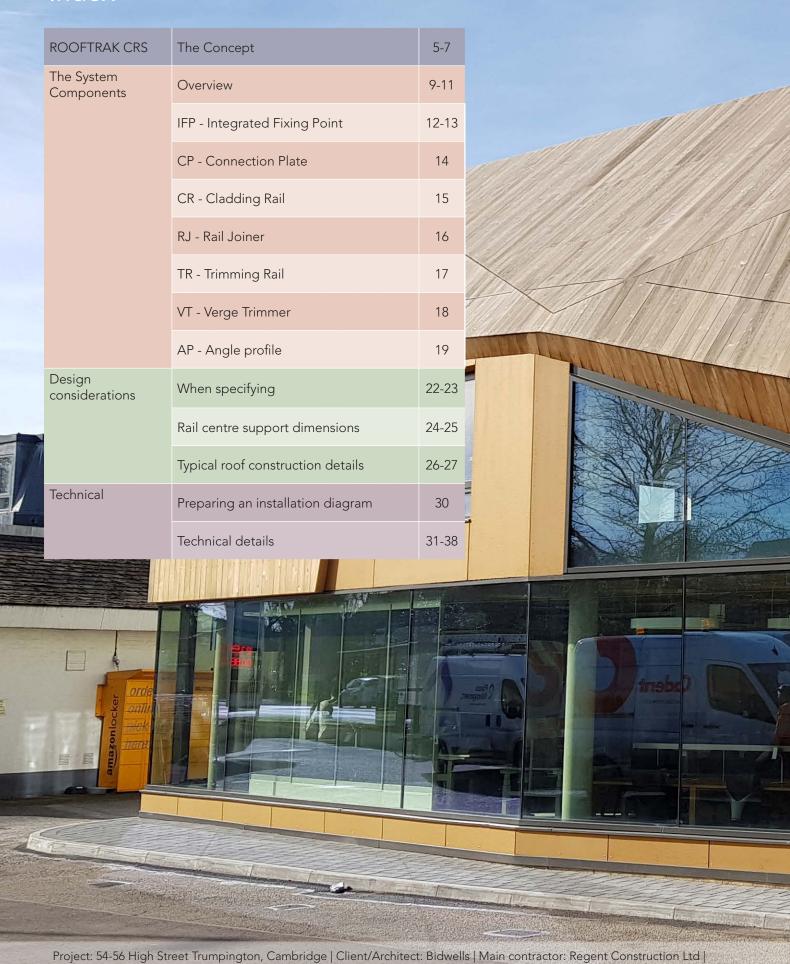
## Simple Installation



The CRS system can be installed by the onsite tradesmen - no requirement for specialist labour.

## Index

Product: Rooftrak CRS





### ROOFTRAK CRS the concept

The CRS system is versatile and can be simply applied to most structures and building designs.



The five basic steps to achieving cladding without compromising the roof weathering membrane:

#### 1. Structure

The Rooftrak CRS Cladding Rail System can be attached to most types of building constructions. In many cases, the structure under the cladding is constructed to have a flat finished surface, typically 18mm plywood, ready to receive the weathering membrane.

#### 2. Waterproofing

The waterproofing membrane is laid on the structure to provide the all important weathering layer. This can be any of the proprietary roofing systems available such as single ply membrane, bitumen membrane, GRP and liquid applied systems.

## ROOFTRAK CRS the concept



## 3. ROOFTRAK® IFP integrated fixing points

The stainless steel fixing points are supplied with a factory fitted weathering flange to match the chosen weathering system. They are used to provide a series of completely waterproof fixing points to attach the cladding rails to.

## 4. ROOFTRAK® CRS cladding rail system

The aluminium cladding rails are fitted to the fixing points ready to receive the cladding. The system includes various components which are assembled to create a framework of rails to receive the cladding. The cladding rail system stands clear of the roof surface allowing rainwater to drain freely.

#### 5. Cladding material

Finally the chosen cladding material is fitted to the aluminium cladding rails to complete the construction. The weight, size, shape and orientation of the cladding material will inform the layout of the cladding rails below.







## ROOFTRAK CRS the system components





#### 1. Rooftrak IFP Integrated Fixing Point

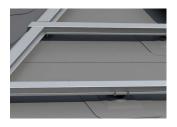
This unique patented fixing point system is compatible with all types of membrane roofing materials and systems. They are supplied factory fitted with a compatible weathering flange to integrate with the chosen roofing system.



#### 2. CRS-CP Connection Plate

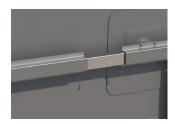
The Connection Plate connects the Cladding Rail to the Fixing Point. These can either be installed as a fixed connection or a moving connection to allow for expansion in the cladding rails.

## ROOFTRAK CRS the system components



#### 3. CRS-CR Cladding Rail

The Cladding Rail is the main component in the system and is normally installed perpendicular to the direction of the cladding. The rail can be cantilevered off the fixing points and the Trimming Rail and Verge Trimmer can be used to provide support or intermediate fixing between the Cladding Rails where required.



#### 4. CRS-RJ Rail Joiner

The Rail Joiner is used to connect lengths of Cladding Rail together. It can be positioned at any point along the length of the rail including in the span between fixing points. This helps to maximise use of the Cladding Rail which is cut and joined as necessary.



#### 5. CRS-TR Trimming Rail

The Trimming Rail is used within the perimeter of the area to be clad to provide intermediate supports where required. Typically at change of pitch or around windows and openings. It is fixed into the flange of the Cladding Rail and aligns with the top face to provide a flush surface for supporting the cladding material.



#### 6. CRS-VT Verge Trimmer

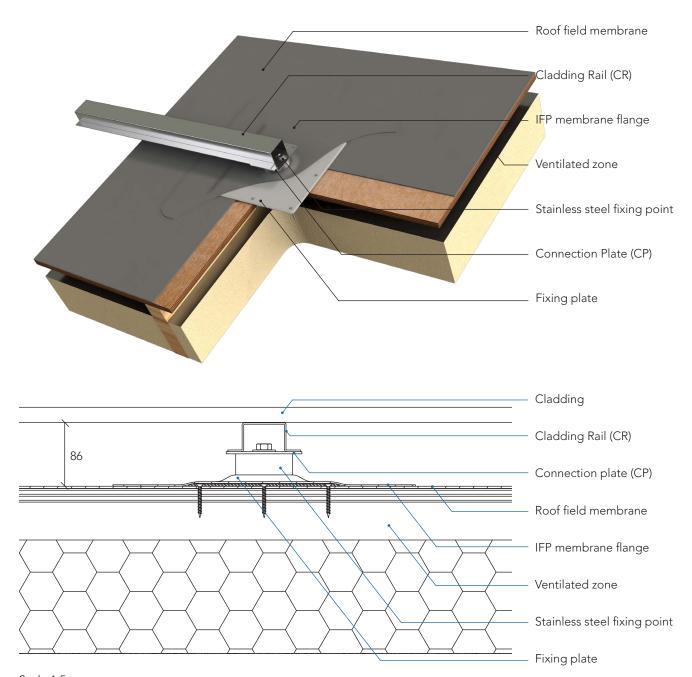
The Verge Trimmer is designed to sit between the Cladding Rails to provide support along the perimeter of the area to be clad where required. The top face is level with the top of the Cladding Rail providing a flush finish for the cladding material to be fixed to.



#### 7. CRS-AP Angle Profile

This aluminium profile is supplied pre-folded to a specific angle and can be used to connect cladding together at a change of pitch or between different planes. It provides a continuous edge to which the cladding can be fixed helping to keep the building lines crisp and clean.

### IFP-200 for cold roof constructions



Scale 1:5

The IFP-200 is designed for use on cold roof constructions where the roofing membrane is laid directly onto an 18mm structural plywood deck, or fully supported warm roofs such as structural insulated panels (SIPs). It comprises a 200mm x 200mm fixing plate and an anchor point with two M10 x 20 blind threads. To weather the fixing plate the IFP-200 is factory fitted with an appropriate flange material to enable it to be weathered or sealed to the main roof area. These must be installed with the fixing holes in line with the Cladding Rail direction.

304 grade stainless steel anchor point – machined finish 2 no M10 x 20 threaded connection points

Mild steel fixing plate - polyester powder coat finish

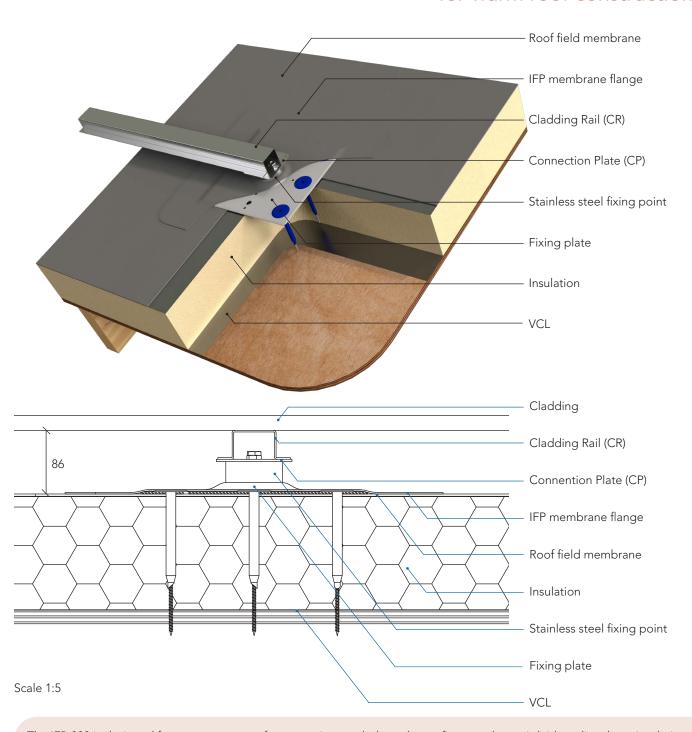
Weathering flange - material to match main roof weathering system

The quantity of IFP-200's required can be determined from the information on pages 24-25

To Specify IFP-200 fitted with \_ roofing membrane



## IFP-300 for warm roof constructions



The IFP-300 is designed for use on warm roof constructions and where the roofing membrane is laid on directly on insulation including composite panel systems. It comprises a  $300 \, \text{mm} \times 300 \, \text{mm}$  fixing plate and an anchor point with two M10 x 20 blind threads. To weather the fixing plate the IFP-300 is factory fitted with an appropriate flange material to enable it to be weathered or sealed to the main roof area. These must be installed with the fixing holes in line with the Cladding Rail direction.

304 grade stainless steel anchor point – machined finish

2 no M10 x 20 threaded connection points

Mild steel fixing plate - polyester powder coat finish

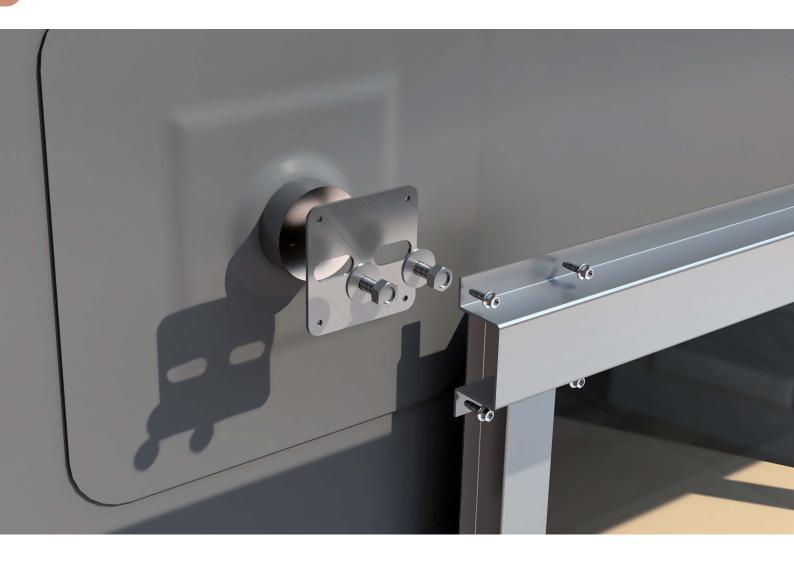
Weathering flange – material to match main roof weathering system

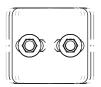
The quantity of IFP-300's required can be determined from the information on pages 24-25

To Specify IFP-300 fitted with \_\_\_\_\_\_ roofing membrane

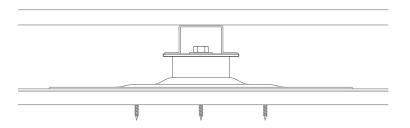


## CRS-CP connection plate









Scale 1:5

The Connection Plate is the connection point between the IFP Integrated Fixing Points and the CRS Cladding Rail System. They can be utilised as either a 'fixed' or 'movement' connection to cope with thermal expansion of the cladding rail. A Connection Plate is required for each IFP Fixing Point and supports the Cladding Rail which is fixed to the Connection Plate using self-drilling and tapping screws. Each Connection Plate comes with the bolts required to fix it to the IFP Fixing Point

Material Aluminium
Dimensions 100 x 100 x 3
A2 M10 x 20 SS bolts and washers
A2 movement collets (if required)

To Specify
CRS-CP Connection Plate - fixed
CRS-CP Connection Plate - movement

## CRS-CR cladding rail





Scale 1:5

The Cladding Rail is the main component of the CRS system. It fixes to the Connection Plates and spans between them providing the main support for the cladding material utilised. Cladding Rails can be joined together using the system Rail Joiner. The span distances can be obtained on pages 24-25. As an option, it can be supplied with a matt black finish where there is a requirement for it not to be visible between open cladding joints. It can cantilever up to 300mm beyond a fixing point.

Material Dimensions Aluminium 38 x 98 x 2000

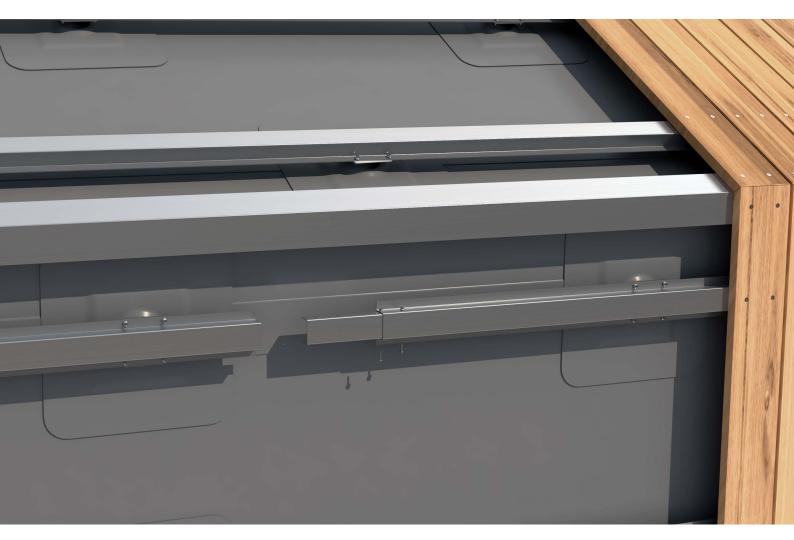
To Specify

CRS-CR Cladding Rail

CRS-CR Cladding Rail – dark coated



## CRS-RJ rail joiner



Scale 1:5



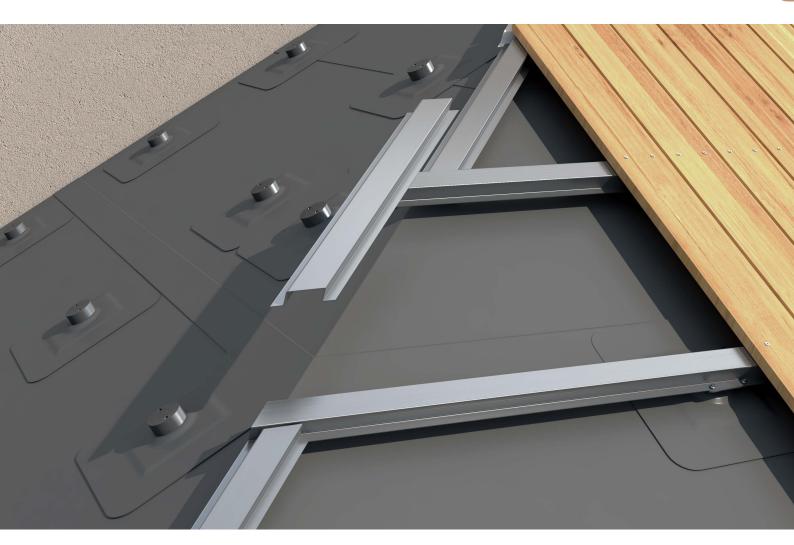
The Rail Joiner is used to connect two lengths of Cladding Rail together. The join can be made anywhere along the length of the Cladding Rail installation. It fits within the Cladding Rail providing a flush joint and flat surface for the cladding material to be fixed to.

Material Dimensions Aluminium 35 x 54 x 300

To Specify CRS-RJ Rail Joiner



## CRS-TR trimming rail



Scale 1:5



The Trimming Rail is designed to be fitted between two parallel Cladding Rails to provide support for the cladding material if required. It is cut to length on site and fixed into the flange of the Cladding Rail using self-drilling screws. It can be cut to an angle to fill in on raking sections of cladding. Typically it is used around the perimeter of an area of cladding or at a change of plane. As an option, it can be supplied with a matt black finish where there is a requirement for it not to be visible between open cladding joints.

Material Dimensions Aluminium 36 x 98 x 2000

To Specify

CRS-TR Trimming rail

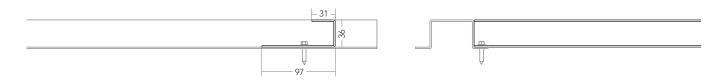
CRS-TR Trimming Rail – dark coated



## CRS-VT verge trimmer



Scale 1:5



The Verge Trimmer is designed to be fitted between two Cladding Rails and provides a square edge for fixing to. This is particularly useful for corners, window and door reveals and roof verges where there is a 90 degree angle in the cladding. The Verge Trimmer can also be cut to an angle for raking intersections. As an option, it can be supplied with a matt black finish where there is a requirement for it not to be visible between open cladding joints.

Material

Aluminium

Dimensions

36 x 97 x 2000

To Specify

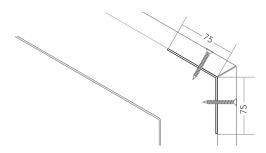
CRS-VT Verge Trimmer

CRS-VT Verge Trimmer – dark coated

## CRS-AP angle profile



Scale 1:5



The Angle Profile is used to connect two different planes of cladding material. It serves to provide a fixing point for the edge of the cladding material and hold the two edges in relation to each other. This is particularly useful for connecting timber cladding at a change of pitch or plane as over time, the timber can warp and twist. As an option, it can be supplied with a matt black finish where there is a requirement for it not to be visible between open cladding joints.

Material Aluminium

Dimensions  $75 \times 75 \times 2000$  – folded to specific angle

To Specify

CRS-AP Angle Profile

CRS-AP Angle Profile – dark coated







## Design considerations when specifying the ROOFTRAK CRS system

#### Structural calculations

The Rooftrak CRS system has been designed to support cladding with a weight of up to 20kg/m² at an altitude of up to 100m above ordnance datum in accordance with Wind Loading to BS 6399-2 and Snow Loading to BS 6399-3. The centres of repeating support required for the cladding material should be obtained from the cladding material manufacturer. Once the support centres dimension is known (dimension A on in the tables on page 24) the spacing of the Fixing Points (dimension B on page 24) can be determined for different areas in the UK using the tables and diagrams on pages 24-25 also taking into account the pitch of the cladding.

Obviously the structure itself needs to be adequately provisioned structurally to support the weight of the cladding material as well as approx.  $20 \text{kg/m}^2$  for the CRS system.

Nicholson does not provide structural calculations for specific projects and where critical or in very exposed areas. The use and application of the CRS system in these situations should be approved by a qualified structural engineer.

#### Types of roof construction

The designer should select a construction that provides adequate fixing capacity for the CRS system. Typically this requires that the construction has an 18mm thick plywood layer within the wall or roof build-up to provide the necessary anchorage for the fixing points.

In cold roof type constructions, this plywood is normally directly beneath the weathering layer. It should be noted that BS5250 requires the roof void in such roof constructions is ventilated.

In warm roof constructions the plywood will usually be on the warm side of the insulation. In this case thermally broken fixings are normally used to maintain the thermal efficiency of the structure and avoid any thermal bridging.

In SIPs (Structurally Insulated Panels) the insulation is normally sandwiched between an internal skin and outer layer. It is important that there is enough strength in these layers to provide adequate fixings.

With all roof constructions, attention should be paid to the VCL (Vapour Control Layer) to help avoid the occurrence of interstitial condensation within the roof build up.

#### Weathering system

The Rooftrak IFP Fixing Points can be used with nearly all roof covering materials and systems including single ply membranes, bitumen membranes, liquid applied and GRP. Where a single ply or bitumen membrane system is utilised, it is important that a matching piece of membrane is factory fitted to the Fixing Point to enable full integration with the roofing system and remain within the roofing system warranty.

Normally the roofing contractor will provide the necessary membrane and also seal the fixing points to the roof after they have been fixed in position. The Fixing Points are usually set out and fixed through the completed weathering.

#### **Cladding material**

There are a variety of timber cladding products and finishes available. There are also many other cladding materials available that can be supported by a suitable framing system. Alongside the aesthetic aspirations of the designer, another key consideration for specifiers is the durability of the chosen cladding.

Another key consideration is the minimum distance between supports for the chosen cladding material. These may differ according to the pitch in which the cladding material is attached and should be obtained from the cladding material supplier.

The current Fire Regulations should also be considered in context to the surrounding buildings and built environment.

#### **Drainage**

Consideration should be given at design stage as to how surface water will be handled. If the cladding is of an 'open' style with gaps between boards then rainwater run-off will need to be detailed into the roof structure below. 'Hidden' gutters are an option that use the weathering membrane to channel the run-off to be directed into the rainwater system.

#### **Service penetrations**

Consideration should be given to service penetrations such as SVP's, extract ducts and cables etc. Ideally, from a visual point of view, these should be concentrated in less obvious areas of the building being clad. The chosen weathering system will need to be detailed around these penetrations which normally involves a minimum 150mm upstand meaning that they could appear above the external level of the cladding.



#### **Detailing small areas of cladding**

The versatile CRS system has been developed specifically for cladding with the main Cladding Rails and the Trimmer Rails and Verge Trimmers connecting together to achieve a flush faced array of rails to receive the cladding material. However, depending on the complexity of the design, the CRS may not be able to provide complete support in smaller areas of cladding such as points of triangular areas, reveals, odd shaped areas etc.

In these areas, some supporting framework may be required to successfully execute the cladding detail. This is normally well within the ability of the on-site operatives fitting the CRS system. However, for particularly intricate details a detail drawing might be appropriate.

#### **Coastal & marine locations**

Locations near the coast (within 2km) are subject to increased amounts of sodium chloride in the atmosphere which, when present with moisture and oxygen, are known to accelerate the corrosion of metals.

In such conditions, the Rooftrak IFP Fixing Points are robust enough to withstand this atmosphere but bare aluminium is likely to be affected with a shortened service life. We currently do not recommend the CRS system for use in these locations but suggest appropriately sized timber rails can be used and attached to the IFP Fixing Points using stainless steel accessory brackets available with the Rooftrak IFP system.

#### **High exposure locations**

Some areas of high ground as well as coastal locations can experience extreme weather conditions and are particularly prone to high winds.

In these locations, care should be taken to ensure that there is sufficient strength in the structure and that the quantity of fixing points used is enough to provide the required anchorage for the cladding. The calculation tables on pages 24-25 are valid at 100m above ordnance datum and in any location irrespective of its proximity to the sea.

Where locations exceed such altitudes or where extreme weather situations are expected, it is advisable to have calculations approved by a structural engineer.

#### Fixings on warm pitched roofs

To ensure stability of the cladding system in the case of fire, for warm pitched roofs from 10°-30° it is recommended that 2 out of 8 fixings in the IFP's are 'direct' type fixings and for pitched roofs over 30° and vertical cladding areas, it is recommended that 4 out of 8 fixings are 'direct' type fixings.

#### Layout plan

A simple layout plan is required for the CRS system to be installed. This can be prepared by the specifier, architect or designer. Instructions and typical diagrams are included on pages 30-33 along with a link to a dwg. file where these templates may be downloaded. The templates include many common cladding details in the CRS system. Should further quidance be required, please contact our technical team on the number below.

#### **Building sequence**

Normally the weathering membrane to the building will be completed before the CRS system is installed.

The IFP Fixing Points are fixed in the correct positions through the completed roof, taking into account the correct spacings in both directions and according to the layout plan.

The roofing contractor should then seal the IFP Fixing Points to the field membrane in accordance with the membrane manufacturers recommendations, ensuring the integrity of the roof and warranty.

The CRS system is then installed, fixing to the IFP fixing points, taking care to use fixed and movement connections as appropriate.

Finally, the cladding material is fixed to the CRS system, ensuring that all ends are supported and fixed to prevent future warping and twisting.

#### Warranty

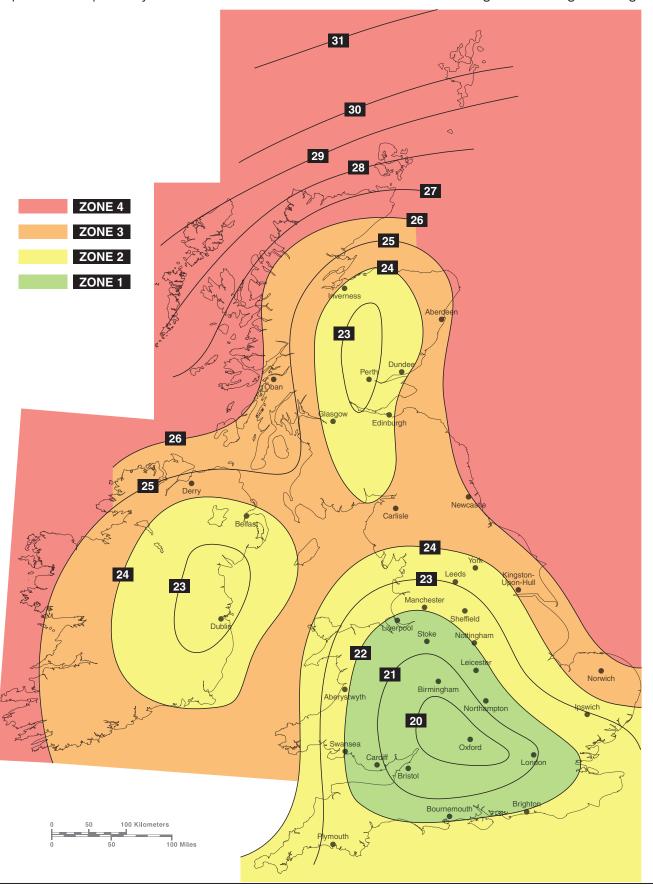
The IFP Fixing Points, if fitted correctly, have a warranty period to match the warranty duration provided by the roof system manufacturer. The roof itself must remain in warranty for this warranty to remain valid. The CRS system has a 10 year product warranty if installed in accordance with the fitting instructions and not in coastal areas.



## Calculating rail centre support dimensions

The information on the following two pages is designed to assist in calculating the number of rail supports that will be needed for your roof. Please follow instructions on page 25.

**NB:** The span tables on page 25 are valid for altitudes up to 100m above ordnance datum and in any location, irrespective of its proximity to the sea. The calculations assume a maximum cladding material weight of 20kg/m<sup>2</sup>



## Calculating rail centre support dimensions

#### Instructions for use:

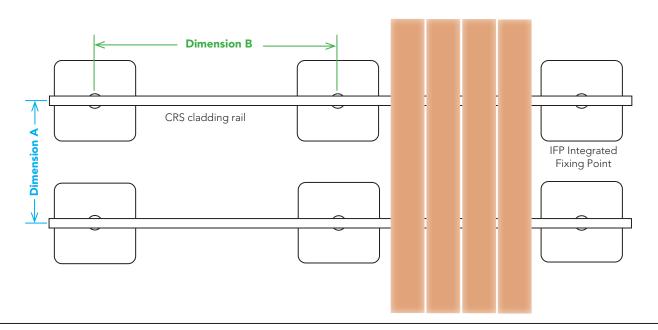
- 1) Ascertain the project zone from the map (page 24)
- 2) Ascertain the support centres dimension 'A' from the cladding material manufacturer
- 3) Choose the table that represents the zone in which the project is located
- 4) Use dimension A along with the pitch of the clad area to determine the distance 'B' between fixing points
- 5) A layout plan can now be prepared using dimension 'A' between the Cladding Rails and dimension 'B' between the supporting Fixing Points see pages 31-38 for typical layout plans.

	Zone 1							
	Dimension B (m)							
	Zone 1							
(mr	control		15°	30°	45°	60°	75°	90°
n A (n	300	1.7	1.7	1.64	1.64	1.7	1.7	1.68
Dimension A (mm)	400	1.58	1.58	1.52	1.53	1.59	1.59	1.57
Dim	500	1.5	1.5	1.44	1.44	1.5	1.5	1.48
	600	1.43	1.43	1.38	1.38	1.43	1.43	1.41

	Zone Z								
Dimension B (m)									
	Zone 2	Roof Pitch							
E (	centres	0°	15°	30°	45°	60°	75°	90°	
Dimension A (mm)	300	1.66	1.66	1.59	1.56	1.6	1.6	1.58	
ensio	400	1.55	1.55	1.48	1.45	1.49	1.49	1.47	
Dim	500	1.46	1.46	1.4	1.37	1.41	1.41	1.39	
	600	1.4	1.4	1.33	1.31	1.35	1.35	1.33	

	Zone 3								
	Dimension B (m)								
	Zone 3	Roof Pitch							
(E	centres	0°	15°	30°	45°	60°	75°	90°	
Dimension A (mm)	300	1.66	1.66	1.58	1.55	1.59	1.59	1.56	
	400	1.54	1.54	1.47	1.44	1.48	1.48	1.46	
	500	1.46	1.46	1.39	1.36	1.4	1.4	1.38	
	600	1.39	1.39	1.33	1.3	1.33	1.33	1.32	

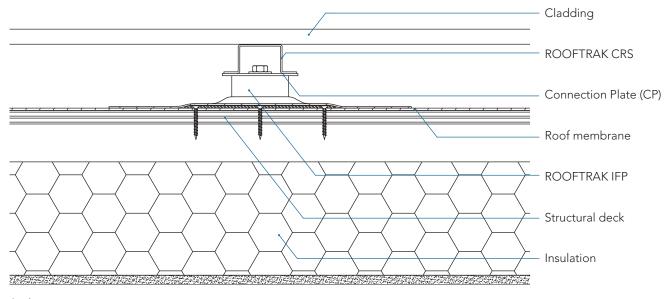
	Zone 4								
	Dimension B (m)								
	Zone 4 centres	Roof Pitch							
(mr		0°	15°	30°	45°	60°	75°	90°	
n A (n	300	1.57	1.57	1.5	1.45	1.49	1.49	1.47	
Dimension A (mm)	400	1.47	1.47	1.39	1.35	1.38	1.38	1.37	
Dim	500	1.39	1.39	1.32	1.28	1.31	1.31	1.29	
	600	1.32	1.32	1.26	1.22	1.25	1.25	1.23	



### Typical roof construction details

### cold roof build-up

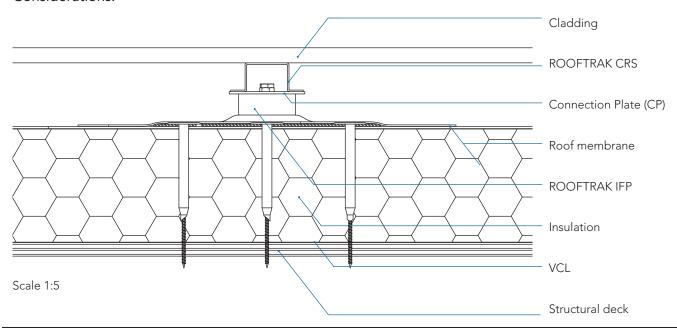
Cold roofs have a timber deck directly below the waterproofing layer. This makes fixing the CRS system to the building structure simple. However, BS5250 Control of Condensation in Buildings requires that cold roofs should be ventilated directly under the roof deck. It requires a 25mm continuous ventilation aperture on two opposite sides of the roof area with a 50mm ventilaion zone between them.



Scale 1:5

## warm roof build-up

Warm roofs have a supporting roof deck below the insulation. Insulation can be of varying thicknesses and the vapour control layer (VCL) is an important part of the roof construction. Thermally broken fixings are normally used with warm roof constructions but see guidance note in the section Design Considerations.

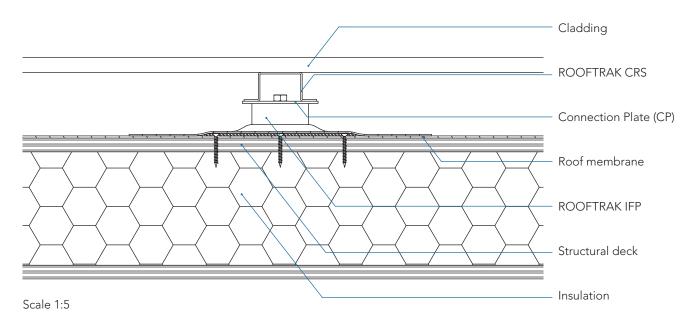




## Typical roof construction details

### SIPs panel build-up

Structural insulated panels (SIPS) are normally pre-manufactured off-site with a single ply weathering layer to the top surface. For use with the Rooftrak-CRS system they should include an 18mm plywood skin to the top face of the panel and be used with 'direct' type fixings.









## Installation diagram

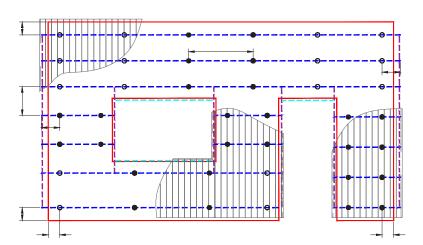
This section shows how to prepare a simple diagram that will be required by the installer of the Rooftrak Cladding Rail System. It details the various components required and how they are assembled together. It can also be used to obtain the approximate quantities of the various components.

On the following pages you will find some typical layout diagrams and and typical sections. More detail can be found by downloading the dwg template by clicking the link on this page.

By following the step by step guide below, you can create an installation diagram for the installer. It is recommended that each area of roof or wall is treated as a separate entity for the purposes of this exercise.

Layo	out diagram process
1	Download the DWG with the templates and details in
2	Prepare a separate layout diagram for each area of cladding
3	Start with an outline of the actual wall or roof area that is to be clad (red line)
4	Add the Cladding Rails (blue) <b></b> running perpendicular to the direction of the cladding material. These should be spaced apart at not less than the dimension at which the cladding material needs to be supported (DIM A). This dimension should be obtained from the cladding material manufacturer.
5	Make sure the Cladding Rails are positioned as close as possible to the parallel edge of the roof to provide a support for the cladding as near to this edge as possible. See DIM C and DIM D
6	The IFP Fixing Points should then be positioned along the Cladding Rail to provide the necessary support. The minimum distance between them (DIM B) can be obtained from the correct zone table on page 25 using the roof pitch, and DIM A.
7	There should be at least two fixed IFP Fixing Points in each run which should be adjacent to each other. For Cladding Rails running horizontally, these should be near to the middle of each Cladding Rail run. On vertical Cladding Rails the two should be at the top of the Cladding Rail.
8	Where necessary, Trimmer Rails, Verge Trimmer rails and Angle Profiles can be added to the perimeter of the area where it interfaces with other adjacent areas of cladding or other elevations of the building. These are detailed in the sections available on the DWG download.

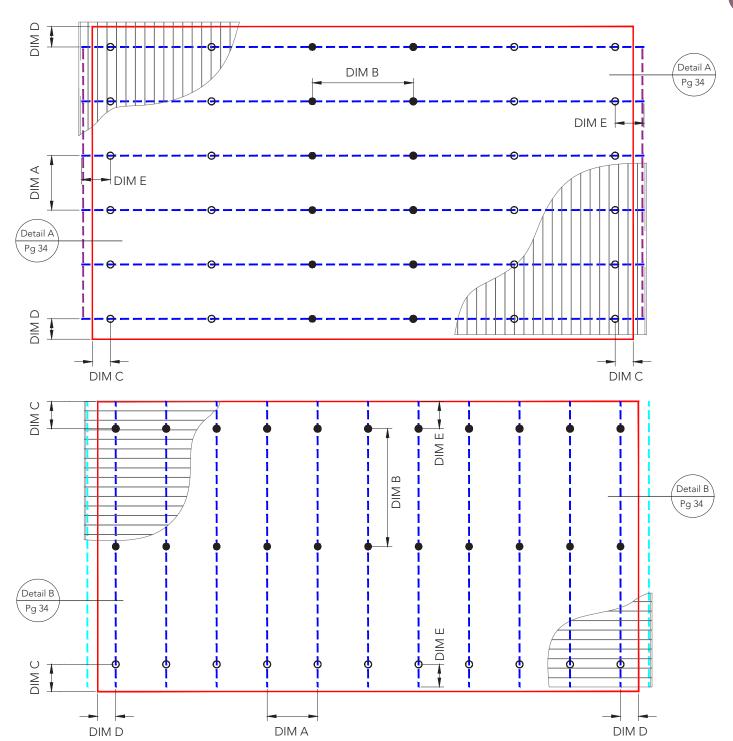






## Download DWG file with templates

## technical details

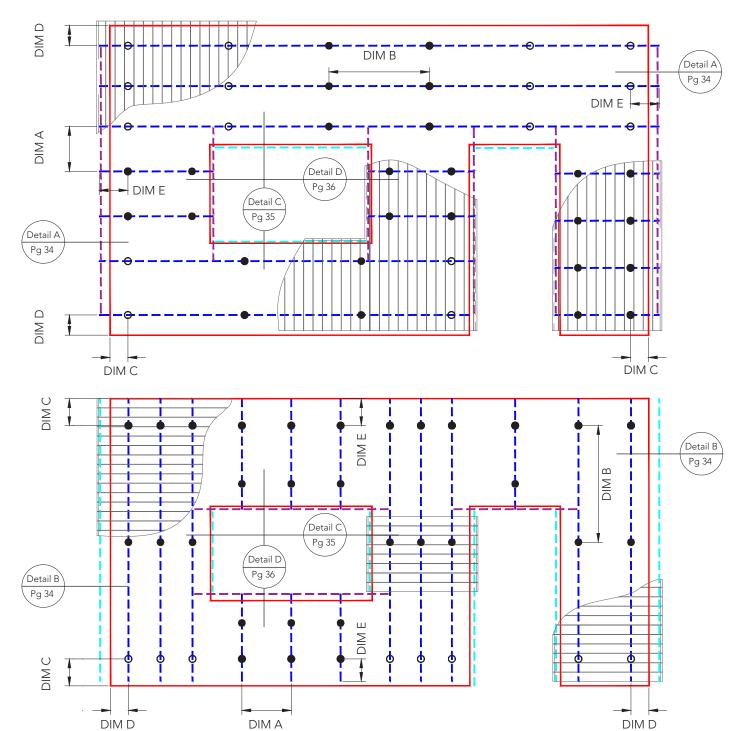


	Outline of roof/wall
	CR Cladding Rail
	VT Verge Trimmer
	AP Angle Profile
	TR Trimmer Rail
0	IFP Fixing Point - thermal movement
	IFP Fixing Point - fixed

DIM A	CR - Cladding Rail spacing see pages 24-25
DIM B	IFP Fixing Point spacing see pages 24-25
DIM C	IFP Fixing Point offset from edge of roof/wall min. 150mm where membrane goes around the corner min. 200mm where the membrane stops at the corner
DIM D	IFP Fixing Point offset from edge of roof/wall min. 150mm where membrane goes around the corner min. 200mm where the membrane stops at the corner
DIM E	CR - Cladding Rail overhang max. 300mm

## technical details





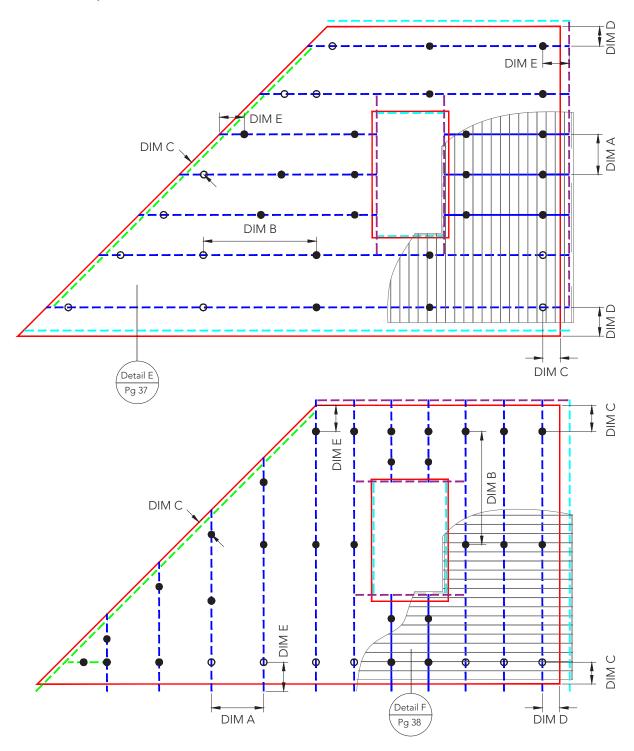
	Outline of roof/wall
	CR Cladding Rail
	VT Verge Trimmer
	AP Angle Profile
	TR Trimmer Rail
0	IFP Fixing Point - thermal movement
	IFP Fixing Point - fixed

DIM A	CR - Cladding Rail spacing see pages 24-25
DIM B	IFP Fixing Point spacing see pages 24-25
DIM C	IFP Fixing Point offset from edge of roof/wall min. 150mm where membrane goes around the corner min. 200mm where the membrane stops at the corner
DIM D	IFP Fixing Point offset from edge of roof/wall min. 150mm where membrane goes around the corner min. 200mm where the membrane stops at the corner
DIM E	CR - Cladding Rail overhang max. 300mm



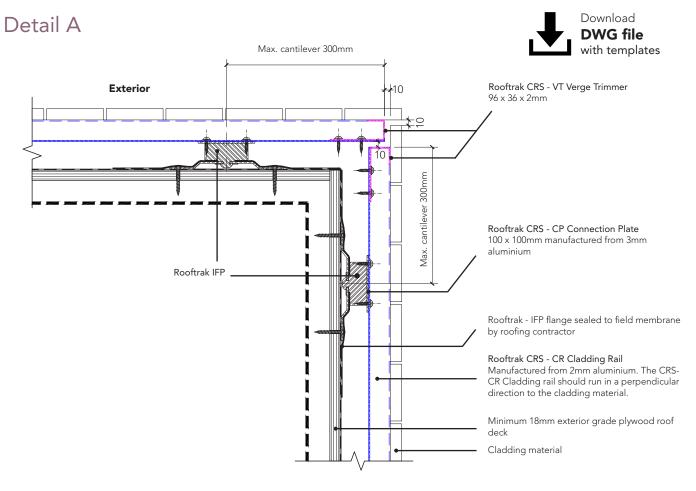


## technical details

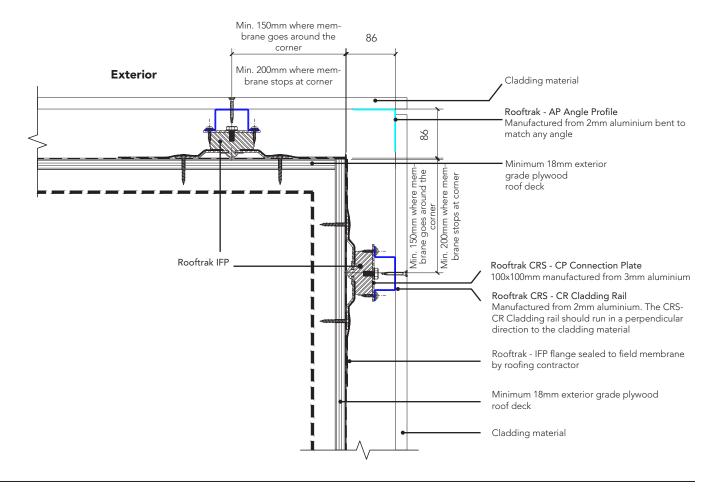


	Outline of roof/wall
	CR Cladding Rail
	VT Verge Trimmer
	AP Angle Profile
	TR Trimmer Rail
0	IFP Fixing Point - thermal movement
	IFP Fixing Point - fixed

DIM A	CR - Cladding Rail spacing see pages 24-25
DIM B	IFP Fixing Point spacing see pages 24-25
DIM C	IFP Fixing Point offset from edge of roof/wall min. 150mm where membrane goes around the corner min. 200mm where the membrane stops at the corner
DIM D	IFP Fixing Point offset from edge of roof/wall min. 150mm where membrane goes around the corner min. 200mm where the membrane stops at the corner
DIM E	CR - Cladding Rail overhang max. 300mm



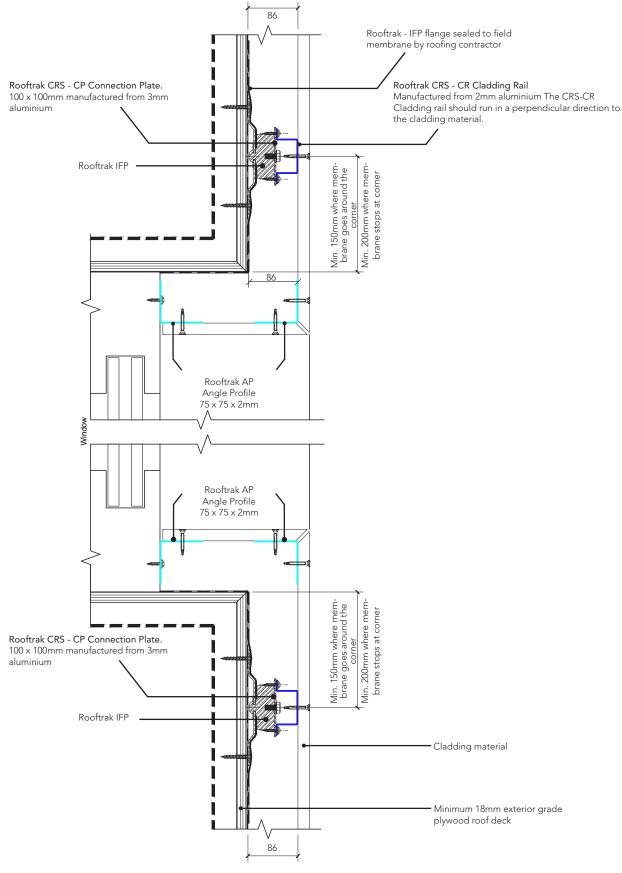
#### Detail B



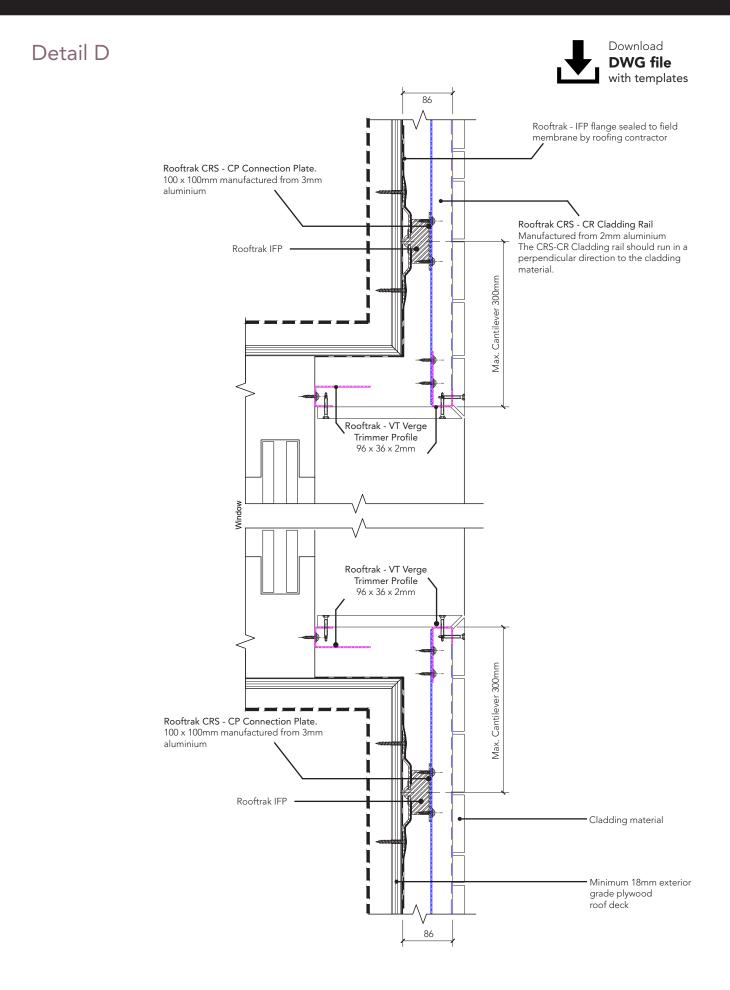


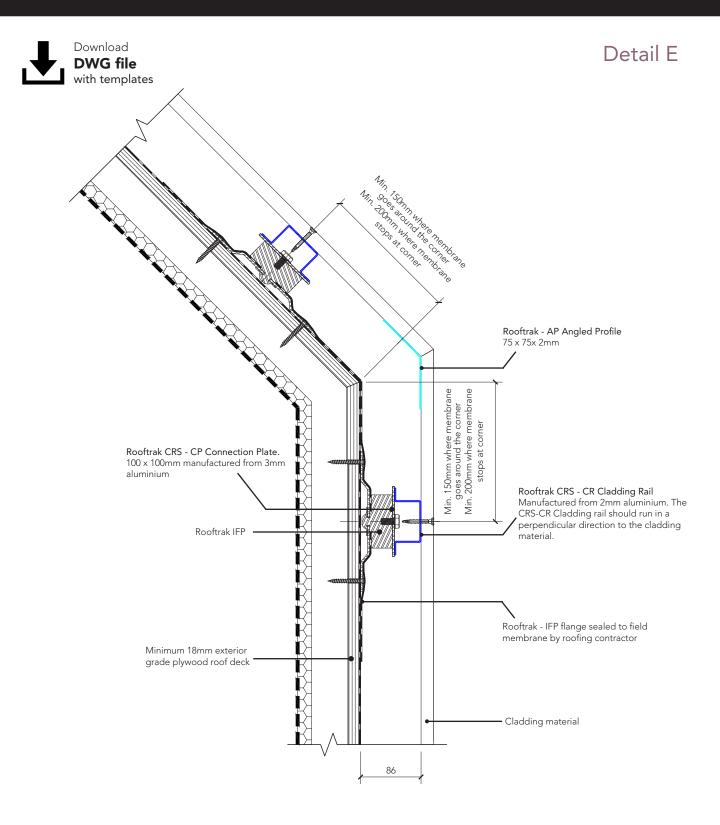


### Detail C

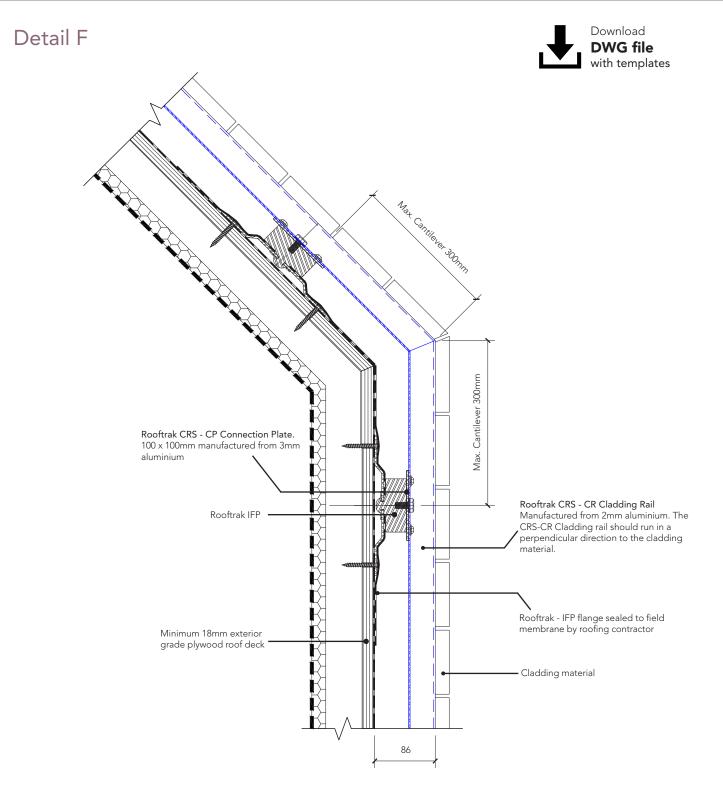


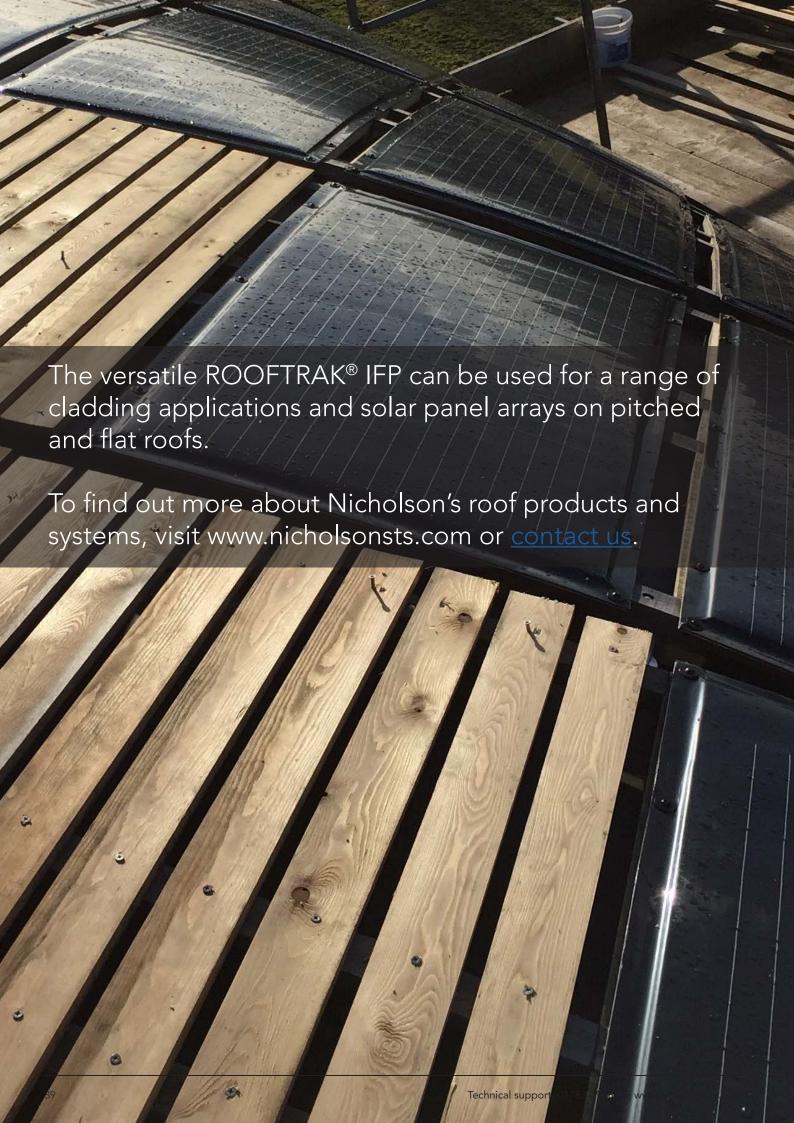














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