

2025 TORONTO CHALLENGE SCENARIO

THE CHALLENGE:

Your team will design and build a device operated by fluid power that picks up wooden cylindrical objects from the “START” position and then places them on one of three destination locations. The object must be moved and placed in an upright position.

Your task will be to transport as many objects as possible in the specified time frame, usually two minutes.

SPECIFICATIONS:

(Please refer to plan and isometric drawings and picture on pages 3,4 and 5.)

The base of your device will sit in the FOOTPRINT AREA, a square, 203 X 203mm, surrounded by a wall approximately 10mm wide and 25mm high. The plane of the START position, the FOOTPRINT AREA and one of the destination locations (#3) is the same. The START position is a small circle 51mm in diameter, where cylinders will be placed at the start of each cycle. Two of the destination locations (#1 and #5) are 51mm above the plane of the FOOTPRINT and START positions. The destination locations are circles 64mm in diameter.

The wooden cylindrical objects are 70mm high by 32mm in diameter and each weighs approximately 43g.

The cylinders will be moved from the start position to one of three locations. Your team can choose a different destination location for each cylinder. The three destinations are worth different points as indicated on the picture: one (1), three (3) and five (5).

Any cylinder dropped in transit will be returned to its starting position. Once a cylinder is moved to its destination zone it will be returned to its starting position ready to be moved again.

*All movements of the device **MUST** be controlled using fluid power.*

DEDUCTIONS:

- *If your team manufactures a device that **only works when it is stabilized by hand(s)** then **only 50% of the “moving object” score will count.***
- *If your team **breaks the device** during the allocated 2 minutes, then your team can repair it during those 2 minutes, and **subsequent ‘moving object’ scores will count 50%.***
- *If your device is **touched by hand in any other way**, then **the “moving object” score will be zero for the pick and place cycle during which the touching occurs.***

BEFORE THE SCHOOL CHALLENGE DAY:

During the Workshop lessons, members of your team will have been introduced to a variety of tools and the materials that you can use to build a device. Your team will have designed, tested and built a prototype device to move the cylinders, and you will have recorded your design process in a team portfolio. In that portfolio, you will also have noted how you could improve your prototype and what you plan to do differently on the Challenge Day. Every member of your team should understand these sections of your portfolio completely so that you can implement those improvements on Challenge Day. Remember that credit will be given to a well-designed device *particularly* one that is strong and stable and rotates efficiently.

AT THE COMPETITION DAY:

Your team will bring two copies of your Design Portfolio to the Competition Day. One of these (for the judges) must be a print-out. The second copy – to be used by your team to guide construction of your device – can be a second print-out or in electronic form on a tablet or laptop computer. Upon arrival at the Competition Day, you will be provided with a new kit of materials to build your device. This “Challenge” kit will have the same parts as the “Prototype” kits that you took back to your school after the Workshop Day with the addition of 8 glue sticks, two 20cc syringes, an extra white syringe holder and an extra 1800mm of tubing.

Referring to your portfolio and working co-operatively and within strict time limits, your team will build the device you have previously designed to meet the Challenge Scenario.

Glue guns will be available at dedicated workstations but only after lunch on the Competition Day. You are encouraged NOT to use hot glue unless it is an emergency. Wood glue and cardboard gussets are much stronger and less likely to come loose if in contact with water.

Using the *Local Challenge Rubric*, The Challenge Judges will evaluate your Design Portfolio, Teamwork & Work Habits and the Design, Construction and Performance of your device as well as asking you four questions specified on the rubric.

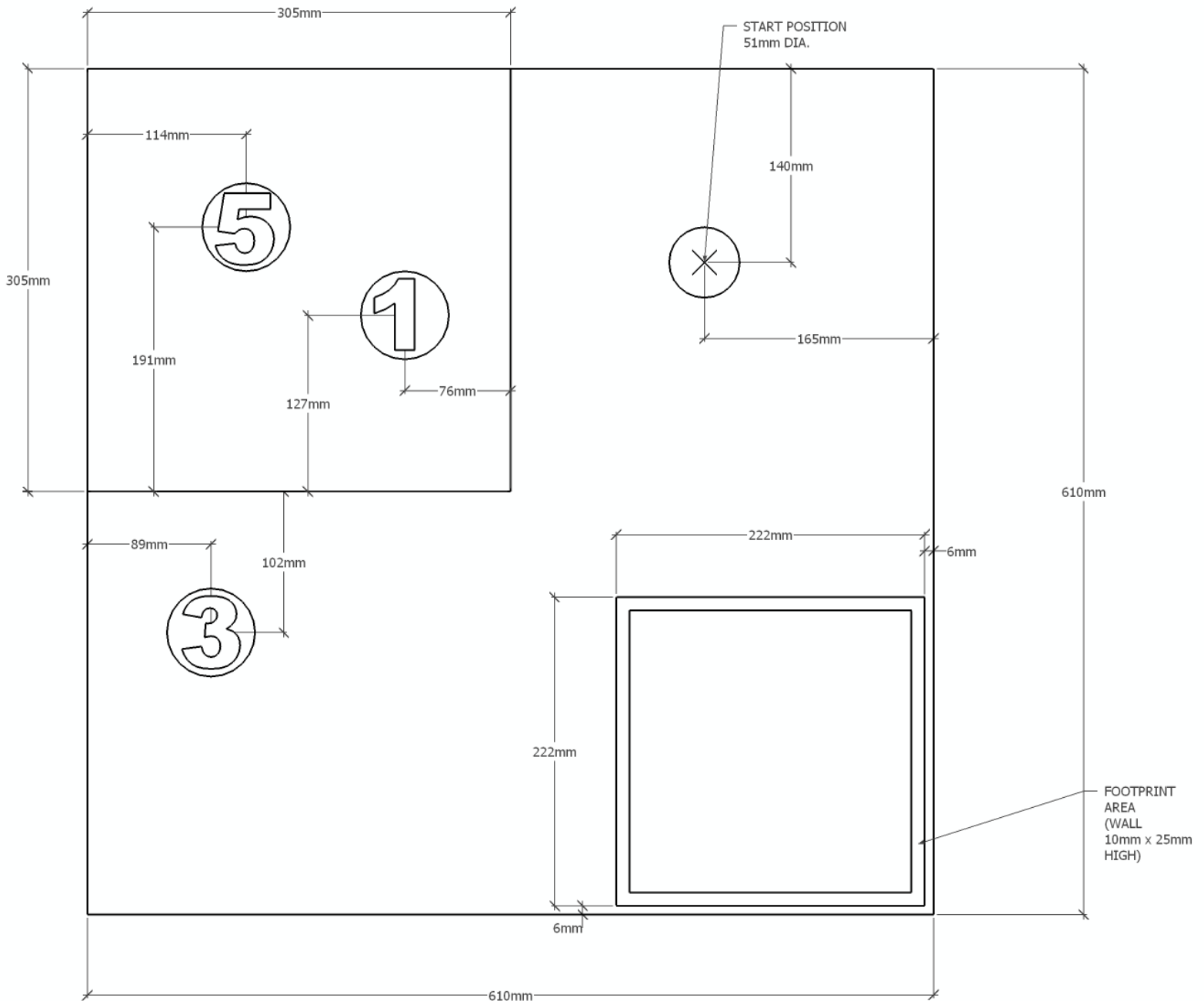
Prizes will be awarded for the best *Overall Score* and the best *Design Portfolio Score*.



**Canadian Fluid
Power Association**

**Association canadienne
d'énergie des fluides**

2025 TORONTO CHALLENGE SCENARIO LAYOUT PLAN VIEW



2025 TORONTO CHALLENGE SCENARIO LAYOUT ISOMETRIC VIEW

