

Pool Courses – Overview & Rules

2021 SeaPerch Season

www.seaperch.org

These rules apply for the 2021 International SeaPerch Challenge. Please check with your local regional coordinator for rules, power requirements, allowable power sources, and course set-ups related to your local regional competition.

Pool Course Event Overview

The Mission Course (Waterway Cleanup Mission) is the sole pool event. There is no obstacle course included in the 2021 International SeaPerch Challenge. The Mission Course should be configured as closely as possible to any of the course options shown and described in this document.

The Mission Course will be split into two separate runs. The first run includes completion of Task 1 (The Active Mine) and Task 2 (The Disposal Vault). The second run includes completion of Task 3 (The Garbage Patch) and Task 4 (Sunken Waste). Each of these runs should be captured in separate video recordings and submitted during registration following the guidelines included in the Submission Instructions.

General Pool Event Rules

- The ROV and Adjustments:
 - Each team must have their own ROV – teams are not allowed to share an ROV or attachments. Controllers may be shared and are not considered attachments.
 - No parts or materials, except as noted in this section, may be added to or removed from the ROV between the two pool event videos. The ROV must compete in both pool event videos with the same attachment and parts connected. Violations will result in disqualification.
 - Attachments and parts may be repositioned between the two videos.
 - Adjustments to buoyancy, including adding or removing buoyancy materials, may be made between the pool event videos.
 - Cables ties, tape, or other material necessary to secure parts may be added or removed.
- Auxiliary Equipment, Batteries, and Power Supplies:
 - Only one battery 12 VDC with a maximum of 9-amp hour rating may be used to power the ROV.
 - Additional batteries may be used for Open Class ROVs in order to power auxiliary equipment.
- ROV Tether Handling
 - The ROV must move only under its own power. Teams will be disqualified if they pull or otherwise maneuver the ROV by the tether.

Pool Course Setup

Two variants of the mission course may be used for the Pool Course event. The **full-size course** can be constructed by reconfiguring the 2019 or 2020 mission course. This course has been reconfigured to closely replicate the size and layout of the mini course. The **mini course** was released in 2020 and provides a smaller footprint and depth requirements to promote use in smaller pools. Additional information on the completion of tasks using these two variants:

- *Task 1:* The electronically activated circuit in the Active Mine is not used. The simplified

Active Mine shown in *Figure 1* or the housing and structure of the Active Mine shown in *Figure 2* may be used.

- **Task 2:** The Mini course does not have a gate, but the skill required to complete the tasks of “opening” and “closing” the Gate Latch is the same for the mini and full-size courses.
- **Task 3:** The Garbage Patch maybe be constructed as shown in either *Figure 1* or *Figure 2*. A simplified single ring frame may be used instead of the double ring frame shown in *Figure 2*. The minimum size of the ring is 24” in diameter or a 24” x 24” square.

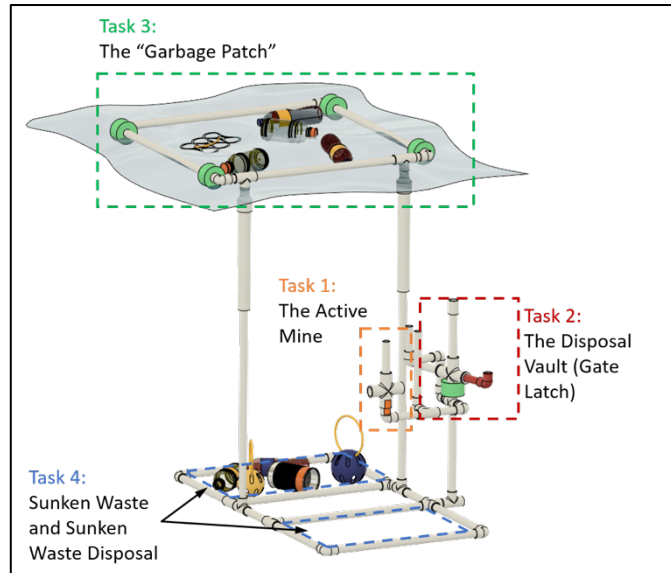


Figure 1 –Waterway Cleanup Mission Course (Mini Course)

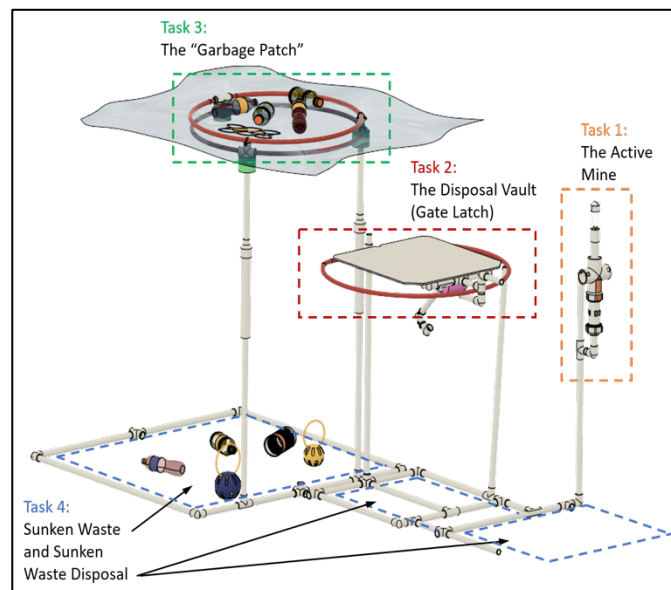


Figure 2 – Waterway Cleanup Mission Course (Full Course)

Run 1 (Tasks 1 & 2)

The following sections provide guidance on how to set up the mini and full-size courses for the first run including Task 1 and Task 2, as well as rules for conducting this run.

1. Run 1 - Course Setup (See Figure 3 & Figure 4)

- The “active mine” must be in the armed position (stripes aligned).
- The “gate latch” must be in the closed position
- One large canister must be placed in the disposal area

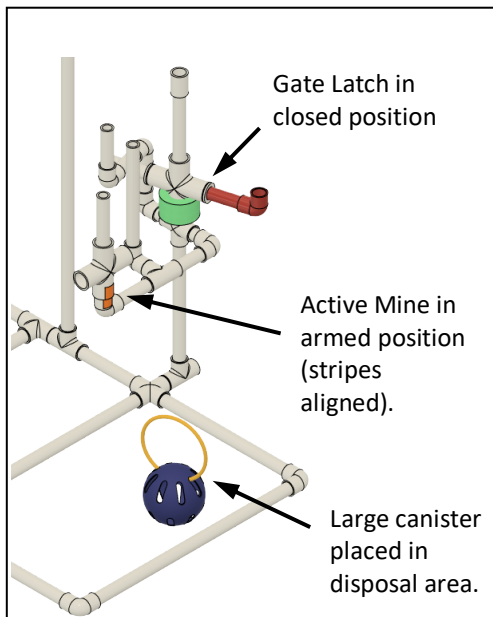


Figure 3 - Task 1 & 2 Setup
(Mini Course)

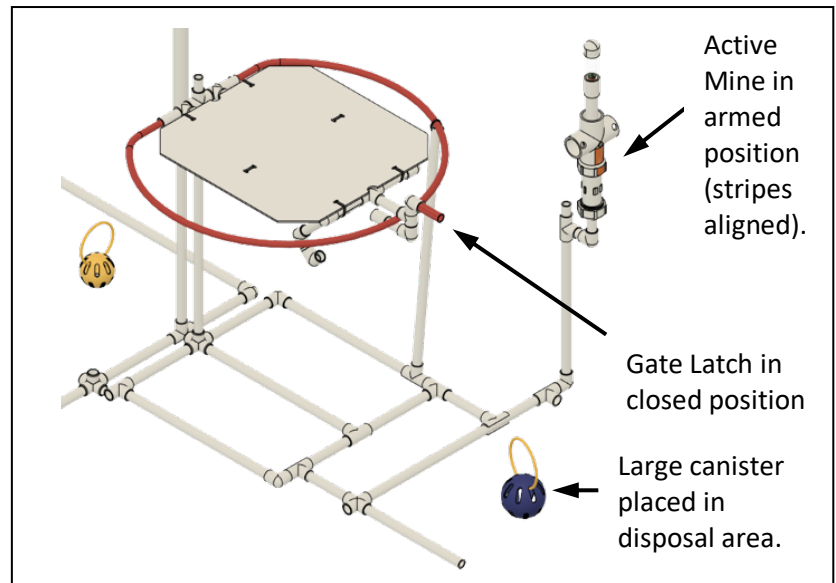


Figure 4 – Task 1 & 2 Setup (Full Course)

2. Run 1 - Course Run

- Start of run:** The ROV must be surfaced, within 6” of the corner of the Garbage Patch Frame (See Figure 5).
- The following tasks may be completed in any order and no tasks are dependent upon others in order to be completed.
- Task 1 – The Active Mine:** The ROV must maneuver to the Active Mine and disarm it by either rotating or removing the Arming Device. When disarmed, the indicator stripes on the Active Mine and the Arming Device will not be aligned.
- Task 2 – The Disposal Vault:** This task includes two subtasks:
 - The ROV must open the disposal vault gate by pushing or pulling the Gate Latch.
 - The ROV must close the vault gate by hooking a mine onto the gate closing arm (full-size course) or the gate latch (mini course).

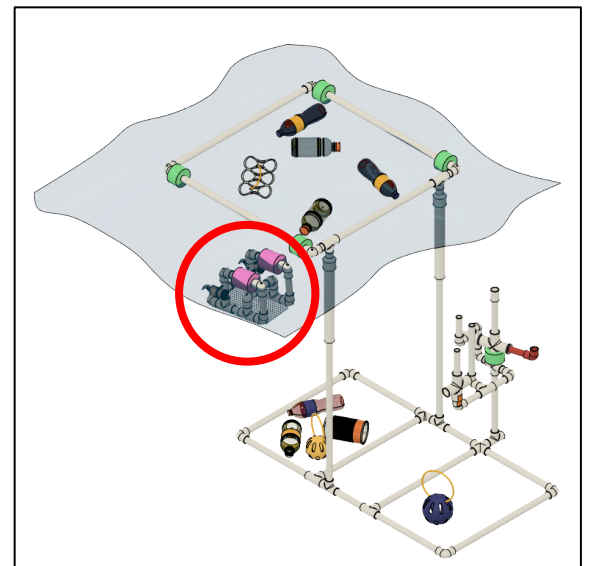


Figure 5 - Mini course with ROV starting location

- e. *End of run (Mission completion):* The run is complete when the ROV returns to the starting position (within 6" of the Garbage Patch Frame) and is surfaced (any part of the ROV breaks the water surface) or when the 2-minute time expires.

3. Run 1 - Scoring

a. Task 1:

- Rotating the Arming Device (10 points): The team will receive points for disarming the Active Mine as shown in Figure 6.
- Removing the Arming Device (15 points): If a team successfully removes the Arming Device, they will be awarded points **only** if they deposit the Arming Device in the Disposal area.
- Other Notes:* If the Active Mine is rearmed after disarmament (the indicator stripes are realigned) the team does not lose their points.

b. Task 2:

- Unlatching/Opening the Vault Gate (10 points): The team will receive points for unlatching and opening the vault gate.
- Closing the Vault Gate (15 points): The team will receive points for hooking a mine onto the closing arm.

- c. *Finish time:* The run finish time will be combined with the Run 2 finish time and this combined time will be used for tie breaking purposes.

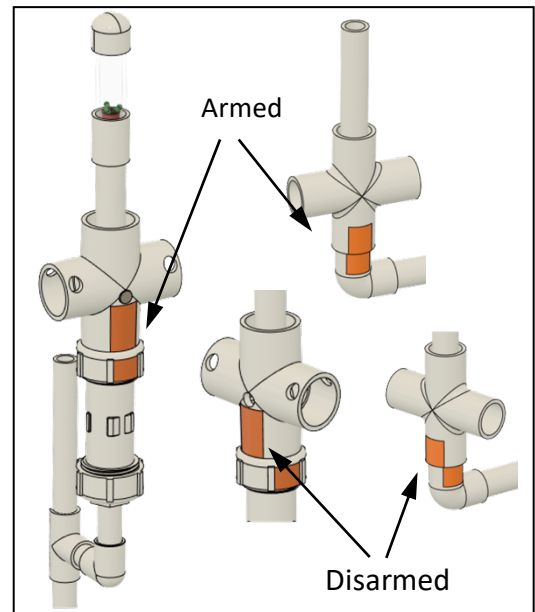


Figure 6 - Active mines shown in armed and disarmed states

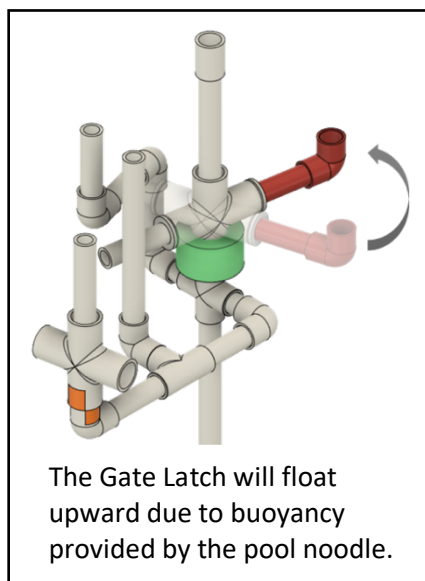


Figure 7 – Gate latch opening (Mini Course)

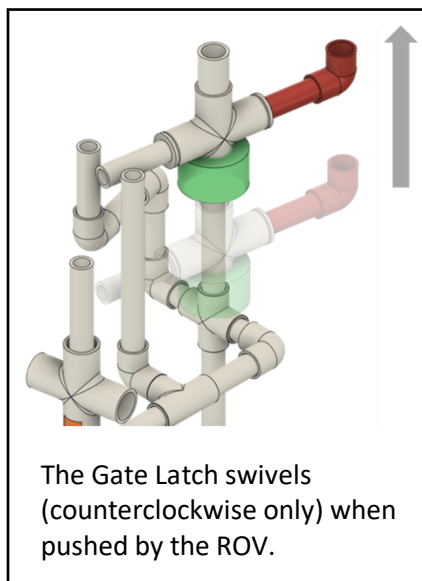


Figure 8 – Gate latch open position (Mini Course)

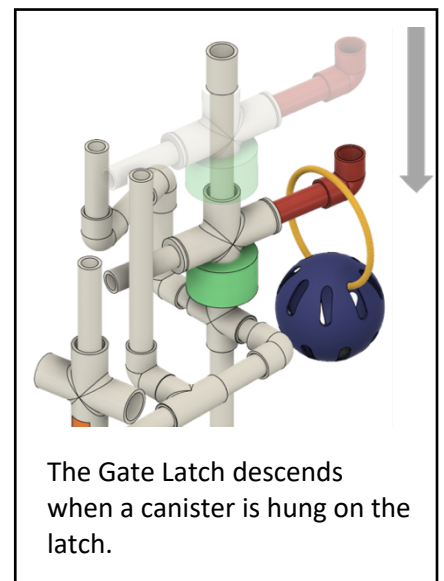


Figure 9 – Gate latch closed (Mini Course)

Run 2 (Tasks 3 & 4)

The following sections provide guidance on how to set up the mini and full-size courses for the first run including Task 1 and Task 2, as well as rules for conducting this run.

1. Run 2 - Course Setup

- a. The setup is the same for both the full-size and mini courses.
- b. The Garbage Patch must include two 16-20oz water bottles, two 12oz small sports drink bottles, and a plastic 6-pack drink ring (See *Figure 10*). These debris objects are described in detail in the Marine Debris Objects guide available in the Resources section of the [2021 SeaPerch Competition webpage](https://www.seaperch.org/2021-competition-webpage).

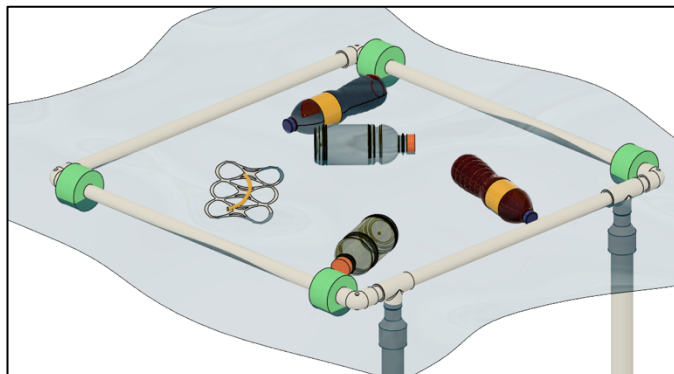


Figure 10 – The Garbage Patch setup

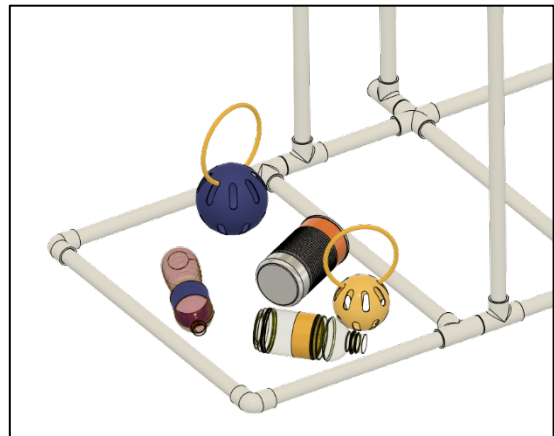


Figure 11 – Sunken Waste on Waste Platform

2. Run 2 - Course Run

- a. *Start of run:* The ROV must be surfaced, within 6" of the corner of the Garbage Patch Frame (this is the same start position as Run 1 - See *Figure 5*).
- b. The following tasks may be completed in any order and no tasks are dependent upon others in order to be completed.
- c. *Task 3 – The Garbage Patch:* The ROV must move objects out of the garbage patch containment ring. The ROV may move objects out of the ring or frame in any direction by any means.
 - i. The ROV may push or pull items over or under the containment ring or frame.
 - ii. Only one object may be transported at a time by the ROV.
 - iii. Objects may be lifted, pushed, dragged, or moved by any means by the ROV.
- d. *Task 4 – Sunken Waste:* The ROV must retrieve sunken waste and deposit the objects in the disposal area. The ROV must move the objects in the path shown in *Figure 8* and *Figure 9*.
- e. *End of run (Mission completion):* The run is complete when the ROV returns to the starting position (within 6" of the Garbage Patch Frame) and is surfaced (any part of the ROV breaks the water surface) or when the 2-minute time expires.

4. Run 2 - Scoring

- a. *Task 3:*
 - i. Five points are awarded for each object removed from the Garbage Patch (25 points max).
 - ii. Points are awarded as soon as the ROV disengages from the garbage patch containment ring as long as the object is fully clear of the containment frame.

- iii. Points will not be deducted if an object is moved back into the garbage patch and any object moved back into the garbage patch cannot be rescored.
- b. **Task 4:**
 - i. Points are awarded for objects deposited in the disposal area as soon as the ROV releases the object (25 points max).
 - ii. Only one object may be transported at a time by the ROV.
 - iii. The objects may be lifted, dragged, or moved by any means using the ROV.
- c. **Finish time:** The run finish time will be combined with the Run 2 finish time and this combined time will be used for tie breaking purposes.

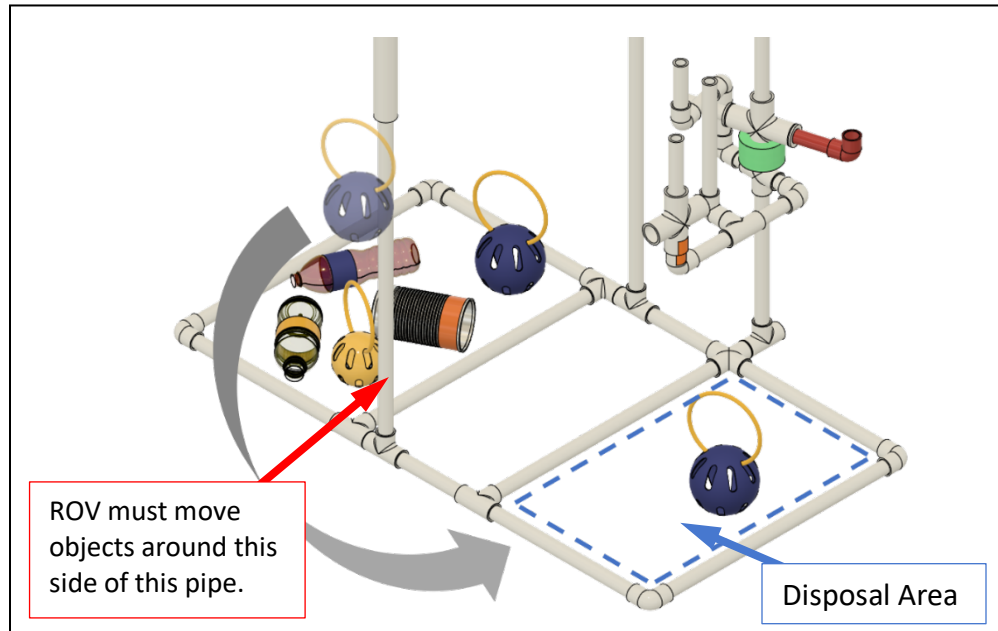


Figure 8 - Mini Course Task 4 ROV Path and Disposal Area (Mini Course)

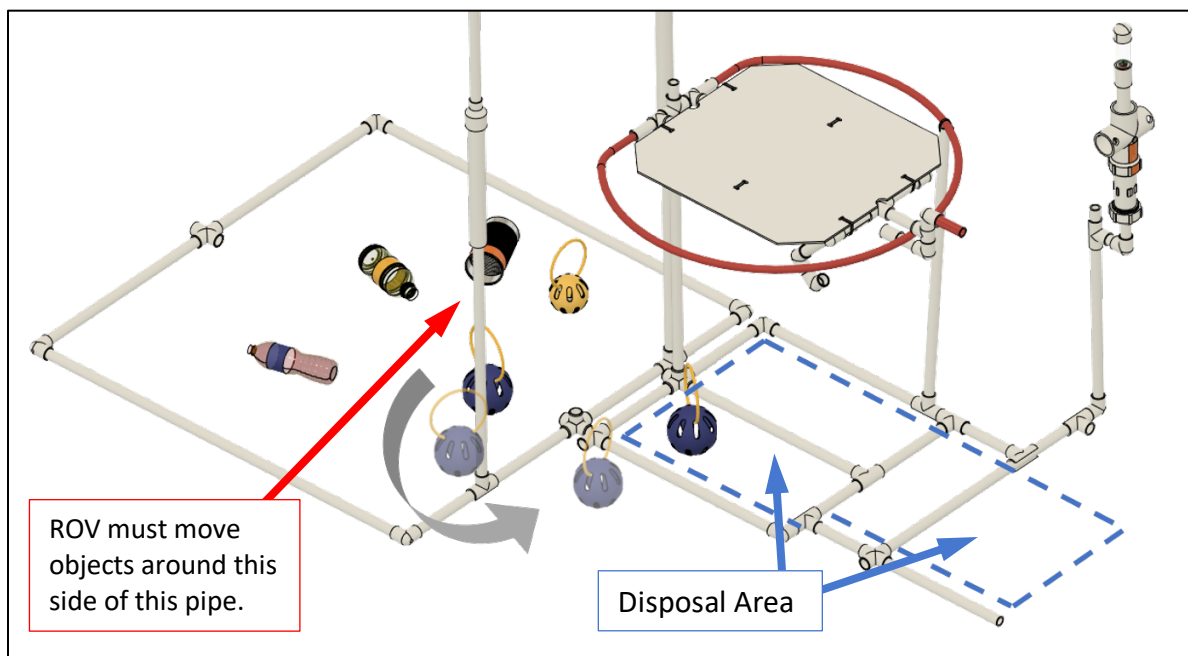


Figure 9 - Task 4 ROV Path and Disposal Area (Full Course)

Submission Instructions

These submission instructions apply to participation and registration for the optional Pool Course event at the 2021 International SeaPerch Challenge. The submissions include videos, images, and document uploads. Additional information for each of these submissions is included below. Please check with your local regional coordinator for rules related to your local regional competition.

1. Pool Event Videos

Two videos must be submitted for these events: one video including the team's Task 1 & 2 effort and one video featuring the team's Task 3 & 4 effort. The following rules apply for all required video submissions:

- Each video must be no longer than 2 minutes and 10 seconds (130 seconds). Videos submitted that are longer than this will not be reviewed, and the team will be disqualified from the event.
- The first 4-5 seconds of the video must show the ROV stationary in the starting position (i.e., not moving forward or diving). To accomplish this, the person videoing the event should start the recording and count down from 5 to 0 with the ROV starting on the 0 mark. The time for the run should start at this point as well.
- Each video must be continuous and uncut. Video judges will use a stopwatch while reviewing the videos to record and verify actual stop and start time of the ROV.
- Videos must clearly show the full course during the entire video.
- Videos should include the team's best attempt. If the ROV becomes entangled in the course structure or if the ROV malfunctions, teams may resolve any issues and create another video for submission.
- Teams will be awarded points for tasks completed during the video.
- If judges identify a discrepancy or rule violation, the team will be questioned, and the score will not be certified until the discrepancy is satisfactorily cleared. If a violation is determined the team will be disqualified from all events within the 2021 International SeaPerch Challenge.

2. ROV & System Images

Teams must submit seven images as supporting documentation. Images required include:

- Front view of ROV
- Back view of ROV
- Top view of ROV
- Bottom view of ROV
- Left view of ROV
- Right view of ROV
- Single image including the ROV, controller, and battery

3. Pool Event Documents

Each team must submit two documents: a compliance checklist and a completed scoresheet. These documents are provided on the website and should be completed and self-certified prior to submission. If judges find major discrepancies in the information provided in these documents, the team's score will not be certified until the discrepancy is satisfactorily cleared. If a violation is determined, the team will be disqualified from all events within the 2021 International SeaPerch Challenge.

4. Submission Checklist

- ☐ Task 1 & 2 video (2:10 max)
- ☐ Task 3 & 4 video (2:10 max)
- ☐ ROV images (6 images)
- ☐ ROV system image (1 image)
- ☐ Self-certified compliance checklist
- ☐ Self-certified scoresheet