

protect what matters

WEB TRUSS ASSEMBLY MANUAL

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Building Erection Manual (Rev-4) 1.21.15

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Congratulations!

You have purchased one of the highest quality steel buildings available. It has been designed to provide years of satisfaction in addition to enhancing the value of your property. This manual has been designed to assist you in the erection of your Worldwide Steel Buildings. If you have any questions, please feel free to call our experts at 1-800-825-0316 Monday-Friday 8:00 am - 4:30 pm Central time. Once again, thank you for investing in a Worldwide Steel Buildings.

Important - Please Read

When receiving your building package, you are strongly encouraged to check it thoroughly before storing.

All sheet metal must be checked for possible moisture that might have collected during the shipping process. If any sheets are wet, it is the customer's responsibility to see that they are dried before they are stored. Failure to store materials without them being completely dried may result in damage such as rust.

The materials making up the building package should never be stored outside. They should always be in a dry storage area.

Whenever sheet metal has to be cut, it is to be cut with the backside facing up. All chips must be wiped off to prevent rusting of the material.

It is the sole responsibility of the customer to store and maintain building materials. Worldwide Steel Buildings assumes no responsibility for weather conditions during transportation or the conditions of any items in the building package after delivery.

It is the responsibility of the customer to provide Builder's Risk Insurance so that all material will be insured during completion process and construction.

Worldwide Steel Buildings are not responsible for materials damaged after delivery or during construction.

All details, recommendations and suggestions in this manual are for general guidelines only, and not meant to be all inclusive. Industry accepted installation practices with regard to all areas not specifically discussed in this manual should be followed. Only experienced, knowledgeable installers familiar with accepted practices should be used to assure a quality project.

All safety requirements, whether statutory, regulatory, or customary, must be adhered to all times during installation of components supplied by Manufacturer.

<u>Knowledge of and adherence to OSHA and other local codes or laws is critical, and is the</u> <u>responsibility of the installer.</u>

STORAGE, HANDLING AND UNLOADING INFORMATION

UNLOADING

There should be a definite loading and unloading plan. Least-handled material is usually safest-handled.

Everyone should be aware of loads that may have shifted in transit. They may shift again in unloading.

Everyone should keep hands and feet clear and from under material.

HANDLING

On jobsites, reasonable care should be taken when handling painted surfaces during installation in order to protect the finish. Although the paint coating is tough and provides impact resistance, dragging the sheets across the surface of one another will mar the finish.

STORAGE

To preserve and protect the attractive appearance of your roofing and siding from damage caused by moisture, corrosive chemicals or improper handling it is necessary that you take a few simple precautions. When material is received bundled, sheets should be inspected for moisture and shipping damage. If present, the carrier should be advised and a notation made on the B.O.L. . . . (Bill Of Lading).

Prolonged storage of sheets in bundles is not recommended. If conditions do not permit immediate erection, extra care must be taken to protect the material from damage caused by moisture.

Store bundled sheets <u>IN A DRY PLACE ONLY</u>. Sheets should be unbundled and stood on end against an interior wall to allow for air circulation. If unable to store sheets in an upright position, strapping bands should be broken and sheets should be blocked off the floor with one end slightly elevated. Stacked sheets should then be completely protected from the elements while maintaining good air flow to prevent condensation. A properly draped canvas tarpaulin is an example of a good protective cover. Do not use plastic as it causes sweating or condensation to occur.

PARTS DESCRIPTION LIST

See Bill Of Lading (Shipment List) for specific components and hardware required for your building. Shipment list will explain where each component is used.

GIRTS Typical

- 1-5/8" x 3-5/8" "C" Channel
- 1-5/8" x 6" "C" Channel
- 2" x 6" Wood provided by other
- 2" x 8" Wood Provided by other

PURLINS Typical

- 1-5/8" x 6" "C" Channel
- 2" x 8" Wood provided by other
- 2" x 10" Wood Provided by other

4" TRACK

• 1-5/8" X 3-5/8" Framing Channel

6" TRACK

• 1-5/8" X 6" Framing Channel

KNEE BRACE

• 2' or 3' X 1" Angle

WIND ROD BRACE

• 3/8" Rod threaded on both ends

TRUSS BOLT

• 5/8" x 1-1/2" Hex Head

KNEE BRACE BOLT

• 5/16" X 3/4" Hex Head (1/2" Head)

WIND ROD BRACE NUT

• 3/8" Hex

WIND ROD BRACE CLIP

• 2" X 2" X 1/4" Angle

WIND ROD BRACE BOLT

- 1/2" X 2-1/2", 1/2" X 3" Hex Head
- 5/8" X 2-1/2", 5/8" X 3" Hex Head
- (See your truss hardware list)

ENDWALL COLUMN SLIDE PLATE

• 1/4" X 5" X 14"

ENDWALL COLUMN BOLT

- 1/2" X 2-1/2", 1/2" X 3" Hex Head or
- 5/8" X 2-1/2", 5/8" X 3" Hex Head
- (See your truss hardware list)

TEK SCREW

• #14 X 3/4" Recommended drill speed for all screws should be between 1800 and 2000 RPM's

LAG SCREW

• 1/4" X 1-1/4" (7/16" Head)

SHEET SCREW

- #12 X 1-1/4" Colored flanged self driller (Steel Package) or #9 or #10 X 1 -1/2" Wood point (Wood Package)
- Recommended drill speed for all screws should be between 1800 and 2000 RPM's

CLOSURE STRIPS

- Treated 1 x 1 Foam rubber with corrugations cut into them.
- 3' long for Inside and Outside closures.
- 25' Roll for Universal.

TOOL LIST

The tool list below is recommended as the minimum requirement for the best erection results.

Safety Glasses First aid kit 100' Tape Measure 25' Tape Measure **Ball Peen Hammer** Claw Hammer 8" Screw Driver 15/16" Spud Wrench 3/8" Drive Ratchet 15/16" Socket 9/16" Socket 15/16" Box Wrench 1/2" Open Wrench Tool Belt and Bags **Tri-Square** Shovel

3/8" Drill 7/16" Magnetized Socket 3/8" Magnetized Socket 5/16" Magnetized Socket 2 -50' Electric Extension Cords 10" Tin Snips -Right Hand 10" Tin Snips -Left Hand 20 Foot Extension Ladder 4 Foot Level Plumb Bob Chalk Box Warehouse Broom 7 – 1/4" Heavy Duty Skill Saw Metal Cutting Blades 10" Vice Grips

STARTING YOUR BUILDING

GENERAL NOTES

It is important to protect metal sheets from potentially corrosive situations and materials. This will ensure the good performance and long life of the metal. If installing over green or damp lumber, a positive vapor barrier must be installed to separate the wood from the sheet. Additional caution must be used when dissimilar metals might be brought in contact with one another; the exception is stainless steel. A positive vapor barrier may be constructed with plastic, builder's felt, or other suitable material. Dissimilar metals may be separated with asphalt, caulking compounds, or gasket materials.

Because some insulation materials may be porous, it is recommended that a vapor barrier also be installed that protects the metal sheets and the insulation materials from contact with moisture. Obtain specific information from the manufacturer of the insulation or a qualified mechanical engineer.

Metal sheets must be further protected from contact with strong chemicals such as fertilizers, lime acids, manure and soil. All of these have the potential to initiate corrosion in metal sheets. **Metal sheets should not be in permanent contact with soil**.

Recommended drill speed for all screws should be between 1800 and 2000 RPM's.

ERECTION

BRACING

Structure should be braced at all times before raising the next part. Structure should be secured with temporary or permanent bracing before release of raising equipment, and at the end of day or other shutdowns.

BOLTING

All joints should be connected and all bolts in place before release.

ROOFING

Starter section-Until the first run of sheets is secured, temporary scaffolding should be used to start sheeting so that builders will have something to stand on.

CLIMBING STRUCTURE

No one should slide down columns since the sheared edges will rip gloves and hands open. Ladders should be used to get on and off the building. Do not climb on the girts since they will bow and work the screws loose.

ELECTRICAL

HIGH LINES [POWER]

Hoisting equipment should be kept clear of power lines. Equipment and loads should be kept clear of any guide wires and anchors.

POWER TOOLS AND GROUNDING

Power tools and cords should be kept in good repair at all times. All power tools should have a three wire ground system without exception. A periodic inspection of each tool including the grounding of the case should be made. In the event that the operator does get a shock, he should not attempt to grab the defective tool with both hands.

Under no circumstances should a worker use power tools while standing on wet ground.

While drilling, grinding, or sawing the operator should wear safety glasses, use safety guards, and other safety devices.

COLUMNS

COLUMN PLACEMENT

The importance of accurate foundation construction and column placement setting cannot be overemphasized. Foundation errors and misallocation of columns are among the most frequent and troublesome errors made in metal building construction. Following procedures and methods should help to minimize these costly errors and delays. You will need to make sure your concrete is the right size and square. Measure the width on both ends and the length of both sides. If these are correct you need to check for square. To do this measure diagonally from corner to corner both ways. Your measurements should be the same for both. See figure 1below.

Measurements Must Be Equal



Measure where your columns will set and mark the center of each one. Chalk a line from end to end on both sides from the outside edge on all four sides of your slab. The dimension will vary depending on the type of building package that you have purchased. (SEE YOUR W-1 COLUMN LAYOUT FOR DIMENSIONS).



Lay your columns and girts out for the sidewalls where they will be ready to be put in place.

COLUMN INSTALLATION

Anchor truss column to floor set back from edges centered on chalk lines previously marked. (SEE BUILDING DRAWINGS FOR DIMENSIONS)

After standing and bolting columns in place, use temporary bracing at the first column on each side to ensure it is plumb. (Anchor bolts supplied by others)





STEEL SIDEWALL GIRTS

Put one Tek screw in the end of each girt except for at corners put two screws. Length of girts for sidewalls are shown on the CAD drawings supplied with the building.

Note:

Girts should stick past the outside of the corner column. All other girts will set end to end at the center of the other columns. (SEE YOUR BUILDING DRAWINGS FOR DIMENSIONS)



WOOD SIDEWALL GIRTS

Put two lag screws in the end of each girt except for at corners put four screws. Length of girts for sidewalls are shown on the CAD drawings supplied with the building.

Note:

Windows and walk doors can be field located. All overhead doors are placed according to drawings. Girts will typically run across center of one column and out to the overhead door track to make the framed opening.

(SEE BUILDING DRAWINGS FOR DIMENSIONS AND

LOCATIONS)



WIND ROD BRACING AT WALLS

Once the sidewall columns are in place and all girts are on, install the wind rod braces at the location shown on drawings using (3/8" Nuts) at the ends of the wind rods and (Nuts, Bolts and Washers) at wind rod clips. Once installed, use wind rods to adjust the columns to be plumb. Once columns are plumb, make sure everything is tight.

(SEE BUILDING DRAWINGS FOR LOCATIONS - DO NOT INSTALL WIND RODS WHERE DOORS OR WINDOWS WILL BE).



KNEE BRACING AT WALLS

Make sure columns are plumb and square before attaching the knee braces to the girt. Attach knee braces to the column at a 45° angle with (5/16" x 3/4" Bolt) and (Nut). Attach knee braces to the wall girts with two (#14 X 3/4") Tek screws for steel girts, one (1/4" X 1-1/4") lag screws for wood girts. If columns are twisted you will need to straighten them before attaching the knee brace.



ROOF

TRUSS PLACEMENT

Trusses should be bolted together at ridge connection using 5/8" x 1-1/2" (Nuts and Bolts) on the ground and lifted into place after columns are standing and girts are installed on the sidewall. The number of nuts and bolts will vary depending on the size of the building.

(SEE SHIPMENT LIST AND DRAWING FOR SIZE AND QUANTITIES).



Note:

Knee braces can be attached to the bolt tab on the truss using a 5/16" x 3/4" (Nuts and Bolts) before lifting into place for easier assembly. See Knee Backing pg. #16 for details.



Note:

If building is wider than forty feet it is recommended that a spreader bar should be used to pick up the trusses.

If spreader is not used the truss can fold in the middle and cause damage.

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Start at one end of the building, line up holes of knee connection using a drift pin and put all bolts in. Once all bolts are in, tighten all bolts at this connecting point. Before you release the truss from the equipment used to set it with, make sure all bolts are tight and truss is stabilized with cables or rope. On each subsequent truss you will want to attach the top two purlins, one on each side of peak to act as bracing to hold assemblies in place until all trusses are set. Once you have all the trusses up attach the remaining purlins.







STEEL PURLINS

Put two Tek screw (#14 X 3/4") in the end of each purlin except for at gable ends put four Tek screws. Length of roof purlins are shown on the CAD drawings supplied with the building.





Building End View

WOOD PURLINS

Put two lag screws $(1/4" \times 1-1/4")$ in the end of each purlin except for at gable ends put four screws. Length of roof purlins are shown on the CAD drawings supplied with the building.



WIND ROD BRACING AT ROOF

Once the Trusses have been set and all purlins are on, install the wind rod braces in the bays as shown on the building drawings using (3/8" Nuts) at the ends of the wind rods and (5/8" or 1/2", Bolts, Nuts and Washers) at wind rod clips. Once installed use these to adjust the trusses to be plumb. Once everything is plumb make sure all bolts are tight and tighten all anchor bolts at this time.



KNEE BRACING AT ROOF

Make sure trusses are vertical and plumb before attaching the knee braces to the purlins. Attach knee braces to the trusses at a 45° angle with (1/2" Hex Head Bolt) and (3/8" Hex Head Nut) if they were no attached previously. Attach knee braces to the roof purlins with two (#14 x 3/4") Tek screw for steel or one (1/4" x 1-1/4") lag screws for wood. If trusses are twisted you will need to straighten them before attaching the knee brace.



Steel Purlins.



Wood Purlins.

EAVE PURLINS

Make sure the face of all eave clips are plumb, straighten as required. Attach eave 6" track at sidewalls with (#14 x 3/4") Tek screws. Nest 6" purlin to track with (#14 x 3/4") Tek screws. Use (1/4" x 1-1/4") lag screws for wood.



6" Track installed to eave clip before nested purlins are installed.



6" purlins nested into 6" track.



Wood eave.

STEEL GABLE

Install 6" track across the ends of the purlins at the gable to cap ends. Cut ends to an angle that matches the roof pitch, 4:12 being the most common at 72°. Secure with one (#14 x 3/4") Tek screw at eave purlin and then every other purlin. In the event there is more than one piece of 6" track, put one Tek screw in the purlins nearest to the seam.





WOOD GABLE

Install board across the ends of the purlins at the gable to cap ends. Cut ends to an angle that matches the roof pitch, 4:12 being the most common at 72°. Secure gable at every purlin with wood fasteners (FASTENERS NOT PROVIDED).

STEEL FRAMING AT TOP OF ENDWALLS BELOW PURLINS



Attach 3 5/8" track to the bottom side of the roof purlins at the top of the sidewalls with $(1/4" \times 3/4")$ Tek screws.



WOOD FRAMING AT TOP OF ENDWALLS BELOW PURLINS

Install board to the bottom side of the roof purlins at the top of the sidewalls with wood fasteners (FASTENERS NOT PROVIDED).

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ENDWALLS



ENDWALL COLUMNS

Note:

Endwall slide plate needs to be inserted loosely in the top of the column prior to anchoring it in place. See next step for fastener information.

We recommend drill-in cement anchor bolts for the end wall columns. Anchor truss column to floor set back from edges at chalk lines previously marked.

(SEE BUILDING DRAWINGS FOR DIMENSIONS)

(Anchor bolts supplied by other)



Attach endwall column connector plate to column with 2 (5/8" x 1 $\frac{1}{2}$ " Hex Head Bolt), 2 (5/8" Hex Head Nut), and 4 (5/8" Washers). Attach endwall column connector plate to truss with 1 (1/2 x 2 $\frac{1}{2}$ " or 5/8" x 3" Hex Head Bolt), 1 (1/2" or 5/8" Hex Head Nut), and 1 (1/2" or 5/8" washer).

Note:

Endwall girts will overlap on top of sidewall girts at corners the depth of the girt.

STEEL ENDWALL GIRTS

Put two Tek screw (#14 X 3/4") in the end of each girt. Length of girts for endwalls are shown on the CAD drawings supplied with the building. Clip bottom corner sidewall girt to form a cap to cover over the bottom endwall girt.







WOOD ENDWALL GIRTS

Put two lag screws in the end of each girt. (FASTENERS NOT PROVIDED). Length of girts for sidewalls are shown on the CAD drawings supplied with the building.

Note:

Windows and walk doors can be field located. All overhead doors are placed according to drawings.

FRAMED OPENINGS

STEEL WINDOW

Mark and trim out girts to form the rough opening. Track should be 12" longer than measurement between connecting points. Measure 6" from ends and clip outside edges only, and then bend to create an attachment tab. Install track using $#14 \times 3/4$ " Tek-screws. Install temporary brace on the inside from the bottom of the framed opening to the foundation until sheeting is installed. Install $#14 \times 3/4$ " Tek-screws from the inside first, outside screws will go on with the J-Trim.



Note:

Temporarily brace bottom of window frame until outside sheeting is installed.

WOOD WINDOW

Mark and trim out girts to form the rough opening. Wood fasteners supplied by others.







STEEL WALK DOORS

Mark and trim out girts to form the rough opening. Track should be 6" longer than measurement between connecting points. Measure 6" from end and clip outside edges only, and then bend to create an attachment tab. Install track using $#14 \times 3/4$ " Tek-screws. Install $#14 \times 3/4$ " Tek-screws from the inside first, outside screws will go on with the J-Trim.



WOOD WALK DOORS

Mark and trim out girts to form the rough opening. Wood fasteners supplied by others.





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Once all openings are done you are ready to start sheeting your building. Recheck and make sure everything is properly installed at this point. If you missed anything now is the time to go back and fix it before you go any further.

FRAMING COMPLETION CHECKLIST

COLUMNS AND ENDWALL COLUMNS

- A. All columns are properly located.
- B. All columns are plumb.
- C. All bolts are in place and tightened.

ROOF TRUSSES

- A. All roof trusses are properly in place.
- B. All bolts are in place and tightened.
- C. Building is plumb.

PURLINS AND GIRTS

- A. All purlins and girts are in place and well attached.
- B. Fascia purlins are installed.
- C. 6" gable track is installed.

BRACING

- A. All knee braces are bolted and tightened on columns and roof trusses.
- B. All knee braces are screwed to girts and purlins.
- C. All wind brace rods are in place.
- D. All wind brace rod nuts should be snugged down against the clip after building is plumb.

SHEETING AND TRIM INSTALLATION

Note:

See shipment list for proper panel placement information. See details on pg.28 for panel starting points. Wall sheets are installed after insulation and before the roof sheeting.

SHEETING PREPARATION

Gang drilling is recommended for even screw lines. To gang drill, measure framing spacing, stack sheets for each section of wall separate and line up the bottom of sheets then clamp the bottom together.

DO NOT STACK MORE THAN 20 SHEETS IN A STACK.



Mark your sheets with a pencil where you need to drill them on the top sheet of the stack. See above drawing for screw placement. After everything is marked on the sheets always double check to make sure your lines run straight before drilling. This will make for straight screw lines which will make for a better looking building when completed.



PROFILES - TRIM & SCREW





Square Base Trim

J-TRIM

J-trim will be attached before the wall sheeting is installed at framed openings with (3) screws per piece, one screw at either end and in the middle. These screws can be removed if they interfere with sheeting during installation. Screws for the sheeting will hold the J-trim in place in this case.



Steel Framed Opening

Wood Framed Opening



Section at Framed Opening

WALL SHEETING

BASE TRIM

Base trim must be attached first with (3) screws per piece at either end and in the middle. These screws can be removed if they interfere with sheeting during installation. Screws for the sheeting will hold the base trim in place in this case.

SHEETING



Note:

For non-insulated buildings, inside closures are provided which are placed between base trim and sheets as sheets are attached. If your building has wall insulation, run double back tape along the bottom of the wall and the top to help hold it in place. All insulation is field cut for the sizes you need. It is best to only do 6' at a time. Insulation is not provided for soffitted overhangs.

After the first sheet is in place make sure it is plumb, check every other wall sheet to make sure they stay plumb.

ROOFING INSTALLATION

Note:

If roof sheets come in two pieces for one side, the standard end lap will be 12" with the upper sheets being installed over the lower sheets.

EAVE TRIM



After the sidewalls are sheeted the eave trim goes on the top of the sidewall with a $1\frac{1}{2}$ overlap at the end walls. Attach eave trim with (3) screws per piece at both ends and in the middle of the eave trim. The top screws can be removed if they interfere with roof sheeting during installation, screws for the roof sheeting will hold the eave trim in place in this case. You are now ready to attach the roof.

Note:

The roof, if insulated, will require tape down both eaves.

SHEETING

Attach first sheet even with the gable and overhang the eave by 2 ¹/₂" inches to prevent water running under the eave of the building. The thinner foam "inside closure" strips are installed between the eave trim and sheet, set in place before screwing sheet to the eave purlin.







RIDGE CAP

Once the roof sheets are attached, apply the thicker foam "outside closures" with self adhesive. Place down from the top of the sheets in line with the edge of the ridge cap where ridge cap meets the roof sheeting. Ridge cap goes on using screws at every high rib. Overhang ends 3 ¹/₂" out from gable track and overlap 6" at seams.

Note:

Do not screw down the ends at the outsides of the roof until the gable trim piece is tucked under and installed.



CORNER TRIM

The corners will be screwed on at the same screw lines as the wall sheets with screws.



Note:

Slide top end under eave trim before attaching to building.



GABLE TRIM

Gable trim will be screwed onto the roof to match the roof screw lines with screws. The gable trim face will screw every three feet through the high rib where the sheets lap with screws. The gable will slide under the ridge cap. Install pieces of "outside closures" to close gap between ridge cap and gable trim. The ridge cap will screw down to the gable trim with screws. Install end cap plates to cover the peak joint in the gable trim.

Note:

We recommend that you walk around your building and make sure that there are not missing screws. Double check everything else to make sure it is tight and secure.

Congratulations!

You have now completed your Worldwide Steel Buildings and can look forward to years of maintenance-free use and enjoyment from it. If you have any questions or comments, feel free to contact us at 1-800-825-0316. Thank you for choosing Worldwide Steel Buildings for your building needs.

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