

# Installation Instructions

## Dynarail® Safety Ladder System



*High Performance Composite Solutions*



- Corrosion
- Fire
- UV Resistant
- Time
- HIGH**  
Strength : Weight
- Low Install Cost
- No tools
- No lightning bolt

# Simplified Ladder Instructions



The **Dynarail® Safety Ladder System** has been designed to combine the best in fiberglass reinforced plastic (FRP) ladders and cages with simplicity of installation. Fibergrate has made every attempt to provide clear and thorough instructions for installing these products. If you have any further questions, or need additional information, do not hesitate to contact Fibergrate at (800) 527-4043.

By following these simple instructions, you should find installation of your ladder system quick and easy.

## TOOLS REQUIRED

- Drill**
- Bits**
  - 1/8" (for rivets)
  - 9/16" & 11/16" (for connection bolts)
- 25' Tape Measure**
- Sealing Kit**
- Bonding (Epoxy) Kit(s)**
- Wrenches**
  - 7/16" (2 each)
  - 9/16" (2 each)
- Sandpaper (80 grit)**
- Hack Saw**
- Level**
- Stir Sticks**
- "C" Clamps**

**NOTE:** Cuts and drilled holes must be sealed to maintain corrosion protection.

## QUICK TIPS FOR INSTALLING LADDERS



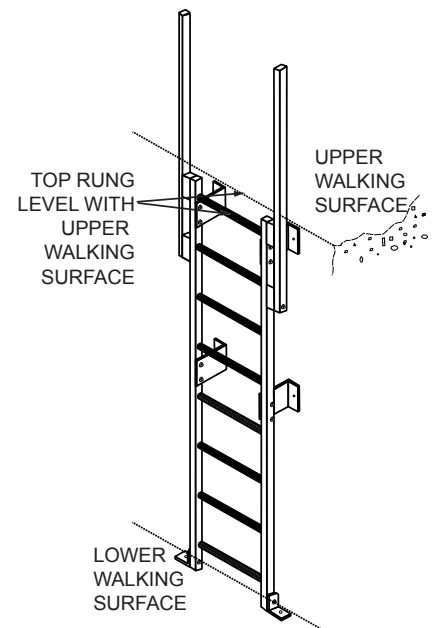
1. Layout ladder, walk thru, wall mount kits and floor mount kits. Cut ladder as required (see **Section I - Installing Ladder and Walk thru**). Attach walk thru to ladder (see **Section I - Installing Ladder and Walk thru**). Attach wall mounts to ladder and mount on wall (see **Section I - Installing Ladder and Walk thru - To Install Wall Mounts**). Attach floor mount clip to ladder and bolt to floor (see **Section I - Installing Ladder and Walk thru - Installing Floor Mounts**).
2. If installing cage, after installation of the ladder, follow the instructions shown in **Section II - Installing Cage** for installation of hoop brackets, hoops and vertical bars.

## IMPORTANT

It is the installer's responsibility to carefully follow fabrication and installation plans and instructions to ensure design performance characteristics of the Dynarail® ladder system.

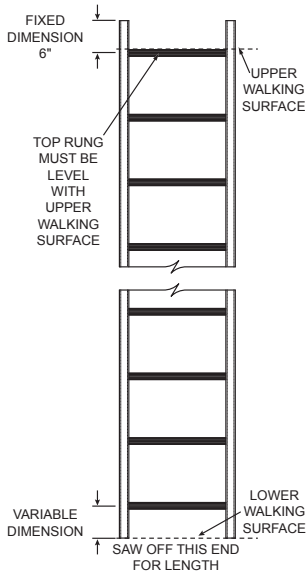
The installer could be liable for claims that result from improper installation.

**DRAWING A -  
INSTALLED LADDER**

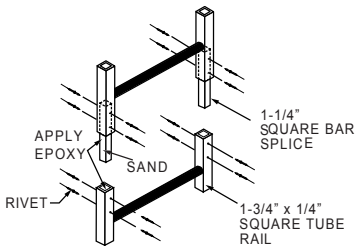


# Section I - Installing Ladder

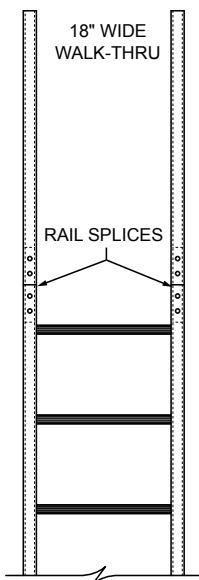
**DRAWING B - VARIABLE & FIXED DIMENSIONS**



**DRAWING C - LADDER RAIL SPLICE**



**DRAWING D - 18\"/>**



**INSTALLING LADDER AND WALK THRU**

1. Determine required ladder height by measuring from walking surface at bottom of ladder to step-off at top of ladder. Add 6" to obtain the required overall ladder length. Any adjustment in the ladder length should be made at the ladder bottom (walking surface end - see **Drawing B**). For example, if the overall ladder length determined is 8'-5" and you are working with a 10' ladder, be sure 6 inches are left from the step-off rung to the top and cut 1'-7" from the opposite end (see **Drawing B**).
2. If installing the standard 18" wide walk thru, mix and apply epoxy to splice end (see **Drawing C**) of one of the walk thru posts and insert splice end into the ladder side rail at the top end (see **Drawing D**). Drill for, and install, 4 rivets - 2 on each side of rail. Repeat with other post.

If installing the 24" wide walk thru, place top spacer of one walk thru post as shown in **Drawing E**, drill and bolt loosely into place. Place the bottom spacer in place, match drill and bit into place. Tighten all bolts. Repeat with other walk thru post.

**INSTALLING WALL MOUNT BRACKETS**

*Note: Maximum 6' spacing between brackets and maximum 6' from bottom end of ladder to first bracket. Ladder must be attached to wall or structure at the top rung.*

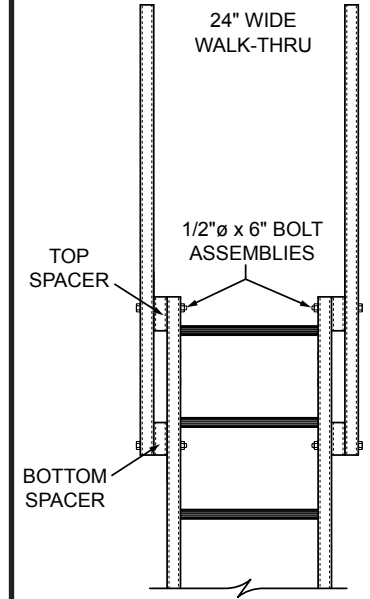
3. With pencil, mark location on wall and ladder where brackets are to be mounted.
4. Locate end of the first wall mount flush with front edge of ladder (**Drawing F**). Match drill two 7/16" diameter holes in ladder rail and bolt bracket to ladder with 3/8" x 3" hex head bolt assemblies. Continue with all wall mount brackets.
5. Drill wall for anchor bolts.
6. Mount ladder to wall with top rung flush with step-off.

**INSTALLING FLOOR MOUNT CLIPS**

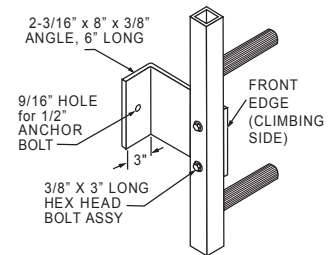
*Note: If floor mount cannot be used, substitute bottom wall mount (Drawing G) and install at bottom of ladder using steps 3-6.*

7. Place the floor clip flush with bottom of ladder rail, mark holes in bottom of ladder rail and drill a 7/16" diameter hole (**Drawing H**). Repeat for opposite rail. Bolt floor clips to ladder with 3/8" x 3" hex head bolt assemblies.
8. Drill floor for anchor bolts.
9. Bolt ladder to floor (**Drawing H**).

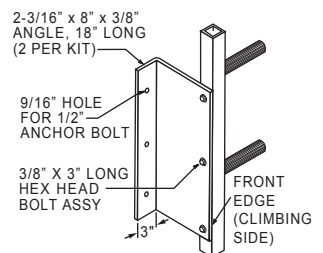
**DRAWING E - 24\"/>**



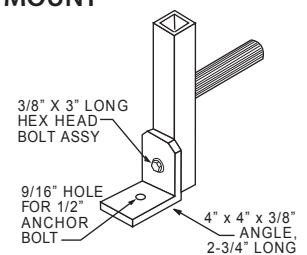
**DRAWING F - STANDARD WALL MOUNT**



**DRAWING G - BOTTOM WALL MOUNT**

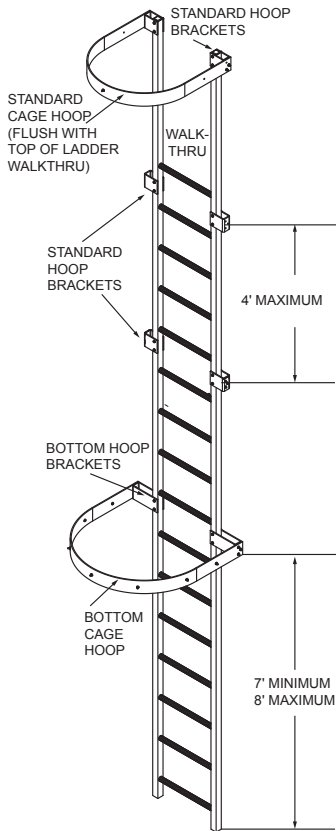


**DRAWING H - FLOOR MOUNT**

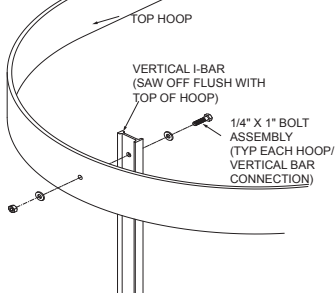


# Section II - Cage Installation

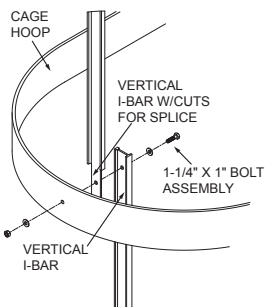
**DRAWING I - TOP AND BOTTOM CAGE HOOPS**



**DRAWING J - VERTICAL I-BAR CONNECTION**

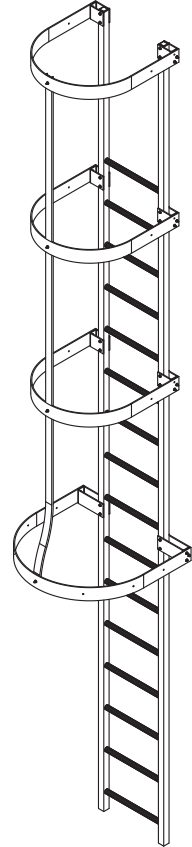


**DRAWING K - VERTICAL I-BAR SPLICE**

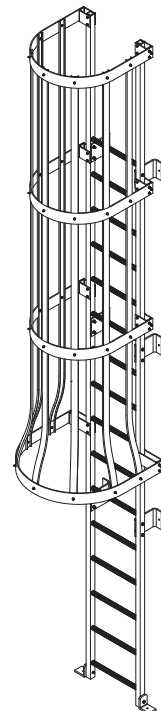


1. If your ladder has an 18" wide walk thru, locate uppermost standard cage hoop bracket flush with inside edge and top of ladder square tube rail (**Drawing I**). If your ladder has a 24" wide walk thru, eliminate the top cage hoop brackets and attach the hoops directly to the walk thru rails using 1/4" x 2-1/2" round head bolts. Proceed as for 18" wide walk thru with remaining installation.
2. Using standard cage hoop brackets as templates, drill 5/16" diameter mounting holes through the ladder rail. Bolt top hoop brackets to the ladder using the 1/4" x 3" round head bolt assemblies provided.
3. Locate bottom hoop brackets by measuring from outside of top bracket to outside of bottom cage bracket for cage height (**Drawing I**). Bottom hoop bracket should be 7' minimum, 8' maximum from walking surface at bottom of ladder. **Remember, hoops should be maximum 4' apart (see step 5).**
4. Using bottom hoop brackets as templates, drill and bolt intermediate hoop brackets to ladder using the 1/4" x 3" round head bolt assemblies provided.
5. After all brackets are attached, mount the cage hoops to the brackets using the 1/4" x 1-1/4" bolt assemblies provided (**Drawing I**).
6. Install the vertical I-bars beginning at the bottom hoop by centering vertical bar over the hole in the hoop, match drilling a 5/16" diameter hole, and bolting with the 1/4" x 1" long bolt with two flat washers and hex nut (**Drawing J**). Continue with the remaining hoops (**Drawing L**). (If vertical bars are not long enough, splice per **Drawing K**). Saw the bar flush with the top hoop.
7. Repeat step #6 until all seven vertical bars are installed.
8. Continue with steps #3 through #9 to finish your Dynarail FRP ladder system installation (**Drawing M**).

**DRAWING L - VERTICAL BAR INSTALLED**



**DRAWING M - INSTALLED LADDER WITH CAGE**



# Section III - Technical Information

## OSHA REQUIREMENTS FOR LADDERS & LADDER SYSTEMS

From the Code of Federal Regulations, Title 29, Labor, 1910.27

Installer is responsible for referring to most current OSHA Code for complete information.

1. (a)(1)(i) 200 lb concentrated load (minimum at center of rung)
2. (b)(1)(ii&iii) Distance between rungs maximum 12", minimum clear width between side rails of 16"
3. (c)(4) Distance from the center line of rungs to wall in back of ladder shall be not less than 7"
4. (d)(1)(ii) Cage required on ladders of more than 20' to a maximum unbroken length of 30'
5. (d)(1)(iii) Cage to extend minimum of 42" above top of landing
6. (d)(1)(iv) Cage shall begin minimum 7' to maximum 8' above base of ladder (floor)
7. (d)(1)(v) Cage shall not be less than 27" in width
8. (d)(1)(v) Cage hoop vertical bars shall be located at a maximum spacing of 40° around the circumference of the cage

## TECHNICAL DATA

(All materials are yellow vinyl ester, fire retardant - VEFR)

### LADDER:

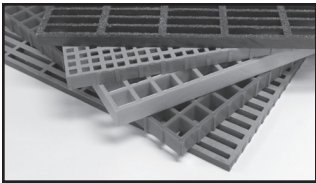
Maximum length without splice	24'-0"	Outside Diameter of rung	1-1/4"
Maximum ladder length with cage	33'-6"	Inside Diameter of rung	7/8"
Clear inside width (inside rail to rail)	18"	Rail - outside width	1-3/4"
Outside width (outside rail to rail)	21-1/2"	Rail - wall thickness	1/4"
Rung Spacing (center to center)	12"	Weight per foot (approximately)	2.7 lbs.

### CAGE:

Product	Description
<b>Standard Hoop Kit</b> (PN 448200)	27" from center line of ladder rung to inside of hoop 3" wide x 1/4" thick hand layup Predrilled holes <i>(with necessary bolt assemblies)</i>
<b>Bottom Hoop Kit</b> (PN 448000)	31" from center line of ladder rung to inside of hoop 3" wide x 1/4" thick hand layup Predrilled holes <i>(with necessary bolt assemblies)</i>
<b>Hoop Brackets</b> (Included with hoop kits)	1/4" thick, "U" shaped hand layup Predrilled holes <i>(with necessary bolt assemblies)</i>
<b>Vertical I-Bars</b> (PN 446211 - 10 ft; PN 446210 - 20 ft)	I-Bar, 1-1/2" deep x 5/8" flange x 1/8" thick
<b>Bottom Wall Mount Bracket Kit*</b> (PN 448400 ISOFR Dk Gray, PN 448401 VEFR Beige ) <i>Required when ladder cannot be floor mounted</i>	2-3/16" x 8" x 3/8" angle, 18" long Two per set <i>(with necessary bolt assemblies)</i>
<b>Wall Mount Bracket Kit*</b> (PN 448500 ISOFR Dk Gray, PN 448501 VEFR Beige )	2-3/16" x 8" x 3/8" angle, 6" long 7" from wall to center of rung Two per set <i>(with necessary bolt assemblies)</i>
<b>Floor Mount Clip Kit*</b> (PN 448700 ISOFR Dk Gray, PN 448701 VEFR Beige)	4" x 4" x 3/8" angle, 2-3/4" long Two per set <i>(with necessary bolt assemblies)</i>

# Fibergrate Products & Services

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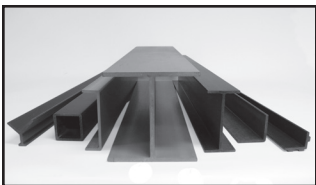
## Fibergrate® Molded Grating

Fibergrate molded gratings are designed to provide the ultimate in reliable performance, even in the most demanding conditions. Fibergrate offers the widest selection in the market with multiple resins and more than twenty grating configurations available in many panel sizes and surfaces.



## Safe-T-Span® Pultruded Industrial and Pedestrian Gratings

Combining corrosion resistance, long-life and low maintenance, Safe-T-Span® provides unidirectional strength for industrial and pedestrian pultruded grating applications.



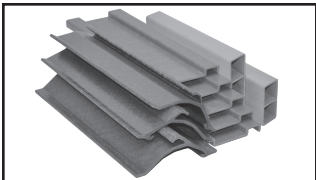
## Dynaform® Structural Shapes

Fibergrate offers a wide range of standard Dynaform® pultruded structural profiles for industrial and commercial use, including I-beams, wide flange beams, round and square tubes, bars, rods, channels, leg angles and plate.



## Dynarail® Guardrail, Handrail & Ladder Systems

Easily assembled from durable components or engineered and prefabricated to your specifications, Dynarail® guardrail, handrail and safety ladder systems meet or exceed OSHA and strict building code requirements for safety and design.



## Custom Composite Solutions

Combining Fibergrate's design, manufacturing and fabrication services allows Fibergrate to offer custom composite solutions to meet our client's specific requirements. Either through unique pultruded profiles or custom open molding, Fibergrate can help bring your vision to reality.



## Design & Fabrication Services

Combining engineering expertise with an understanding of fiberglass applications, Fibergrate provides turnkey design and fabrication of fiberglass structures, including platforms, catwalks, stairways, railings and equipment support structures.



## Worldwide Sales & Distribution Network

Whether a customer requires a platform in a mine in South Africa to grating on an oil rig in the North Sea, or walkways in a Wisconsin cheese plant to handrails at a water treatment facility in Brazil; Fibergrate has sales and service locations throughout the world to meet the needs and exceed the expectations of any customer.

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# DynaRound™ Hatch Guard System Installation Instructions

**Estimated Installation Time:** 2 Man Crew, 60 - 90 Minutes

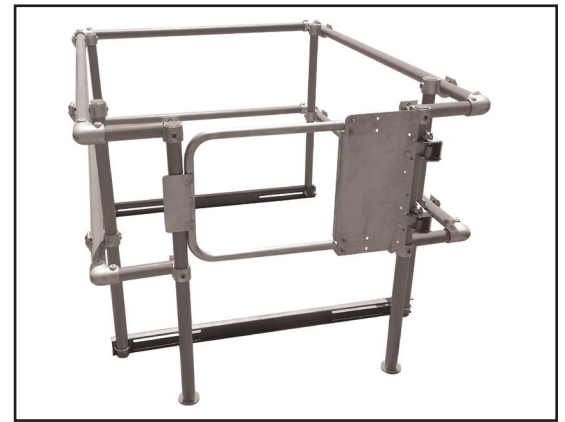
The DynaRound Hatch Guard System is designed to protect all rooftop hatch entry and exit points. This non-penetrating system is easily installed and can be used both temporarily and preeminently depending on need. The FRP railings and galvanized fittings ensure a long service life.

## INSTALLATION INSTRUCTIONS ARE FOR:

- PN 5041210 DynaRound Hatch Guard –Fits Hatches 30-36 inches x 30-54 inches**
- PN 5041310 DynaRound Hatch Guard –Fits Hatches 30-36 inches x 96-114 inches**
- PN 5041410 DynaRound Hatch Guard –Fits Hatches 42-48 inches x 42-60 inches**

## TOOLS REQUIRED

- 5/16-inch Hex (Allen) Wrench**
- 5/16-inch Hex Drive Socket (to fit torque wrench)**
- Torque wrench 5 – 50 lb-ft range (6.8 –67.6 N-m)**
- Socket Set with extensions – SAE (inches)**
- Open End Wrench Set – SAE (inches)**
- Marker or Pencil**
- 25-foot tape measure**
- Blue (removable) thread locking compound**



**NOTE:** Cuts and drilled holes must be sealed to maintain corrosion protection.

## IMPORTANT

Read these instructions completely before attempting to install the DynaRound Hatch Guard. It is important to understand the installation procedure thoroughly prior to beginning work. It is the installer's responsibility to carefully follow fabrication and installation plans and instructions to ensure design performance characteristics of the DynaRound Hatch Guard. The installer could be liable for claims that result from improper installation.

## ASSEMBLY INSTRUCTIONS:

1. Inspect and inventory all components of the DynaRound Hatch Guard and compare to the bill of materials listed on the first page of the drawings to verify that all materials are available for installation. Contact Fibergrate at 1-800-427-4043 to report missing material and obtain replacements.
2. Read these instructions and study the drawings (pages 3-5) thoroughly before attempting to install the DynaRound Hatch Guard. Be sure you are referring to the correct drawings for the Hatch Guard being installed.
3. Inspect the hatch and surrounding roof area where the DynaRound Hatch Guard is to be installed. Remove any debris or obstructions in the installation area and verify all field dimensions and conditions prior to assembling and installing the Hatch Guard.
4. It is recommended to assemble the Hatch Guard adjacent to the hatch, then lift it over the hatch and clamp the Hatch Guard in place. Prepare a suitable assembly area adjacent to the hatch and protect the roof in that area following the roofing manufacturer's recommendations
5. While the components of the DynaRound Hatch Guard which contact the roof are designed not to damage roofing materials, it is recommended that the roof manufacturers recommendations be followed for protecting the roofing material from abrasion damage at any location where the Hatch Guard contacts the roof.
6. Attach two Item (7) Angle Bracket into the long slots in each Item (6) Hatch Channels using 3/8" diameter nuts, bolts, and washers, Items (9) – (11). Install item (7) on the flange side of the channels as shown in the plan view. Build two sub-assemblies. Do not torque the bolts at this time, allowing the Angle Bracket to slide freely in the slot in the Hatch Channel.

# Installation Instructions

7. Assemble two Item (15) Posts to each Item (6) Hatch Channel. Attach the Posts in the semi-circular cut-outs in the ends of the Hatch Channels using one each Item (8) 3/8" x 4" U-Bolts with 3/8" nuts and washers. Install Item (15) Post with the plug end up and the open, bottom end flush with the bottom of Item (6) Hatch Channel. Apply blue thread locking compound to the threads and torque the bolts to 40 lb-ft (54.1 N-m). Cap the bottom of each post with one each Item (4) Yellow Flanged Plug.
8. Install two Item (1) Open Cross Over to each post as shown in Section D-D on page 3 of 4 of the drawings. The upper Open Cross Over should be flush with the top of the post. The lower Open Cross Over should be installed 20 inches below the top of the post. Torque the set screws only as needed to hold the Open Cross Overs in place. They may require adjusting later in the assembly process.
9. Mark each of the four longest sections of 1.9" Diameter Round Tube (Item (13) for PN 5041210, Item (16) for PN 5041310, and Item (19) for PN 5041410) at 6 inches from one end.
10. Stand up the two post/channel assemblies oriented as they will be in the final assembly (flanges of the Item (6) Channel facing each other). Locate them approximately the maximum distance apart as shown in the drawings. Place the four long sections of 1.9" Diameter Round Tube into the Open Cross Overs and align the rails so that the center of the post opposite the gate is aligned with the marks made in Step 7. After checking that the post channel assemblies are plumb and properly aligned, torque the set screws in the Open Cross Overs only as needed to hold the 1.9" Diameter Round Tube in place.
11. Install the two 1.9" Diameter Round Tube Rails (Item (14) for PN 5041210, Item (14) for PN 5041310, and Item (20) for PN 5041410) on the side of the Hatch Guard opposite the gate using four each of Item (2) Two Way Elbow. Torque the set screws in the Two-Way Elbows only as needed to hold the 1.9" Diameter Round Tube in place.
12. Assemble the remaining two Item (15) Posts by adding two each Item (1) Open Cross Over as shown in Section A - A of the drawings. The upper Open Cross Over should be flush with the top of the post. The lower Open Cross Over should be installed 20 inches below the top of the post. Cap the bottom of each post with one each Item (4) Yellow Flanged Plug.
13. Following the layout shown in Section A - A, connect the two assembled Item (15) Posts to the ends of the rails installed in Step (9) using Items (2) Two Way Elbows and the four short sections of 1.9" Diameter Round Tube (Item (12) for PNs 5041210 and 5041310, Item (18) for PN 5041410). Torque all set screws only as needed to hold the assembly in place.
14. Assemble and install Item (5) Self Closing Gate 30"-36" following the instructions provided with the gate. The gate is clamped to the right-hand Item (15) Post when facing the opening in the Hatch Guard from the outside. Adjust the posts and the gate as needed to achieve satisfactory operation of the gate.
15. Using a minimum of two people, lift the assembled Hatch Guard over the hatch and position the hatch so that it falls between the post/channel assemblies. Orient the Hatch Guard so that the self-closing gate faces the open side of the hatch.
16. Push the assembled Hatch Guard so that the post/channel assembly that is opposite the gate bears against the hatch body. Insure that the Hatch Guard is centered on the hatch body. Slide the two Item (7) Angle Brackets until they just contact the hatch body. Apply blue thread locking compound to the bolt threads and torque the bolts to 40 lb-ft (54.1 N-m).
17. Loosen the set screws in the Open Cross Overs on the post/channel assembly adjacent to the Self Closing Gate and slide the post channel assembly until it bears against the hatch body. Re-torque the set screws in the Open Cross Overs to hold the post/channel assembly in place. Slide the two Item (7) angle brackets until they just contact the hatch body. Apply blue thread locking compound to the bolt threads and torque the bolts to 40 lb-ft (54.1 N-m).
18. Insure that the self-closing gate operates properly and adjust where required. Check the opening of the hatch door to ensure that the Hatch Guard does not interfere with its operation. Adjust as the Hatch Guard needed to clear the interference.
19. Once correct operation of the Hatch Guard is achieved, all set screws in the (1) Open Cross Overs and (2) Two Way Elbows should have thread locking compound applied to them and be torqued to 7.5 lb-ft (10.1 N-m)
20. The installed system should be inspected annually by a qualified inspector. The inspection should include checking the set screws for correct torque, checking for corrosion of the metallic fittings, inspecting the 1.9" diameter FRP tubes for signs of damage, and checking the self-closing gate for correct operation. Any corrective actions required by this inspector must be implemented immediately or the Hatch Guard should be clearly tagged as unsafe for use. Written logs should be kept of every inspection and any corrective actions documented.



# Installation Drawings

## DYNAROUND HATCH GUARD 30 - 36 X 30 - 54 - PN 5041210

PLAN VIEW

**DynaRound RG Hatch Guard  
30-36 x 30-54**

**PN 5041210 (ASSEMBLY)**

FIND ELECTRIC COPY AT:  
\\stv-dc\DATA\Engineering\Fabrication Engineering\ECN

**Material Requirements for 5041210**

ITEM NO.	QTY REQ'D	PART NUMBER	DESCRIPTION
15	6	UTILIZE	1.9"Ø Round Tube - UV Coated (Parent PN 5001010)
14	2	UTILIZE	1.9"Ø Round Tube - UV Coated (Parent PN 5001010)
13	4	UTILIZE	1.9"Ø Round Tube - UV Coated (Parent PN 5001010)
12	4	UTILIZE	1.9"Ø Round Tube - UV Coated (Parent PN 5001010)
11	12	785200	3/8" Ø Washer
10	12	784200	3/8" Ø Nut
9	4	754520	3/8" Ø x 1 Lg. Bolt
8	4	793114	McMaster 3/8"Ø x 4" U-Bolt Zinc Plated PN 8875T858
7	4	793112	Garlock Angle Bracket Zinc Dichromate
6	2	793110	Garlock Hatch Channel - 53.25" Galvanized
5	1	793115	Garlock Self Closing Gate 30"-36" Yellow
4	6	793113	Caplugs Yellow Flanged Plug WWX-17
3	10	7926150	End Cap - UV Coated
2	8	793125	Two Way Elbow
1	12	793201	Open Cross Over

WEIGHT = 152 LBS

REV	DESCRIPTION	DATE	BY
0	ECN 173	09/20/17	CS

**HATCH GUARD**

SCALE: N.T.S.    DATE: 09/20/17    DRAWN: CS

DRAWING NUMBER: **5041210**    SHEET: 1 OF 4

ELEVATION

WEIGHT = 152 LBS

REV	DESCRIPTION	DATE	BY
0	ECN 173	09/20/17	CS

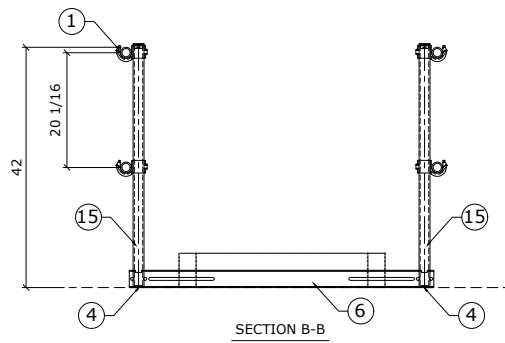
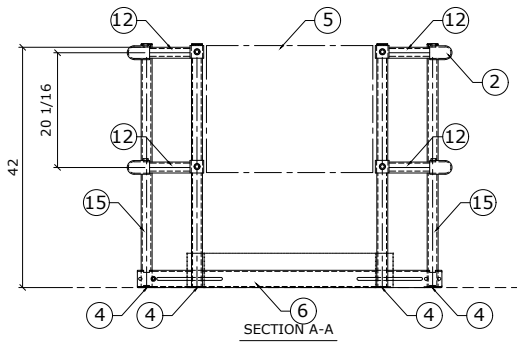
**HATCH GUARD**

SCALE: N.T.S.    DATE: 09/20/17    DRAWN: CS

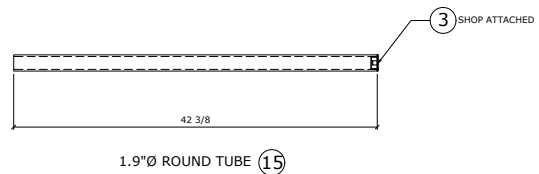
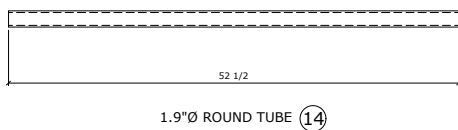
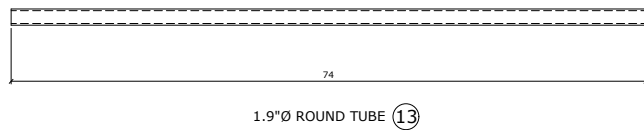
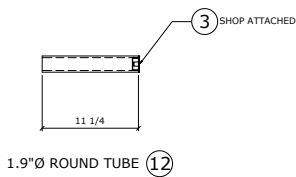
DRAWING NUMBER: **5041210**    SHEET: 2 OF 4

# Installation Drawings

## DYNAROUND HATCH GUARD 30 - 36 X 30 - 54 - PN 5041210 (CONTINUED)



REV	DESCRIPTION	DATE	BY	HATCH GUARD			
0	ECN 173	09/20/17	CS	SCALE	N.T.S.	DATE: 09/20/17	DRAWN: CS
				DRAWING NUMBER	5041210		SHEET 3 OF 4



REV	DESCRIPTION	DATE	BY	HATCH GUARD			
0	ECN 173	09/20/17	CS	SCALE	N.T.S.	DATE: 09/20/17	DRAWN: CS
				DRAWING NUMBER	5041210		SHEET 4 OF 4

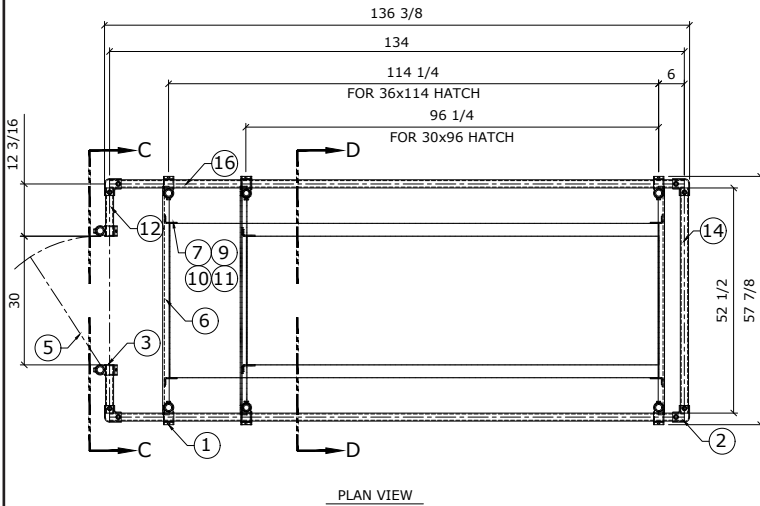
# Installation Drawings

## DYNAROUND HATCH GUARD 30 - 36 X 96 - 114 - PN 5041310

### DynaRound RG Hatch Guard - 30-36 x 96-114

#### PN 5041310 (ASSEMBLY)

FIND ELECTRIC COPY AT:  
 \\stv-dc\DATA\Engineering\Fabrication Engineering\ECN



PLAN VIEW

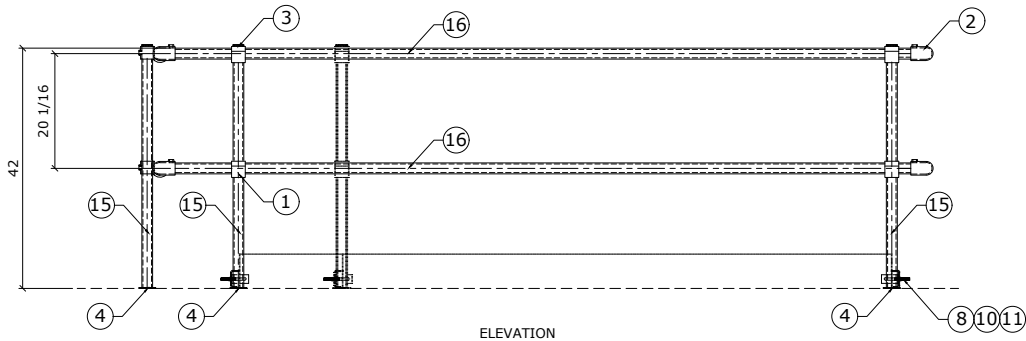
#### Material Requirements for 5041310

ITEM NO.	QTY REQ'D	PART NUMBER	DESCRIPTION
16	4	UTILIZE	1.9"Ø Round Tube - UV Coated (Parent PN 5001010)
15	6	UTILIZE	1.9"Ø Round Tube - UV Coated (Parent PN 5001010)
14	2	UTILIZE	1.9"Ø Round Tube - UV Coated (Parent PN 5001010)
12	4	UTILIZE	1.9"Ø Round Tube - UV Coated (Parent PN 5001010)
11	12	785200	3/8" Ø Washer
10	12	784200	3/8" Ø Nut
9	4	754520	3/8" Ø x 1 Lg. Bolt
8	4	793114	McMaster 3/8"Ø x 4" U-Bolt Zinc Plated PN 8875T858
7	4	793112	Garlock Angle Bracket Zinc Dichromate
6	2	793110	Garlock Hatch Channel - 53.25" Galvanized
5	1	793115	Garlock Self Closing Gate 30"-36" Yellow
4	6	793113	Caplugs Yellow Flanged Plug WWX-17
3	10	7926150	End Cap - UV Coated
2	8	793125	Two Way Elbow
1	12	793201	Open Cross Over

WEIGHT = 176 LBS



REV	DESCRIPTION	DATE	BY	HATCH GUARD		SCALE	DATE	DRAWN
0	ECN 173	09/20/17	CS	N.T.S.	09/20/17			CS
				DRAWING NUMBER	5041310			SHEET
								1 OF 4



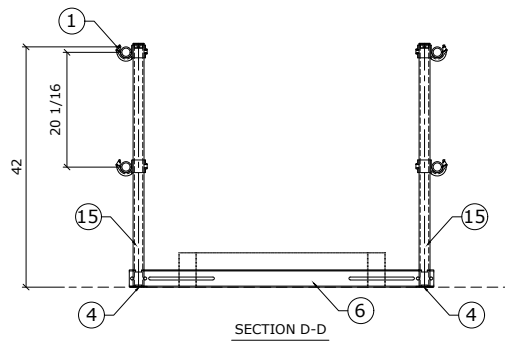
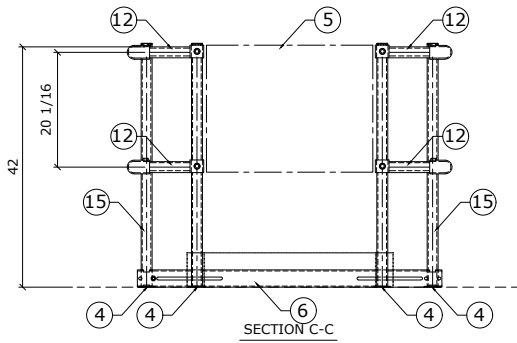
ELEVATION



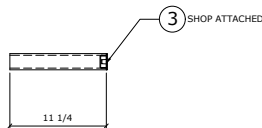
REV	DESCRIPTION	DATE	BY	HATCH GUARD		SCALE	DATE	DRAWN
0	ECN 173	09/20/17	CS	N.T.S.	09/20/17			CS
				DRAWING NUMBER	5041310			SHEET
								2 OF 4

# Installation Drawings

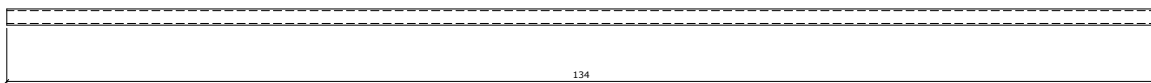
## DYNAROUND HATCH GUARD 30 - 36 X 96 - 114 - PN 5041310 (CONTINUED)



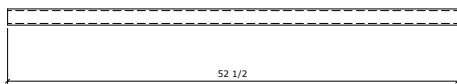
REV	DESCRIPTION	DATE	BY	HATCH GUARD			
0	ECN 173	09/20/17	CS	SCALE	N.T.S.	DATE: 09/20/17	DRAWN: CS
				DRAWING NUMBER	5041310		SHEET 3 OF 4



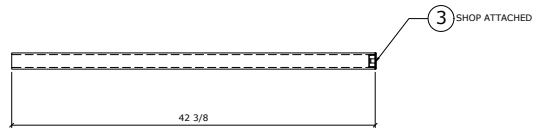
1.9"Ø ROUND TUBE (12)



1.9"Ø ROUND TUBE (16)



1.9"Ø ROUND TUBE (14)



1.9"Ø ROUND TUBE (15)



REV	DESCRIPTION	DATE	BY	HATCH GUARD			
0	ECN 173	09/20/17	CS	SCALE	N.T.S.	DATE: 09/20/17	DRAWN: CS
				DRAWING NUMBER	5041310		SHEET 4 OF 4

# Installation Drawings

## DYNAROUND HATCH GUARD 42 - 48 X 42 - 60 - PN 5041410

**PLAN VIEW**

**DynaRound RG Hatch Guard - 42-48 x 42-60**

**PN 5041410 (ASSEMBLY)**

FIND ELECTRIC COPY AT:  
 \\stv-dc\DATA\Engineering\Fabrication Engineering\ECN

**Material Requirements for 5041410**

ITEM NO.	QTY REQ'D	PART NUMBER	DESCRIPTION
21	2	793111	Garlock Hatch Channel - 65.25" Galvanized
20	2	UTILIZE	1.9"Ø Round Tube - UV Coated (Parent PN 5001010)
19	4	UTILIZE	1.9"Ø Round Tube - UV Coated (Parent PN 5001010)
18	4	UTILIZE	1.9"Ø Round Tube - UV Coated (Parent PN 5001010)
15	6	UTILIZE	1.9"Ø Round Tube - UV Coated (Parent PN 5001010)
11	12	785200	3/8" Ø Washer
10	12	784200	3/8" Ø Nut
9	4	754520	3/8" Ø x 1 Lg. Bolt
8	4	793114	McMaster 3/8"Ø x 4" U-Bolt Zinc PLATED PN 8875T858
7	4	793112	Garlock Angle Bracket Zinc Dichromate
5	1	793115	Garlock Self Closing Gate 30"-36" Yellow
4	6	793113	Caplugs Yellow Flanged Plug WWX-17
3	10	7926150	End Cap - UV Coated
2	8	793125	Two Way Elbow
1	12	793201	Open Cross Over

**WEIGHT = 163 LBS**

REV	DESCRIPTION	DATE	BY	HATCH GUARD	
0	ECN 173	09/20/17	CS	SCALE: N.T.S.	DATE: 09/20/17
				DRAWING NUMBER: 5041410	DRAWN: CS
					SHEET: 1 OF 4

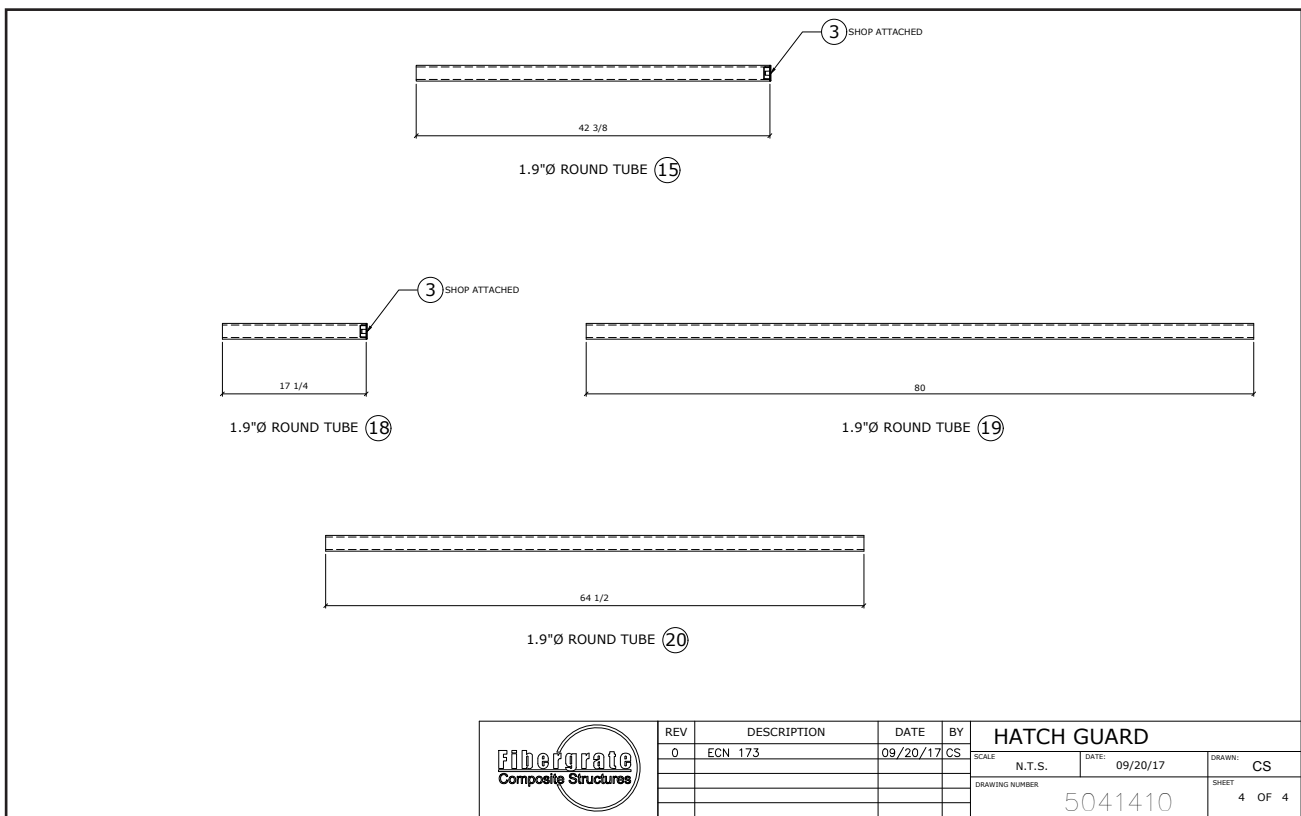
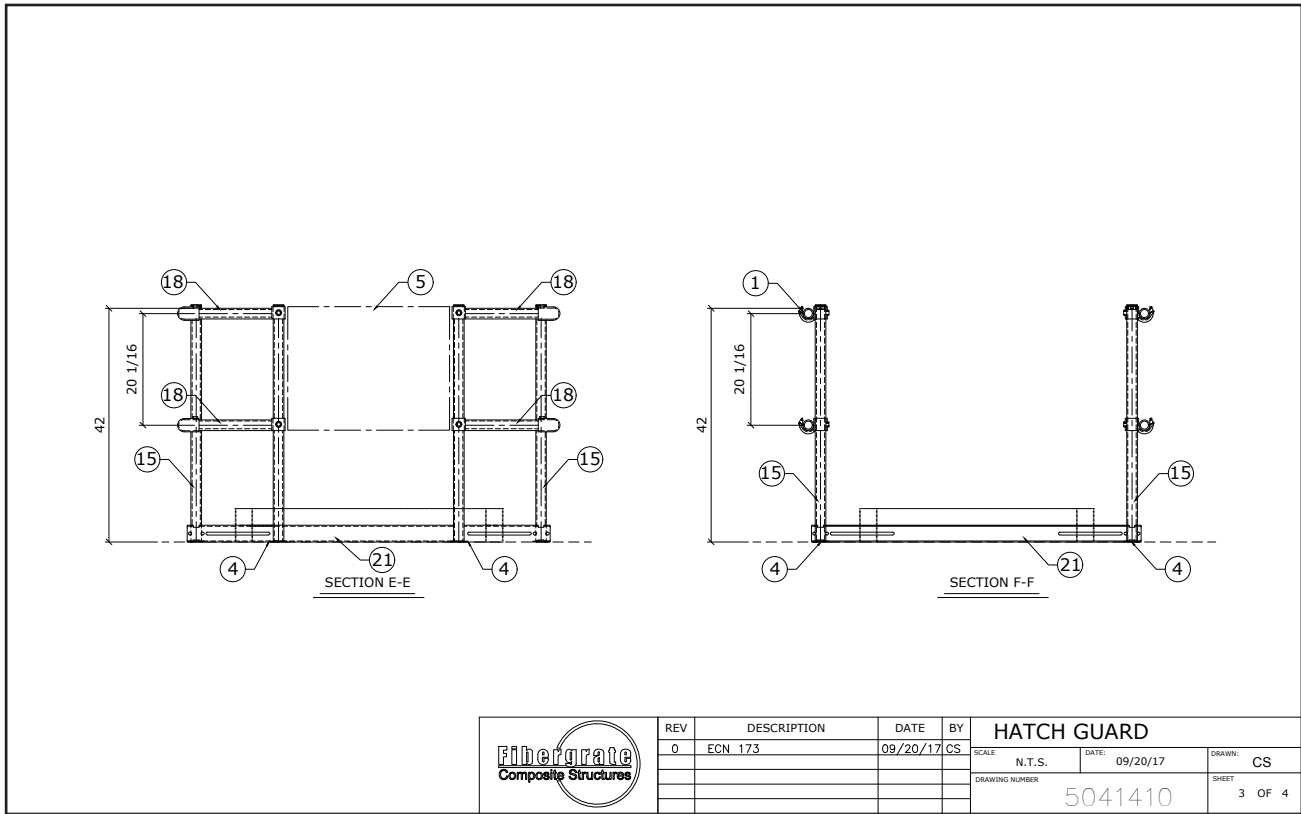
**ELEVATION**

**WEIGHT = 163 LBS**

REV	DESCRIPTION	DATE	BY	HATCH GUARD	
0	ECN 173	09/20/17	CS	SCALE: N.T.S.	DATE: 09/20/17
				DRAWING NUMBER: 5041410	DRAWN: CS
					SHEET: 2 OF 4

# Installation Drawings

## DYNAROUND HATCH GUARD 42 - 48 X 42 - 60 - PN 5041410 (CONTINUED)



Phone: 972-250-1633  
Fax: 972-250-1530



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info@fibergrate.com

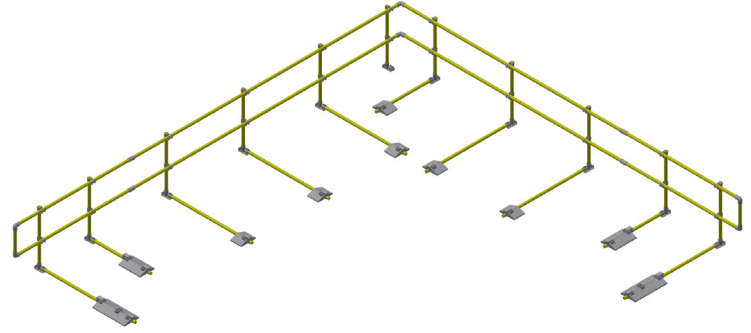
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©Fibergrate Inc. 2015 - Part No. 883304-11/17 - DynaRound-Hatch-Guard-System-Installation-Instructions.pdf



# DynaRound RG™ System Installation Instructions

**Estimated Installation Time:** 2 Man Crew, 40LF Per Hour

Fibergrate's ballasted rooftop guardrail system, DynaRound RG (Roof Guard)™, is designed for safety and fall protection on rooftop applications. Each system is made of durable, weather-resistant fiberglass reinforced plastic (FRP) composite uprights and non-FRP counterbalance weights and connector components. This system meets applicable safety standards in the US and Canada to protect people working at heights.



## TOOLS REQUIRED

- Circular Saw with carbide or masonry blade for cutting rail tubes to length
- 25' Tape measure and marking tools or scribe
- Torque wrench of up to 20 lb-ft or 240 lb-in capacity with 5/16" Allen Key Socket
- Removable thread locking compound (such as Blue Loctite)
- The installer is responsible for job site safety and lifting equipment required

**Note:** Cuts and drilled holes must be sealed to maintain corrosion protection.

## IMPORTANT

Read these instructions completely before attempting to install the DynaRound RG™ System. It is important to understand the installation procedure thoroughly prior to beginning work. It is the installer's responsibility to carefully follow fabrication and installation plans and instructions to ensure design performance characteristics of the DynaRound RG™ System. The installer could be liable for claims that result from improper installation.



## ASSEMBLY INSTRUCTIONS

1. Inspect and inventory all DynaRound RG™ components and compare to the packing list or bill of materials to verify that all materials are available for installation. Contact Fibergate at 1-800-427-4043 to report and missing material.



2. Inspect the roof to verify that the area where the DynaRound RG™ is to be installed is prepared for installation. Remove any debris/ obstructions in the installation area and verify all field dimensions prior to assembling the DynaRound RG™ System.
3. Verify that the location where the post assemblies will be placed are free of debris and that the roof surface has been protected as directed by roofing manufacturer.



4. Locate the first post/outrigger and assemble the post and outrigger to slipper by torquing the set screws to 15 lbs-ft (20.3 N-m). Add a removable thread locking compound (such as Blue Loctite) to the set screws to prevent loosening. Refer to the drawing on page 4 for details of the five types of post/outrigger assemblies. Install the Roofs and Special Hooks on the outrigger and torque the set screws. Verify that the post is plumb using a spirit level. Install the Open Cross Over fittings to the posts in the positions indicated.



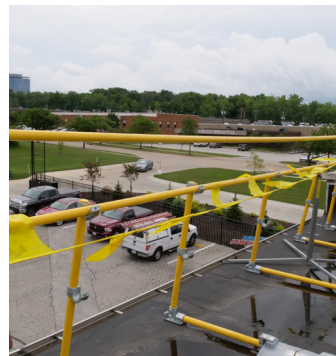
5. When placing the post/outrigger assemblies, ensure that the bottom surface of the slipper and the roofs make full contact with the supporting surface. The heel of the slipper in each post/outrigger assembly should bear against the roof parapet. If the parapet is absent, the heel of the Slipper must be a minimum of 12" from the roof edge.



6. Locate the next post/outrigger assembly and repeat steps 4&5 until all post/outrigger assemblies are in place.



7. Install 20 ft sections of 1.9" OD FRP tube top and mid rails through the open cross over fittings on the posts. Torque the set screw to 7.5 lb-ft (10.1 N-m). Add thread locking compound to the set screws to prevent loosening. Splice the rails together using PN 504701 Rail splice assembly which consists of two PN 793149 Sleeve joints.





- 8.** At returns (unsupported terminations of the guardrail), connect the two ends of the 1.9" OD FRP tube using PN 5045010 Return Assembly which consists of a length of 1.9" OD FRP tube and two PN 793125 Two Way Elbows. Torque set screws to 7.5 lb-ft (10.1 N-m). Add thread locking compound to the set screws to prevent loosening.



- 9.** Returns are supported with an A post assembly at a maximum of 1'-9" from the unsupported end of the rail and a B Post Assembly at a maximum of 3'-3" from the A Post Assembly. Refer to the drawing on page 5.



- 12.** At supported rail terminations to walls, the rails are attached to the wall using PN 504601 Wall Assembly which consists of two PN 793131 Base Flanges. The Maximum distance from the last post/outrigger assembly to the wall is 5'-0". The Base Flanges are connected to the 1.9" OD FRP rails via set screws and the Base Flanges are connected to the wall or to other fixed structure using 4 1/4" diameter countersunk head fasteners. Verify that the wall or other fixed structure can sustain the required loads. Unless noted otherwise, the 1/4" diameter countersunk head fasteners are to be supplied by the customer and suitable for installation based on the field conditions. Refer to the drawing on page 4.

- 13.** After completion, perform a complete inspection of the DynaRound RG™ installation to ensure that the posts are spaced at the correct intervals and that all set screws are torqued to the minimum required torque. The system can then be inspected by the owner or the owner's engineer and accepted. A written log of the final inspection should be kept by the owner.



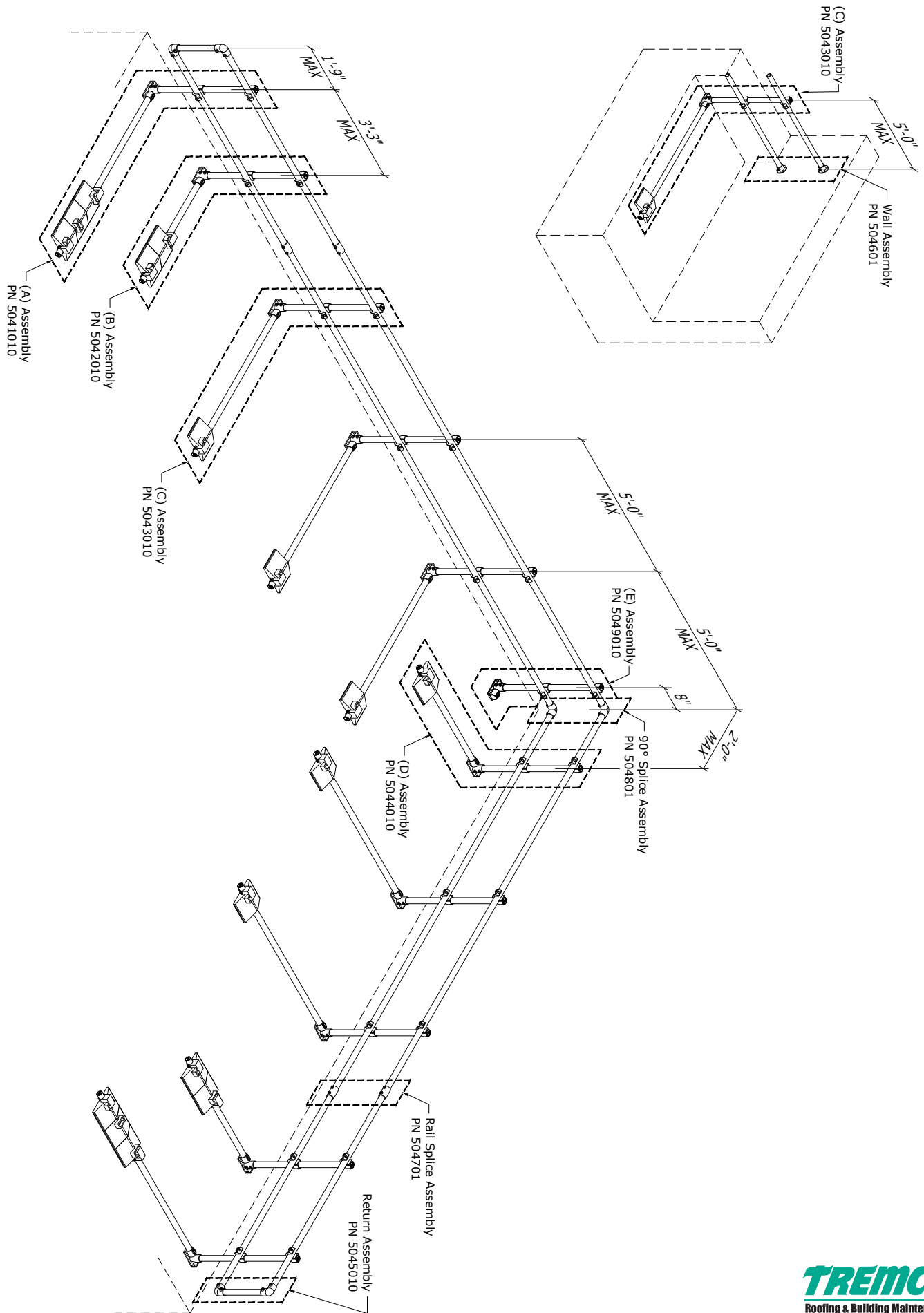
- 10.** At 90° corners, connect the 1.9" OD FRP rails using PN 504801-90 Degree Splice Assembly which consists of two PN 793125 Two Way Elbows. Torque the set screws to 7.5 lb-ft (10.1 N-m). Add a removable thread locking compound (such as Blue Loctite) to the set screws to prevent loosening. Install one Post Assembly D a maximum of 2'-0" from the corner on one side, and a Post Assembly E at a maximum 8" from the corner at the other. The Next Post Assembly C is at a maximum of 5'-0" from the corner as shown. Refer to the drawing on page 5.

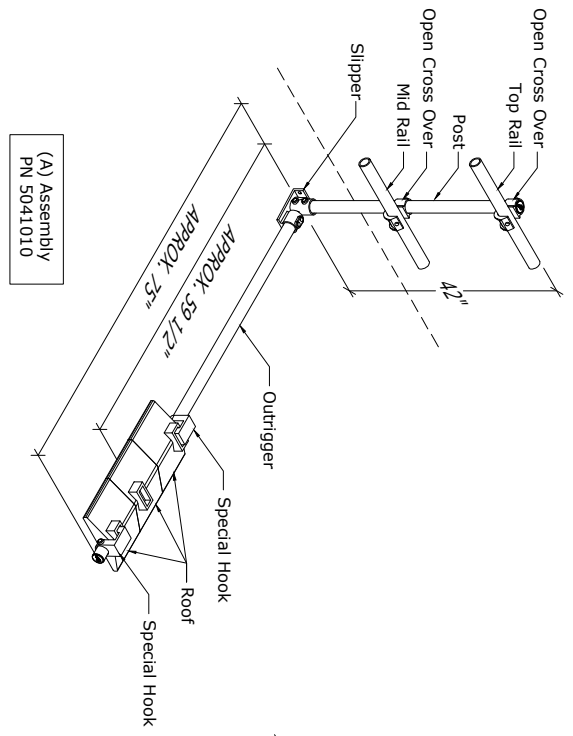


- 14.** The installed system should be inspected annually by a qualified inspector. This inspection should include checking fittings for looseness, checking for corrosion of the fittings, checking that the minimum setback from the roof edge is maintained, and inspecting the 1.9" OD FRP tubes from any sign of damage. Any corrective actions required by this inspector must be immediately implemented or the DynaRound RG™ should be clearly ragged as unsafe for use until repairs are implemented. Written logs should be kept of every inspection and any corrective actions documented.

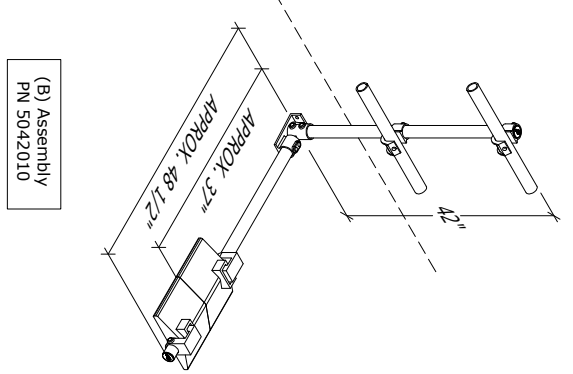


- 11.** Maximum spacing of C Post Assembly is 5'-0" on center. Refer to the drawing on page 5.

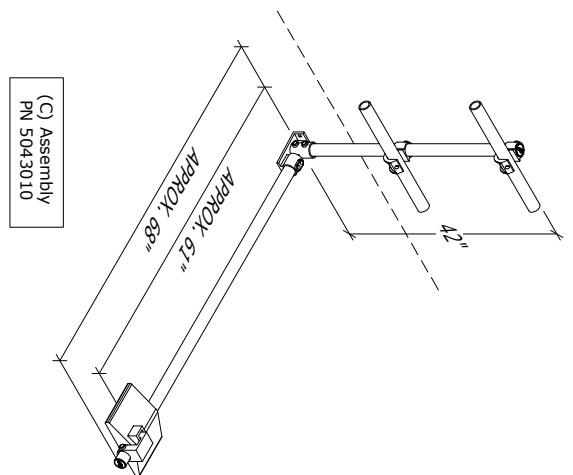




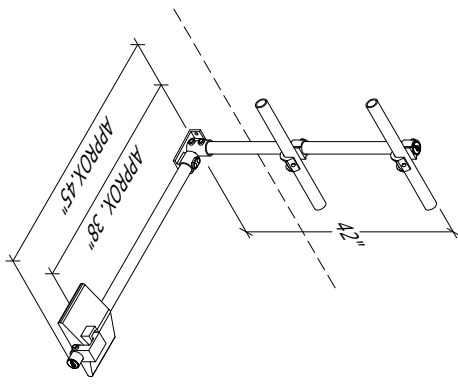
(A) Assembly  
PN 5041010



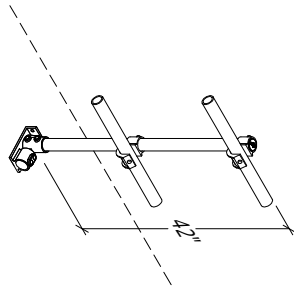
(B) Assembly  
PN 5042010



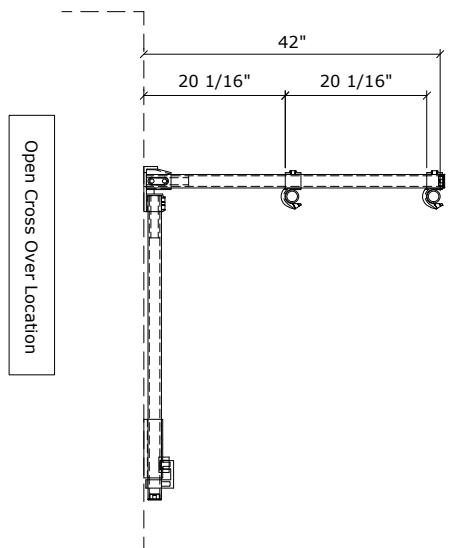
(C) Assembly  
PN 5043010



(D) Assembly  
PN 5044010



(E) Assembly  
PN 5049010

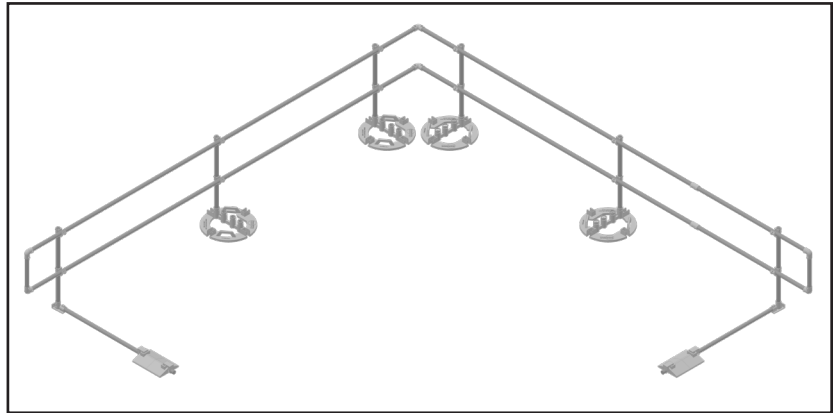


Open Cross Over Location

# DynaRound RG Slimline™ System Installation Instructions

**Estimated Installation Time:** 2 Man Crew, 40LF Per Hour

Fibergrate's new ballasted rooftop guardrail system, DynaRound RG SlimLine™, provides safety and fall protection on rooftop applications. The SlimLine system uses both counterbalance bases in addition to circular galvanized bases with less interference. Each Slimline system is made of durable, weather-resistant fiberglass reinforced plastic (FRP) composite uprights and rails, galvanized steel base weights, and galvanized connector components. This system meets applicable safety standards in the U.S. and Canada to protect people working at heights.



## TOOLS REQUIRED

- Circular Saw with carbide or masonry blade for cutting rail tubes to length**
- 25' Tape measure and marking tools or scribe**
- Torque wrench of up to 20 lb-ft or 240 lb-in capacity with 5/16" Allen Key Socket**
- Removable thread locking compound (such as Blue Loctite)**
- The installer is responsible for job site safety and lifting equipment required**

**NOTE:** Cuts and drilled holes must be sealed to maintain corrosion protection.

## IMPORTANT

Read these instructions completely before attempting to install the DynaRound RG™ System. It is important to understand the installation procedure thoroughly prior to beginning work. It is the installer's responsibility to carefully follow fabrication and installation plans and instructions to ensure design performance characteristics of the DynaRound RG™ System. The installer could be liable for claims that result from improper installation.

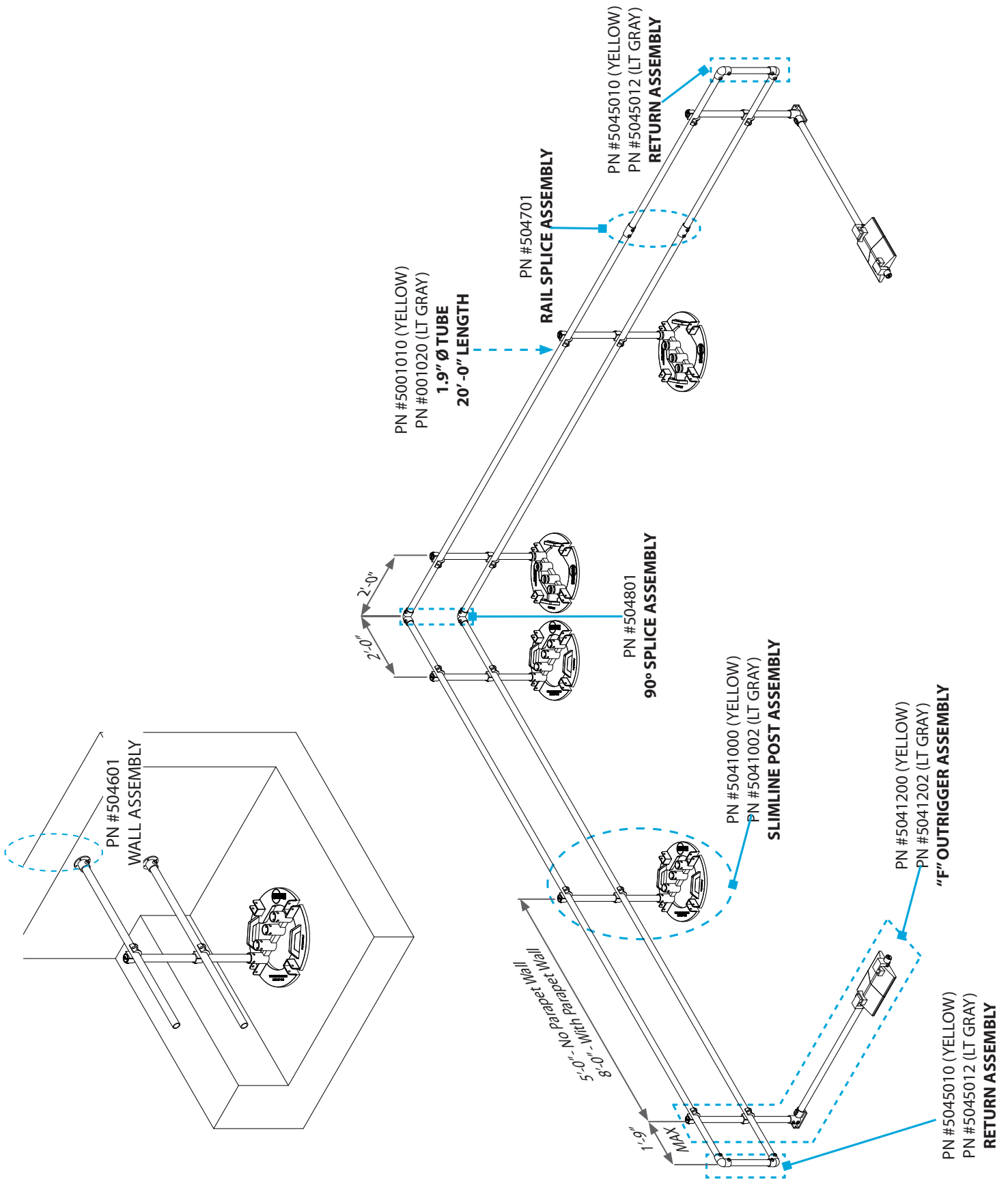
## ASSEMBLY INSTRUCTIONS

1. Inspect and inventory all DynaRound RG Slimline components and compare to the packing list or bill of materials to verify that all materials are available for installation. Contact Fibergrate at 1-800-427-4043 to report any missing or damaged material.
2. Inspect the roof to verify that the area where the DynaRound RG Slimline is to be installed is prepared for installation. Remove any debris/obstructions in the installation area and verify all field dimensions prior to assembling the DynaRound RG Slimline System.
3. Verify that the locations where the posts will be placed are free of debris and that the roof surface has been protected as directed by the roofing manufacturer. Most roofing manufacturers recommend placing a loose patch of the roofing material between the building roof and any object which contacts it.
4. Prior to beginning installation, it will save time to pre-assemble the Open Cross Over fittings to the Posts in the positions indicated on the drawing. The upper Open Cross over should be flush with the top of the post (the capped end) and the second one 21 inches (533 mm) below the top of the post. Insure that they are oriented correctly and not rotated relative to each other on the post. Only snug the set screws as required to hold the fittings in place. Note that the post for the 'F' Outrigger assemblies are 1 inch (25.4mm) longer and have a reinforcement at the uncapped bottom end, but are assembled in the same way.
5. If starting the layout with 'F' Outrigger Assembly (PN 5041200), locate it a maximum of 1'-9" (533 mm) from the beginning of the guardrail run. Install the 'F' Post/Open Cross Over assembly and the Outrigger to the Slipper and temporarily torque the set screws to hold them in place. Install the Roofs and Special Hooks on the outrigger and temporarily torque the set screws.

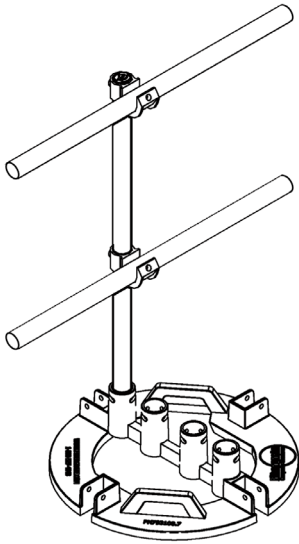
# Installation Instructions

6. If starting the layout with a DynaRound RG SlimLine Kicker Assembly (PN 5041102), begin by laying out the DynaRound RG Slimline guardrail system starting with step (7) and setting the first DynaRound RG Slimline Base a maximum of 1'-9" (533mm) from the beginning of the guardrail run. After the guardrail system is installed, go back and install the DynaRound SL Kicker Assembly following the same procedures as the rest of the DynaRound RG Slimline System.
7. Locate the first DynaRound RG Slimline Base following the desired layout. Orient the base as shown in the attached drawings. It is recommended to snap chalk lines or follow a string line to ensure that the bases are laid out in a straight line. If there is no parapet present, the bases should be set back a minimum of 12 inches (305 mm) from the roof edge and spaced at a maximum of 5 ft (1524 mm) on center. If a parapet is present, the bases may be spaced at a maximum of 8 ft (2438 mm) on center and the bases placed as close to the parapet as possible.
8. Repeat step (7) until all bases have been located.
9. Install the Post/Open Cross Over assemblies from step (4) into the opening in the base closest to the roof edge and secure in place using the Steel Lock Pin. Be sure that the wire retainer of the Lock Pin is engaged. The Open Cross Overs should be oriented so that the horizontal rails are on the roof side of the guardrail.
10. Install 20 ft (6.1 m) sections of 1.9" OD FRP tube top and mid-rails through the Open Cross Over fittings on the posts. Temporarily torque the set screws only as required to hold the rails in place to allow for adjustment later. Splice the rails together using PN 504701 Rail Splice Assembly which consists of two PN 793149 Sleeve Joints. Cut the 1.9" OD FRP tube rails to length as required.
11. At Returns (unsupported terminations of the guardrail), connect the two ends of the 1.9" OD FRP tube using PN 5045010 Return Assembly, which consists of a length of 1.9" OD FRP tube and two PN 793125 Two Way Elbows. Temporarily torque the set screws only as needed to hold the fittings in place to allow for adjustment later.
12. Returns are supported with a F Post Assembly a at a maximum of 1'-9" (533 mm) from the unsupported end of the rail as described in Step (5).
13. At 90° corners, connect the 1.9" OD FRP rails using PN 504801 - 90 Degree Splice Assembly which consists of two PN 793125 Two Way Elbows. Temporarily torque the set screws only as needed to hold the fittings in place to allow for adjustment later. A DynaRound RG Slimline Post Assembly must be located a maximum of 2'-0" from the corner on each side.
14. At non-90° corners, connect the 1.9" OD FRP rails using PN 504802 – Swivel Elbow Assembly which consists of two PN 793123 Swivel Elbows. Install per the directions given in (10) for the 90 Degree Splice Assembly.
15. At rail terminations to walls, the rails are attached to the wall using PN 504601 Wall Assembly which consists of two PN 793131 Base Flanges. The maximum distance from the last post/outrigger assembly to the wall is 5 ft (1524 mm) for non-parapet roofs and 8 ft (2438 mm) for roofs with parapets. The Base Flanges are connected to the wall or fixed structure using 4 each ¼" diameter countersunk head fasteners. Verify that the wall or other fixed structure can sustain the required loads. Unless noted otherwise, the ¼" dia. countersunk head fasteners are to be supplied by the customer and suitable for installation based on the field conditions.
16. After completing the layout, go back and verify that all posts are vertical, correctly spaced, and that the system is assembled per the attached drawings. To complete the installation, go back and apply thread locking compound to all set screws at the Open Cross Overs, 90 Degree/Swivel Elbow Connectors, and Wall Assemblies and torque the set screws to 7.5 lb-ft (10.1 N-m). At the 'F' Outrigger Assemblies, apply thread locking compound and torque the set screws at the Slipper to 15 lb-ft (20.3 N-m), and at the Roofs/Special Hooks to 7.5 lb-ft (10.1 N-m).
17. After installation, the system can be inspected by the owner or the owner's engineer and accepted. A written log of the final inspection and acceptance should be kept by the owner.
18. The installed system should be inspected annually by a qualified inspector or Fibergrate representative. This inspection should include checking the fittings for looseness, checking for corrosion of the fittings, checking that the minimum setback from the roof edge is maintained, and inspecting the 1.9" OD FRP tubes for any signs of damage. Any corrective actions required by this inspector must be immediately implemented or the DynaRound RG Slimline system should be clearly tagged as unsafe for use until repairs are implemented. Written logs should be kept of every inspection and any corrective actions documented.

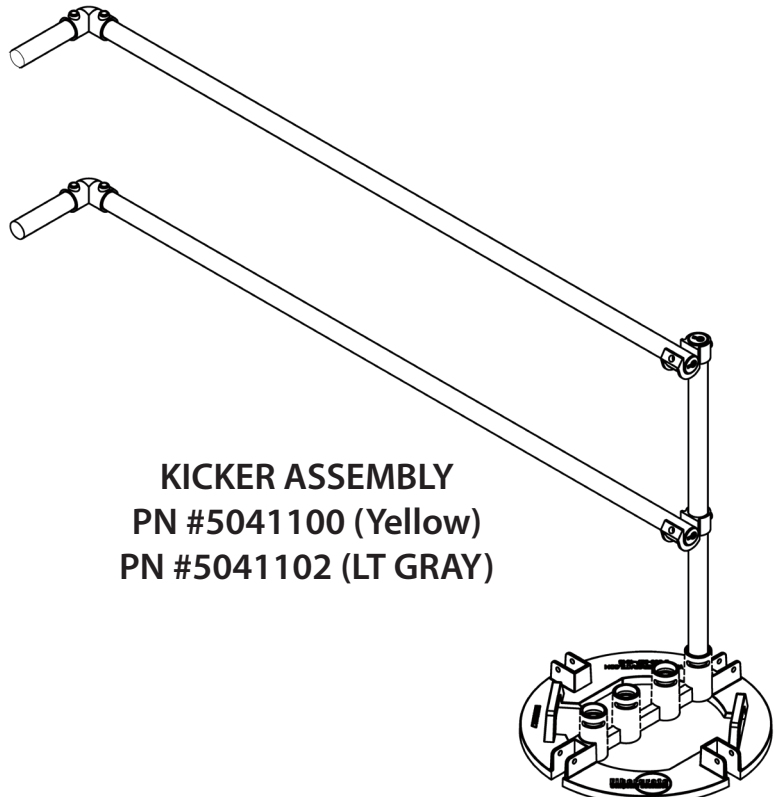
# DynaRound RG Slimline™ System Example Layout



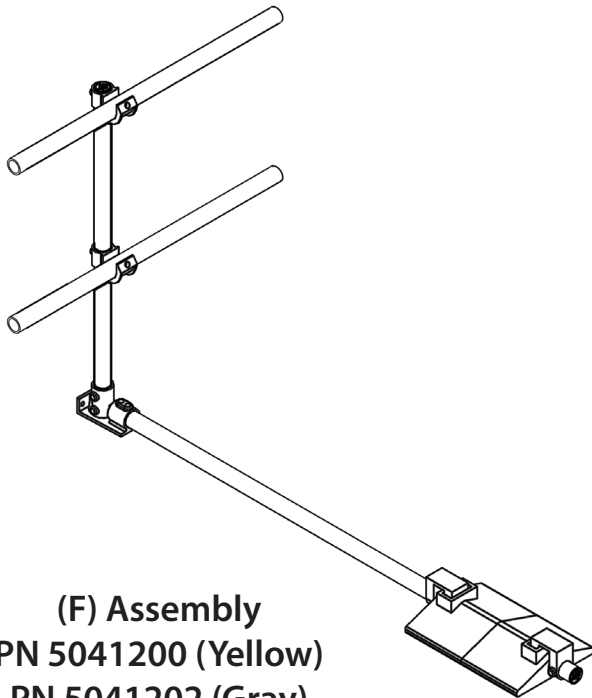
# DynaRound RG: Post Assemblies



**POST ASSEMBLY**  
**PN #5041000 (Yellow)**  
**PN #5041002 (LT GRAY)**



**KICKER ASSEMBLY**  
**PN #5041100 (Yellow)**  
**PN #5041102 (LT GRAY)**



**(F) Assembly**  
**PN 5041200 (Yellow)**  
**PN 5041202 (Gray)**



Phone: 972-250-1633  
Fax: 972-250-1530



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# FRP Ship Stair Crossovers

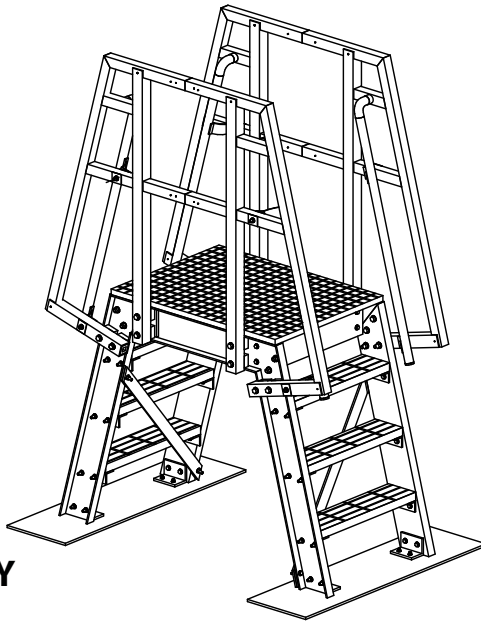


**Estimated Installation Time:** 2 Man Crew, 2 Hours

## ASSEMBLY INSTRUCTIONS

ITEM DESCRIPTION	PART NUMBER
FRP Ship Stair Crossover - 10" Clearance	866110.01
FRP Ship Stair Crossover - 19-1/2" Clearance	866119.01
FRP Ship Stair Crossover - 29" Clearance	866129.01
FRP Ship Stair Crossover - 38-1/2" Clearance	86138.01
FRP Ship Stair Crossover - 48" Clearance	866148.01
FRP Ship Stair Crossover - 67" Clearance	866167.01

**COMPLETED FRP SHIP STAIR CROSSOVER LADDER WITH OPTIONAL ROOF PLATE (POST ASSEMBLY ILLUSTRATION)**



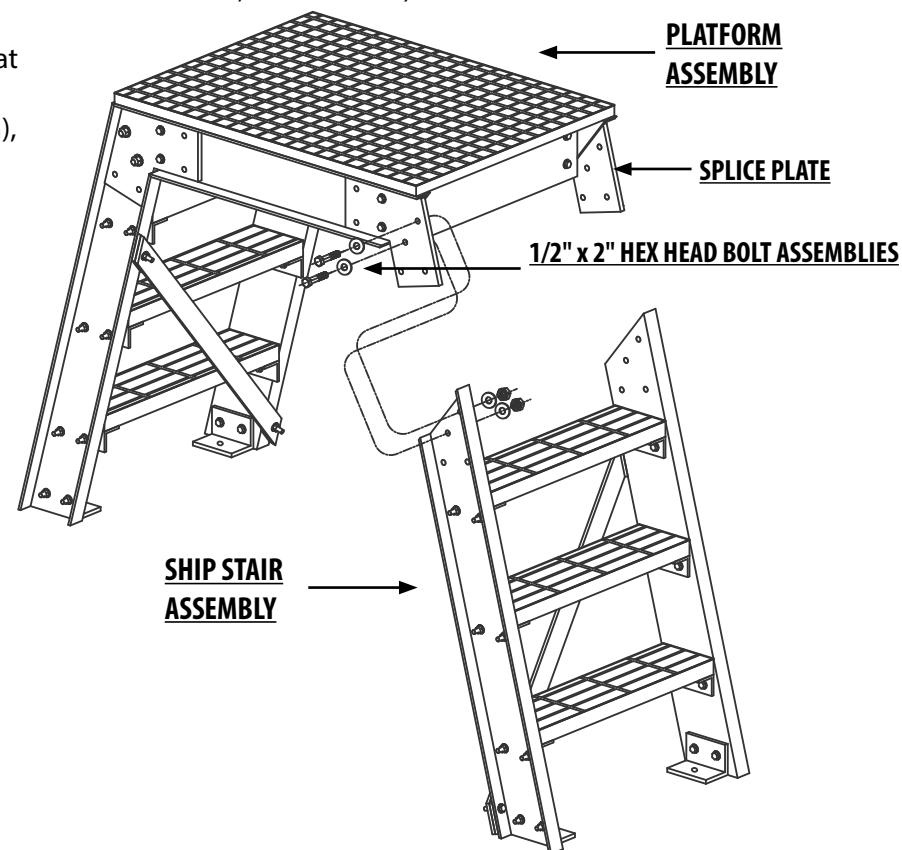
### STEP 1: ATTACH SHIP STAIR ASSEMBLIES TO PLATFORM ASSEMBLY

A) Slide channels of Ship Stair Assembly inside of Splice Plates on Platform Assembly and line up the holes. Refer to Drawing B-02822 Rev 1 dated 4/5/17 for the exact configuration of the crossover. The illustration shown in these instructions may vary from the crossover you are assembling.

B) For the 19-1/2 inch (495 mm) (PN866119.01) clearance crossover only: At each splice plate, install two each 1/2" x 2" hex head bolt assemblies (1/2" x 2" bolt, 2 each flat washers, and 1/2" nut) and one each 3/8" x 2" hex head bolt assembly (3/8" x 2" bolt, 2 each flat washers, and 3/8" nut) in the holes indicated. Use a flat washer under the bolt head and the nut. Torque the 1/2 inch nuts to 45 ft-lb (5.1 N-m), the 3/8 inch nuts to 30 ft-lb (3.9 N-m). Leave the holes for the guardrail posts open until Step Three.

C) For the 10 inch (254 mm) (PN 866110.01) and 29 inch (736mm) clearance crossover (PN 866129.01) and deeper: At each splice plate, install three each 1/2" x 2" hex head bolt assemblies (1/2" x 2" bolt, 2 each flat washers, and 1/2" nut) and one each 3/8" x 2" hex head bolt assembly (3/8" x 2" bolt, 2 each flat washers, and 3/8" nut) in the holes indicated. Use a flat washer under the bolt head and the nut. Torque the 1/2 inch nuts to 45 ft-lb (5.1 N-m), the 3/8 inch nuts to 30 ft-lb (3.9 N-m).

D) Repeat for second Ship Stair Assembly.



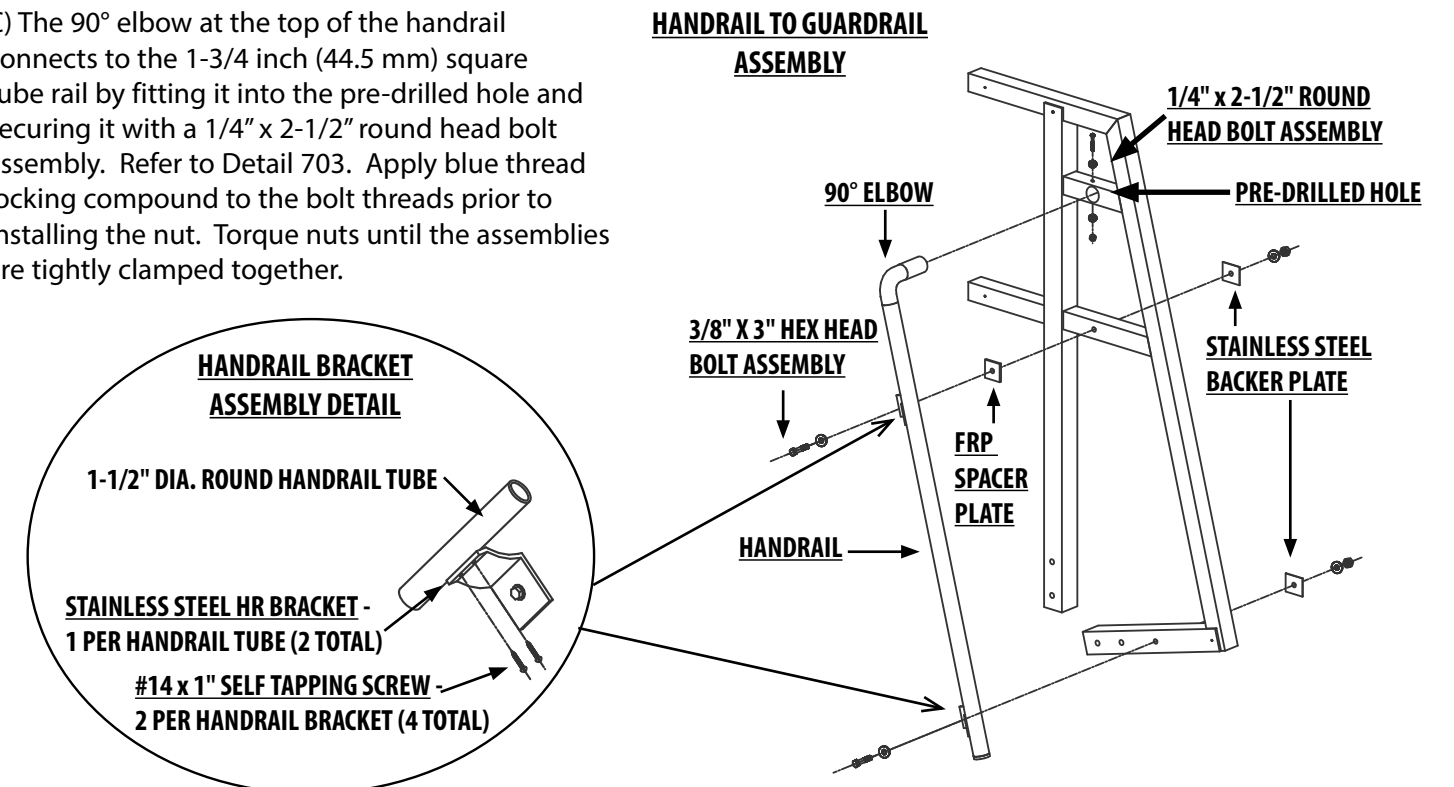
# Ship Stair Crossover Assembly Instructions

## STEP 2: ASSEMBLE HANDRAIL TO GUARDRAILS

A) Attach the stainless steel handrail brackets to the 1-1/2 inch dia. round handrail tubes using two #14 x 1 inch self-tapping screws per handrail bracket. The pilot holes for the screws are shop drilled into the handrail tubes. Be careful not to over-torque the screws to prevent stripping the holes. Note that you will be assembling a left hand and a right hand set of handrails for each ship stair.

B) Attach the handrail to the guardrail by following Details 701, 702, and 703 in Drawing B-02822 (on page 11). The stainless steel handrail brackets connect to the 2-1/8 inch (54 mm) post and 1-3/4 inch (44.5 mm) rail with a 3/8" x 3" hex head bolt assembly (3/8" x 2" bolt, 2 each flat washers, and 3/8" nut), and backer plate. A 1/4 inch (6 mm) thick FRP spacer plate is used between the stainless steel handrail bracket and the 1-3/4 inch (44.5 mm) square tube rail. Apply blue thread locking compound to the bolt threads prior to installing the nuts. Torque nuts until the assemblies are tightly clamped together.

C) The 90° elbow at the top of the handrail connects to the 1-3/4 inch (44.5 mm) square tube rail by fitting it into the pre-drilled hole and securing it with a 1/4" x 2-1/2" round head bolt assembly. Refer to Detail 703. Apply blue thread locking compound to the bolt threads prior to installing the nut. Torque nuts until the assemblies are tightly clamped together.



### STEP 3: REFER TO GUARDRAIL ASSEMBLY ILLUSTRATION ON PAGE 3

## INSTALL GUARDRAILS

A) Assemble Guardrails - Slide the two halves of each Guardrail Assembly together at the splices as shown in the diagram. Holding the joints tightly together, drill each side of the top and bottom rail with a 1/8 (3 mm) diameter drill bit and install 1/8 inch diameter pop rivets as shown.

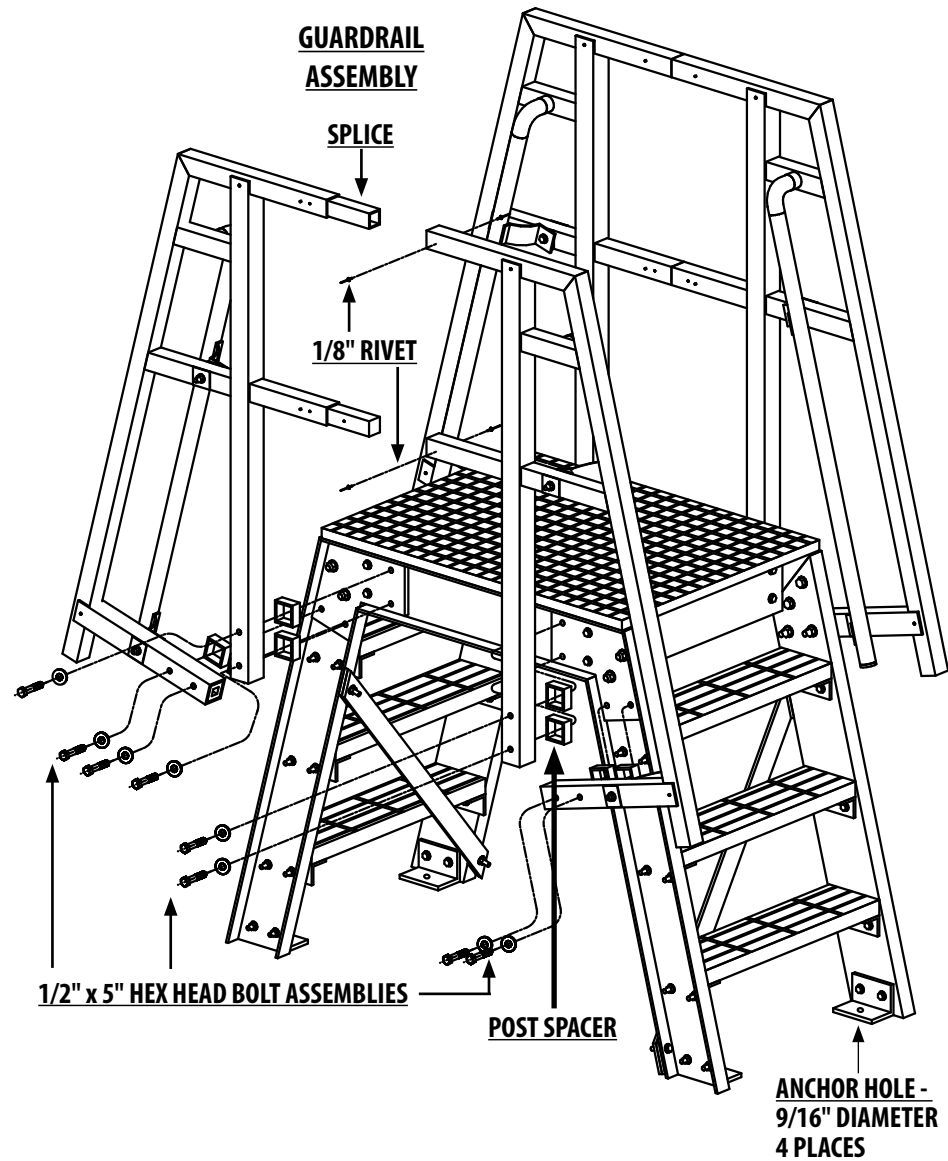
B) Install each finished Guardrail Assembly to the Crossover by sandwiching the 2-1/8" x 3/16" Square Tube Post Spacers between the Guardrail Assembly and the Crossover and Installing the 1/2" x 5-1/2" hex head bolt assemblies (1/2" x 5" bolt, 2 each flat washers, and 1/2" nut) in the holes indicated. Where the post falls on a splice plate, use the shorter spacer. The longer spacers are for the locations where the post is bolted directly to the web of the channel. Use a flat washer under the bolt head and the nut. Hold Post Spacers in alignment before torquing nuts. Torque the nuts to 45 ft-lb (5.1 N-m).

C) Repeat for second Guardrail Assembly.





# Ship Stair Crossover Assembly Instructions



## STEP 4: ANCHOR SHIP STAIR CROSSOVER

A) Prior to use, the Ship Stair Cross Over must be anchored to the supporting surface to prevent tipping. Anchor holes are 9/16 inch (14.3 mm) diameter and located at the bottom of the ship stair in four locations. Anchoring hardware is not included.

B) Concrete Floors: Anchor Ship Stair Cross Over to concrete floors using 4 each 1/2" diameter expansion or adhesive concrete anchors. A minimum embedment of 2-1/2" is required. D) Repeat for second Guardrail Assembly.

C) Wood Floors: Anchor Ship Stair Crossover to wooden floors with four each 1/2" x 3" lag bolts.

D) For other support conditions, contact a qualified engineer to develop adequate anchoring details. For installations on roofs or other areas where the supporting surface cannot be penetrated by fasteners, install the Roof Plate Kit following Step Five below.

# Ship Stair Crossover Assembly Instructions

## STEP 5:

### OPTIONAL ROOF PLATE KIT

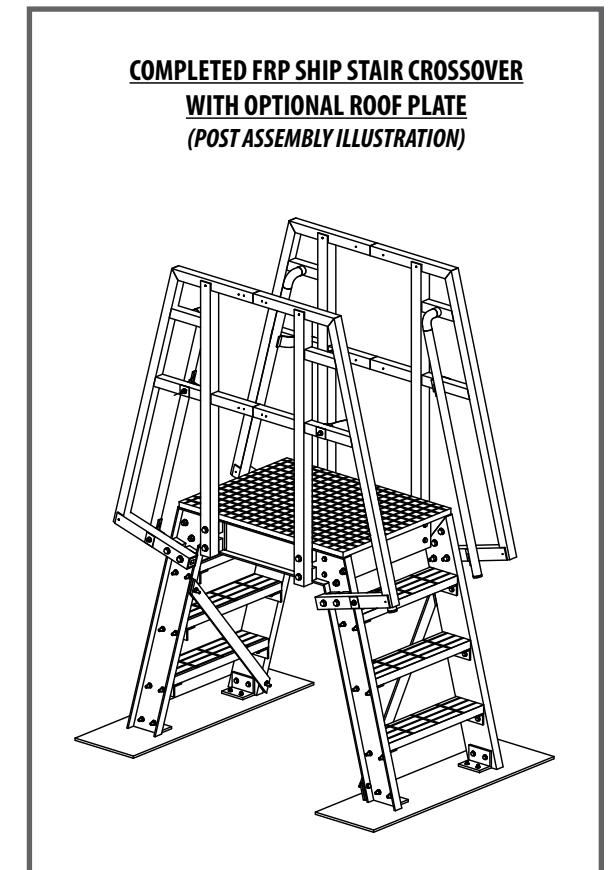
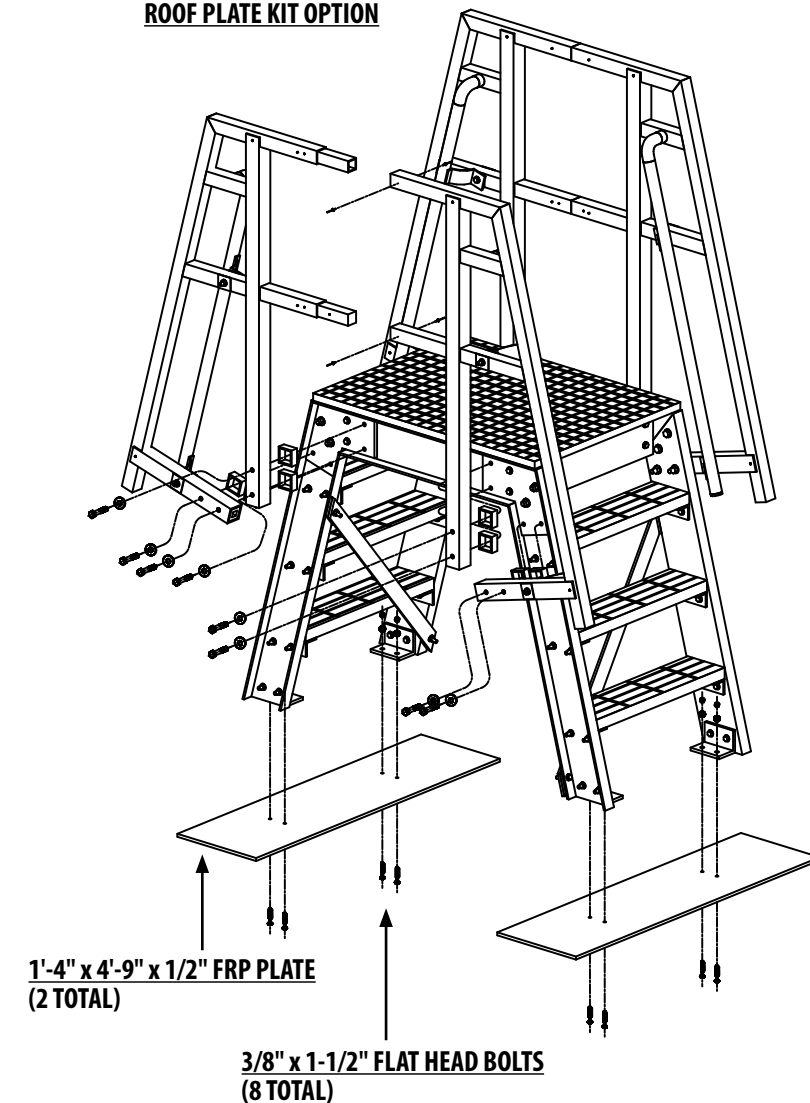
A) Remove the four 3" x 3" x 3/8" x 6" long angles at the bottom of the ship stairs by removing the two factory installed 3/8" x 1-1/2" hex head bolts at each angle. Retain the bolts, discard the angles. The angles removed in this step will have a total of three holes each.

B) Attach the four 3" x 3" x 3/8" x 6" long angles supplied with the kit to the bottoms of the ship stair stringers using the 3/8" x 1-1/2" hex head bolt assemblies removed in Step 1. The angles installed in this step will have a total of four holes each.

C) Turn the ship stair onto its side and attach the 1'-4" x 4'-9" x 1/2" thick FRP plate to these angles using the 3/8" x 1-1/2" long flat head bolts supplied with the kit. Repeat for the second plate. Torque the bolts to 30 lb-ft (3.9 N-m).

D) Before placing the finished crossover onto the roof surface, protect the roof from abrasion following the roof manufacturer's recommendations. Add ballast as required to the locations indicated in Drawing B-02822.

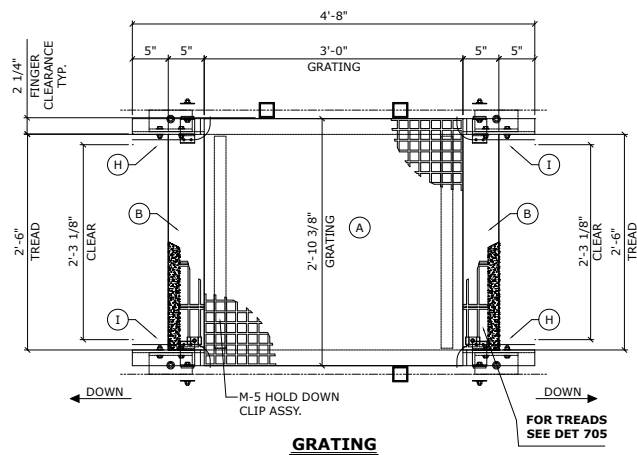
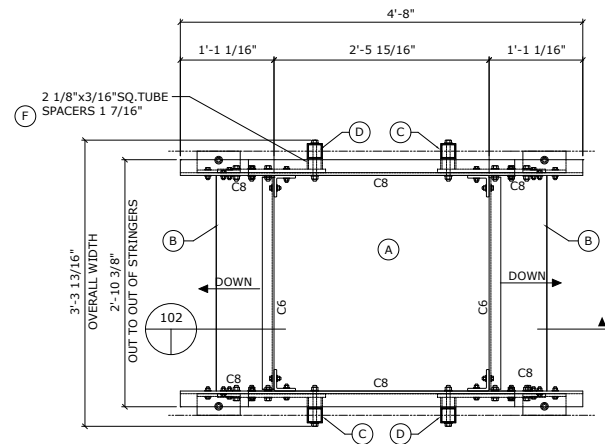
### ROOF PLATE KIT OPTION



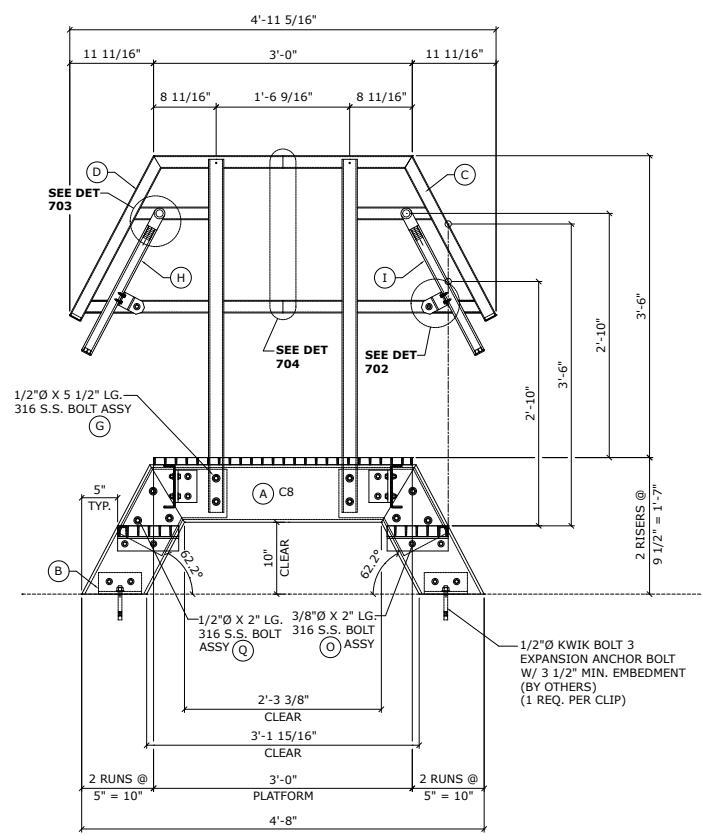
# 866110.01 FRP Ship Stair Crossover

## 10" Clearance

### Weight = 105Lbs



101 PLAN - FRP STAIR WALKOVER



102 ELEVATION - FRP STAIR WALKOVER

ASSY. NO.	P/N	QTY.	DESCRIPTION
1000000	T	1	FRP Ship Stair Crossover Assembly Instructions
1000000	S	8	Rivets
1000000	R	1	Bond Kit
1000000	Q	12	1/2" Dia. x 2" Lg. 316 S.S. Bolt Assy.
1000000	P	4	3/8" Dia. x 3" Lg. Hex Head Bolt Assembly
1000000	O	4	3/8" Dia. x 2" Lg. 316 S.S. Bolt Assy.
1000000	N	4	1/4" Dia. x 2 1/2" Lg. Round Hd S.S. Bolt Assy
1000000	M	8	#14 x 1" Lg. S.S. Self Tap Screw
1000000	L	4	1 3/4"x1 3/4"x1/4" Thick FRP Spacer Plate
1000000	K	4	2" x 1 3/4" x 14 GA. 316 S.S. Plate
1000000	J	4	S.S. Handrail Bracket
1000000	I	2	1 1/2" Dia. Round Tube Handrail
1000000	H	2	1 1/2" Dia. Round Tube Handrail
1000000	G	8	1/2" Dia. x 5 1/2" Lg. 316 S.S. Bolt Assy.
1000000	F	8	2 1/8"x3/16" Sq. Tube Post Spacer (1 7/16" Lg.)
1000000	E	-	2 1/8"x3/16" Sq. Tube Post Spacer (1 7/16" Lg.)
1000000	D	2	Sq. Tube Guardrail Assembly
1000000	C	2	Sq. Tube Guardrail Assembly
1000000	B	2	Ship Stair Assembly
1000000	A	1	Platform Assembly

**BILL OF MATERIALS**

**CONTRACTOR:** 10" FRP SHIP STAIR CROSSOVER  
DRAWING # B-02822

DATE: 05/14/14  
STRUCTURAL DESIGNER: Ethan Love P.E.  
PROJECT COORDINATOR:

**Fibergrate Composite Structures Inc.**  
Fiberglass Grating • Structural • Fabrication

900 FM 205 • STEPHENVILLE, TEXAS 76401

SCALE: N.T.S.  
DWG. SHT.: 1 OF 7

**LEGEND:**

A2=2"x2"x1/4" ANGLE	□ = GUARDRAIL POST
A3=3"x3"x3/8" ANGLE	■ = GUARDRAIL RETURN
C8=8"x2 3/16"x3/8" CHANNEL	— = FB BRACE
FB=3/8" THICK FLAT BAR	— = HANDRAIL

NO.	BY	DATE	REVISION	CHKD. BY	DATE
3					
2	SLV/JM	04/04/17	NEW OSHA RULES ECN-171	EAL	04/05/17
1	BH	05/14/14	FOR PRODUCTION	EAL	05/14/14

**FABRICATION TOLERANCES (U.N.O.)**

	MOLDED GRATING	PULTRUDED GRATING	DYNAFORM SHAPES
LENGTH	+1/8, -5/16	+1/8	+1/8
WIDTH	+1/8, -5/16	+1/8	+1/8
HOLE LOC.	+1/16	+1/16	+1/16
CIRC. CUTS	+3/16	+3/16	N/A
NOTCHES	+1/8	+1/8	N/A
SQUARE OF CUT ANGLE/ARTY	1°	1°	2°
	+2	+2	+2

DO NOT STACK TOLERANCES

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GRATING: Corvex 1" Deep 1 1/2" Sq. Mesh Molded Grating  
COLOR: Dk. Gray SURFACE: Meniscus

TREADS: Corvex Fibertred 1 1/2" Deep 1 1/2"x6" Rect. Mesh  
COLOR: Dk. Gray

DYNAFORM SHAPES: ISOFR  
COLOR: SL, GRAY

DYNAFORM GUARDRAIL: ISOFR  
COLOR: YELLOW

HARDWARE: 316 S.S.  
GRATING H.D.C. ASSYS: M-2 & M-5

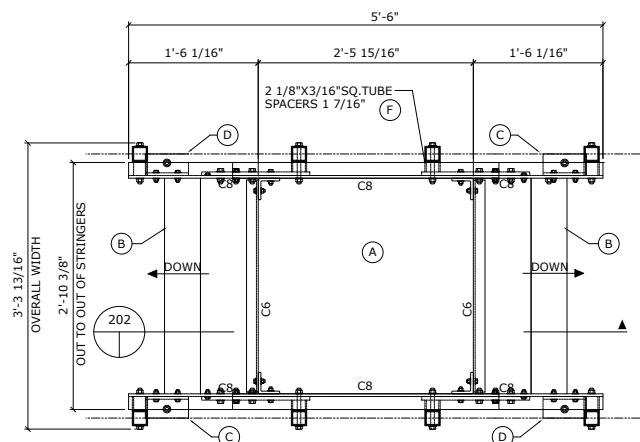
COATING: FLATSHEET: 1/2"

REFERENCE DWGS.:

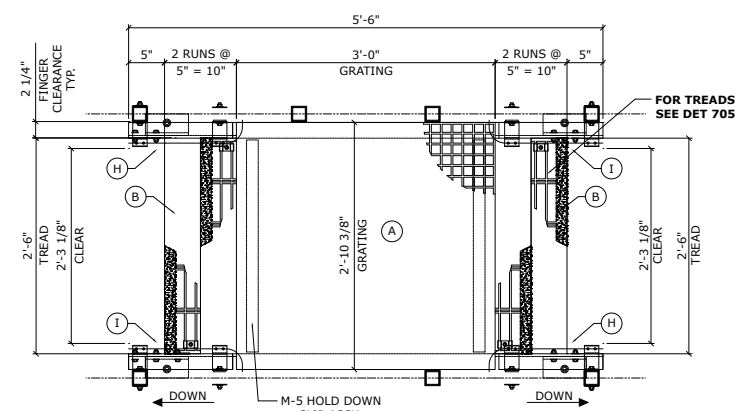
# 866119.01 FRP Ship Stair Crossover

## 19 1/2" Clearance

### Weight = 111Lbs

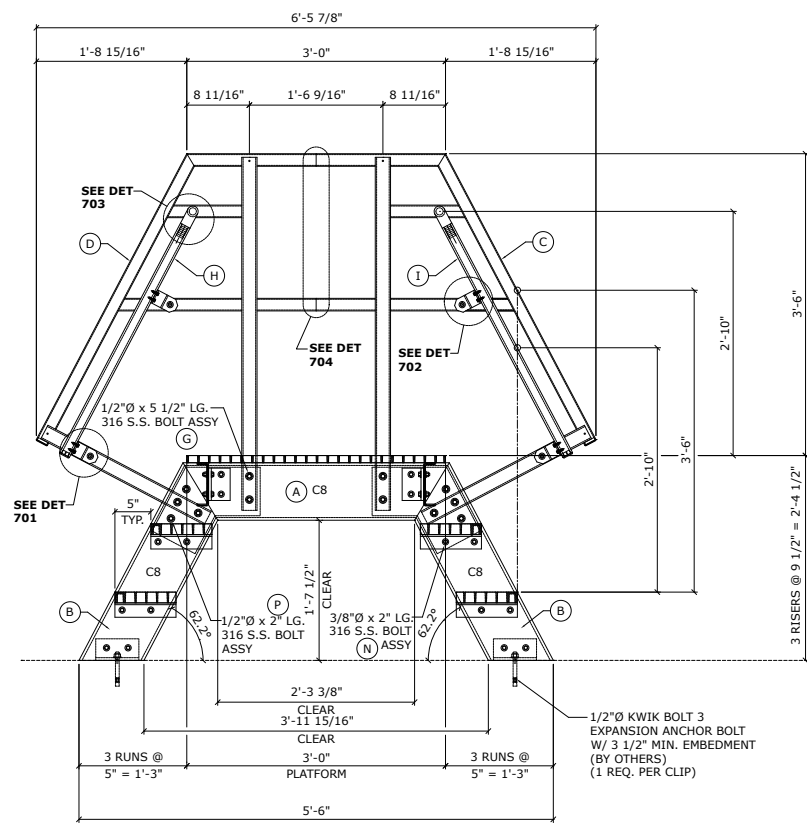


**STRUCTURE**



**GRATING**

201 PLAN - FRP STAIR WALKOVER



202 ELEVATION - FRP STAIR WALKOVER

ASSY. NO.	P/N	QTY.	DESCRIPTION
1000000	T	1	FRP Ship Stair Crossover Assembly Instructions
1000000	S	8	Rivets
1000000	R	1	Bond Kit
1000000	Q	8	1/2" Dia. x 2" Lg. 316 S.S. Bolt Assy.
1000000	P	8	3/8" Dia. x 3" Lg. Hex Head Bolt Assembly
1000000	O	4	3/8" Dia. x 2" Lg. 316 S.S. Bolt Assy.
1000000	N	4	1/4" Dia. x 2 1/2" Lg. Round Hd S.S. Bolt Assy
1000000	M	16	#14 x 1" Lg. S.S. Self Tap Screw
1000000	L	4	1 3/4" x 1 3/4" x 1/4" Thick FRP Spacer Plate
1000000	K	8	2" x 1 3/4" x 14 GA. 316 S.S. Plate
1000000	J	8	S.S. Handrail Bracket
1000000	I	2	1 1/2" Dia. Round Tube Handrail
1000000	H	2	1 1/2" Dia. Round Tube Handrail
1000000	G	16	1/2" Dia. x 5 1/2" Lg. 316 S.S. Bolt Assy.
1000000	F	16	2 1/8" x 3/16" Sq. Tube Post Spacer (1 7/16" Lg.)
1000000	E	-	2 1/8" x 3/16" Sq. Tube Post Spacer (1 15/16" Lg.)
1000000	D	2	Sq. Tube Guardrail Assembly
1000000	C	2	Sq. Tube Guardrail Assembly
1000000	B	2	Ship Stair Assembly
1000000	A	1	Platform Assembly

**BILL OF MATERIALS**

CONTRACTOR: <b>19.5" FRP SHIP STAIR CROSSOVER</b>			
DRAWING # <b>B-02822</b>			
DRAWN BY: <b>BH</b>	DATE: <b>05/14/14</b>	STRUCTURAL DESIGNER: <b>Ethan Love P.E.</b>	PROJECT COORDINATOR:
<b>Fibergate Composite Structures Inc.</b> Fiberglass Grating • Structurals • Fabrication <b>Fibergate</b> Composite Structures 900 FM 205 • STEPHENVILLE, TEXAS 76401			
SCALE: <b>N.T.S.</b>		DWG. SHT.: <b>2 OF 7</b>	

**LEGEND:**

A2=2"x2"x1/4" ANGLE	— = GUARDRAIL
A3=3"x3"x3/8" ANGLE	□ = GUARDRAIL POST
C8=8"x2 3/16"x3/8" CHANNEL	■ = GUARDRAIL RETURN
FB=3/8" THICK FLAT BAR	— = FB BRACE
	— = HANDRAIL

NO.	BY	DATE	REVISION	CHKD. BY	DATE
3					
2					
1	SLV/JM	04/04/17	NEW OSHA RULES ECN-171	EAL	04/05/17
0	BH	05/14/14	FOR PRODUCTION		05/14/14

**FABRICATION TOLERANCES (U.N.O.)**

	MOLDED GRATING	PULTRUDED GRATING	DYNAFORM SHAPES
LENGTH	+1/8, -5/16	#1/8	#1/8
WIDTH	+1/8, -5/16	#1/8	#1/8
HOLE LOC.	#1/16	#1/16	#1/16
CIRC. CUTS	#3/16	#3/16	N/A
NOTCHES	#1/8	#1/8	N/A
SQUARE OF CUT	1"	1"	2"
ANGULARITY	#2	#2	#2

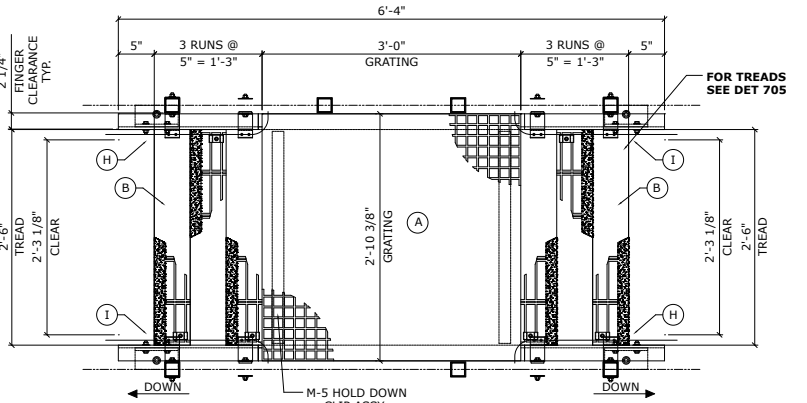
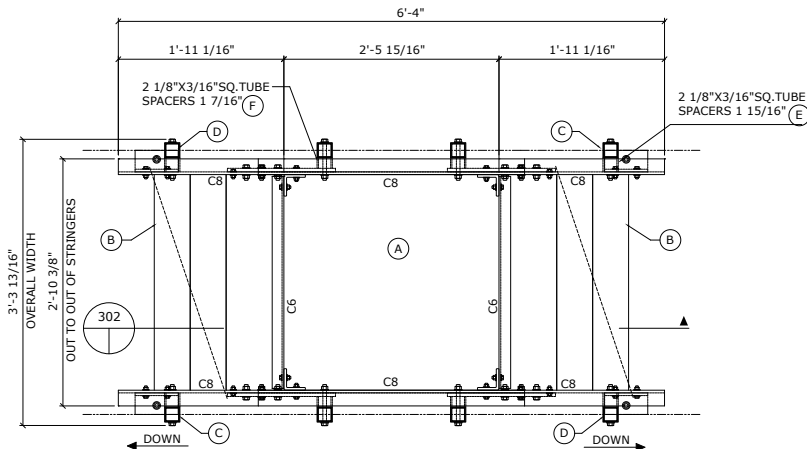
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GRATING: Corvex 1" Deep 1 1/2" Sq. Mesh Molded Grating  
COLOR: Dk. Gray SURFACE: Meniscus  
TREADS: Corvex Fibertred 1 1/2" Deep 1 1/2" x 6" Rect. Mesh  
COLOR: Dk. Gray  
DYNIFORM SHAPES: ISOFR DYNIFORM GUARDRAIL: ISOFR  
COLOR: SL. GRAY COLOR: YELLOW  
HARDWARE: 316 S.S. GRATING H.D.C. ASSYS: M-2 & M-5  
COATING: FLATSHEET: 1/2"  
REFERENCE DWGS.:

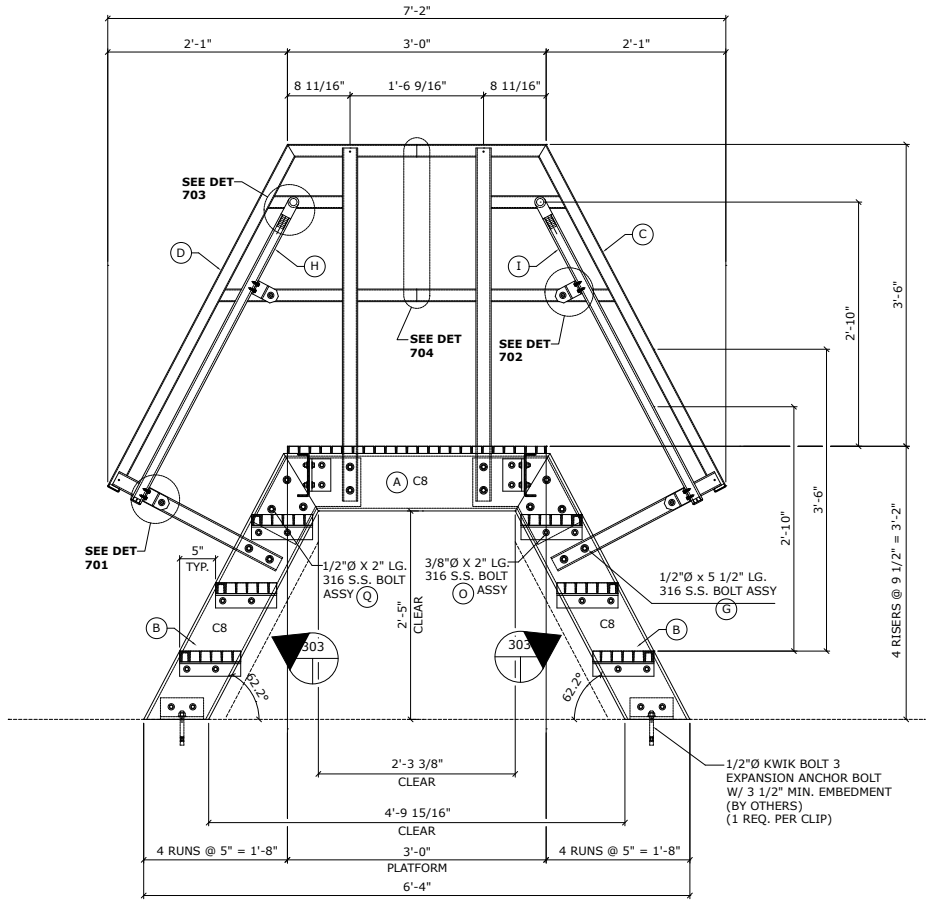
# 866129.01 FRP Ship Stair Crossover

## 29" Clearance

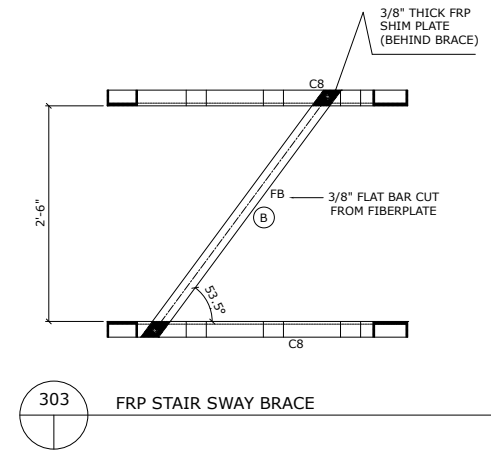
### Weight = 125Lbs



301 PLAN - FRP STAIR WALKOVER



302 ELEVATION - FRP STAIR WALKOVER



ASSY. NO.	P/N	QTY.	DESCRIPTION
1000000	T	1	FRP Ship Stair Crossover Assembly Instructions
1000000	S	8	Rivets
1000000	R	1	Bond Kit
1000000	Q	12	1/2" Dia. x 2" Lg. 316 S.S. Bolt Assy.
1000000	P	8	3/8" Dia. x 3" Lg. Hex Head Bolt Assembly
1000000	O	4	3/8" Dia. x 2" Lg. 316 S.S. Bolt Assy.
1000000	N	4	1/4" Dia. x 2 1/2" Lg. Round Hd S.S. Bolt Assy
1000000	M	16	#14 x 1" Lg. S.S. Self Tap Screw
1000000	L	4	1 3/4"x1 3/4"x1/4" Thick FRP Spacer Plate
1000000	K	8	2" x 1 3/4" x 14 GA. 316 S.S. Plate
1000000	J	8	S.S. Handrail Bracket
1000000	I	2	1 1/2" Dia. Round Tube Handrail
1000000	H	2	1 1/2" Dia. Round Tube Handrail
1000000	G	16	1/2" Dia. x 5 1/2" Lg. 316 S.S. Bolt Assy.
1000000	F	8	2 1/8"x3/16" Sq. Tube Post Spacer (1 7/16" Lg.)
1000000	E	8	2 1/8"x3/16" Sq. Tube Post Spacer (1 15/16" Lg.)
1000000	D	2	Sq. Tube Guardrail Assembly
1000000	C	2	Sq. Tube Guardrail Assembly
1000000	B	2	Ship Stair Assembly
1000000	A	1	Platform Assembly

BILL OF MATERIALS			
CONTRACTOR: <b>29" FRP SHIP STAIR CROSSOVER</b>			
DRAWING # B-02822			
CONTRACTOR:	DATE:	STRUCTURAL DESIGNER:	PROJECT COORDINATOR:
BH	05/14/14	Ethan Love P.E.	
DRAWN BY:			CUST. NO.:
Fibergrate Composite Structures Inc.			W.D. NO.:
Glass Grating • Structural • Fabrication			SCALE:
<b>Fibergrate</b>			N.T.S.
Composite Structures			DWG. SHT.:
900 FM 205 • STEPHENVILLE, TEXAS 76401			3 OF 7

LEGEND:

A2=2"x2"x1/4" ANGLE	□ = GUARDRAIL POST	— = GUARDRAIL
A3=3"x3"x3/8" ANGLE	■ = GUARDRAIL RETURN	— = FB BRACE
C8=8"x2 3/16"x3/8" CHANNEL	— = HANDRAIL	
FB=3/8" THICK FLAT BAR		

NO.	BY	DATE	REVISION	CHKD. BY	DATE
3					
1	SLV/JM	04/04/17	NEW OSHA RULES ECN-171	EAL	04/05/17
2	BH	05/14/14	FOR PRODUCTION	EAL	05/14/14

FABRICATION TOLERANCES (U.N.O.)

LENGTH	MOLDED GRATING	PULTRUDED GRATING	DYNAFORM SHAPES
±1/8"	±1/8"	±1/8"	±1/8"
±1/16"	±1/16"	±1/16"	±1/16"
±1/32"	±1/32"	N/A	N/A
±1/8"	±1/8"	N/A	N/A
±1"	±1"	±2"	±2"
±2"	±2"	±2"	±2"

DO NOT STACK TOLERANCES

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GRATING: Corvex 1" Deep 1 1/2" Sq. Mesh Molded Grating

COLOR: Dk. Gray SURFACE: Meniscus

TREADS: Corvex Fibertred 1 1/2" Deep 1 1/2"x6" Rect. Mesh

COLOR: Dk. Gray

DYNAFORM SHAPES: ISOFR

COLOR: SL. GRAY

HARDWARE: 316 S.S.

GRATING H.D.C. ASSYS: M-2 & M-5

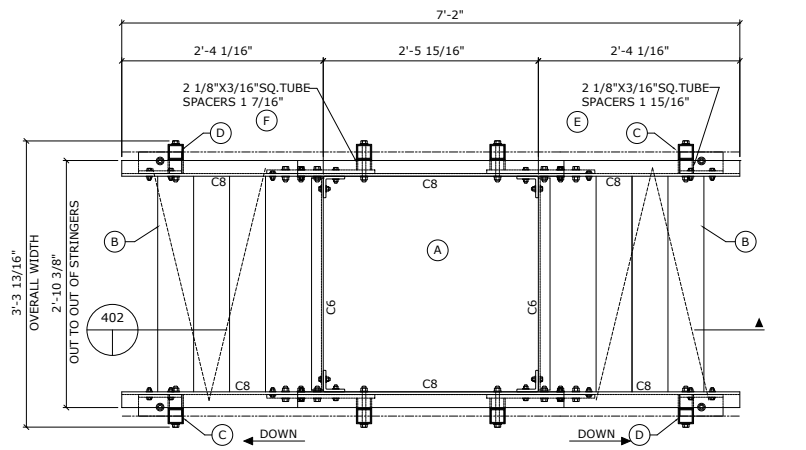
COATING: FLATSHEET: 1/2"

REFERENCE DWGS.:

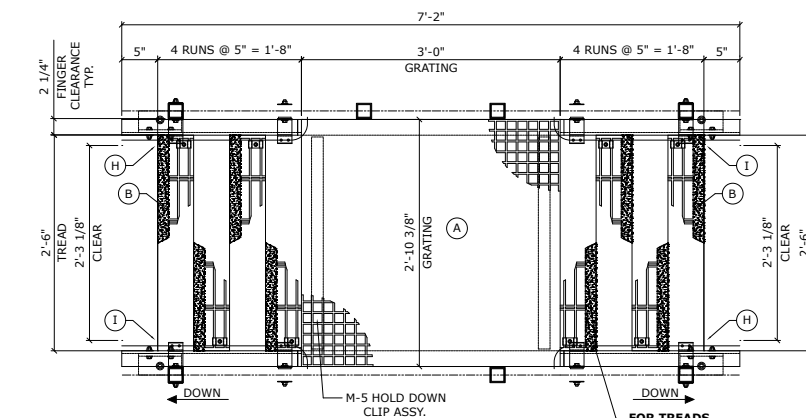
# 866138.01 FRP Ship Stair Crossover

## 38 1/2" Clearance

### Weight = 158Lbs

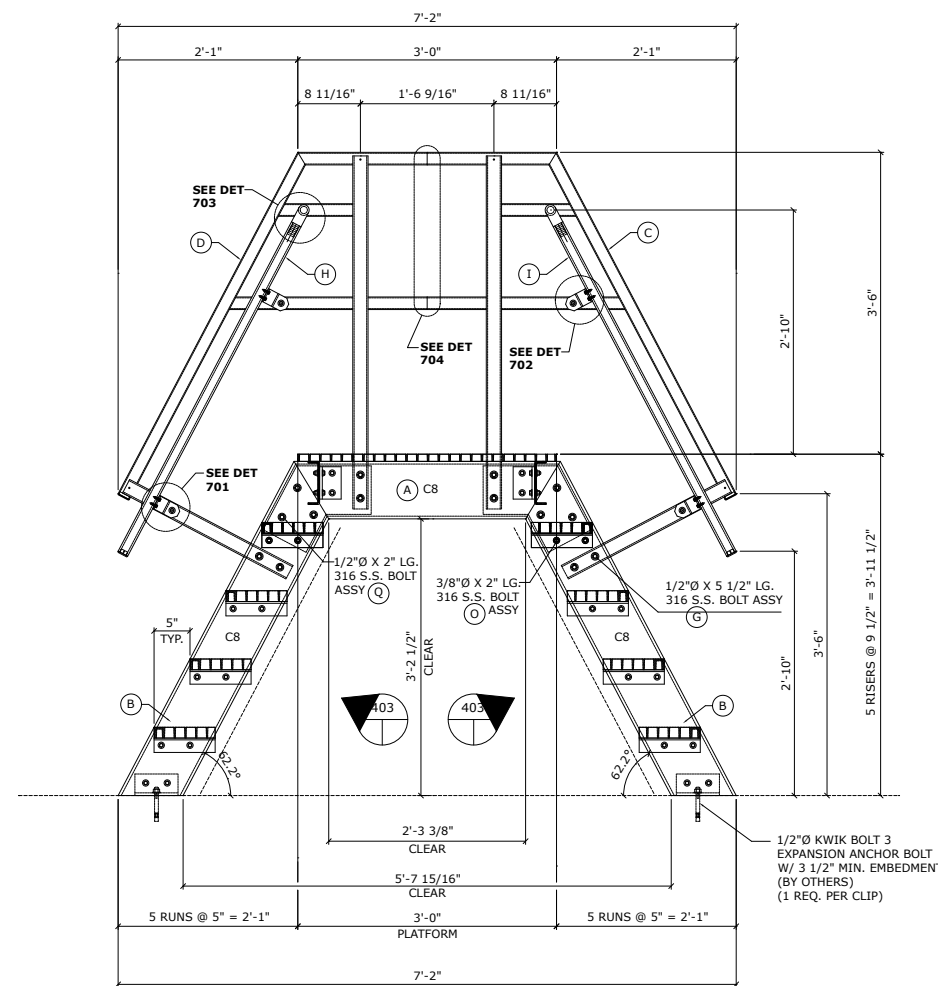


**STRUCTURE**

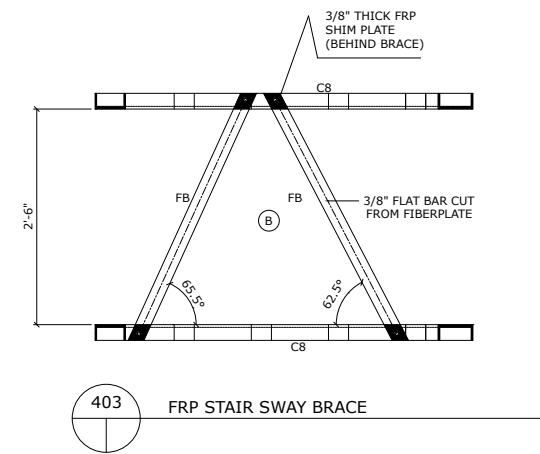


**GRATING**

401 PLAN - FRP STAIR WALKOVER



402 ELEVATION - FRP STAIR WALKOVER



403 FRP STAIR SWAY BRACE

ASSY. NO.	P/N	QTY.	DESCRIPTION
1000000	T	1	FRP Ship Stair Crossover Assembly Instructions
1000000	S	8	Rivets
1000000	R	1	Bond Kit
1000000	Q	12	1/2" Dia. x 2" Lg. 316 S.S. Bolt Assy.
1000000	P	8	3/8" Dia. x 3" Lg. Hex Head Bolt Assembly
1000000	O	4	3/8" Dia. x 2" Lg. 316 S.S. Bolt Assy.
1000000	N	4	1/4" Dia. x 2 1/2" Lg. Round Hd S.S. Bolt Assy
1000000	M	16	#14 x 1" Lg. S.S. Self Tap Screw
1000000	L	4	1 3/4"x1 3/4"x1/4" Thick FRP Spacer Plate
1000000	K	8	2" x 1 3/4" x 14 GA. 316 S.S. Plate
1000000	J	8	S.S. Handrail Bracket
1000000	I	2	1 1/2" Dia. Round Tube Handrail
1000000	H	2	1 1/2" Dia. Round Tube Handrail
1000000	G	16	1/2" Dia. x 5 1/2" Lg. 316 S.S. Bolt Assy.
1000000	F	8	2 1/8"x3/16" Sq. Tube Post Spacer (1 7/16" Lg.)
1000000	E	8	2 1/8"x3/16" Sq. Tube Post Spacer (1 15/16" Lg.)
1000000	D	2	Sq. Tube Guardrail Assembly
1000000	C	2	Sq. Tube Guardrail Assembly
1000000	B	2	Ship Stair Assembly
1000000	A	1	Platform Assembly

**BILL OF MATERIALS**

<b>CONTRACTOR</b>			
<b>38 1/2" FRP SHIP STAIR CROSSOVER</b>			
<b>DRAWING # B-02822</b>			
DRAWN BY:	DATE:	STRUCTURAL DESIGNER:	PROJECT COORDINATOR:
BH	05/14/14	Ethan Love P.E.	

**Fibergrate Composite Structures Inc.**  
*Fiberglass Grating • Structural • Fabrication*

**Fibergrate**  
 Composite Structures  
 900 FM 205 • STEPHENVILLE, TEXAS 76401

W.O. NO.:  
SCALE:  
N.T.S.  
DWG. SHEET:  
4 OF 7

**LEGEND:**

A2=2"x2"x1/4" ANGLE	— = GUARDRAIL
A3=3"x3"x3/8" ANGLE	□ = GUARDRAIL POST
C8=8"x2 3/16"x3/8" CHANNEL	■ = GUARDRAIL RETURN
FB=3/8" THICK FLAT BAR	— = FB BRACE
	— = HANDRAIL

**FABRICATION TOLERANCES (U.N.O.)**

	MOLDED GRATING	PULTRUDED GRATING	DYNAFORM SHAPES
LENGTH	+1/8, -5/16	#1/8	#1/8
WIDTH	+1/8, -5/16	#1/8	#1/8
HOLE LOC.	#1/16	#1/16	#1/16
CIRC. CUTS	#3/16	#2/16	N/A
NOTCHES	#1/8	#1/8	N/A
SQUARE OF CUT	1°	1°	2°
ANGULARITY	#2	#2	#2

DO NOT STACK TOLERANCES  
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GRATING: Corvex 1" Deep 1 1/2" Sq. Mesh Molded Grating  
 COLOR: Dk. Gray SURFACE: Meniscus  
 TREADS: Corvex Fibertred 1 1/2" Deep 1 1/2"x6" Rect. Mesh  
 COLOR: Dk. Gray

DYNAFORM SHAPES: ISOPR  
 DYNAFORM GUARDRAIL: ISOPR  
 COLOR: SL. GRAY GRATING H.D.C. ASSYS.: M-2 & M-5  
 COLOR: YELLOW  
 HARDWARE: 316 S.S.  
 COATING: FLATSHEET: 1/2"

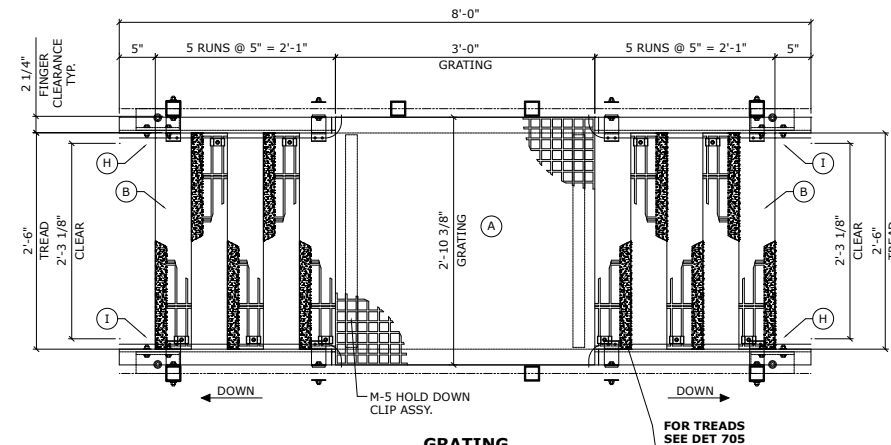
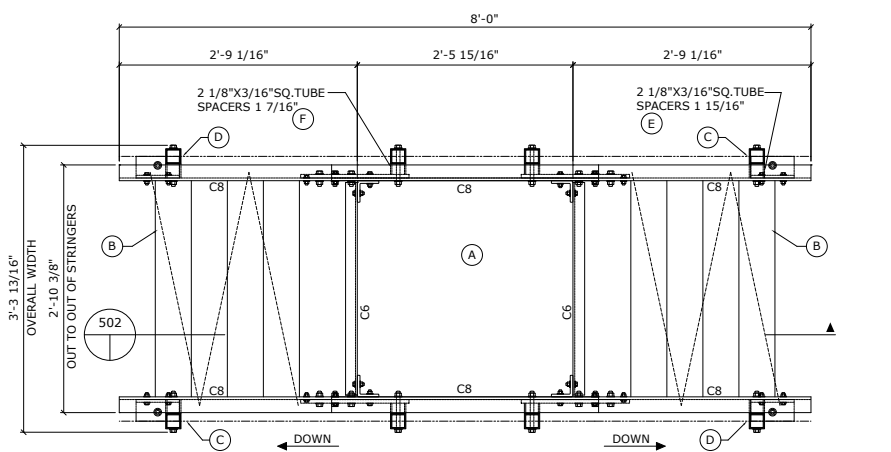
REFERENCE DWGS.:

NO.	BY	DATE	REVISION	CHKD. BY	DATE
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△	BH	05/14/14	FOR PRODUCTION	EAL	05/14/14

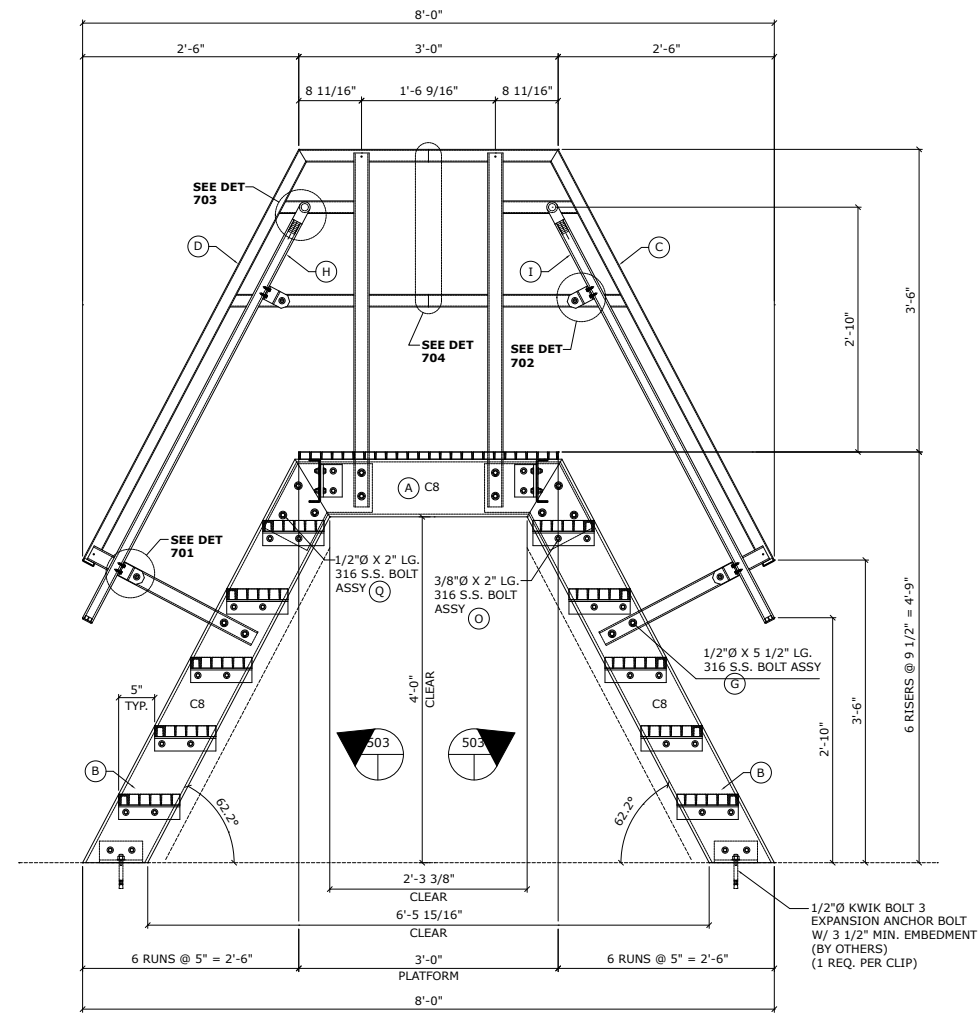
# 866148.01 FRP Ship Stair Crossover

## 48" Clearance

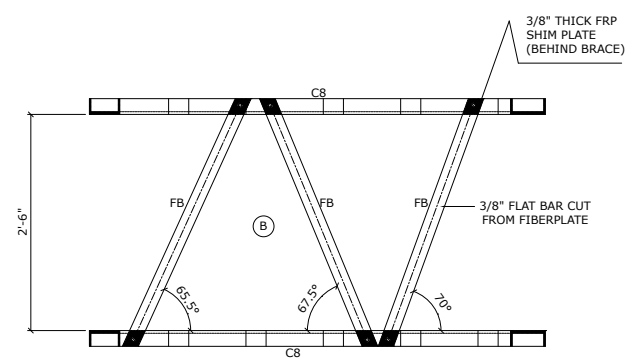
### Weight = 174Lbs



501 PLAN - FRP STAIR WALKOVER



502 ELEVATION - FRP STAIR WALKOVER



503 FRP STAIR SWAY BRACE

ASSY. NO.	P/N	QTY.	DESCRIPTION
1000000	T	1	FRP Ship Stair Crossover Assembly Instructions
1000000	S	8	Rivets
1000000	R	1	Bond Kit
1000000	Q	12	1/2" Dia. x 2" Lg. 316 S.S. Bolt Assy.
1000000	P	8	3/8" Dia. x 3" Lg. Hex Head Bolt Assembly
1000000	O	4	3/8" Dia. x 2" Lg. 316 S.S. Bolt Assy.
1000000	N	4	1/4" Dia. x 2 1/2" Lg. Round Hd S.S. Bolt Assy
1000000	M	16	#14 x 1" Lg. S.S. Self Tap Screw
1000000	L	4	1 3/4"x1 3/4"x1/4" Thick FRP Spacer Plate
1000000	K	8	2" x 1 3/4" x 14 GA. 316 S.S. Plate
1000000	J	8	S.S. Handrail Bracket
1000000	I	2	1 1/2" Dia. Round Tube Handrail
1000000	H	2	1 1/2" Dia. Round Tube Handrail
1000000	G	16	1/2" Dia. x 5 1/2" Lg. 316 S.S. Bolt Assy.
1000000	F	8	2 1/8"x3/16" Sq. Tube Post Spacer (1 7/16" Lg.)
1000000	E	8	2 1/8"x3/16" Sq. Tube Post Spacer (1 15/16" Lg.)
1000000	D	2	Sq. Tube Guardrail Assembly
1000000	C	2	Sq. Tube Guardrail Assembly
1000000	B	2	Ship Stair Assembly
1000000	A	1	Platform Assembly

BILL OF MATERIALS

CONTRACTOR: **48" FRP SHIP STAIR CROSSOVER**  
DRAWING # B-02822

DRAWN BY: BH DATE: 05/14/14 STRUCTURAL DESIGNER: Ethan Love P.E. PROJECT COORDINATOR:

Fibergrate Composite Structures Inc.  
Fiberglass Grating • Structural • Fabrication

**Fibergrate**  
Composite Structures  
900 FM 205 • STEPHENVILLE, TEXAS 76401

LEGEND:

A2=2"x2"x1/4" ANGLE	— = GUARDRAIL
A3=3"x3"x3/8" ANGLE	□ = GUARDRAIL POST
C8=8"x2 3/16"x3/8" CHANNEL	■ = GUARDRAIL RETURN
FB=3/8" THICK FLAT BAR	— = FB BRACE
	— = HANDRAIL

NO.	BY	DATE	REVISION	CHKD. BY	DATE
3					
2	SLV/JM	04/04/17	NEW OSHA RULES ECN-171	EAL	04/05/17
1	BH	05/14/14	FOR PRODUCTION	EAL	05/14/14

FABRICATION TOLERANCES (U.N.O.)

	MOLDED GRATING	PULTRUDED GRATING	DYNAFORM GRATING
LENGTH	+1/8, -5/16	+1/8	+1/8
WIDTH	+1/8, -5/16	+1/8	+1/8
HOLE LOC.	+1/16	+1/16	+1/16
CIRC. CUTS	+3/16	+3/16	N/A
NOTCHES	+1/8	+1/8	N/A
SQUARE OF CUT	1°	1°	2°
ANGULARITY	#2	#2	#2

DO NOT STACK TOLERANCES

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GRATING: Corvex 1" Deep 1 1/2" Sq. Mesh Molded Grating

COLOR: Dk. Gray SURFACE: Meniscus

TREADS: Corvex Fibertred 1 1/2" Deep 1 1/2"x6" Rect. Mesh

COLOR: Dk. Gray

DYNAFORM SHAPES: ISOFR

COLOR: SL. GRAY

HARDWARE: 316 S.S.

GRATING H.D.C. ASSYS.: M-2 & M-5

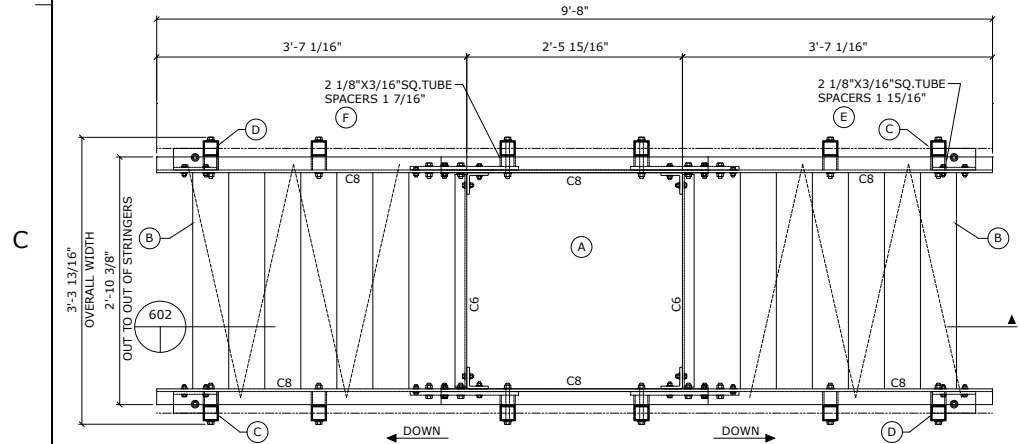
COATING: FLATSHEET: 1/2"

REFERENCE DWGS.:

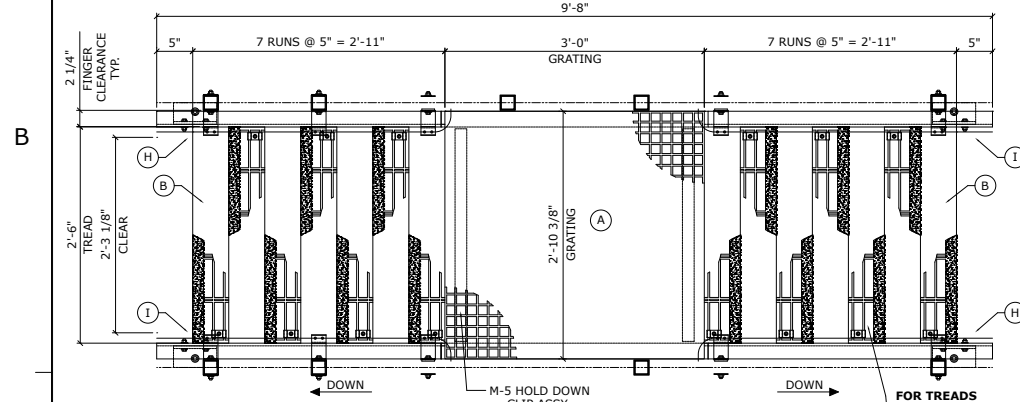
# 866167.01 FRP Ship Stair Crossover

## 67" Clearance

### Weight = 204Lbs

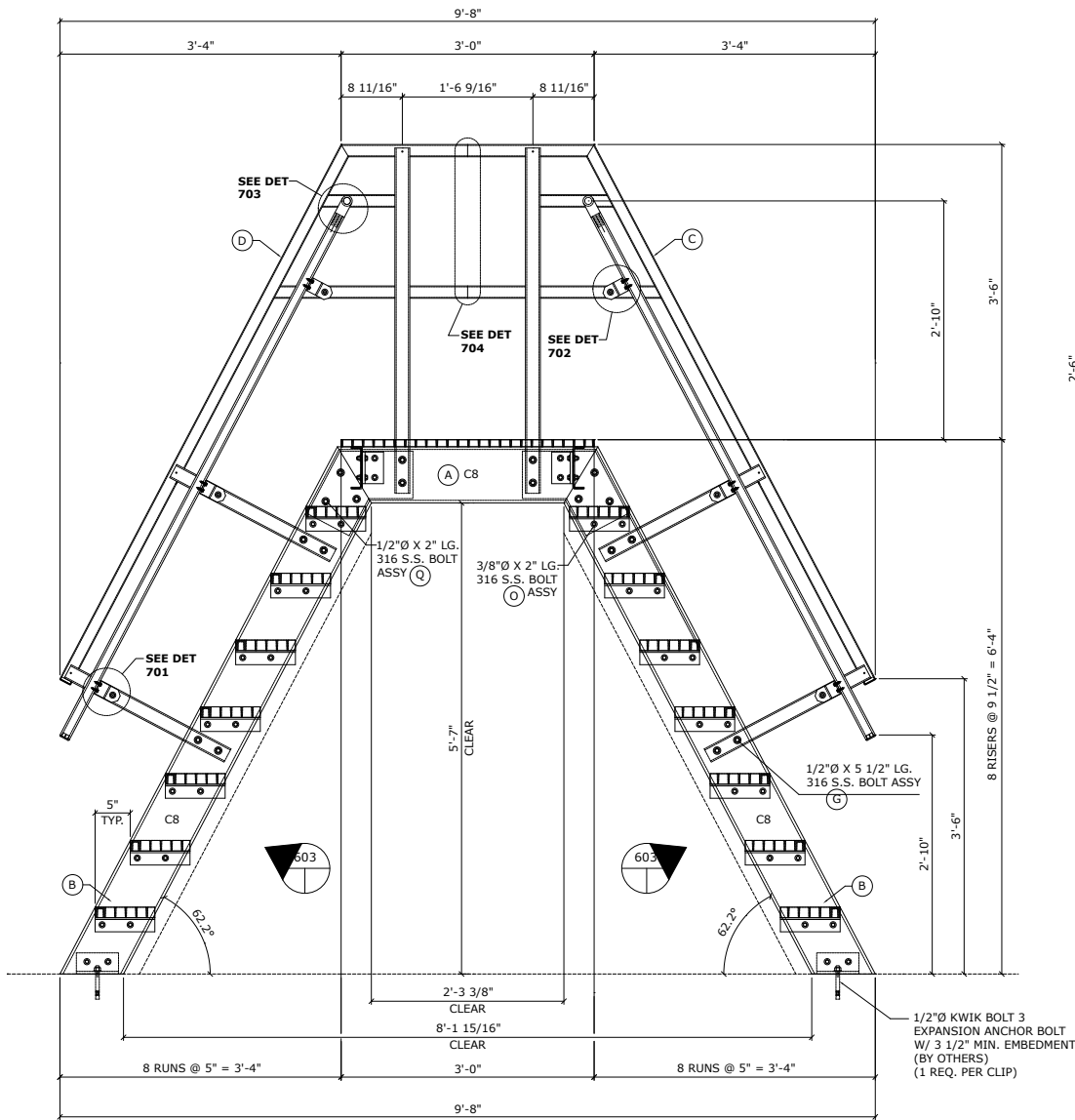


**STRUCTURE**

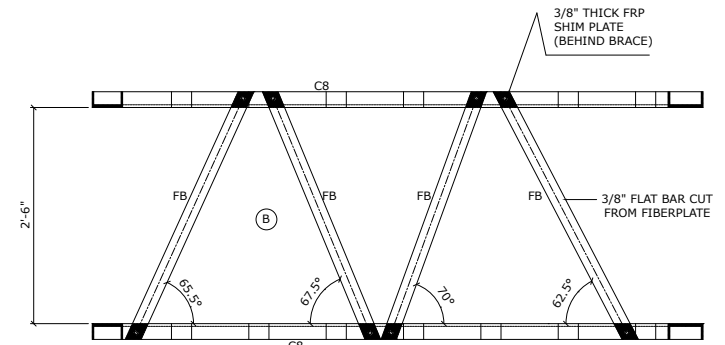


**GRATING**

601 PLAN - FRP STAIR WALKOVER



602 ELEVATION - FRP STAIR WALKOVER



603 FRP STAIR SWAY BRACE

ASSY. NO.	P/N	QTY.	DESCRIPTION
1000000	T	1	FRP Ship Stair Crossover Assembly Instructions
1000000	S	8	Rivets
1000000	R	1	Bond Kit
1000000	Q	12	1/2" Dia. x 2" Lg. 316 S.S. Bolt Assy.
1000000	P	12	3/8" Dia. x 3" Lg. Hex Head Bolt Assembly
1000000	O	4	3/8" Dia. x 2" Lg. 316 S.S. Bolt Assy.
1000000	N	4	1/4" Dia. x 2 1/2" Lg. Round Hd S.S. Bolt Assy
1000000	M	24	#14 x 1" Lg. S.S. Self Tap Screw
1000000	L	4	1 3/4"x1 3/4"x1/4" Thick FRP Spacer Plate
1000000	K	12	2" x 1 3/4" x 14 GA. 316 S.S. Plate
1000000	J	12	S.S. Handrail Bracket
1000000	I	2	1 1/2" Dia. Round Tube Handrail
1000000	H	2	1 1/2" Dia. Round Tube Handrail
1000000	G	24	1/2" Dia. x 5 1/2" Lg. 316 S.S. Bolt Assy.
1000000	F	8	2 1/8"x3/16" Sq. Tube Post Spacer (1 7/16" Lg.)
1000000	E	16	2 1/8"x3/16" Sq. Tube Post Spacer (1 15/16" Lg.)
1000000	D	2	Sq. Tube Guardrail Assembly
1000000	C	2	Sq. Tube Guardrail Assembly
1000000	B	2	Ship Stair Assembly
1000000	A	1	Platform Assembly

**BILL OF MATERIALS**

**CONTRACTOR: 67" FRP SHIP STAIR CROSSOVER DRAWING # B-02822**

DATE: 05/14/14  
STRUCTURAL DESIGNER: Ethan Love P.E.  
PROJECT COORDINATOR:

**Fibergrate Composite Structures Inc.**  
Fiberglass Grating • Structurals • Fabrication

900 FM 205 • STEPHENVILLE, TEXAS 76401

SCALE: N.T.S.  
DWG. SHT.: 6 OF 7

**LEGEND:**

A2=2"x2"x1/4" ANGLE	— = GUARDRAIL
A3=3"x3"x3/8" ANGLE	□ = GUARDRAIL POST
C8=8"x2 3/16"x3/8" CHANNEL	■ = GUARDRAIL RETURN
FB=3/8" THICK FLAT BAR	— = FB BRACE
	— = HANDRAIL

NO.	BY	DATE	REVISION	CHKD. BY	DATE
3					
2	SLV/JM	04/04/17	NEW OSHA RULES ECN-171	EAL	04/05/17
1	BH	05/14/14	FOR PRODUCTION	EAL	05/14/14

**FABRICATION TOLERANCES (U.N.O.)**

	MOLDED GRATING	PULTRUDED GRATING	DYNAFORM SHAPES
LENGTH	+1/8, -5/16	#1/8	#1/8
WIDTH	+1/8, -5/16	#1/8	#1/8
HOLE LOC.	+1/16	#1/16	#1/16
CIRC. CUTS	#3/16	#3/16	N/A
NOTCHES	#1/8	#1/8	N/A
SQUARE OF CUT	1"	1"	2"
ANGULARITY	#2	#2	#2

DO NOT STACK TOLERANCES

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GRATING: Corvex 1" Deep 1 1/2" Sq. Mesh Molded Grating  
COLOR: Dk. Gray SURFACE: Meniscus  
TREADS: Corvex Fibertred 1 1/2" Deep 1 1/2"x6" Rect. Mesh  
COLOR: Dk. Gray

DYNAFORM SHAPES: ISOFR  
COLOR: SL. GRAY

DYNAFORM GUARDRAIL: ISOFR  
COLOR: YELLOW

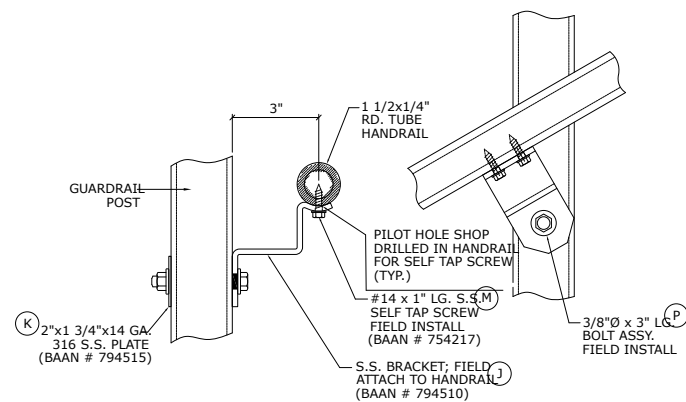
HARDWARE: GRATING H.D.C. ASSYS.: 316 S.S.  
M-2 & M-5

COATING: FLATSHEET: 1/2"

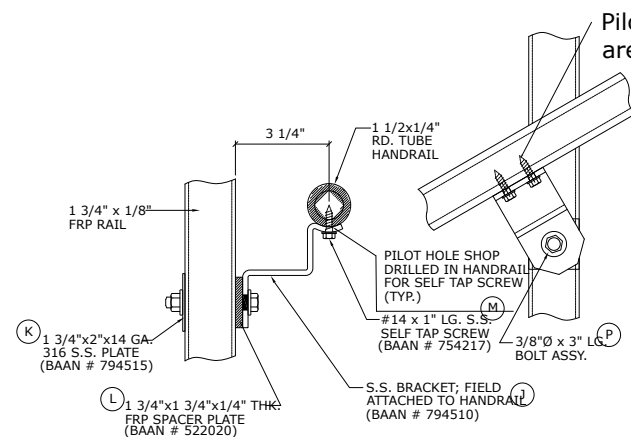
REFERENCE DWGS.:

# FRP Ship Stair Crossover

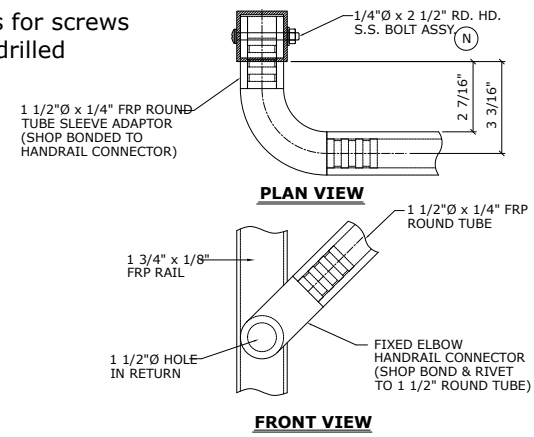
## Additional Details



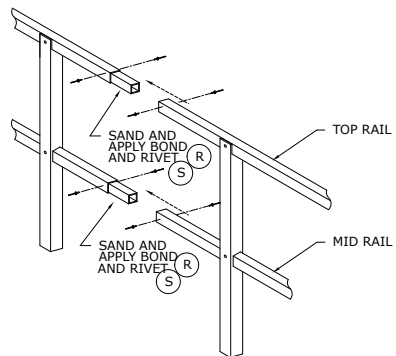
701 S.S. HANDRAIL BRACKET TO POST



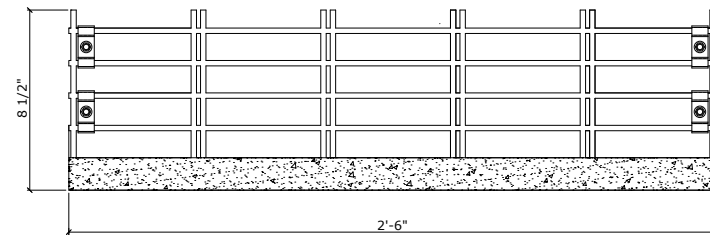
702 S.S. HANDRAIL BRACKET TO RAIL



703 DETAIL - HANDRAIL TO RAIL CONNECTION



704 DETAIL - IN LINE HANDRAIL SPLICE



705 FIBERTRED

LEGEND:	
	= GUARDRAIL
	= GUARDRAIL POST
	= GUARDRAIL RETURN
	= FB BRACE
	= HANDRAIL

A2=2"x2"x1/4" ANGLE  
A3=3"x3"x3/8" ANGLE  
C8=8"x2 3/16"x3/8" CHANNEL  
FB=3/8" THICK FLAT BAR

NO.	BY	DATE	REVISION	CHKD. BY	DATE
3					
2					
1	JM	04/04/17	NEW OSHA RULES ECN-171	EAL	04/05/17
0					

FABRICATION TOLERANCES (U.N.O.)		
LENGTH	+1/8, -5/16	±1/8
WIDTH	+1/8, -5/16	±1/8
HOLE LOC.	±1/16	±1/16
CIRC. CUTS	±3/16	±3/16
NOTCHES	±1/8	±1/8
SQUARE OF CUT	1°	2°
ANGULARITY	±2	±2

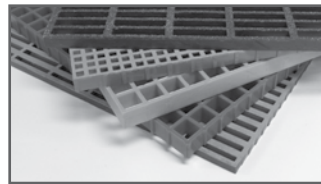
GRATING:	Corvex 1" Deep 1 1/2" Sq. Mesh Molded Grating
COLOR:	Dk. Gray SURFACE: Meniscus
TREADS:	Corvex Fibertred 1 1/2" Deep
COLOR:	Dk. Gray
DYNAFORM SHAPES:	ISOFR
COLOR:	SL. GRAY
DYNAFORM GUARDRAIL:	ISOFR
COLOR:	YELLOW
HARDWARE:	GRATING H.D.C. ASSYS.: M-2 & M-5
COATING:	FLATSHEET: 1/2"
REFERENCE DWGS.:	

CONTRACTOR:			FRP Ship Stair Crossover Additional Details		
DRAWN BY: BH			DATE: 05/14/14		
STRUCTURAL DESIGNER: Ethan Love P.E.			PROJECT COORDINATOR:		
Fibergate Composite Structures Inc.			Cust NO.:		
Fiberglass Grating • Structurals • Fabrication			W.O. NO.:		
900 FM 205 • STEPHENVILLE, TEXAS 76401			SCALE: N.T.S.		
			DWG. SHT.: 7 OF 7		



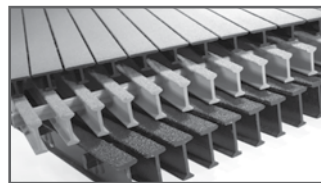
# Fibergrate Products & Services

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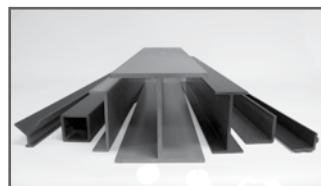
## Fibergrate® Molded Grating

Fibergrate molded gratings are designed to provide the ultimate in reliable performance, even in the most demanding conditions. Fibergrate offers the widest selection in the market with multiple resins and more than twenty grating configurations available in many panel sizes and surfaces.



## Safe-T-Span® Pultruded Industrial and Pedestrian Gratings

Combining corrosion resistance, long-life and low maintenance, Safe-T-Span® provides unidirectional strength for industrial and pedestrian pultruded grating applications.



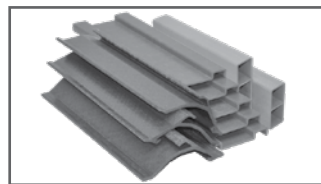
## Dynaform® Structural Shapes

Fibergrate offers a wide range of standard Dynaform pultruded structural profiles for industrial and commercial use, including I-beams, wide flange beams, round and square tubes, bars, rods, channels, leg angles and plate.



## Dynarail® & DynaRound™ Guardrail, Handrail & Ladders

Easily assembled from durable components or engineered and prefabricated to your specifications, Dynarail square tube and DynaRound round tube railing systems and Dynarail safety ladder systems meet or exceed OSHA and strict building code requirements for safety and design.



## Custom Composite Solutions

Combining Fibergrate's design, manufacturing and fabrication services allows Fibergrate to offer custom composite solutions to meet our client's specific requirements. Either through unique pultruded profiles or custom open molding, Fibergrate can help bring your vision to reality.



## Design & Fabrication Services

Combining engineering expertise with an understanding of fiberglass applications, Fibergrate provides turnkey design and fabrication of fiberglass structures, including platforms, catwalks, stairways, railings and equipment support structures.



## Worldwide Sales & Distribution Network

Whether a customer requires a platform in a mine in South Africa to grating on an oil rig in the North Sea, or walkways in a Wisconsin cheese plant to railing at a water treatment facility in Brazil; Fibergrate has sales and service locations throughout the world to meet the needs and exceed the expectations of any customer.

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Printed in the USA



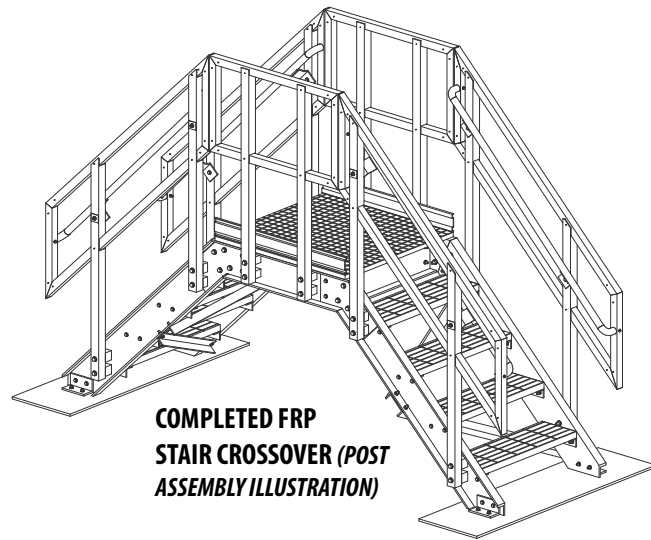
# FRP Stair Crossovers



**Estimated Installation Time:** 2 Man Crew, 2 Hours

## ASSEMBLY INSTRUCTIONS

ITEM DESCRIPTION	PART NUMBER
FRP Stair Crossover - 10" Clearance	866210.01
FRP Stair Crossover - 19-1/2" Clearance	866219.01
FRP Stair Crossover - 29" Clearance	866229.01
FRP Stair Crossover - 38-1/2" Clearance	866238.01
FRP Stair Crossover - 48" Clearance	866248.01
FRP Stair Crossover - 65" Clearance	866265.01

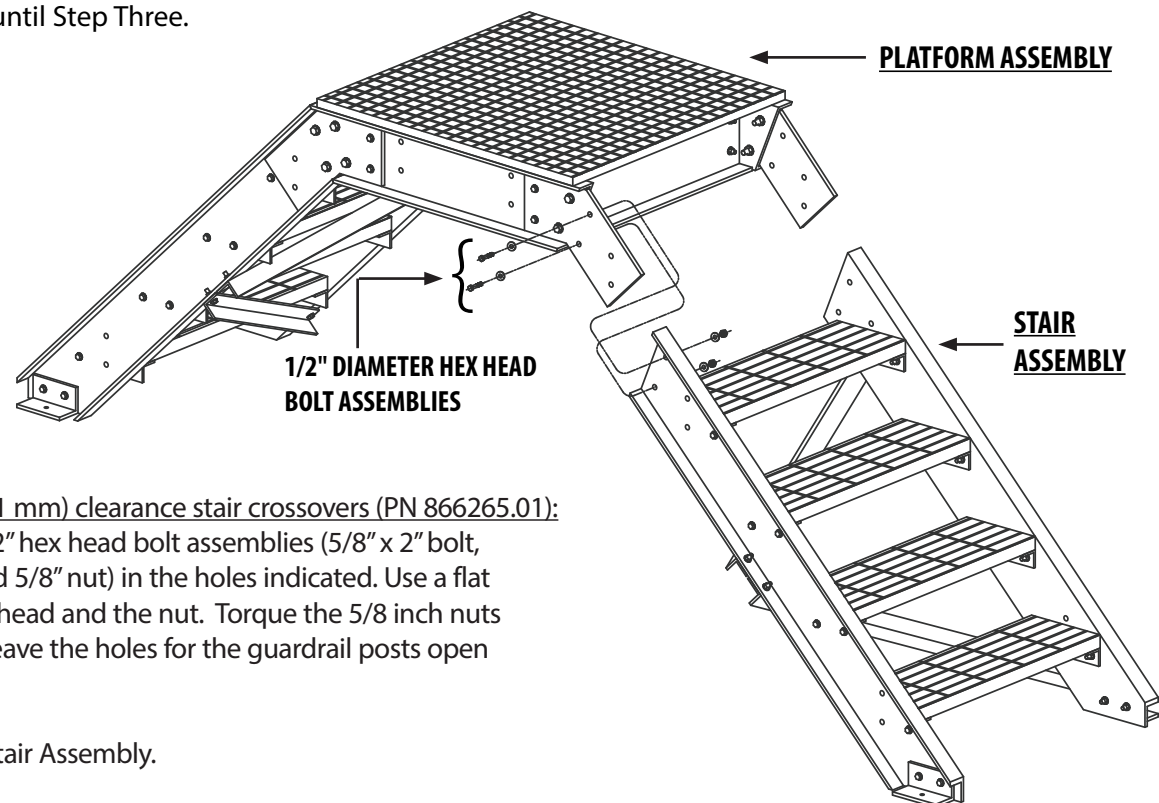


### STEP 1:

#### ATTACH STAIR ASSEMBLIES TO PLATFORM ASSEMBLY

A) Slide channels of Stair Assembly inside of Splice Plates on Platform Assembly and line up the holes. Refer to Drawing B-03060 Rev 1 dated 2/23/17 for the exact configuration of the crossover. The illustration shown in these instructions may vary from the crossover you are assembling.

B) For the stair crossovers up to and including the 48 inch (1219 mm) clearance crossover (PN 866248.01): Install two each 1/2" x 2" hex head bolt assemblies (1/2" x 2" bolt, 2 each flat washers, and 1/2" nut) in the holes indicated. Use a flat washer under the bolt head and the nut. Torque the 1/2 inch nuts to 45 ft-lb (5.1 N-m). Leave the holes for the guardrail posts open until Step Three.



C) For the 65 inch (1651 mm) clearance stair crossovers (PN 866265.01): Install two each 5/8" x 2" hex head bolt assemblies (5/8" x 2" bolt, 2 each flat washers, and 5/8" nut) in the holes indicated. Use a flat washer under the bolt head and the nut. Torque the 5/8 inch nuts to 45 ft-lb (5.1 N-m). Leave the holes for the guardrail posts open until Step Three.

D) Repeat for second Stair Assembly.

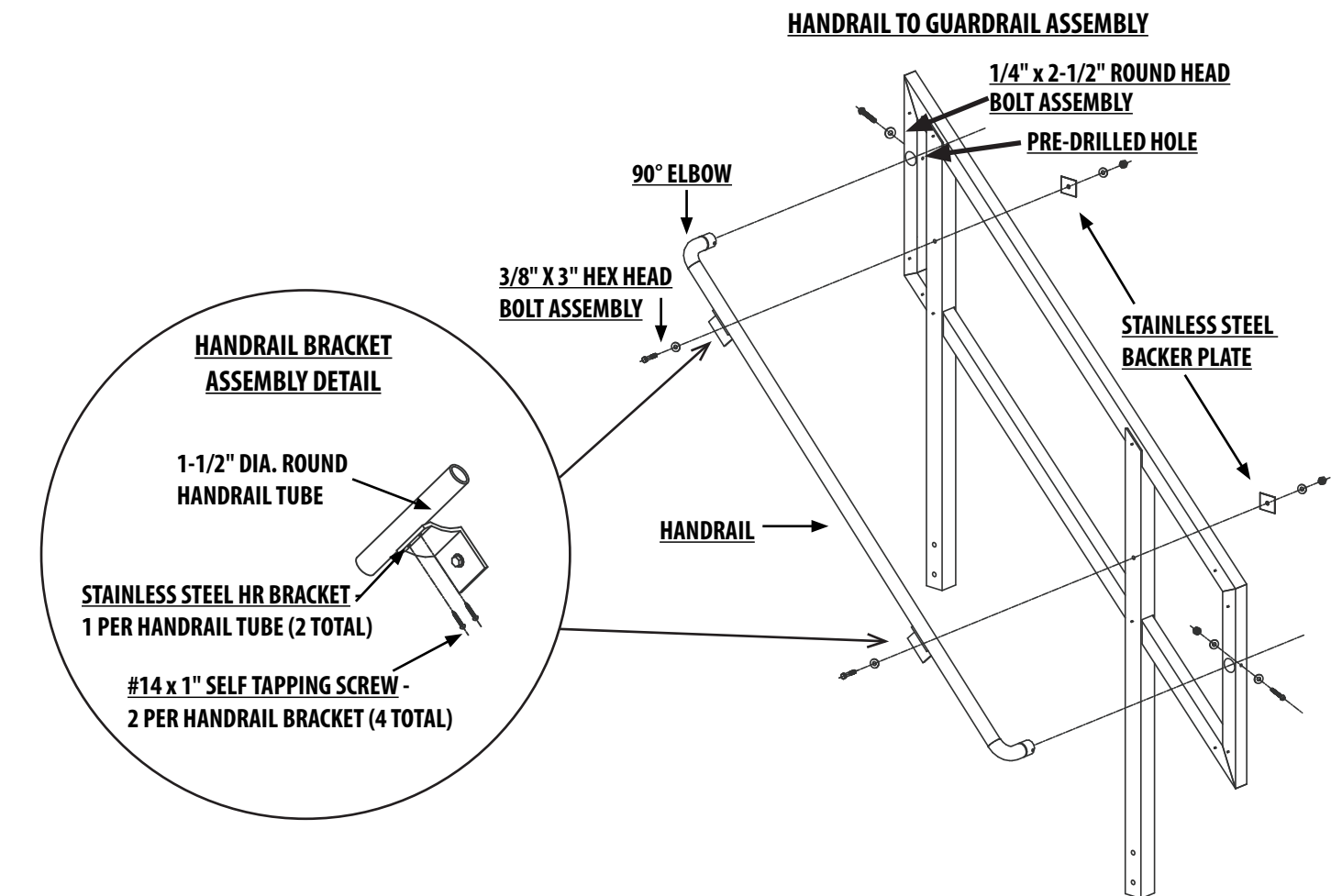
# Stair Crossover Assembly Instructions

## STEP 2: ASSEMBLE HANDRAIL TO GUARDRAILS

A) Attach the stainless steel handrail brackets to the 1-1/2 inch dia round handrail tubes using two #14 x 1 inch self-tapping screws per handrail bracket. The pilot holes for the screws are shop drilled into the handrail tubes. Be careful not to over-torque the screws to prevent stripping the holes. Note that you will be assembling a left hand and a right hand set of handrails for each stair.

B) Attach the handrail to the guardrail by following Details 702 and 703 in Drawing B-3060. The stainless steel handrail brackets connect to the 2-1/8 inch (54 mm) post and 1-3/4 inch (44.5 mm) rail with a 3/8" x 3" hex head bolt assembly, flat washer, and backer plate. Apply blue thread locking compound to the bolt threads prior to installing the nuts. Torque nuts until the assemblies are tightly clamped together.

C) The 90° elbow at the top and bottom of the handrail connects to the 1-3/4 inch (44.5 mm) square tube rail return by fitting it into the pre-drilled hole and securing it with a 1/4" x 2-1/2" round head bolt assembly. Install the round head bolt so that the nut is oriented toward the inside of the assembly. Refer to Detail 703. Apply blue thread locking compound to the bolt threads prior to installing the nut. Torque nuts until the assemblies are tightly clamped together.



# Stair Crossover Assembly Instructions

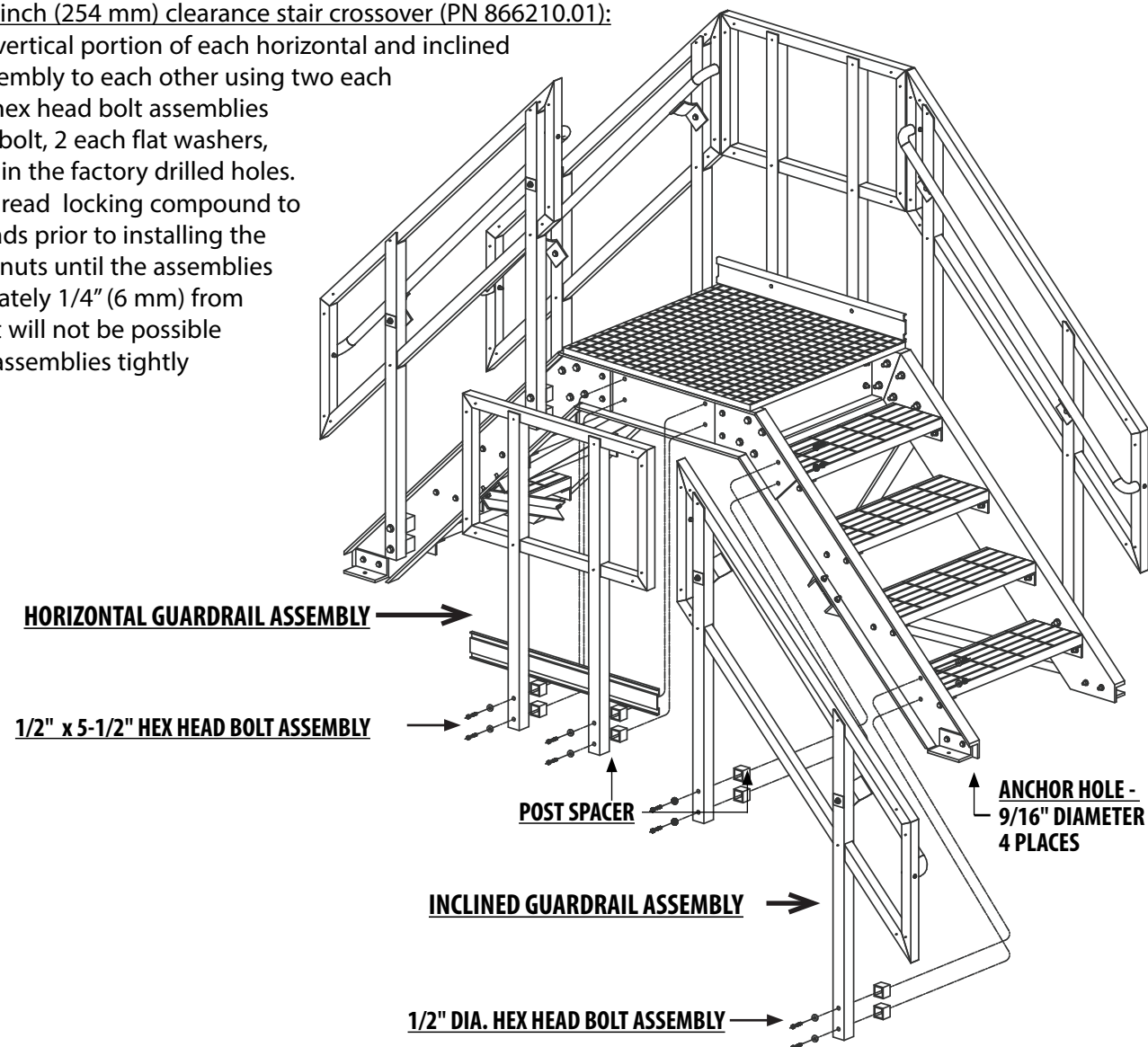
## STEP 3: INSTALL GUARDRAILS

A) For the stair crossovers up to and including the 48 inch (1219 mm) clearance crossover (PN 866248.01): Install each Guardrail Assembly to the Crossover by sandwiching the 2-1/8 inch x 3/16 inch (54 x 4.8 mm) Square Tube Post Spacers between the Guardrail Assembly and the Crossover and installing the 1/2 inch x 5-1/2 inch hex head bolt assemblies (1/2 inch x 5-1/2 inch bolt, 2 each flat washers, and 1/2" nut) in the holes indicated. Where the post falls on a splice plate, use the shorter spacer. The longer spacers are for the locations where the post is bolted directly to the web of the channel. Use a flat washer under the bolt head and the nut. Hold Post Spacers in alignment with the edges of the post while torquing the nuts. Torque the nuts to 45 ft-lb (5.1 N-m).

B) For the 65 inch (1651 mm) clearance stair crossovers (PN 866265.01): Follow the instructions above except use 1/2 inch x 6 inch hex head bolt assemblies (1/2 inch x 6 inch bolt, 2 each flat washers, and 1/2" nut) for installing the Guardrail Assemblies.

C) Repeat for all six Guardrail Assemblies.

D) For the 10 inch (254 mm) clearance stair crossover (PN 866210.01): Connect the vertical portion of each horizontal and inclined Guardrail Assembly to each other using two each 1/4" x 4-1/2" hex head bolt assemblies (1/4" x 1-1/2" bolt, 2 each flat washers, and 1/4" nut) in the factory drilled holes. Apply blue thread locking compound to the bolt threads prior to installing the nuts. Torque nuts until the assemblies are approximately 1/4" (6 mm) from each other. It will not be possible to pull the two assemblies tightly together.



# Stair Crossover Assembly Instructions

## STEP 4: ANCHOR STAIR CROSSOVER

A) Prior to use, the Stair Crossover must be anchored to the supporting surface to prevent tipping. Anchor holes are 9/16 inch (14.3 mm) diameter and located at the bottom of the stair in four locations (see illustration on page 3). Anchoring hardware is not included.

B) Concrete Floors: Anchor Stair Crossover to concrete floors using 4 each 1/2" diameter expansion or adhesive concrete anchors. A minimum embedment of 2-1/2" is required.

C) Wood Floors: Anchor Stair Crossover to wooden floors with four each 1/2" x 3" lag bolts.

D) For other support conditions, contact a qualified engineer to develop adequate anchoring details. For installations on roofs or other areas where the supporting surface cannot be penetrated by fasteners, install the Roof Plate Kit by following Step Five below.

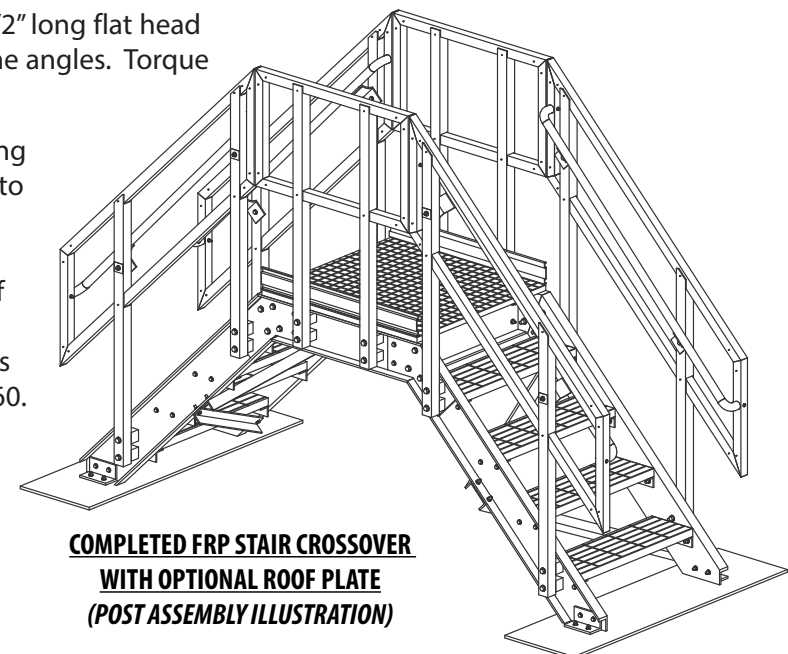
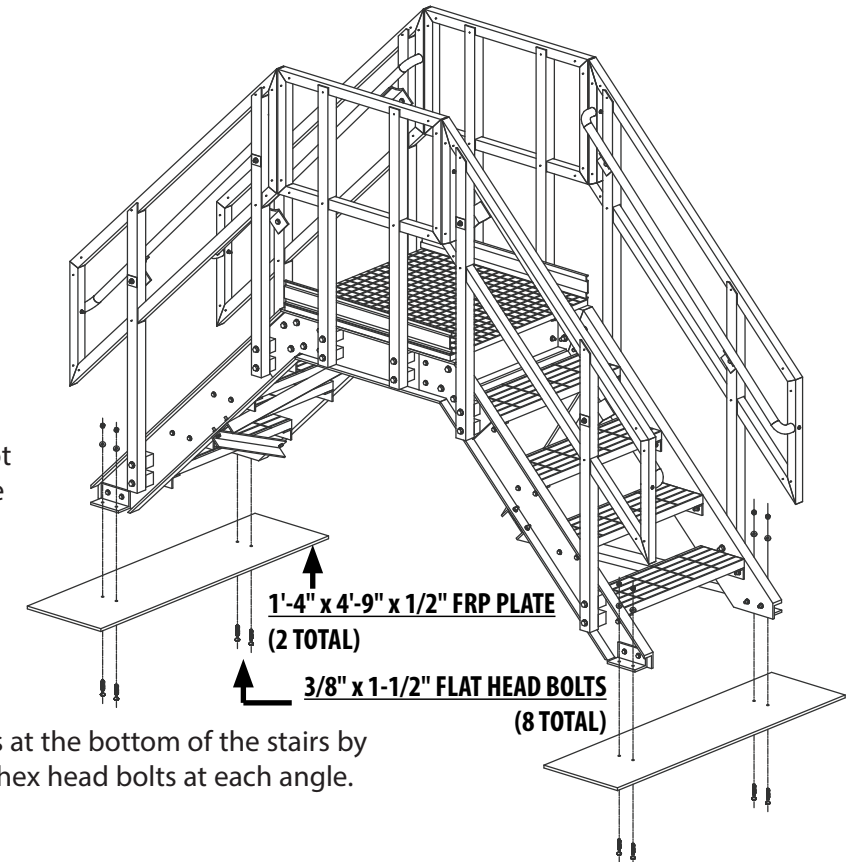
## STEP 5: OPTIONAL ROOF PLATE KIT

A) Remove the four 3" x 3" x 3/8" x 6" long angles at the bottom of the stairs by removing the two factory installed 3/8" x 1-1/2" hex head bolts at each angle. Retain the bolts; discard the angles.

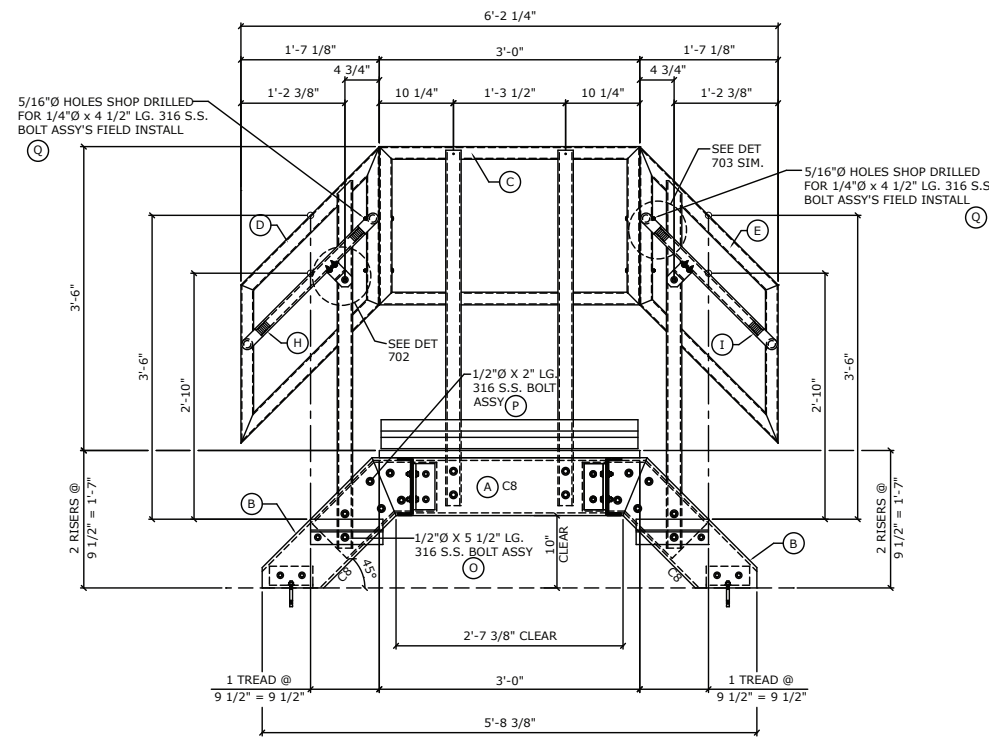
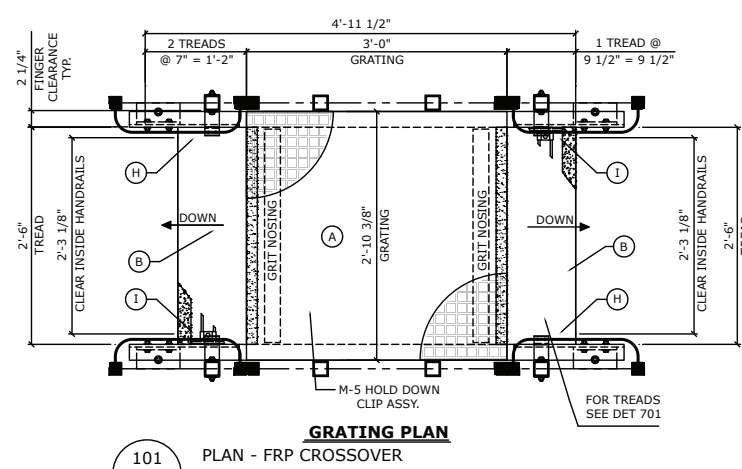
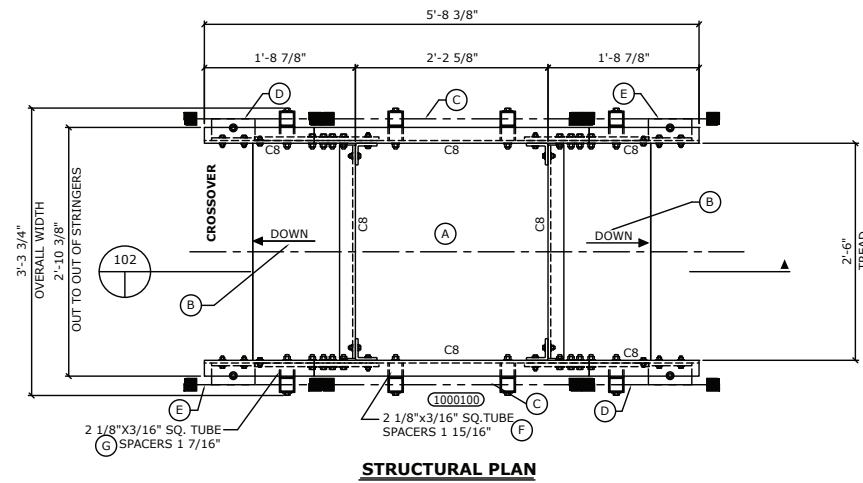
B) Attach the four 3" x 3" x 3/8" x 6" long angles supplied with the kit to the 1'-4" x 4'-9" x 1/2" thick FRP plate using the 3/8" x 1-1/2" long flat head bolts supplied with the kit. Note the orientation of the angles. Torque the bolts to 30 lb-ft (3.9 N-m).

C) Attach this assembly to the bottom of the stair using the 3/8" x 1-1/2" removed in step 2. Torque the bolts to 30 ft-lb (3.9 N-m).

D) Before placing the finished crossover onto the roof surface, protect the roof from abrasion following the roof manufacturer's recommendations. Add ballast as required to the locations indicated in Drawing B-03060.



# Part No. 866210.01 FRP Crossover Stair 10" Clearance, 45° Stringer Weight = 200Lbs



**NOTE TO PRODUCTION**  
BOTTOM RAIL OF INCLINED GUARDRAIL ADJUSTED TO FIT WITH HORIZONTAL GUARDRAIL, ADJUST GUARDRAIL SHEETS ACCORDINGLY.

1000000	R	1	FRP Crossover Stair Assembly Instructions
1000000	Q	8	1/4" Dia. x 4 1/2" Lg. 316 S.S. Bolt Assy.
1000000	P	8	1/2" Dia. x 2" Lg. 316 S.S. Bolt Assy.
1000000	O	16	1/2" Dia. x 5 1/2" Lg. 316 S.S. Bolt Assy.
1000000	N	4	3/8" Dia. x 3" Lg. Hex Head Bolt Assembly
1000000	M	4	1/4" Dia. x 2 1/2" Lg. Round Hd S.S. Bolt Assy
1000000	L	8	#14 x 1" Lg. S.S. Self Tap Screw
1000000	K	4	2" x 1 3/4" x 14 GA. 316 S.S. Plate
1000000	J	4	S.S. Handrail Bracket
1000000	I	2	1 1/2" Dia. Round Tube Handrail
1000000	H	2	1 1/2" Dia. Round Tube Handrail
1000000	G	8	2 1/8"x3/16" Sq. Tube Post Spacer (1 7/16" Lg.)
1000000	F	8	2 1/8"x3/16" Sq. Tube Post Spacer (1 15/16" Lg.)
1000000	E	2	Inclined Sq. Tube Guardrail Assembly
1000000	D	2	Inclined Sq. Tube Guardrail Assembly
1000000	C	2	Horizontal Sq. Tube Guardrail Assembly
1000000	B	2	Stair Assembly
1000000	A	1	Platform Assembly
ASSY. NO.			

**LEGEND:**

—	= GUARDRAIL
□	= GUARDRAIL POST
■	= GUARDRAIL RETURN
—	= A2 BRACE
—	= HANDRAIL

A2=2"x2"x1/4" ANGLE  
C8=8"x2 3/16"x3/8" CHANNEL

NO.	BY	DATE	REVISION	CHKD. BY	DATE
3					
2	SLV/JM	04/04/17	NEW OSHA RULES ECN-171	EAL	04/05/17
1	BM	10/11/16	FOR PRODUCTION ECN-160	EL	10/11/16

**FABRICATION TOLERANCES (U.N.O.)**

LENGTH	MOLDED GRATING	PULTRUDED GRATING	DYNAFORM SHAPES
	+1/8, -5/16	±1/8	±1/8
WIDTH	+1/8, -5/16	±1/8	±1/8
HOLE LOC.	±1/16	±1/16	±1/16
CIRC. CUTS	±3/16	±3/16	N/A
NOTCHES	±1/8	±1/8	N/A
SQUARE OF CUT	1°	1°	2°
ANGULARITY	±2	±2	±2

DO NOT STACK TOLERANCES

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**10" FRP CROSSOVER**  
Drawing No. B-03060

CONTRACTOR: BM  
DATE: 10/11/16  
STRUCTURAL DESIGNER: ETHAN LOVE P.E.  
PROJECT COORDINATOR: -

COATING: CORVEX 1" DEEP 1 1/2" SQ. MESH MOLDED  
COLOR: DK.GRAY SURFACE: MENISCUS

TREADS: CORVEX FIBERTRED 1 1/2" DEEP 1 1/2"x6" RECT. MESH MOLDED  
COLOR: DK.GRAY SURFACE: MENISCUS

CHANDRIFORM SHAPES: ISOFR  
COLOR: DK.GRAY

CHANDRIFORM GUARDRAIL: ISOFR  
COLOR: YELLOW

HARDWARE: 316 SS  
GRATING H.D.C. ASSYS.: M-5, M-2

COATING: FLATSHEET: 1/2"

REFERENCE DWGS.: -

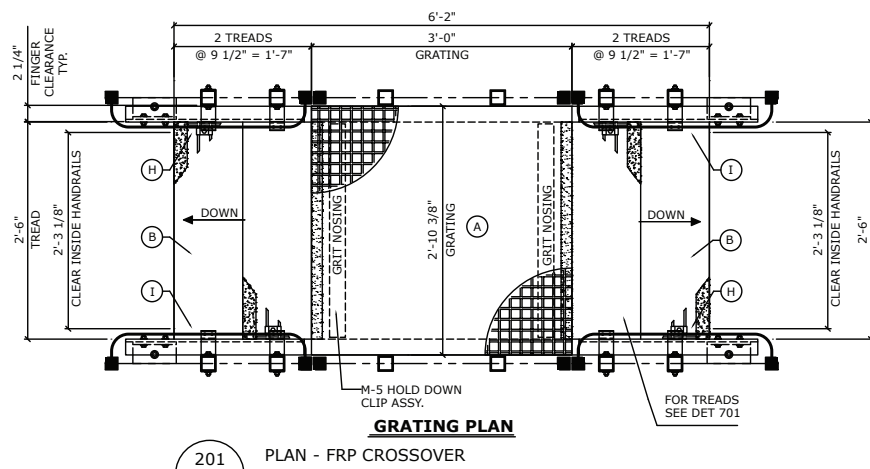
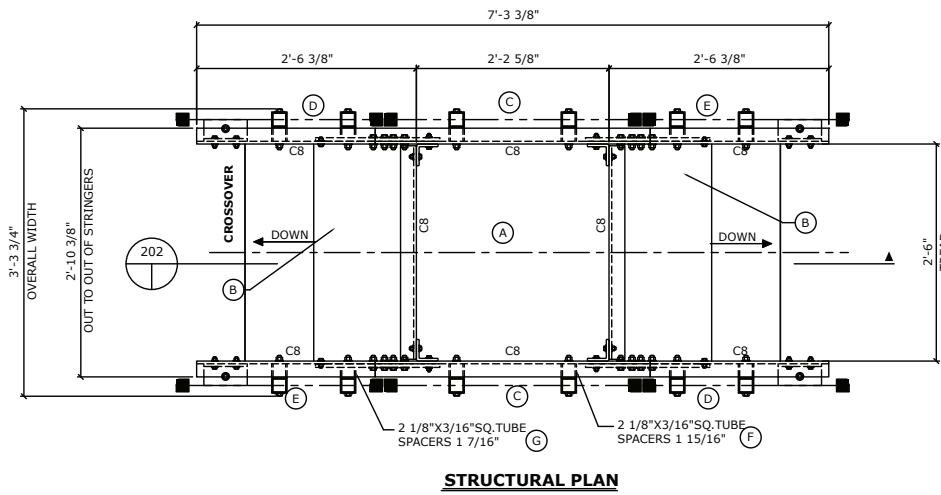
**Fibergrate Composite Structures**

900 FM 205 • STEPHENVILLE, TEXAS 76401 • Phone: (800) 527-4043

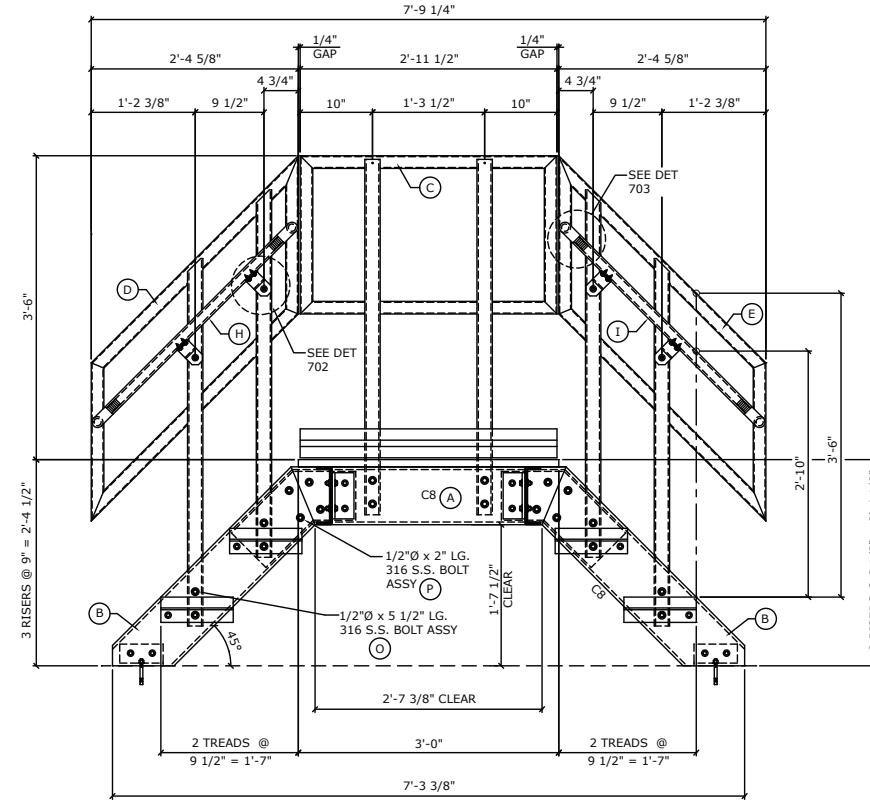
W.D. NO.: 865312  
SCALE: N.T.S.  
DWG. SHIT: 1 OF 8

# Part No. 866219.01 FRP Crossover Stair 19 1/2" Clearance, 45° Stringer Weight = 240Lbs

**NOTE TO PRODUCTION**  
BOTTOM RAIL OF INCLINED  
GUARDRAIL ADJUSTED TO FIT WITH  
HORIZONTAL GUARDRAIL, ADJUST  
GUARDRAIL SHEETS ACCORDINGLY.



201 PLAN - FRP CROSSOVER



202 SECTION - FRP CROSSOVER

**LEGEND:**

A2=2"x2"x1/4" ANGLE  
C8=8"x2 3/16"x3/8" CHANNEL

- = GUARDRAIL
- = GUARDRAIL POST
- = GUARDRAIL RETURN
- = A2 BRACE
- = HANDRAIL

**FABRICATION TOLERANCES (U.N.O.)**

LENGTH	MOLDED GRATING		PULTRUDED GRATING		DYNAFORM SHAPES	
	+1/8, -5/16	+1/8	+1/8	+1/8	+1/8	+1/8
WIDTH	+1/8, -5/16	+1/8	+1/8	+1/8	+1/8	+1/8
HOLE LOC.	+1/16	+1/16	+1/16	+1/16	+1/16	+1/16
CIRC. CUTS	+3/16	+3/16	+3/16	+3/16	N/A	N/A
NOTCHES	+1/8	+1/8	+1/8	+1/8	N/A	N/A
SQUARE OF CUT	1"	1"	1"	1"	2"	2"
ANGULARITY	#2	#2	#2	#2	#2	#2

**DO NOT STACK TOLERANCES**

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COATING: CORVEX 1" DEEP 1 1/2" SQ. MESH MOLDED COLOR: DK. GRAY SURFACE: MENISCUS	CONTRACTOR: 19 1/2" FRP CROSSOVER Drawing No. B-03060
TREADS: CORVEX FIBERTRED 1 1/2" DEEP 1 1/2"x6" RECT. MESH MOLDED COLOR: DK. GRAY SURFACE: MENISCUS	DRAWN BY: BM DATE: 10/11/16 STRUCTURAL DESIGNER: ETHAN LOVE P.E. PROJECT COORDINATOR: -
DYNAFORM SHAPES: ISOFR COLOR: DK. GRAY	GRATING H.D.C. ASSYS: M-5, M-2
HARDWARE: 316 SS	FLATSHEET: 1/2"
REFERENCE DWGS.:	

ASSY. NO.	P/N	QTY.	DESCRIPTION
1000000	Q	1	FRP Crossover Stair Assembly Instructions
1000000	P	8	1/2" Dia. x 2" Lg. 316 S.S. Bolt Assy.
1000000	O	24	1/2" Dia. x 5 1/2" Lg. 316 S.S. Bolt Assy.
1000000	N	8	3/8" Dia. x 3" Lg. Hex Head Bolt Assembly
1000000	M	8	1/4" Dia. x 2 1/2" Lg. Round Hd S.S. Bolt Assy
1000000	L	16	#14 x 1" Lg. S.S. Self Tap Screw
1000000	K	8	2" x 1 3/4" x 14 GA. 316 S.S. Plate
1000000	J	8	S.S. Handrail Bracket
1000000	I	2	1 1/2" Dia. Round Tube Handrail
1000000	H	2	1 1/2" Dia. Round Tube Handrail
1000000	G	8	2 1/8"x3/16" Sq. Tube Post Spacer (1 7/16" Lg.)
1000000	F	16	2 1/8"x3/16" Sq. Tube Post Spacer (1 15/16" Lg.)
1000000	E	2	Inclined Sq. Tube Guardrail Assembly
1000000	D	2	Inclined Sq. Tube Guardrail Assembly
1000000	C	2	Horizontal Sq. Tube Guardrail Assembly
1000000	B	2	Stair Assembly
1000000	A	1	Platform Assembly

**BILL OF MATERIALS**

CONTRACTOR: 19 1/2" FRP CROSSOVER Drawing No. B-03060

DRAWN BY: BM DATE: 10/11/16 STRUCTURAL DESIGNER: ETHAN LOVE P.E. PROJECT COORDINATOR: -

Fiberglass Grating • Structurals • Fabrication

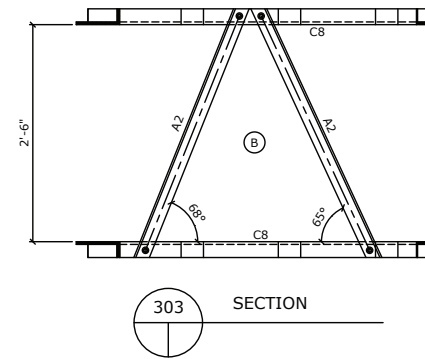
**Fibergrate**  
Composite Structures

900 FM 205 • STEPHENVILLE, TEXAS 76404 • Phone: (800) 527-4043

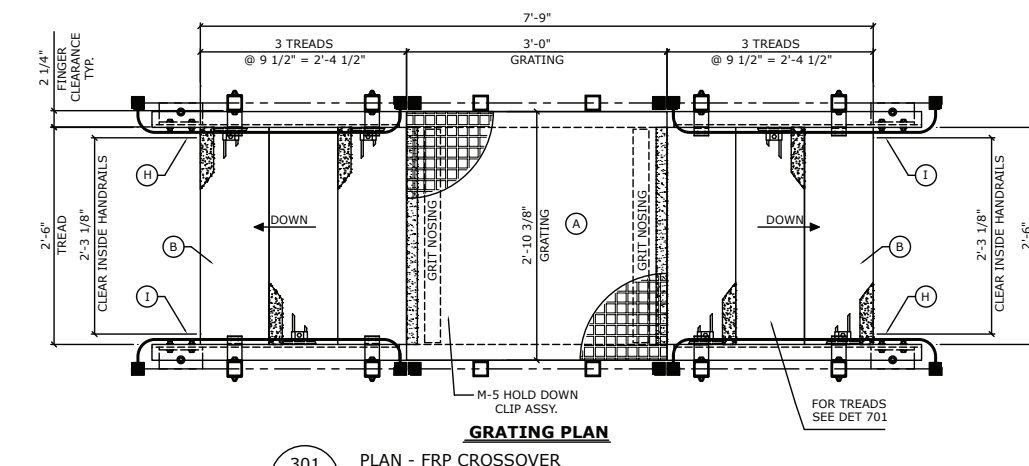
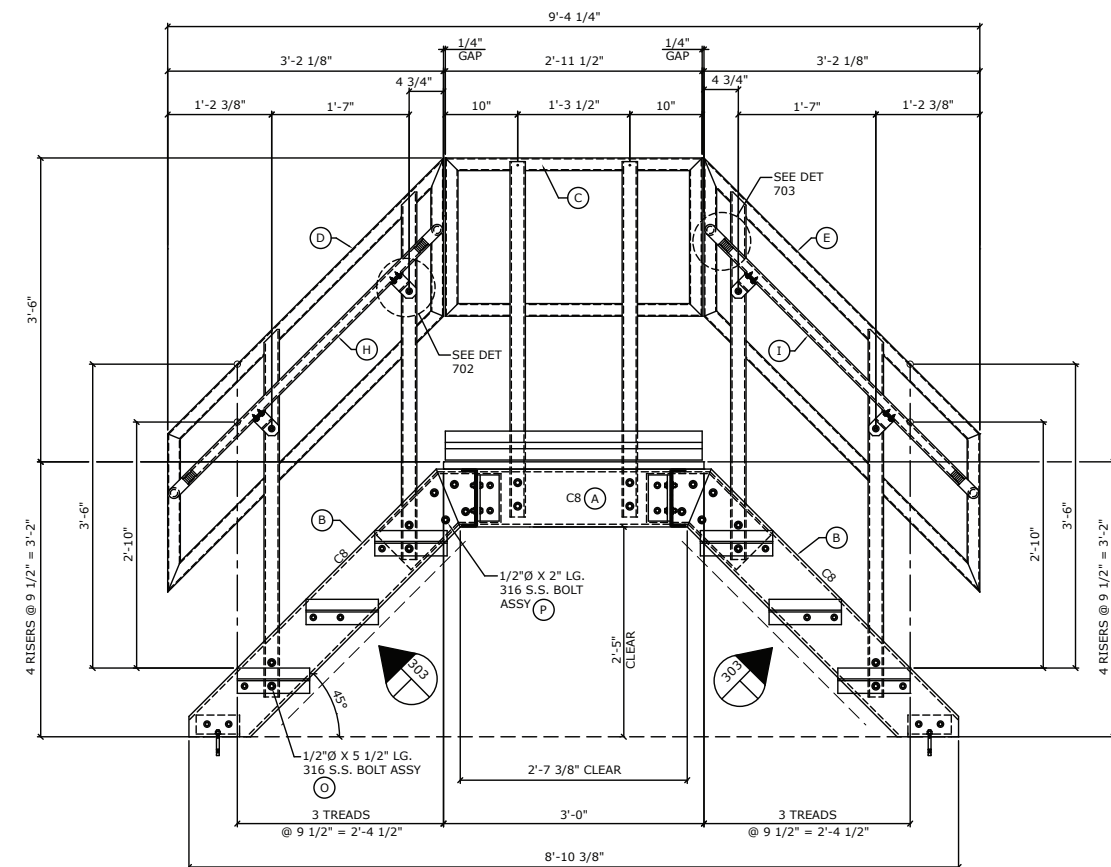
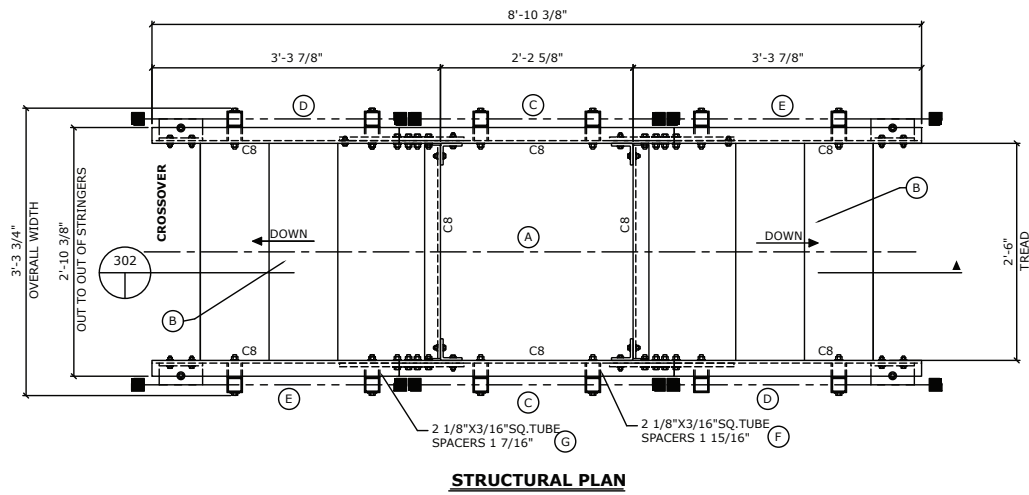
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W.O. NO.: 865318  
SCALE: N.T.S.  
DWG. SHEET: 2 OF 8

NO.	BY	DATE	REVISION	CHKD. BY	DATE
3					
2	SLV/JM	04/04/17	NEW OSHA RULES ECN-171	EAL	04/05/17
1	BM	10/11/16	FOR PRODUCTION ECN-160	EL	10/11/16

# Part No. 866229.01 FRP Crossover Stair 29" Clearance, 45° Stringer Weight = 266Lbs



**NOTE TO PRODUCTION**  
BOTTOM RAIL OF INCLINED  
GUARDRAIL ADJUSTED TO FIT WITH  
HORIZONTAL GUARDRAIL, ADJUST  
GUARDRAIL SHEETS ACCORDINGLY.



ASSY. NO.	P/N	QTY.	DESCRIPTION
1000000	Q	1	FRP Crossover Stair Assembly Instructions
1000000	P	8	1/2" Dia. x 2" Lg. 316 S.S. Bolt Assy.
1000000	O	24	1/2" Dia. x 5 1/2" Lg. 316 S.S. Bolt Assy.
1000000	N	8	3/8" Dia. x 3" Lg. Hex Head Bolt Assembly
1000000	M	8	1/4" Dia. x 2 1/2" Lg. Round Hd S.S. Bolt Assy
1000000	L	16	#14 x 1" Lg. S.S. Self Tap Screw
1000000	K	8	2" x 1 3/4" x 14 GA. 316 S.S. Plate
1000000	J	8	S.S. Handrail Bracket
1000000	I	2	1 1/2" Dia. Round Tube Handrail
1000000	H	2	1 1/2" Dia. Round Tube Handrail
1000000	G	8	2 1/8"x3/16" Sq. Tube Post Spacer (1 7/16" Lg.)
1000000	F	16	2 1/8"x3/16" Sq. Tube Post Spacer (1 15/16" Lg.)
1000000	E	2	Inclined Sq. Tube Guardrail Assembly
1000000	D	2	Inclined Sq. Tube Guardrail Assembly
1000000	C	2	Horizontal Sq. Tube Guardrail Assembly
1000000	B	2	Stair Assembly
1000000	A	1	Platform Assembly

BILL OF MATERIALS			
CONTRACTOR: <b>29" FRP CROSSOVER</b>			
Drawing No. B-03060			
DRAWN BY: BM	DATE: 10/11/16	STRUCTURAL DESIGNER: ETHAN LOVE P.E.	P.O. NO.: -
Fibergate Structures			CURT NO.: -
900 FM 205 • STEPHENVILLE, TEXAS 76404 • Phone: (800) 527-4043			W.O. NO.: 865324
			SCALE: N.T.S.
			DWG. SHT.: 3 OF 8

**LEGEND:**

	= GUARDRAIL
	= GUARDRAIL POST
	= GUARDRAIL RETURN
	= A2 BRACE
	= HANDRAIL

A2=2"x2"x1/4" ANGLE  
C8=8"x2 3/16"x3/8" CHANNEL

NO.	BY	DATE	REVISION	CHKD. BY	DATE
3					
2					
1	SLV/JM	04/04/17	NEW OSHA RULES ECN-171	EAL	04/05/17
0	BM	10/11/16	FOR PRODUCTION ECN-160	EL	10/11/16

**FABRICATION TOLERANCES (U.N.O.)**

LENGTH	MOLDED GRATING	PULTRUDED GRATING	DYNAFORM SHAPES
	+1/8, -5/16	#1/8	#1/8
WIDTH	+1/8, -5/16	#1/8	#1/8
HOLE LOC.	#1/16	#1/16	#1/16
CIRC. CUTS	#3/16	#3/16	N/A
NOTCHES	#1/8	#1/8	N/A
SQUARE OF CUT ANGLE	1°	1°	2°
	#2	#2	#2

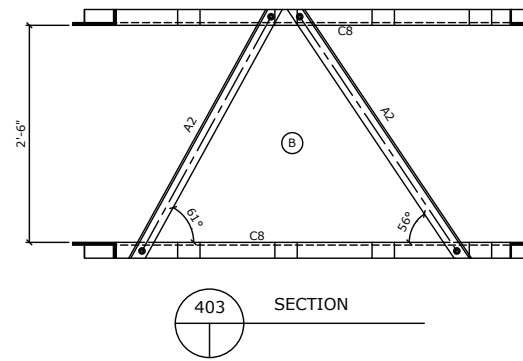
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# Part No. 866238.01

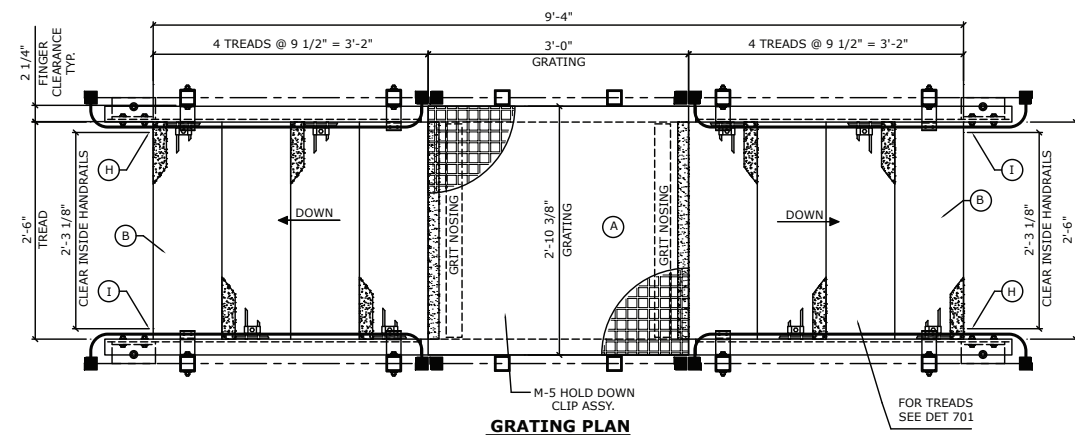
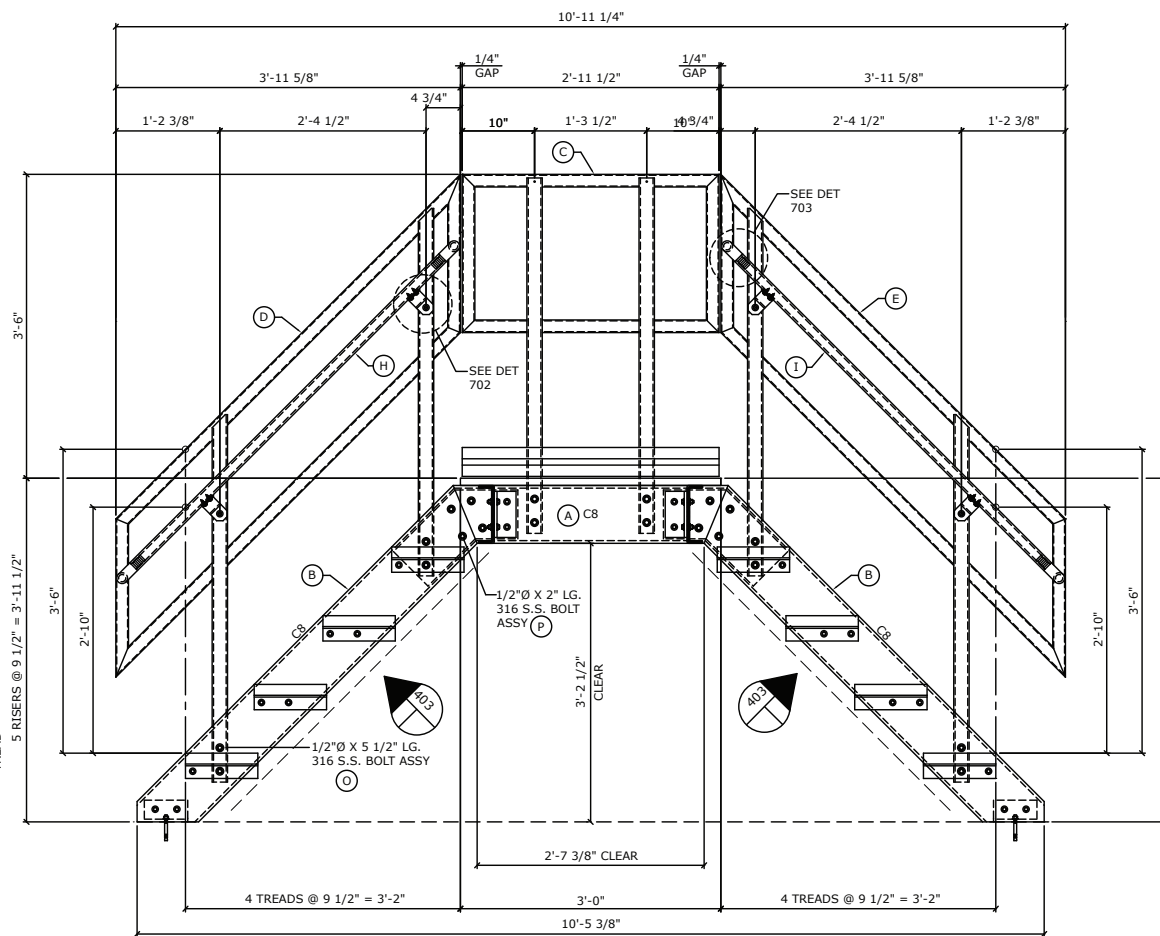
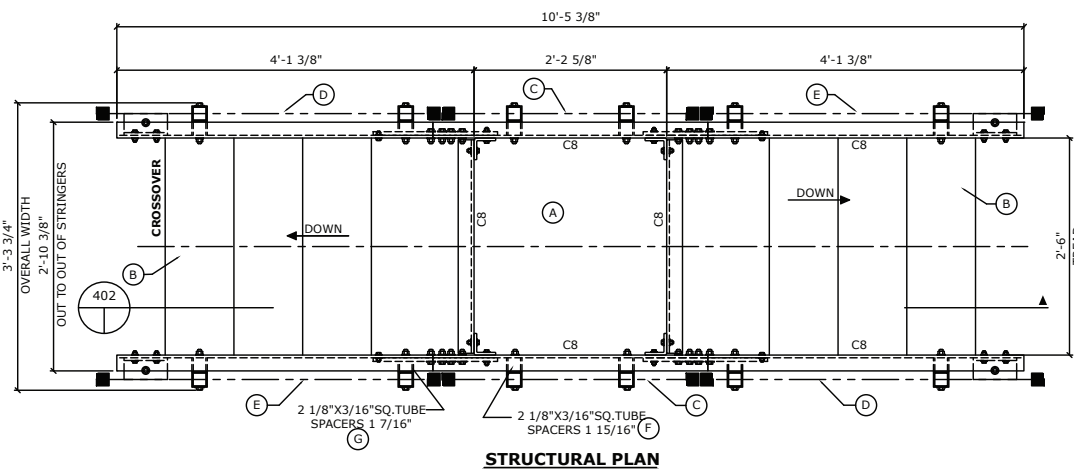
## FRP Crossover Stair

### 38 1/2" Clearance, 45° Stringer

### Weight = 320Lbs



**NOTE TO PRODUCTION**  
 BOTTOM RAIL OF INCLINED  
 GUARDRAIL ADJUSTED TO FIT WITH  
 HORIZONTAL GUARDRAIL, ADJUST  
 GUARDRAIL SHEETS ACCORDINGLY.



ASSY. NO.	P/N	QTY.	DESCRIPTION
1000000	Q	1	FRP Crossover Stair Assembly Instructions
1000000	P	8	1/2" Dia. x 2" Lg. 316 S.S. Bolt Assy.
1000000	O	24	1/2" Dia. x 5 1/2" Lg. 316 S.S. Bolt Assy.
1000000	N	8	3/8" Dia. x 3" Lg. Hex Head Bolt Assembly
1000000	M	8	1/4" Dia. x 2 1/2" Lg. Round Hd S.S. Bolt Assy
1000000	L	16	#14 x 1" Lg. S.S. Self Tap Screw
1000000	K	8	2" x 1 3/4" x 14 GA. 316 S.S. Plate
1000000	J	8	S.S. Handrail Bracket
1000000	I	2	1 1/2" Dia. Round Tube Handrail
1000000	H	2	1 1/2" Dia. Round Tube Handrail
1000000	G	8	2 1/8"x3/16" Sq. Tube Post Spacer (1 7/16" Lg.)
1000000	F	16	2 1/8"x3/16" Sq. Tube Post Spacer (1 15/16" Lg.)
1000000	E	2	Inclined Sq. Tube Guardrail Assembly
1000000	D	2	Inclined Sq. Tube Guardrail Assembly
1000000	C	2	Horizontal Sq. Tube Guardrail Assembly
1000000	B	2	Stair Assembly
1000000	A	1	Platform Assembly

BILL OF MATERIALS			
CONTRACTOR: 38 1/2" FRP CROSSOVER			
Drawing No. B-03060			
DRAWN BY: BM	DATE: 10/11/16	STRUCTURAL DESIGNER: ETHAN LOVE P.E.	PROJECT COORDINATOR:
Fiberglass Grating • Structurals • Fabrication			CUR NO.: -
			W.O. NO.: 865336
			SCALE: N.T.S.
			DWG. SH. 4 OF 8
900 FM 205 • STEPHENVILLE, TEXAS 76401 • Phone: (800) 527-4043			

**LEGEND:**

	= GUARDRAIL
	= GUARDRAIL POST
	= GUARDRAIL RETURN
	= A2 BRACE
	= HANDRAIL

A2=2"x2"x1/4" ANGLE  
 C8=8"x2 3/16"x3/8" CHANNEL

NO.	BY	DATE	REVISION	CHKD. BY	DATE
3	SLV/JM	04/04/17	NEW OSHA RULES ECN-171	EAL	04/05/17
2	BM	10/11/16	FOR PRODUCTION ECN-160	EL	10/11/16

**FABRICATION TOLERANCES (U.N.O.)**

LENGTH	MOLDED GRATING	PULTRUDED GRATING	DYNAFORM SHAPES
+	+1/8, -5/16	+1/8	+1/8
-	+1/8, -5/16	+1/8	+1/8
HOLE LOC.	+1/16	+1/16	+1/16
CIRC. CUTS	+3/16	+3/16	N/A
NOTCHES	+1/8	+1/8	N/A
SQUARE OF CUT	1°	1°	2°
ANGULARITY	#2	#2	#2

DO NOT STACK TOLERANCES

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COATING: CORVEX 1" DEEP 1 1/2" SQ. MESH MOLDED  
 COLOR: DK.GRAY SURFACE: MENISCUS

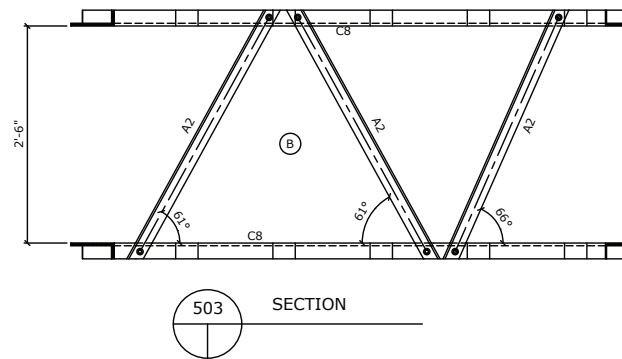
TRENDS: CORVEX FIBERTRED 1 1/2" DEEP 1 1/2"x6" RECT. MESH MOLDED  
 COLOR: DK.GRAY SURFACE: MENISCUS

FINISH SHAPES: ISOFR  
 COLOR: DK.GRAY GRATING H.D.C. ASSYS.: M-5, M-2

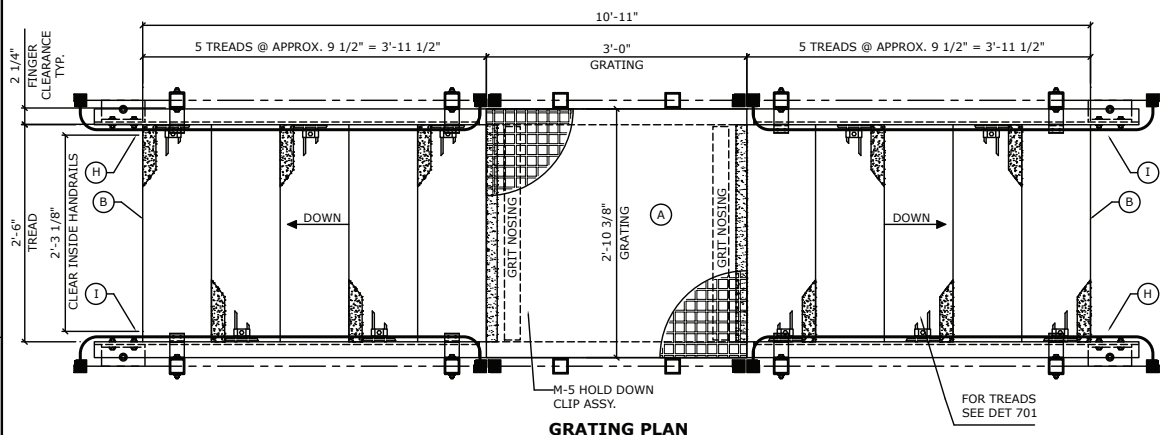
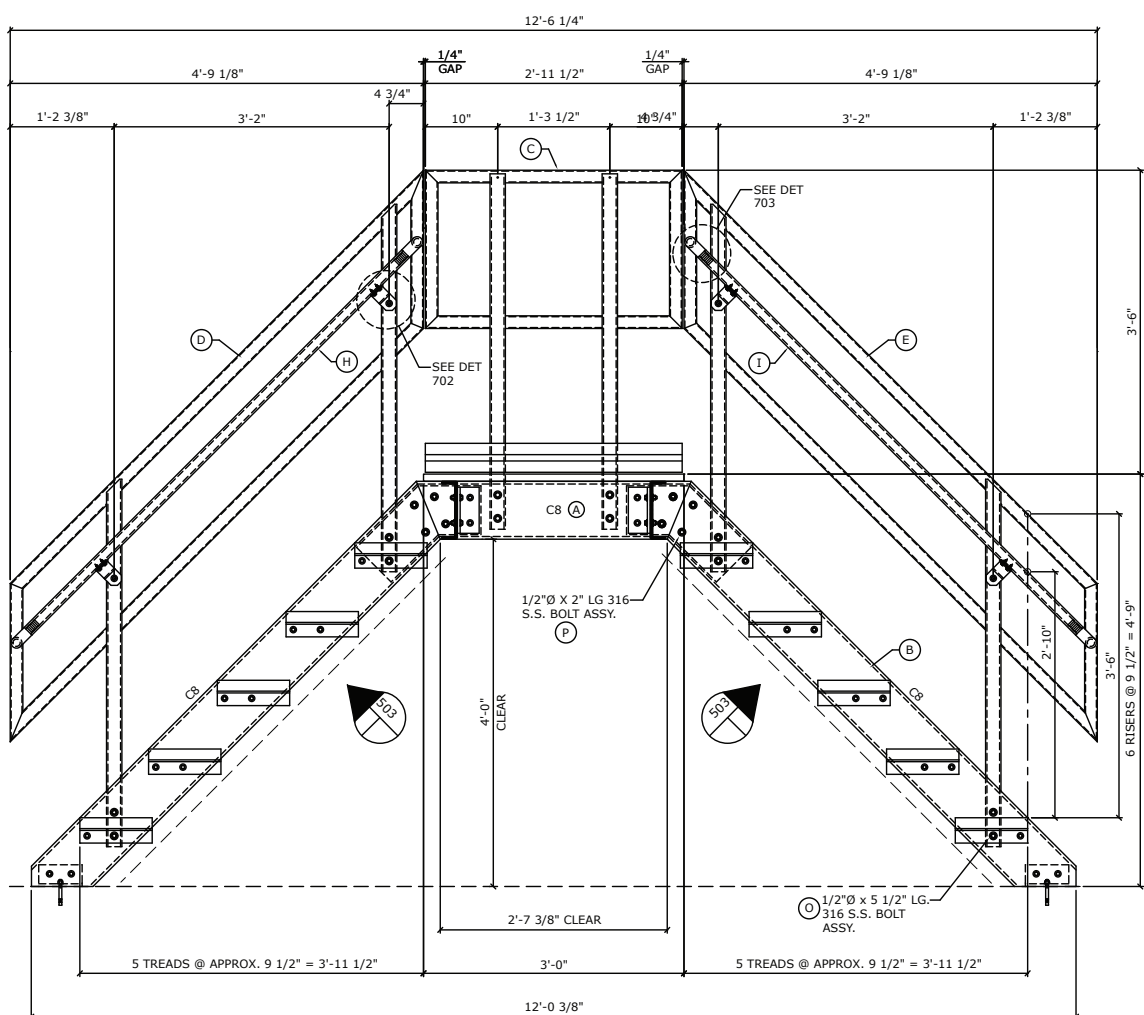
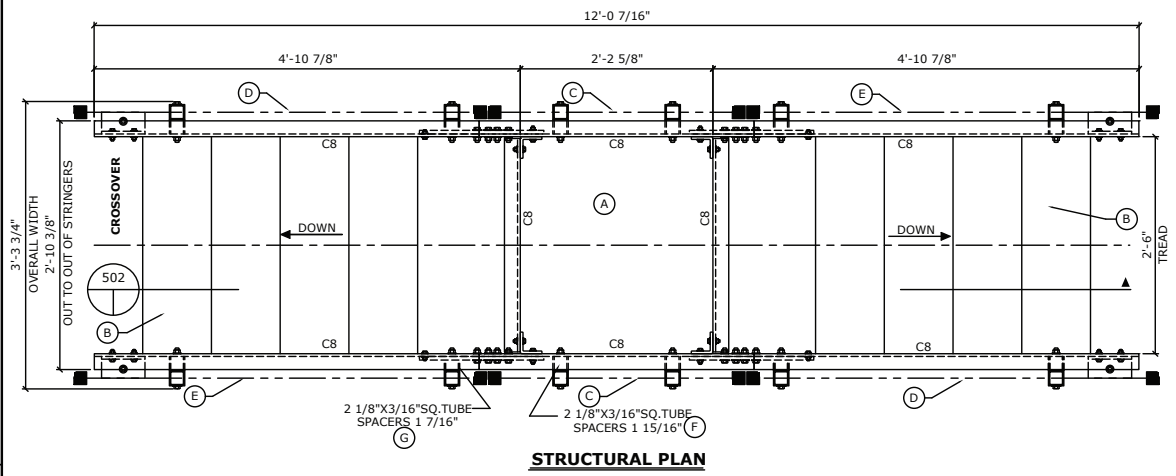
COATING: FLATSHEET: 1/2"

REFERENCE DWGS.:

# Part No. 866248.01 FRP Crossover Stair 48" Clearance, 45° Stringer Weight = 374Lbs



**NOTE TO PRODUCTION**  
BOTTOM RAIL OF INCLINED  
GUARDRAIL ADJUSTED TO FIT WITH  
HORIZONTAL GUARDRAIL, ADJUST  
GUARDRAIL SHEETS ACCORDINGLY.



ASSY. NO.	P/N	QTY.	DESCRIPTION
1000000	Q	1	FRP Crossover Stair Assembly Instructions
1000000	P	8	1/2" Dia. x 2" Lg. 316 S.S. Bolt Assy.
1000000	O	24	1/2" Dia. x 5 1/2" Lg. 316 S.S. Bolt Assy.
1000000	N	8	3/8" Dia. x 3" Lg. Hex Head Bolt Assembly
1000000	M	8	1/4" Dia. x 2 1/2" Lg. Round Hd S.S. Bolt Assy
1000000	L	16	#14 x 1" Lg. S.S. Self Tap Screw
1000000	K	8	2" x 1 3/4" x 14 GA. 316 S.S. Plate
1000000	J	8	S.S. Handrail Bracket
1000000	I	2	1 1/2" Dia. Round Tube Handrail
1000000	H	2	1 1/2" Dia. Round Tube Handrail
1000000	G	8	2 1/8"x3/16" Sq. Tube Post Spacer (1 7/16" Lg.)
1000000	F	16	2 1/8"x3/16" Sq. Tube Post Spacer (1 15/16" Lg.)
1000000	E	2	Inclined Sq. Tube Guardrail Assembly
1000000	D	2	Inclined Sq. Tube Guardrail Assembly
1000000	C	2	Horizontal Sq. Tube Guardrail Assembly
1000000	B	2	Stair Assembly
1000000	A	1	Platform Assembly

**BILL OF MATERIALS**

**48" FRP CROSSOVER**  
Drawing No. B-03060

CONTRACTOR:	DATE:	STRUCTURAL DESIGNER:	PROJECT COORDINATOR:
BM	10/11/16	ETHAN LOVE P.E.	-
Fiberglass Grating • Structurals • Fabrication			
			P.O. NO.: - W.O. NO.: 865348 SCALE: N.T.S. DWS. SH.: 5 OF 8
900 FM 205 • STEPHENVILLE, TEXAS 76404 • Phone: (800) 527-4043			

**LEGEND:**

	= GUARDRAIL
	= GUARDRAIL POST
	= GUARDRAIL RETURN
	= A2 BRACE
	= HANDRAIL

A2=2"x2"x1/4" ANGLE  
C8=8"x2 3/16"x3/8" CHANNEL

NO.	BY	DATE	REVISION	CHKD. BY	DATE
3	SLV/JM	04/04/17	NEW OSHA RULES ECN-171	EAL	04/05/17
2	BM	10/11/16	FOR PRODUCTION ECN-160	EL	10/11/16

**FABRICATION TOLERANCES (U.N.O.)**

LENGTH	MOLDED GRATING	PULTRUDED GRATING	DYNAFORM SHAPES
+1/8, -5/16	#1/8	#1/8	#1/8
+1/8, -5/16	#1/8	#1/8	#1/8
HOLE LOC.	#1/16	#1/16	#1/16
CIRC. CUTS	#3/16	#3/16	N/A
NOTCHES	#1/8	#1/8	N/A
SQUARE OF CUT	1"	1"	2"
ANGULARITY	#2	#2	#2

DO NOT STACK TOLERANCES

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COATING: CORVEX 1" DEEP 1 1/2" SQ. MESH MOLDED  
COLOR: DK.GRAY SURFACE: MENISCUS

TREADS: CORVEX FIBERTRED 1 1/2" DEEP 1 1/2"x6" RECT. MESH MOLDED  
COLOR: DK.GRAY SURFACE: MENISCUS

DYNAFORM SHAPES: ISOFR  
COLOR: DK.GRAY SURFACE: YELLOW

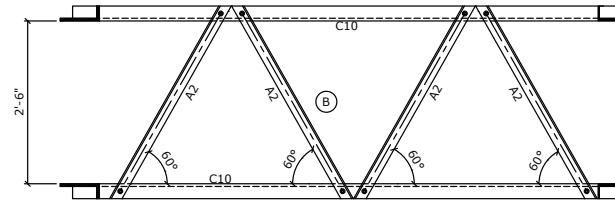
HARDWARE: GRATING H.D.C. ASSYS.: 316 SS GRATING H.D.C. ASSYS.: M-5, M-2

COATING: FLATSHEET: 1/2"

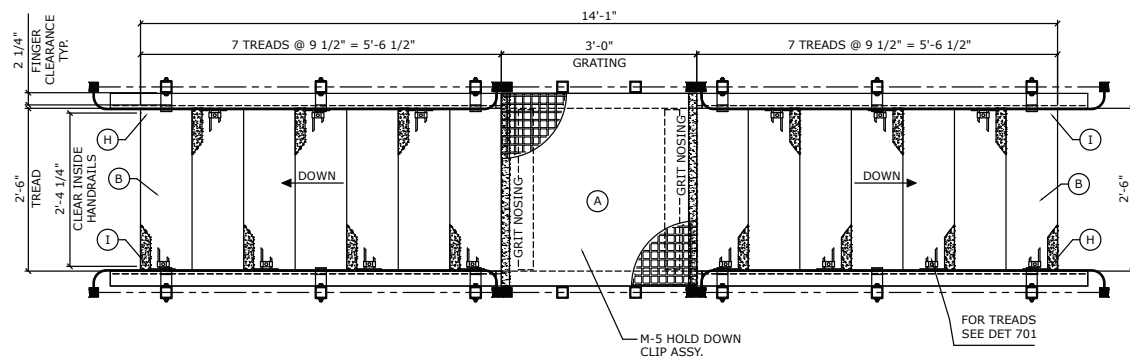
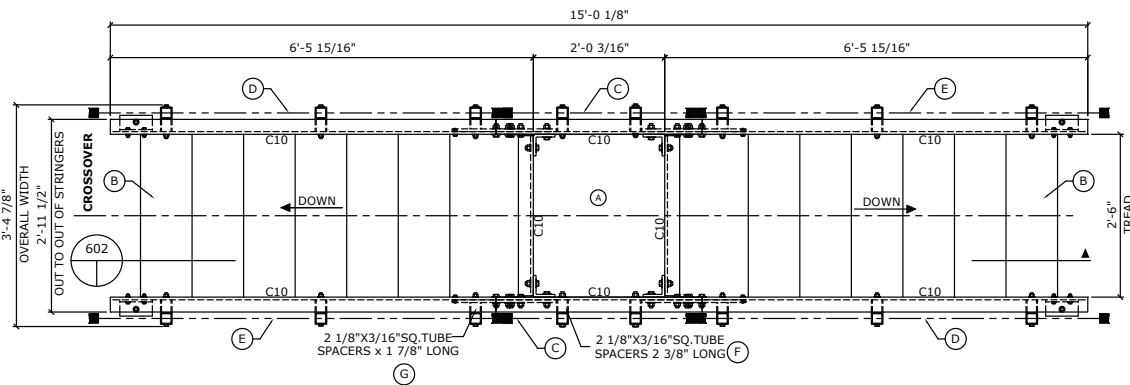
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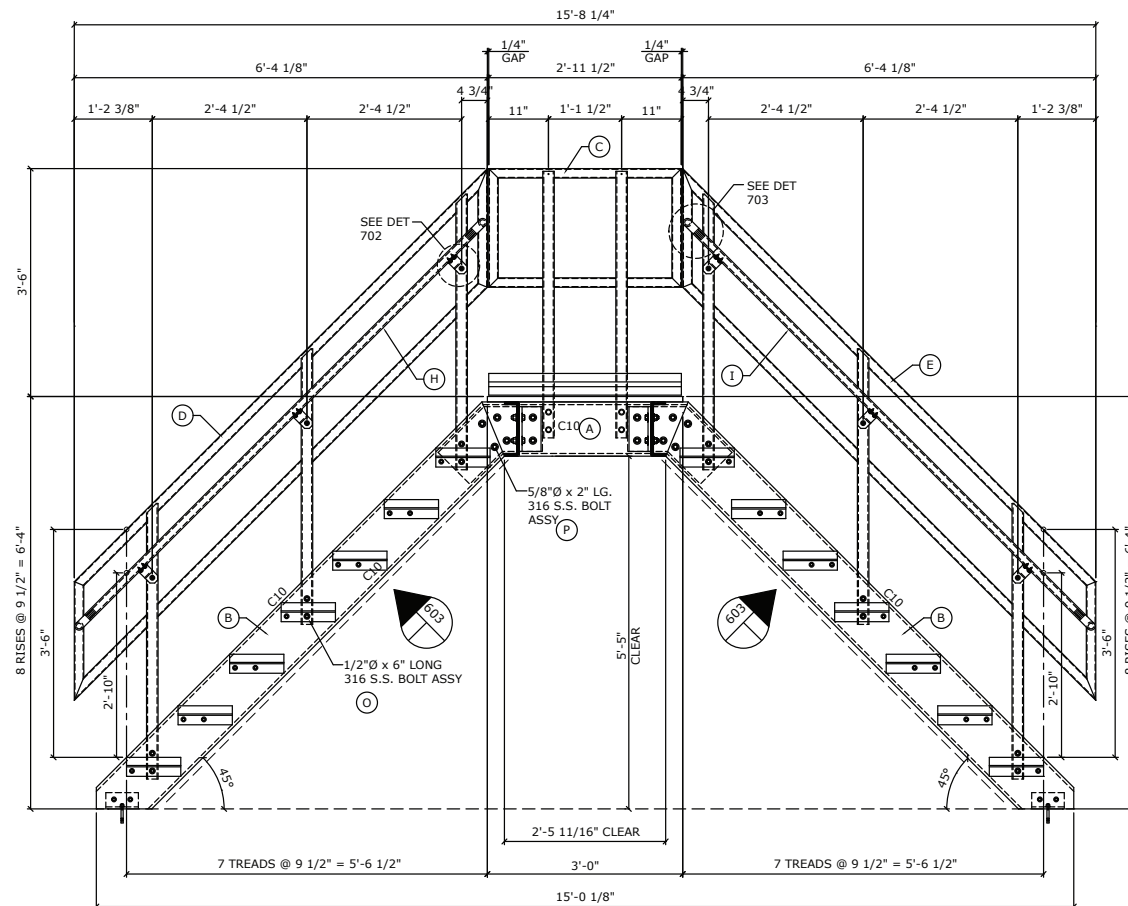
# Part No. 866165.01 FRP Crossover Stair 65" Clearance, 45° Stringer Weight = 447Lbs



NOTE TO PRODUCTION  
BOTTOM RAIL OF INCLINED  
GUARDRAIL ADJUSTED TO FIT WITH  
HORIZONTAL GUARDRAIL, ADJUST  
GUARDRAIL SHEETS ACCORDINGLY.



601 PLAN - FRP CROSSOVER



602 SECTION - FRP CROSSOVER

ASSY. NO.	P/N	QTY.	DESCRIPTION
1000000	Q	1	FRP Crossover Stair Assembly Instructions
1000000	P	8	5/8" Dia. x 2" Lg. 316 S.S. Bolt Assy.
1000000	O	32	1/2" Dia. x 6" Lg. 316 S.S. Bolt Assy.
1000000	N	12	3/8" Dia. x 3" Lg. Hex Head Bolt Assembly
1000000	M	8	1/4" Dia. x 2 1/2" Lg. Round Hd S.S. Bolt Assy
1000000	L	24	#14 x 1" Lg. S.S. Self Tap Screw
1000000	K	12	2" x 1 3/4" x 14 GA. 316 S.S. Plate
1000000	J	12	S.S. Handrail Bracket
1000000	I	2	1 1/2" Dia. Round Tube Handrail
1000000	H	2	1 1/2" Dia. Round Tube Handrail
1000000	G	8	2 1/8"x3/16" Sq. Tube Post Spacer (1 7/8" Lg.)
1000000	F	24	2 1/8"x3/16" Sq. Tube Post Spacer (2 3/8" Lg.)
1000000	E	2	Inclined Sq. Tube Guardrail Assembly
1000000	D	2	Inclined Sq. Tube Guardrail Assembly
1000000	C	2	Horizontal Sq. Tube Guardrail Assembly
1000000	B	2	Stair Assembly
1000000	A	1	Platform Assembly

BILL OF MATERIALS

CONTRACTOR: <b>65" FRP CROSSOVER</b> Drawing No. B-03060				P.O. NO.:
DRAWN BY:	DATE:	STRUCTURAL DESIGNER:	PROJECT COORDINATOR:	CURT NO.:
BM	10/11/16	ETHAN LOVE P.E.		

Fiberglass Grating • Structurals • Fabrication

900 FM 205 • STEPHENVILLE, TEXAS 76401 • Phone: (800) 527-4043

W.O. NO.: 865360  
SCALE: N.T.S.  
DWG. SHIT: 6 OF 8

LEGEND:

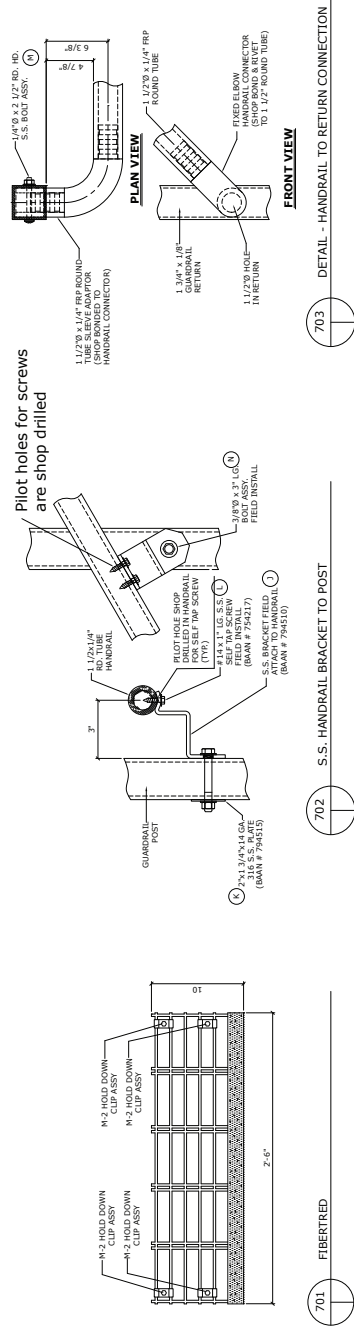
A2=2"x2"x1/4" ANGLE	□ = GUARDRAIL POST	— = GUARDRAIL
C10=10"x2 3/4"x1/2" CHANNEL	■ = GUARDRAIL RETURN	— = A2 BRACE
	— = HANDRAIL	

NO.	BY	DATE	REVISION	CHKD. BY	DATE
3	SLV/JM	04/04/17	NEW OSHA RULES ECN-171	EAL	04/05/17
2	BM	10/11/16	FOR PRODUCTION ECN-160	EL	10/11/16

DO NOT STACK TOLERANCES  
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COATING: CORVEX 1" DEEP 1 1/2" SQ. MESH MOLDED COLOR: DK.GRAY SURFACE: MENISCUS	GRATING H.D.C. ASSYS.: M-5, M-2
TREADS: CORVEX FIBERTRED 1 1/2" DEEP 1 1/2"x6" RECT. MESH MOLDED COLOR: DK.GRAY SURFACE: MENISCUS	FLATSHEET: 1/2"
CHANGEOVER SHAPES: ISOFR	REFERENCE DWGS.:
HARDWARE: 316 SS	

# FRP Crossover Stair Additional Details



**LEGEND:**  
 A2=2"x2"x1/4" ANGLE  
 C8=8"x2 3/16"x3/8" CHANNEL

— = GUARDRAIL  
 □ = GUARDRAIL POST  
 □ = GUARDRAIL RETURN  
 ■ = A2 BRACE

NO. BY DATE REVISION  
 1. SILV/JM 04/04/17 NEW OSHA RULES ECN-171  
 2. EAL 04/05/17 IN THE SOLE PROPERTY OF FIBERGRATE COMPOSITE STRUCTURES INC. DRAWING IS NOT TO BE DISCLOSED OR COPIED WITHOUT THE WRITTEN AUTHORIZATION OF FIBERGRATE COMPOSITE STRUCTURES INC.

NO.	BY	DATE	REVISION	CHKD. BY	DATE
1	SILV/JM	04/04/17	NEW OSHA RULES ECN-171	EAL	04/05/17
2	EAL	04/05/17	IN THE SOLE PROPERTY OF FIBERGRATE COMPOSITE STRUCTURES INC. DRAWING IS NOT TO BE DISCLOSED OR COPIED WITHOUT THE WRITTEN AUTHORIZATION OF FIBERGRATE COMPOSITE STRUCTURES INC.		

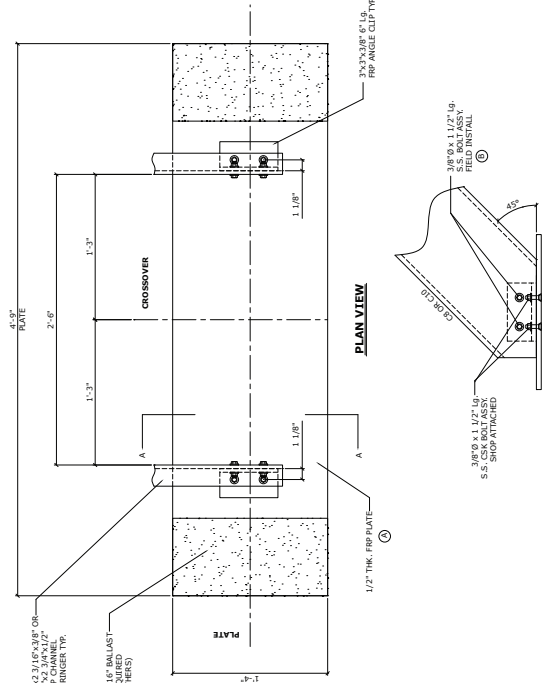
**Additional Details For FRP Crossover Stairs**

DESIGNED BY: BM  
 DATE: 10/11/16  
 PROJECT: ETHAN LOVE P.E.  
 DRAWING NO.: B-03060  
 PROJECT COORDINATOR: ETHAN LOVE P.E.  
 900 W. 20th • STEPHENSVILLE, TEXAS 75086 • PHONE: (800) 527-4043

**FIBERGRATE Composite Structures**

REV. NO. 7 OF 8  
 DATE: 10/11/16

# Part No. 865300 FRP Crossover Stair OPTIONAL BASE PLATE Weight = 35Lbs



**LEGEND:**  
 A2=2"x2"x1/4" ANGLE  
 C8=8"x2 3/16"x3/8" CHANNEL

— = GUARDRAIL  
 □ = GUARDRAIL POST  
 □ = GUARDRAIL RETURN  
 ■ = A2 BRACE

NO. BY DATE REVISION  
 1. SILV/JM 04/04/17 NEW OSHA RULES ECN-171  
 2. EAL 04/05/17 IN THE SOLE PROPERTY OF FIBERGRATE COMPOSITE STRUCTURES INC. DRAWING IS NOT TO BE DISCLOSED OR COPIED WITHOUT THE WRITTEN AUTHORIZATION OF FIBERGRATE COMPOSITE STRUCTURES INC.

NO.	BY	DATE	REVISION	CHKD. BY	DATE
1	SILV/JM	04/04/17	NEW OSHA RULES ECN-171	EAL	04/05/17
2	EAL	04/05/17	IN THE SOLE PROPERTY OF FIBERGRATE COMPOSITE STRUCTURES INC. DRAWING IS NOT TO BE DISCLOSED OR COPIED WITHOUT THE WRITTEN AUTHORIZATION OF FIBERGRATE COMPOSITE STRUCTURES INC.		

**OPTIONAL BASE PLATE FOR ROOFTOP APPLICATIONS Drawing No. B-03060**

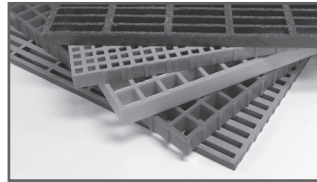
DESIGNED BY: BM  
 DATE: 10/11/16  
 PROJECT: ETHAN LOVE P.E.  
 DRAWING NO.: B-03060  
 PROJECT COORDINATOR: ETHAN LOVE P.E.  
 900 W. 20th • STEPHENSVILLE, TEXAS 75086 • PHONE: (800) 527-4043

**FIBERGRATE Composite Structures**

REV. NO. 8 OF 8  
 DATE: 10/11/16

# Fibergrate Products & Services

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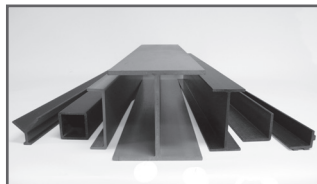
## Fibergrate® Molded Grating

Fibergrate molded gratings are designed to provide the ultimate in reliable performance, even in the most demanding conditions. Fibergrate offers the widest selection in the market with multiple resins and more than twenty grating configurations available in many panel sizes and surfaces.



## Safe-T-Span® Pultruded Industrial and Pedestrian Gratings

Combining corrosion resistance, long-life and low maintenance, Safe-T-Span® provides unidirectional strength for industrial and pedestrian pultruded grating applications.



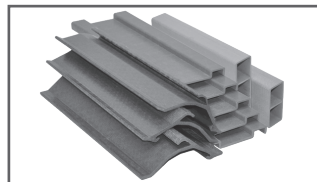
## Dynaform® Structural Shapes

Fibergrate offers a wide range of standard Dynaform pultruded structural profiles for industrial and commercial use, including I-beams, wide flange beams, round and square tubes, bars, rods, channels, leg angles and plate.



## Dynarail® & DynaRound™ Guardrail, Handrail & Ladders

Easily assembled from durable components or engineered and prefabricated to your specifications, Dynarail square tube and DynaRound round tube railing systems and Dynarail safety ladder systems meet or exceed OSHA and strict building code requirements for safety and design.



## Custom Composite Solutions

Combining Fibergrate's design, manufacturing and fabrication services allows Fibergrate to offer custom composite solutions to meet our client's specific requirements. Either through unique pultruded profiles or custom open molding, Fibergrate can help bring your vision to reality.



## Design & Fabrication Services

Combining engineering expertise with an understanding of fiberglass applications, Fibergrate provides turnkey design and fabrication of fiberglass structures, including platforms, catwalks, stairways, railings and equipment support structures.



## Worldwide Sales & Distribution Network

Whether a customer requires a platform in a mine in South Africa to grating on an oil rig in the North Sea, or walkways in a Wisconsin cheese plant to railing at a water treatment facility in Brazil; Fibergrate has sales and service locations throughout the world to meet the needs and exceed the expectations of any customer.

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# Non-Penetrating Rooftop Walkway Grating Installation Guide

## Pedestal Layouts

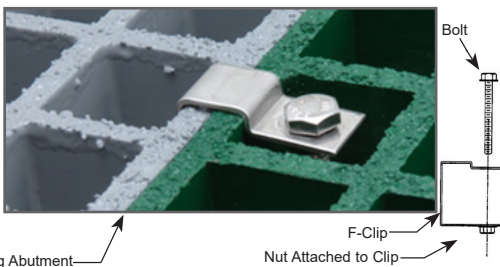
### For 1" & 1-1/2" deep square mesh molded grating

- 100 psf
- Deflection  $\leq 0.25"$
- The standard rubber feet layout will meet or exceed industry standards for typical pedestrian loads.



## Installation Instructions

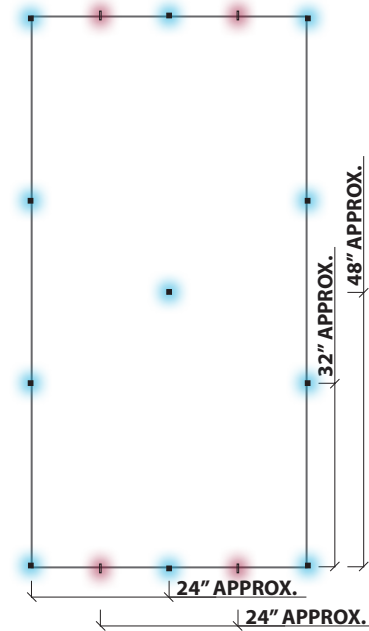
1. Turn the molded grating panel upside down.
2. Use the diagram for the coordinating grating panel size and place the rubber feet onto the bottom of the molded grating and push into place.
3. Repeat for each dot in the diagram.
4. When connecting one panel to another, use two "F" style clips to join abutting edges at a maximum spacing of 24" on center. Reference the diagrams to the right for visual description.



Depth	Clip	Bolt Size
1"	F-1	1/4" x 1-1/2"
1-1/2"	F-2	1/4" x 1-3/4"

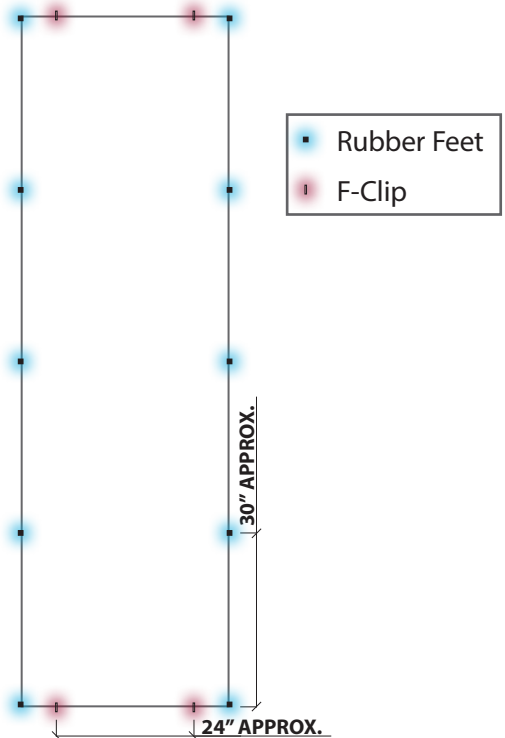
### 4' x 8' Grating Panels

11 Rubber Feet Per Panel



### 3' x 10' Grating Panels

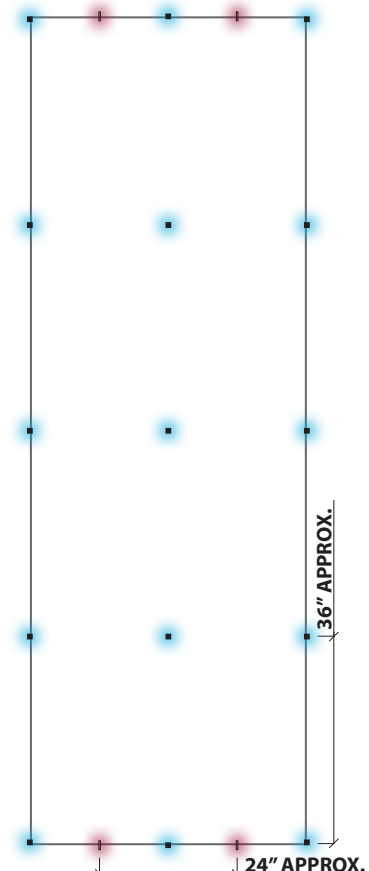
10 Rubber Feet Per Panel



- Rubber Feet
- F-Clip

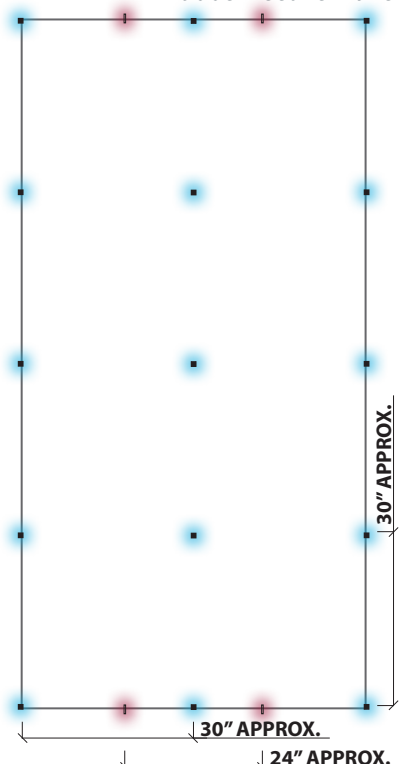
### 4' x 12' Grating Panels

15 Rubber Feet Per Panel

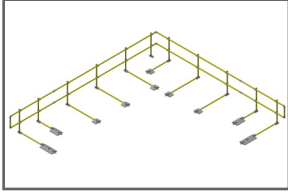


### 5' x 10' Grating Panels

12 Rubber Feet Per Panel



# ADDITIONAL ROOF SAFETY SOLUTIONS by Fibergrate



## DYNAROUND RG™ (ROOF GUARD)

DynaRound RG™ Roof Guard ballasted rooftop guardrail system is designed for safety and fall protection on roof top applications. Each system is made of durable, corrosion-resistant fiberglass reinforced plastic (FRP) composite uprights and non-FRP counterbalance weights and connector components. DynaRound RG provides the utmost in safety by protecting against injuries or death from accidental falls from the roof. This system meets all applicable safety standards in the U.S. and Canada to protect individuals on rooftop surfaces.



## DYNAWEIGHT FALL PREVENTION SYSTEM

DynaWeight Fall Protection System is the perfect solution for fall protection when circumstances require non-penetrating versatility. This system is tested and approved for use on flat rooftop surfaces (single ply, BUR, concrete, and modified bitumen membranes), with a maximum incline of 5 degrees. It provides tie off options for 2 people if used for fall restraint or 1 person for fall arrest; sets up quickly and is easy to move. The DynaWeight Fall Protection System is corrosion resistant and meets all applicable safety standards in the U.S. and Canada to protect individuals on rooftop surfaces.



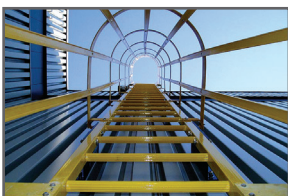
## DYNAROUND HATCH GUARD

DynaRound Hatch Guard provides a non-penetrating guard solution for safe entry and exit through roof access hatches. The adjustable self-closing gate prevents accidental entrance when hatch is open. The DynaRound Hatch Guard mounts directly to the roof hatch with a compression fit design so no drilling is necessary which means the rooftop waterproofing system is not compromised.



## CORVEX® MOLDED GRATING WITH RUBBER FEET

Molded Walkway Grating is made with a unique Corvex® resin system that outperforms many competitive fiberglass and metal products. Our molded grating is corrosion resistant, lightweight, slip resistant, and easy to install. Specially designed rubber feet can be added to molded grating, elevating it 1/2" above the surface, offering an economical raised walkway solution, for use around maintenance equipment, machines, wet areas, and rooftop walkway areas.



## FRP DYNARAIL® SAFETY LADDERS

DynaRail® Safety Ladder Systems combine a corrosion resistant, low maintenance design to ensure a long-life cycle. Ladder rungs include heavily serrated flutes for slip resistant footholds that are easy on the hands while ensuring safety. Our system is designed and manufactured to be easily installed with no guesswork involved. Components are lightweight and easy to fabricate, which saves you on labor and equipment. UV inhibitors in the resin, along with a secondary UV coating maximizes protection from the effects of UV weathering. The Dynarail safety ladder system meets or exceeds all OSHA requirements.



## CROSSOVERS

Our FRP Crossovers provide a pre-engineered, corrosion and slip resistant solution for your rooftop. Available in a variety of heights that address most standard clearances, these Crossovers create a cost effective and safe solution over many rooftop obstructions. The crossover systems create a safe working environment, are lightweight and easy to install. Designed to meet all applicable safety standards in the U.S. and Canada.



## STAIR SOLUTIONS

Fibertred® slip molded FRP stair treads can be used for both new or replacement steps. Treads are engineered to exceed OSHA and other model building code standards for safety, strength, durability and corrosion resistance. Fiberplate® stair tread covers are a convenient way to provide solid, slip resistant footing for existing wood, concrete, metal or FRP treads that are still structurally sound.



## DYNAROUND WARNING LINES

DynaRound Warning Lines are available in a heavy and light duty design. Our heavy-duty warning line systems can be used as a permanent warning system with heavy-duty galvanized base plates, plastic coated steel cable, and plastic pennants. The heavy-duty stanchions and bases are designed to withstand years of use. The standard system includes 3 stanchions, 3 bases, and 100 feet of plastic coated steel cable with flags. Our light duty warning line system can be used as a temporary warning system. This system includes three folding stanchions, 100' of nylon flagged line. Both systems meet all applicable safety standards in the U.S. and Canada to protect individuals on rooftop surfaces.



Phone: 972-250-1633  
Fax: 972-250-1530



[www.fibergrate.com](http://www.fibergrate.com)



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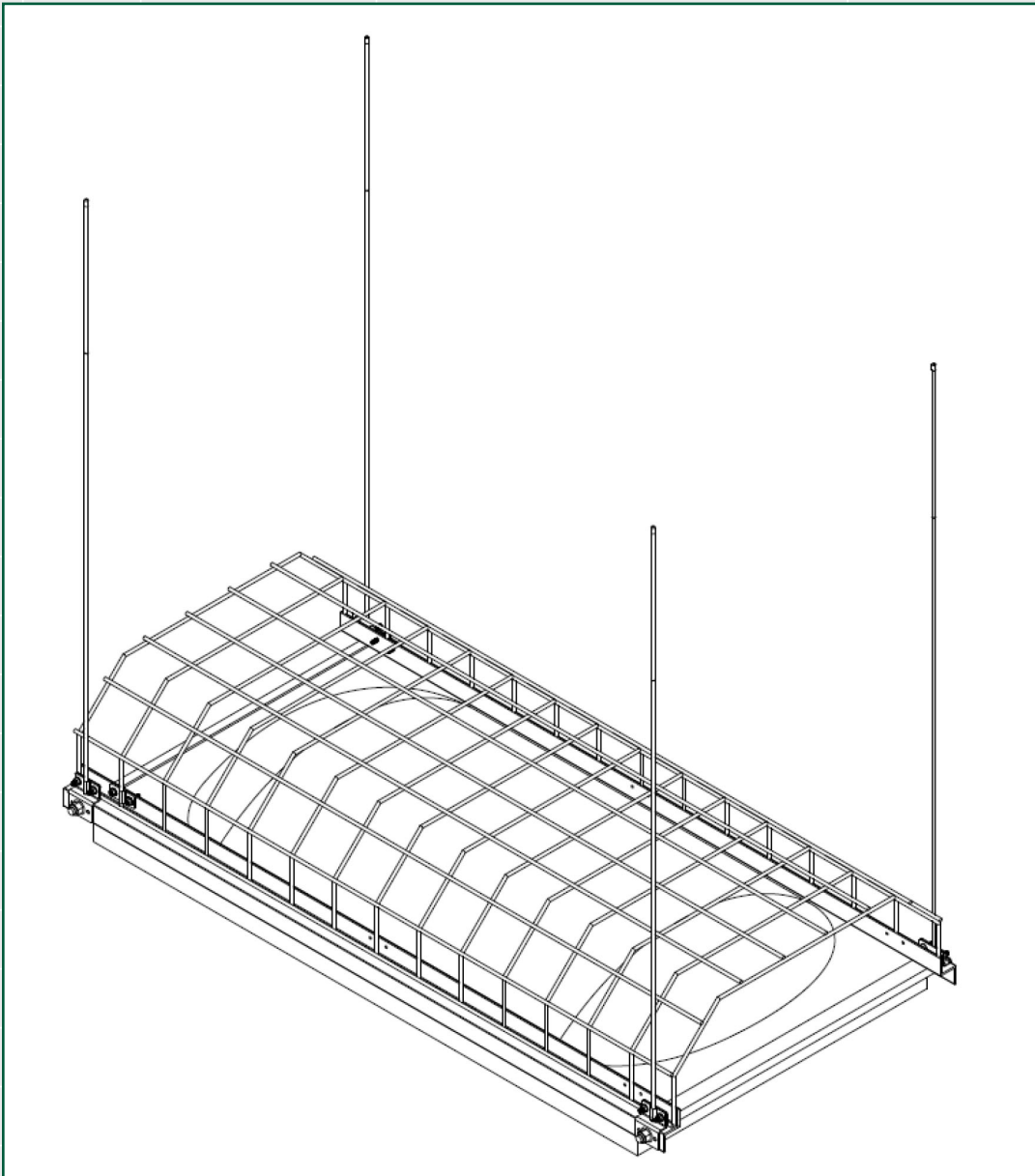
**Fibergrate**  
Composite Structures

## ***Demarcation Kit*** December 21, 2016; Revision B

### **RECOMMENDED TOOLS FOR ASSEMBLY:**

- Cordless Drill
- Socket Set

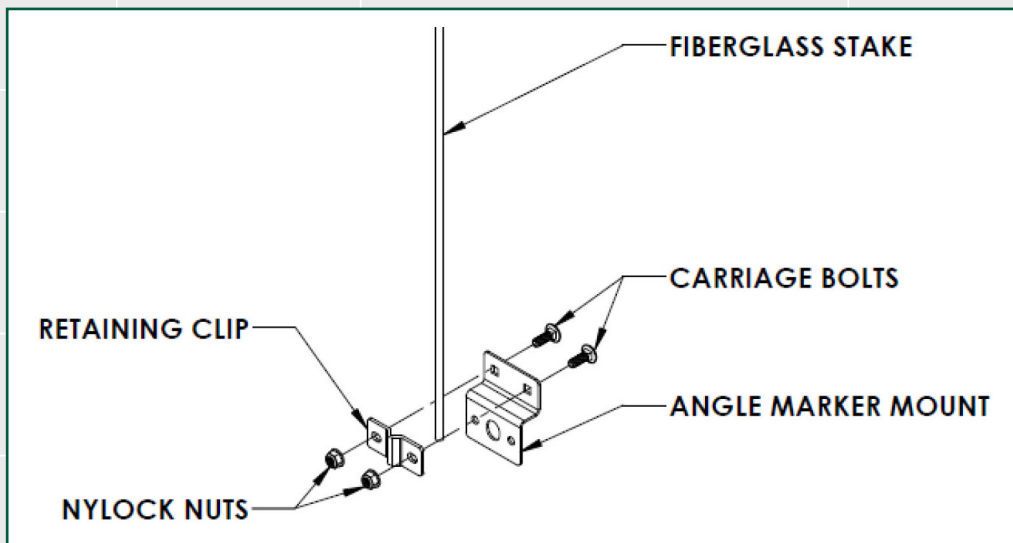
**PLEASE NOTE:** Skylight demarcation markers must be used in addition to an OSHA approved skylight guard. The markers do not meet OSHA fall protection requirements when used alone.



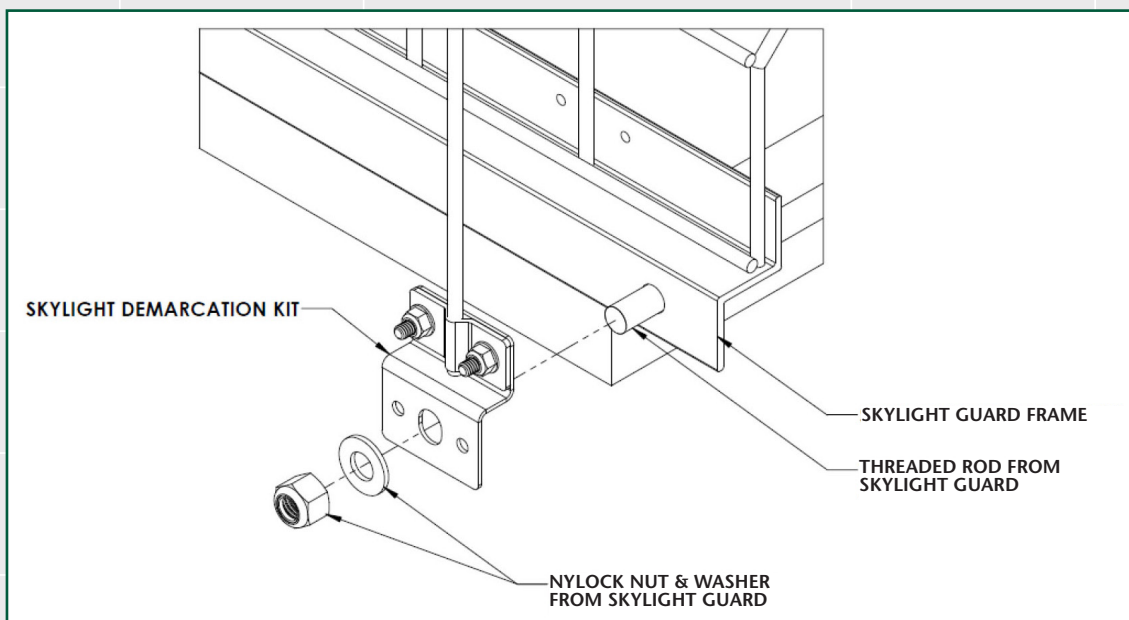
## Demarcation Kit December 21, 2016; Revision B

### INSTALLATION PROCEDURE:

1. Place the carriage bolts through the angle marker mount.
2. Place the retaining clip onto the carriage bolts.
3. Screw nylock nuts onto carriage bolts.
4. Place the fiberglass stake between the angle marker mount and the retaining clip.
  - a. Ensure that the bottom of the stake is resting on the angle marker mount.
5. Tighten the nylock nuts onto the carriage bolts until snug.
  - a. Ensure that the stake does not pull free from the mount housing.



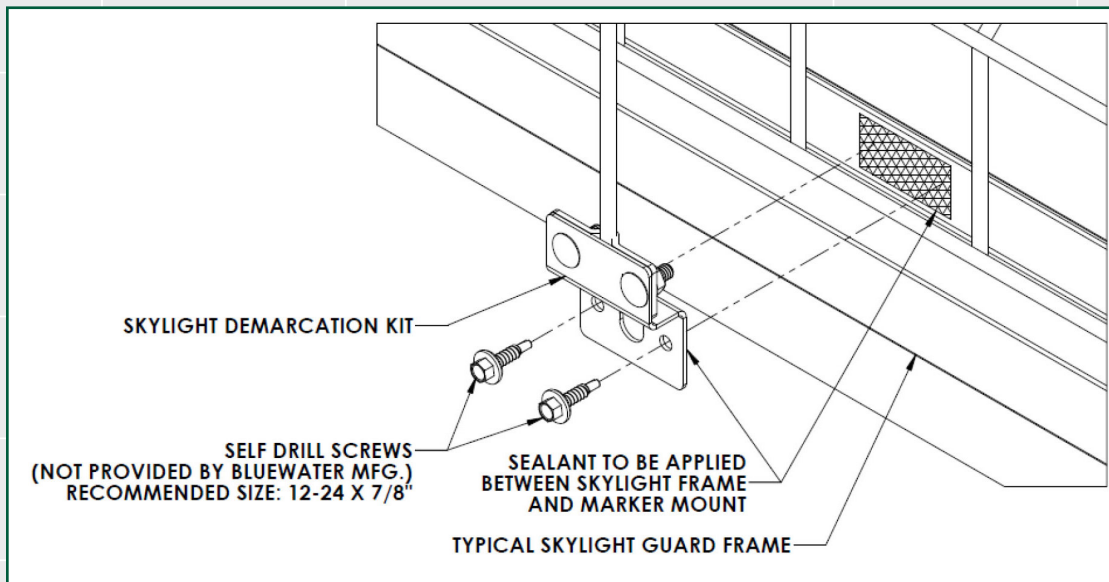
6. If fastening the Skylight Demarcation Kit to a Tremco Incorporated Skylight Guard continue, otherwise proceed to page 3.
7. Remove the nylock nut and the washer from the threaded rod located on the Skylight Guard.
8. Insert the assembled Skylight Demarcation Kit onto the threaded rod.
9. Place the washer onto the threaded rod.
10. Place the nylock nut onto the threaded rod and re-tighten nut to the Skylight Guard frame.



## **Demarcation Kit** December 21, 2016; Revision B

### **INSTALLATION PROCEDURE:** *(continued)*

- 11.** Please note: The Skylight Demarcation Kit may be installed and placed anywhere along the side of any skylight guard.
- 12.** Place the Skylight Demarcation Kit along the side of the skylight guard.
- 13.** Fasten the Demarcation kit securely to the skylight frame by using self-drilling screws with a rubber washer, not provided by Tremco Incorporated.
  - a. The recommended self-drilling screw size to use is 12-24 x 7/8" for most applications.
- 14.** If penetrating the interior of the skylight, sealant must be applied between the demarcation marker mount and the skylight frame.



### **ANNUAL INSPECTION PROCEDURE:**

- Verify that all fasteners are tightened.
- Replace any missing fasteners.
- Inspect screen for damage. Replace if damage is found.



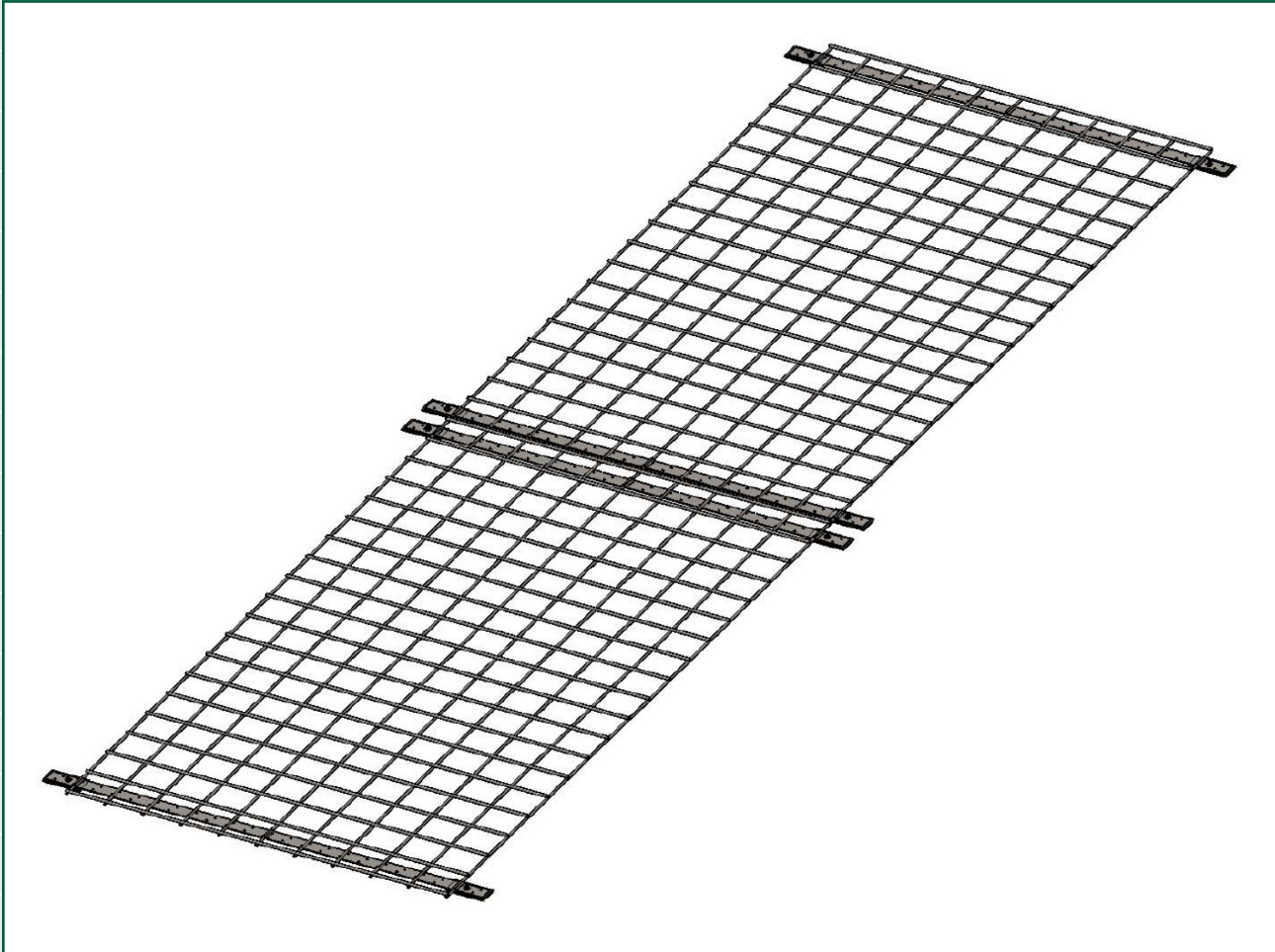
## **Flat Corrugated** December 21, 2016; Revision B

### **SINGLE PANEL:**

- 40" X 64"
- Part Number BW501023

### **DOUBLE PANEL:**

- 40" X 128"
- Part Number BW501052

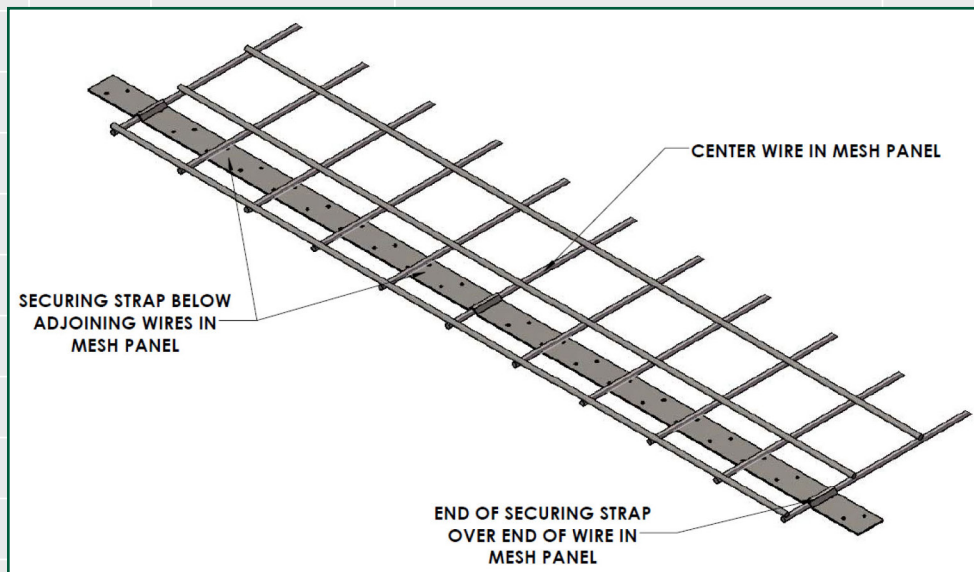


### **ANNUAL INSPECTION PROCEDURE:**

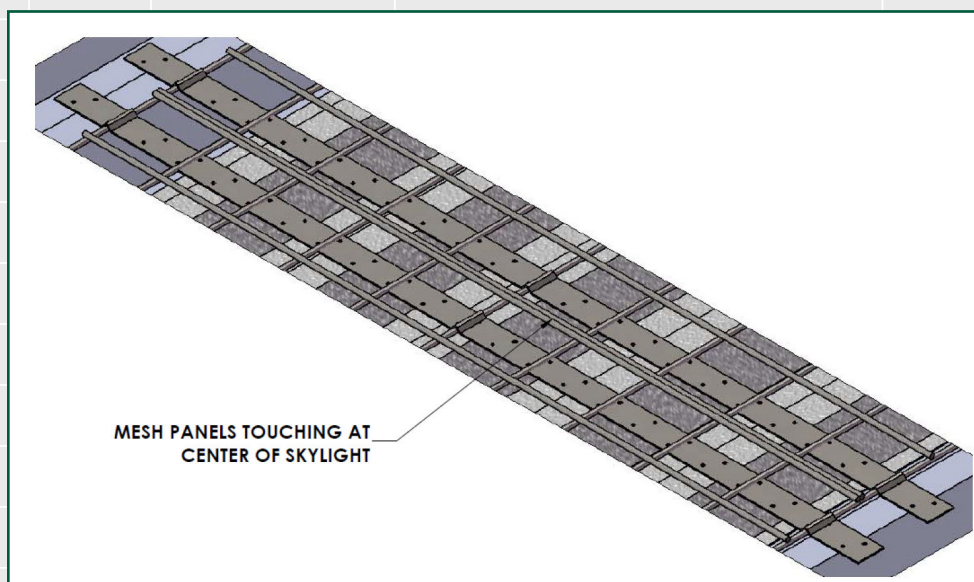
- Verify that all fasteners are tightened.
- Replace any missing fasteners.
- Inspect screen for damage. Replace if damage is found.

## Flat Corrugated December 21, 2016; Revision B

### INSTALLATION PROCEDURE:



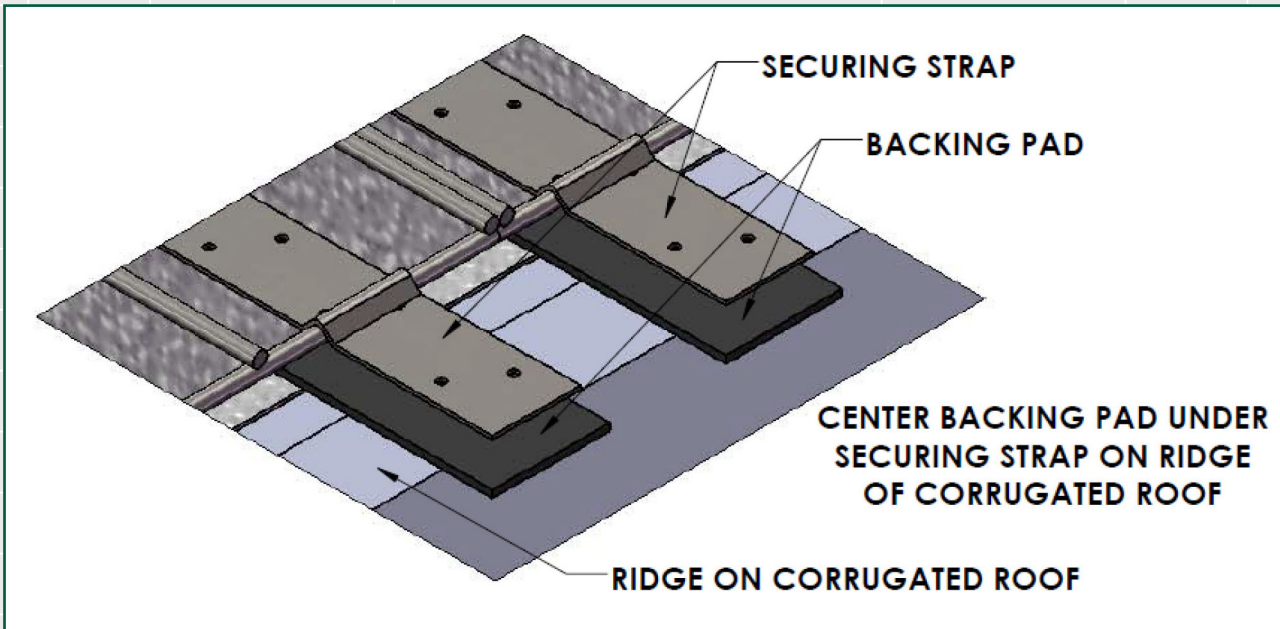
1. Insert the securing strap into the wire mesh panel.
  - a. PLEASE NOTE: the straps must be inserted into the ends of the wire mesh panel.
  - b. Feed strap upward at an angle around the center wire in the panel.
  - c. Adjust the end as the strap is being fed to go under the adjacent wire on the panel.
  - d. Adjust the strap as necessary to ensure that the bend in the strap is on the wire of the mesh panel.
2. Pull one end to the edge of the mesh and feed it over the wire in the panel.
  - a. Please note: from the center wire to the end, the strap must be below all adjoining wires on the panel.
3. Repeat steps 1 and 2 until the four straps are inserted into the two mesh panels.



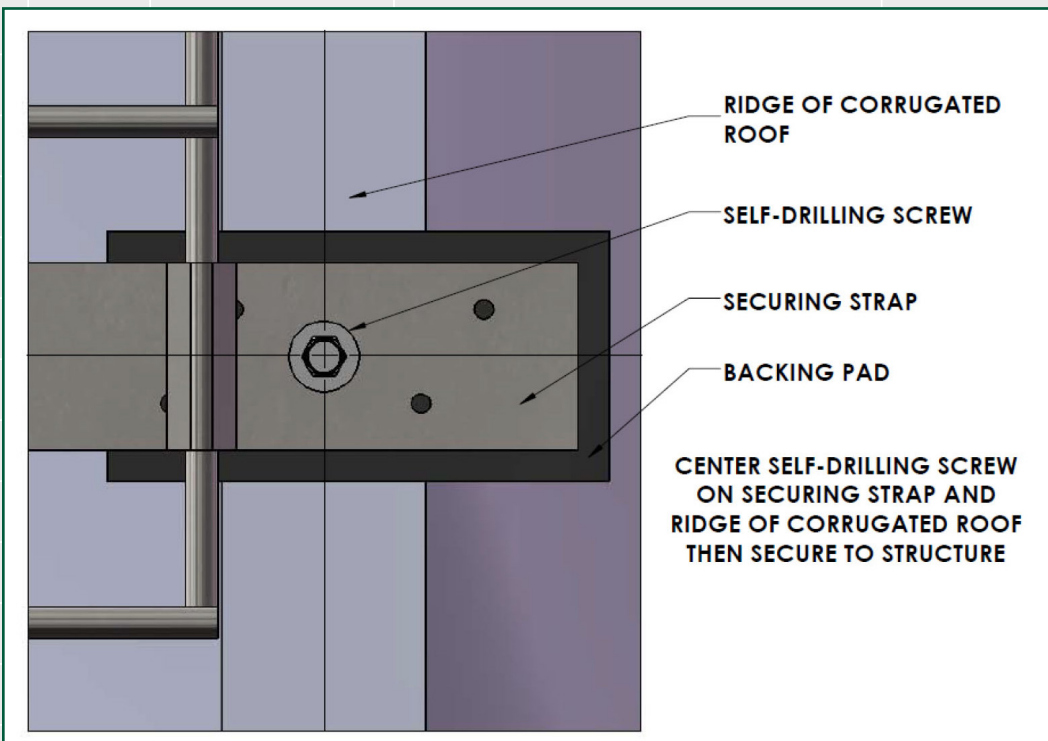
4. Center the panels over the skylight.
  - a. Ensure that the 2 mesh panels are touching at the center of the skylight.

**Flat Corrugated** December 21, 2016; Revision B

**INSTALLATION PROCEDURE:** (continued)



5. Place the pads under each of the ends of the securing straps on the ridge of the corrugated roof.

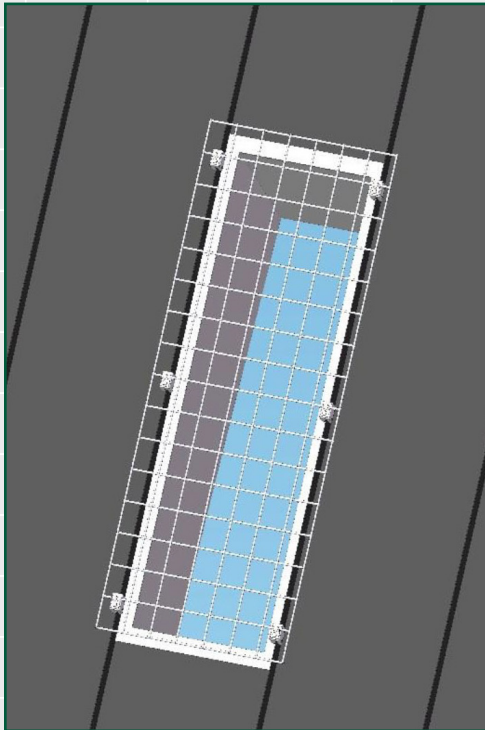


6. Center a self-drilling screw on the securing strap and the ridge of the corrugated roof.
  - a. PLEASE NOTE: the self-drilling screw does not need to be placed into an existing hole on the securing strap.
7. Secure the self-drilling screw to the flat skylight guard and the corrugated roof.
8. Repeat steps 6 and 7 as necessary until flat skylight guard is fastened to the corrugated roof in eight places.

## **Flat Standing Seam** December 21, 2016; Revision B

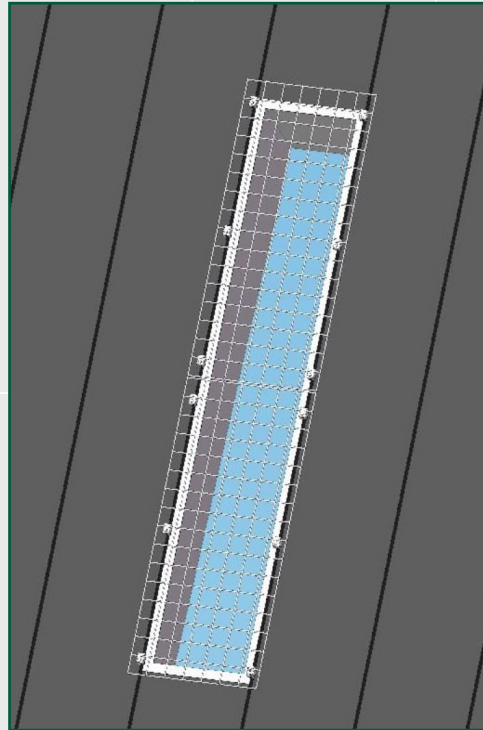
### **SINGLE SCREEN:**

- Fits 2 ft. long to 5 ft. long Skylights
- S5-E P/N: BW550125  
S5-U P/N: BW550123  
S5-S P/N: BW550127  
S5-N P/N: BW550129



### **DUAL SCREEN:**

- Fits 6 ft. long to 10 ft. long Skylights
- S5-E P/N: BW550126  
S5-U P/N: BW550124  
S5-S P/N: BW550128  
S5-N P/N: BW550130



Screens fit Seam Spacing from 12" to 36" wide.

### **RECOMMENDED TOOLS FOR ASSEMBLY:**

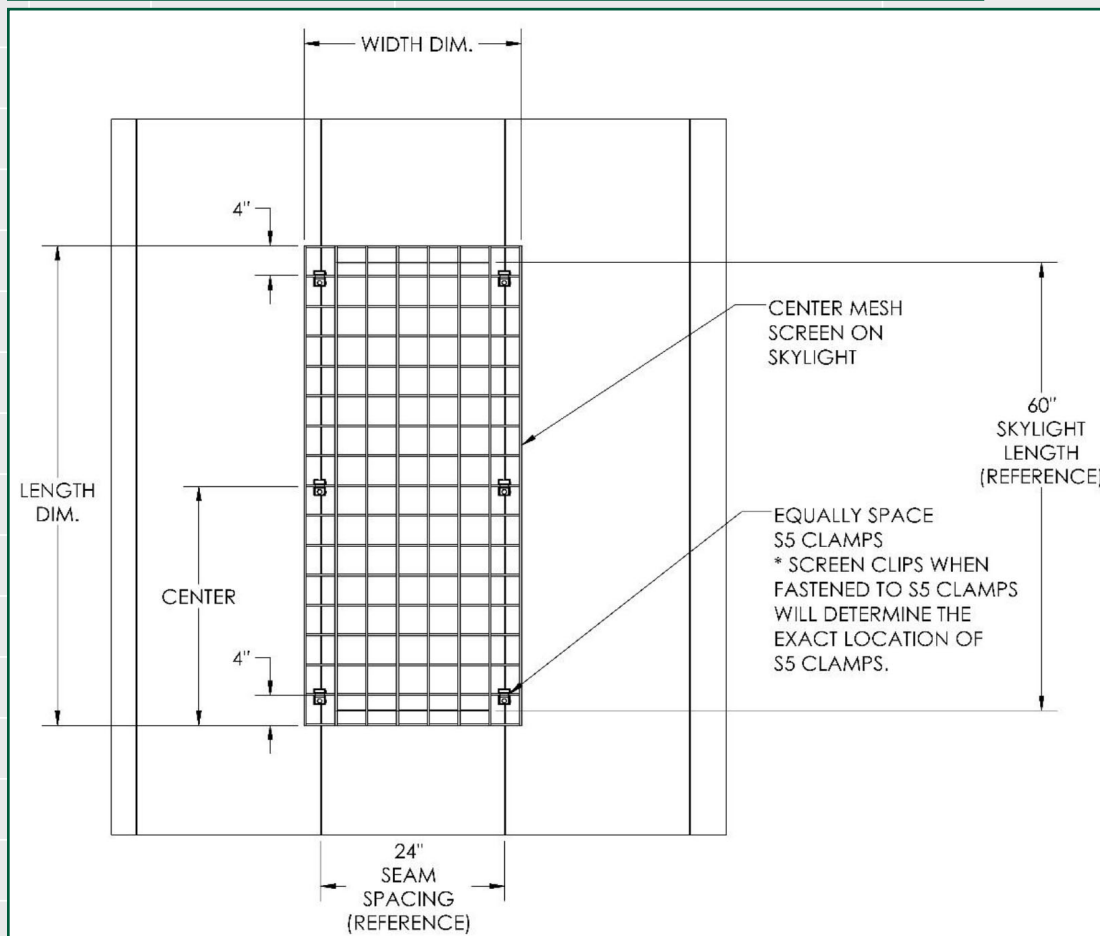
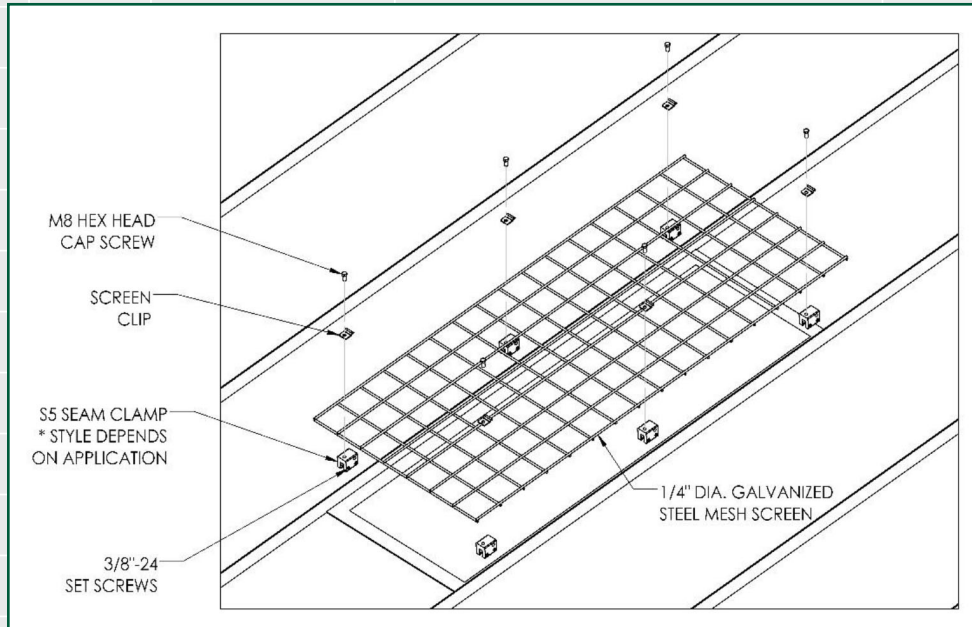
- 13mm wrench & 3/16" Allen wrench (hex key)

### **INSTALLATION PROCEDURE:**

1. Place S5 clamps on seams equally spaced and center Screen Panel on top of S5 clamps.
2. Install Screen Clips with M8 Hex Head Cap Screws. Clips will determine the actual location of the S5 clamps on the seams.
3. Adjust Screen and S5 clamps again to make sure screen is centered on the Skylight.
4. Tighten M8 Hex Head Screws & 3/8"-24 Set Screws on S5 clamps.
5. Repeat for Dual Screen allowing 1/4" space between screens.

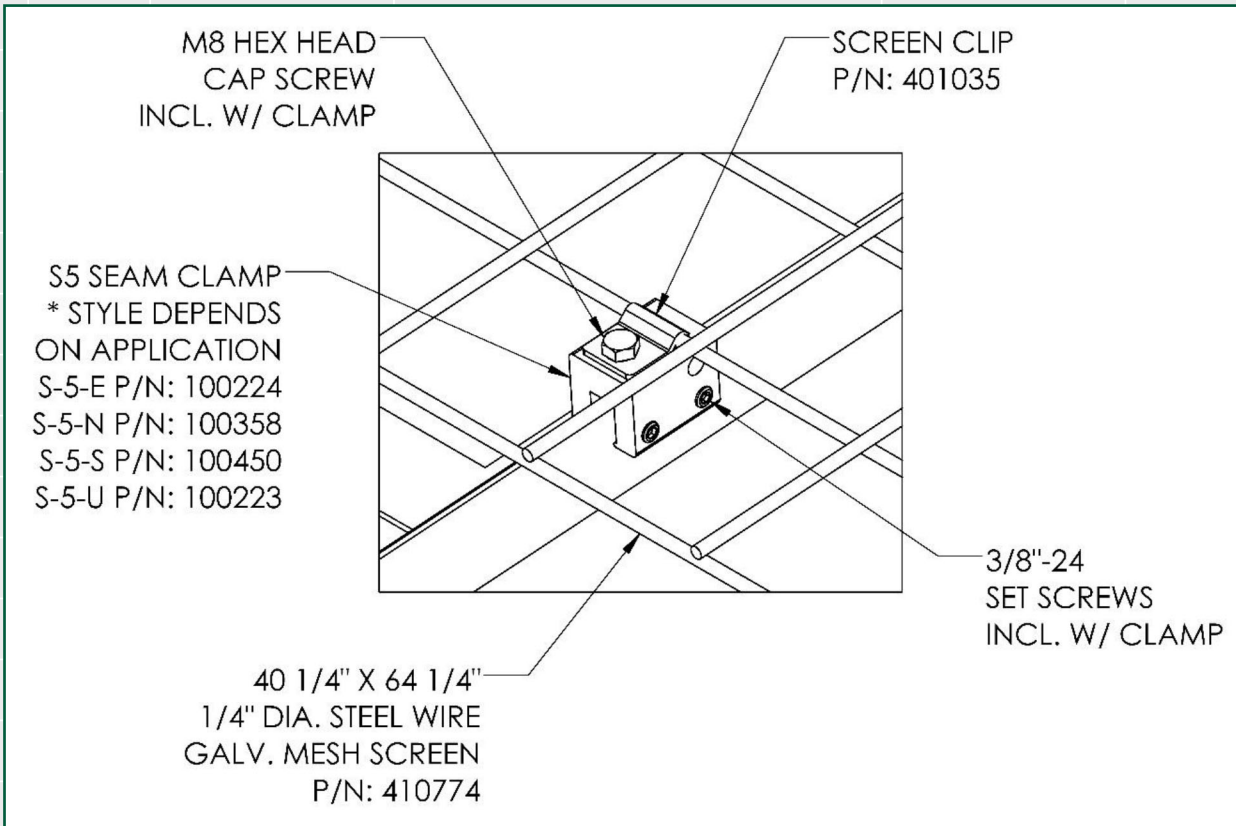
## Flat Standing Seam December 21, 2016; Revision B

### INSTALLATION PROCEDURE: (continued)



## Flat Standing Seam December 21, 2016; Revision B

### INSTALLATION PROCEDURE: (continued)



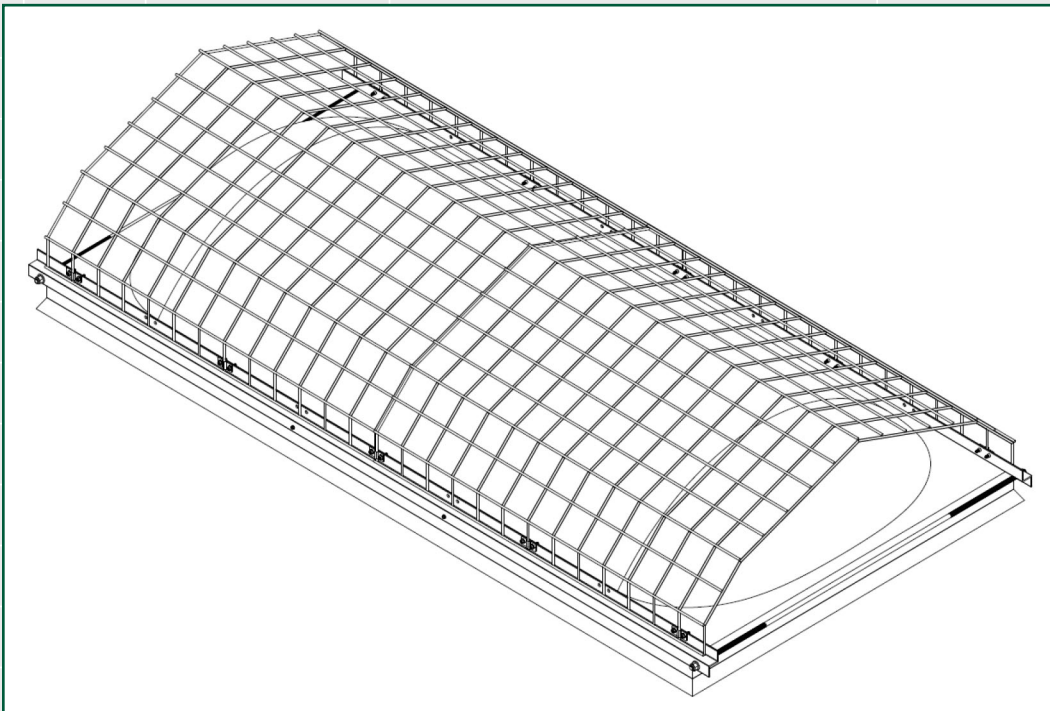
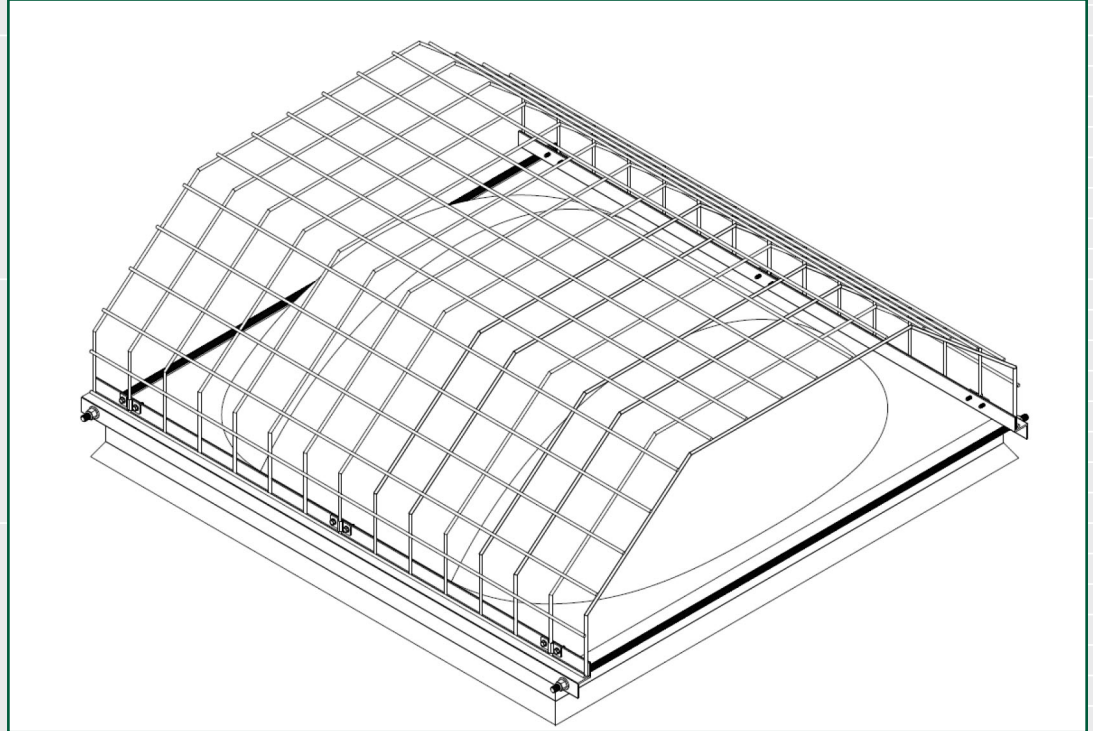
### ANNUAL INSPECTION PROCEDURE:

- Check for any loose or missing fasteners.
- Replace and tighten all fasteners.
- If mesh screen is damaged replace with a new one.

**Square & Rectangular** November 30 2016, Revision C

## RECOMMENDED TOOLS FOR ASSEMBLY:

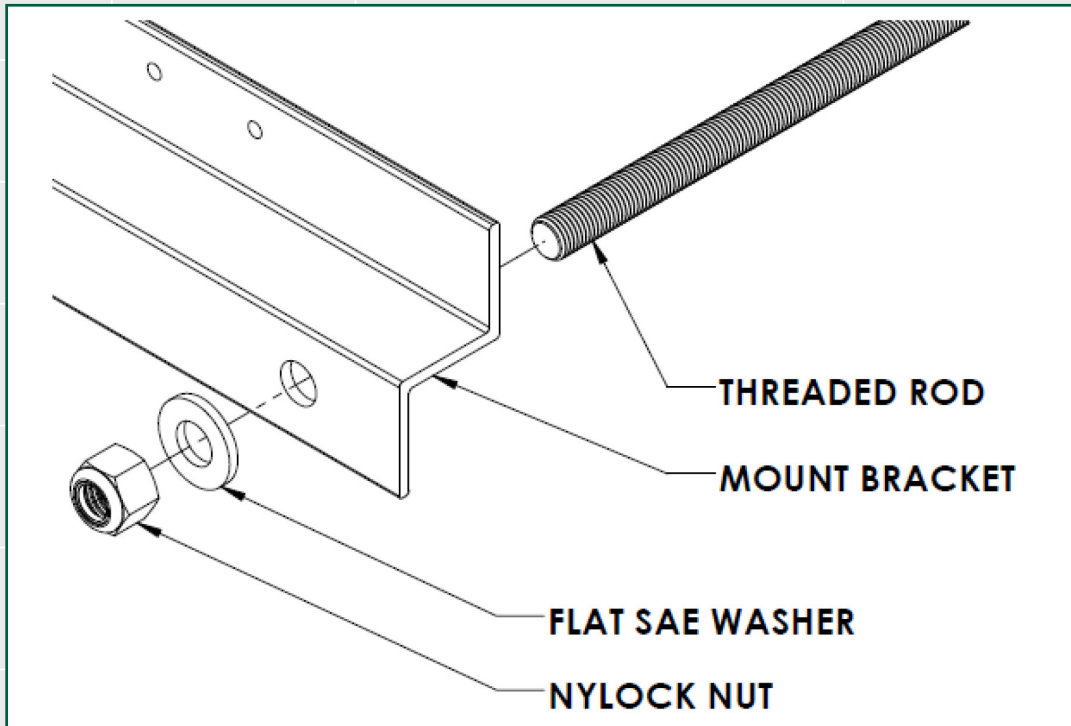
- Cordless Drill
- 3/8" Socket Driver
- Vice Grip
- 3/4" Socket or Wrench



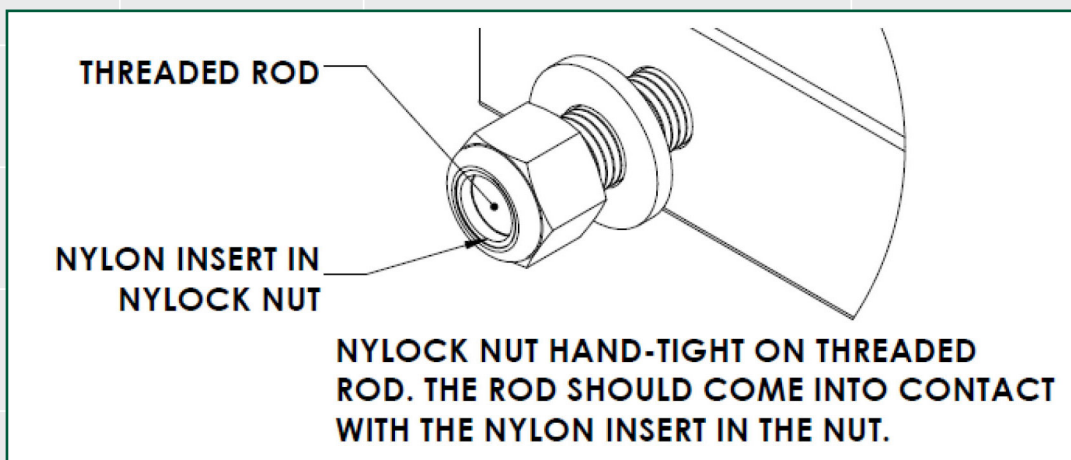
## **Square & Rectangular** November 30, 2016; Revision C

### **INSTALLATION PROCEDURE:**

1. Insert a threaded rod through the mount bracket.
2. Place a flat washer onto the end of the threaded rod.
3. Secure the nut onto the end of the rod hand-tight.
  - a. Please refer to the illustration for step 7 for further information.



4. Place the mount bracket with the threaded rod loosely onto the skylight frame.
5. Insert the second threaded rod through the opposite end of the mount bracket.
6. Place a flat washer onto the end of the threaded rod.
7. Secure the nut onto the end of the rod hand-tight.



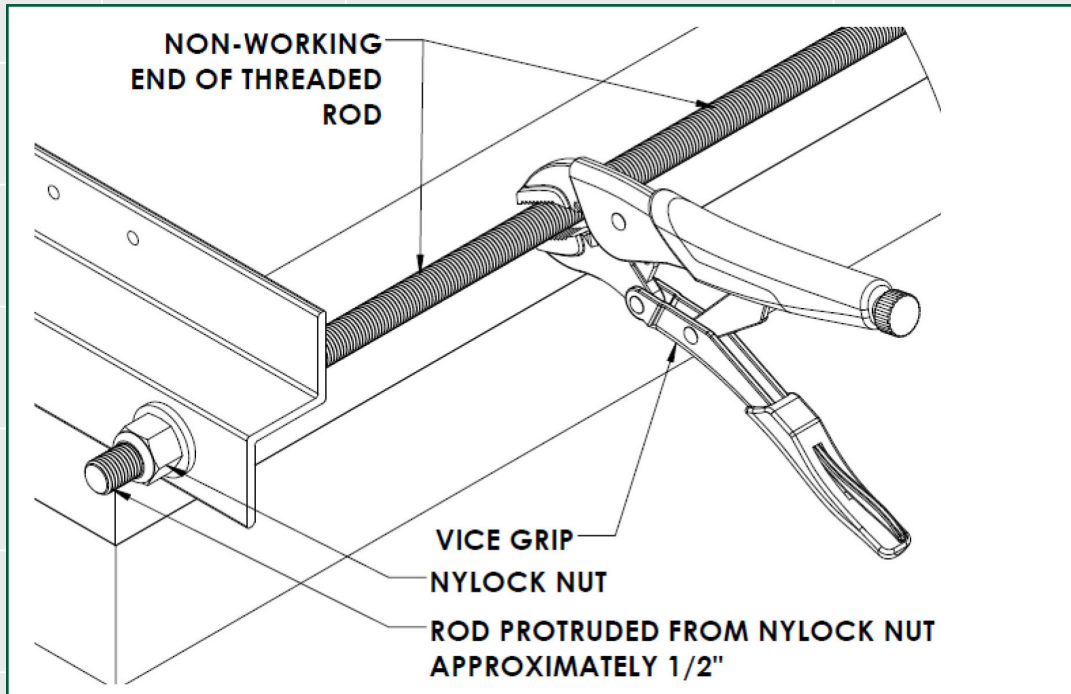
8. Place the second mount bracket onto the opposite end of the threaded rods.
9. Place flat washers onto the ends of the threaded rods.



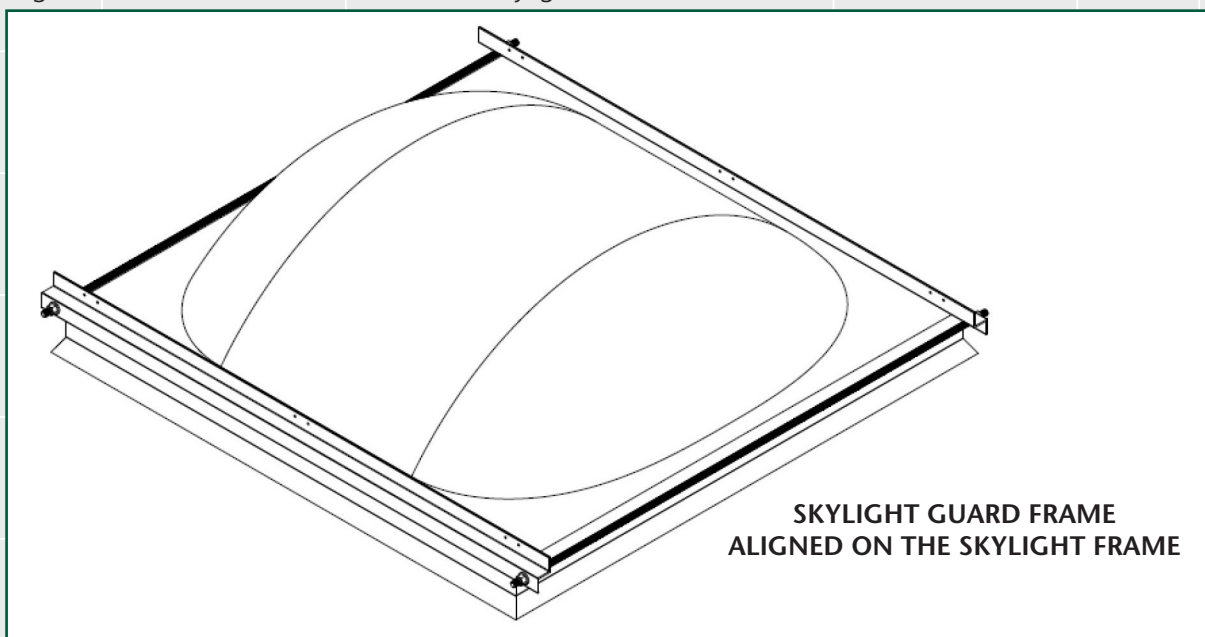
## **Square & Rectangular** November 30, 2016; Revision C

### **INSTALLATION PROCEDURE:** *(continued)*

- 10.** Secure the nuts onto the ends of the threaded rods hand-tight.
- 11.** On one side of the mount bracket, tighten the nuts onto the threaded rods until approximately 1/2" of the rod has protruded from the nuts.
  - a. Use a vice grip to hold the rod on the non-working area of the rod while tightening the nut.



- 12.** Align and center the mount bracket on the skylight frame.

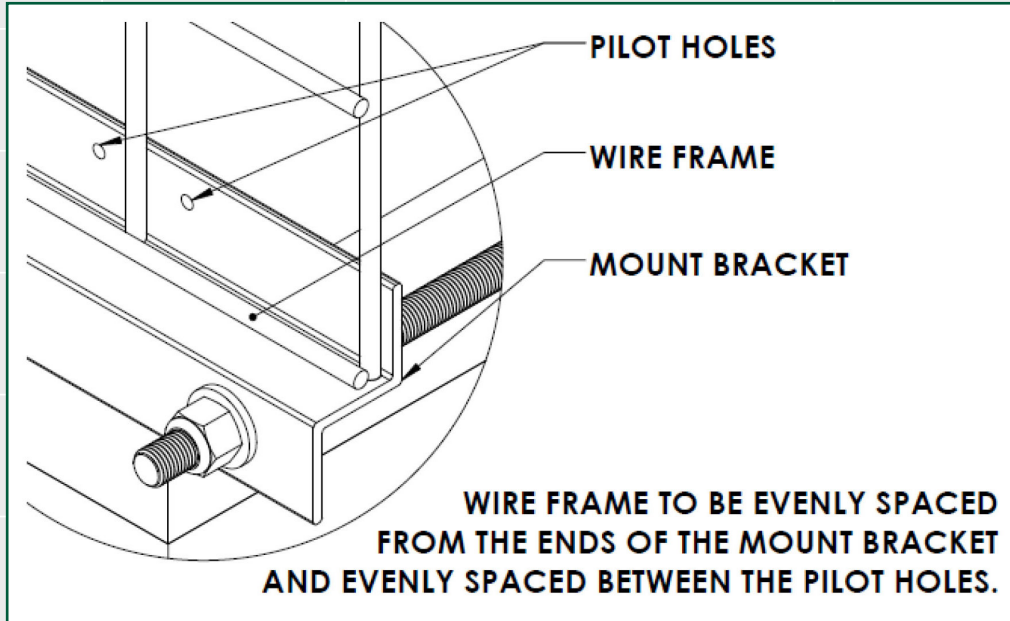


- 13.** Place the wire cage over the skylight and onto the mount brackets.

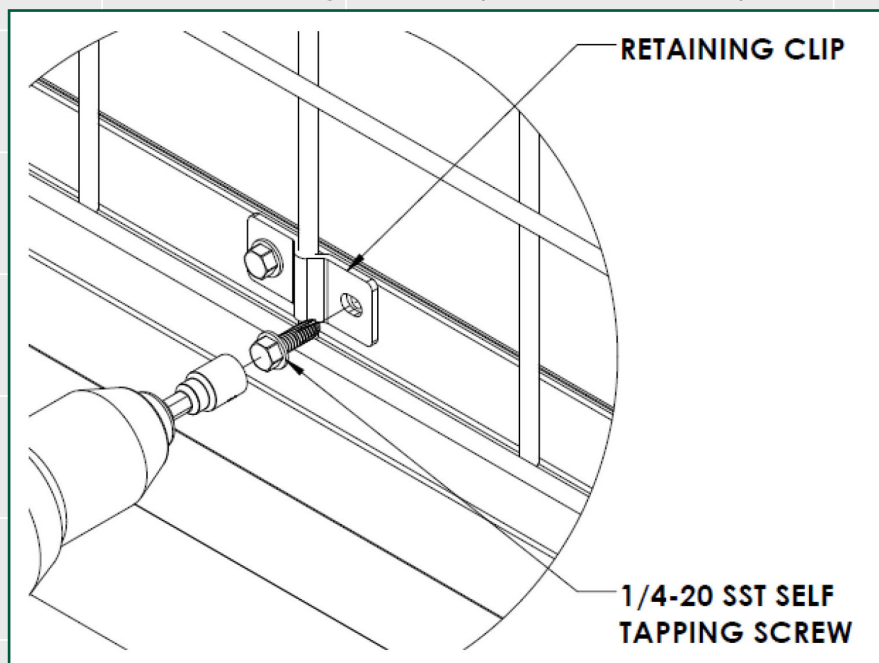
## **Square & Rectangular** November 30, 2016; Revision C

### **INSTALLATION PROCEDURE:** *(continued)*

- 14.** Align a wire cage to be evenly spaced from the edge of the mount frame and between the pilot holes.



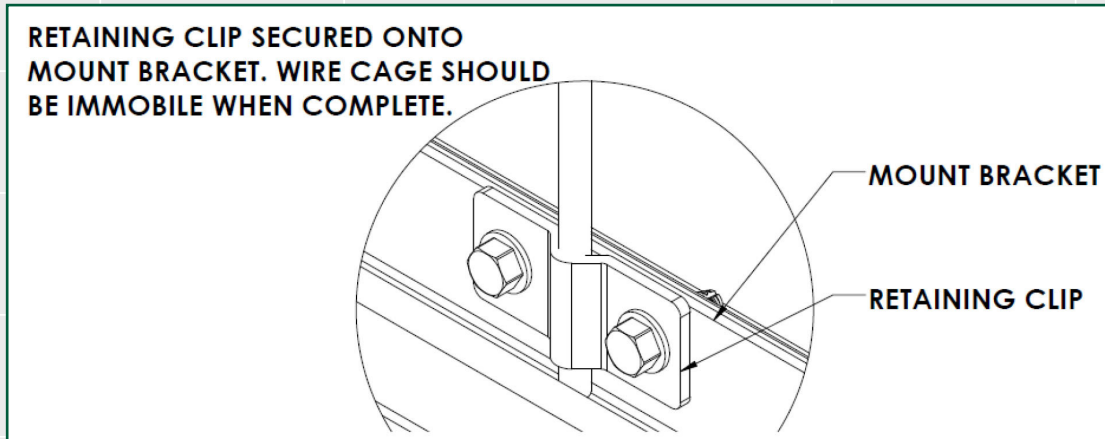
- 15.** Place a retaining clip over the cage wire and align with the pilot holes on the mount bracket.
- 16.** Secure the retaining clip to the mount bracket by using a cordless drill with a 3/8" socket driver and 1/4"-20 tap screws *(provided)*.
- a. CAUTION - Do not over tighten and strip the threads on the tap screw.



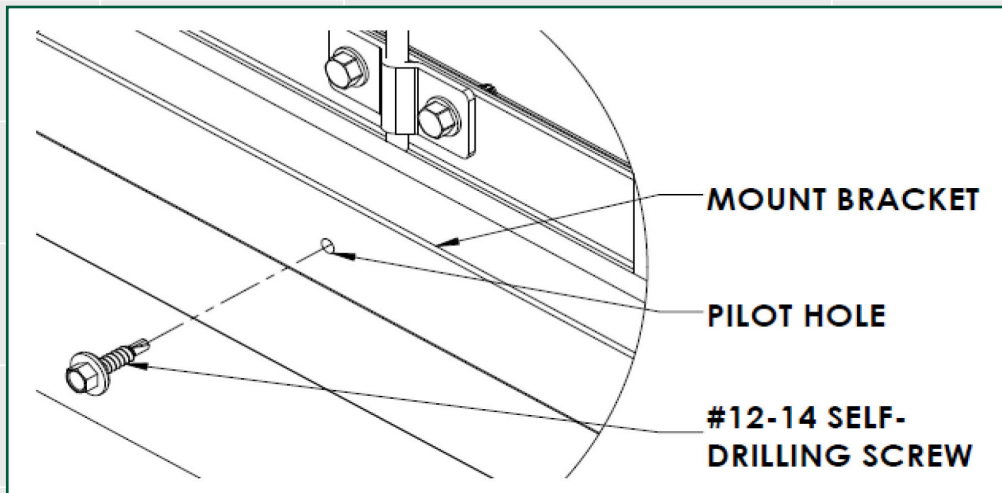
- 17.** Repeat steps 15 through 16 along the entire side of the mount frame being worked on.

## **Square & Rectangular** November 30, 2016; Revision C

### **INSTALLATION PROCEDURE:** *(continued)*



- 18.** Adjust the wire cage on the unsecured side to be aligned consistently with the secured side of the wire cage.
- 19.** Proceed to steps 15 through 16 on the unsecured end of the Skylight Guard assembly.
- 20.** Move to the opposite end of the Skylight Guard assembly from the tightened nuts on the threaded rods and tighten the nuts until the mount brackets are tightly secured onto the skylight frame.
  - a. Adjust the mount brackets as necessary to keep them centered and resting on the skylight frame.
  - b. Please note - do not over tighten one end of the frame. Keep torque consistent on both ends.
- 21.** Ensure that both ends of the Skylight Guard assembly are firmly secured to the skylight frame. Make any necessary adjustments to ensure the Skylight Guard is properly attached to the skylight frame.
- 22.** Some units that utilize longer mount brackets that will require the addition of two self-drilling screws. Fasten the self-drilling screws securely to the mounting brackets and skylight in the pilot holes on the exterior of the mounting bracket.
  - a. **CAUTION** - Do not over tighten and strip the threads on the self-drilling screw.



### **ANNUAL INSPECTION PROCEDURE:**

- Check for any loose or missing fasteners, tighten or replace as necessary.
- Check for damage to wire cage, if bent, or corroded replace.