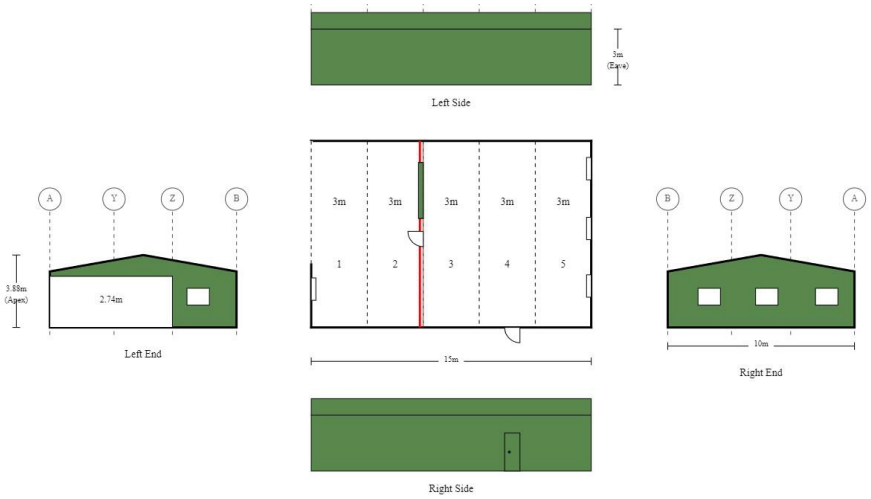


Job Number: **WSS234854**

Customer Name: Boreland, David

Site Address: 53 Moreton St Toogoom QLD 4655 Australia

Construction Manual

Wide Span Sheds
No Compromise Steel Building Solutions

Disclaimer

This manual is provided to assist with the erection of your steel building. Any person constructing the building needs be competent in general construction processes. You may also need a license to construct the building (consult you state building authority). You should also ensure that relevant construction insurance has been taken out.

The building is fully engineered and MUST be built in accordance with the Manuals, Plans and the Bill of Materials fo the engineering to be valid. This includes the proper use of construction bracing, fixing of all screws and the correct bolts. If there are any discrepancies between the Plans, Manual and Bill of Materials please contact your Customer Service Representative for clarification.

Construction Bracing is **essential** to ensure the site and building are safe during the construction process.

Refer to the construction bracing section for more information.

OCCUPATIONAL HEALTH AND SAFETY (OHS)

IMPORTANT: This is not a WHS or OHS document, this is not a safety plan or a resource for ensuring your site safety. This document is provided for guidance only, Steelx PTY LTD takes no responsibility for site safety or construction requirements on site. All persons involved in the construction of this project have a duty of care to their and other people's safety.

It is the purchaser's responsibility to ensure that all persons constructing or responsible for the construction of this building have all the necessary licenses accordingly to Australian state and federal legislation as well as WHS regulations and requirements. High risk construction sites require a safe work method statement (SWMS). More information, resources and links can be found at https://www.safeworkaustralia.gov.au/construction or by using the QR code at the bottom of the page.

Whilst the building is under construction, then the site is a construction site and under no circumstance should the building be used for storage or any other use. Only construction personnel properly trained and authorized should be allowed on the site at any time.

You should be familiar with the current workplace health and safety requirements in relation to acceptable workplace procedures. It is recommended that you check with the appropriate Authority in your area as to your responsibilities.

INTRODUCTION

Before commencing, it is vital that you completely have read and understand this manual, the construction Plans and the Bill of Materials (BOM) in their entirety. You will receive documents from our suppliers with the delivery. These documents are for delivery purposes only and will not assist you with construction.

The building is fully engineered and **MUST** be built in accordance with these documents for the engineering to be valid. This includes the fixing of all screws and the correct bolts. If something does match up or make sense, please contact your customer service representative for clarification before proceeding.

A construction copy of the plans is provided with the latest engineering and construction details. Council Plans received at initial deposit are not to be used for this build.
The construction plans, the bill of materials and this manual provide all of the information required for a competent person to complete this project .

IMPORTANT: Construction bracing is CRITICAL; the building is required to be braced during construction until the project is nearing completion.
If you are relying on the base plates alone to keep the portals standing during construction, the building will FAIL. The roof and wall sheeting add substantial bracing to the completed building and needs to be substituted with fixed bracing during the construction phase.

Do not cut COLORBOND® materials with abrasive cutters. Use electric/hand shears or nibblers.
Use a screwgun with 2,000rpm for Framing Screws (no Impact drivers for these screws).

End Wall Mullions, unless being utilised for roller doors, are placed at 90° to the direction of the main Columns.

Roof Purlins , Side Wall Girts and End Wall Girts are overlaping and are placed on the **outside** of the Rafters / Columns / End Wall Mullions (not between them).

For single portal frames, your mid portal columns MUST lay with the open C facing towards the right end. For the end portals (main building and leanto), the open C faces towards the inside of the building.

UNLESS

the column is being used as a roller door jamb. In which case, the open C will face towards the outside of the building to enable the door and door guides to be fitted;

OR as a beam over support column or double column, in which case, the open C will face towards the outside of the building to enable the addition support column to be fitted inside the building line.

Side Girts and Roof Purlins overhang the end portals by the width of the End Wall Girt..

Your layout plan shows bays numbers, Left and Right orientation. **Portal numbers start from the Left end.**

DELIVERY AND BILL OF MATERIALS

A check of materials is required upon delivery. Any missing items need to be reported to your customer service representative as soon as possible.

You should check that you are able to locate all materials nominated in the Bill of Materials (BOM). You should also confirm that the length and size (including thickness) nominated in the BOM is what has been delivered.

BILL OF MATERIALS

Usage	Code	Qty	Measure	Supplier	Marking	Description	Check
Bracing Strap	BST321650	2	EA	METROLL		Bracing Strap (Per 50m Roll) 32 x 1.6 - G450	☐
Eave Purlin	C10010	1	4.000m	METROLL	PL3	C10010	☐
Eave Purlin	C10010	1	8.000m	METROLL	PL4/5	C10010	☐
Eave Purlin	C10010	1	4.000m	METROLL	PR3	C10010	☐
Eave Purlin	C10010	1	8.000m	METROLL	PR4/5	C10010	☐
PA Door Header	C10010	2	0.835m	METROLL		C10010	☐
GSD Header	C10010	1	2.110m	METROLL		C10010	☐
Eave Purlin	C10012	1	8.000m	METROLL	PL1/2	C10012	☐
Eave Purlin	C10012	1	8.000m	METROLL	PR1/2	C10012	☐
PA Door Jambs	C10012	4	2.315m	METROLL		C10012	☐
GSD Jambs	C10012	2	2.315m	METROLL		C10012	☐
End Wall Mullions	C15012	1	2.442m	METROLL	M-1-1	MC 150 x 1.2mm MEGA C PURLIN 55w/ 528f/ 1520f/ 2056f/	☐
Rafter (End Portal)	C15019	2	3.993m	METROLL	Y1	MC150 x 1.9mm MEGA C PURLIN 45w/ 188w/ 3893w/ 3963w/ 65f/ 188f/ 977f/ 1766f/ 2554f/ 3343f/ 3953f/	☐
Apex Braces	C15019	1	2.400m	METROLL	Q2	MC150 x 1.9mm MEGA C PURLIN 35w/ 2365w/	☐
Knee Braces	C15019	8	0.983m	METROLL		MC150 x 1.9mm MEGA C PURLIN	☐

Understanding the Bill of Materials

The USAGE columns clearly indicate what each item is to be used for and is refered to in this construction manual in italic lettering.

The MARKING column is to help you identify some of the frame components and their location. You also need to refer to the Layout Plan for Left and Right and the bay numbers. Portal numbers start from the Left end.

The coding on these is as follows:

First Prefix - component (see component coding section of this document)
Second prefix - Left (L) or Right (R) - where applicable
Third Prefix - Bay or portal number or Top(T) or Bottom(B)
Fourth Prefix - Bay or portal number

eg. ZL2 - is the Main building column, Left hand side for portal 2
AR2 - is the Roof Purlin, Right hand side for bay 2

Where items are identical, this is nominated in the description column

Top hat sections although marked on the BOM are not marked on the materials. The markings nominated in the BOM will assist in the correct location of these items. Identify these top hats by the lengths supplied. (Note: short lengths - under 2.5m, may be combined together and supplied as long lengths)

COMPONENT CODING

Note your building may not have all of these components

A - Main Building Roof Purlins
B - Main Building Side Girts
C - Main Building End Girts
D - Lean to Purlins
E - Lean to Side Girts
F - Left Lean to End Girts
H - Lean-to Knee Brace
K - Right Lean to End Girts
N - Lean to End Wall Mullions
M - Main Building End Wall Mullions
P - Eve Purlin G - Lean to Eave Purlin
Q - Apex Brace
R - Knee Brace
T – Droppers
W - Lean to Rafters
X - Lean to Columns
Y - Main Building Rafter - Left and Right not applicable
Z -Main Building Columns

TOOLS AND ADDITIONAL MATERIALS REQUIRED

The following is a basic list of trade tools that may be necessary to construct the building. It is difficult to construct the building without using professional trade tools.

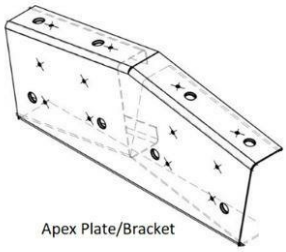
- Spirit Level
- Set out pegs (normally 6 or 8mm round steel pegs approx 500mm long)
- Theodolite – dumpy – laser or other levelling device
- Steel measuring tapes (do not use nylon or plastic) You require tape measures suitable to the size job that you are working on.
- Texta markers (DATA brand textas fade from material after 4 days)
- Metal square (roofers square)
- Metal square (general purpose)
- Clamps (quick clamps and substantial G clamps)
- Metal Snips (hand held)
- Pliers, multi grips and spanners including sockets
- Electric drill (at least half inch chuck)
- Concrete hammer drill
- Large magnetic drill (only on larger buildings. Usually a hired item).
- Tek screw gun and a two (2) speed framing gun
- Nibblers or electric shears (3mm cutting capacity required)
- Electric or air impact guns (½ inch for smaller buildings, ¾ inch for larger buildings).

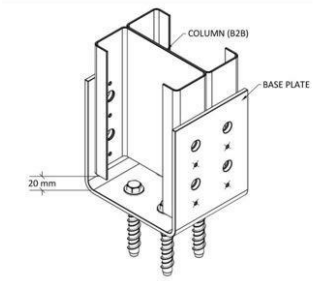
The following items are not supplied within the Bill of Materials for this project. Your builder or may include these materials as part of their construction services, all additional materials required are to be purchased by the client.o construct the building. It is difficult to construct the building without using professional trade tools.

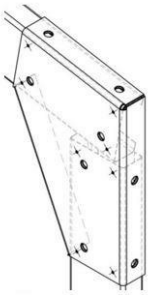
- Construction Bracing materials is not supplied.
- Silicon
- Chemset or anchor adhesive
- Concrete including but not limited to Footing, Slab, formwork and reinforcement materials.

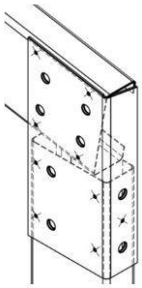
COMPONENTS

These common components are used in most of the portal frame structures. Please note these are generic/ diagrammatic only and may vary from those on site. If you are unsure, please contact your customer service representative for clarification.



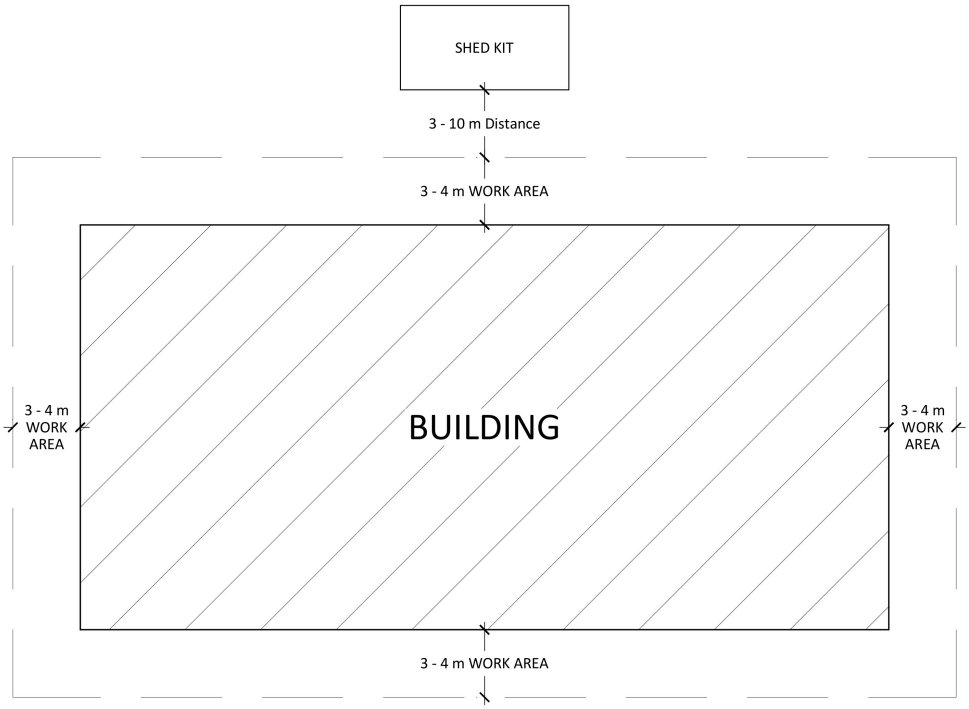






SITE PREPARATION

When forming your building pad allow space for machinery (cranes and scissor lifts) to safely move around your building. A perimeter around the building of approximately 3-4 metres wide level with the pad is desirable.



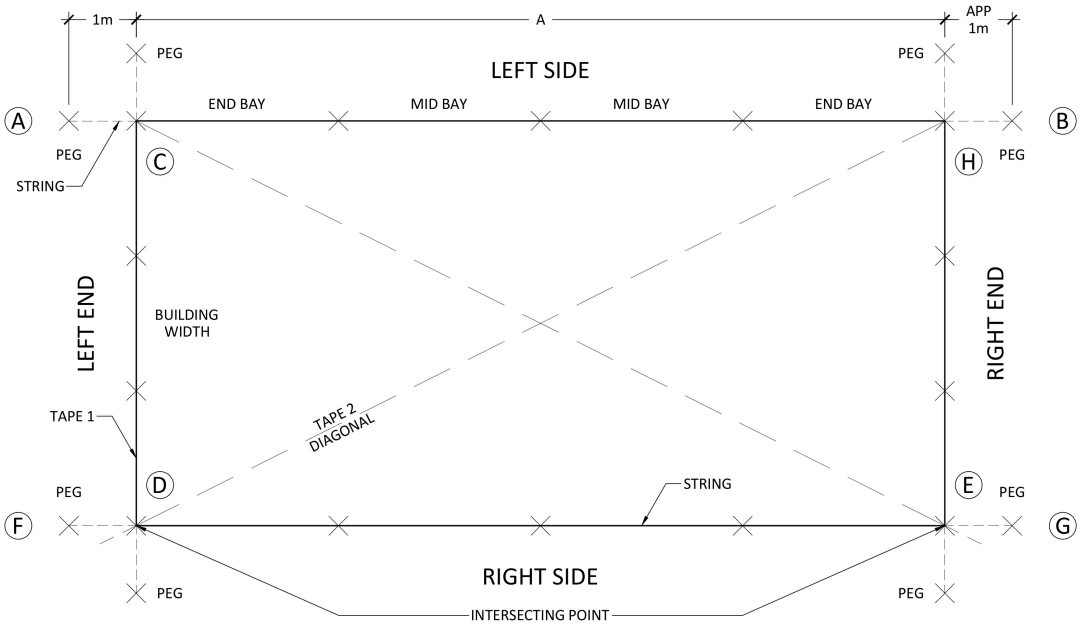
SITE PREPARATION

The finished pad or site should be clean, level and compacted if necessary. The layout of your foundations is accomplished with the use of profiles and string lines and extraneous material such as long grass, large rocks and clumps of dirt will impede this process.

A badly prepared area will cause delays for your builder / concretor and will involve extra costs.

BUILDING LAYOUT

The foundation designs provided by the engineer ONLY cover classes nominated and where the safe bearing capacity is a minimum of 100kPa. You should obtain from the owner a copy of the soil test, for the site, that meets these requirements. Outside of these requirements a slab/foundation design will need to be done by a suitably qualified person.



BUILDING LAYOUT

Outside of these requirements a slab/foundation design will need to be done by a suitably qualified person.

Initially, setout the main building only. Any leantos are described later.
Your slab and/or footings should be installed by a suitably qualified concreter.

SLAB & FOOTINGS

Slab exterior measurements are exactly as overall measurement given on the plans. Where it is intended to put in a partial slab, the slab size needs to consider the position of the dividing wall girts and mid columns plus if it is intended for the dividing wall sheeting to protrude past the slab or sit on the slab. Establish the basic parameters of your building, a good starting point is the left side wall.

Place pegs approximately 1 meter each side of the left side wall corners (shed length + 2 m) Marked “A” and “B”. Stretch a string line between. This line represents the left side wall.

Refer to your slab plan. From “A”, measure in from the peg one meter. Mark the point directly under your string line “C”. Ensure the string line is extremely tight and watch for deviation in the line due to wind pressure or debris. “C” is the left end / left side corner of the building.

Using your slab plan continue down the string line marking your footings as per the given measurements. The last measurement “H” is the right end / left side corner of the building.

To set the right side wall, use two long steel tapes. From “C” measure out the full width distance shown on your slab plan. With your second tape measure the diagonal from “H”. Where the two tapes cross at the specified measurements mark your left end / right side corner of the building“D”.

Repeat this process to locate and mark your right end / right side corner of the building “E”. Run another string line over the two marks “D” and “E”. Drive in two more pegs, “F” and “G” Run two more string lines to locate and mark your gable footings according to the spacings marked on your slab plan.

- Run two more string lines to locate and mark your gable footings according to the spacings marked on your slab plan.
- Locate and mark your Roller door Jamb footings.
- Piers marked '50mm Step' on the Piers Plan indicate those piers are 50mm below main slab/piers. Shaded areas on the Slab Plan indicate those parts of the slab are 50mm below main slab/piers.
- Prior to digging your footings use spray type ground paint to assist in directing the Auger.
- Dig your footings, clean debris from around the top and base of the footing.
- Check your footing centres by running your string lines and re-measure your spacings.
- Box up and prepare your slab.
- Obtain an engineer or council inspection prior to pouring your slab.
- Pour your slab and footings.
- Following the departure of the concrete truck do a level check on your slab.

FOOTINGS ONLY

Establish the basic parameters of your building, a good starting point is the left side wall.

Place pegs approximately 1 meter each side of the left side wall corners (shed length + 2 m) Marked “A” and “B”. Stretch a string line between. This line represents the column centers of the left side wall.

Refer to your Footing Plan. From “A”, measure in from the peg one meter. Mark the point directly under your string line “C”. Ensure the string line is extremely tight and watch for deviation in the line due to wind pressure or debris. “C” is the center of the left end / left side Column.

Using your Footing Plan continue down the string line marking your footings as per the given measurements. The last measurement “H” is the center of the right end / left side Column.

To set the right side wall, use two long steel tapes. From “C” measure out the full width distance shown on your slab plan. With your second tape measure the diagonal from “H”. Where the two tapes cross at the specified measurements mark your left end / right side Column center of the building “D”.

Repeat this process to locate and mark your Column center of the right end / right side “E”.

Run another string line over the two marks “D” and “E”. Drive in two more pegs, “F” and “G” approximately 1m out. Check the measurements to ensure that “D” & “E” is correctly located. Measuring from “D” proceed down the string line marking your right side footings. Done correctly your slab setout should be accurate within 5mm.

Run two more string lines to locate and mark your gable footings according to the spacings marked on your footing plan.

Piers marked '50mm Step' on the Piers Plan indicate those piers are 50mm below main slab/piers. Shaded areas on the Slab Plan indicate those parts of the slab are 50mm below main slab/piers.

Prior to digging your footings use spray type ground paint to assist in directing the Auger.

DO NOT move pegs A, B, F or G. you will need to maintain these pegs untill after pouring the footings so as to locate the footing bolt positions.

NOTE: Footings must comply with specification requirements and be fully located in natural ground to the required depth. Any protrusion out of natural ground is an extension of the requirements.

Dig your footings, clean debris from around the top and base of the footing.

Check your footing centres by running your string lines and re-measure your spacings.

Obtain an engineer or council inspection prior to pouring your footings.

Pour your footings, supporting your steel reinforcment whilst pouring the concrete. Ensure the reinforcement has at least 50mm cover all round.

Use a level (dumpy or laser) while pouring so the concrete truck is portioning approximately the required amounts of concrete per hole so that final levelling is not a major job.

Whilst the concrete truck is on site, make sure to maintain separation between the truck and footings to prevent the hole from collapsing.

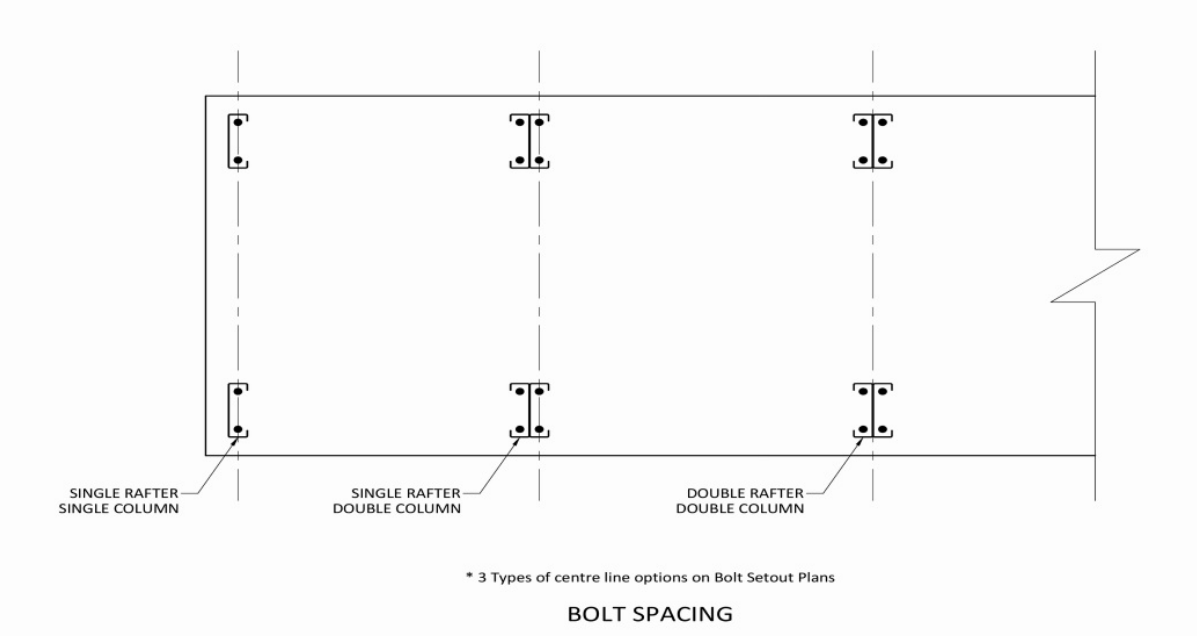
Following the departure of the concrete truck do a level check on your footings.

Replace your string lines tightly. Re-establish “A” and with the edge of a trowel and roofing square place a shallow line partially across the footing top at 90° to your string line. This line is the line for placement of your footing bolts.

Using the bolt setout plan, mark all footings for placement of your footing bolts.

BOLT SPACING

The bay spacing for design and construction are based off the Centreline of the Rafters. This means that the Centrelines of the columns may vary for the size of the Bay. Ensure that you confirm the location of the anchors are correct using the Bolt Setout Plan provided and not at Nominal spacing. Dimensions shown on the Bolt Setout are the Centre of the baseplate or fixing. This will be the centre of Column for Single portals and the Web where the columns meet for a Back to Back Column.

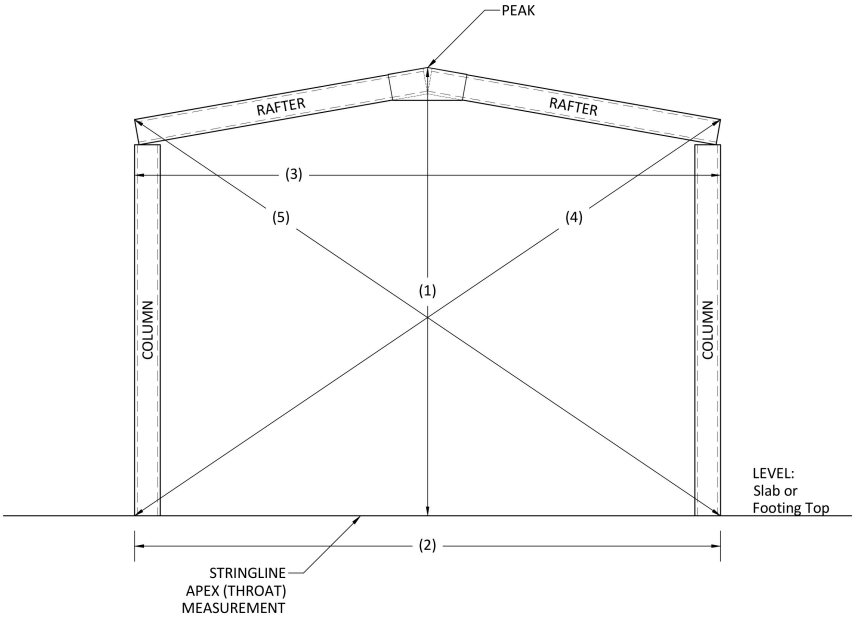


Example Footing Centreline

Example Footing Centreline

PORTAL MEASUREMENT SEQUENCE

The set out of your portals requires a five measurement system. The portal is laid out on your building site with the Columns in line with your foundation bolts. This gives you a parallel base point to start from. With your Rafters, Haunch Brackets and Apex Bracket attached the portal can now be measured for height and square. Do NOT over tighten your bolts at this stage, as you will need to be able to move your frame to achieve accuracy. Use steel measuring tapes only as nylon tapes stretch.



(1) : Base to Apex
(2) : Outside of Column to Outside of Column at Base
(3) : Outside of Column to Outside of Column at Top
(4) : Diagonal Outside of Column Base to Outside Rafter
(5) : Diagonal Outside of Column Base to Outside Rafter

PORTAL MEASUREMENT SEQUENCE

Measurement No 1 = 3.78m

This height is achieved by extending a string line across the bottom of your Column Base Plates. From the middle of the string line measure to your highest point at the apex. This measurement should be the specified apex height less the height of your roof purlins.

Measurement No 2 = 9.796m

As your columns have been laid out on the ground parallel you now need to check the overall measurement of your columns outside flange to outside flange. Start at the column base and measure to the same spot on the opposite column base.

Measurement No 3 = 9.796m

Measurement No 3 is a repeat of Measurement No 2 except that it is made just below the Haunch Bracket.

Measurement No 4
To complete the square on your portal you now have to measure the diagonals of the basic frame.

Measurements should be made from the furtherest points to enable the greatest degree of accuracy. Mark these points for future reference.

Note the measurement that you have achieved to compare with Measurement No 5.

Measurement No 5
Measurement No 5 is a repeat of Measurement No 4. but for the opposing diagonal.

NOTE:
Measurement No 4 and 5 must be equal for the portal to be square (asuming the slab is level).

To be valid, the diagonal measurements being taken must be from the same opposing points.

Minor adjustments can be made by moving the Columns and Rafters up or down as required.

If any adjustment is made you must repeat the five measurement system as a final check before tightening your fastenings or attaching any Knee Braces or Apex Braces.

PORTAL MEASUREMENT SEQUENCE – SINGLE

Lay out the Columns flange down in line with your foundation bolts according to the location determined by the Mark. Place on timbers to allow access for structural frame bolt placement.

Fit the Haunch Bracket into place at column top using your structural frame bolts and hand tighten

Fix the Base Plates to the columns.

Place the Rafters in position flange down to the column top. Loosely fit the Apex Bracket to the Rafters using your structural frame bolts and hand tighten.

Follow the "Portal Measurement Sequence" guide and align the main part of the frame (columns and rafters).

With the main frame correct, place frame screws in the Haunch Bracket and Apex Bracket to prevent movement while securing bolts. Tighten all bolts securely.

NOTE: End wall (Gable) portals unless exposed are always single section without knees and apex braces (refer to your specification sheet and BOM).

Locate the Apex Brace in position web to web. The ends should be equal distances from the apex. Fit screws and bolts as per the connection details drawing.

Locate and fit the Knee Braces into position web to web. A approximately equidistant triangle between the Columns and Rafters should be formed. Fit screws and bolts as per the connection details drawing.

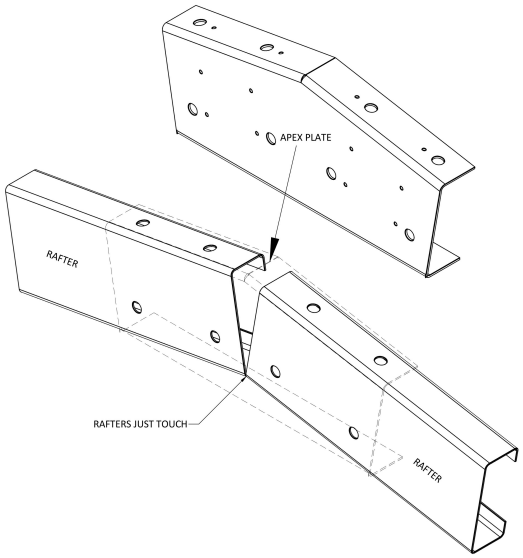
Do a final measurement check and remove and extraneous matter such as drill swarf, filings, spare bolts and screws from the completed portal.

APEX BRACKET - SINGLE RAFTER

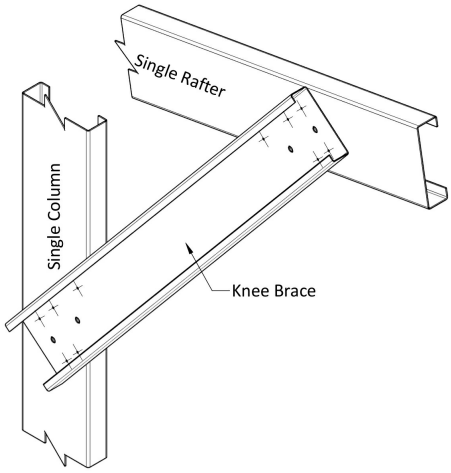
The Rafter to Rafter connection is achieved by using a Apex Bracket.
The bottom leading flange of the opposing Rafters should just touch.
The Apex Bracket aligns with the top flange edges of the Rafters.

Refer to the Connection Detail drawing and BOM for type and number of screws and bolts.
Place your Apex Bracket on the rafter joint so that the return flange on the Apex Bracket faces down the same as the Rafters.
The Apex Bracket is designed to fit inline with the pitch of the Rafter.
Once you have followed the measurement sequence and are satisfied that your portal is correctly positioned place 2 tek screws through the Apex Bracket into the Rafters each side to prevent movement whilst tightening your main connection bolts.

The Apex Bracket is designed to fit inline with the pitch of the Rafter.
Once you have followed the measurement sequence and are satisfied that your portal is correctly positioned place 2 tek screws through the Apex Bracket into the Rafters each side to prevent movement whilst tightening your main connection bolts.



KNEE BRACES - SINGLE SECTION PORTAL



KNEE BRACE FOR
SINGLE COLUMN + SINGLE RAFTER

Once you have determined that your first mid portal is square and of the correct height, it is now time to locate your Knee Brace. These Knee Braces are fitted web to web.

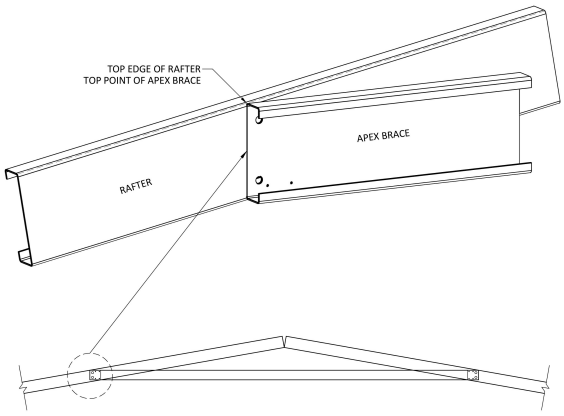
Knee Braces are used only in mid portals unless the end portal is fully open.

Place the Knee Brace, web to web, on the portal Column and Rafter. Position the top points of the Knee Brace to the top of the Rafter and to the outer edge of the Column as shown above. This configuration should form an equilateral triangle when correctly placed.

Recheck your measurements, clamp each end of the Knee Brace, place two tec screws in each end to assist in maintaining correct placement.

Drill two bolt holes each end in the inside web of the brace through the brace and Column and Rafter respectively. Secure your bolts tightly and then place the remaining tec screws required.

APEX BRACE



Once you have determined that your first mid portal is square and of the correct height, it is now time to locate your Apex Brace.

Apex Braces are used only in mid portals unless the end portal is fully open.

Place the Apex Brace web to web with the Rafter.
Position the top corner of the Apex Brace to the top edge of the rafter on each side.
Locate the apex bracket by measuring down the rafter from the apex to the apex brace. The distance should be the same on both sides.
Recheck your measurements, clamp the Apex Brace in position and attach with two 14.20 x 22 tek screws. Be careful to maintain the correct position of the brace whilst affixing it to the portal rafters.
Using the punching on the brace as a guide, drill 2 bolt holes through the rafter on each end. Secure with bolts and tek screws as specified in the connection details of your construction plans.

CONSTRUCTION BRACING

WARNING - Construction Bracing is essential to ensure the site and building are safe during the construction process.

The building is not designed to withstand erection forces nor to stand up by itself when it is partially complete. Consequently construction bracing is CRITICAL.
If you are relying on the base plates alone to keep the portals standing during construction, the building will FAIL.

The roof and wall sheeting add substantial bracing to the completed building and needs to be substituted with fixed bracing during the construction phase. It is essential that your construction bracing remains in place until the building is complete.

When erecting your portals substantial bracing is required and has to be sufficient to fully restrain the building in all directions. It is the builders responsibility to determine what bracing method and how much bracing is required. Factors will include the building size, the wind region and any other site or other relevant factors. The building should always be braced on the asumption that a "design event" wind condition will occur during the construction period.

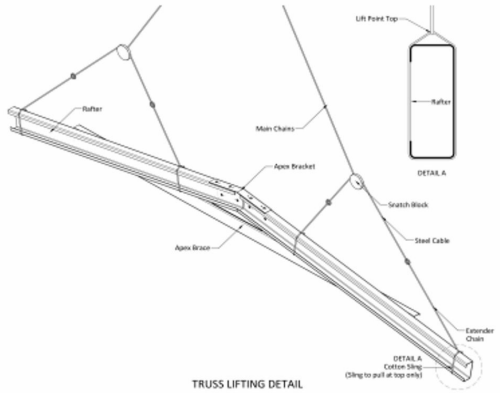
As an absolute minimum, fixed bracing must be fitted, to both ends plus at least every third portal. In addition to this, all other side columns must be braced in both directions. It is best to fit these on the inside of the columns so as to not intefer with any wall girts / sheeting.

Fixed bracing should be fixed to the top of the columns plus to the rafter near the apex

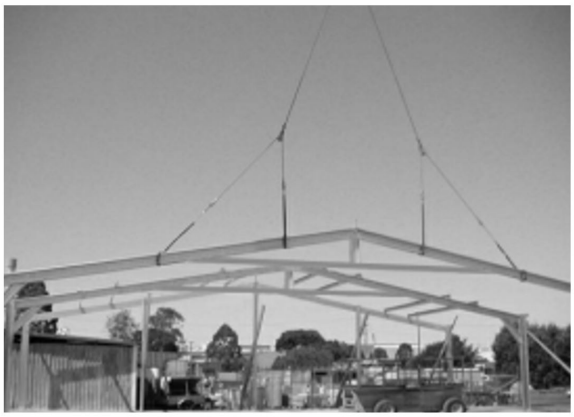
PORTAL ERECTION

It is always important to have ample material for construction bracing prior to erecting the portal. Please ensure that you have enough to suit your building before progressing further.

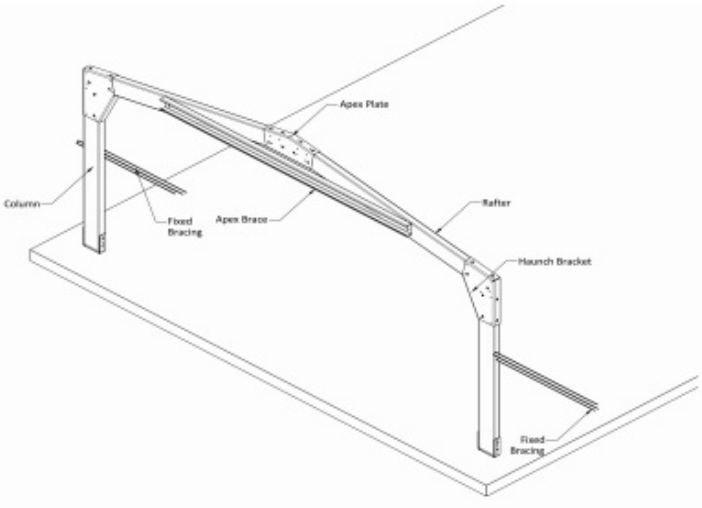
Stand the end portal as a complete assembly, otherwise lift the rafter and apex bracket assembly onto the columns if using column in concrete as the nominated fixing method. To secure the rafters, use a minimum of two equally spaced lifting points. Take care when selecting these points, as the angle between the two chains should not exceed 60°. Use cotton slings around the rafters to reduce any chances of slippage and to help maintain control of the portal once it is in the air. Raise the portal smoothly until the columns/ rafters are completely clear of the ground.



TRUSS LIFTING DETAIL



Move the portal into position whilst avoiding contact with the ground, nearby structures, and the columns. The portal is not safe to release until all connections and adequate construction bracing have been secured.



PORTAL ERECTION LAYOUT

Install the knee braces (if applicable), fixed bracing, and end wall mullions (refer to the section below on end wall mullions). The fixed bracing must remain attached until the cladding is complete. Use a spirit level against your columns and install the construction bracing once you are confident that they are plumb. Undo the slings and use the same procedure as before to stand portal 2. Refer to the eave and roof purlin sections of this manual and the purlin / girt plan in your construction plans to fit the purlins between the two standing portals. Apply final

fixing to the end portal and temporary fixing to portal 2, as you may need to adjust it later. Stand portal 3 and attach the fixed bracing to the rafters and columns in the same way as portal 1. You can now fix the eave and roof purlins across bay 2 using final fixing for portal 2 and temporary fixing for portal 3. Repeat all the above steps until all portals are stood. Once all portals and purlins are secured, begin mounting the girts. Fit the fly bracing and cross bracing to the shed frame as per the bracing plan and connection details in your construction plans.

END WALL MULLIONS

End Wall Mullions are positioned as shown in the layout plan, take into account any openings. The End Wall Mullions lay at 90degrees to the Column direction and may need to be cut and fitted into the correct position - generally spaced evenly between the inside edge of the Columns (End Portal). Mullions may need to be moved or removed to allow for openings and or Doors positions.

Mullions are also positioned in the any dividing walls.

The outer flange of the End Wall Mullions should be in-line with the outer edge of the Rafter so that the End Wall Girts can be fitted to the outside of the Columns (End Portal) and flanges of the End Wall Mullions. The base of the End Wall Mullions are fixed with EWM Base Plates and EWM Footing Bolt.

End Wall Mullions that are **NOT** directly under the Apex Bracket are fitted to the web of the Rafter and End Wall Mullion with the Rafter Fixing Angle. The Top Fixing Angle is fixed to the flange of the Rafter and the web of the End Wall Mullion. A Fly Brace is then added. Refer to connection details
End Wall Mullions that are directly under the Apex Bracket are fitted to the web of the Rafter and End Wall Mullion with the Rafter Fixing Angle. A Fly Brace is then added. Refer to connection details.

SLEEVE ANCHOR BOLTS - TRU-BOLTS OR DYNABOLTS

Size	Type	Drill diameter	Hole depth
M8 x 40	Dynabolt	8 mm	40mm
M10 x 50	Dynabolt	10 mm	50 mm
M12 x 80	Tru-Bolt	12 mm	60 mm
M16 x 105	Tru-Bolt	16 mm	80mm

Make sure the drilled hole is clean by using a vacuum or compressed air to clear dust and debris.
Base plates can now be fitted to the footings or slab. Pass the bolt through the base plate and into the concrete. Ensure that the nut on top of the bolt is either flush with the top of the thread or slightly above it.
The bolt should be a neat snug fit in the drilled hole and may require a light tap with a hammer to seat it all the way down the hole. DO NOT use excessive force in seating this bolt. If the bolt has been incorrectly placed and has jammed it is extremely difficult to remove. It pays to be careful when seating these bolts.
The nuts may now be tightened. Once tightened, you should have at least two full threads of the bolt above the nut.

ROLLER DOOR JAMBS

Roller Door Jambs should be fitted prior to the girts for the door bay being fitted.

Gable Wall Doors

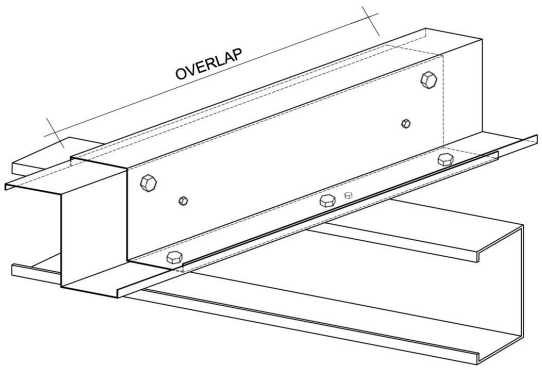
Refer to the detailed connection details on how to fit the Roller Door Jambs.
The open C of the Roller Door Jamb faces to the outside of the building, level with the edge of the girts. This enables the roller Door to be fixed to the web of the Roller Door Jambs.
The Roller Door Jamb is attached directly to the under side of the Rafter (cut to suit). The End Wall Girts and the Roller Door Header End Girt go over the open side of the Roller Door Jamb and tek screw onto the return flanges.
For doors over 4m wide a C section Roller Door Header End Girt is also supplied.

The opening between the Roller Door Jambs is the door width less the required manufacturers clearance subject to this not exceeding the maximum possible opening. Where supplied, triming of the C section Roller Door Header End Girt may be required.
The bottom of the Roller Door Header should be fitted at a height from the ground equal to the nominated door height or such lower height as required to enable to the door to fit in the head space available.
The Roller Doors are nominated in the BOM and are the **DOOR** sizes. The sizes are the Height and then the Width. eg 3.0 x 3.05 = 3.0m high by 3.05m wide door.
For Doors up to 5.1m high, the height to the bottom of the Header = Door Height.
Subject to the above limitations

PERSONAL ACCESS (PA) DOOR JAMBS

The location of the PA Door can be varied according to the clients requirements. The girts and sheeting need to be cut to suit. Usually the PA Door will be placed to suit the wall sheets.
Refer to the detailed connection details on how to fit the PA Door Jambs.

PURLIN AND GIRTS



Punching of girts around Roller Doors is not practical. Bolts and structural screws are provided for fixing. Some drilling may be needed if it is desired to bolt the girts. If the end columns are facing out, fixing is into the lips of the Column Cee(min of 4 screws). Self drilling tec screws are sufficient fixing (i.e. no bolts are required).

For correct connection details refer to Connection Details drawings.
The Roof Purlins and Side Girts for this building are an overlapping Z100. End Wall Girts are Z100.
The Purlins - End Bays and Side Girts - End Bays protrude 102mm past the web of the Rafter (End Portal) and Column (End Portal).

Roof Purlins
Where **Top Hat Purlins** are used, the top (apex) Roof Purlin is fixed as close as possible to the apex end of the Rafter. Where **Z Purlins** are used, the top (apex) Roof Purlin is installed in the Second hole down from the top of the rafter. The bolt will go through the purlin, apex bracket and Rafter.

The bottom Roof Purlin is the Eave Purlin (See below).

Refer to the Specification Sheet in the drawings for the Roof Purlin spacing.

Side Girts
Where the walls are sheeted to ground level, the bottom girt around the building is fixed 200mm above the finished floor height. Or, if using Top Hats, fixing is above the top bracket bolt.

The top girt is the Eave Purlin (See below). *Refer to the Specification Sheet in the drawings for the Roof Purlin spacing.*

Purlins and Girts
Where Header Sheets are provided, a Side Girt (if supplied) should be fixed under the Eave Purlin to suit the header sheet length.

End Wall Girts
The End Wall Girts attach to the web of the portal Column (End Portal) and overlap on the flange of the End Wall Mullions. In the event that the end wall girt conflicts with the haunch bracket, the girt may be placed above or below so long as the spacing is less than the Maximum outlined on the specifications page.
To enable the End Wall Sheeting to be fixed at the corners, a small angle bracket (cut from the Fixing Trim Angle - General Purpose or strap) is fixed to the Side Girts - End Bays.

Where the walls are sheeted to ground level, the bottom girt around the building is fixed 200mm above the finished floor height. Or, if using Top Hats, fixing is above the top bracket bolt.
Additional girts are provided where the distance above the Roller Door Header to the apex exceeds the maximum allowable Wall Girt spacing.
Refer to the Specification Sheet in the drawings for the End Wall Girt spacing.

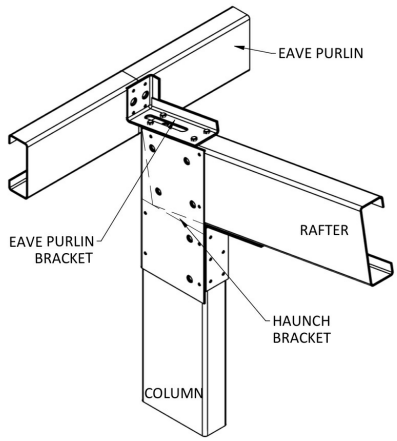
Gable sheet fixing at the roof line is to the Raking Girt. The Raking Girt should be fixed on top of the Roof Purlins.

EAVE PURLINS

The Eave Purlin is installed (Open Web facing out) using an Eave Purlin Bracket mounted off the top of the rafter, The Eave purlin is the lowest support point for the roof Sheets and also acts as The Top Girt or header on the Gutter side of the building. To Do this the Eave purlin needs be in the same plane as the roof and wall cladding.

The top of Eave purlin should be the same as Eave height. (Refer to the Layout Drawing on your construction plans for the Buildings Eave Height.) The outside of the Eave Purlin sits out past the Column by 102 mm. So that it is inline with the outside of girts. The Eave purlin Bracket is centered on the rafter and fixed to the web on the Eave purlin using Bolts and/or Tek Screws , the bracket extends out from the column (102 minus the flange width of the Eave purlin). If this is a Roof Only Building please refer to the connection details as the installation may differ.

Where necessary the Eave Purlins will be split at the centre of the Rafter. One Eave purlin bracket will support both Eave purlins.



× FIXING SCREWS - 4 of 14.20 x 22

EAVE PURLIN BRACKET TO RAFTER

Similar to the Girts the Eave Purlin on the end bays will extend past the End Portal Columns by 102 mm.

Refer to the Eave Purlin Connection Details on your Construction Plans for Fixing and Connection requirements.

FLY BRACING

For location and position, refer to the General Notes plan.

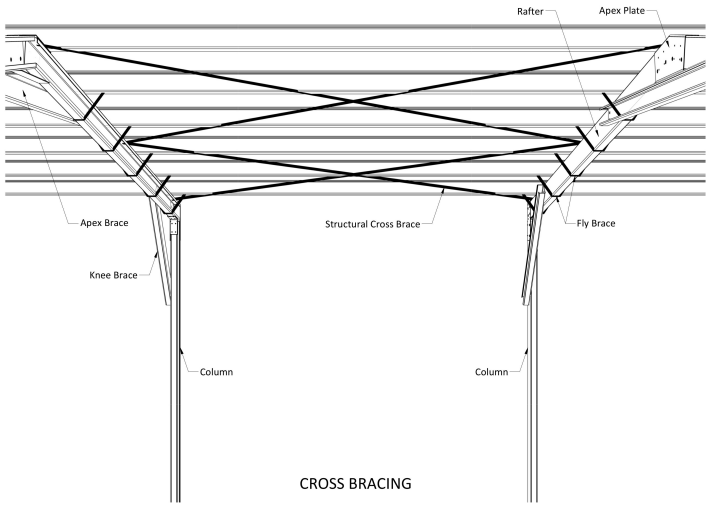
The structural fly bracing consists of strap material and is fixed by the use of 14.20 x 22 structural screws.

Fly bracing should be fitted to the preceding bay after the adjoining bay has had all purlins and girts fitted. The successful installation of fly bracing will assist greatly in firming up the main structure.

The strap required for fly brace is to be cut to a suitable length as per "Connection Details Plan". It pays to make one of each size, test it and then make the required number using the first as a template. The strap needs to be fixed so that no lateral movement is achievable. (taut not sloppy).

CROSS BRACING

The structural cross bracing where nominated in the Bracing Plan is carried out with 32mm Strap. It is fixed by the use of 14.20x22 structural screws (number of screws as per Connection Details plan).



CROSS BRACING

For location and position of cross bracing, refer to the Bracing plan.

Following the installation of the fly bracing to the finished purlins and girts, fit the structural cross bracing to the roof and wall bays.The strap is attached to the rafter close to the apex, then either centre of rafter or close to the haunch bracket. If finishing centre of a rafter, then another strap will continue to the haunch bracket. The strap is also fixed to the top and bottom of the required columns as per Bracing plan.

If double strapping is required there should be at least 5mm gap between the straps.

The steps are as follows:

- Measure the length required for the strap as per the Bracing plan and add 300mm.
- Roll out the strap and cut to length.
- Fix the strap with 1 screw at the apex end of the rafter, or top of column.
- Bend the strap in a loop at the other end (reason for extra 300mm) and put a screw through the strap.
- Using a claw hammer or rod place through loop and stretch tight, fix screw to rafter/column.
- Fit the required screws into each end as per Connection Detail plans.
- Repeat other side.
- When both sides of a cross brace are finished fix 2 screws to each point where the strap crosses the bottom of the purlins/girts.
- Repeat for each roof and wall bay requiring cross bracing.

NOTE: Cross bracing that is not taut is of no value. All slackness must be taken out of the strap when fixing it.

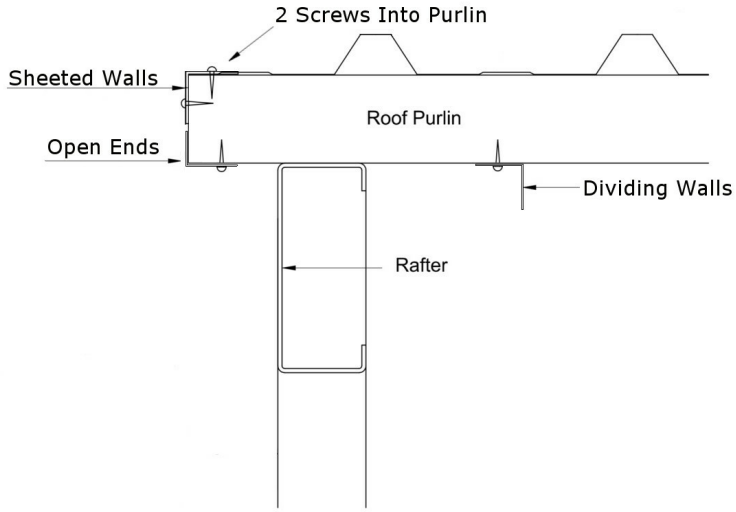
ANGLE TRIMMER TO GABLE ENDS RAKING GIRTS

Angle Trimmer is provided to allow for the End Wall Sheeting to be fixed at the top.

For the sheeted end walls, fix the Angle Trimmer to the top exterior edge of the Roof Purlins using two frame screws per purlin. For open bays and Dividing Walls, fix the Angle Trimmer to the underside of the purlins.

The angle extends from the apex to the Eave Purlin.

Where the angle does not join over a purlin, it can be joined midspan by using two frame screws to each face of the angle with a minimum overlap of 200mm.

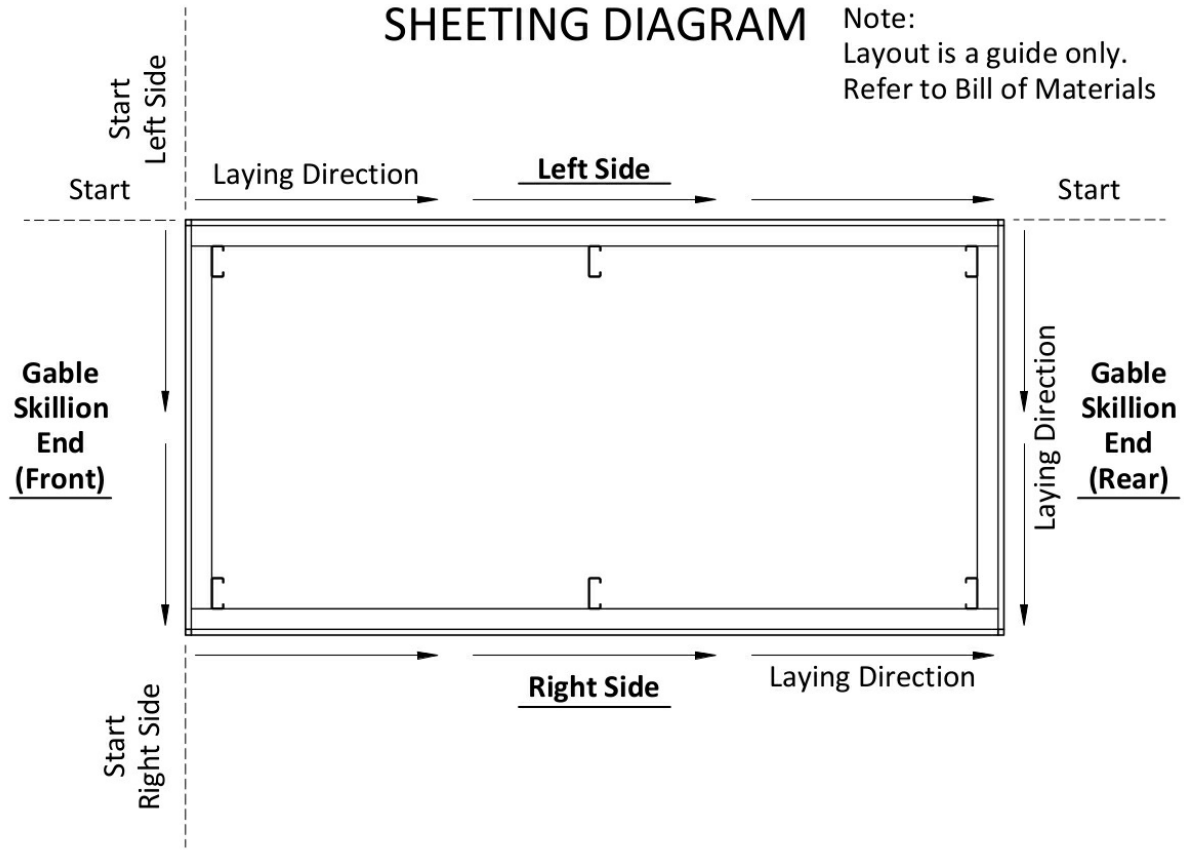


Position Of Raking Girt

SHEETING

Sheeting lengths have been provided on the basis of commencing sheeting as follows :
Side Walls - from the left Gable/Skillion end through to the right Gable/Skillion end
Roof - from the left end Gable/Skillion through to the right Gable/Skillion end
End Walls - from the left side of the shed through to the right side of the shed (As if looking from the front pitched end, not necessarilly your left and right)

Sheeting for the end walls is described in the bill of materials by numbering with the portal number first, followed by the sheet sequence number. Eg. End Wall Sheeting 5-03 would represent the 5th portal; 3rd sheet from the left side.



Dividing Walls - from the left side through to the right side

Fit sheeting in the following sequence :
1st - Side Wall sheeting (including header sheets)
2nd - Roof sheeting

3rd - End Wall sheeting (and dividing wall sheeting)

SIDE WALL SHEETING

It is important to start wall sheeting on the side walls as soon as possible. This long wall sheeting provides excellent bracing in your partially finished building.

Always place wall screws through the pan, adjacent to the crest.

Four (4) wall screws per full sheet per purlin are fitted at each girt line.

The edge of the sheeting with the capillary groove is always the underlap.

For maximum weather tightness, start laying sheets from the end of the building that will be in the lee of the worst antipicated or prevailing weather. Put the edge of the sheet as close to the edge of the wall girts as possible, starting with your cover lap first and proceed along the long wall.

Place the sheeting just below the top of the eave purlin so as not to interfere with the roof sheeting. Do not put the sheet past the top of the eave purlin as this will impede placement of the roof sheet. This will bring the sheeting 40mm below the slab / column.

Take particular care to level your first and second sheets, and then check every couple of sheets from there on with a spirit level to maintain correct level.

Screws should be fixed in straight lines using a level. Continue along the wall with the sheeting, until such time as you reach a opening. Stop one sheet before the opening, measure and cut the next sheet and to fit accordingly beside and over the opening.

Header Sheets MUST be screwed in the valley to each side of the peak at the top and bottom (8 screws per purlin per sheet)

Take care to install any Header Flashings before continuing the sheeting, otherwise you will have to go back and redo those. All other flashings are done at a later stage.

Take particular care with your wall sheeting that your cover laps are correctly positioned, a neat fit and seal correctly.

ROOF SHEETING

Roof foot traffic must be limited to "Controlled Foot Traffic". Extreme care should be exercised when roofs are installed to prevent any unsightly aesthetic imperfections.

In the event of roof sheeting being loaded onto the frame, then the delivered packs must be broken down into bundles no larger than the number of sheets required to fit over one side of one bay.

Spread the bundles of roof sheets on both sides of the building and only directly over a rafter (not mid span). Only one bundle per rafter.

The frame is not designed to take the dead load of excessive bundels of roof sheets in the one location.

Before lifting sheets onto the roof, check that they are the correct way up and that the overlaping side is towards the edge of the roof from which the installation will start.

Once the side walls are screwed off the roof sheeting can be installed. It pays to place a couple of sheets on the

roof first and get them exactly in the right position before proceeding further. Insure that the sheet protrudes 60mm past the wall sheet ridge into the gutter to avoid any drainage problems.

Always place roof screws through the crest, perpendicular to the sheeting and in the centre of the crest.

Four (4) roof screws per full sheet per purlin are fitted at each purlin line.

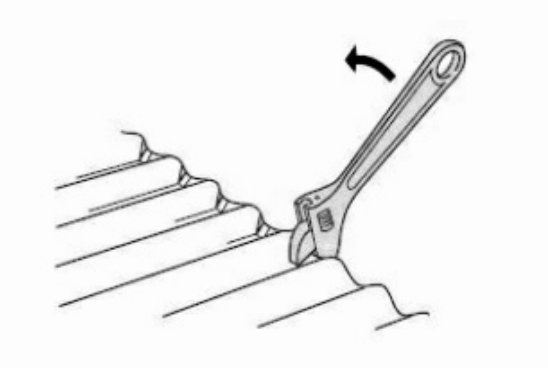
Do not fix the apex screws until fixing the flashing. (apex and parapet flashings)

The edge of the sheeting with the capillary groove is always the underlap.

For maximum weather tightness, start laying sheets from the end of the building that will be in the lee of the worst antipicated or prevailing weather.

Ensure that screws are not over tightened and that sheeting is exactly aligned at the lower end. This provides a far better finished product.

Always take care after sheeting the roof that you weather the sheets at the top (apex) and the bottom (gutter end).



Any swarf, filings etc left from putting tek screws in should be removed with a soft broom. Take care that there is no moisture on the roof, as it is extremely slippery.

END WALL SHEETING

On your gable ends, the increment rise **per meter** is -

105mm per metre for a 6 degree roof ;
176mm per metre for a 10 degree roof ;
212.5mm per metre for a 12 degree roof ;
268mm per metre for a 15 degree roof ;
414mm per metre for a 22.5 degree roof ;
577mm per metre for a 30 degree roof.

Check your wall sheeting width to determine the rake to cut your sheets.

You will need to cut your End Wall Sheeting at the appropriate roof angle. You can either pre-cut your End Wall Sheeting on an angle on the ground or once it's up there, use your nibblers to follow the roof sheet line just below the level of the roof sheet line.

The Raking Girt is tec screwed onto the top of the overhanging roof purlins. The End Wall Sheeting is then screwed off to the Raking Girt.

Start sheeting from the left hand side, and continue through to the right hand side. Sheeting lengths supplied allow for major openings. Never start at the middle of the gable.

Ensure you maintain your level carefully as you go across the end wall with a spirit level and make sure your screw lines are straight.

FLASHINGS

It is essential that everything aligns correctly to provide a very neat finished product, so some care and a lot of thought must be taken when applying the flashings.

BARGE CAPPING

Always start from the bottom (the gutter line) and protrude the barge cap at the same level as the roof sheet (about 60mm into the gutter). Start from that point and go to the peak. Remember if it is several pieces for a large building always start from the bottom and work up. Cut the overhanging top face so there is a vertical joint line showing at the peak of the building

RIDGE CAP

The ridge cap should be fixed in a direction so that the joins do not allow rain to be driven into them. The overlaps of the ridge cap should be silicone and screwed down.

The ridge cap fits over the roof sheets and is screwed to the roof sheeting and into the apex purlin. Fix with standard roof screws to each crest.

CORNER FLASHINGS

The main corner flashings fit up behind the barge capping and gutter. Fix with wall screws on the same line as the wall-girt screws.

GABLE END HEADER FLASHINGS

Any gable end header flashings are fixed using wall screws as stiching screws. The number of fixings is the same as the number fixed to the eave purlin. Do not over screw as this will cause a "wave" in the sheet line.

GUTTER AND RAINWATER GOODS

The gutter lengths supplied will be the equivalent of the bay size of your building plus 75mm for a join overlap. Lengths are split in two for bays over 6.1m to assist with installation. Also supplied will be stop ends and gutter brackets. Due to specific requirements for water tanks or hydraulic plans, nozzels and downpipes are supplied by others.

Gutter brackets are attached by wafer head screws to the top of the wall sheet on the sheet ridges just under the protruding roof sheet. Place brackets at least 250mm from gutter joints. Do not place brackets at the same juncture as a down pipe nozzle.

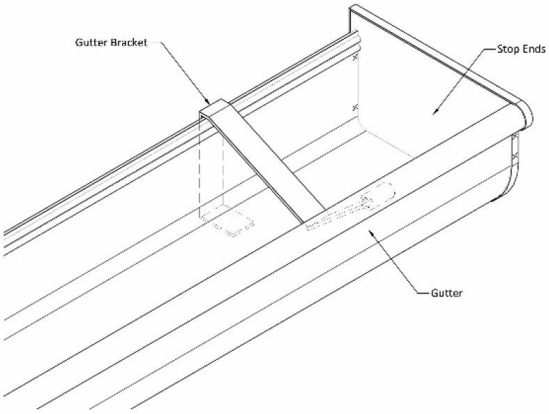
When fixing the gutter brackets use a string line from one corner of the building to the other to maintain a straight line. Gutters require slope to allow for proper drainage. Depending on your downpipe spacings, the gutters may slope from one end of the building to the other, or from the middle outwards. The gutter slope should be between 0.5 to 1%.

Turn your gutter upside down with the bottom flat showing. Using a downpipe nozzle as a template, mark the area that you are going to remove to fit the down pipe nozzle. Carefully cut this section out so that the nozzle will fit snugly allowing the flanged edges of the nozzle to be fixed to the inside of the gutter. Take the nozzle and place a bead of silicone around the flange faces and place into position. Fix with four wafer head Tek screws.

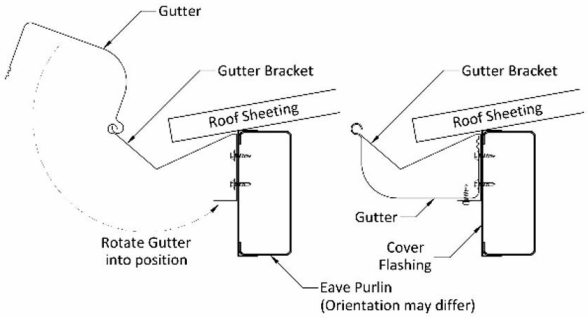
With COLORBOND® gutter it is necessary to remove the plastic from the area you are working on. Now fit the stop end bracket to the gutter end with four wafer screws. Seal the inside of the stop end with suitable plumbers silicone to prevent leakage. Remove all plastic from the section and place the gutter on the brackets. Be sure that the stop end of the gutter fits neatly under the barge cap at the end of the building.

Now that the section has been attached to the brackets, depress the tags on the back of the gutter to hold the gutter against the wall and screw a wafer through the bottom flange of the bracket into the base of the gutter. Silicone the protruding screw to prevent leakage.

You are now ready to place the next section of gutter on your building. Allow for a 75mm overlap on each gutter, remove the plastic if COLORBOND®, place two lines of silicone in the new section at the overlap point. Follow the same procedure for fixing along the building until the entire wall is correctly guttered.



GUTTER DETAILS - STOP END



GUTTER FIXING DETAILS

ROLLER DOOR INSTALLATION

Note: Doors are to be installed by a Experienced Installer.

The installation instructions and video can be accessed via the downloads page on the manufacturers Website https://www.cgdoors.com.au/downloads/

Please contact the manufacture for more details and instructions.

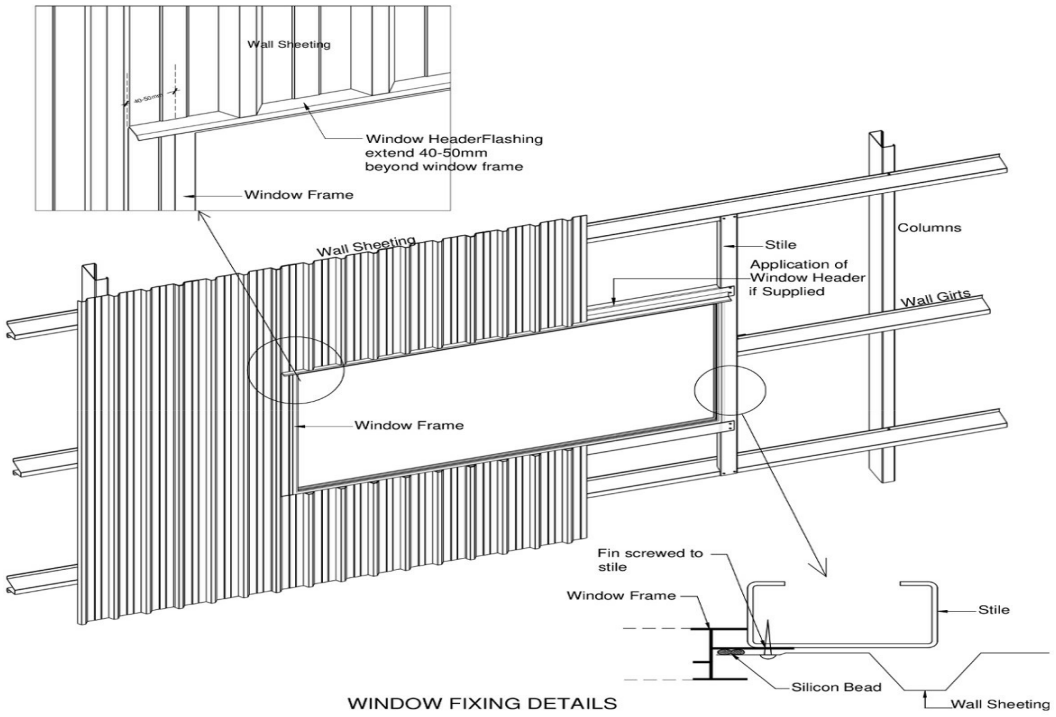
PA DOOR INSTALLATION

- Place some non abrasive covering on the ground.
- Stand your door on it's side on the covering with the lockside down.
- Remove any plastic from the hinge side of the door. To provide a small degree of protection, leave any other plastic on until the installation is complete.
- Measure 250mm in from each end and mark the holes for fixing the hinges. When marking make sure the barrel or pin of the hinge protrudes past the exterior edge of the door.
- Use a fine head center punch and carefully indent the hole centers.
- Drill these holes with a drill bit that is fractionally larger than the supplied rivets.
- Replace the hinge on the door edge and rivet the hinge onto the door through one of the middle holes.
- Check that the hinge is aligned with the door edge and fix the remaining rivets.
- Replace the hinge on the door edge and rivet the hinge onto the door through one of the middle holes.
- Using suitable packers stand the door at 90 degrees to the door jamb to which the hinges will attach. Ensure to a minimum of 5mm clearance from door base to slab.
- Mark the hinge hole positions on the door jamb ensuring the barrel or pin of the hinge protrudes clear of the jamb exterior edge.
- Remove the door and drill the holes. Reposition the door and fix in place. Fit the door handle mechanism as per supplied instructions with lockset.
- Mark the position where the striker connects to the non hinge jamb.
- Attach the vertical flashing to the striker side door jamb. Place the striker plate in position and mark. Cut the appropriate hole use drill bits, routers and tri-cnr foiles to achieve the desired configuration.
- Fix the striker plate in position, test the door operates correctly.
- Fit the hinge side flashing, mark and notch out to fit around the hinges.

WINDOWS

The specified size of the windows is approximate. The fin is used in fixing the window in place and should not be removed. Most windows supplied are of standard sizes calculated to fit in the pans of the vertical sheet. A rubber weather strip attached to the frame identifies the bottom of a window.

Position the window so it falls between the pans for vertical sheeting. For horizontal sheeting the window position is not critical. Cut out any girts that fall in the required window space and attach the window stile as per connection details. For larger windows if header and bottom plate are supplied, cut and fit over the stiles. Allow 5mm clearance between all stiles and window. Screw the fins of the window to the window stiles at the required height. Cut the wall sheeting 2-3mm below the top of the rubber seal and 2-3mm above the window (not the fin). The sheeting on the sides will fit behind the outer window flange and in the front of the fin. Extend the top cut approx. 40-50mm horizontally allowing the flashing to extend past the top of the window, creates side overhang. Silicone down the side fin, fit the sheet ensuring the rubber seal protrudes over the top of the cut sheet. Partial screw fix all but the top fin. Slide the top flashing between the sheet and the fin and above the top of the window. Cut the opposing side sheet, silicone the side fin and screw off. The sides are screwed through the fins and the window stiles. The top is screwed through the flashing and the fin. At the bottom screw fix only the fin (unless windows have bottom and top stiles).



WINDOW FIXING DETAILS

GLOSSARY

Please note that these terms are only a guide to industry terminology used throughout the construction kit. Some items may not be applicable to your specific building.

Apex
The highest point being the peak of building.

Apex Brace
Horizontally positioned C-Section used below peak of rafters to assist in rafter section strength.

Apex Brackets
Plate used to join rafters at peak of building.

Back to Back - B2B - B/B
This refers to when two C-Sections are joined web to web to form a "H" section.

Barge Capping
Used to cover the gap between the roof and the end wall sheeting on gable ends. It extends from over the edge of the roof sheet, and fixes to the face of the end wall or gable sheet, from apex of building to gutter.

Base Plates - Column Base Plates, EWM Base Plates, PAD Base Plates - RD Base Plates
Angle bracket used for fixing the columns to the footing/slab

Bays
Reference to the size of the spacing between Columns and/or End Wall Mullions Reference to bays is end or middle for both the sides and ends.

BOM
Bill of Materials. This contains the quantities, lengths, usage and component descriptions

Bridging
Mid Span Bracing fixed to the underside or inside of either purlins, girts or both. Position noted on the Specification Plan, which bays are required and number of rows.

Columns
The verical C section of the portal frame that makes up the side walls.

Column in Concrete (CIC)
As stated this means, the engineer due to structural requirements, has deemed in necessary to embed the column bottoms into concrete for the specified depth nominated on the BOM.

Corner Flashings
Cover material in an ‘L’ shape placed vertically in corner situations.

Downpipe
Rectangular or round section formed as a conduit for the disposal of rainwater collected in the gutters to the ground. Each length of downpipe has one end larger than the other to allow for joining of different lengths.

Eave Purlins
C-Section either C100 or C150. Attached to Rafter top by way of Eave Purlin Bracket. The brackets project out from the outside Column flange the distance of the Side Girt projection.

Eave Purlin Brackets
Brackets used to attach the Eave Purlins to the Rafter tops. The brackets project out from the outside Column flange the distance of the Side Girt projection at the eave point

End Wall Girts
These girts are fitted to the outside web of the corner Columns and to the outside flange of the End Wall Mullions

End Wall Mullions (EWM)
C section used for supporting the gable / dividing wall Rafters and fixing the End Wall Girts to.

End Wall Sheeting
Gable End Wall Sheets (non gutter side). These need to be cut at the angle to suit the roof pitch. They and are supplied long enough to enable the sheeting to extend past the finished floor line by 40mm. End Wall Sheets are fixed with Wall Screws in the lower pans of the sheeting to the End Wall Girts and to the Raking Girt at the top.

Fixing Brackets
A general purpose bracket for attachment of girts, mullions, headers and other components.

Flange
This term describes the shorter of the two main folded sections.

Footing Bolts
Threaded bolts embedded into the slab/footings or Dynabolts . Used to fix (via a base plate) the columns and/or mullions to the footings/slab.

Footings
Foundations formed with reinforced concrete and placed under each column and mullion. Footings are placed regardless of whether a slab is being installed, but vary in size accordingly.

Frame Screws
Two types – 14.20 x 22 for up to 5mm thickness and 12.24 x 32. for up to 12mm thickness. These are vital in the building for overall strength.

Gable
The end wall that is peaked. It does not have the gutter attached but is finished off with the Barge Capping.

Girt (Side Wall Girt, End Wall Girt)
Folded section fixed horizontally to the Columns and Mullions.

Gutter
Fitted to the top of the side walls to collect the roof water.

Gutter Brackets
Fitted to the peak of the wall sheeting or beams to enable the gutter to be fixed in place.

Haunch Brackets
Used for connecting the Columns and Rafters.They are left - handed and right - handed.

Header Purlin
Double C-Section. Attached to Rafter top by way of Eave Bracket. The brackets project out from the outside Column flange by the distance of the Side Girt projection. The two C-Sections are bolted together, with a bracket fastened to the bottom flange.

Knee Brace
C-Section connecting the Column and Rafters to strengthen the connection.

Mark
A reference marked on some materials to assist with the identification and placement.

Nozzle
Cut into the bottom of the Gutter. Downpipes are fitted over.

Parapet Sheeting
Sheeting on the side wall of the central building above the leanto roof and below the main building roof.

Roof Purlin
Folded section attached to the Rafters.

Rafter
The C-section connected to the column tops both sides and joined at the apex of the building. On larger building these may be back to back.

Ridge Cap
This is the folded flashing, which covers the gap between the Roof Sheets at the ridge or peak of the building .

Roller Door Jambs
C section used to support the door, fix the roller door brackets and track guides to.

Roof Screws
Fixed through the peaks (ridges) of the sheeting to the purlins. The type and number of screws varies depending on the wind region, sheeting profile and position on the roof.

Roof Sheet
Sheeting for the roof. Fitted with roof screws through the peak (ridges) of the sheeting and into the roof purlin / eave purlin. The sheeting extends half way into the gutter.

Side Wall Sheeting
Long wall (gutter side) sheets. These are supplied approximately 40mm longer than the eave height of the building to enable the sheeting to extend past the finished floor line. Wall sheets are fixed with Wall Screws in the lower pans of the sheeting to the Side Wall Girts.

Slab
Refers to a concreted area of a minimum reinforced thickness on which to construct the building. A slab can be a partial area or full sized. A partial slab can be combined with other types of foundations for the remainder of the construction.

Stop Ends
Fitted to the end of the gutter in opposing pairs.

Trim Angle
Equal angle screwed to the top exterior edge of the Roof Purlins from the apex to Gutter. It is placed to allow for the End Wall Sheeting to be fixed at the top. Can be cut and used as general purpose brackets.

Wall Screws
These are smaller screws and fixed in the lower pans of the sheeting.

Web
The largest exterior flat side of C-Section and Z-Section.

End Of Manual