



# ***VEX Robotics Competition Starstruck – Appendix A***

## Appendix A – Field Specs & Assembly Instructions



### **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 – Starstruck* 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 – Starstruck* competition manual.

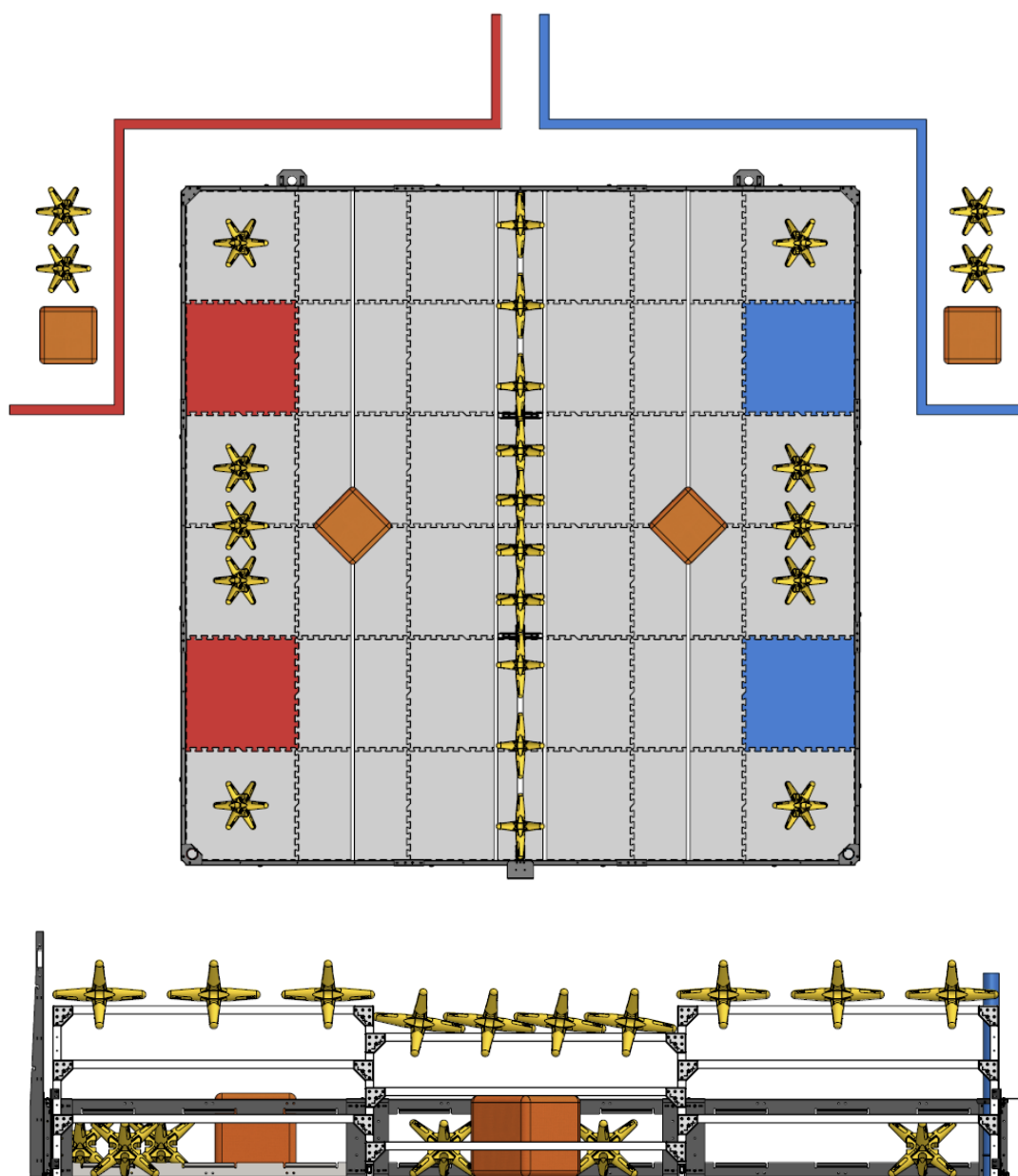
For more information on reducing costs on an unofficial field construction, refer to the accompanying “Low Cost Field” document located online at [vexrobotics.com](http://vexrobotics.com).

# VEX Robotics Competition Starstruck – Appendix A

## Field Overview

The game *VEX Robotics Competition – Starstruck* is played on a 12ft x 12ft foam-mat, surrounded by a sheet-metal and polycarbonate perimeter. In two corners of this field are colored PVC pipes which denote hanging bars. The field is bisected by a *Fence* made of 1.26in square PVC extrusion and plastic gussets. Foam *Stars* and pillow-like *Cubes* are placed across the field and atop the *Fence* throughout.

For more details and specific game-play rules, please refer to the *VEX Robotics Competition – Starstruck* competition manual.



# VEX Robotics Competition Starstruck – Appendix A

## Game Objects & Field Bill of Materials

All of these items are available for purchase from: [www.vexrobotics.com](http://www.vexrobotics.com).

### Generic Field Elements – Reusable Each Year

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

### Official VEX Robotics Competition – Starstruck Specific Elements

Part Number	Description	Quantity per Full Field
276-4848	VRC Starstruck Game Element Kit	4
276-4897	VRC Starstruck Field Element Kit	1

### Practice Elements

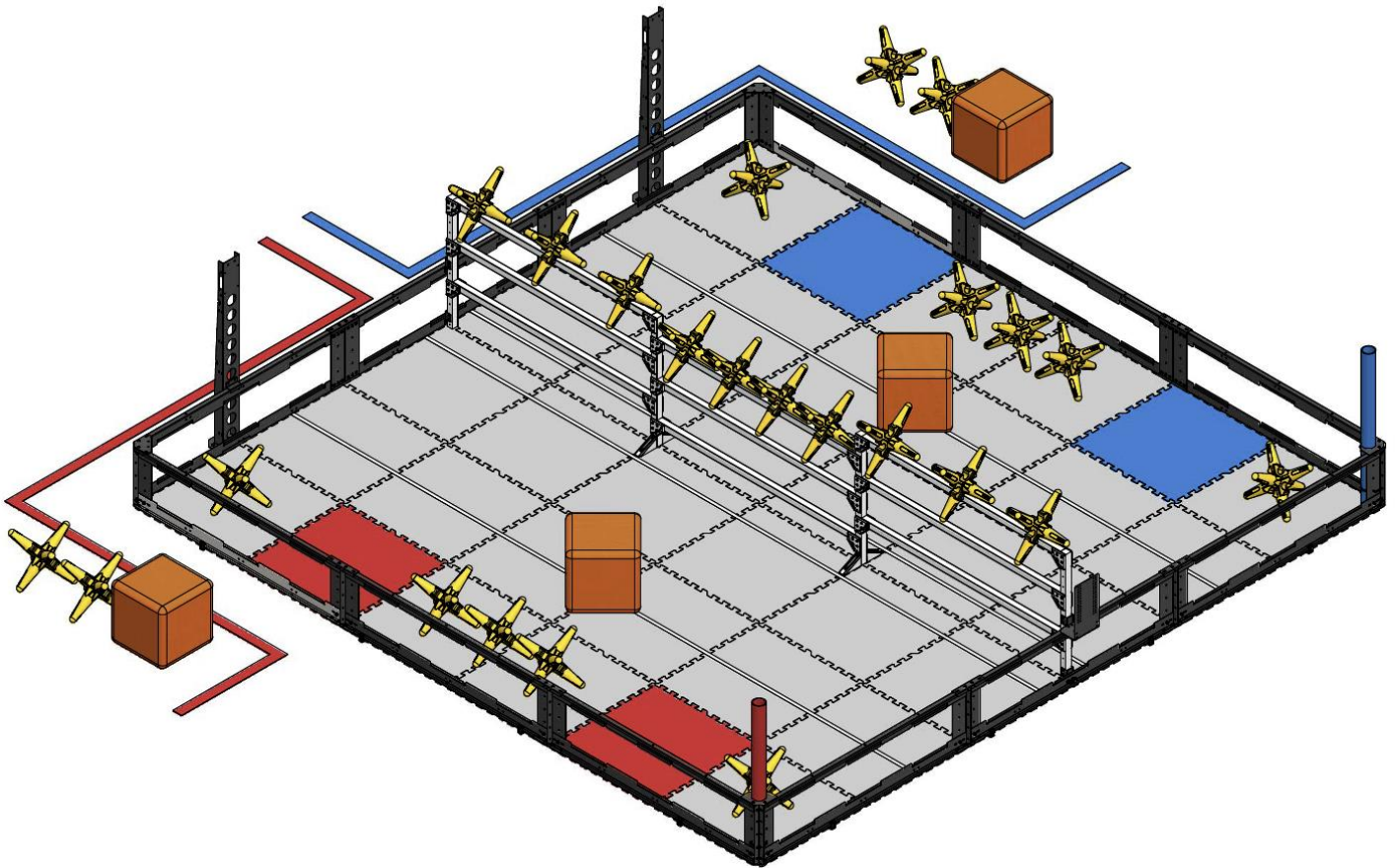
Part Number	Description
276-4848	VRC Starstruck Game Element Kit

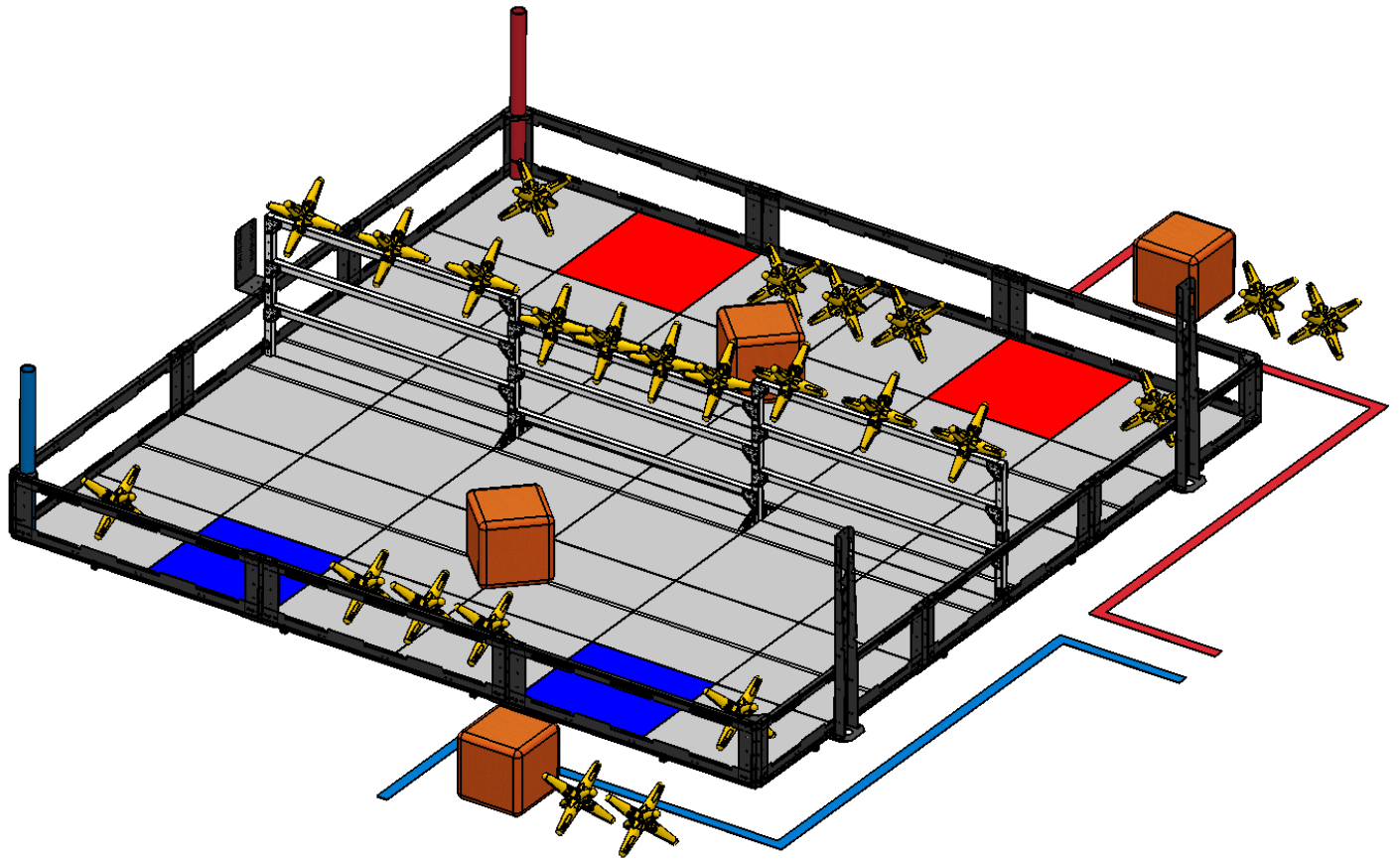
# VEX Robotics Competition Starstruck – Appendix A

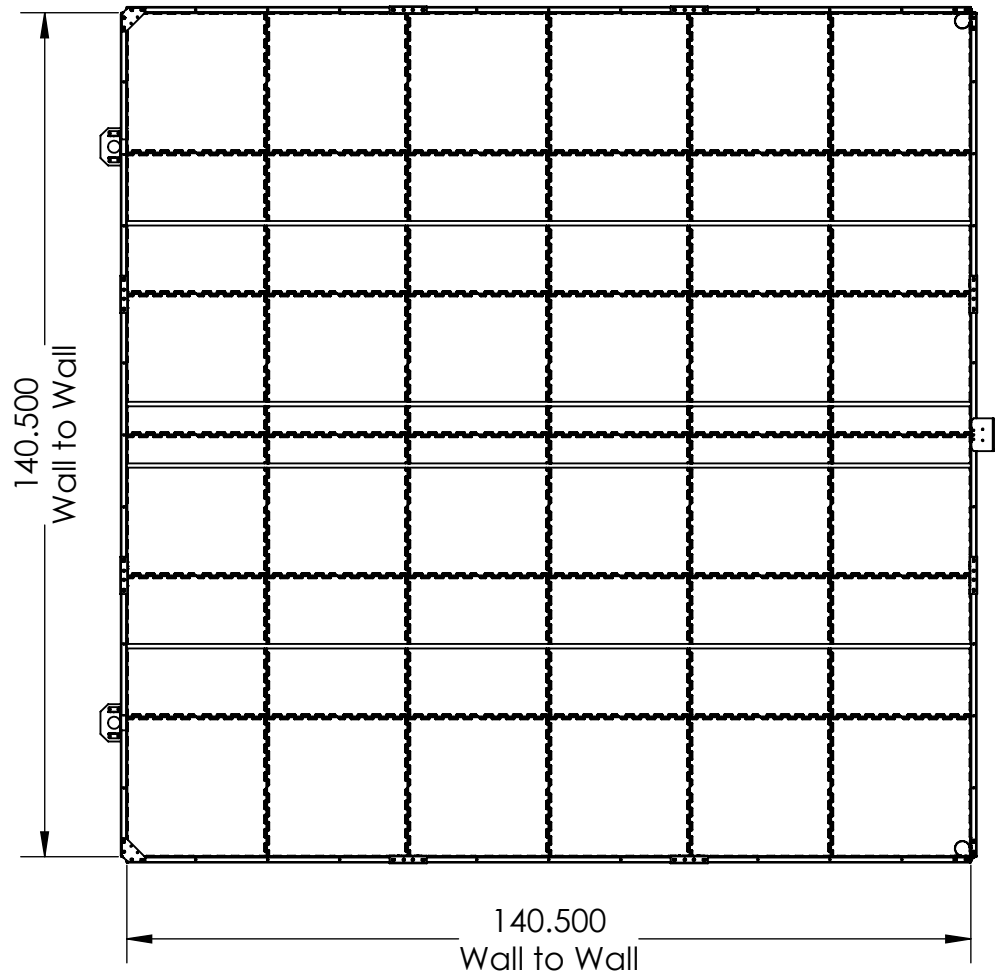
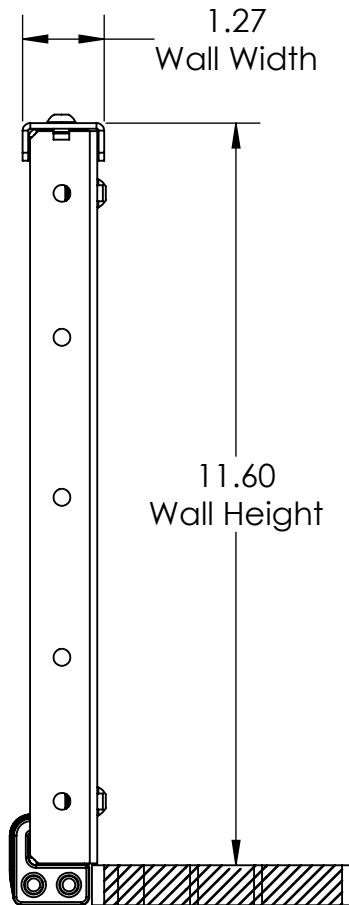
## Field Specifications Introduction

This section will outline the specifications that are most important to teams designing a robot to compete in the *VEX Robotics Competition – Starstruck*. 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 to "virtually" measure whatever dimension is necessary.

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.



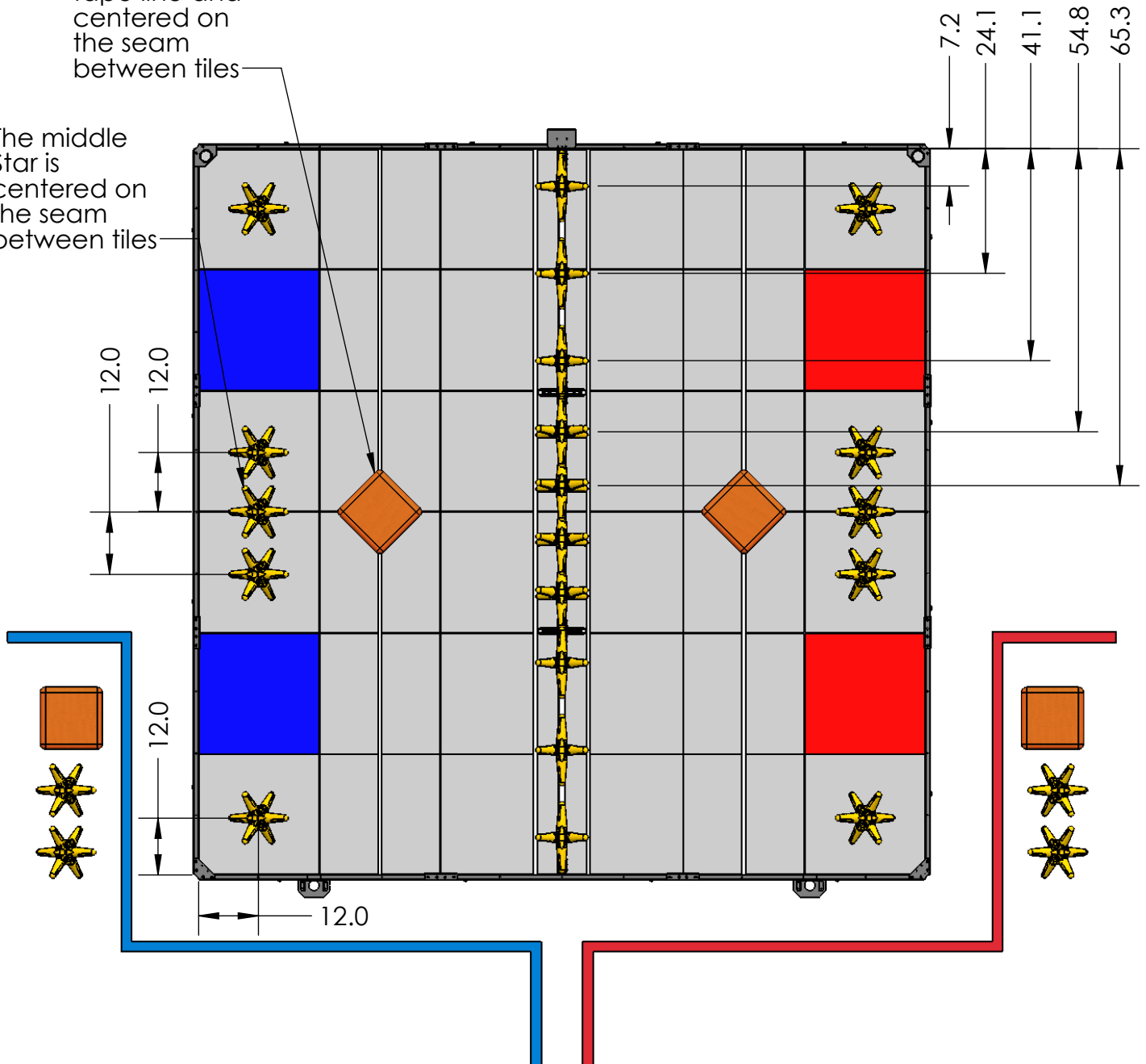




#### Field Critical Dimensions:

- ~140.5" Square Wall-Wall, Inside
- 11.60" Wall Height
- 1.27" Wall Thickness

The middle  
Star is  
centered on  
the seam  
between tiles

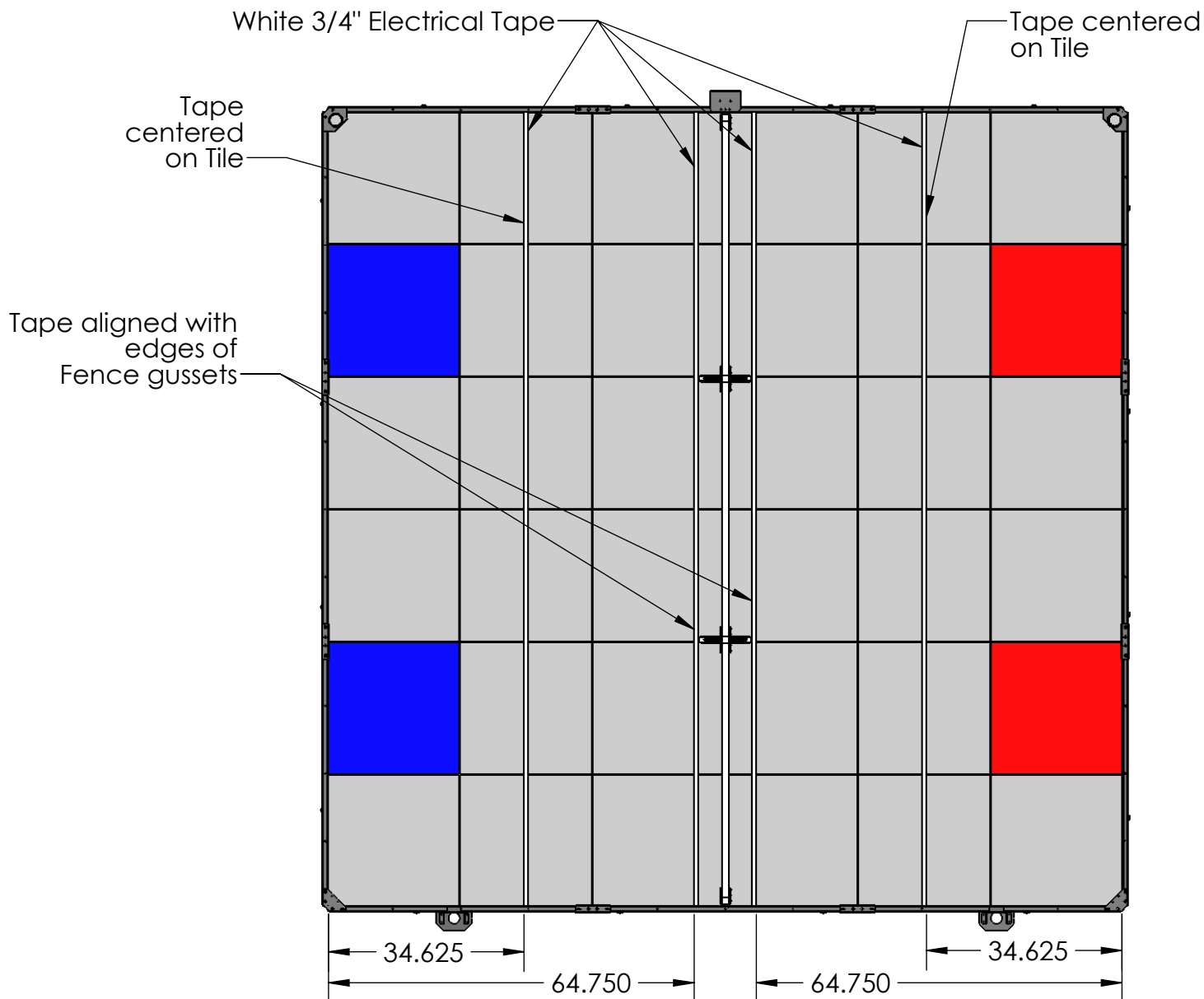


Description	Game Piece Location	
Dwg No	276-4847-000 Rev4	
Project	VRC 2016-2017	Sheet 3 of 28
Release	2016-05-26	<b>ALL DIMENSIONS ARE IN INCHES.</b>



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

Dimensions are for reference only.




#### IMPORTANT NOTE:

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

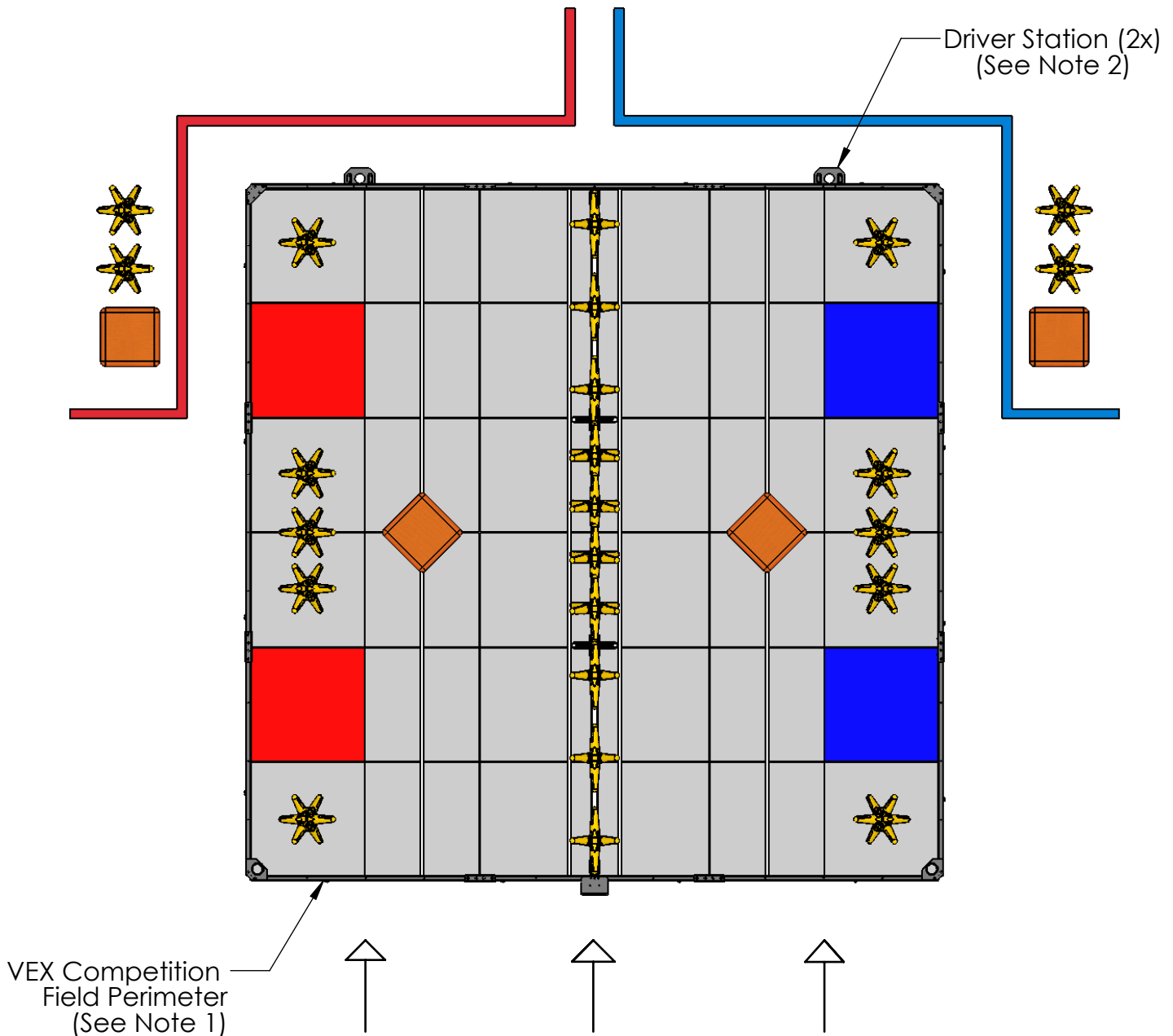
To prevent tape lines from being pulled up during competition, it is recommended that the ends of the tape are tucked into Tile seams.

#### 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.

	Description Tape Lines	
	Dwg No 276-4847-000 Rev4	
	Project VRC 2016-2017	Sheet 4 of 28
	Release 2016-05-26	ALL DIMENSIONS ARE IN INCHES.




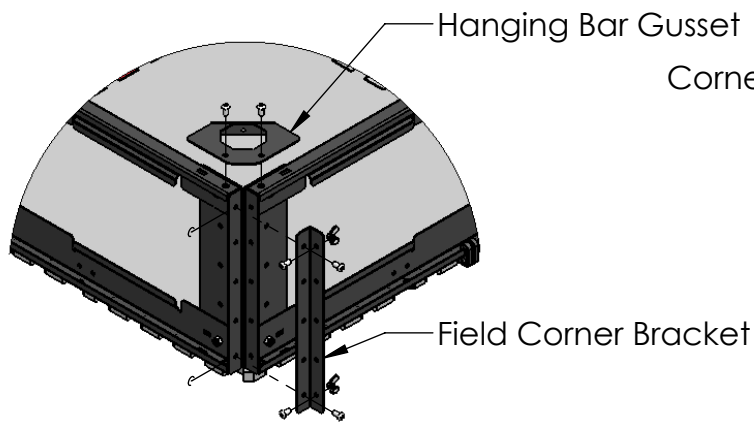
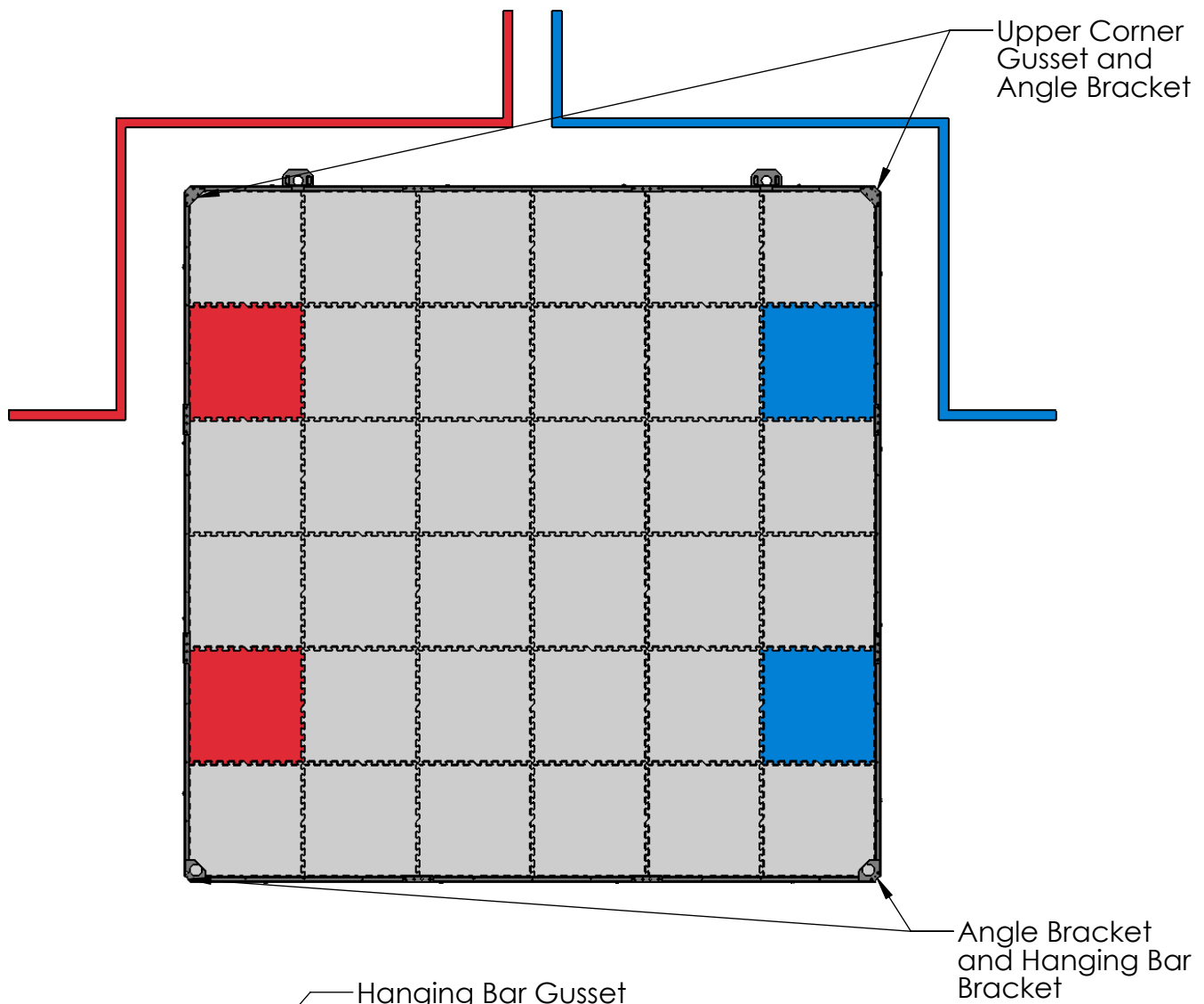


## CROWD VIEW

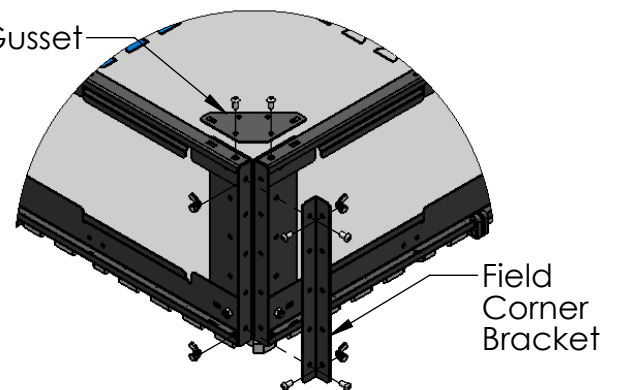
### Notes:

1. Assemble the VEX Competition Field Perimeter (see separate VEX Competition Field Perimeter assembly instructions.) Position the perimeter so that noted side is "facing" the crowd.
2. Attach driver station as shown. (~1ft off Field Perimeter edge opposite of crowd.) Instructions for assembly are included with the VEX Competition Field Perimeter Instructions.
3. Assemble the Foam Tiles inside the Perimeter. Refer to sheet 12 of this document for instructions.

	Description 2016-2017 Field	
	Dwg No 276-4847-000 Rev4	
	Project VRC 2016-2017	Sheet 5 of 28
	Release 2016-05-26	ALL DIMENSIONS ARE IN INCHES.



Hanging Bar Corners



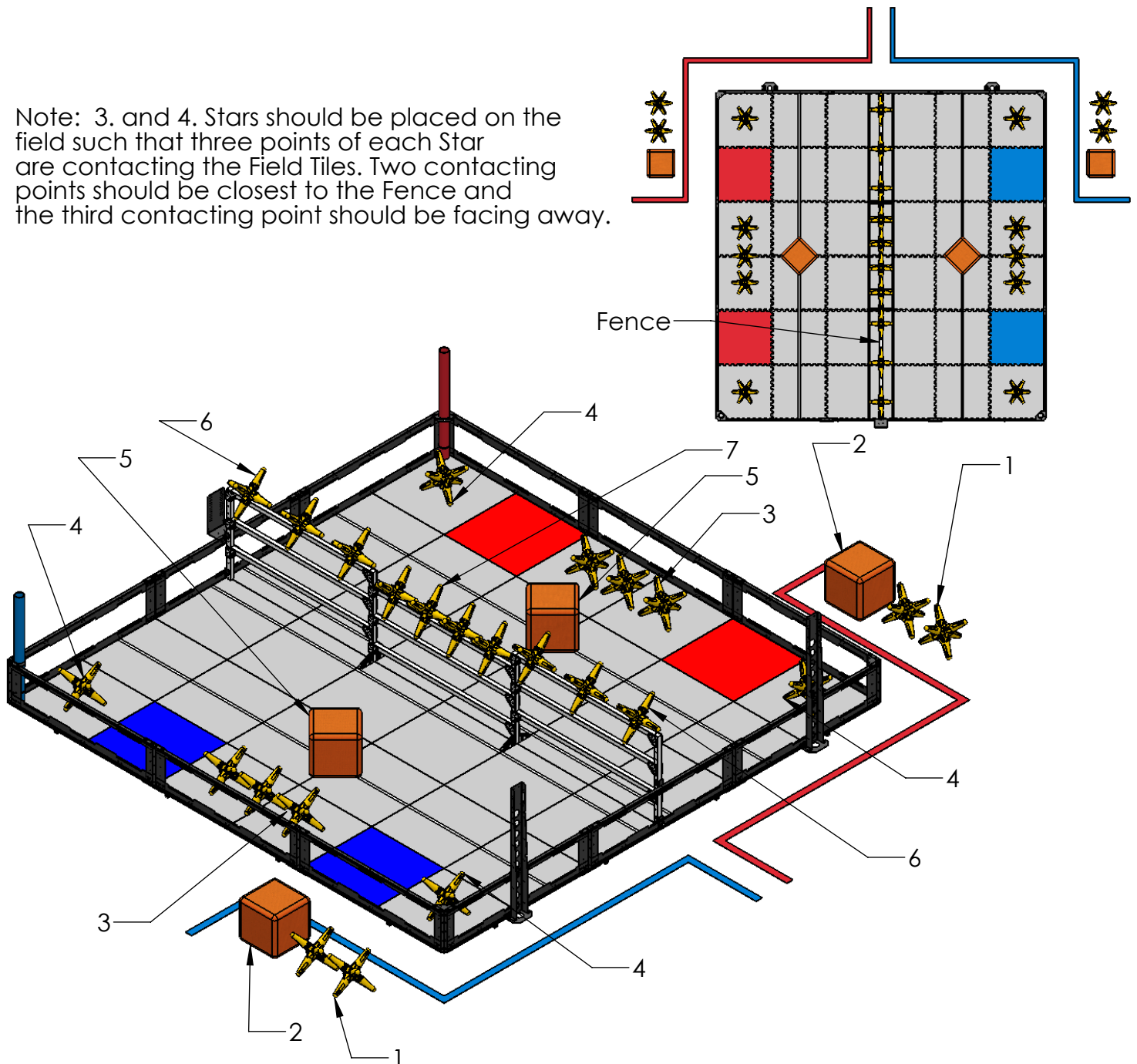
Non-Hanging Bar Corners


Corners for the Competition Field Perimeter are configured as shown above.

## The Stars and Cubes are placed as follows before the start of each match.

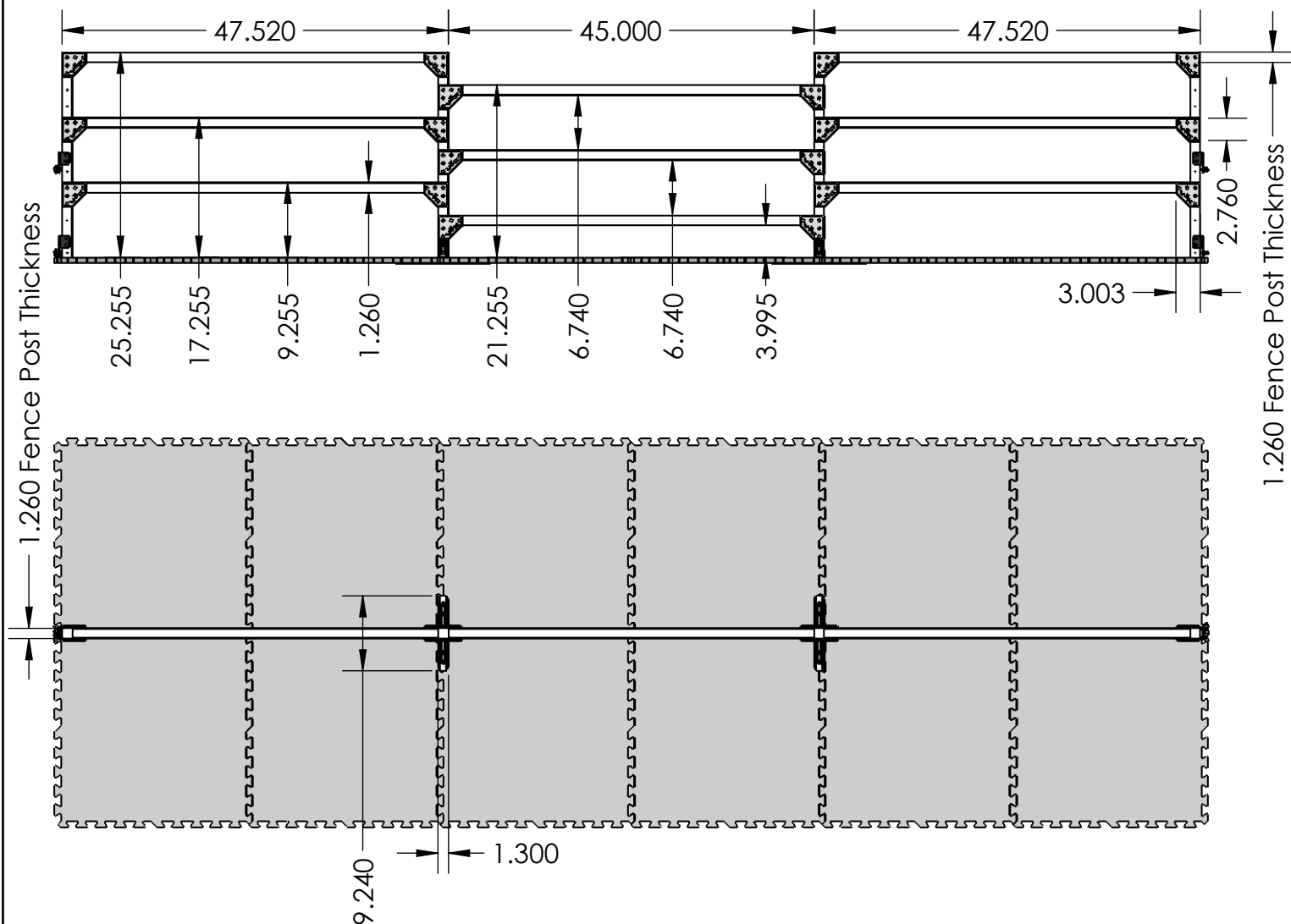
1. There are (2X) Stars for Preload in each Alliance Station
2. There is (1X) Cube as a Driver Control Load in each Alliance Station
3. There are (3X) Stars centered on each half of the field between Alliance Starting Tiles.
4. There is (1X) Star centered on each corner Field Tile.
5. There is (1X) Cube on each half of the field diagonally centered on the Far Zone tape line.
6. There are (3X) Stars equally spaced on both outside sections of the Fence.
7. There are (4X) Stars equally spaced on the middle section of the Fence.

Note: 3. and 4. Stars should be placed on the field such that three points of each Star are contacting the Field Tiles. Two contacting points should be closest to the Fence and the third contacting point should be facing away.



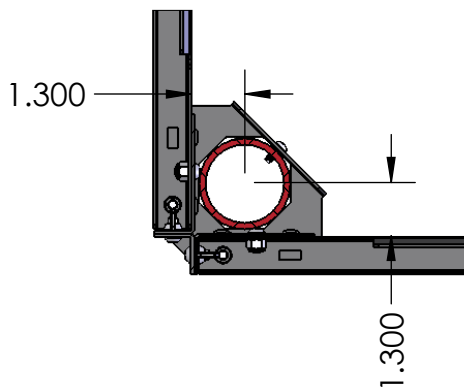
	Description: Game Object Placement	
	Dwg No: 276-4847-000 Rev4	
	Project: VRC 2016-2017	Sheet 7 of 28
	Release: 2016-05-26	ALL DIMENSIONS ARE IN INCHES.

# Fence Specs:



Fence is made of 32mm Square PVC Extrusion and Plastic Triangular Gussets.

# Vertical Hanging Bar Specs:

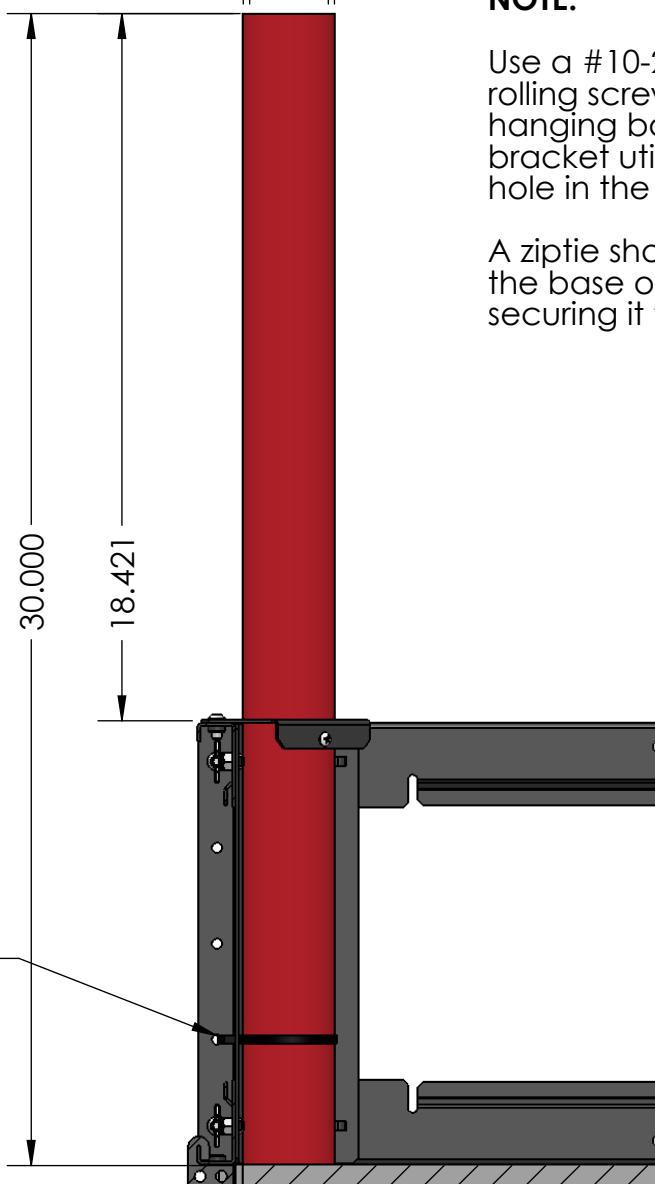


Ø 2.375 O.D.  
Ø 2.047 I.D.

## NOTE:

Use a #10-24 x 0.5" thread rolling screw to secure hanging bar to the corner bracket utilizing the pre-drilled hole in the bar.

A ziptie should be placed at the base of the hanging bar, securing it to the field wall.

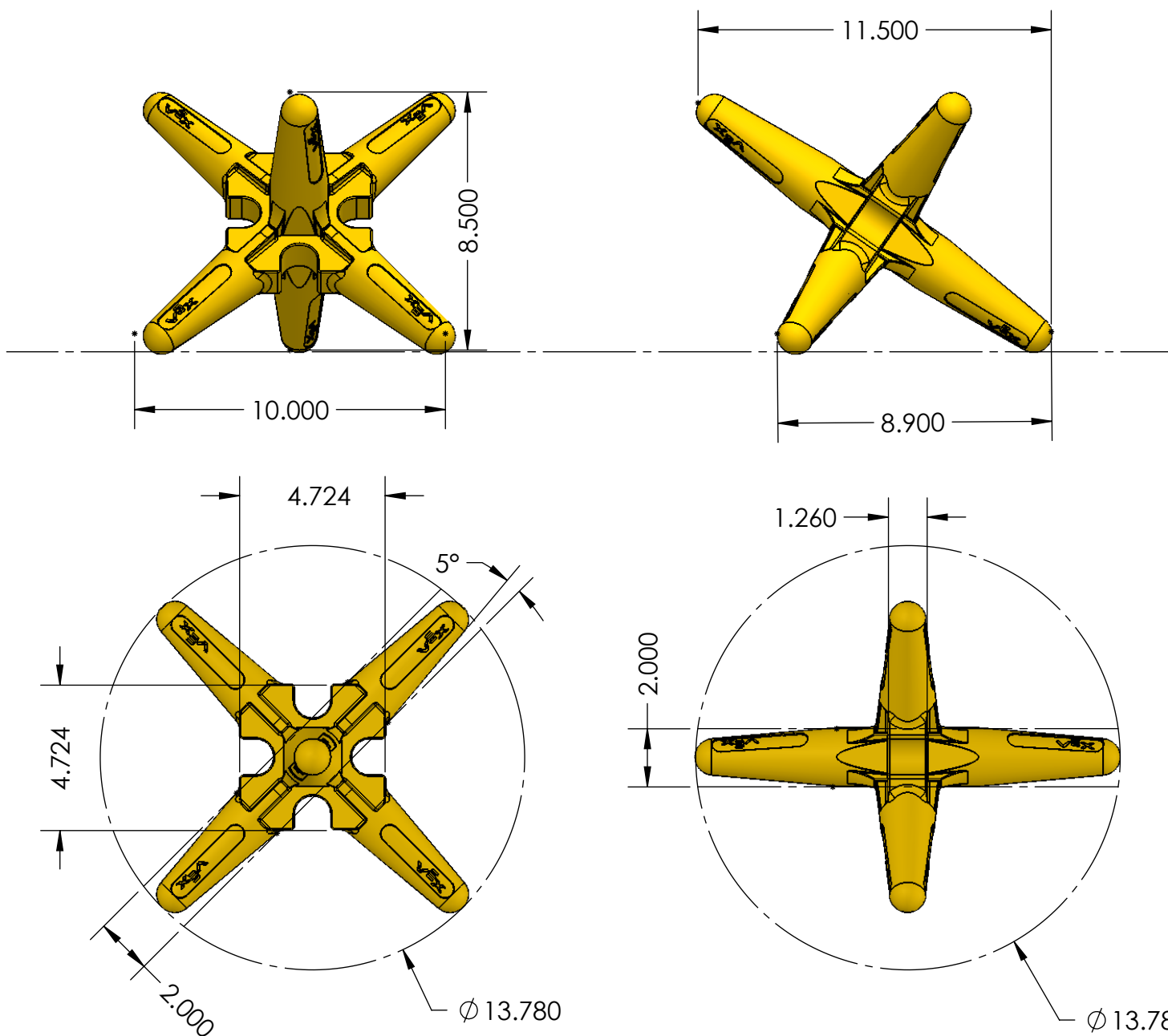
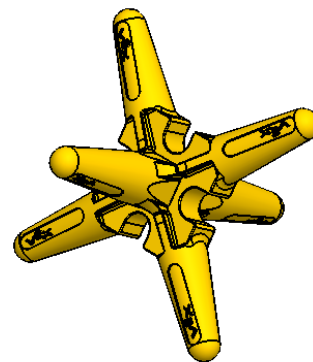


## Ziptie:

(Secure through Field Holes and around the Vertical Hanging Bar)

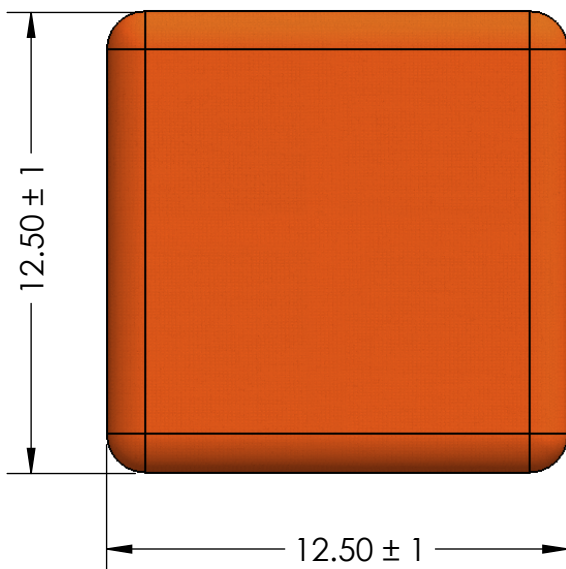
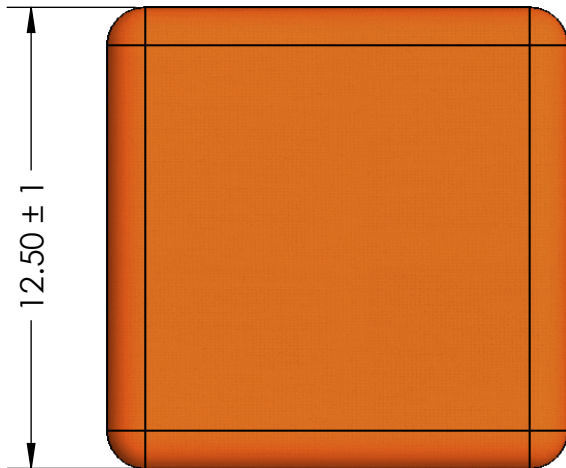
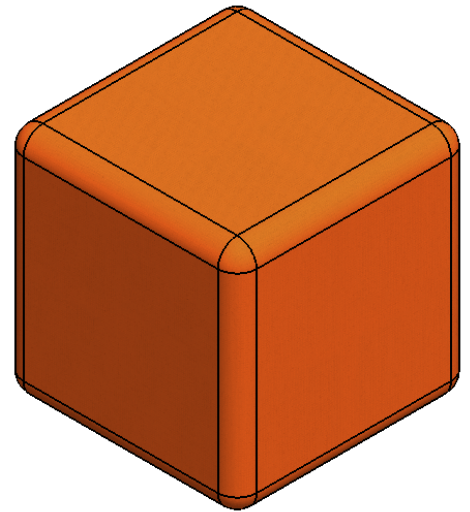
# Star Specs:

Weight: 270g  $\pm$  15%



## Cube Specs:

The Cube is fabric filled with polyester fiber.  
Cube is pillow like and easy to deform.



### NOTE:

Cubes will come vacuum packed and will need to be fluffed before use.

All dimensions are nominal and will vary due to deformation.

Weight:  $760\text{g} \pm 15\%$





# **VEX Robotics Competition Starstruck – Appendix A**

## **Field Assembly Introduction**

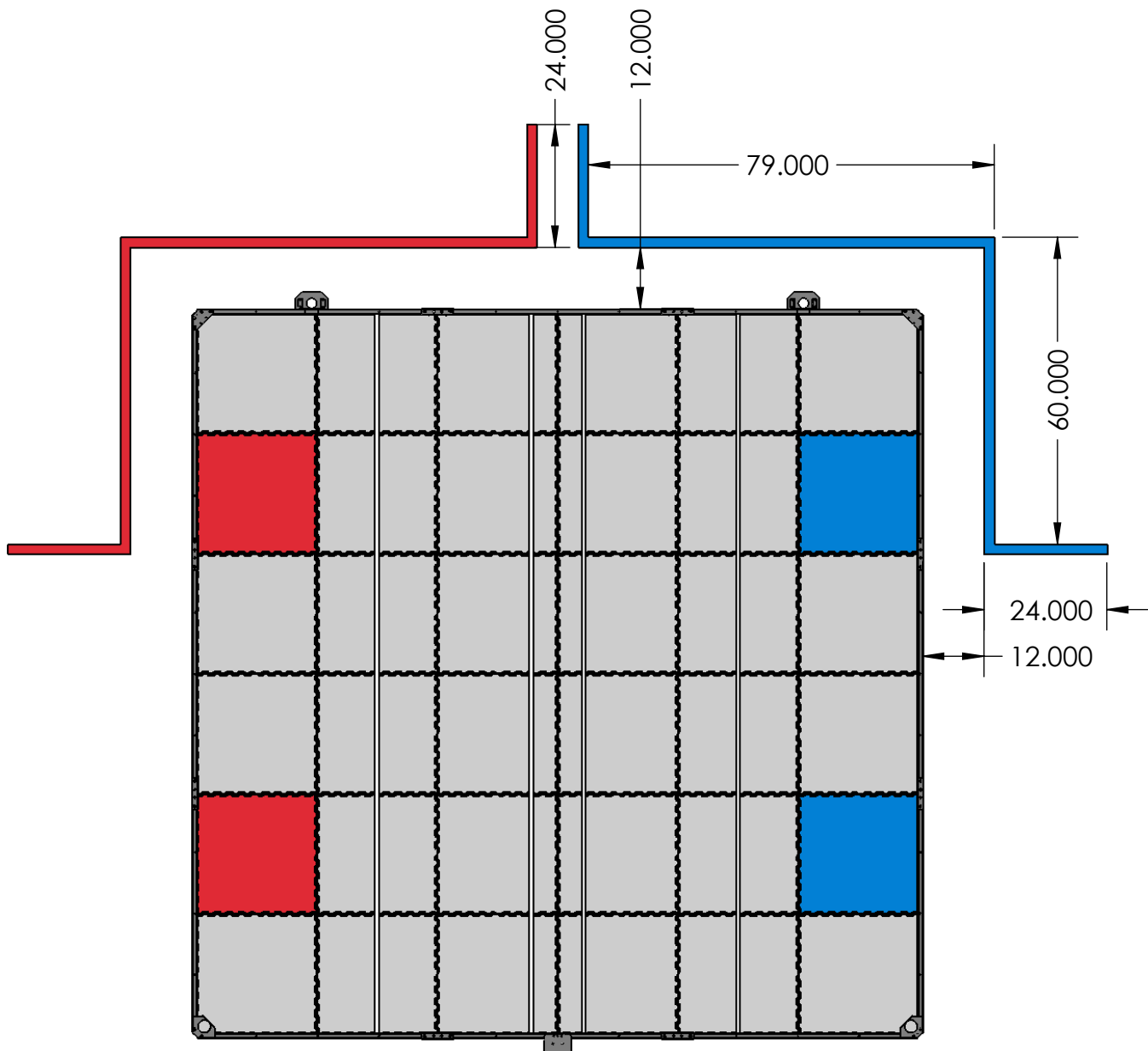
This section will detail the steps required to construct the competition field for the *VEX Robotics Competition – Starstruck*. The field utilizes the “VEX Competition Field Perimeter” (278-1501). For specifications and instructions for assembling this frame, please refer to the separate “VEX Competition 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 – Starstruck field:

- 3/32" Allen Wrench
- 11/32" Wrench
- 1/4" Wrench
- Phillips Head Screw Driver
- Side Cutters or Scissors (for cutting zip ties)

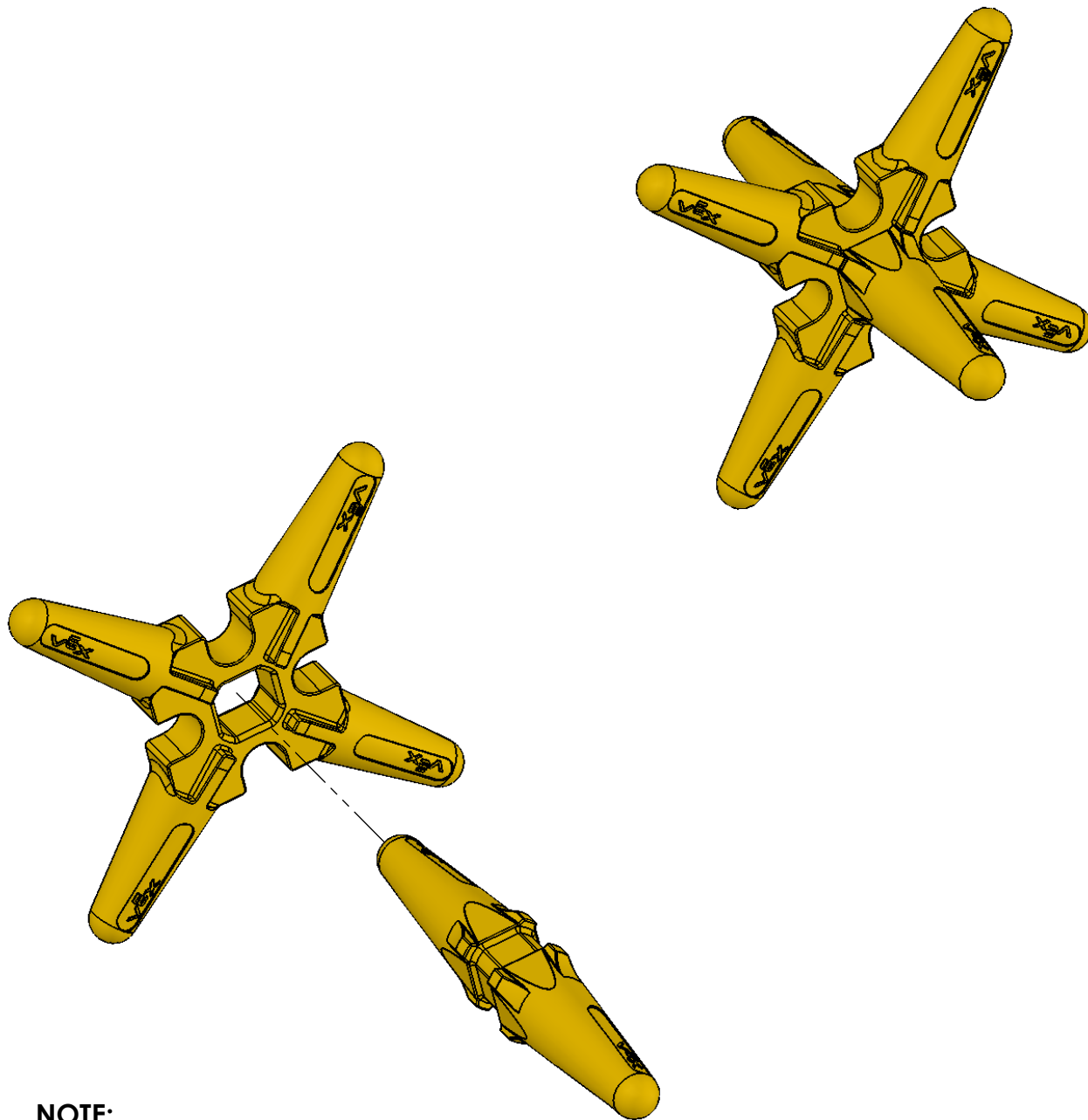


## CROWD

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

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

## Star Assembly:



### NOTE:

The Star should be assembled as shown above.

Push the insert **evenly** until the tabs are seated on both sides of the Star body.

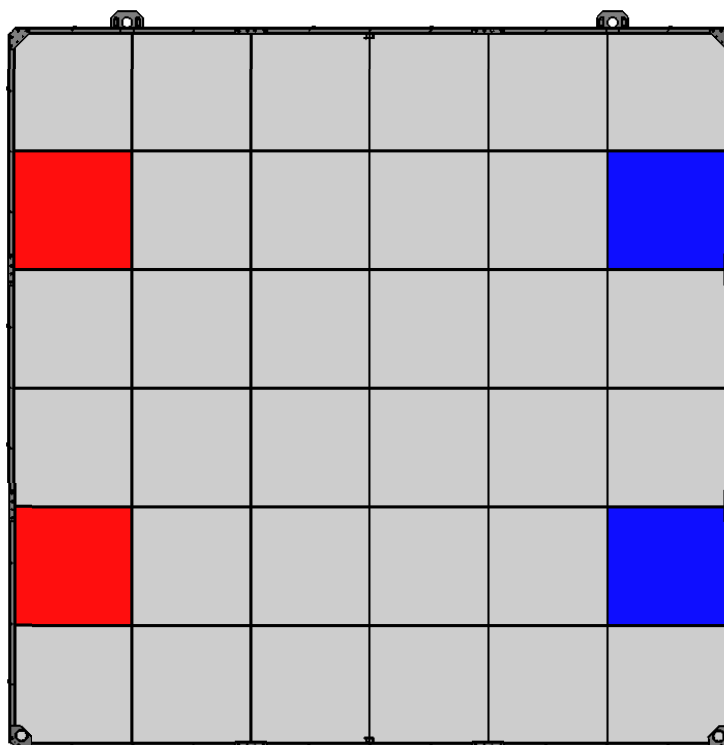
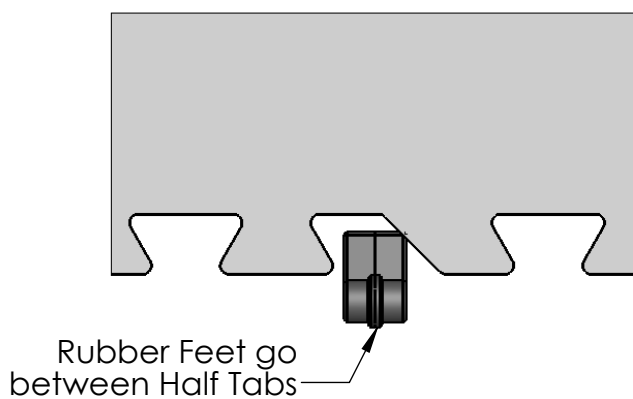
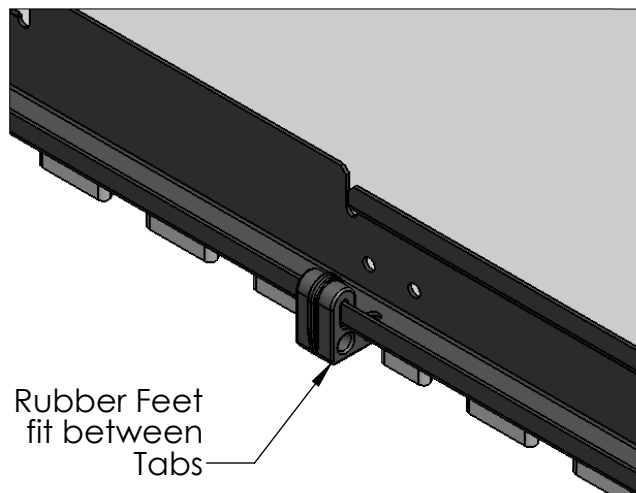
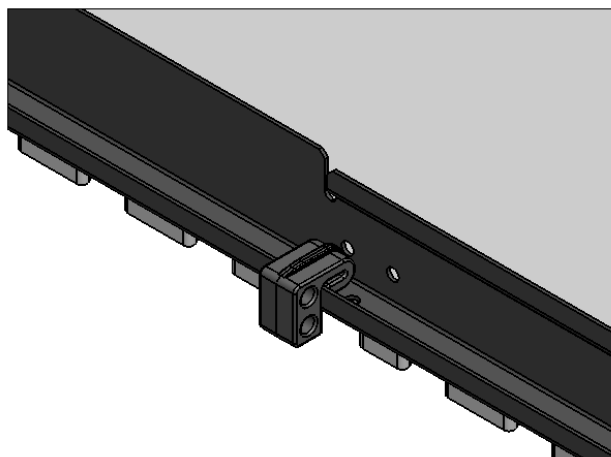
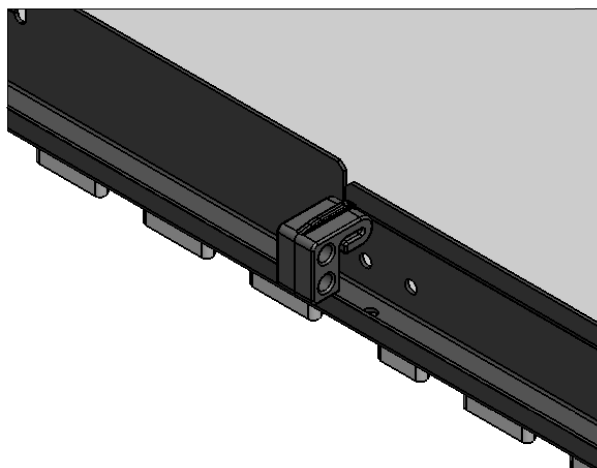
Uneven pressure can cause permanent damage to the Star.

Once the Star has been assembled, **DO NOT** disassemble. Disassembly can cause permanent damage to the game piece.

Field Perimeter Rubber Feet are attached to the Field Perimeter as shown.

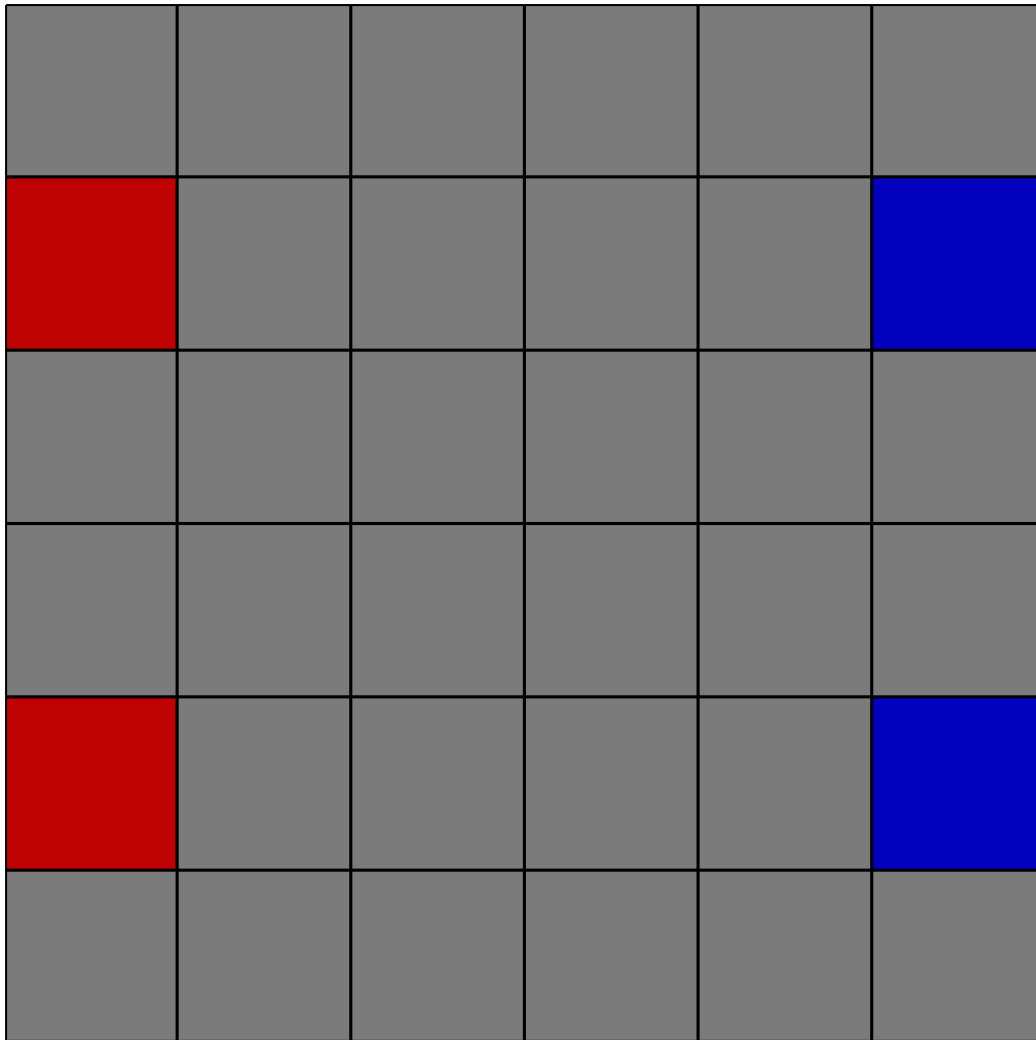
(4X) Rubber Feet are used on each Field Perimeter side.

**Note: Field Perimeter Rubber Feet fit between Foam Tile tabs. Tabs do NOT need to be removed.**



4 Field Perimeter Rubber Feet per side (typical)

## Do NOT remove Foam Tile tabs!




### 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" Tiles should be placed as shown above.

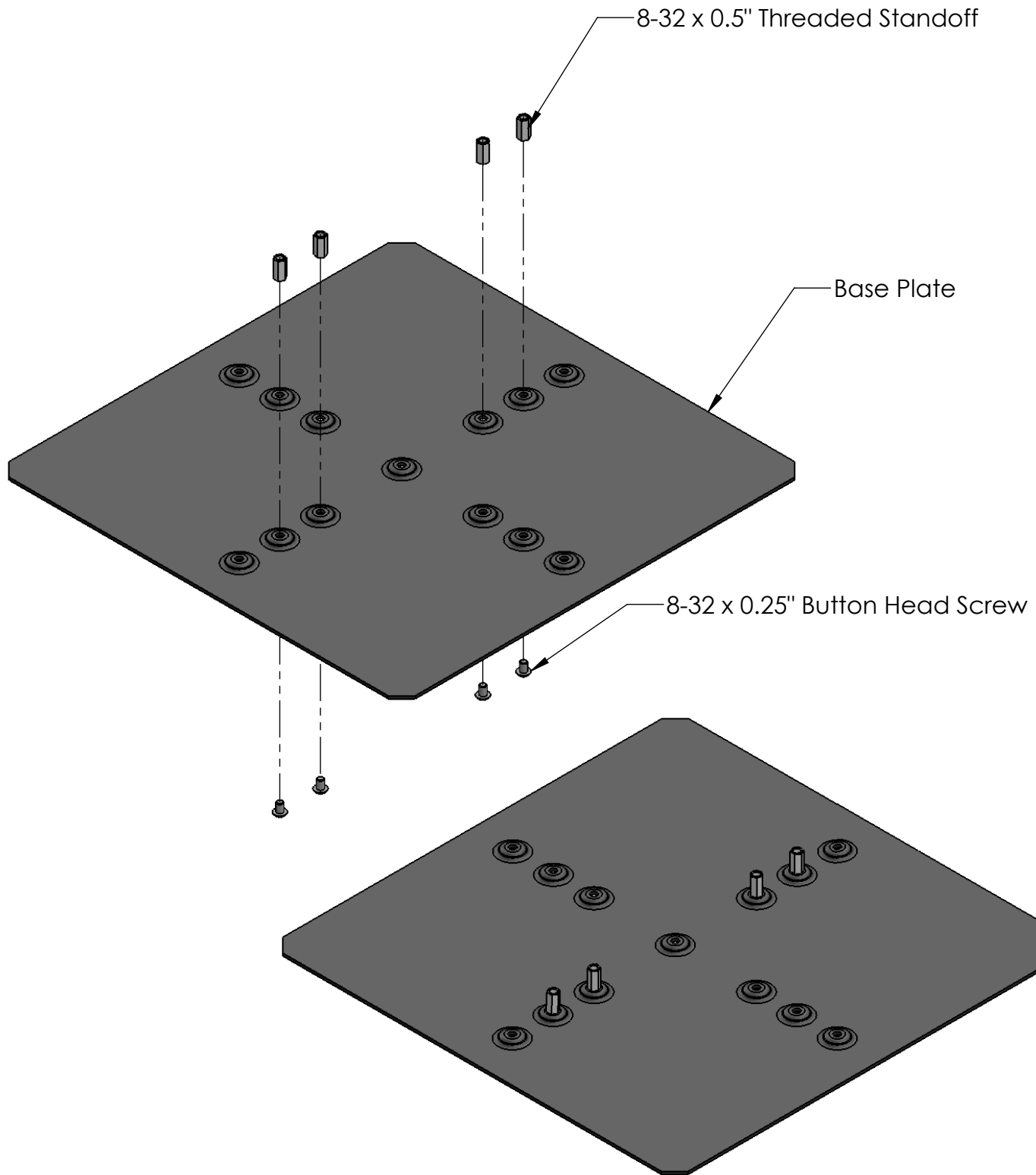
The grid-lines are for reference only.

**Note: Tabs DO NOT need to be removed from Foam Tiles.**

	Description    Field Tile Assembly	
	Dwg No        276-4847-000 Rev4	
	Competition    VRC 2016-2017	Sheet 15 of 28
	Release        2016-05-26	<b>ALL DIMENSIONS ARE IN INCHES.</b>

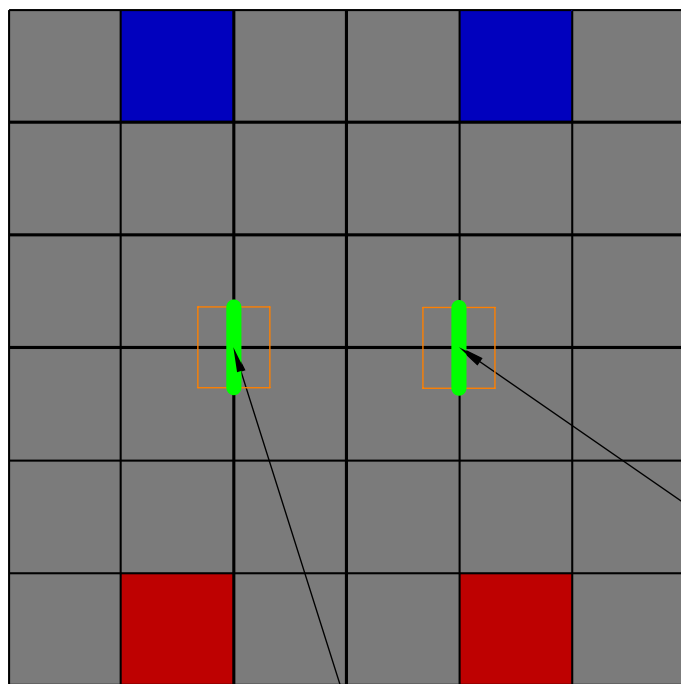
## Step 1:

Attach (4X) 8-32 x 0.5" Threaded Standoffs to the Base Plate using (4X) 8-32 x 0.25" Button Head Screws. Repeat this (2X).

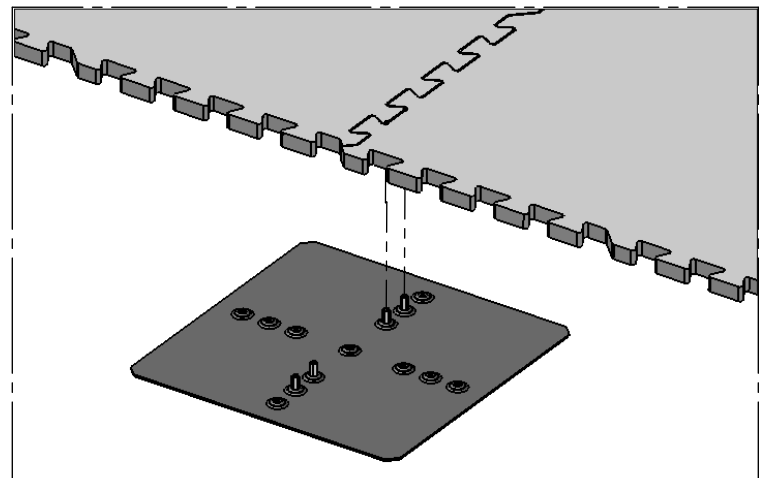


## Step 2:

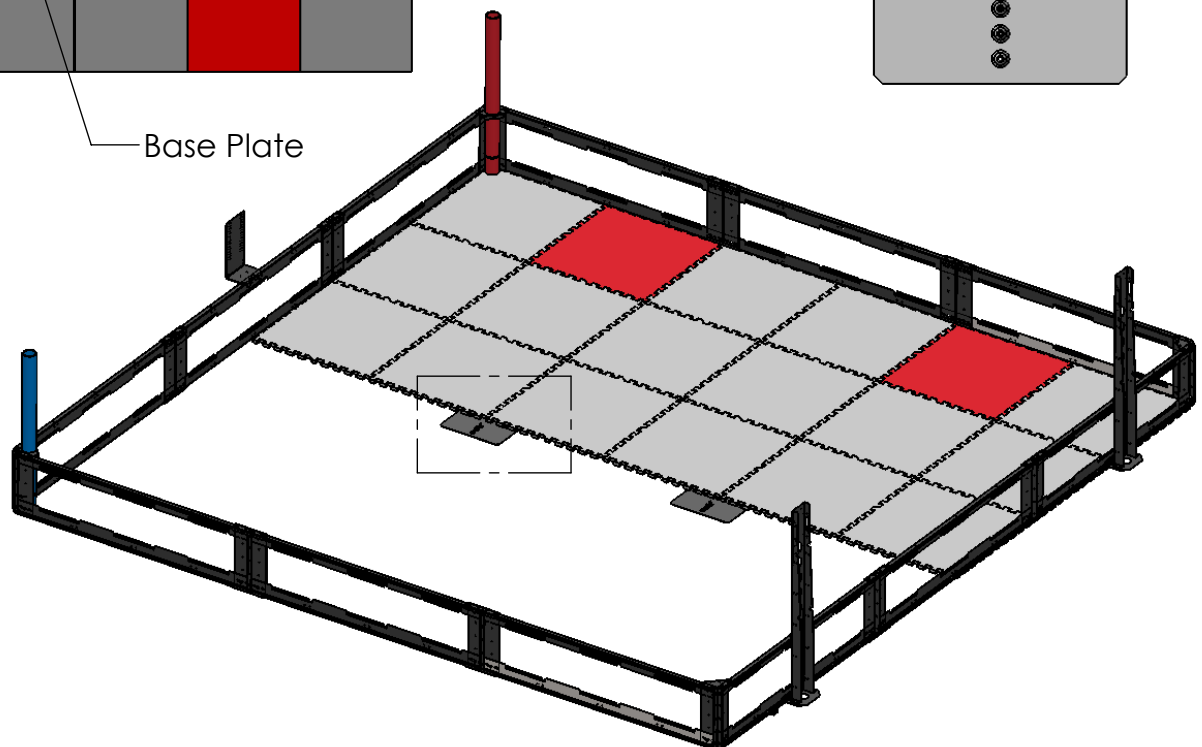
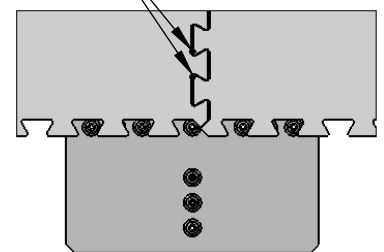
Place the Base Plate Stand-off Assembly under the Field Tiles as specified below.



Base Plate



Stand-offs go between  
Foam Tile tabs





The Fence in VEX Robotics Competition Starstruck is made up of:

1. (4X) Vertical Fence Post
2. (9X) Horizontal Fence Bar
3. (36X) Fence Gusset
4. (4X) "Fence To Base" Gusset
5. (2X) Base Plate
6. (4X) "Fence To Wall" Bracket
7. (80X) 8-32 x 1.75" Screw
8. (80X) 8-32 Nylock Nut
9. (16X) 8-32 x 0.25" Screw
10. (8X) 0.5" Threaded Standoff
11. (8X) 1/4-20 x 0.5" Screw
12. (8X) 1/4-20 Wingnut

Vertical Fence Post (4X)



Fence Bar (9X)



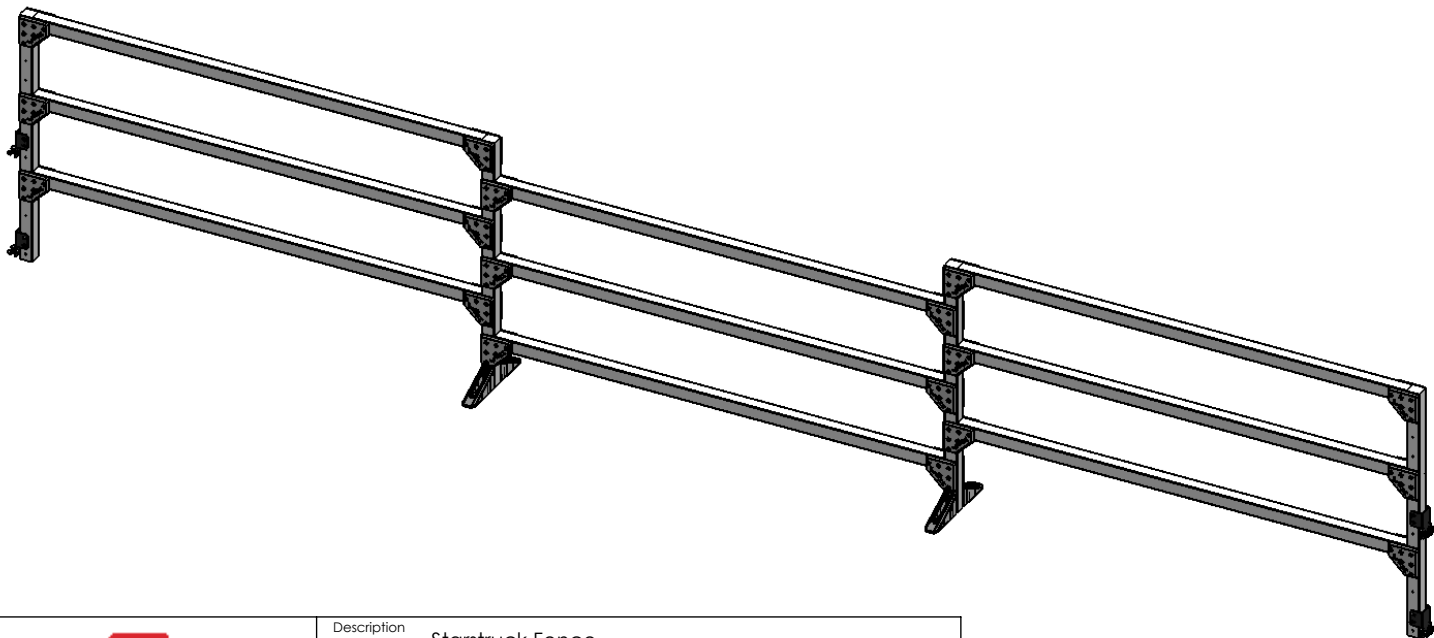
Fence Gusset (36X)



"Fence to Base" Gusset (4X)

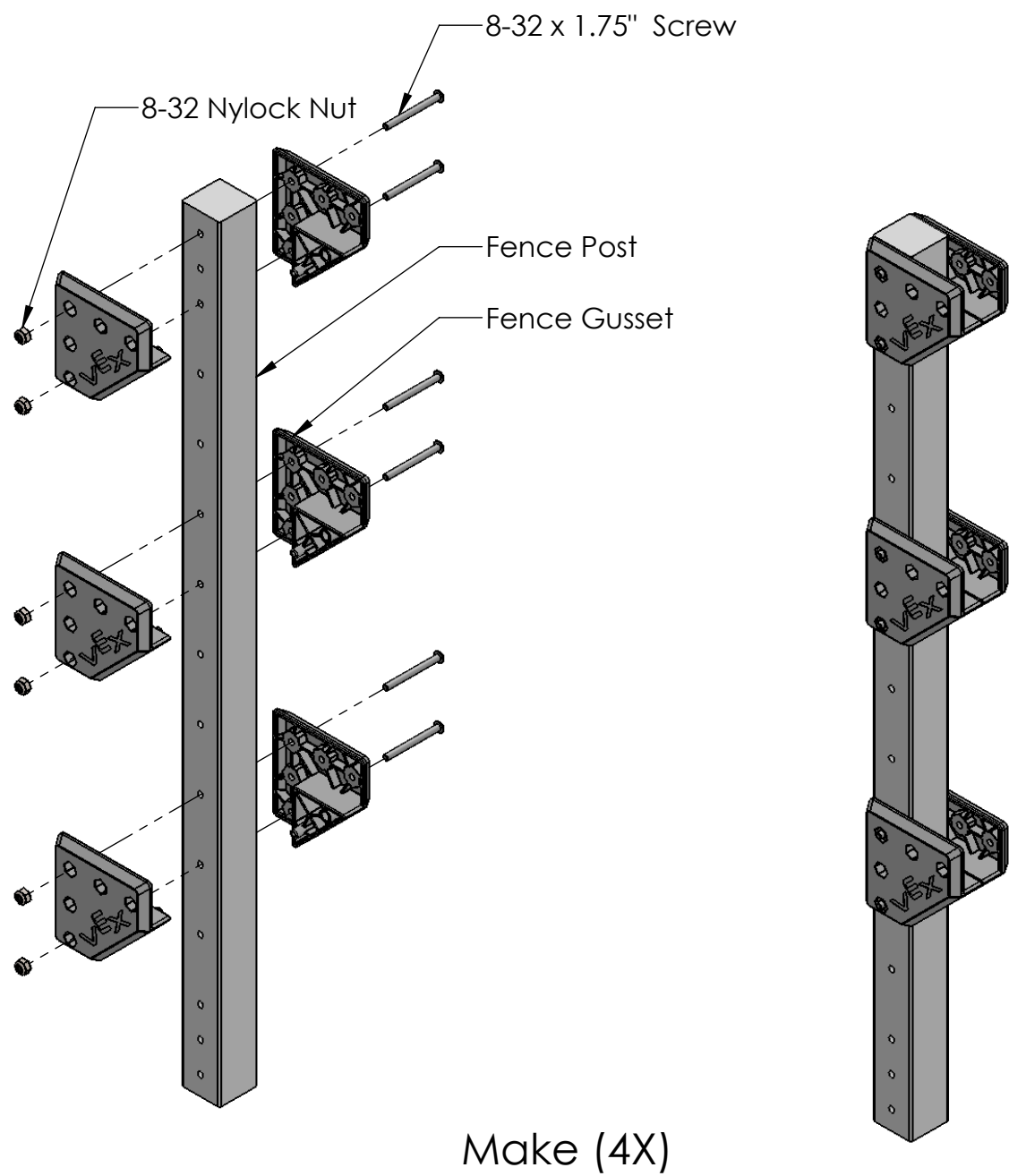



"Fence to Wall" Bracket (4X)



Step 1:

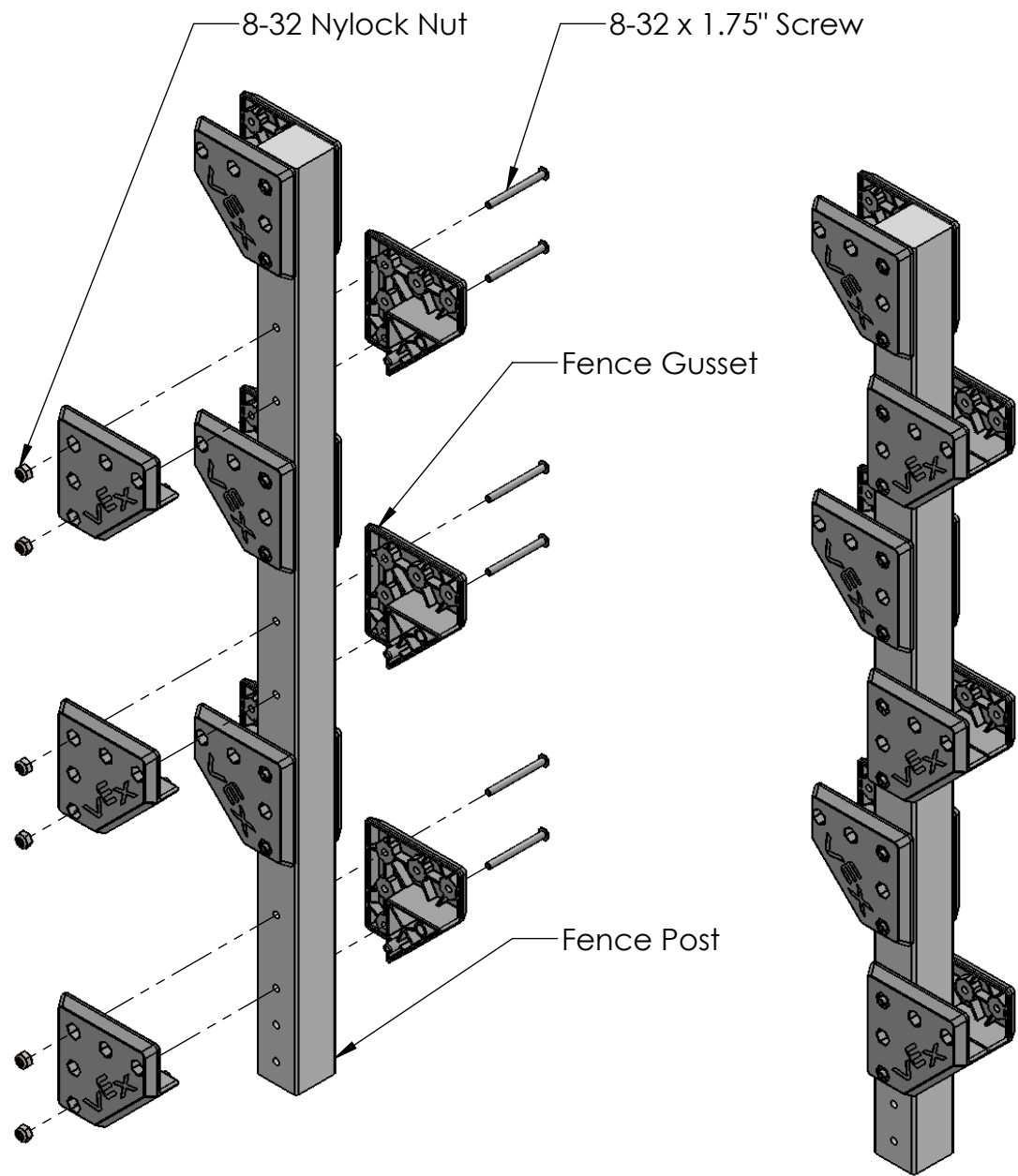
Attach (3X) pairs of Fence Gussets to the Vertical Fence Post using (6X) 8-32 x 1.75" Screws and (6X) Nylock Nuts. Repeat this (4X).




	Description Fence Gusset Assembly	
	Dwg No 276-4847-000 Rev4	
	Project VRC 2016-2017	Sheet 19 of 28
	Release 2016-05-26	ALL DIMENSIONS ARE IN INCHES.

Step 2:

Attach (3X) pairs of Fence Gussets to the Vertical Fence Post using (6X) 8-32 x 1.75" Screws and (6X) Nylock Nuts. Repeat this (2X).

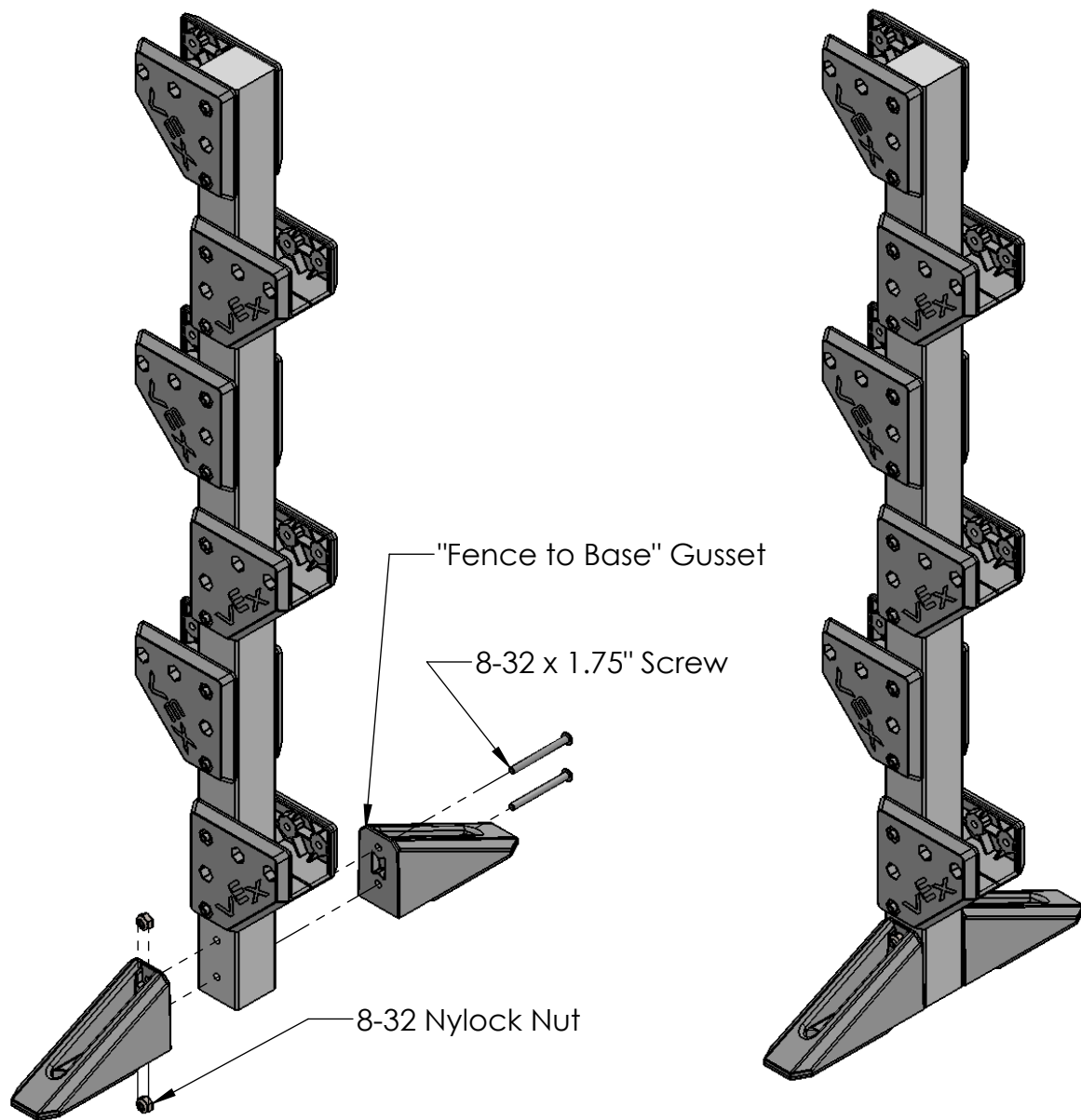


Make (2X)

	Description Fence Gusset Assembly		
	Dwg No 276-4847-000 Rev4		
	Project	VRC 2016-2017	Sheet 20 of 28
	Release	2016-05-26	ALL DIMENSIONS ARE IN INCHES.

Step 3:

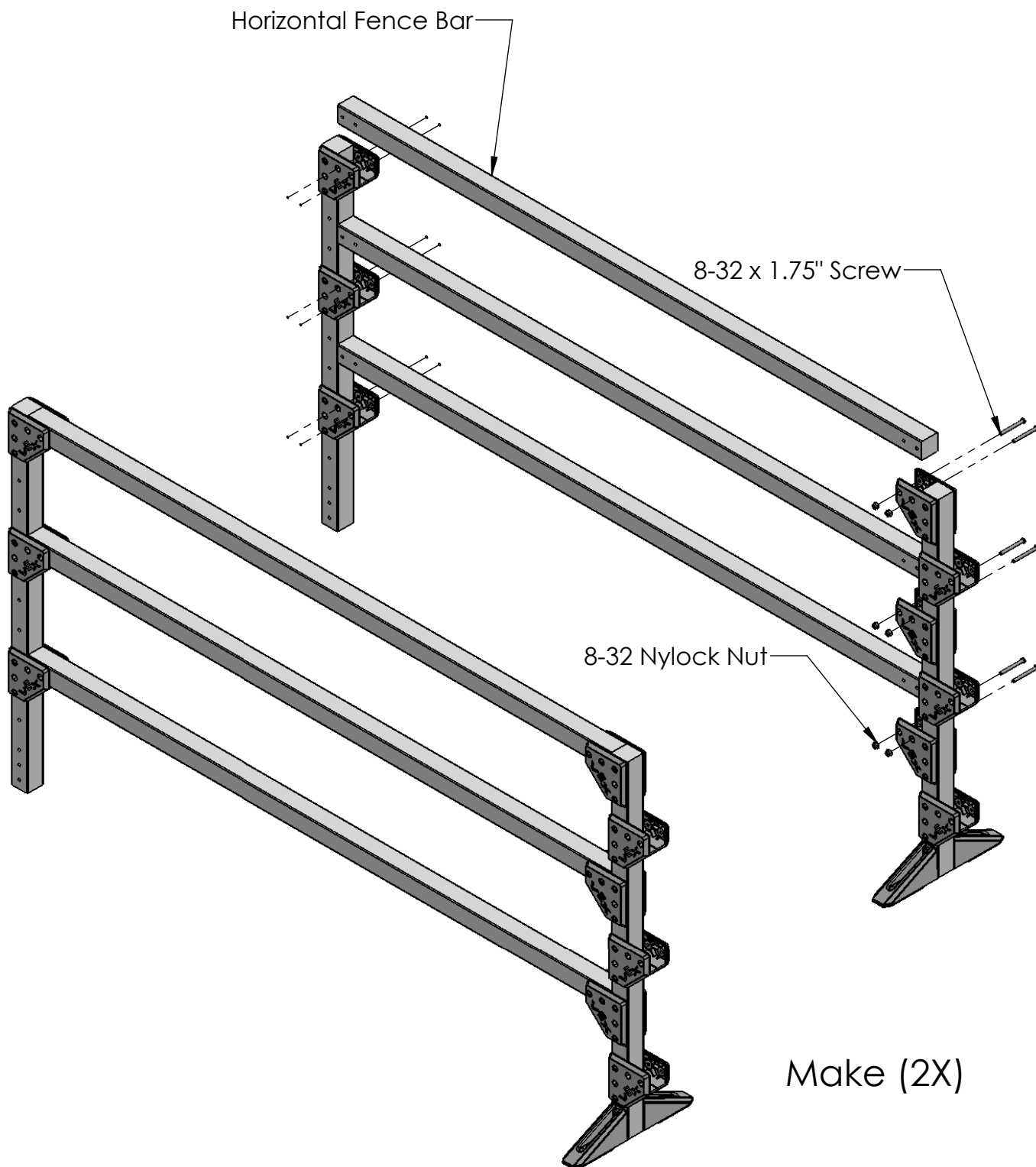
Attach (1X) pair of "Fence to Base" Gussets to the Vertical Fence Post using (2X) 8-32 x 1.75" Screws and (2X) Nylock Nuts. Repeat this (2X).



Make (2X)

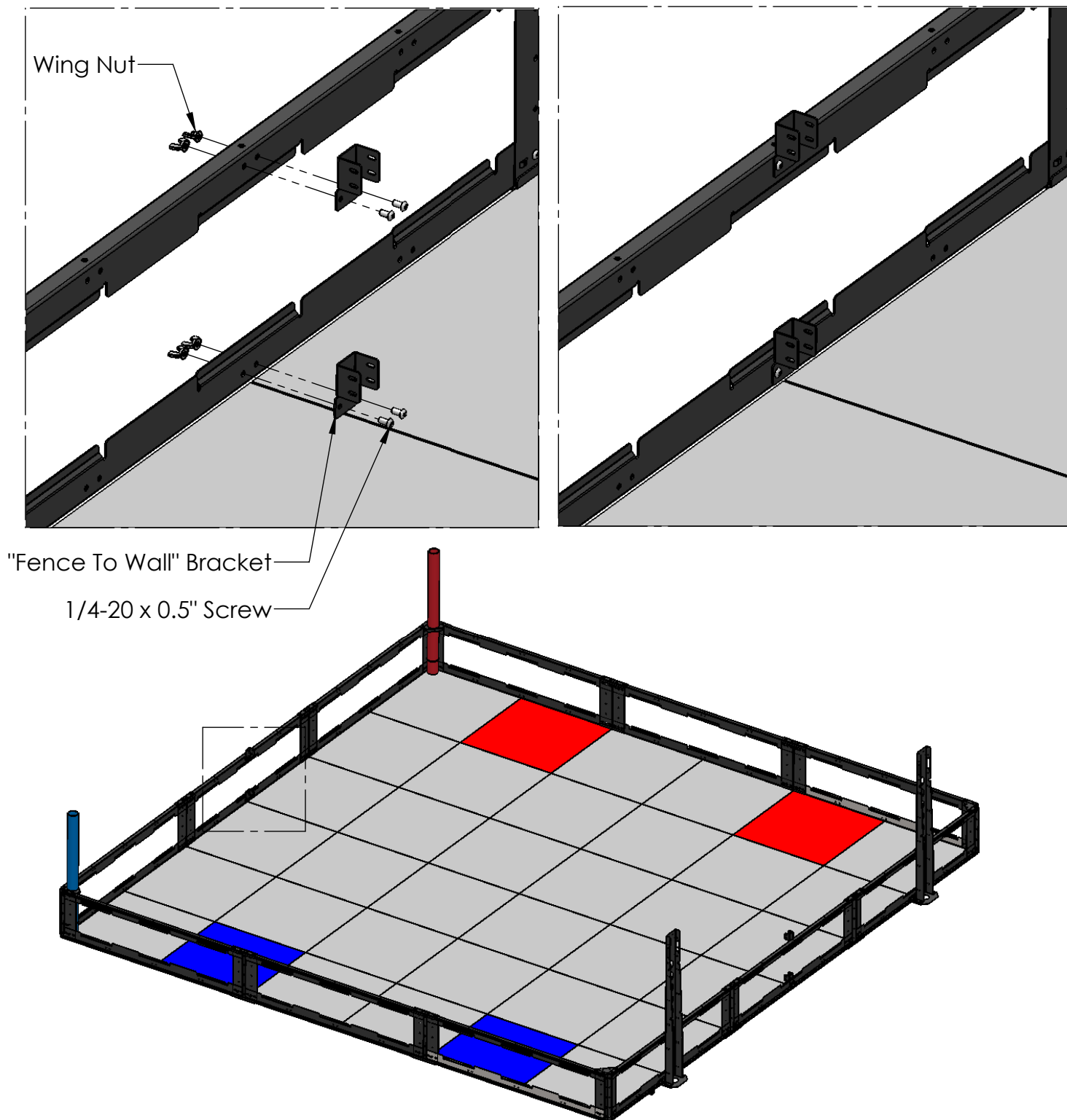
#### Step 4:

Attach (3X) Horizontal Fence Bars to the Vertical Fence Assembly using (12X) 8-32 x 1.75" screws and (12X) 8-32 Nylock Nuts. Repeat this (2X).



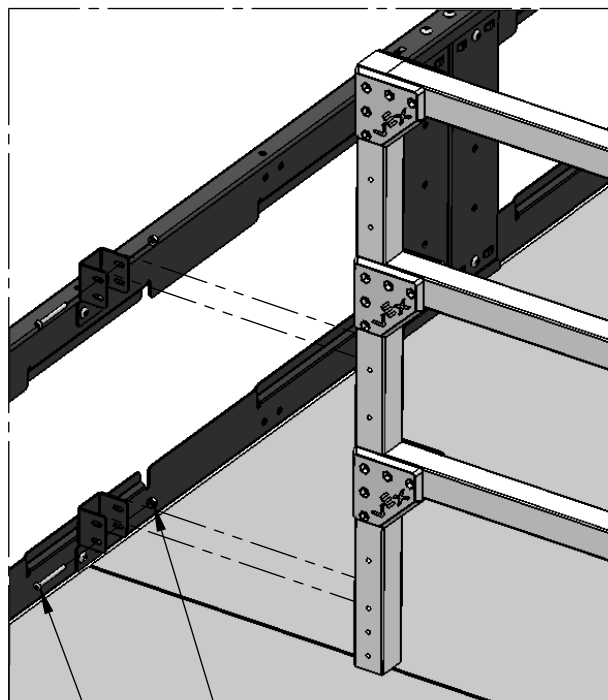
## Step 5:

Attach (2X) "Fence to Wall" Brackets to the center holes in the Field Perimeter using (4X) 1/4-20 x 0.5" Screws and (4X) 1/4-20 Wingnuts. Repeat this (2X) for other side of the Field.



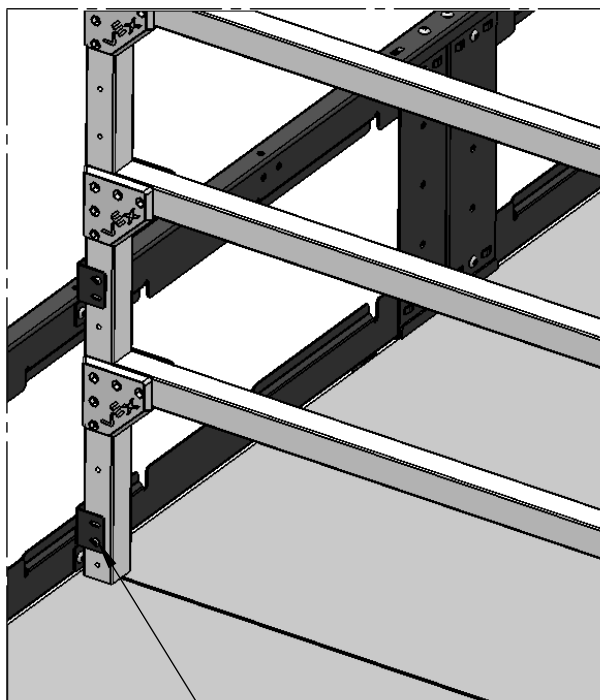
## Step 6:

Attach the Fence segment to the Fence to Wall Bracket using (2X) 8-32 x 1.75" Screws and (2X) 8-32 Nylock Nuts. Repeat this (2X) for other side of the Field.

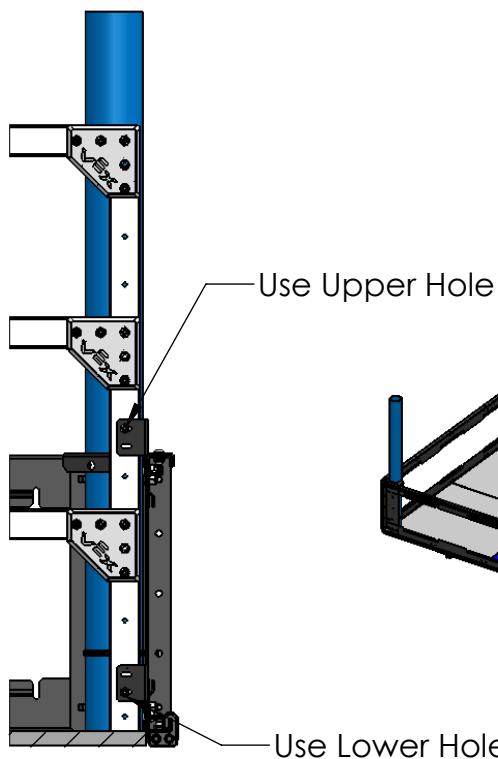


8-32 Nylock Nut

8-32 x 1.75" Screw

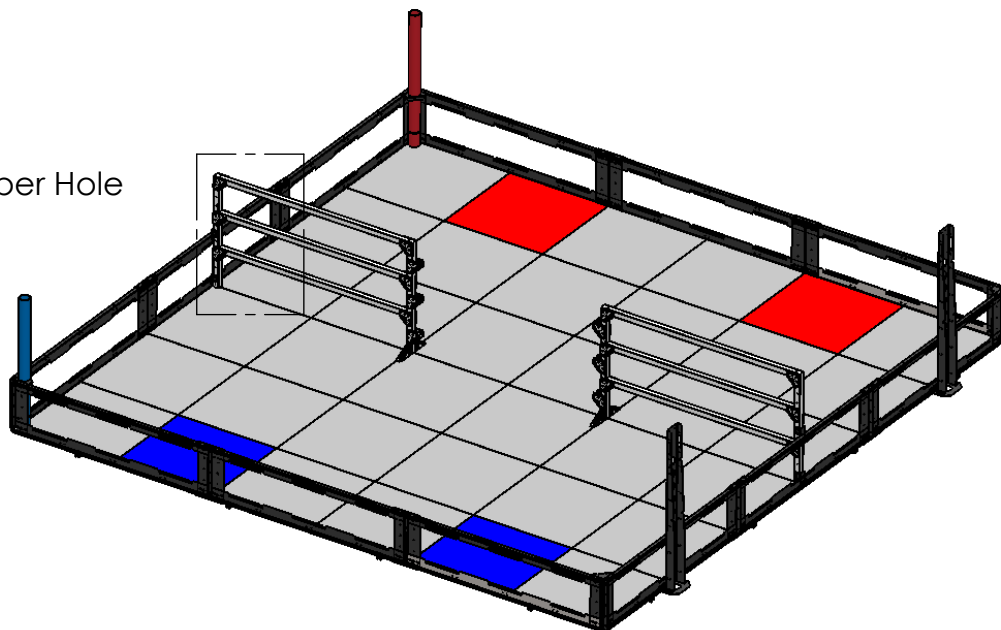


**DO NOT** tighten the bolts until the Fence is fully assembled.



Use Upper Hole

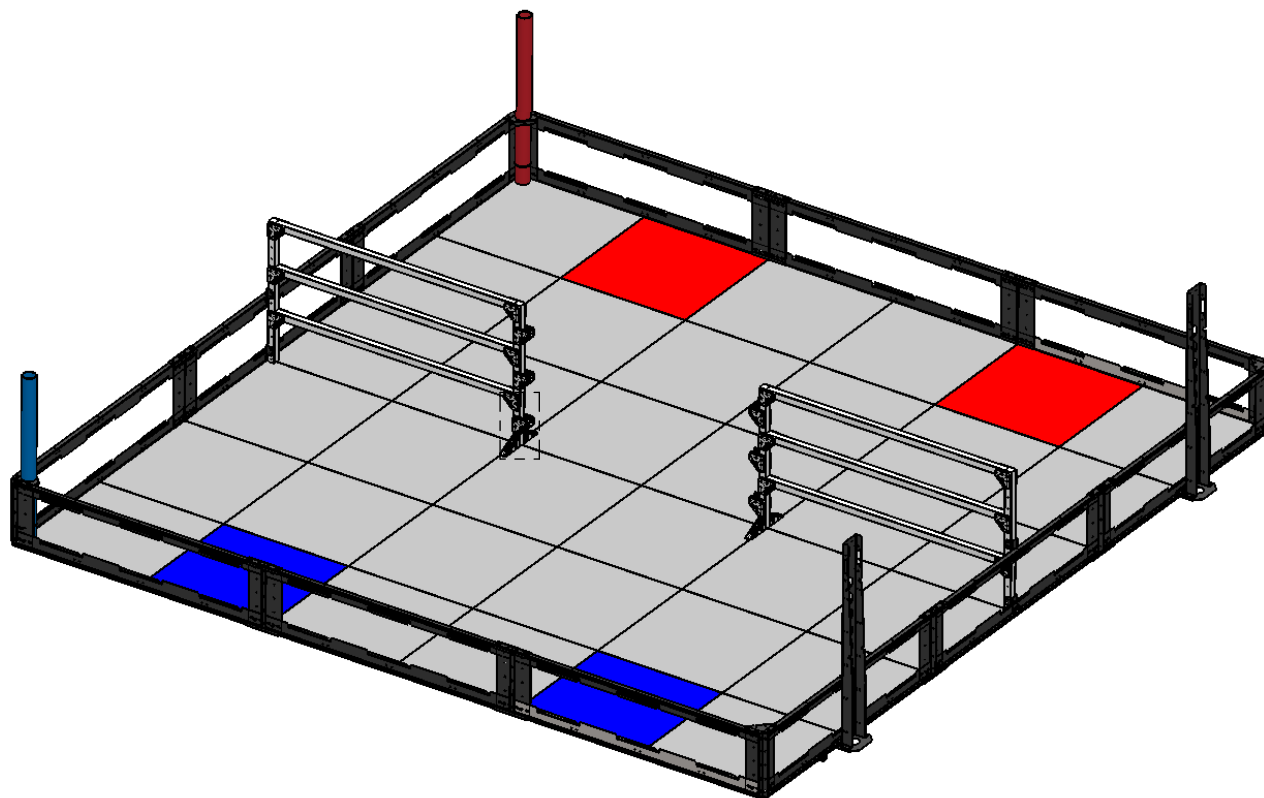
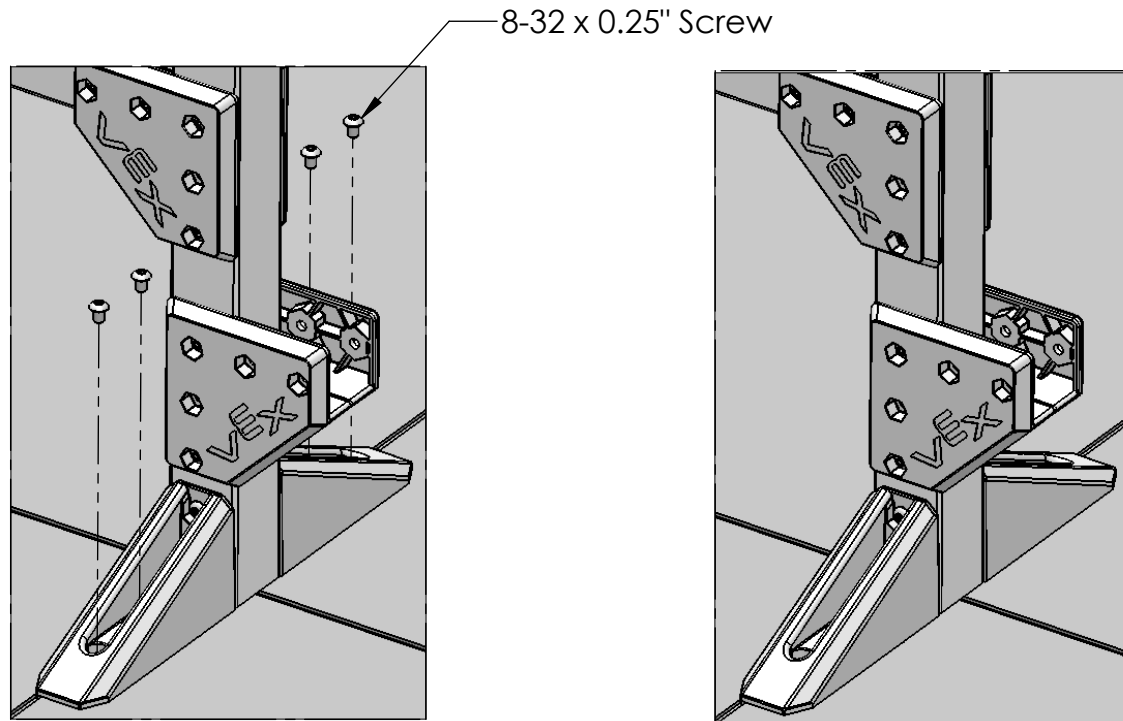
Use Lower Hole





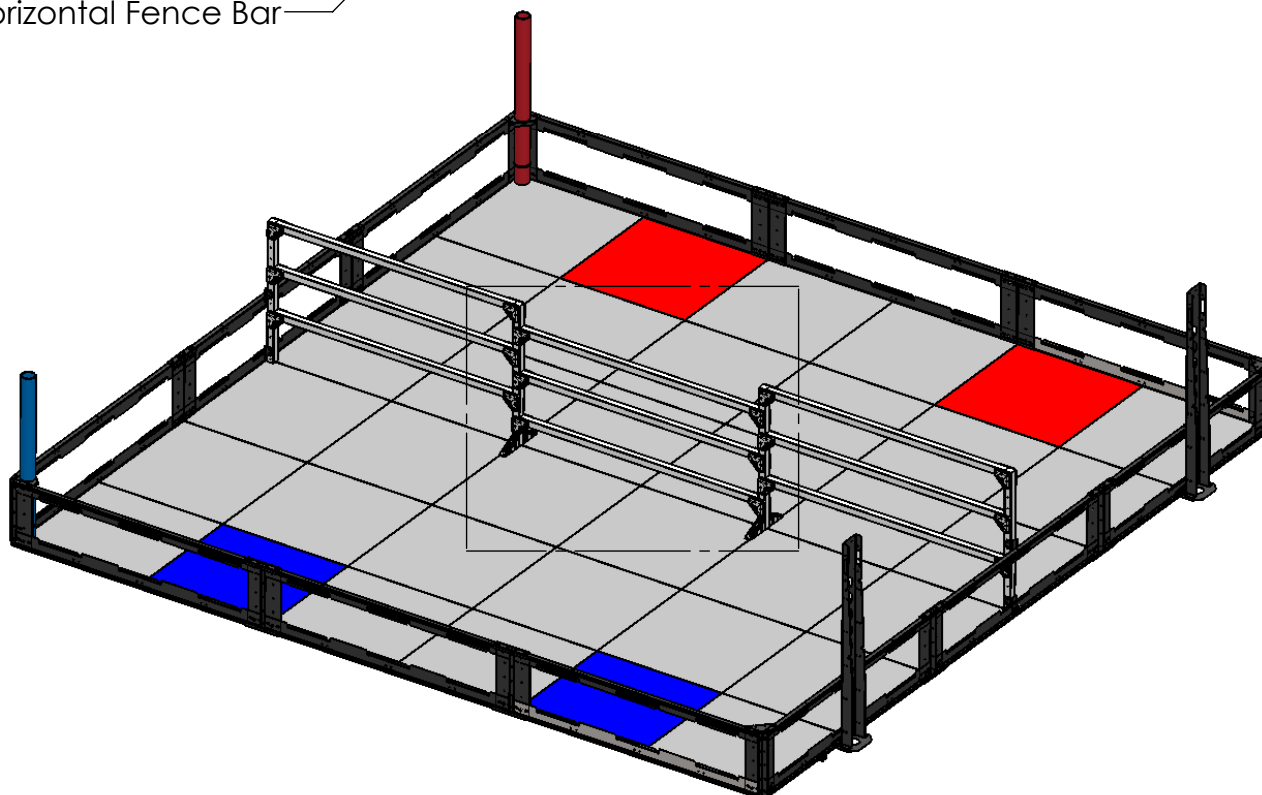
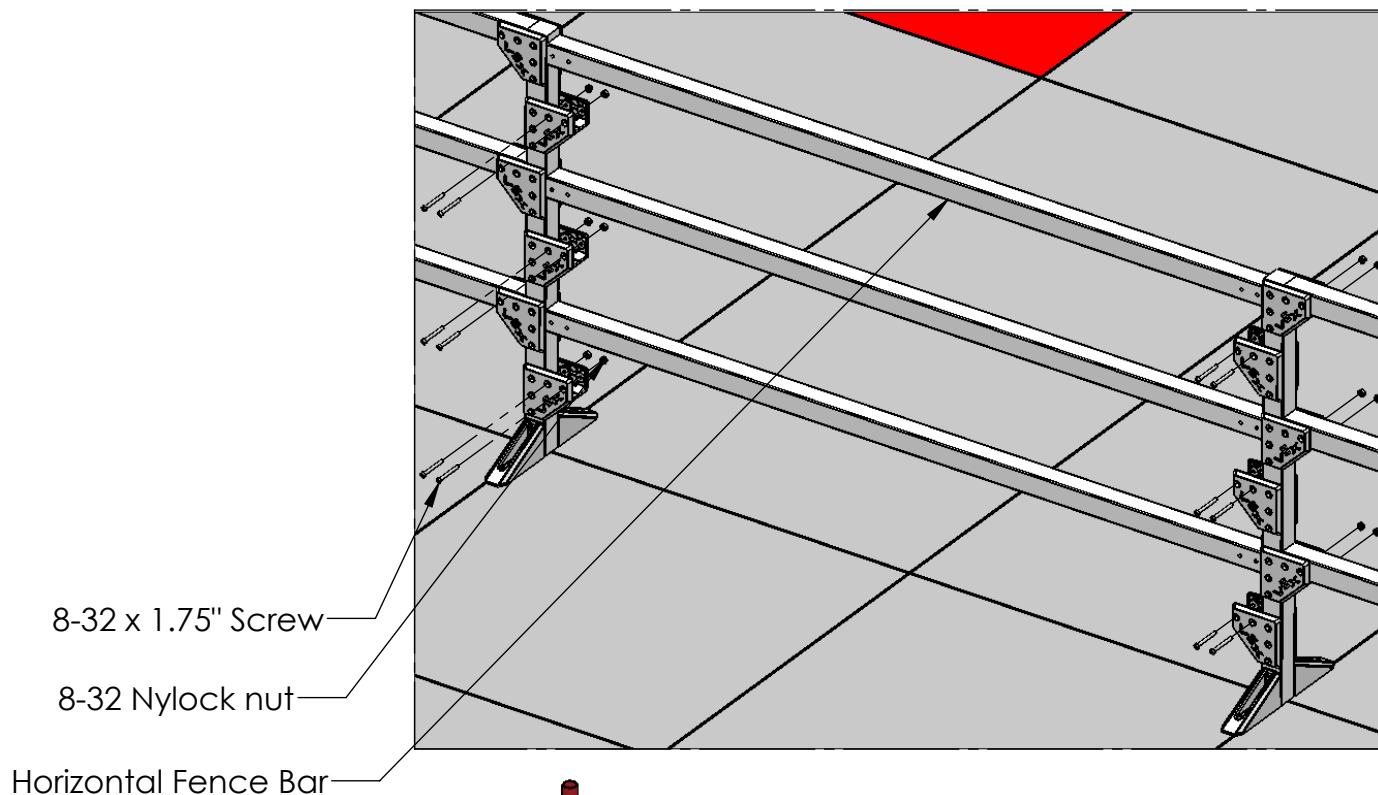
## Step 7:

Attach the Half Fence to the Base Plate Assembly under the Field Tiles using (4X) 8-32 x 0.25" Screws. Repeat this (2X) for both sides of the Field.

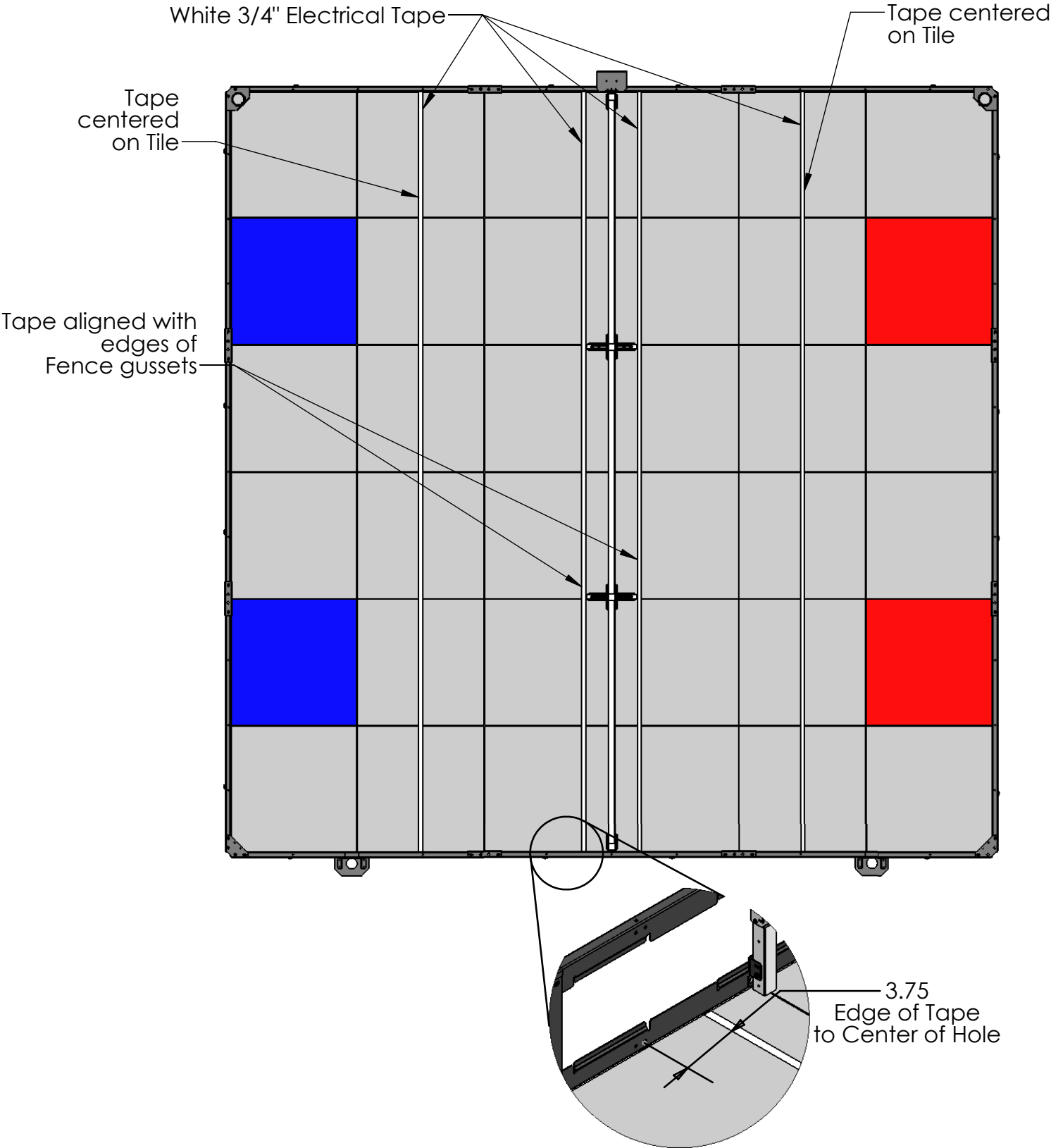



## Step 8:

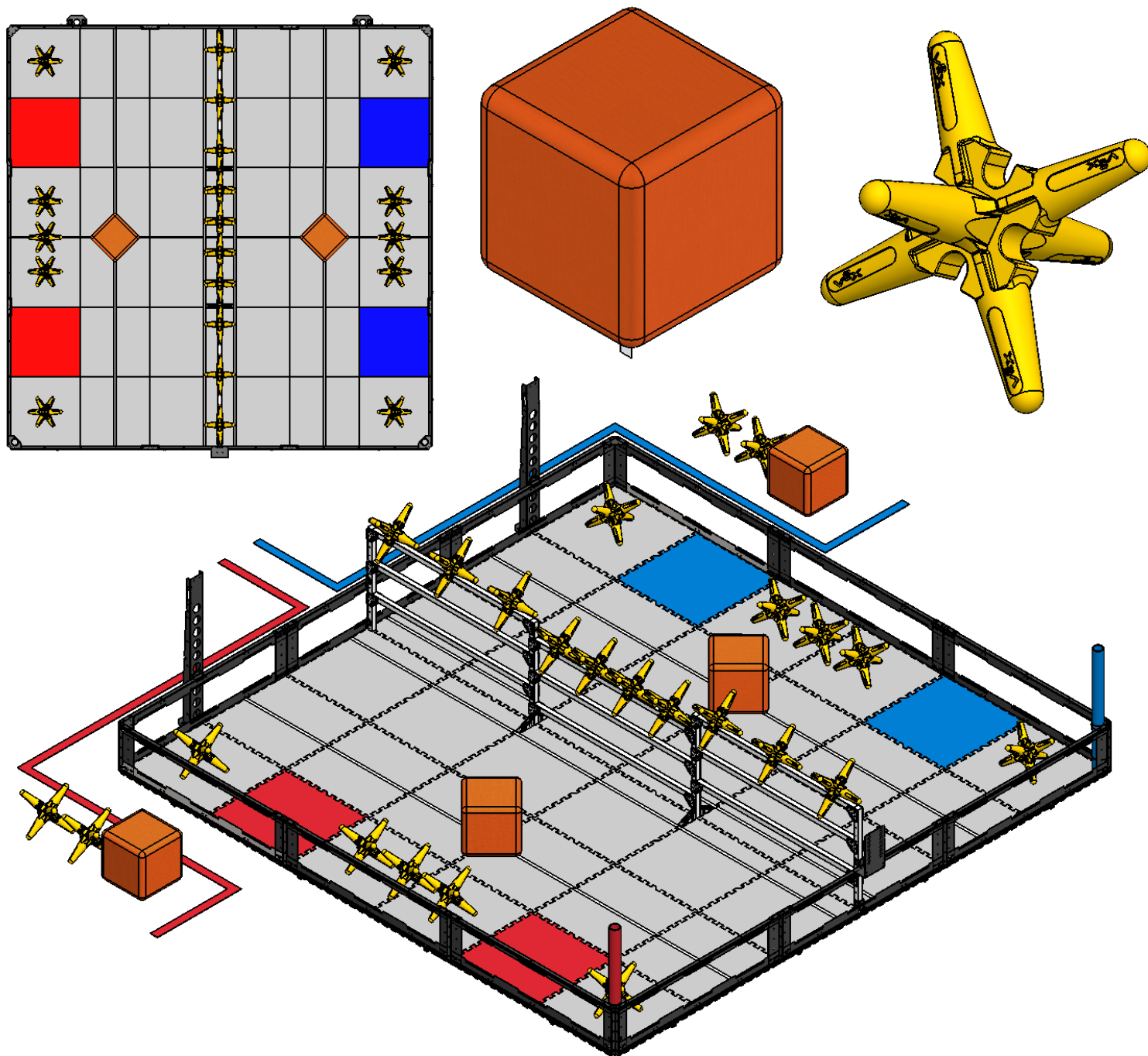
Attach the Fence segment Assemblies together using (3X) Horizontal Fence Posts (12X) 8-32 x 1.75" Screws and (12X) 8-32 Nylock Nuts. Tighten all remaining screws.



After the Fence has been assembled, apply (4X) strips of White Electrical Tape to the grey Foam Tiles as shown on Sheet 4 and below.



	Description Tape Lines	
	Dwg No 276-4847-000 Rev4	
	Project VRC 2016-2017	Sheet 27 of 28
	Release 2016-06-15	ALL DIMENSIONS ARE IN INCHES.



Use (10x) Stars to prepare the Fence for competition. Make sure the Stars are oriented as shown on Sheet 6 and in accordance to the VRC Starstruck Game Manual before beginning.

**DO NOT** take apart the Stars after initial assembly, damage to the Star may occur.

Refer to the VRC Starstruck Game Manual for more details, including all official rules and regulations.

Use the 3D CAD model of the VRC Starstruck Field for additional details not shown in the Field Drawings.