ESONANCE 2016

EEE, IUT

resonance of engineering innovation

ROBOMANA V3.0 : RoboRace

Competition Guidelines

organized by

Department of Electrical and Electronic Engineering (EEE)

Islamic University of Technology

technical support

IEEE IUT Student Branch

Organized by :

Esonance 2016 RoboRace Rules

BOT Specifications:

- Robot must be a ground wheeled autonomous vehicle
- The robot must not be built from any sort of ready-made chassis
- **Length**: Maximum length is 30 cm
- **Width**: Maximum width is 20 cm
- **Height**: Not to exceed 20 cm
- **Weight**: 5 kg maximum
- **Power**: Maximum *24* volts on-board power supply
- The robot **must** have a single **kill switch** to turn off the power .
- Each team has to bring their own power supply for charging the robot. No additional equipment/parts will be supplied in the competition
- The robot cannot split into several parts during the run. No other gimmicks may be employed to gain unfair advantage

Arena Specifications:

- Competition arena will be made of a flat wooden platform.
- The arena consists of a semi-gloss painted road (track) with a centered white/black line of *2.5*cm width.
- There will be several elements (turn, bridges, line gaps etc) in the track.
- Position of check points, gaps, obstacles and hill/bridge may be anywhere on the track.
- Lighting levels are unpredictable, so the robot must be able to operate over a wide range of lighting conditions

Scoring:

- Time will be given the first priority in case of scoring. Essentially, the fastest robot to finish the track wins the challenge
- The track will be divided into several zones by using checkpoints. Each checkpoint will have a maximum amount of time and points to offer. The time taken by a robot to cross each checkpoint will be calculated and scoring will be done based on this.
- Points will be awarded based on the formula: $\mathbf{(T_{total} - T_{taken}) * 100}$ *(Time in minutes)*
- Say a checkpoint offers a total of 250 points and max time of 2.5 minutes. A robot takes 1 minute to cross the checkpoint, then points awarded would be (2.5 – 1) * 100 = 150
- In case of restarts, the extra time taken will be counted (Suppose 10 second penalty for each restart)
- If a robot takes more than the max time to travel through a checkpoint, then the extra time will be carried on to the next checkpoint.

**Detailed information about the maximum time, allocated point and location of the checkpoints will be revealed on the day of the competition.

Rules:

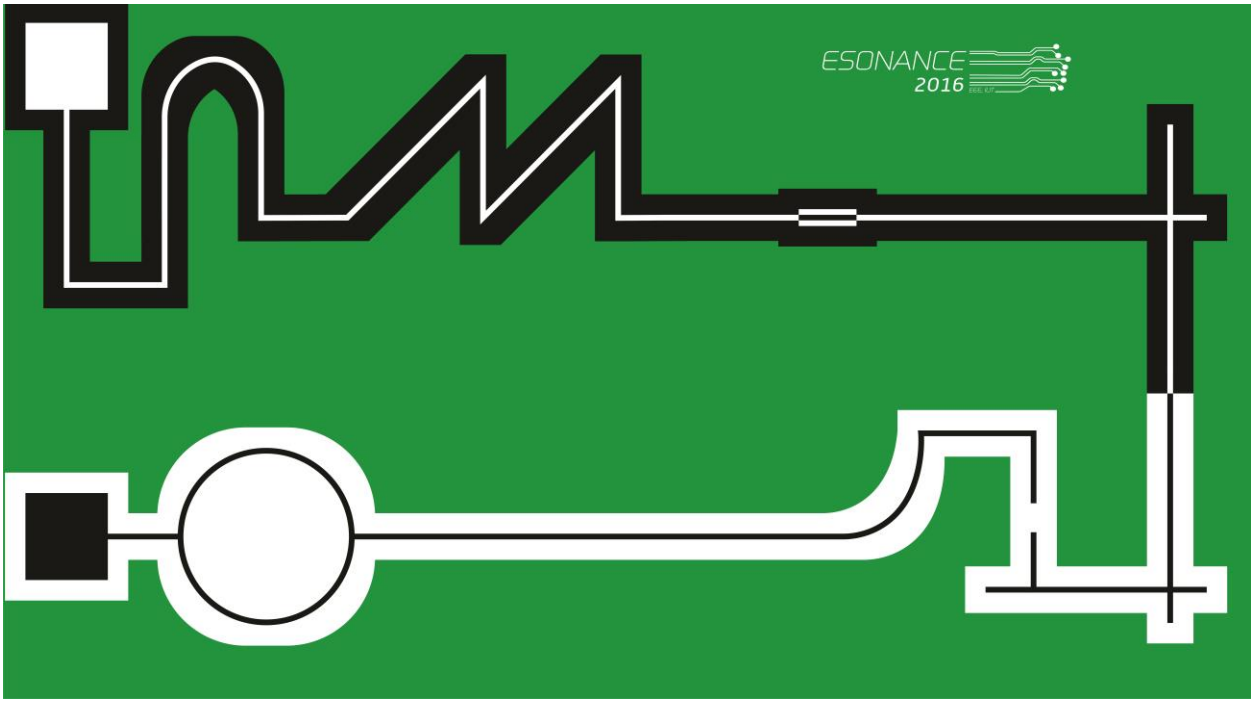
- The number of rounds will be announced a week before the competition. *
- Only one team member may enter the arena and place the robot to start the run
- After the calibration time once the robot starts its run it cannot be touched. If it is picked up or touched, it will be considered as a [1]**restart**
- Points will be awarded only if the robot travels through the whole path of the checkpoint and crosses the line.
- No additional points will be awarded for crossing any element or crossing a checkpoint. Only the calculated points based on the runtime will be awarded
- A restart **must** be taken in case of a [2]**line loss**
- A restart **can** be taken by the team if the robot takes a wrong turn or seems to lose the line. But they have to inform/declare the organizers prior to taking the restart
- Maximum number of restarts: 5 restarts (Max)
- Any kind of [3]cheat/gimmicks will be [4]penalized

1| **Restart:** In case of a restart the robot must be picked up and rerun from the last checkpoint it successfully crossed.
2| **Line loss:** The arena is green and the track is a white on black and also black on white. If a robot enters the green zone, it will be considered as a line loss
3| **Cheat**: Any kind of wireless/wired communication with the robot will be considered as a cheat. The robot must be totally autonomous. Any other form of attempt to gain unfair advantage will also be considered as cheats
4| **Penalty**: Penalties include point deduction or total disqualification based on the offence. The judges will hold the total authority to penalize any team that are caught cheating.

***The judges have the right to modify the rules (if necessary).**
***Modifications will be notified to the contestants prior to the event.**

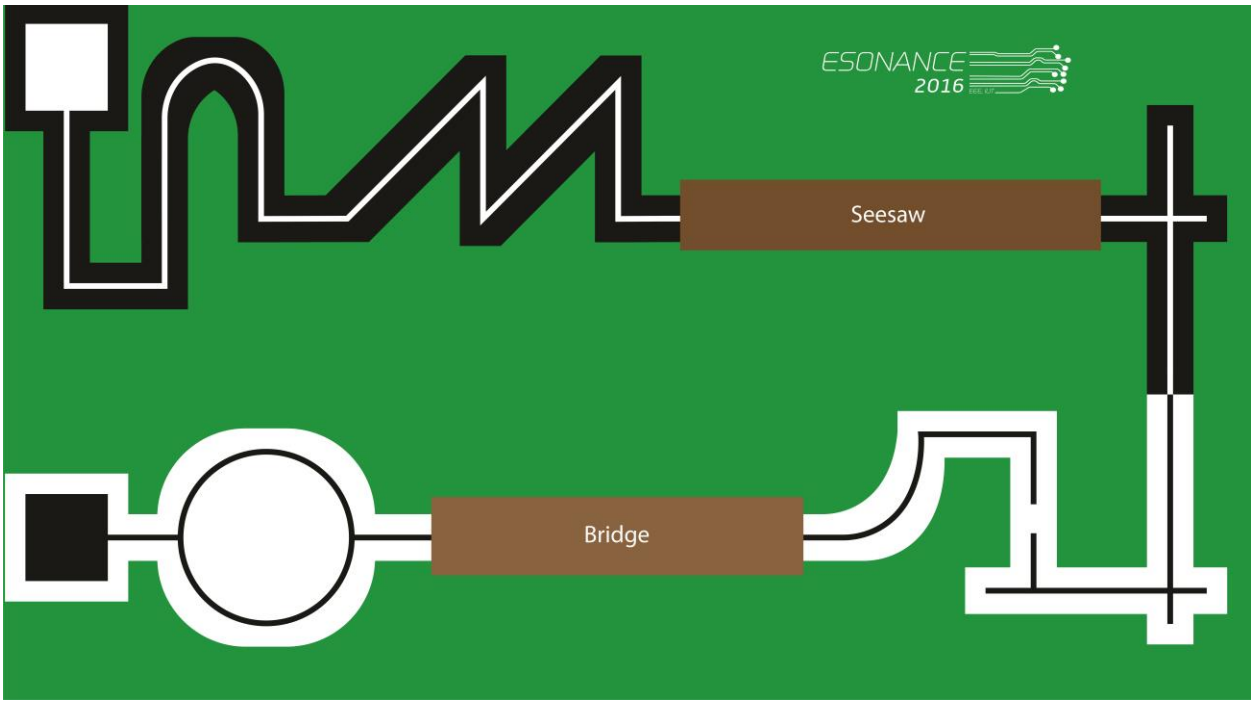
Primary Round track:

Primary round is a typical line follower track without any bridge or seesaw. Half of the track is white line on black surface and rest half is black line on white surface. A rough illustration of the track has been given below:



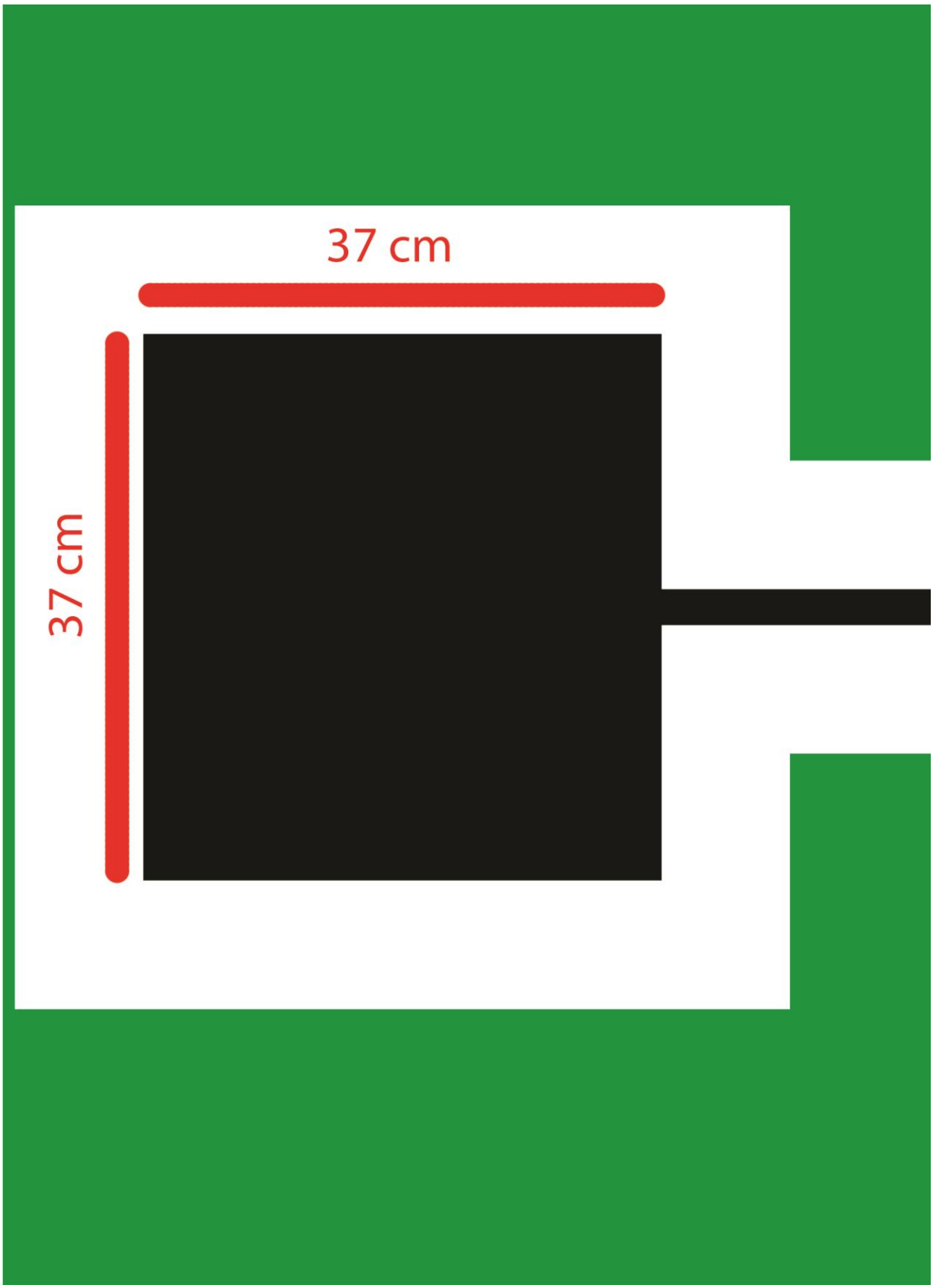
Final round track:

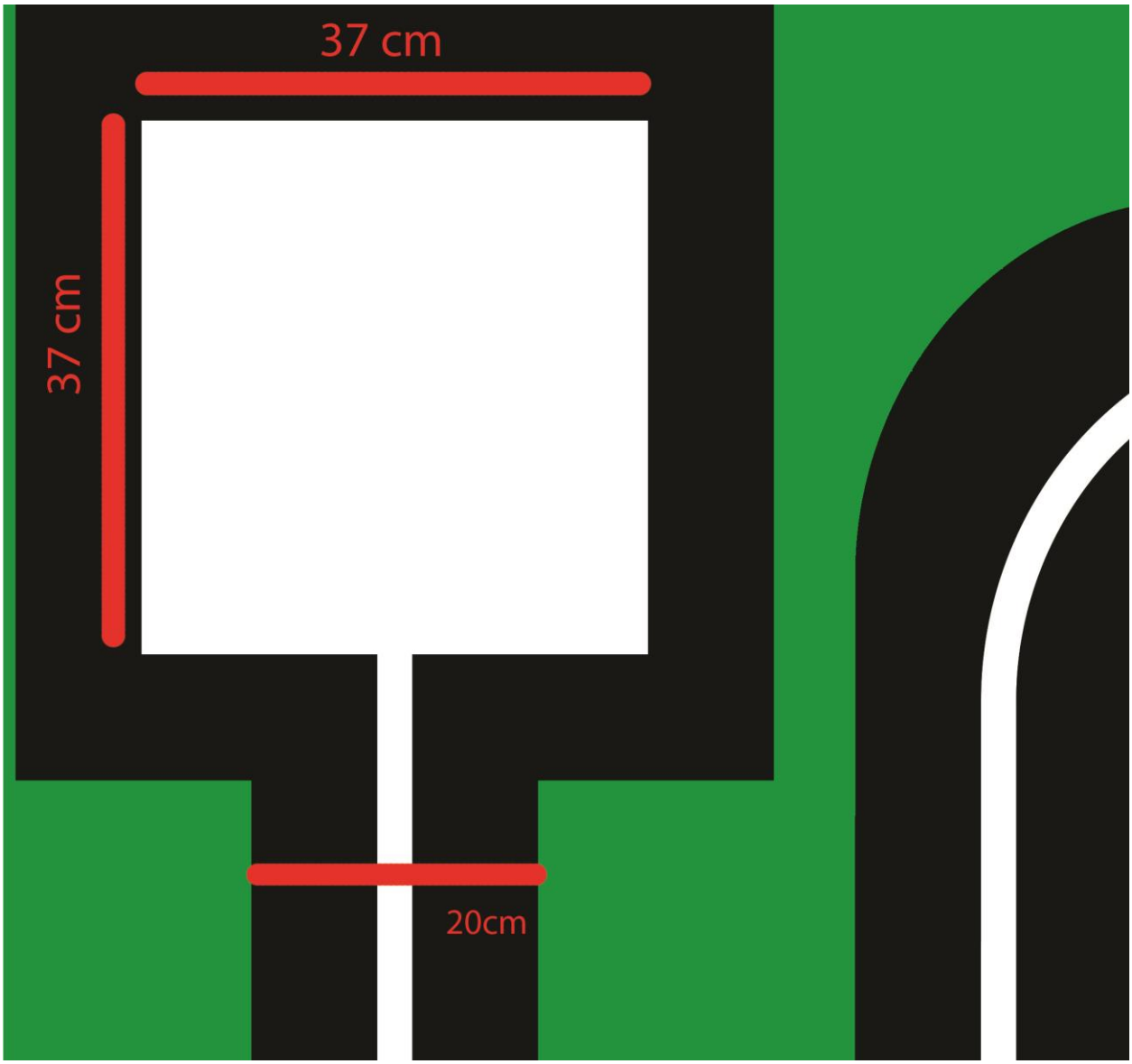
The final round will include a bridge and a seesaw. The slope of the bridge will not exceed 30 degree and the drop of the seesaw will be within safe limits. Probable location of the bridge and seesaw has been shown with an illustration:

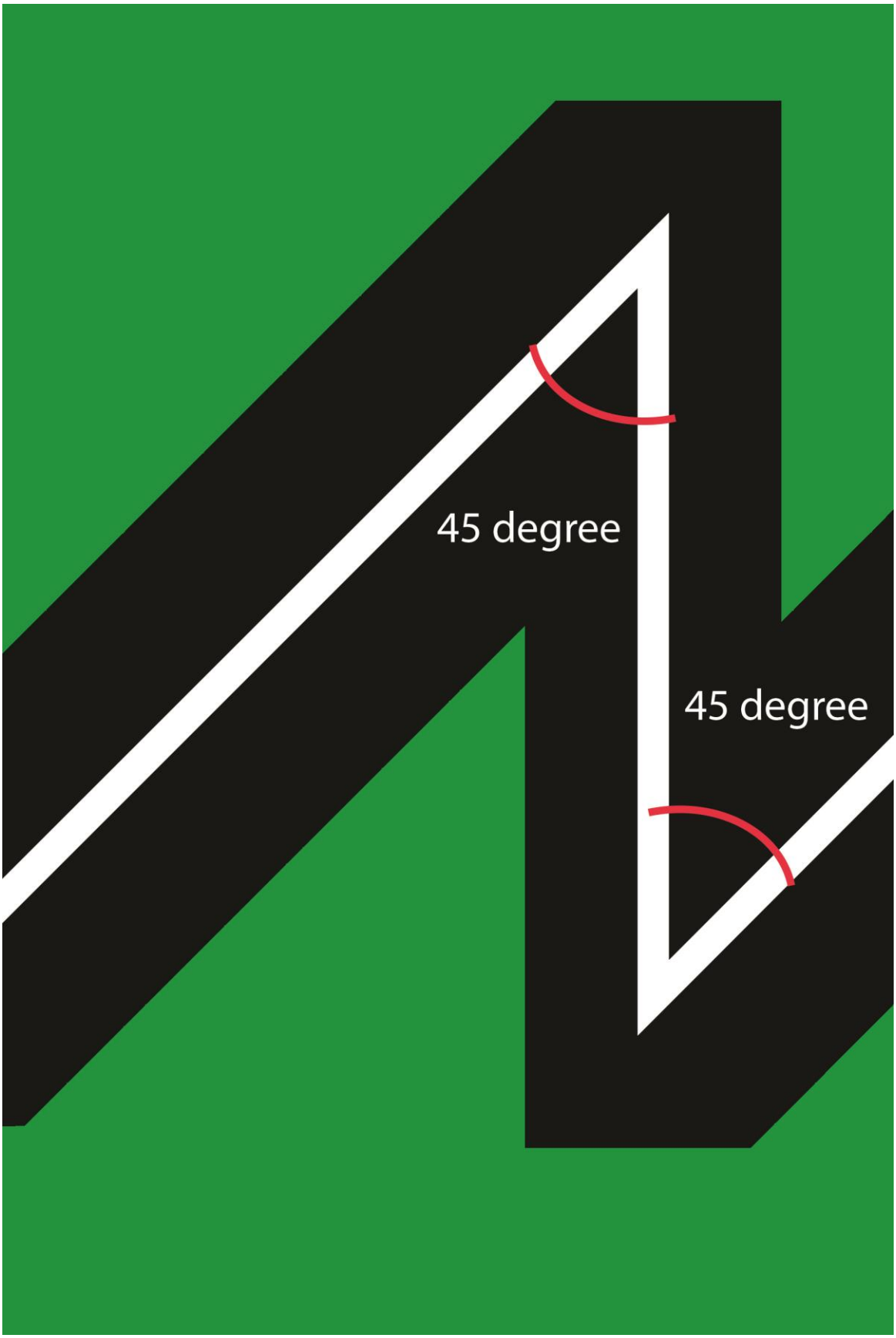


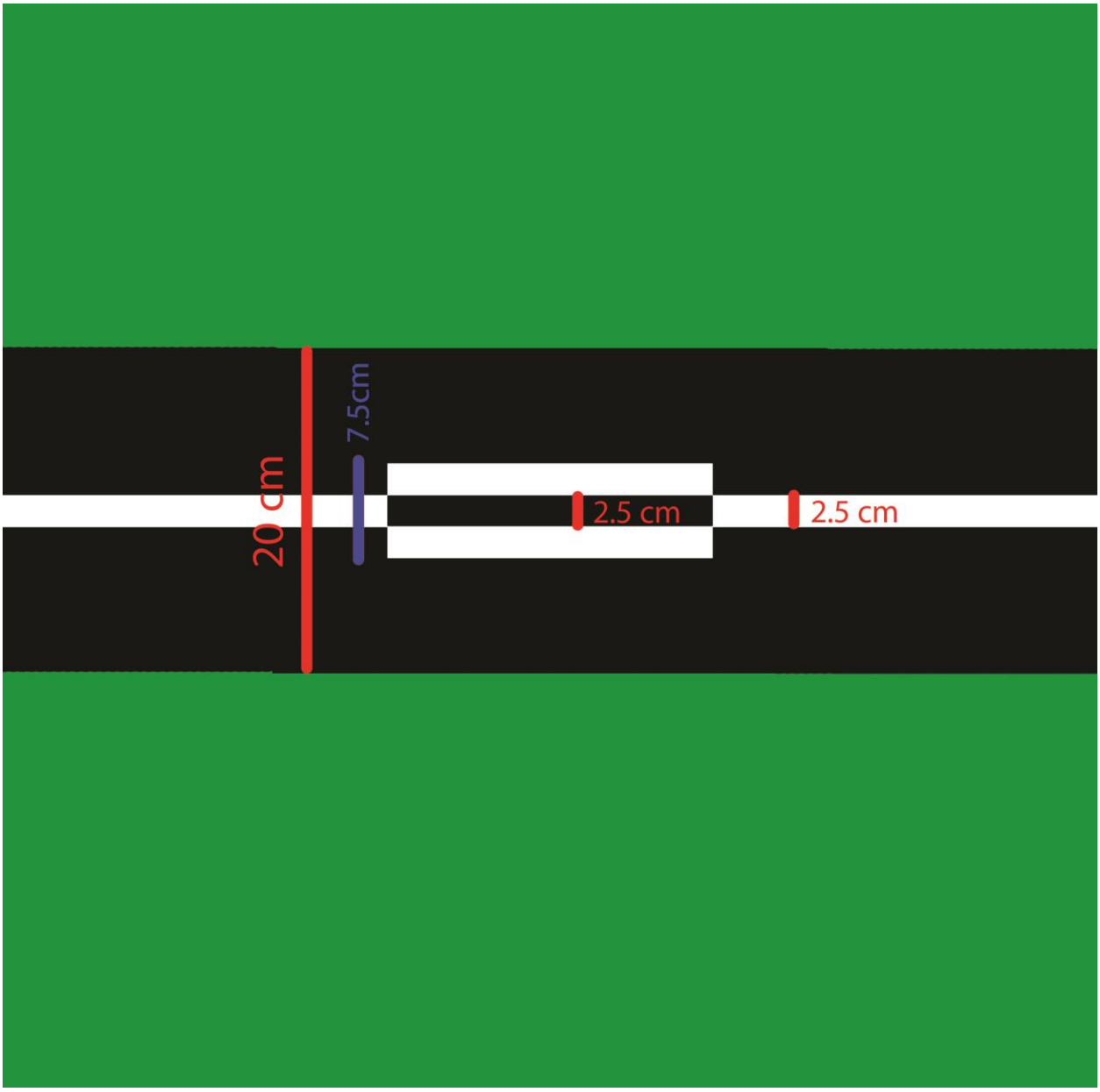
Track specifications:

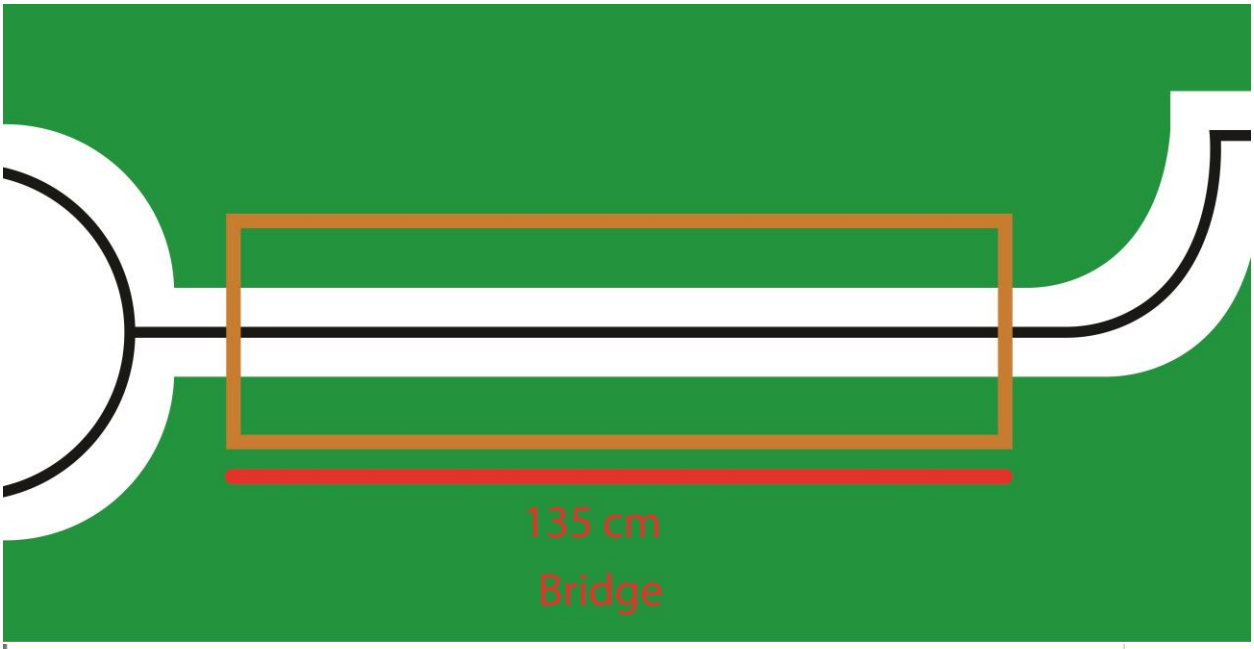
These are some of the rough illustrations of track specifications:


37 cm
37 cm


37 cm
37 cm
20cm


45 degree
45 degree


20 cm
7.5cm
2.5 cm
2.5 cm



Isometric View of Bridge

Isometric of seesaw