



# 2018 Competition Levels

*Schools may compete in both performance tier levels.  
Schools must submit one separate craft for each tier.*

## **Tier 1**

### **Prototype Design Phase**

- Introductory Competition Level
- Time Based Challenge
- Compete with basic SeaGlide kit
- 3 Judged categories - 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> place receive certificates
- Overall winner receives trophy
- Implemented 2018 Competition
- \$50 Max Budget

## **Tier 2**

### **Advanced Design Phase**

- Advanced Competition Level
- Scenario Based Challenge
- Compete with a single modification to SeaGlide Kit
- 3 Judged categories - 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> place receive trophies
- Overall winner receives trophy
- Implemented 2018 Competition
- \$100 Max Budget



# TIER 1: PROTOTYPE DESIGN CHALLENGE

*The Navy is looking for companies to build, test and demonstrate a craft capable of autonomously or semi-autonomously navigation.*

## **Scenario:**

- The US has released a request for proof of concept designs of a highly-efficient, autonomous, underwater glider capable of being adapted to perform in a variety of roles in the US Navy. As part of this request, each company is required to build, design, and demonstrate an underwater glider, which the Navy is calling a SeaGlide, and present their design at an upcoming competition.

## **Design Criteria:**

- Design must demonstrate the ability to travel accurately in a straight line over long distances.
- Design must perform its mission autonomously or semi-autonomously. There can be no remote control of the design.
- Design must utilize the highly efficient buoyancy engine provided to each team.

## **Objective:**

- It is up to your company to design an autonomous or semi-autonomous underwater glider which can accurately travel in a straight line.

## **Evaluation Factors:**

- Speed
- Navigation Accuracy



# TIER 1: PROTOTYPE DESIGN CHALLENGE

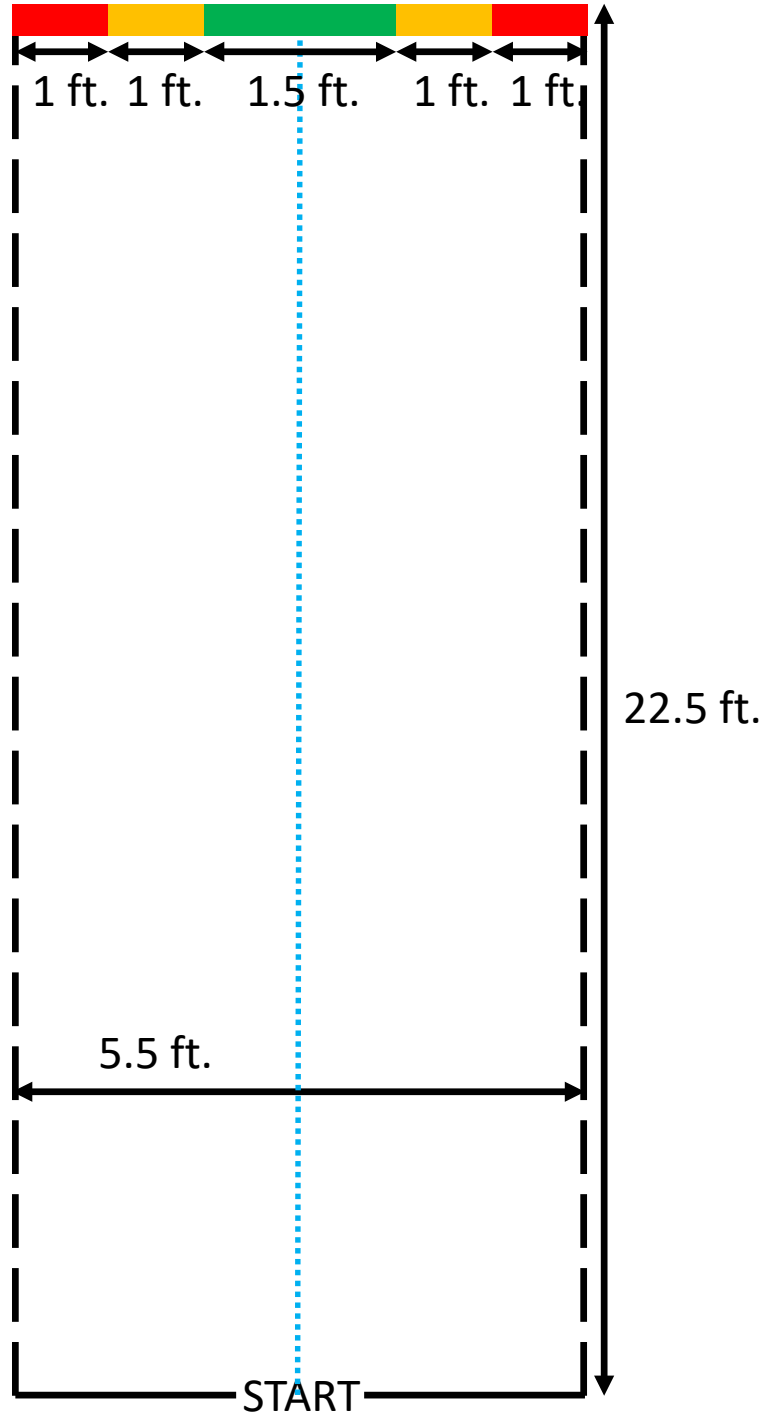
## COURSE

### Shallow End of Pool

**LEGEND**

- Team Lane
- ..... Optimal Glide Path
- Best Accuracy Target
- Mid Accuracy Target
- Worst Accuracy Target

**SHALLOW END DEPTH**  
3 FEET





## TIER 2: ADVANCED DESIGN CHALLENGE

*The Navy is looking for companies to build, test and demonstrate a craft capable of autonomously or semi-autonomously navigating an underwater canyon system.*

### **Scenario:**

- The US has received intel regarding a nuclear warhead that was smuggled out of a politically unstable country and lost at sea when the ship carrying it sunk. The location of the warhead must be identified prior to the disarmament and recovery of the nuclear material. Unfortunately, it is located in a controversial location in the current world geopolitical climate. It is suspected that the warhead is lost somewhere in a large canyon system and may take weeks to locate. Deploying a submarine to the area would raise already high tensions in the area. This is a perfect mission for the SeaGlide.

### **Mission:**

- Navigate through the undersea canyon.
- Identify the location of the nuclear warhead within the canyon.

### **Objective:**

- It is up to your company to design an autonomous or semi-autonomous underwater glider capable of navigating the trench and identifying the location of the nuclear warhead based on thermal measurements.

### **Goal:**

- Build, test and demonstrate a craft capable of autonomously or semi-autonomously navigating a simulated underwater canyon system.

### **Evaluation Factors:**

- Navigation Capability
- Navigation Accuracy
- Speed

# TIER 2: ADVANCED DESIGN CHALLENGE

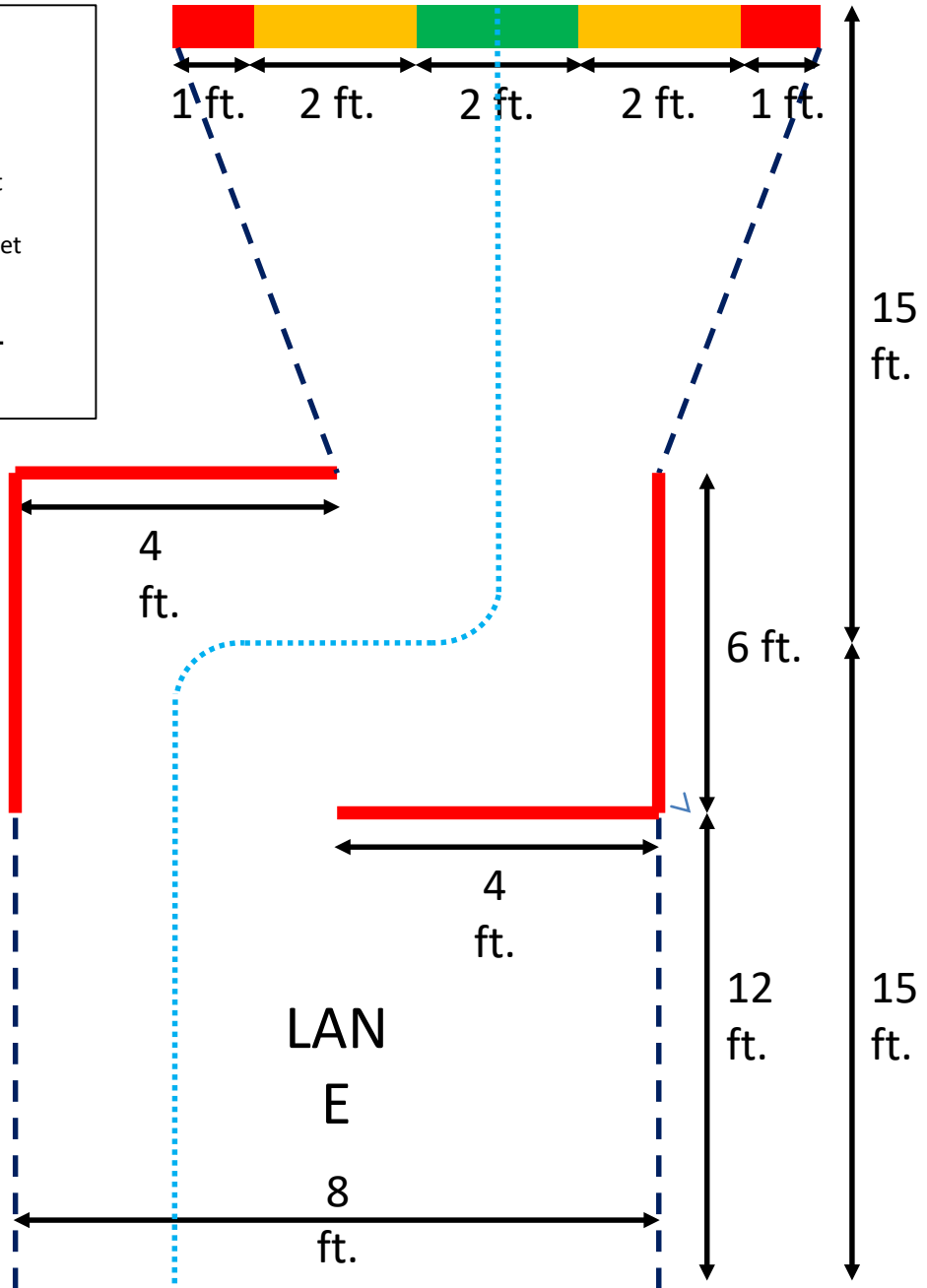
## COURSE

Deep End of Pool

**LEGEND**

- Team Lane
- Wall
- ... Optimal Glide Path
- Best Accuracy Target
- Mid Accuracy Target
- Worst Accuracy Target

**DEEP END DEPTH**  
10.5 FEET





# SeaGlide Performance Scoring

## Tier 1

### Prototype Design Phase

- Total Points: 100
  - Accuracy: 50
  - Time: 50
- Accuracy
  - Green: 50
  - Yellow: 30
  - Red: 10
  - Out of Lane: 0

## Tier 2

### Advanced Design Phase

- Total Points: 100
  - Navigation: 50
  - Accuracy: 30
  - Time: 20
- Accuracy
  - Green: 30
  - Yellow: 20
  - Red: 10
  - Out of Lane: 0
- Navigation Scoring
  - Right Turn: 25
  - Left Turn: 25
- Hit a Wall: -10 Points

### A Note on Accuracy

Accuracy will be judged from the middle “bottle” of the SeaGlide. If the bottle hits between two zones, the score of the higher zone will be given. For example, in the figure to the right, the score associated with GREEN would be given.

