
ADAMBOTS
Team 245
FIRST
DIVE
PRESENTED BY
Qualcomm

We need more mentors – especially Mechanical

If you have any mechanical experience, we need you!

Currently only a few active mechanical mentors!

Great opportunity to spend time with your student!

See Rick Drummer to volunteer or learn more

Important Information

- *FIRST* sign up – links coming in next week
- Sign in books – sign in and out each session
- Sub-Teams schedules
- Project management
- Safety
- Robotics Collaboration Meetings - Saturday at 10 AM
- Spotlight on Alumni Success
- Fun activities (Bowling, Talent Show, Road Rally, Board Game Night, etc.)
- Team meetings after school
    - Team updates
    - Sustainability / Impact Award / Core Values
    - Leadership training
    - Interview training
    - Project management training

Agenda

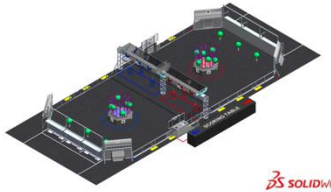
- Game Overview Presentation
- Scoring Options and Strategy Discussion
  - Strategy Helps Inform Design – Form Follows Function
- Break – Move to normal area of building / option to leave
- Preliminary design discussion for those who want to participate
- Finished by 4:00 PM

2025 Game Overview – Created by the Adambots FRC245

- Game Overview
- The Arena
- Match Play
- Game Play Scoring
- Rules / Violations
- Game Play
- Human Actions
- Tournaments
- Considerations
- Key Dates
- Discussion

You may ask questions at any time; but try not to ask before the subject is reviewed!

Game Overview



Two competing alliances are invited to score coral, harvest algae, and attach to the barge before time runs out. Alliances earn additional rewards for meeting specific scoring thresholds and for cooperating with their opponents.

First 15 seconds, robots are autonomous. Without guidance from their drivers, robots leave their starting zone, score coral on the reef, harvest algae from the reef, and collect and score additional coral.

The remaining 2 minutes and 15 seconds, drivers control their robots. Robots collect coral from human players at their coral station and score them on the reef. To unlock all scoring locations on the reef, robots must dislodge algae from the reef and either score it in the barge or deliver it to the human player through the processor.

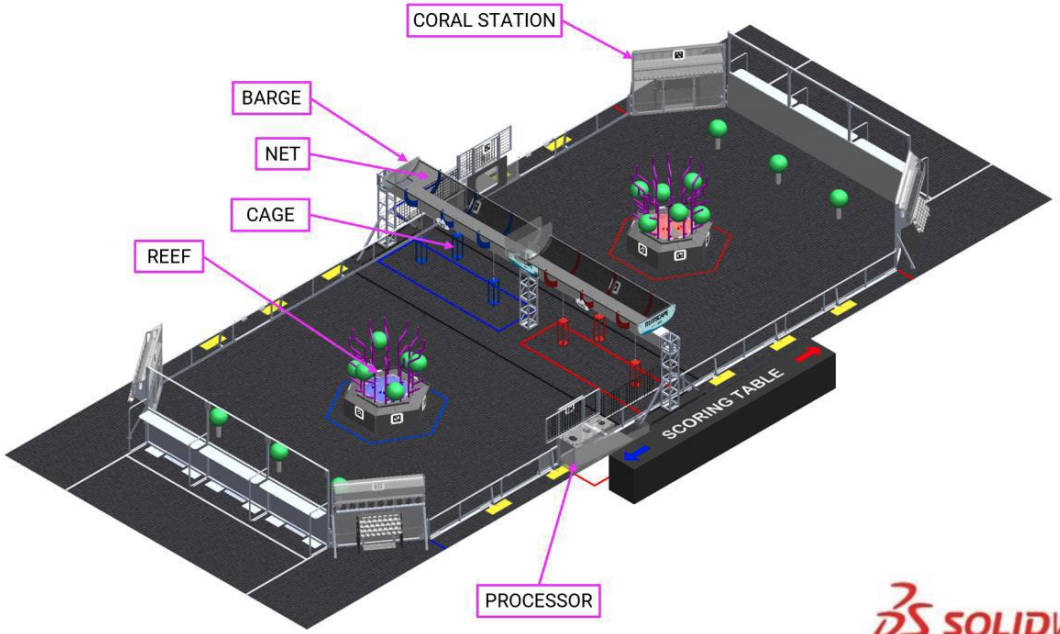
A human player can then deliver the algae to the barge. If at least two algae are scored in the processor by each alliance, both alliances earn a *Coopertition* Point (which influences their rank in the tournament) and lowers the requirements for a ranking point.

As time runs out, robots prepare to return to the surface with their algae by grabbing onto their cages and parking under the barge.

The alliance that earns the most points wins the match!

Game Overview - Arena

- Field
- Scoring Elements
- Queue Area
- Team Media Area
- Technician Area
- Field Equipment
- Robot Control
- Scorekeeping



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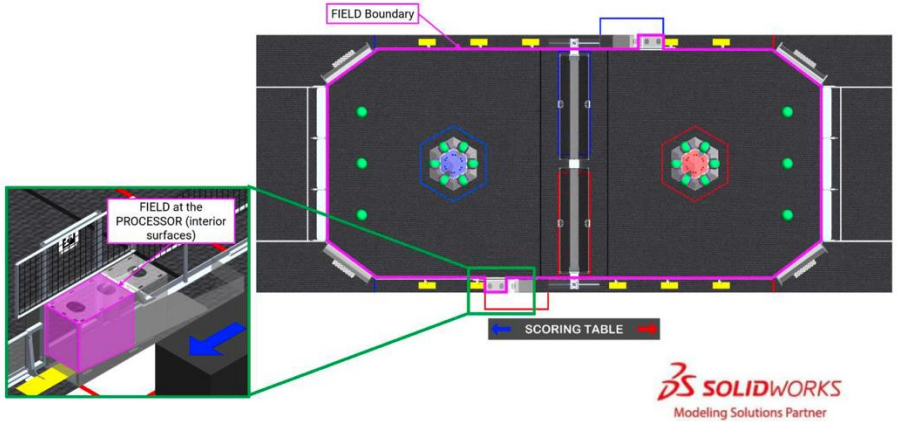
Field

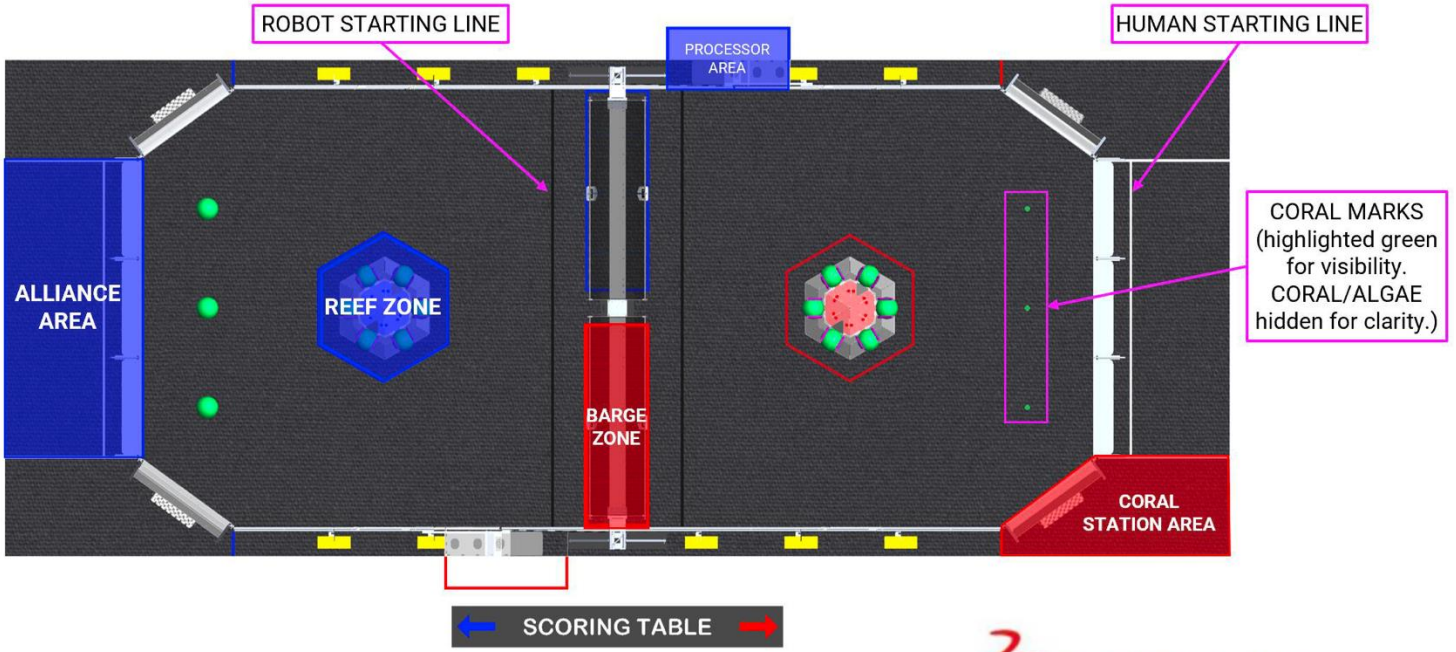
Each FIELD for REEFSCAPE is a 26 ft. 5 in. by 57 ft. 6⅞ in. carpeted area

The FIELD elements per alliance:

- 1 REEF,
- 1 PROCESSOR,
- 2 CORAL STATIONS, and
- 1 BARGE which consists of 3 CAGES and 1 NET.



Field Zones



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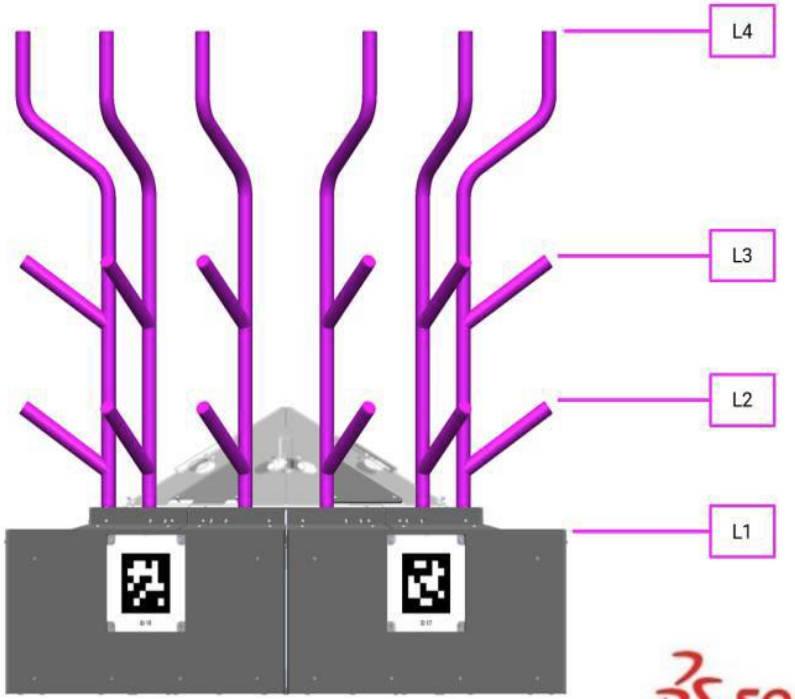
Field Reef

A REEF is 1 of 2 5 ft. 5 ½ in. hexagonal structures with BRANCHES that extend from each side where CORAL are scored. Each ALLIANCE has a dedicated REEF centered between each guardrail and located 12 ft. away from the ALLIANCE WALL.

Field Reef

Each REEF has 4 levels to score on Level 1 (L1), Level 2 (L2), Level 3 (L3), and Level 4 (L4). The base of each REEF has a trough (L1) into which ROBOTS can score CORAL. The front edge of the trough is 1 ft. 6 in. off the carpet.



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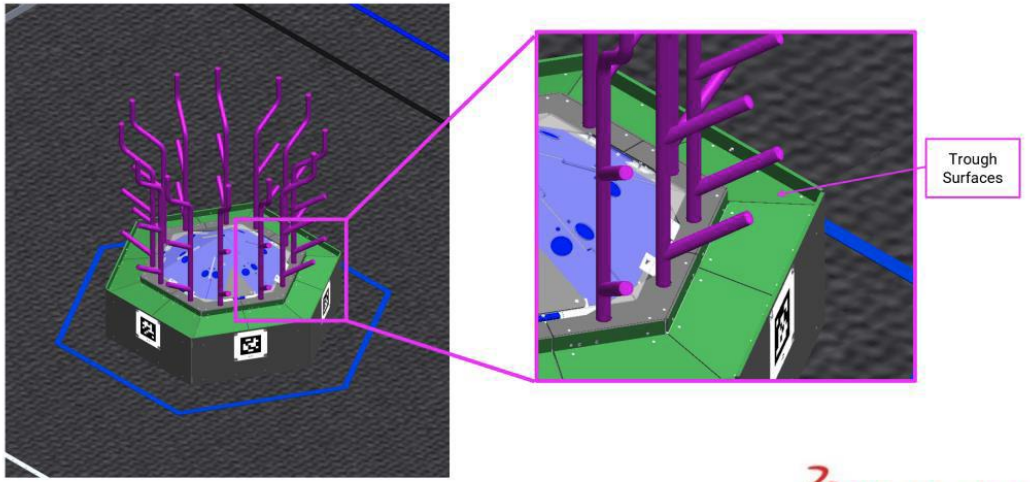
Field Reef

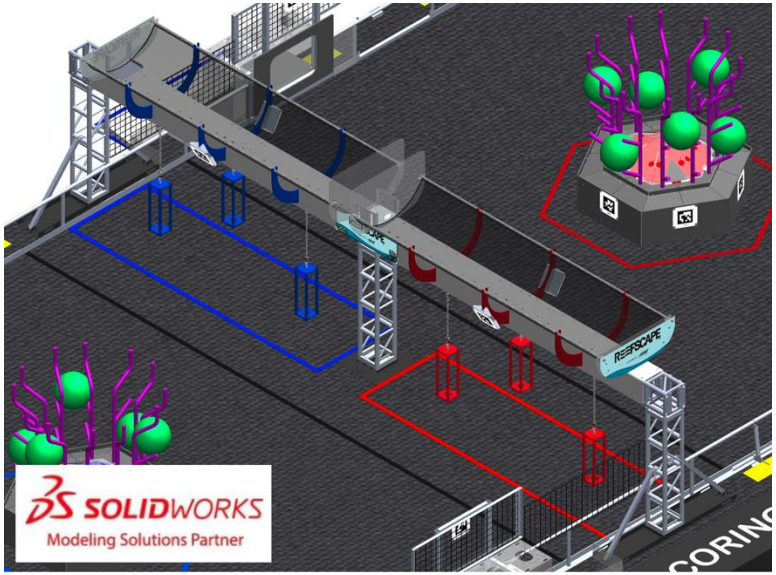
Vertical pipes are 1 ft. 1 in. apart (center to center). The pipes are 1-¼ in. Schedule 40 Steel.
L2 is the 12 lowest level BRANCHES and are angled up at 35°. The highest point of the L2 BRANCH is 2 ft. 7⅞ in. from the carpet and is inset 1⅝ in. from the REEF base.
L3 is the 12 mid-level BRANCHES and are angled up at 35°. The highest point of the L3 BRANCH is 3 ft. 11⅝ in. from the carpet and is inset 1⅝ in. from the REEF base.
L4 is the 12 highest-level BRANCHES and they are vertical. The highest point of the L4 BRANCH is 6 ft. from the carpet and is inset 1⅛ in. from the REEF base.



Field Barge

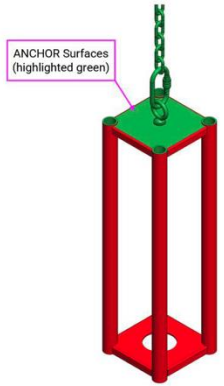
The BARGE is a 29 ft. 2 in. wide, 3 ft. 8 in. deep, and 8 ft. 5 in. tall structure that spans the center of the FIELD. The BARGE includes 6 CAGES, a red and blue NET, and all structure supporting CAGES and NETS. The horizontal truss structure is 5 ft. 2 in. above the carpet. The BARGE has three CAGE locations on each side located 3 ft. 5½ in., 7 ft. ⅜ in., 10 ft. 7⅜ in. from mid field to the center of the CAGE.

The BARGE has three segments of lights on each side of the truss which indicate progression toward and completion of the *Coopertition* Bonus and the final 20 seconds in the match. One segment will light up each time an ALGAE is scored in the PROCESSOR. Once each alliance has scored two ALGAE all six segments will illuminate. The lights will flash to indicate that there are 20 seconds left in the match.



Field Cage

CAGES are 2 ft. tall and 7⅜ in. wide (outside dimension) rectangular structures. CAGES are suspended from the truss structure in specific locations and hang at shallow or deep positions according to the corresponding team's selection such that the bottom of the cage is 3½ in. and 2 ft. 5⅜ in. from the carpet respectively.



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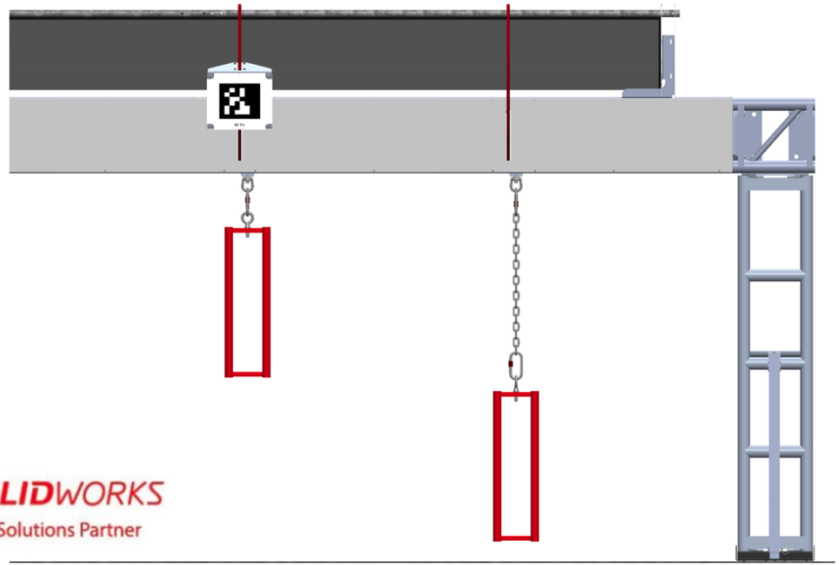

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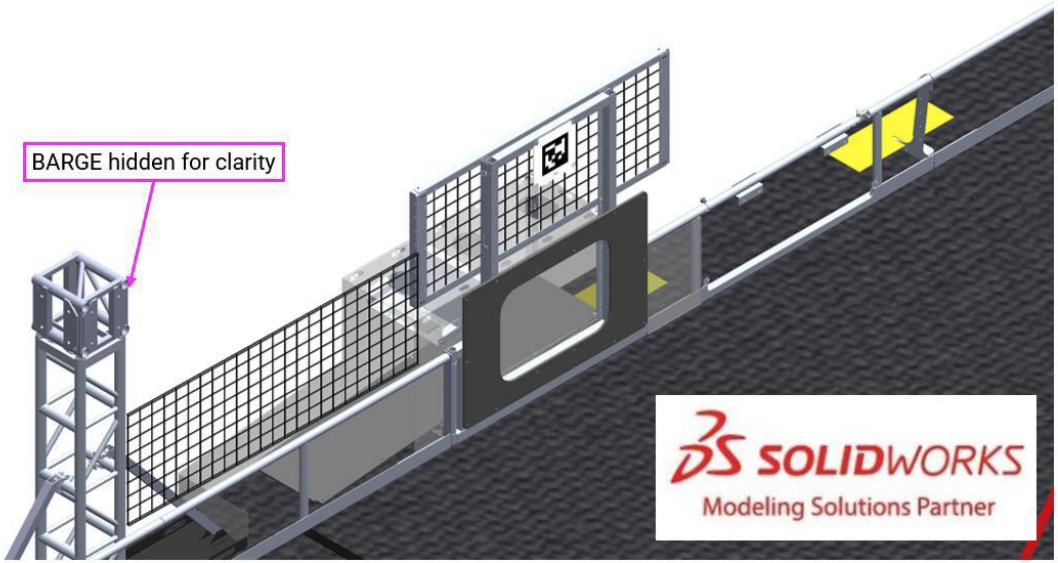
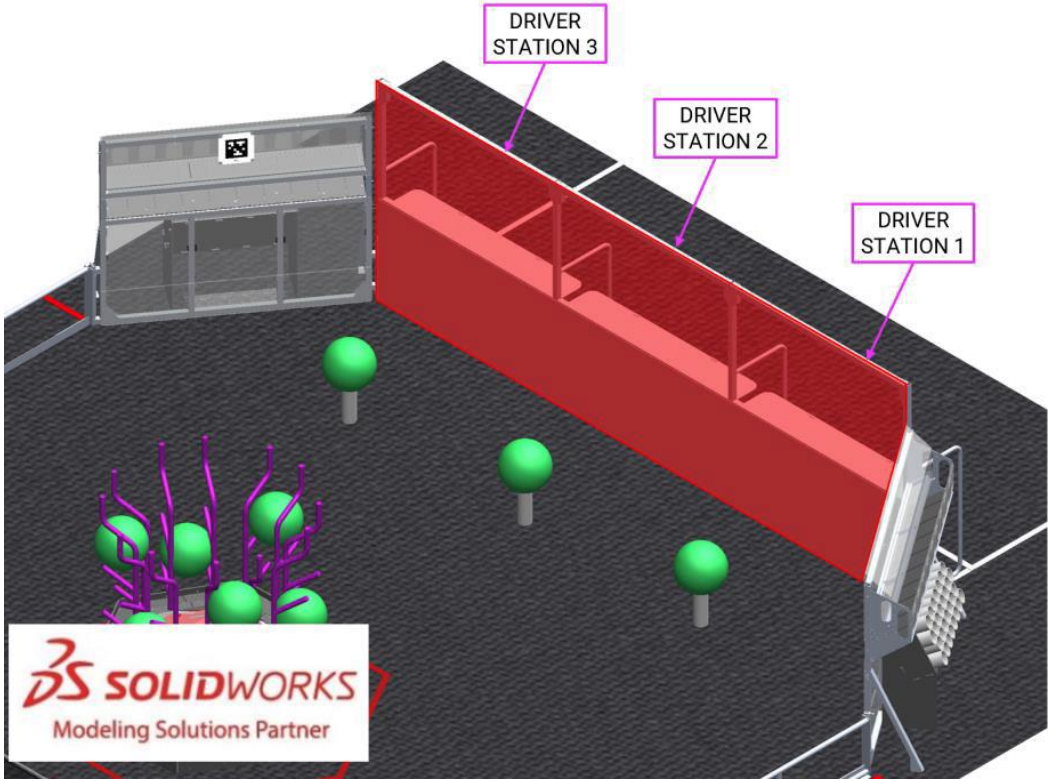
Field Processor

A PROCESSOR is a goal into which an ALLIANCE scores ALGAE. There is 1 per ALLIANCE. It is integrated into the guardrail near the ALLIANCE'S REEF ZONE and adjacent to the opponent's PROCESSOR AREA. Each PROCESSOR has a rectangular opening through which ROBOTS score ALGAE which is 2 ft. 4 in. wide, 1 ft. 8 in. tall, and 7 in. from the carpet.

ALGAE rolls past a scoring sensor array and into the opponent's PROCESSOR AREA. To keep the PROCESSOR clear for scoring, the HUMAN PLAYER can shift scored ALGAE on top of the PROCESSOR where there are designated ALGAE holders.

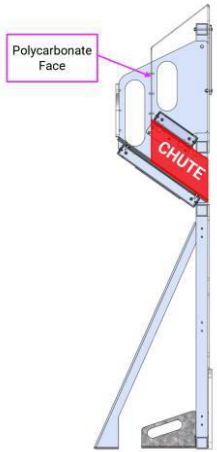


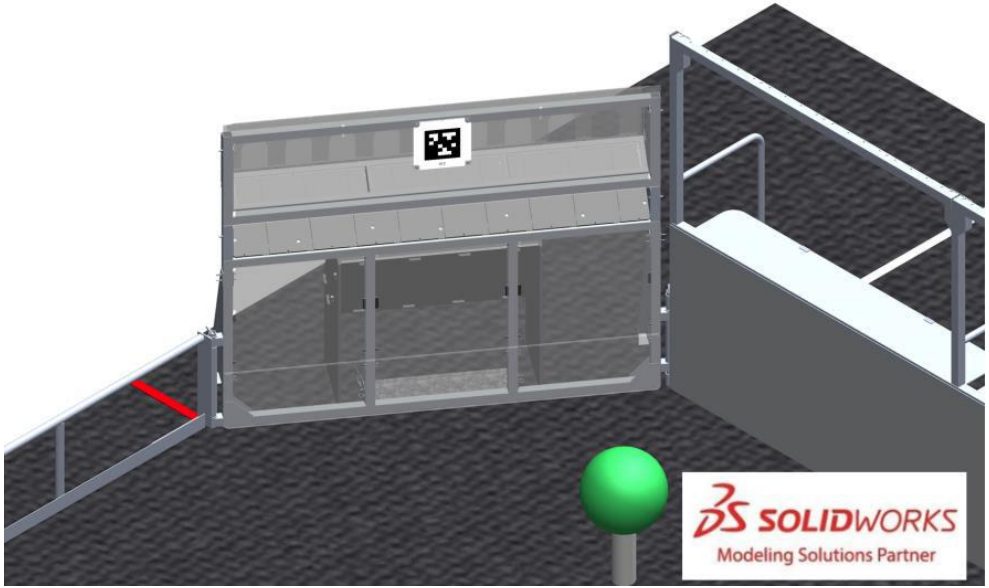
Field Alliance Wall



Field Coral Station

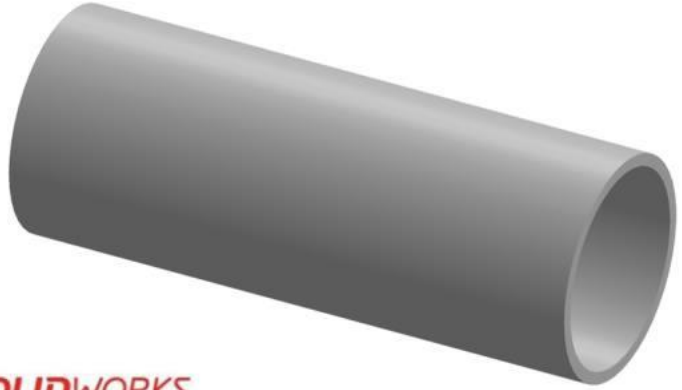
A CORAL STATION is an assembly through which HUMAN PLAYERS feed CORAL into the FIELD. There are 4 CORAL STATIONS, 1 in each corner of the FIELD connecting the guardrail to the ALLIANCE WALL.





Field Scoring Elements - Coral

A CORAL is a 11 ⅞ in. long piece of 4 in. diameter Schedule 40 Cellular (Foam) Core PVC pipe. CORAL has a 4-in. inside diameter and a 4½-in. outside diameter.



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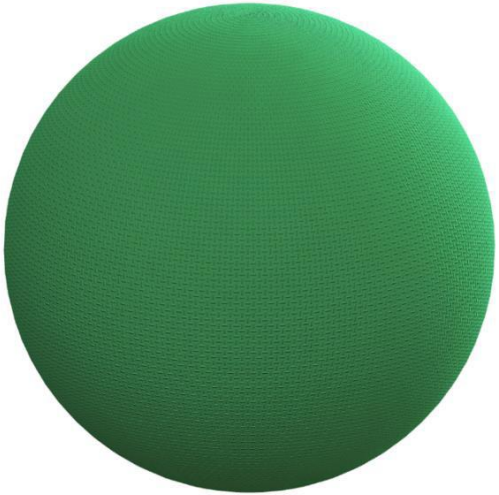
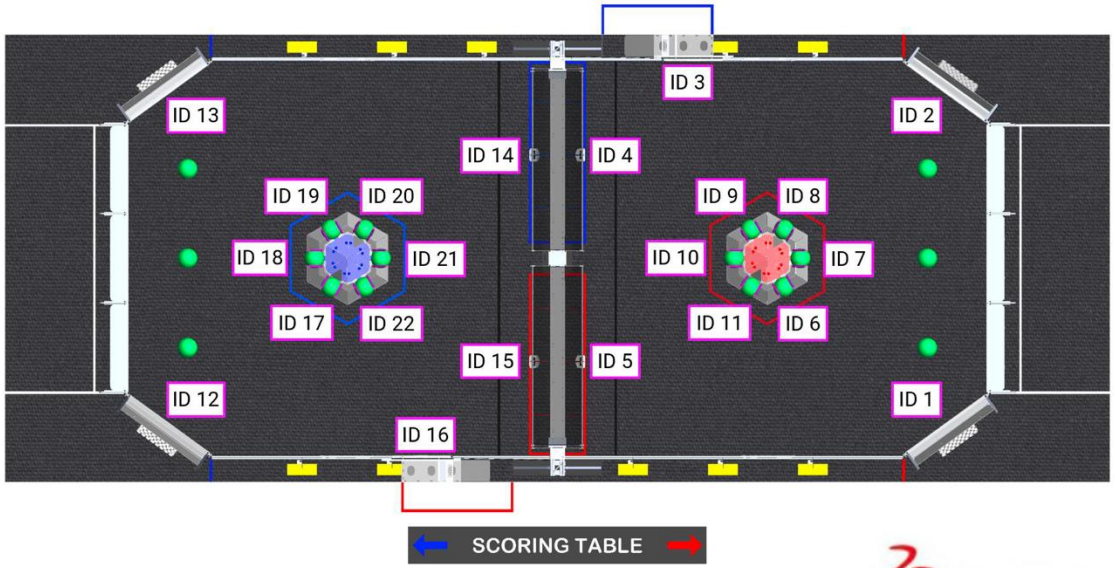
Field Scoring Elements - Algae

Each ALGAE is a 16 in. ±½ in. diameter rubber playground ball. At events, ALGAE will be inflated using a sizing gauge so that the diameter measures between 15.5 in. and 16.5 in.
The tolerances to which ALGAE are manufactured allow for variances in diameter, wall thickness, weight distribution and overall weight. They may not always be uniformly spherical, roll straight, or bounce



Field April Tags

AprilTags are 8⅛ in. square targets located above CAGES, PROCESSORS, CORAL STATIONS and on REEFS. There are 22 unique markers on the FIELD, positioned as shown



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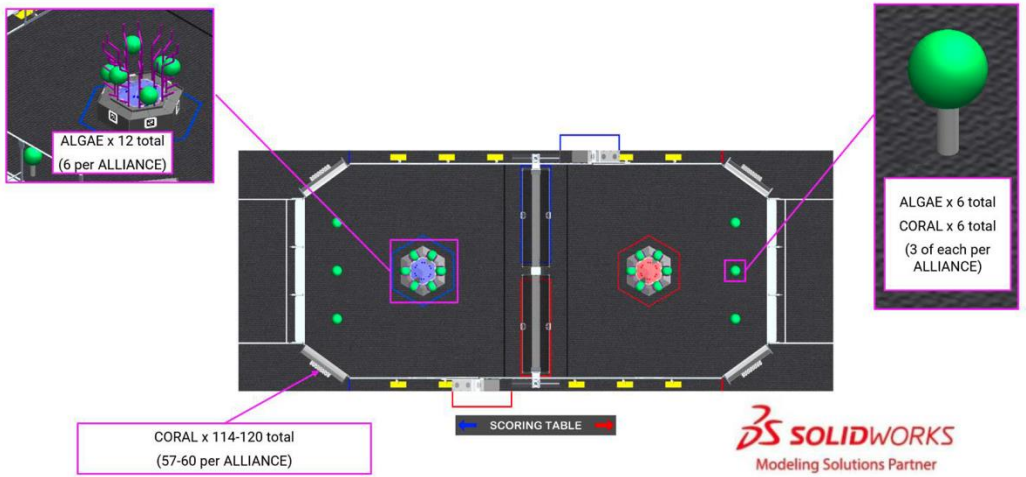
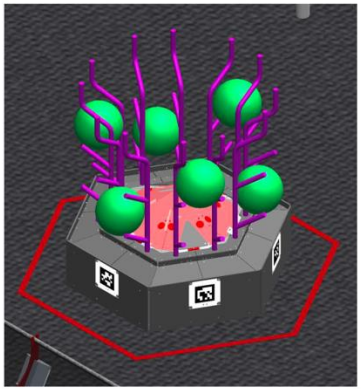
Match Play - Setup

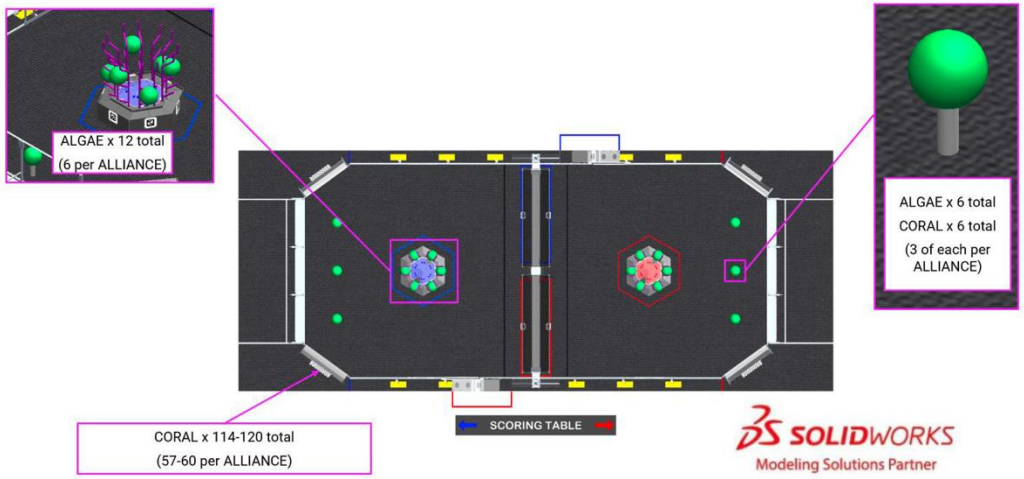
126 CORAL are staged for each MATCH
1 CORAL is staged on each CORAL MARK (6 total)
1 CORAL may be preloaded in each ROBOT by the ROBOT'S DRIVE TEAM, (up to 6 total, a CORAL not pre-loaded in a ROBOT is staged with CORAL in the corresponding ALLIANCE AREA), and remaining CORAL are split evenly behind each CORAL STATION (57 to 60 per ALLIANCE, depending on how many are preloaded in ROBOTS).



Match Play - Setup

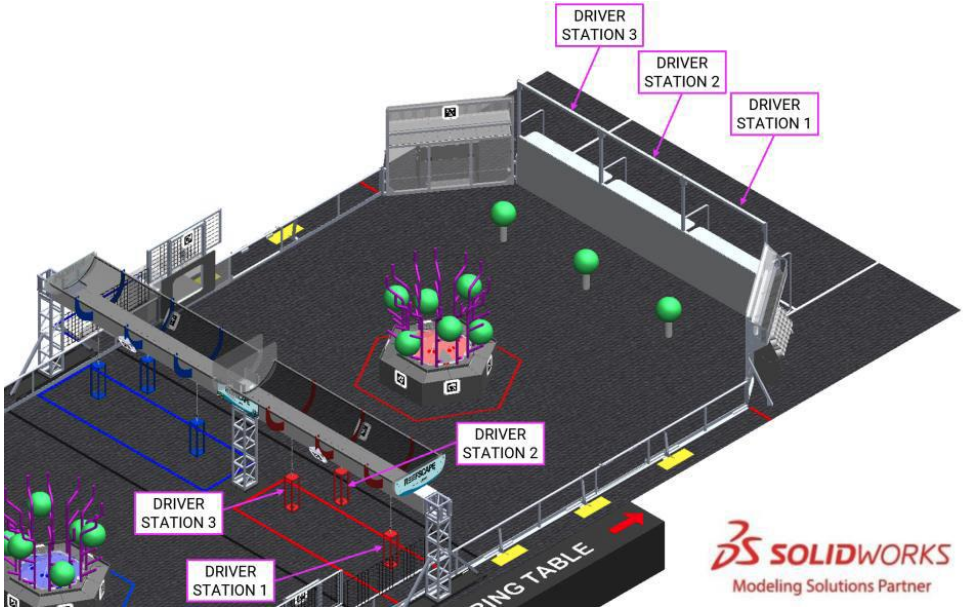
18 ALGAE are staged for each MATCH
6 ALGAE are staged on pairs of BRANCHES and
1 ALGAE is placed on top of each CORAL staged on a CORAL MARK (6 total).





Match Play - Setup

Each team can choose the height of the CAGE closest to their driver station. By default, all CAGES are left in the state from the last match.



Match Play - Setup

A DRIVE TEAM is a set of up to 5 people from the same *FIRST* Robotics Competition team responsible for team performance for a specific MATCH. There are 4 specific roles on a DRIVE TEAM which ALLIANCES can use to assist ROBOTS with REEFSCAPE, and no more than 1 member of the DRIVE TEAM may be a non-STUDENT.

Role	Description	Max. / Drive Team	Criteria
COACH	A guide or advisor	1	Any team member, must wear COACH button
TECHNICIAN	A resource for robot troubleshooting, setup, and removal from the field	1	Any team member, must wear TECHNICIAN button
DRIVER	An operator and controller of the robot	3	Student, must wear a DRIVE TEAM button
Human Player	A scoring element manager		

Match Play - Scoring

A CORAL is scored in the trough (L1) of the REEF if it is not in contact with a ROBOT and

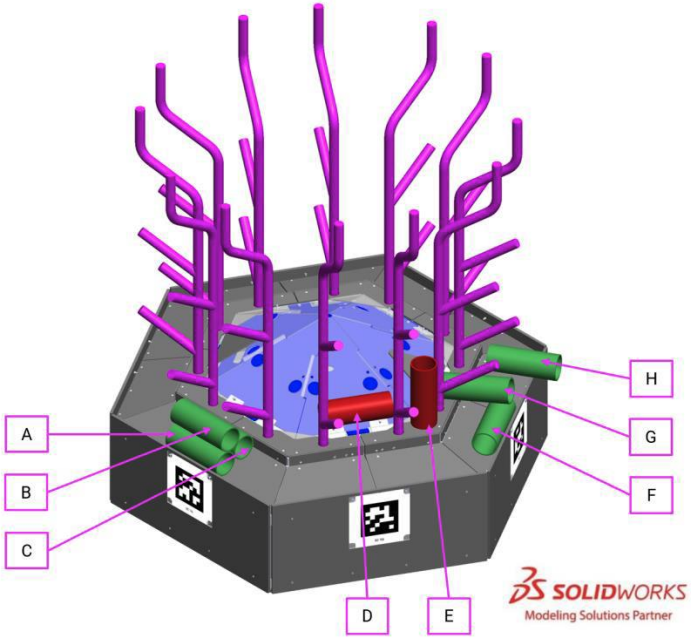
contacting the trough, or

fully or partially supported by a CORAL in contact with the trough.

A, C, F, and H are contacting the trough

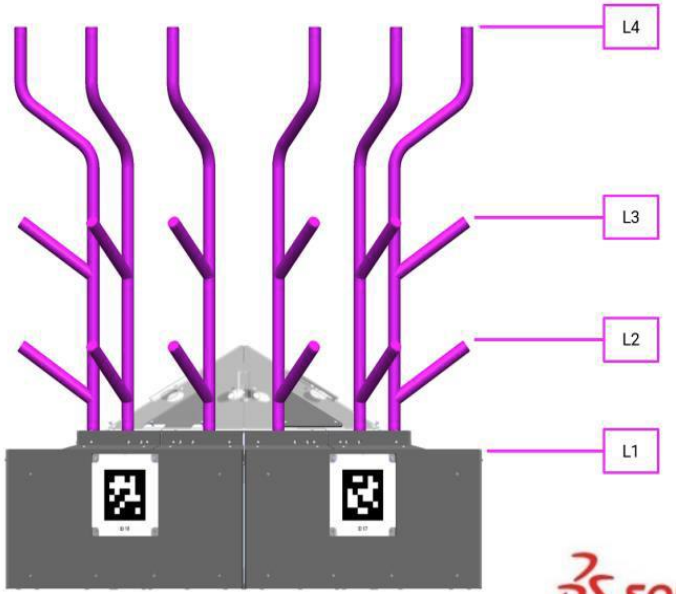
D and G are fully or partially supported by a CORAL in contact with the trough

D and E are not scored



Match Play - Scoring

A CORAL is scored on L2-L4 BRANCH if the end of the BRANCH is inside the volume of the CORAL and the CORAL is not in contact with a ROBOT or an ALGAE.



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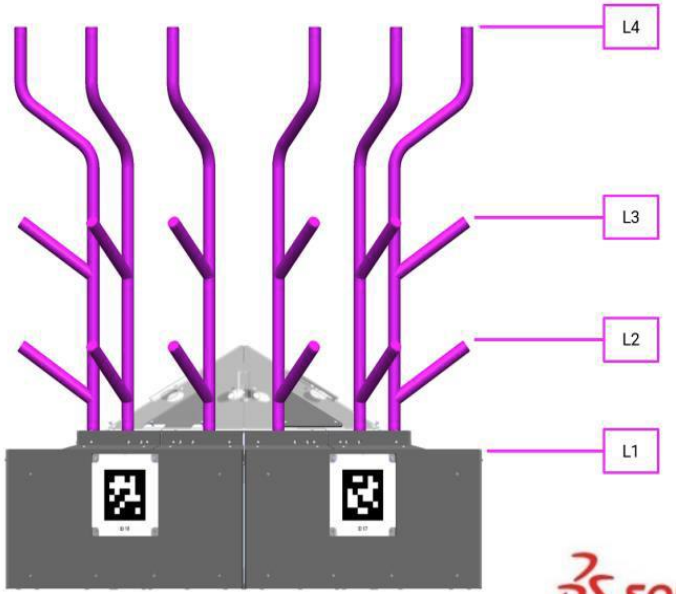
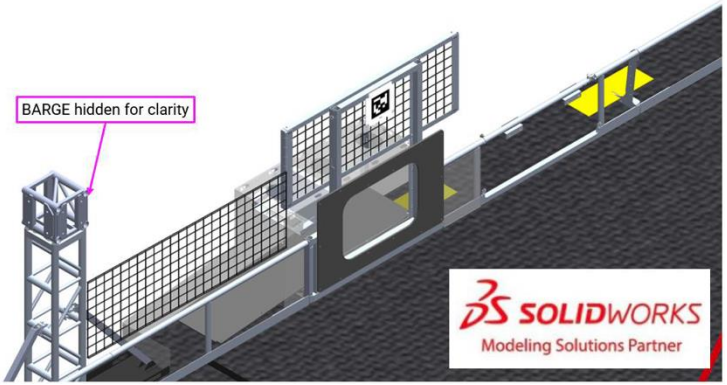
Match Play - Scoring

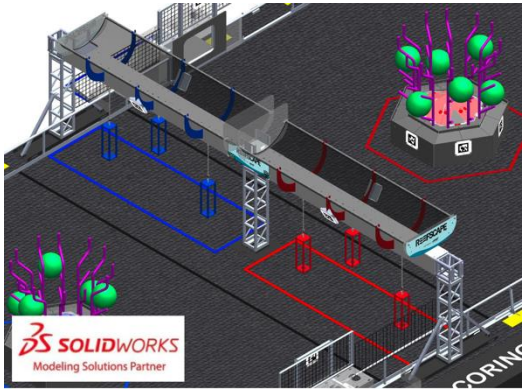
If a CORAL scored in AUTO gets removed from a BRANCH during TELEOP, the AUTO points are removed. If a CORAL is scored in that location again, the AUTO points associated with the original scored CORAL is restored. CORAL scored in the trough is not tracked by specific location, if a CORAL is removed from the trough after AUTO, the points removed will correspond to the lowest scoring CORAL (i.e. TELEOP CORAL removed first); if CORAL is re-scored in the trough, points will be re-added in the reverse order (i.e. AUTO CORAL re-added first).



Match Play - Scoring

An ALGAE is scored in a PROCESSOR once it has passed through the opening of the PROCESSOR and by the sensor array. An ALGAE is scored in a NET if it is above the NET and within the perimeter of the NET.





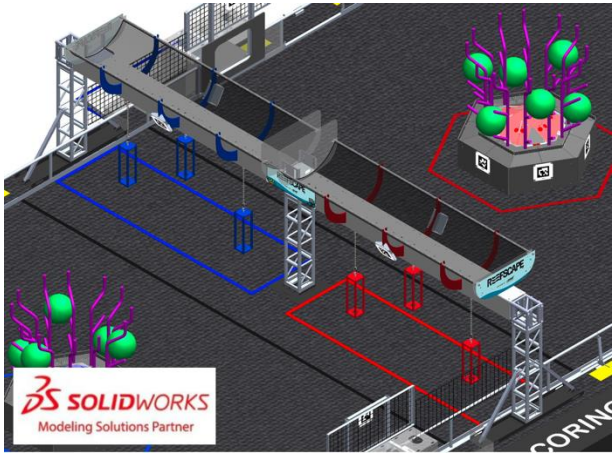
Match Play - Scoring

To qualify for LEAVE points, a ROBOT must move such that its BUMPERS no longer overlap its ROBOT STARTING LINE at the end of AUTO.

To qualify for PARK points, a ROBOT'S BUMPERS must be partially or completely contained in their BARGE ZONE at the end of the MATCH and does not meet the criteria for CAGE points.

To qualify for CAGE points, a ROBOT must be contacting a CAGE (with the exception of the ANCHOR), not contacting the carpet, and may additionally contact only the following elements:

- Scoring elements
- another robot qualified for CAGE points
- a partner robot contacted by an opponent in violation of G428
- an opponent robot



Match Play - Scoring

In Qualification MATCHES, if both ALLIANCES score at least 2 ALGAE in their PROCESSOR, all teams earn 1 *Coopertition* Point, and the threshold for the CORAL RP decreases a

Match Play – Scoring – Point Values

		Auto	Teleop	Ranking Points	Coopertition Points
Leave		3			
CORAL	Trough L1	3	2		
	Trough L2 Branch	4	3		
	Trough L3 Branch	6	4		
	Trough L4 Branch	7	5		
Algae	Scored in Processor	6	6		
	Scored in Net	4	4		
Barge	Park in the barge zone		2		
	Off-the-ground via shallow cage		6		
	Off-the-ground via deep cage		12		
Coopertition Bonus – as least 2 Algae scored in each processor					1
Auto RP – all enabled robots leave and at least 1 coral scored in auto				1	
Coral RP – If at least 5 coral scored on each level (If Cooperation achieved, 5 coral on 3 levels				1	
Barge RP - at least 14 barge points are scored				1	
Win – completing a match with more match points than your opponent				3	
Tie – completing a match with the same number of match points as your opponent				1	

Match Play Violations

Penalty	Description
MINOR FOUL	a credit of 2 points towards the opponent's MATCH point total
MAJOR FOUL	a credit of 6 points towards the opponent's MATCH point total
YELLOW CARD	issued by the Head REFEREE for egregious ROBOT or team member behavior or rule violations. A subsequent YELLOW CARD within the same tournament phase results in a RED CARD.
RED CARD	issued by the Head REFEREE for egregious ROBOT or team member behavior or rule violations which results in a team being DISQUALIFIED for the MATCH.
DISABLED	the state in which a ROBOT is commanded to deactivate all outputs, rendering the ROBOT inoperable for the remainder of the MATCH.
DISQUALIFIED	the state of a team in which they receive 0 MATCH points and 0 Ranking Points in a Qualification MATCH or causes their ALLIANCE to receive 0 MATCH points in a Playoff MATCH
VERBAL WARNING	a warning issued by event staff or the Head REFEREE.

Match Play Rules

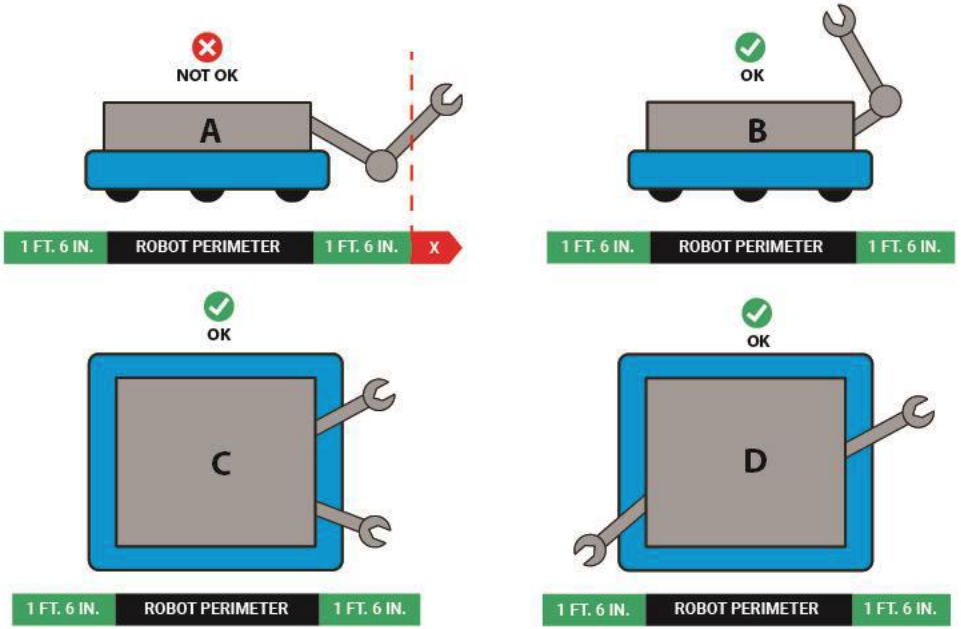
Lots of conduct rules in manual – will be covered with drive team in February

Match Play Rules

Only throw Coral in your reef zone – (bumpers are partially in the reef zone.

Robot Rules

Expansion limits. A ROBOT may not extend more than 1 ft. 6 in. beyond the vertical projection of its ROBOT PERIMETER.



Robot Rules

An Opponent's CAGES are off-limits in TELEOP. In TELEOP, A ROBOT may not contact an opponent's CAGE.

ANCHORS are off-limits. A ROBOT may not contact the ANCHORS. Exceptions are granted for actions that are, MOMENTARY, and inconsequential.

NET and contents are off-limits. A ROBOT may not contact either NET or any ALGAE scored in a NET.

1 defender at a time. A ROBOT may not cross from its side of the FIELD (i.e. containing its REEF) and end on the opponent's side of the FIELD (i.e. containing the opponent REEF) outside and beyond the BARGE ZONES if an ALLIANCE partner ROBOT'S BUMPERS are completely across the BARGE ZONES and on the opponent's side of the FIELD.

Robot Rules

ROBOT weight limit. The ROBOT weight must not exceed 115 lbs. When determining weight, the basic ROBOT structure and all elements of all additional MECHANISMS that might be used in a single configuration of the ROBOT shall be weighed together.

For the purposes of determining compliance with the weight limitations, the following items are excluded:

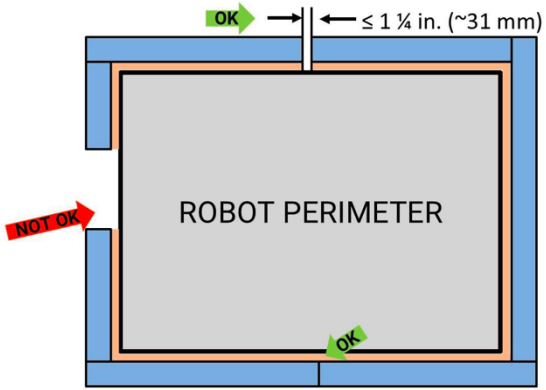
1.ROBOT BUMPERS,

2.ROBOT battery and its associated half of the Anderson cable quick connect/disconnect pair (including no more than 12 in. (~30 cm) of cable per leg, the associated cable lugs, connecting bolts, and insulation), and

3.tags used for location detection systems if provided by the event.

STARTING CONFIGURATION – max size. A ROBOT'S STARTING CONFIGURATION may not have a ROBOT PERIMETER greater than 120 in. and may not be more than 3 ft. 6 in. tall.

Bumper Rules



***BUMPERS all around.** ROBOTS are required to use BUMPERS to protect the entire ROBOT PERIMETER.

Note: Read the manual before making bumpers as the rules are slightly different this year.

Tournaments

Michigan Districts have qualification matches to determine seeding.

- Three team alliance play and each alliance members gets the ranking points for the match for their alliance, unless a red card is issued
- Teams ranked by ranking points with tie breakers.

Order Sort	Criteria
1	Ranking Score
2	Average Coopertition Bonus Points
3	Average alliance match points, not including minor fouls and major fouls
4	Average alliance leave & auto scoring element points
5	Average alliance barge points
6	Random sorting by the FMS

Additional information in manual on robot construction rules, number of motors, alliance selection process, etc.

Tournaments:
Kettering #1 – Load in Feb 27, Competition Feb 28 – Mar 1 (Fri and Sat)
Woodhaven - Load in Mar 21, Competition Mar 22-23 (Sat and Sun)

State Championship – 160 Teams

World Championship – 80 Teams from Michigan

Considerations:

What is important to do?

- For ranking points
- To demonstrate we are a robot team others want in an alliance
- For making it into the playoffs
- For durability and reliability
- To potentially earn engineering awards

Form follows function

- Decide what function(s) we want to perform before deciding on what form to make the robot

Considerations:

- Want robot built and programmed in time to allow practice by drive team
- Apriltags – how can we get better at using them?
- Think about how you would play the game with only humans
- Everything needs to fit in robot, consider other teams needs
- Is there anything we want to eliminate from design consideration?
- Doing a few things really well is usually better than trying to do everything not-so-well

Considerations

- What is needed to win in week one might not win in week four or State Championship.
- The better the robot and drive team, the more we play and the more wear and tear on the robot.
- What about defense with this years game?

This week we will concentrate on discussion of strategy and design and prototype options.

Monday – Thursday reviews and discussions

Saturday – make decisions and start going

Note: once chassis size and type is determined, can start on it even if we do not know all the above chassis items needed

Robotics Collaboration Meetings on Saturdays

FRC Collaboration Meetings 2025 Season

	Team Number	Team Name	School	Name	email
	201	FEDS	Rochester HS, Rochester Hills, MI	Ari McEntire	ari.mcentire@gmail.com
				Shishir Gupta	skgupta44120@gmail.com
	245	Adambots	Rochester Adams HS, Rochester Hills, MI	Rick Drummer	rickdrumrs@aol.com
	302	The Dragons	Lark Orion HS, Lake Orion, MI	Tanay Patel	adambots.tanay@gmail.com
	2224	Renaissance RoboPhoenix	Renaissance HS, Detroit, MI	Dominic Lanni	domLanni55@gmail.com
	3096	Village Bulldogs	East English Village Prep High School, Detroti, MI	Regina Himmelspach	trhimmel@gmail.com
				Keith Buford	keith.buford@gmail.com
	3478	LamBot	Technologico de Monterrey Campus, San Luis, Mexico	David Bustost	david.bustost@gmail.com
				Bernardo Fernandez	bfl.1691@gmail.com
	4735	DEROF	Torreon, Mexico		
	5213	SHIELD	Lasalle HS, St. Ignace, MI	Andrew Long	along@eupschools.org
				Merlin Doran	merdoran@gmail.com
	5436	Cyber Cats	Stoney Creek HS, Rochester Hills, MI	Lou Begin	Louis.begin@gm.com
				Ed Gemellaro	egeme@gsielectric.com
				Chris Lata	lata12175@sbcglobal.net
				Jacob Russell	jacob_24@live.com
	6121	RoboVikes	Grayling HS, Grayling, MI	Rick McBride	rickmcbride7@gmail.com
	6832	STEAMex	Santa Catarina, Nuevo Leon, Mexico	Jesus Betancourt	jafbetancourt@gmail.com
				Miguel Garcia	miangaro@hotmail.com
				Grecia Pacheco	A01366730@tec.mx
	7911	Belding Scrapcat Robotics	Belding, MI	Alex Colville	colvillea@beldingschools.org
	9252	Wingspan	Pontiac, MI	Angelica Tibbits	angelica.tibbitts@leonagroupmw.com

Sub-team meetings:

We are trying to use the Adambots calendar to post all meetings. Each team should communicate with Rick Drummer to post the items.

One final reminder:

We really need more help with adult mentors:

- Consider a night or two a week and maybe a Saturday time
- You do not need to be an expert
- It is lots of fun working with the students and helping them learn and grow
  - 14 of the mentors have a student on the team
  - 10 mentors no longer have a student on the team but still help

Questions and Answers

After done, break to move to normal rooms 213, 214, 215, and 216