

# ***VEX Robotics Competition In the Zone – 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 – In the Zone* 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 – In the Zone* competition manual.

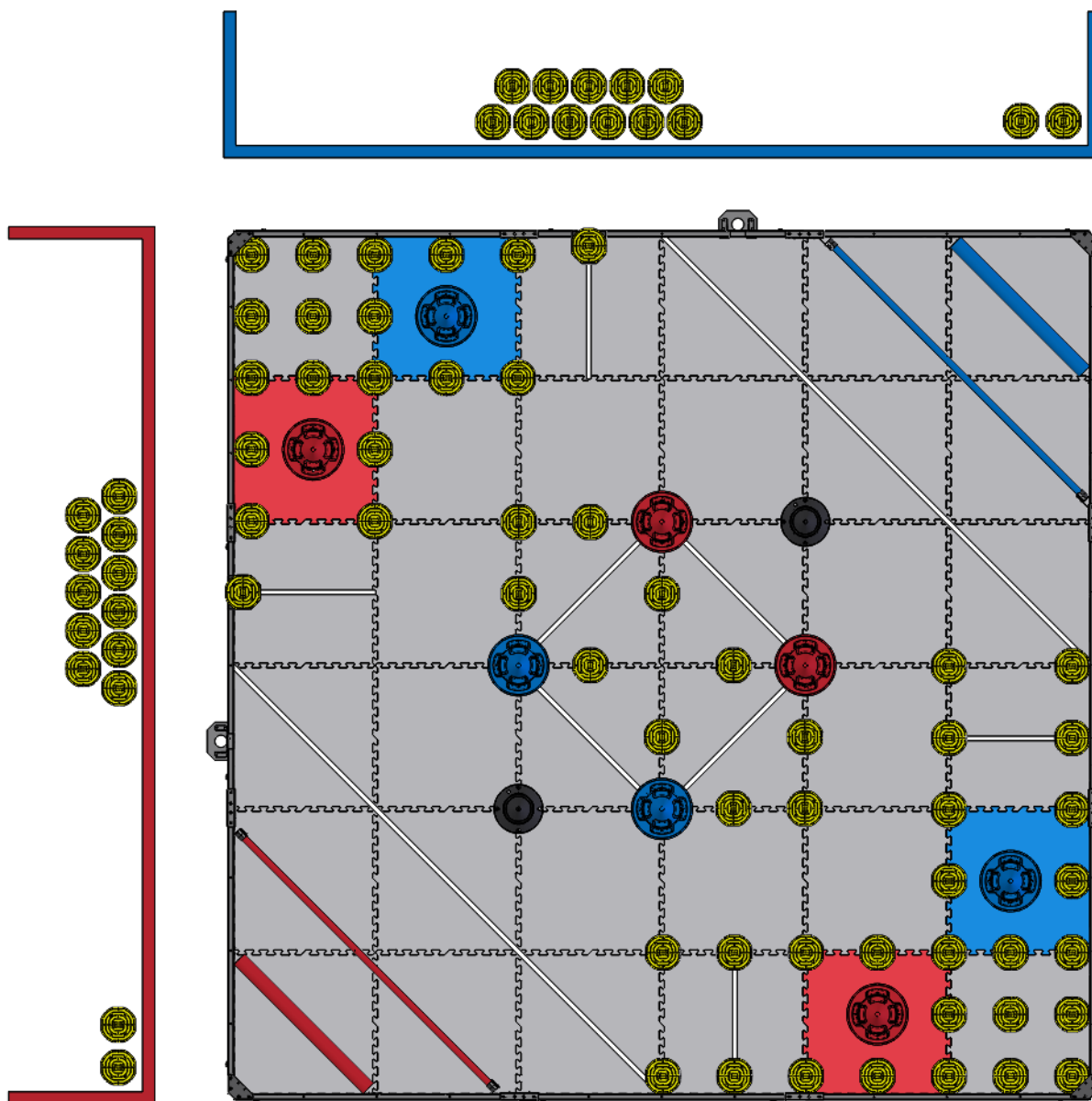
For more information on reducing costs on an unofficial field construction, refer to the accompanying “Low Cost Field” section located online at [vexrobotics.com](http://vexrobotics.com).

# VEX Robotics Competition In the Zone – Appendix A

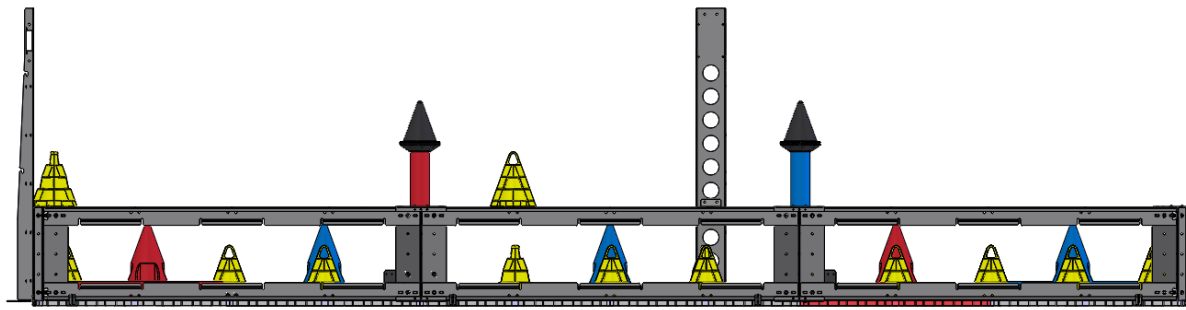
## Field Overview

The game *VEX Robotics Competition – In the Zone* 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 *Scoring Zones* which are denoted by a tape line and two PVC pipes. Towards the center of the field two alliance specific *Stationary Goals* made of plastic pieces and PVC pipe. Each alliance also has a sheet steel *Loader* attached to the field perimeter near their alliance station. Plastic *Cones* and alliance specific *Mobile Goals* are placed across the field.

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



# VEX Robotics Competition In the Zone – 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 – In the Zone Specific Elements

Part Number	Description	Quantity per Full Field
276-5370	VRC In the Zone Game Element Kit	4
276-5544	VRC In the Zone Field Element Kit	1

Practice Elements

Part Number	Description
276-5370	VRC In the Zone Game Element Kit
276-5543	VRC In the Zone Scoring Kit



# ***VEX Robotics Competition In the Zone – Appendix A***

## **Field Assembly Introduction**

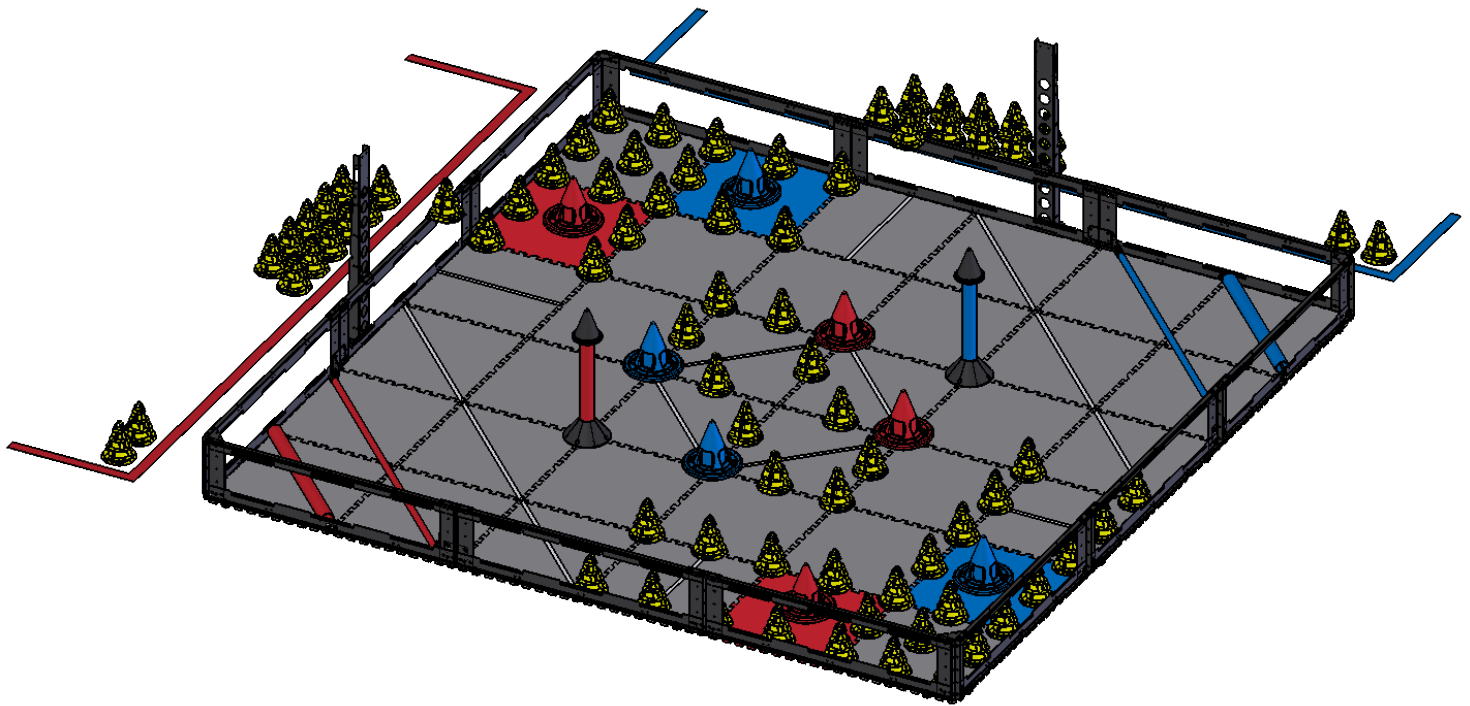
This section will detail the steps required to construct the competition field for the *VEX Robotics Competition – In the Zone*. The field utilizes the “VEX Competition Field Perimeter” (278-1501). For specifications and instructions for assembling this frame, please refer to the separate “VEX Competition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

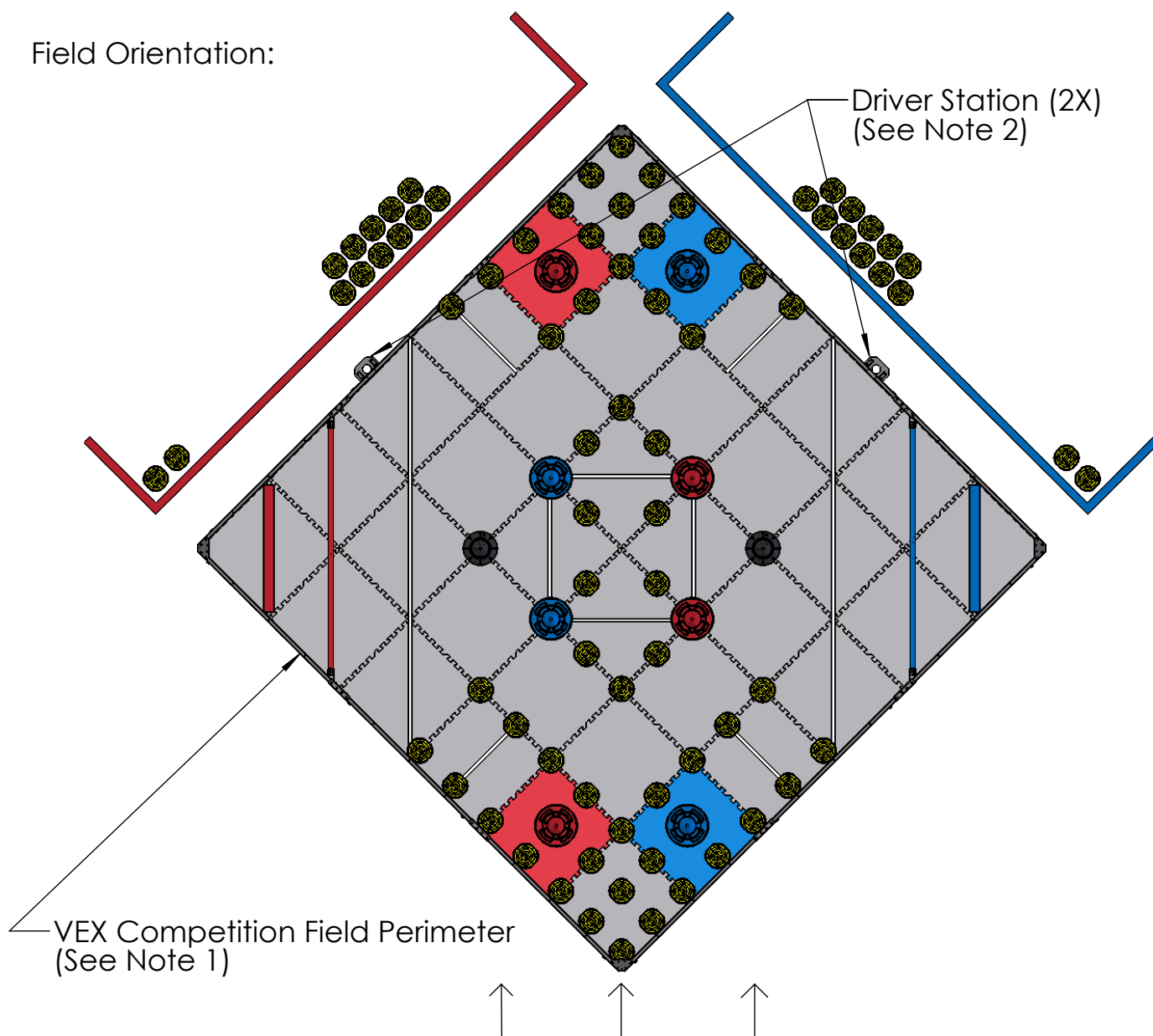
The following tools are required for assembly of the official VEX Robotics Competition – In the Zone field:

- 3/32" Allen Wrench
- T15 Screw Driver
- 11/32" Wrench
- 1/4" Wrench
- Side Cutters or Scissors (for cutting tape)



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Competition	VRC 2017-2018	Sheet 1 of 22	
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Field Orientation:



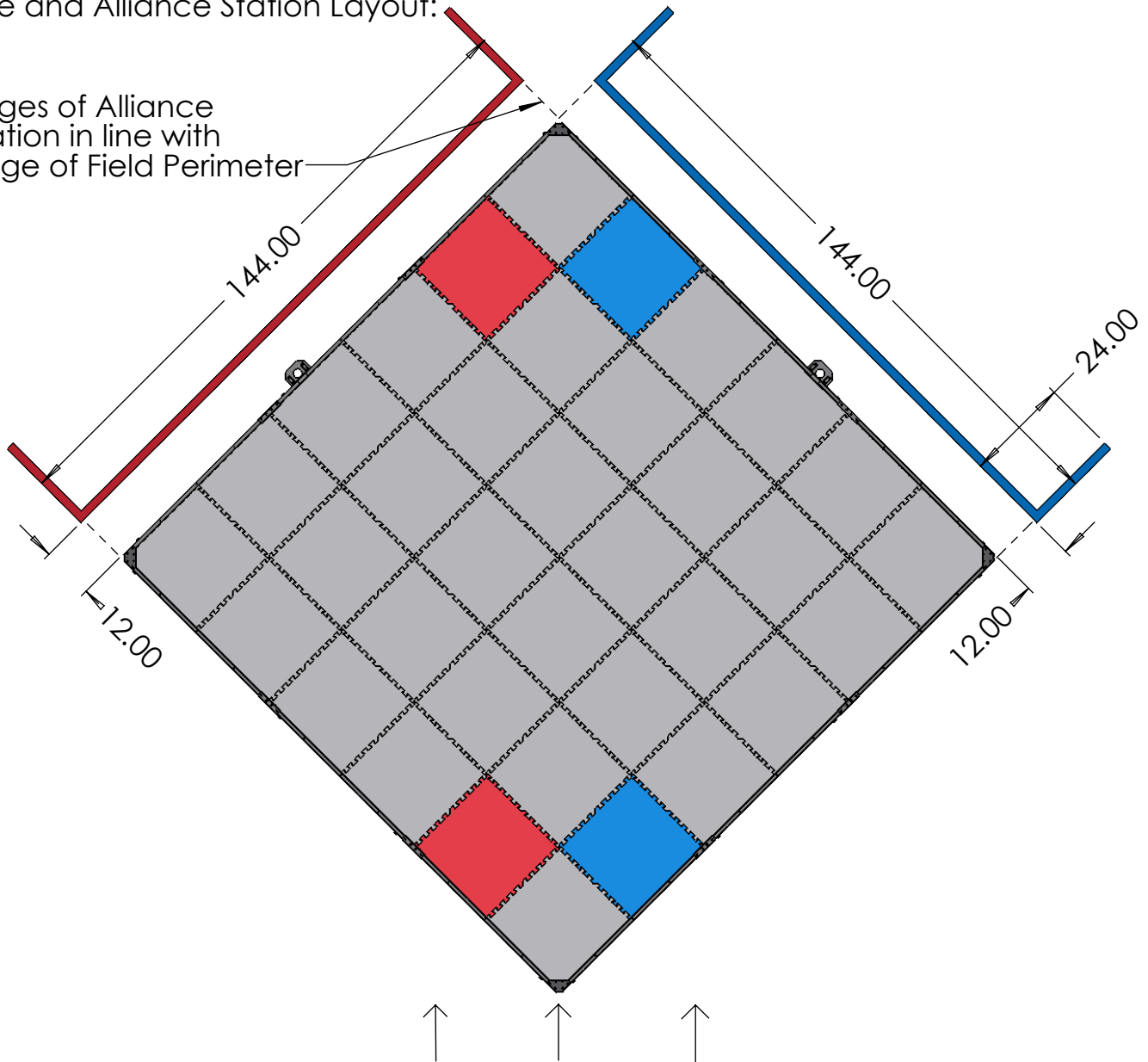
## CROWD VIEW

### NOTES:

1. Assemble the VEX Competition Field Perimeter (see separate VEX Competition Field Perimeter assembly instructions.) Position the perimeter so that the diagonal is facing the crowd.
2. Attach the Driver Stations as shown. Instructions for assembly are included with the VEX Competition Field Perimeter Instructions.

## Foam Tile and Alliance Station Layout:

Edges of Alliance Station in line with edge of Field Perimeter



## CROWD VIEW

### Foam Tile and Alliance Station Layout 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.

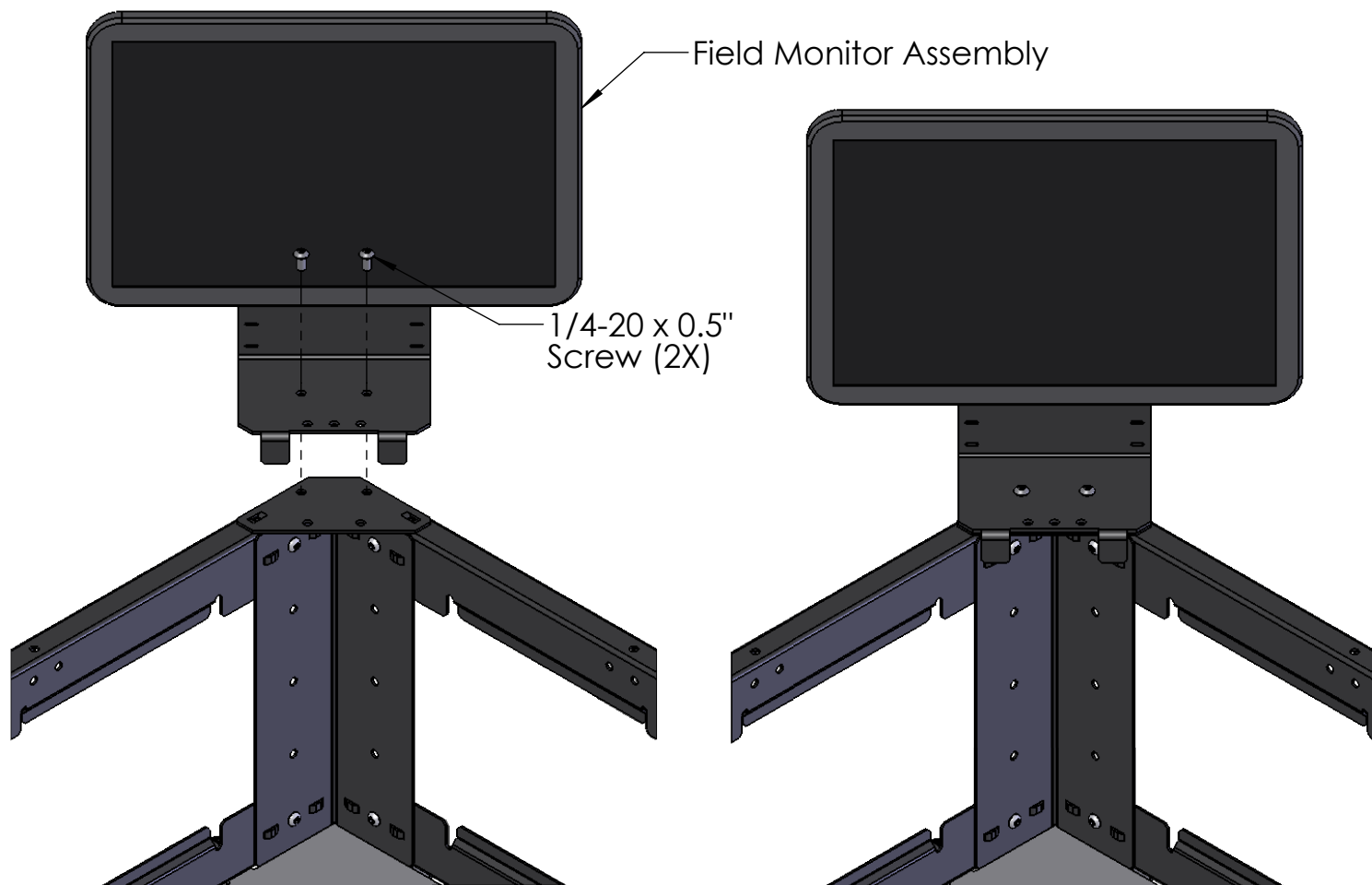
Once the Field Perimeter is in place, mark off the Alliance Stations using Red or Blue Tape as shown above.

The edges of the Alliance Stations should be in line with the edges of the Field Perimeter.

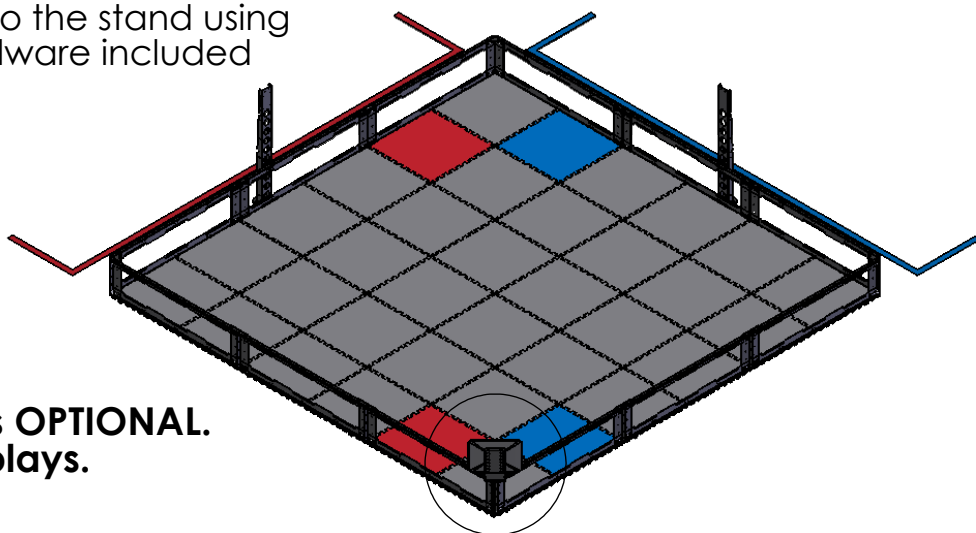


## Field Monitor Assembly:

Remove (2X) 1/4-20 x 0.5" Screws from the corner of the Field. Use those 1/4-20 x 0.5" Screws to attach the Field Monitor Assembly to the corner of the Field Perimeter.



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

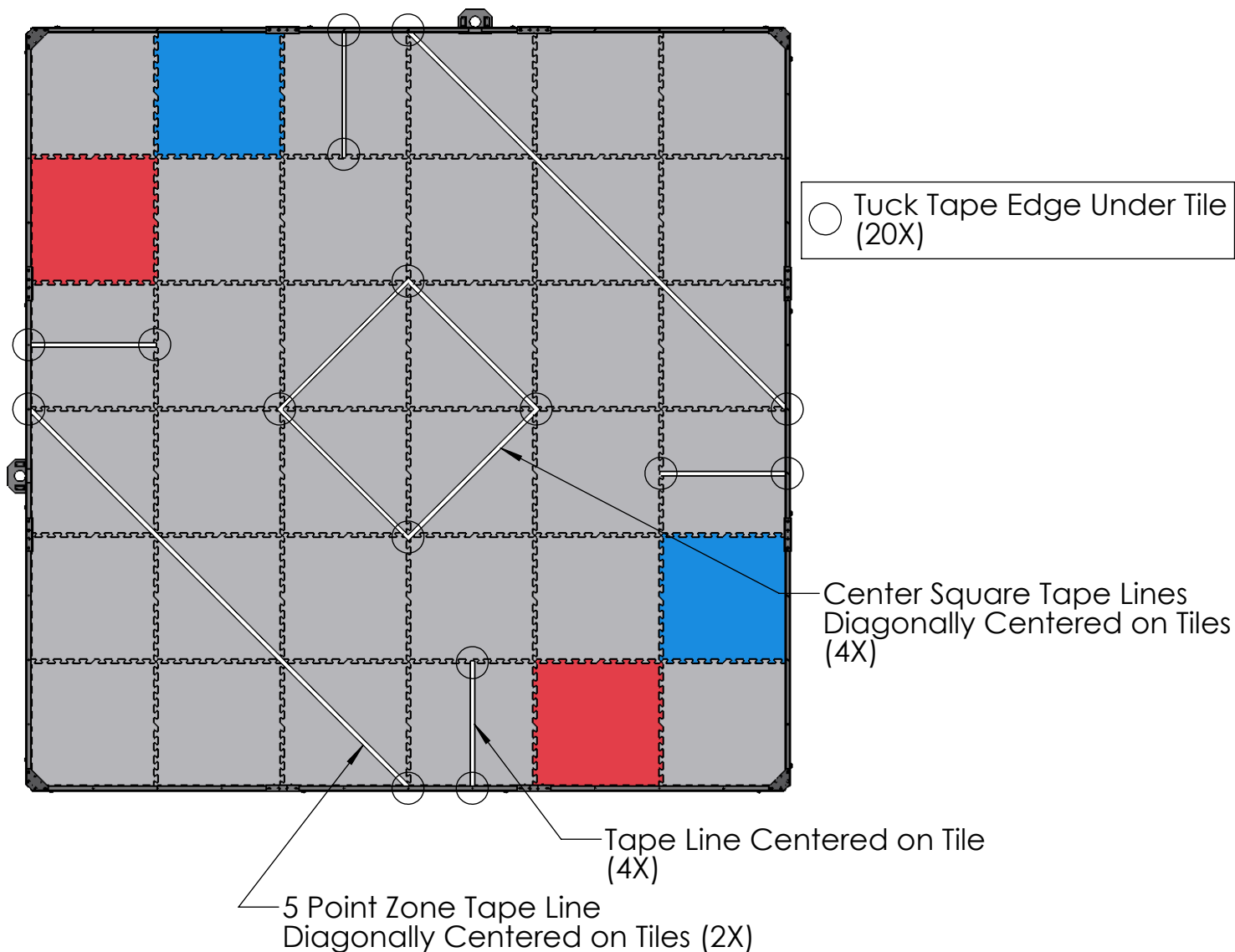


**NOTE:**  
Field Monitor Mounting is **OPTIONAL**.  
Events may use side displays.



## Tape Line Locations:

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



### IMPORTANT NOTE:

**DO NOT stretch tape when applying to the foam tile floor. For best results, smooth out any bubbles that form during application.**

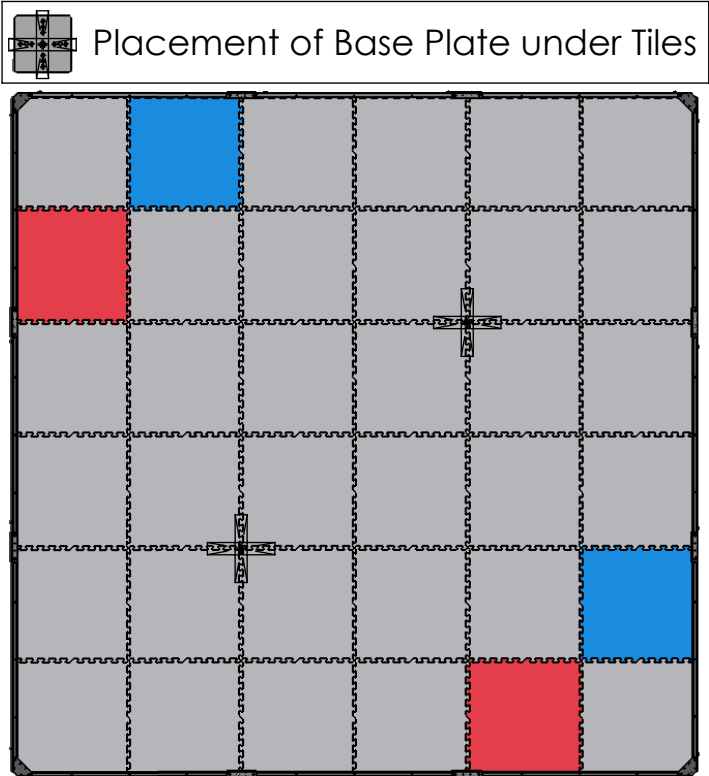
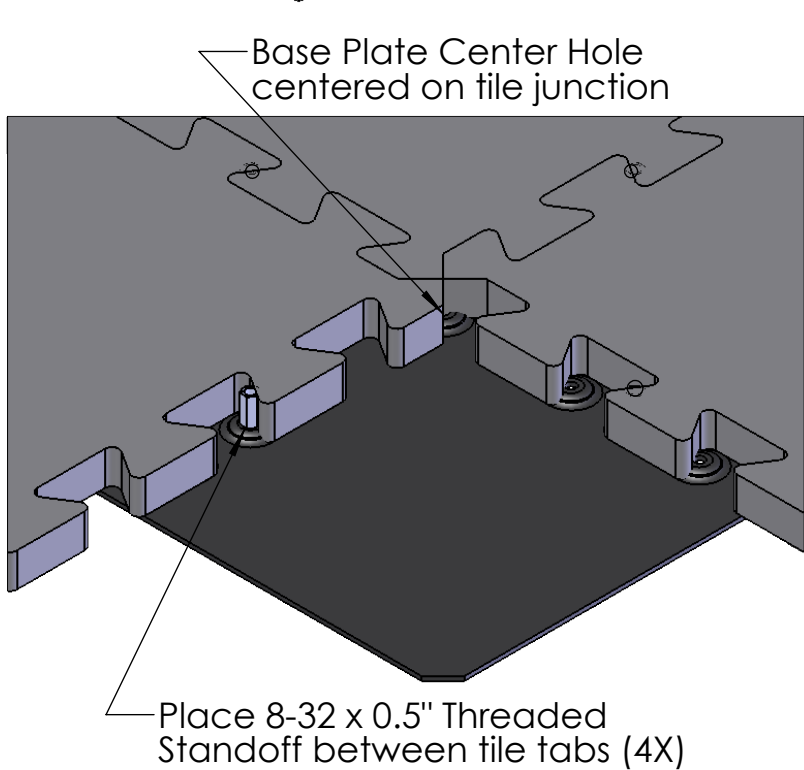
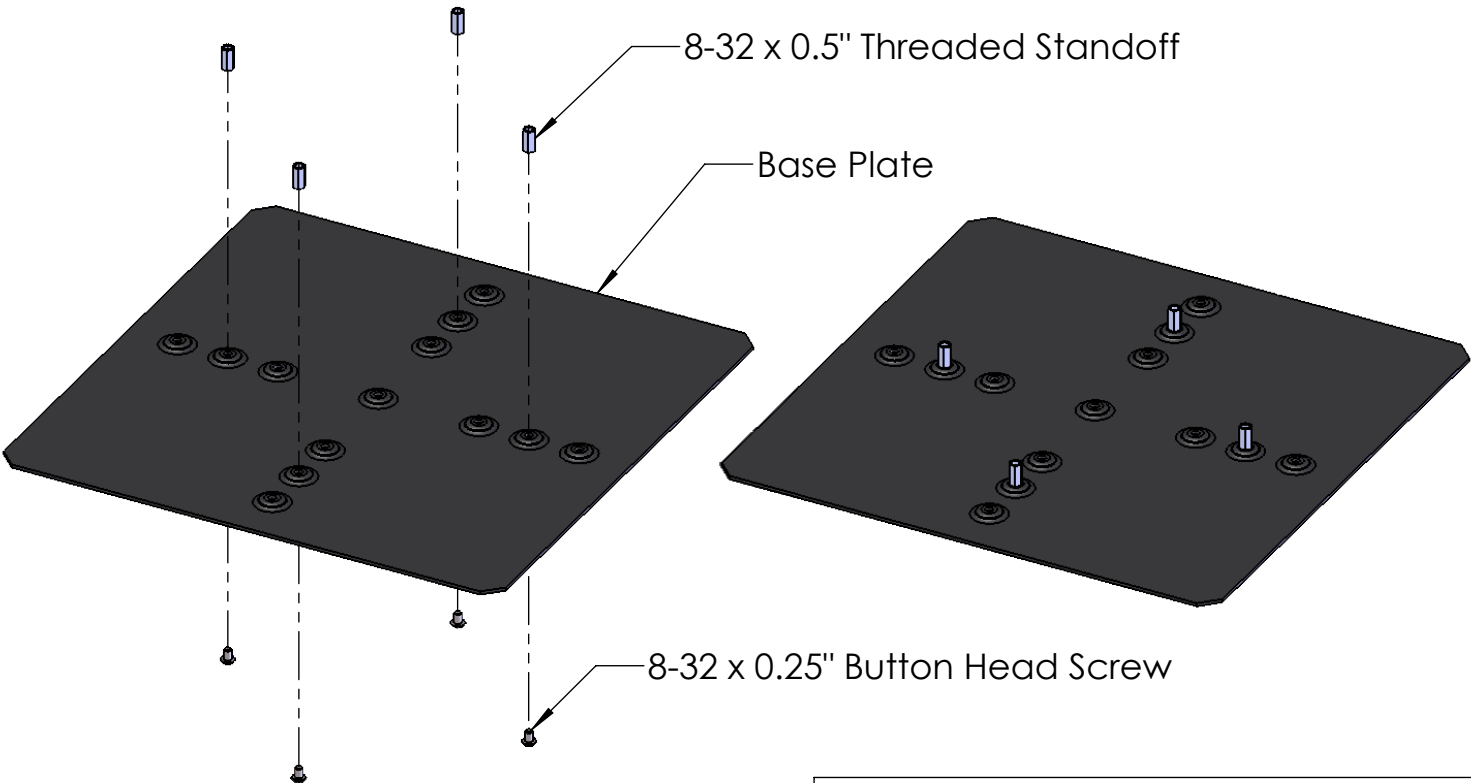
To prevent tape lines from being pulled up during competition, it is recommended that the ends of the tape are tucked into tile seams.


### Pro-Tip:

If the tiles will 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.

Stationary Goal Assembly - Step 1:

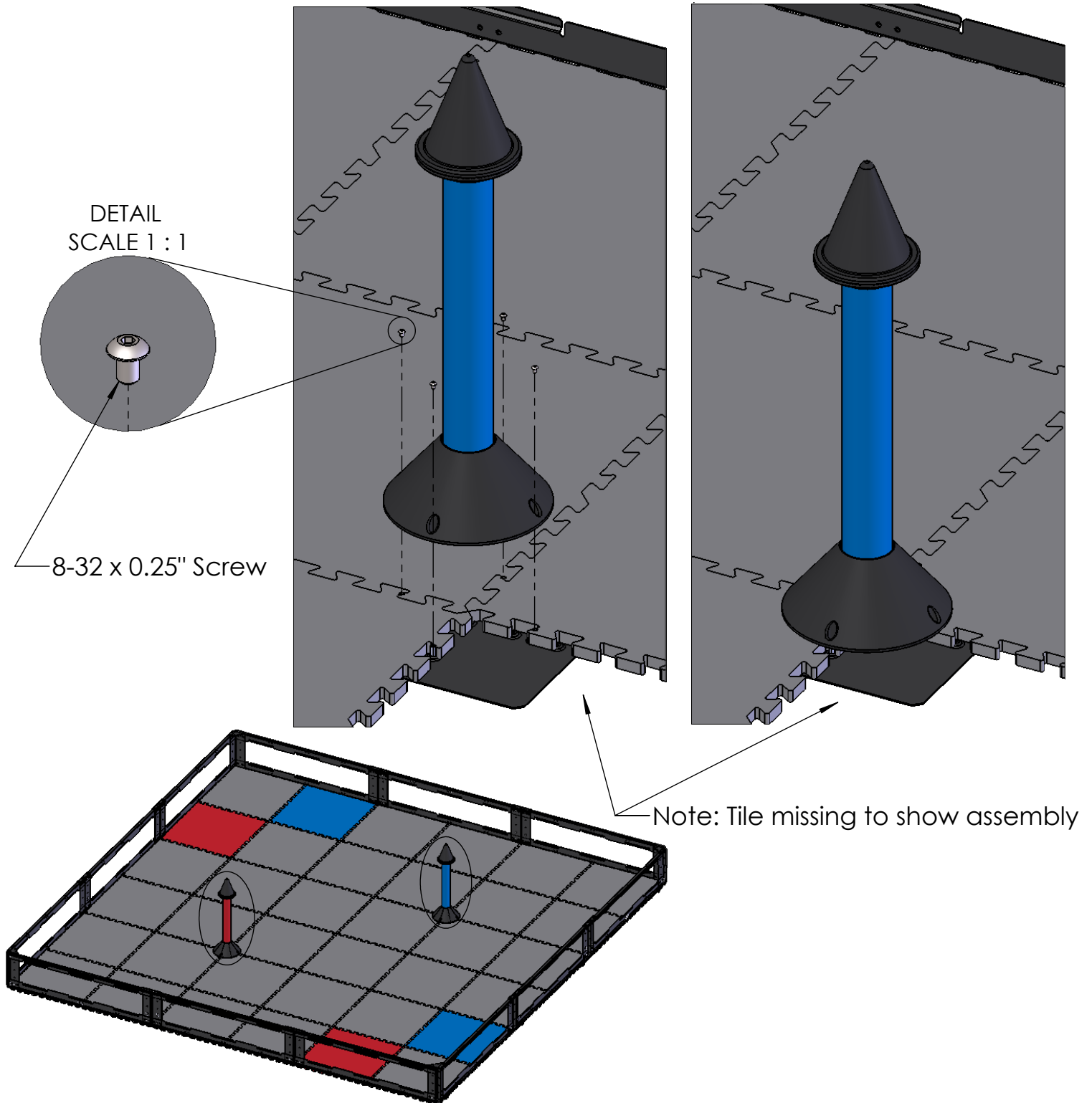
Attach (4X) 8-32 x 0.5" Threaded Standoffs to the Base Plate using (4X) 8-32 x 0.25" Button Head Screws. Place the Base Plate Assembly under the field tiles aligned with the proper corner junction. Repeat this (2X).



	Description Stationary Goal - Step 1	
	Dwg No 276-5369-000	
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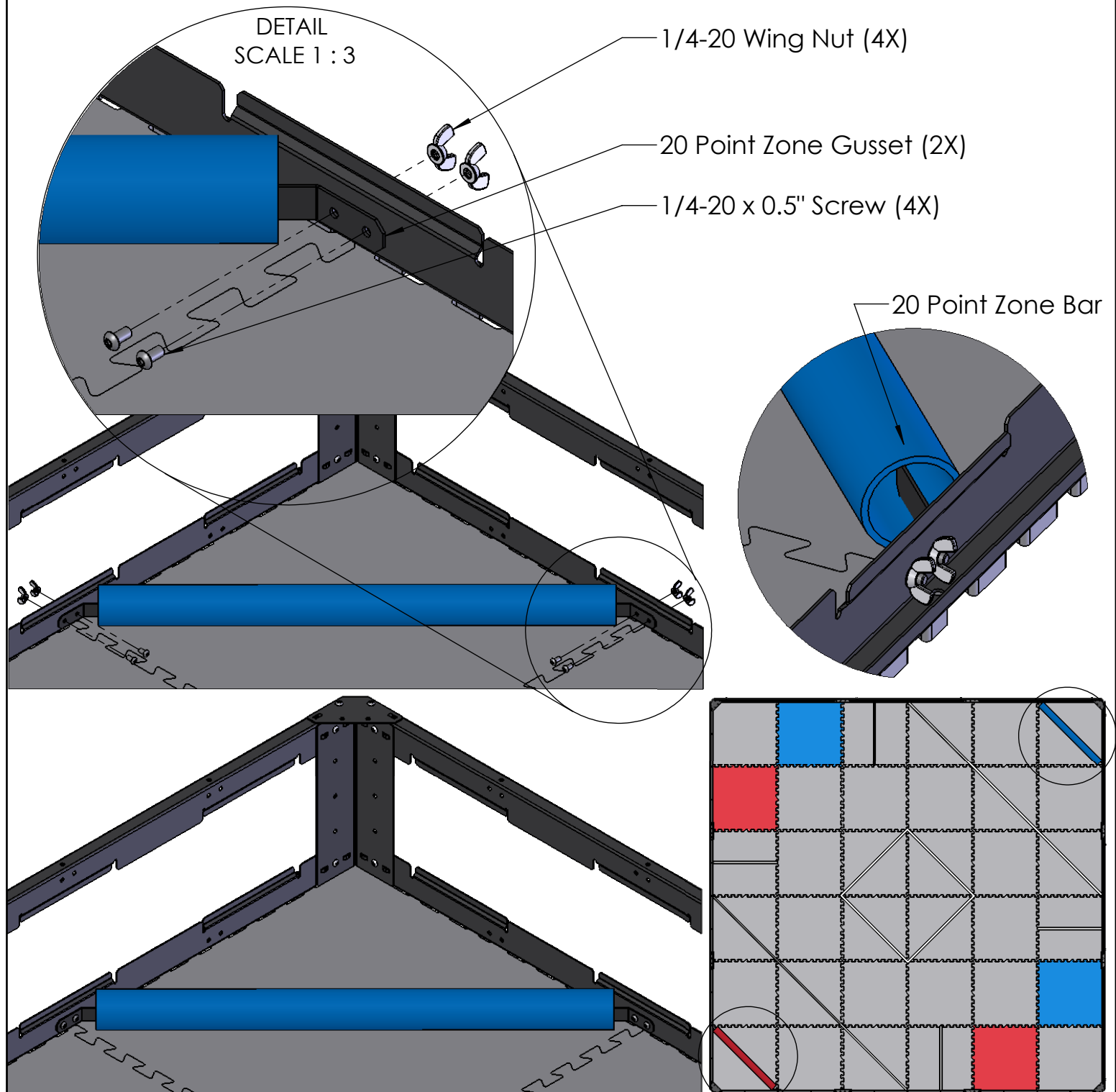
## Stationary Goal Assembly - Step 2:

Attach the Stationary Goal to the Base Plate Assembly using (4X) 8-32 x 0.25" Button Head Screws. Repeat this process (2X).



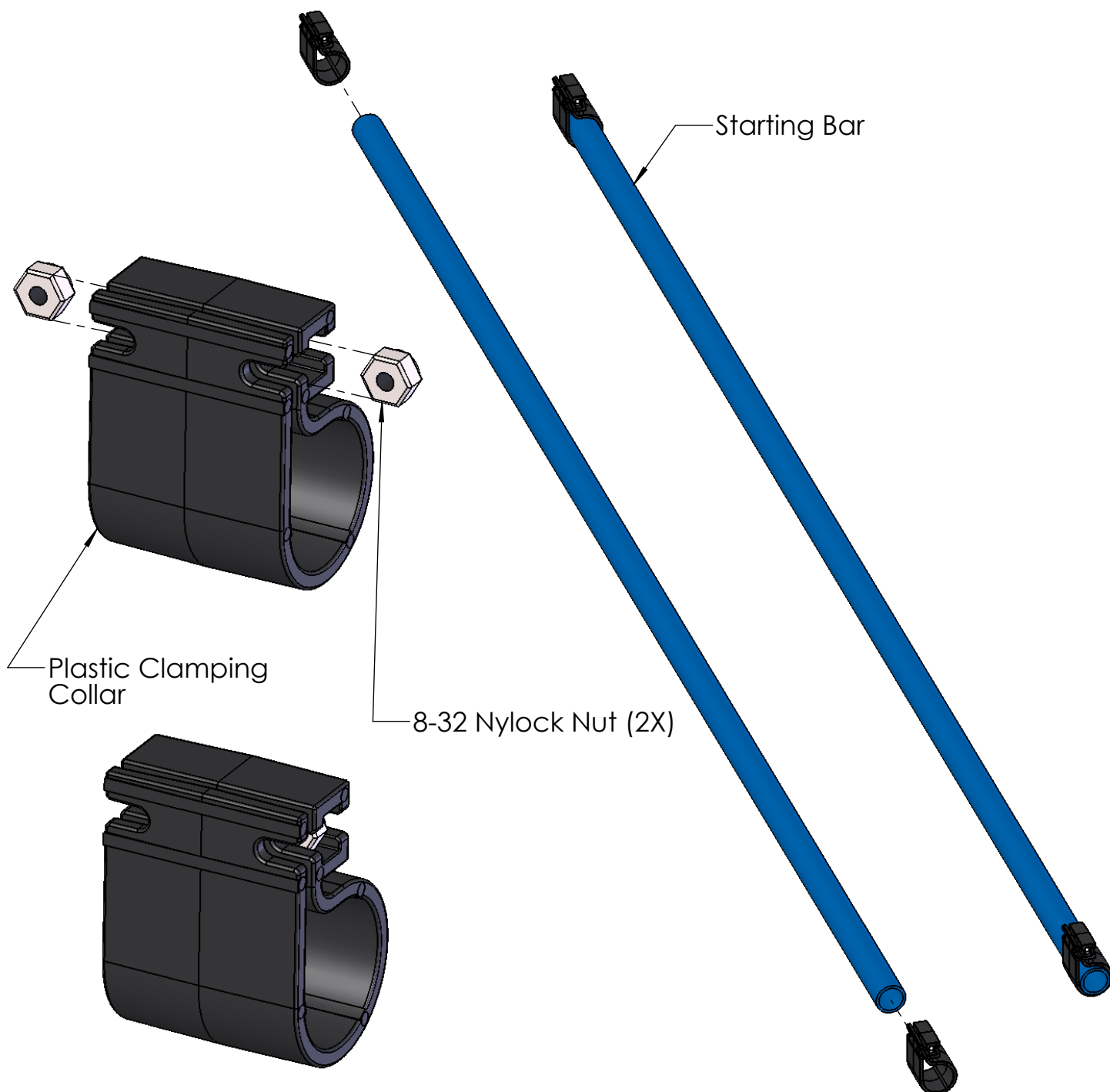
## 20 Point Zone Assembly:

Attach (2X) 20 Point Zone Gusset's to the Field Perimeter using (4X) 1/4-20 x 0.5" Button Head Screws and (4X) 1/4-20 Wing Nuts, capturing the 20 Point Zone Bar in between them. Repeat this process (2X).



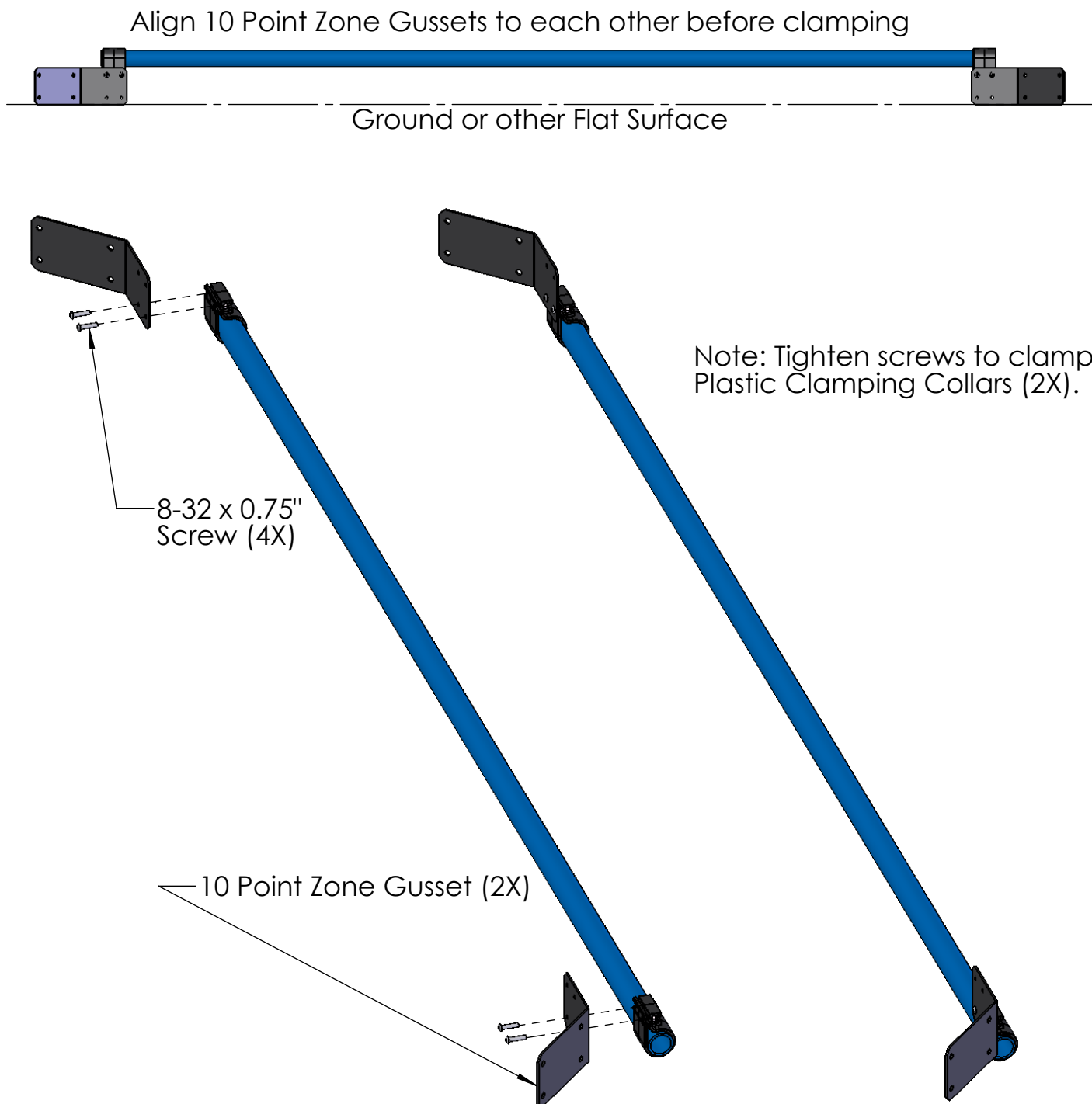
## 10 Point Zone Assembly - Step 1:

Insert (2X) 8-32 Nylock Nuts into (2X) Plastic Clamping Collars. Slide (2X) Plastic Clamping Collars onto the ends of the Starting Bar. Repeat this process (2X).



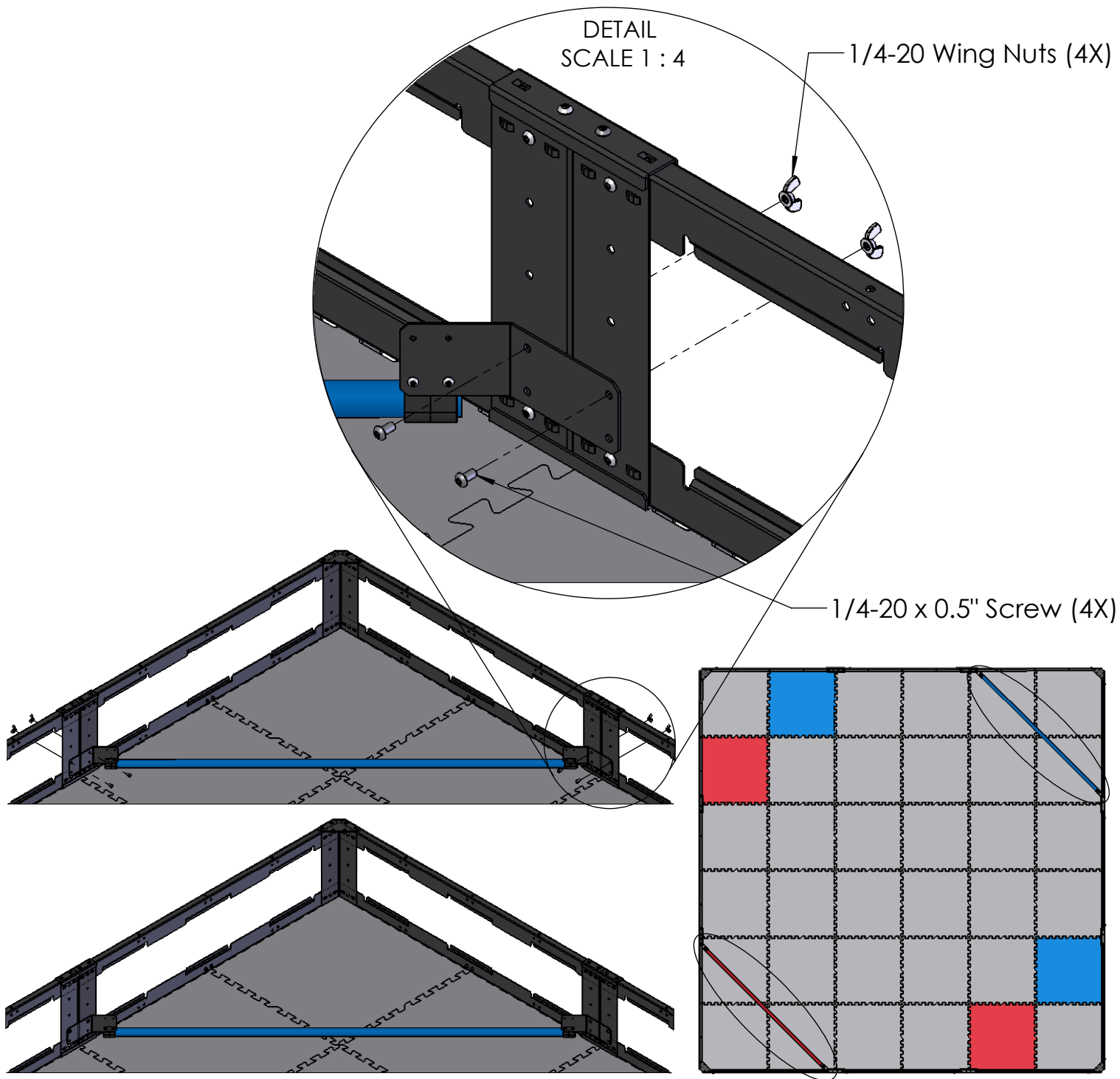
## 10 Point Zone Assembly - Step 2:

Attach (2X) 10 Point Zone Gusset to the Plastic Clamping Collar using 8-32 x 0.75" Button Head Screws. Align the (2X) 10 Point Zone Gussets to each other before tightening screws. Repeat this process (2X).



### 10 Point Zone Assembly - Step 3:

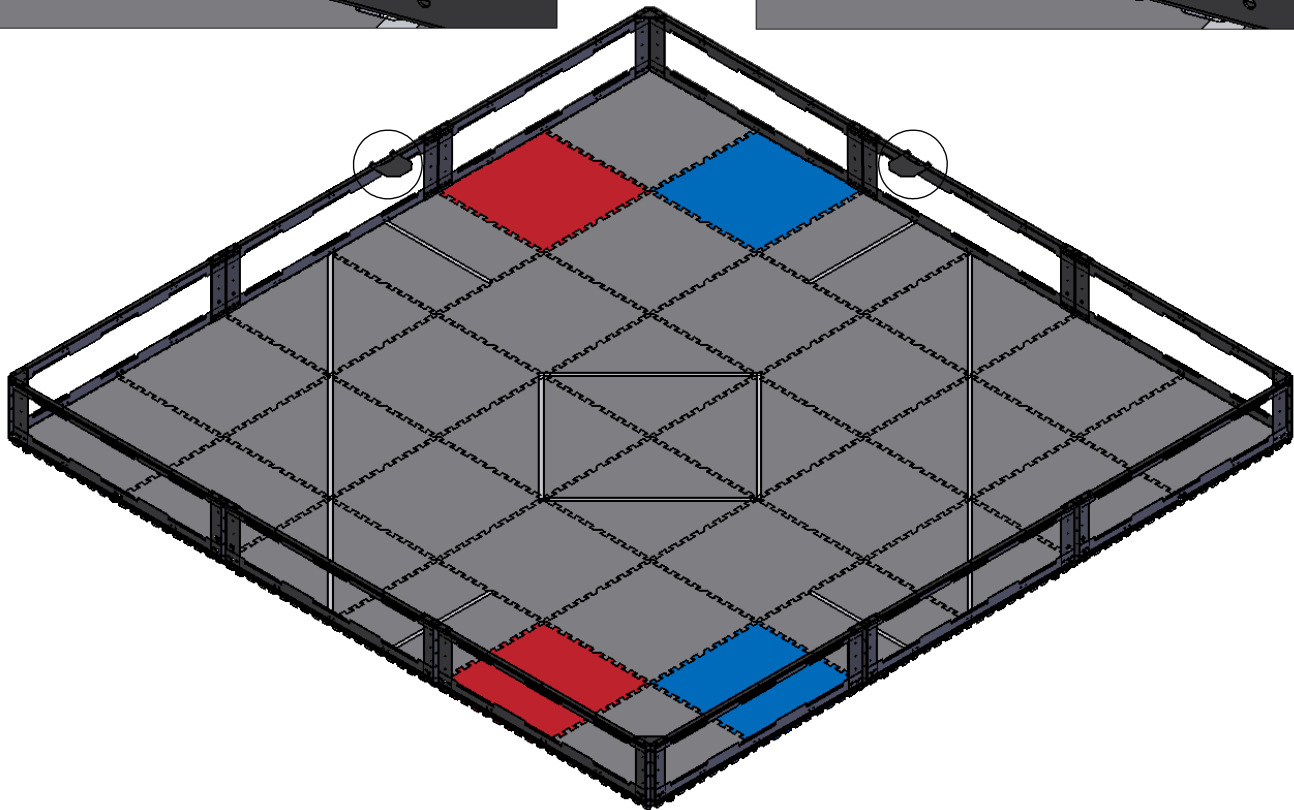
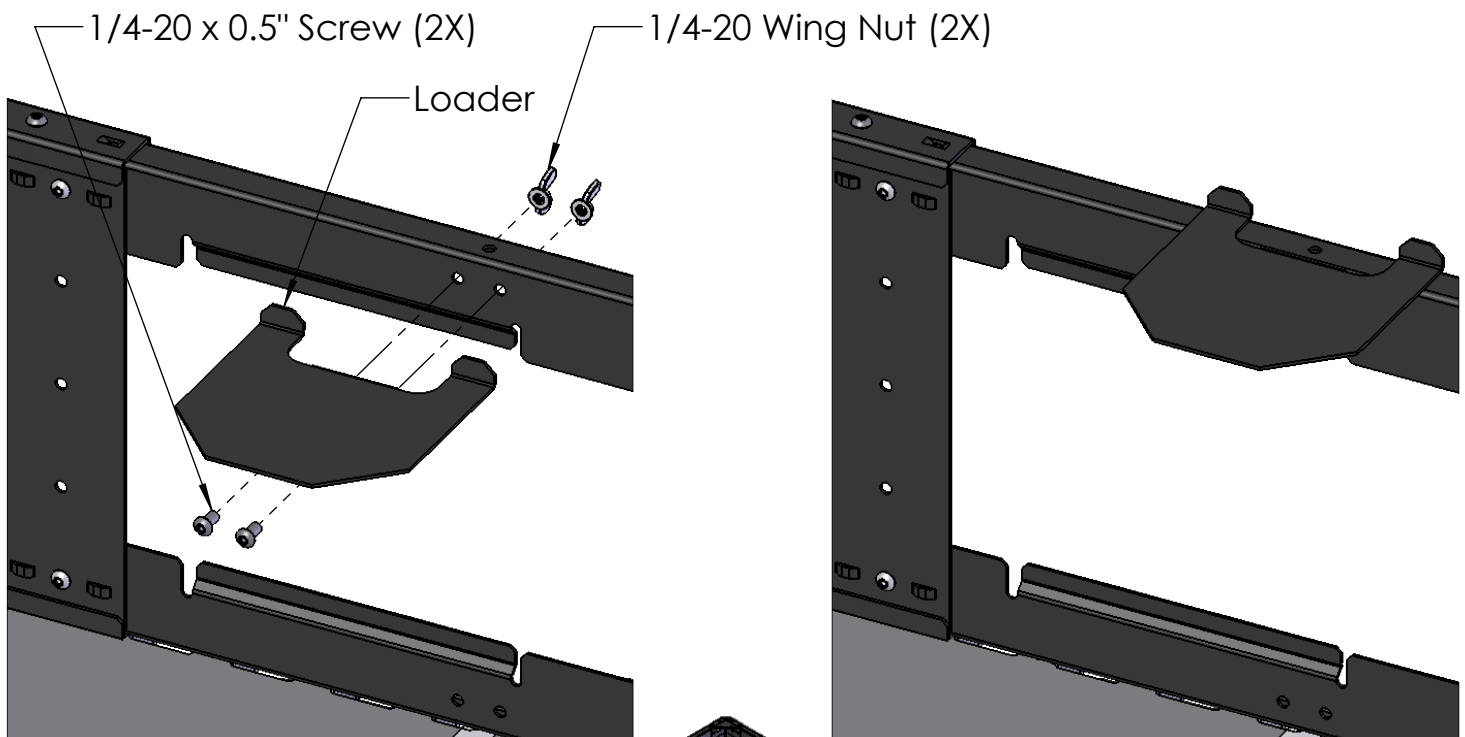
Attach the 10 Point Zone Assembly to the Field Perimeter using (4X) 1/4-20 x 0.5" Button Head Screws and (4X) 1/4-20 Wing Nuts. Repeat this process (2X).





## Loader Assembly:

Attach (1X) Loader to the Field Perimeter using (2X) 1/4-20 x 0.5" Button Head Screws and (2X) 1/4-20 Wing Nuts. Repeat this process (2X).

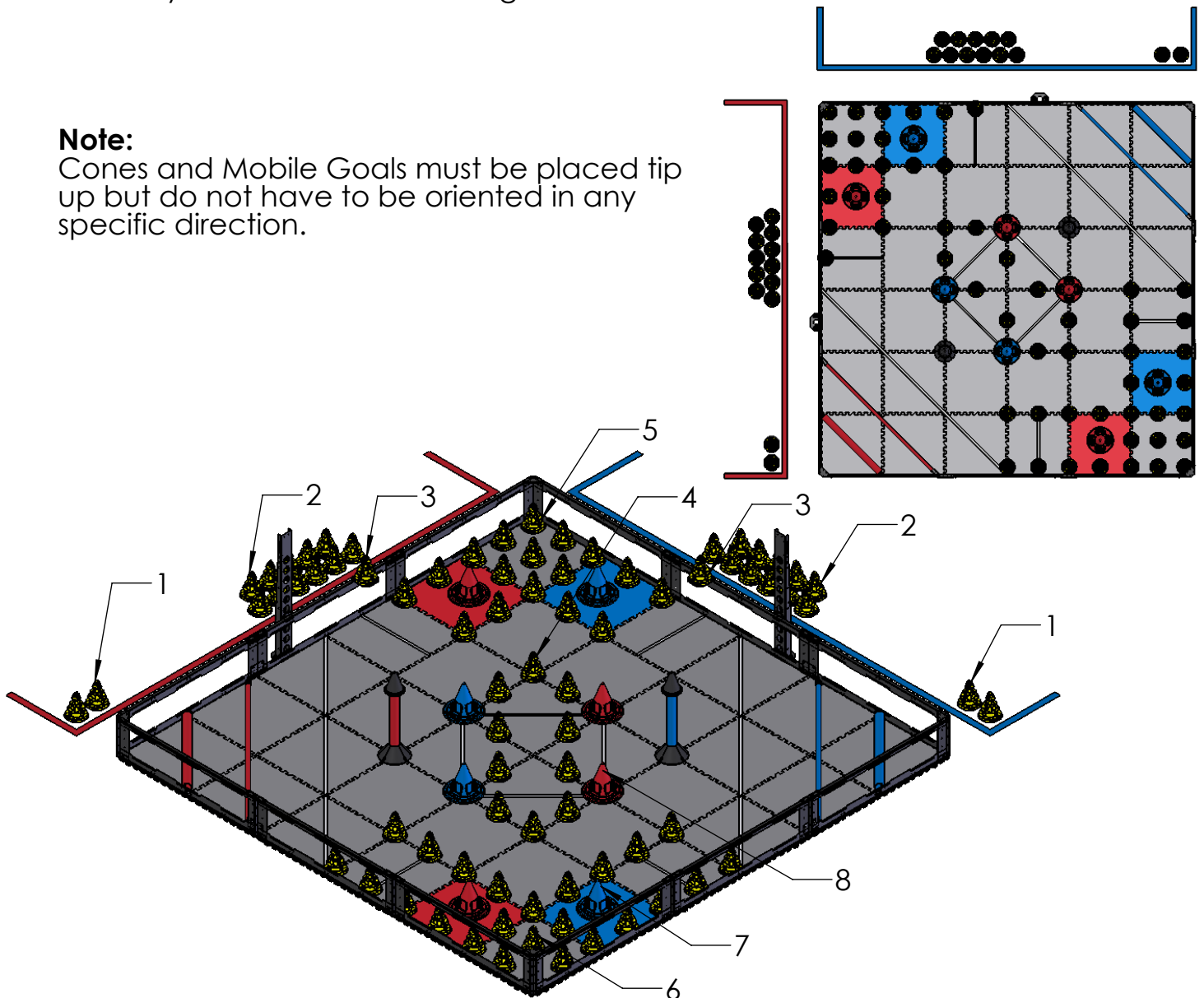


**The Cones and Mobile Goals are placed as follows before the start of each match.**

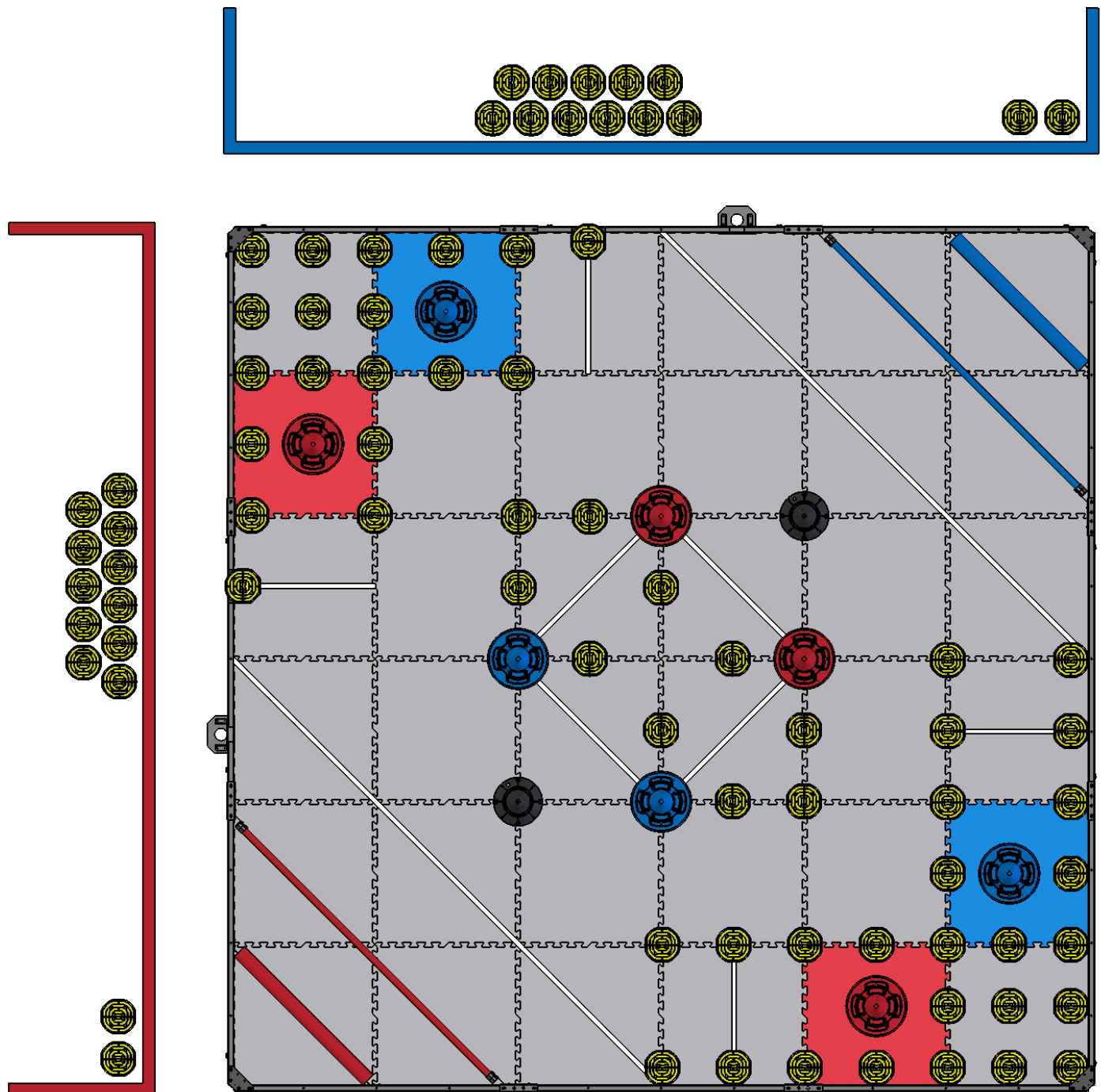
1. There is (1X) Cone for Preload into each Robot.
2. There are (11X) Cones as Driver Control Loads in each Alliance Station.
3. There is (1X) Cone as a Driver Control Load on each Loader.
4. There are (10X) Cones centered in the middle of the field in an elongated hexagon with half-tile spacing.
5. There are (17X) Cones across the three corner tiles farthest from the Crowd with approximately half-tile spacing.
6. There are (25X) Cones across the five corner tiles closest to the Crowd with approximately half-tile spacing.
7. There are (2X) Red Mobile Goals and (2X) Blue Mobile Goals centered on the two tiles of the same color.
8. There are (2X) Red Mobile Goals and (2X) Blue Mobile Goals centered on the four corners of the tape square in the center of the field. Each color is farthest away from its colored Scoring Zone.

**Note:**

Cones and Mobile Goals must be placed tip up but do not have to be oriented in any specific direction.



# Reference Object Placement Image:

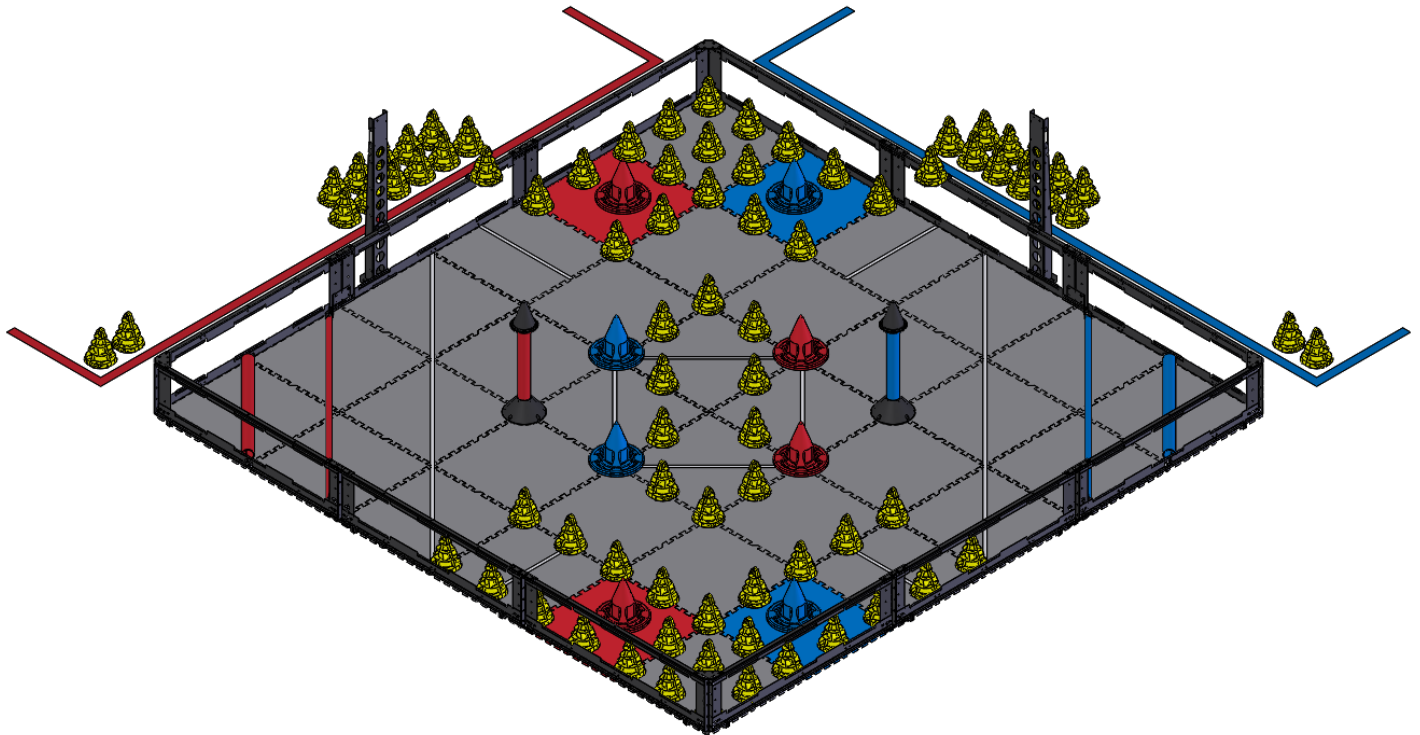


# VEX Robotics Competition In the Zone – Appendix A

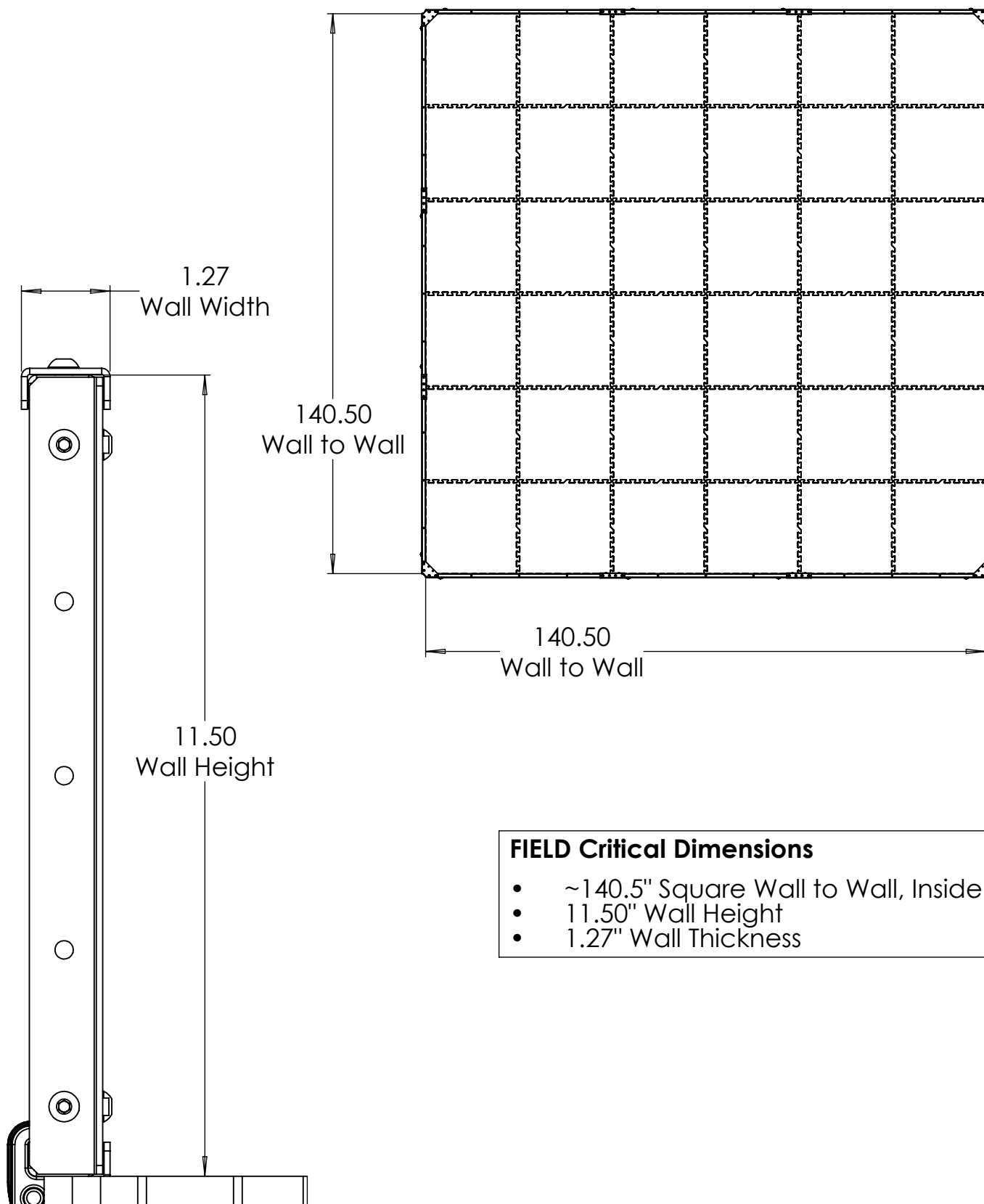
## Field Specifications Introduction

This section will outline the specifications that are most important to teams designing a robot to compete in the *VEX Robotics Competition – In the Zone*. 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.



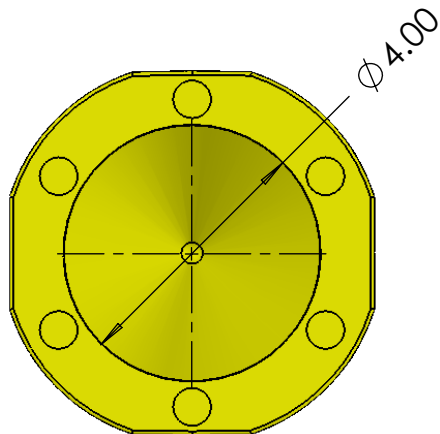
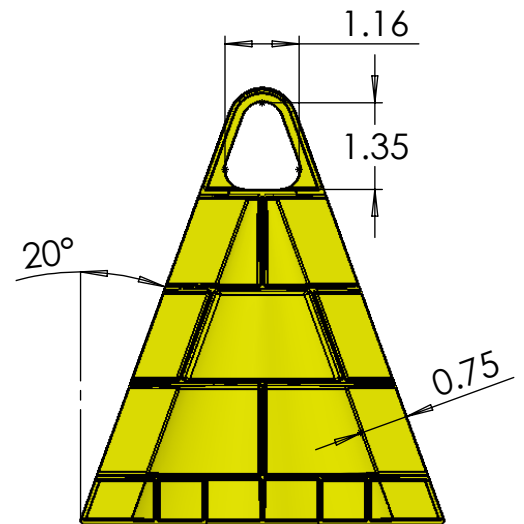
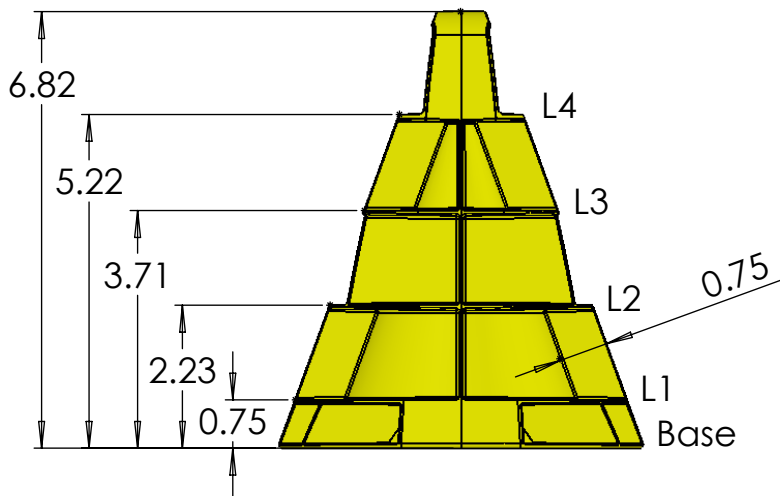
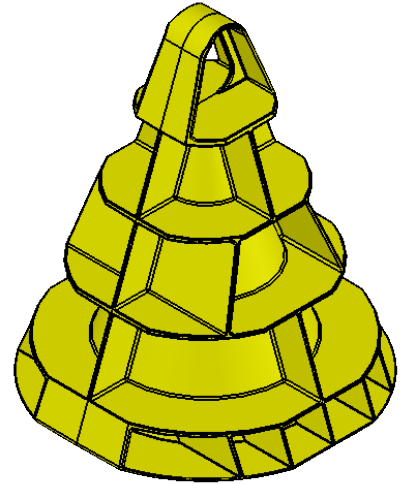
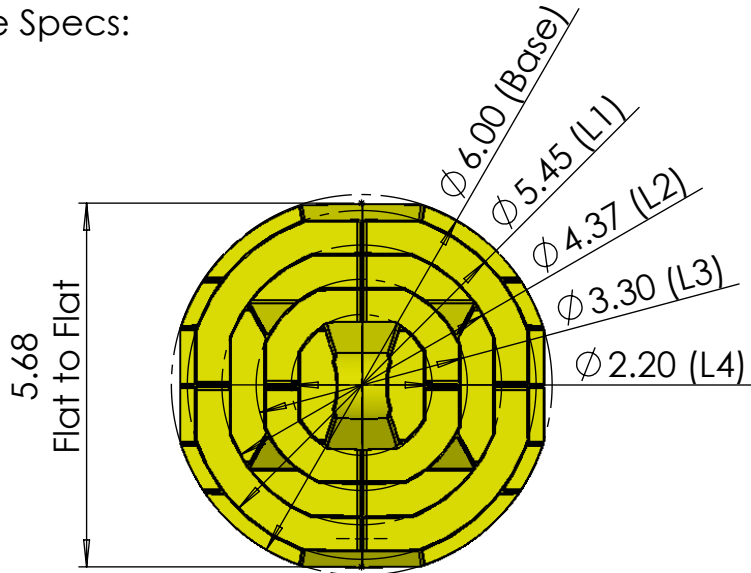
# Field Critical Specs:




## FIELD Critical Dimensions

- ~140.5" Square Wall to Wall, Inside
- 11.50" Wall Height
- 1.27" Wall Thickness

# Cone Specs:

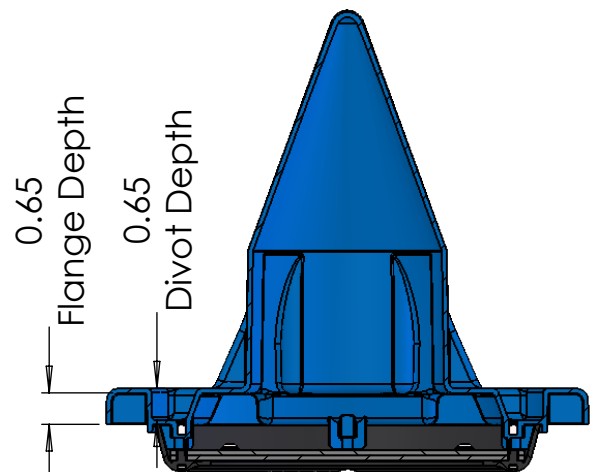
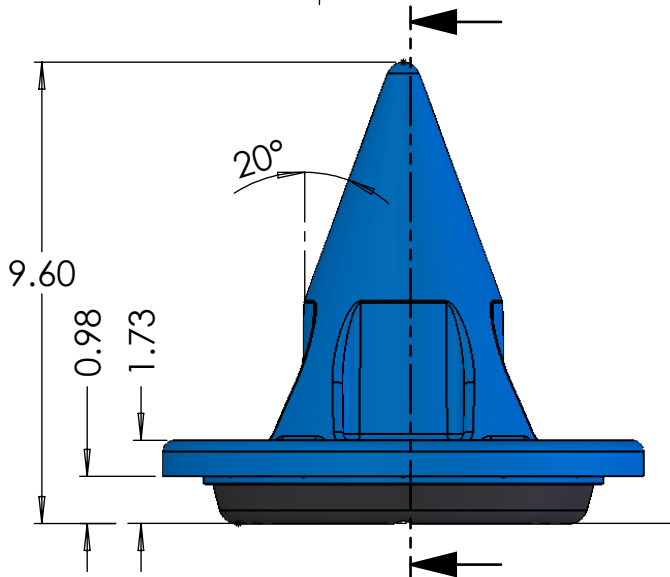
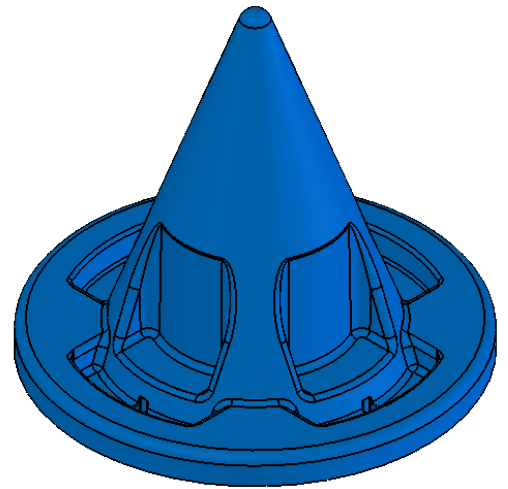
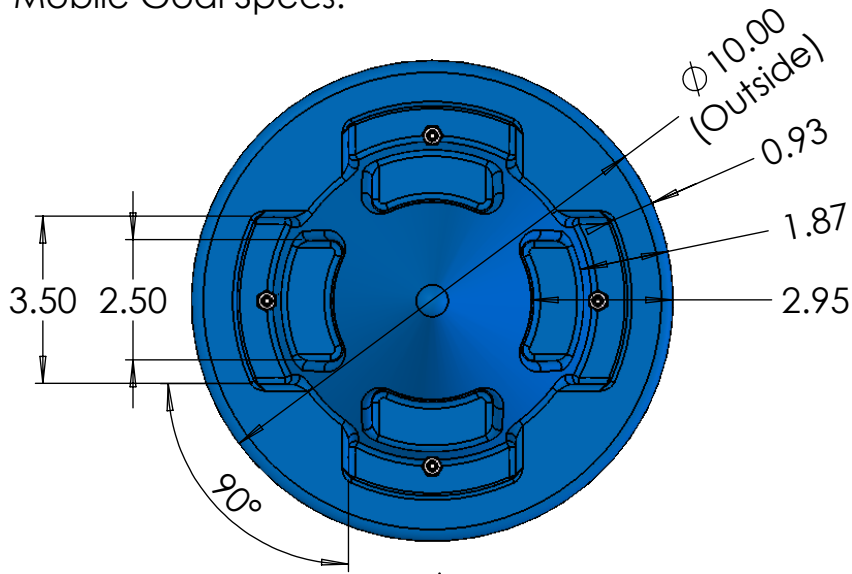


Weight: 118 grams  $\pm$  10%

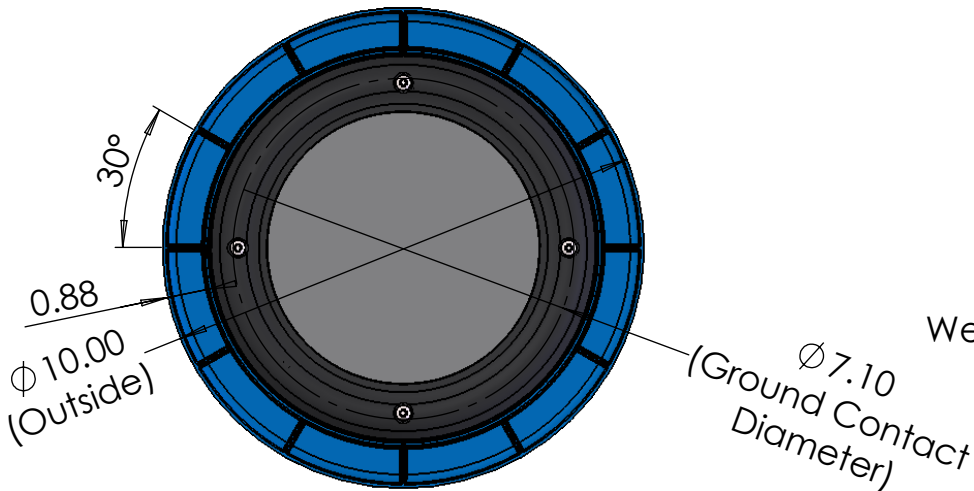
	Description Cone Specifications	
	Dwg No 276-5369-000	
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	Release 2017-03-27	ALL DIMENSIONS ARE IN INCHES.



# Mobile Goal Specs:



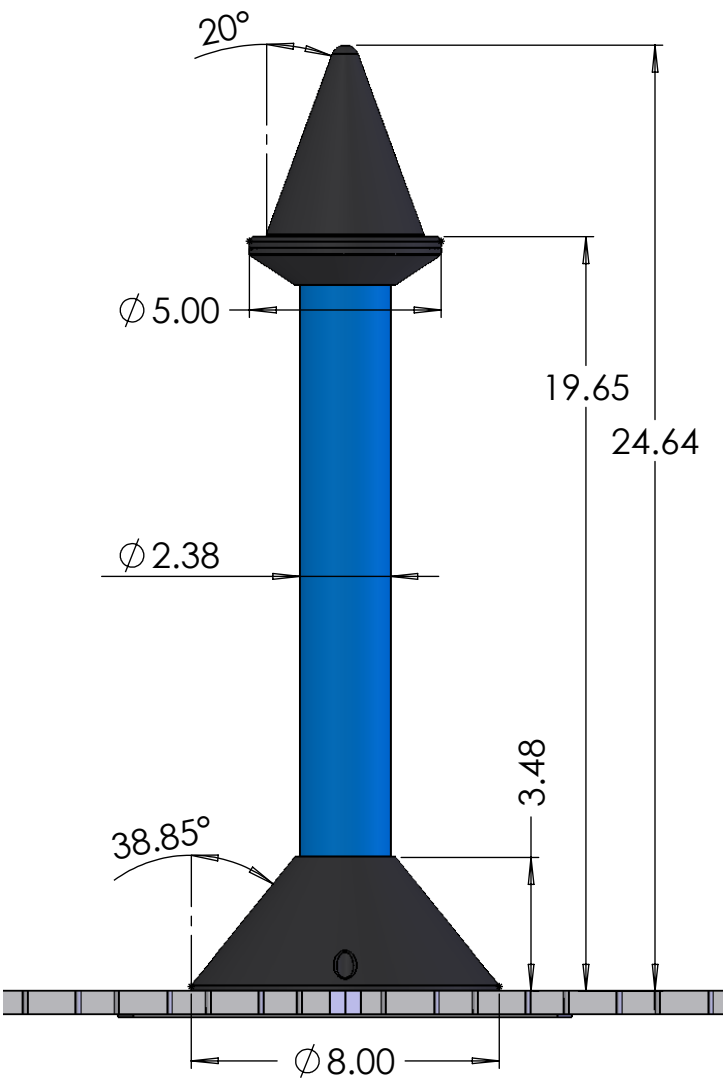
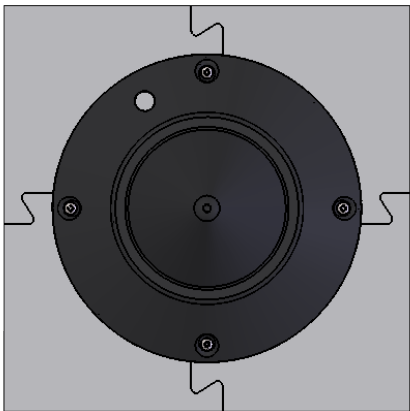
SECTION -  
SCALE 1 : 4




Weight: 1.68 kilograms  $\pm 15\%$

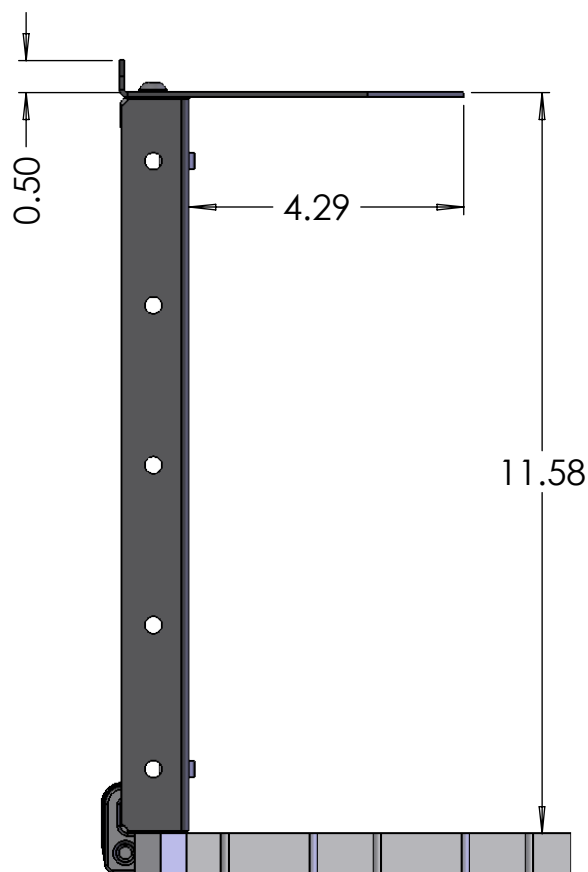
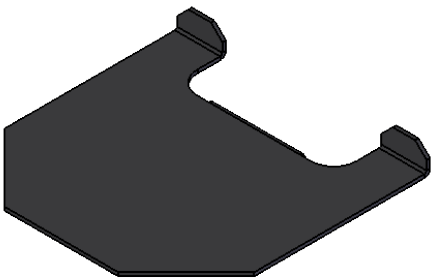
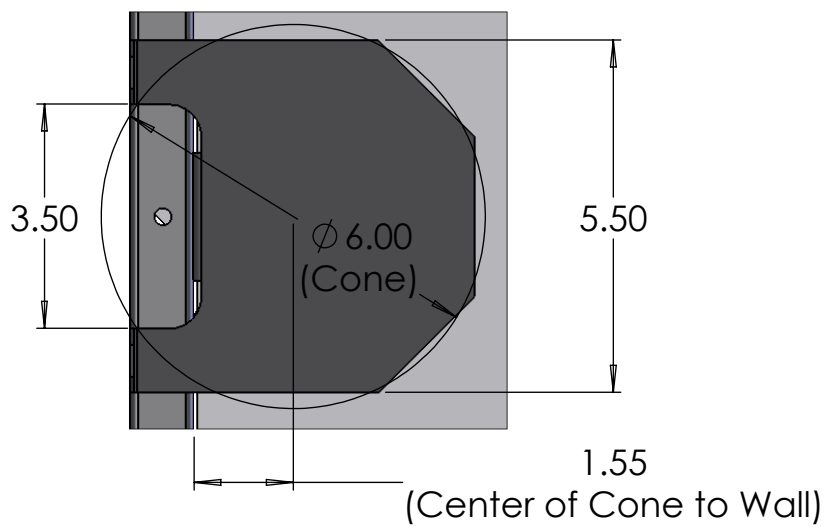



Stationary Goal Specs:



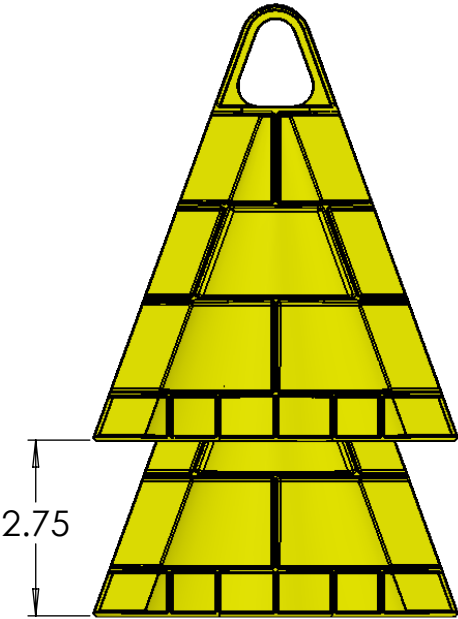
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	Competition VRC 2017-2018	Sheet 18 of 22
	Release 2017-03-27	ALL DIMENSIONS ARE IN INCHES.

Loader Specs:

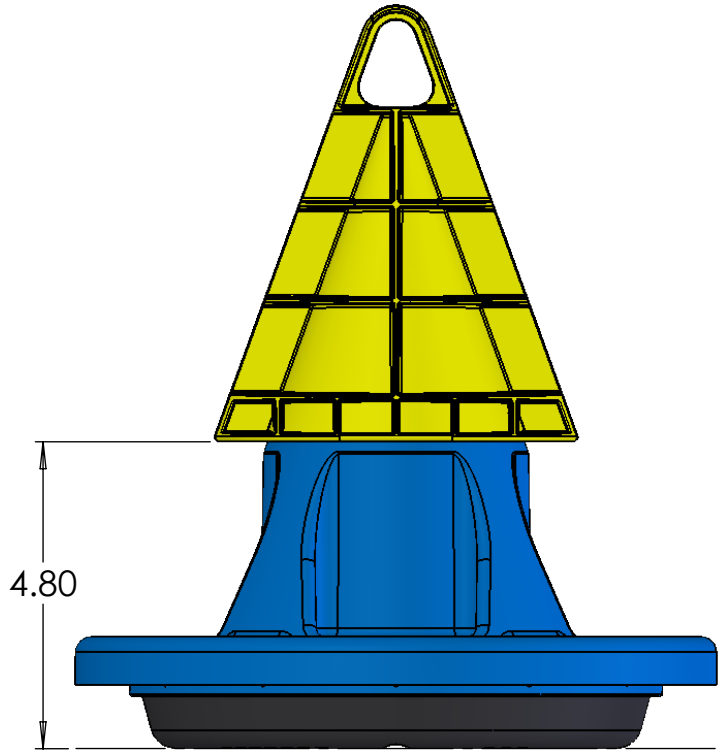


	Description Loader Specifications		
	Dwg No 276-5369-000		
	Competition VRC 2017-2018	Sheet 19 of 22	
	Release 2017-03-27	ALL DIMENSIONS ARE IN INCHES.	

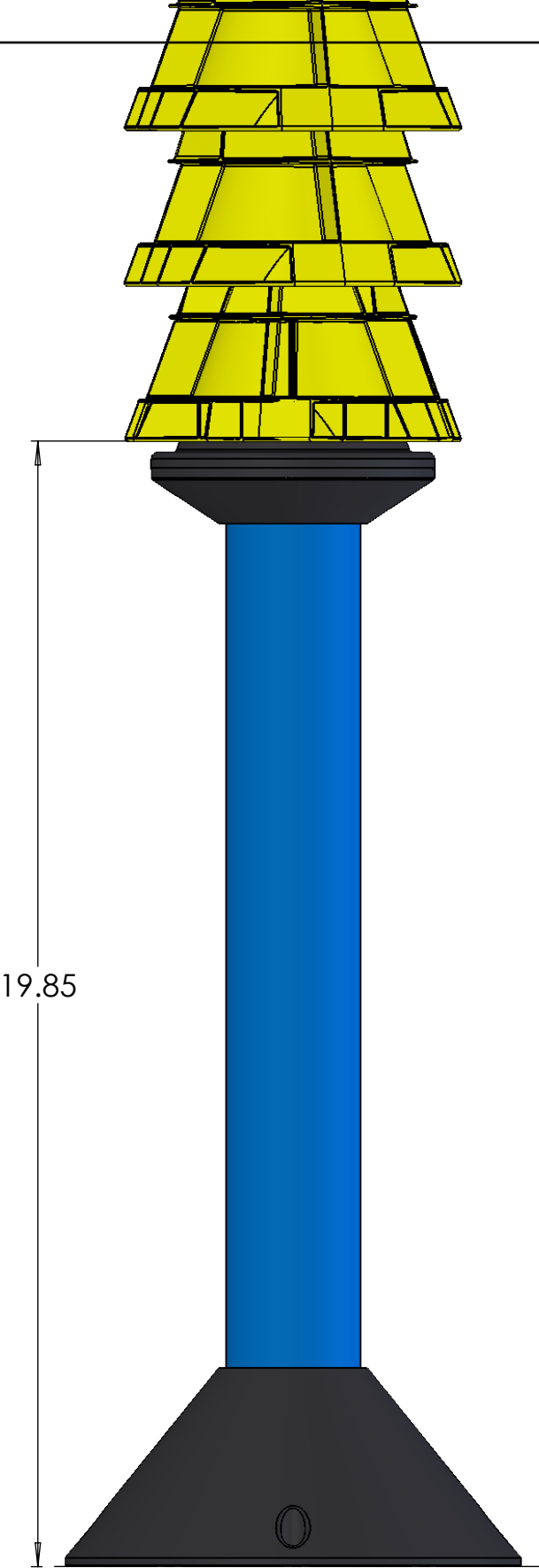
Stacking Specs:




Stack of 2 Cones

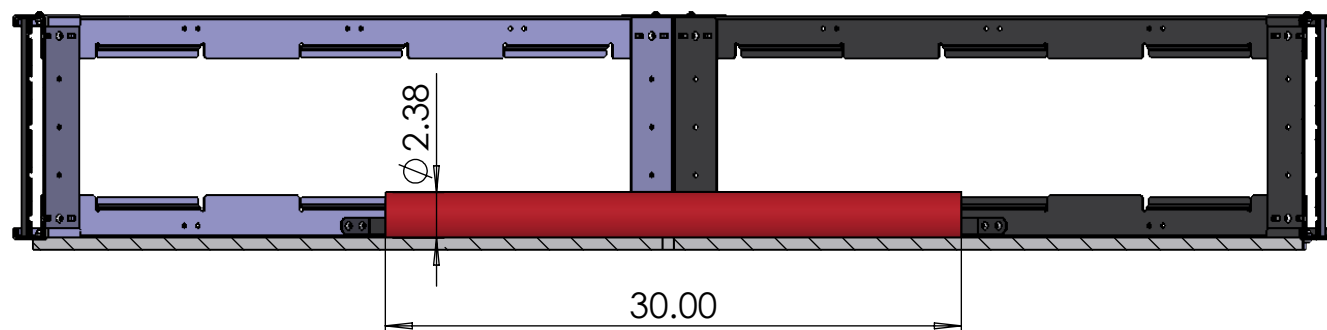
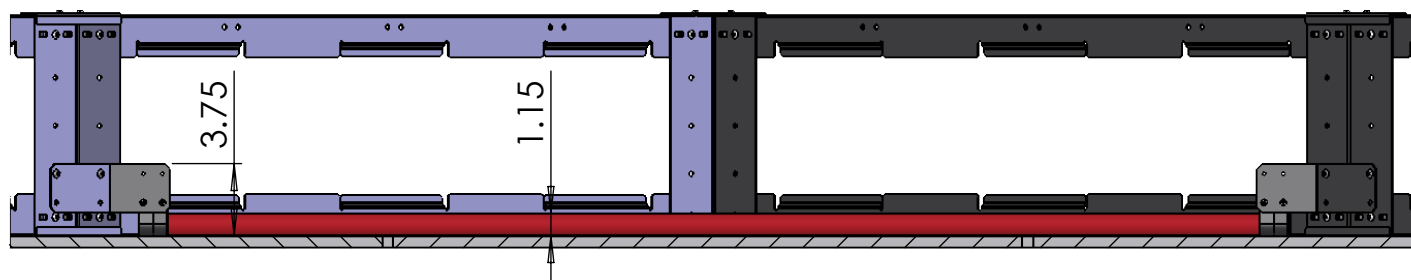


Cone on Mobile Goal

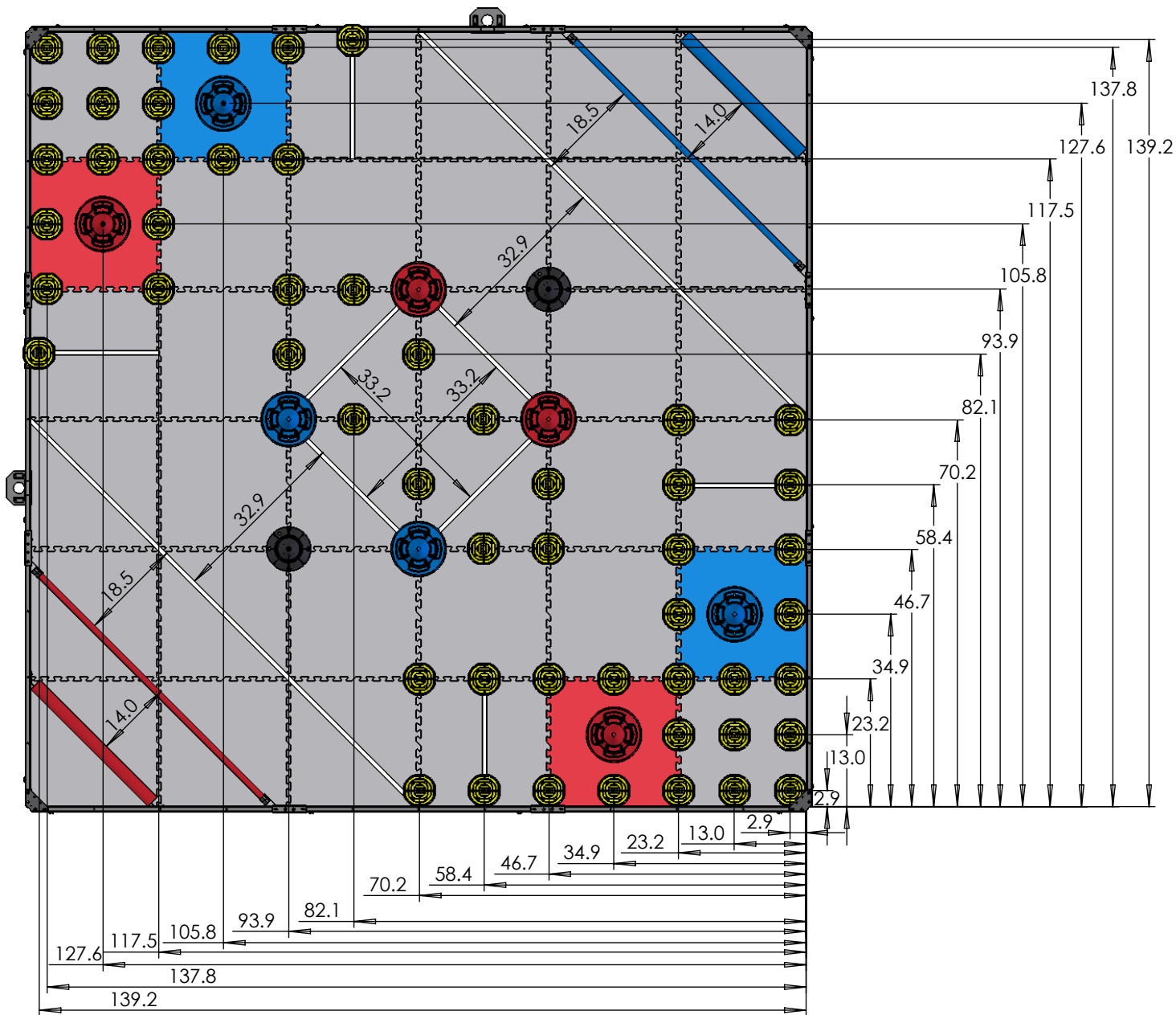


Cone on Stationary Goal


	Description Cone Stacking Specifications	
	Dwg No 276-5369-000	
	Competition VRC 2017-2018	Sheet 20 of 22
	Release 2017-03-27	ALL DIMENSIONS ARE IN INCHES.



# Field Reference Specs:



Note: All dimensions subject to ± 1.0" Tolerance

	Description    Field Position Specifications	
	Dwg No    276-5369-000	
	Competition    VRC 2017-2018	Sheet 22 of 22
	Release    2017-03-27	<b>ALL DIMENSIONS ARE IN INCHES.</b>