FUTURA

HANDLING GUIDE

More span, more strength, less cost.

Contents

Handling & Storage Guidelines

for Futura® Box-Beams

Correct handling and storage are essential to prevent injury, ensure product is not damaged, and to achieve maximum product durability and performance.

1. Protective gloves must be worn at all times when handling the product. Treat all cut edges as sharp.
2. A visual inspection should always be carried out when delivery is taken on site to ensure the product is free from damage. Damaged product must not be installed and should be replaced.
3. Product must always be lifted when moved, and not dragged, to avoid damage to the galvanised coating. Long members must be carefully lifted at two or more points distributed evenly along their length to avoid excessive load concentration. Woven lifting straps of appropriate load ratings should be used in contact with the member, not chains.
4. Product on site should be stored on dunnage to keep it clear of the ground. The dunnage should be arranged to produce a slope so that any water drains from one end.
5. Bundles of product must not be stored outside in wet weather without using a cover to protect each bundle from water ingress. The cover must not be in direct contact with product or prevent free air movement around them. Failure to observe this may lead to moisture being trapped between adjacent surfaces, resulting in 'White rust', which is an undesirable aesthetic blemish.
6. If a bundle is accidentally exposed to wet weather, the product must immediately be either installed, or unpacked in a dry internal environment and each member separated and allowed to dry thoroughly before re-bundling.
7. The building must be closed in as soon as possible to limit exposure to the elements, preferably within 12 weeks in moderate environments, or within 3 weeks in marine or geothermal environments.
8. Product must not be placed in direct contact with timber or concrete which is subject to wetting. A Damp-Proof-Course (DPC) may be used to provide separation.
9. Protect the surface from splashes of cement and immediately wash off any that do occur.
10. Product must be protected at all times from exposure to chemicals, fertiliser, effluent, soil, geothermal emissions, green concrete, dissimilar metals, or other potential corrosion sources and moisture retaining materials.
11. The product may be trimmed on site using an abrasive steel blade, observing all safety precautions, including goggles to protect the eyes. Care must be taken to ensure swarf does not fall on other products. All swarf must be removed from the product after cutting is completed and sharp edges deburred.
12. Holes may not be made in members except as permitted by the plans or the project engineer. Gas cutting of holes, or welding of members or connections, are *not* permitted under any circumstances.
13.

Futura Lifting Guide

Introduction

This guide provides useful recommendations on how to lift Futura members safely without causing any damage to the product. It is crucial to be aware of the weight and dimensions of the product before attempting to lift it, as well as to have a clear understanding of the correct lifting techniques.

Member orientation

Futura members can be lifted either in a flat or vertical orientation. However, it is essential to note that there are specific length restrictions for each lifting position. When lifting Futura members in a flat orientation, it is crucial to ensure that the length of the member does not exceed 25m. Exceeding this length may compromise the safety and integrity of the product, potentially resulting in damage or injury.

(a) Flat (b) Vertical

Fig. 1 – Futura® Member Orientation

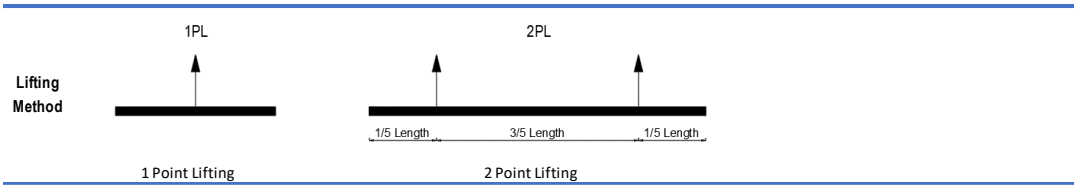
Lifting method

In Table 1, you will find that lifting methods are denoted by 1PL and 2PL, indicating one and two point lifting, respectively. For the 2PL lifting method, it is recommended to follow the "fifth point" rule. To ensure safety and prevent damage, it is essential to use appropriate straps that have a width greater than 100mm. It is also important to avoid wrapping chains around members or stacks as this can cause damage to the members. Instead, opt for straps that are designed for the specific purpose of securing the load.

Table. 1 – Recommended Lifting Type and Maximum Lengths for Futura® Members

Section	Members in FLAT orientation Length (m)				
	9	12	15	25	35
FB15008	1PL	2PL			
FB20008	1PL	2PL			
FB25010	1PL				
FB30010	1PL				
FB30020	1PL				
FB35012	1PL		2PL		
FB40015	1PL			2PL	
FB45020	1PL			2PL	
FB54020	1PL			2PL	Not allowed

Section	Members in VERTICAL orientation Length (m)				
	12	15	25	35	
FB15008	1PL				
FB20008	1PL				
FB25010	1PL				
FB30010	1PL				
FB30020	1PL				
FB35012	1PL				
FB40015	1PL		2PL		
FB45020	1PL		2PL		
FB54020	1PL			2PL	

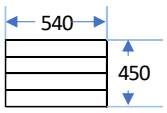


Member Pack Sizes and Weights

FB54020

Member size: 540x125 mm
Member weight: 20.7 kg/m

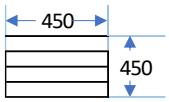
Stack Number: 4 members
Stack Weight: 82.8 kg/m



FB45020

Member size: 450x125 mm
Member weight: 17.9 kg/m

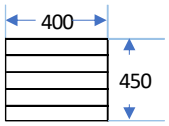
Stack Number: 4 members
Stack Weight: 71.6 kg/m



FB40015

Member size: 400x100 mm
Member weight: 11.6 kg/m

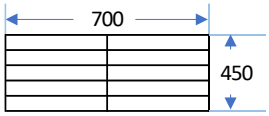
Stack Number: 5 members
Stack Weight: 58.0 kg/m



FB35012

Member size: 350x90 mm
Member weight: 8.1 kg/m

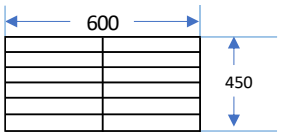
Stack Number: 10 members
Stack Weight: 81.0 kg/m



FB30020

Member size: 300x70 mm
Member weight: 12 kg/m

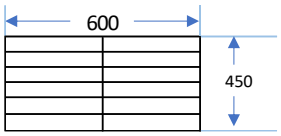
Stack Number: 12 members
Stack Weight: 144.0 kg/m



FB30010

Member size: 300x70 mm
Member weight: 5.7 kg/m

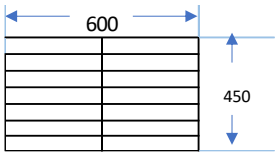
Stack Number: 12 members
Stack Weight: 68.4 kg/m



FB25010

Member size: 250x65 mm
Member weight: 4.9 kg/m

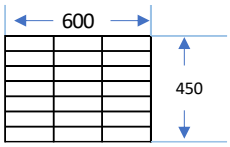
Stack Number: 14 members
Stack Weight: 68.6 kg/m



FB20008

Member size: 200x65 mm
Member weight: 3.2 kg/m

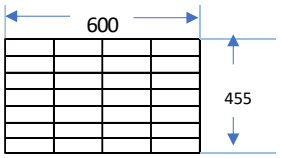
Stack Number: 21 members
Stack Weight: 67.2 kg/m



FB15008

Member size: 150x65 mm
Member weight: 2.7 kg/m

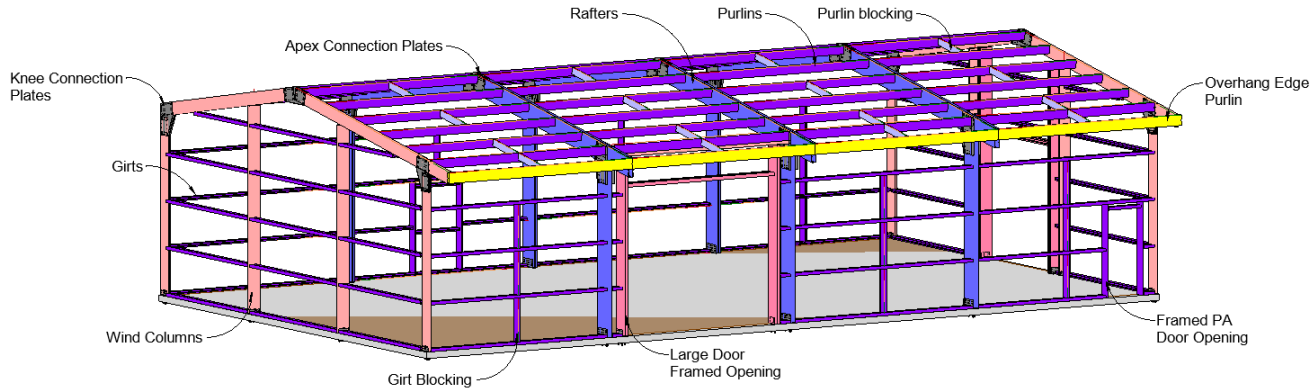
Stack Number: 28 members
Stack Weight: 75.6 kg/m



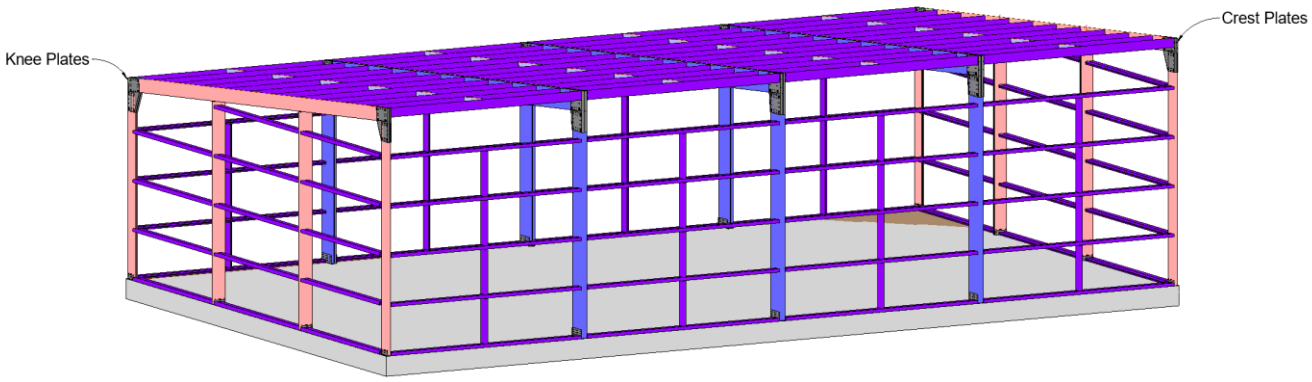
Futura Construction

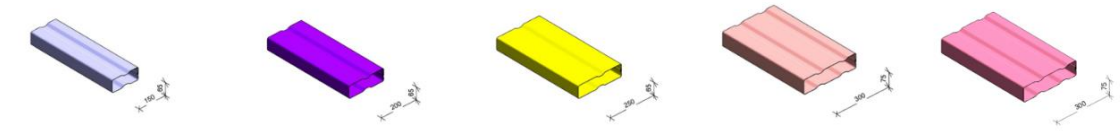
Futura Box-Beam System

Example 3D Gable Structure



Example 3D Monoslope Structure





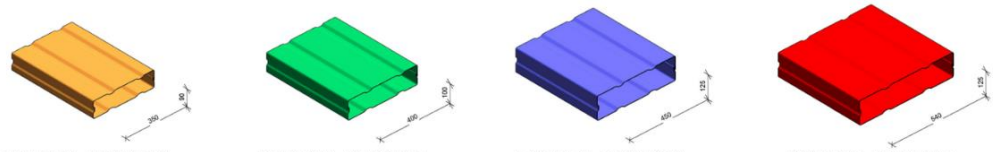
FUTURA FB15008
NTS

FUTURA FB20008
NTS

FUTURA FB25010
NTS

FUTURA FB30010
NTS

FUTURA FB30020
NTS



FUTURA FB35012
NTS

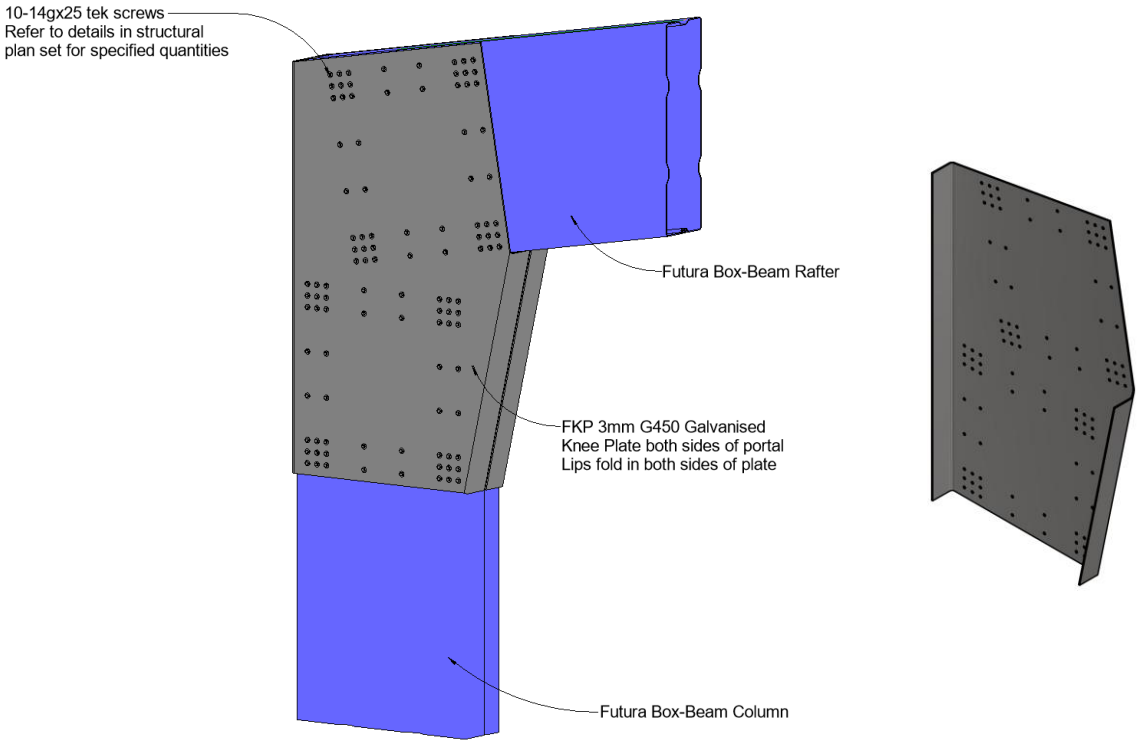
FUTURA FB40015
NTS

FUTURA FB45020
NTS

FUTURA FB54020
NTS

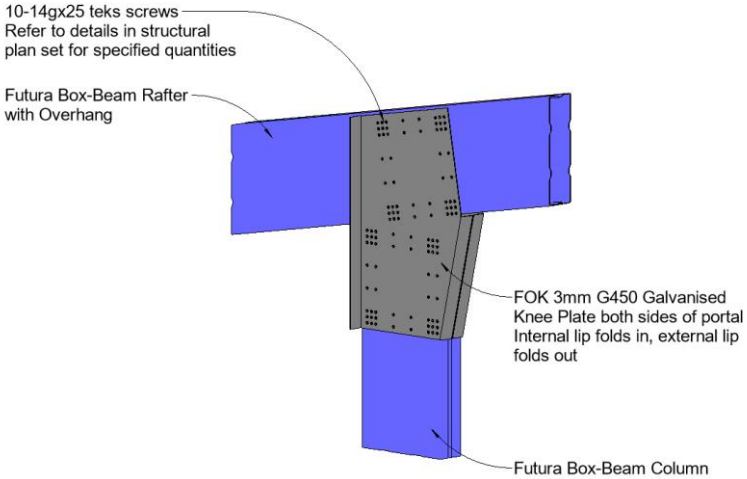
Futura Construction

Futura Knee Connection Plates



FKP Knee Plates

10-14gx25 Screws

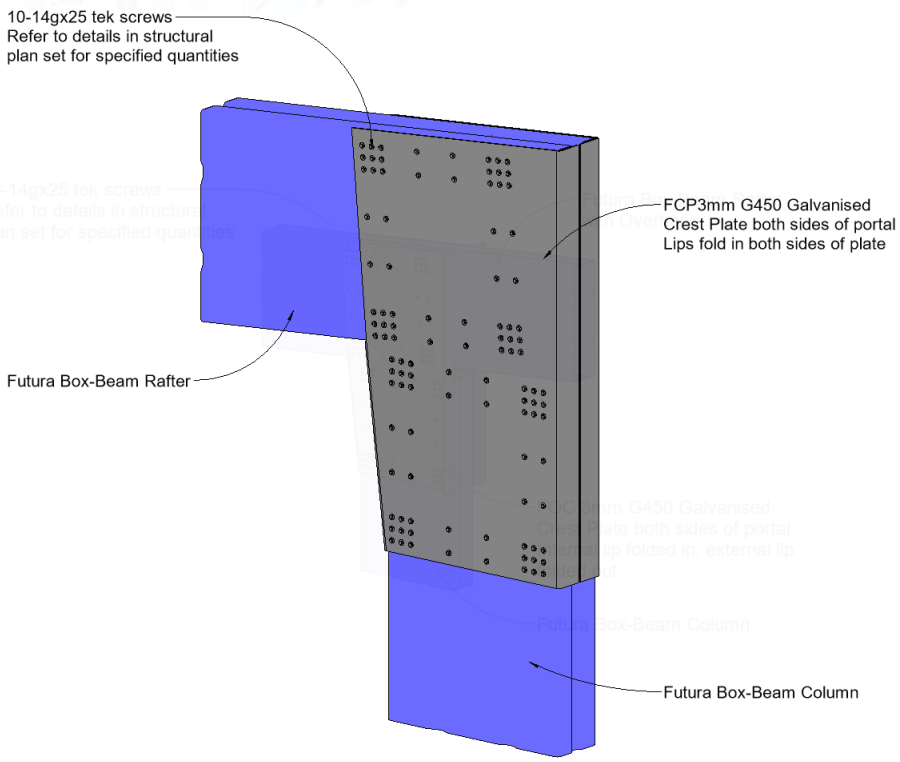


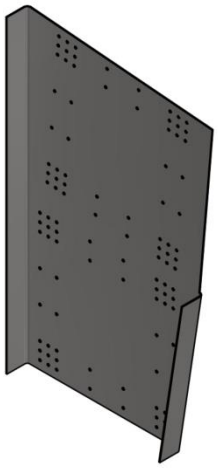
FOK Knee Plate

Typical Knee connection shown as an example only. Refer to structural plans for correct sizing and screw fixing

Futura Construction

Futura Knee Connection Plates

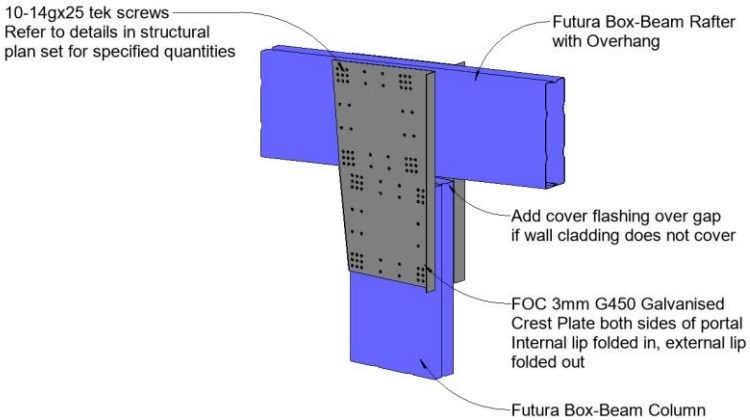




FCP Crest Plate

10-14gx25 Screws

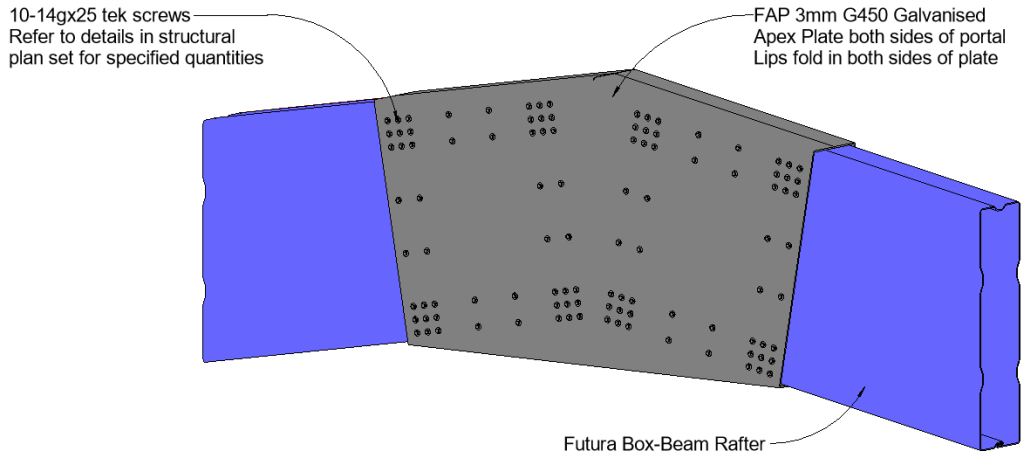
Typical Knee connection shown as an example only. Refer to structural plans for correct sizing and screw fixing



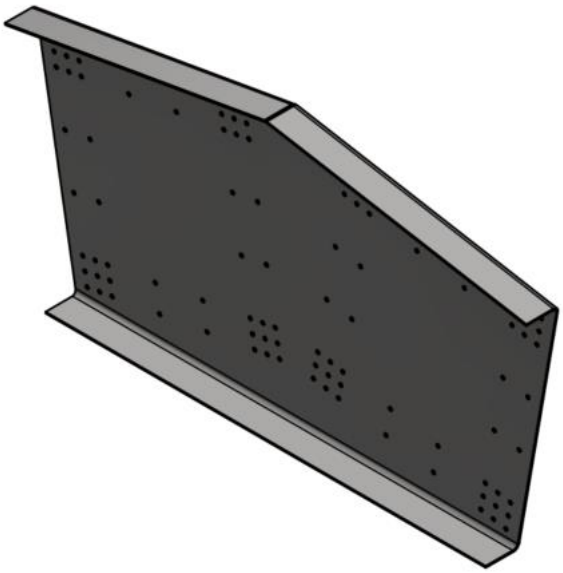
FOC Crest Plate

Futura Construction

Futura Apex Connection Plates



FAP Apex Plate

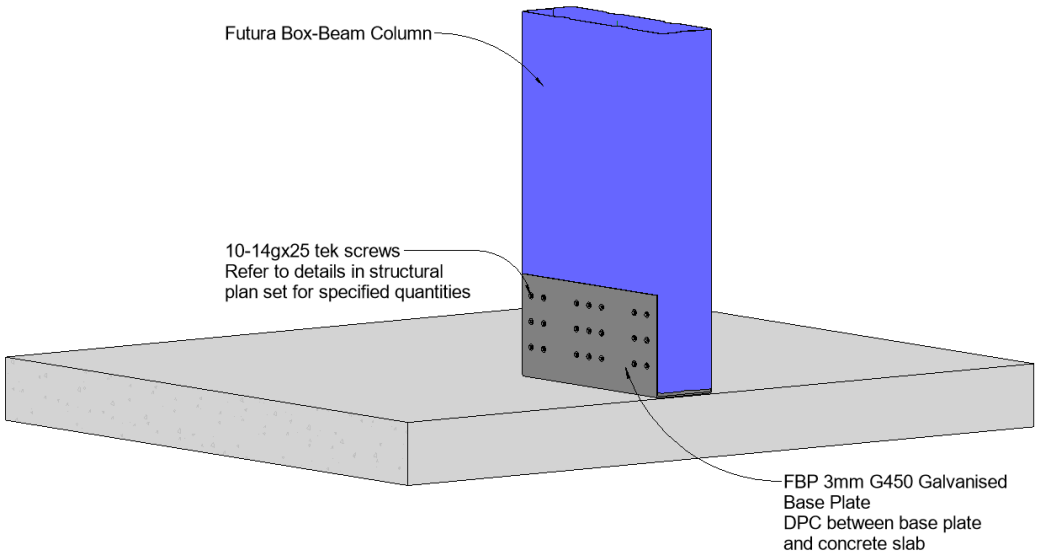


10-14gx25 Screws

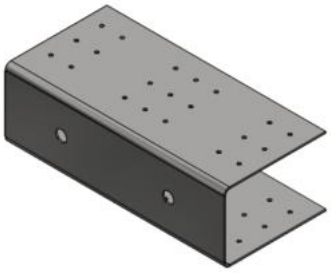
Typical Apex connection shown as an example only. Refer to structural plans for correct sizing and screw fixing

Futura Construction

Futura Base Plate



FBP Base Plate



FBP Base Plate

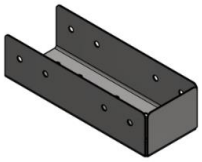
Cast-in Hold Down Bolt

10-14gx25 Screws

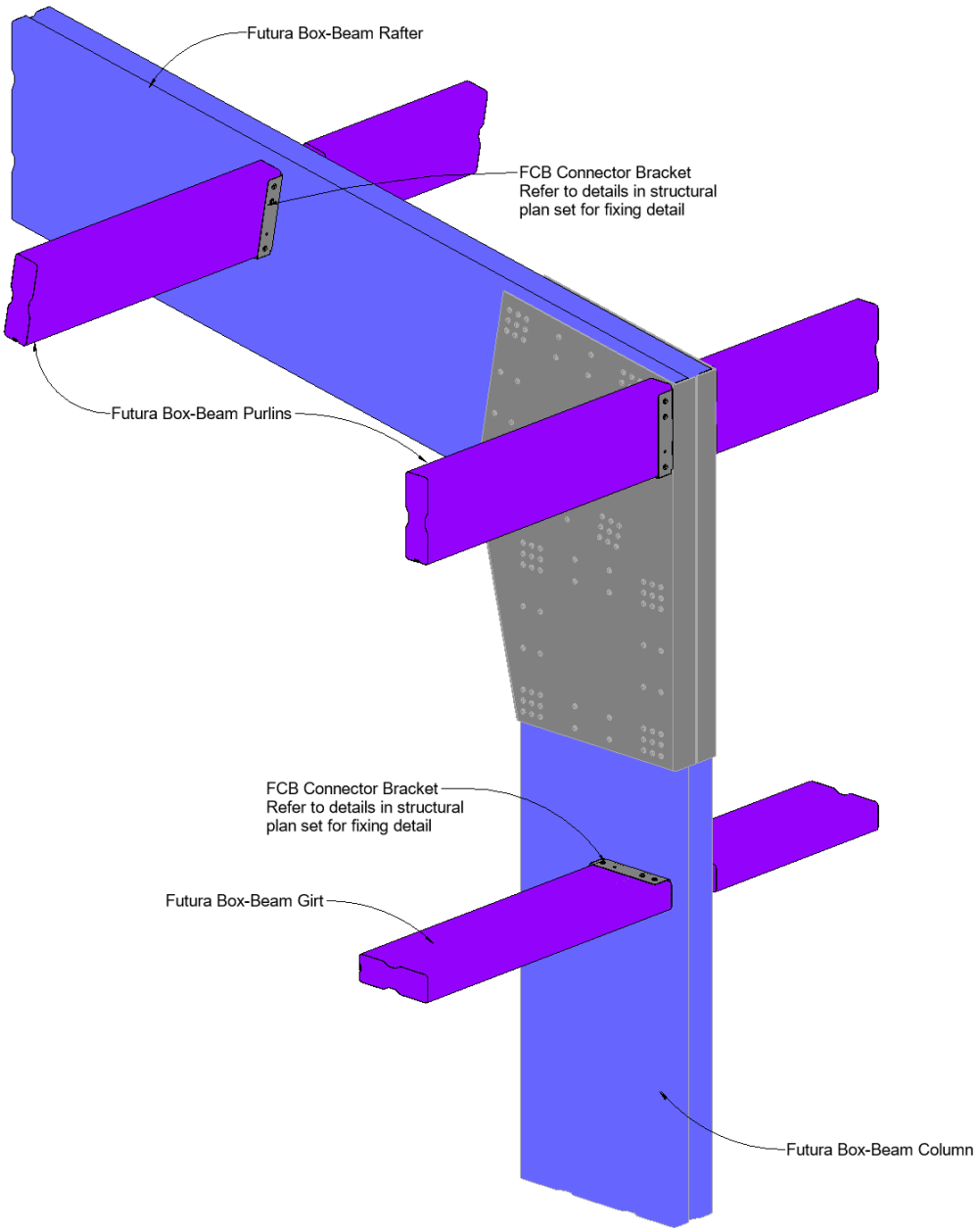
Futura Construction

Futura Connector Bracket

10-14gx25 Screws

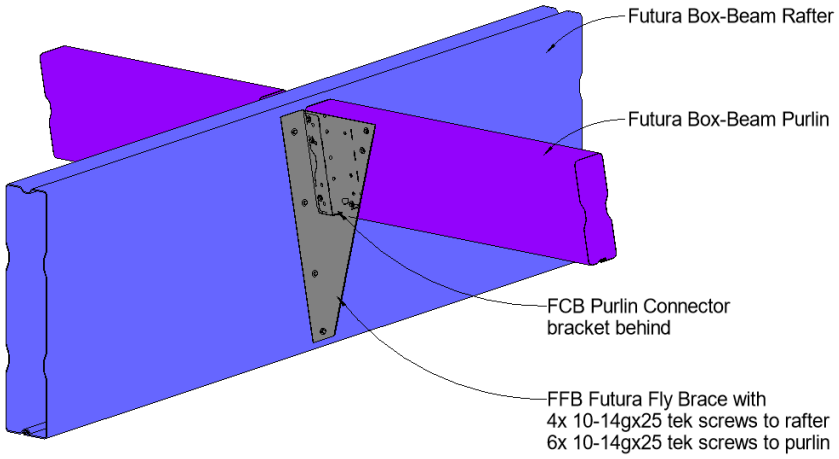


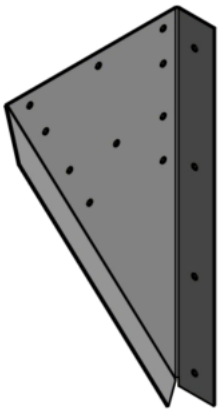
FCB Connector Bracket



Futura Construction

Futura Fly Brace



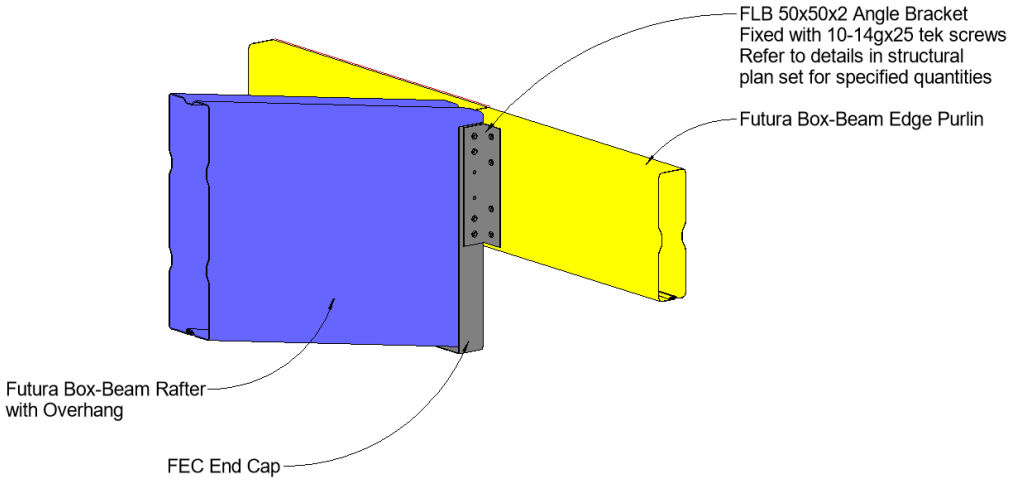


FFB Fly Brace
LH & RH versions required

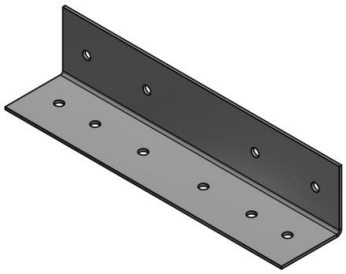
10-14gx25 Screws

Futura Construction

Overhang Edge Purlin Connection



FEC End Cap

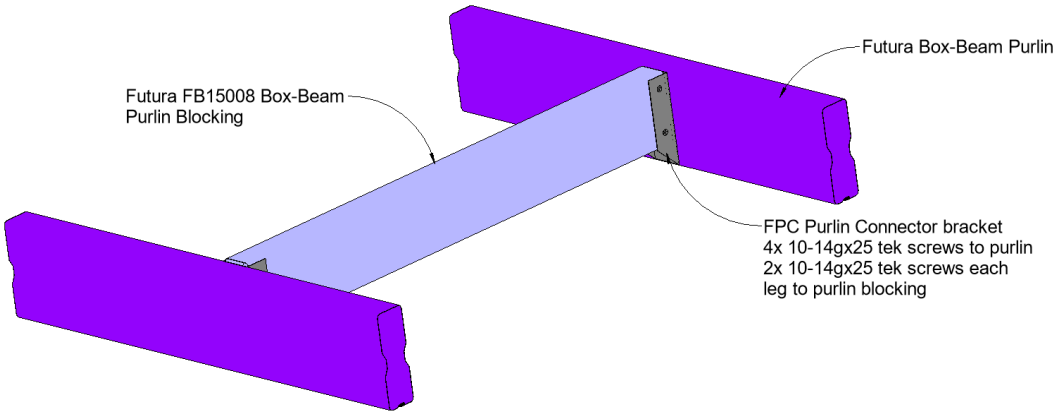


FLB Angle Bracket

10-14gx25 Screws

Futura Construction

Futura Purlin-Brace Connector Bracket



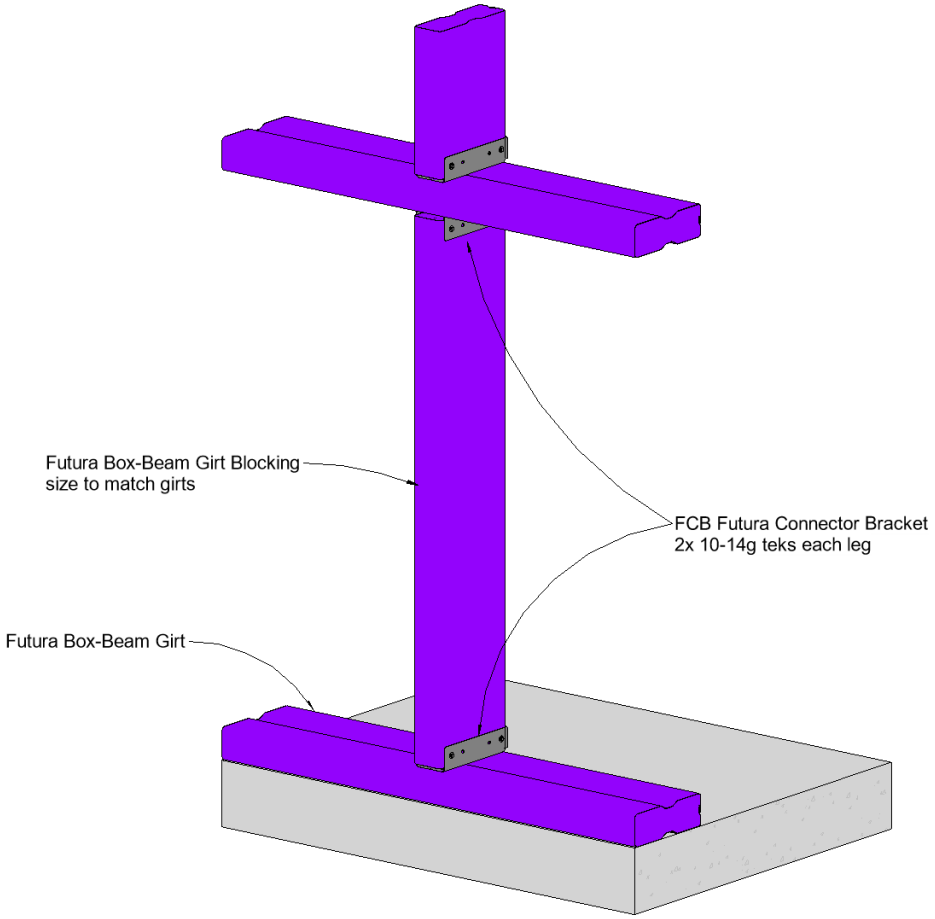
Use FB15008 Futura Box-Beam members for purlin blocking with purlins up to FB35012.

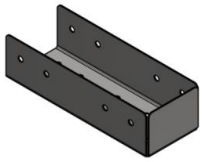
FPC Purlin-Brace Connector

10-14gx25 Screws

Futura Construction

Futura Girt Blocking



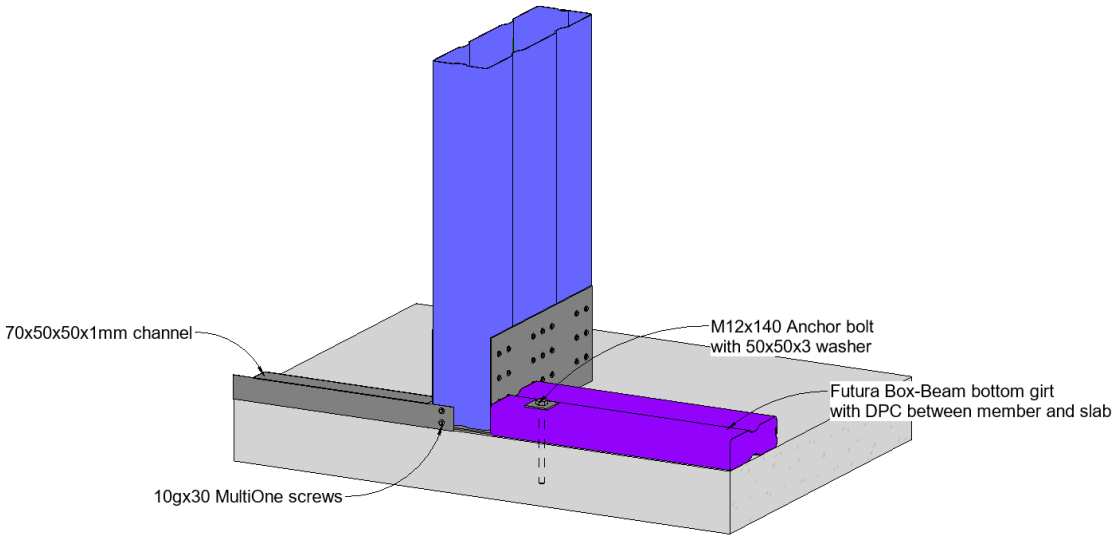


FCB Connector Bracket

10-14gx25 Screws

Futura Construction

Futura Bottom Girt Fixing



Bottom Girt Fixing Requirements:

Girt Length <550mm	70x50x50x1mm U-channel. Cut tabs each end and fix to columns with 10gx30 MultiOne screws as specified in structural plan set
Girt Length 550 – 1500mm	M12x140 anchor bolt 100mm in from each end
Girt Length >1500mm	M12x140 anchor bolt 100mm in from each end, and at mid span

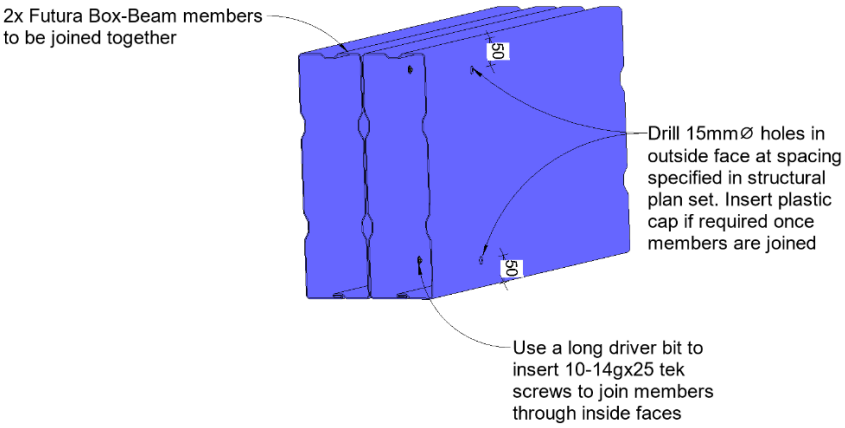
Girts must have appropriate size DPC between the member and the slab.

Anchor Bolt

10g MultiOne screws

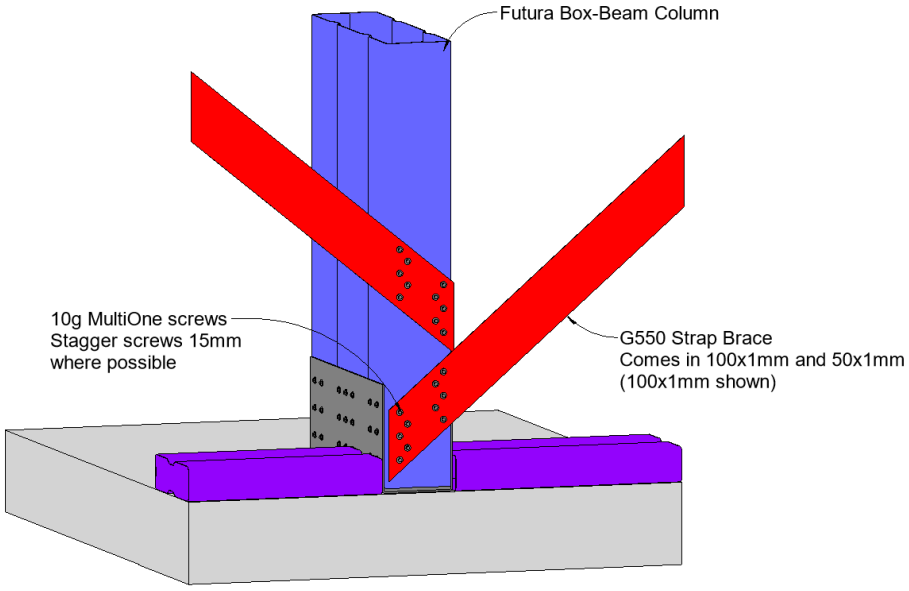
Futura Construction

Futura Box-Beam Double Member Joining



10-14gx25 Screws

Futura Strap Bracing



Futura Strap Bracing

Refer to structural plan set for specified quantity of 10g MultiOne screws.

Typical fixing is:

100x1mm strap = 10 screws

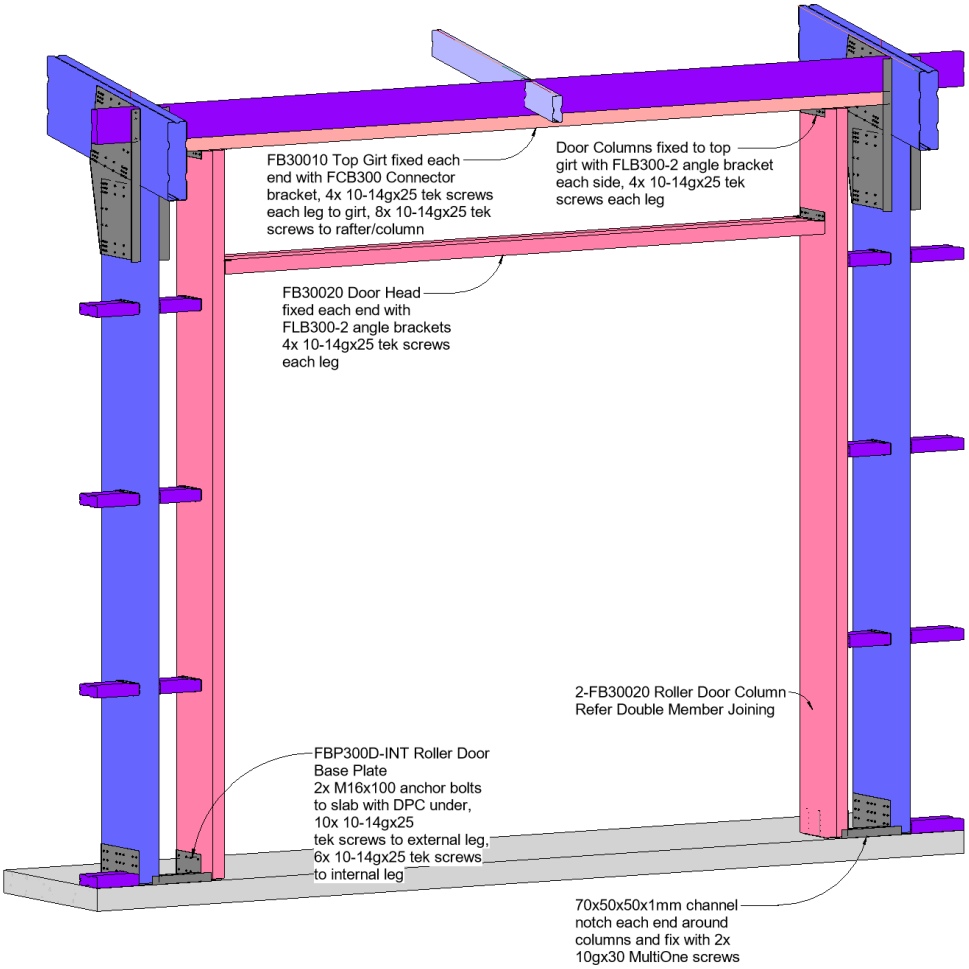
50x1mm strap = 6 screws

Stagger screws where possible. Maintain minimum 15mm screw spacing and edge clearance

10g MultiOne screws

Futura Construction

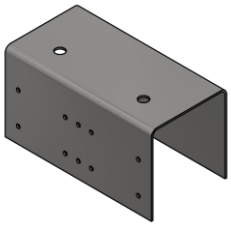
Futura Roller Door Framing – Side Wall



Futura Roller Door Frame

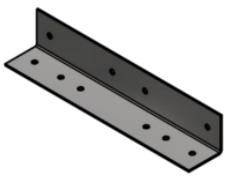
10g MultiOne screws

10-14gx25 Screws



FBP300D-INT

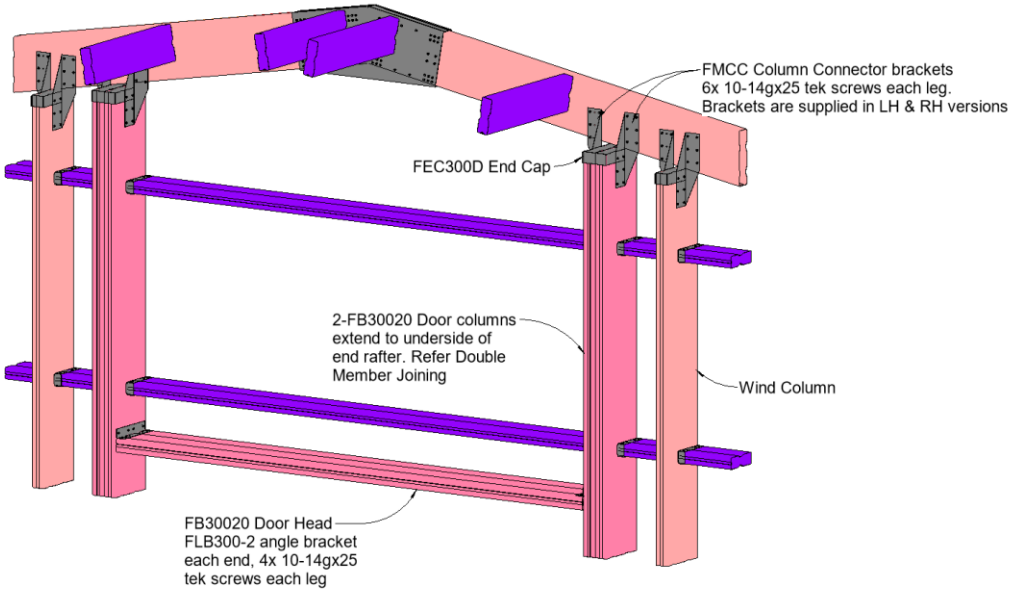
Anchor Bolt



FLB300-2

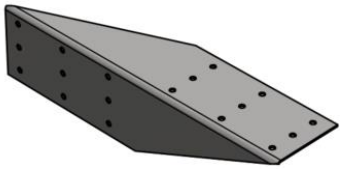
Futura Construction

Futura Roller Door Framing – End Wall

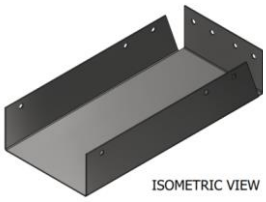


Futura Roller Door Frame – viewed from inside

10-14gx25 Screws



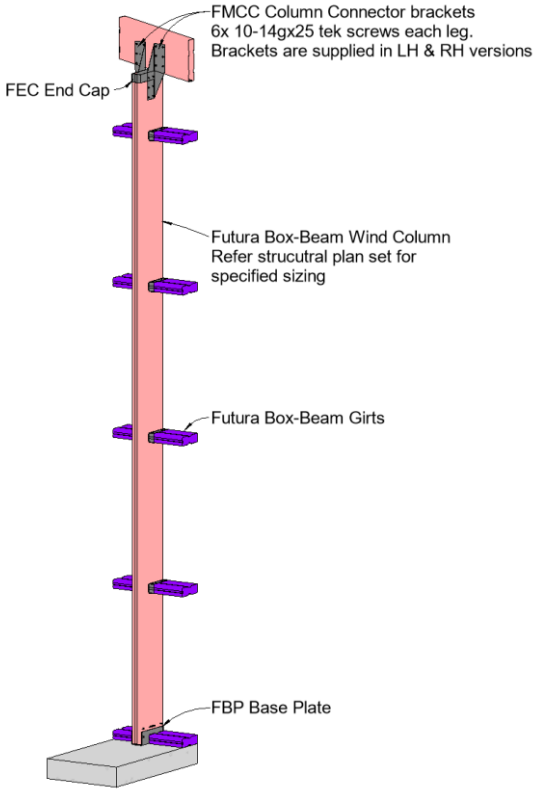
FMCC Column Connector



FEC300-D End Cap

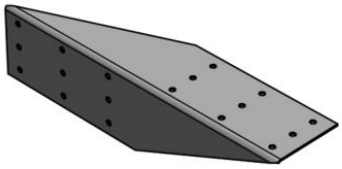
Futura Construction

Futura Wind Column



Futura Wind Column – viewed from inside

10-14gx25 Screws

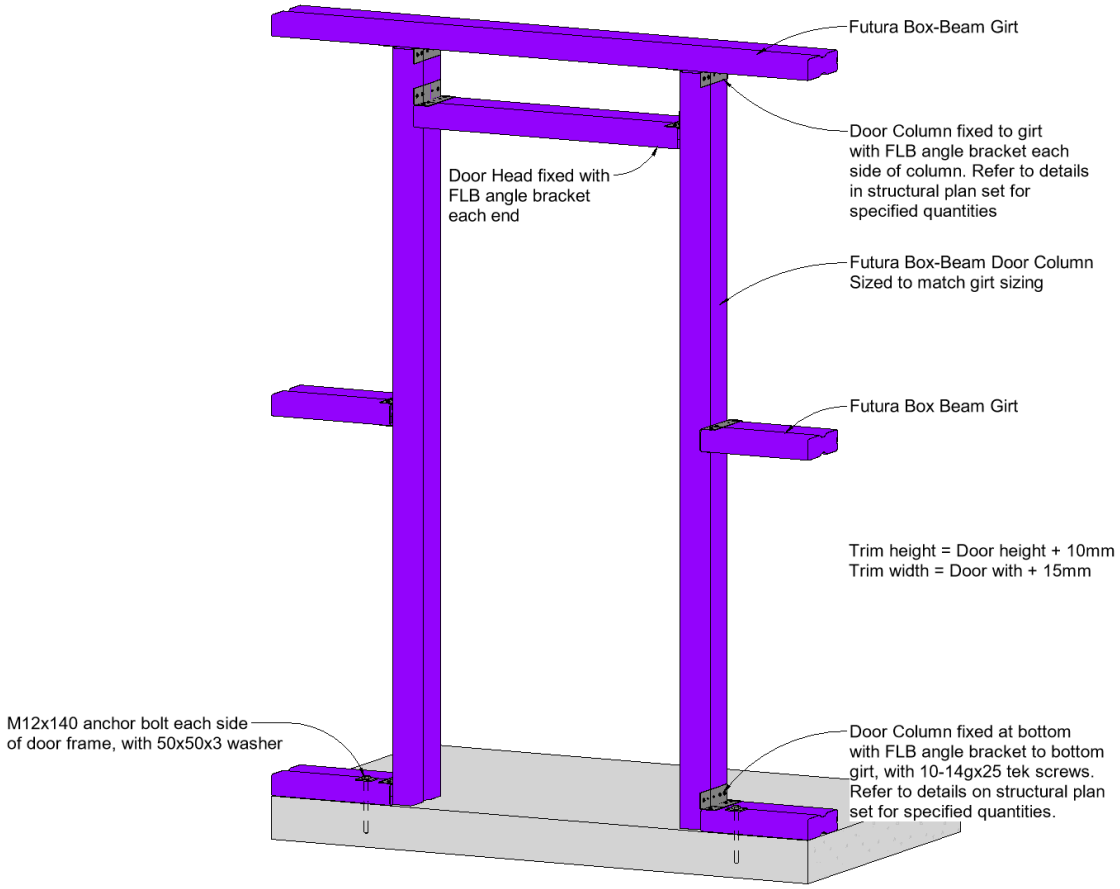


FMCC Column Connector

FEC End Cap

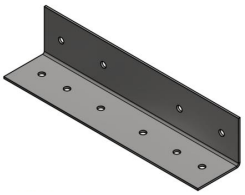
Futura Construction

Futura Door Framing



Futura PA Door Framing – Ranchslider etc similar

10-14gx25 Screws

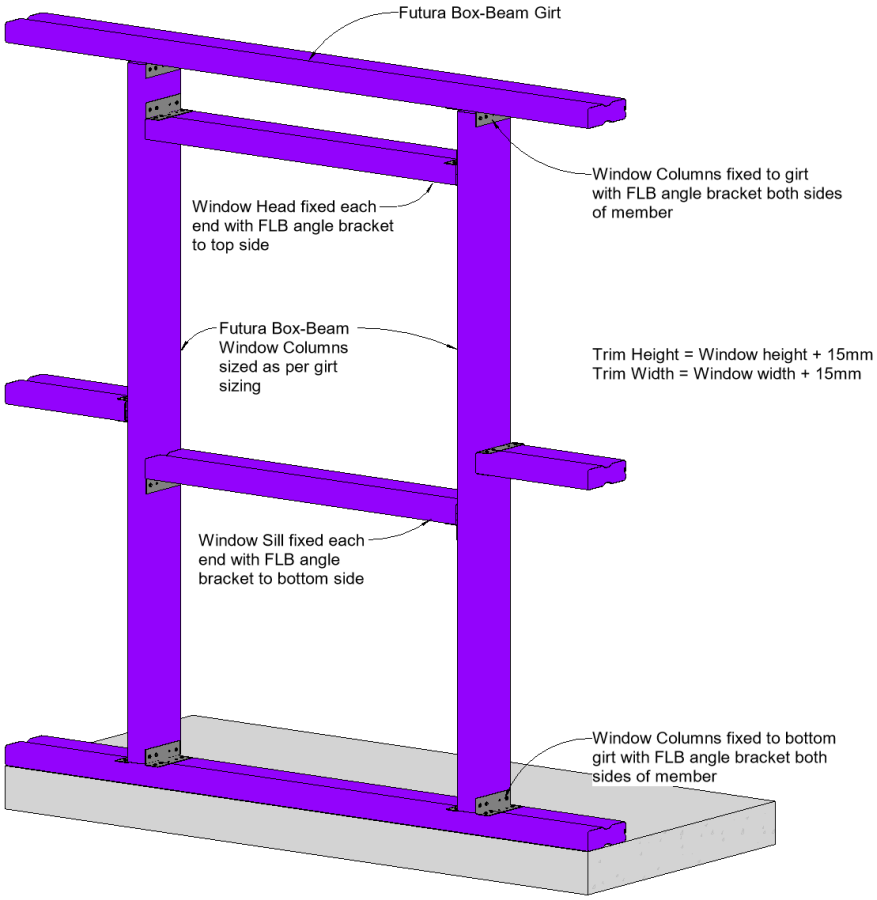


FLB Angle Bracket

Anchor Bolt

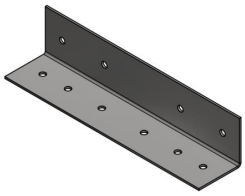
Futura Construction

Futura Window Framing



Futura Window Framing

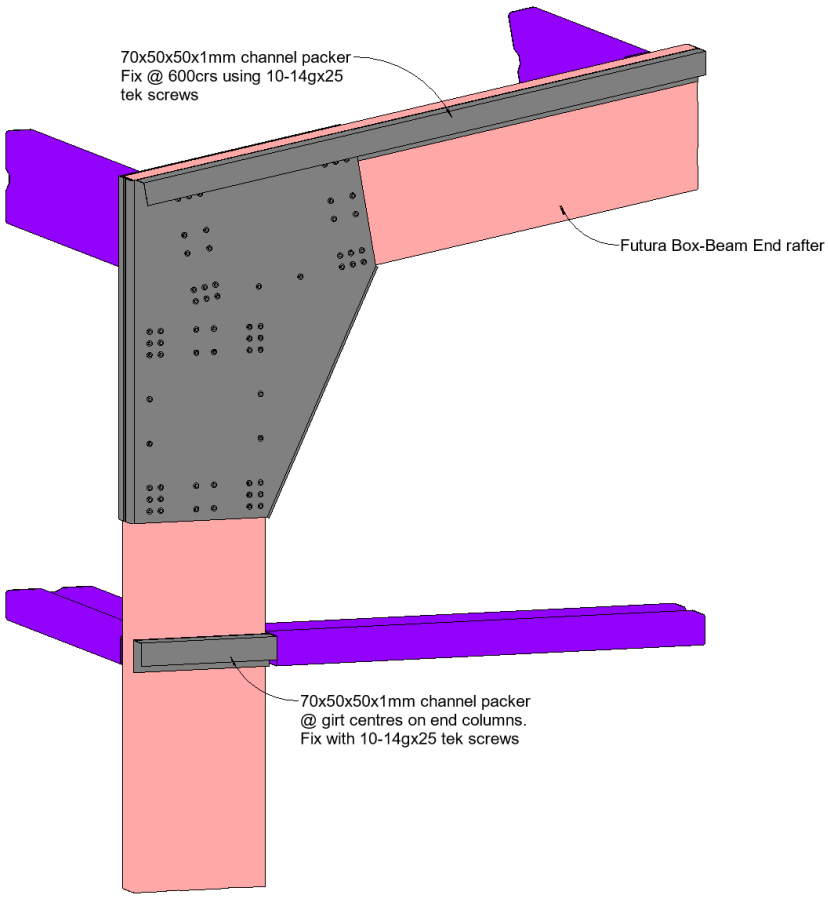
10-14gx25 Screws



FLB Angle Bracket

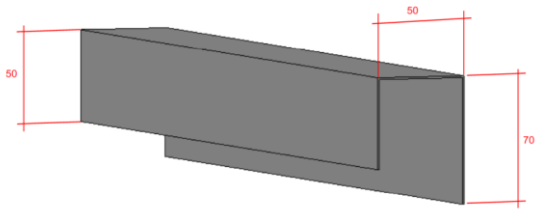
Futura Construction

Futura Channel Packer



Futura Channel Packer

10-14gx25 Screws

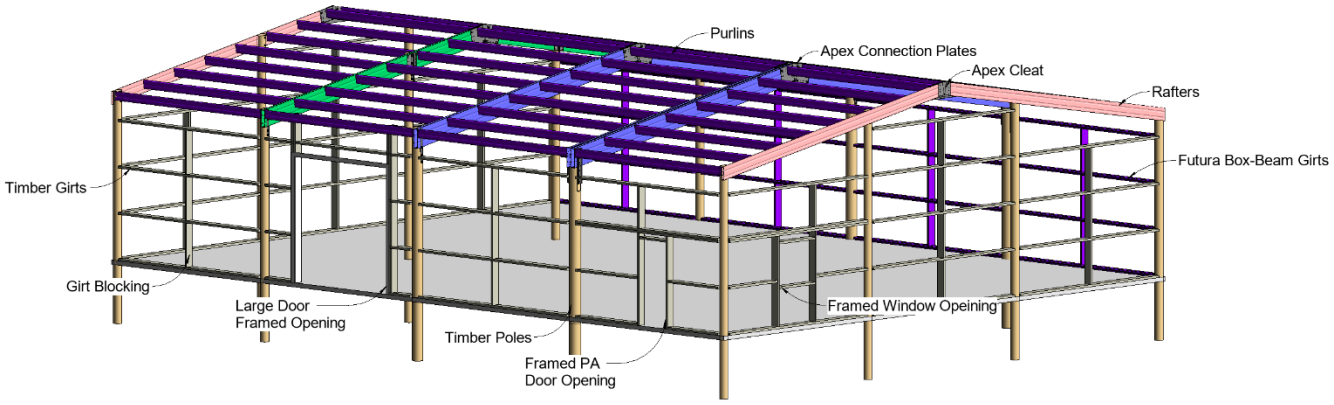


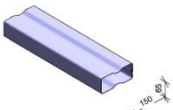
Futura Channel Packer

Pole Construction

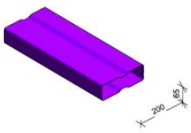
Pole System

Example 3D Structure





FUTURA FB15008
NTS



FUTURA FB20008
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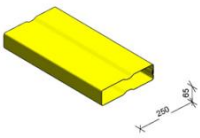
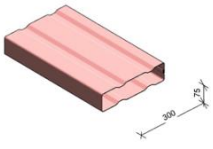


FUTURA FB25010
NTS



FUTURA FB30010
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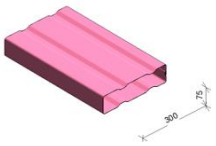

FUTURA FB30020
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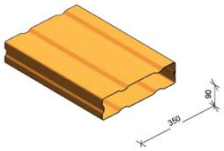

FUTURA FB35012
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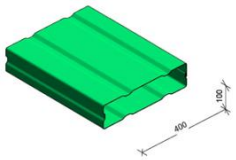
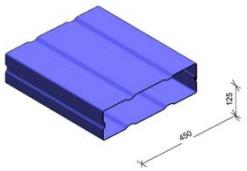
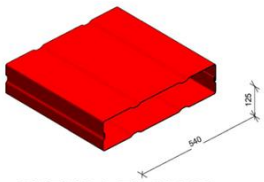


FUTURA FB40015
NTS



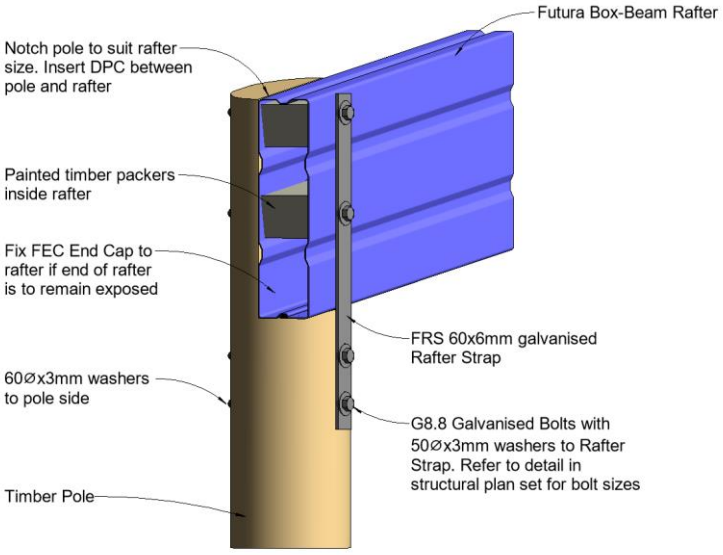
FUTURA FB45020
NTS



FUTURA FB54020
NTS

Pole Construction

Main Rafter Connection – Single

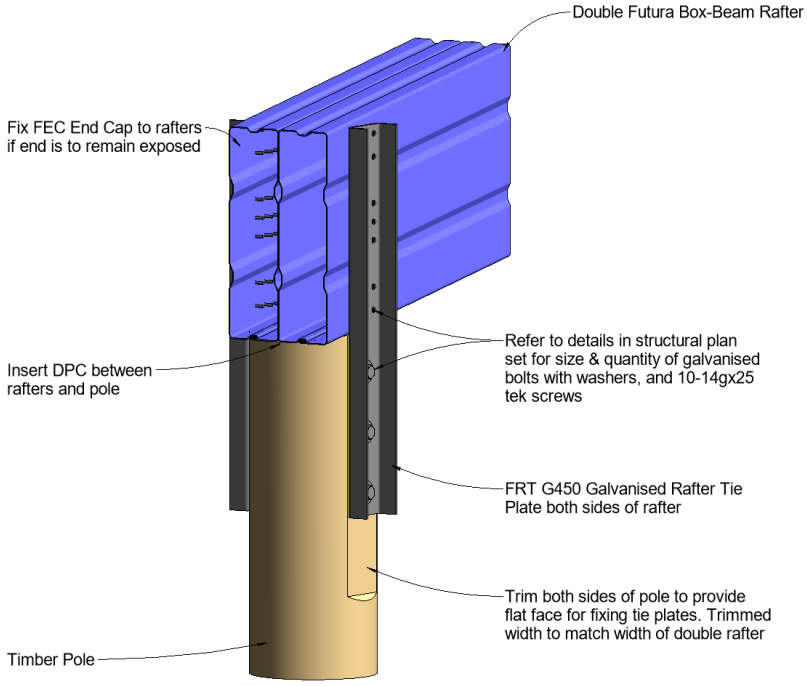


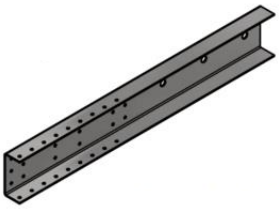
FRS Rafter Strap Connection

FRS Rafter Strap

Galvanised Bolt

Main Rafter Connection – Double



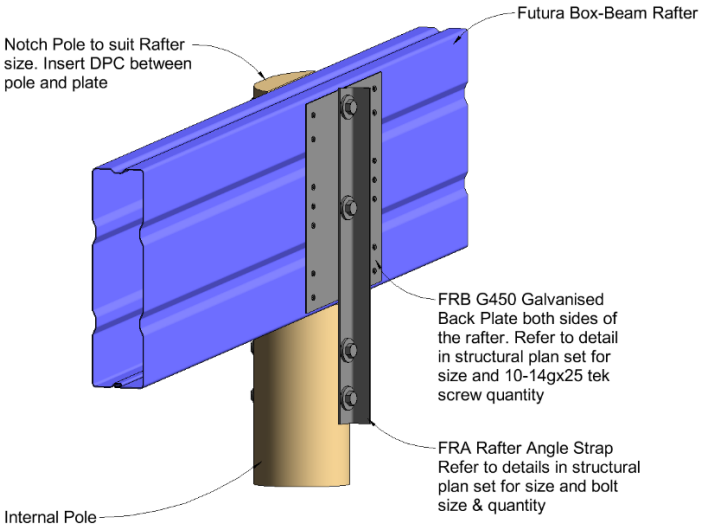


FRT Rafter Tie Plate

10-14gx25 Screws

Pole Construction

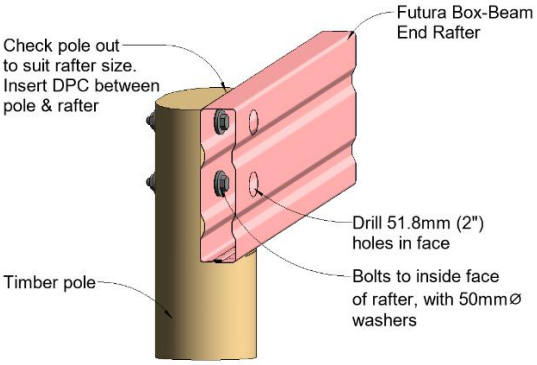
Main Rafter Connection – Internal Pole



FRB Rafter Back Plate

FRA Rafter Angle Strap

End Rafter Connection

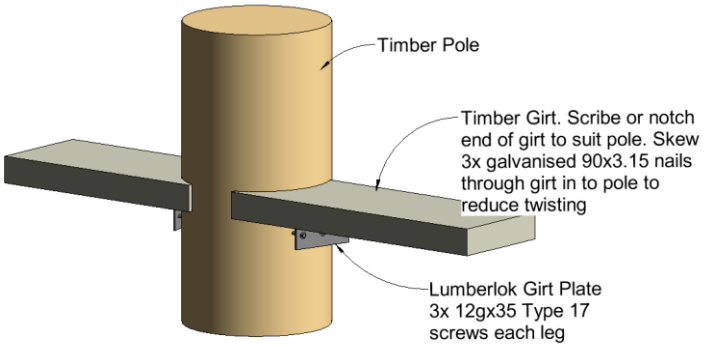


Galvanised Bolt

10-14gx25 Screws

Pole Construction

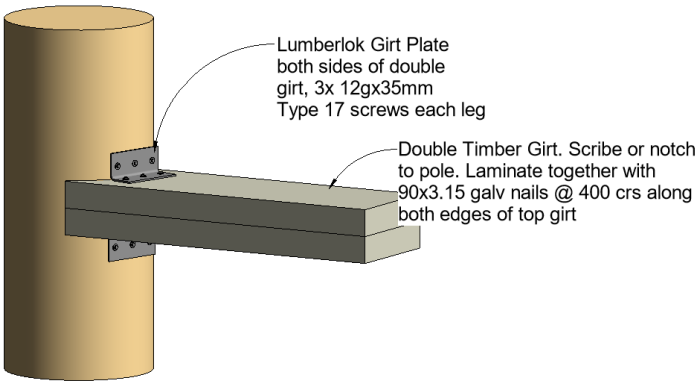
Timber Girt Connection



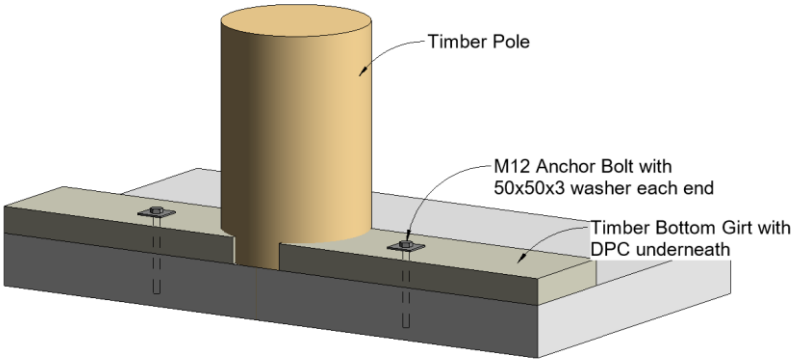
Typical Girt Fixing

Lumberlok Girt Plate

12gx35 Type 17 screws



Double Girt Fixing

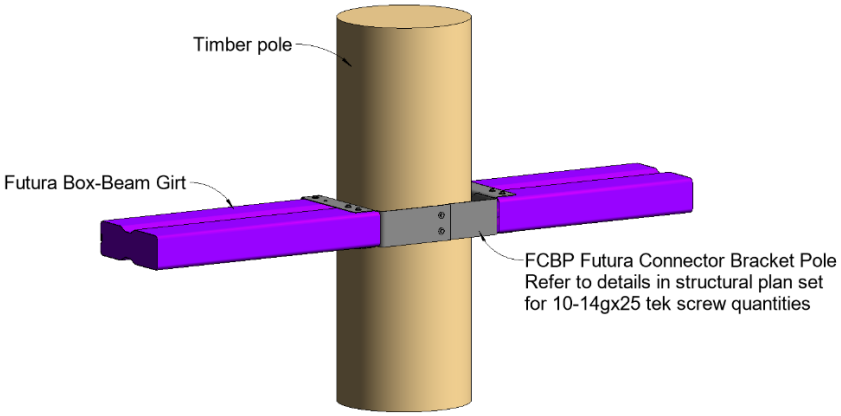


Bottom Girt Fixing

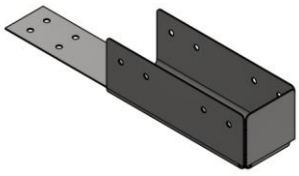
Anchor Bolt

Pole Construction

Futura Box-Beam Girt to Pole Connection



Typical Futura Box-Beam Girt to Pole Connection



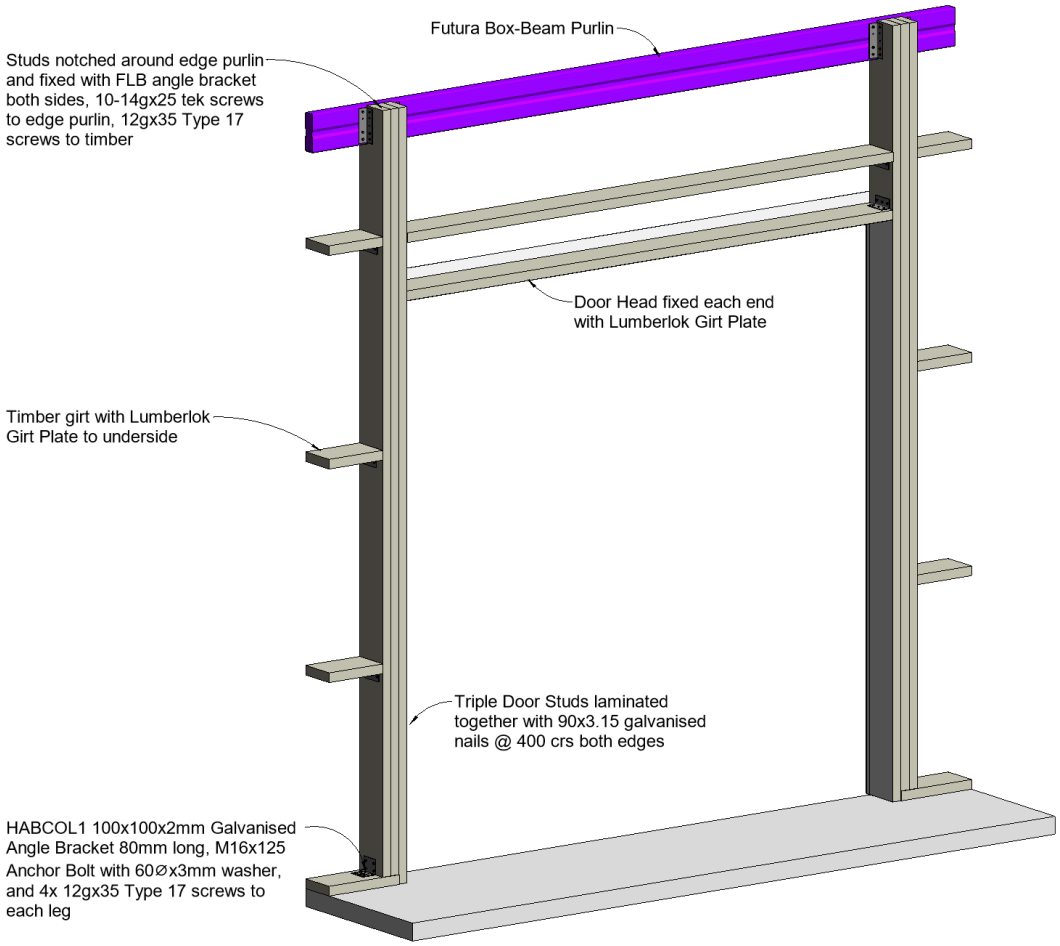
FCBP Connector Bracket - Pole

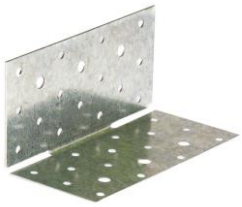
12gx35 Type 17 screws

10-14gx25 Screws

Pole Construction

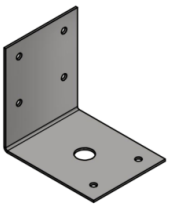
Timber Roller Door framing



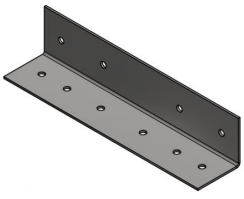


Lumberlok Girt Plate

<u>Timber Roller Door Framing</u> – viewed from inside



HABCOL1 Column Bracket



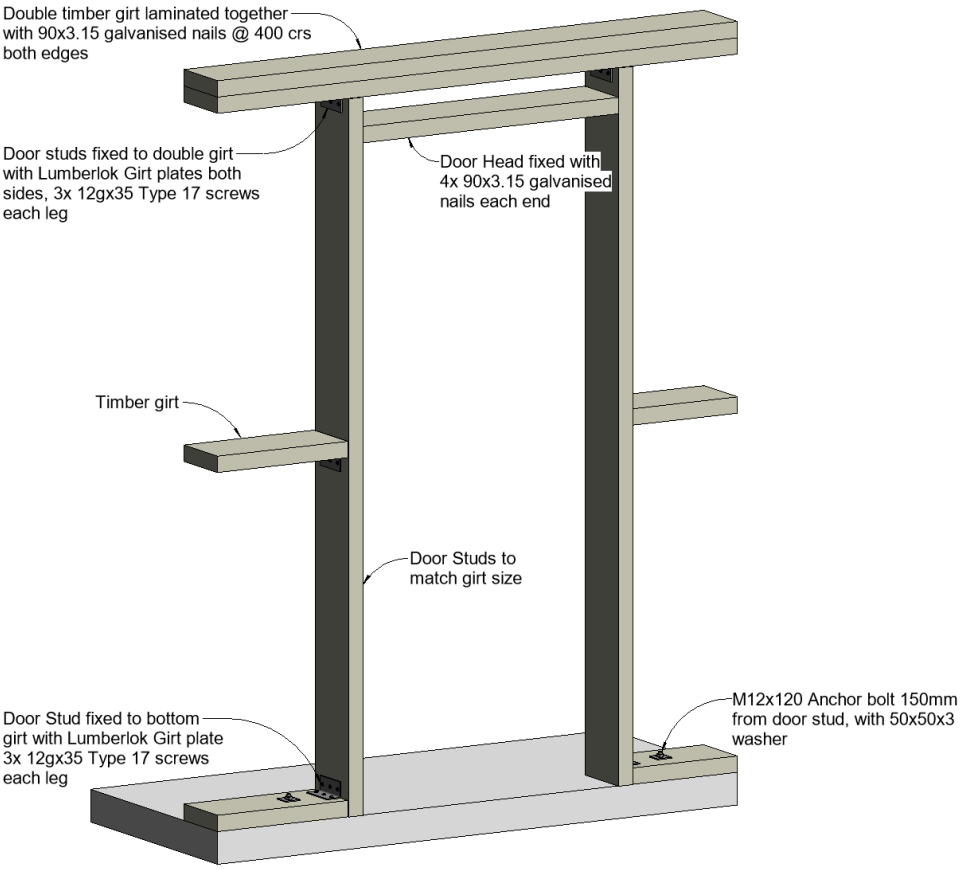
FLB Angle Bracket

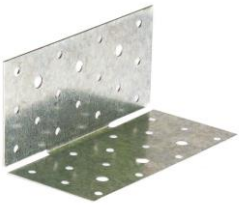
10-14gx25 Screws

12gx35 Type 17 screws

Pole Construction

Timber PA Door/Ranchslider Framing





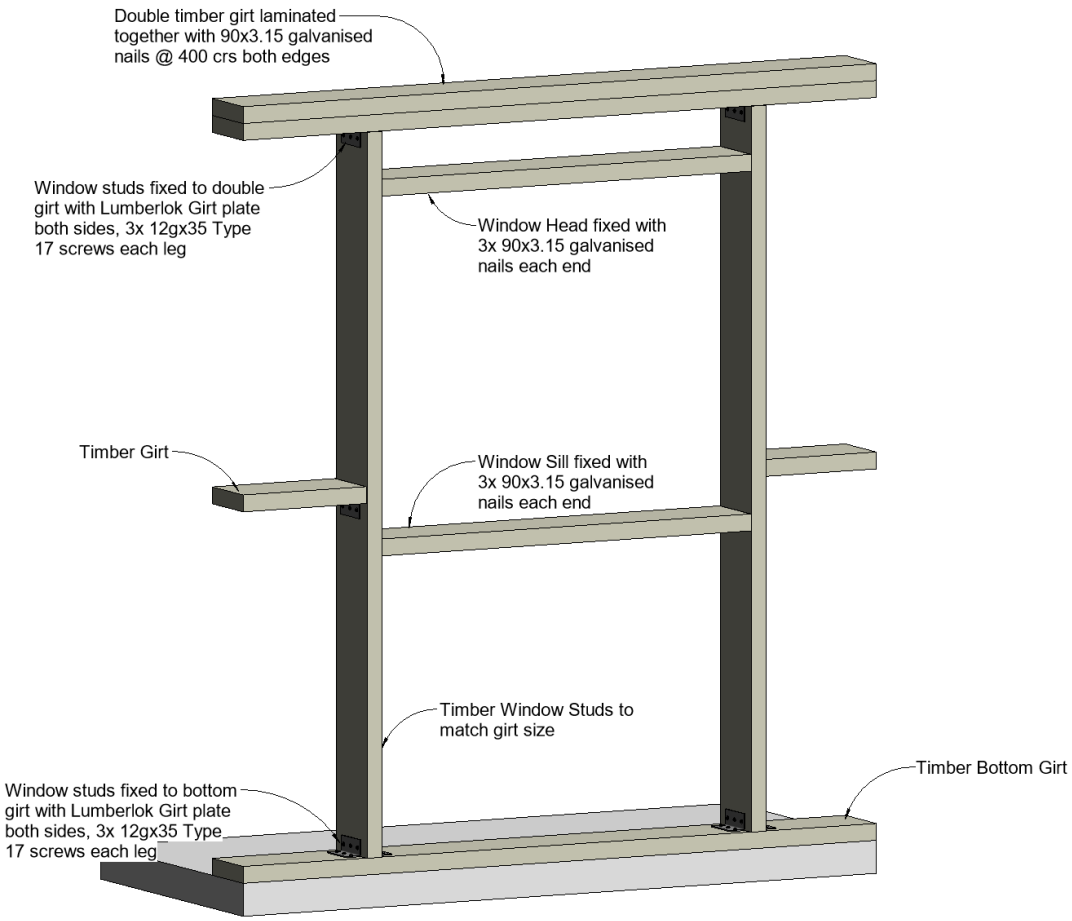
Lumberlok Girt Plate

12gx35 Type 17 screws

Anchor Bolt

Pole Construction

Timber Window Framing

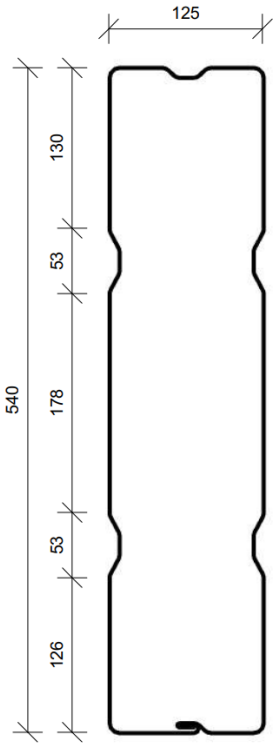


Lumberlok Girt Plate

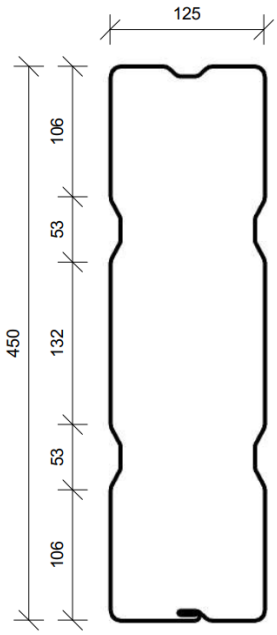
12gx35 Type 17 screws

Members, Plates & Components

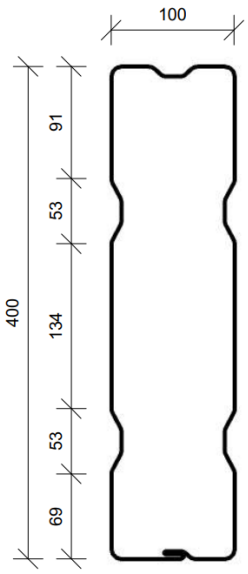
Futura Box-Beam Sections



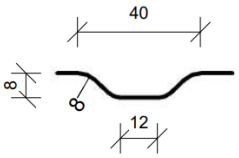
FB54020 Profile
1.95 BMT Wall Thickness



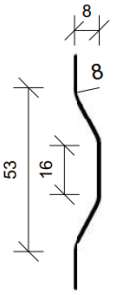
FB45020 Profile
1.95 BMT Wall Thickness



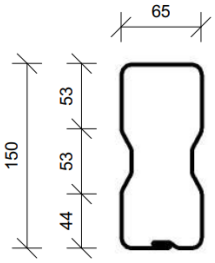
FB40015 Profile
1.45 BMT Wall Thickness



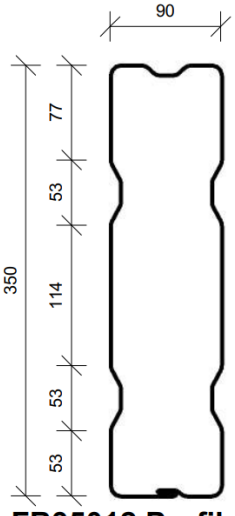
Top Flange Stiffener



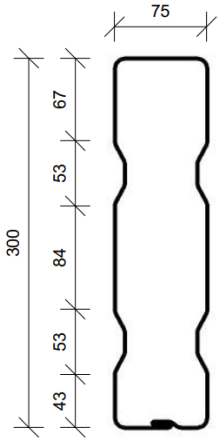
Web Stiffener



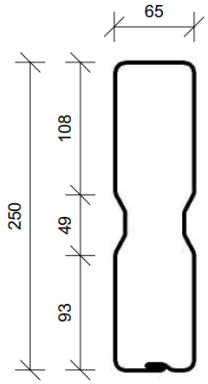
FB15008 Profile
0.75 BMT Wall Thickness



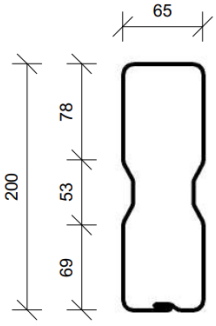
FB35012 Profile
1.15 BMT Wall Thickness



FB30010 Profile
0.95 BMT Wall Thickness



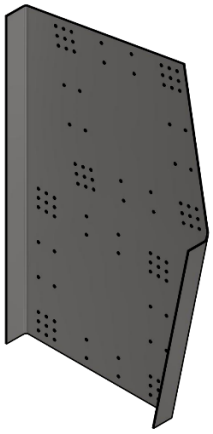
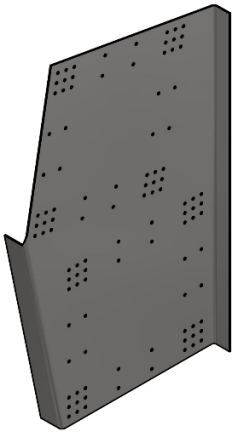
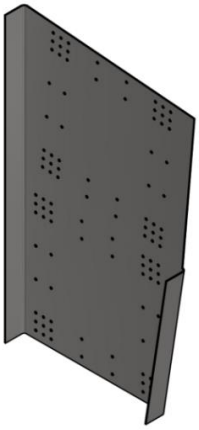
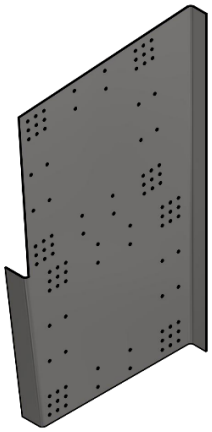
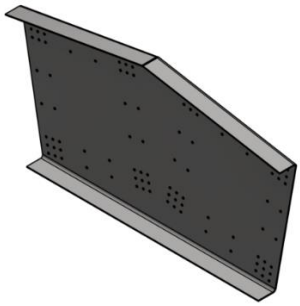
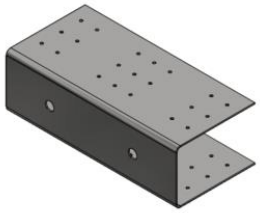
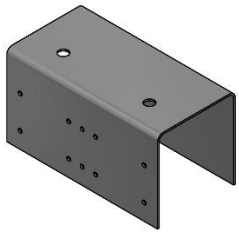
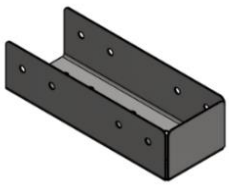
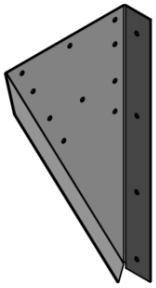
FB25010 Profile
0.95 BMT Wall Thickness



FB20008 Profile
0.75 BMT Wall Thickness

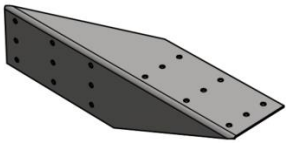
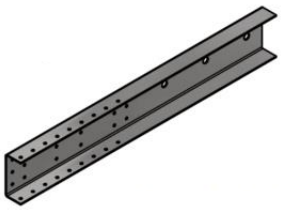
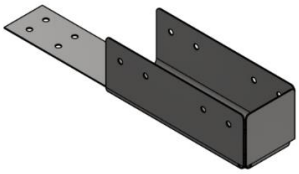
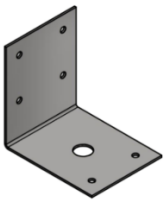
Members, Plates & Components

Futura Plates

 **FKP** Knee Plate L & R	 **FOK** Knee Plate L & R	 **FCP** Crest Plate L & R	 **FOC** Crest Plate L & R
 **FAP** Apex Plate	 **FBP** Base Plate	 **FBP300D-INT** Roller Door Column Base Plate	 **FCB** Connector Bracket
 **FFB** Fly Brace	 **FEC** End Cap	 **FLB** Angle Bracket	 **FPC** Purlin-Brace Connector

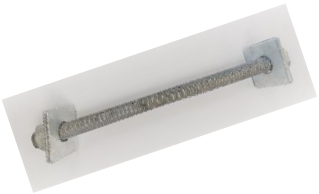
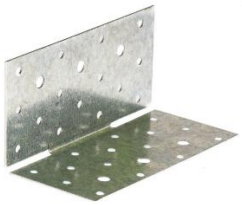
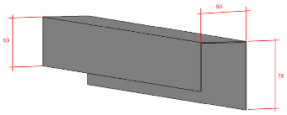
Members, Plates & Components

Futura Plates

 **FMCC** Column Connector	 **FRS** Rafter Strap	 **FRT** Rafter Tie Plate	 **FRA** Rafter Angle Strap
 **FRB** Rafter Back Plate	 **FCBP** Connector Bracket - Pole	 **HABCOL1** Column Bracket	

Members, Plates & Components

Components

 10-14gx25 Tek Screws	 Cast-in Hold Down Bolt	 Anchor Bolt with washer	 10g MultiOne Screws
 Galvanised Coach Bolt with washers	 Lumberlok Girt Plate	 12gx35 Type 17 Screws	 Channel Packer

General tips for Efficiency

Construction Sequence

Construction of your building will usually follow a logical sequence, essentially working from the ground up. Below are a few tips to assist with the construction of your Futura Box-Beam structure.

1. During the foundation phase, it is important to check whether your hold-down bolts are cast into the slab, or drilled and epoxied into the slab after it is poured. If the hold-down bolts are cast in, care needs to be taken to ensure the bolts are securely and correctly positioned.

   The best method for casting in bolts is to attach them to a template drilled to match the bolt spacing of the baseplate. The bolts need to be clear of the reinforcing bars. This may require some minor adjustment of the reinforcing to ensure it is not pushing against the bolts.

   The bolts need to be secured against the force of the concrete being poured around them. There needs to be a minimum of 50mm (or 75mm if dry pack is being used under the baseplates) of thread above the finished concrete level. Below is an example of well secured hold-down bolts in a timber template.

   Once the concrete slab has cured sufficiently, the templates can be removed.

   If the hold down-bolts are drilled and poxied in to the finished slab, the manufacturers specifications must be strictly followed to ensure correct embedment depth is achieved. Care also needs to be taken prior to pouring the slab to ensure the reinforcing will not conflict with the hold-down bolts, as once the slab is poured the reinforcing cannot be seen nor moved.

   Once the concrete slab has been poured and hardened, it is time to fix the base plates in position over the cast-in bolts, or drill and epoxy the hold-down bolts in place.

General tips for Efficiency

2. The finished concrete slab makes a great surface to start assembling the frames on, ready for erection. There are a couple of different ways of erecting the frames.

   The first method is to assemble all the columns, attaching the structural knee plates and even the wall framing connection brackets if desired, and then standing the columns up plumb and true. The rafters, once assembled with the purlin connection brackets correctly positioned (and structural apex plates attached if a gable), can then be lifted on to the columns.

   The second method is to assemble each entire portal frame, including the columns and rafters with their respective structural connections, and lift the whole frame in to position.

   The chosen method will ultimately be decided by the building size, and the availability of lifting equipment of sufficient capacity. For example, a 25m portal will more likely be constructed using the first method, whereas a 8m portal could be constructed using either method. To prevent damage, care needs to be taken to ensure the members are not able to flex and distort too much, as this could lead to structural failure.

   The portals must be braced against movement. It is preferable to use rigid temporary bracing components, such as Acrow/panel props or lengths of timber or steel attached to the columns. The temporary bracing must be sufficiently strong to hold up the entire portal. If the portals are large gables of >9m span, bracing the apex of 1 or more portals is also recommended.

   Once 2x portals are standing plumb and true, and braced well, a purlin near the apex (if a gable) or near each knee connection may be fixed in place to assist with transferring the bracing to the next portal. As each portal is stood, fix another purlin in place to help hold eveything in place. Alternatively, all purlins in a bay can be installed, and roof and wall strap bracing installed, to create a solid structure to continue building off. Below is a picture of a well braced structure.

General tips for Efficiency

3. Once all the portals are standing plumb and true, and are braced correctly, it is now time to install the remaining purlins, and purlin blocking members (if specified). The captive design of the purlin connector brackets means the purlins can be placed without screwing initially, often by one person if the members are not too long and difficult to handle. Once the purlins are placed, they can then be screwed off, using the specified number of screws detailed in the structural plan set.

   Prior to placing the purlins, while they are still on the ground it is recommended to attach the connector brackets for the purlin blocking. It is essential to place these at a set measurement, generally the mid-point, to ensure these are installed in a straight line.

   Once the purlins are all installed, the purlin blocking can be installed using a similar methodology as the purlins. If the roof pitch is steeper and causes the purlins to sag a little, now is a good time to correct the sag by using a prop against the first purlin. As each purlin blocking member is installed, check each purlin for straight and screw the blocking in place.

4. Once all the purlins and purlin blocking members are in place, it is time to attach the roof strap bracing. The structural plan set will detail where the strap bracing is required.

   Begin by attaching 1 end of the first strap with 1 screw only. Next, attach the other end, pulling it as tight as possible by hand, and fix with the required number of screws as detailed in the plan set. Now finish screwing the first end of the strap. Repeat this until all the required strap bracing is in place.

   Next the straps need to be tensioned. Tensioning kits will have been supplied in the kitset. These comprise of a stiff angle section, with a hole for a bolt in the centre of the angle. Drill a hole in the strap to suit the supplied bolt. Insert the bolt through the strap and then the angle. Attach the nut and tighten to tension the strap. This will be repeated for each strap.

5. Now it is time to install the wall framing, including any framed openings for doors and windows. The structural plans detail the fixing of wall framing components, which are like purlins. Framed openings for PA Doors and windows will be formed as the wall framing is installed.

   Framed openings for large doors such as roller doors will be formed in the relevant bay space prior to the remaining wall framing being installed in that bay. Refer to the structural plan set for details on joining the double member door columns and fixing these in place.

   Once all the wall framing is fixed in place, add any wall strap bracing as detailed in the structural plan set. Follow the same methodology as the roof strap bracing as detailed in step 4 above.

   Any temporary bracing can now be removed as all the permanent bracing is now in place.

6. CONGRATULATIONS! Your Futura Box-Beam structure is now complete, ready for adding roof and wall cladding. Follow manufacturers specifications, and any details included in the architectural drawings to enclose your new building.

General tips for Efficiency

Pre-Assemble your components

Pre-assembling as many components as possible on the ground will save a lot of time and effort compared with trying to assemble components in the air!

All your columns and rafters can have most of the components for fixing purlins and girts fixed to them prior to lifting into place. The structural plans detail the set-out dimensions for these fixings. Remember to allow for any offset at the bottom of the columns.

You will not be able to attach connections for the edge purlins however, as these need to be fixed to the knee plates, and putting screws through the knee plates above the column will mean your rafter will not fit in between the plates.

As mentioned in the previous section, purlins and girts can also have the connection brackets for the blocking members fixed to them. It is important to fix these at common dimensions to ensure the members are installed in straight lines!

Joining any double members such as large door columns is also recommended to be done on the ground.

Temporary Bracing

Temporarily bracing your structure is important.

As mentioned in a previous section, using rigid materials to brace the structure is ideal, however large ratchet tiedowns can also be used if required. The downside of using ratchet tiedowns is they are not rigid, and unless they are tightened up very tight, your structure can still experience a bit of movement. Using rigid components such as Acrow or panel props, or even just lengths of suitably sized timber provide a much stiffer brace.

When using timber, it is recommended to fix a block to the outside of the columns and fix the bracing to this. This way the braces are out of the way of your wall framing.

Maintenance

Just like your car, buildings require regular maintenance to maximise their lifespan. Recommended minimum maintenance procedures are given below for typical building products. However, refer to product manufacturers warranty terms for more specific maintenance requirements.

Exterior

Regular washing prevents a build-up of atmospheric deposits that can reduce the life of the cladding. Your building requires regular washing especially on the parts of the building not normally exposed to rain, e.g. underneath the gutters, the soffits, and under canopies. You should wash your building at least every 6 months in inland regions and at least every 3 months in areas within 1000m off the coastline. In addition, you should remove any deposits of salt and/or contamination as soon as they appear. Full details of the maintenance programme for cladding recommended by NZ Steel may be found in their brochure 'Environmental Categories, Warranty & Product Maintenance Recommendations'. This brochure may be downloaded from their website: www.nzsteel.co.nz

Open Sided Buildings & Animal Housing Environments

Due to an absence of rain washing, airborne contaminants can accumulate on interior surfaces and absorb moisture, particularly in the presence of high humidity. This may accelerate the development of corrosion unless preventative steps are taken. Regular inspection of galvanized surfaces and cleaning of these surfaces is recommended to prolong product life and you should remove any contamination as soon as it appears. If there is any degradation of galvanized surfaces, these areas should be coated with Zinc-rich paint.

Gutters

Clean the inside of the gutters at least every 6 months. This prevents a build-up of leaves and dirt that can cause corrosion. If your building is near trees, the gutters should be cleaned on a more regular basis.

Wall Cladding

Keep the surrounding ground and any animal bedding clear of the wall cladding. This is to prevent moisture build up in contact with cladding which can cause deterioration.

Additional Building Loads

Any load to the rafters or structure of the building additional to the design loads of the building should be confirmed by a Futura Engineer.

Roller & Sectional Doors

Oil the pivot points, roller wheels and keyholes every 12 months to retain a smooth operation.

Personnel Doors

Oil hinges and keyholes annually.