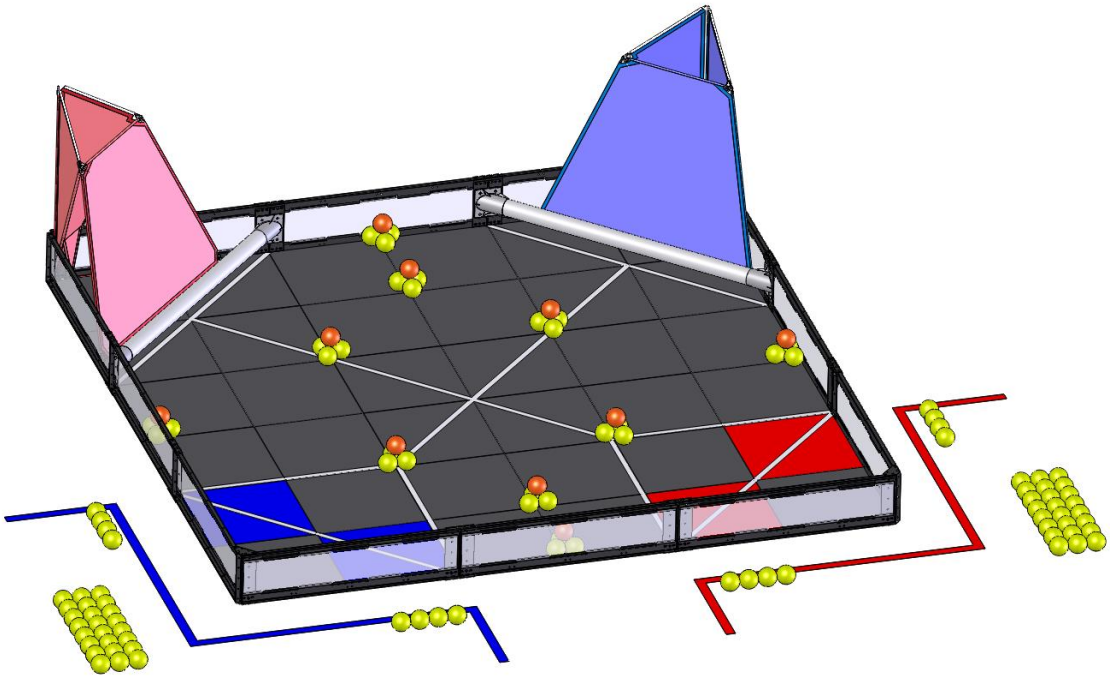
VEX ROBOTICS COMPETITION

NOTHING BUT NET

Field Specs & Assembly Instructions



APPENDIX A

Game Field

Introduction

This document will provide detailed specifications, BOM information, and assembly instructions for the Official Competition Field.

Teams who do not need an "official" field should refer to the separate low-cost field guide for cost-reduction options.

Please note: this field utilizes the VEX Competition Field Perimeter (278-1501) developed by VEX Robotics. Instructions and specifications for this field perimeter are available in a separate document, and are important for the field assembly.

This document is divided up into four sections:

1. Field Overview
2. Field Bill of Materials
3. Field Specifications
4. Field Assembly Instructions

There is also an accompanying STEP file which can be imported into most 3D modeling programs (i.e. Autodesk Inventor). This 3D model not only shows the "official" setup of a *VEX Robotics Competition - Nothing But Net* Competition field, but it also includes detailed models of all the individual field elements.

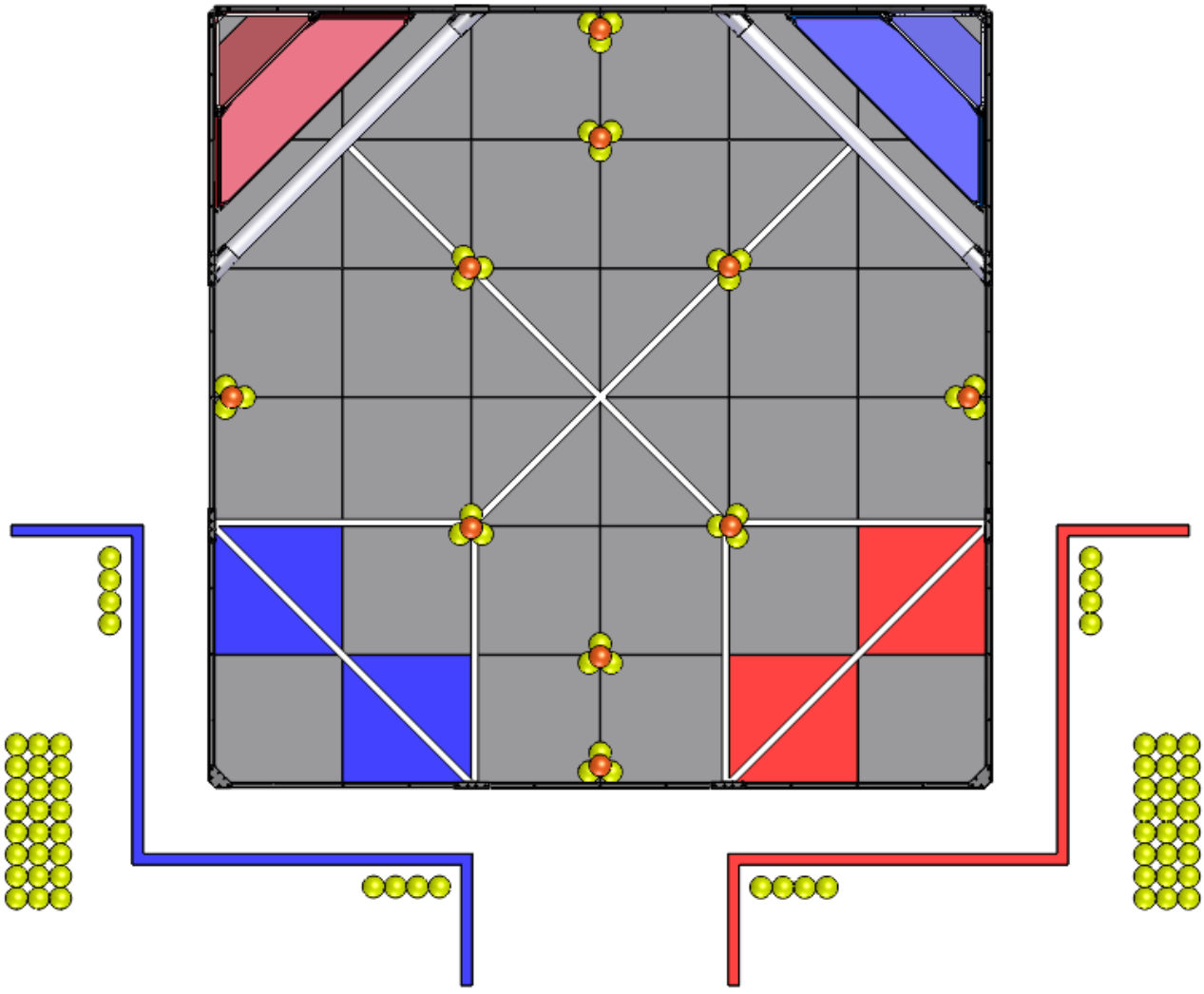
For additional game-play detail, please refer to the *VEX Robotics Competition - Nothing But Net* competition manual.

For more information on reducing costs on unofficial field construction, refer to the accompanying "Low Cost Field" section of this Appendix.

Field Overview

The game *VEX Robotics Competition - Nothing But Net* is played on a 12 ft x 12 ft foam-mat, surrounded by a sheet-metal and polycarbonate perimeter. In two corners of this field there are the alliance goals, a *High Goal* made of netting and fiberglass rods, and a *low goal* partitioned by a piece of 3.5” diameter pipe. In the opposite corners a taped off zone signifies the *Climbing Zone* where teams may *Elevate* robots for extra points. Placed throughout the field are *Balls* and *Bonus Balls,* additional *Balls* are available for preload to be entered on the field during the match.

For more details and specific game-play rules, please refer to the *VEX Robotics Competition - Nothing But Net* competition manual.



VEX Robotics Competition

Game Objects & Field Bill of Materials

All these items are available for purchase from:
www.VEXrobotics.com

Generic Field Elements - Reuseable Each Year

Part Number	Description	Price
278-1501	VRC Field Perimeter Frame & Hardware	$ 799.99
278-1502	VRC Foam Field Surface - *(36) Grey, (2) Red, (2) Blue Tiles*	$ 189.99
275-1401	VRC VEXnet Field Controller	$ 149.99

Total Price $ 1,139.97

Official *VEX Robotics Competition - Nothing But Net* Specific Elements

Part Number	Description	Price
276-4162	ALL Official *VEX Nothing But Net* Field & Game Objects	$ 499.99

(1) High Goal Kit (Red)
(1) High Goal Kit (Blue)
(100) Game Balls
(12) Bonus Balls
(4) Mesh Ball Bags
(4) PVC Corner Connectors
(2) PVC Corner Pipes
(2) Competition Field Corner Brackets
All necessary assembly hardware

Total Price $ 499.99

Practice Elements

Part Number	Description	Price
276-4257	VRC 2015-2016 Game Element Kit	$ 59.99

(25)Game Balls
(3) Bonus Balls
(1) Mesh Ball Bag

276-4365	VRC 2015-2016 High Goal (Random Color)	$ 74.99

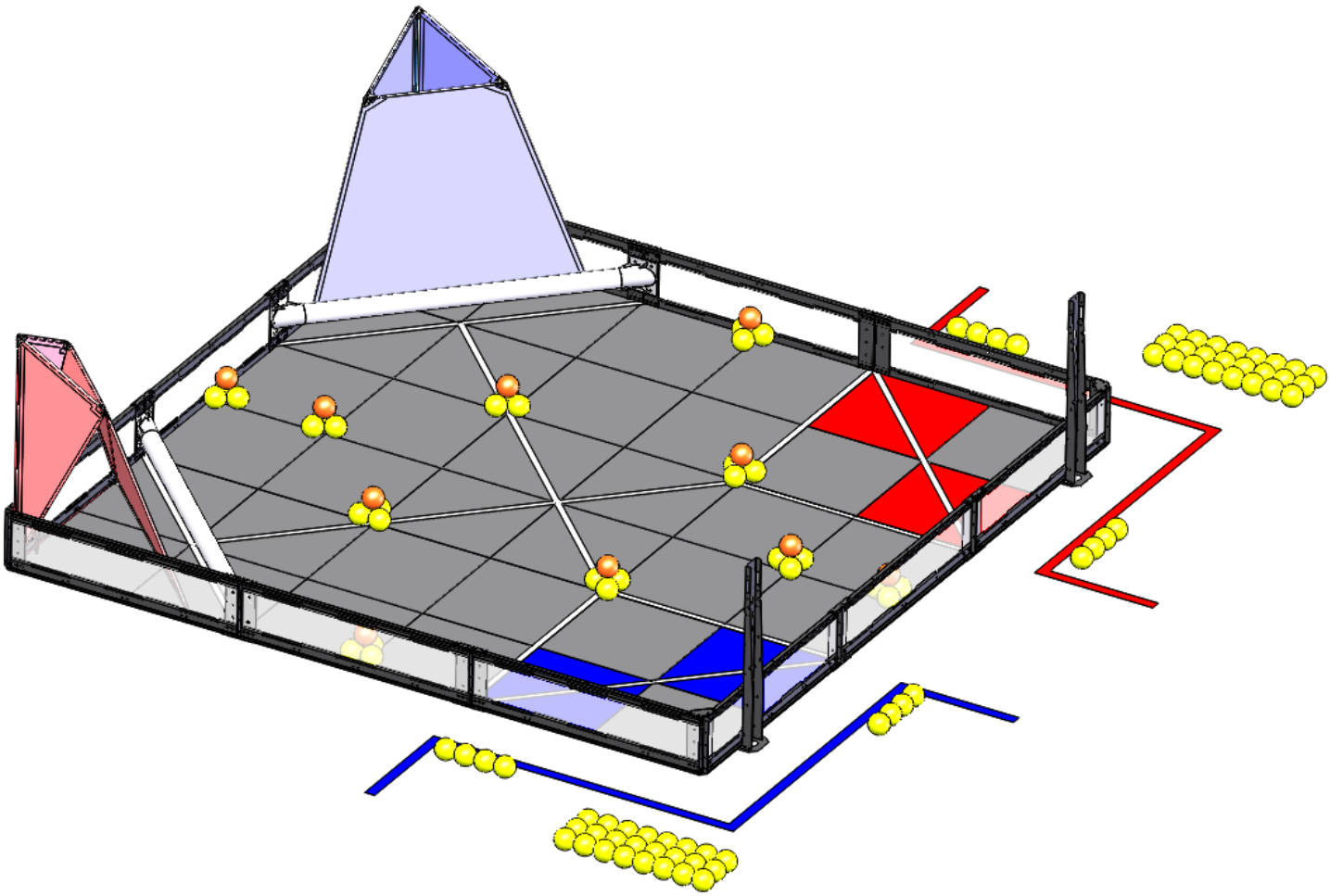
(1) High Goal Kit (random color)

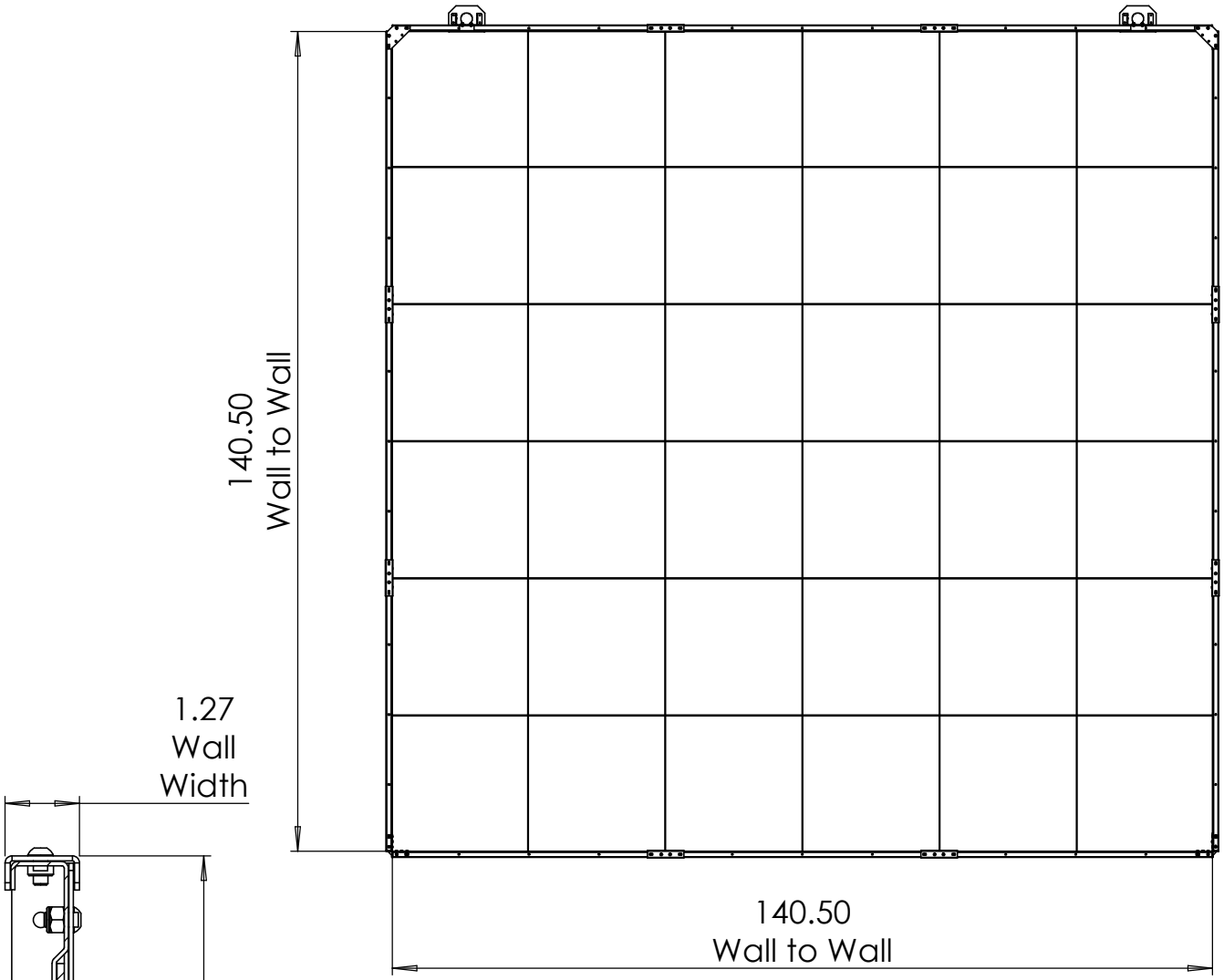
Field Specifications

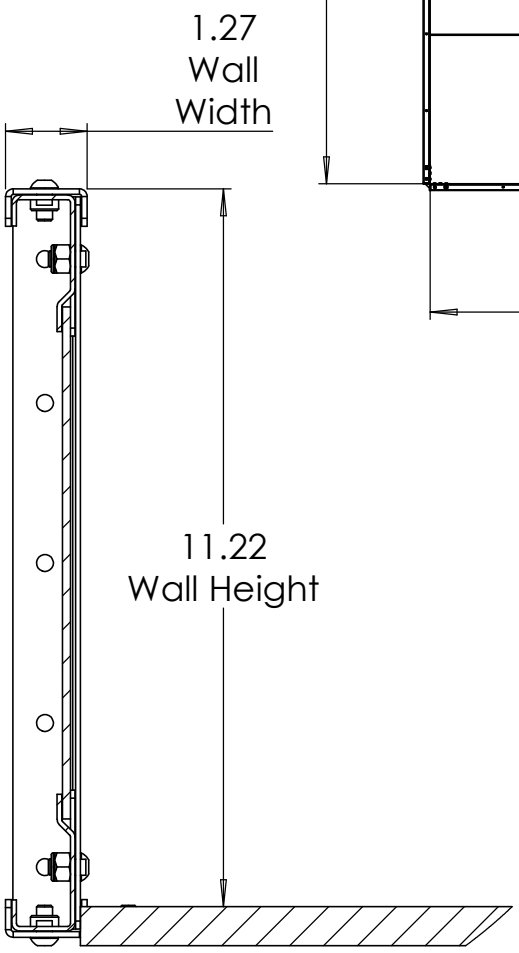
Introduction

This section will outline the specifications that are most important to teams designing a robot to compete in the VEX Robotics Competition – *Nothing But Net*. Though many of the critical dimensions are included in this section, it may be necessary to consult the separate assembly guide and 3D-CAD models of the field for an additional level of detail (if you can't find a dimension in the specifications, we include a FULL model of the field – "virtually" measure whatever you need).

Field components may vary slightly from event to event. This is to be expected; teams will need to adapt accordingly. It is good design practice to create mechanisms capable of accommodating variances in the field and game pieces.

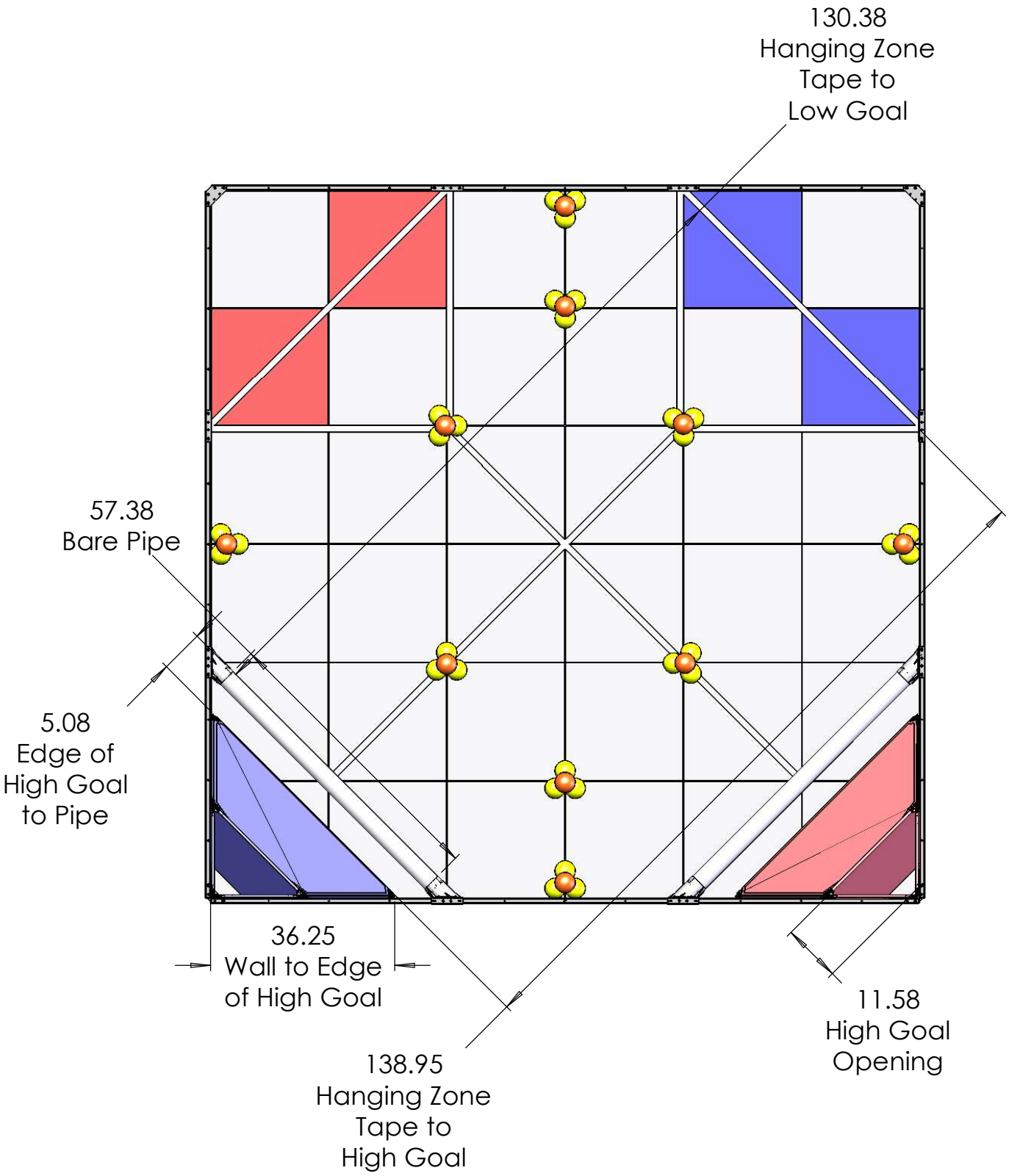




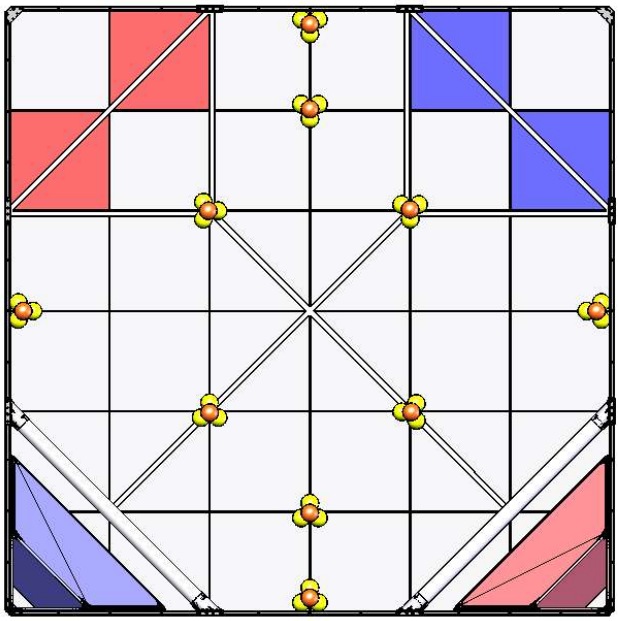


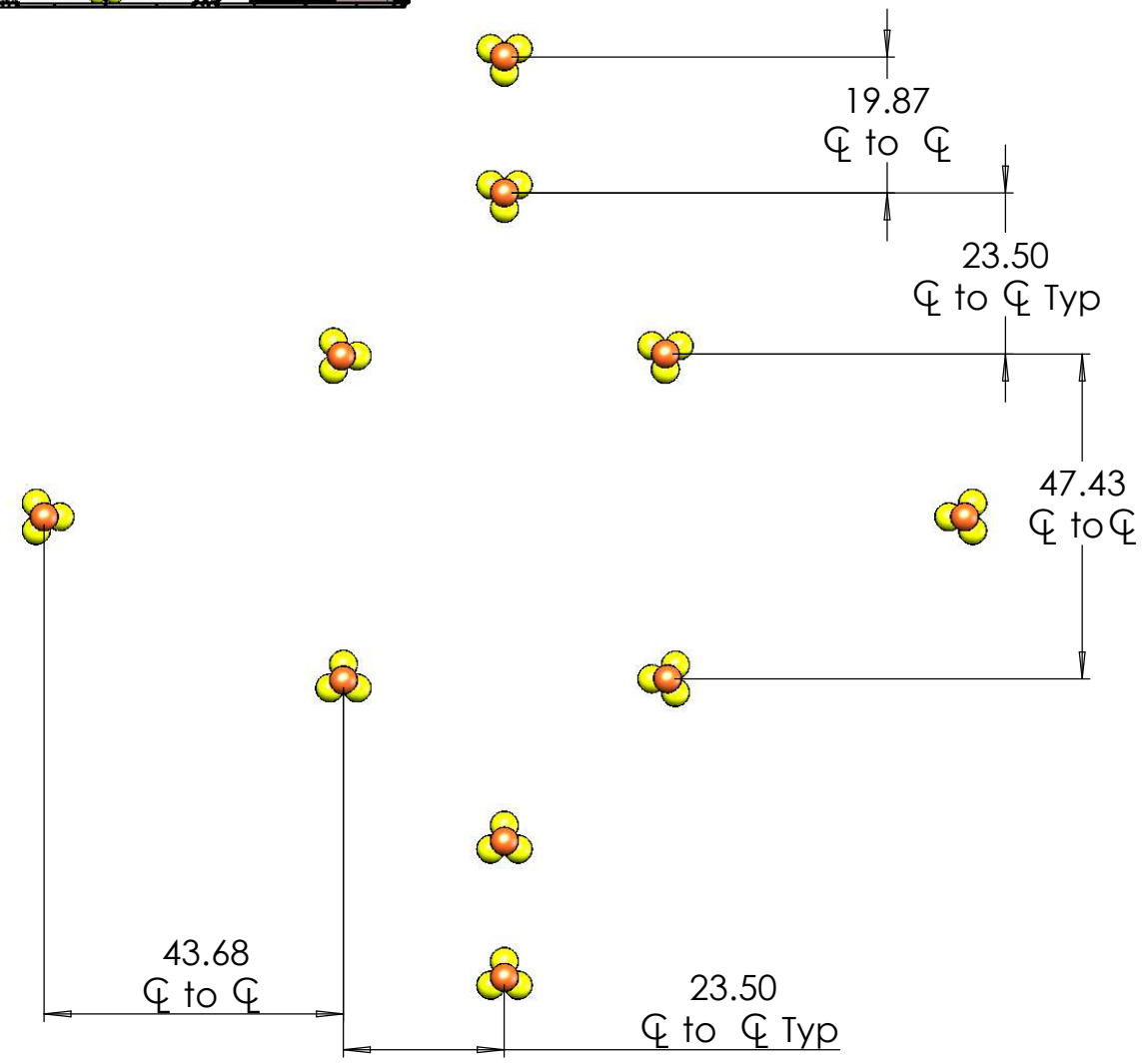
Field Critical Dimensions:
- ~140.5" Square Wall - Wall, Inside
- 11.22" Wall Height
- 1.27" Wall Thickness

Description	Field Perimeter Specs	
Dwg No	15-16 Field Specs Rev1	
Competition	VRC 2015-2016	Sheet 1 of 8
Release	6/3/2015	ALL DIMENSIONS ARE IN INCHES.

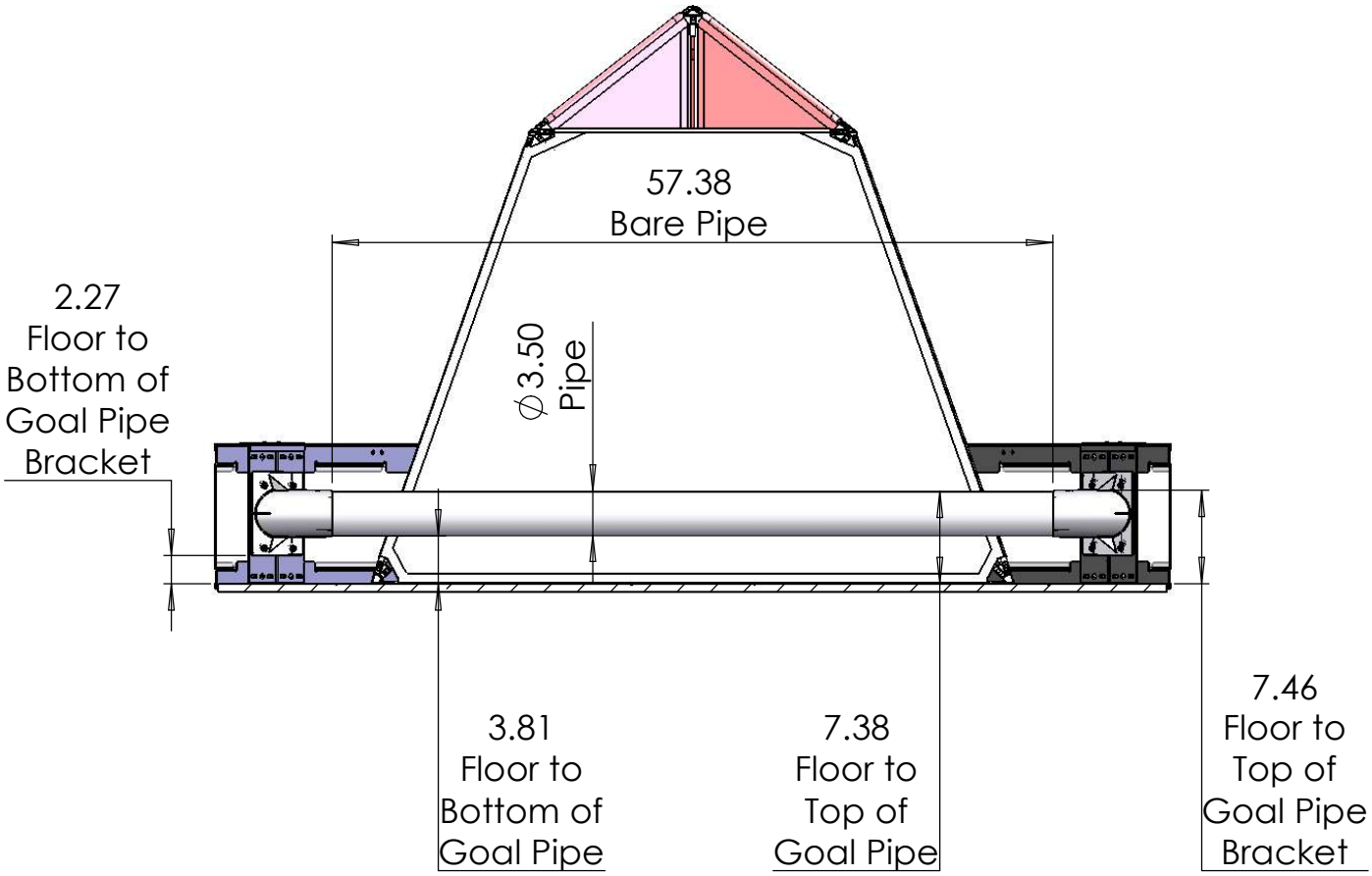


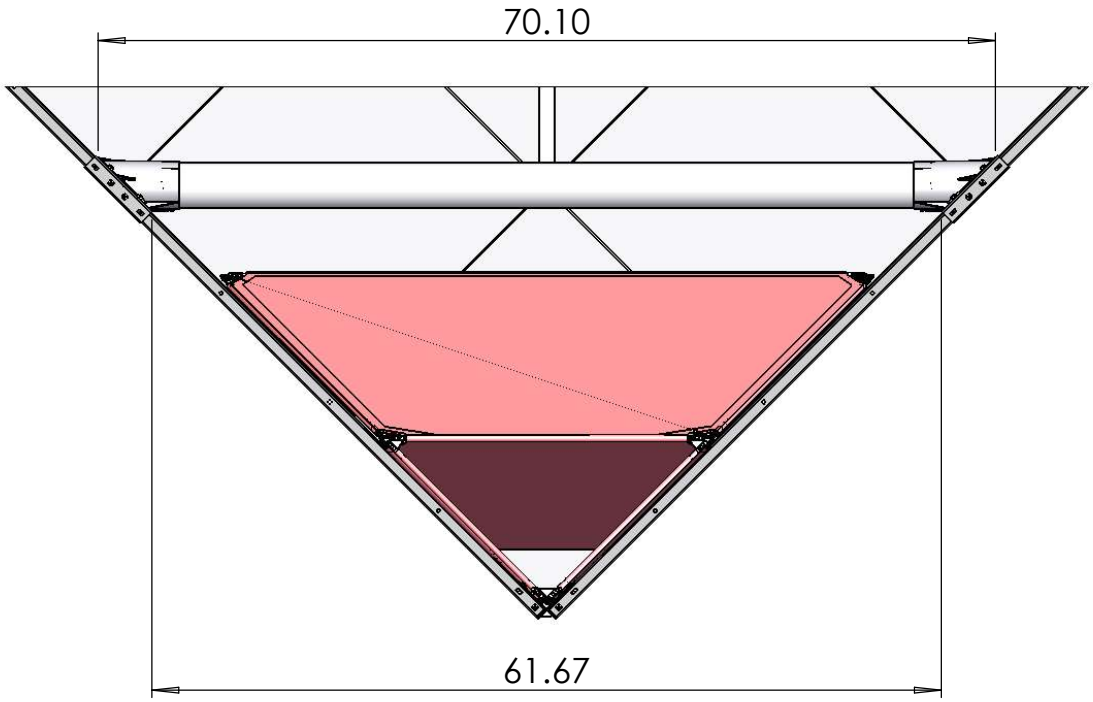
VEX ROBOTICS COMPETITION	Description	Field Details	
	Dwg No	15-16 Field Specs Rev1	
	Competition	VRC 2015-2016	Sheet 2 of 8
	Release	6/3/2015	ALL DIMENSIONS ARE IN INCHES.



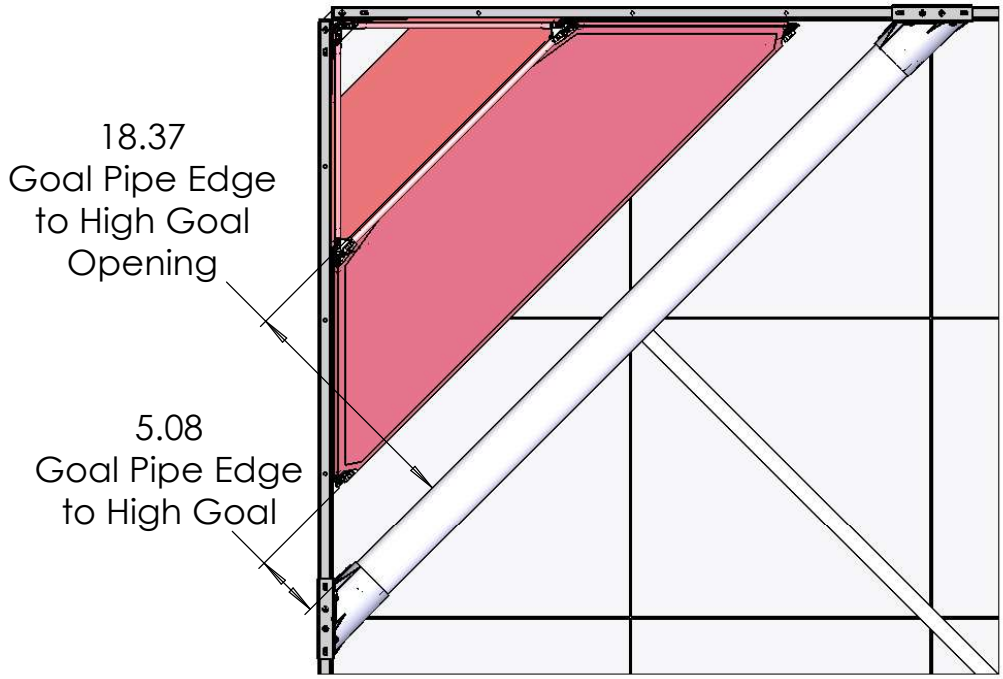


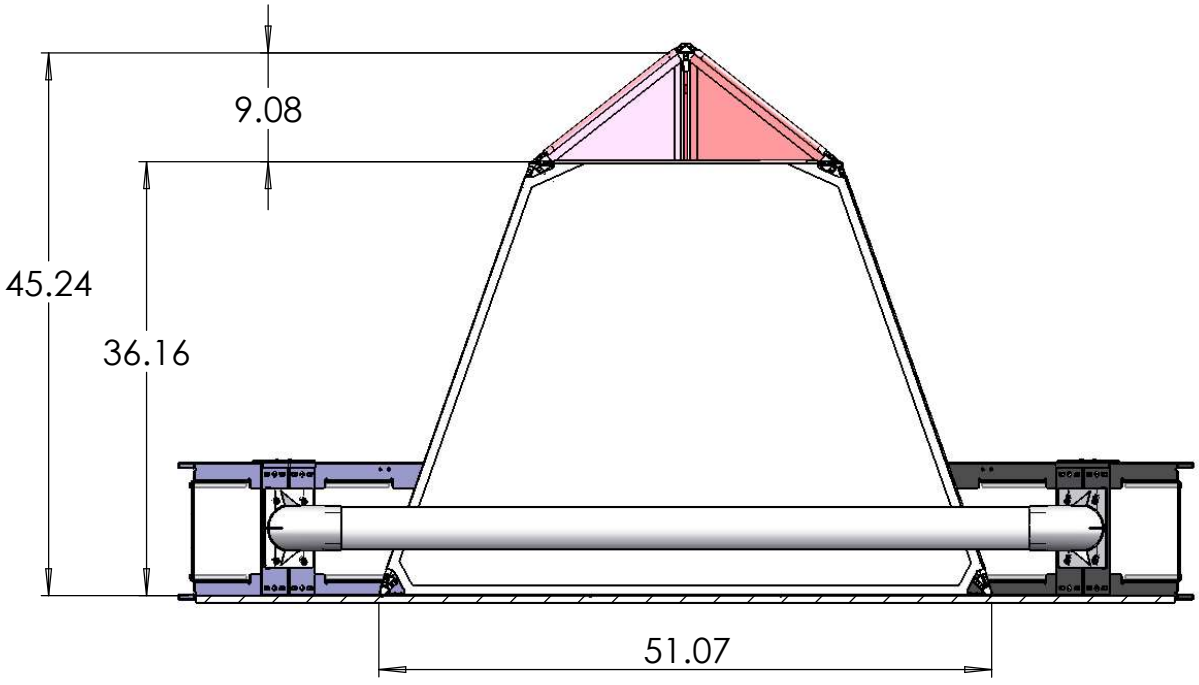
Description	Game Piece Locations		
Dwg No	15-16 Field Specs Rev1		
Competition	VRC 2015-2016	Sheet 3 of 8	
Release	6/3/2015	ALL DIMENSIONS ARE IN INCHES.	



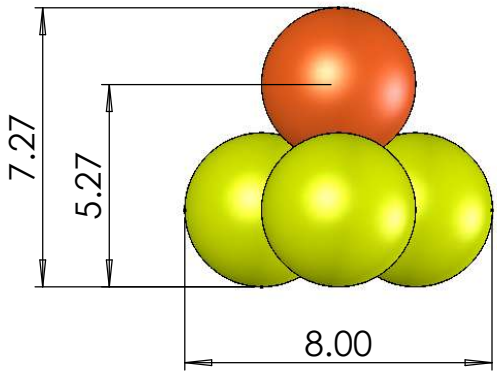


Goal Pipes are made of 3" (3.5" OD) Schedule 20 PVC.



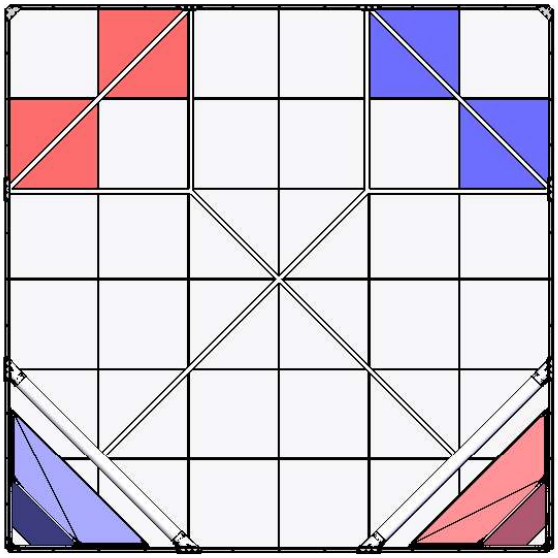


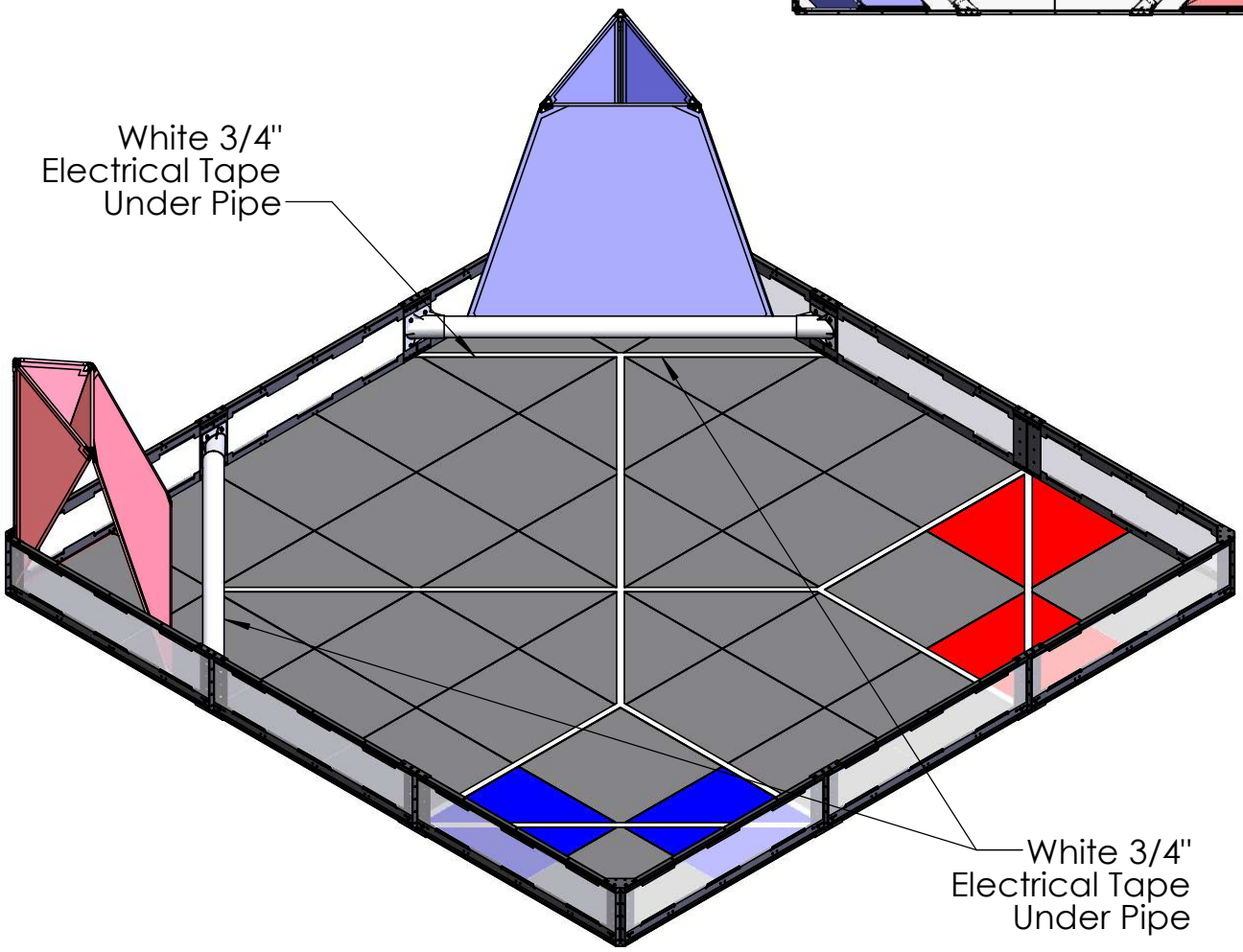
Description	High Goal Specs		
Dwg No	15-16 Field Specs Rev1		
Competition	VRC 2015-2016	Sheet 5 of 8	
Release	6/3/2015	ALL DIMENSIONS ARE IN INCHES.	



There are (94X) Balls and (10X) Bonus Balls on the Field. Each Ball weighs 0.115lbs ±15%. Ball dimensions may vary by as much as 1/8".

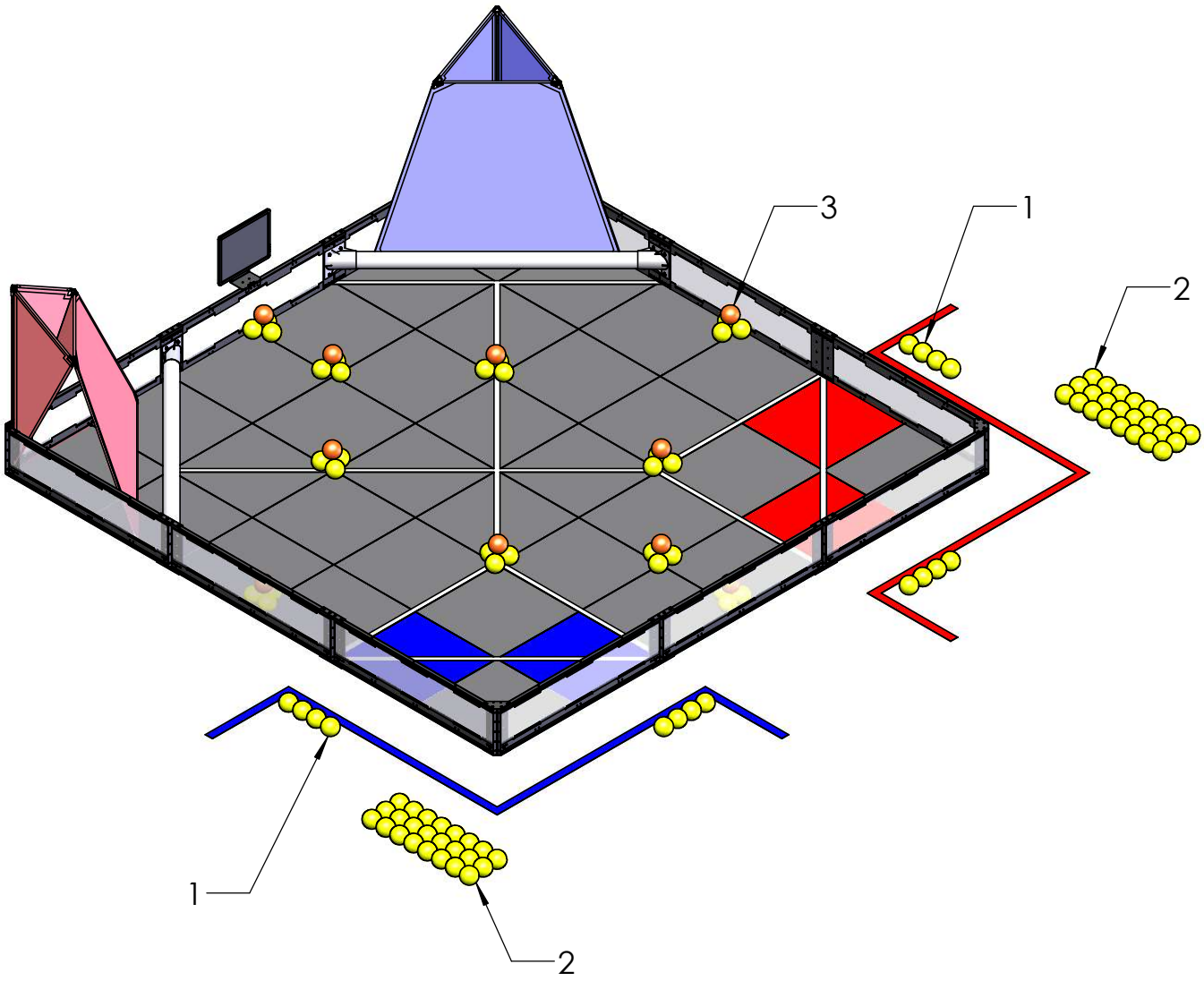
There are (10X) strips of White 3/4" Electrical Tape running across the Field, as shown below.





The Balls are placed as follows before the start of each match.

1. There are (2X) sets of (4X) Balls for Preload in each Alliance Station
2. There are (24X) Balls in a bag in each Alliance Station
3. There are (10X) stacks of Balls placed around the Field, as shown. These stacks are centered on Tile junctions or seams.

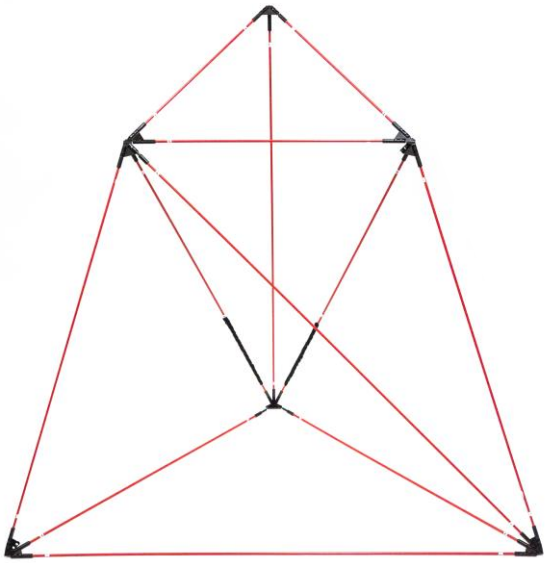


Field Assembly

Introduction

This section will detail the steps required to construct the competition field for the *VEX Robotics Competition - Nothing But Net*. The field utilizes the "VEX Competition Field Perimeter" (278-1501). For specifications and instructions for assembling this frame, please refer to the separate "VEX Competition Field Perimeter" manual.

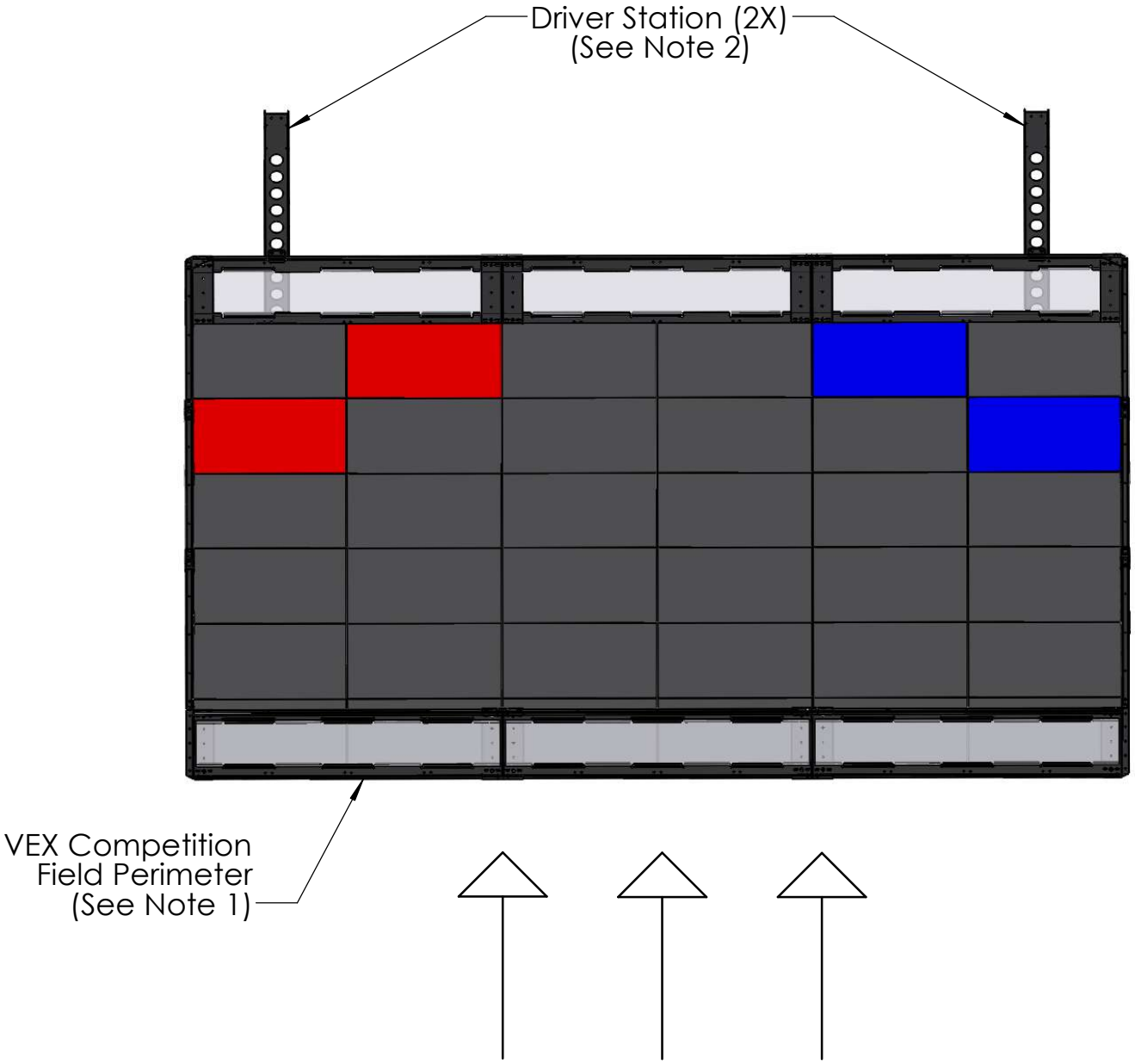
Also refer to the separate low-cost field document, which provides lower cost options to teams not needing a full "official" competition field.



Tools Required

The following tools are required for assembly of the official *VEX Robotics Competition - Nothing But Net* field:

- 5/32" Allen Wrench
- Phillips Head Screw Driver
- Side Cutters or Scissors (for cutting zip ties)
- Sharp Knife or Razor Blade (for cutting foam tiles)



CROWD VIEW

Notes:

1. Assemble the VEX Competition Field Perimeter (see separate VEX Competition Field Perimeter assembly instructions.) Position the Perimeter such that one side is "facing" the crowd.

2. Attach the Driver Station Posts as shown. (~1ft off Field Perimeter edge opposite of the crowd.) Instructions for assembly are included with the VEX Competition Field Perimeter Instructions.

3. Assemble the Foam Tiles inside the Perimeter. Refer to sheets 2-3 of this document for instructions.

Before assembling the Foam Tile Floor, some Tiles will need to be modified. There are 3 types of Tiles.

IMPORTANT:
BEFORE MODIFYING ANY TILES, CHECK TO ENSURE YOUR SET OF TILES NEEDS MODIFICATION.

Foam Tile modification has changed since previous years. Use a razor or sharp knife to remove only 1/2 of each tab as described below.

Cut off 1/2 of each tab on this side

(4X) Corner Tiles (C)
Corner tiles have their interlocking tabs cut away on TWO adjacent edges. These will be used in the (4) corners of the Field.

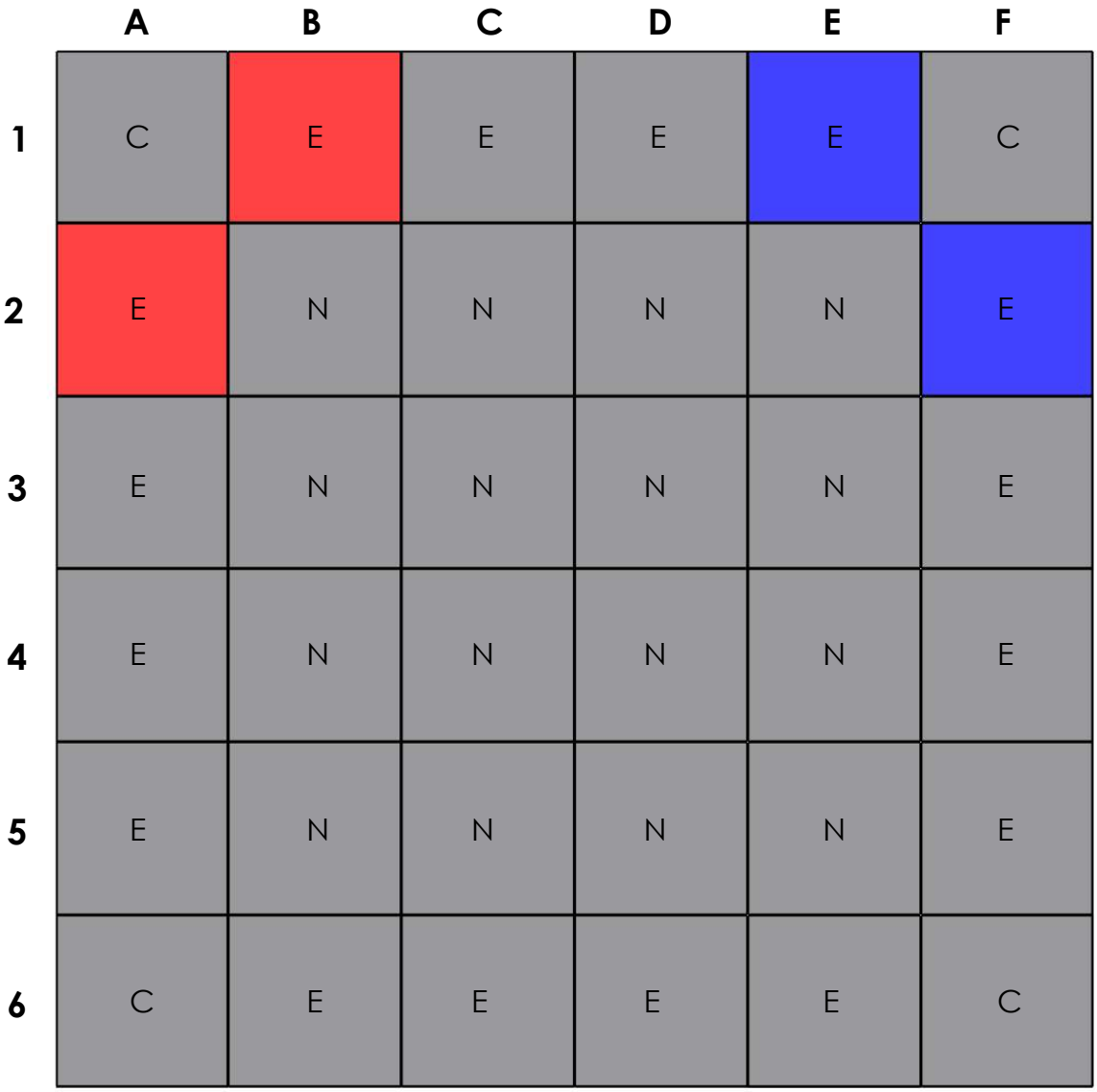
(16X) Edge Tiles (E)
(2X) Red Edge Tiles
(2X) Blue Edge Tiles
(12X) Gray Edge Tiles

Edge Tiles have their interlocking tabs cut away on ONE edge. These will be used along the edges of the Field.

(16X) Normal Tiles (N)
Normal Tiles are unmodified. Normal Tiles are used on the "inside" of the Foam Tile Floor.

Note:
Older Tiles may need more than 1/2 of each outside tab removed.

Letters in parenthesis are for reference on next page.



Assemble Foam Tiles as shown above.
The "smooth" side of the Tiles should be up, and the "textured" side down.
The Tiles should be assembled "in-place", with the Field Perimeter.

The "Blue" and "Red" Edge Tiles should be placed as shown above.

The grid-lines are for reference only.

Note:
The Tile grid can be labeled on a coordinate system horizontally with letters A-F and vertically with numbers 1-6.
If you label the back of your Tiles in this manner it will make it easier to reassemble your Field later.

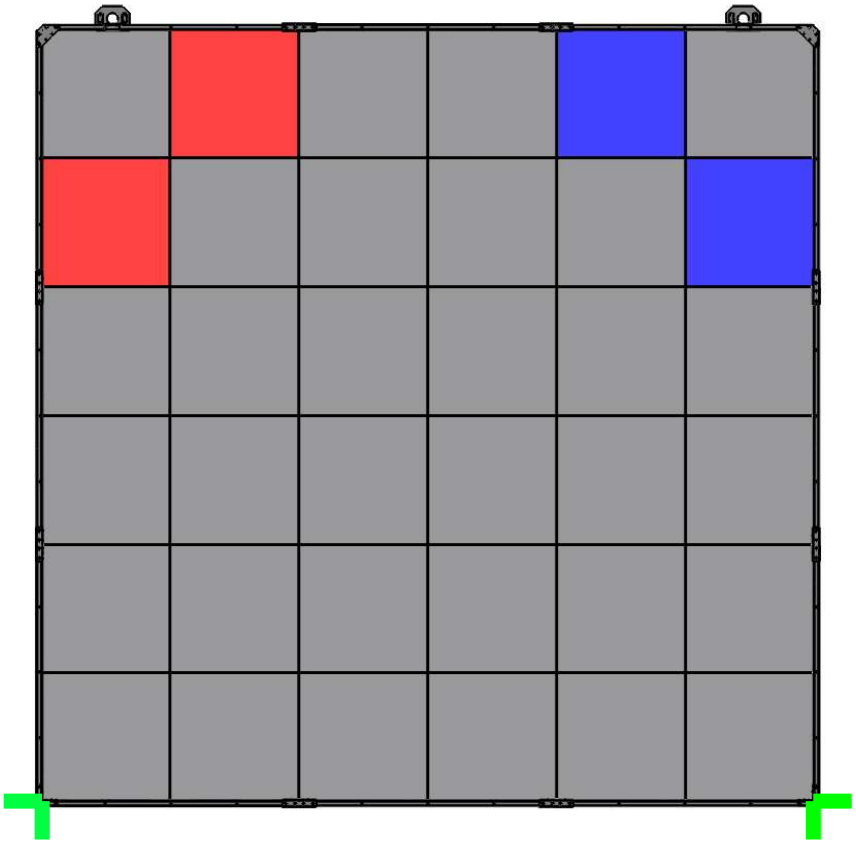


Image A

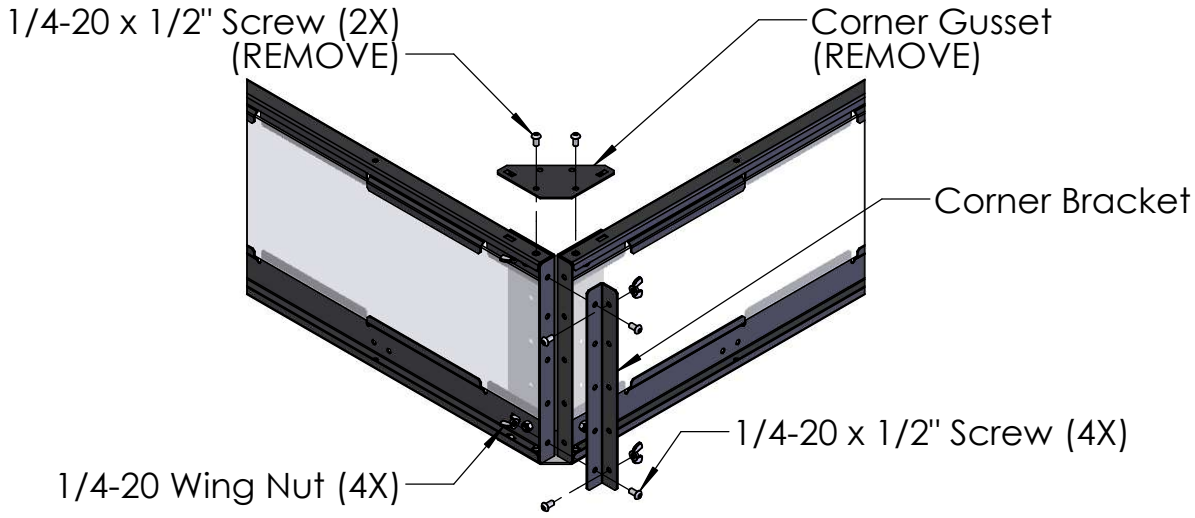
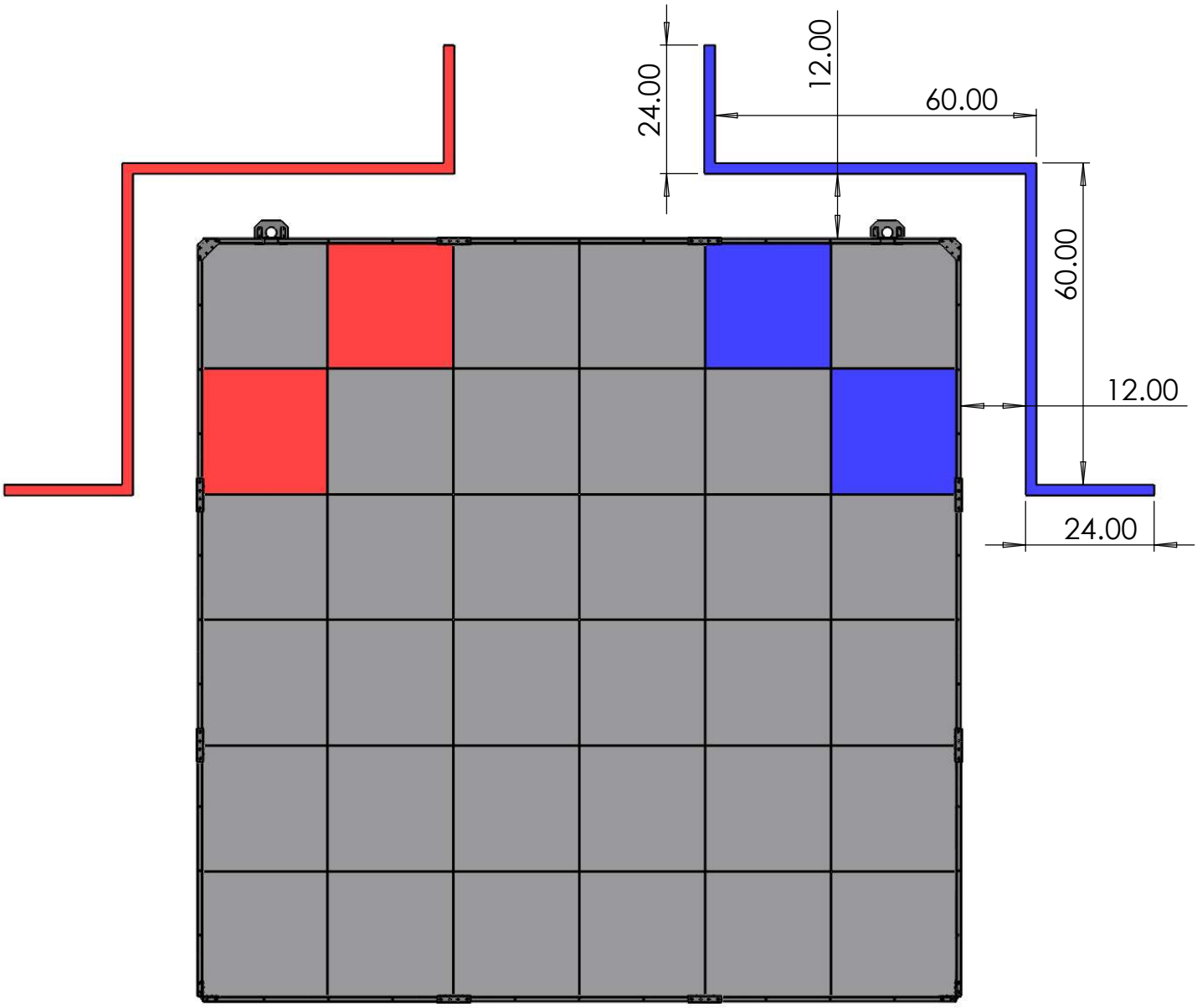


Image B

When assembling the Field Perimeter, (2X) Corner Brackets must be installed in the corners highlighted in Image A. The Corner Gussets from these locations are not used and can be stored elsewhere.

Use (4X) 1/4-20 x 1/2" Screws and (4X) 1/4-20 Wing Nuts to secure each Corner Bracket as shown in Image B.



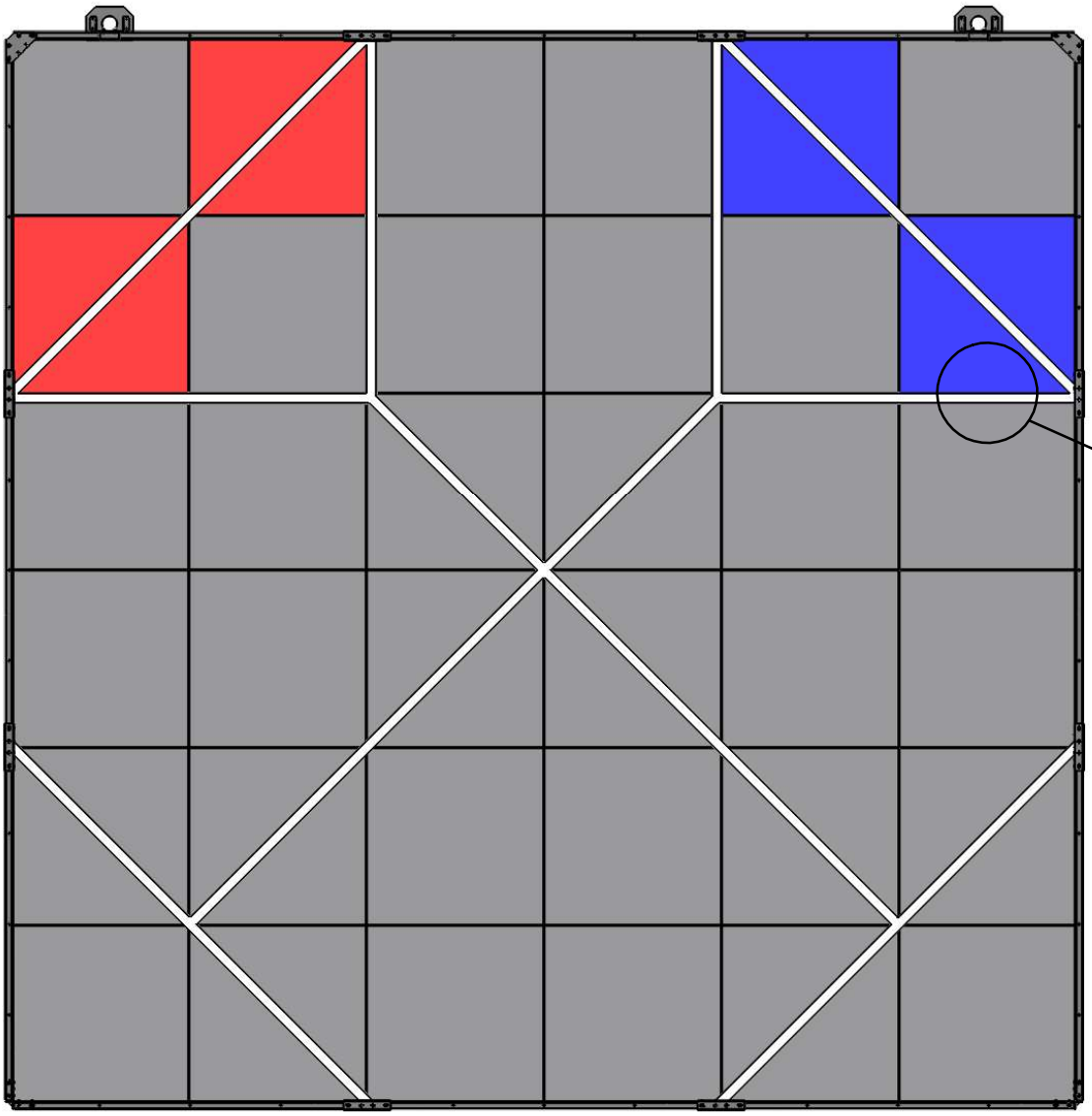
CROWD

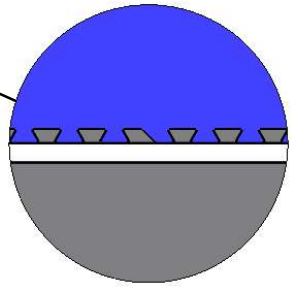
Once the Field Perimeter is in place, mark off the Alliance Stations using Red and Blue Tape as shown above.

Do not close the Alliance Stations.

The outside edges of the Alliance Stations should be in line with the edges of the corresponding colored tiles.

There are (10X) strips of White 3/4" Electrical Tape running across the Field, as shown.
The Tape Lines should be centered across the Tiles that they lay on or centered along the seam





The tape forming the square should be entirely on the gray tiles

IMPORTANT NOTE:
DO NOT stretch the Tape when applying to the Foam Tile Floor. For best results, smooth out any bubbles that form during application..

To prevent tape lines from being pulled up during competition, it is recommended that the ends of the tape are tucked into Tile seams.

Pro-Tip:
If the Tiles are to be used at multiple events, it is not necessary to remove the Tape. Simply cut the Tape at the Tile seams and note the order of the Tiles when they are stored.

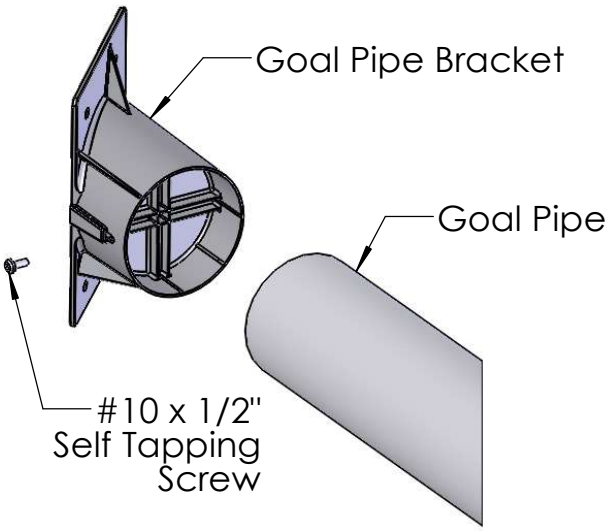


Image A

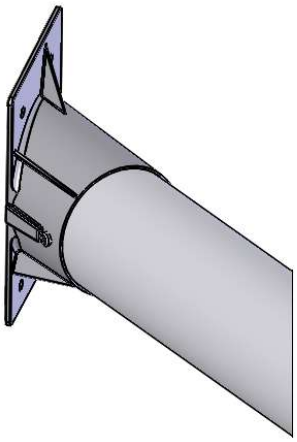


Image B

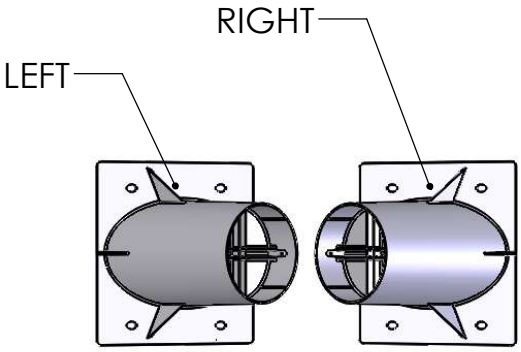


Image C

Use (1X) #10 x 1/2" Self Tapping Screw to attach each Goal Pipe to a Goal Pipe Bracket, as shown in Images A & B. A pilot hole may be drilled in the Goal Pipe to assit with screw insertion.

There are (2X) different Goal Pipe Brackets. Each type has either LEFT or RIGHT printed as shown in Image C. One Left Goal Pipe Bracket and one Right Goal Pipe Bracket are required for each Goal Pipe Assembly.

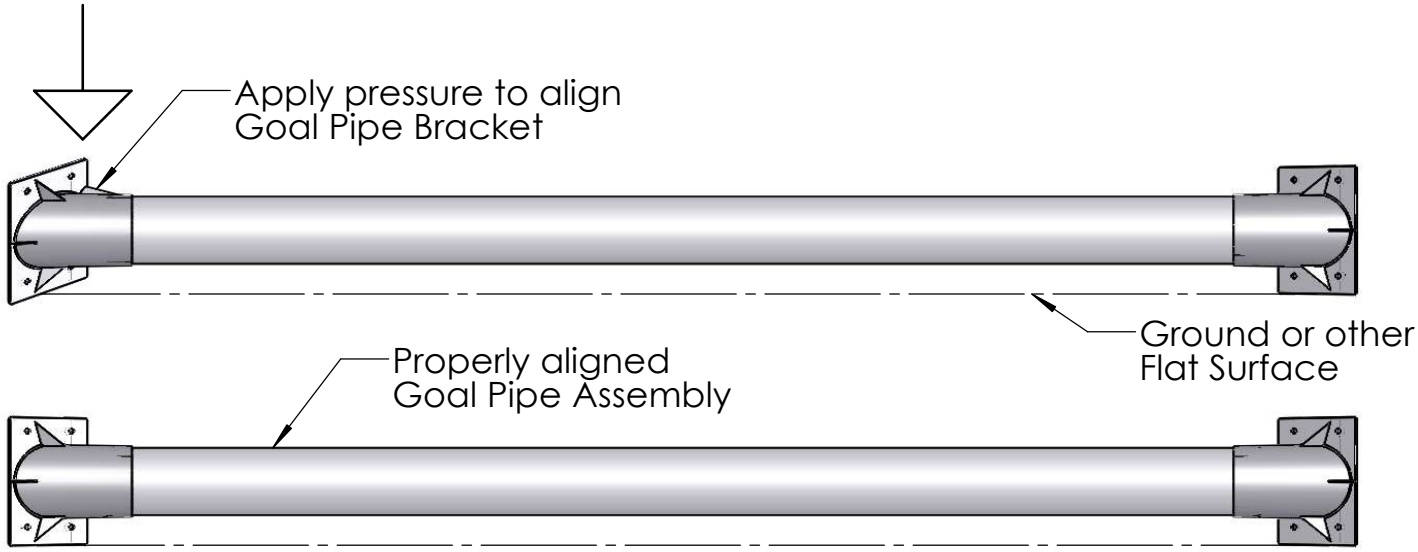


Image D

Loosely attach a second Goal Pipe Bracket to the other end of the Goal Pipe. Apply pressure on the top of the Bracket to straighten and align the Goal Pipe Brackets as shown in Image D before securing with (1X) #10 x 1/2" Self Tapping Screw.

(Optional): A 1/8" pilot hole may be drilled in the Goal Pipe to assist with screw insertion.

Repeat for a total of (2X) Goal Pipe Assemblies.

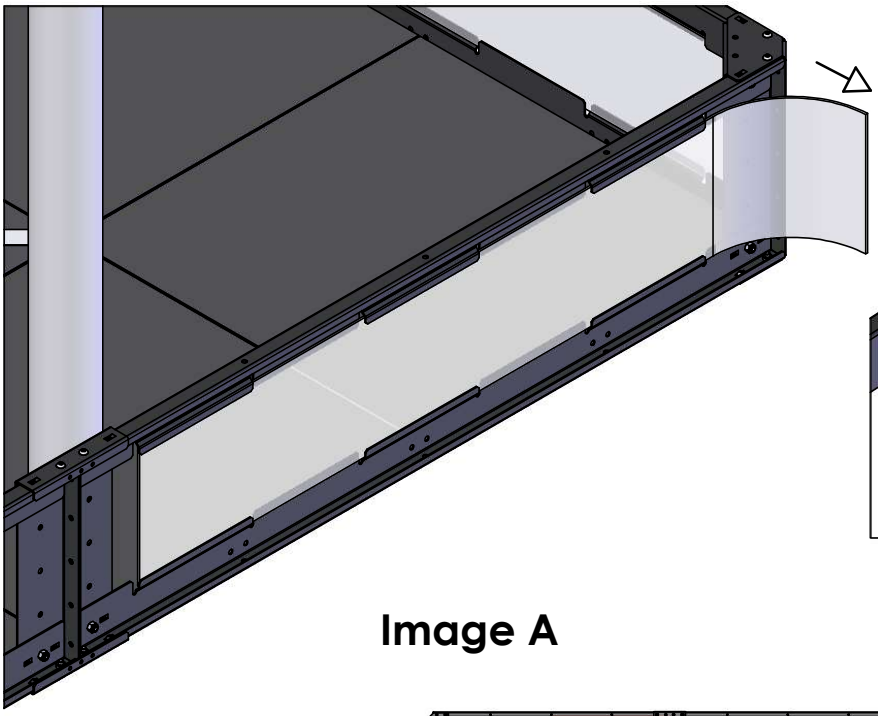


Image A

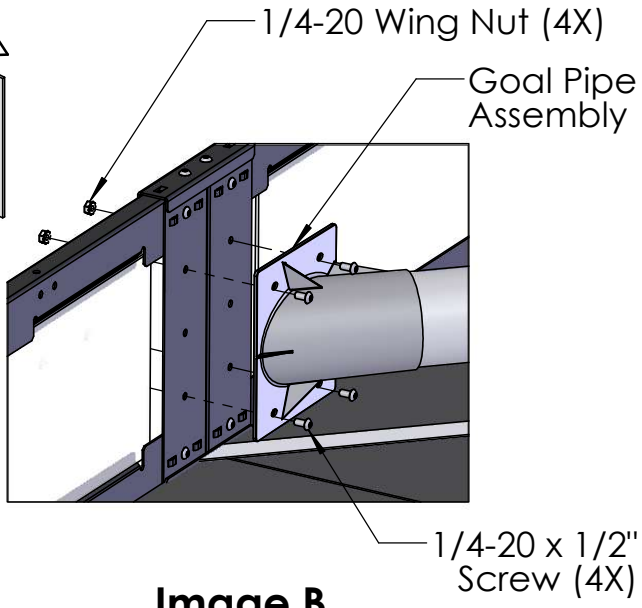


Image B

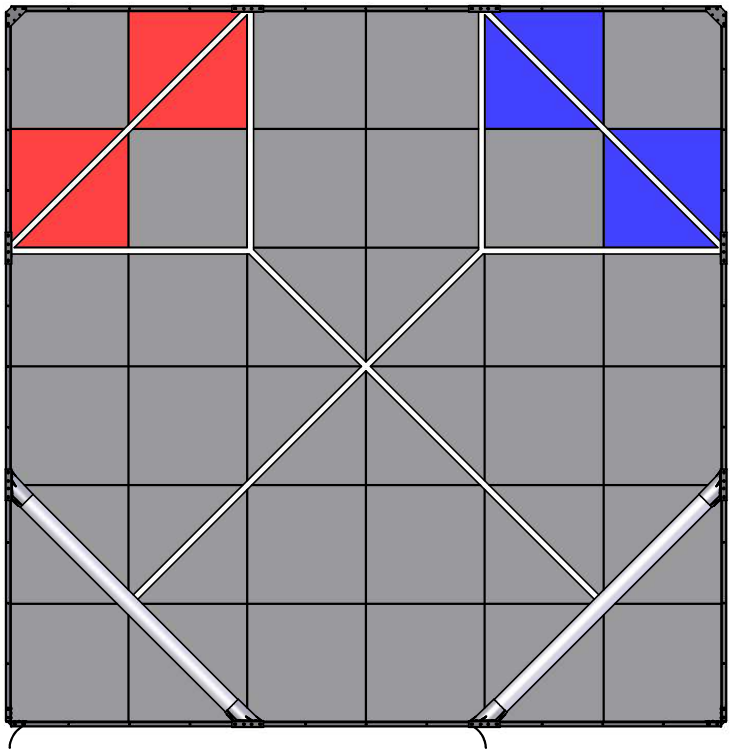


Image C

Slide the Lexan panel out of the Field Perimeter as shown in Image A. Then use (16X) 1/4-20 x 1/2" Screws and (16X) 1/4-20 Wing Nuts to mount (2X) Goal Pipe Assemblies to the Field Perimeter as shown in Images B & C (Wingnuts on the outside of the field).

After Goal Pipe Assemblies have been installed, return each Lexan panel to its original position.

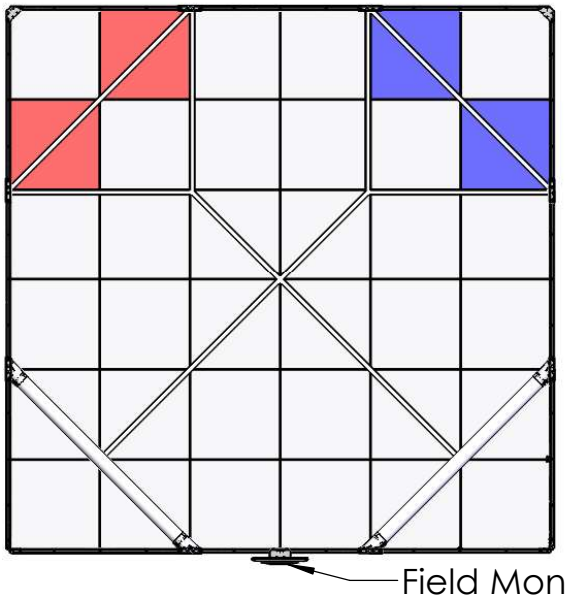


Image A

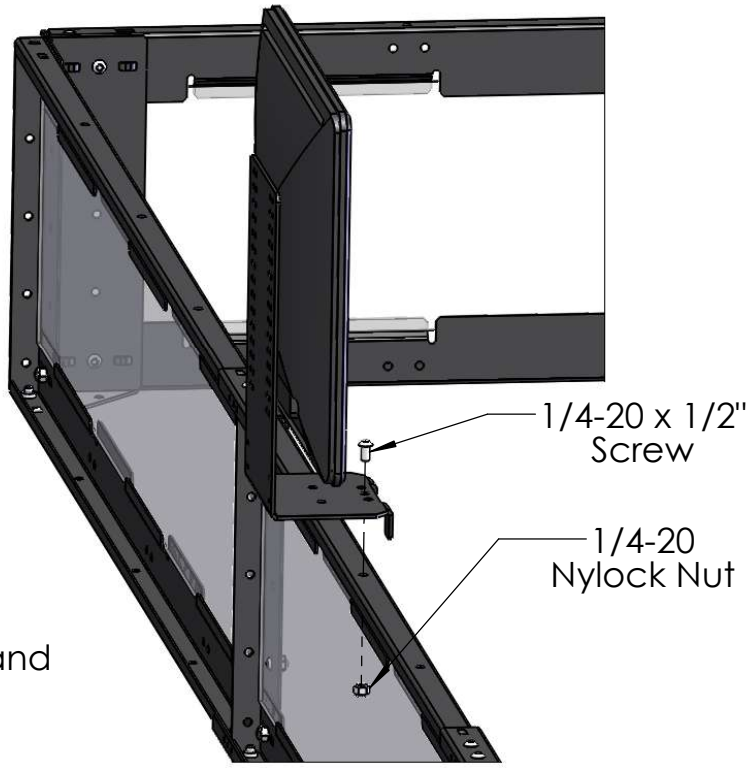


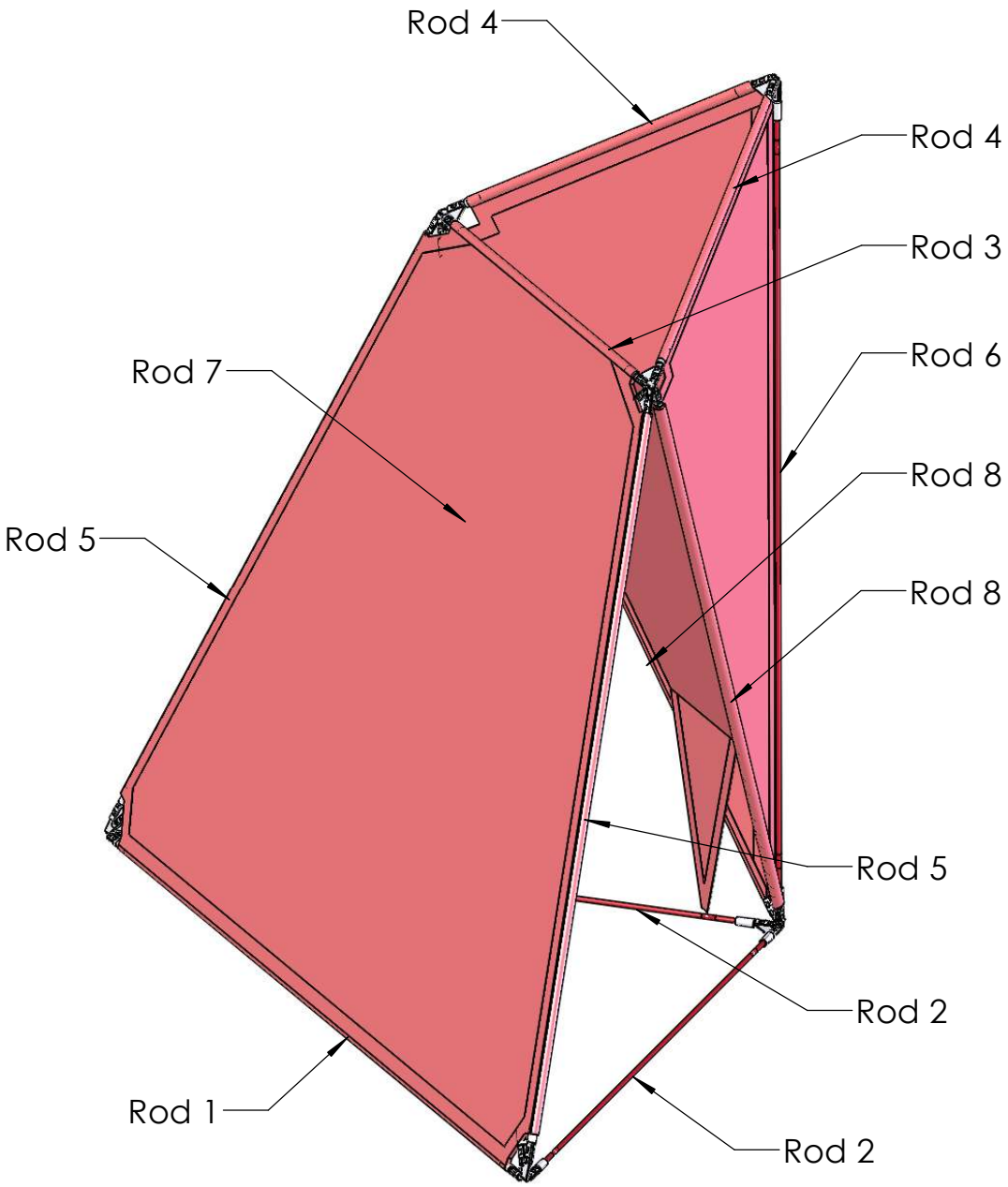
Image B

[Optional]: For events using Field Monitors.

Place the Field Monitor Stand with monitor attached in the center of the the wall as shown in Image A. Use a 1/4-20 x 1/2" Screw and a 1/4-20 Nylock Nut to mount the Field Monitor Stand to the Field Perimeter as shown in Image B.

Monitor can be mounted to the stand using the monitor mounting hardware included with the stand.

Note: Field Monitor Mounting is OPTIONAL. Events may use field side displays.



There are a total of (2X) High Goals in VEX Nothing But Net - (1X) for Red Alliance and (1X) for Blue Alliance. There are (4X) different Fiberglass Rod Corner Connectors and (8X) lengths of Fiberglass Rod in locations indicated above.

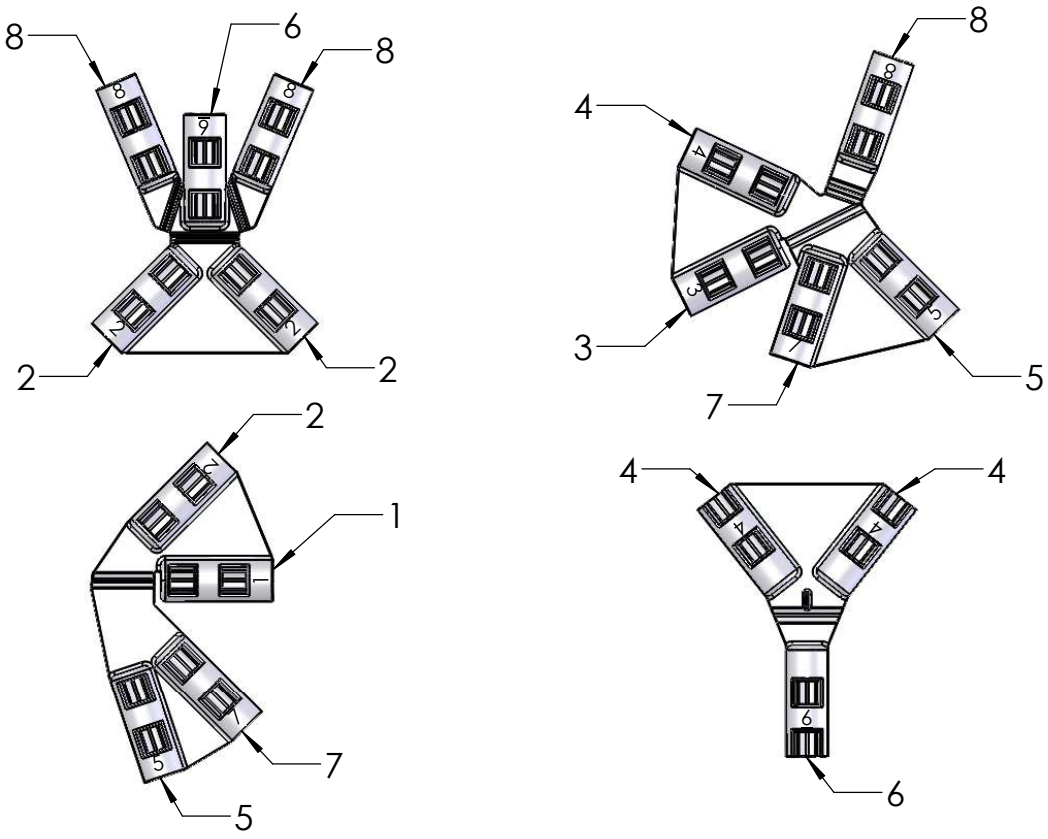


Image A

There are 4 different Rod Corner Connectors and 8 lengths of Fiberglass Rod. Each Corner Connector has a number printed on the Rod Receptacle as shown in Image A.

Each Fiberglass Rod has a number labeled in 2 locations along its length. **In ascending order, match the number on the Rod to the number on the Rod Corner Connectors.** All Fiberglass Rods except both Rod 8's are assembled flat on the ground as shown in Image B.

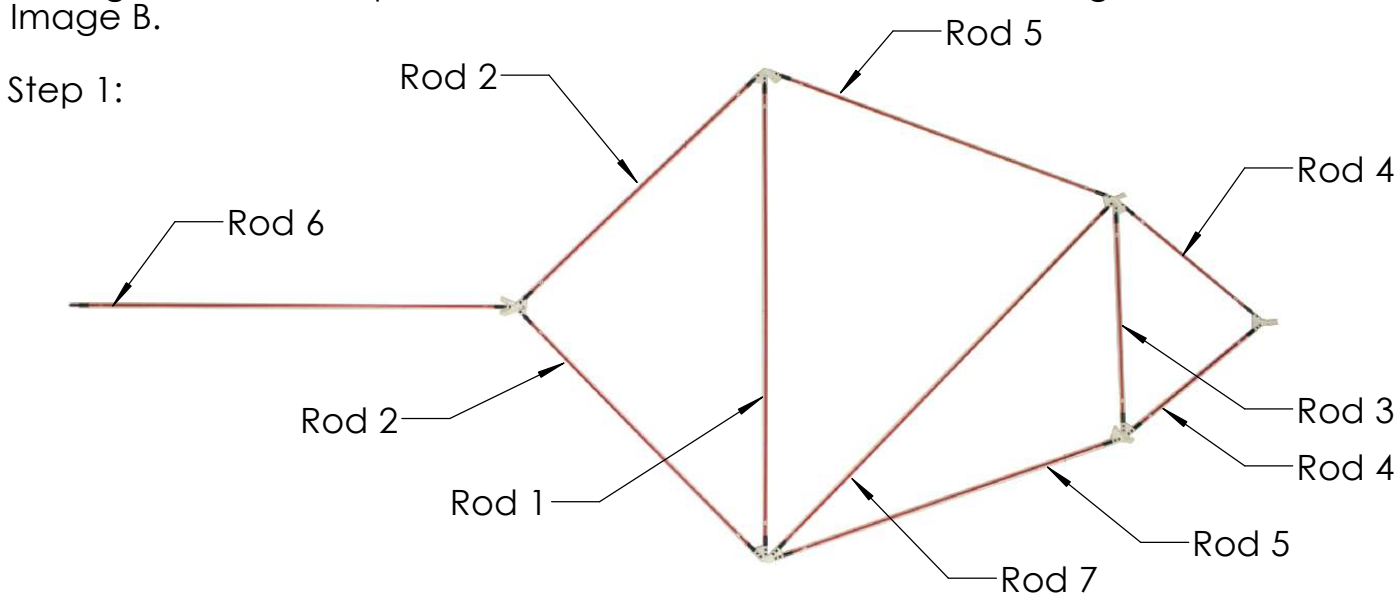


Image B

Once the Goal is assembled flat, connect the free end of Rod 6 into the top gusset as shown in Image C. The High goal will now approximatly the correct shape.

Step 2:

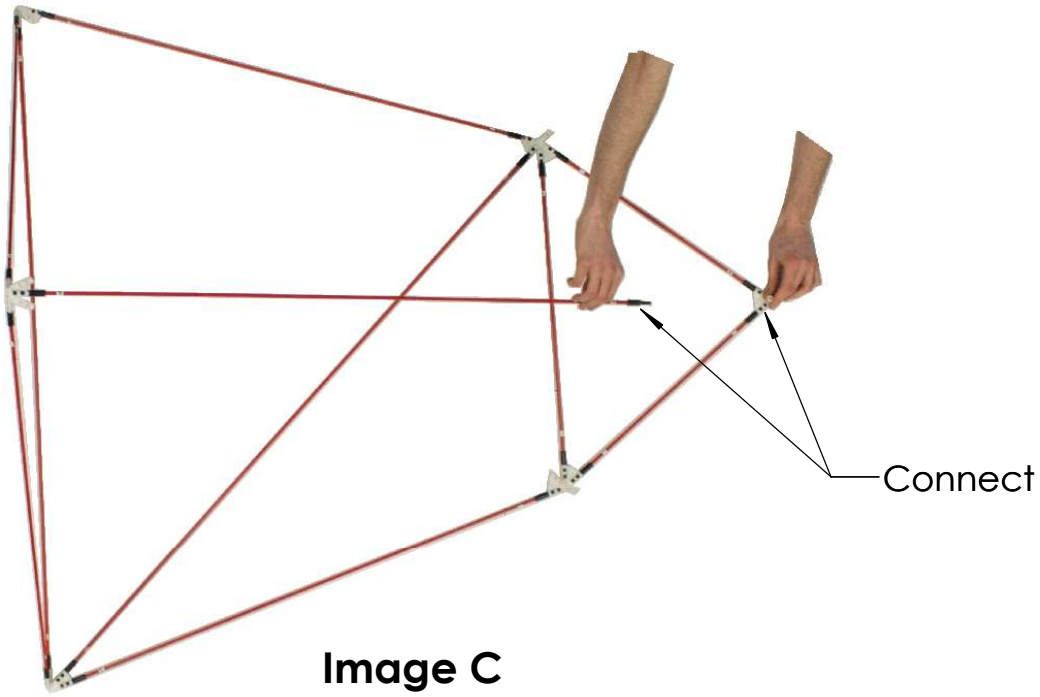


Image C

Finally, both Rod 8's must be inserted into the remaining open connectors as shown in Image D. The High Goal is now the correct shape and the net can be put on.

Step 3:

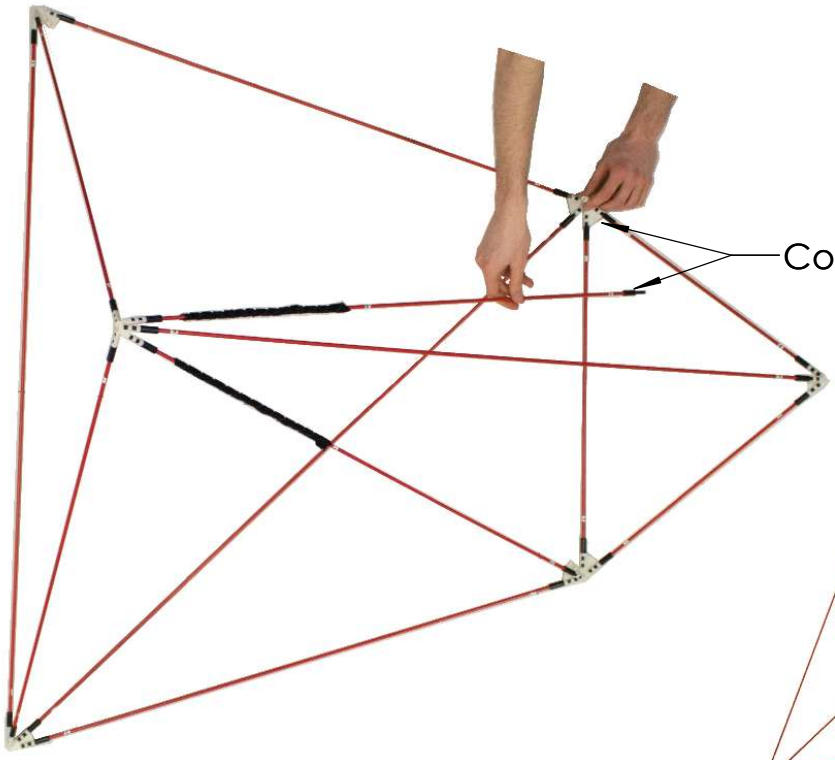
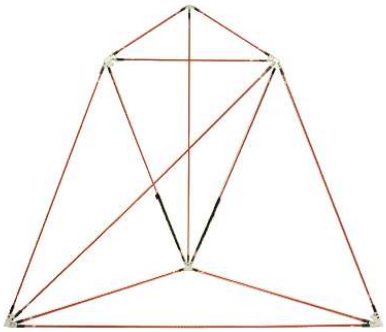


Image D



Completed Frame

Goal Net Installation

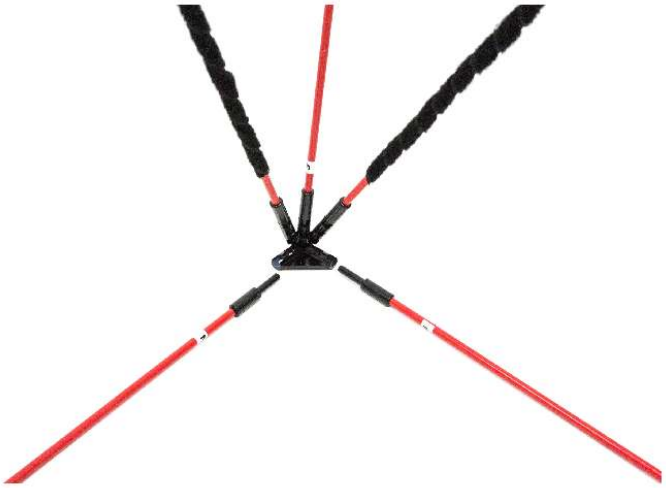


Image A

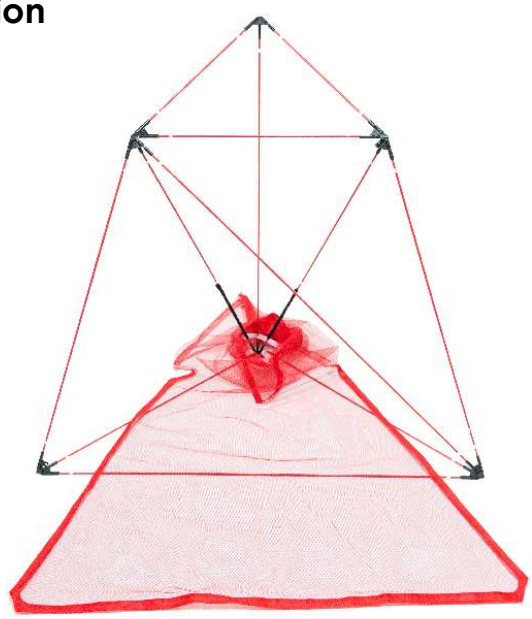


Image B

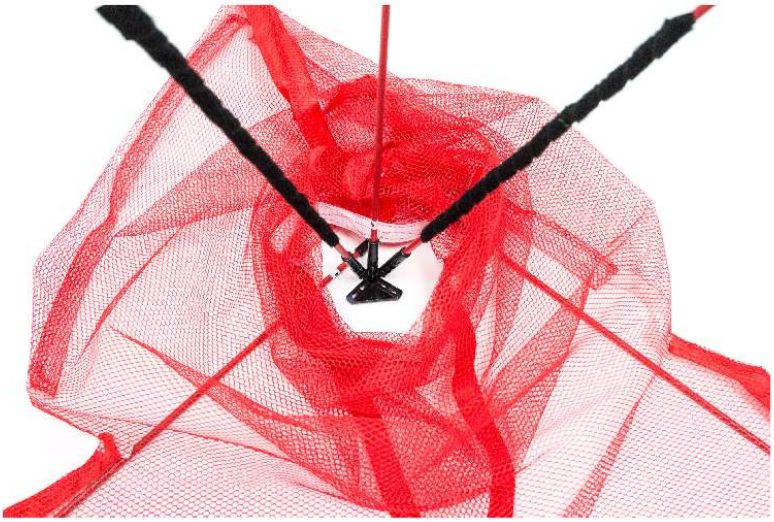


Image C

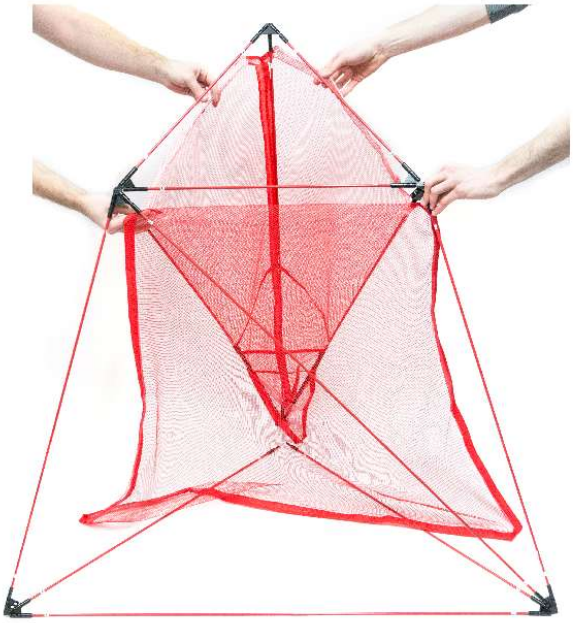


Image D

Step 4: Remove (2X) Rod 2 from the lower rod receptacle at the back of the Goal per Image A.

Step 5: Orient the Goal Net as shown in Image B. Bunch the "rear" part of the Goal Net to create a thru-hole as shown in Images B and C.

Step 6. Place the rear Rod Receptacle in the Goal Net as shown in Image C.
Then reattach (2X) Rod 2.

Step 7. Bring the Goal Net up around the Goal as shown in Image D.

See next page.

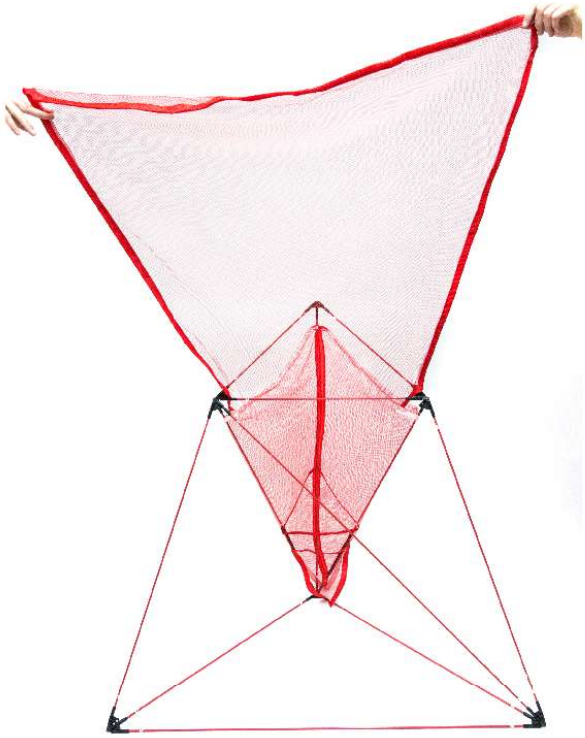


Image E

Image F

Image G

Image H

Image I

Image J

Step 8. Bring the "front" of the Goal Net above the horizontal Rod 4 as shown in Image E.

Step 9. Begin securing the Goal Net to the Frame by wrapping the hook and loop fastener around the rods as shown in Images F and G.

Step 10. Secure the Goal Opening Flaps to the Loop side fastener on the (2X) Rod 8.

Step 11. Your High Goal is completely assembled, see Image J for reference.

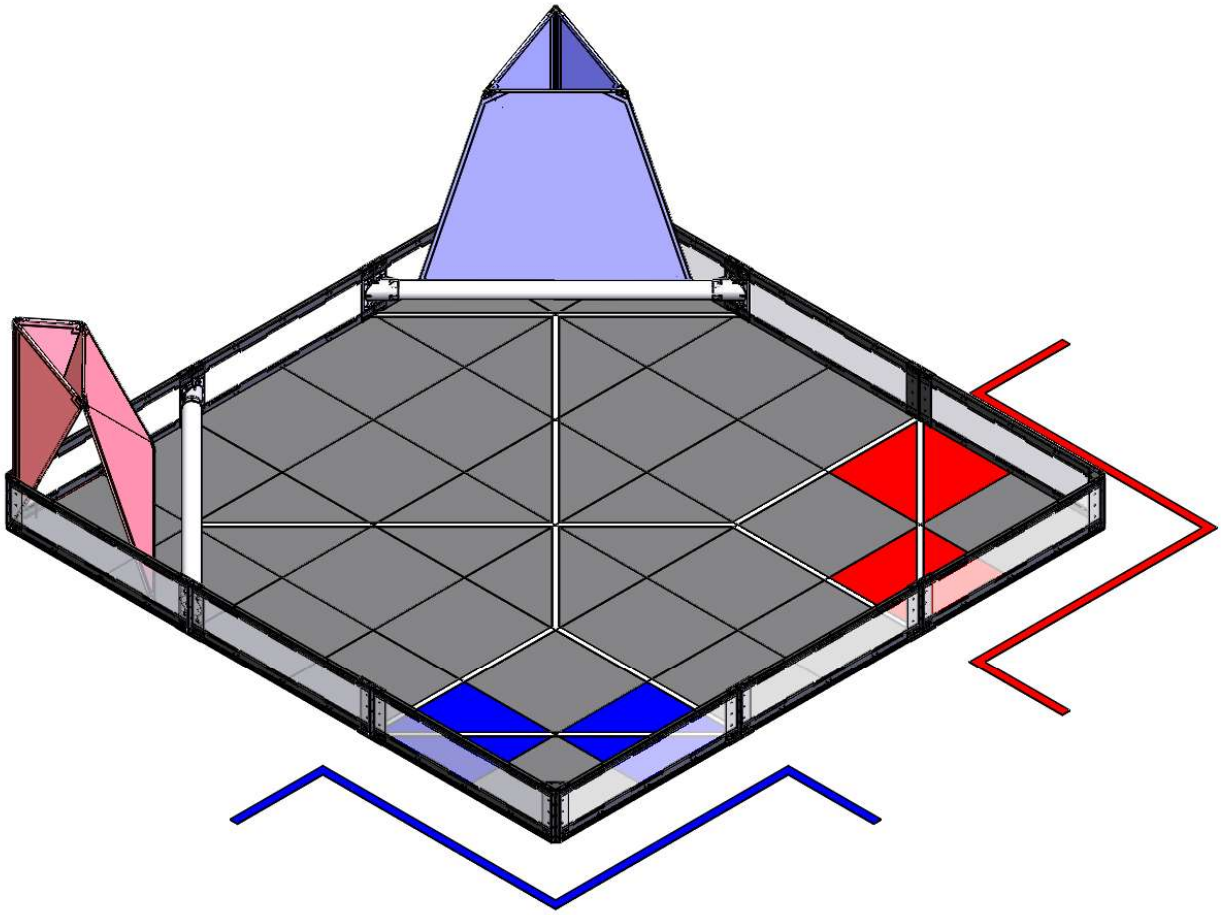
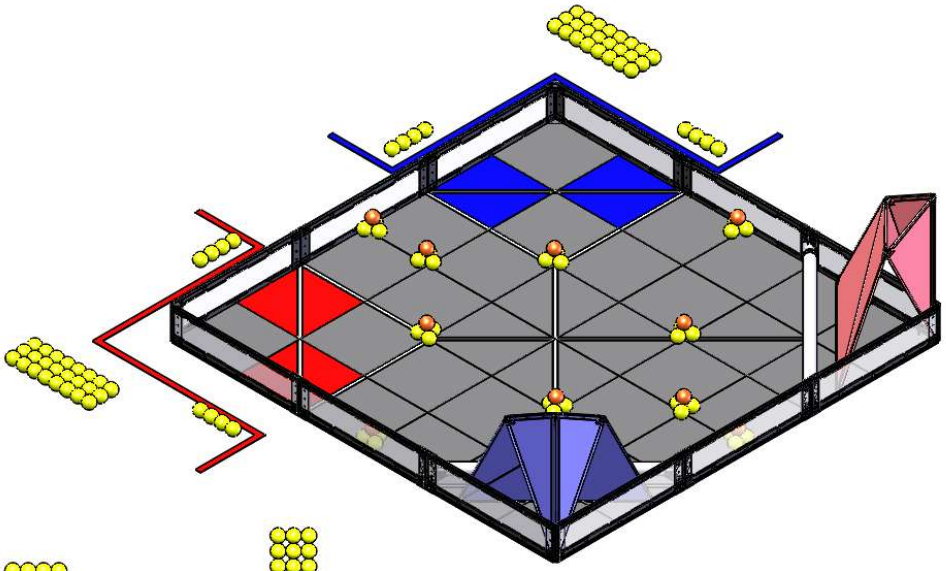
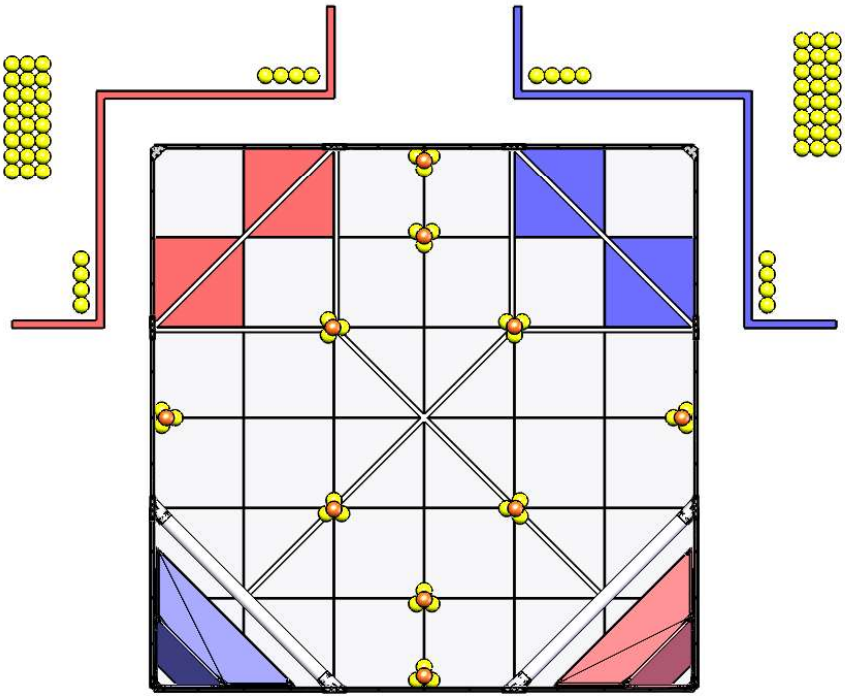


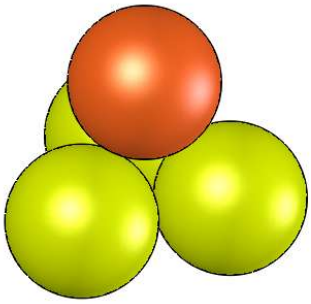
Image A

Image B

Place the (2X) High Goals onto the field as shown in Image A. Secure the High Goals using (4X) Zip Ties as shown in Image B.







Place the green Balls and orange Bonus Balls on the Field in the positions shown. Please note that the six (6) piles of balls not adjacent to a wall may be placed in a random orientation, as long as the pile maintains the same shape and is approximately centered on the junction of the foam field tiles.
(i.e. the piles may rotated from what is depicted above)

Place (24X) green Balls in a Bag located in each driver station.

Tip: For easy transportation and storage, High Goals can be disassembled and stored inside their respective Goal Pipes.

Refer to the Nothing But Net Game Manual for more details, including all official rules and regulations.

Also, use the 3D CAD model of the Nothing But Net Field for additional details not shown in the Field Drawings.