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Technologies

2021-2022 *FIRST*[®] Tech Challenge

Remote Field Requirements

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Revision History		
Revision	Date	Description
1	9/18/2021	Initial Release

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Introduction

What is FIRST® Tech Challenge?

FIRST® Tech Challenge is a student-centered program that focuses on giving students a unique and stimulating experience. Each year, teams engage in a new game where they design, build, test, and program autonomous and driver operated robots that must perform a series of tasks. To learn more about FIRST® Tech Challenge and other FIRST® Programs, visit www.firstinspires.org.

Gracious Professionalism®

FIRST® uses this term to describe our programs' intent.

Gracious Professionalism® is a way of doing things that encourages high-quality work, emphasizes the value of others, and respects individuals and the community.

Watch Dr. Woodie Flowers explain *Gracious Professionalism* in this [short video](#).

How to Use This Document

Teams competing remotely in the FREIGHT FRENZYSM presented by Raytheon Technologies season must follow the field requirements outlined in this manual. Teams are allowed some flexibility in how their field is set up based on the resources they have access to. This guide outlines the allowable options for remote field setup.

The “Field Description” section of this document lists all of the game and scoring elements used in the remote game. Using all of these elements enables a team to participate in all scoring aspects of FREIGHT FRENZYSM.

The “Remote Gameplay Minimum Requirements” section walks through the bare minimum requirements to participate in the season remotely. The minimum requirements do not include every game element, and therefore there are some activities that teams cannot participate in using the absolute minimum requirements. For example, the Carousel is not part of the minimum requirements, therefore a team who does not purchase the Carousel, or build the Do-It-Yourself (DIY) version, cannot earn Delivery points as part of gameplay.

Questions about the requirements should be referred to the Remote Game forum. Teams that need access to the forum must email firsttechchallenge@firstinspires.org.

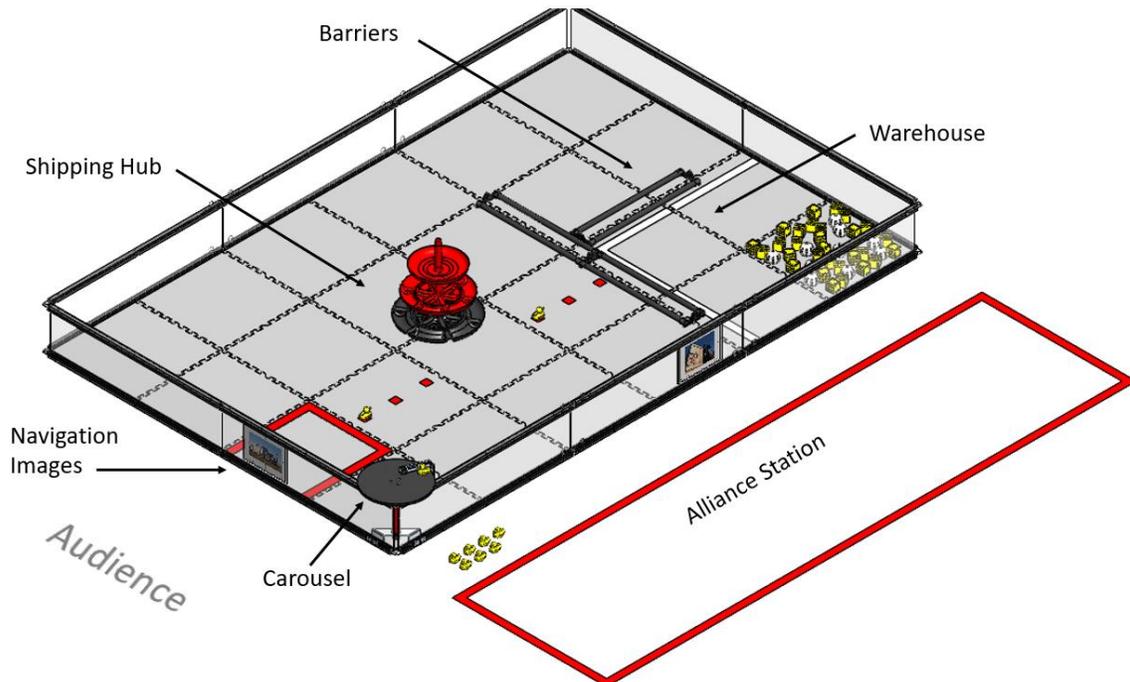
Field Description

Overview

The Remote Competition field for Freight FrenzySM presented by Raytheon Technologies consists of the following elements:

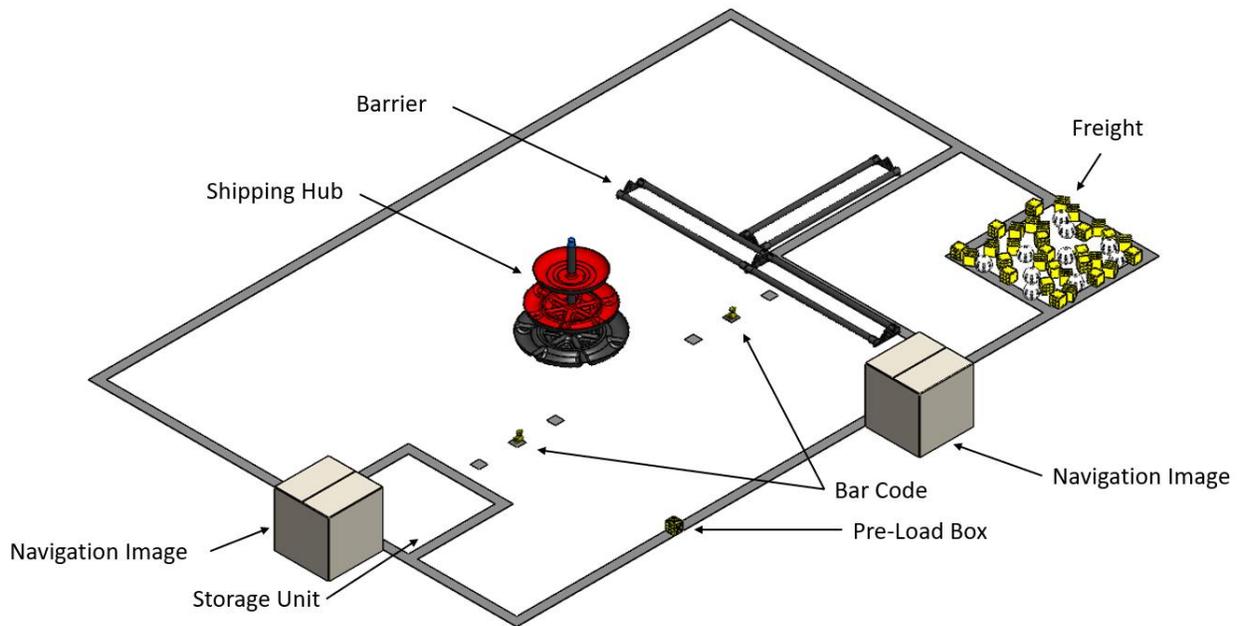
1. Scoring Elements
 - a. Freight
 - i. Cargo
 - ii. Box
 - iii. Duck
 - b. Team Scoring Element (DIY only)
2. Playing Field Surface
3. Playing Field Boundary
4. Taped Areas
 - a. Alliance Station
 - b. Bar Codes
 - c. Storage Unit
 - d. Warehouse
5. Field Elements
 - a. Barriers
 - b. Alliance Shipping Hub
 - c. Carousel
 - d. Navigation Images

Playing Field Overview



The above figure shows all of the purchased game and scoring elements, floor tiles, and the AndyMark field perimeter.

Remote Gameplay Minimum Requirements



The above figure shows the minimum required elements to complete in FREIGHT FRENZYSM.

Minimum Purchase

- 1 Alliance Shipping Hub (red OR blue)
- Boxes*
 - 15 Light
 - 10 Medium
 - 5 Heavy
- 10 Cargo**
- 8 Ducks
- Barrier (purchased or DIY option)

The Remote Game Kit can be purchased through AndyMark®: www.andymark.com/FTC

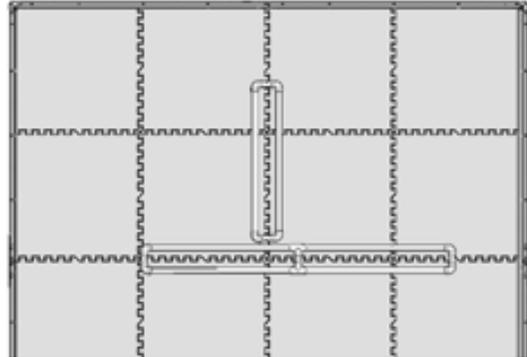
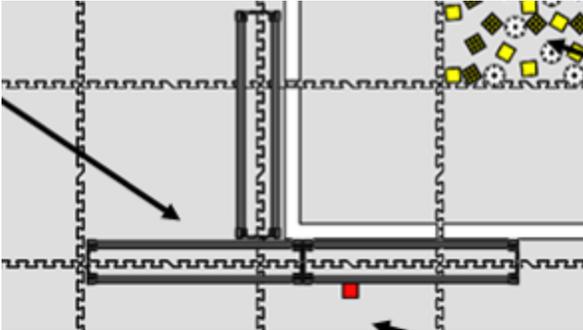
*Teams who have Box (block) elements from previous seasons (Block Party, FIRST RES-Q, Rover Ruckus) do not need to purchase new blocks, however, they need to purchase weights from AndyMark to retrofit the Box (block) for this season's game. It is recommended to clean the marks off of the blocks from previous seasons with an alcohol-based cleanser.

**Teams who have Cargo (2.75 inch plastic ball) from previous seasons games (Cascade Effect, FIRST RES-Q, Rover Ruckus) do not need to purchase new balls. It is recommended to clean the marks off of the balls from previous seasons with an alcohol-based cleanser.

Reminder: The Carousel is not part of the minimum requirements, therefore a team who does not purchase the Carousel, or build the DIY version, cannot earn Delivery points as part of gameplay.

Additional Purchase/DIY Option

Teams are required to use Barriers as part of the remote game. Barriers can be purchased through AndyMark or built as a DIY option using the instructions in this guide.



Field Boundary Requirements – Taped Boundary

The minimum requirement is to have a taped boundary to define the Playing Field area. This option involves defining the field boundary by using tape to mark off the 141" x 94" (3.58 m x 2.39 m) space. The tape should be placed such that the outer edge of the tape defines the playing field area. See Appendix B for taping instructions.

2" wide Gaffers tape is recommended, but any type or color of tape is acceptable. Below are examples of tape that can be used.

- Gaffers Tape: <https://www.findtape.com/gaffer-tape?tref=hp>
- Stucco Tape: <https://www.findtape.com/Shurtape-PE-444-Stucco-Masking-Film-Tape/p372/?idx=1&tid=2&info=stucco>
- Masking Tape: <https://www.findtape.com/Shurtape-CP-106-Economy-Grade-Masking-Tape/p364/?idx=2&tid=2&info=masking%2520tape>

When selecting a type of tape, pay attention to the floor it will be placed on to ensure the floor surface is not damaged by the tape.

Because FREIGHT FRENZYSM involves Cargo (2 1/2" ball) and Boxes (2 inch block), there is a likelihood that Cargo may roll out of a taped boundary, while Boxes may be pushed outside of the boundary during normal robot play. Having a perimeter around the playing field boundary will help teams to keep the elements within the playing field boundaries. Such a perimeter can be as simple as PVC tubing or lumber laid alongside the tape boundaries.

Scoring Zone Requirements

The Storage Unit, Auto Targets, and Warehouse are taped off areas within the Field Boundary. For remote teams that are not using soft tiles must also tape a boundary where the Freight will be placed during pre-match setup. 2" wide Gaffers tape is recommended but any type and color of tape is acceptable. Please see Appendix B for the Scoring Zone tape guide.

Barricade

Barricades are required outside of the Playing Field Boundary at two of the three Barrier segments. Part of the challenge of FREIGHT FRENZY is to navigate either over the Barrier, or through the approximate 13.5” gap between the Playing Field Boundary and the Barriers. Teams can be creative when deciding what to use for a barricade, from cardboard boxes, to crates, or other items found in your home or robotics lab.



Playing Field Surface

The playing field surface is the area within the field boundary where the robots will be driving and competing. Teams have the option of playing on any surface type available such as carpet, cement, etc. If teams competing remotely switch to traditional events during the season, they must plan for a difference in how the robot drives/performs as soft tiles are used in the traditional event format.

Teams may opt to purchase soft tiles, which are used in traditional events. They can be purchased directly through www.softtiles.com or through [AndyMark](http://AndyMark.com).

Field Boundary

FREIGHT FRENZYSM remote version is played on an approximately 12 ft x 8 ft (3.65m x 2.44m) field. The Boundary of the Field can be defined in one of three ways, official perimeter walls, DIY perimeter walls, or a simple tape outline. Any of these options are acceptable for official gameplay.

1. Option 1 – Official AndyMark or IFI Field Perimeter.

Freight Frenzy – Remote uses a subset of a standard *FIRST* Tech Challenge perimeter, two panels from the standard 12 ft x 12 ft field are not used.

- AndyMark Field Perimeter: <https://www.andymark.com/products/first-tech-challenge-perimeter-kit>
IFI Field Perimeter: <https://www.vexrobotics.com/278-1501.html>

2. Option 2 – DIY Field Perimeter

This is a lower cost alternative to the commercially available perimeter walls. *FIRST* has made DIY guides available to build the perimeter walls with recommendations on where to purchase materials. Teams can use this guide or opt to build their own DIY walls.

- DIY Build Guide: <https://www.firstinspires.org/resource-library/ftc/game-and-season-info>

3. Option 3 – Taped Boundary

The minimum requirement is to have a taped boundary to define the Playing Field area. This option involves defining the field boundary by using tape to mark off the 141" x 94" (3.58 m x 2.39 m) space. The tape should be placed such that the outer edge of the tape defines the playing field area. See the Scoring Zone Requirements section for taping instructions.

Navigation Images

Field built with Blue
Alliance components



Image 1
Blue Alliance Wall

Field built with red
Alliance components



Image 4
Red Alliance Wall



Image 2
Audience Wall
Blue Side



Image 3
Audience Wall
Red Side

Image 1- The center of the image is on the *Playing Field Wall* closest to the blue *Alliance Station* and is aligned to the center of the fourth tile in from the *Playing Field Wall* closest to the audience.

Image 2 - The center of the image is on the *Playing Field Wall* closest to the *Audience* and is aligned to the center of the second tile in from the blue *Alliance Station*.

Image 3 - The center of the image is on the *Playing Field Wall* closest to the *Audience* and is aligned to the center of the second tile in from the red *Alliance Station*.

Image 4 - The center of the image is on the *Playing Field Wall* closest to the red *Alliance Station* and is aligned to the center of the fourth tile in from the *Playing Field Wall* closest to the audience.

Do not print the images from this manual for practice purposes, as they are not to the same scale as Teams will see in actual competition. Please refer to the [website](#) for printable versions of these images.

Field Requirements Chart

This chart is a quick visual aid to help teams understand what is needed to complete remotely.

Item	AndyMark Only	AndyMark or DIY	DIY Only	Required/Optional
Box and Weights	X			Required
Cargo	X			Required
Duck	X			Required
Alliance Shipping Hub	X			Required
Barrier		X		Required
Tape		X		Required
Border		X		Required
Team Shipping Element			X	Optional
Carousel		X		Optional
Navigation Targets			X	Optional
Barricade*			X	Required

*Only required if team is using a taped boundary. Teams that use official field perimeter walls or the DIY Field perimeter are not required to use barricades.

FIRST Tech Challenge Remote Scoring System

Teams will be responsible for scoring their own matches during a remote event. Teams can score their matches electronically or using paper scoring sheets:

- Option 1 – Use the cloud-based FTC scoring system to score a team’s matches
 - Requires a stable, reliable Internet connection
 - Requires a device (smartphone, tablet, Chromebook, laptop, or desktop computer) to enter scores during the match
 - Must be connected to Internet
 - Must have a web browser
 - Can be used to play match audio cues
 - Team can optionally have a second device to act as a field/team display during the match
 - Must be connected to Internet
 - Must have a web browser
 - Can be used to play match audio cues
- Option 2 – Use paper scoresheets to score a team’s matches
 - Scoresheets can be downloaded from <https://www.firstinspires.org/resource-library/ftc/game-and-season-info>. After a match is complete, a team’s score must eventually be entered into the FTC scoring system
 - A program delivery partner, event admin, or team admin who has Internet access can be designated to enter in the score for the team
 - Scores must be entered before the close of the remote event’s submission window

For detailed information, please refer to the FTC Live Cloud Scoring Guide, which is available from the [game and season page](#).

Appendix A – Resources

Game Forum Q&A

<https://ftc-qa.firstinspires.org/>

Anyone may view questions and answers within the *FIRST*® Tech Challenge game Q&A forum without a password. To submit a new question, you must have a unique Q&A system user name and password for your team.

Volunteer Forum

Volunteers can request access to role specific volunteer forums by emailing FTCTrainingSupport@firstinspires.org. You will receive access to the forum thread specific to your role.

FIRST Tech Challenge Game Manuals

Part 1 and 2 - <https://www.firstinspires.org/resource-library/ftc/game-and-season-info>

FIRST Headquarters Pre-Event Support

Phone: 603-666-3906

Mon – Fri

8:30am – 5:00pm

Email: Firsttechchallenge@firstinspires.org

FIRST Websites

FIRST homepage – www.firstinspires.org

[FIRST Tech Challenge Page](#) – For everything *FIRST* Tech Challenge.

[FIRST Tech Challenge Volunteer Resources](#) – To access public volunteer manuals.

[FIRST Tech Challenge Event Schedule](#) – Find *FIRST* Tech Challenge events in your area.

FIRST Tech Challenge Social Media

[FIRST Tech Challenge Twitter Feed](#) - If you are on Twitter, follow the *FIRST* Tech Challenge Twitter feed for news updates.

[FIRST Tech Challenge Facebook page](#) - If you are on Facebook, follow the *FIRST* Tech Challenge page for news updates.

[FIRST Tech Challenge YouTube Channel](#) – Contains training videos, game animations, news clips, and more.

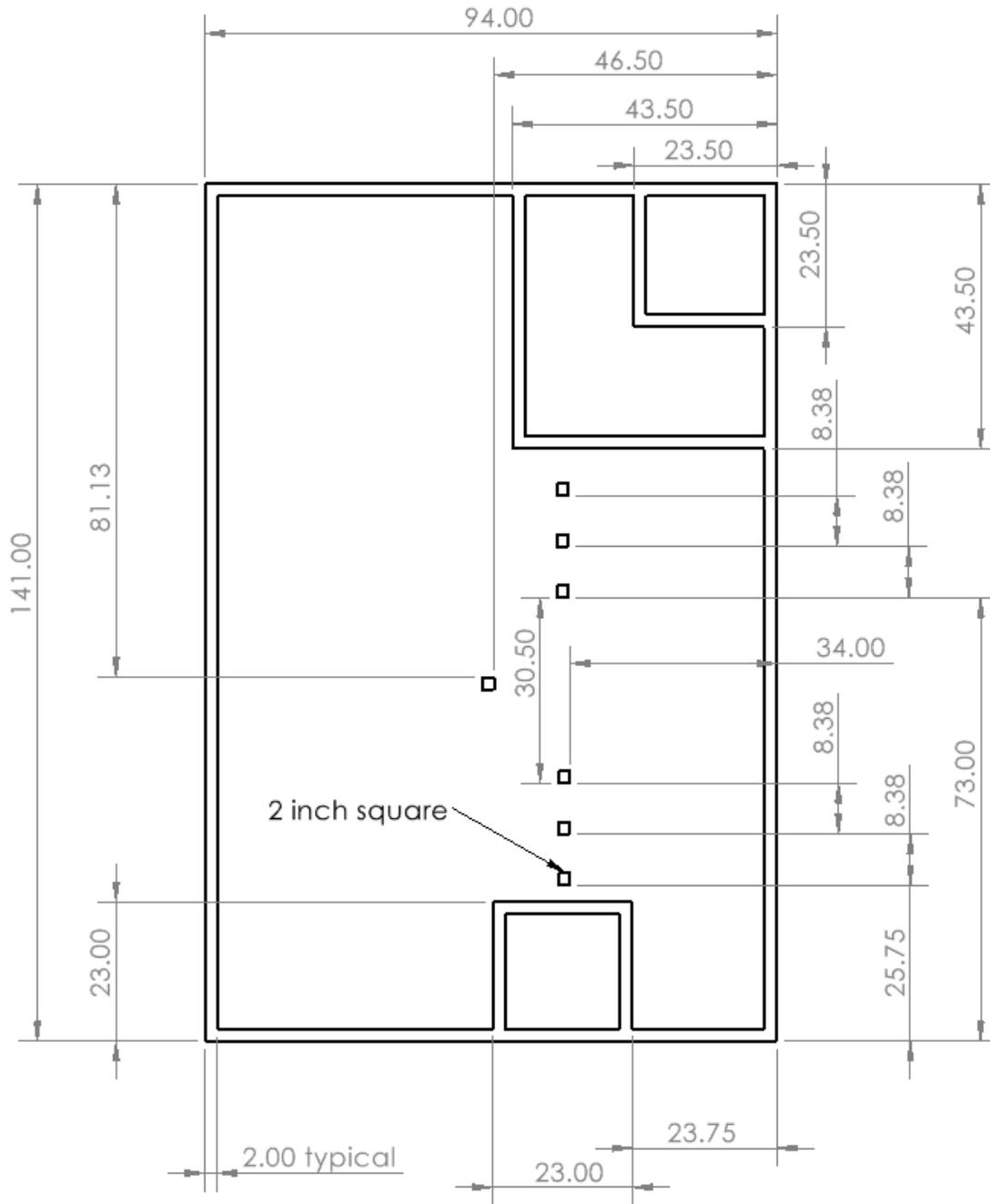
[FIRST Tech Challenge Blog](#) – Weekly articles for the *FIRST* Tech Challenge community, including outstanding volunteer recognition!

[FIRST Tech Challenge Team Email Blasts](#) – contain the most recent *FIRST* Tech Challenge news for teams.

Feedback

We strive to create support materials that are the best they can be. If you have feedback about this manual, please email firsttechchallenge@firstinspires.org. Thank you!

Appendix B – Field Boundary and Scoring Zone Measurements



Appendix C – Barrier Installation

AndyMark Official Barriers

The following instructions are for teams who are using the barriers purchased directly from AndyMark and not using soft tiles. These instructions show how to set up and secure barriers to the floor. The barriers should be already built using the instructions in the [Field Assembly Guide](#).

Step 1:

Route a zip tie through the holes in the under tile plate. The remote field will require 5 under tile plates.



Step 2:

Measure the distance of the horizontal barrier to the inside edge of the field tape border. There should be a gap of 13.68 inches.



Step 3:

Carefully slide the under tile plate under the bracket of the barrier. DO NOT tighten zip tie yet, this will be the last step.

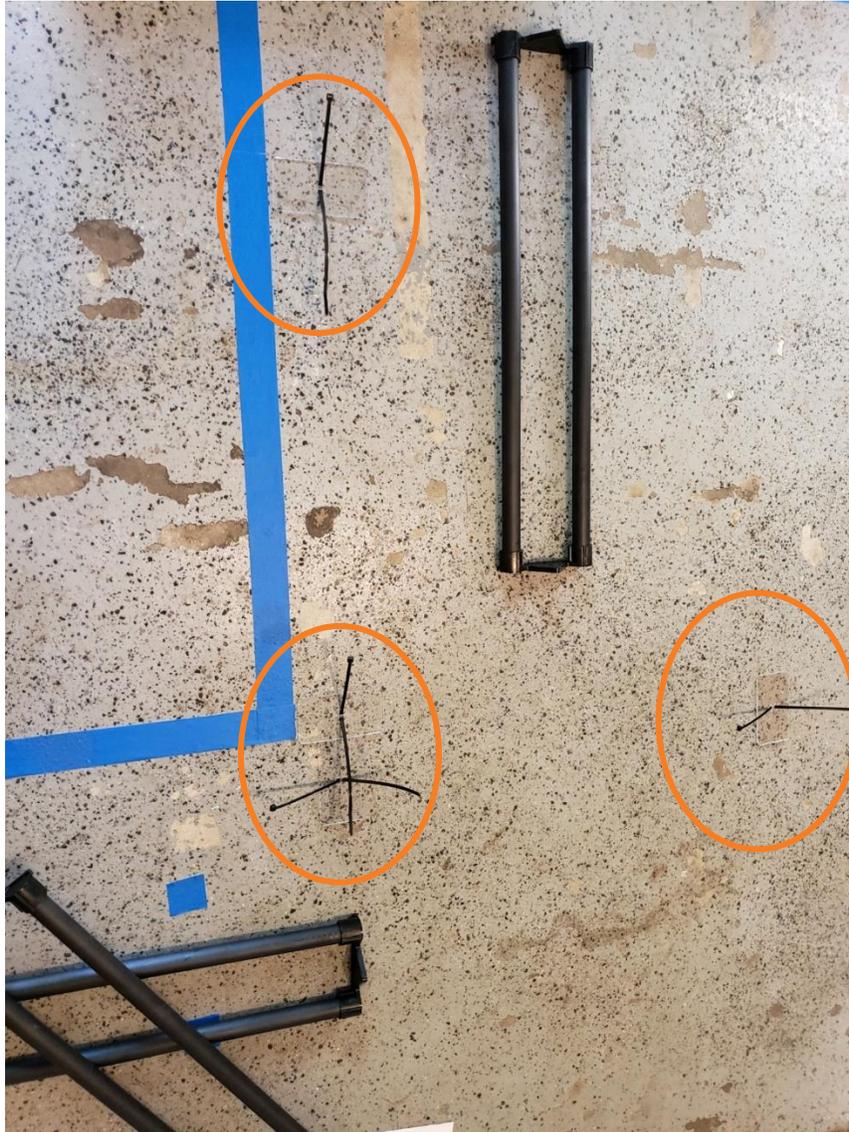
**Step 4:**

Line up the remaining barriers and slide the under tile plates under each bracket. The two adjoining barriers only require a single under tile plate. Once again, DO NOT tighten the zip ties.



Step 5:

Carefully lift the barriers without moving the under tile plate locations. Note that the under tile plate closest to the field barrier is not shown in this image.



Step 6:

Tape the under tile plates to the floor, being careful not to move the placement.

**Step 7:**

Place the barriers back over the taped under tile plates. Thread the zip ties through

