

Section
3

THE ARENA

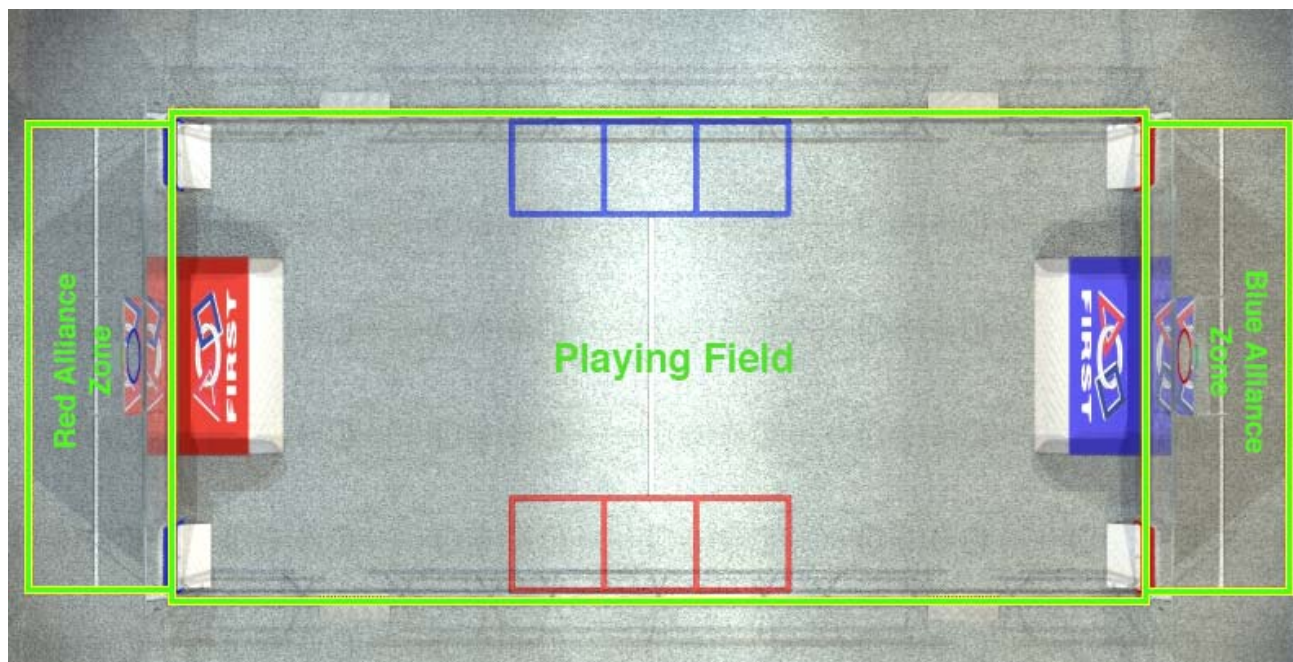


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3 THE ARENA

3.1 OVERVIEW



Note: The illustrations in this section of the manual are for a general visual understanding of the field only. Teams should refer to the drawings for exact dimensions and field construction.

The Playing Field is a rectangular area in which the Robots compete. The Red and Blue Alliance Stations are rectangular areas, each consisting of three team stations, which are located outside of the ends of the Playing Field. The three teams that make up each Alliance play the game from these stations.

The specifications below are for the FIRST playing fields used in competition. These fields are welded aluminum, which are built to withstand rigorous play and damage from frequent shipping. Specifications and drawings for low cost versions of the field components are available on the FIRST website at http://www.usfirst.org/robotics/doc_updt.htm. Refer to “Team Drawings” in Section 3 of the 2006 First Robotics Competition Document.

3.1.1 Dimensions and Tolerances

All official dimensions are on the following drawings:

FRC DRAWINGS			
TITLE LINE 1	TITLE LINE 2	DWG NO.	SHEET/S
2006 FIELD	LAYOUT AND MARKING	6F-001	1 SHEET
DRIVERS STA. PANEL	FABRICATION	F05-0001	1 SHEET
DRIVERS STA. PANEL	ASSEMBLY	F05-0002	1 SHEET
DRIVERS STA. SUPPORT	FABRICATION	F05-0003	1 SHEET
DRIVERS STA. SUPPORT	ASSEMBLY	F05-0004	1 SHEET
CORNER SUPPORT	FABRICATION	F05-0005	1 SHEET
CORNER SUPPORT	ASSEMBLY	F05-0006	1 SHEET
FIELD, RAIL	FABRICATION & ASSEMBLY	F05-0007	1 SHEET

TITLE LINE 1	TITLE LINE 2	DWG NO.	SHEET/S
FIELD, RAIL / GATE	FABRICATION & ASSEMBLY	F05-0008	1 SHEET
FIELD, LEFT END RAIL	FABRICATION & ASSEMBLY	F05-0009	1 SHEET
FIELD, RIGHT END RAIL	FABRICATION & ASSEMBLY	F05-0010	1 SHEET
FIELD, TOP RAIL	FABRICATION & ASSEMBLY	F05-0011	1 SHEET
FIELD BORDER PANELS	FABRICATION & ASSEMBLY	F05-0012	1 SHEET
OUTRIGGER	FABRICATION & ASSEMBLY	F05-0013	1 SHEET
FIELD SUPPORT WEIGHT	FABRICATION & ASSEMBLY	F05-0014	1 SHEET
HINGE INSERT	FABRICATION	F05-0015	1 SHEET
2006 VISION TARGET	FABRICATION & ASSEMBLY	2F-202	2 SHEETS
2006 CORNER GOAL	FABRICATION & ASSEMBLY	2F-100	3 SHEETS
2006 PLATFORM	FABRICATION & ASSEMBLY	2F-401	1 SHEETS
2006 CENTER GOAL	FABRICATION & ASSEMBLY	2F-500	4 SHEETS

TEAM FIELD ELEMENT DRAWINGSS			
TITLE LINE 1	TITLE LINE 2	DWG NO.	SHEET/S
2006 TFE CENTER GOAL	FABRICATION & ASSEMBLY	2F-T500	3 SHEETS
2006 TFE VISION TARGET	FABRICATION & ASSEMBLY	2F-T202	1 SHEETS
2006 TFE CORNER GOAL	FABRICATION & ASSEMBLY	2F-T100	3 SHEETS
2006 TFE PLATFORM	FABRICATION & ASSEMBLY	2F-T401	3 SHEETS

Where surfaces are indicated as flush, expect variations as much as 1/4 inch. This is not considered abnormal and is part of the game challenge. The reasons for these variations are numerous; different arenas are manufactured at different sites, set up by different volunteers, and undergo different temperature extremes. Volunteers and FIRST staff at each competition site will do their best to make the Arena and its elements as close to nominal as reasonably possible.

3.2 PLAYING FIELD

Note: The official Playing Field description, layout, dimensions and parts list are contained in the “2006 Arena Layout and Marking” Drawing. Diagrams and dimensions below are for illustrative purposes only.

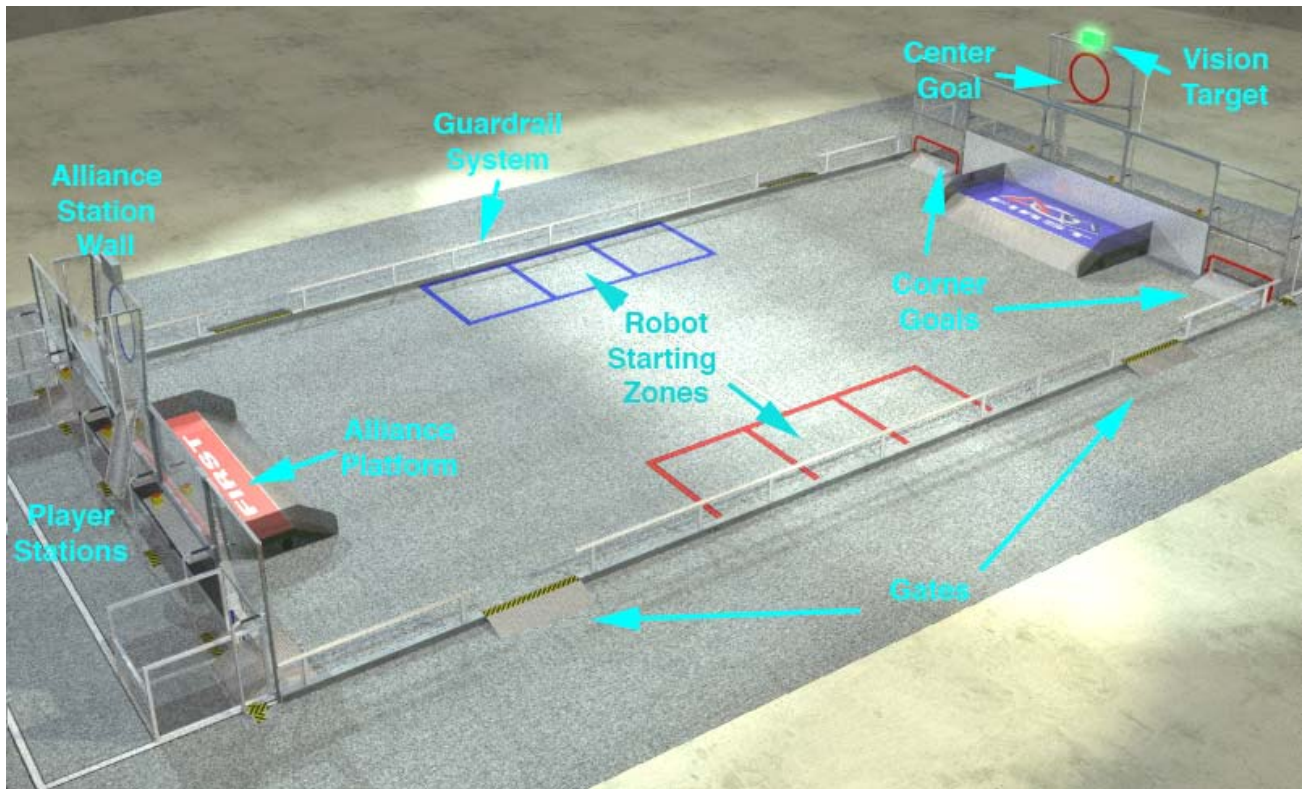
3.2.1 Boundaries and Markings

The carpeted Playing Field is 54 feet by 26 feet, bounded by two Alliance Station Walls and a Guardrail System.

The Alliance Station Wall is 6-1/2 feet high. The entire Alliance Station Wall is 26 feet wide, centered on the ends of the field. The center 18 feet of the wall is composed of a 3-foot high base of diamond plate aluminum topped with a 3-1/2-foot high transparent acrylic panel. The outer four-foot section of either end of the Alliance Station Wall is made of transparent polycarbonate from floor to top.

The Guardrail System is a 20-inch high horizontal pipe with vertical supports mounted on a 3” aluminum angle. A shield is attached on the field side of the Guardrail system, extending from the floor to the top of the guardrail, and running the length of the guardrail. The Guardrail System defines the borders of the Playing Field except where it is bounded by the Alliance Station Wall.

Four gates in the Guardrail System allow easy access to the Playing Field for placement and removal of robots. The gates are four feet wide and are located in each quadrant of the field. The gates are closed during game play.



At each side of the Playing Field, two-inch wide lines of gaffers tape define three five-by-five foot areas. These areas are the Robot Starting Zones. The tape is colored red or blue, to indicate which alliance should use the Robot Starting zone. The tape is not part of the Robot Starting zone. There is a 2" white line across the center of the field between the robot starting zones.

Scoring platforms are located at each end of the Playing Field. The scoring platform is colored red or blue, to correspond to the alliance located at the same end of the field.

3.2.2 Corner Goals

The Corner Goals are openings at the outer corners of the Alliance Station Wall through which the scoring objects (balls) may pass from the field into the Ball Corrals. The openings are 44 inches wide by 10 inches tall, and outlined with a 2-inch wide border of red or blue acrylic. The bottom of the opening is approximately 6-1/2 inches above the floor. A 24-inch long ramp leads up from the floor level to the bottom of the opening. The ramp permits easy entry of the scoring objects into the opening, while preventing them from rolling back out through the opening once they have passed through.



3.2.3 Center Goal

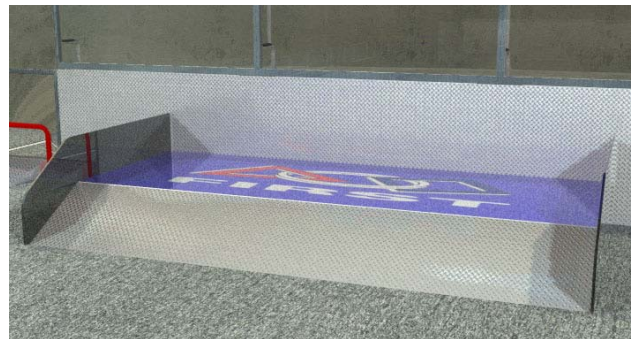
The Center Goal is located above each Alliance Station. The center six-foot section of each Alliance Station Wall extends to approximately 10-1/2 feet above the floor. A 30-inch diameter opening is located in the extended portion of the wall, centered at 8 feet, 6 inches above the floor. The opening is outlined by a 4-inch wide border of red or blue acrylic. The opening is backed by a rope mesh and suspended chains to absorb the impact of any scoring objects going through the opening. Scoring objects passing through the opening will be deflected downward by the mesh, and will exit the Center Goal by dropping into a collection tube at the bottom of the goal. There, they can be retrieved by the Human Players.



A vision system target is located immediately above the Center Goal. This target is an illuminated panel measuring 8 by 16 inches that is back-lit by a series of cold cathode tubes mounted in an aluminum enclosure. The vision system target will be illuminated when the Center Goal is “active” and available for scoring.

3.2.4 Alliance Platform

An Alliance Platform is located at each end of the field adjacent to the Alliance Station Wall. The horizontal surface of the platform is 12 inches above the field, 48 inches deep, and 11 feet wide. The surface of the platform is covered by clear polycarbonate. An aluminum diamond-plate ramp leads up from floor level to the top of the platform at a 30-degree angle. 24-inch tall walls made of 1/2 inch polycarbonate form the ends of the platform to prevent robots from falling off the platform.



3.3 SCORING OBJECTS

The Scoring Objects are 7-inch diameter self-skinning foam balls. They are “7-inch Foam Basketballs” made by Poof-Slinky, Inc. Each alliance will have forty balls at the start of each match.

3.4 ALLIANCE ZONES



Each Alliance Zone is 8' x 26', with three identical player stations. All Human Players stand behind the Alliance Station Wall, where they can move between the Center Goal and Side Goals.

3.4.1 Boundaries and Markings

Each Alliance Zone shares the Alliance Station Wall with the Playing Field and has its outer and back edges marked on the carpet with white gaffer tape. The Alliance Zone extends eight feet back from the Alliance Station Wall, and is the width of the field. Four feet from the Alliance Station Wall, the Starting Line is marked on the carpet with a two-inch wide white gaffers tape. The tape boundaries are considered “in” the Alliance Zone.

3.4.2 Ball Returns

A Ball Return is located at the lower edge of each Center Goal, to guide scored balls safely down to the player stations for retrieval by the Human Players. The Ball Return is a section of 9 inch diameter corrugated plastic pipe through which the balls descend from an opening in the bottom of the Center Goal.

3.4.3 Ball Corrals

A Ball Corral is located at the ends of the Alliance Station Wall to restrain any balls that enter through the Corner Goals. The Ball Corral covers a four-by-four foot area. The side walls of the Ball Corral are three feet tall and constructed of square aluminum tube and polycarbonate. The back wall of the Ball Corral is of similar construction, except it is only 20 inches tall to permit easy retrieval of balls from the interior of the corral.

3.4.4 Player Stations

Attached to the Alliance Station Wall are three aluminum shelves to support the alliance robot control systems of the three teams. At each setup location a Competition Cable (to attach to the “Competition Port” of the Operator Interfaces) and a Communication Cable (to attach to the “Radio Port” of the Operator Interface) for each team will be available. These cables will provide power and communications for the team’s Operator Interface will be attached to the alliance station wall. Emergency Stop (E-Stop) buttons for each team are located on the left end of each Player Station shelf.

3.5 DRAWING NOTES

The materials required to construct the “Aim High” playing field are commonly available from multiple sources. In most cases, teams should be able to obtain all the materials required to construct a practice field from local hardware stores, home improvement centers, and/or industrial supply resources. If all materials are not available through your local outlets, some sources for field construction materials are listed below:

- Supplier for the White Gaffer’s Tape for field markings: Go to <http://www.tapemonster.com>
 - Order Shurtape PC-628 2” x 60 yds Red Gaffers Tape for the line that marks the Red Alliance End Zone. It is ~\$8 per roll.
 - Order Shurtape PC-628 2” x 60 yds Blue Gaffers Tape for the line that marks Blue Alliance End Zone. It is ~\$8 per roll.
 - Order Shurtape PC-628 2” x 60 yds White Gaffers Tape for the lines that mark the Team Zones. It is ~\$8 per roll.

- Supplier for plastics & HDPE: Plastic Supply Inc., located in Manchester, NH. Go to <http://www.plasticsupply.com/> or call 800-752-7759 or 603-669-2727 (Fax 603- 668-1691; Email: plasticsupply@conversent.net). Identify yourself as a FIRST team and give them your team number.