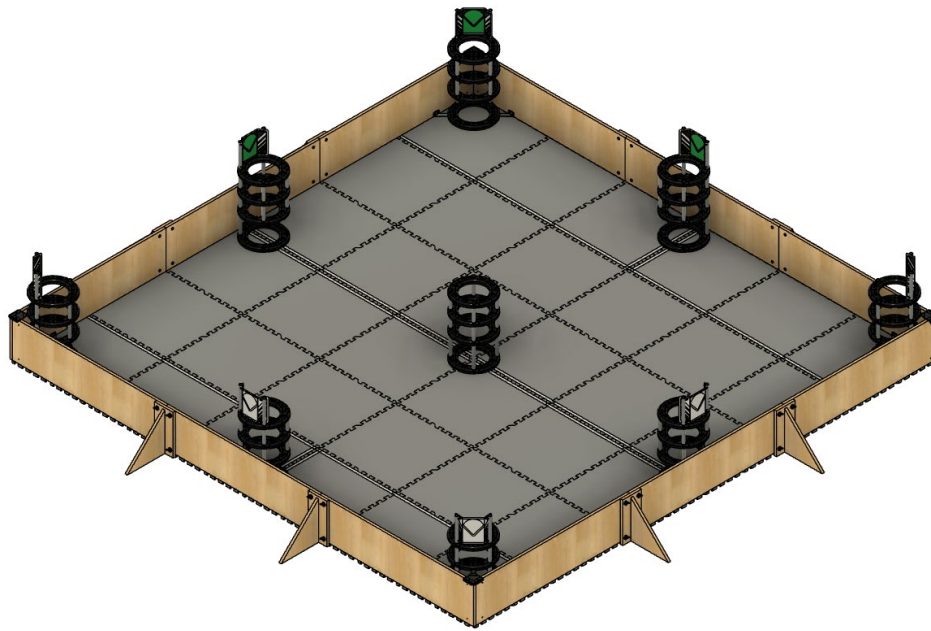
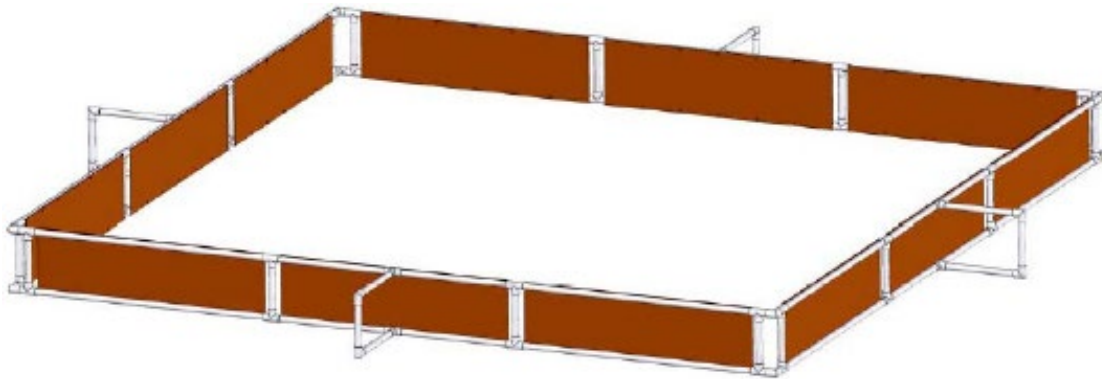


DIY Competition Field Options

Introduction

The official field perimeter components and game objects used in *VEX Robotics Competition* games are all available for purchase from www.vexrobotics.com (P/N 278-1501). However, not every team needs the exact objects which will be used at official VEX Robotics Competition tournaments. This section will outline some options for teams wishing to use lower-cost substitutes for field objects, such as those participating in Live Remote or Remote Skills Challenge tournaments.





VEX Robotics Competition DIY Field Perimeter

Field Perimeter Cost Reductions

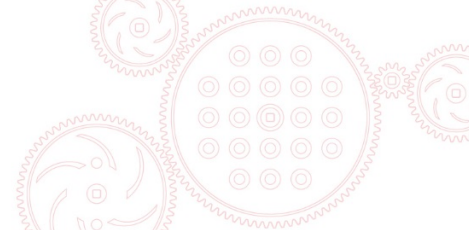
When participating in an official Remote tournament, a perimeter that meets the Non-Standard Field Perimeter Guidelines found in Appendix A is required. This document outlines two different options for lower-cost methods of building a perimeter from materials that are available at your local hardware store.

Field Surface

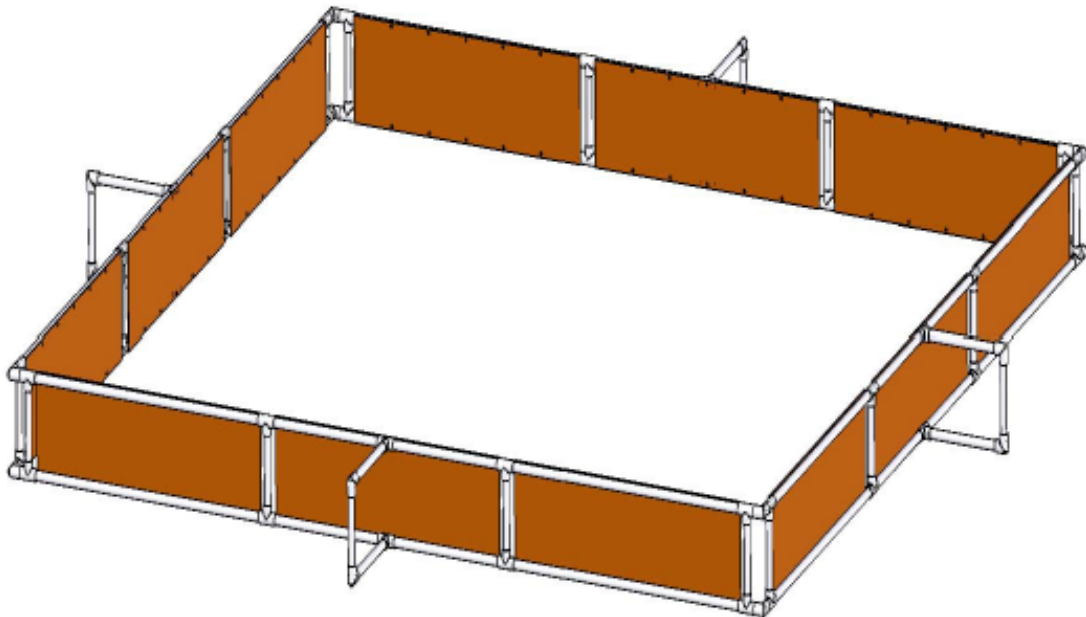
There are several surfaces suitable for use in the playing field. In practice, it may be appropriate and acceptable to simply use the surface which the field happens to be sitting on. However, in order to meet the Non-Standard Field Perimeter Requirements, official 2'x2' foam tiles (VEX P/N: [276-7175](#)) must be used. Use a set of [Field Perimeter Rubber Feet](#) to raise the field perimeter to the height of the tiles.

Perimeter Modularity

The low-cost perimeter will break down into smaller sections easily. For a more permanent solution it is recommended that some of the PVC connections be secured together using PVC glue (available at any hardware store). When choosing which connections to glue, choose the ones which would not be disconnected when breaking the field down into smaller modules.



DIY Competition Field Option 1



DIY Competition Field Perimeter – Bill of Materials

Materials needed to construct the field, and the necessary modifications are show below.

DIY Competition Field Perimeter - Bill of Materials			
Description	Unit	Qty	Total
3/4" x Sch-40 PVC Pipe - 10' Long	\$ 5.82	12	\$ 69.84
3/4" x Sch-40 PVC T-Connector	\$ 0.43	40	\$ 17.20
3/4" x Sch-40 PVC 90-Degree Connector	\$ 0.35	16	\$ 5.60
#8 x 1/2" Flathead Wood Screw (100 Pk)	\$ 2.81	1	\$ 2.81
4' x 8' Sheet of 1/8" Thick Hardboard	\$ 6.67	2	\$ 13.34

Approximate Total Price \$108.79

- From the (2x) sheets of 1/8" Thick Hardboard, cut (9x) pieces which are (11.5" Tall x 41.75" Long)
- The (12x) 10-foot lengths of PVC pipe must be cut into smaller sections for the field. These lengths and quantities are listed in the "PVC Lengths" table to the right. Ensure all cuts are square. Deburr pipe edges using a flat file or deburring tool. To get these shorter segments out of (12x) 10-foot lengths, refer to the table below.

PVC Cut List - Smaller PVC Sections												
	Cut 1	Cut 2	Cut 3	Cut 4	Cut 5	Cut 6	Cut 7	Cut 8	Cut 9	Cut 10	Cut 11	Cut 12
1	43.5	21.125	21.125	9.25	9.25	14						
2	43.5	21.125	21.125	9.25	9.25	14						
3	43.5	21.125	21.125	9.25	9.25	14						
4	43.5	21.125	21.125	9.25	9.25	14						
5	43.5	21.125	21.125	9.25	9.25	14						
6	43.5	21.125	21.125	9.25	9.25	14						
7	43.5	21.125	21.125	9.25	9.25	14						
8	43.5	21.125	21.125	9.25	9.25	14						

9	43.5	43.5	9.25	9.25	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75
10	43.5	43.5	9.25	9.25	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75

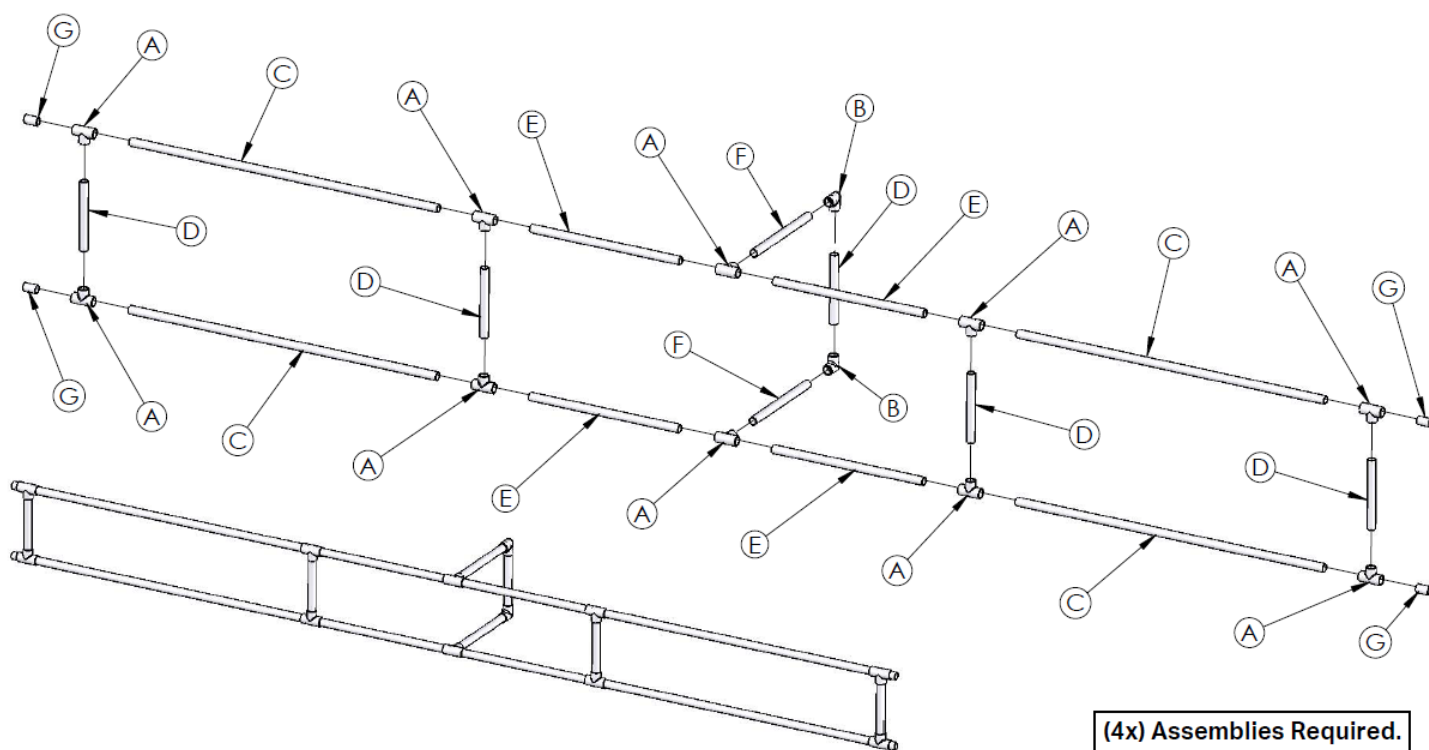
11	43.5	43.5
12	43.5	43.5

PVC Lengths	
Length	Qty
43.5"	16
9.25"	20
21.125"	16
14"	8
1.75"	16

3. **Assemble (4x) Field Walls, as shown below.** Ensure that ALL pipe-lengths are fully inserted into their connectors.



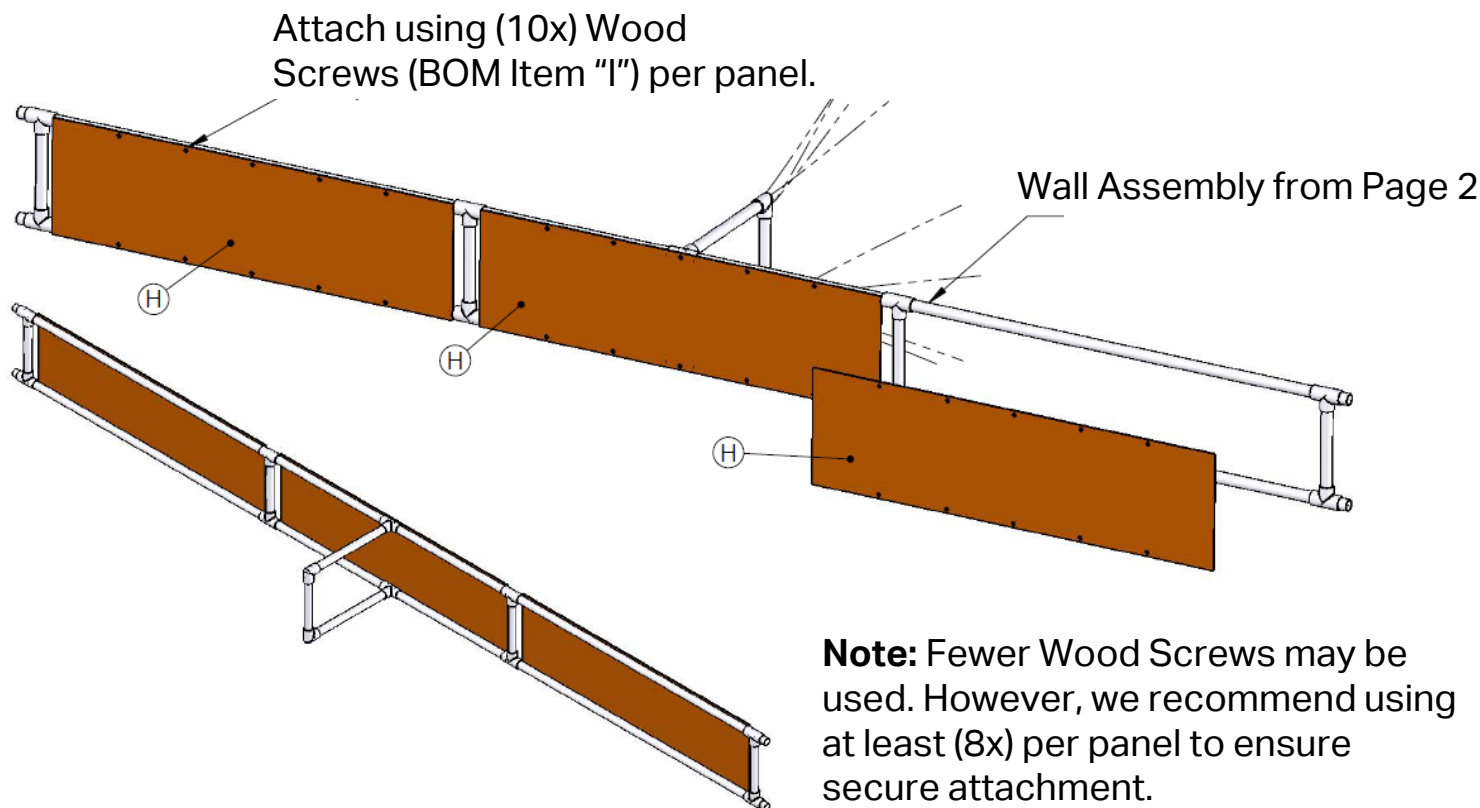
Item	Description	Qty
A	3/4" x Sch-40 PVC T-Connector	40
B	3/4" x Sch-40 PVC 90-Degree Connector	16
C	3/4" x Sch-40 PVC Pipe -43.5" Long	16
D	3/4" x Sch-40 PVC Pipe -9.25" Long	20
E	3/4" x Sch-40 PVC Pipe -21.125" Long	16
F	3/4" x Sch-40 PVC Pipe -14" Long	8
G	3/4" x Sch-40 PVC Pipe -1.75" Long	16
H	1/8" Thick Hardboard - 11.5" x 41.75"	9
I	#8 x 1/2" Flathead Wood Screw	90



4. **Attach (3x) Hardboard Panels to each of the (4x) Field Walls.** Position each panel so they are centered on each "section" of the wall. Ensure that screw-heads are as flush with the surface as possible.

(4x) Assemblies Required

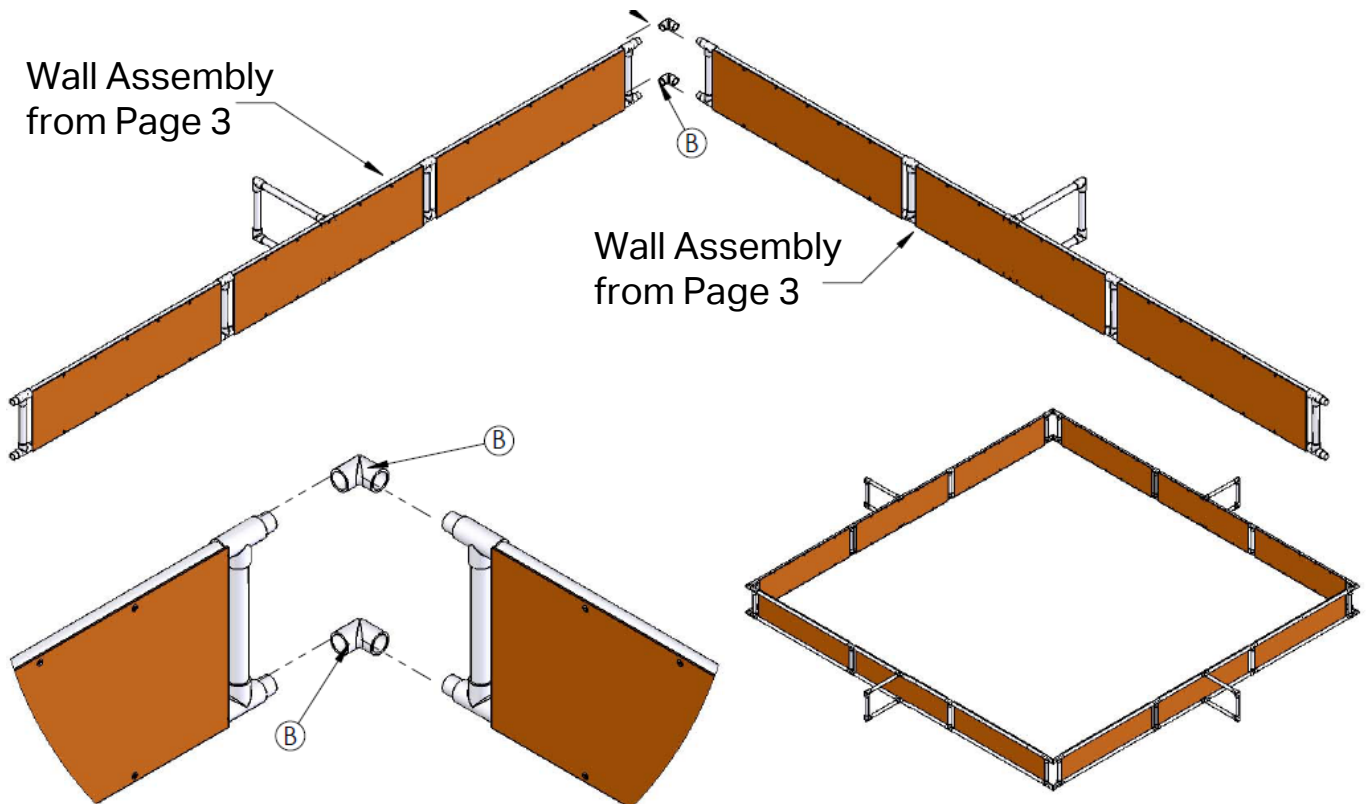
Item	Description	Qty
A	3/4" x Sch-40 PVC T-Connector	40
B	3/4" x Sch-40 PVC 90-Degree Connector	16
C	3/4" x Sch-40 PVC Pipe -43.5" Long	16
D	3/4" x Sch-40 PVC Pipe -9.25" Long	20
E	3/4" x Sch-40 PVC Pipe -21.125" Long	16
F	3/4" x Sch-40 PVC Pipe -14" Long	8
G	3/4" x Sch-40 PVC Pipe -1.75" Long	16
H	1/8" Thick Hardboard - 11.5" x 41.75"	9
I	#8 x 1/2" Flathead Wood Screw	90



5. **Attach the (4x) Wall Assemblies together.** Position the (4x) walls such that they are approximately in the correct orientation. Ensure that the walls are perpendicular to each other. Ensure that ALL pipe-lengths are fully inserted into their connectors.

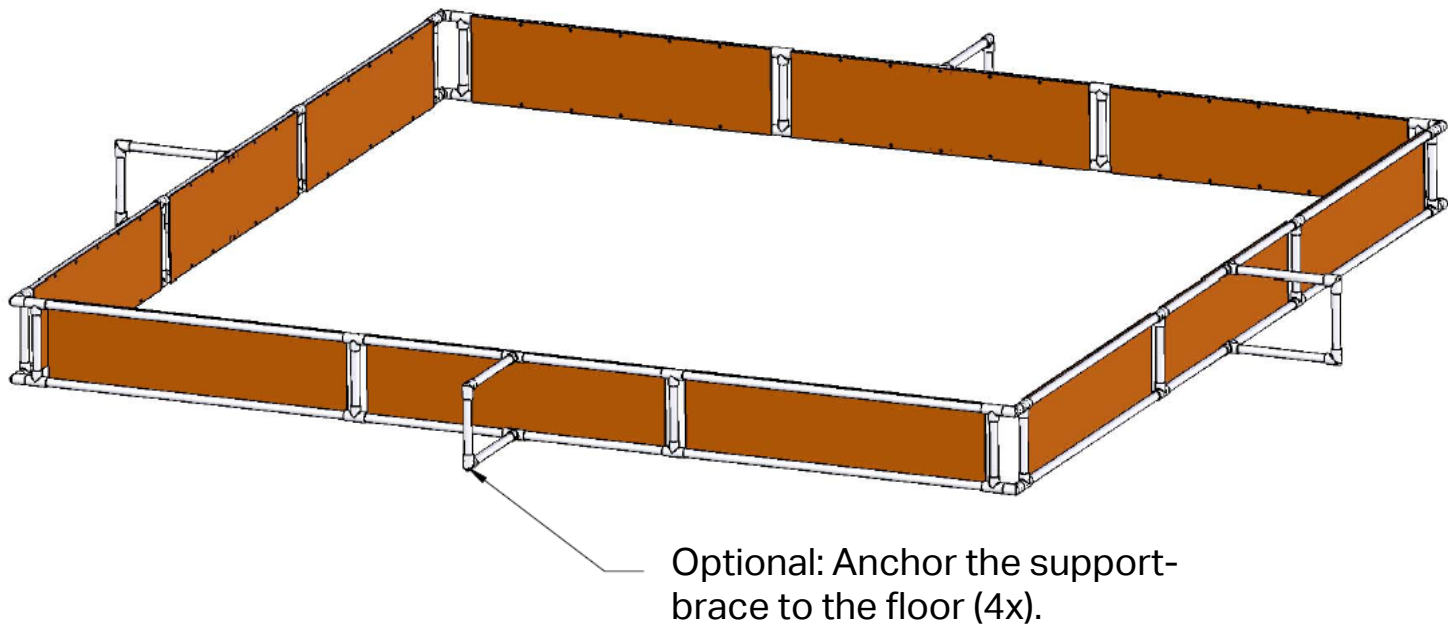
Repeat for all (4) corners!

Item	Description	Qty
A	3/4" x Sch-40 PVC T-Connector	40
B	3/4" x Sch-40 PVC 90-Degree Connector	16
C	3/4" x Sch-40 PVC Pipe -43.5" Long	16
D	3/4" x Sch-40 PVC Pipe -9.25" Long	20
E	3/4" x Sch-40 PVC Pipe -21.125" Long	16
F	3/4" x Sch-40 PVC Pipe -14" Long	8
G	3/4" x Sch-40 PVC Pipe -1.75" Long	16
H	1/8" Thick Hardboard - 11.5" x 41.75"	9
I	#8 x 1/2" Flathead Wood Screw	90



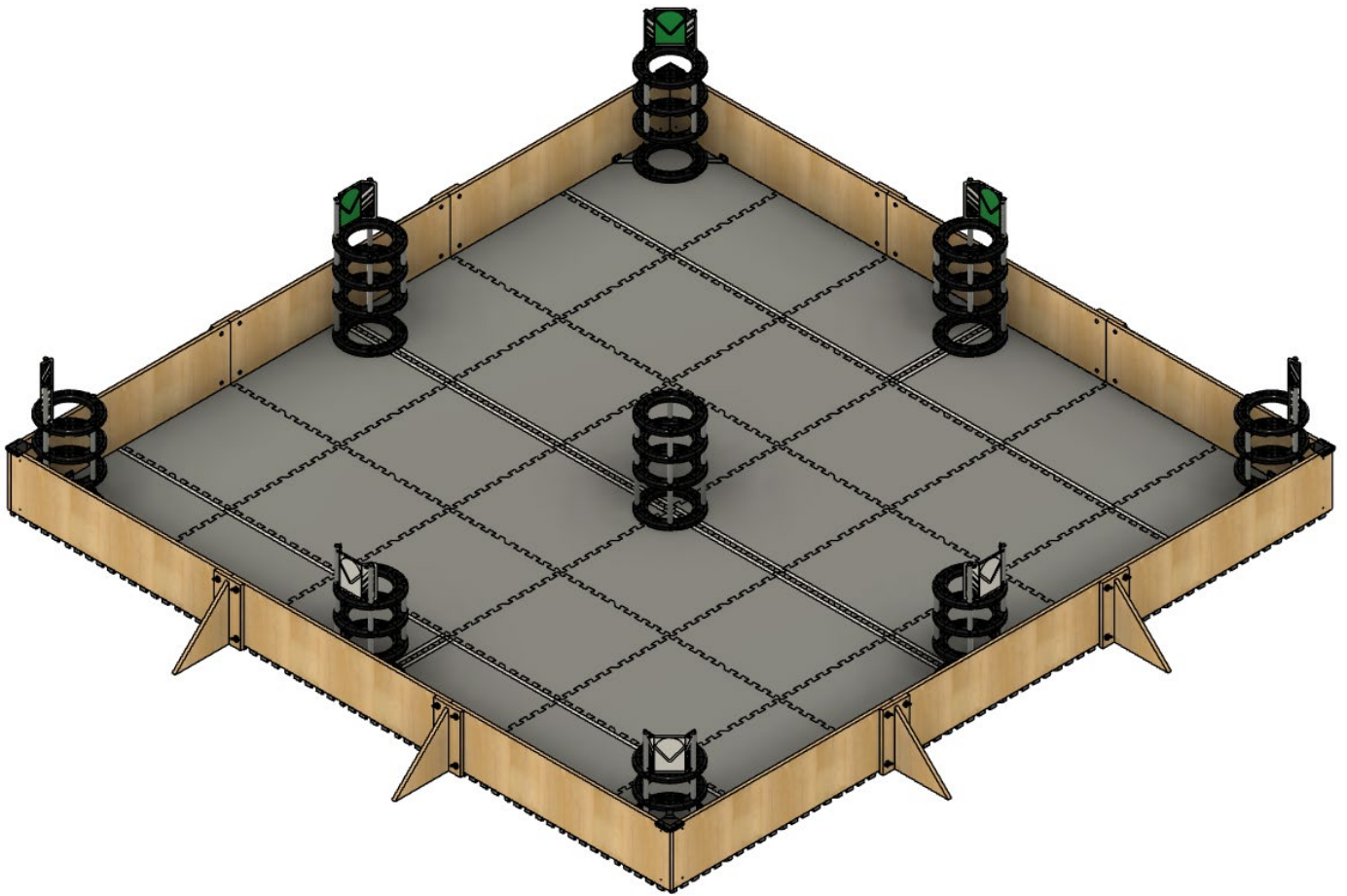
- 6. Place Field Perimeter in Position.** After the Field Perimeter is in position, it may be necessary to anchor it in place. One method would be to Velcro or tape the support-braces to the floor. Alternately, place weights on the support-braces to hold them in place.

Once field is anchored in place, install field interior components.





DIY Competition Field Option 2



DIY Field Perimeter

These instructions allow teams to build a DIY Field Perimeter which is ideal for practicing or for use in Remote Competitions where the rules allow.

These instructions act as a guide only and it is the builders responsibility to ensure that the dimensions and construction is correct.

It may not be possible to use official game element mounts when attaching these to the perimeter. The builder assumes responsibility for adequately securing these.

Materials Required

Description	Quantity
2.4m x 1.2m 18mm (4' x 8' x ¾") OSB or plywood sheets	2
50mm M6 (2" 1/4-20) coach bolts	32
M6 (1/4") flat washers	32
M6 (1/4-20) wingnuts	32
16mm x ø4.2mm (#8 x 0.75") wood screws	24
32mm x ø4.2mm (#8 x 1.25") wood screws	24
Wood glue	
Gaffer Tape	Optional

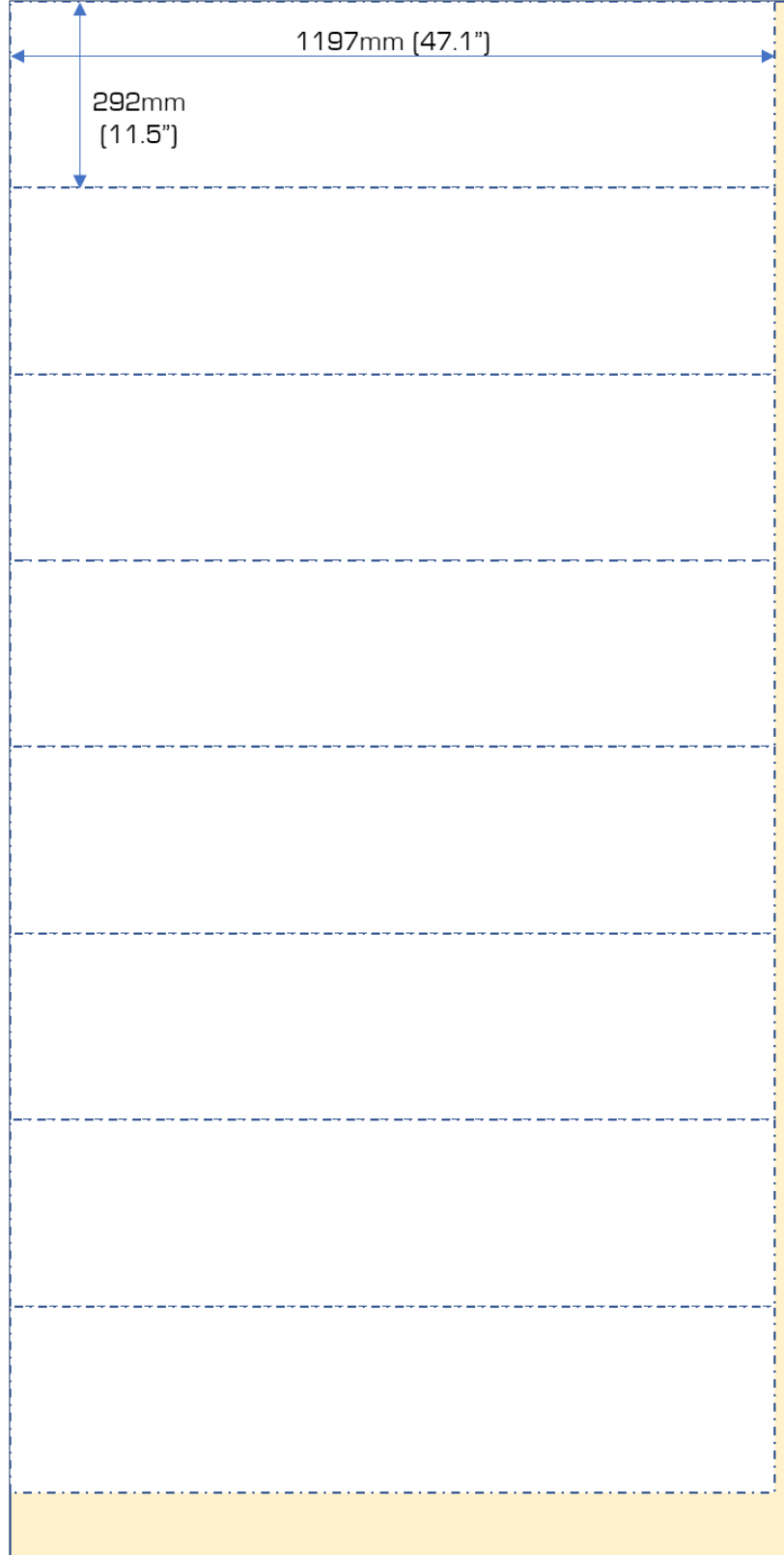
DIY Field Perimeter

Sheet 1

Sheet 1 will be used to make (8) of the side panels.

Cut the sheet in to (8) identical strips of 1197mm x 292mm (47.1" x 11.5")

Sand the edges of all parts to ensure they are smooth and free of splinters. You may want to finish the edges with gaffer tape as shown on page 12.



DIY Field Perimeter

Sheet 2

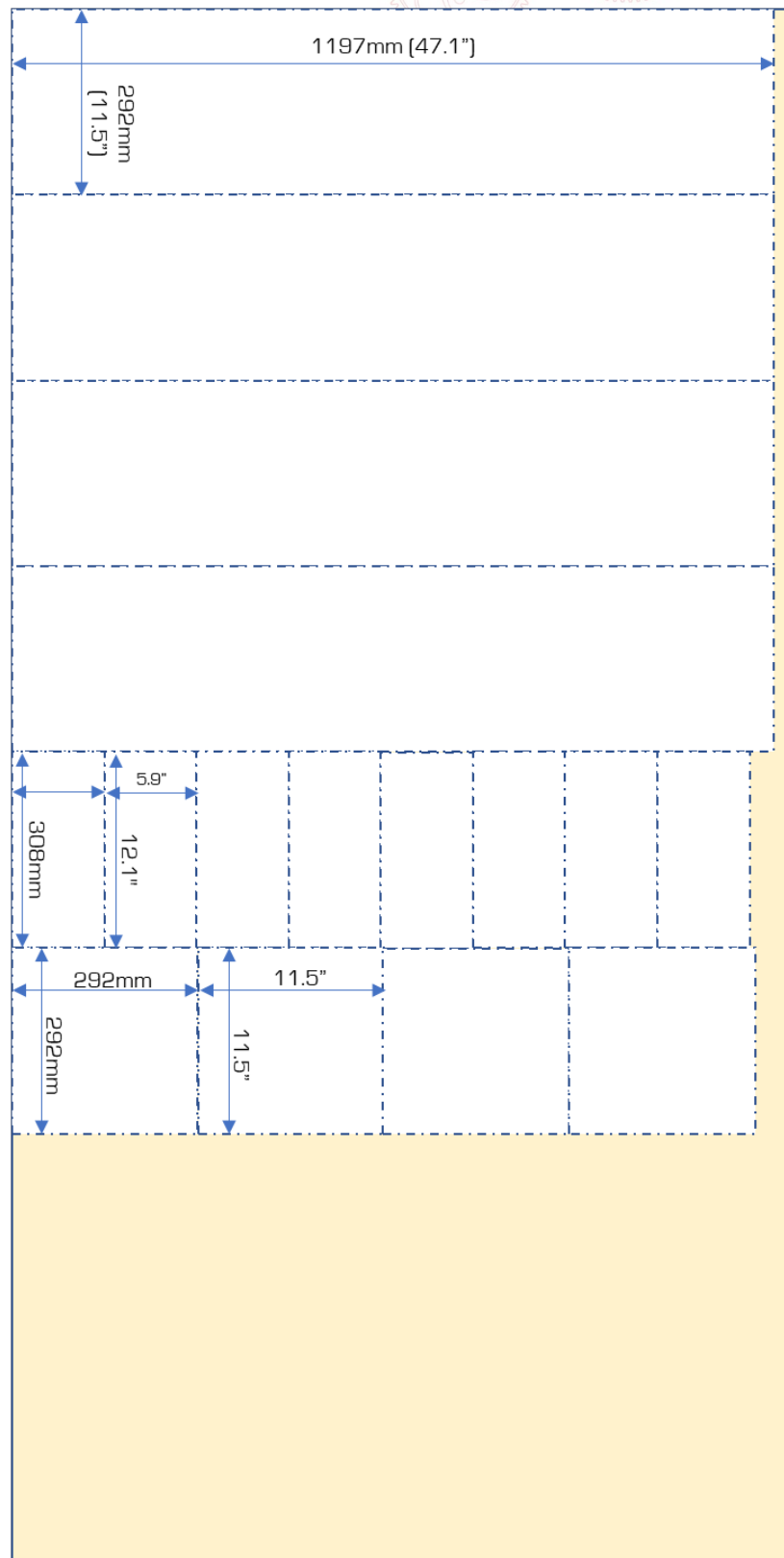
Sheet 2 will be used to make (4) of the side panels and (8) supports for the side of the Field.

Cut the sheet in to (4) identical strips of 1197mm x 292mm (47.1" x 11.5")

From the remainder, cut (8) plates of 150mm x 308mm (2.9" x 12.1")

Finally cut (4) squares of 292mm x 292mm (11.5" x 11.5")

Sand the edges of all parts to ensure they are smooth and free of splinters. You may want to finish the edges with gaffer tape as shown on page 12.

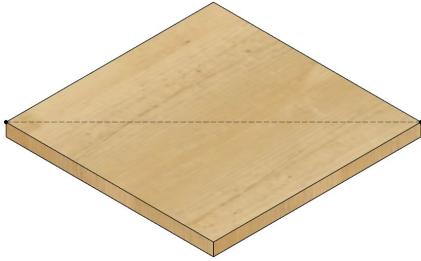


DIY Field Perimeter

Field Supports

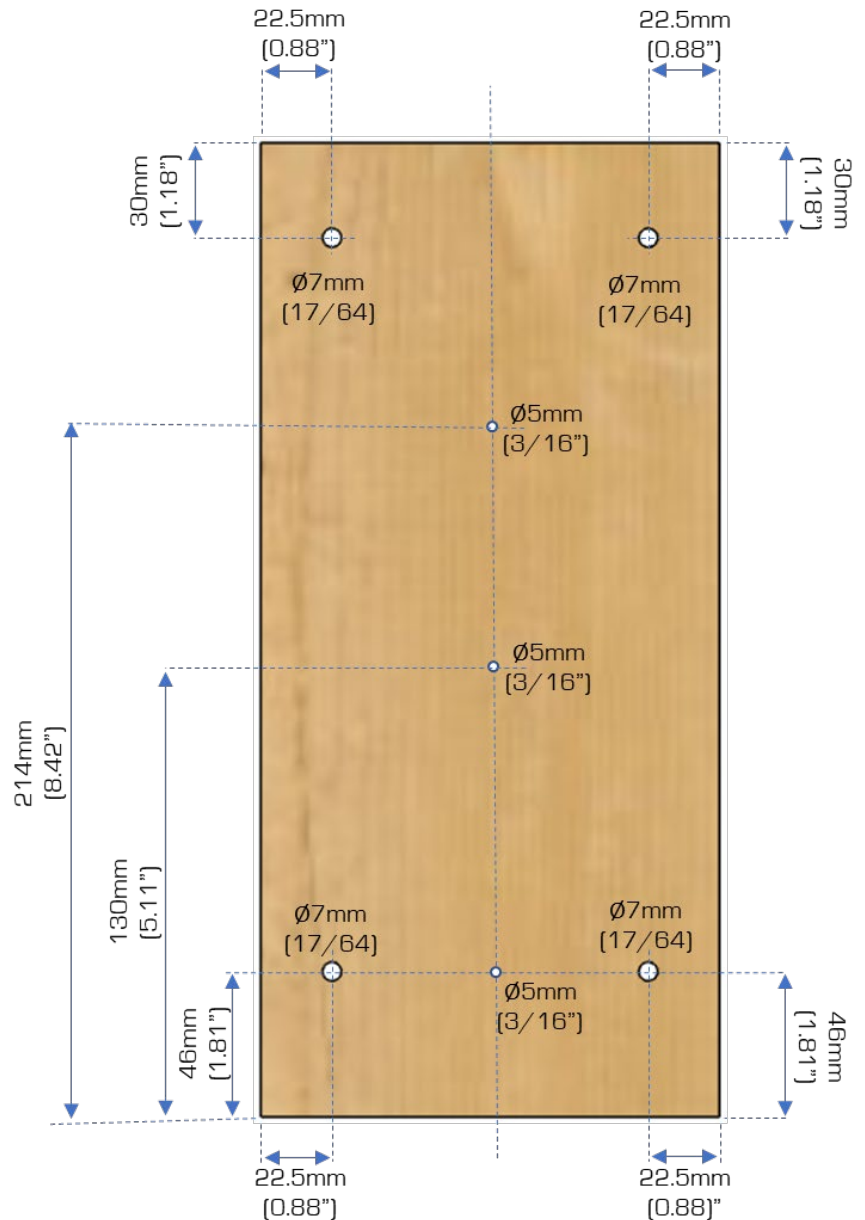
(8) supports are used around the perimeter of the Field. These also act as joiners to hold the panels of each side together.

1. Cut the (4) 292mm x 292mm (11.5" x 11.5") squares into equal triangles



2. In each of the (8) 150mm x 308mm (2.9" x 12.1") plates, drill (4) 7mm (11/64") holes as shown

3. In each of the (8) 150mm x 308mm (2.9" x 12.1") plates, drill (3) 5mm (3/16") holes as shown

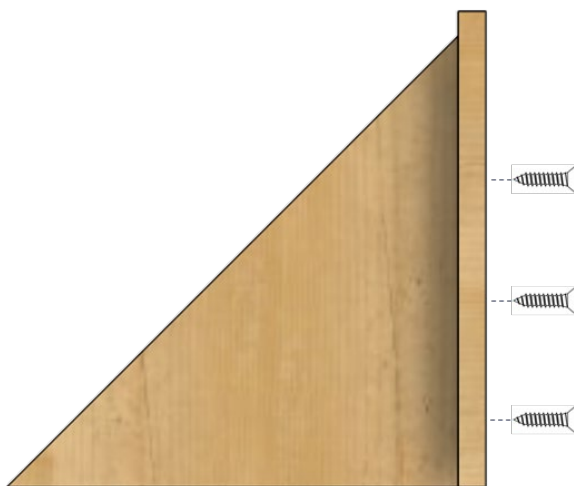


DIY Field Perimeter

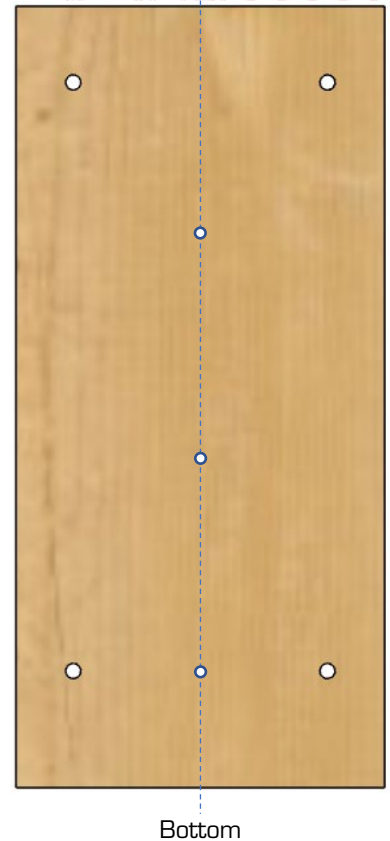
Field Supports (cont.)

4. Using wood adhesive, glue the triangles along the centre line ensuring that each triangle is flush with the bottom of the plate.

Note: The bottom of the plate is the side with the holes furthest from the edge



Side View



5. Use (3) 32mm x \varnothing 4.2mm (#8 x 1.25") wood screws to secure the triangle to the plate.

Note: You may want to drill 3mm (1/8") pilot holes in the triangle to prevent the wood from splitting when screwed.

DIY Field Perimeter

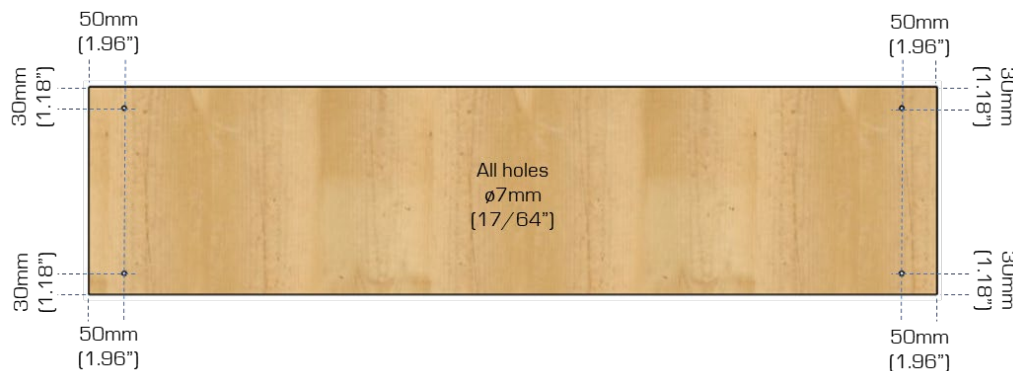
Side Panels



Each side of the Field perimeter is made from (3) panels – (1) Central Panel and (2) Corner Panels. Take care when drilling, as the holes in the Central panel are different from the holes in Corner Panel.



1. Drill (4) of the 1197mm x 292mm (47.1" x 11.5") panels as shown. These will be the Central Panels.



2. Drill (8) of the 1197mm x 292mm (47.1" x 11.5") panels as shown. These will be the Corner Panels.



DIY Field Perimeter

Side Assembly

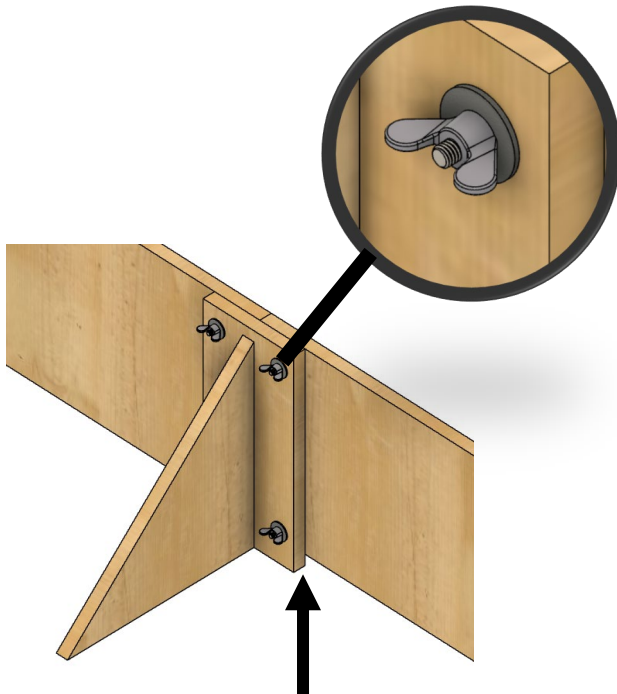
Each side assembly requires:

- (2) Corner Panels
- (1) Central Panel
- (2) Assembled Field Supports
- (8) 50mm M6 (1/4"-20 x 2") coach bolts
- (8) M6 (1/4") washers
- (8) M6 (1/4"-20) wing nuts

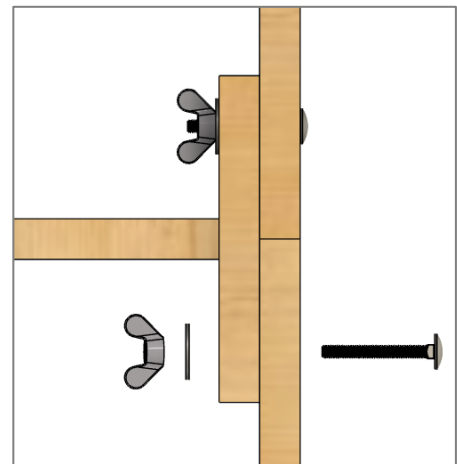


1. Join (1) Corner Panel to (1) Central Panel using (4) coach bolts, (4) washers and (4) wing nuts.

Note: The washer and wing nut should be on the Field Support side of the assembly



Note: The Field Support should protrude below the Panels. This will raise the completed Field onto the tiles.



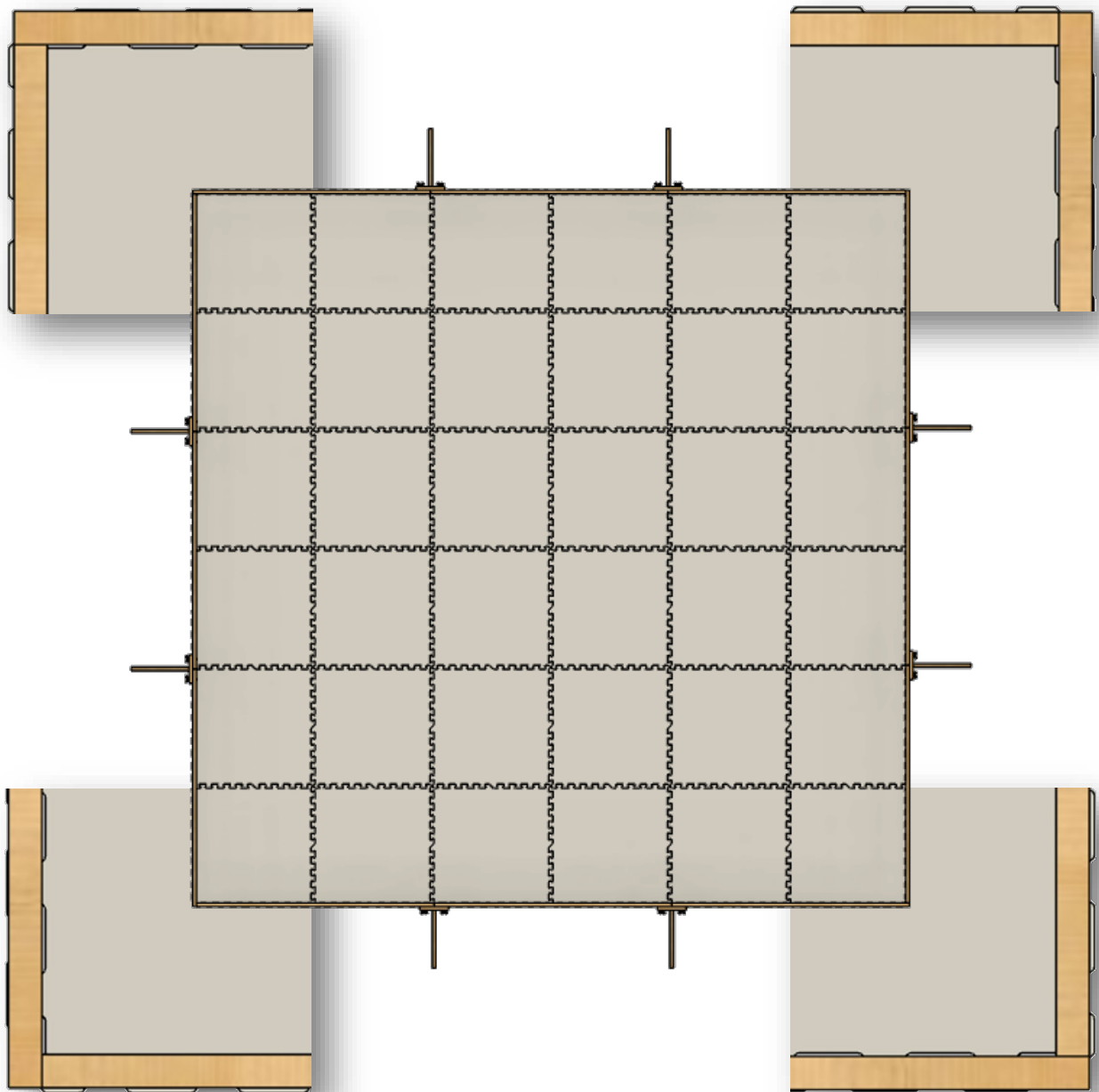
2. Repeat the process at the other end of the Central Panel to complete the Side Assembly.

DIY Field Perimeter

Complete Perimeter Assembly

1. Using the (4) Side Assemblies, place them around your VEX Field Tiles as shown.

Note: To ensure the correct internal Field dimensions, make sure that the overlaps between the Side Assemblies are as indicated.

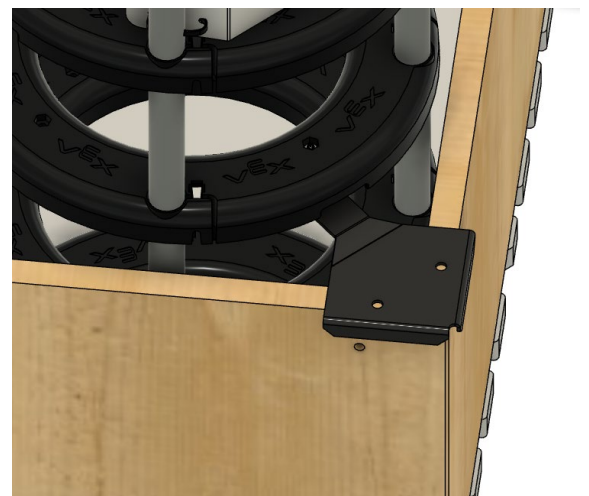
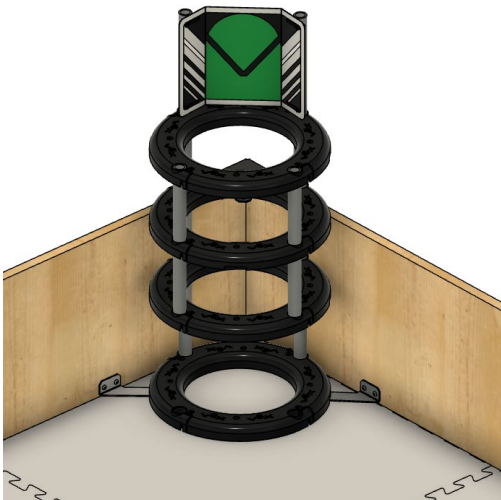
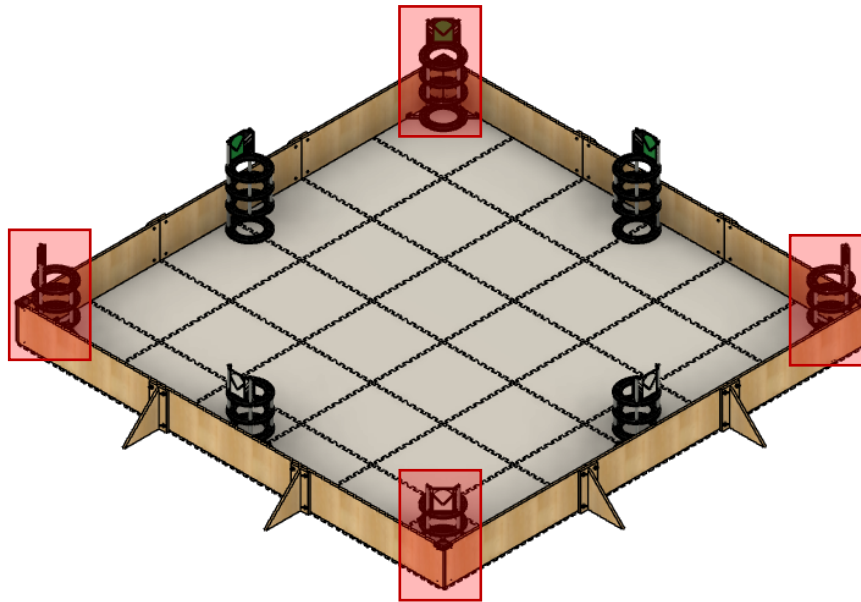


DIY Field Perimeter

Complete Perimeter Assembly (cont.)

2. Secure the corners of the Field using the (4) VEX Robotics Competition Change Up corner goals and brackets assembled as per the instructions.

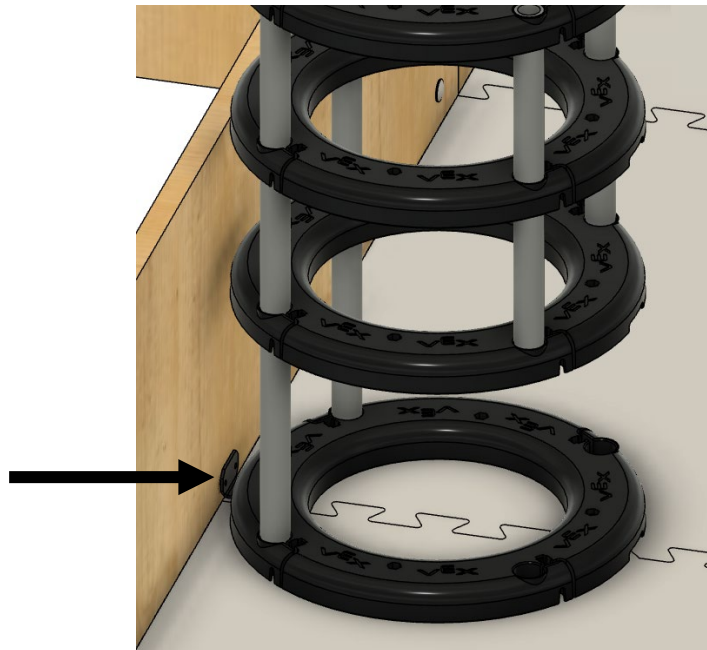
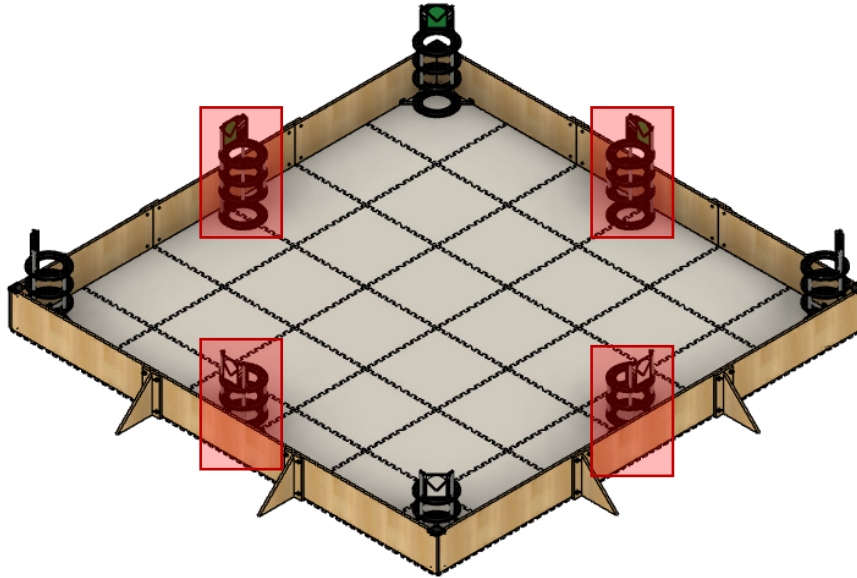
16mm length 4.2mm diameter (#8 x 0.75") wood screws should be used to fix to the inside and top of the Field Perimeter Assembly.



DIY Field Perimeter

Complete Perimeter Assembly (cont.)

3. Fix the (4) mid Goals using (2) 16mm length 4.2mm diameter (#8 x 0.75") wood screws for each goal.



DIY Field Perimeter

Finishing

Complete the Field by adding the centre Goal as per the usual instructions.

You may also want to trim the edges of the panels with gaffer tape. This prevents rough edges and gives the Field that VEX look!



Images courtesy of Stuart Sweetman, King Henry VIII School, Coventry