



**DUTCH GABLE CARPORT
RECOMMENDED
INSTRUCTION MANUAL**

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Introduction

This Recommended Instruction Manual is a guide only.

IT IS IMPERATIVE TO REFER TO THE ENGINEERING PLANS SUPPLIED WITH THIS MANUAL FOR SPECIFICATIONS AND DETAILS TO ALL THE CHAPTERS IN THIS MANUAL.

Due to the large range of sizes and styles available, it is not possible to prepare an instruction manual for all styles, sizes and models.

The following instruction manual is an EXAMPLE of a 7.5m wide x 7.5m long Dutch Gable Roof Carport.

Things to do before you commence construction

- It is recommended to obtain professional advice to ensure your needs are adequately met.
- Check with your local government of any approval or restriction requirements. It is your responsibility to ensure that all approvals required are obtained.

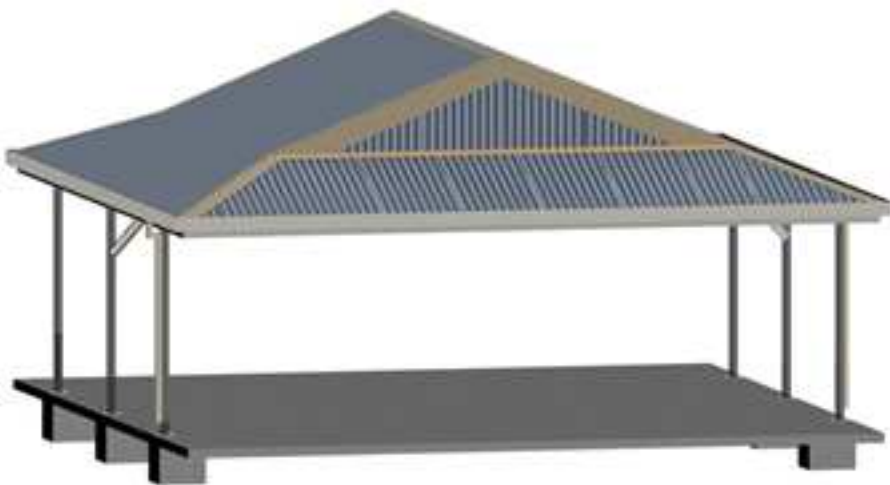
Safety Advice – Important

DISCLAIMER: This is a general safety advice. Refer to relevant state workplace authority website www.safeworkaustralia.gov.au for safety advice on specific items and OH&S safety requirements.

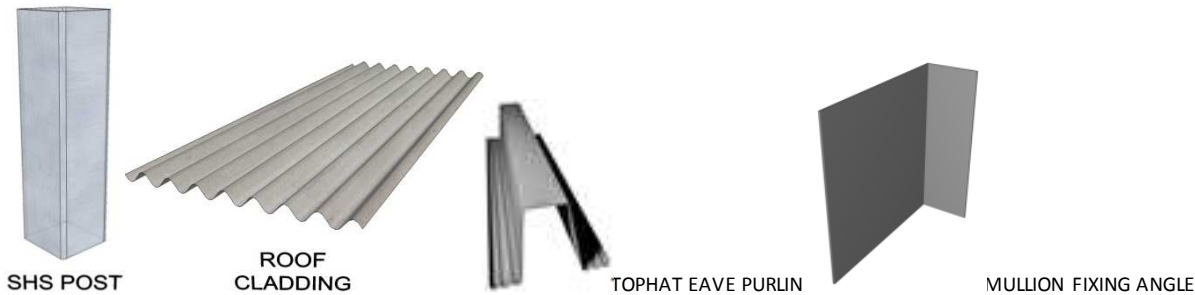
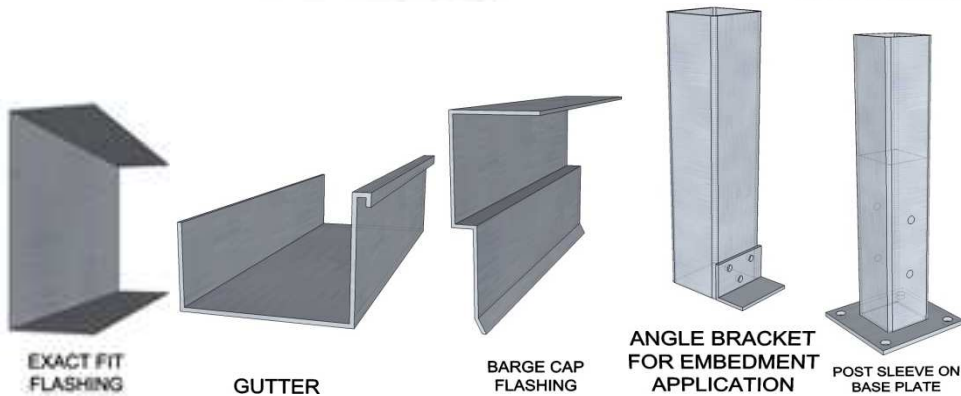
NOTE: Do not rely on this guide as exhaustive of all hazards that may exist on a construction site.

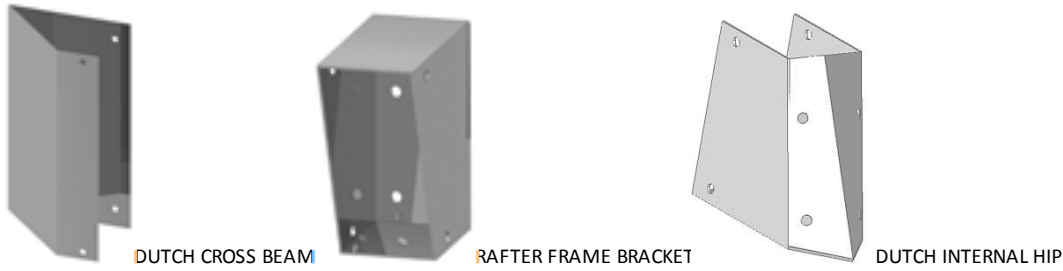
Construction hazards must be assessed for risk and controls put in place to reduce the risk identified before commencing work.

CHECK AND ENSURE THAT YOUR COMPONENTS ON SITE ARE CORRECT AND COMPLETE AS PER THE BILL OF MATERIALS. IF IN DOUBT, PLEASE CONTACT YOUR SUPPLIER.



Components



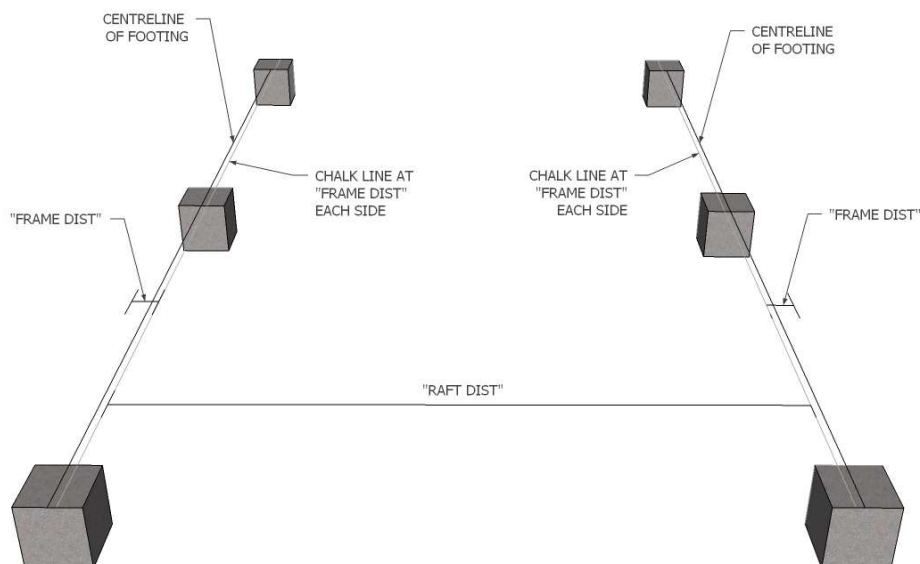


Step 1a – Marking out the Perimeter of the Carport with Footing only

Measure the width and the length of the centreline of the block pad footing and ensure that it is equivalent to the centreline of the columns as per Engineering Plans. Measure the 2 diagonals from centreline to centreline of the block pad footing and ensure that the dimensions are equal, level and square.

Mark out (chalk line) the inside face of the SHS Posts to outside face of the Eave Purlin flange width on each footing. This distance is equal to the web size of the SHS Post and the flange width of the Eave Purlin and is referred to as "Frame Dist". Repeat the procedure to the other side along the length of the building.

The distance between the inside face of the SHS Posts is referred to as "Raft Dist". This distance is equal to the span of the building minus 2 x "Frame Dist". The "Raft Dist" is equal to the measurement of an assembled rafter on the ground from RAFT POINT 1 to RAFT POINT 2. This will be discussed more in the "Fitting of Rafters with Apex Bracket" Chapter.



NOTE: For less or equal to 5m Span, Post offset on Endwalls is 900mm. For Span greater than 5m, Post offset is 1300mm.

Step 2a – Footing Set-Out for Concrete Block Pad Footing

Mark and set-out the perimeter of the Carport with pegs and strings. In this example, the size of the carport is 7.5m wide x 7.5m long. Refer to Engineering Plans for the actual size and specifications of your specific job.

Mark and set-out the location of concrete pad footings to be excavated. The centre line of the posts is equivalent to the centre line of the pad or bored footings. Using the string set-out of the perimeter as a guide, edge of the post is set in on the sidewall by the flange width of the Eave Purlin and on the endwall by 1300mm. To determine the centreline of the post from the string set-out on the sidewall, add 1/2 of the post size to the flange width of the Eave Purlin. To determine the centreline of the post from the string set-out on the endwall, add 1/2 of the post to 1300mm.

Example (Sidewall): C150 Eave Purlin has a 64mm flange width so the edge of the post is set in by 64mm from the string set-out. The post size is 75mm x 75mm so half of 75mm is 37.5mm. The centreline of the post set in from the string set-out is 64mm + 37.5mm.

Example (Endwall): The outer edge of the post is set in by 1300mm from outer of Eave Purlin. The post size is 75mm x 75mm so half of 75mm is 37.5mm. The centreline of the post set in from the string set-out is 1300mm + 37.5mm.

The length of the carport is from outer face of one Eave Purlin to the other Eave Purlin. The webs of the end rafters face in and are flushed to the inner face of the end.

The centre line of the posts is equivalent to the centre line of the pad footings set-out as shown in Diagram Ab.

Refer to the Engineering Plans for size and specifications of the concrete pad footing. Dig out and pour concrete pad footings.

NOTE: For less or equal to 5m Span, Post offset on Endwalls is 900mm. For Span greater than 5m, Post offset is 1300mm.

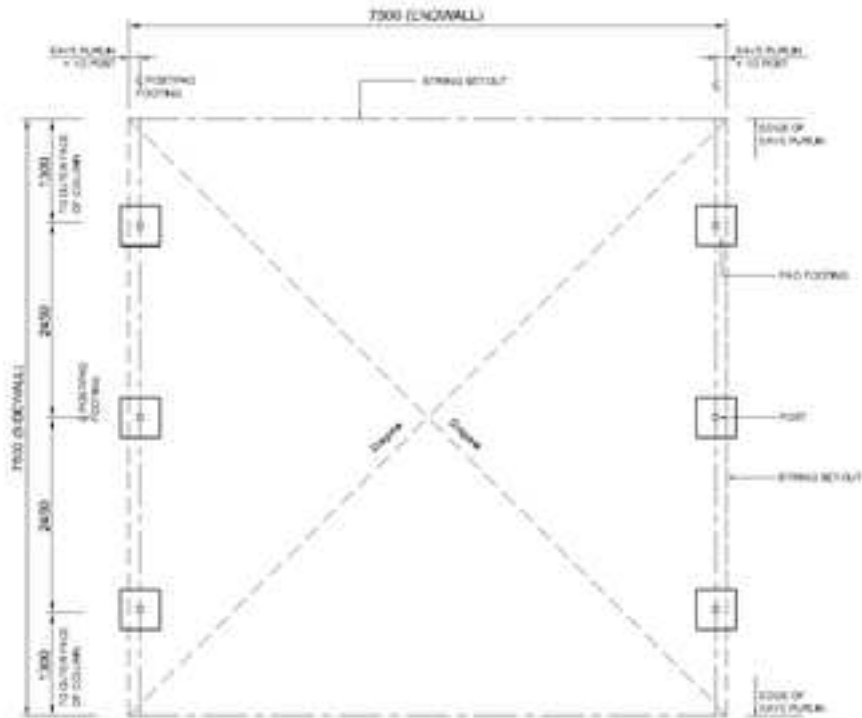


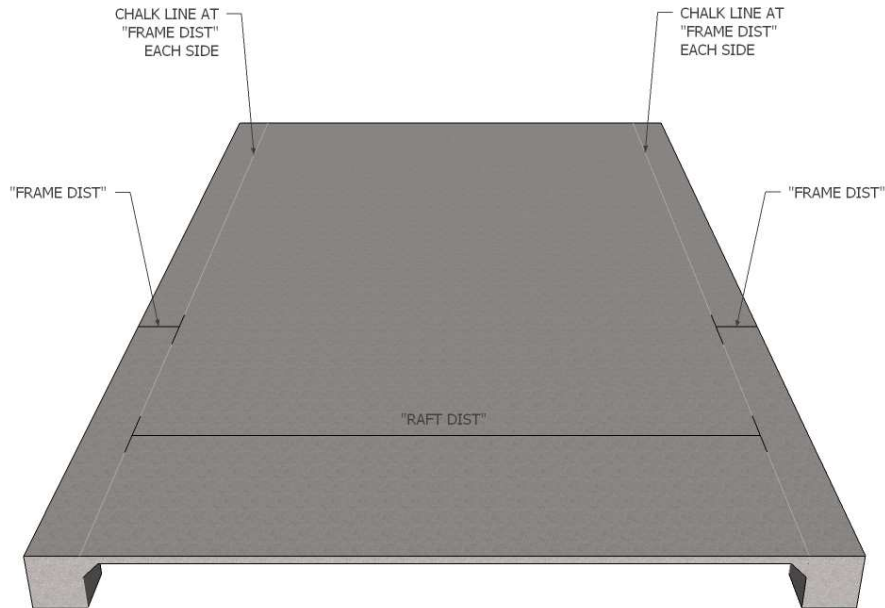
Diagram A6
CONCRETE BLOCK PAD FOOTING
SET-OUT

Step 1b – Marking out the Perimeter of the Carport with Slab

Measure the width and the length of the slab and ensure that it is equivalent to the size of the building as per Engineering Plans. Measure the 2 diagonals and ensure that the dimensions are equal, level and square.

Mark out (chalk line) the inside face of the SHS Posts from the edge of the slab along one side of the length of the building. This distance is equal to the web size of the SHS Post and the flange width of the Eave Purlin and is referred to as “Frame Dist”. Repeat the procedure to the other side along the length of the building.

The distance between the inside face of the SHS Posts is referred to as “Raft Dist”. This distance is equal to the span of the building minus $2 \times$ “Frame Dist”. The “Raft Dist” is equal to the measurement of an assembled rafter on the slab from RAFT POINT 1 to RAFT POINT 2. This will be discussed more in the “Fitting of Rafters with Apex Bracket” Chapter.



Step 2b – Footing Set-Out for Concrete Slab

Mark and set-out the perimeter of the Carport with pegs and strings. In this example, the size of the carport is 7.5m wide x 7.5m long. Refer to Engineering Plans for the actual size and specifications of your specific job.

Mark and set-out the edges of the concrete slab to be excavated. The edge of the slab is equivalent to the string set-out of the building perimeter plus 100mm slab extension each sidewall, thereby adding a total of 200mm to the width of the Carport.

Example (Sidewall): C150 Eave Purlin has a 64mm flange width so the edge of the post is set in by 64mm + 100mm (slab extension) from the string set-out. The post size is 75mm x 75mm so half of 75mm is 37.5mm. The centreline of the post set in from the string set-out is 37.5mm + 64mm + 100mm (slab extension).

Example (Endwall): The edge of the post is set in by 1300mm from outer of Eave Purlin and slab edge. The post size is 75mm x 75mm so half of 75mm is 37.5mm. The centreline of the post set in from the string set-out is 1300mm + 37.5mm.

The length of the carport is from outer face of one Eave Purlin to outer face of the other Eave Purlin. The webs of the end rafters face in and are flushed to the inner face of the end posts.

Ensure that the diagonal measurements of the concrete slab are equal, level and square. Refer to the Engineering Plans for size and specifications of the concrete slab.

TIP: Another option to use to check that the diagonals are equal is to calculate using this formula.
 $\text{Diagonal} = \text{square root} (\text{length}^2 + \text{width}^2)$.

TIP: Pegs and strings marking the perimeter of the building to be left in place until the position of base plates are clearly marked.

NOTE: For less or equal to 5m Span, Post offset on Endwalls is 900mm. For Span greater than 5m, Post offset is 1300mm.

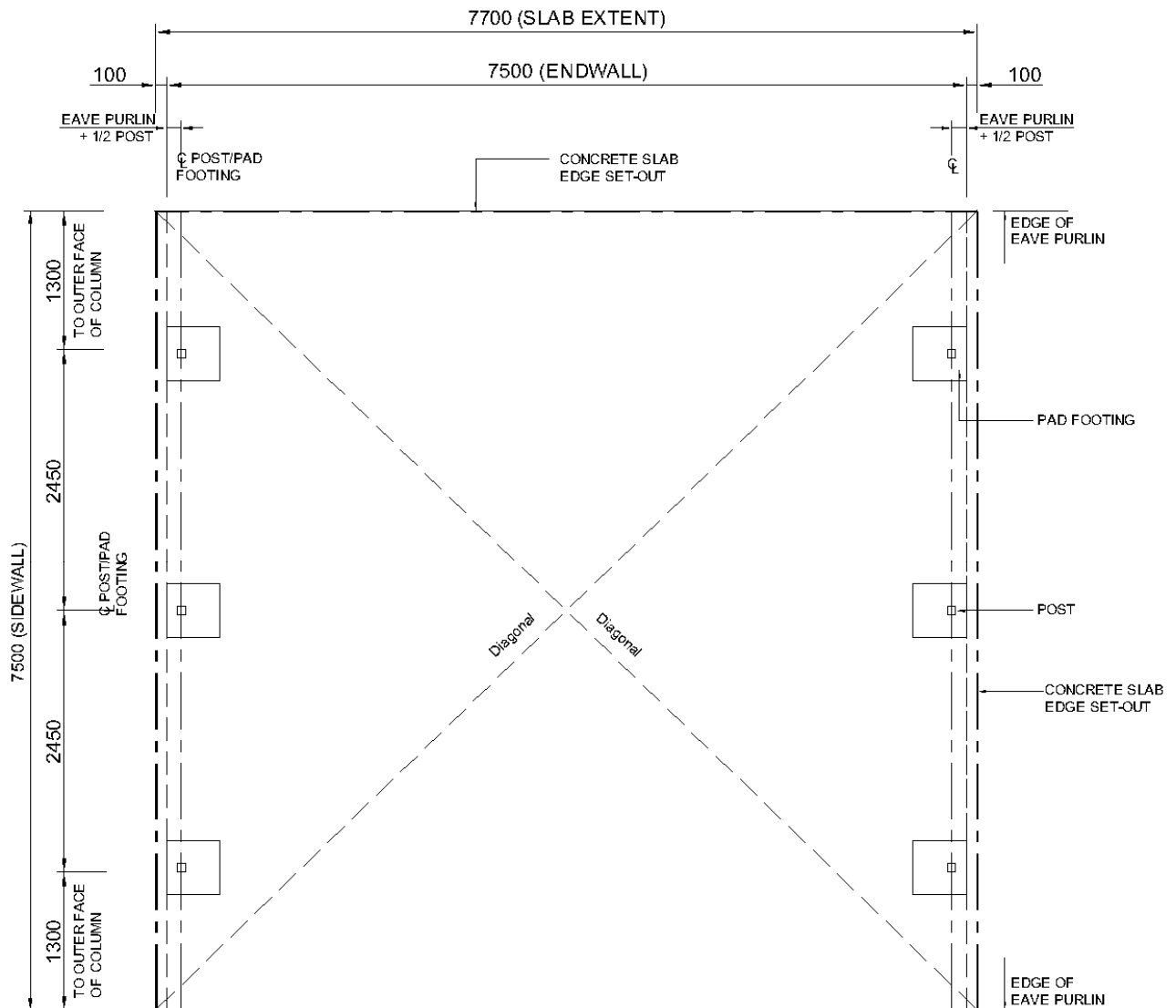
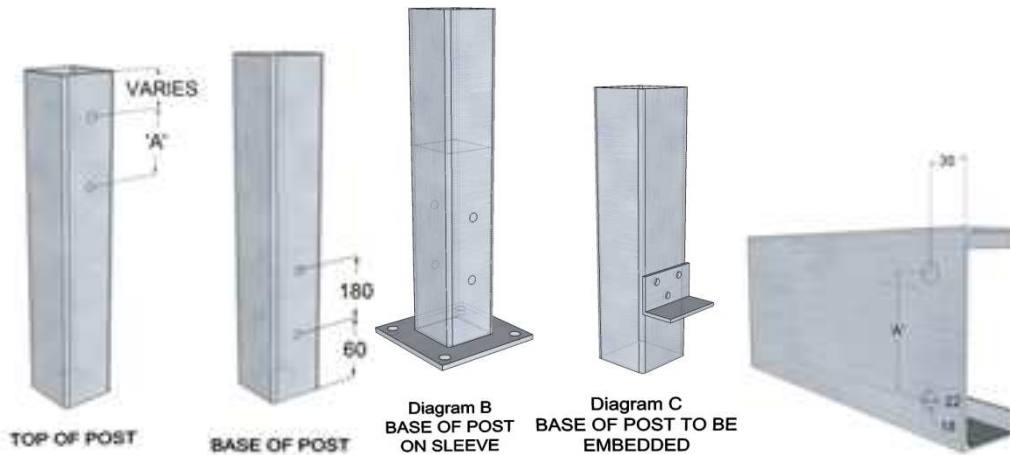


Diagram As
CONCRETE SLAB SET-OUT

Step 3 – Preparation of Carport Posts

Check levels of footings and if required, cut posts accordingly to suit the building height requirements as the posts are supplied in stock lengths.

Set-out and bore two holes at the top of the carport posts to match the punching (holes) detail of the Haunch Bracket. Refer to the Engineering Plans for the holes specifications. Size of holes and punching details vary according to the specifications of the Haunch Bracket. Refer to the Engineering Plans for bolt size and specifications.



Set-out and bore two holes at the bottom of the carport post, 60mm from the bottom of the post to the first hole and 180mm from the first hole to the next hole. Holes at bottom of post are required for the post sleeve to be bolted to the post, Refer to “Base of Post” and Diagram B. Refer to Engineering Plans for the bolt specifications.

TIP: If Post is to be embedded, angle bracket at the base of the post with 3 tek screws is to be fixed in lieu of the bolt holes. Refer to Diagram C. You may stand the plumb post into the excavated holes and pour concrete at this stage or go to Step 7 to bolt the eave purlin to the posts before standing the posts.

Step 4a – Post Sleeve on Base Plate Set-out on Footing only

Using the set-out string marking the perimeter of the building as a guide, mark the position of the post sleeve on base plate. The post sleeve which is inserted to the bottom of the post is in on the sidewall by the flange width of the Eave Purlin plus 1/2 of the post size from the string set-out. On the endwall, it is in 1300mm plus 1/2 of the post size from the string set-out.

The length of the carport is from outer face of one Eave Purlin to outer face of the other Eave Purlin. The web of the end rafters face in and are flushed to the inner face of the post.

The centre line of the posts is equivalent to the centre line of the post sleeve and pad footings as shown in Diagram Da.

Fix the post sleeve on base plate to the concrete footing with fastening type as per the Engineering Plans.

TIP: The centre line of post is equivalent to the centre line of post sleeve on base plate.

NOTE: The post sleeve on base plate is a 4-hole plate. Refer to the Engineering Plans for the specifications of the post sleeve and bolts.

NOTE: For less or equal to 5m Span, Post offset on Endwalls is 900mm. For Span greater than 5m, Post offset is 1300mm.

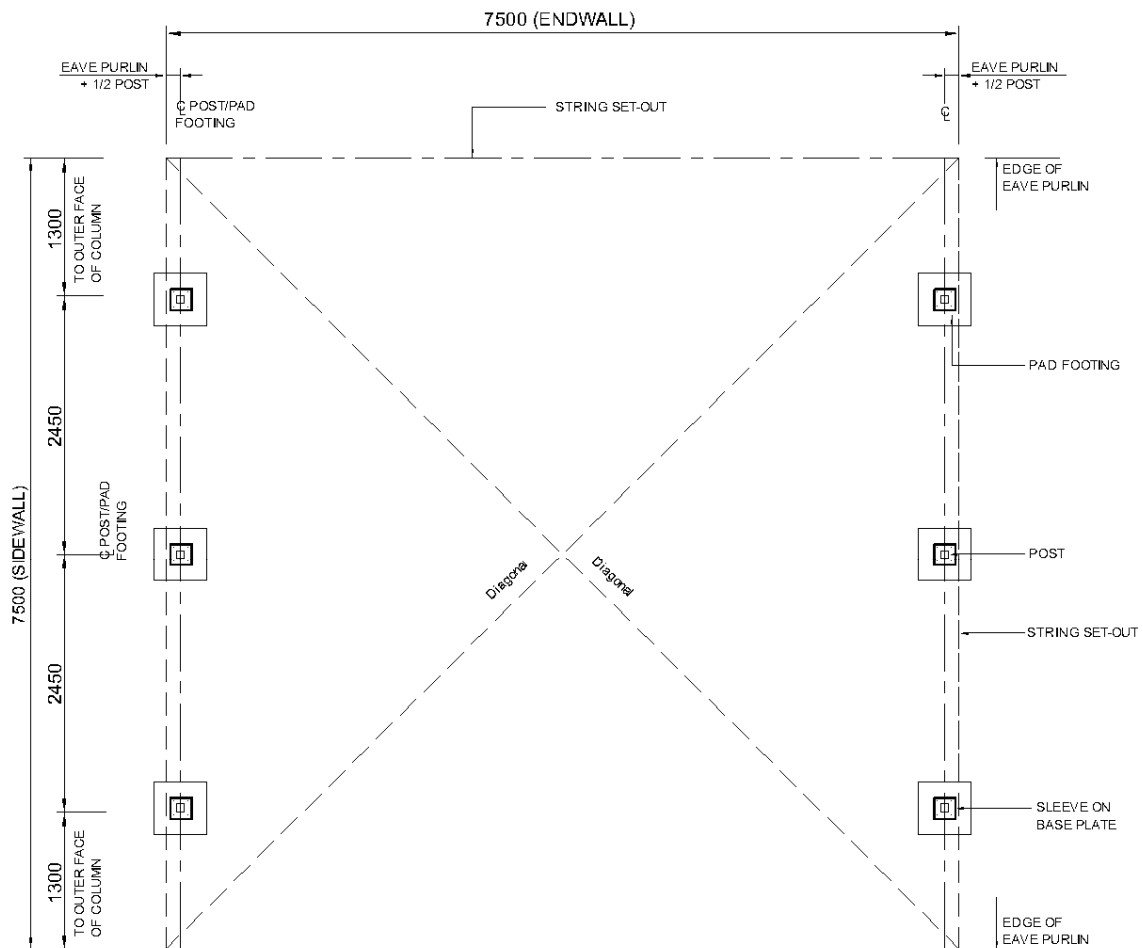


Diagram Da
POST SLEEVE ON BASE PLATE SET- OUT
BLOCK PAD FOOTING

Step 4b – Post Sleeve on Base Plate Set-out on Slab

Using the set-out string marking the perimeter of the building as a guide, mark the position of the post sleeve. The post sleeve which is inserted to the bottom of the post is in on the sidewall by the flange width of the Eave Purlin plus 1/2 of the post size from the slab edge set-out. On the endwall, it is in by 1300mm plus 1/2 of the post size from the string set-out as shown in Diagram Db.

The length of the carport is from outer face of one Eave Purlin to outer face of the other Eave Purlin. The web of the end rafters face in and are flushed to the inner face of the post.

Ensure that the diagonal measurements of the concrete slab are equal, level and square. Refer to the Engineering Plans for size and specifications of the concrete slab.

TIP: The centre line of post is equivalent to the centre line of post sleeve on base plate.

NOTE: The post sleeve on base plate comes in a 4-hole plate. Refer to the Engineering Plans for the specifications of the post sleeve and bolt.

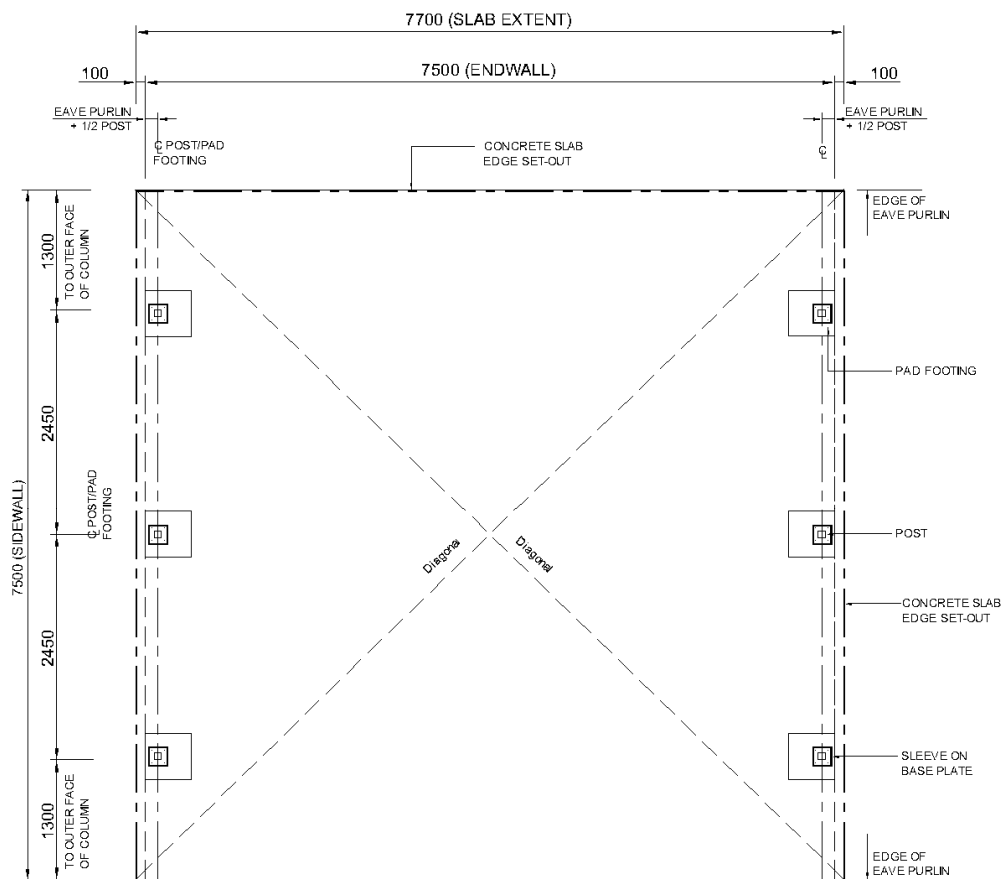


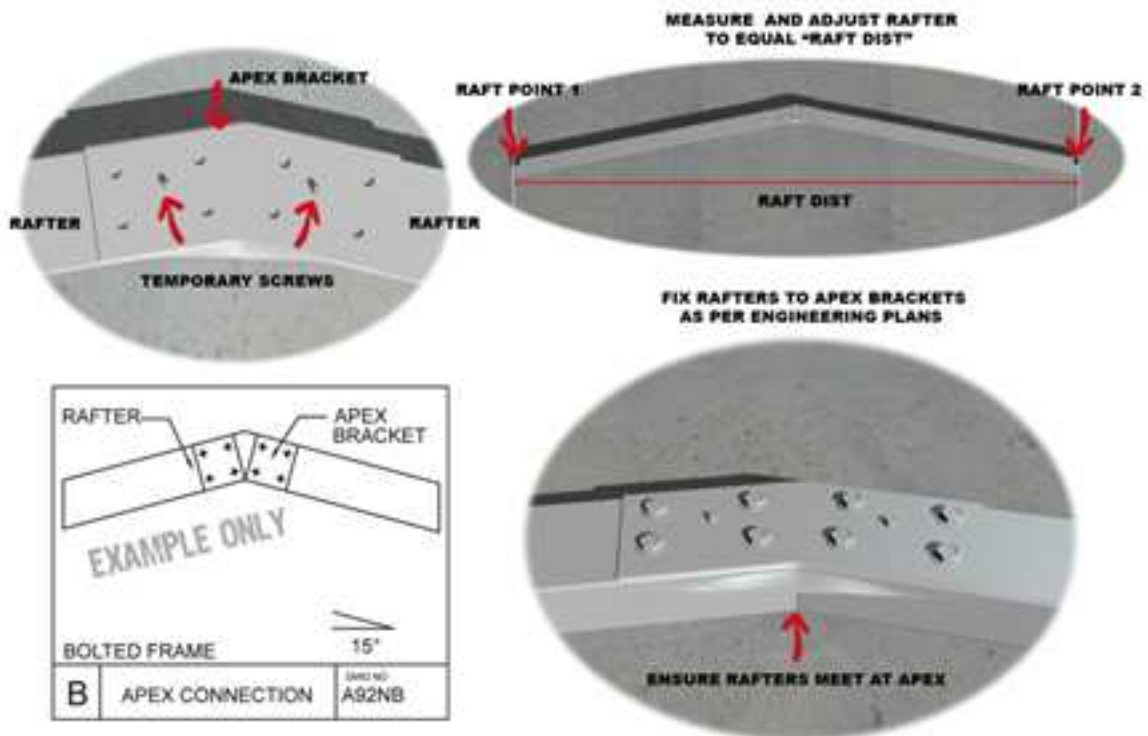
Diagram Db
POST SLEEVE ON BASE PLATE SET- OUT
CONCRETE SLAB

Step 5 - Fitting of Intermediate Rafters with Apex Bracket

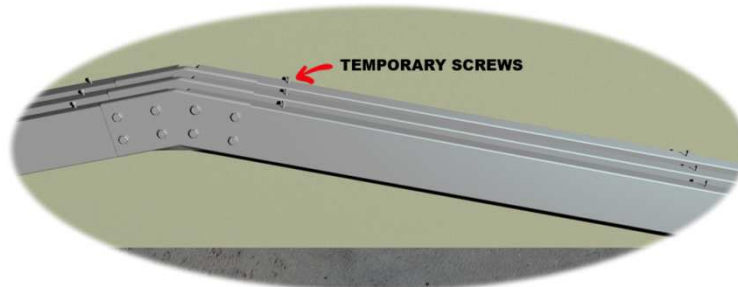
Layout the rafters and apex brackets on the slab. Split rafters equally on 2 sides and stand on flanges. Ensure that the correct end of the rafter is at the top. This can be achieved by measuring the punching of the apex bracket against the punching on the rafter. Start the rafter assembly to the first

set of rafters and apex bracket. Lay the first 2 rafters flat on the slab, web facing up at the approximate roof pitch. Ensure that the rafters meet at the lower point of apex. Attach the apex bracket to the top end of the rafter forming an apex. Keep the apex bracket temporarily in place with 2 frame tek screws. Measure "RAFT POINT 1" and "RAFT POINT 2" and adjust until measurement equals "RAFT DIST". Refer to "Marking Roof Purlin Position on Rafter Assembly" images. Bolt the apex bracket securely into position. Repeat procedure to the rest of the rafters. Stand rafter assembly side by side, measure and mark on the rafter the position of purlins based on the spacing specified on the engineering plans. Move aside for later use.

FITTING OF RAFTERS WITH APEX BRACKET



MARKING ROOF PURLIN POSITION ON RAFTER ASSEMBLY



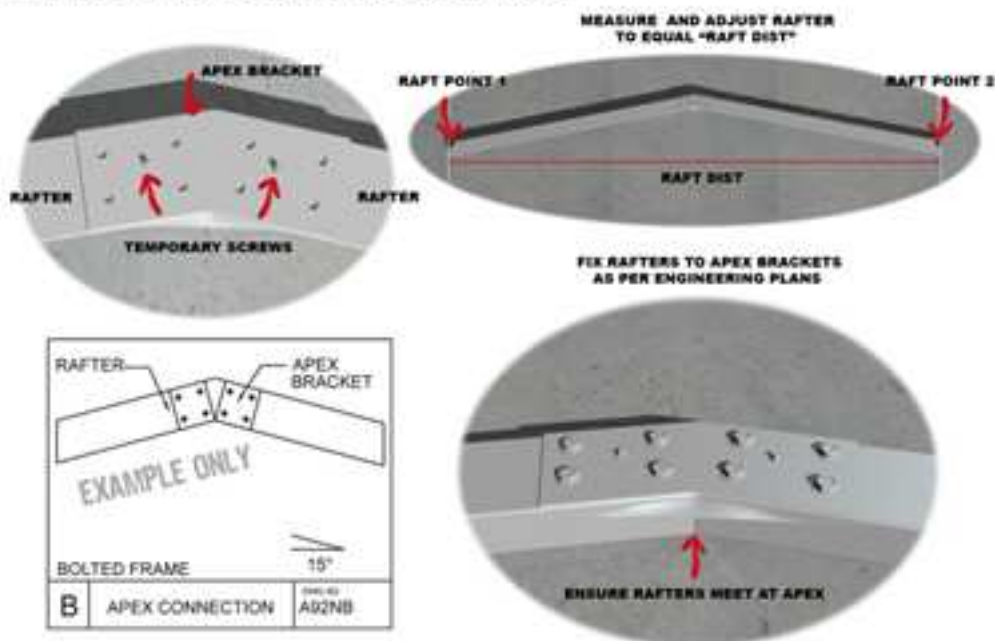
Step 6 - Fitting of End Rafters with Apex Bracket and Cross Beam Assembly

Layout the rafters and apex brackets on the slab. Ensure that the correct end of the rafter is at the top. This can be achieved by measuring the punching of the apex bracket against the punching on the rafter. Start the rafter assembly to the first set of end rafters and apex bracket. Lay the first 2

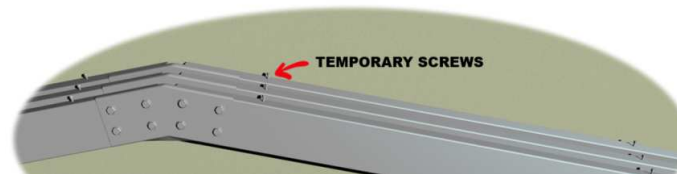
end rafters flat on the slab, web facing up at the approximate roof pitch. Ensure that the rafters meet at the lower point of apex. Attach the apex bracket to the top end of the rafter forming an apex. Keep the apex bracket temporarily in place with 2 frame tek screws. Measure “RAFT POINT 1” and “RAFT POINT 2” and adjust until measurement equals “RAFT DIST”. Refer to “Marking Roof Purlin Position on Rafter Assembly” images. Bolt the apex bracket securely into position.

Attach the Cross Beam End Bracket to each end of the Cross Beam. Fix the Cross Beam Assembly to the lip side of the Rafter. Attach the Frame Rafter bracket on each side of the cross beam bracket to allow for the connection of the Dutch Hip Rafter. Repeat procedure to the other end rafter. Stand rafter assembly side by side, measure and mark on the rafter the position of purlins based on the spacing specified on the engineering plans. Move aside for later use.

FITTING OF RAFTERS WITH APEX BRACKET



MARKING ROOF PURLIN POSITION ON RAFTER ASSEMBLY



FITTING OF END RAFTERS WITH CROSS BEAM AND THE BRACKET FOR HIP RAFTER



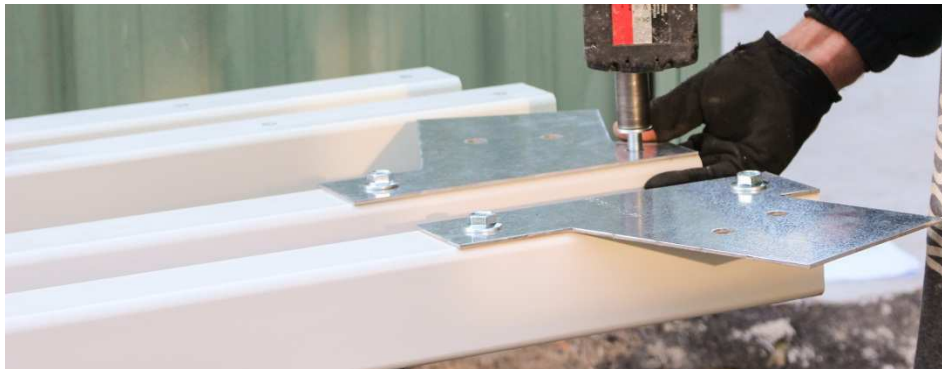
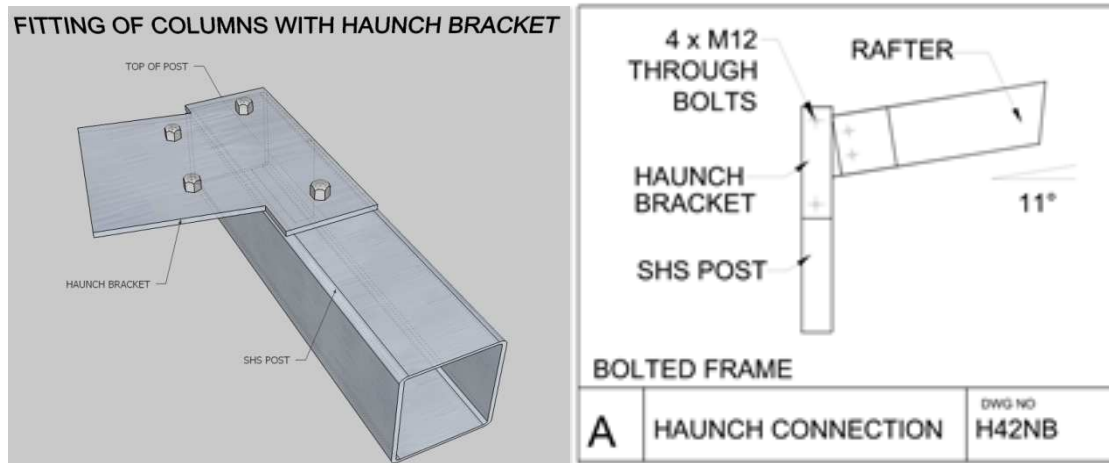


Step 7 - Fitting of Columns with Haunch Bracket

Layout SHS Posts and Haunch Brackets on the slab, approximately at bay spacing distance. Ensure that the correct end of the Post is at the top. This can be achieved by matching the punched holes of the haunch bracket against the punched holes on the post.

Lay the Post flat on the slab, one flange side up. Attach the Haunch Bracket to the top end of the column on one flange side. Keep the haunch bracket temporarily in place with 2 frame tek screws.

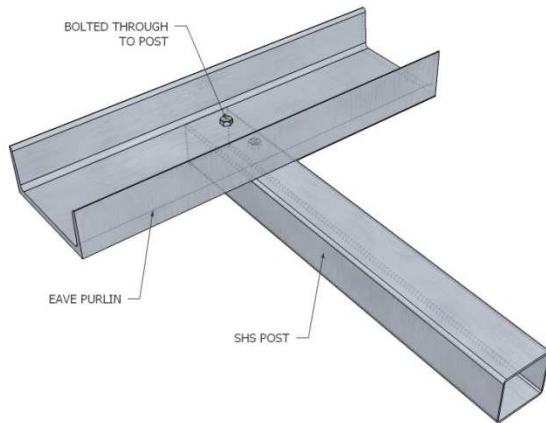
Repeat procedure to the rest of the Posts. Stand the Post on one flange and permanently bolt the haunch bracket to the Post.



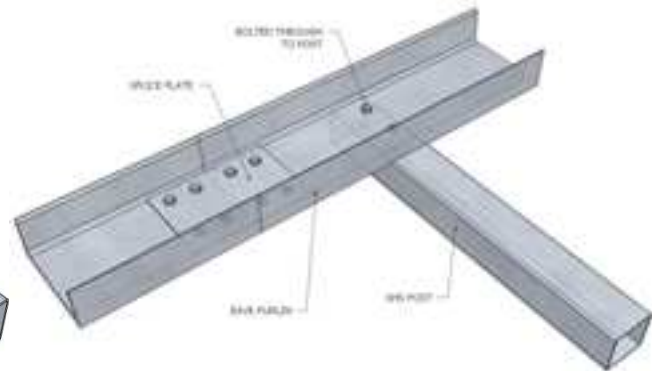
TIP: Layout the haunch brackets web face up to determine the Left and Right Haunch Bracket. Where the Post attachment is on the left, it is the Left Haunch Bracket and where the Post attachment is on the right, it is the Right Haunch Bracket.

Step 8 - Fitting of Sidewall Eave Purlin (SW) to Post

Lay the SHS Post on one flange side. Attach the Eave Purlin directly to the Post with fastening types as required. If the total length requires more than one continuous piece, C-Eave Purlins are butt-jointed with splice plate as shown on the image below, no closer to support at 15% of bay width. Refer to Engineering Plans on the height specifications and fastening type of the C-Eave Purlin. Repeat this procedure to the other Eave Purlins.



ATTACHING EAVE PURLINS



SPLICE PLATE DETAIL @ EAVE PURLINS



Step 9 – Fixing of Cover Flashing to Sidewall Eave Purlin (SEP)

Attach the cover flashing to the open side of the Sidewall Eave Purlin (SEP) to top and bottom of the flanges with fastening type as required.



Step 10 - Gutter

Depending on the length of the building, gutter can now be fitted or later when the walls are already standing.

NOTE: If gutter is to be fixed now, ensure that eave purlin cover flashing is attached prior to installing the gutter.

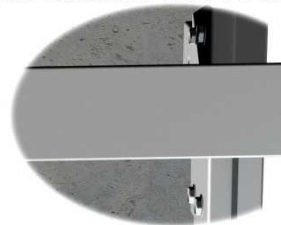
Peel the protective plastic cover of the gutter. Fix the stop ends and rivet into position. Position the downpipe nozzle under the gutter and trace the inside of the nozzle with a permanent marker. Cut the holes in the gutter with tinsnips, silicone, drill and rivet into position.

CAUTION: Use caution in handling cut steel as it is extremely sharp.

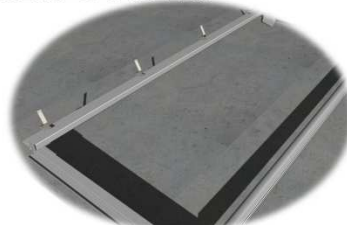
TIP: Gutter and gutter brackets may vary from State to State.

Position the gutter brackets spaced at 1.0meter maximum as a guide. Mark a chalk line from top of the flashing down to determine the height of the brackets, highest point of gutter bracket to line up with the top of flashing. Attach the gutter brackets to the ribs of the flashing with pop rivets with a slight downward slope towards the downpipe. Apply silicone to joints of gutter prior to installation. Clip gutter into gutter brackets and ensure that the gutter overhang the gable end wall by the profile width of the sheets. Fold gutter bracket tags into the gutter to hold it into position.

ATTACHING GUTTER BRACKETS & GUTTER



MARK A CHALK LINE WITH A SLIGHT DOWNWARD SLOPE TOWARDS DOWNPIPE END

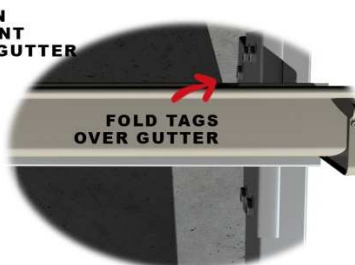


DISTRIBUTE HALF OF THE GUTTER BRACKETS EVENLY DOWN EACH SIDE WALL



ATTACH BRACKETS TO CLADDING WITH POP RIVETS

SILICONE ON GUTTER JOINT TO ATTACH GUTTER



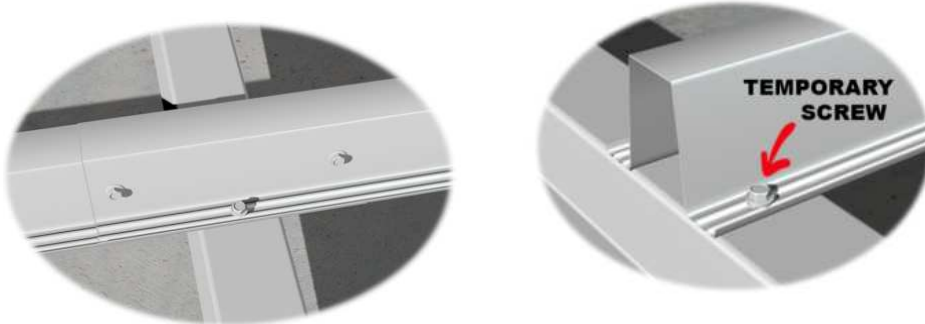
FOLD TAGS OVER GUTTER



Step 11 - Sidewall Frame Assembly

Following the attachment of C-Eave Purlin, stand the columns on one flange side, C-Eave Purlin facing up. Distances of the posts to suit bay widths. The temporary tophat is to be attached 600mm from top of slab or footing to bottom lip of the tophat. The temporary tophat is used to stabilize the frame and to be able to measure the diagonals. Join the tophats with even overlaps to suit the length of the carport. For ease of handling, it is recommended that tophats be joined in multiples of two at a time. Allow 1 framing tek screw per attachment for temporary fixing. When the setting out of the temporary girt is complete, string line the bottom of the columns to ensure that a straight line is achieved. The 2 diagonal measurements of the wall frame have to be equal. If the measurements are not equal, adjust the wall frame until the 2 measurements are the same. Refer to “Standing the First Sidewall Assembly” to illustrate the location of the temporary tophat.

NOTE: THE TEMPORARY TOPHAT CAN BE REMOVED ONCE STABILITY OF THE BUILDING IS ACHIEVED.



Step 12 - Other Sidewall Frame Assembly

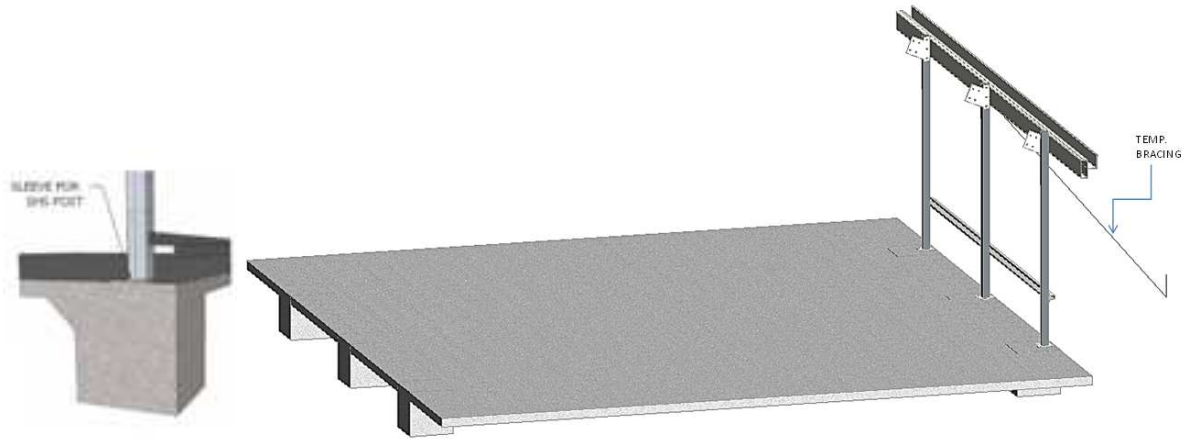
Repeat the process on “Sidewall Frame Assembly” Chapter through to “Gutter” Chapter for the other Sidewall Frame Assembly.

Step 13- Standing First Sidewall Frame Assembly

WARNING: DO NOT ATTEMPT TO STAND A WALL FRAME ASSEMBLY ON WINDY DAYS. CAUTION SHOULD BE OBSERVED AND SAFETY TO BE THE UTMOST PRIORITY WHEN STANDING PORTAL FRAME OR WALL FRAME ASSEMBLY.

NOTE: OTHER TEMPORARY BRACING REQUIREMENTS ARE OMITTED FOR CLARITY. RESPONSIBILITY FOR ENSURING STABILITY OF STRUCTURE REMAINS WITH THE BUILDER

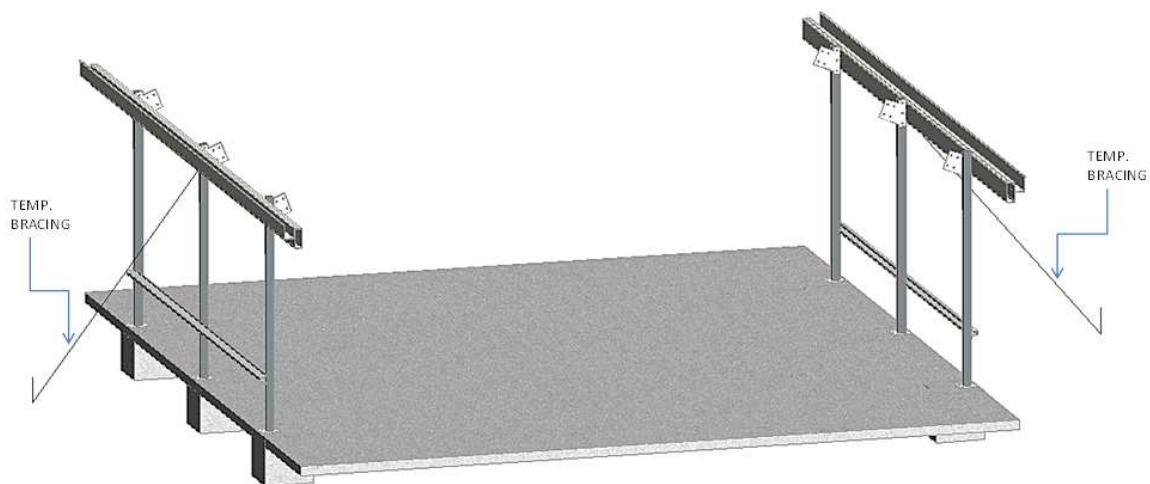
Secure with temporary bracing material into the ground with stakes or equivalent material then tie off onto the frame. Responsibility for ensuring stability of structure remains with the builder. With the assistance of other installers, lift one sidewall frame assembly into position. Brace and prop both ends of the wall frame assembly with the appropriate temporary bracing material tied securely around stakes or equivalent driven into the ground.



Step 14 - Standing Second Sidewall Frame Assembly

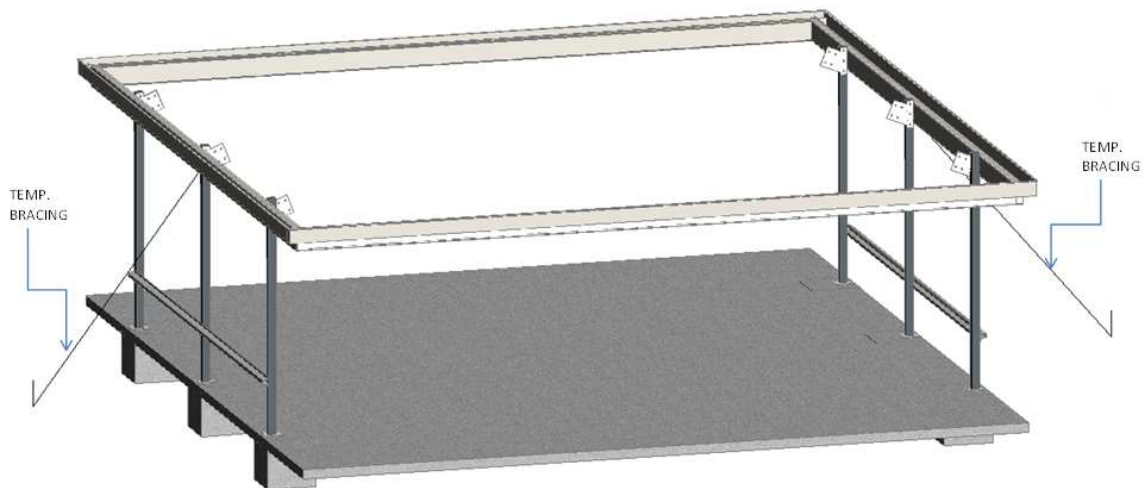
Repeat Step 11 process for the Second Sidewall Assembly.

NOTE: OTHER TEMPORARY BRACING REQUIREMENTS ARE OMITTED FOR CLARITY. RESPONSIBILITY FOR ENSURING STABILITY OF STRUCTURE REMAINS WITH THE BUILDER



Step 15- Fixing of Endwall Eave Purlin (EEP) to Sidewall Eave Purlin (SEP) on the Rear Endwall

Attach Endwall Eave Purlin (EEP) to Sidewall Eave Purlin (SEP) with an angle bracket on each end of EEP. Fastening location of the angle bracket is to the maximum top and bottom to allow for the fixing of the Internal Hip Rafter bracket. Attach the cover flashing to the top and bottom flanges of the EEP with fastening type as per the Engineering plans. Repeat Step 8 for fixing the Gutter. Repeat this process to the Front Endwall.



Step 16- Installation of Rear Endwall Rafter

Starting at the rear end of the building, carefully lift the Rafter Assembly to fit into the haunch bracket. Ensure that the web of the end rafter faces inside the building. Use quick release clamps to secure the rafters to the haunch brackets. The centre of the rafter assembly should be supported temporarily as per the Builder's requirements until all the roof purlins are in place or until it is safe to remove the temporary bracing. Use 2 frame screws per haunch bracket connection to hold portals in place. Check and ensure that the columns are plumb and adjust props as necessary. Complete the haunch bracket connection with the fastening type specified in the engineering plans. Ensure that bolts and screws are tightened to specifications.

NOTE: OTHER TEMPORARY BRACING REQUIREMENTS ARE OMITTED FOR CLARITY. RESPONSIBILITY FOR ENSURING STABILITY OF STRUCTURE REMAINS WITH THE BUILDER



Step 17- Fixing of Dutch Cross Beam

Attach the Dutch Cross Beam to the endwall rafter, both facing the same direction with cross beam end bracket on both ends. Ensure that the open side of the end bracket is at the top. Attach the web of the cross beam to the bottom lip of rafter where it intersects with 5 tek screws on each side.



CROSS BEAM ON END BRACKETS TO RAFTER

Step 18 - Fixing of Rafter Frame Bracket to Cross Beam End Bracket

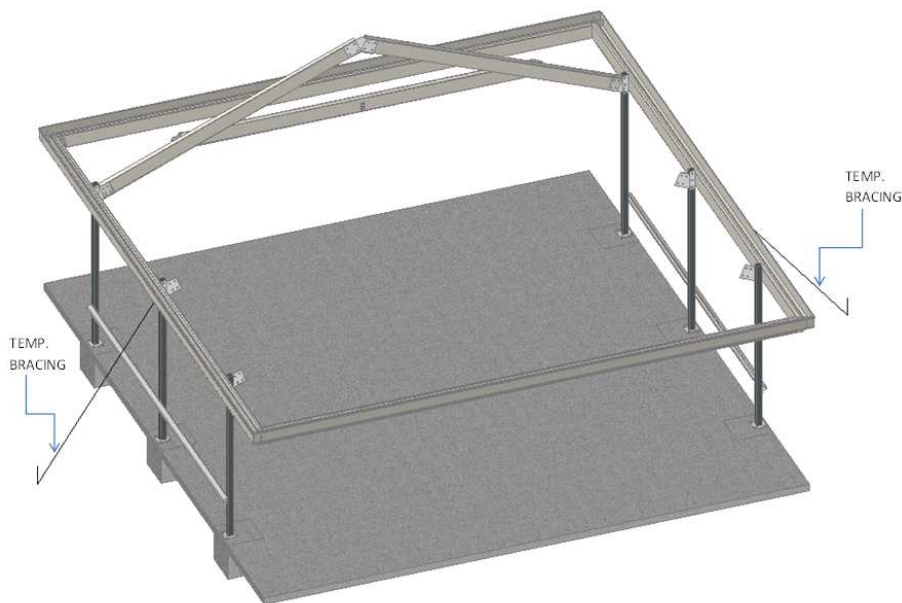
Attach the 15 degree Rafter Frame Bracket to the cross beam end bracket. Ensure that it is flushed to the top and in the middle of the end bracket. Refer to the 2 photos below for reference.



RAFTER FRAME BRACKET TO CROSS BEAM END BRACKET - TOP VIEW



RAFTER FRAME BRACKET TO CROSS BEAM END BRACKET - FRONT VIEW



Step 19 - Fixing of Internal Hip Bracket

Attach the Internal Hip Bracket in the corner to each side of the eave purlin for the attachment of Hip Rafter on the low end.



INTERNAL HIP BRACKET TO EAVE PURLIN – BOTTOM VIEW

Step 20 - Fixing of Dutch Hip Rafter

Attach the Dutch Hip Rafter to the pre-installed rafter frame bracket on the high end and to the internal hip bracket on the low end with fastening type as per the Engineering plans.



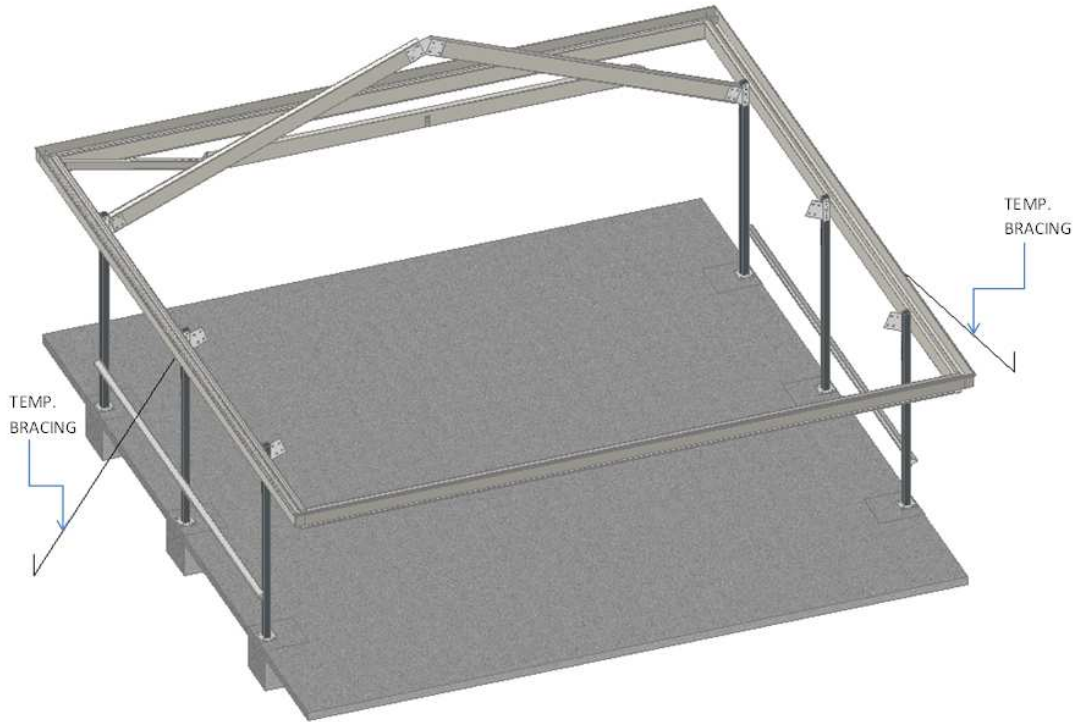
HIP RAFTER TO RAFTER FRAME BRACKET AT HIGH END - BOTTOM VIEW



HIP RAFTER TO RAFTER FRAME BRACKET AT HIGH END - CLOSE UP VIEW

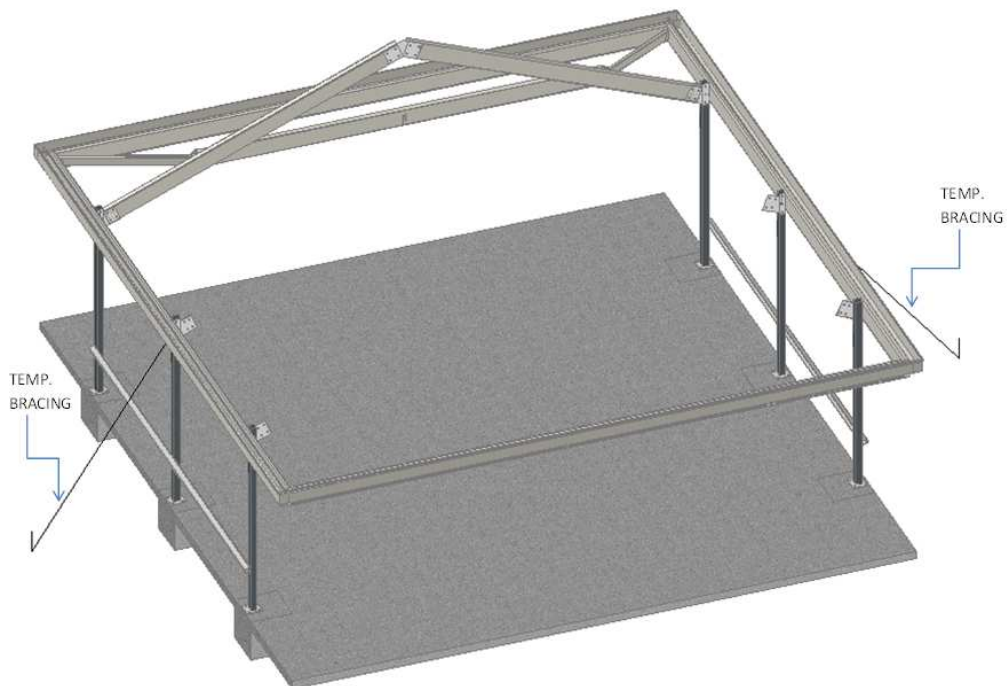


HIP RAFTER TO INTERNAL HIP BRACKET AT LOW END - SIDE VIEW



Step 21- Fixing of Dutch Hip Rafter to the opposite corner

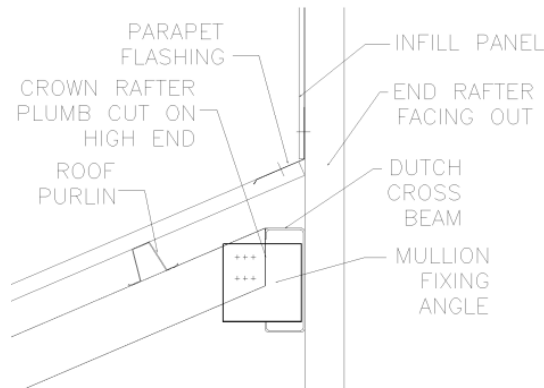
Repeat "Fixing of Dutch Hip Rafter" process.



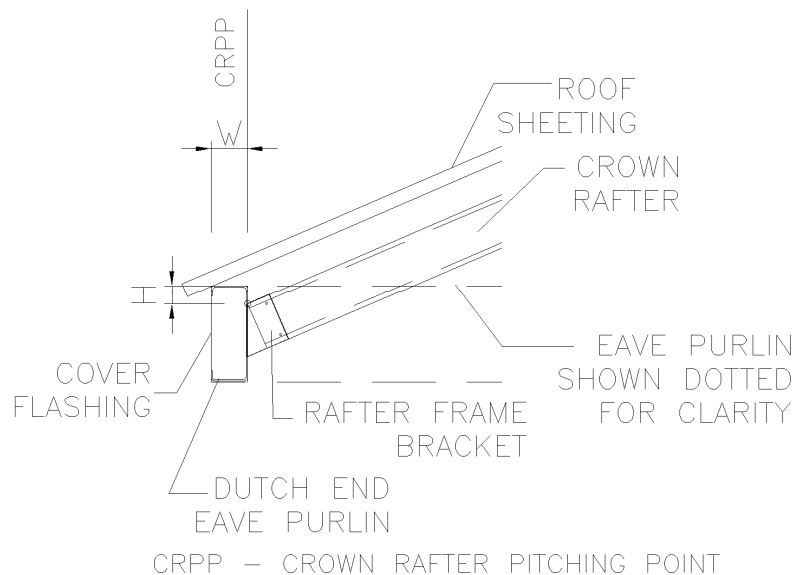
Step 22 - Fixing of Crown Rafter

The crown rafter application is dependent on the span of the building and other structural criteria. If crown rafter is not required and not supplied, go to the next step.

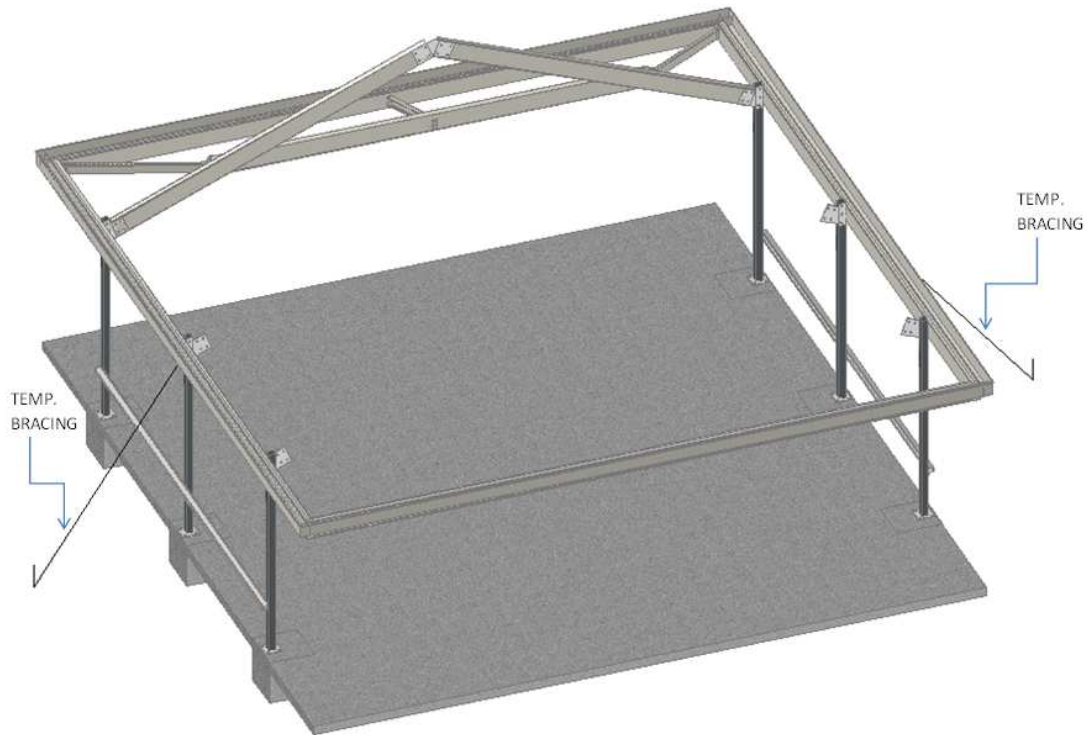
The crown rafter is attached to the web of the dutch end eave purlin with a Rafter Frame Bracket with fastening type as per the Engineering plans. On the high end, it is attached with a Mullion Fixing Angle to inside of the Dutch Cross Beam. Crown Rafter is to be plumb cut on the high end to be able to attach to the mullion fixing angle.



CROWN RAFTER TO DUTCH CROSS BEAM



CROWN RAFTER TO DUTCH END EAVE PURLIN



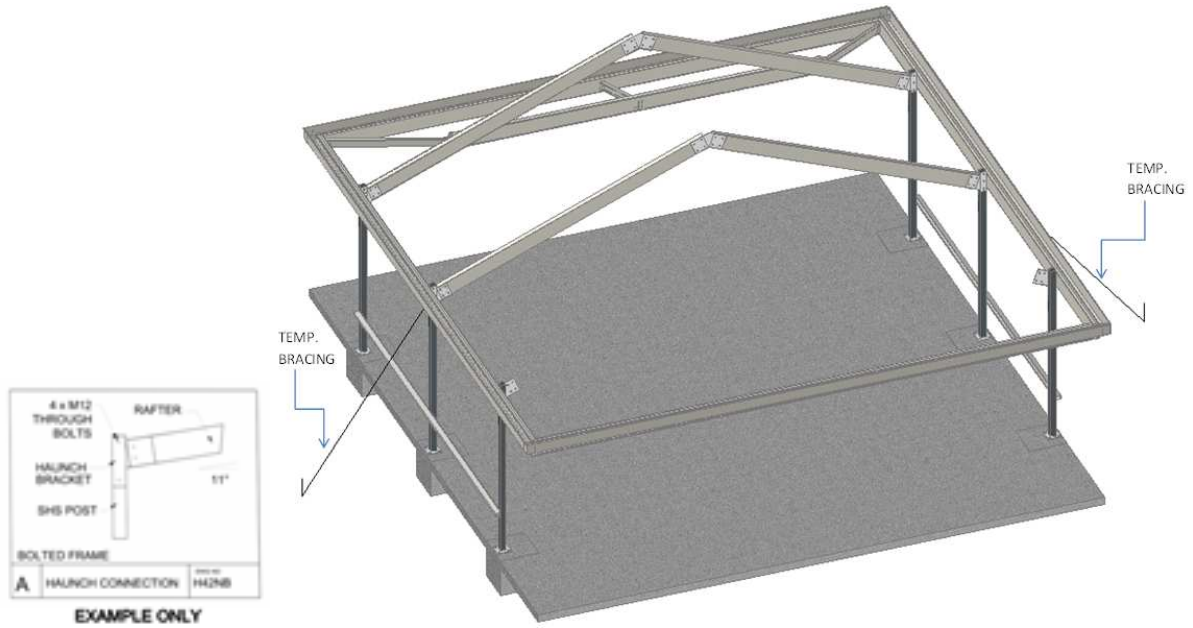
NOTE: CROWN RAFTER IS TO BE PLUMB CUT ON THE HIGH END TO BE ABLE TO ATTACH TO THE MULLION FIXING ANGLE.

Step 23 - Installation of Intermediate Rafters

Fix the remaining intermediate Rafters to the Haunch Brackets. As one intermediate rafter assembly is put into place, at least one purlin in small buildings or more in big buildings must be fixed into position to act as brace support. If purlins are not sufficient brace support, additional temporary brace is required. Ensure each portal frame is plumb before permanently fixing the frame with the fastening type as per the Engineering Plans.

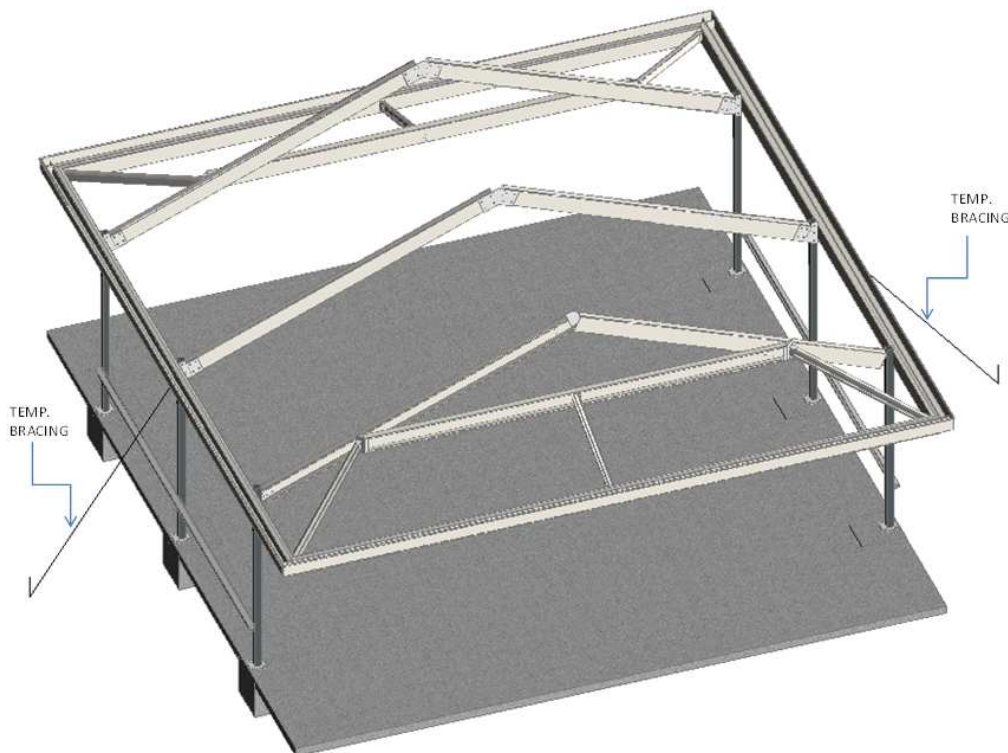
TIP: ADDITIONAL TEMPORARY BRACE OR ADDITIONAL PURLINS MAY BE REQUIRED TO ENSURE THAT THE RAFTERS DO NOT ROTATE AROUND THE HAUNCH BRACKETS.

NOTE: OTHER TEMPORARY BRACING REQUIREMENTS ARE OMITTED FOR CLARITY. RESPONSIBILITY FOR ENSURING STABILITY OF STRUCTURE REMAINS WITH THE BUILDER.



Step 24 - Fixing of Front Endwall Rafter with Dutch Frame Assembly

Repeat the process of Fixing rear endwall rafter, cross beam, dutch hip rafters and crown rafter (if required) to the Front Endwall.

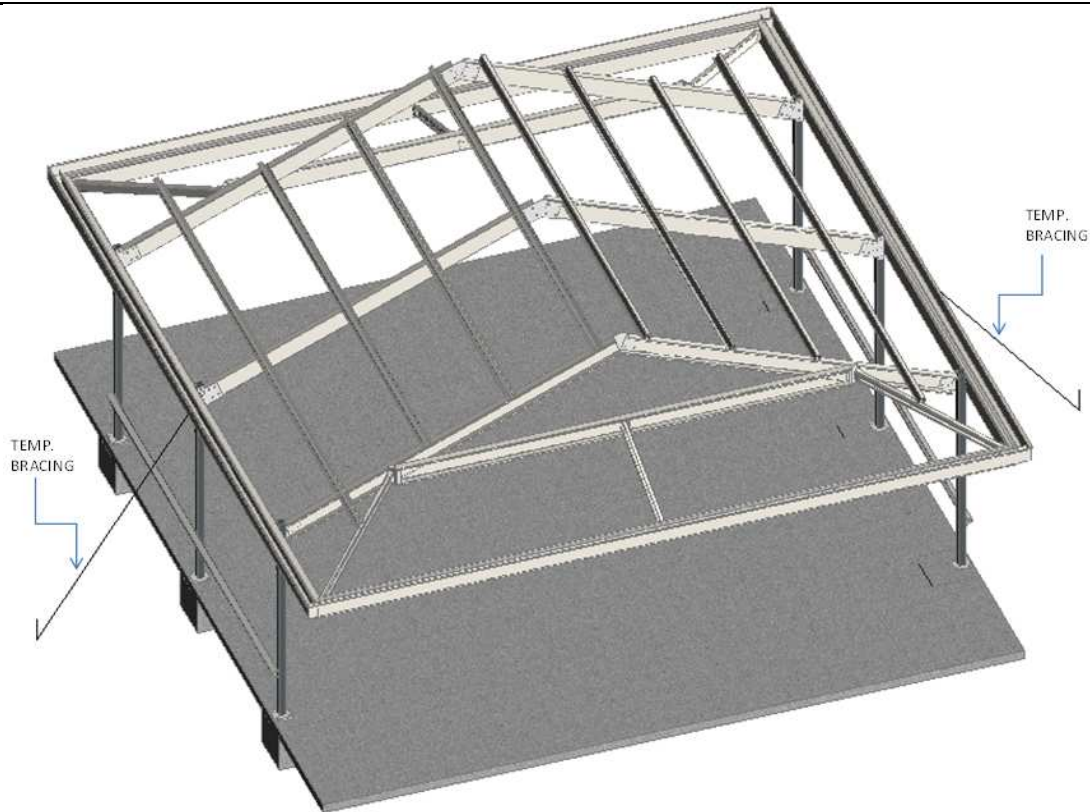


Step 25 - Fixing of Roof Purlins to Main Roof

Lift the pre-joined roof purlins into the rafters to line up with the temporary screws of the rafters for the purlin location. Roof purlins are to flush with the outer face of the end rafters. Attach the roof

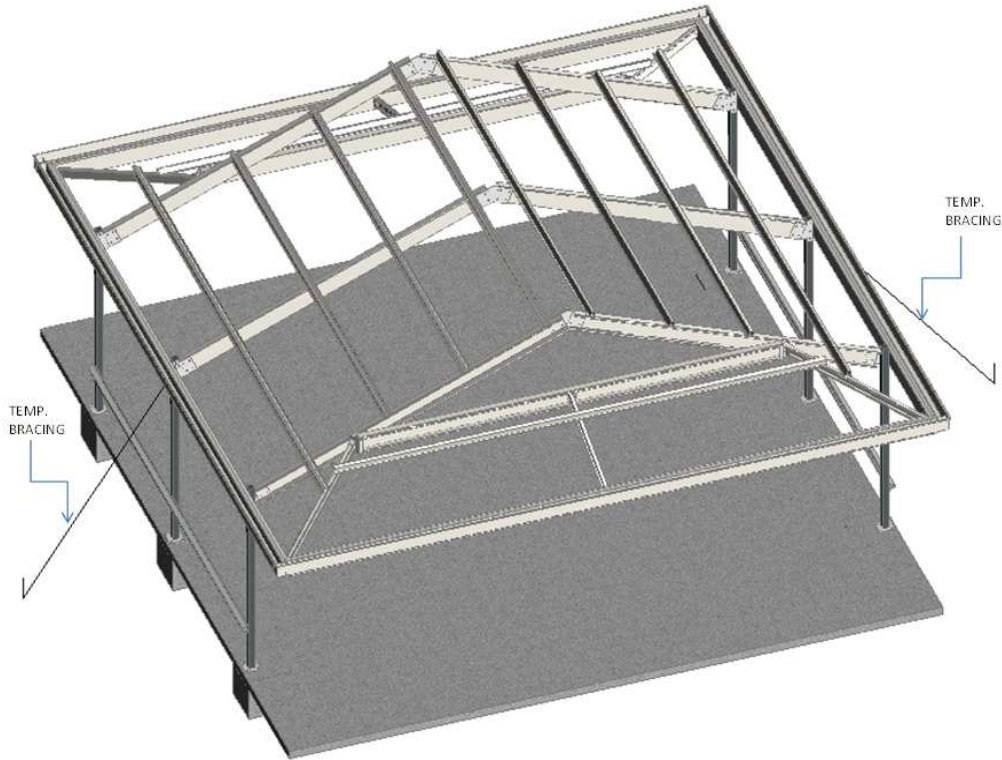
purlins with one screw per connection initially. Ensure that endwall rafters and all intermediate rafters are plumb prior to purlins being permanently attached. Refer to Engineering Plans for purlin spacing. If roof strap bracing is required, fix into position as per Engineering Plans prior to laying sheets on the roof.

NOTE: OTHER TEMPORARY BRACING REQUIREMENTS ARE OMITTED FOR CLARITY. RESPONSIBILITY FOR ENSURING STABILITY OF STRUCTURE REMAINS WITH THE BUILDER.



Step 26 - Fixing of Roof Purlins to Dutch Gable

Roof purlin to sit on the 2 Dutch Hip Rafters. Attach the roof purlins with one screw per connection initially. Ensure that Hip Rafters and Crown Rafters (if required) are plumb prior to purlins being permanently attached. There is only one row of purlin on the high end of the dutch gable. If roof strap bracing is required, fix into position as per Engineering Plans prior to laying sheets on the roof.



Step 27 - Fixing of Knee and Apex Brace

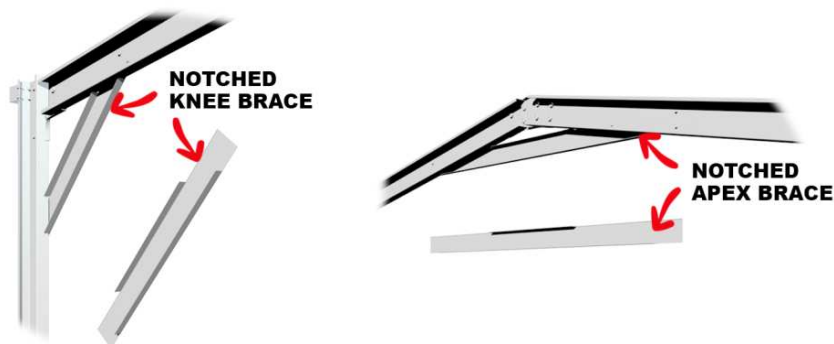
Fit knee and apex brace as required.

For Single Portal Frame and Single Brace application – two options in attachment method

Flanges not notched – This option is to have the webs of knee and apex brace attach to the webs of the rafter and column where open sides face the opposite direction as the rafter and column.

Flanges notched – This option is to notch the flanges of the knee and apex brace, attach to the webs of the rafter and column where open sides face the same direction as the rafter and column.

SINGLE FRAME AND SINGLE BRACE APPLICATION





CAUTION: TEMPORARY TOPHAT BRACE CAN NOW BE REMOVED AFTER FIXING THE KNEE AND APEX BRACES IF THE STRUCTURE IS STABLE. RESPONSIBILITY FOR ENSURING STABILITY OF STRUCTURE REMAINS WITH THE BUILDER.

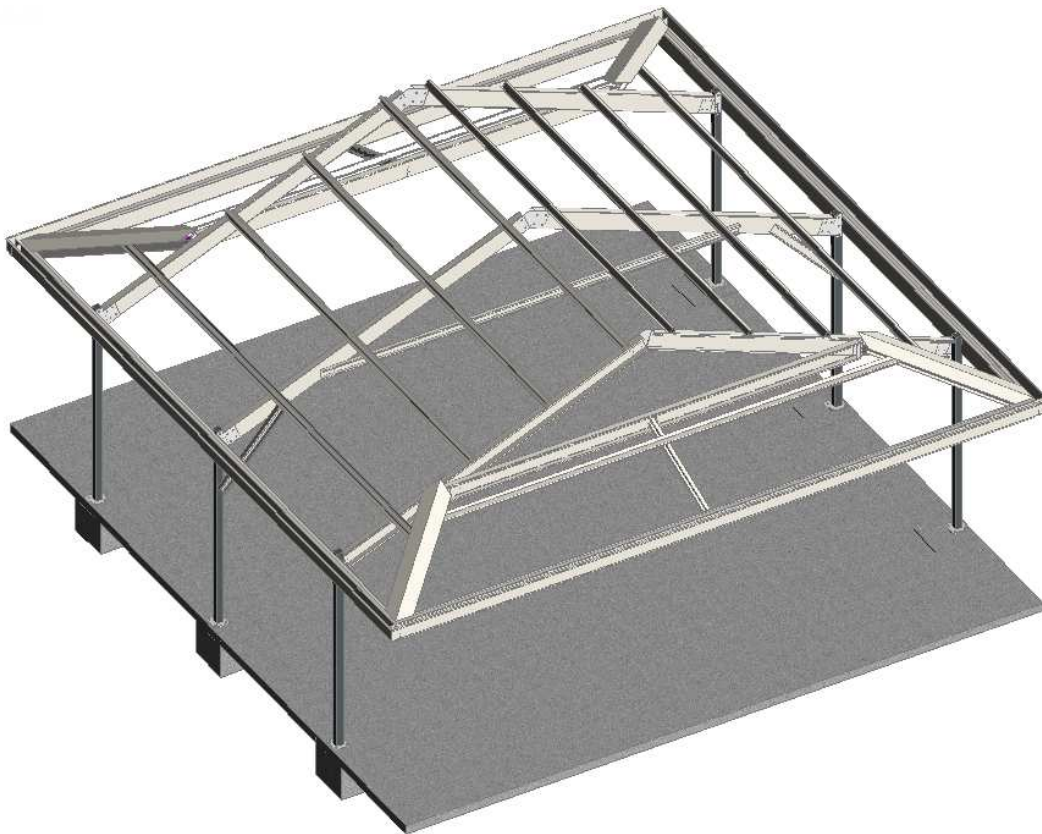
NOTE: OTHER TEMPORARY BRACING REQUIREMENTS ARE OMITTED FOR CLARITY. RESPONSIBILITY FOR ENSURING STABILITY OF STRUCTURE REMAINS WITH THE BUILDER.

Step 28 - Fixing of Under Flashing to Dutch Hip Rafters

Attach the under flashing to the roof purlin at main and at dutch gable over the Dutch Hip Rafter. Repeat the process to the other 3 Dutch Hip Rafters. Refer to Engineering plans for fastening type specifications and spacing.



UNDER FLASHING TO DUTCH HIP RAFTER – BOTTOM VIEW



Step 29 - Fixing of Roof Sheeting to Main Roof

CAUTION: Prior to fixing the roof sheeting into position, it is imperative to check that both side walls and endwalls are plumb and straight by using a string line along the inner face of the columns. Re-prop intermediate columns if necessary which helps the structure become more rigid while working on the roof.

Prior to fixing the roof sheeting to the purlins, turn up the sheeting along the ridge line with pliers for added protection from rain. This process is called “weathering” the sheets. Fix the roof sheeting and allow approximately half the gutter width or 50mm (whichever is lesser) to overhang into the gutter. Ensure that the female rib of the cladding faces away from the prevailing winds. Fix the roof sheeting with the required number of roof screws. Refer to Engineering Plans for roof screw specifications and spacing.

NOTE: If roof strap brace or fly brace is required, fix into position first prior to fixing the roof sheeting. Refer to the Engineering Plans for specifications and location of the roof strap brace and fly brace.

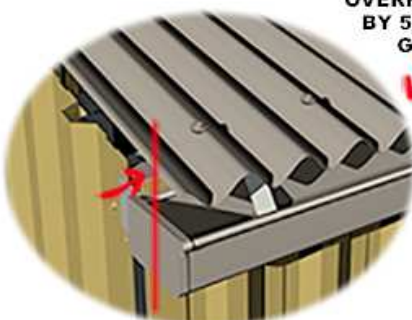
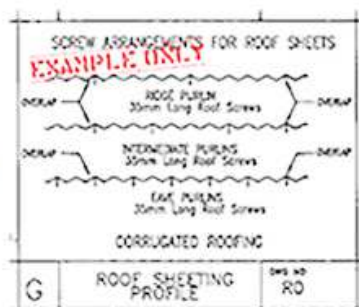
NOTE: If skylights are required, they must be installed with safety precautions. Safety wire mesh is a requirement under the skylights. Refer to manufacturer’s specifications and installation procedure for additional information.

CAUTION: It is imperative to sweep the edge of the metal with a soft hair brush to remove “swarf” whenever the sheets are cut. Any remaining swarf on the sheets after cutting will cause rusting and may void the warranty.

ROOF SHEETS

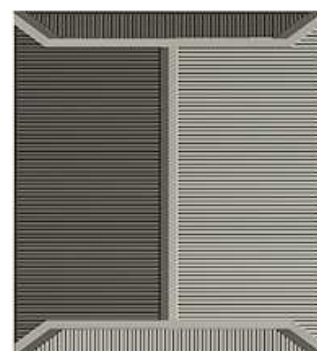


“WEATHERING” ROOF SHEETS



ROOF SHEETS CUT FLUSH TO END OF GUTTERS

OVERHANG GUTTER BY 50mm OR HALF GUTTER WIDTH



ROOF SHEETS IN PLACE



Step 30 - Fixing of Roof sheeting to Dutch Gable

Fix the roof sheeting to dutch gable and allow approximately half the gutter width or 50mm (whichever is lesser) to overhang into the gutter. Ensure that the female rib of the cladding faces away from the prevailing winds. Fix the roof sheeting with the required number of roof screws. Refer to Engineering Plans for roof screw specifications and spacing.



Step 31 - Fitting of Ridge Cap to Dutch Hip Rafters

Fix the ridge cap over the roof sheeting on 4 hip corners. Fix the ridge cap with the required fastening type and spacing.



Step 32 - Fixing of Parapet Flashing to Dutch Gable Roof

Fix the parapet flashing on the high end of the dutch gable roof to the lips of the end rafter with the required fastening type and spacing.



Step 33 - Fixing of Infill Panel to Dutch Gable Vertical Face

Fix the infill panel on the vertical face of the dutch gable to the lips of the Endwall Rafter and over the Parapet Flashing with the required fastening type and spacing.



NOTE: OTHER TEMPORARY BRACING REQUIREMENTS ARE OMITTED FOR CLARITY. RESPONSIBILITY FOR ENSURING STABILITY OF STRUCTURE REMAINS WITH THE BUILDER.

Step 34 - Fixing of Ridge Cap to Main Roof

Fix the ridge cap to the main roof with the required fastening type and spacing.



Step 35 - Fixing of Barge Cap to Dutch Gable Vertical Face

Fix the Barge Cap to Dutch Gable Vertical Face with the required fastening type and spacing.



Step 36 - Fixing of Flashings

Fix all flashings with pop rivets or wall screws as required. Ensure that all flashings are completed using the correct fasteners as required. Ensure that all flashings are secure and watertight. Run a bead of silicone on the overlap and joints of flashings as required.

Step 37 - Fixing of Gutter

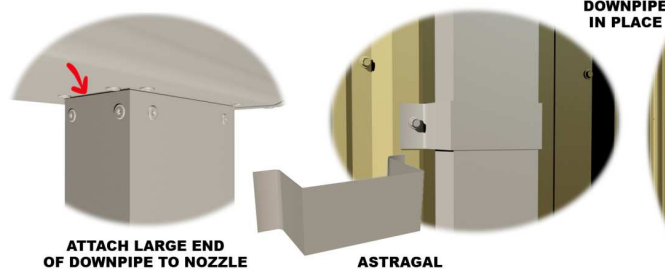
Refer to Step 8 "Gutter" for the "Fixing of Gutter" if gutter was not fitted prior to "Standing the First Sidewall Frame Assembly".

Step 38 - Fixing of Downpipe

Remove plastic coating from the downpipe. Fix downpipes to nozzle with pop rivets or wall screws whichever is applicable. The larger end of the downpipe is attached to the nozzle to allow for a correct water flow. A downpipe bracket called "astragal" can be formed by trimming and folding to suit the required shape. Alternately, a wall screw can be fixed from the inside of the building through the bottom sidewall girt into the downpipe.



ATTACHING THE DOWNPIPE



STOP ENDS & DOWNPIPE NOZZLES



Completion

Make a final check of the completed structure.

Ensure that all base cleats have been tightened down firmly.

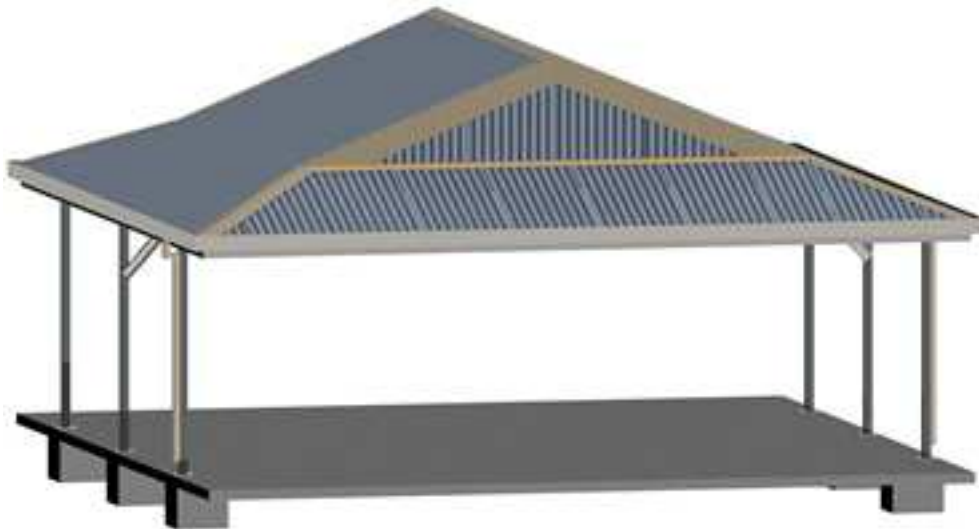
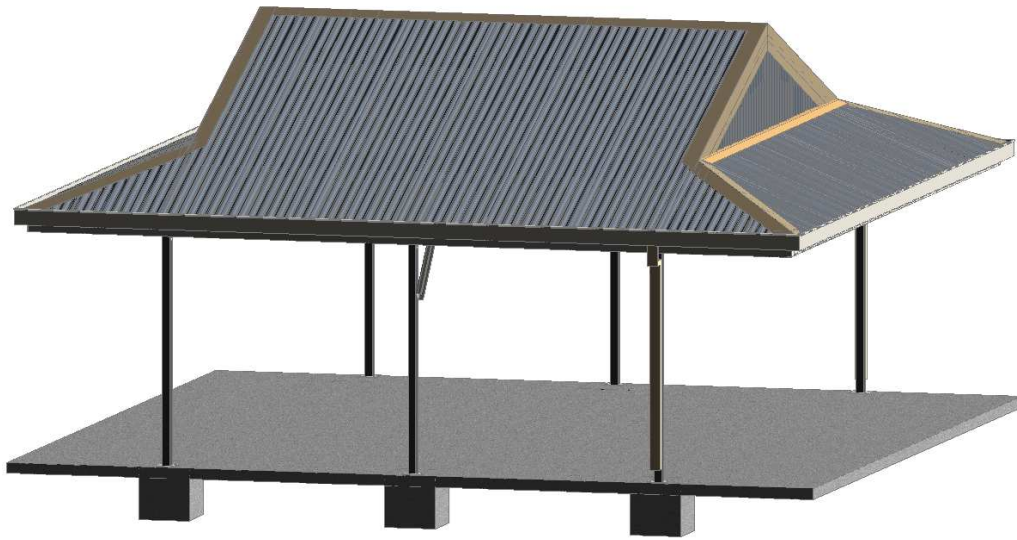
Ensure that all bolts are complete and tightened.

Check that the roof and wall screws are complete and tightened.

Remove the temporary tophats on 2 sides of the building if it has not been removed yet.

Brush the completed structure down including the roof with a soft hair broom to remove any swarf (metal dust and fillings caused by an angle grinder).

Hose down the concrete slab to remove any particles, screws and rivets for safety.



STAND BACK AND CONGRATULATE YOURSELF ON A JOB WELL DONE!