



FAST TRACK

MISSION 2027

GAME ELEMENT ASSEMBLY INSTRUCTIONS

Version 1.0

RECF Aerial Drone Competition Mission 2027: Fast Track 2026-2027

Game Element Assembly Instructions Version 1.0

August 11, 2026

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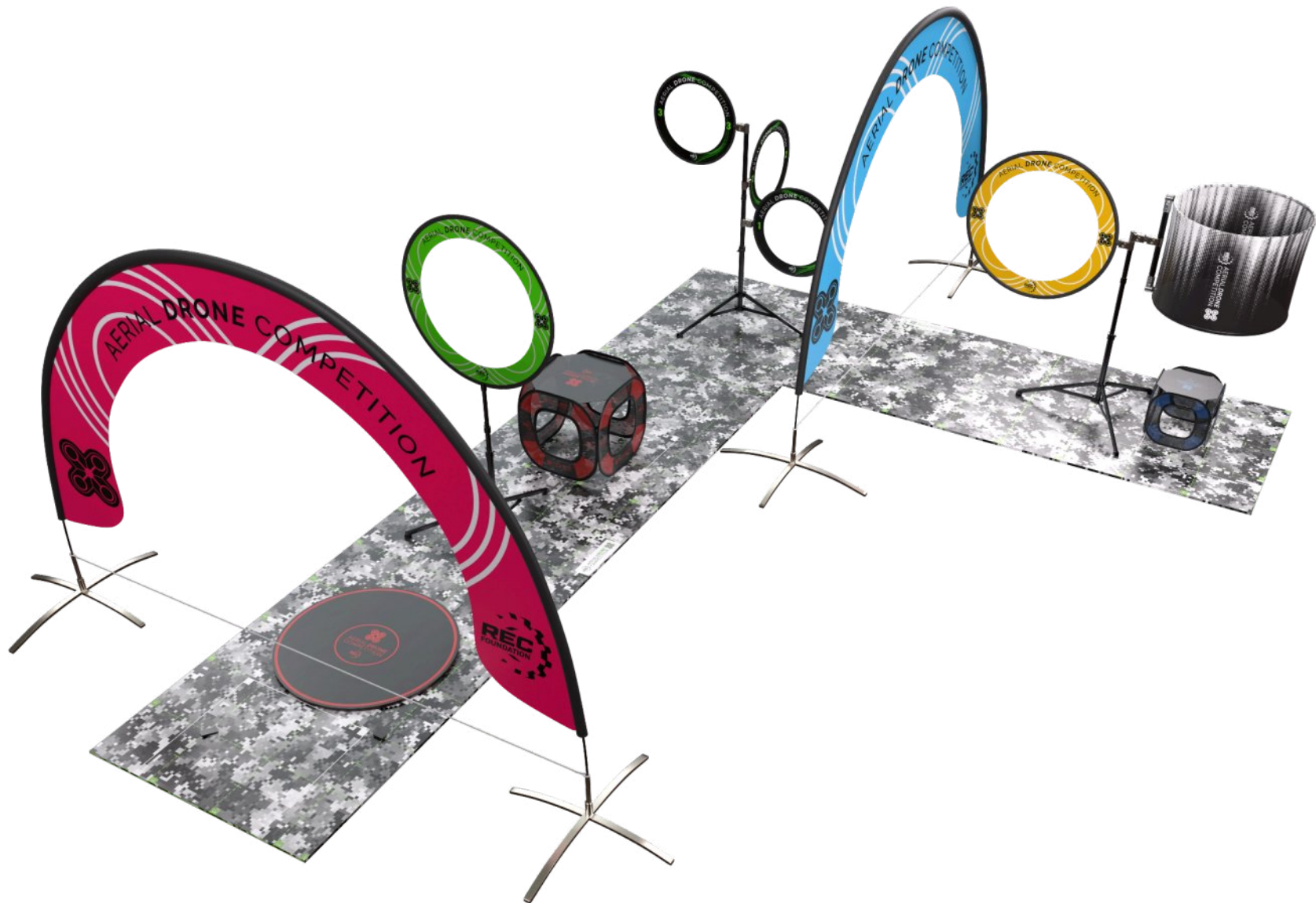


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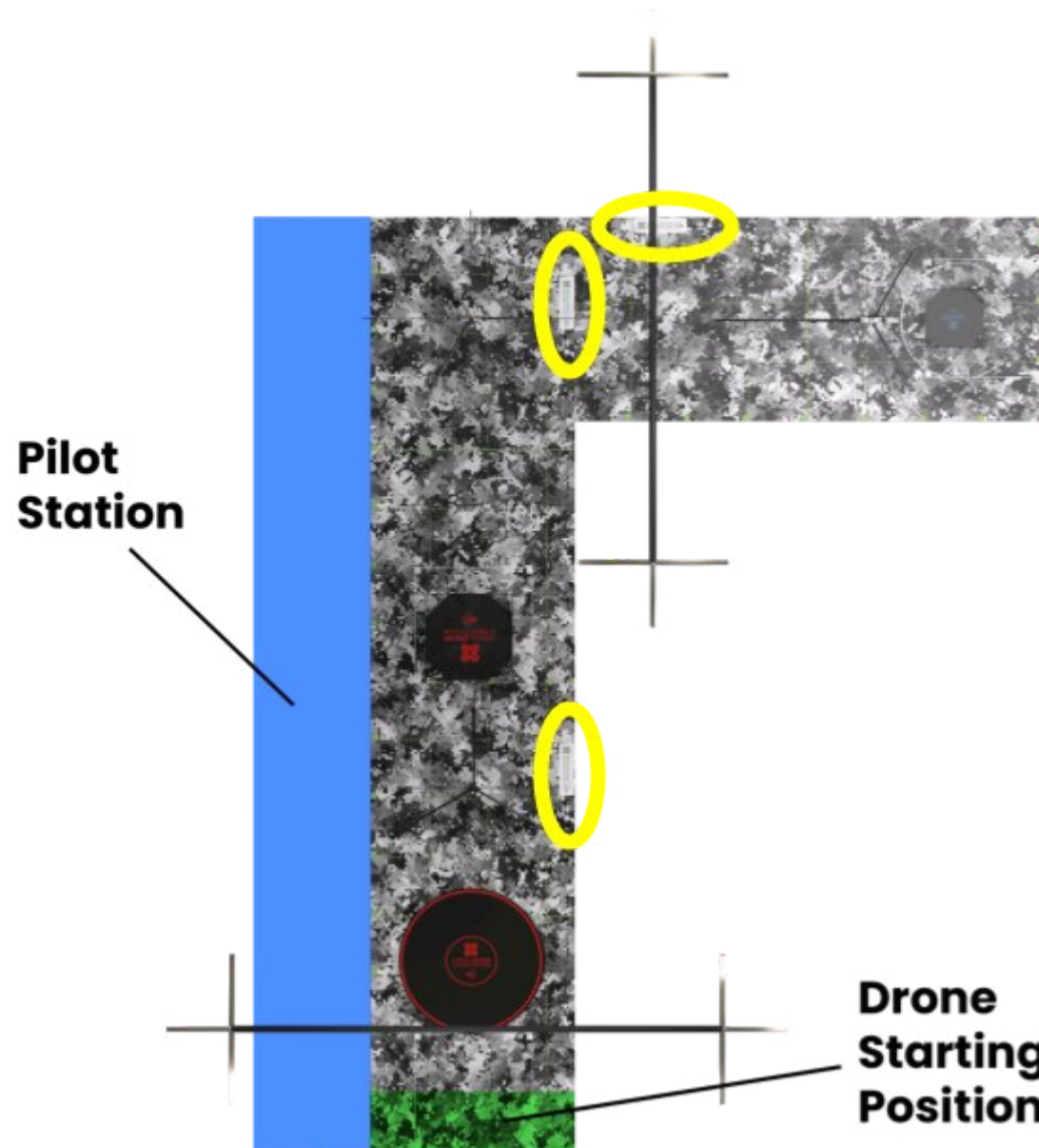
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Section 1: Setting up the Solo Mission Field

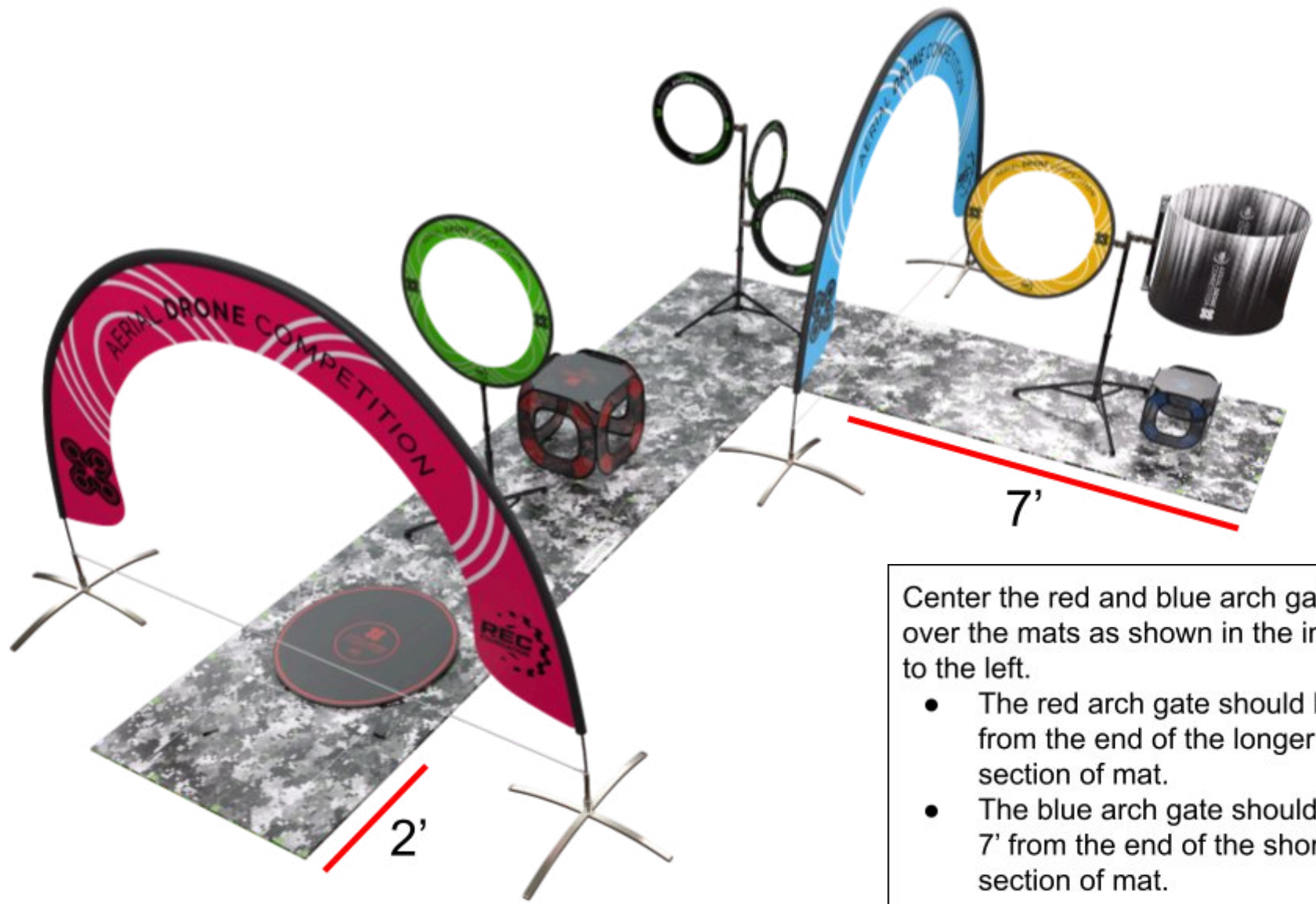


1.1 Solo Mission Field Setup Step 1: Place the Mats



Place the three mats on the floor as shown, ensuring that the positions of the logos (circled in yellow on the image to the left) on the mats line up as indicated.

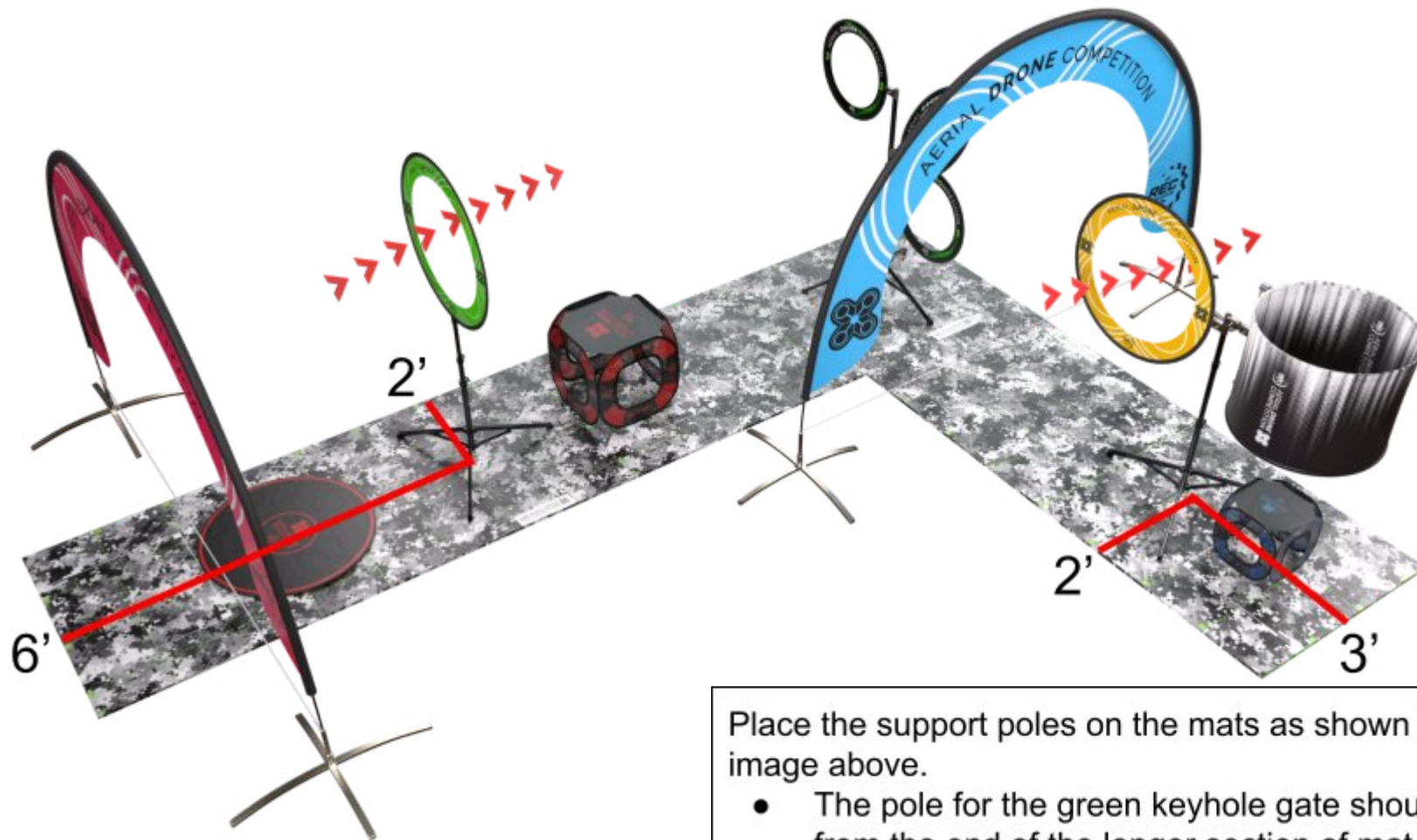
1.2 Solo Mission Field Setup Step 2: Place the Arch Gates



Center the red and blue arch gates over the mats as shown in the image to the left.

- The red arch gate should be 2' from the end of the longer section of mat.
- The blue arch gate should be 7' from the end of the shorter section of mat.

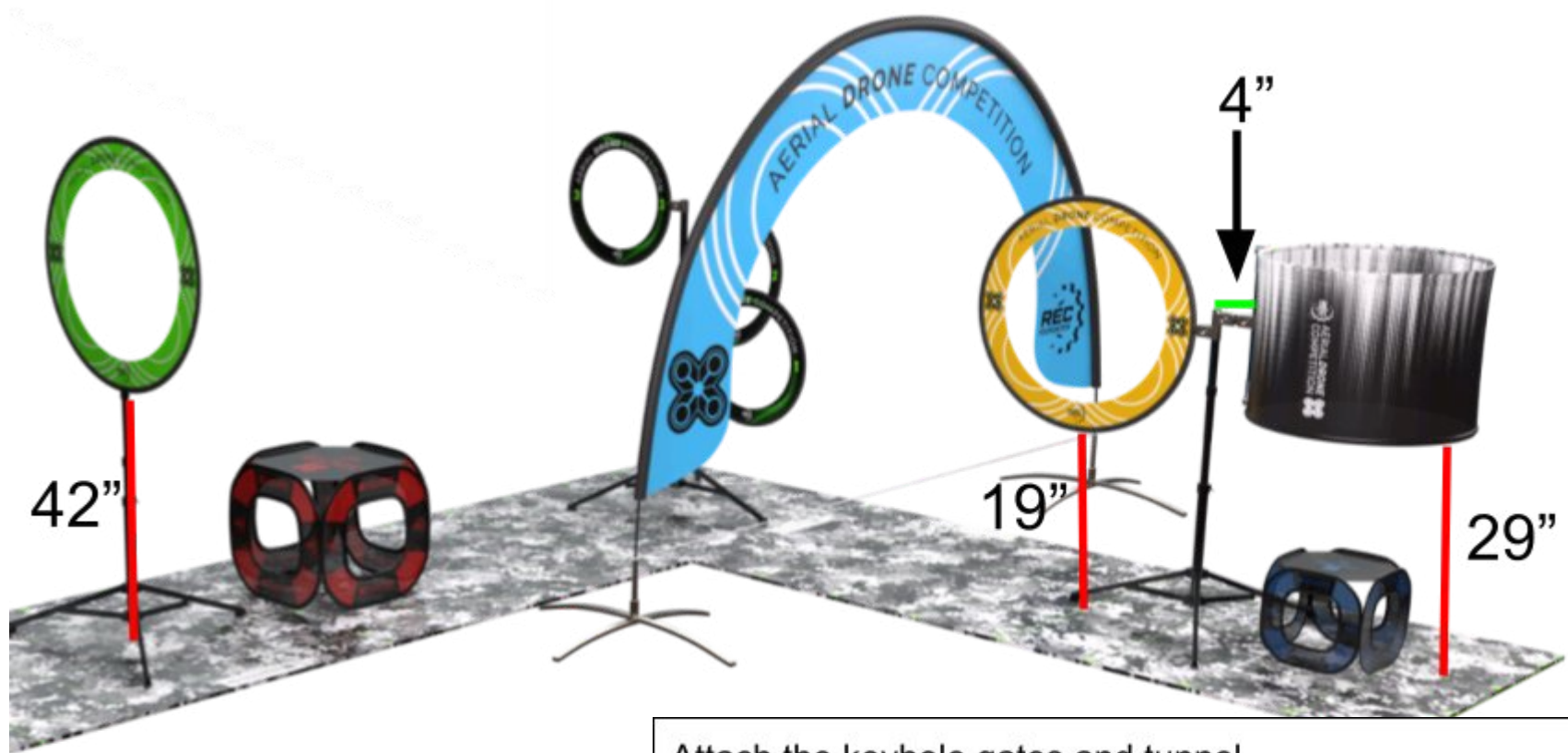
1.3 Solo Mission Field Setup Step 3: Place Supports for the Green & Yellow Keyhole Gates



Place the support poles on the mats as shown in the image above.

- The pole for the green keyhole gate should be 6' from the end of the longer section of mat, and 2' in from the edge of the mat.
- The pole for the yellow keyhole gate should be 3' from the end of the shorter section of mat, and 2' in from the edge of the mat.

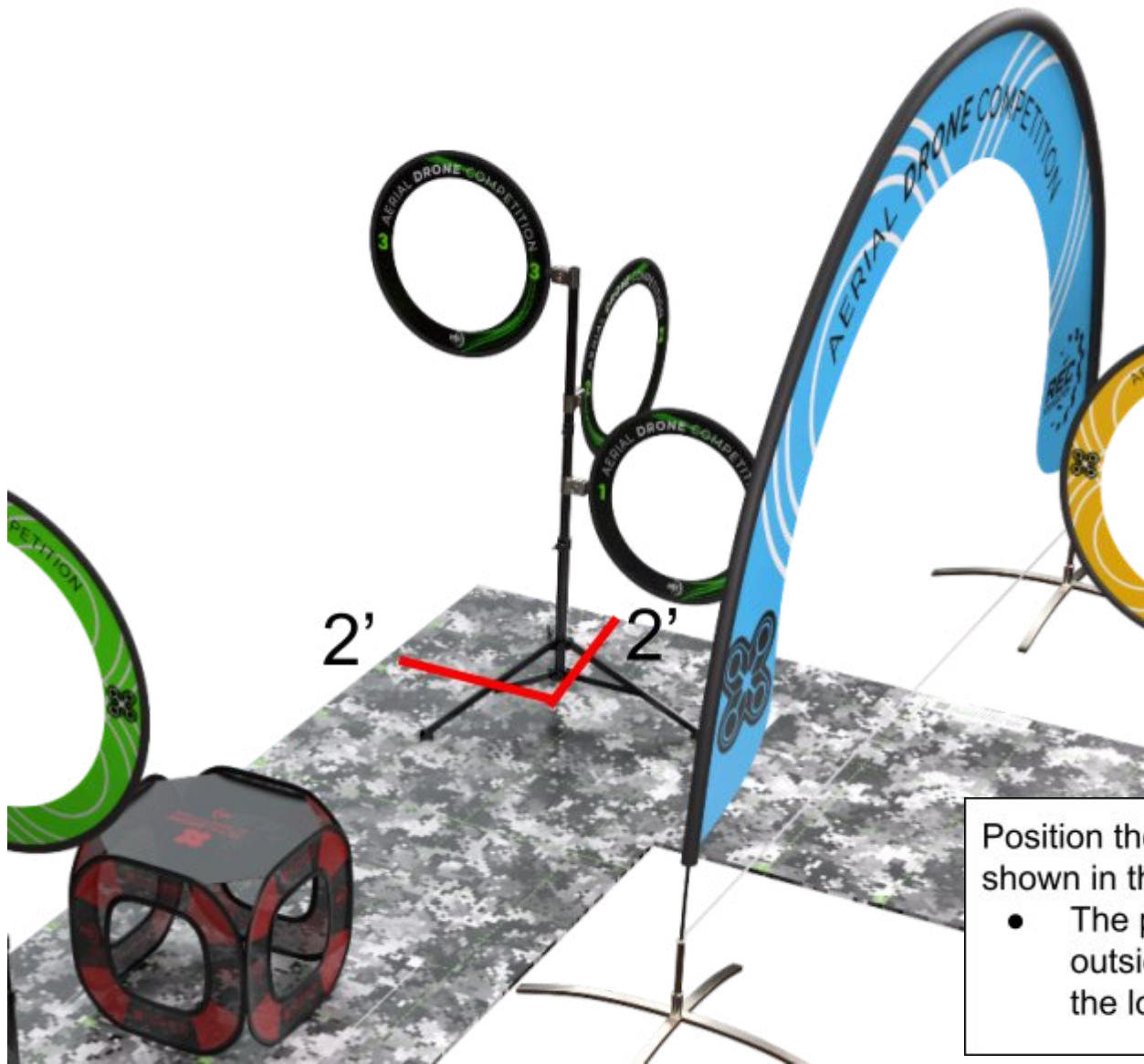
1.4 Solo Mission Field Setup Step 4: Add Green & Yellow Keyhole Gates and the Tunnel



Attach the keyhole gates and tunnel.

- Attach the green keyhole gate and adjust it so the bottom of the yellow keyhole is 42" above the mat.
- Attach the yellow keyhole gate using a metal T-bracket and adjust it so the bottom of the yellow keyhole is 19" above the mat.
- Attach the tunnel using two metal T-brackets connected by a 4" metal pipe, and adjust it so the bottom of the tunnel is 29" above the mat.

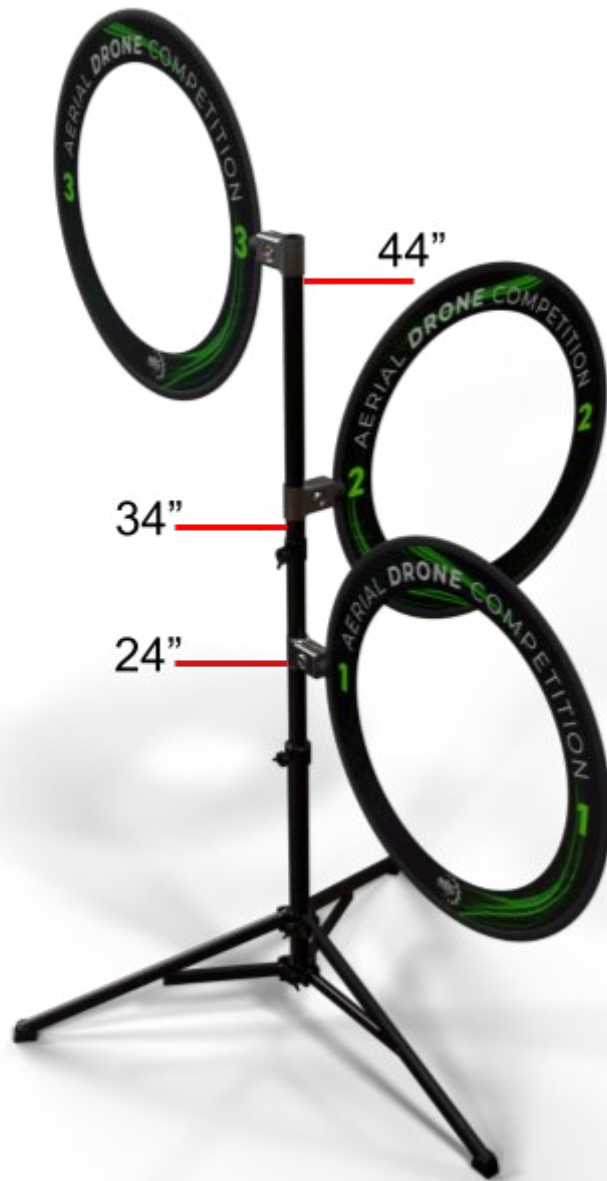
1.5 Solo Mission Field Setup Step 5: Place the Support for the Spiral



Position the support pole on the mats as shown in the image to the left.

- The pole should be 2' from each outside edge of the corner made by the long and short sections of mat.

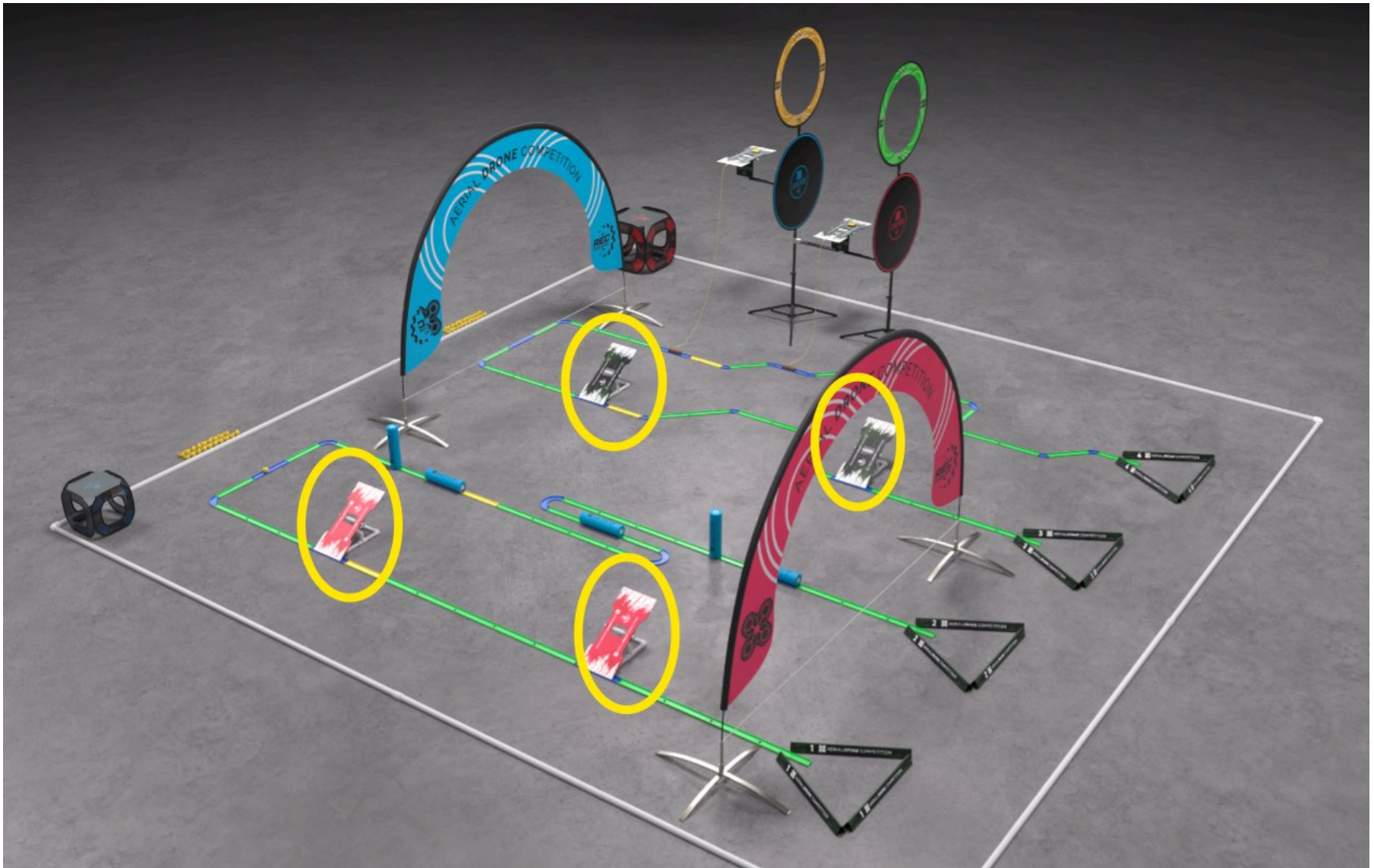
1.6 Solo Mission Field Setup Step 6: Add the Mini Keyholes to the Spiral Support



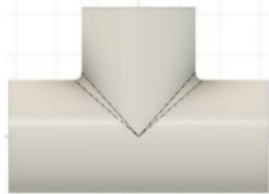
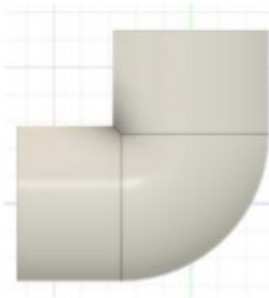
Attach the mini keyhole gates using metal T-brackets.

- Each mini keyhole is 90 degrees from the previous one, with mini keyholes 1 & 3 parallel to the edge of the mat.
- Adjust the heights so the bottom of each bracket is at the specified height.
 - Mini keyhole 1 = 24"
 - Mini keyhole 2 = 34"
 - Mini keyhole 3 = 44"

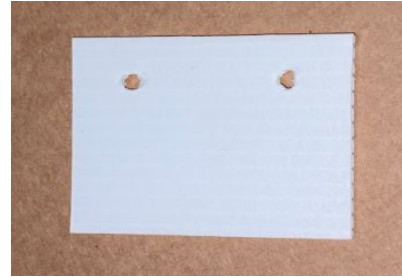
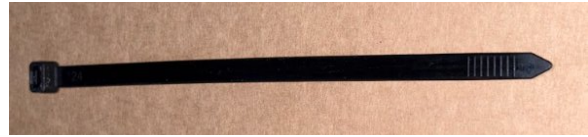
Section 2: Assembling the Low Switches (4 total)



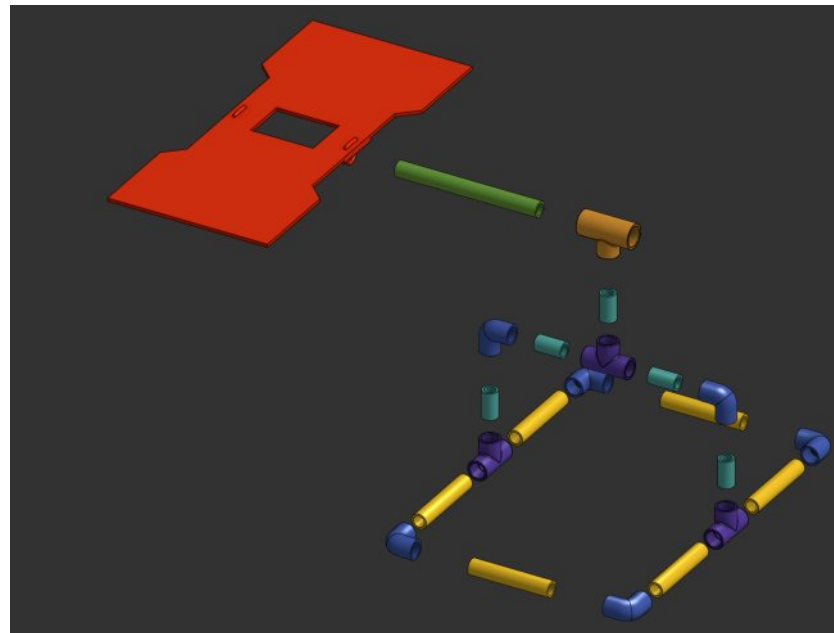
2.1 Table of Parts for Each Low Switch

Color in Instructions	Quantity for each assembly	Description	
Cyan	5	½" PVC - 5cm length	
Purple	3	½" 3-way PVC T-Connector	
Blue	6	½" PVC Elbow Connector	
Yellow	6	½" PVC - 12cm length	

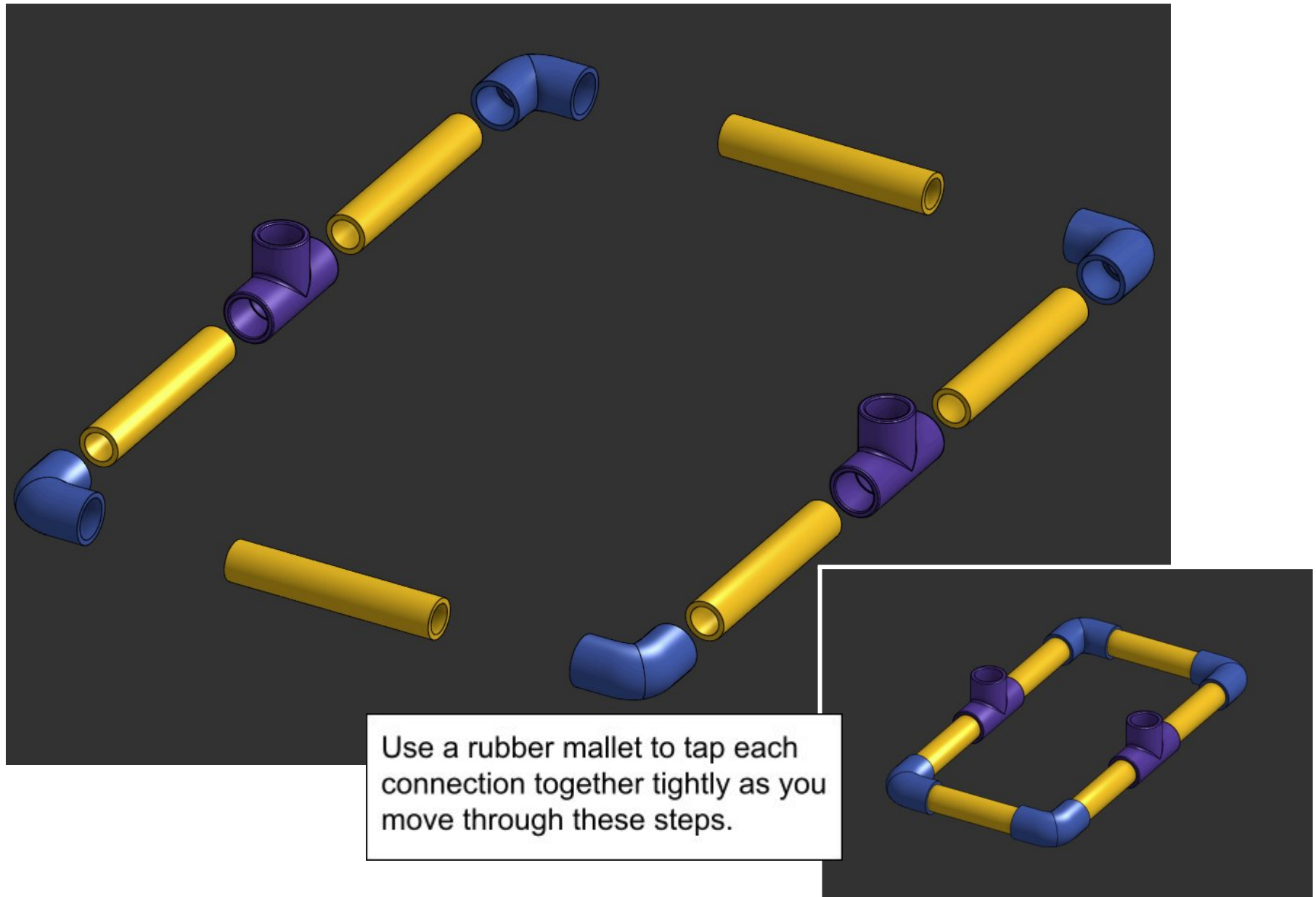
Orange	1	½" to ¾" 3-way PVC T-Connector	
Green	1	½" PVC - 17cm length	
Red	1	Low switch plate - corrugated plastic The game element includes two green/black switch plates and two red/white switch plates	 

N/A; see step 4	2	Small corrugated plastic piece - 6.5cm x 4.5cm	
N/A; see step 4	2	Zip tie	

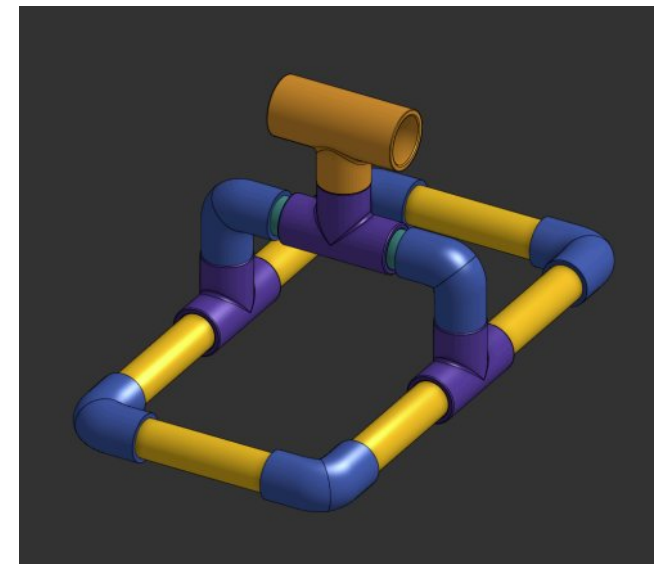
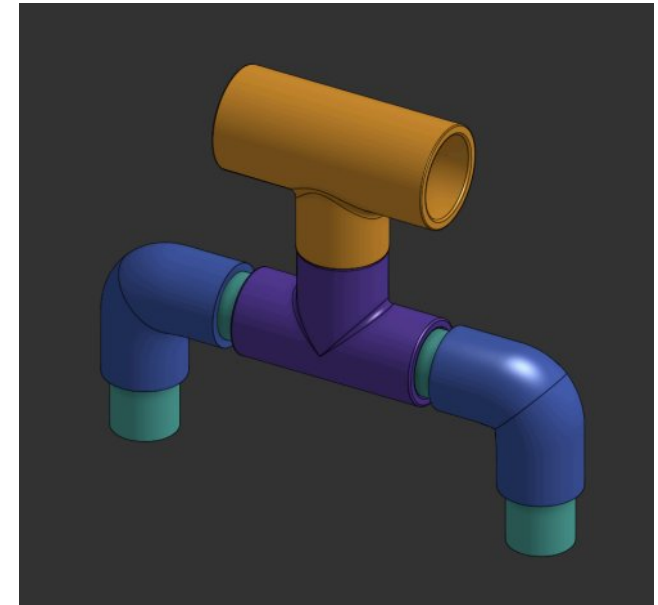
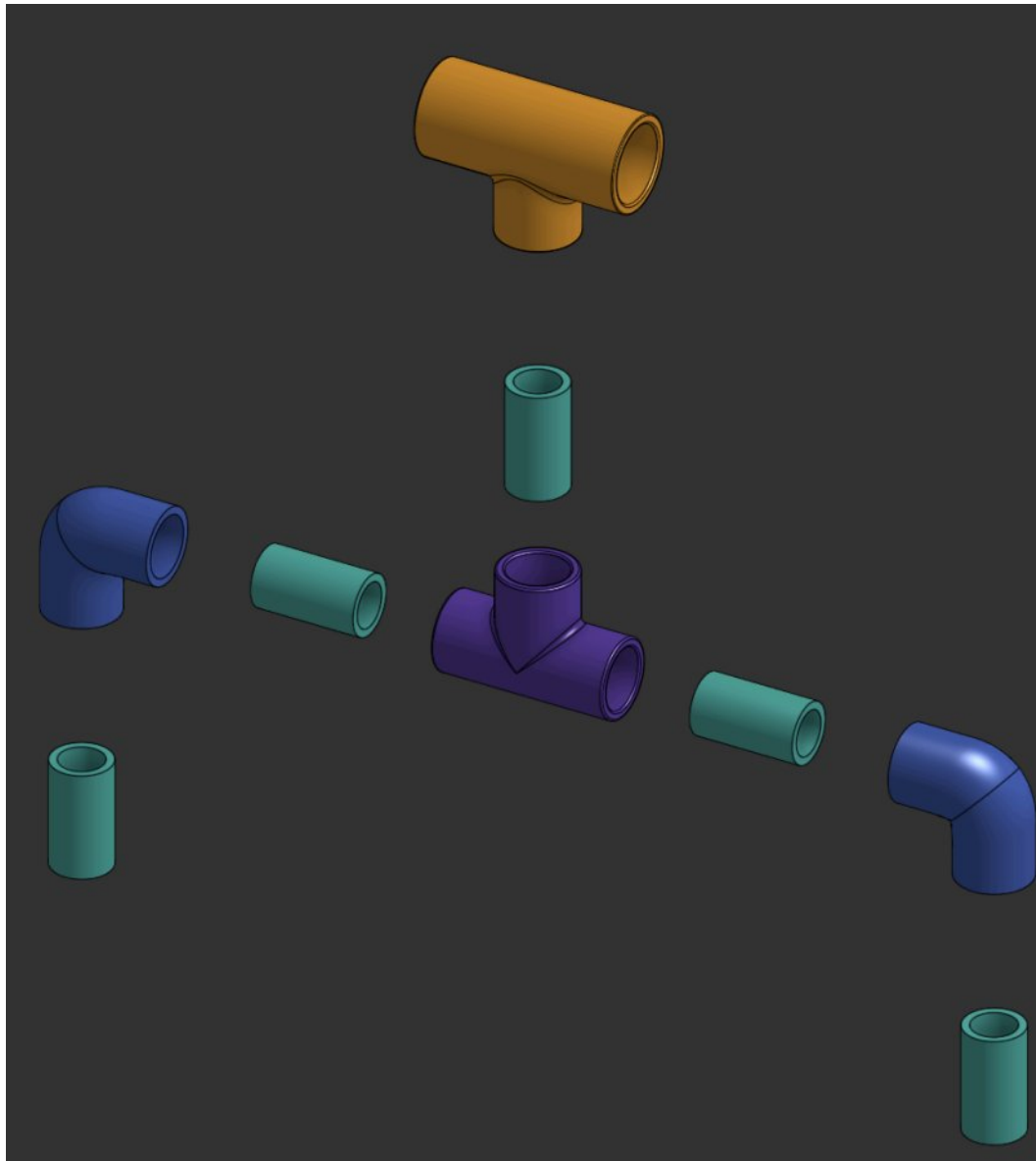
2.2 Low Switch Assembly Overview



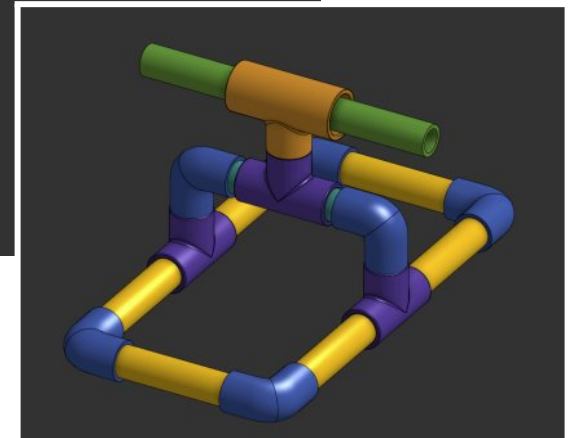
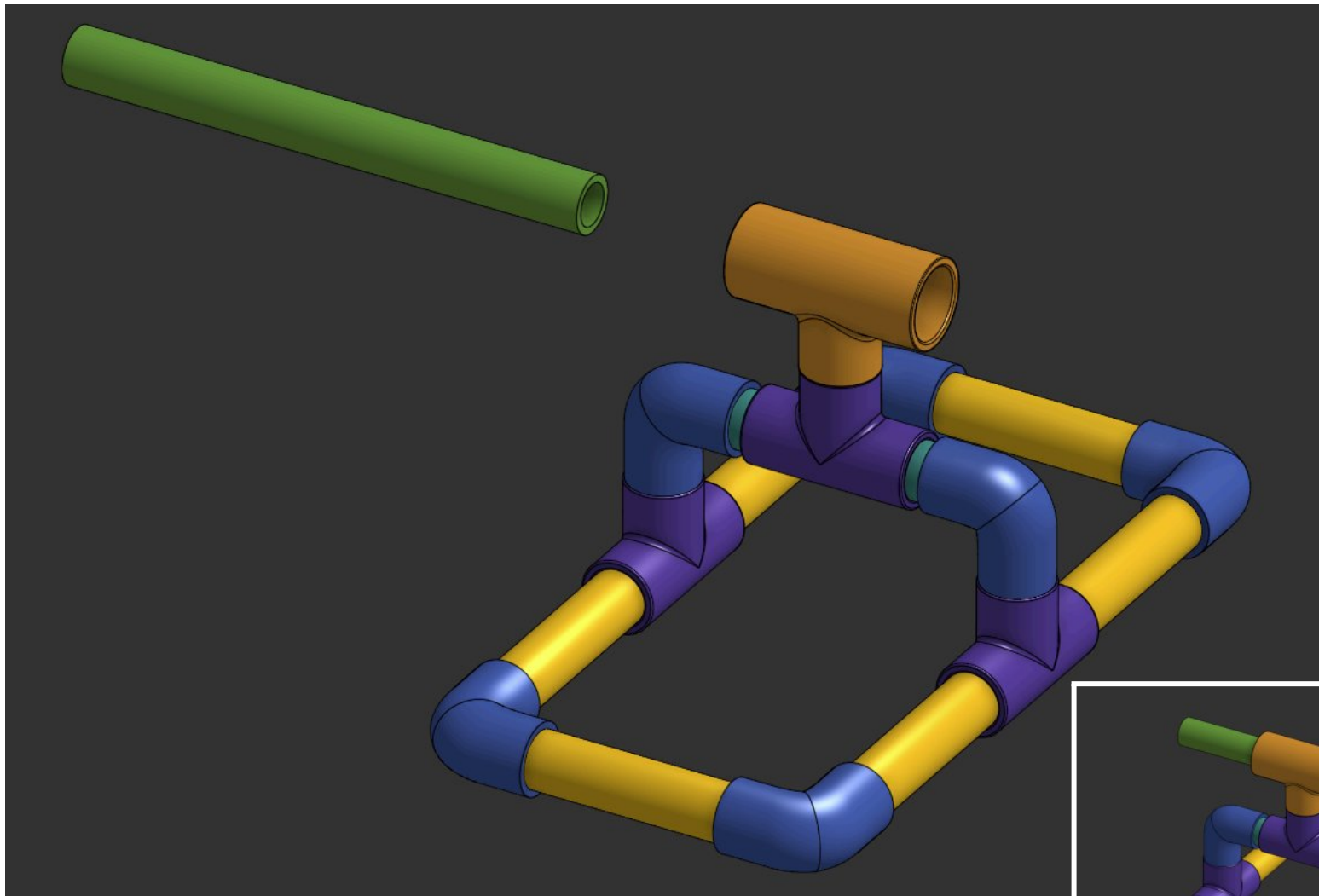
2.3 Low Switch Assembly Step 1: Build the Base of the Switch



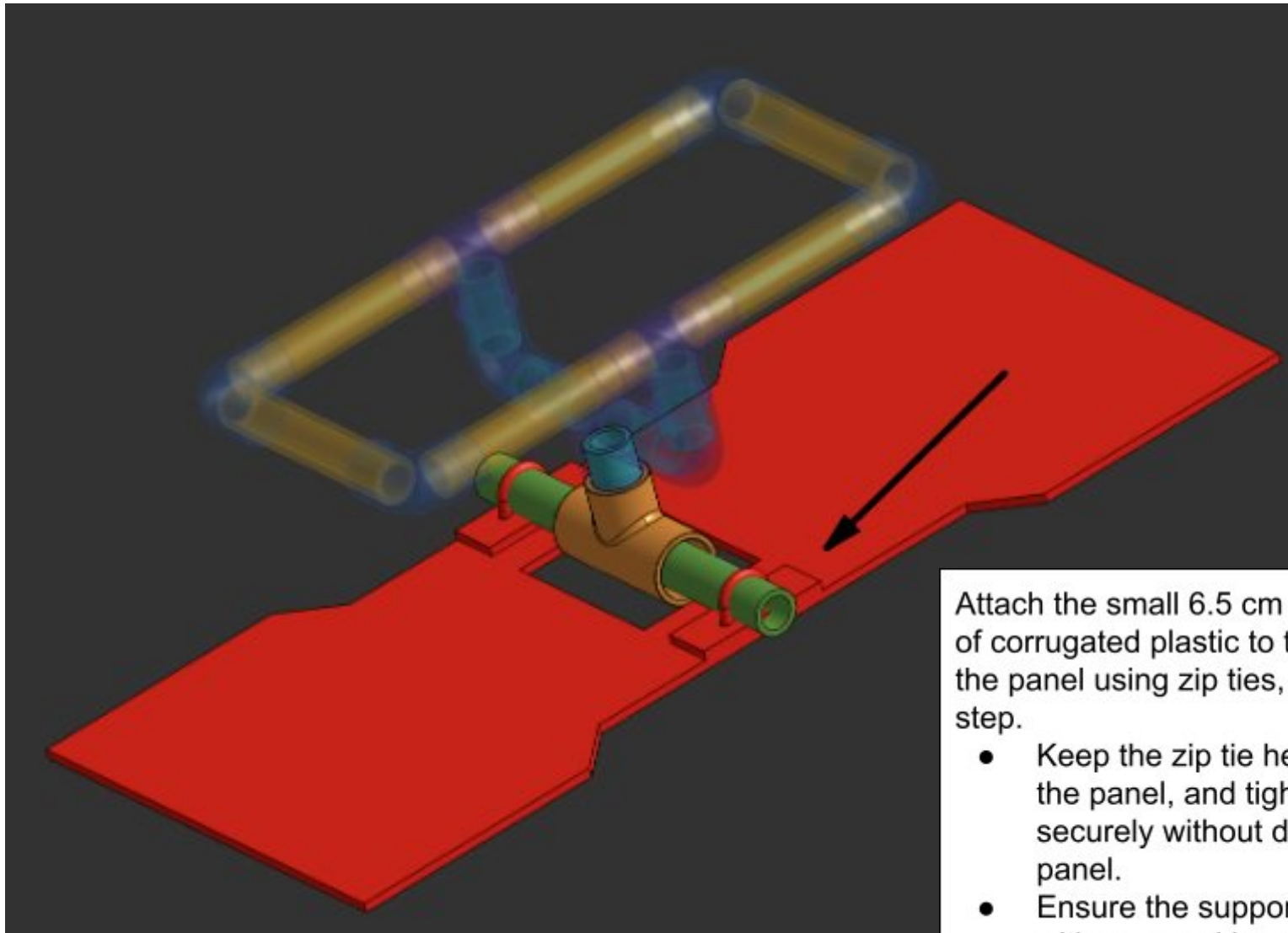
2.4 Low Switch Assembly Step 2: Build the Center Structure



2.5 Low Switch Assembly Step 3: Insert the Support Pole



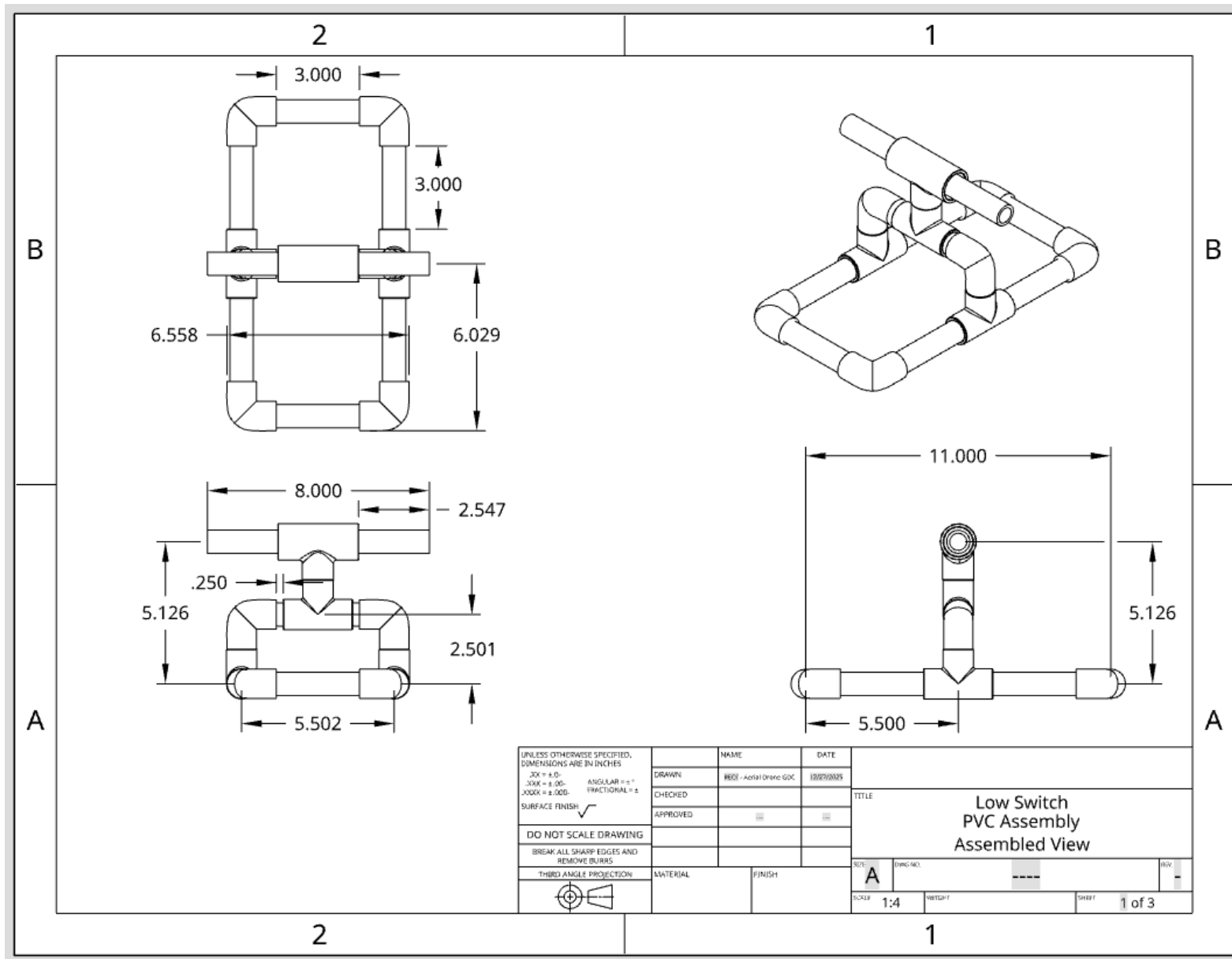
2.6 Low Switch Assembly Step 4: Attach the Switch Plate

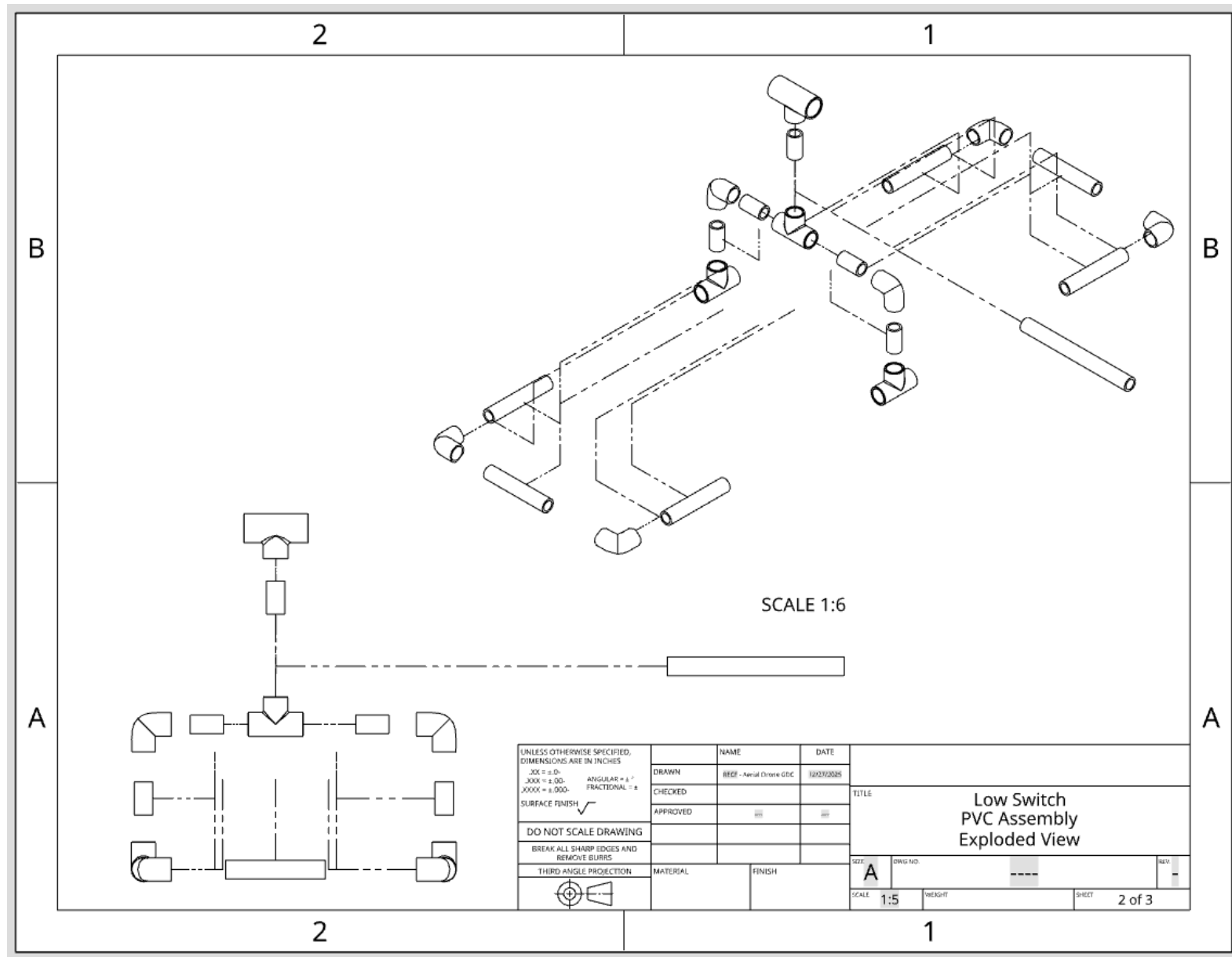


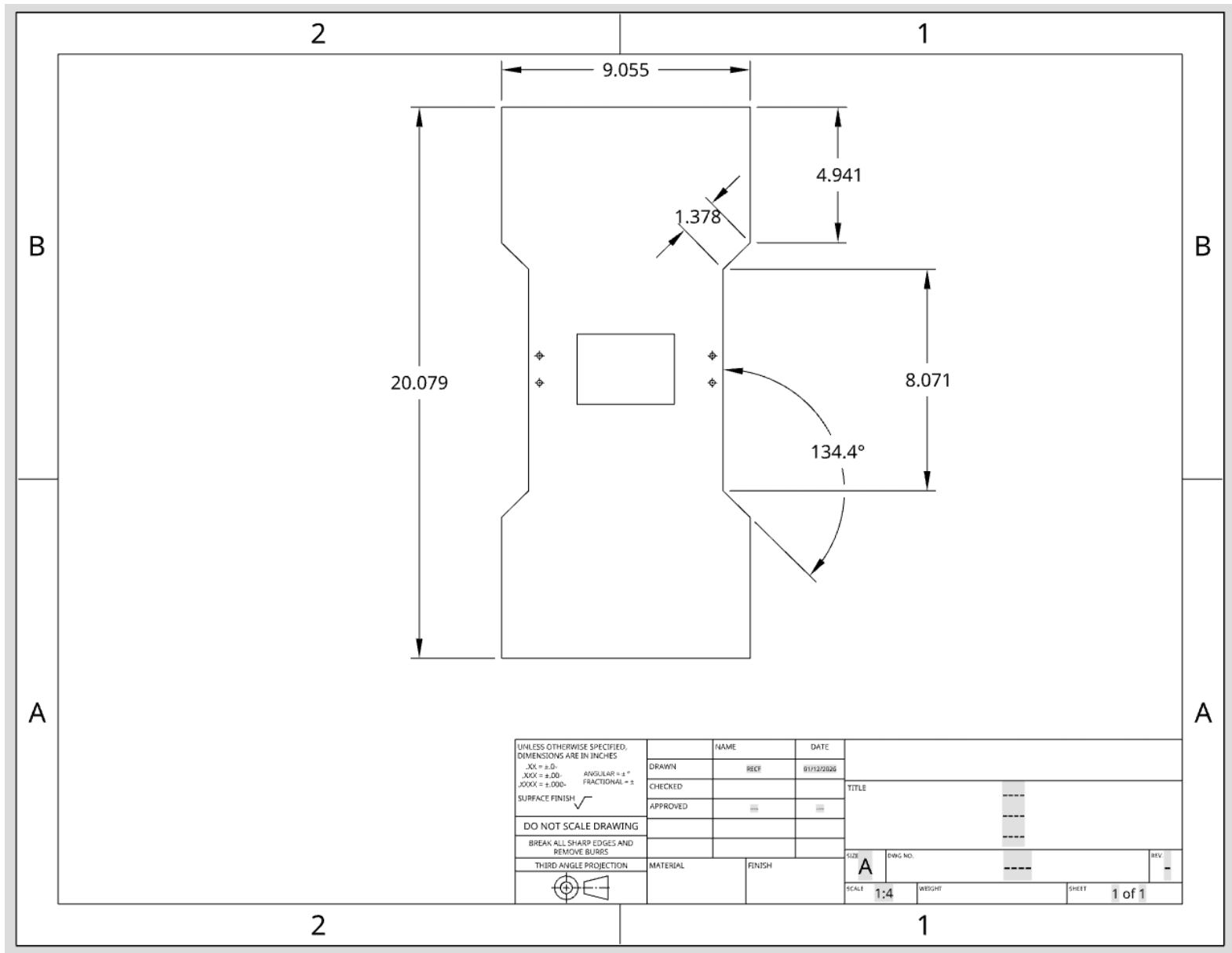
Attach the small 6.5 cm x 4.5 cm pieces of corrugated plastic to the underside of the panel using zip ties, as shown in this step.

- Keep the zip tie head underneath the panel, and tighten the zip tie securely without deforming the panel.
- Ensure the support pipe is centered, with an equal length extending on each side.

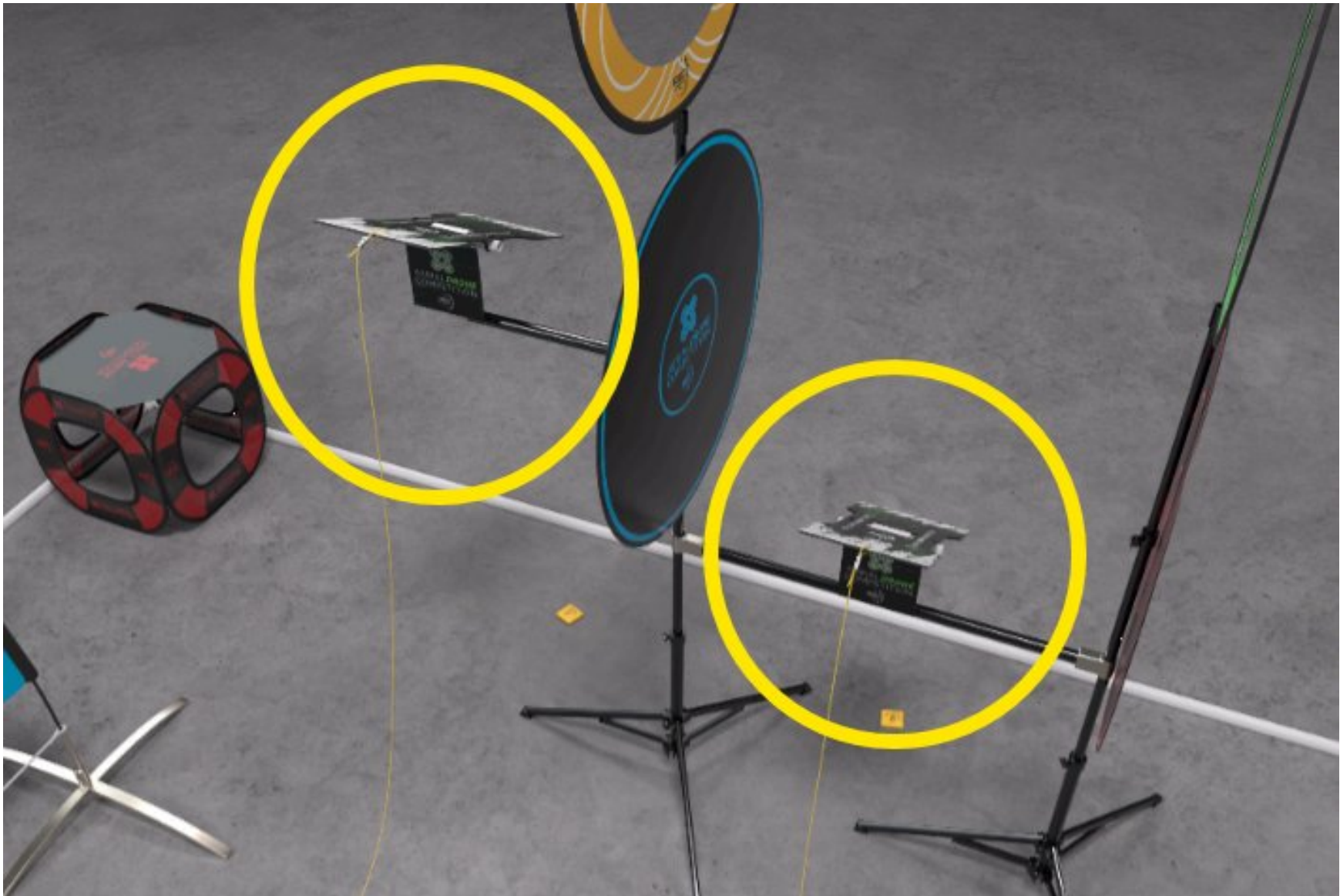
2.7 Low Switch Technical Drawings





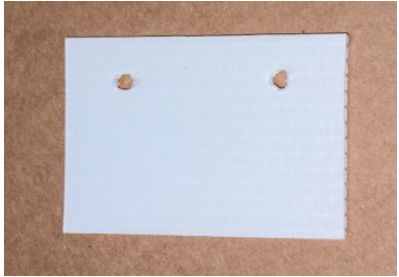


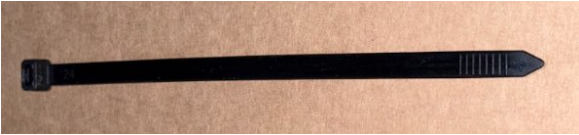
Section 3: Assembling the High Switches (2 total)



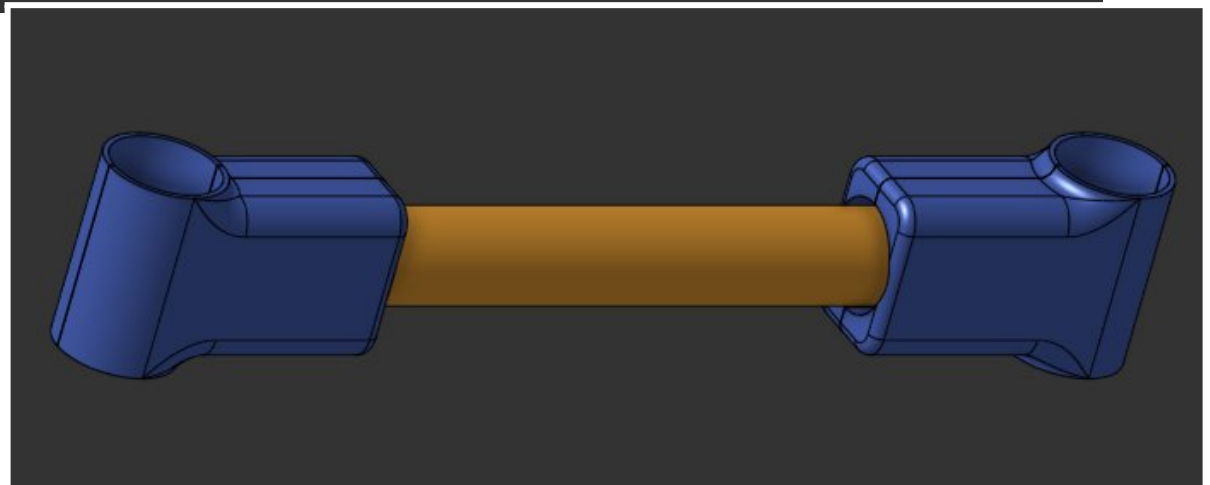
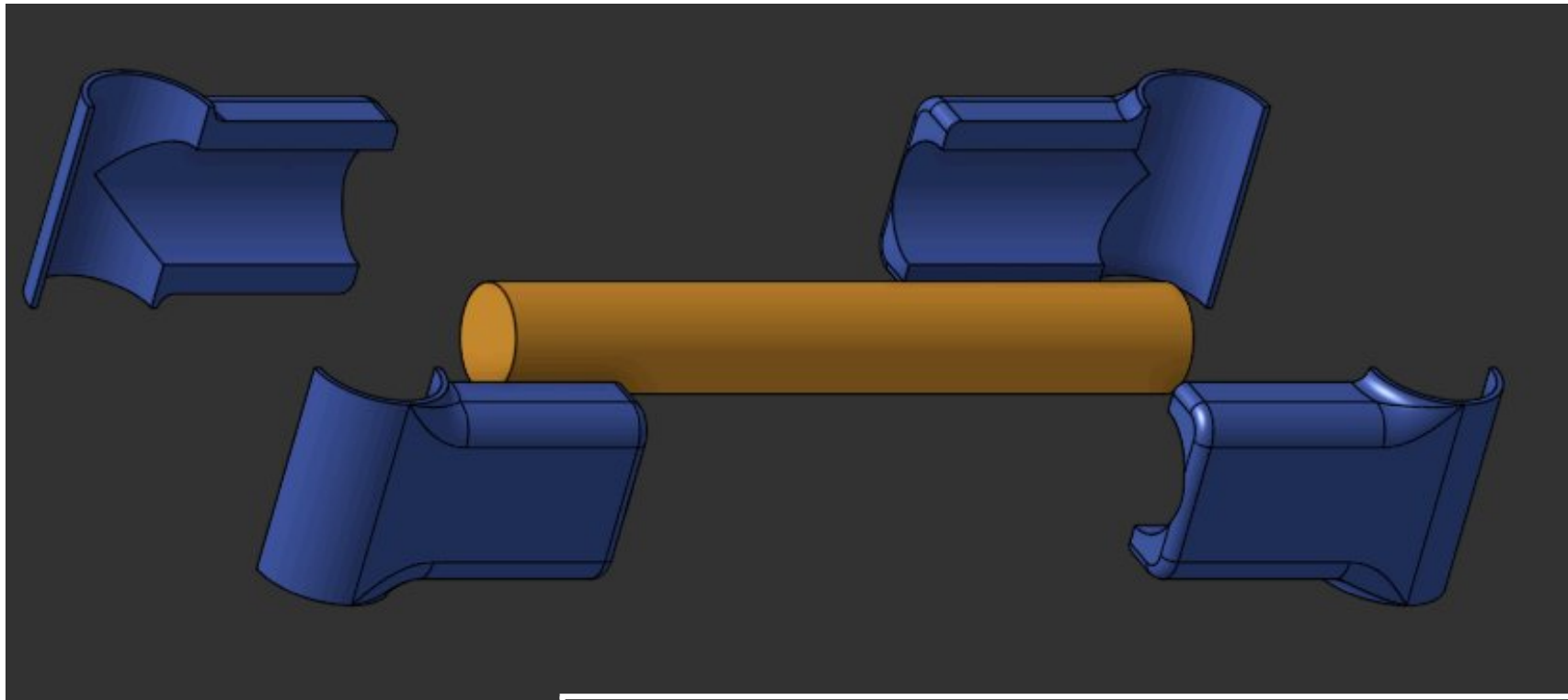
3.1 Table of Parts for Each High Switch

Color in Instructions	Quantity for each assembly	Description	
Light Blue	1	High switch plate - corrugated plastic Note: A green square (on the left side of the image) shows the intended starting position for the bean bag on the assembled switch.	
Purple	1	Level plate - corrugated plastic - 18cm x 14cm	
Blue	2	Metal T-Connector	

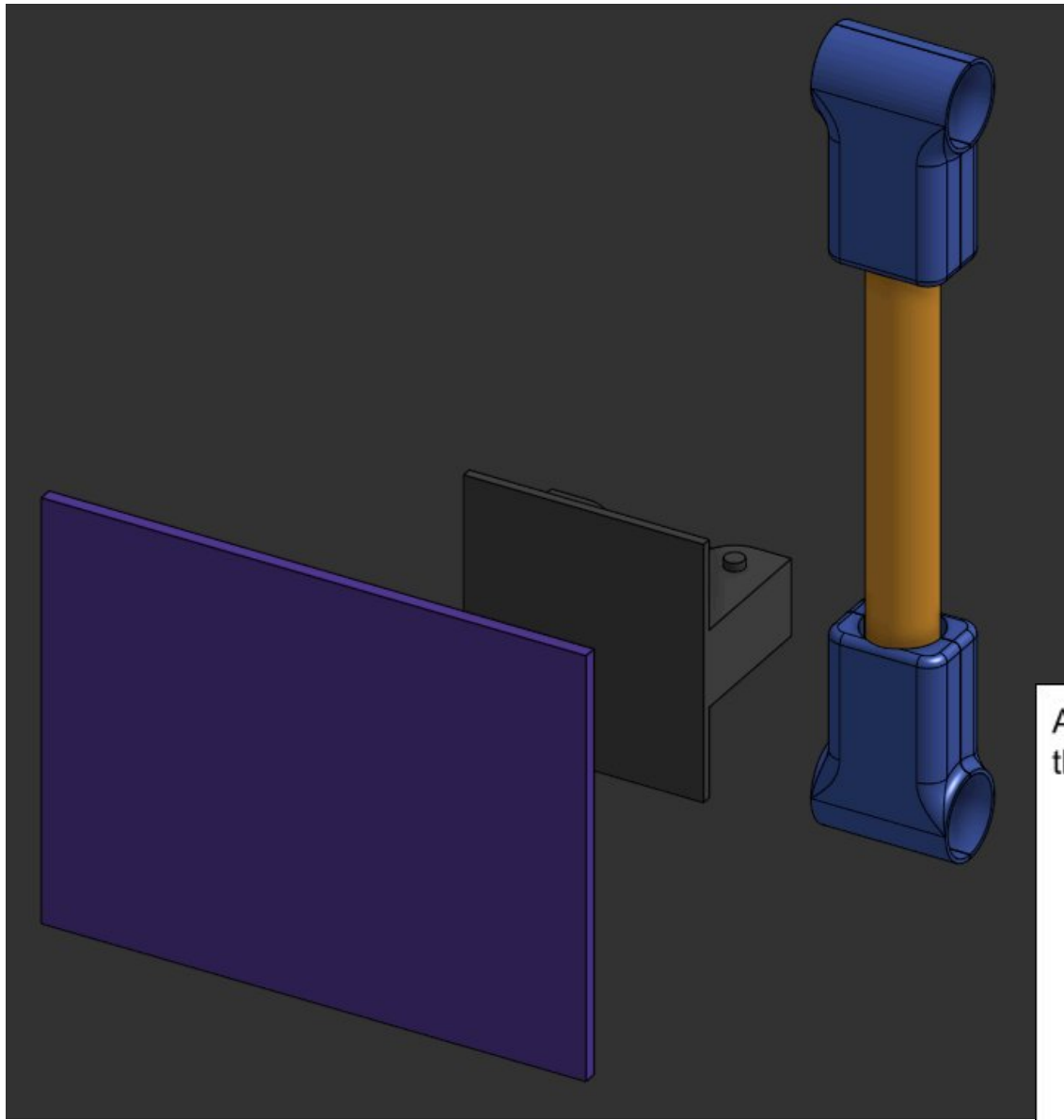
Orange	1	1" metal pipe - 6" length	
Yellow	1	½" PVC - 6.5" length	
Black	1	Clip bracket and adhesive	
N/A; see step 4	2	Small corrugated plastic piece - 6.5cm x 4.5cm	

N/A; see step 4	2	Zip tie	
N/A; see step 6	1	Wire	

3.2 High Switch Assembly Step 1: Attach Metal T-Connectors to 1" Metal Pipe



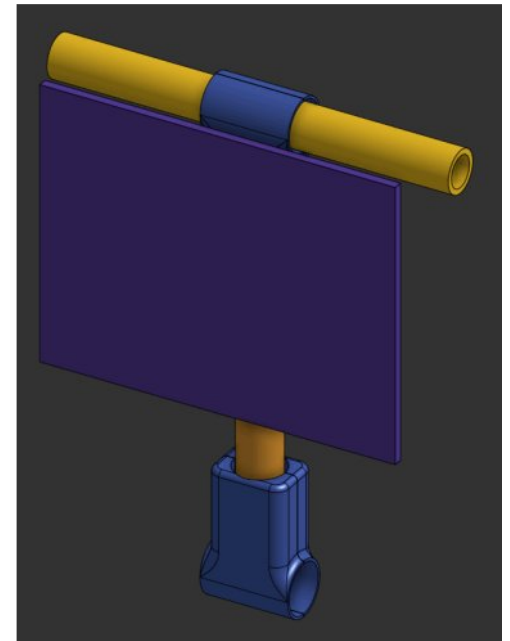
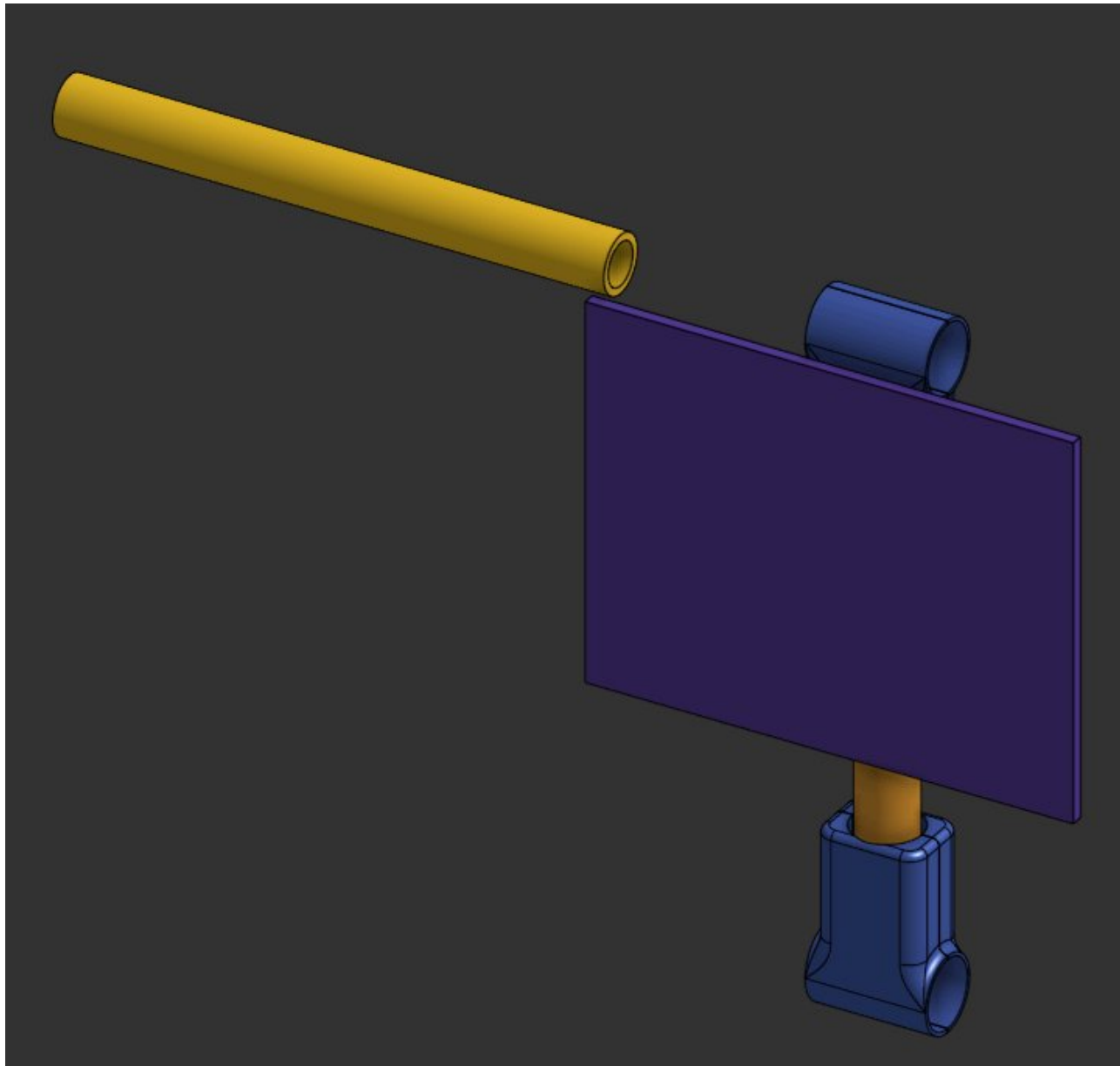
3.3 High Switch Assembly Step 2: Assemble and Attach Level Bracket



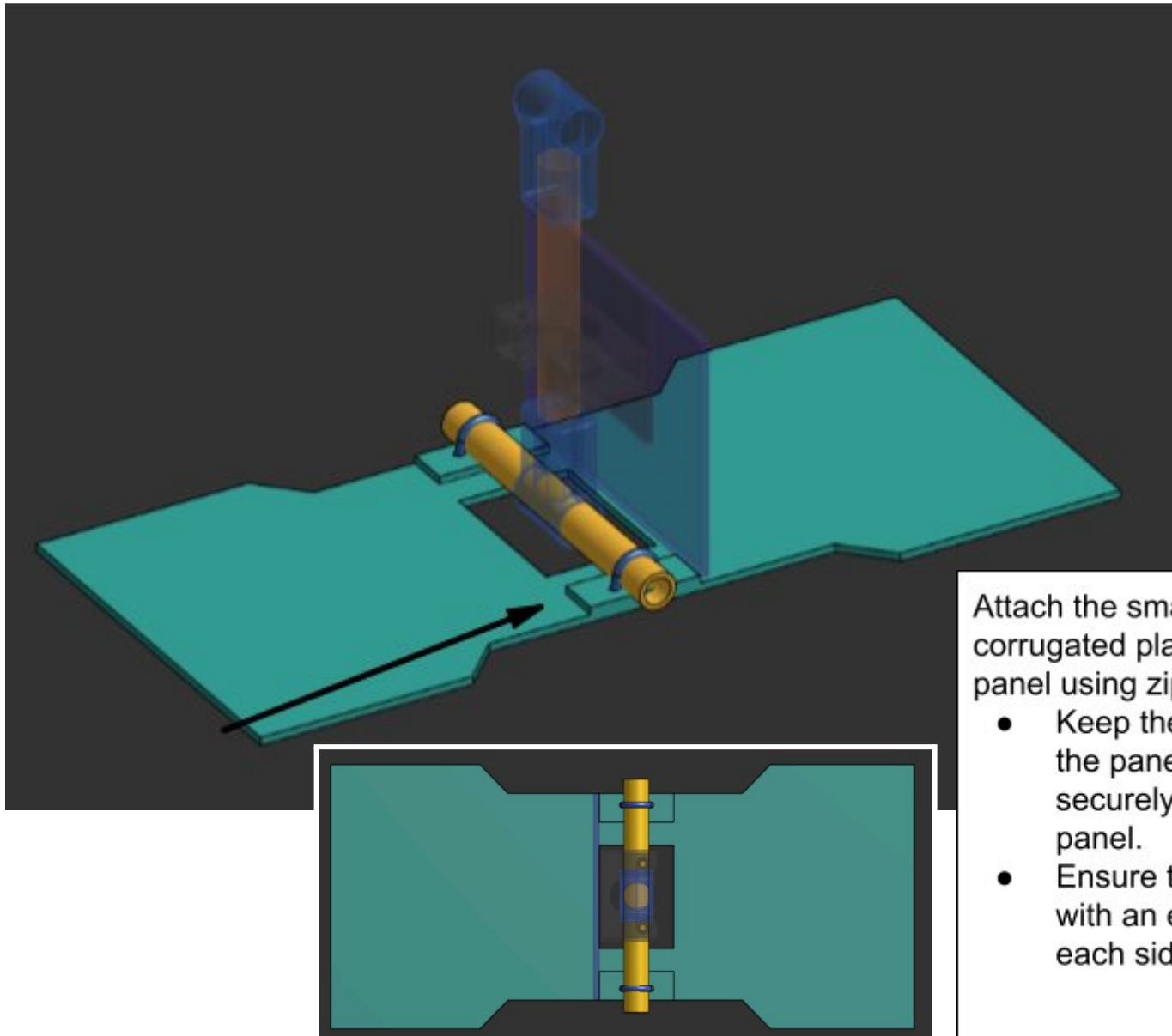
Attach the level plate (18cm x 14cm) to the bracket using the enclosed adhesive.

- Align the bracket with the bottom of the level plate.
- Attach the clip bracket to the PVC from step 1 (you can adjust the height later).
- When assembled correctly, this assembly will keep the high switch level and prevent it from tipping forward.

3.4 High Switch Assembly Step 3: Insert the Support Pole



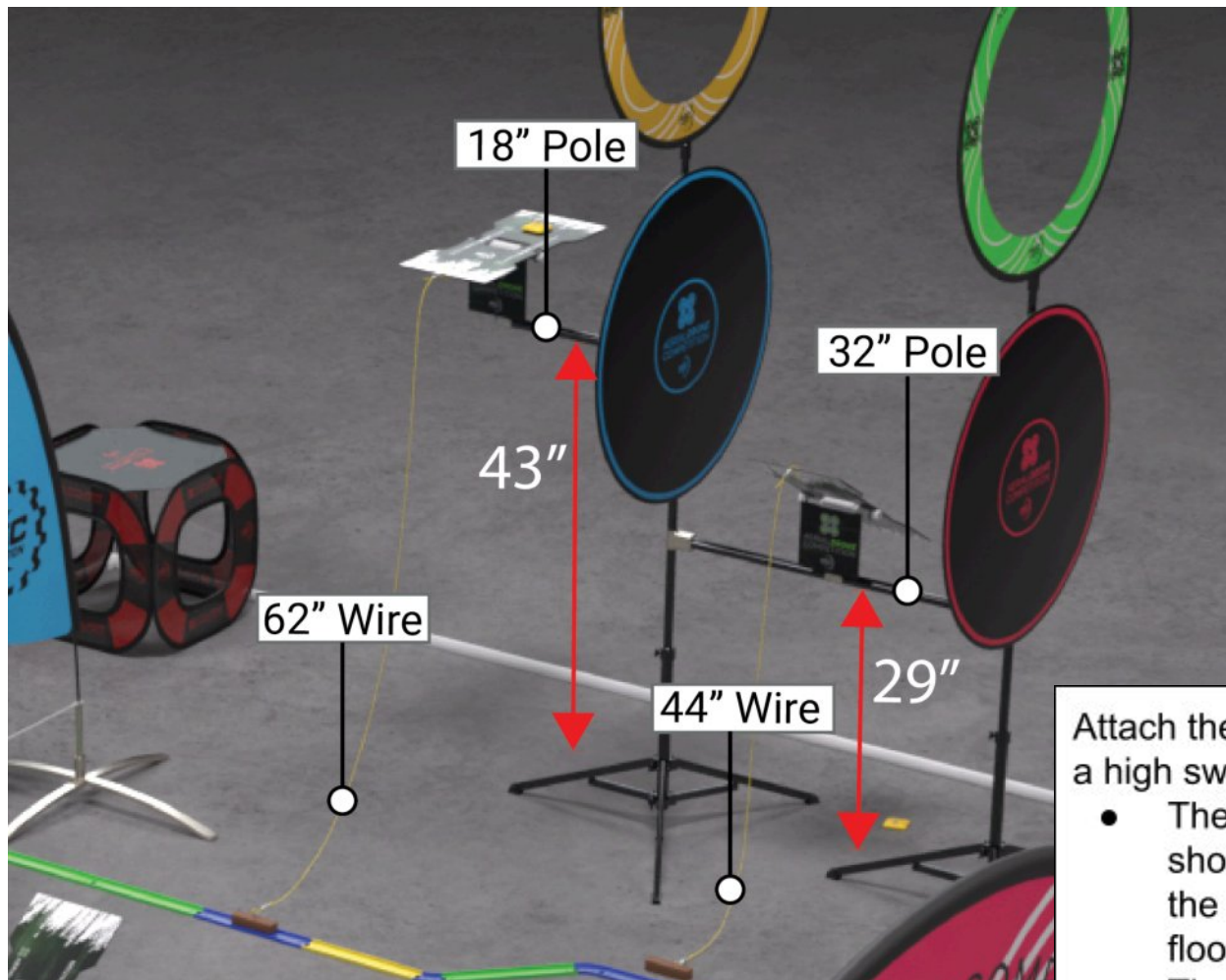
3.5 High Switch Assembly Step 4: Attach the Switch Plate



Attach the small 6.5cm x 4.5cm pieces of corrugated plastic to the underside of the panel using zip ties, as shown in this step.

- Keep the zip tie head underneath the panel, and tighten the zip tie securely without deforming the panel.
- Ensure the support pipe is centered, with an equal length extending on each side.

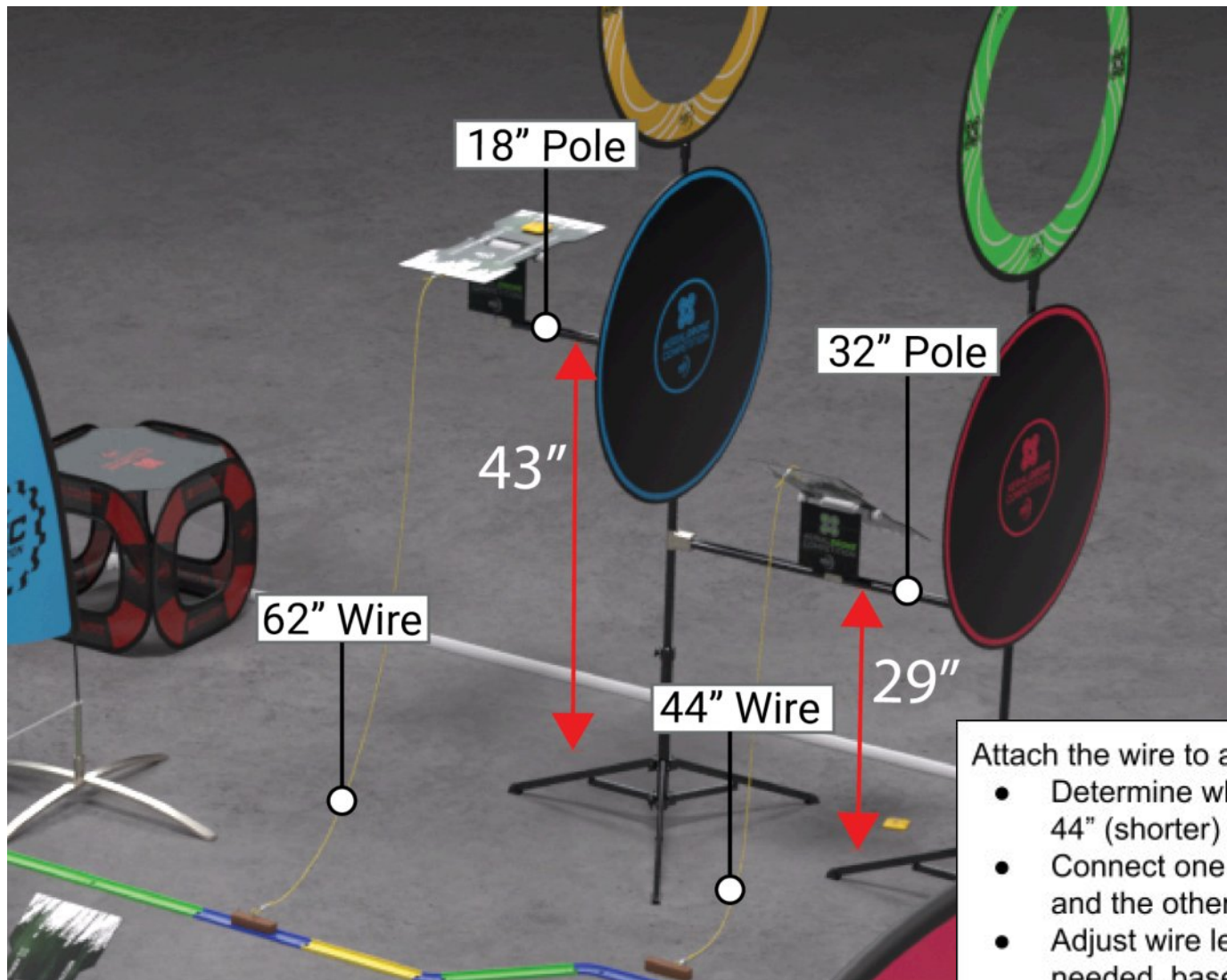
3.6 High Switch Assembly Step 5: Attach the Switch to the High Switch Pole



Attach the high switch to a cross pole on a high switch pole.

- The switch on the lower cross pole should be centered on the pole, with the pole at a height of 29" from the floor.
- The switch on the higher cross pole should be positioned at the end of the pole, with the pole at a height of 43" from the floor.

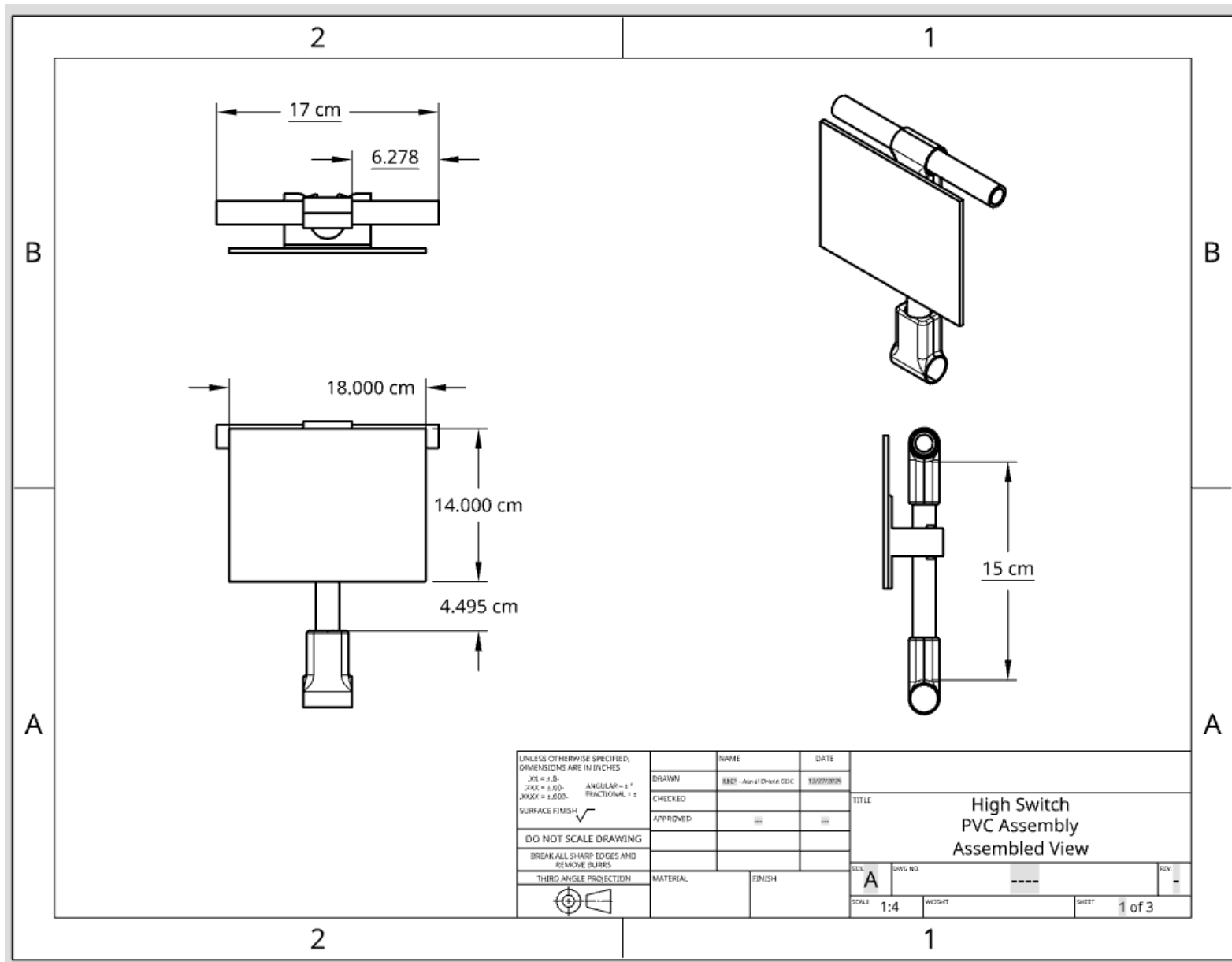
3.7 High Switch Assembly Step 6: Attach the Wire to a Block and a Switch

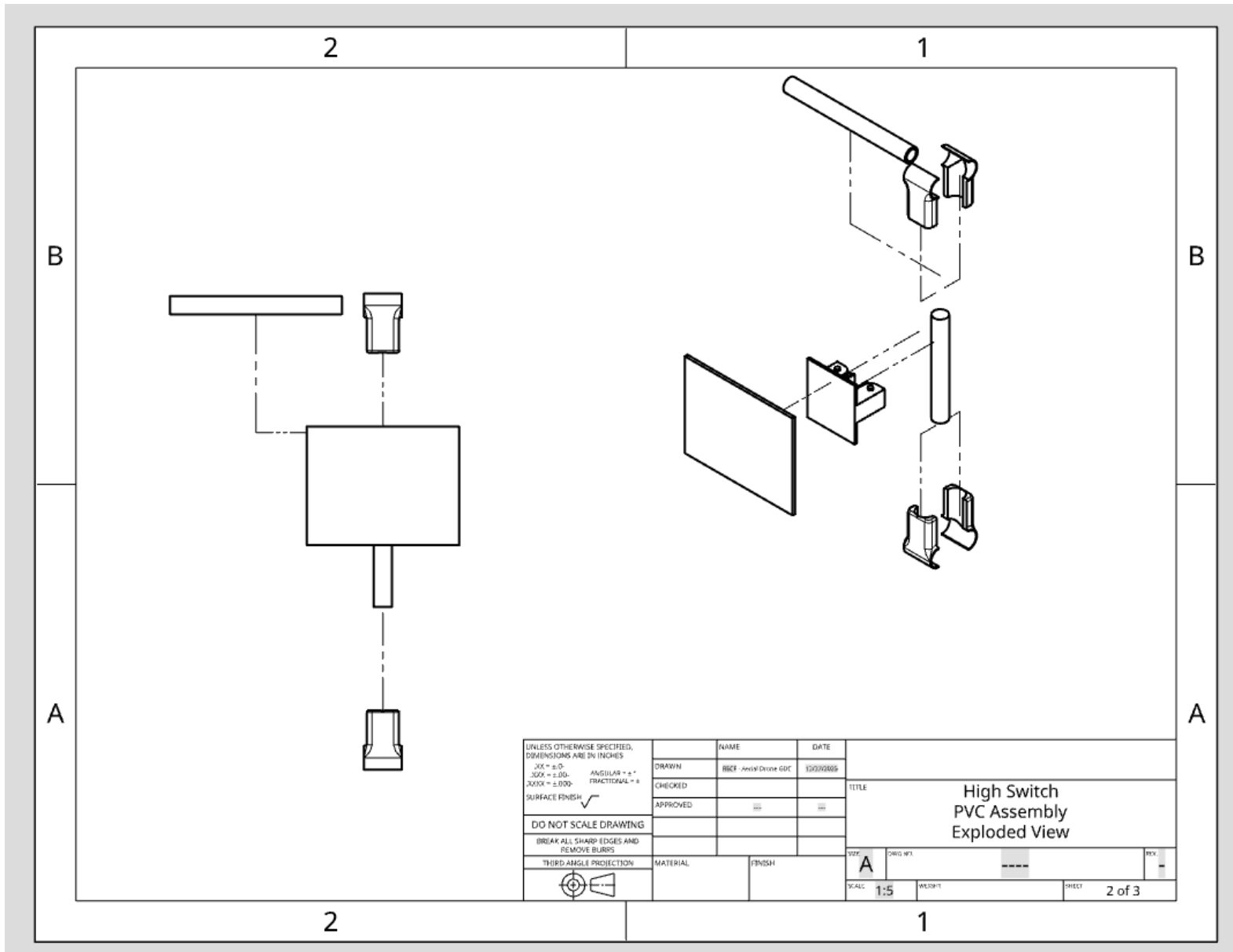


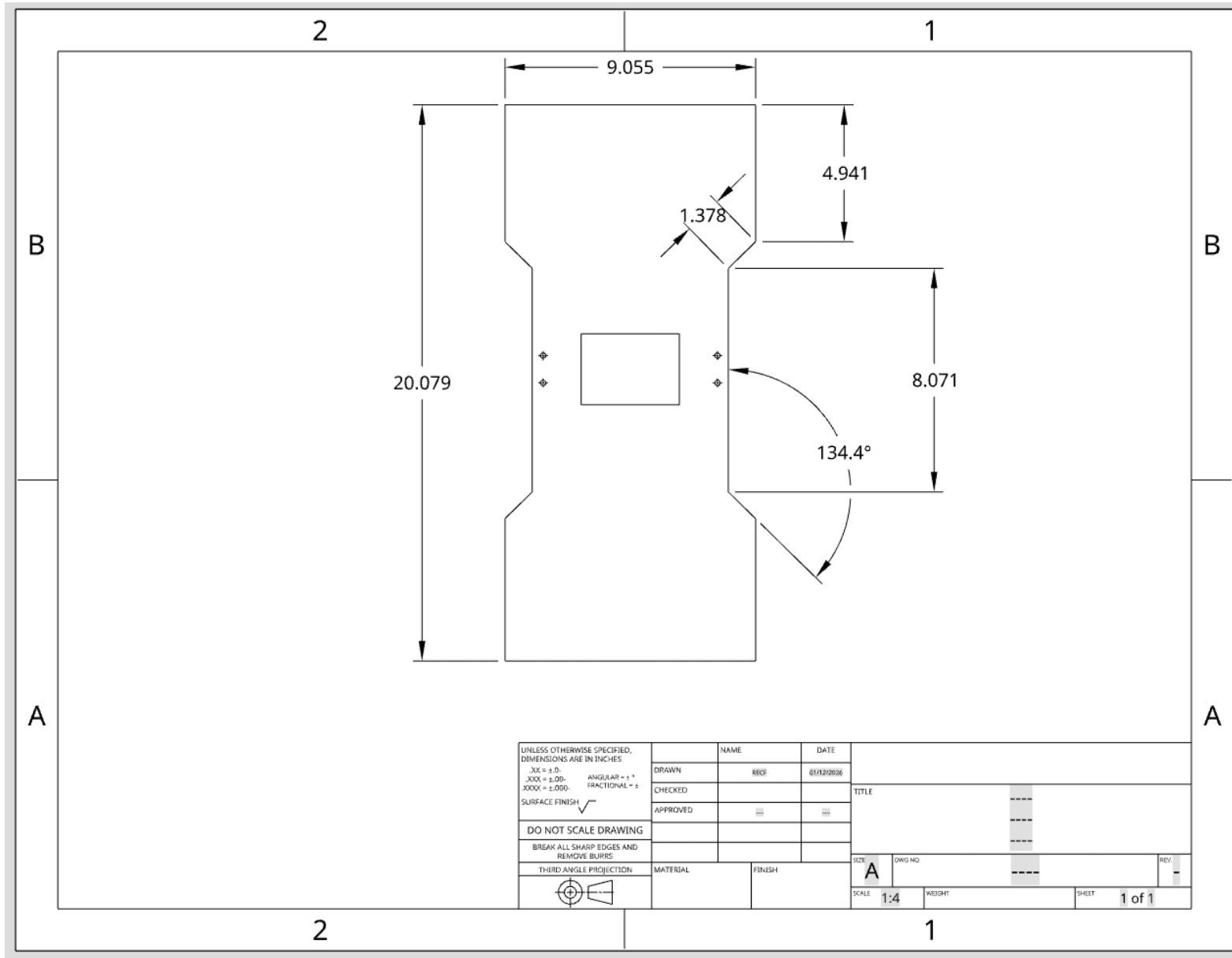
Attach the wire to a block and a switch.

- Determine whether the wire should be 44" (shorter) or 62" (longer)
- Connect one end of the wire to a switch and the other end to a block.
- Adjust wire lengths to 44" and 62" as needed, based on the illustration.
- Both high switch plates should be level at the start of each match.

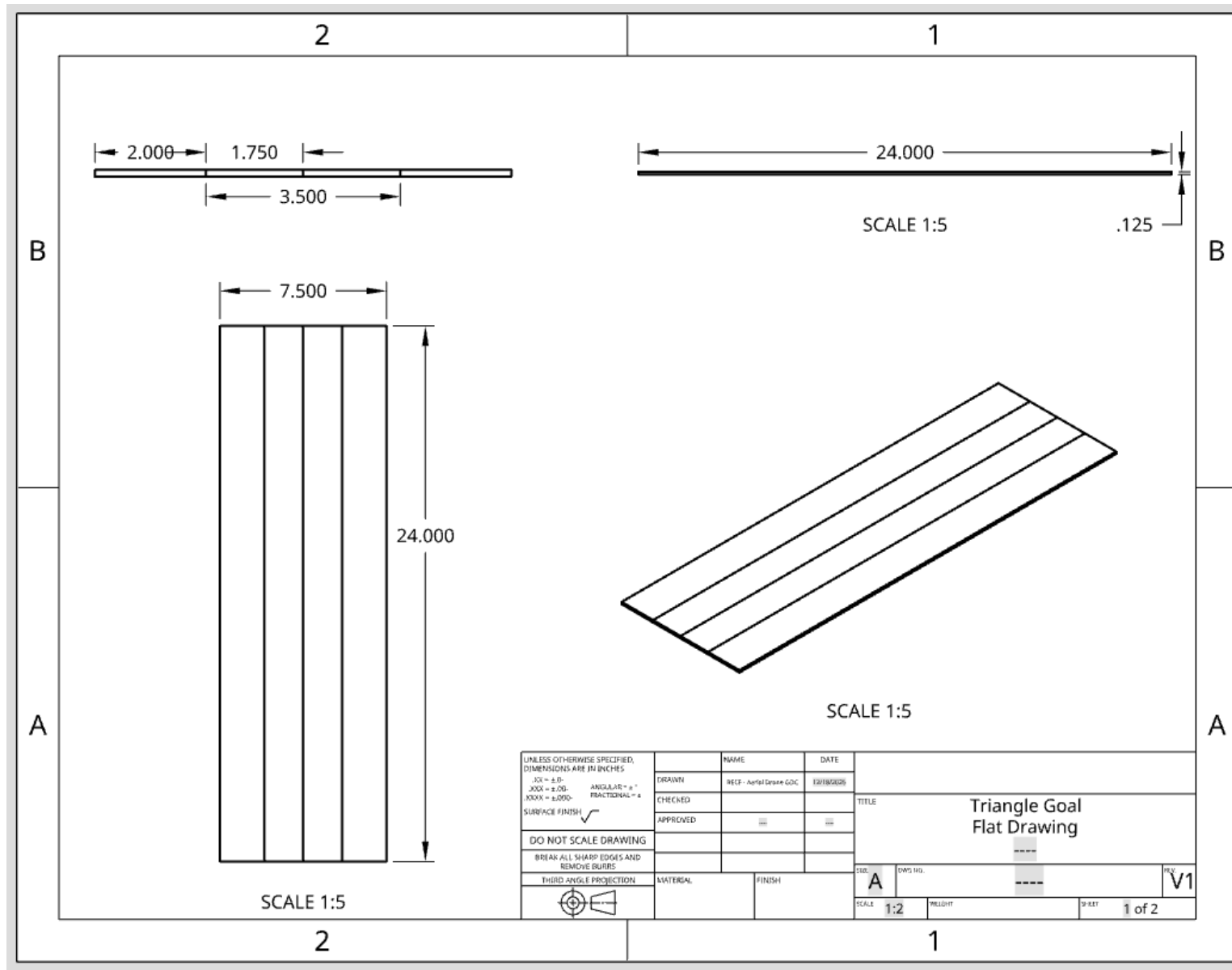
3.8 High Switch Technical Drawings

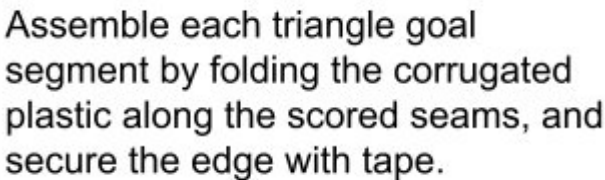




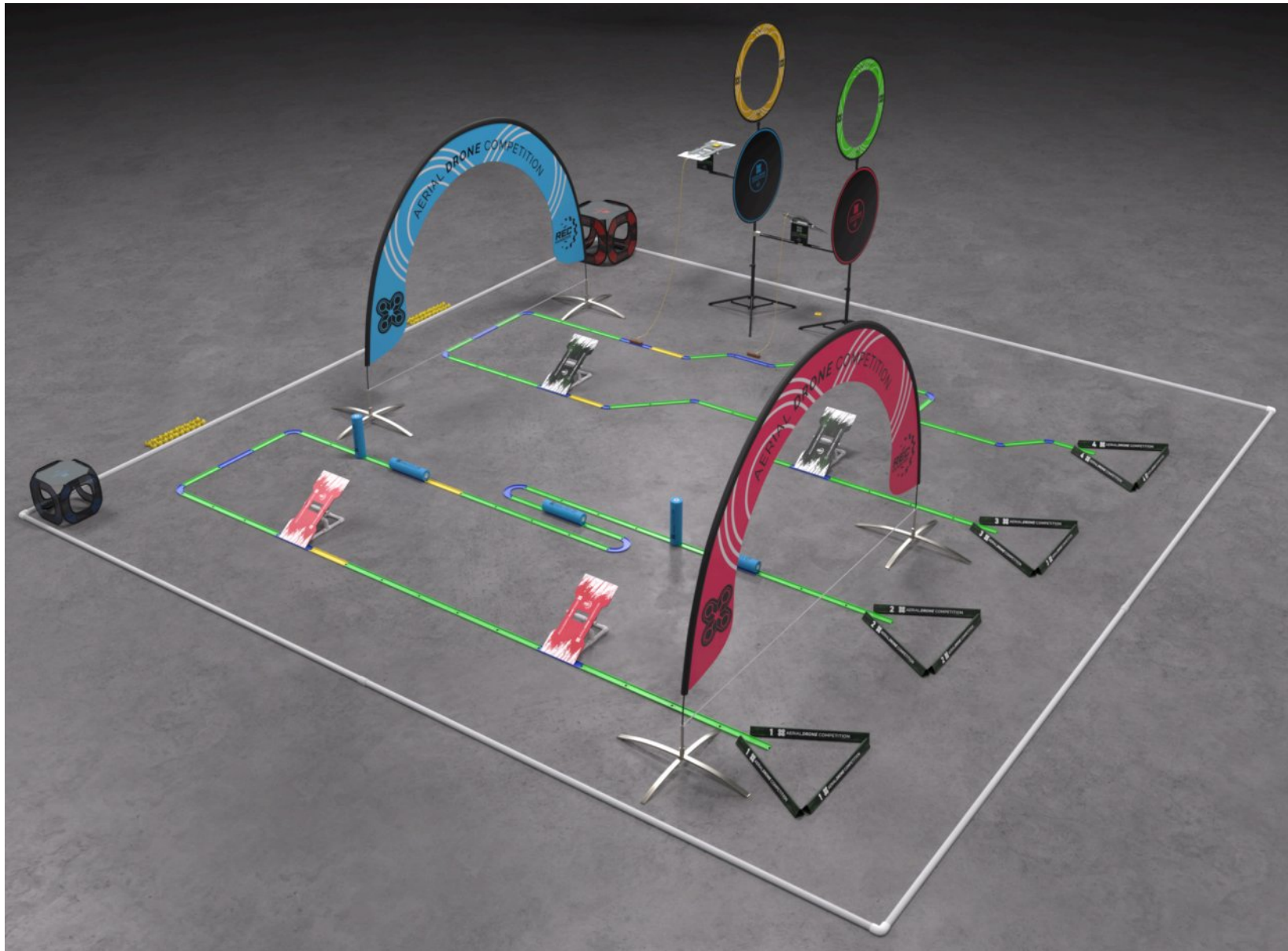


Section 4: Assembling the Triangle Goal Segments (12 total)

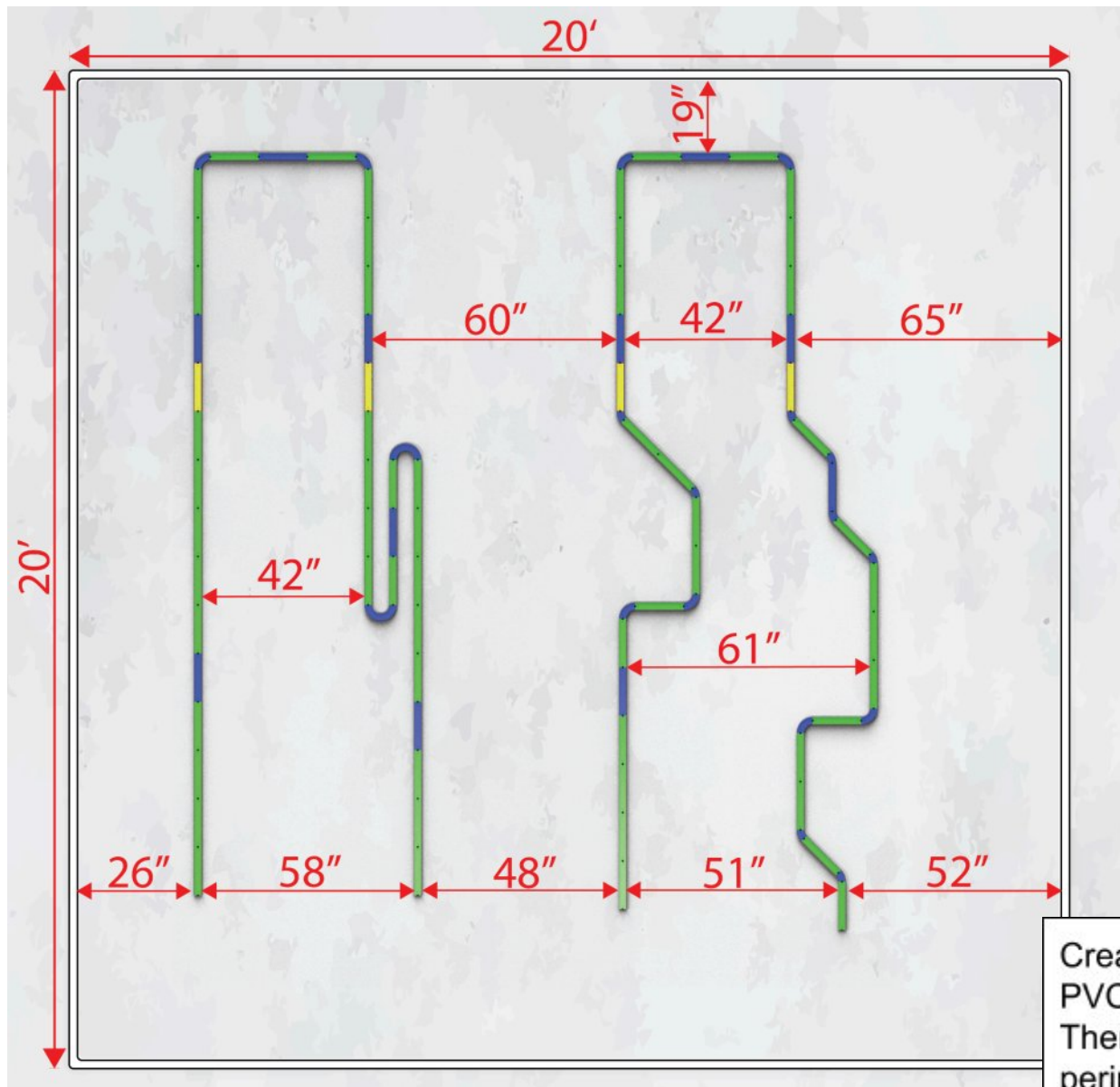




Section 5: Setting up the Alliance/Teamwork Mission Field

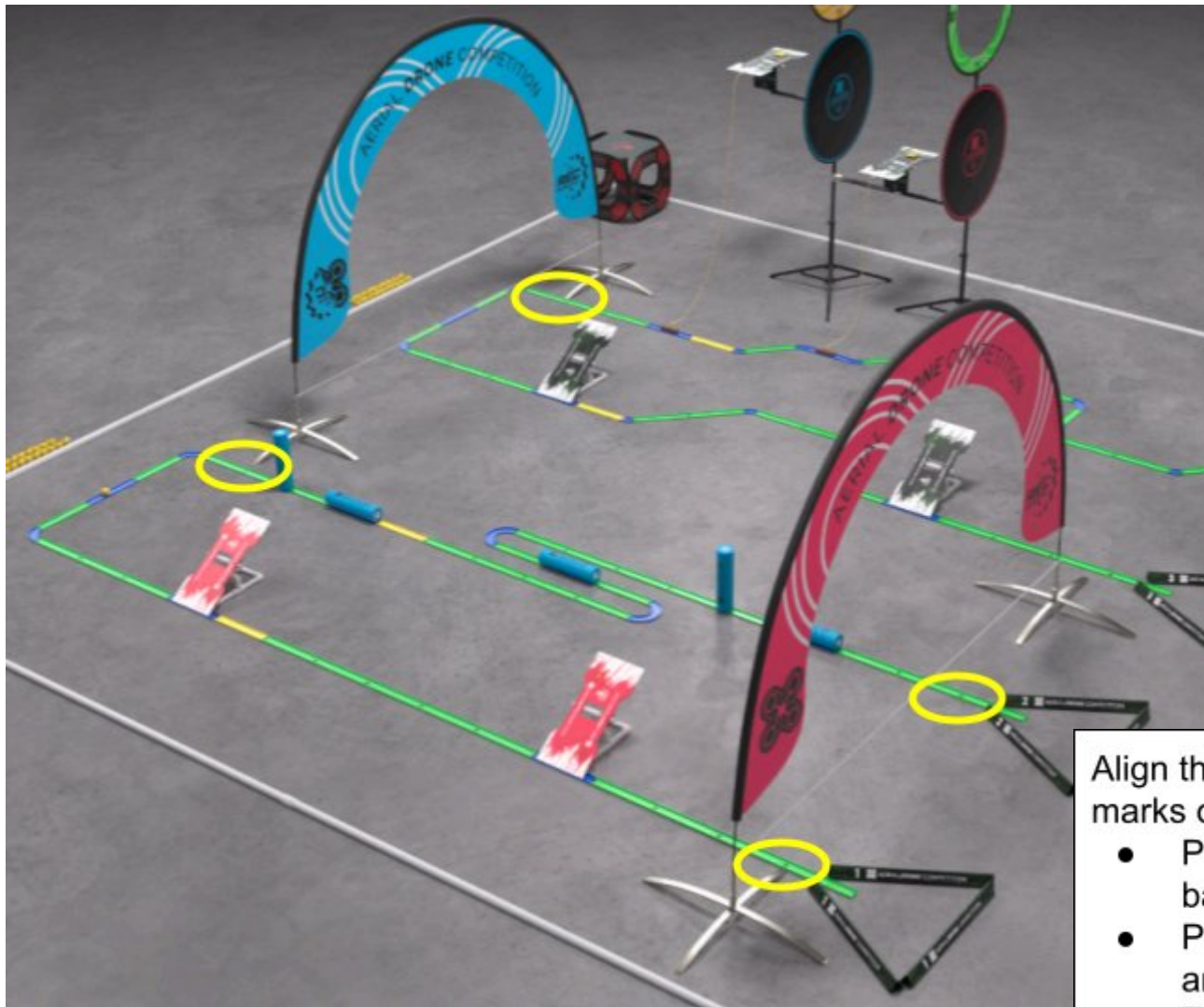


5.1 Alliance Mission Field Setup Step 1: Create a Perimeter and Assemble the Track



Create a 20' x 20' perimeter using PVC pipe, tape, rope, or cones. Then lay out the track inside the perimeter as shown.

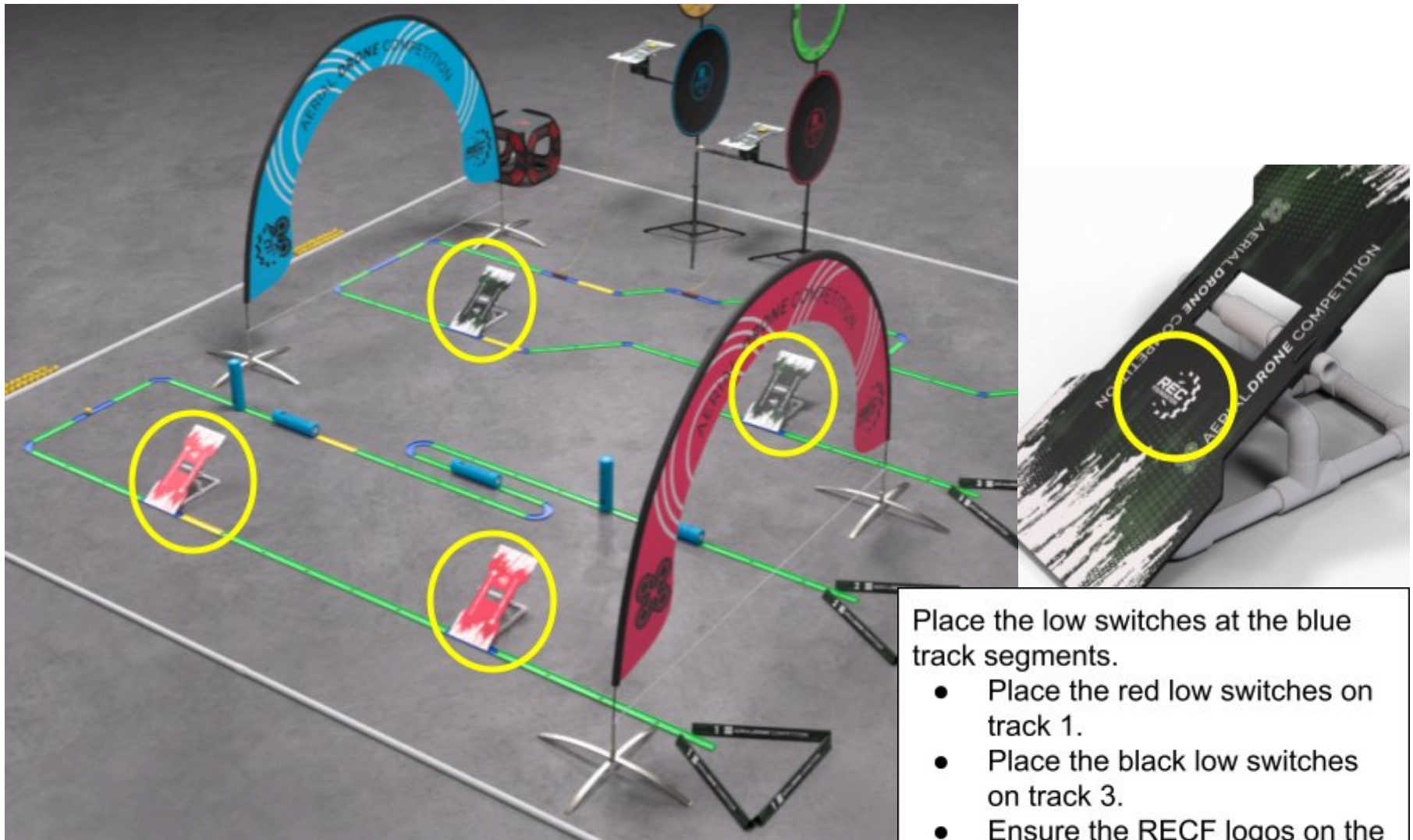
5.2 Alliance Mission Field Setup Step 2: Place the Arch Gates



Align the arch gates with the 1' marks on the tracks.

- Position the feet of the red arch base along track 1.
- Position the feet of the blue arch base along track 4.
- The tension wire should be 102" long.

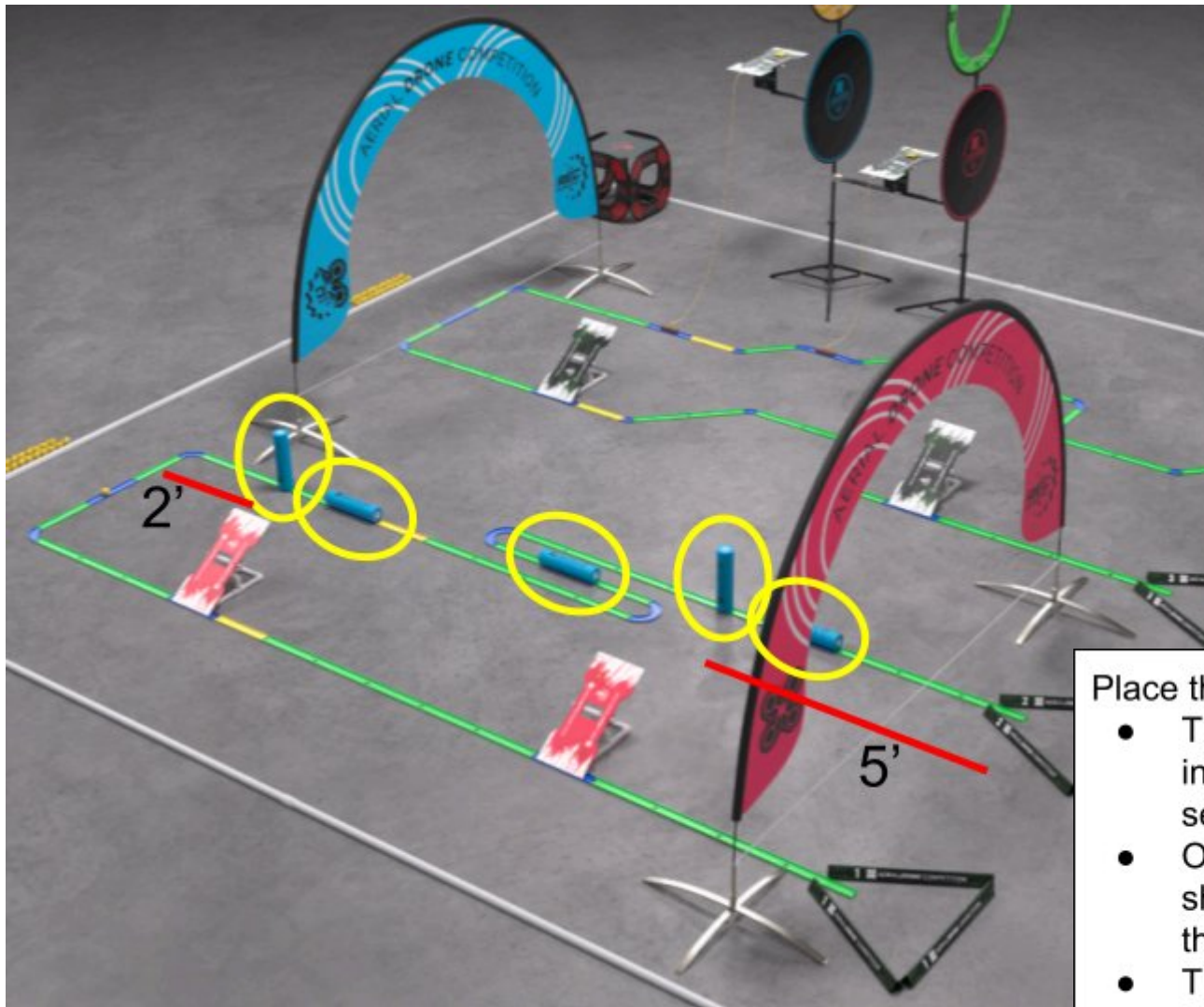
5.3 Alliance Mission Field Setup Step 3: Place the Low Switches



Place the low switches at the blue track segments.

- Place the red low switches on track 1.
- Place the black low switches on track 3.
- Ensure the RECF logos on the switches are oriented correctly when the switches are installed on the track.

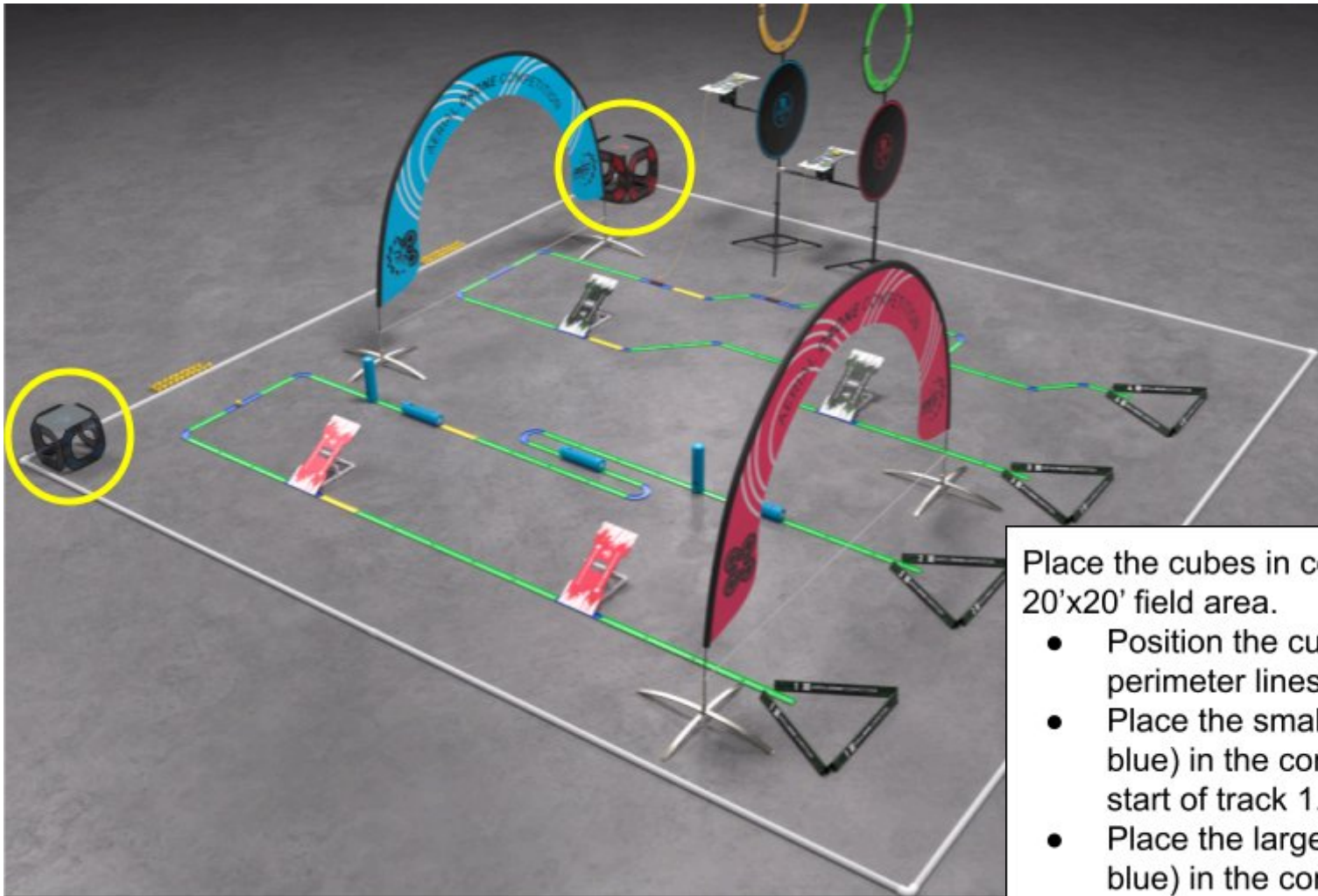
5.4 Alliance Mission Field Setup Step 4: Place the Pillars



Place the pillars on track 2.

- The horizontal pillars (without inserts) rest on blue track segments.
- One vertical pillar (with insert) should stand on the track at the 2' mark.
- The other vertical pillar (with insert) should stand on the track at a point 5' from the end of the track.

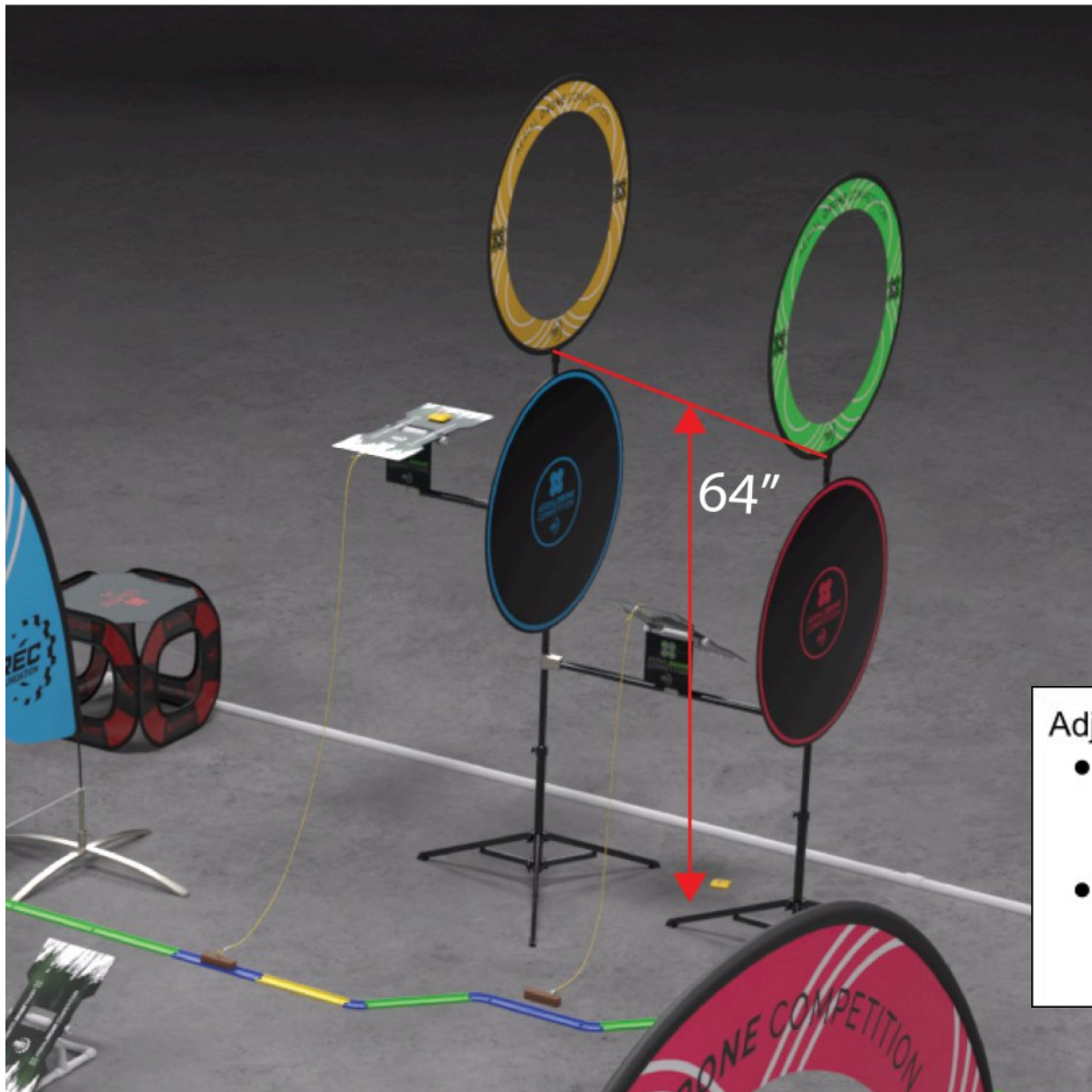
5.5 Alliance Mission Field Setup Step 5: Place Cubes



Place the cubes in corners of the 20'x20' field area.

- Position the cubes 3" from the perimeter lines.
- Place the small cube (red or blue) in the corner near the start of track 1.
- Place the large cube (red or blue) in the corner near the start of track 4.

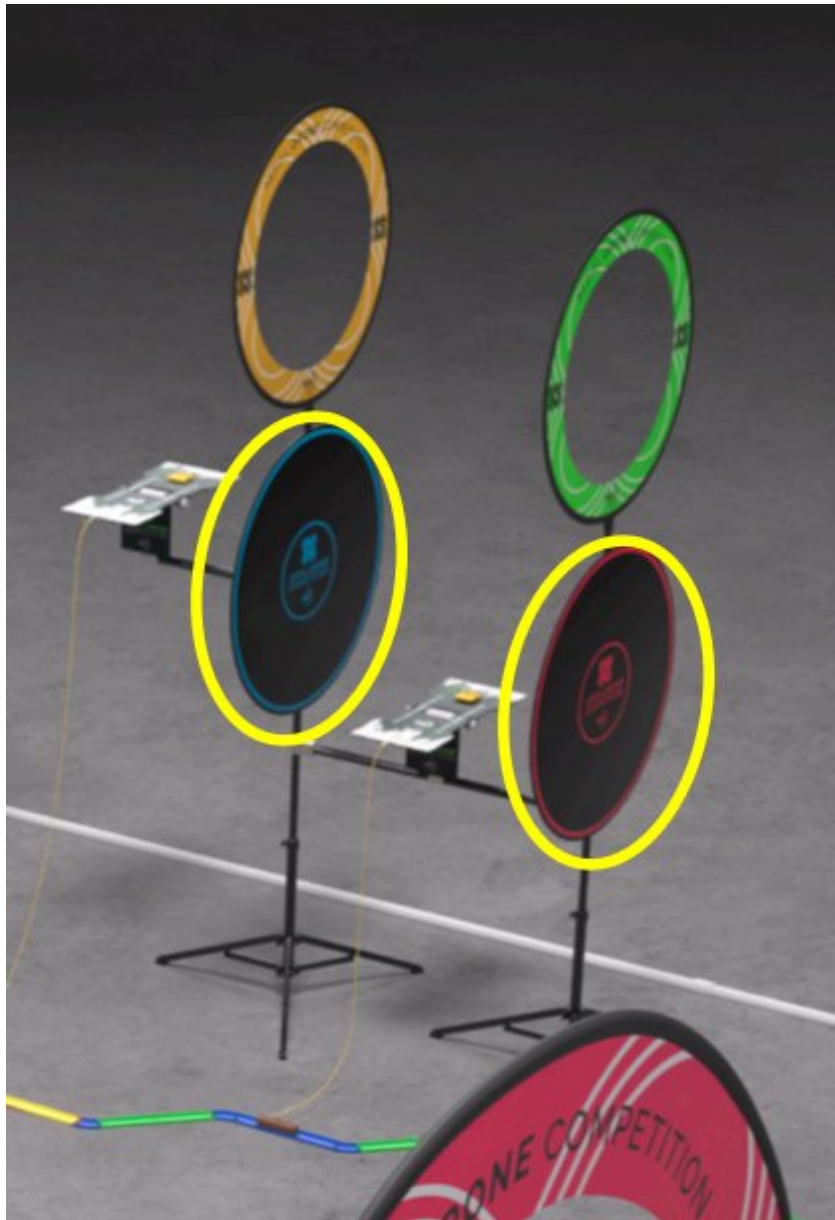
5.6 Alliance Mission Field Setup Step 6: Complete the High Switch Assembly



Adjust heights, switches, and wires.

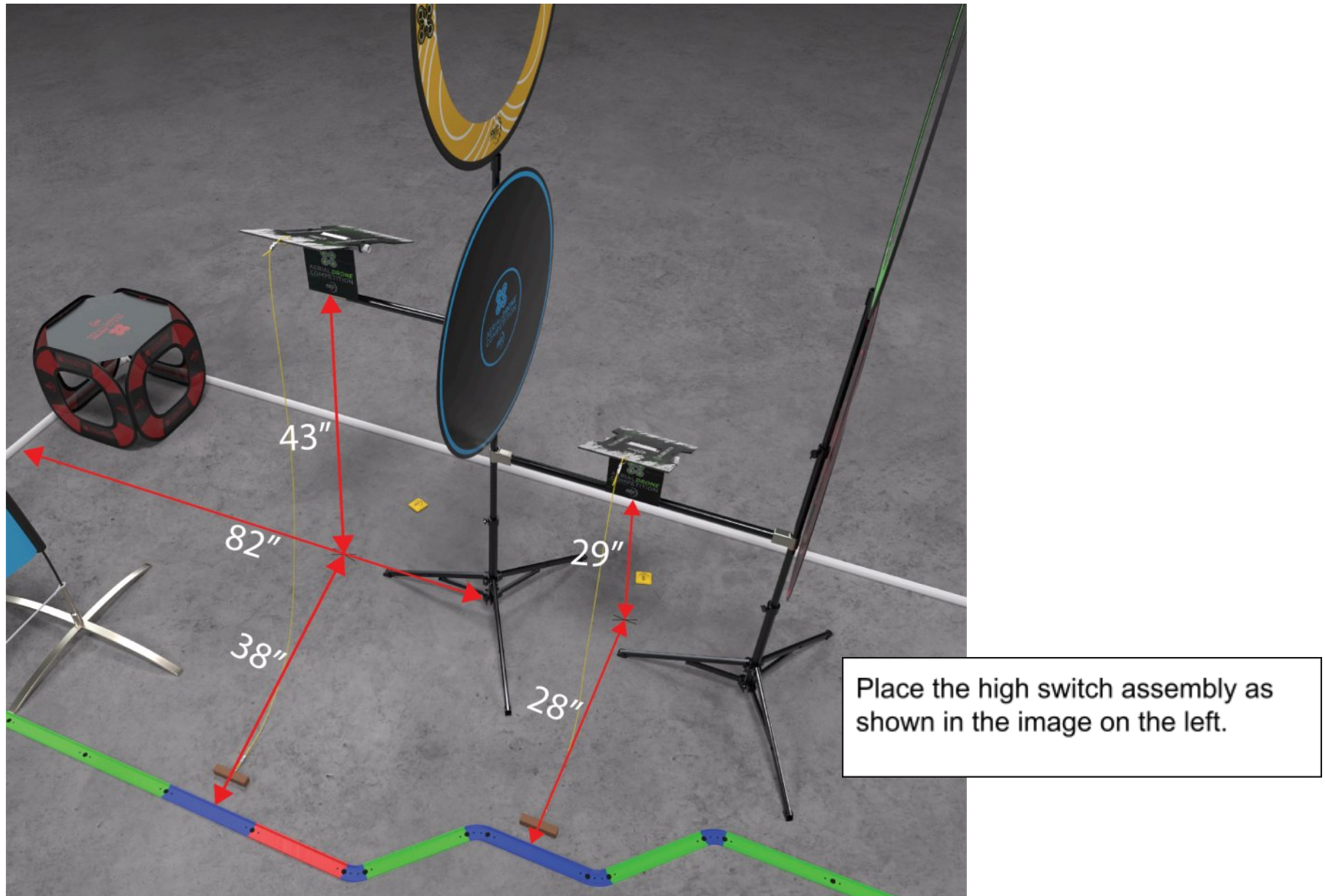
- Adjust keyhole gates so the bottom edge is 64" inches from the floor.
- Adjust the high switches and wires as needed (see sections 3.6 & 3.7).

5.7 Alliance Mission Field Setup Step 7: Attach Landing Pads



- Use zip ties to attach landing pads.
- Run a zip tie through the loop of a landing pad above the bracket that holds a keyhole gate, and tighten.
 - The top of the landing pad should be 1-2" below the bottom of the keyhole gate.

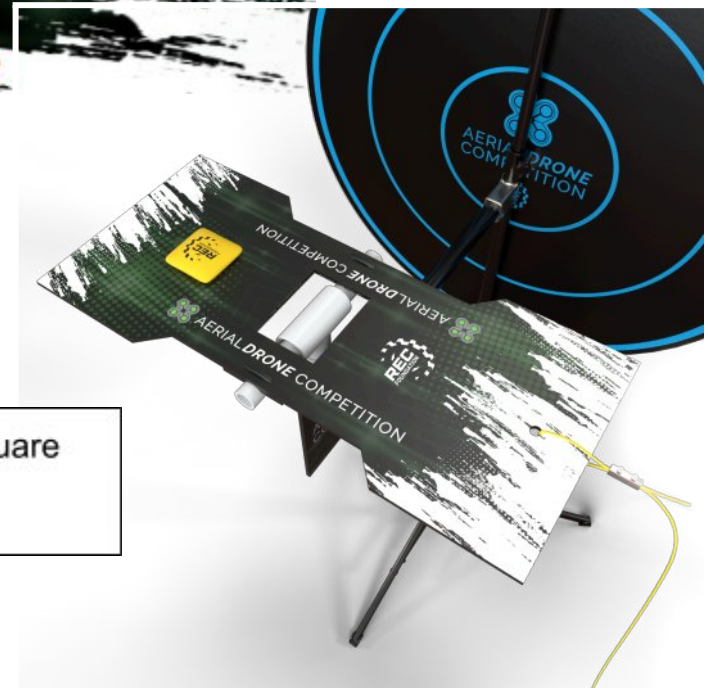
5.8 Alliance Mission Field Setup Step 8: Place the High Switch Assembly



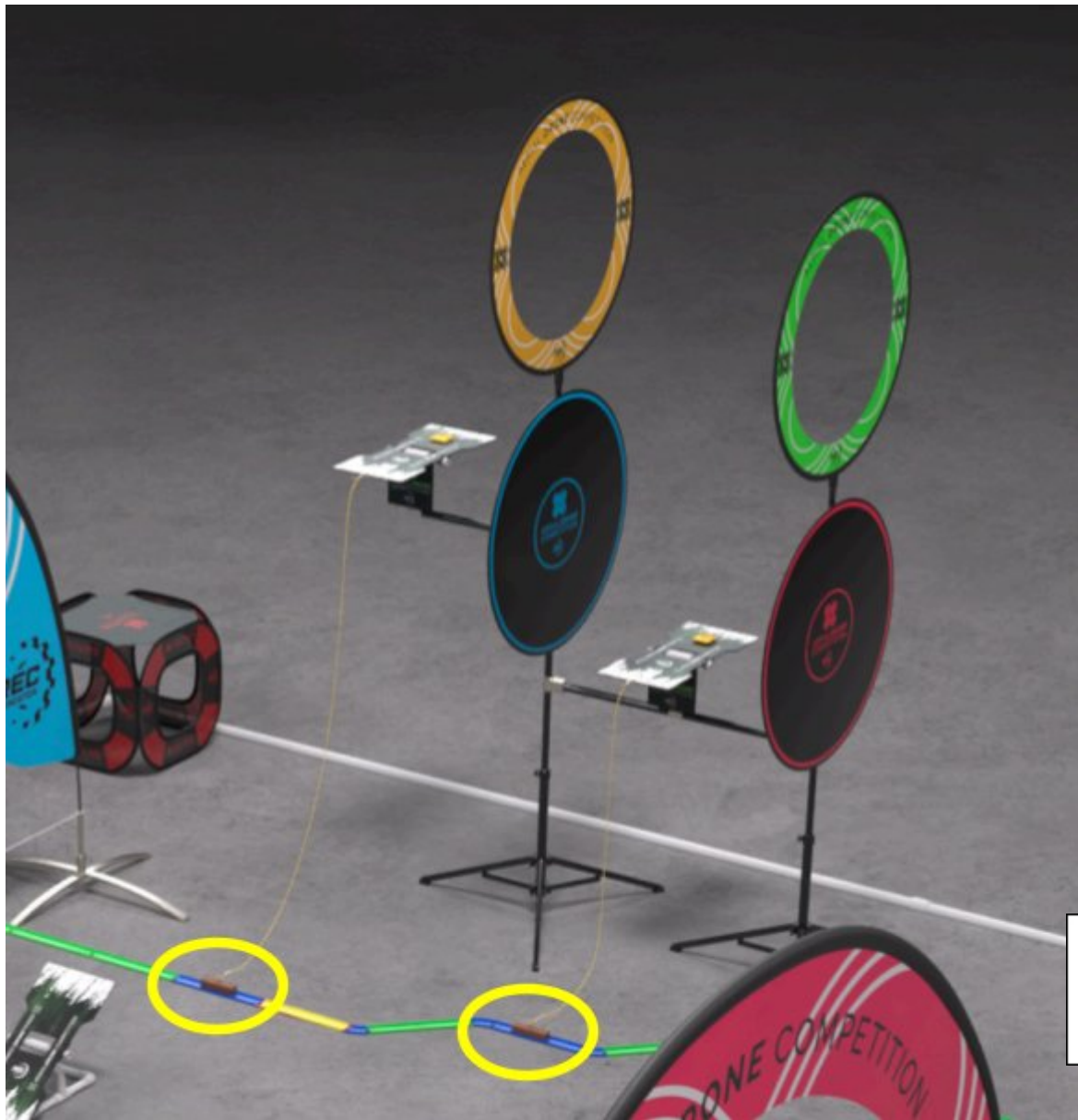
5.9 Alliance Mission Field Setup Step 9: Place a Bean Bag on each High Switch



Place a bean bag on the green square marked on the high switch plate.

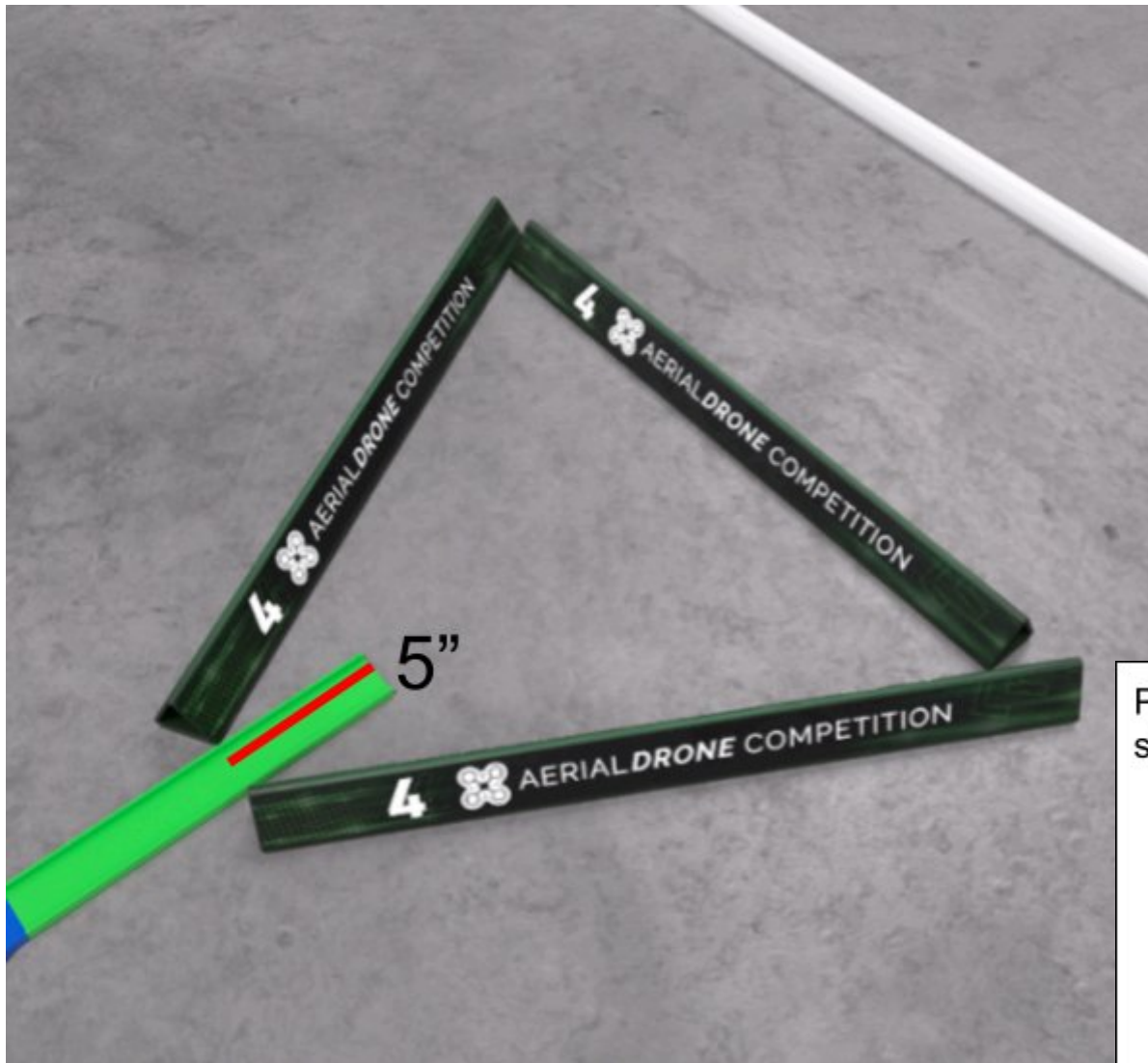


5.10 Alliance Mission Field Setup Step 10: Place the Blocks on Track 4



Place a block in the center of each blue segment of track 4.

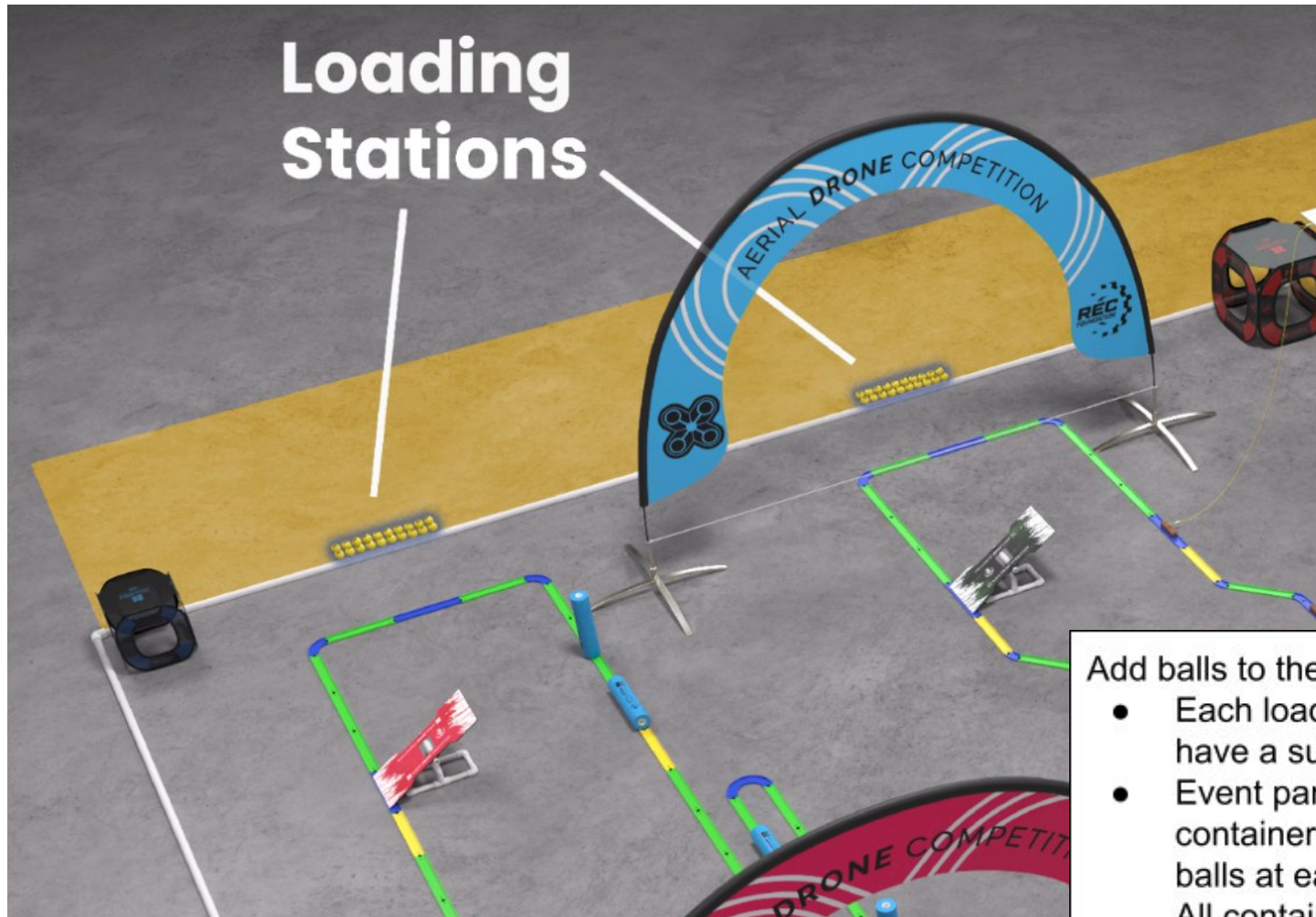
5.11 Alliance Mission Field Setup Step 11: Place the Goals



Position three goal segments as shown at the end of each track.

- The track should extend approximately 5" into the goal.
- The track segments and goal are not attached to each other, and simply create an enclosed space for scored balls in a way that allows for easy setup and storage.

5.12 Alliance Mission Field Setup Step 12: Add Balls to the Loading Stations



Add balls to the loading stations.

- Each loading station should have a supply of 20 balls.
- Event partners may provide containers to hold the supply of balls at each loading station. All containers used at an event must be identical in size and shape across all loading stations at that event.