designations on the carpet, particularly if you want to use them to aid in telling your crew to do things at specific locations. If so, add the “P0” notation here.

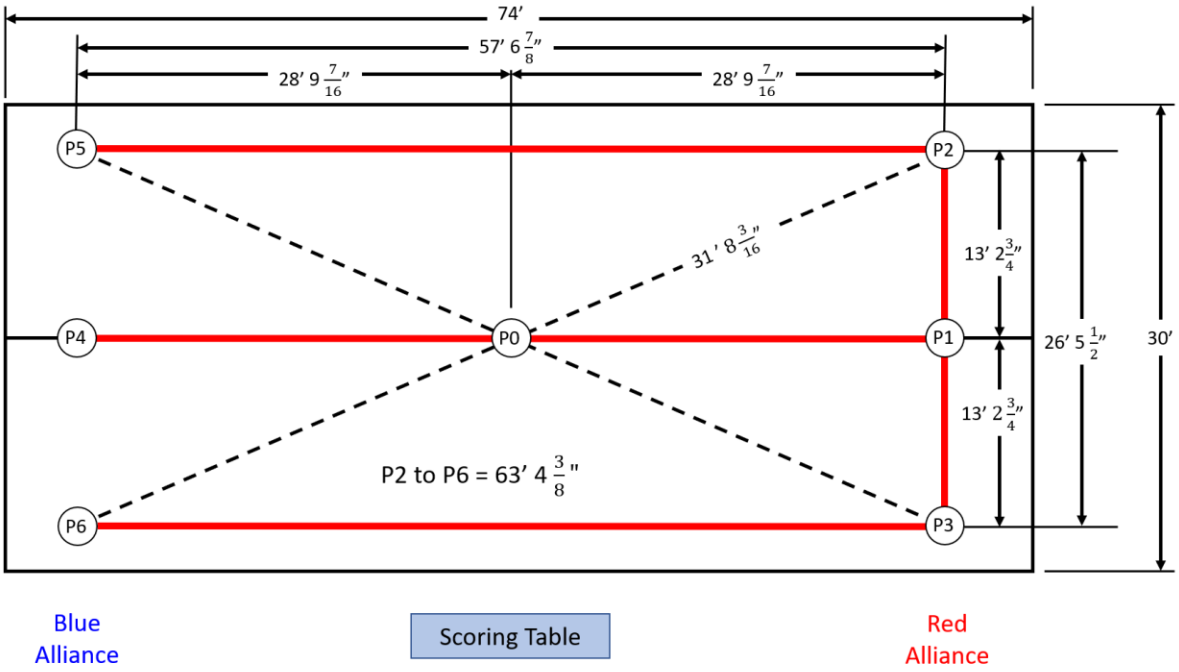
3.2.2 Initial Carpet Marking

Note: There are different marking for AndyMark fields. See Section 3.2.2.3.

3.2.2.1 Tools Required

- 100’ Measuring Tape – 1
- 25’ Measuring Tape – 1
- Sharpie or White Paint Pen – 1
- 100’+ Chalk Line – 1
- Roll of 2” White Gaffer’s Tape – 1

3.2.2.2 Markings

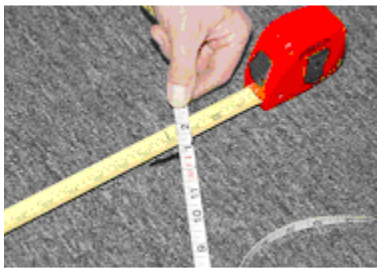


2025 Carpet Markings for Field Position and Layout - 1

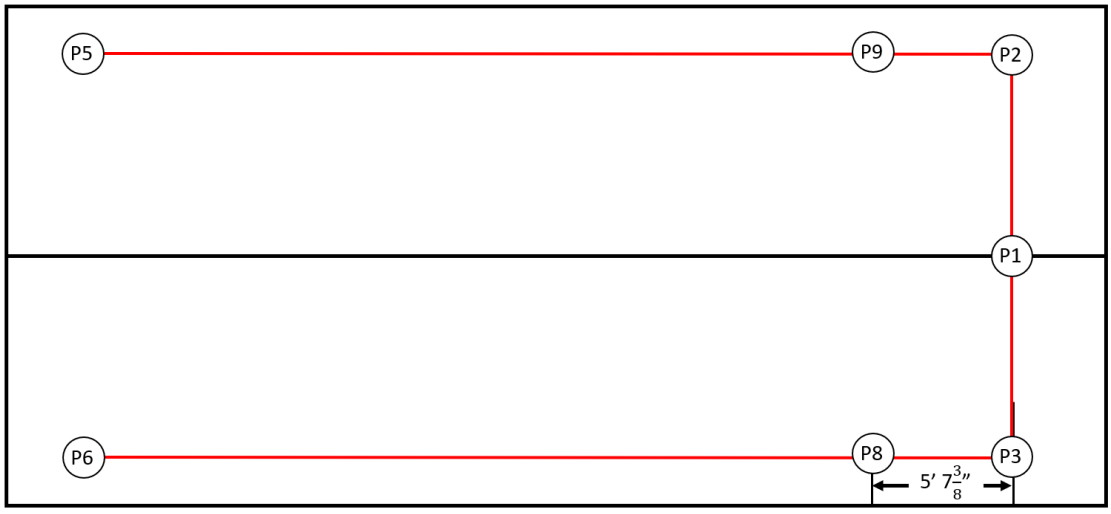
See Chapter 3 for full instructions, Updated 10/28/2024 - Draft

Note - The “P” used on the Carpet Markings diagram above and the accompanying text means Point. The compass notations (“North”, etc.) are provided to assist in locating items with the Field and are not meant to imply any particular orientation of the Field reference to geographic North.

- Snap the centerline of the field where the edges of the two carpets meet. The exact length does not matter provided it is longer than 57’ 7” and is centered on the carpet. If P0 is no longer directly on the line, transfer the mark to the closest point of the snapped line.



- Locate the P2 Field Corner. Starting from P0, measure east along the center chalk line 28’ 9-7/16”, and mark P1. Starting again from P0, measure northeast 31’ 8-3/16”. At the same time, starting from P1, measure north 13’ 3-3/4”. Place a small piece of Gaffer’s tape at the intersecting point to temporarily mark the intersection as the P2 Field Corner. After you remove the tape measures, make a bold “**+**” at this point with the Sharpie.
- Using the same technique as above, locate and mark the P3 Field Corner. Verify 26’ 5-1/2” between P2 and P3.
- Using the same technique as above, locate and mark the P5 and P6 Field Corners. Verify 26’ 5-1/2” between P5 and P6.
- Verify that the distance from P2 to P6 and from P3 to P5 is 63’ 4-3/8”.
- **Snap the following chalk lines:** P2 to P3, P2 to P5, & P3 to P6
- Measure 5’ 7-3/8” from P3 along the chalk line that connects P3 and P6. Mark this location P8. Measure 5’ 7-3/8” from P2 along the chalk line that connects P2 and P5. Mark this location P9.



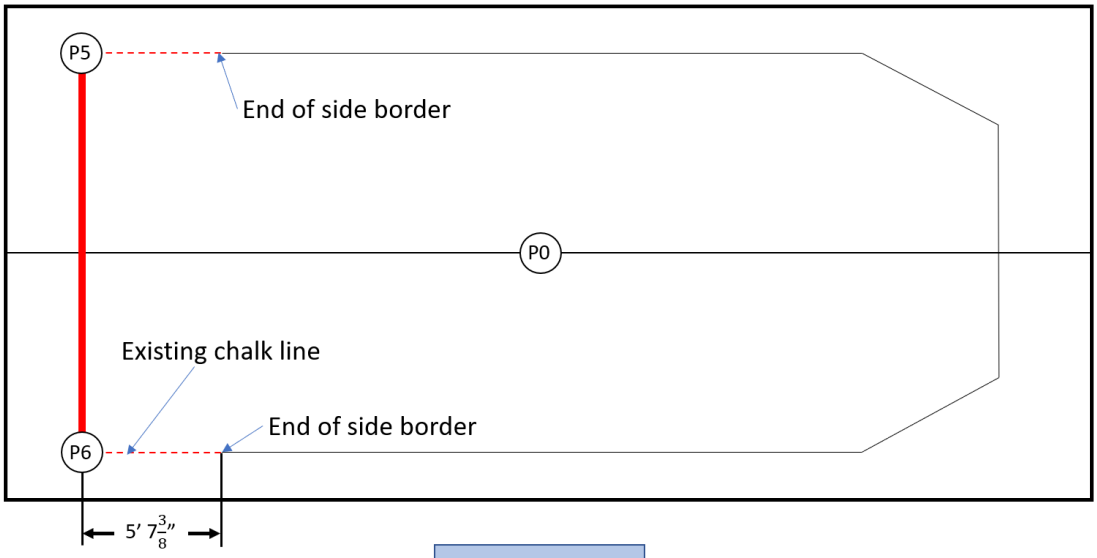
Blue Alliance | Scoring Table | Red Alliance

2025 Carpet Markings for Field Position and Layout - 2

See Chapter 3 for full instructions, Updated 10/28/2024 - Draft

Suggestions for snapping chalk lines:

- Be sure there is a sufficient level of chalk in the chalk marker container. If you need to add chalk, do so away from the carpet and over a trash can.
- Extend the chalk line while standing off the carpet to the necessary distance. Then move onto the carpet to lay the marks. This helps avoid dumping chalk onto the carpet. It is also a good idea to use a surplus cardboard box, or trash can under the line spool while the line is pulled out to catch the spillage.
- Prior to snapping the line, hold and stretch the line taut so the chalk line will move straight up and down. This helps to make a straight line.
- When winding the chalk line up, stand off the carpet to prevent the chalk from spilling onto the carpet.
- Follow instructions to place the red alliance wall, Coral Station frame, and side borders



2025 Carpet Markings for Field Position and Layout - 4

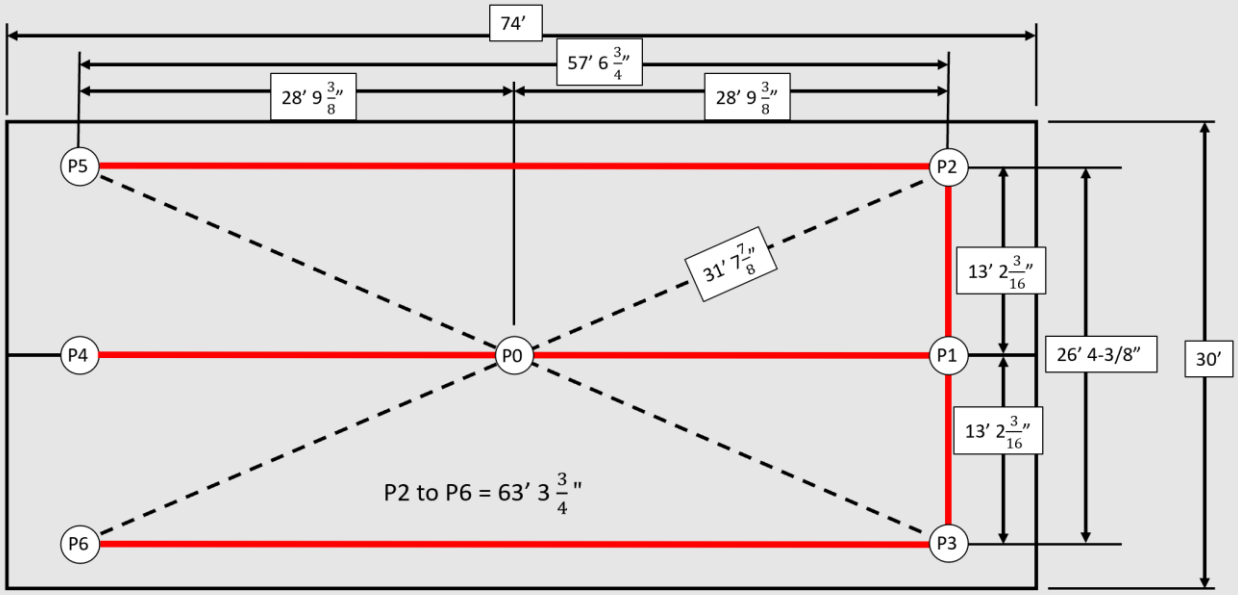
See Chapter 3 for full instructions, Updated 10/29/2024 - Draft

- Verify that P5 aligns with the end of the side border. Measure 5' 7-3/8" from the end of the both side borders to verify the locations of P5 and P6. Measure from the surface highlighted in 3.3.2 - Step 5. If necessary, remark P5 and P6. Snap a chalk line from P5 to P6.
- Follow instructions to place blue alliance wall and Coral Station frame

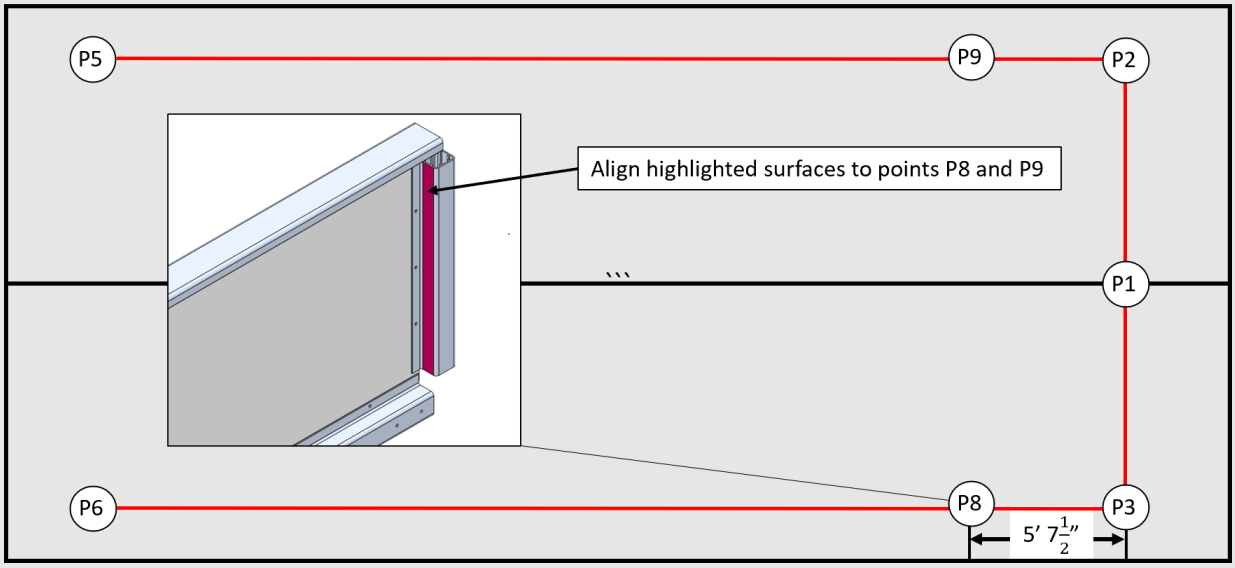
3.2.2.3 AndyMark Field Markings

FOR ANDYMARK FIELD ONLY

For the AndyMark Field, use the following carpet markings and measurements instead. The same general procedure as above should be followed.



2025 Carpet Markings for Field Position and Layout – 1 – AndyMark



2025 Carpet Markings for Field Position and Layout – 2 – AndyMark

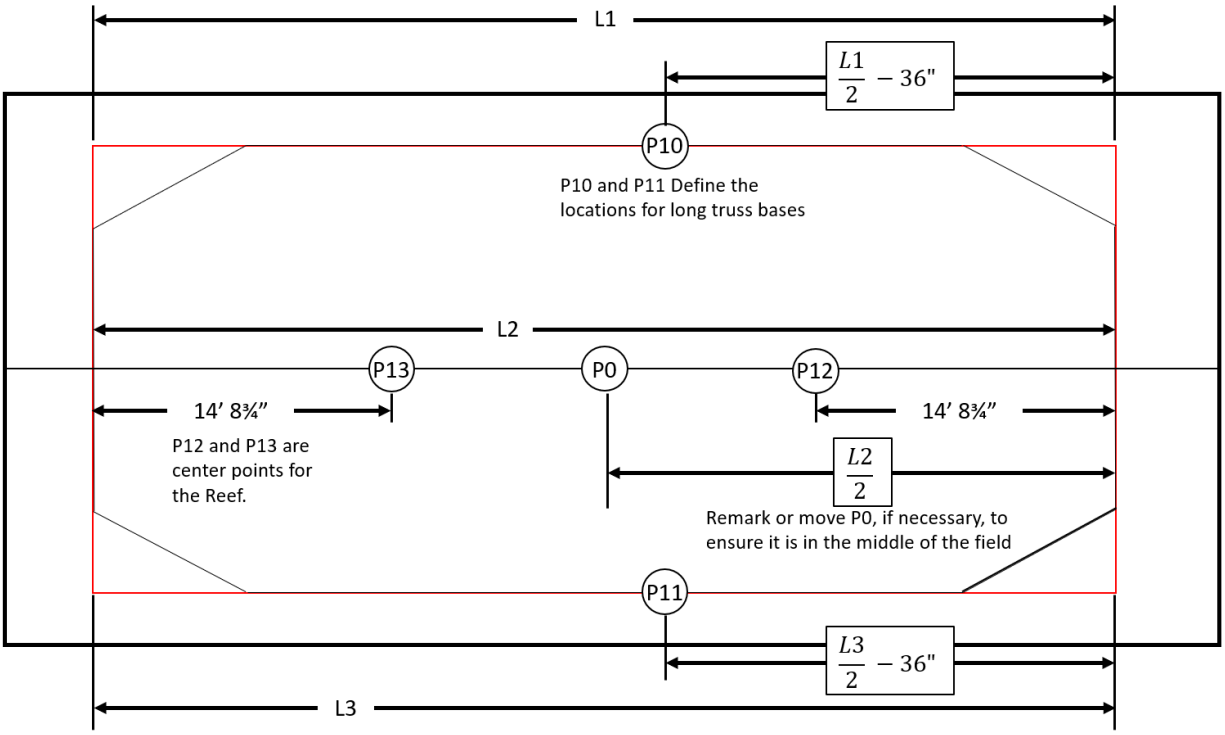
3.2.3 Marking BARGE and REEF locations

Note: Alliance Walls and Side Borders must be complete before this process.

3.2.3.1 Tools Required

- 100’ Measuring Tape – 1
- Sharpie or White Paint Pen – 1
- 100’+ Chalk Line – 1
- Roll of 2” White Gaffer’s Tape – 1

3.2.3.2 Markings



2025 Carpet Markings for Field Position and Layout - 4

- Measure the length of the field along the centerline. Take half of this measurement and reposition P0, if necessary.
- Measure/mark P12 and P13. Each are 14’ 8-3/4” from both alliance walls along the center line.
- On each side of the field, measure the distance between alliance wall chalk lines. Take half of this measurement, subtract 36” and mark P10 and P11 just outside the field next to the side border angle.

3.3 Side Borders and Gates

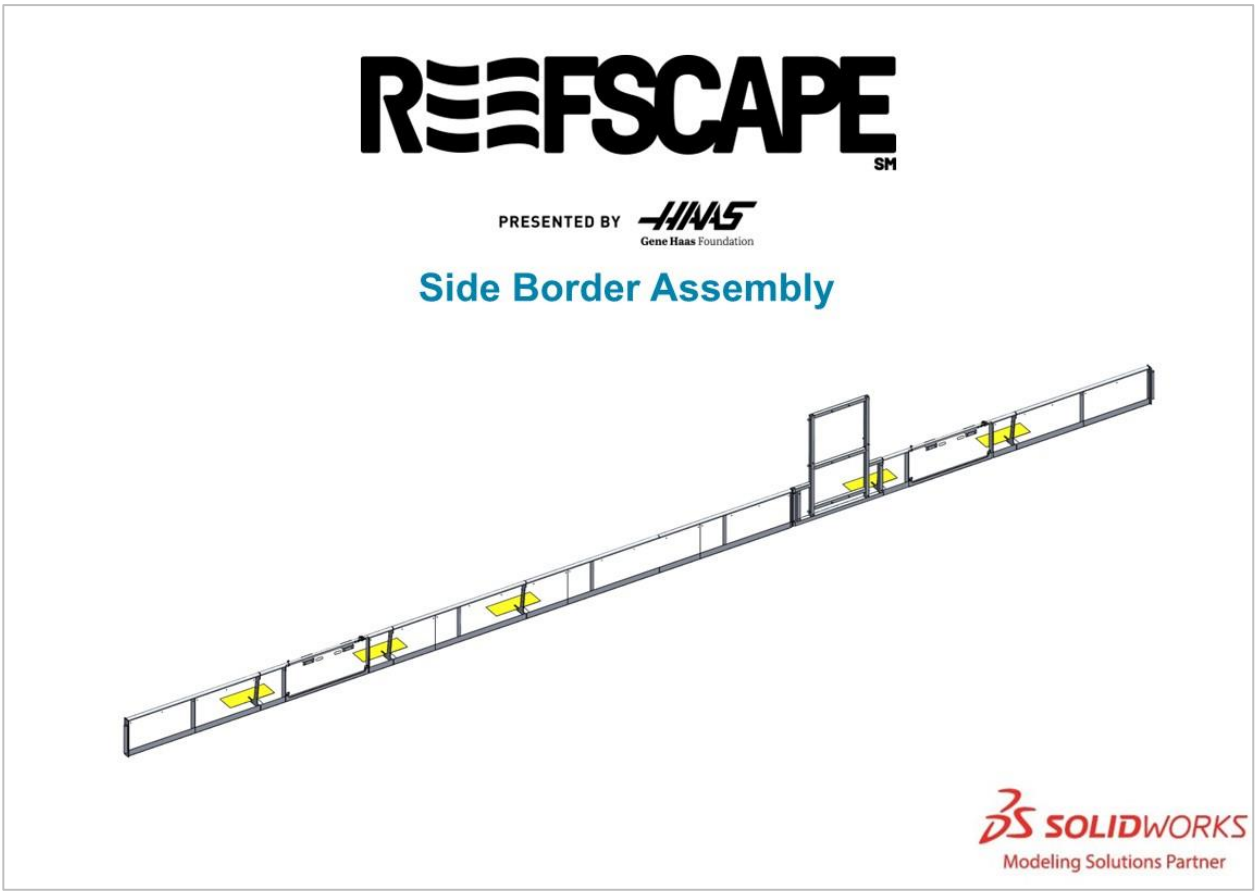
In this step you will build two complete Side Borders with their respective Gates. The two sides can be built simultaneously.

Note: When unloading and handling border segments containing Gates, make sure they are in the closed and locked position.

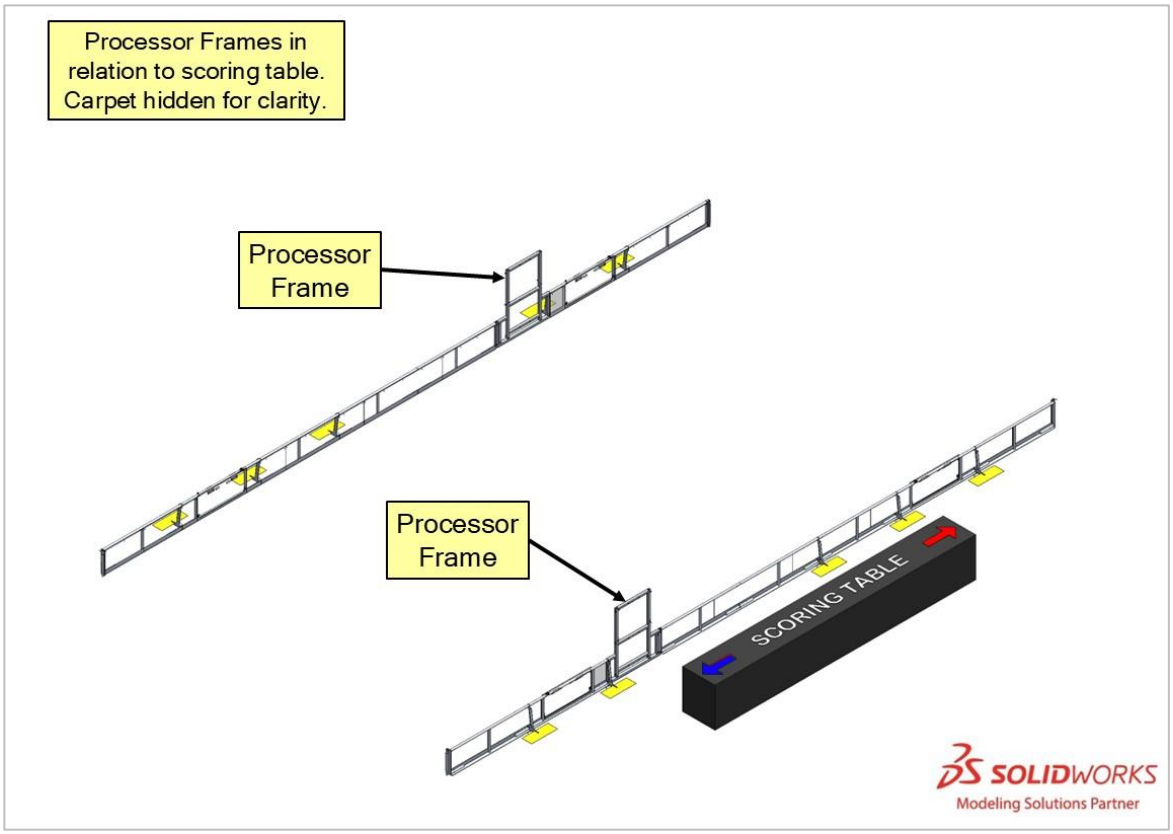
3.3.1 Tools & Equipment

- Side Border Cases (Cases 03, 04, and 05)

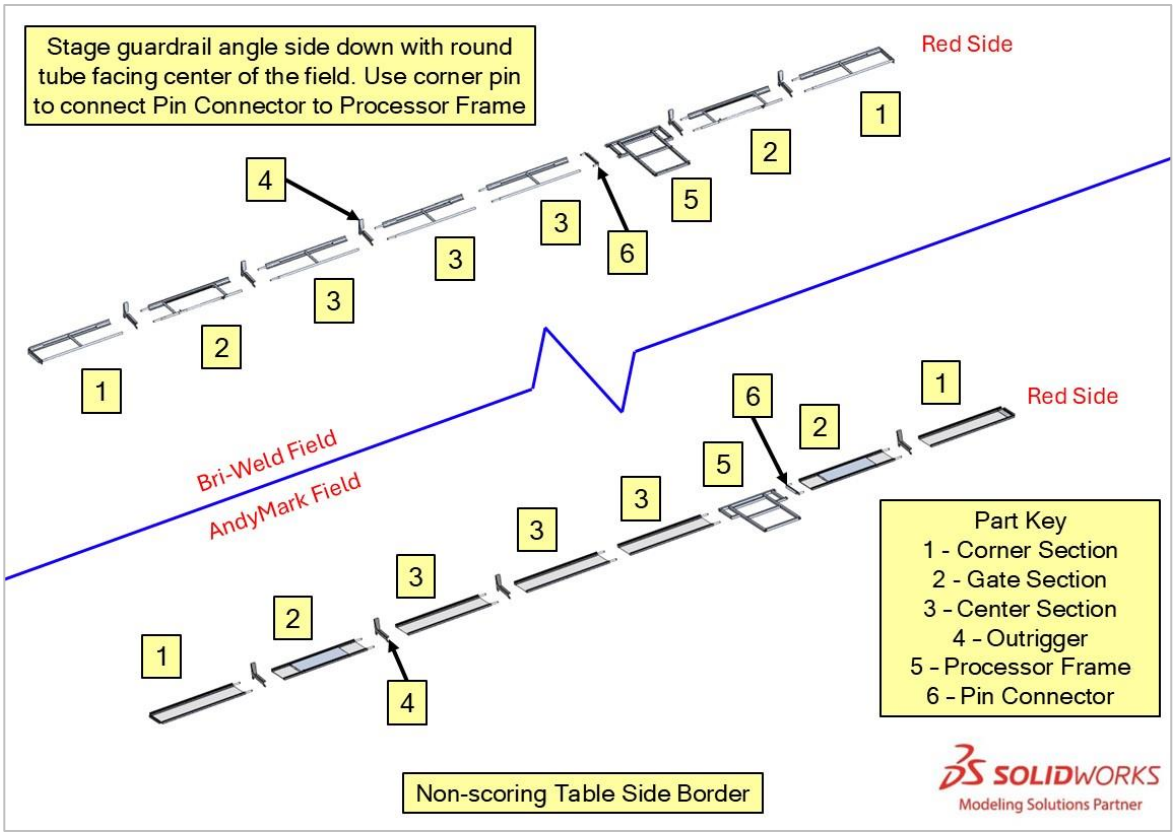
3.3.2 Assembly

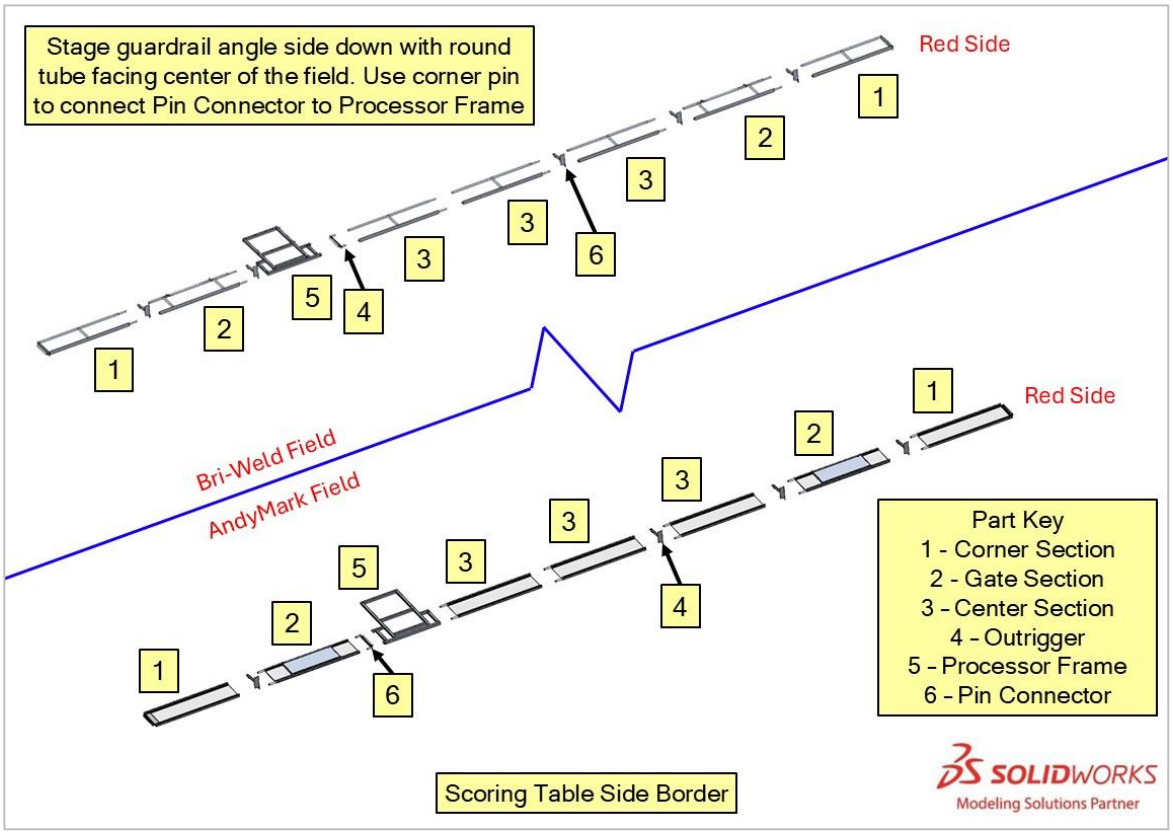
1. 

2.

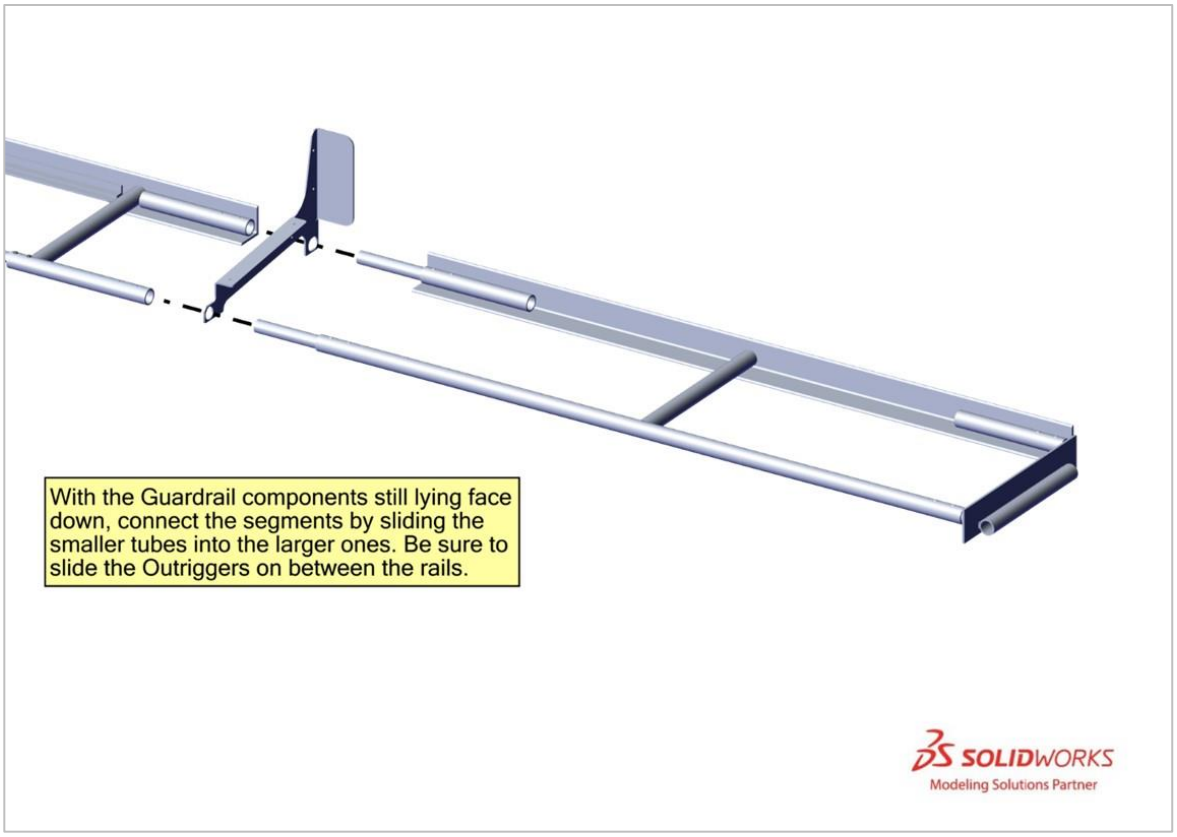

Processor Frames in relation to scoring table. Carpet hidden for clarity.
Processor Frame
Processor Frame
SCORING TABLE
SOLIDWORKS
Modeling Solutions Partner

3.

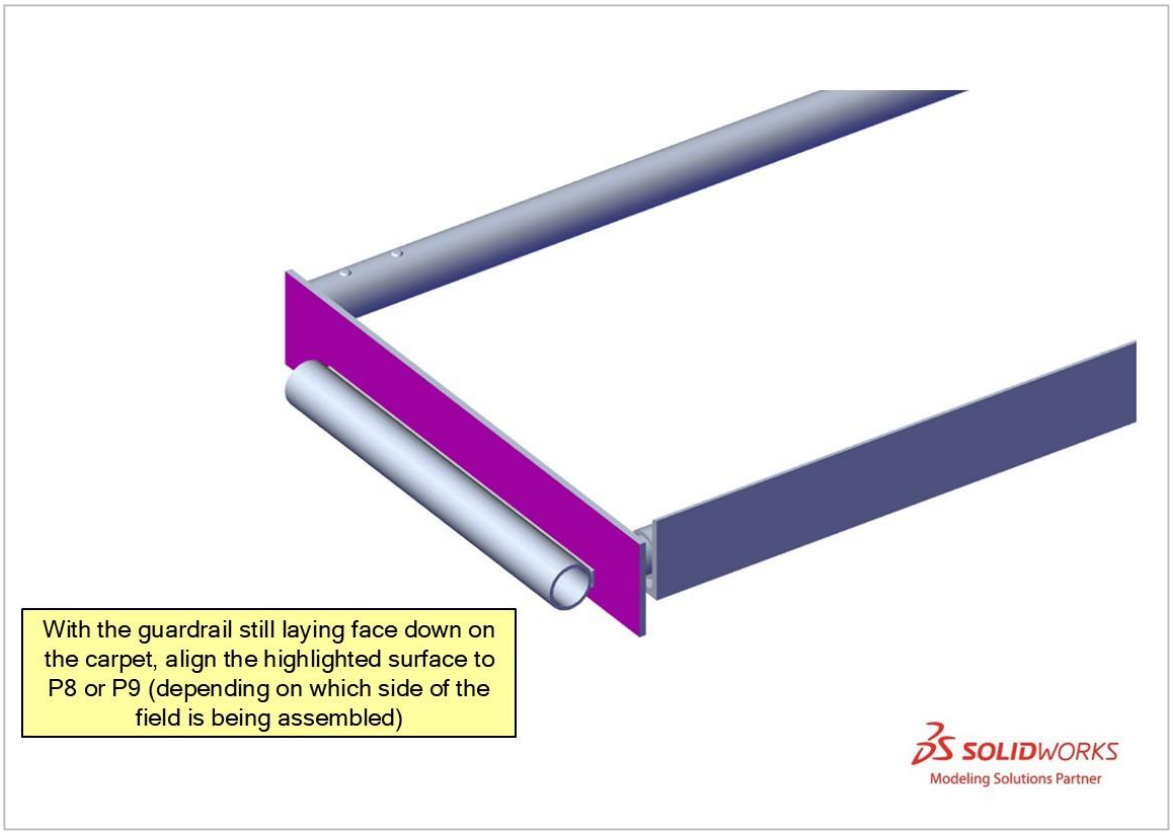

Stage guardrail angle side down with round tube facing center of the field. Use corner pin to connect Pin Connector to Processor Frame
Red Side
Red Side
Bri-Weld Field
AndyMark Field
Part Key
1 - Corner Section
2 - Gate Section
3 - Center Section
4 - Outrigger
5 - Processor Frame
6 - Pin Connector
Non-scoring Table Side Border
SOLIDWORKS
Modeling Solutions Partner


Stage guardrail angle side down with round tube facing center of the field. Use corner pin to connect Pin Connector to Processor Frame
Red Side
Red Side
Bri-Weld Field
AndyMark Field
Part Key
1 - Corner Section
2 - Gate Section
3 - Center Section
4 - Outrigger
5 - Processor Frame
6 - Pin Connector
Scoring Table Side Border
SOLIDWORKS
Modeling Solutions Partner

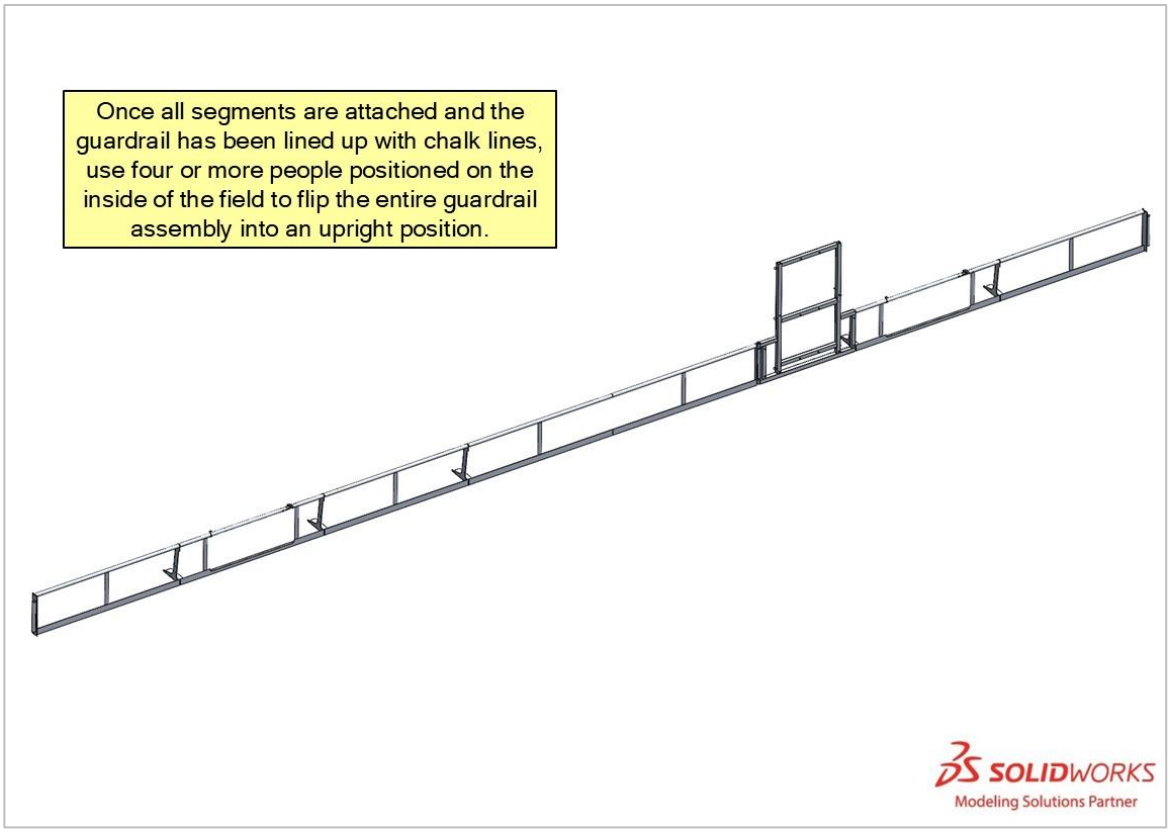
4.


With the Guardrail components still lying face down, connect the segments by sliding the smaller tubes into the larger ones. Be sure to slide the Outriggers on between the rails.
SOLIDWORKS
Modeling Solutions Partner

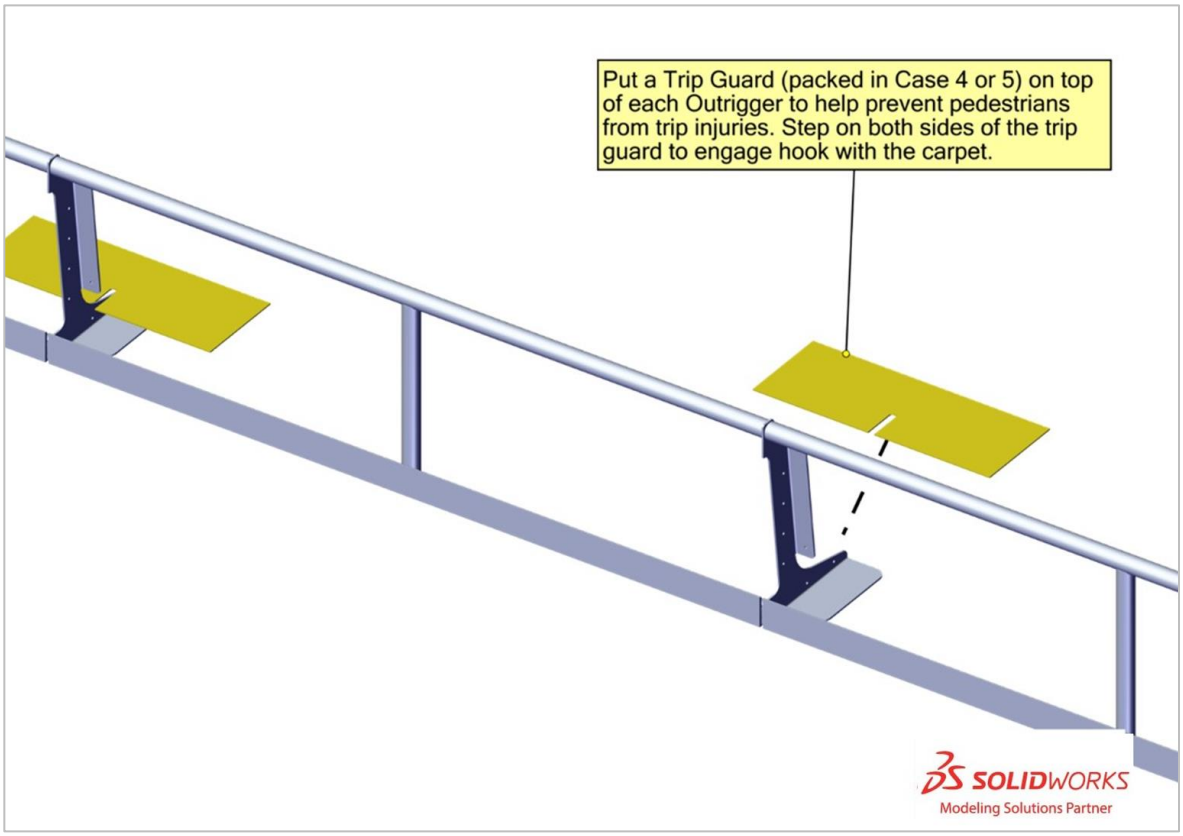
5.


With the guardrail still laying face down on the carpet, align the highlighted surface to P8 or P9 (depending on which side of the field is being assembled)
SOLIDWORKS
Modeling Solutions Partner

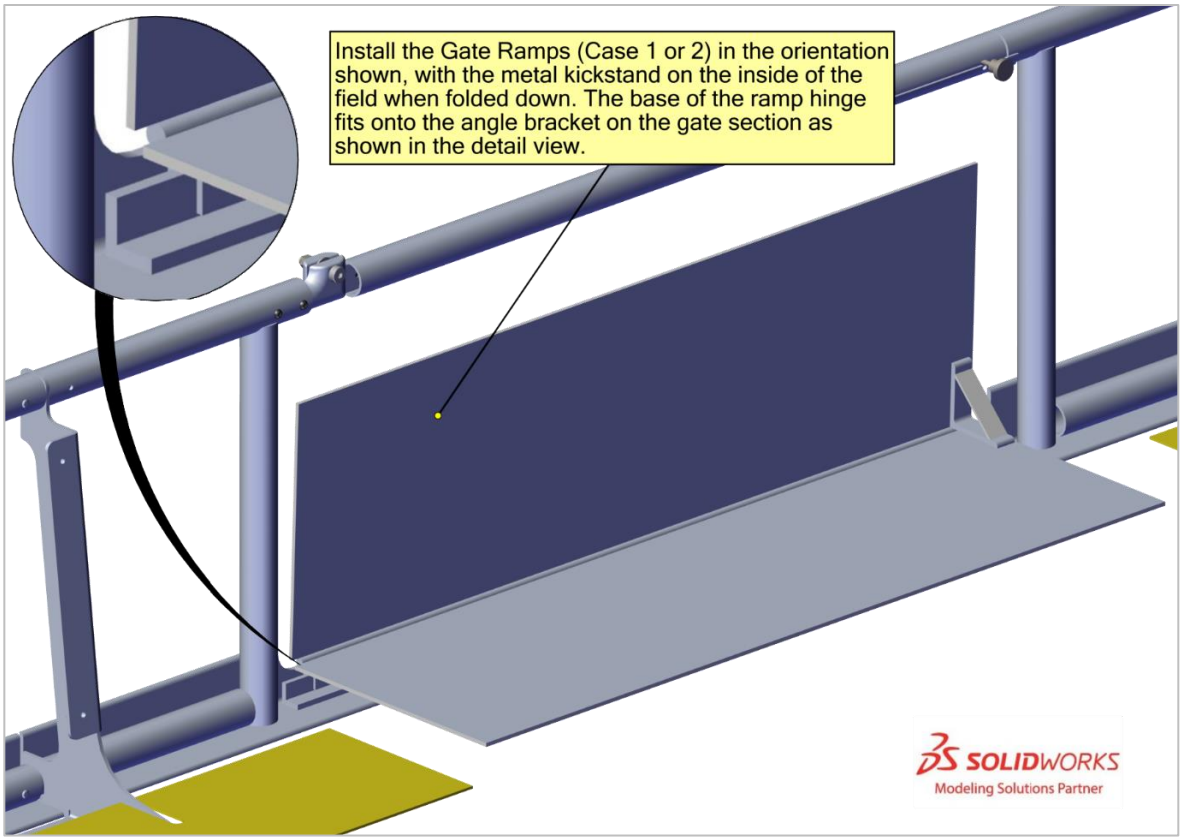
6.


Once all segments are attached and the guardrail has been lined up with chalk lines, use four or more people positioned on the inside of the field to flip the entire guardrail assembly into an upright position.
SOLIDWORKS
Modeling Solutions Partner

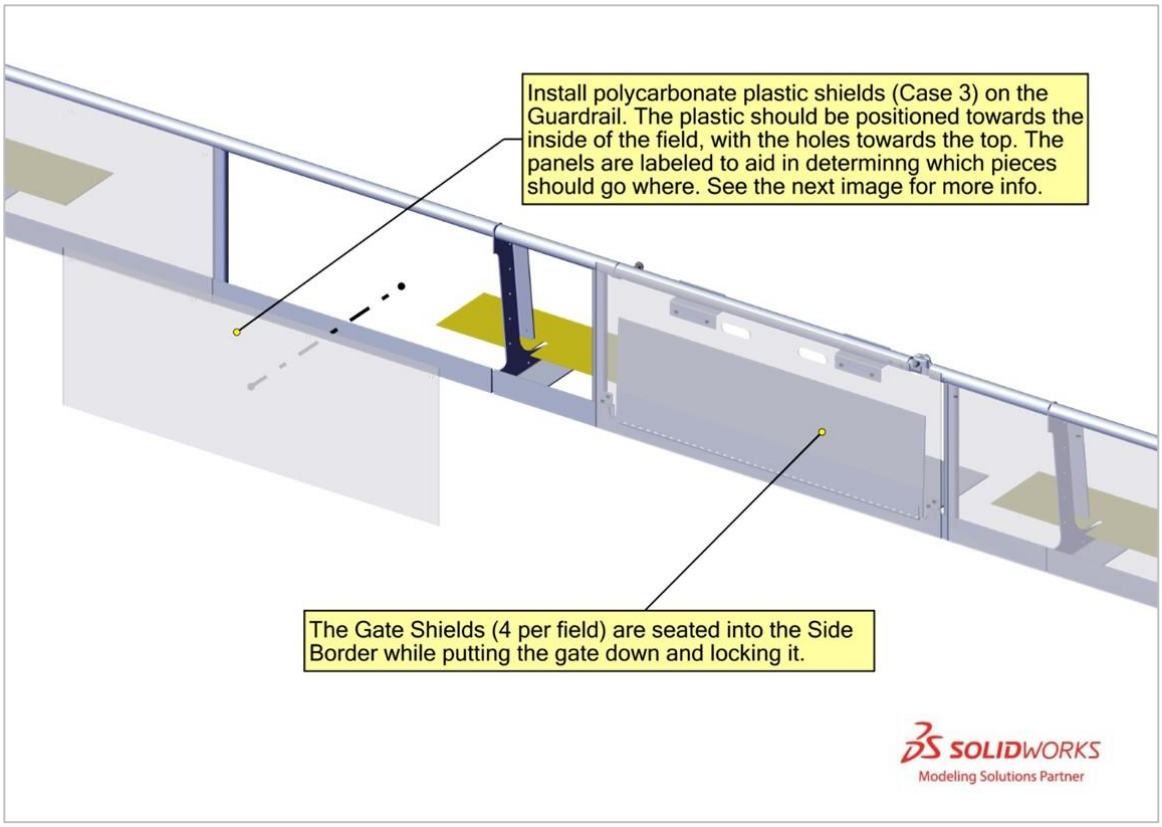
7.


Put a Trip Guard (packed in Case 4 or 5) on top of each Outrigger to help prevent pedestrians from trip injuries. Step on both sides of the trip guard to engage hook with the carpet.
SOLIDWORKS
Modeling Solutions Partner

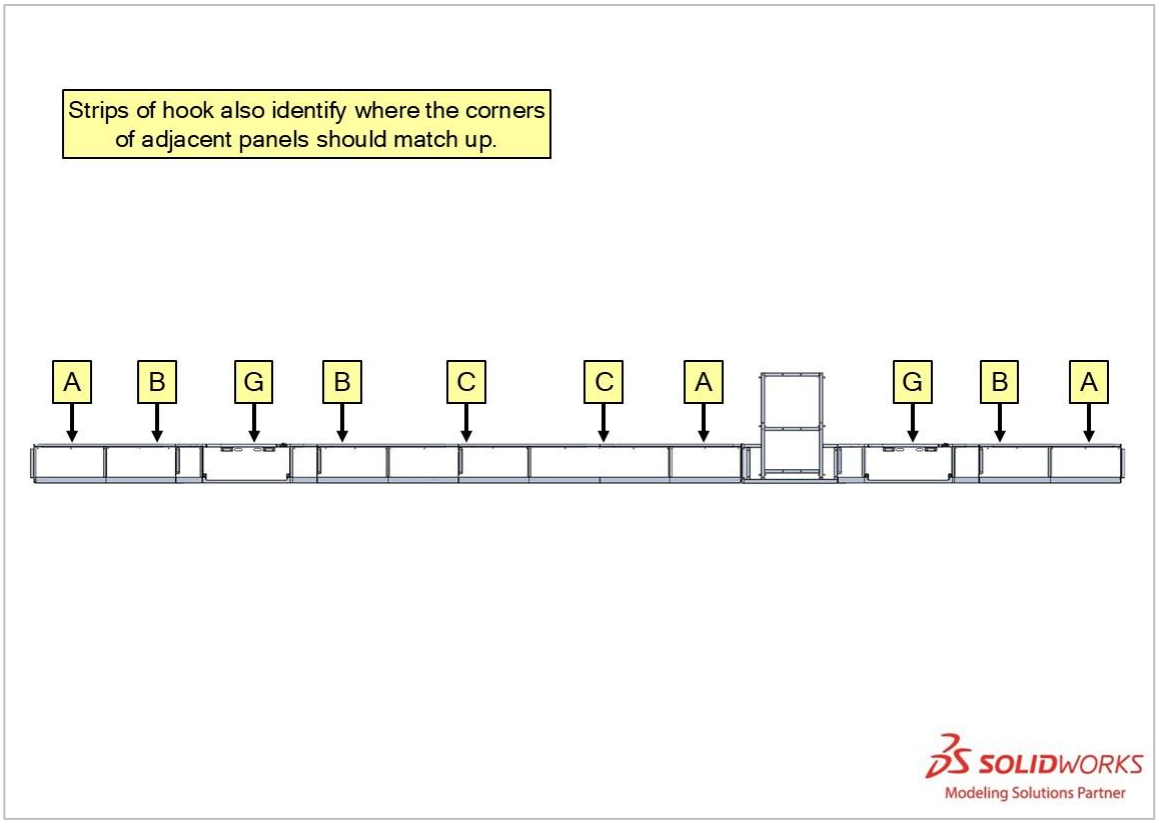
8.


Install the Gate Ramps (Case 1 or 2) in the orientation shown, with the metal kickstand on the inside of the field when folded down. The base of the ramp hinge fits onto the angle bracket on the gate section as shown in the detail view.
SOLIDWORKS
Modeling Solutions Partner

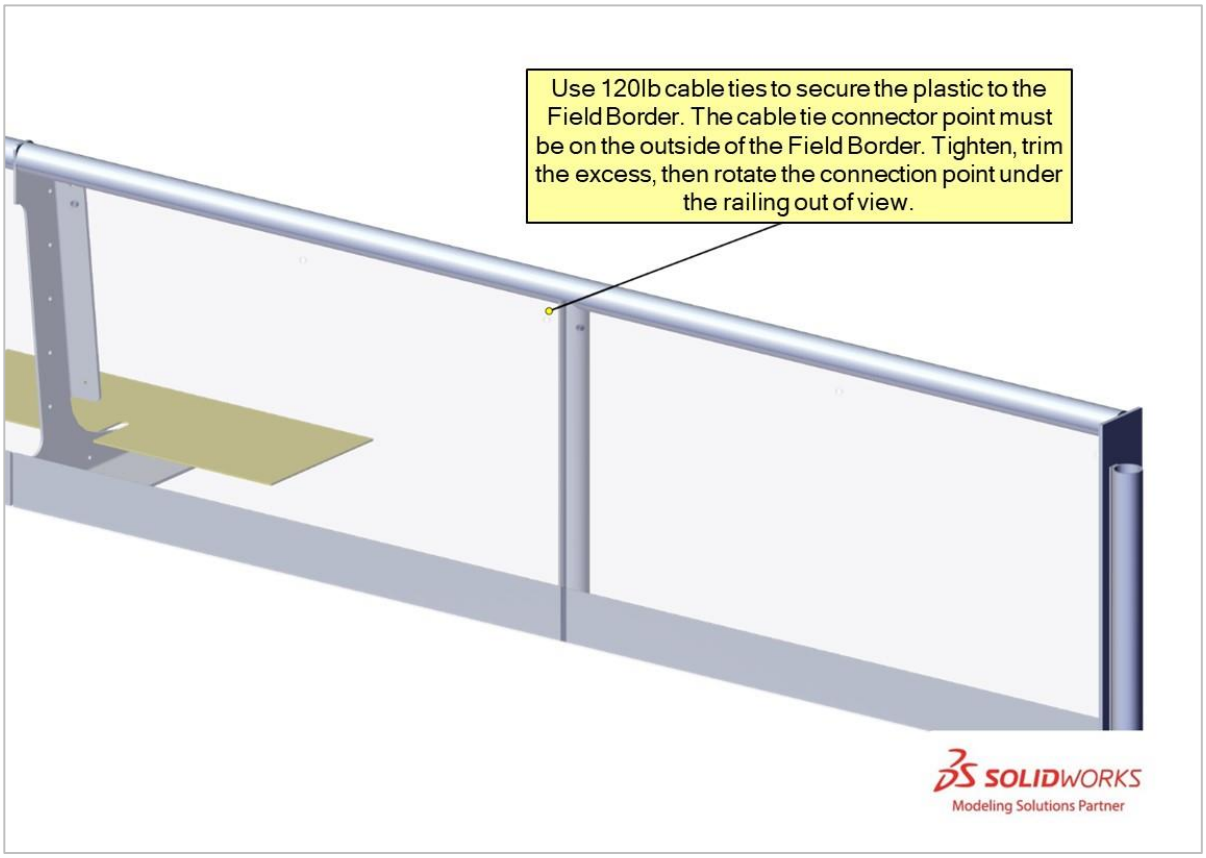
9.


Install polycarbonate plastic shields (Case 3) on the Guardrail. The plastic should be positioned towards the inside of the field, with the holes towards the top. The panels are labeled to aid in determinng which pieces should go where. See the next image for more info.
The Gate Shields (4 per field) are seated into the Side Border while putting the gate down and locking it.
SOLIDWORKS
Modeling Solutions Partner

10.


Strips of hook also identify where the corners of adjacent panels should match up.
A
B
G
B
C
C
A
G
B
A
SOLIDWORKS
Modeling Solutions Partner

11.


Use 120lb cable ties to secure the plastic to the Field Border. The cable tie connector point must be on the outside of the Field Border. Tighten, trim the excess, then rotate the connection point under the railing out of view.
SOLIDWORKS
Modeling Solutions Partner

3.4 Alliance Wall

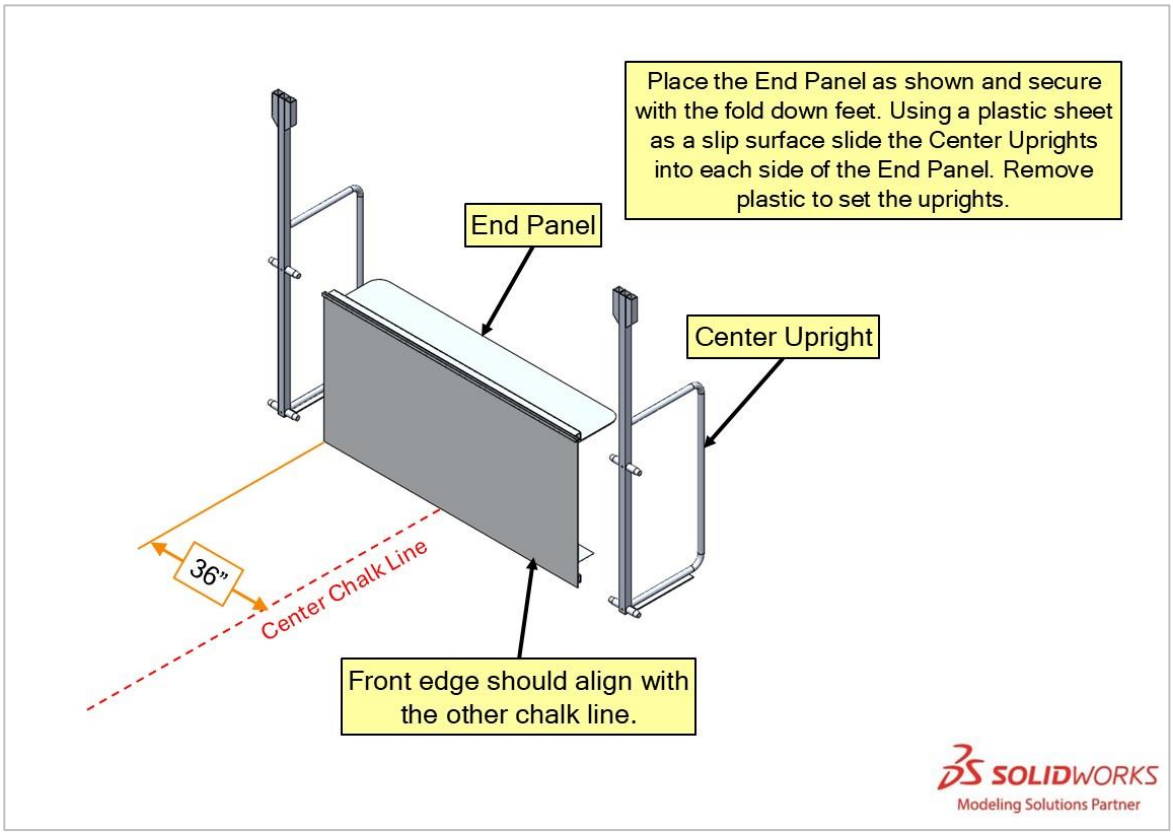
3.4.1 Tools & Equipment Required

- Case 20 or 21
- Case 1 or 2
- 25’ tape measure
- Sharpie
- HDPE sheets (from Case 1 or 2, used as sliders in between hook and carpet)

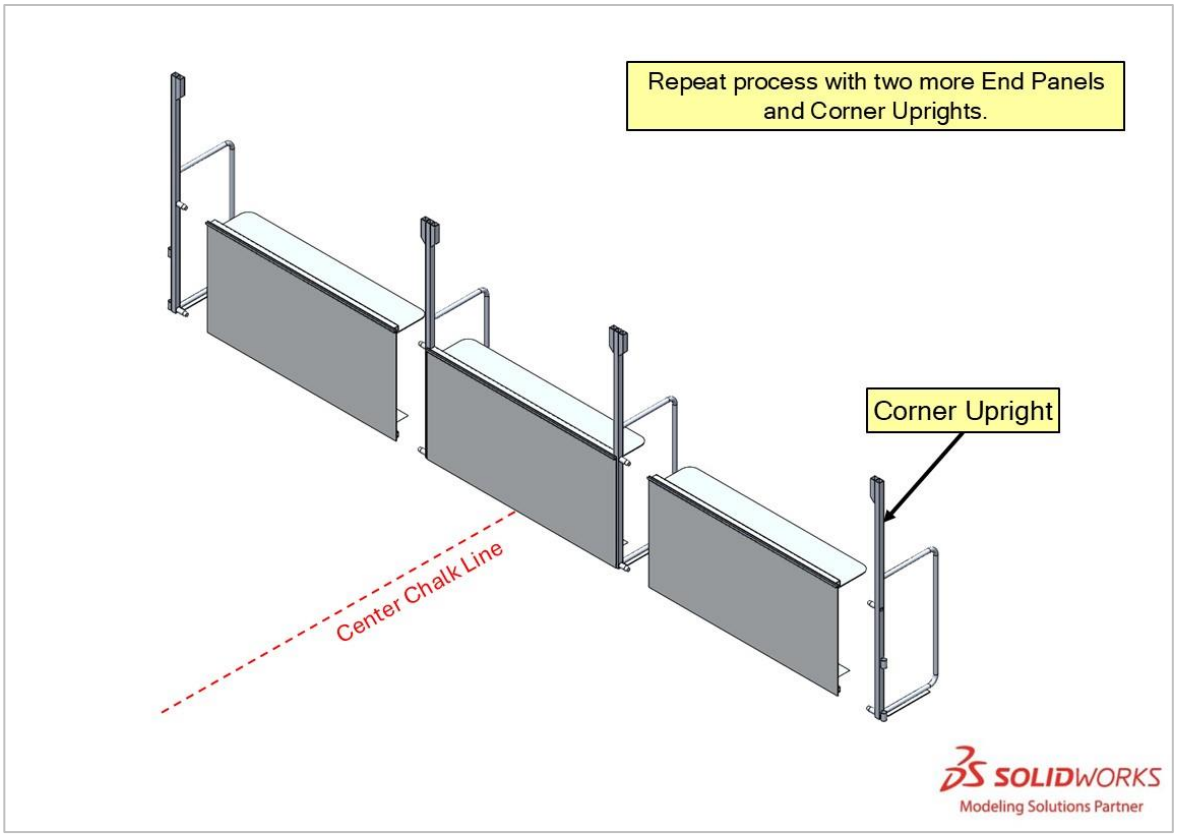
3.4.2 Assembly

1. 

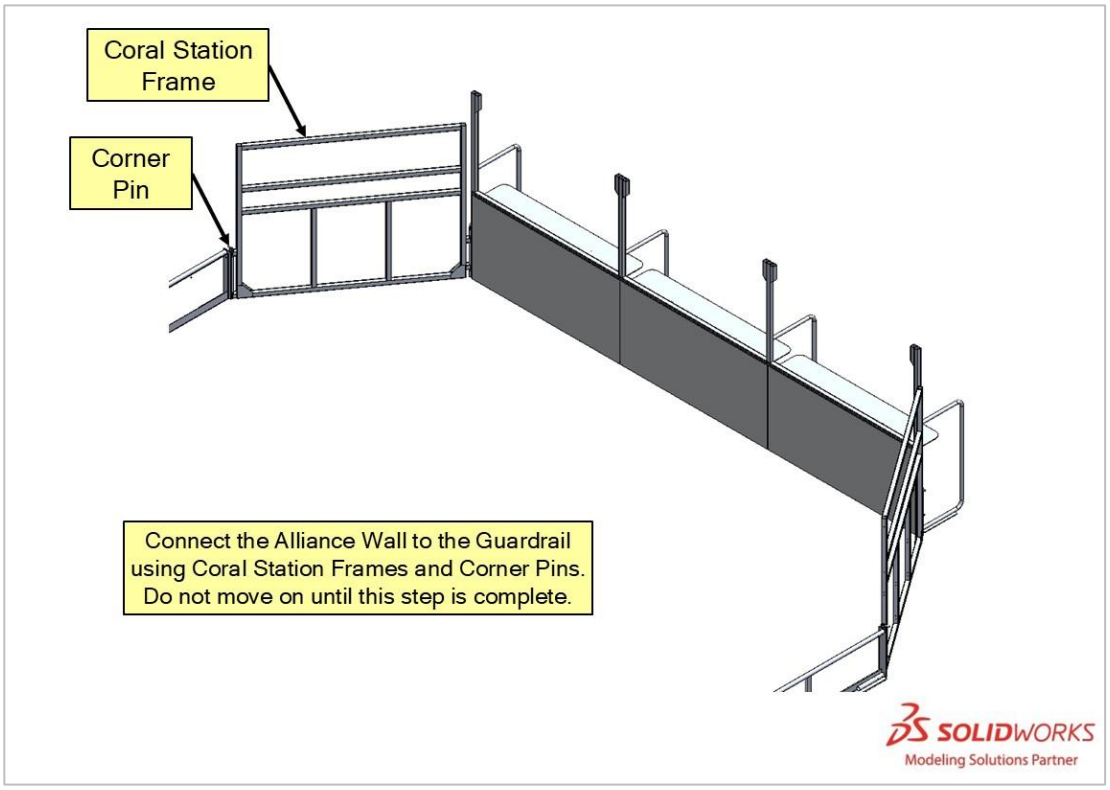
2.


Place the End Panel as shown and secure with the fold down feet. Using a plastic sheet as a slip surface slide the Center Uprights into each side of the End Panel. Remove plastic to set the uprights.
End Panel
Center Upright
36"
Center Chalk Line
Front edge should align with the other chalk line.
SOLIDWORKS
Modeling Solutions Partner

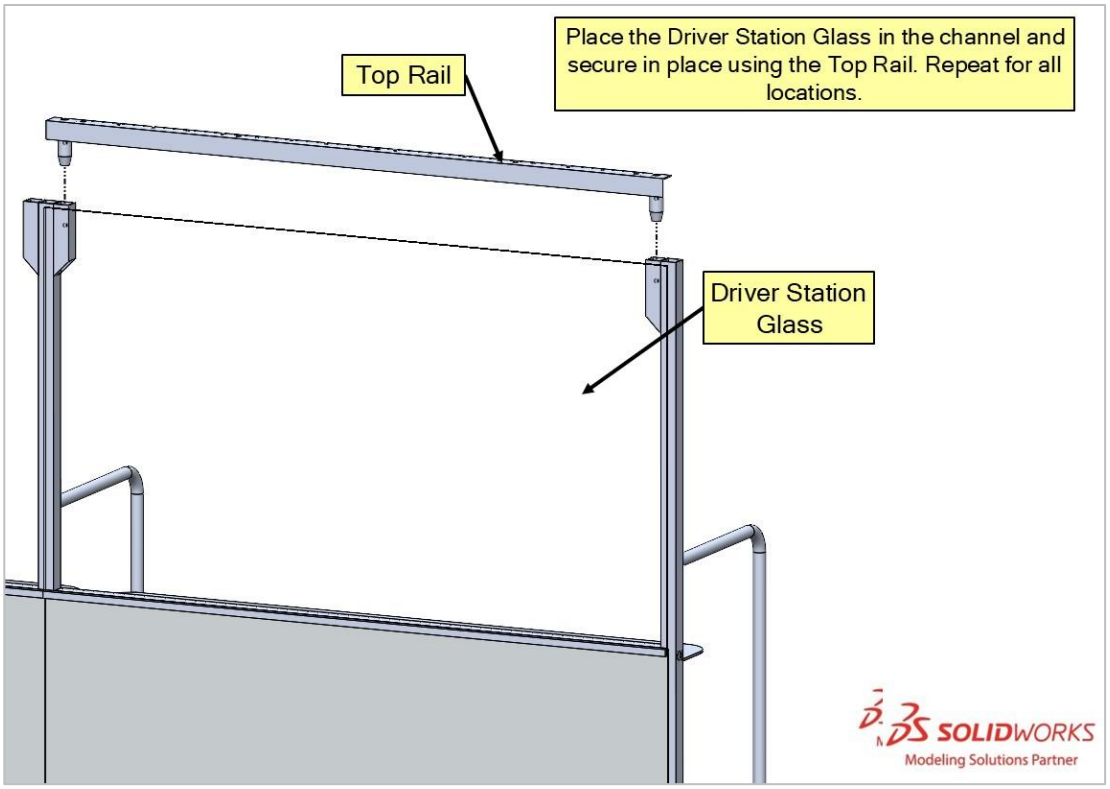
3.


Repeat process with two more End Panels and Corner Uprights.
Corner Upright
Center Chalk Line
SOLIDWORKS
Modeling Solutions Partner

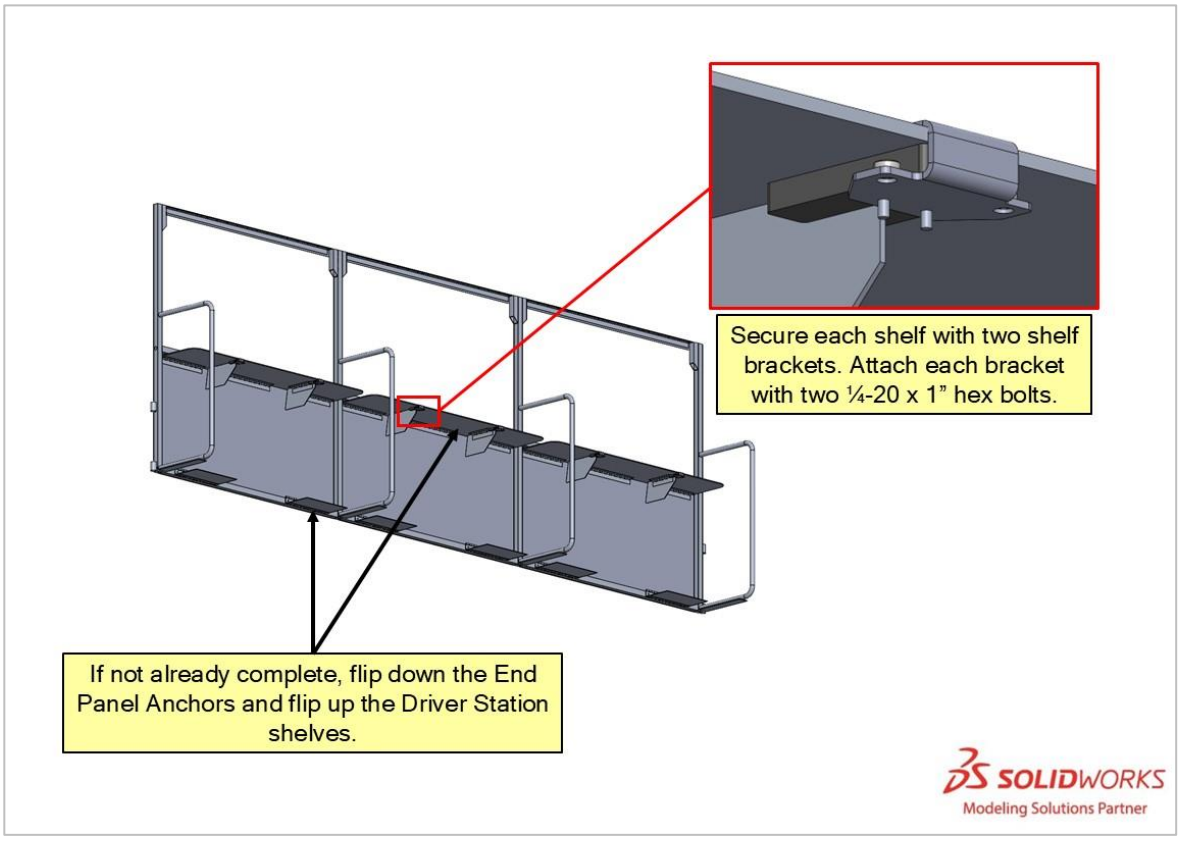
4.


Coral Station Frame
Corner Pin
Connect the Alliance Wall to the Guardrail using Coral Station Frames and Corner Pins. Do not move on until this step is complete.
SOLIDWORKS Modeling Solutions Partner

5.


Place the Driver Station Glass in the channel and secure in place using the Top Rail. Repeat for all locations.
Top Rail
Driver Station Glass
SOLIDWORKS Modeling Solutions Partner

6.



3.4.3 Alliance Wall Electronics

3.4.3.1 Equipment List

- Case 6
  - 2 (75-100') AC power cables
  - 2 20m Ethernet cables
  - 2 Station Control Cabinets (SCCs) (one red and one blue)
    - 2 power cable for SCCs
  - 8 Cypress Team signs. (4 red and 4 blue)
  - 6 Team Stack Lights (3 red and 3 blue)
  - 6 E-Stops
  - 6 A-Stops
  - Yellow AB Cables
    - 6 A/E-Stop Y-Cable
    - 2 A/E-Stop cable 5m
    - 4 A/E-Stop cable 10m

- 2 Team Light cable 5m
- 4 Team Light cable 10m

- Ethernet cables
  - SCC Ethernet - 20m (teal, Allen Bradley)
  - 4 Team Sign Ethernet cables 5m
  - 4 Team Sign Ethernet cables 10m
- 2 8-Outlet power strips (Tripp Lite or similar)
- 2 sets of Driver Station power outlets

3.4.3.2 Equipment Layout

- The Field should be run on at least 2 20-Amp electrical circuits to minimize the risk of tripping a breaker.

Figure 3-1 Alliance Area - Electronics Layout (viewed from within Alliance Station)

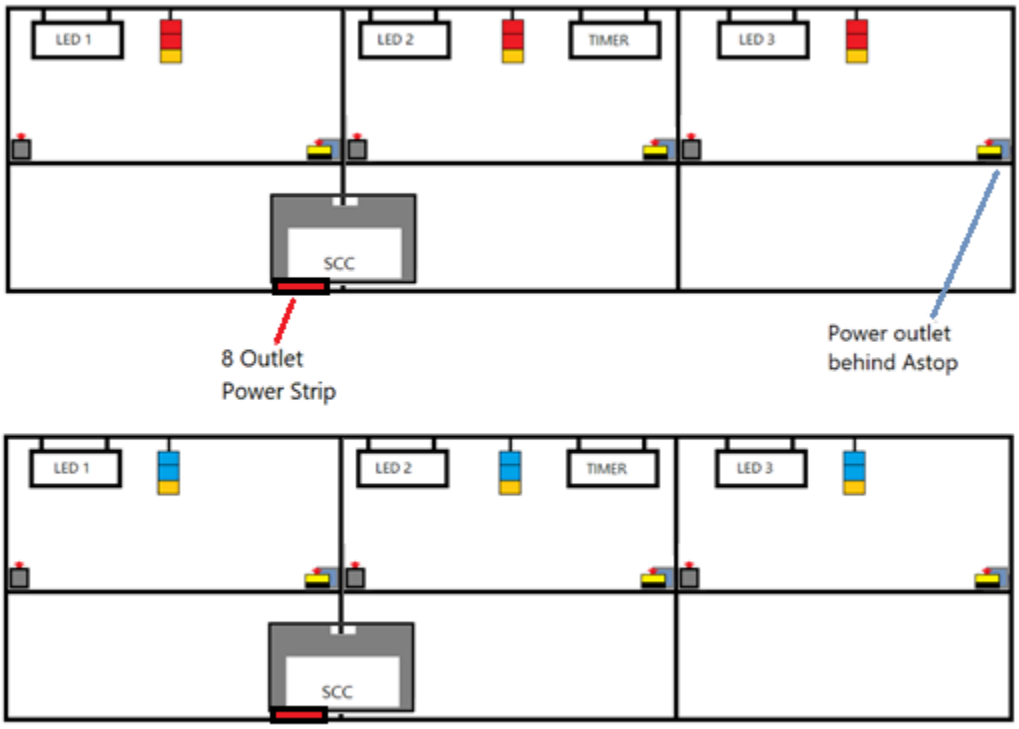
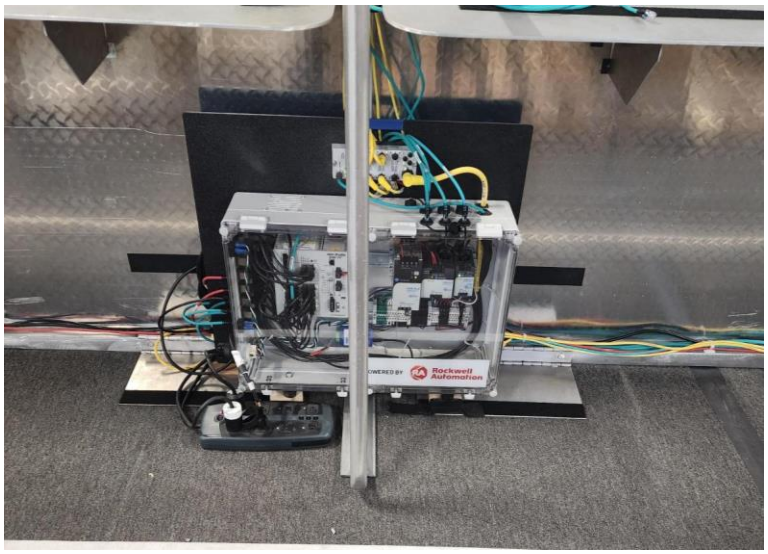


Figure 3-2 Alliance Area - SCC placement



SCC: Place one (1) Station Control Cabinet at each end of the Field between Driver Stations 1 and 2 as shown in the figures above. The SCC has tape on the handle to indicate the Field end at which it should be placed.

- The SCC with blue tape is placed at the blue alliance end of the Field (when powered some have blue LED's)
- The SCC with the red tape is placed at the red alliance end of the Field (when powered some have red LED's)
- The Spare SCC is stored is Case 19 and has black or white tape on its handle. It has no lights.

Team Signs: Team Signs units #1, #2, and #3 are mounted in each of the three Driver Stations. Team Signs are attached by hooking the "J" hooks into the left-most holes (when looking at the Driver Station from the Alliance Station side) pre-drilled in the rail of each Driver Station section. Spare Team Signs can be used by switching the team sign settings in FMS:

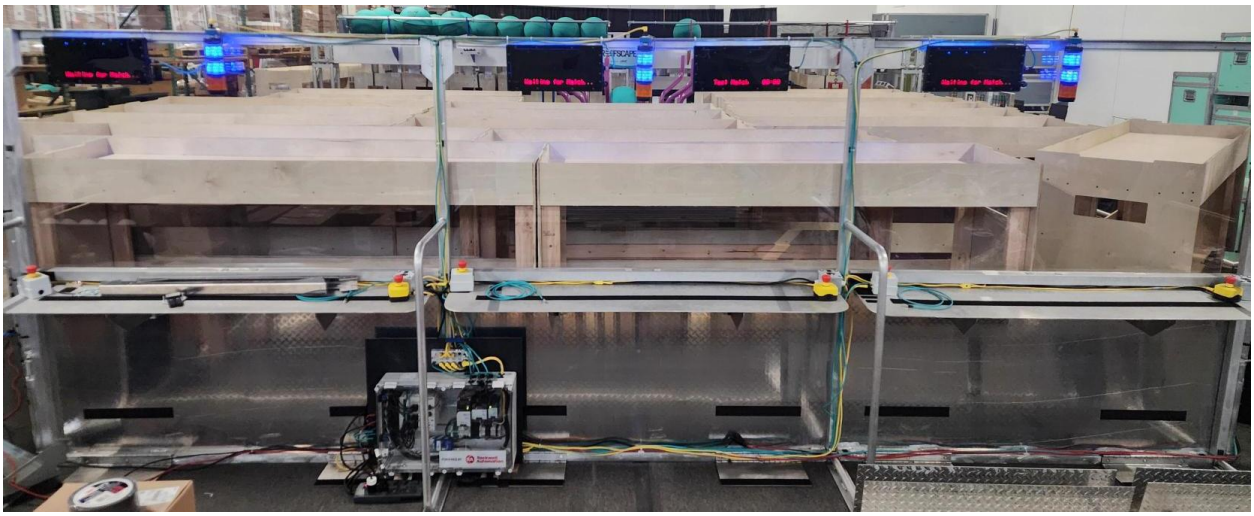
Timer units are mounted in each Alliance Station #2, on the opposite side of the station as the Team Sign. The Timer is attached by hooking the "J" hooks into the right-most holes (when looking at the Driver Station from the Alliance Station side) pre-drilled in the rail of Driver Station #2 as shown in Figure .

Team Stack Lights: Mount one Team Stack Light onto each of the three Driver Stations by sliding the light hanger over the middle hole of the rail. Secure the light by inserting the locking pin through the light plate and hole in the top rail. Each light is centered in its Driver Station, the 8th hole from either side.

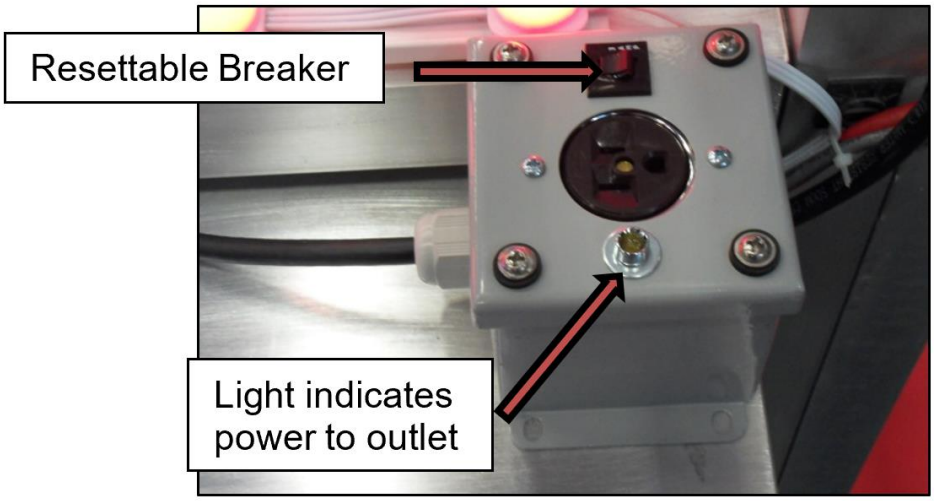
E-stops: Place one E-Stop on the left edge of the Driver Station shelf. Confirm that the cable connector faces inward for cable routing.

A-Stops: Place one A-Stop on the right edge of the Driver station. Confirm that the cable connector faces inward for cable routing.

The E-Stop and A-Stop both connect to the E/A-Stop Y-cable with the A-Stop connected to the end labeled “A” and the E-Stop connected to the end labeled “B”. An extension cable may be required to reach the SCC from the base of the Y-cable. If FMS indicates that both buttons are pressed when both buttons are in their reset position (i.e. up) they may be plugged into the wrong ends of the Y-cable.



Team Power Outlets: Place one power outlet on the right edge of the driver station shelf. Behind the A-Stop



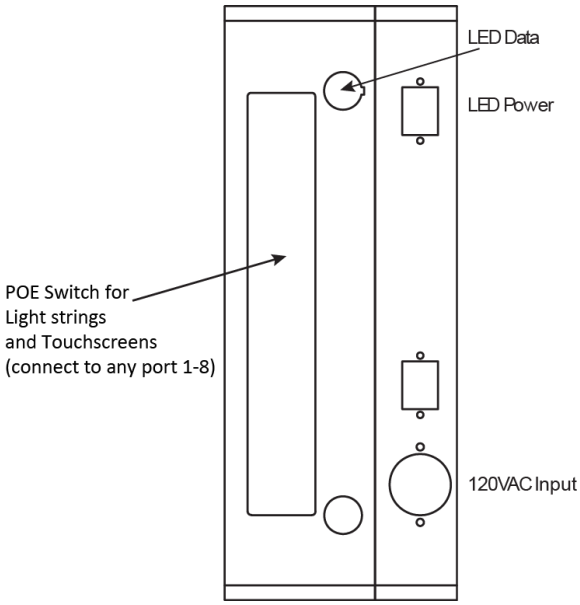
8-outlet Power Strip: Place one power strip under on the floor to the left of the SCC

3.4.3.3 Wiring

Looping 11” or 14” cable ties through the holes of the end frame top rails initially helps to form the harness support required for finishing the cable installation.

Station Control Cabinets (SCC) The SCC has connections located on the top and left side. They are for connecting the E-Stops, Ethernet, Team Lights, AC Power, Team Sign AC power, Team Sign data cables, and Touchscreens. The 120 VAC input is located on the left side of the SCC.

Figure 3-3 SCC (V1) Side Connections



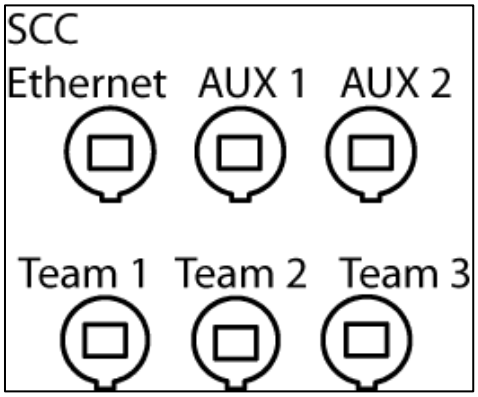
AC Power cable: from Scoring Table (75-100') –There is an AC power cable to feed each end of the field. The 3-pin male plug connects to the power strip at the Scoring Table and the female end connects to the power strip next to the SCC. A short power cable (SCC pigtail) connects from the power strip to the AC inlet on the SCC.

Ethernet Cable: from Scoring Table (20 meter) - Connects from the designated RJ-45 input, labeled *SCCE*, on the top of the SCC to the corresponding field end input on Case 33 at the Scoring Table.

Driver Station Ethernet Cables: The Driver Station Ethernet cables are used by teams to connect their Driver Stations into the field run from the top of the SCC to the corresponding Driver Station shelf.

Make sure to leave ample slack so teams can connect to their laptops anywhere along the shelf.

Figure 3-4 SCC Top Connections

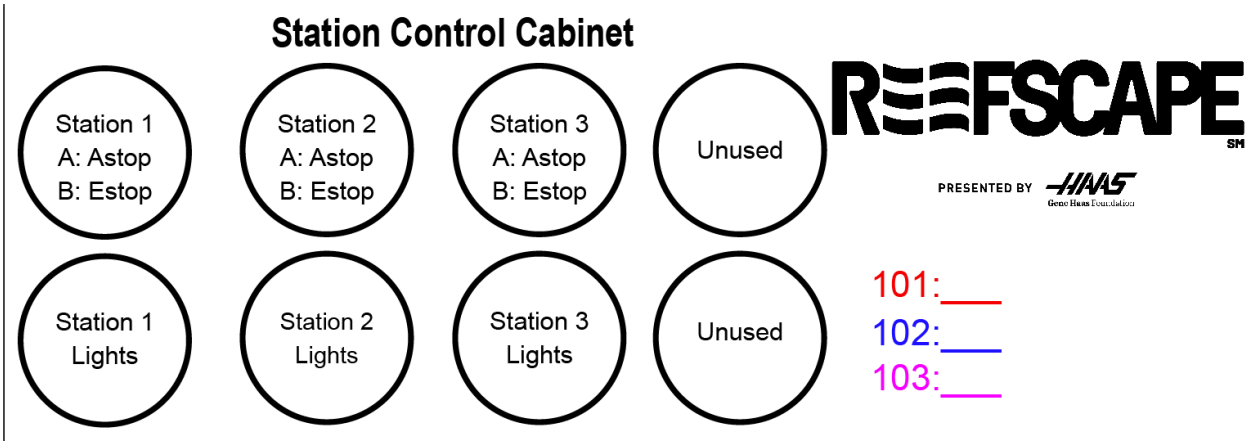


AUX1 and AUX2 are spare connections to be used only under FMS Support guidance.

Team Signs: Team signs are connected via a single Ethernet cable. Connect all 4 team signs to the POE switch ports on the left side of the SCC. 5m cable is used for the stations nearest the SCC while the 10m cable should be used for the farther stations.

Team Stack Lights: Team Stack Light cabling all runs directly from the Station Cabinet to each light. Attach the yellow Allen Bradley cables to the corresponding ports on the I/O module mounted at the top of SCC back panel as shown in Figure 3-5.

Figure 3-5 SCC Armor block Label-



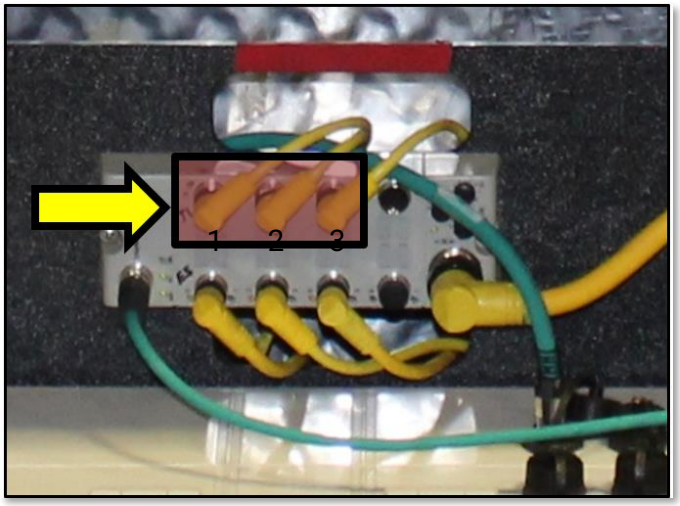
Wire routing:

- Team Lights #1 and #2 from the Station Control Cabinet up to the top of the upright between stations #1 and #2, and then over to the light assembly.
- Team Light #3: From the Station Control Cabinet across the floor to the uprights between stations #2 and #3, up to the top of the Alliance wall and then Over to the #3 light assemblies.

E/A-Stops: E/A-stop cabling all runs directly from the Station Cabinet through a Y-cable to each E-stop and A-Stop. Extensions may be needed for the Y-cable to reach the SCC. Attach the

yellow Allen Bradley cables to the corresponding ports on the I/O module mounted above the SCC (i.e. STOPS ON TOP!) (see Figure 3).

Figure 3-8 Highlight of E/A-Stop Ports on SCC Armorblock



Wire routing:

- E/A-stop #1: From the Station Control Cabinet along the base of the diamond plate, up to the E-Stop via the left Driver Station 1 upright on the left side of Driver Station 1 shelf.
- E/A-stop #2: From the Station Control Cabinet up the left Upright of Driver Station #2 to the Driver Station shelf.
- E/A-stop #3: From the Station Control Cabinet along the base of the diamond plate across to Driver Station #3, up the left Upright of Driver Station #3, to the Driver Station shelf.

3.5 Referee Panels

3.5.1 Equipment – Found in Case 34

- Referee Panel touchscreens
- Referee Panel Bases
- Lower Mounting Pole
- Upper Mounting Pole
- 5 red 15m Ethernet cables
- Mounting Pins (3 per Referee Panel)

Figure 3-6 Case 34 - Regionals

Figure 3-7 Case 34 - Districts

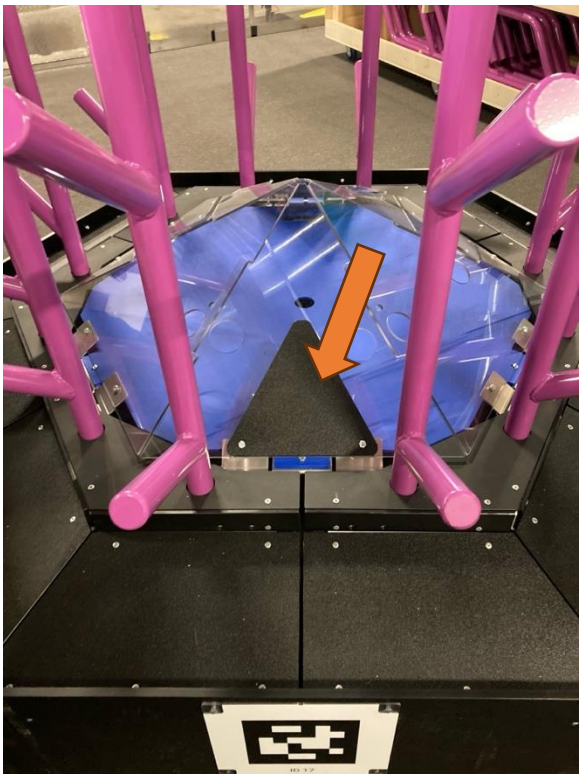
Districts receive a modified version of the previous style Case 34. Be cautious unloading this case and unload the poles and single Panel base from the compartments at the back of the case to help prevent the case from being unbalanced and potentially tipping over.

3.5.2 Location

Each ref location on the field uses 1 of each item in the list. The locations are shown below in Figure 3-9.

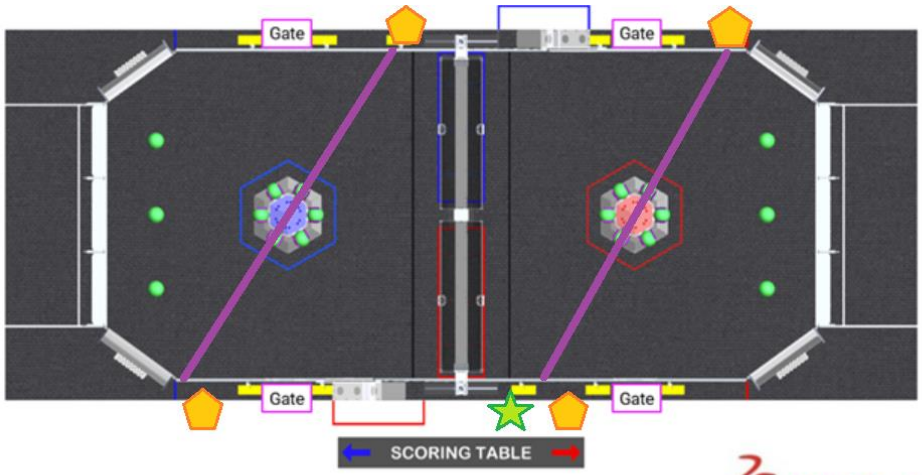
Note the Official Scorer site line requirements (purple lines in Figure 3-9) when positioning the Ref Panels. Official Scorer Triangles on the Reef define the center of each Official Scorer's designated scoring area.

Figure 3-8 Official Scorer fiducial



The Head Referee panel (star in Figure 3-9) is offset towards the red alliance side of the field to leave room between the truss and the Scoring Table for people to walk by.

Figure 3-9 Referee Panel Locations



3.5.3 Wiring

Power for the Referee Panels is over Ethernet, make sure all Referee Panels are plugged into POE capable ports.

The Head Ref (HR) panel is the only panel to receive its Ethernet connection from the Scoring Table.

- The RN and RF panels connect to the Red SCC using the red Ethernet cables.
- The BN and BF panels connect to the Blue SCC using the red Ethernet cables.