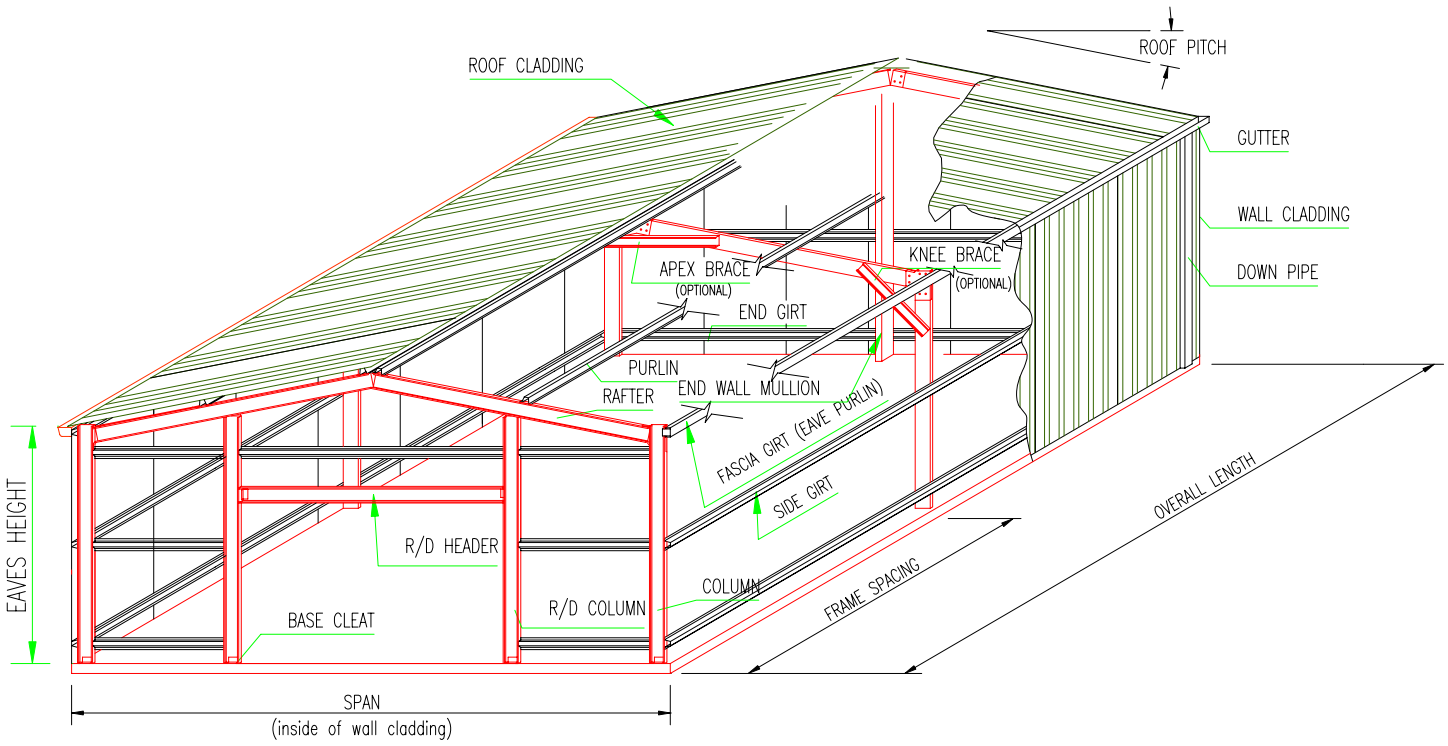
INSTRUCTION MANUAL FOR MULTIBUILD

ALL STEEL BUILDINGS

3 TO 30 METRE SPAN



SUPPLIED BY:

LAST UPDATED November 19, 2003

It is important to be aware of the following:
Before erecting your new building, please check that all local building department requirements such as Building Applications are adhered to.
This is not a work safety manual, so it is of utmost importance to follow all safety recommendations of the OH&S. (Occupational Health and Safety) Do not work on the building in damp conditions and do not walk on roof sheeting in damp or frosty conditions.
If you are employing a tradesman to erect your building for you, check with the governing authority to see if he needs to be licensed and also check that all insurances for both he and his employees are current.
Any information contained in this instruction manual overrides any details as shown on the instruction video. This manual must be used in conjunction with the engineer's plans as submitted to the building department.
NOTE: THE ENGINEERS PLANS OVERRIDE ANY INFORMATION IN THIS MANUAL.
An instruction video/CD for a 6 x 7 x 2.4m garage is available from your garage/shed reseller, and is to be used as a guide only, to show you tips and techniques.
All measurements are to be taken from the accompanying plans and specifications.
This manual is to be read in conjunction with:

1. **Engineering plans supplied with the building.**
   This contains a Members Isometric Drawing of a typical building and is not specific to the building purchased. It has all of the connection details for the specific building and contains elevation drawing of the building supplied. The members schedule is written from the supplier's software, and will give particulars on member sizes and spacing, as well as other relevant information.
2. **Bill Of Materials**
   This is a list of all components ordered for this building. You can consult it to check you have received all components. It also shows what each component is intended for.
3. **Structural Details**
   This is a list of all structural components, including the spacing of these items and their location in the building. It also gives an estimated height to the apex of the structure.

These are the two basic methods of erecting these structures:

1. The tilt up method (Part 1) where the walls are assembled and clad on the ground and then lifted into position.

2. The frame first method (Part 2) where the framework is erected first, then clan and completed. This is the preferred method for large structures over 9m span or 3m high and more than 12m in length. This method is also used in adverse wind conditions.

Refer to the following schedules for the following:

Schedule 1 - Tools

Schedule 2 - Eave Purlin Bracket Location

Schedule 3- Installation of Side Door.

Schedule 4- Installation of End Door.

Schedule 5- Fitting Windows and Doors.

Annexure 1- Garaport Bay extension. (Separate)
- Lean-tos on the side of buildings

Annexure 2 - Mezzanine floors and Staircases (Separate)

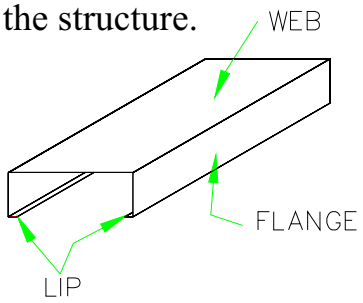
Annexure 3 - Horizontal Clad Buildings. (Separate)

Frame Components

The following is a description of each of the components used in construction. The underlined component name corresponds with the name used on the Engineering Plans, Members Isometric Drawing and the Bill Of Materials (BOM) and Structural Details.

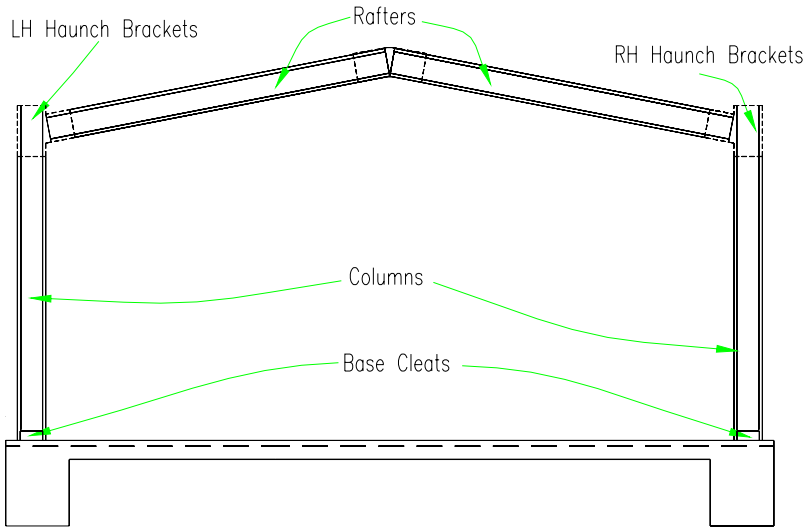
1. **Columns**. CEE Sections which may vary in size depending on the span, height and other relevant considerations. These may be double or single pieces. They may also have wind braces attached. They are the main supports for the centre of the building. The rafters and the lean-to rafters are attached to them.

2. **Rafter**. CEE Sections which may vary in size depending on the span, height and other relevant considerations. This member is used in the main centre section of the structure. They can be single or doubled regardless of the configuration of the columns. They are joined together with apex brackets. Rafters are also referred to as end wall rafters and intermediate rafters, depending on their location in the structure.



C SECTION.

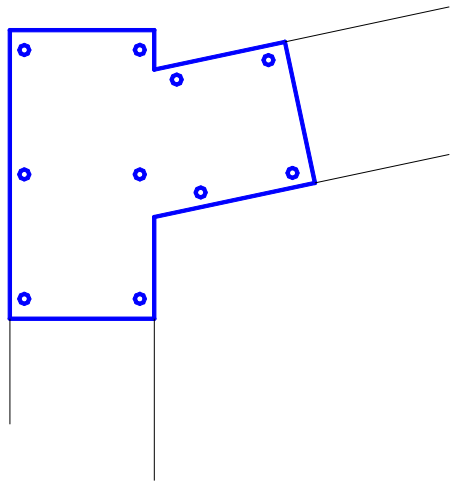
3. **Portal Frame.** Consists of 2 Columns and 2 Rafters joined together with bracketry to make up a complete frame. It is common to have a double frame, consisting of 4 columns and 4 rafters attached back to back, or even double columns and single rafter, as the engineering may require.



PORTAL FRAME ASSEMBLY

4. **Haunch Brackets.** The brackets used to join the columns to the rafters. Haunch brackets must always be attached to the web side of the CEE Section. It is of the utmost importance to follow the screwing or bolting procedure as shown.

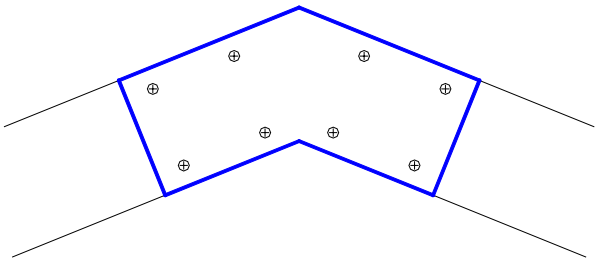
Important Note: Some connections require 2 brackets per connection, and back to back connection may require 4 brackets. Check your MultiBuild BOM output for clarification.



Haunch Brackets

5. **Apex Brackets** A Bracket to join the two rafters to form the roof apex. These must be attached to the web side of the CEE Section. Follow the screwing or bolting procedure as shown.

Important Note: Some connections require 2 brackets per connection, and back to back connection may require 4 brackets. Check your MultiBuild output for clarification.



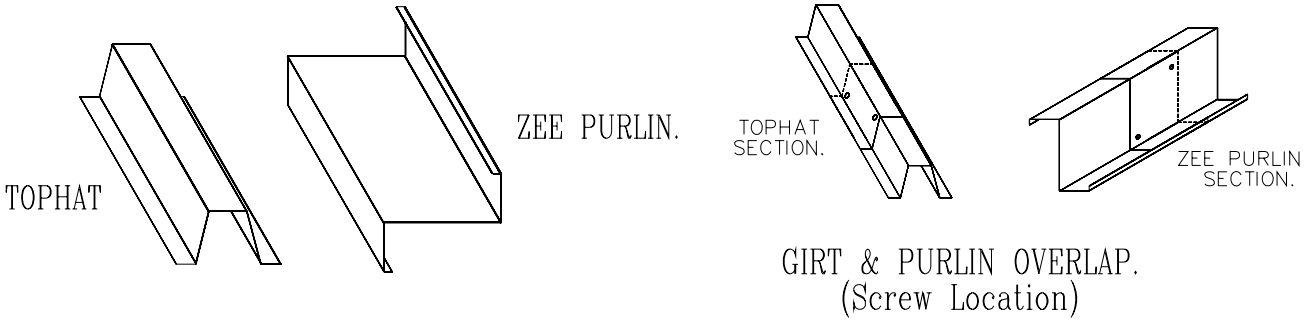
Apex Brackets

6. **Roof Purlin.** Either a Tophat or a ZEE Section depending on the size and type of structure, tek screwed to the rafters to support the roof cladding. Use the frame teks to attach all framework.

7. **Side Girts.** Either a Tophat or a ZEE Section depending on the size and type of structure, attached with frame teks to the columns to support the wall cladding.

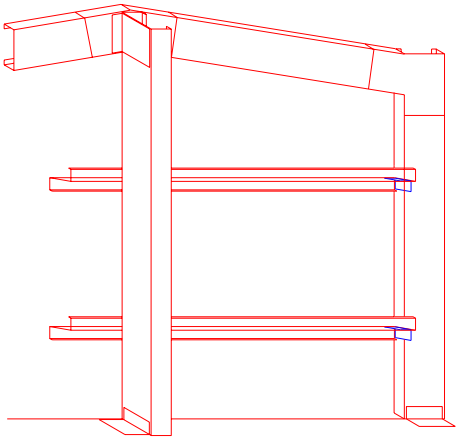
8. **End Girts.** Either a Tophat or a ZEE Section depending on the size and type of structure, attached between the corner columns with one end wall girt bracket

on each end and tek screwed to the end wall mullion where they overlap.

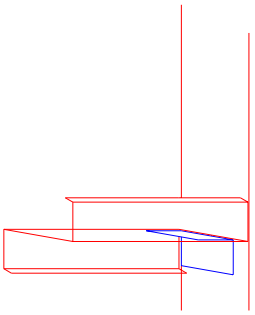


Purlin and Girts

9. **Girt Bracket.** An 'L' shaped bracket to join wall girts to columns and door headers to doorjambs.



REAR WALL SETUP

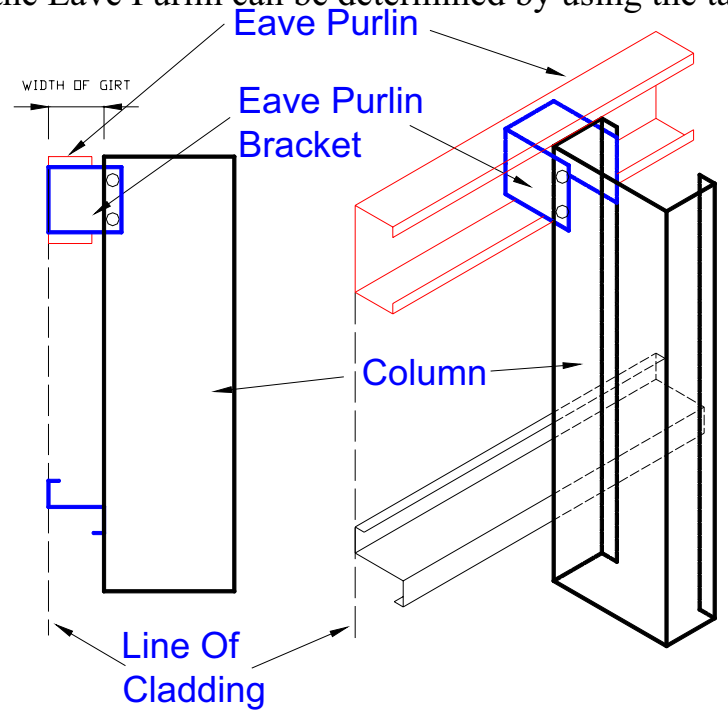


END GIRT
BRACKET DETAIL

10. **Eave Purlin Bracket.** A U-shaped bracket tek screwed to one 'web' and one lip of the column to hold the eave purlin in place. The purpose of the

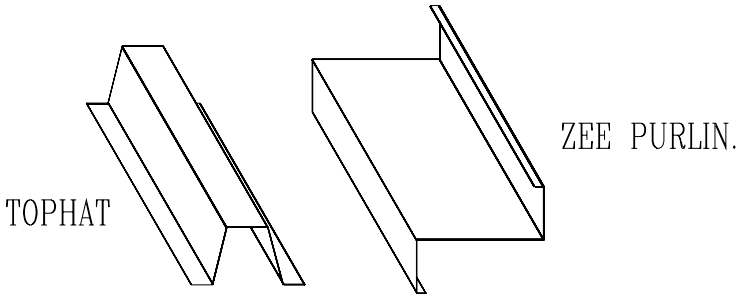
bracket is to hold the eave purlin out and in line with the outside edge of the side girts. The location of the Eave Purlin Bracket on the column, and lean-to column, is detailed in Schedule 8.
Note: For back-to-back columns, a double eave purlin bracket is used. These are screwed to the 'lip' side of both columns.

11. **<u>Eave Purlin.</u>** This is used to support the top of the wall cladding, where it joins the roof cladding. The size of the Purlin varies with the rest of the frame. The location of the Eave Purlin can be determined by using the table in Schedule 8.



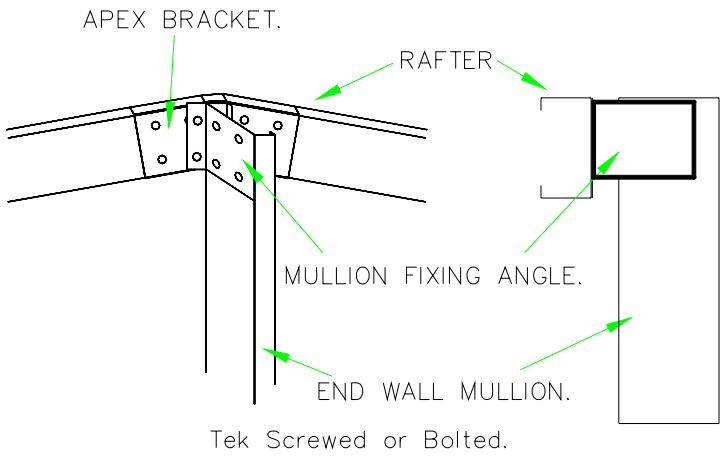
a. **<u>Eave Purlin.</u>** These are a CEE Section screwed onto the column using the Eave Purlin Bracket.

b. **<u>Topspan Eave Purlin.</u>** This is an option in lieu of a CEE Section eave purlin and tek screws directly to the columns. This option can only be used only for frames using Tophat purlins and girt.



12. **<u>End Wall Mullion.</u>** A CEE Section usually the same size as the columns but oriented sideways. (I.e. perpendicular to the end wall.) These are longer than the columns and extend to the top of the rafters. They are attached to the rafters with a Mullion Fixing angle and attach to the footing or slab via a base cleat.

13. **<u>Mullion Fixing Angle.</u>** An 'L' shaped bracket tek screwed to the web at the top of the end wall mullion/s and to the web of the rafter. Centre end wall mullions are situated directly under the apex of the roof and are tek screwed through the Apex Bracket into the "web" of the rafter. Also used to connect the end wall door jamb/s to the rafter. (See diagram)

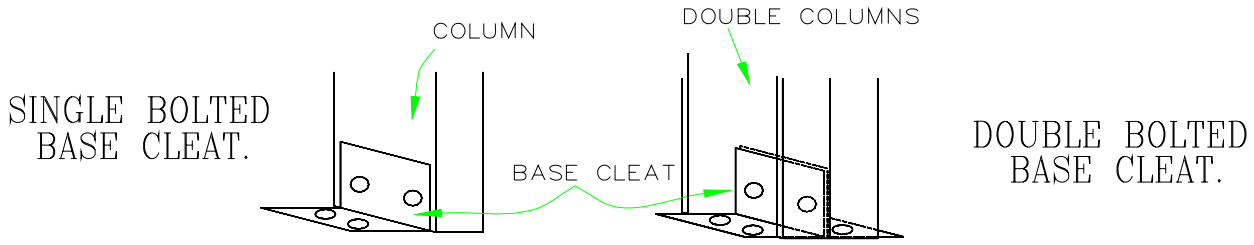


MULLION FIXING ANGLE.

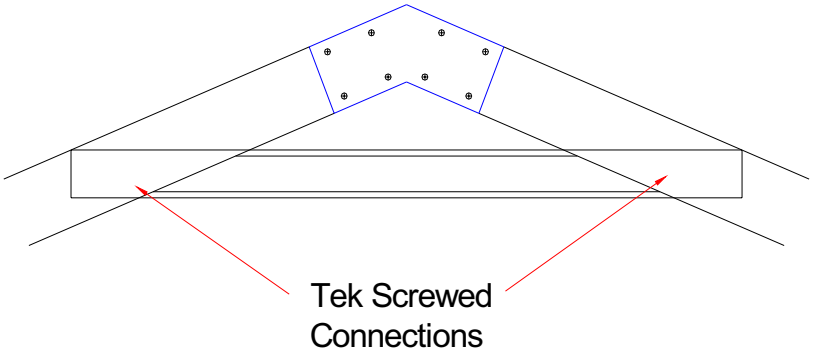
Refer to Engineering plans for fixing schedule

14. **<u>Base Cleat.</u>** Angle bracket tek screwed or bolted to the web of the base of the column, end wall mullions and end wall doorjambs, which are then attached to the footing or slab. Where a double column is used, attach a base cleat

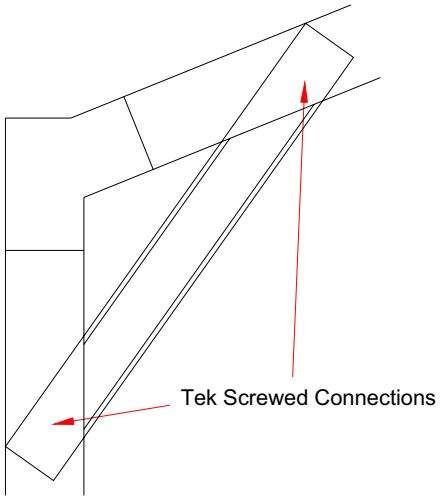
to the inside of each back-to-back column.



15. **Apex Brace.** CEE Purlin, which connects to the intermediate rafters (end rafters only if end wall is not clad) on either side of the apex. The brace is tek screwed to the rafters. These are not used on all buildings. Refer to the plans.

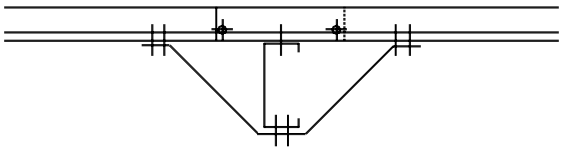


16. **Knee Brace.** CEE Purlin, which forms a brace between the columns to the rafter. These are not used on all buildings. Refer to the plans. Tek screw the knee brace into position.



17. **Fly Brace.** Galvanized strapping tek screwed to the underside of the rafter and the roof purlin on either side. Place two tek screws to each end into the roof purlins and two screws into the bottom flange of the rafter. Refer to plans for

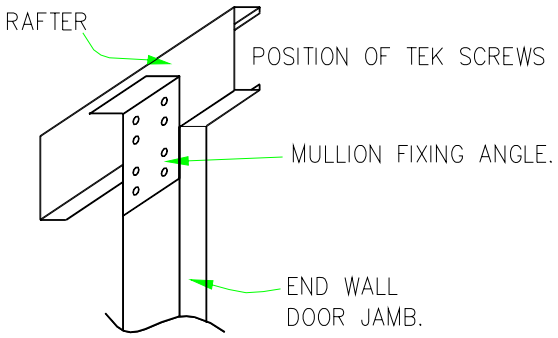
usage.



FLYBRACE.

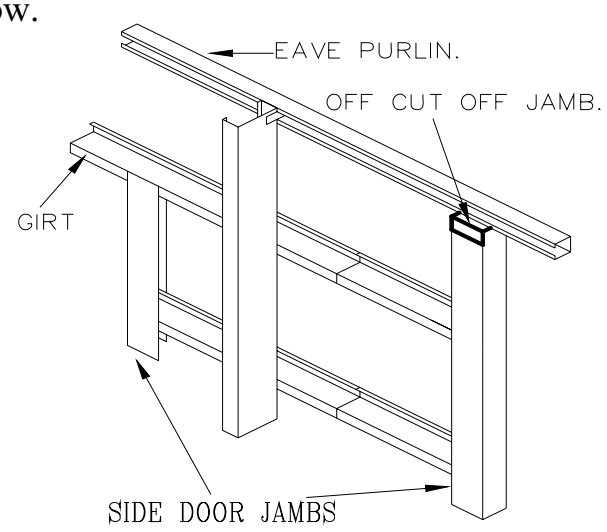
18. **Diagonal Bracing Strap.** Bracing is required on most buildings to reduce movement caused by wind. Refer to engineering plans to type, size, and location and connection details.

19. **Door Jamb.** (End Wall) A CEE Purlin, which is usually, the same size as the main columns, and forms the side framework of the door opening to an end wall. It fits under the rafter and is attached to the web of the rafter with a mullion fixing angle.



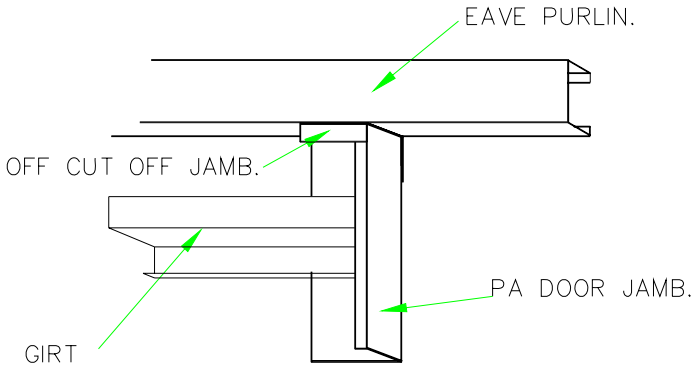
DOOR JAMB

20. **Door Jamb.** (Side Wall) Is a length of folded galvanized section which wraps around the wall girt to form the door opening. The length of the jamb will vary depending on the height of the door and the height of the structure. The door Jamb will either extend to the eave purlin or to the next girt above the opening as illustrated below.



21. **<u>Door Header.</u>** Either a CEE or a Tophat purlin. These are fitted between the End wall doorjambs or the sidewall jamb to form a header above the door. They are secured to these members using end wall girt brackets and framing tek screws.

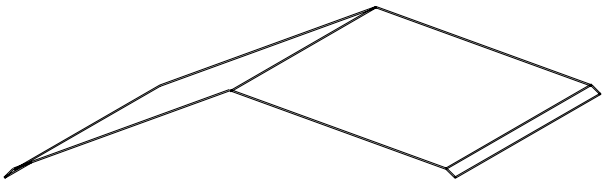
22. **<u>P.A. Door Jambs.</u>** These are of the same configuration as the doorjamb mentioned previous. They form the opening for the framed P.A. Door (Personal Access) to fit into.



PA DOOR JAMB.

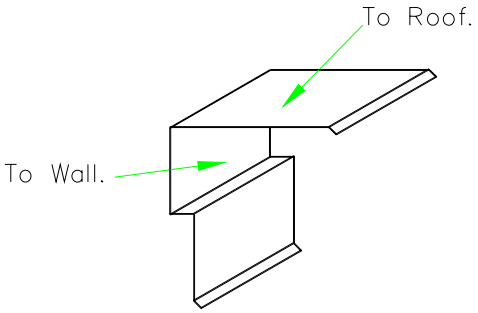
23. **<u>Roof & Wall Sheets.</u>** Wall and roof sheeting is fixed to the wall girts and roof purlins the screws provided. See the manufacturer's product book for profiles and fixing details.

24. **<u>Ridge Cap.</u>** This covers the gap between the two runs of roof cladding at the apex of the roof. Fixed with tek screws into the top of the roof cladding. Below is a diagram of a typical Ridge Cap.



RIDGE CAP

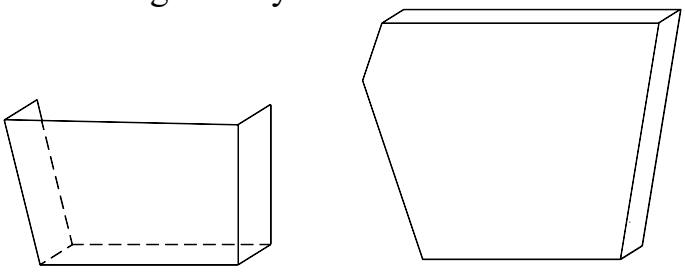
25. **<u>Barge Capping.</u>** To cover the gap between the roof and the wall cladding at the gable ends of the building. Fixed the roof with teks and to the wall cladding overlaps with rivets. Below is a diagram of a typical gable flashing, also called a rake flashing.



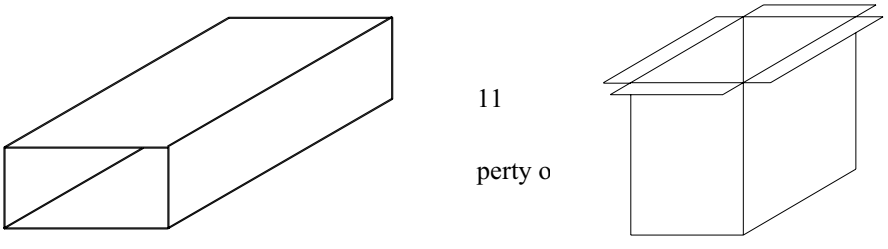
RAKE FLASHING / BARGE CAP

26. **<u>Gutter.</u>** Guttering is optional on all structures. If used, follow the following instructions. Fitted to the top of the sidewall cladding to collect rainwater from the roof sheets. Gutter brackets are attached to the rib on the roof sheet, to the top outside edge of the gutter, to hold the shape of the gutter and to stop it from collapsing under peak volume

27. **<u>End Caps.</u>** To seal gutter ends. Riveted into position and sealed to stop leaks. The shape will match the gutter style chosen.



28. **<u>Downpipe & Nozzle.</u>** Connected to the guttering with a downpipe nozzle to convey the rainwater to ground level. Riveted to the downpipe nozzle at the gutter and held in place with a tek screw drilled into the back of the downpipe from inside the building. Nozzle connects the gutter to the downpipe.



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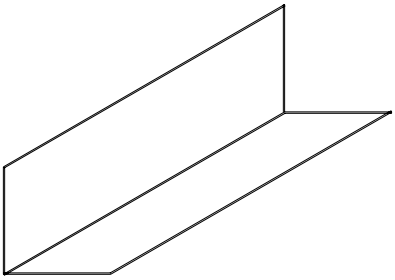
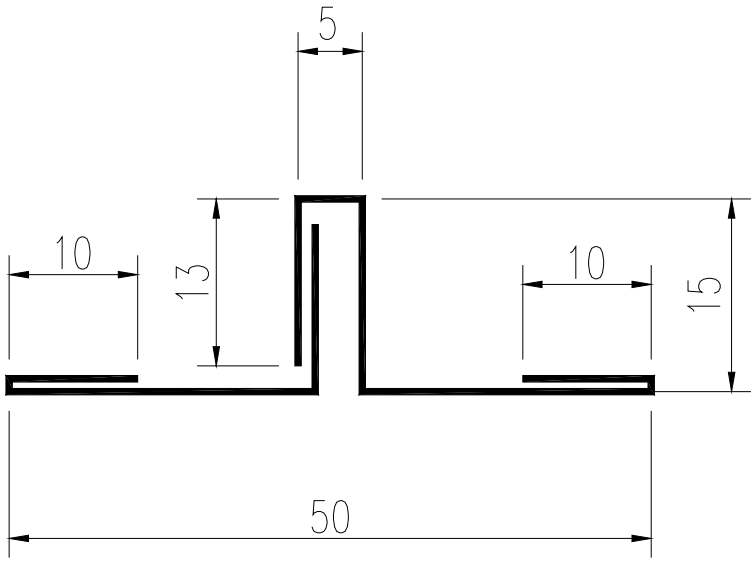
29. **<u>Corner Flashing.</u>** The style depends on the style of building and the type of wall cladding being used. Also used for door trims etc.



CORNER FLASHING.

30. **<u>Horizontal Cladding Joiner.</u>** This Joiner is used when horizontal cladding has to be joined along the length of the building. See details in instructions.



31. **<u>Screws.</u>**

Wall Screws. To screw the wall cladding to the wall girts. These are the smallest screw supplied. This screw comes with a neoprene washer.

Frame Screw. (No Seal) To screw the bracketry to the framework and the purlins and girts to the frame. These are a stubby screw with a built-in washer type head.

Roofing Screw. To screw the roof sheets into the roof purlins. This screw comes with a neoprene washer.

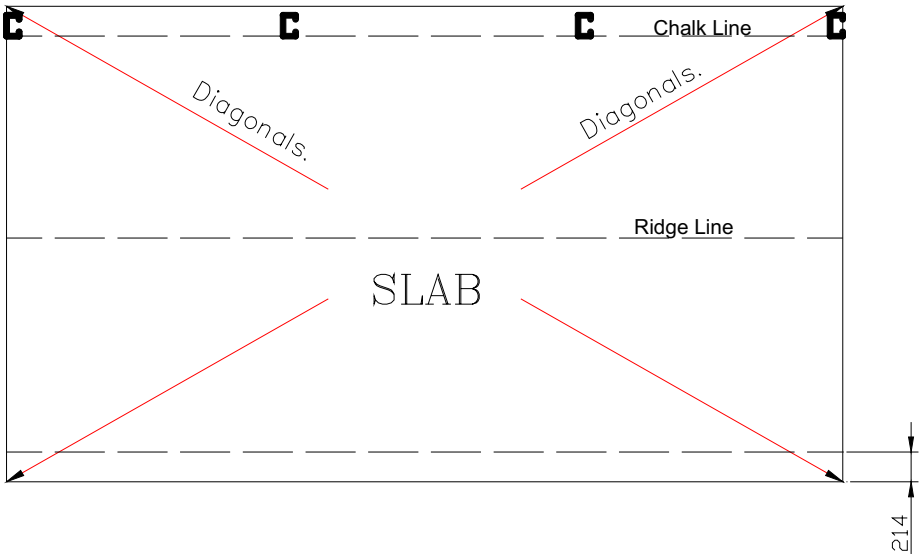
32. **Pop Rivets.** To fix corner flashings, trim angles and barge capping to the wall cladding. Also to fix downpipes to downpipe nozzle.

33. **Structural Frame Bolts.** There are two types of bolt sets supplied with this line of buildings. For the smaller buildings a 12mm bolt set is supplied and for the larger buildings a 16mm bolt set is required. A Bolt set consists of 1 bolt, 2 washers and 1 nut. Due to the bolts being slightly smaller than the punched hole size, it is recommended that framing screws be used in conjunction with the bolts to eliminate the brackets slipping.

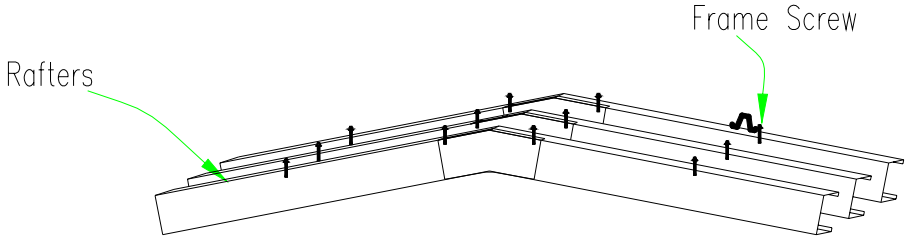
34. **Hold Down Bolts.** These will vary depending on the wind rating and the size of the building. They may be power bolts, wedge anchors, tru bolts, hold down 'U' bolts or chemical anchors.

Part 1 – Tilt up Method

1. The most common type of footing for these buildings is a concrete slab. It is important that your slab or footings comply with the accompanying engineer's details, and are both diagonally square and level before starting.
   The slab size must be the exact size of the building. At this point the location of the inside of the column on the side wall can be marked with a chalk line down the length of the structure. This measurement is calculated by adding the width of the column and the side wall girt together. I.e. C150 column and 64mm side girt equals 214mm in from the side of the slab.
   Pier must be to the correct depth, square and cleaned out to remove any loose soil.
   If using footings other than a slab, refer to the supplier for an engineering output for the dimensions of the specific footing required.

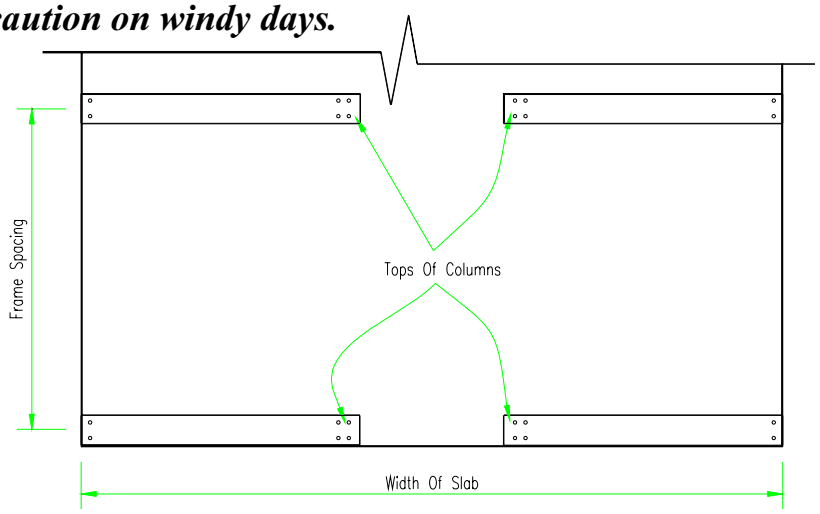


2. Using Apex Brackets, join the rafters together in pairs. Stand rafters side by side on the slab and mark the position of the roof purlins with a permanent marker or crayon, (quantity and spacing as per the MultiBuild Structural Printout) and put aside until required. The diagram below shows an optional way of inserting a temporary frame screw at the bottom of each purlin.

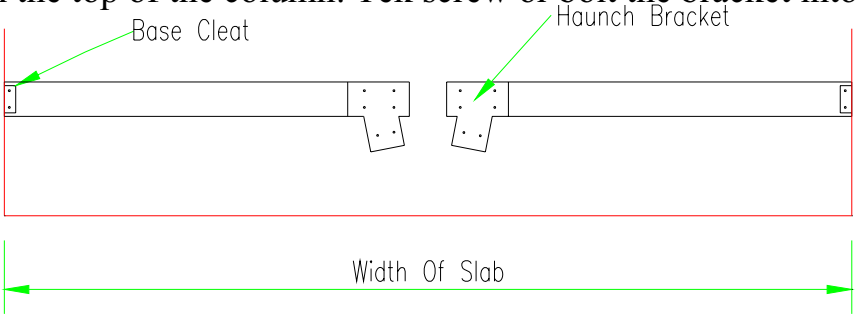


TEMPORARY SCREWS TO POSITION ROOF PURLINS
(Spacings As Per Plans)

3. Lay the columns flat on the slab or ground, with the “web” face up. These columns are to be laid out across the slab in pairs with the top of the column facing each other. Top of the column (if punched brackets are used) will have more than 2 holes punched in it. Distance the columns apart to suit the bay spacings. This wall is then stood and propped, before the second wall is made. ***Use extreme caution on windy days.***

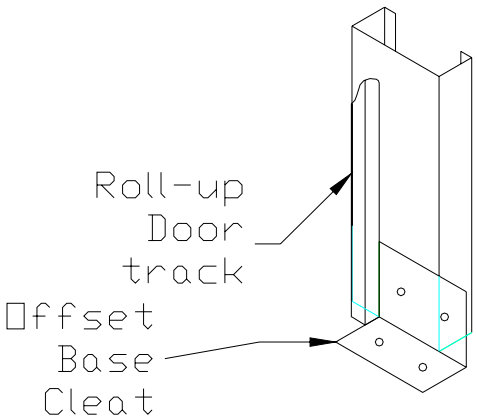


Attach haunch brackets to the web side of the columns. Ensure that the top of the bracket is flush with the top of the column. Tek screw or bolt the bracket into place.



4. Fix base cleat bracket to the web side of the base of the column. Where double columns are used, base cleats are fixed to the inside of the CEE.

Note: It maybe necessary to offset base cleats on door mullions to allow for door tracks.

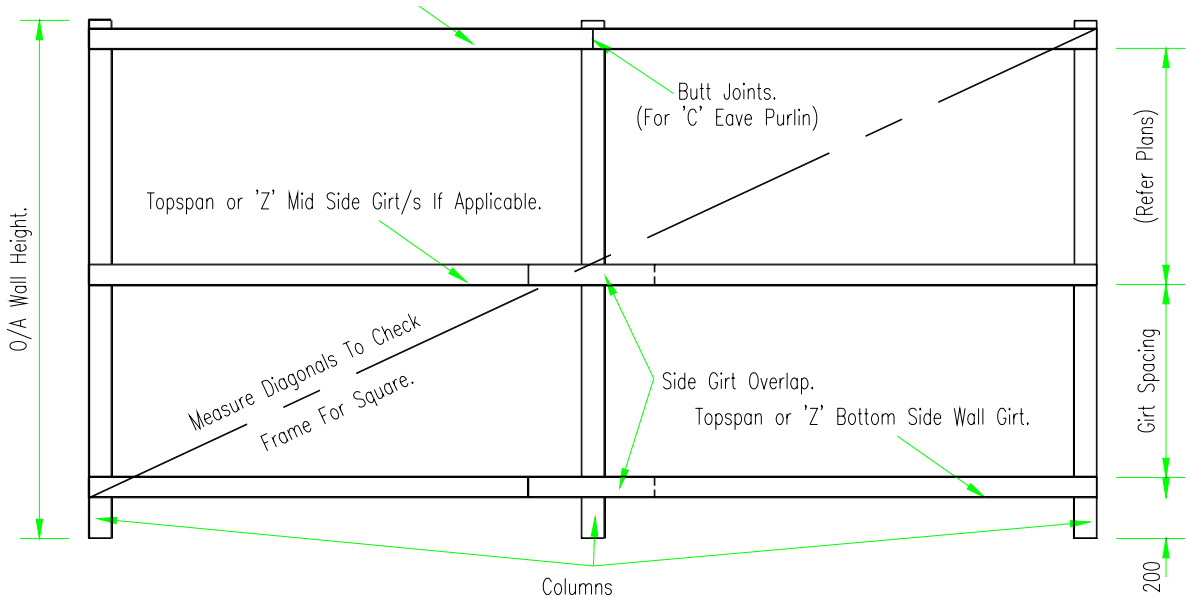


5. Attach Eave Purlin Brackets to the top of each column, using 2 frame screws per side. The Eave purlin should be at the height stipulated in schedule 8. Eave Purlin Brackets come in Single for end columns or for single intermediate columns, and double for intermediate “back to back” columns. They vary in size depending on girt and frame size.

6. The Eave Purlin is a CEE purlin, which is used as the top most side girt. The size of the eave purlin is dependant on the size of the frame. On some buildings, Tophat eaves are used.
Screw the eave purlin to the eave purlin bracket using 2 framing screws per connection. (4 screws when butting purlins together)

7. Join sidewall girts together (with overlap required) to suit the length of the building. For ease of handling, it is recommended that the girts be joined together in multiples of two at a time. First row of girts is 200mm from floor level. If a Side Door is to be installed, refer to the schedule covering this topic. Note: The eave purlin which is a CEE is not overlapped. They are ‘Butt Jointed’ together on an eave purlin bracket.

8. Frame screw top girt (being the eave purlin) bottom side girt and intermediate girt/s to the column using one (1) screw per join ONLY at this stage. The end of the girts will be flush with the outside edge of the end columns. I.e. overall length of the slab.



9. Sight along the bottom of the columns or use a string line to make sure the

bottoms of the columns are in a straight line.

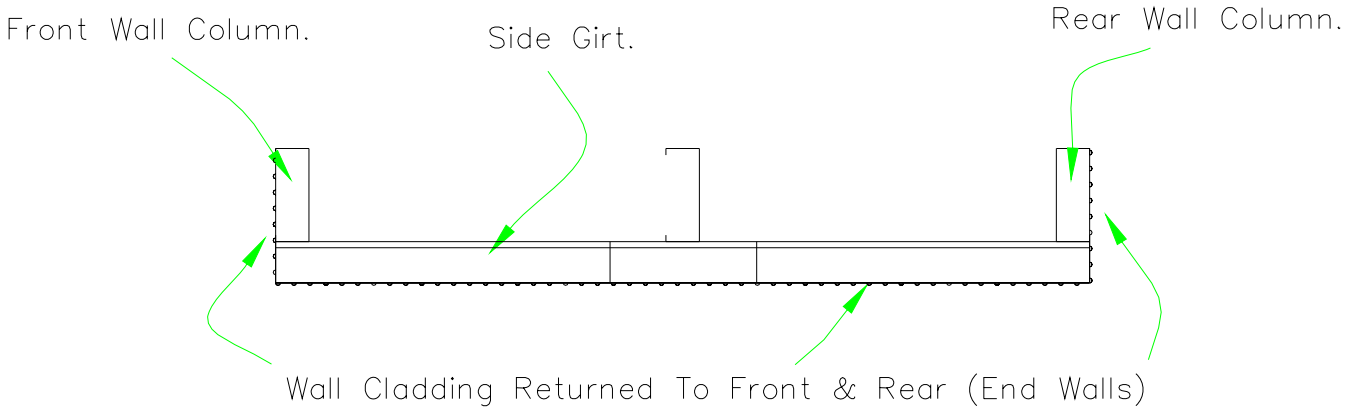
10. Measure the diagonals of the wall frame ensuring that both measurements are the same. If not, adjust the wall, without removing the girt, until the measurements are the same.

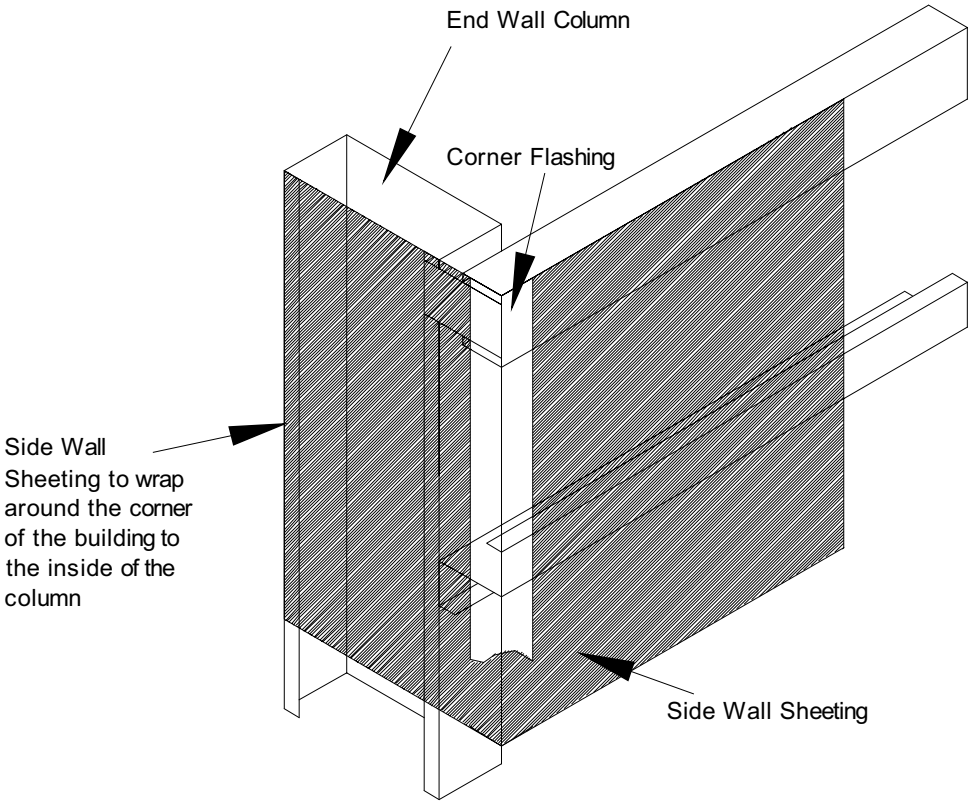
11. Finish screwing the side girts to the columns using 2 screws per connection.

12. At this stage the wall can be stood in place, anchored into place and propped. Alternately, you can sheet the wall on the ground as described below.

13. Start sheeting side walls, (wall cladding to be a minimum of 35mm below the bottom of the column i.e. below the top of the slab) making sure that the male rib of the cladding i.e. the edge of the sheet with the lip, faces the rear of the building. (away from the doors)

14. The quantity of sidewall sheets supplied allows for the sheeting to be folded around both end walls (i.e. front and rear wall) to the inside edge of the column. The sheeting may also be cut at the position where it would normally be folded to allow for the use of corner flashings.
It is most important that the off cuts are then used as per usual on the end walls. (Otherwise a shortage of end wall cladding may occur.)

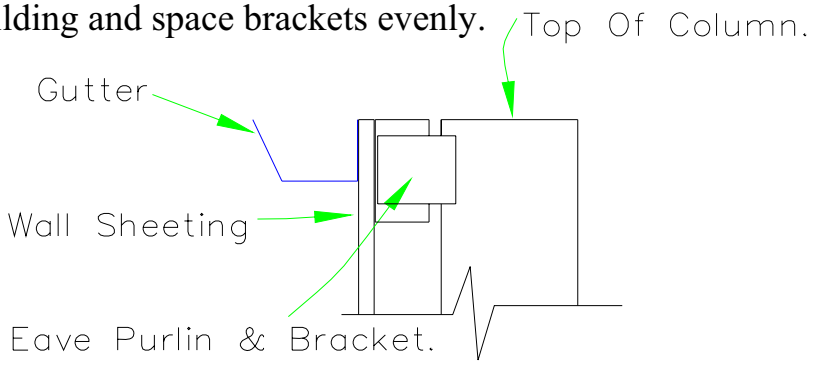




15. Using the required number of wall screws per sheet per girt, fix wall sheets, one sheet at a time, using a straight edge to ensure screws are placed in a straight line. Mark and cut last wall sheet to each sidewall, flush to end of wall girts (if corner flashings are applicable) and use off cut around the corner on end wall.
Where no corner flashings are supplied, fold wall sheeting around corners. Always start sheeting from the inside of the column at the end of building.

16. If a P.A. (Personal Access) Door is to be installed, either on the gable end or side wall, allow the standard overlap on wall cladding, and leave out the wall sheeting where the door is to be positioned, until all other sheets are screwed into position. Install the sheet above the personal door once the height of the door has been established. Do not fit P.A. Door until walls are standing.

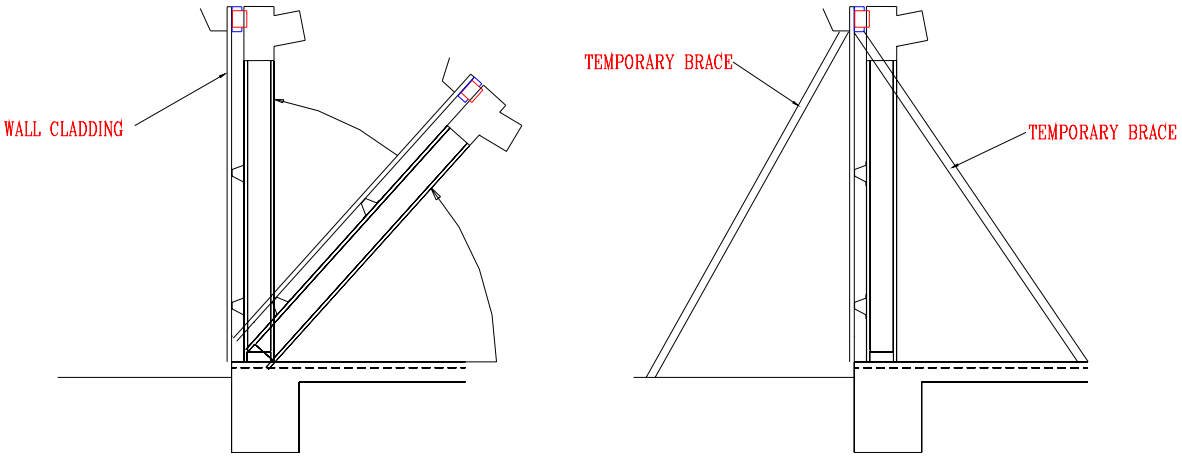
17. Fit gutter to ribs of wall sheets with wall screws. Gutters maybe installed level or with a slight downfall to downspout end. Count the number of brackets per side of building and space brackets evenly.



18. Fit gutter stop ends to the gutter and rivet into position.
Cut a hole in the gutters to suit the size and quantity of the downpipe nozzle as supplied and rivet into position. Apply silicone to the downpipe nozzle and end caps to avoid any leakage.
Overall length of the gutters is the overall length of the building from outside to outside edge of end wall sheets.
Depending upon the length of the structure, gutters can either be fitted now or after the walls are standing.

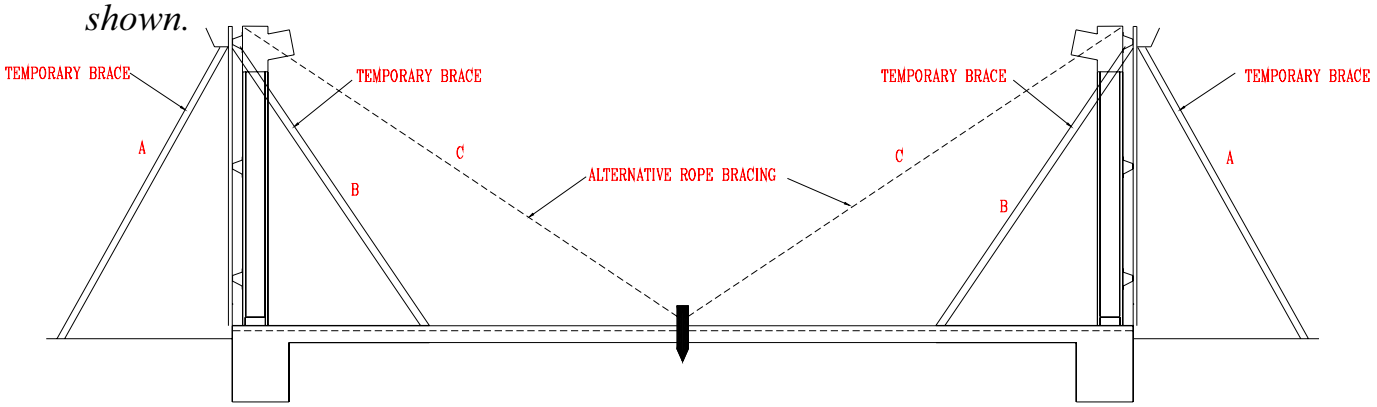
19. At this stage, both sidewalls of the structure are usually sheeted and ready to stand. On smaller buildings where space is limited on the floor slab, only one wall at a time can be built.

20. With the assistance of competent helpers, one sidewall can be lifted into position, keeping the ends of the side girts flush with the ends of the slab. If slab has been made the correct size, the wall can be pulled in so that the wall cladding is up against the concrete (edge of the slab). If using footings other than a slab, stand the walls and measure the width of the building between the wall sheeting. Brace and prop both sides of the wall using timber or alternately ropes tied securely around stakes driven into the ground.
When propping under gutter, it is recommended that soft cloth or similar be tied around the end of props to avoid marking the gutter.
Do not attempt to stand sheeted walls on windy days.

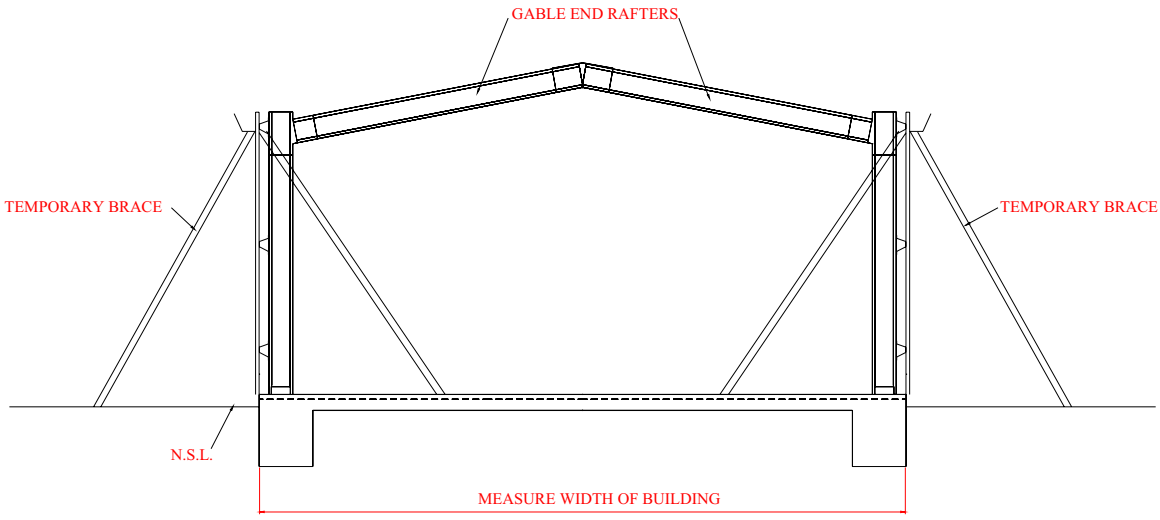


21. Drill and anchor one sidewall to slab, ensuring that all holes are clean before placing masonry anchors. Check that all anchors are tightened down sufficiently and check columns for plumb using a level. Re-adjust props if necessary. Stand other sidewall.

22. Measure width of building between inside of wall sheeting. Anchor and plumb wall and re-prop if necessary. ***Note:*** *If there is insufficient space to use props 'A' then a rope 'C' may be used as well as Props 'B' to hold walls plumb. Rope 'C' is attached to a peg or star post, which is driven into the ground as shown.*



23. Fit gable end rafters (previously made up) into the haunch brackets with the bolts supplied. Using quick release clamps, clamp the rafters to the haunch bracket until all bolts are in position and tightened. The centre of the rafter should be supported by either an offsider or other means until the haunch brackets are connected and the end wall frame is completed.



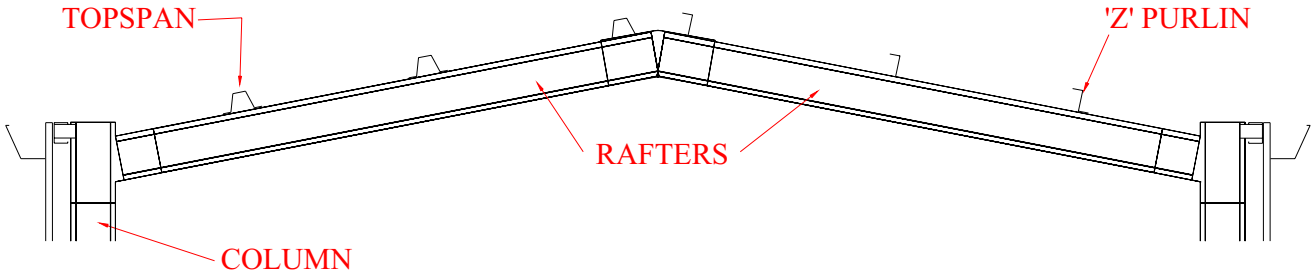
24. Fit intermediate rafters in the same manner. As each intermediate rafter is fitted at least one roof purl must be fitted for the finished end wall rafter to secure them into position. Ensure that the spacing between the rafters is the same and the spacing between the columns.

25. Fit any knee or apex braces as supplied. Refer to engineering plans and

specifications for size, fitting location and fixing detail.

26. Fit gutters and gutter brackets. (See step 17)

27. Attach the roof purlins on the previously marked rafters. Roof purlins end flush with the outer face of rafters on the gable end. Ensure that the end wall assembly is plump before the roof purlins are fully secured.
It is advisable to fit the 2 roof purlins (one either side of apex) at this stage, checking frame spacings between the rafters correspond with the frame spacings between the columns. Fit and screw all purlins to portals. Check rafters for plumb. **Refer to Engineering Plans for spacing of roof purlins allowed.**
Roof purlins may be Topspan or 'Z' Purlin.

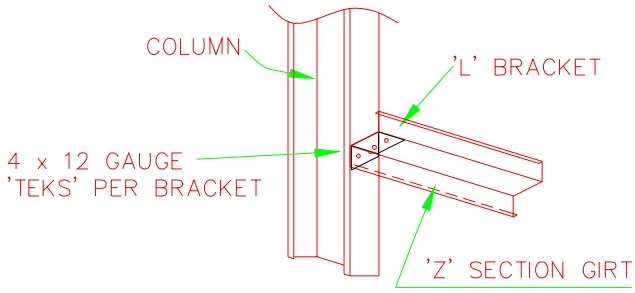


OPTIONAL ROOF PURLIN LAYOUT SHOWN WITH TOPSPAN PURLIN & ZEE PURLIN

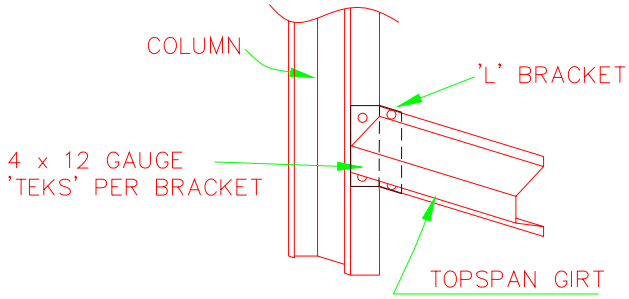
28. Check end walls for plumb by placing a level against the flange side of the end wall columns. Prop until end walls are fully sheeted and screwed.

29. Fit end wall mullion/s. (long side of the C-section perpendicular to the end girt). End wall mullion/s is offset by the size of the end girt from the edge of the slab. Screw the base cleat to the bottom of the end wall mullion and fix the top of the mullion to the "web" side of the rafter with a mullion fixing angle
End wall mullion/s is usually equally spaced.
If only one mullion per end wall is used then these will be attached to the end wall rafter's apex bracket with a mullion fixing angle.
Check end wall mullion for 'plumb' by using a level on the 'web' side.
Check that the distance from the edge of the slab to the outside 'flange' side of mullion is the same depth as the end wall girts.

30. Screw the end wall girt brackets to the inside edge of the end wall columns. Attach the end wall girts to these brackets with screws, overlapping the end wall girts past the end wall mullion/s.

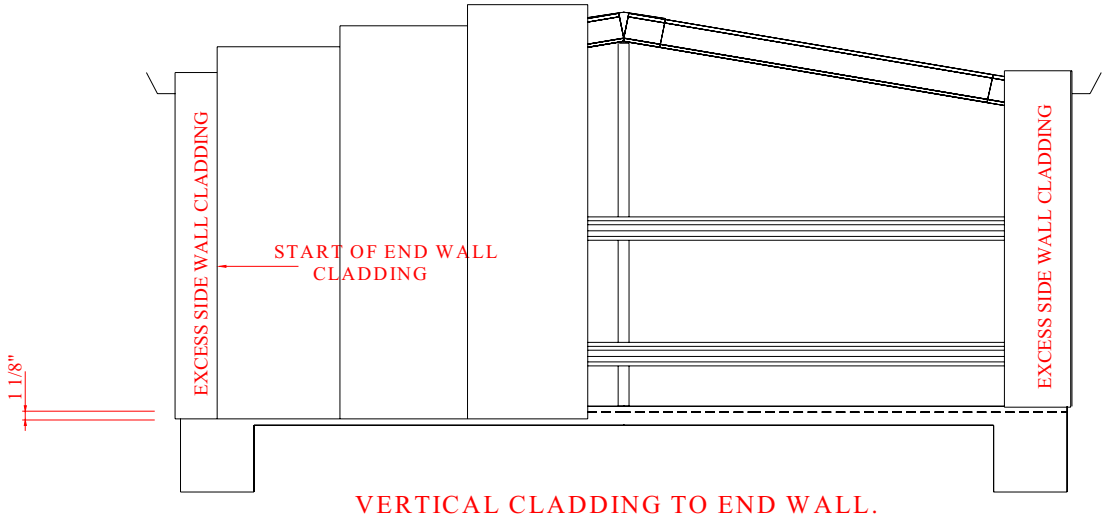


ZEE SECTION END WALL GIRT



TOPSPAN ENDWALL GIRT

31. Start cladding the end wall/s. Keep the bottom of the end wall cladding level with the bottom of the sidewall cladding. Check each sheet for plumb with a level. Place two screws per sheet per girt at this stage. (One to each side of sheet) Once all end wall cladding is in place, flick a chalk line for each row of girts and finish screwing all cladding into position.
Remove Props.
Note: Sidewall cladding is folded around corners to the inner face of the corner column. Gable end wall cladding is NEVER folded as it starts from the inner face of the corner column where the sidewall cladding has ended.



VERTICAL CLADDING TO END WALL.

If door/s are being installed into one end wall (i.e. gable end wall)
Find End Door Jamb/s and place base cleat to bottom (inside of 'C' purlin so as not to interfere with roller door tracks.) and a mullion fixing angle at the top. Measure door size and allow clearance (2' for domestic doors and 4' for industrial doors.)
Note: On some buildings with 2 doors to the end wall, only 1 End Door Jamb is required. The opening size left for the door may be slightly more or less than the measurement required. The doors will still fit these openings.

32. Plumb and prop door end columns at this stage, before fitting End Door Jamb/s.

33. Fit Door Header/s using a girt bracket to each end.

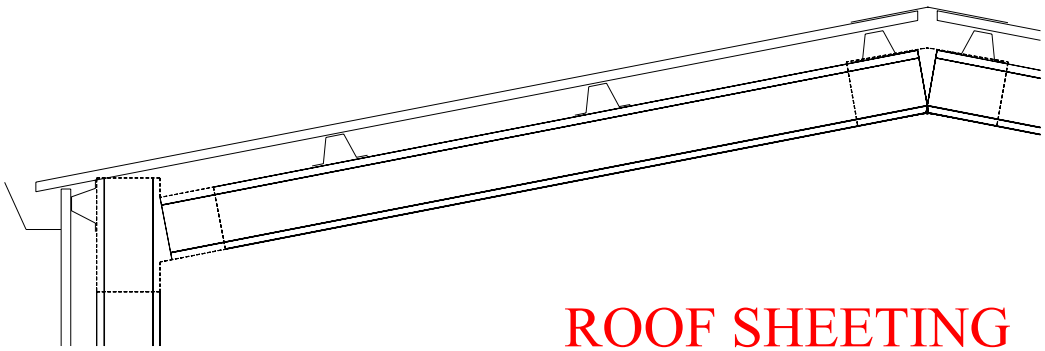
34. If a door is offset, or only one door is used, then additional end wall girts will need to be fitted between the end wall column and the doorjamb. These are fitted using Girt Brackets.
Clad front wall of garage (door end).

35. At this stage, fit the PA door jambs (only if applicable), before the roof is installed. Cut out the bottom row/s of wall girt where a space was provided for the PA door. The PA doorjamb is made to fit around the ends of the wall girts. The top of the jamb is connected to the girt above the opening. Ensure that you measure the doorframe size, and that both jambs are plumb before finally securing them to the wall girts and attaching them to the concrete slab.

36. **Before fixing the roof sheeting into position, check that both side walls are straight by using a string line along the inside of the columns. Re-prop intermediate columns if necessary. This also keeps structure more rigid while working on the roof.**

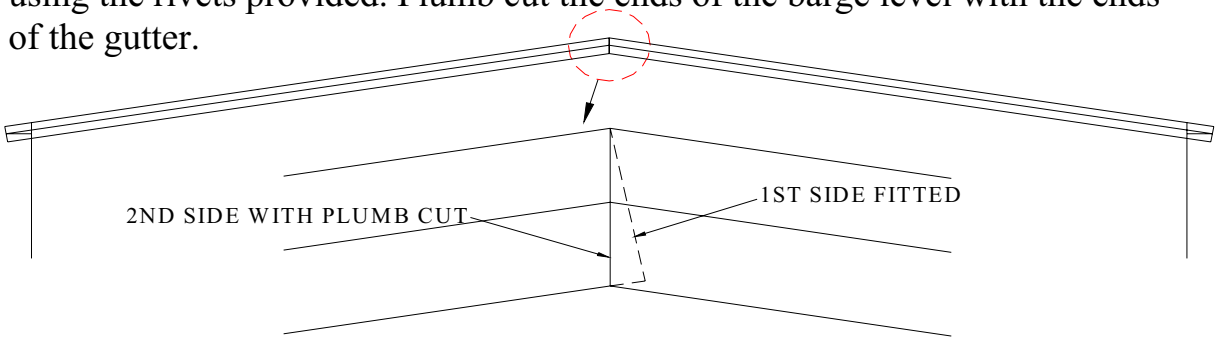
37. Fix roof sheeting allowing approximately half the gutter width overhang into the gutter. Start sheeting from door end (if applicable) Check that roof sheets are parallel to the front edge of gutter at all times. **Be sure to turn up apex end of roof cladding to help keep building waterproof.**

38. Install ridge capping, ensuring that the ends are flush to the ends of the roof cladding. It is best to keep the joins facing away from prevailing weather and run a bead of silicone between ridges at overlaps. (See diagram below)



ROOF SHEETING
With Ridge Capping

39. Fit Barge Capping to each gable end of building. Sit one length of the flashing into position and mark centre line of ridge cap. Fix into position. Sit the opposite barge into position allowing a 10mm overlap over the centre on the ridge. Mark a vertical cutting line (plumb cut) down the face of the barge using a level and trim. Fasten the Barge into position using the Roof Flashing screws provided. Secure the vertical edge of the barge to the end wall sheets using the rivets provided. Plumb cut the ends of the barge level with the ends of the gutter.



BARGE CAPPING

40. Fit downpipes by riveting to dropout and screw or rivet from inside of garage through rib or pan into back of downpipe towards bottom. An astragal can be formed by trimming 50mm off the end of the downpipe and trimmed and folder into the desired shape.

41. Install door brackets making sure they are level. Install doors following the instructions supplied with the door.

42. Install fly bracing if specified. Refer to Specifications.

43. Make a final check on the structure. Make sure that all base cleats have been tightened down firmly. Check that the roof and wall screws are complete.

44. Brush the complete structure down, including the roof with a soft hair broom to remove any swarf (metal dust and filings caused by angle grinder)

45. Hose down the concrete slab to remove any steel particles, screws and rivets which may puncture a tire. Stand back and congratulate yourself on a job well done.

PART 2 - FRAME FIRST METHOD

Before commencing the erection of the structure, it is an idea to set out the locations of each column using a chalk line to ensure all columns are in a straight line. The slab size is the neat measurement between the wall sheets (i.e. overall measurement from outside to outside of wall girts.)
Note: this method is a lot slower than the tilt up method, but is better for larger structures or in windy conditions. Most procedures covered in Part 2 have

been described in Part 1. Please read this section first.
WARNING. The joint between the columns and rafters, and the apex will need to be temporarily braced before lifting into position.

1. Make each of the portal assemblies on the ground. Check them for square and bolt them together.
   TIP: Line up the bottom of the columns with the edge of the slab, and measure the diagonals for square. Trace around the completed portal assembly once it has been squared up and remove from this location. You now have a template to make the subsequent assemblies.

2. The first of the portals is positioned on the edge of the slab, or where the edge of the slab should be if other foundations are being used. Stand the assembly and prop securely. Anchor the base cleats to the concrete with the anchor bolts provided. Use a chalk line to mark the alignment of the remaining columns.
   Note: The column will be located the depth of the side girts in from the edge of the building. I.E. if the structure has a nominal width of 7m, and the side girts are 64mm Tophats, then the outside measurement from column to column will be 6875mm.

3. Install the second of the portal assemblies, and once in position, install a couple of the roof purlins to hold it into position.

4. Continue installing the portal assemblies and roof purlins until the last of the portals is in position.

5. Install the eave purlins located at the tops of the column. Remember these are butt joined not overlapped.

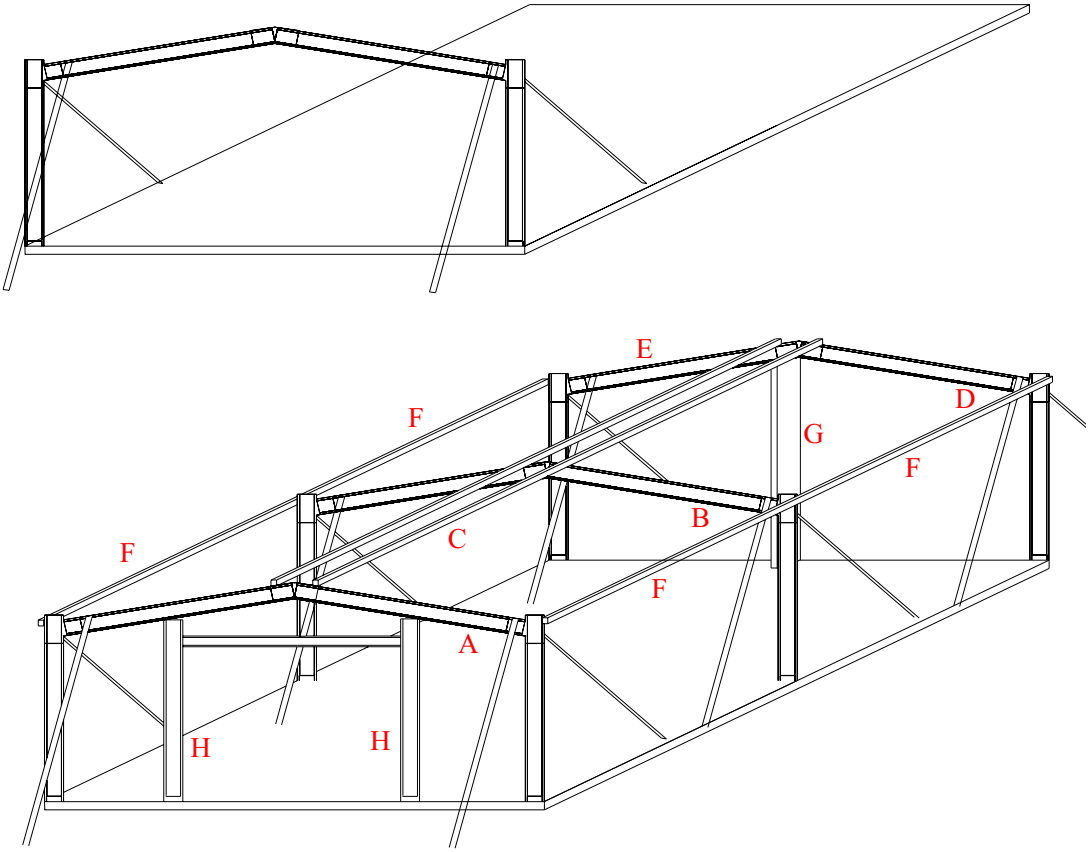
6. Install the side wall girts at the spacing required.

7. Install the end wall mullion using the mullion/s to angle bracket/s.

8. Insert the end wall girt brackets and the end wall girts.

9. Insert the remaining roof purlins at the required spacing.

10. Install the door jambs and headers.



ERECTING PROCEDURE FOR FRAME WORK

1.ERECT PORTAL FRAME .A.
2.ERECT PORTAL FRAME .B.
3.ERECT APEX PURLINS .C.
4.ERECT PORTAL FRAME .D.
5.ERECT APEX PURLINS .E.
6.ERECT EAVE PURLINS .F.
7.INSTALL SIDE WALL GIRTS (NOT SHOWN).
8.INSTALL END WALL MULLION .G.
9.INSTALL END WALL GIRTS (NOT SHOWN).
10.INSTALL REMAINDING ROOF PURLINS (NOT SHOWN).
11.INSTALL ROLLER DOOR JAMBS .H.
12.INSTALL ROLLER DOOR HEADER .I.

Schedule - 1 Tools

The following is a list of basic tools required:

1. Hammer

2. Small Tape Measure

3. Long Tape Measure

4. Quick release clamps

5. Snips

6. Socket Set

7. Crayon or Permanent marker.

8. Pencil

9. Score and Snap Knife for scribing and folding wall sheets

10. Chalk line

11. String line

12. Water level or Auto Level

13. Builders level

14. Square

15. Screw Drivers

16. Tek Screw Gun or Electric Drill with Clutch with a 5/16" Hex Head and a wafer tek bit to suit wafer screws. (If supplied in kit)

17. Electric Drill (a battery drill will also be very handy)

18. Nibbler OR

19. Angle Grinder

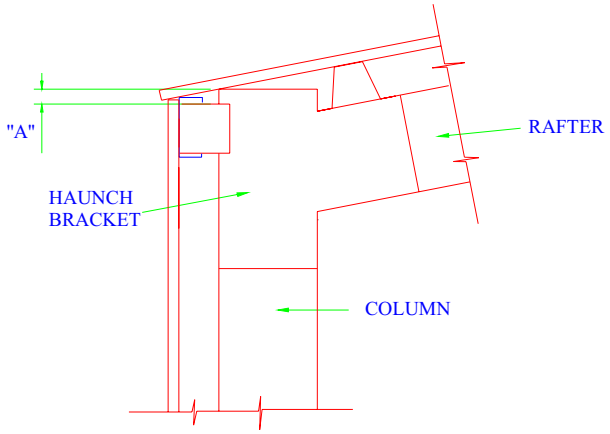
20. Silicone and Calking Gun or alternately 2 tubes of Gutter Silicone.

21. Multigrips or pliers.

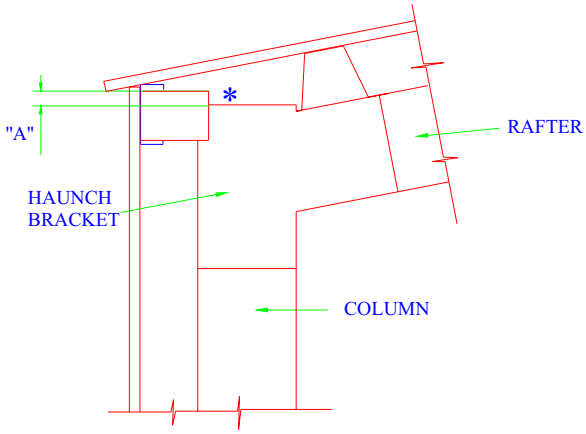
If using an angle grinder BEWARE.

Not only can these be extremely dangerous to operate, they leave ‘swarf’ on zinc and Colorbond cladding, which can cause rusting and void any warranties. Be sure to thoroughly sweep any ‘swarf’ off with a soft hair broom.
DO NOT USE NEAR ANY COLORBOND FENCING, MOTOR VEHICLES OR GLASS.
If using an angle grinder be sure to wear safety goggles and follow all safety regulations in relation to the use of power tools.

Schedule 2 - Eave Purlin Bracket Location



DETAIL - 1



DETAIL - 2

* NOTE: FOR ALL MINUS DIMENSIONS SEE DETAIL - 2

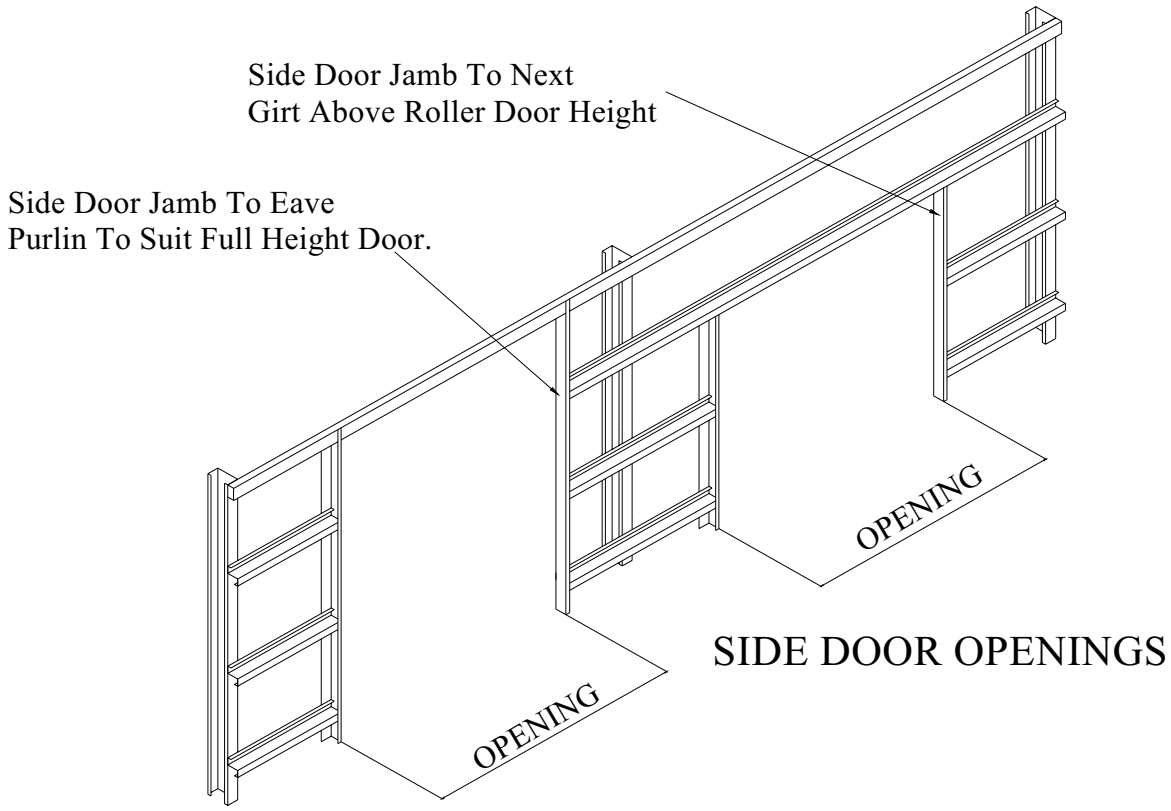
	TOPSPAN 64					TOPSPAN 120				
PITCH	**11**	**15**	**22**	**30**	**45**	**11**	**15**	**22**	**30**	**45**
C150	21.5	27.5	31.5	45.5	72.5	-23	-14	-5	16	52
C200	21.5	26.5	35.5	45.5	72.5	-22	-14	-0	16	52
C250	-	-	-	-	-	27	35	51	84	135
C300	-	-	-	-	-	38	47	63	84	-
	"A"					**"A"**				

	'Z' PURLIN 100					'Z' PURLIN 150				
PITCH	**11**	**15**	**22**	**30**	**45**	**11**	**15**	**22**	**30**	**45**
C150	-21	-14	-7	13	45	-62	-52	-41	-16	24
C200	-20	-14	2	13	45	-61	-52	-35	-16	24
C250	-	-	-	-	-	-12	-1	18	53	110
C300	-	-	-	-	-	-1	9	28	-	-
	"A"					**"A"**				

Schedule 3- Installation of Side Door.

1. Opening size for the side door will be the nominal width of the door. Cut the wall girt to allow for the width or the door to be installed.

2. If there is a side girt between the top of the door and the top eaves purlin then the jamb will suit this length. IF THERE IS NO GIRT ABOVE THE OPENING, (i.e. between the top of door and top eaves purlin) then the length of the jamb will be to the top eaves purlin. It is to be attached to the eave purlin or side girt whichever is applicable.



SIDE DOOR OPENINGS

DOOR OPENING EQUALS WIDTH OF DOOR CURTAIN LESS
- FOR INDUSTRIAL DOORS DEDUCT 100mm
- FOR RESIDENTIAL DOORS DEDUCT 50mm

NOTE: FULL HEIGHT DOORS CAN VARY FROM
300mm - 600mm SHORTER THAN WALL HEIGHT.
E.G. 2.4m WALL HEIGHT = 2.1m HEIGHT DOOR
E.G. 5m WALL HEIGHT = 4.4m HEIGHT DOOR

3. Fit L/H and R/H side doorjamb to the next side girt above door opening if

there is any. If there is no side girt above the opening, then it is to be attached to the eave purlin. Cut corners of the jamb vertically to the required height, fold back and screw to the underside of the eave purlin. Screw the two upright (uncut) legs to both sides of the eave purlin. Screw the base cleat to the bottom of doorjamb and screw the doorjamb at intersection of girts, which were cut off.

4. Fit the CEE section door header between the jambs using girt brackets and screws. Height of door header is equivalent to the height of the door opening required.

5. Side doors can be located anywhere between two sidewall columns. If the door should be offset to either the Left or Right of the Bay, allow a minimum of 100mm for the door brackets, from door opening to inside face of column.

6. Follow manufacturer's installation supplied with the door.

7. Fit wall sheeting above and around the opening.

8. Trim the opening.

Schedule 4 - Installation of end door.

1. Opening size for the end door will be the nominal width of the door. Fit L/H and R/H end wall doorjambs, usually CEE's to the underside of the rafter with mullion fixing angle. (Note: For exact fit roller doors to end wall, only one doorjamb is required, between the doors.) The orientation of the end wall doorjamb is in the same manner as the columns of the structure. The distance between the jambs is the nominal width of the door. Fit base cleat to bottom of column.

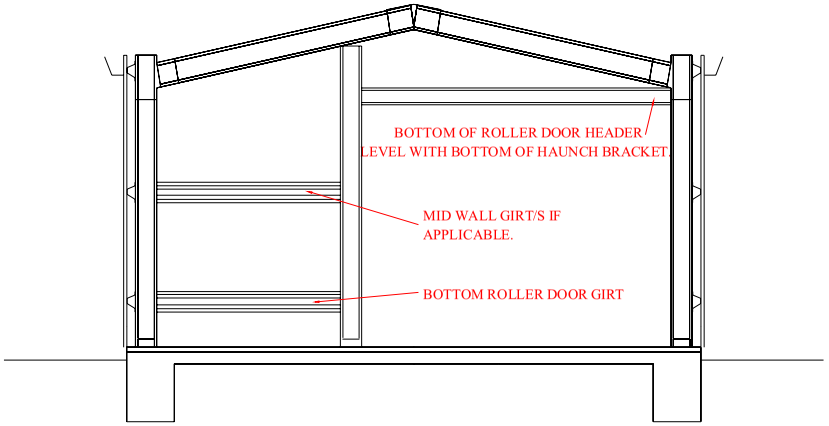
2. Attach the CEE section door header between the jambs above the door opening with an angle bracket and screws. Height of door header is equivalent to the height of the door opening required, but will usually be at a maximum level of to the bottom of the haunch brackets. The door header is flush to outside face of the doorjamb. Level across to the other jamb. Web side of CEE section faces outside of the structure.

3. End wall door/s must be located as per plan, as end wall doorjambs are usually cut to required size.

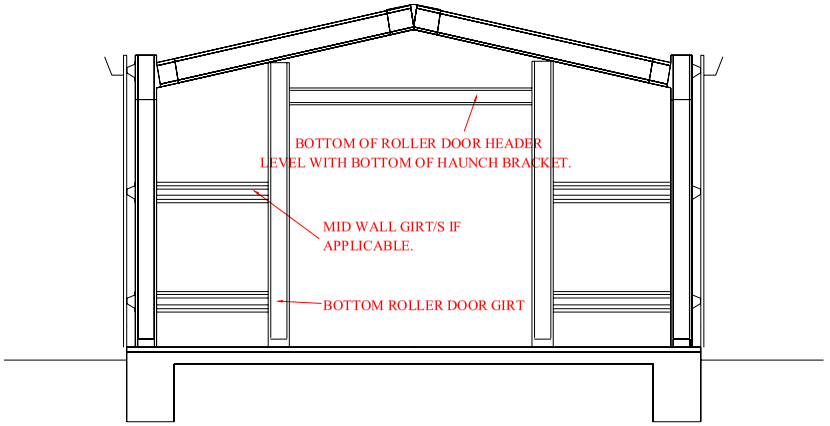
4. Follow manufacturer's installation instructions supplied with the door.

5. Fit wall sheeting above and around the opening.

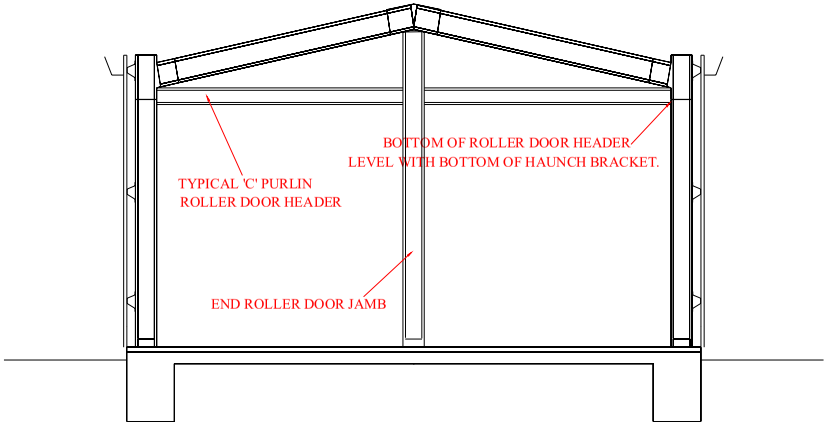
6. Trim around the opening.



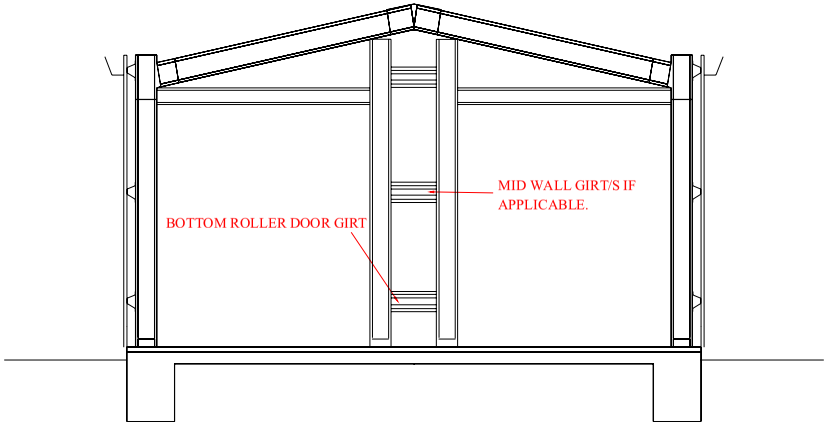
TYPICAL GARAGE
WITH ONE OFFSET ROLLER DOOR



TYPICAL GARAGE
WITH ONE OFFSET ROLLER DOOR



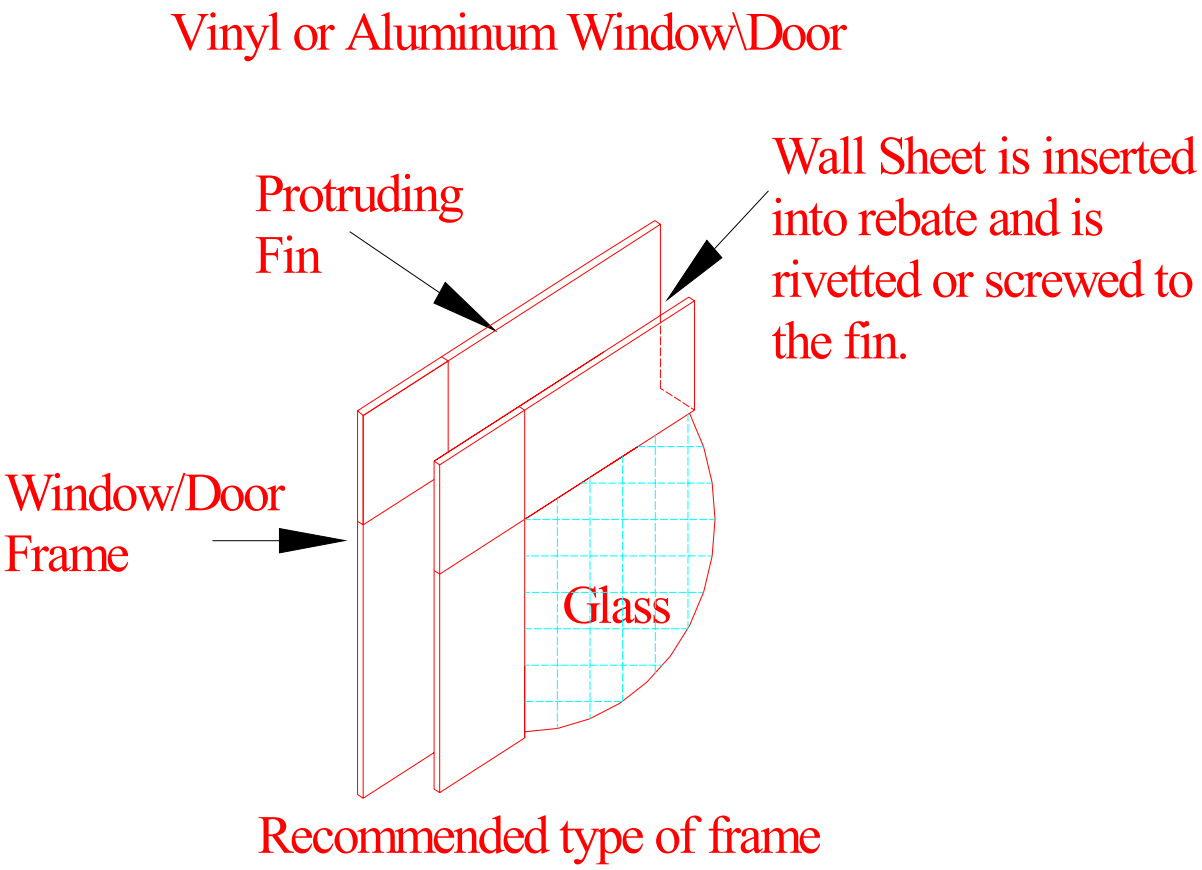
STANDARD TWO DOOR DOUBLE GARAGE
WITH ONE END ROLLER DOOR JAMB



TWO DOOR DOUBLE GARAGE
WITH WIDE CENTRE MULLION

Schedule 5 – Fitting Windows and Sliding glass doors.

The windows and glass sliding doors used have a reveal or fin protruding from the centre of the window frame which extends for approximately 30mm.

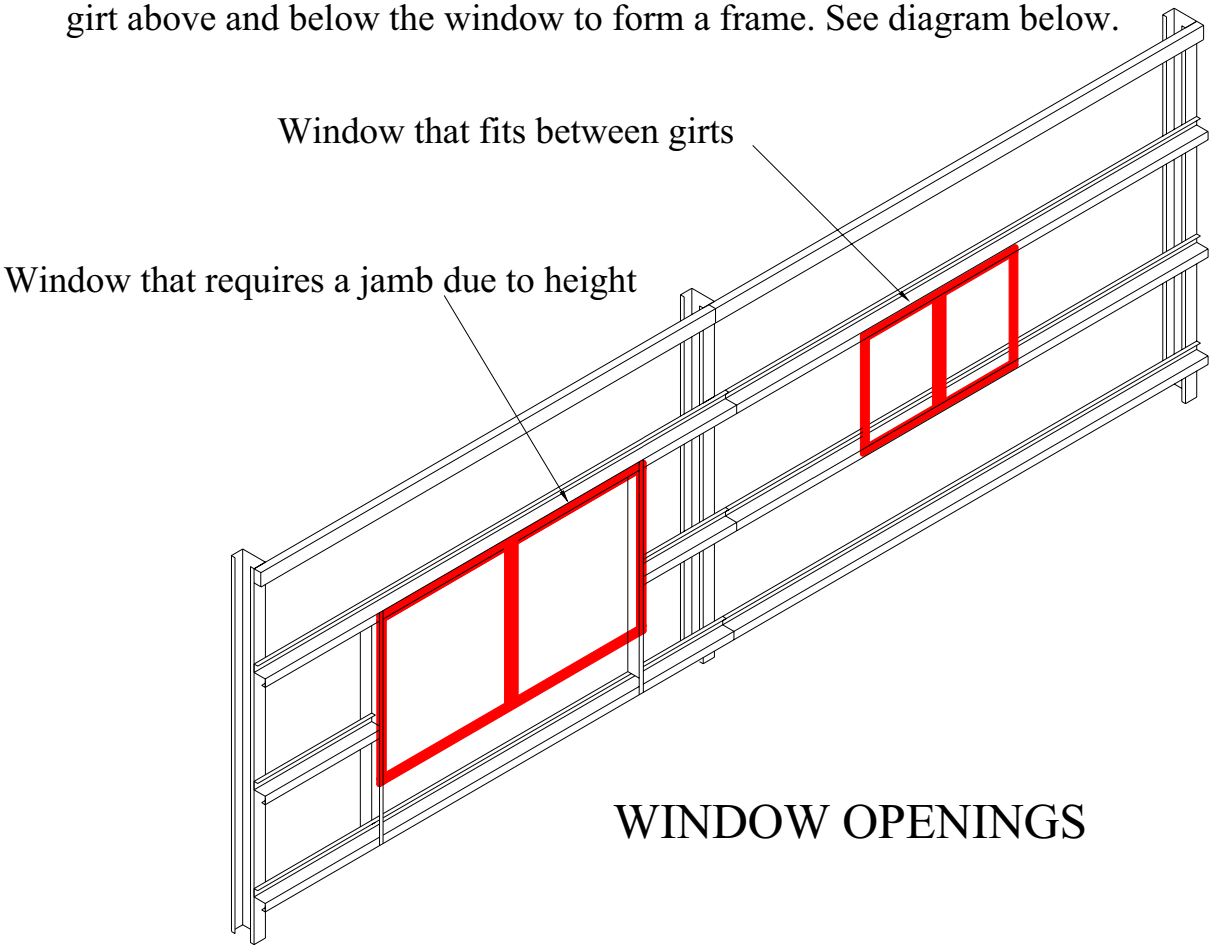


Windows and glass sliding doors may be installed in the following ways:

1. Providing that the height of the window is not greater than the spacing between the girts, the bottom flange of the window can be attached to the girt found at about 1200mm from the ground. The protruding fin is attached directly to that girt.

2. The top of the window is attached to either the next girt above the window, the wall sheeting if close to a girt, (200mm) or directly to the eave purlin in particular instances.

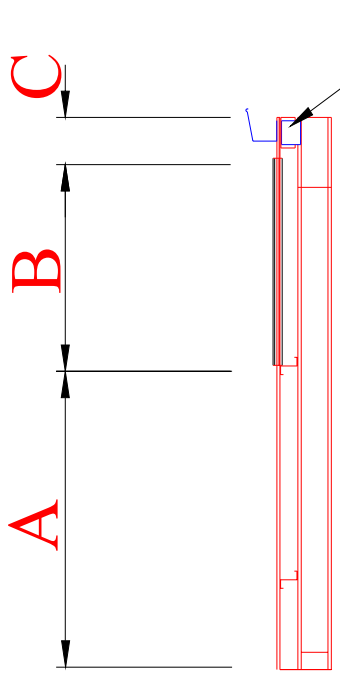
3. Windows that are higher than the girt spacing and glass sliding doors will require side door jambs to be fitted so that the side flanges may be attached to these jambs for rigidity. Measure the width of the door or window and allow a slight clearance so as not to break glass when installing into opening. Install the jambs as per the instructions found in Schedule 2. Note: windows that are higher that the spacing between the girts will only require a jamb between the girt above and below the window to form a frame. See diagram below.



WINDOW OPENINGS

4. Trim sheeting to fit around the window or door and fasten to window or door reveal with wall screws or rivets. These will need to be measured and cut on site.

Note: on end walls, the sheets above the window or door will need to be measured and cut to the required length with the required angle to suit roof pitch.

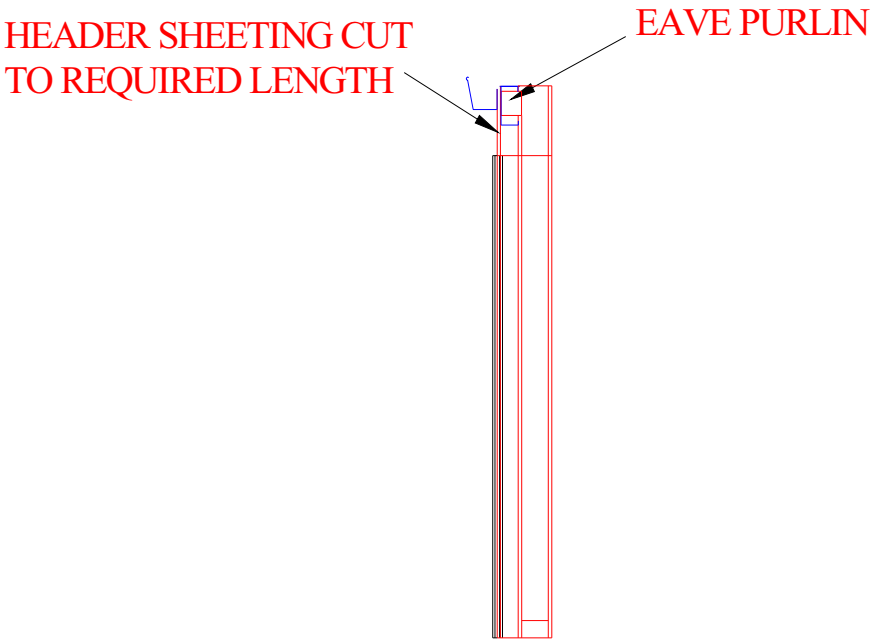


MEASUREMENT C EQUALS:
REMAINDER OF WALL SHEET

MEASUREMENT B EQUALS:
WINDOW HEIGHT

MEASUREMENT A EQUALS:
BOTTOM OF SHEET TO TOP
OF LEADING EDGE OF SIDE GIRT.

WINDOW INSTALLATION



SLIDING GLASS DOOR INSTALLATION