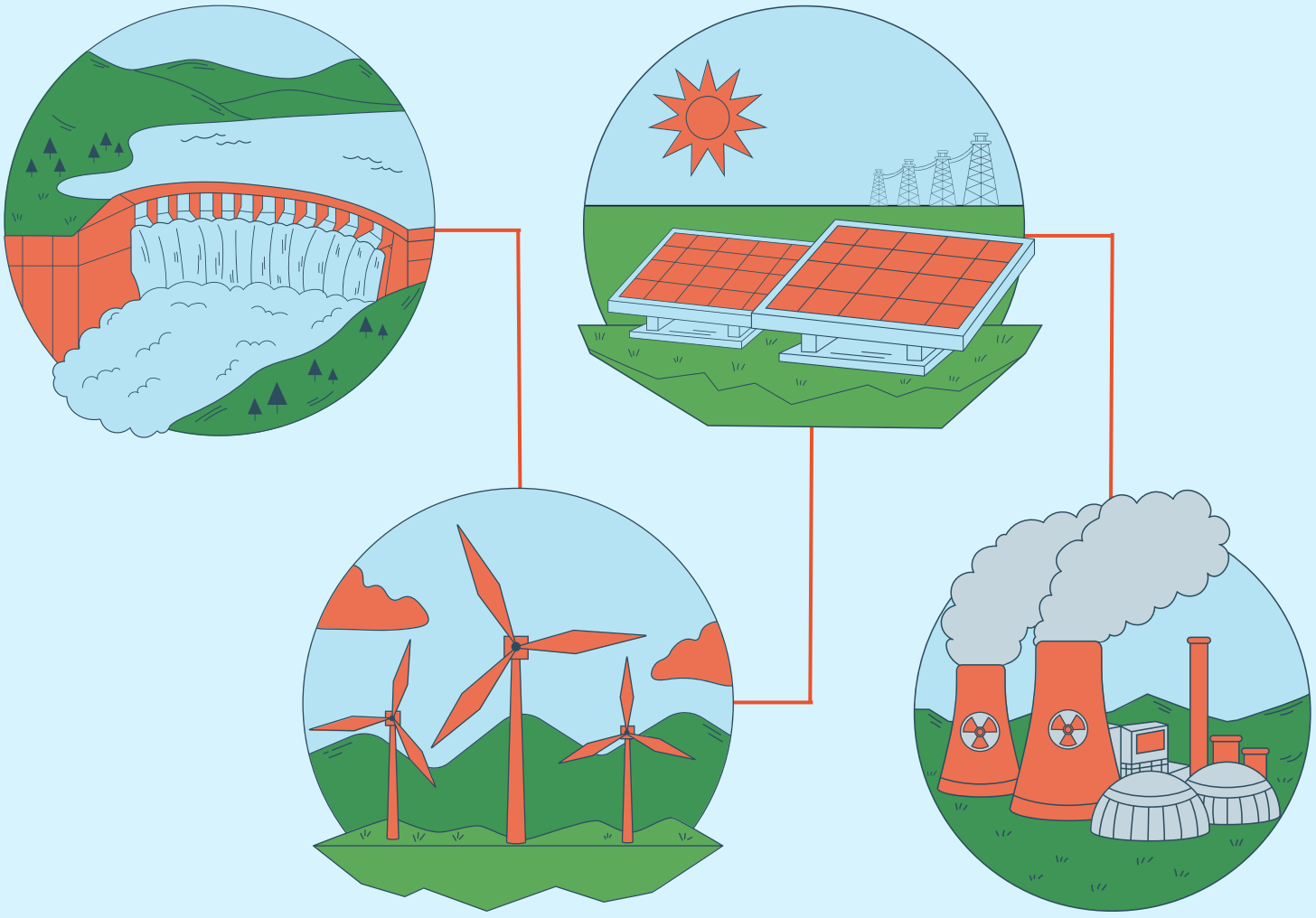
ENGINEERING GAMES 2026
From dream to reality

MACHINE CONSTRUCTION RULEBOOK

JANUARY 3RD TO 7TH 2026 | POLYTECHNIQUE MONTREAL
35TH EDITION OF THE ENGINEERING GAMES



SEPTEMBER 8TH 2025
ENGLISH VERSION

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THE MACHINE CHALLENGE

A true pillar of the Games, the Machine competition tests the technical rigor, creativity, and problem-solving ability of future engineers.

For several months, teams will work tirelessly to design, build, and test a robotic machine capable of tackling a series of technical challenges on a predefined course. Every mechanism, every component, and every line of code must be carefully designed to meet the strict evaluation criteria set by the jury.

Beyond mechanical performance, teams will need to demonstrate flawless coordination, resilience, and a strong ability to adapt. This multidisciplinary challenge is a unique opportunity to put their technical skills into practice while developing an unshakable team spirit.

The projects will then be presented at the Engineering Games in January 2026, before a panel of experts who will no doubt be impressed by the ingenuity of the participants.

Get ready to push the limits of innovation!

The Machine Team

THANK YOU TO THE OFFICIAL SPONSOR OF THE MACHINE COMPETITION!

Intelcom

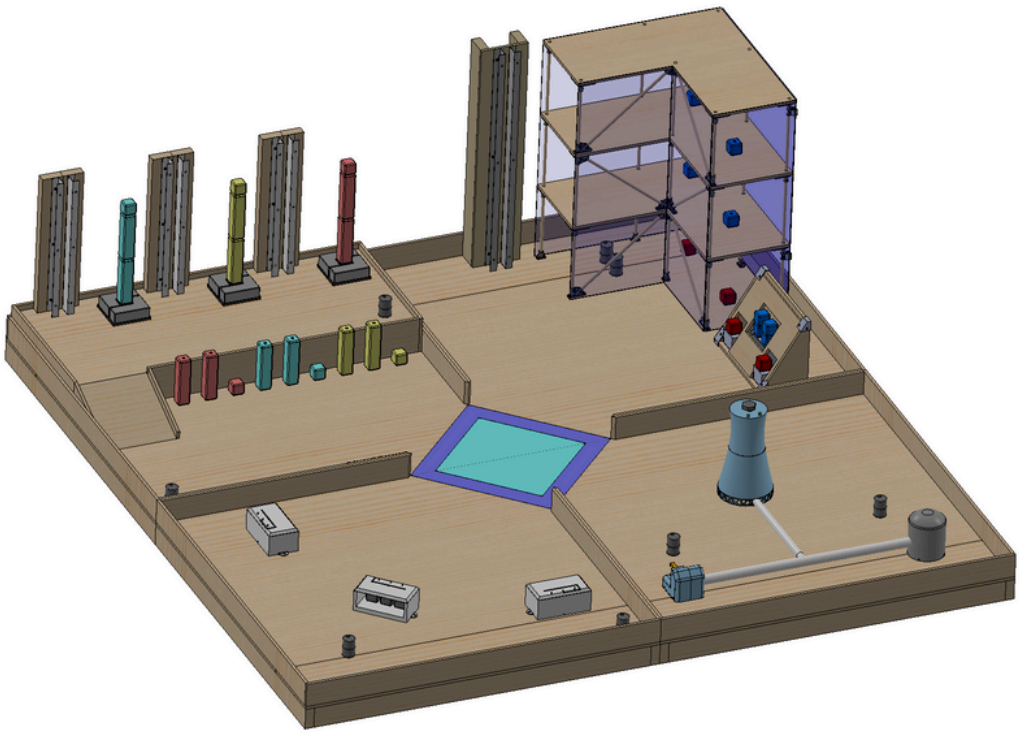
1. INTRODUCTION

This document aims to present to the teams the different steps necessary for the realization of the course of the Machine Challenge of the 2026 Engineering Games.

The organizing committee offers two options for setting up the course: either a complete construction, where all the course elements will be identical to the course that will be used during the official trial of the challenge, or a simplified version, less costly and requiring fewer resources. This simplified version will still allow for the evaluation of robotic solutions on all aspects of the challenge.

The purpose of this rulebook is to present and guide the machine teams from the different participating universities in constructing their course for the Machine Challenge of the 2026 Engineering Games.

For 3D printed parts, the CAD files will be provided. The electrical circuits will all be provided to allow for reproduction of the challenge course.



2. PLATEFORM

2.1 COMPLETE CONSTRUCTION

Here is the material required to build the complete platform:

- **4' x 8' x ½" plywood sheets (6x)**
- **2"x4"**
- **1" wood screws**
- **1.5" wood screws**
- **3" wood screws**
- **Corner brackets (48x)**

The platform is the base on which the components of each section are installed. The modular design of the entire setup helps simplify both installation and storage. The platform is made up of 4 sections, each measuring 5' x 5'. Each section consists of a frame and a sheet of plywood, along with edging.

Assembly steps:

1. Cut the plywood sheets and 2"x4" lumber as shown in the plans.
2. Assemble the frame using the 3" screws, screw the plywood sheets onto the frame using the 1.5" screws, and attach the edges using the corner brackets and 1" wood screws according to the plans.

Repeat step 2 of this procedure for all 4 sections of the platform. The sections can be joined together using the 3" wood screws listed in the materials. You can use the leftover plywood for the individual challenge sections (see the plans).

2. PLATFORM

2.2 SIMPLIFIED CONSTRUCTION

It is possible to build only one-quarter of the platform in order to reduce costs and the amount of storage space required. In this case, the team only needs to change what is installed on the platform (Hydroelectric, Wind, Nuclear, or Solar) in order to test each section.

Materials required to build the simplified platform:

- **4' x 8' x ½" plywood sheets (3x)**
- **2"x4"**
- **1" wood screws**
- **1.5" wood screws**
- **3" wood screws**
- **Corner brackets (12x)**

Assembly steps:

1. Cut the plywood sheets and 2"x4" lumber as shown in the plans.
2. Assemble the frame using the 3" screws, screw the plywood sheets onto the frame using the 1.5" screws, and attach the edges using the corner brackets and 1" wood screws according to the plans.

You can use the leftover plywood for the individual challenge sections (see the plans).

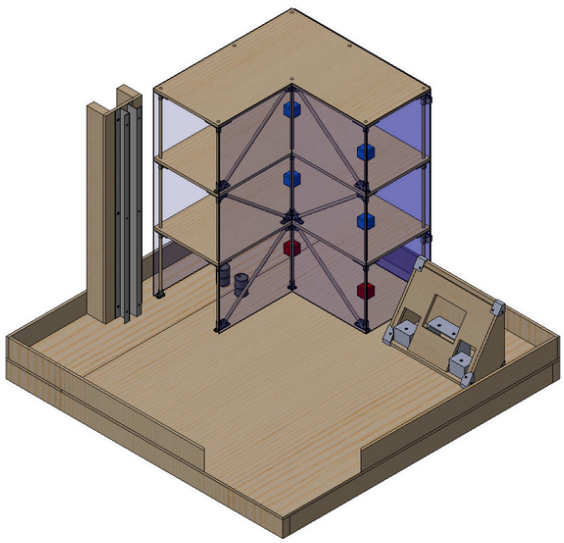
3. HYDROELECTRIC POWER PLANT

3.1 INTRODUCTION

Here is the material required for the construction of the hydroelectric section:

- **½" (13 mm) plywood (see plans for quantity)**
- **½" (13 mm) diameter wooden rods, 48" (1220 mm) long (11x)**
- **2"x4" (see plans for quantity)**
- **Metal strapping for #8 diameter screws (1 pack)**
- **Provided aluminum rails (2x 39")**
- **M2 screws and nuts, 20 mm long (43x)**
- **M2 screws and nuts, 25 mm long (10x)**
- **1" (25 mm) flat head screws (12x)**
- **⅝" (16 mm) flat head screws (85x)**
- **½" (13 mm) flat head screws (18x)**
- **1 1/2" (39mm) flat head screws (6x)**
- **3" (75 mm) wood screws (2x)**
- **PLA filament**

During the on-stage competition, plexiglass will be attached to the sides of the search zone to prevent your robot from falling. However, to avoid costs, you are invited to apply your own safety measures (mesh screen, etc.).

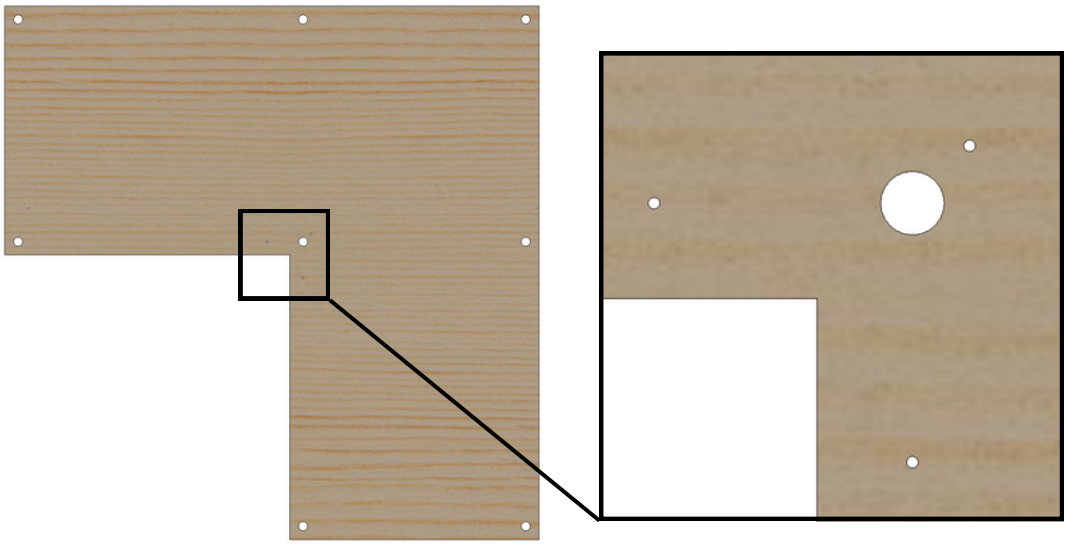


3. HYDROELECTRIC POWER PLANT

3.2 SEARCH ZONE DESCRIPTION

Here are the main construction guidelines for the floors of the search zone:

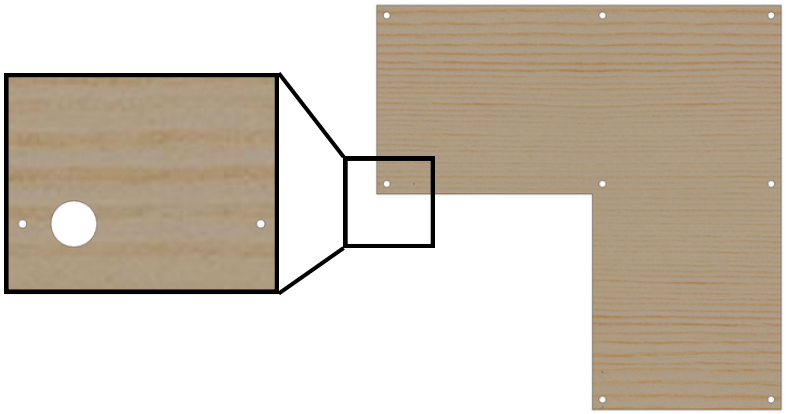
- Each floor of the Search Zone has the same dimensions: an L-shape of 30” (762 mm) by 30”, with a leg width of 14” (356 mm)
- The column holes are ½” (13 mm) in diameter and are positioned ¾” (19 mm) from the edge of the board (distance between the center of the hole and the edge of the board)
- Some of these floors have holes of 3/32” (2.4 mm) in diameter. The first floor has the code F-1, the second F-2, and the roof is F-3
  - For the placement of M2 screw holes on floor F-1, see the diagrams, the plans and use any of the B pieces for reference
  - For the placement of M2 screw holes on floor F-2, see the diagrams, the plans and use any of the A-2 pieces for reference
- Each 3D printed part has its code inscribed on the piece to help you place them



Floor F-1 with M2 screw holes

3. HYDROELECTRIC POWER PLANT

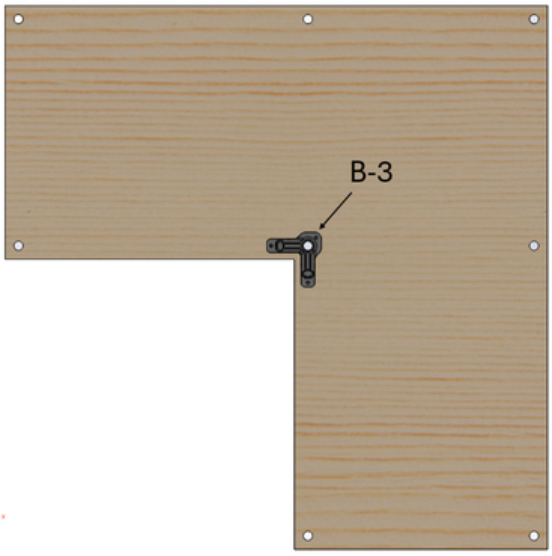
3.2 SEARCH ZONE DESCRIPTION (CONTINUED)



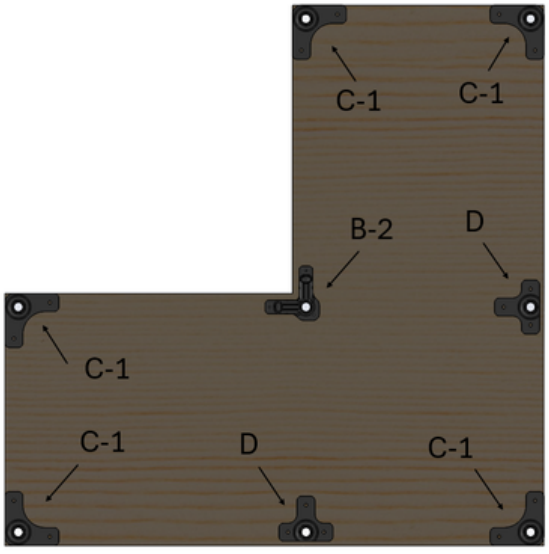
Detail of the holes for M2 screws on F-2

Floor F-3

Each floor has its configuration of 3D printed parts: some on the top and some on the bottom of the floor.



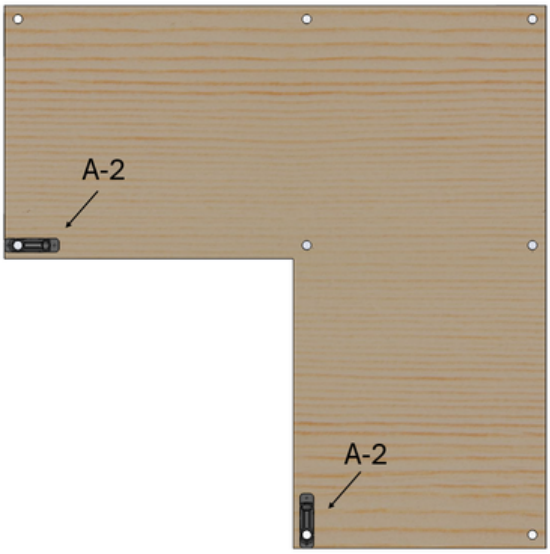
Top of F-1



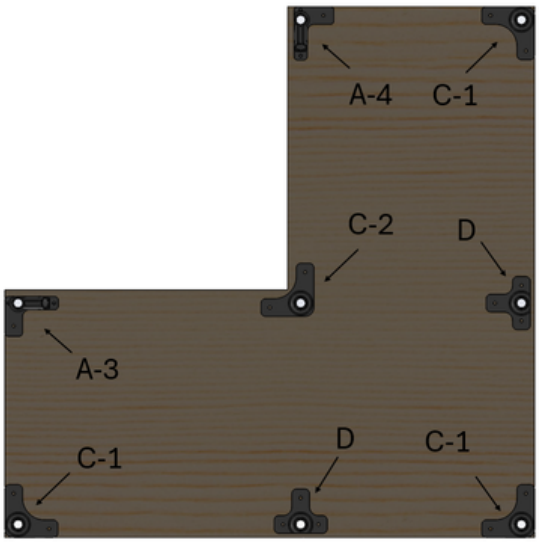
Bottom of F-1

3. HYDROELECTRIC POWER PLANT

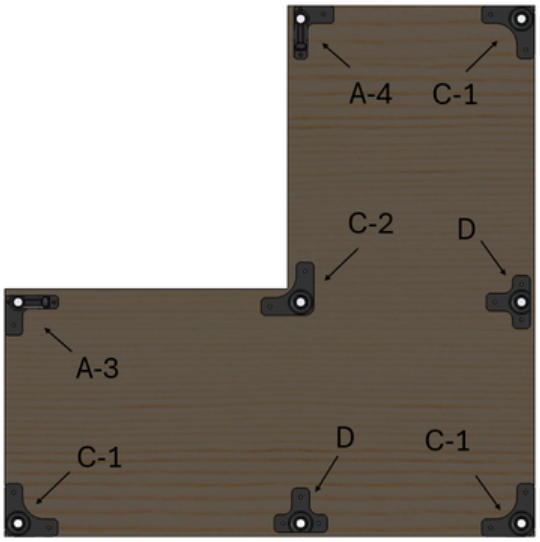
3.2 SEARCH ZONE DESCRIPTION (CONTINUED)



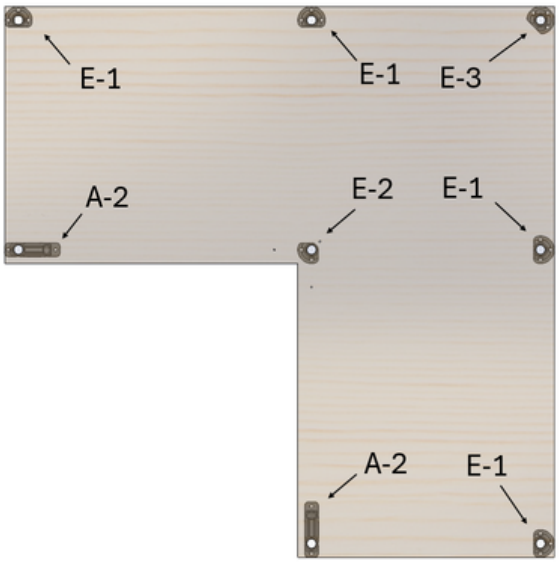
Top of F-2



Bottom of F-2



Bottom of F-3



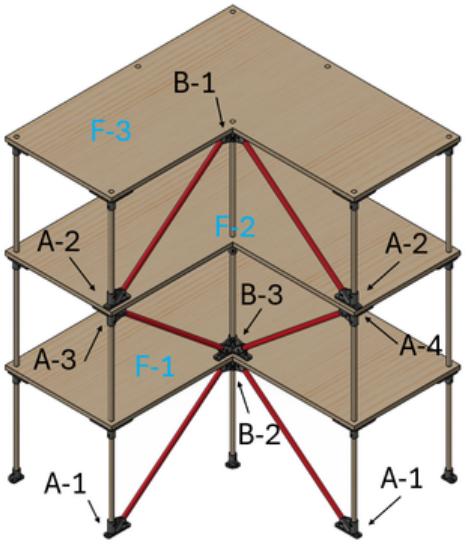
Floor (View through F-1)

3. HYDROELECTRIC POWER PLANT

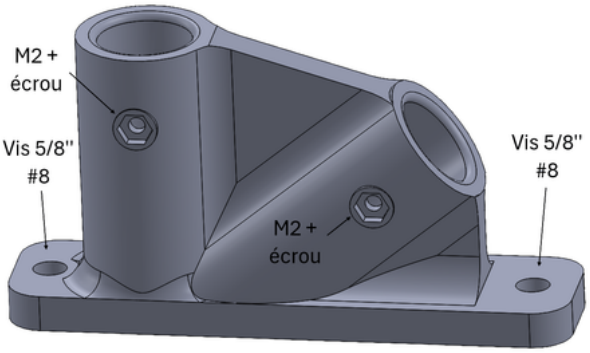
3.2 SEARCH ZONE DESCRIPTION (CONTINUED)

Each column must be cut to 39” (991 mm) long. You must have 8 columns in total, which are inserted into the ½” holes. Note that the columns also pass through the roof (F-3): they are properly positioned when their top is flush with the top of the roof.

The braces are placed diagonally and must be cut to 18 ½” (470 mm) long. They are inserted as shown in the following diagram, where the braces are in red, the floor names in blue, and the parts they attach to in black.



Bracing installation diagram



Part A-1 with hole details

The 3D printed parts have three types of holes:

- Holes of 4.35 mm in diameter to accommodate #8 diameter screws
- Holes of 2.3 mm in diameter to accommodate M2 screws
- Holes of 2.3 mm in diameter with receptacle for M2 nuts

The M2 screws are used to secure the printed parts with the columns, braces, and floors. The 20 mm M2 screws are used to secure the columns and braces. The 25 mm M2 screws are for securing parts A-2 and A-3, A-2 and A-4, and B-3 and B-2 together, through the floor. The printed parts with holes for #8 screws are fastened with ⅝” long screws.

3. HYDROELECTRIC POWER PLANT

3.3 SEARCH ZONE ASSEMBLY

The assembly steps can be summarized as follows:

1. Cut 30” (762 mm) squares out of plywood and stack them together

2.Cut a 16” (406 mm) by 16” square out of one of the corners on all 3 floors at once

3.While keeping the floors together, drill the ½” (13 mm) column holes ¾” (19 mm) from the edges, as shown in the diagrams

- Note that the columns “in the middle” of the 30” side are not actually in the middle; they are aligned with the holes on the short sides. See the figure on the right for more details

Alignment of ½” holes

4.Screw the A, B, C, and D pieces as shown in the diagrams

5.Drill the M2 holes on the B and A pieces precisely; otherwise, the braces will not be properly aligned

6.Cut 8 columns from the ½” rods at 39” (991 mm) long and insert them into the column holes for floor F-3 only

7.Fasten the columns to F-3 with M2 screws, drilling the holes through the columns

8.Cut 6 braces from the ½” rods at 18 ½” (470 mm) long

9.Insert the braces connected to B-1. Do not fasten them right away

10. Insert the A-2 pieces into the columns and attach them with the braces connected to B-1.

11. Insert floor F-2 into the columns

12. Fasten floor F-2 to the columns with M2 screws, so that the top of floor F-2 is 13” (330 mm) from the top of F-3

13. Fasten the B-1 and A-2 pieces with M2 screws in their respective holes through F-2 and F-3

14. Repeat steps 8 to 12 with the braces in pieces B-2, A-3, and A-4, fasten the top of floor F-1 to 13” from the top of floor F-2, and fasten pieces B-2, A-3, and A-4 with M2 screws

15. Fasten the E pieces to the base of the columns

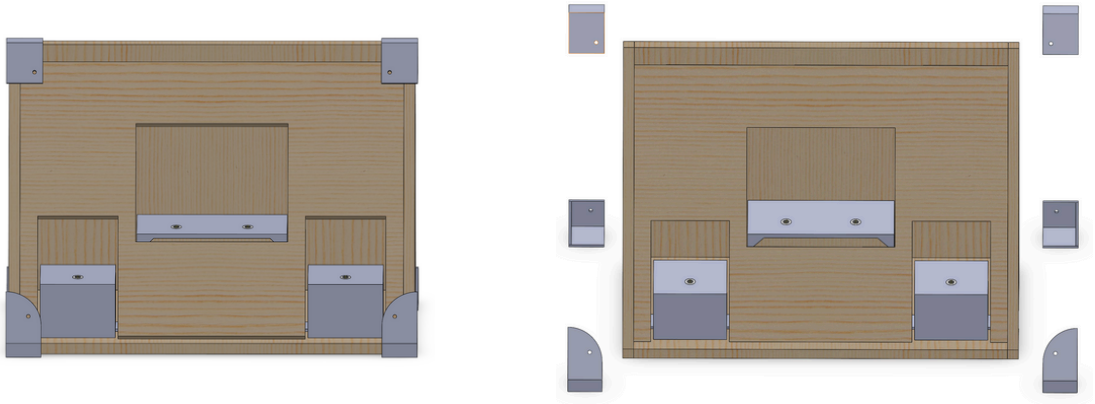
16. Insert the braces into B-3 and A-2 and fasten the B-3 and A-2 pieces

17. Fasten the E and A-2 pieces to the floor, and do not forget to keep the vertical alignment of the columns to ensure the necessary spacing between the columns

3. HYDROELECTRIC POWER PLANT

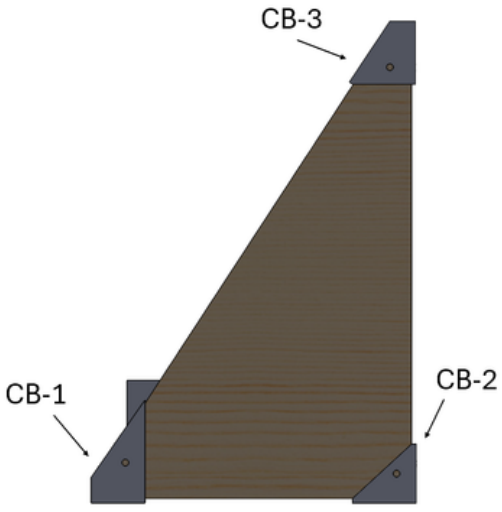
3.4 DESCRIPTION OF THE DAM

The dam is made up of 5 pieces of plywood assembled with 3D printed parts and two block supports. All the parts are fastened with ½" #8 screws.

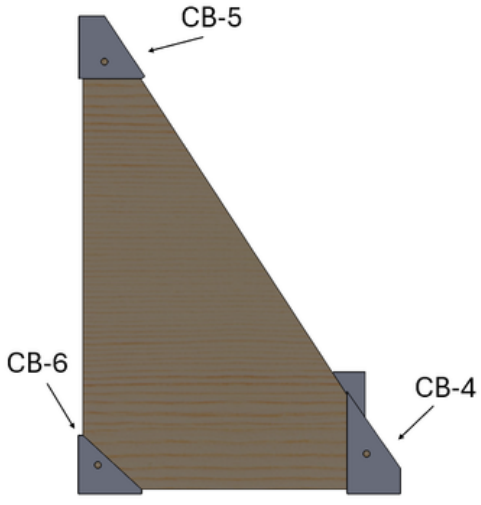


General assembly of the dam

Refer to the diagrams from the plans for the ½" plywood pieces to be fabricated. All the parts are held together according to the following diagrams:



Right side of the dam

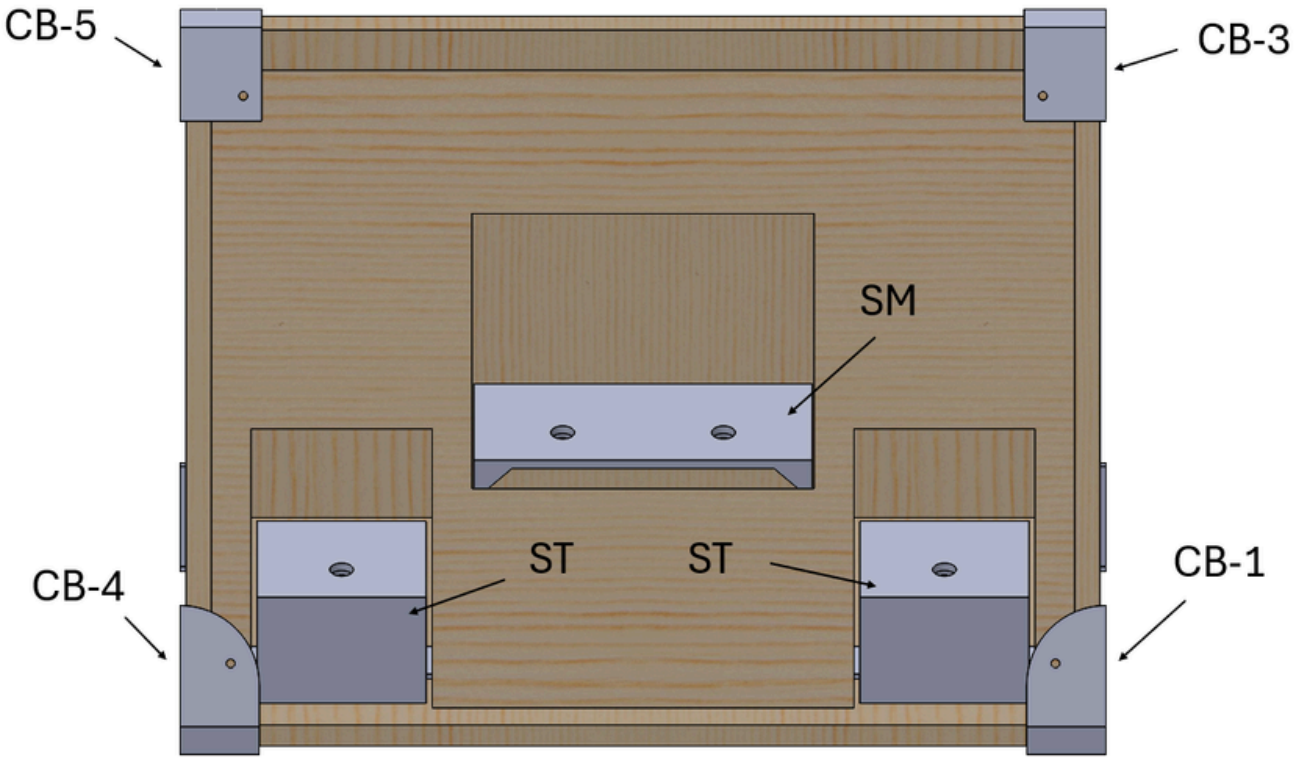


Left side of the dam

3. HYDROELECTRIC POWER PLANT

3.4 DESCRIPTION OF THE DAM (CONTINUED)

The ST pieces must be centered with the openings and placed ¾" (20 mm) from the front of the dam. The SM piece must be centered with the opening and placed 3 9/16" (90 mm) from the front of the dam. These pieces are screwed into the bottom piece with ½" (13 mm) #8 screws. These pieces serve to support the blocks and hold them in place with the magnets of the pogopins, which will be inserted into their bases and which will be provided to you.



Front of the dam

3. HYDROELECTRIC POWER PLANT

3.5 DAM ASSEMBLY

The assembly steps of the dam can be summarized as follows:

- Cut the plywood pieces as shown in the diagrams
- Assemble the back and bottom pieces with all the CB-2 and CB-6 parts
- Set up the block supports
- Install the CB-3 and CB-5 parts
- Fasten the front piece in place with the CB-3 and CB-5 corners
- Fasten the CB-4 and CB-1 parts
- Fasten the bottom piece to the floor with two 1” screws

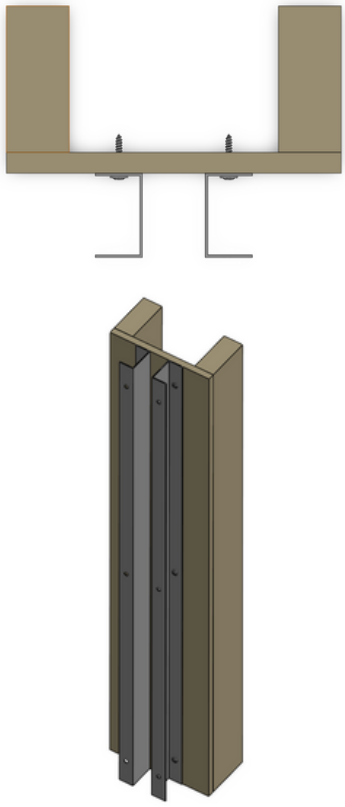
3. HYDROELECTRIC POWER PLANT

3.6 DESCRIPTION OF THE RAIL SUPPORT

The rail support is composed of two 2x4s, a plywood piece fastened onto the 2x4s, and rails screwed onto the plywood. The support has been tested for its rigidity and its ability to hold heavy loads.

You will notice that the rails have two types of holes: holes with a diameter of 5/16” (8 mm) and holes of 3/16” (5 mm). The larger holes are there so that you can screw in the #8 screws that will fasten the rails to the support. The rails are held by 1” (25 mm) screws, screwed into the plywood. The rails are made of aluminum and are exactly 39” (991 mm) long. They are spaced, back to back, 1.5” (38 mm) apart, and are, of course, centered on the plywood. The manufacturing of these rails was done by hand with industrial tools: it is possible that these rails may not be perfect (hole alignment).

We apologize for this inconvenience. However, we encourage you to “rework” the rail if necessary. In addition, the OC guarantees that the rails will be perfect for the competition. The 2x4s are 39” (991 mm) long, and the plywood has dimensions of 8” (200 mm) wide by 39” (991 mm) long.



Rail support

The plywood is fastened to the 2x4s with 1 1/2” screws, using 3 screws per 2x4. To fasten the support to the floor, 3” (75 mm) screws are screwed through the floor into the bottom end of the 2x4s. As indicated at the beginning of this section, you will need metal strapping. The strapping is recommended to have a minimum length of 8” (200 mm). This strapping must be anchored into the 2x4 supporting the floor and fastened onto the back of the 2x4s, in order to obtain maximum resistance to bending.

To help the support avoid bending during the propulsion of your robotic solution, it is recommended to install a 2x4 under the floor at a distance of 6” (150 mm) from the side. This distance is measured from the side of the field to the middle of the installed 2x4. Therefore, it must be placed under the spot where the rails touch the ground.

3. HYDROELECTRIC POWER PLANT

3.7 RAIL SUPPORT ASSEMBLY

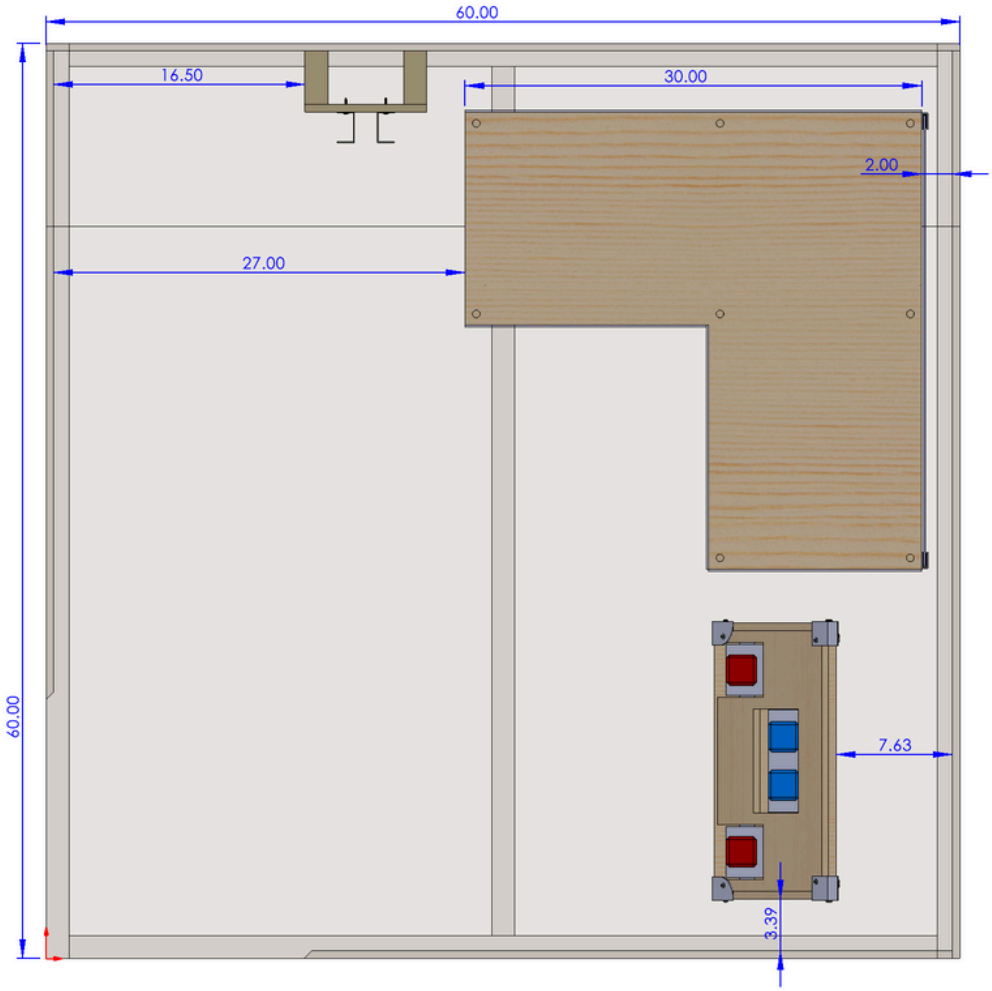
The assembly steps of the rail support can be summarized as follows:

- Cut two 2x4s to 39” long
- Cut a plywood board to 8” by 39”
- Assemble and fasten the 2x4s to the plywood as shown in the diagram, with 1 1/2” #8 screws
- Fasten the rails to the plywood, as described above, with 1” screws
    - Be careful with any protruding points
- Fasten the support to the floor with 3” (75 mm) screws through the floor and into the ends of the 2x4s
    - Make sure the back of the support is aligned with the side of the floor
- Cut two sections of metal strapping to the desired length
    - At least 8” long is recommended
- Fasten one strap to each 2x4 and fasten the other end to the 2x4 that supports the floor

3. HYDROELECTRIC POWER PLANT

3.8 ASSEMBLY OF THE PARTS

The different elements of the hydro challenge are assembled as shown here:



Position of elements (refer to the plans for more details)

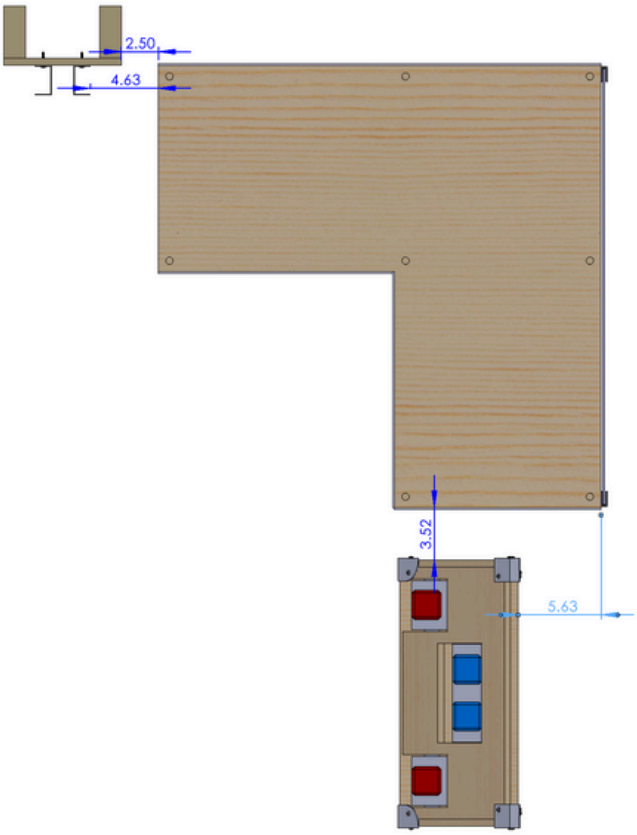
The side of the Search Zone adjacent to the dam is located 2” (50 mm) from the edge. See the plans for more details

3. HYDROELECTRIC POWER PLANT

3.8 ASSEMBLY OF THE PARTS (CONTINUED)

The rail support is placed back-to-back with the side of the course. The Search Zone is aligned with the outer face (the face with the large holes) of the rails, i.e., 6” (150 mm) from the side of the floor.

The rail support and the Search Zone are separated by a distance of 2 ½” (64 mm), as shown in the diagram below. The dam is located on the other side of the L of the Search Zone. The front of the dam is aligned with the side of the Search Zone and is centered in the remaining space.



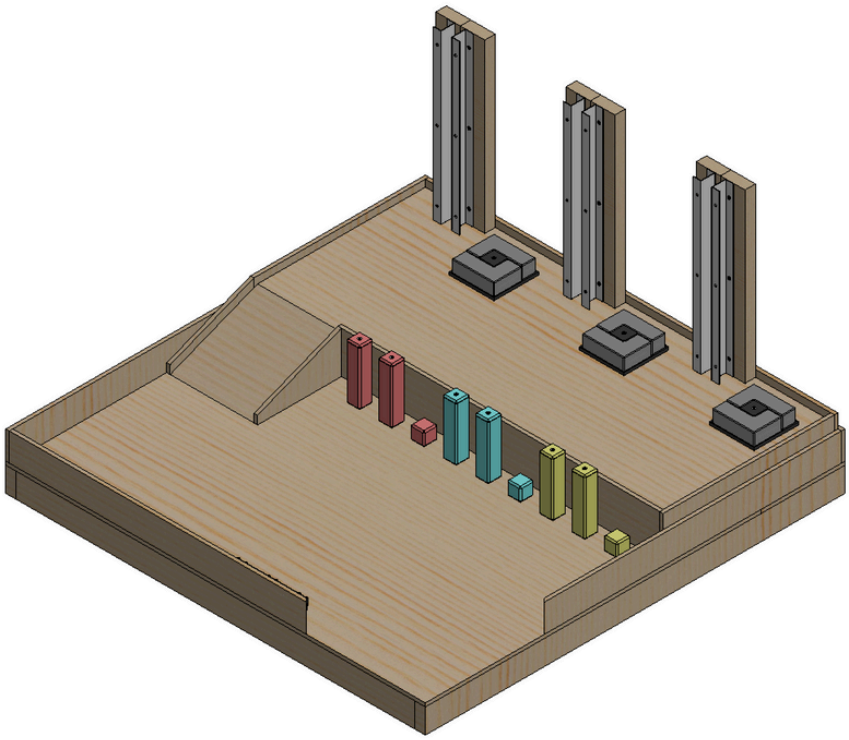
Arrangement of the components between each other

4. WIND POWER PLANT

4.1 INTRODUCTION

Here is the material required for the construction of the wind section:

- **½" (13 mm) plywood (see plans for quantity)**
- **2"x4" (see plans for quantity)**
- **#8 flat head wood screws, ⅝" (16 mm) long (12x)**
- **#8 wood screws, 1" (25 mm) long (21x)**
- **#8 flat head wood screws, 1 1/2" (39 mm) long (18x)**
- **#8 wood screws, 3" (75 mm) long (17x)**
- **#8 wood screws, 2" (50 mm) long (13x)**



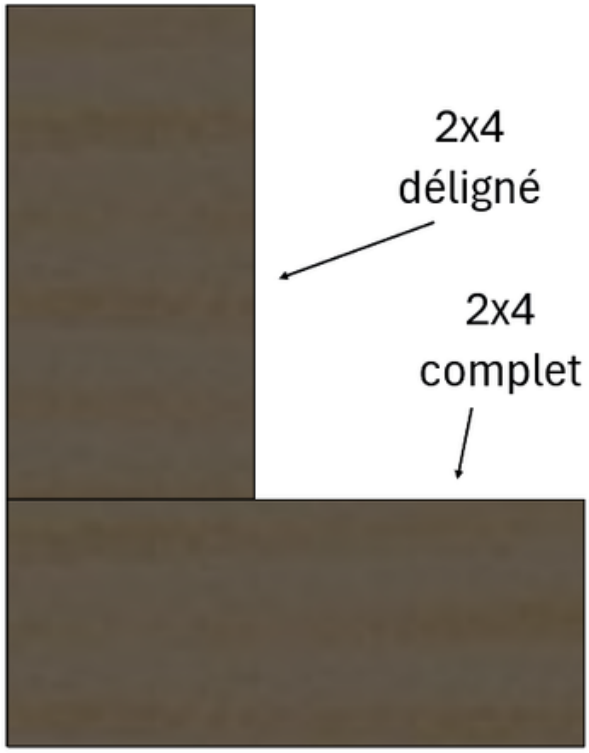
4. WIND POWER PLANT

4.2 DESCRIPTION OF THE MOUNTAIN

The mountain is a platform supported by 2x4s. It is elevated 5” (130 mm) (distance between the top of the floor and the top of the mountain) and is composed of a ramp 12” (305 mm) long by 12” wide. On top of the mountain, three pairs of rails supported by 2x4s will allow you to solve the challenge. For the support of the mountain you will need:

- 2 full 2x4s, 24” (610 mm) long (2x)
- 2 cut along the length 2x4s, 24” long (2x)
- 2 cut along the length 2x4s, 55” (1400 mm) long (2x)
- 1 cut along the length 2x4, 17 ¾” (451 mm) long (1x)
- ½” thick plywood, cut into triangles (described later) (2x)
- #8 3” screws (17x)
- #8 1” screws (3x)
- ¾” (20 mm) brackets, found at hardware stores

To begin, assemble with 3” screws a full 24” 2x4 and a ripped 2x4 in the shape of an L. A ripped 2x4 is a 2x4 from which a thickness of wood along the length of the piece has been removed. For reference, a 2x4 is purchased with dimensions of 1 ½” (38 mm) by 3 ½” (89 mm), in cross section. The cut along the length 2x4s will therefore have the following dimensions: 1 ½” by 3”. The full piece is placed, with the larger face, on the ground. The support beams are mounted on the beam supports (2x4 on the ground) and connected with 3” screws (two per L). The first beam is installed directly on one side of the mountain. The second beam is installed 3 ½” (89 mm) from the other side of the mountain. This distance is measured from the side of the mountain to the middle of the beam. Each beam requires two screws per side to be fastened.

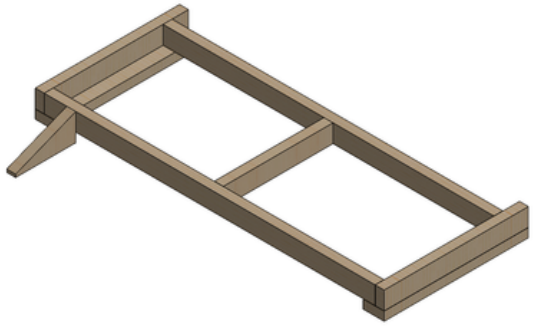


Mountain Beam Support

4. WIND POWER PLANT

4.2 DESCRIPTION OF THE MOUNTAIN (CONTINUED)

The intermediate beam is fastened in the middle of the main beams with 3” screws, like the main beams. The last piece is composed of two elements: two ½” plywood triangles with the dimensions shown in the plans. These plywood pieces are screwed together with 3 screws of 1”. The height of this ramp support is 4 ½” (114 mm) and it is located in the middle of the ramp. It is fastened to the support with one 3” screw and one 2” screw into the floor. The ramp is fastened onto the ramp support with 1” screws. It is recommended to place brackets under the ramp and screw them into the adjacent plywood.



Mountain supports

Then, to finish the mountain, you will need:

- ½” (13 mm) plywood
- #8 screws, ⅝” (16 mm) (12x)
- 2x4s, 29” (737 mm) long (6x)
- Rails, 24” (610 mm) long, provided by the OC (6x)
- 1” screws (8x)

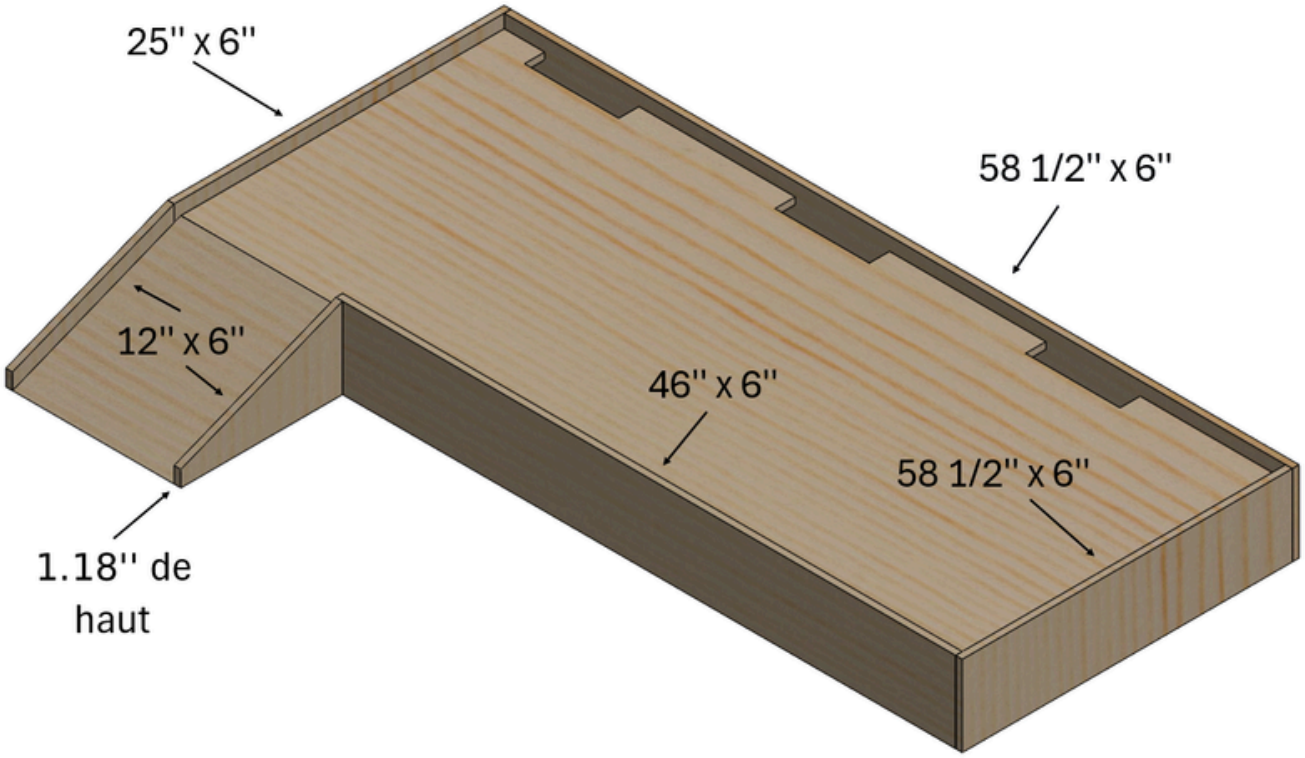
The top of the mountain is composed of a ½” plywood with openings for the rail supports. The top is screwed with 6 screws of 1” (25 mm) onto the mountain support (at the four corners, midpoints of the sides, and 2 per main beam). The mountain is covered on the sides with different pieces of ½” plywood with the following dimensions:

- 46” (1168 mm) long by 6” (150 mm) high
- 24 ½” (622 mm) long by 6” high
- 58 ½” (1486 mm) long by 6” high
- 25” (635 mm) long by 6” high
- Two right triangles, 12” long by 6” high, keeping a nose of 1.2” (30 mm) (see diagram below)

The different pieces are arranged as shown in the diagram on the next page.

4. WIND POWER PLANT

4.2 DESCRIPTION OF THE MOUNTAIN (CONTINUED)



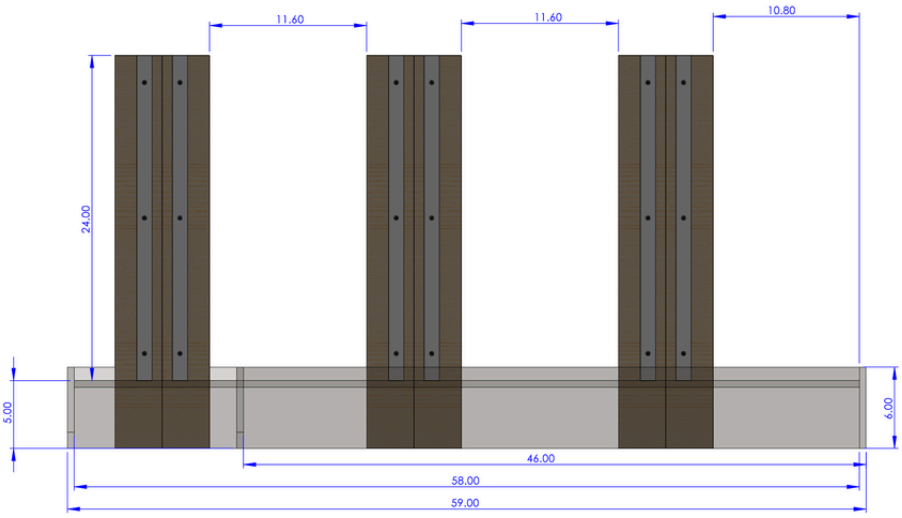
Arrangement of the plywood around the mountain

The 58 ½” long piece must be securely fastened with 2” screws (place 2 screws per 2x4 that is a rail support, and 1 screw per corner of the piece) into the mountain support because the rail supports are screwed onto the plywood. This ensures that the supports will remain solid when the robotic solution climbs onto the rails. Also take note of how the pieces are arranged around the mountain.

4. WIND POWER PLANT

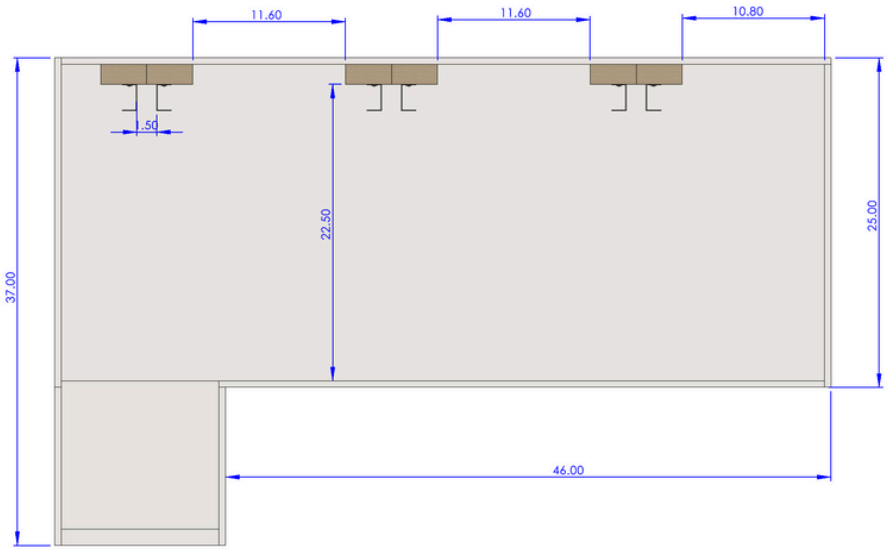
4.3 DESCRIPTION OF THE RAILS

The rail supports are composed of 2x4s and 24” rails provided by the OC. However, the arrangement is different from that of the hydroelectric power plant: the 2x4s are placed side by side. See the figure below for more details:



Rail support dimensions

The rails are spaced, back to back, 1 ½” apart, like those of the hydroelectric power plant. The rails are screwed with 1 1/2” flat head screws into the 2x4s. The 2x4s are inserted into the openings on the top of the mountain, as shown in the figure below:



Mountain - view from above

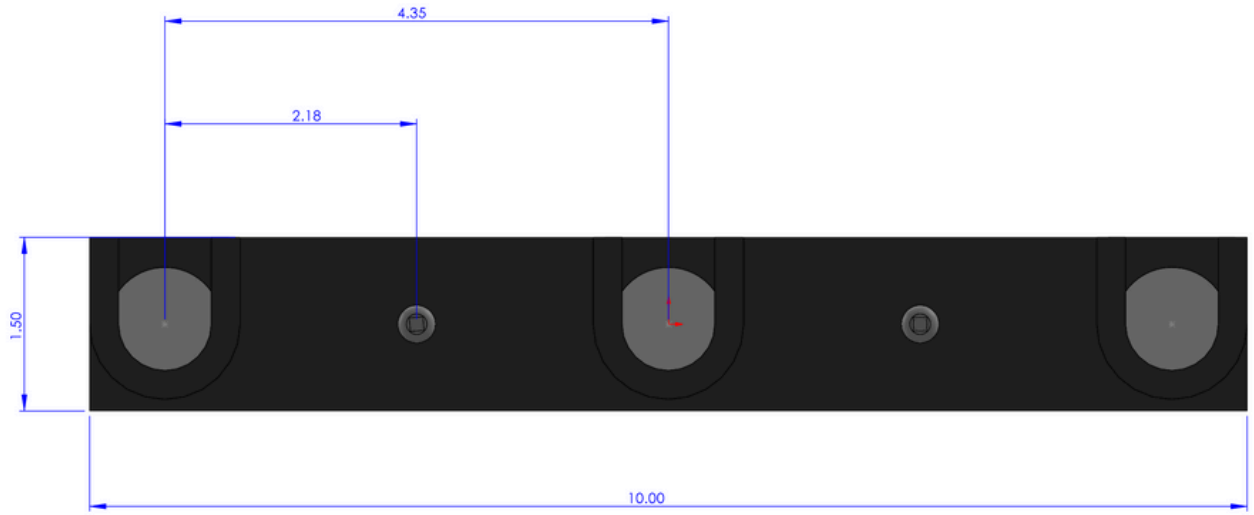
4. WIND POWER PLANT

4.4 DESCRIPTION OF THE BASES

The wind turbines are mounted on 3D printed bases, for which the CAD files are provided. These bases are installed adjacent to the rail supports and screwed into the top of the mountain with 4 screws, ⅝” long. The concrete bases, L-shaped, must also be printed and inserted into the bases once completed.

4.5 DESCRIPTION OF THE NFC TAG SUPPORTS

3 NFC tags are inserted into the support for which the CAD file is provided. The support must be printed and placed as shown in the plans, with ⅝” screws (3x).



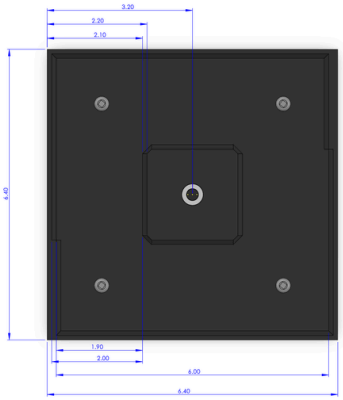
NFC chip support

4. WIND POWER PLANT

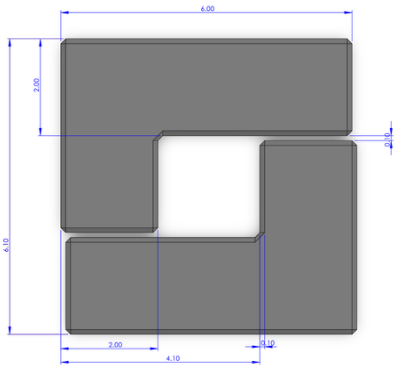
4.6 DESCRIPTION OF THE BLOCS AND THE BASES

The wind turbine blocks must be assembled according to the color and required placement given by the NFC tag. These blocks come in two sizes: 2” blocks and 8” blocks. The competition blocks will be translucent to verify the connection of your block by the lighting of a LED inside. Some blocks will be provided by the OC so that you can still test the functioning of your solution.

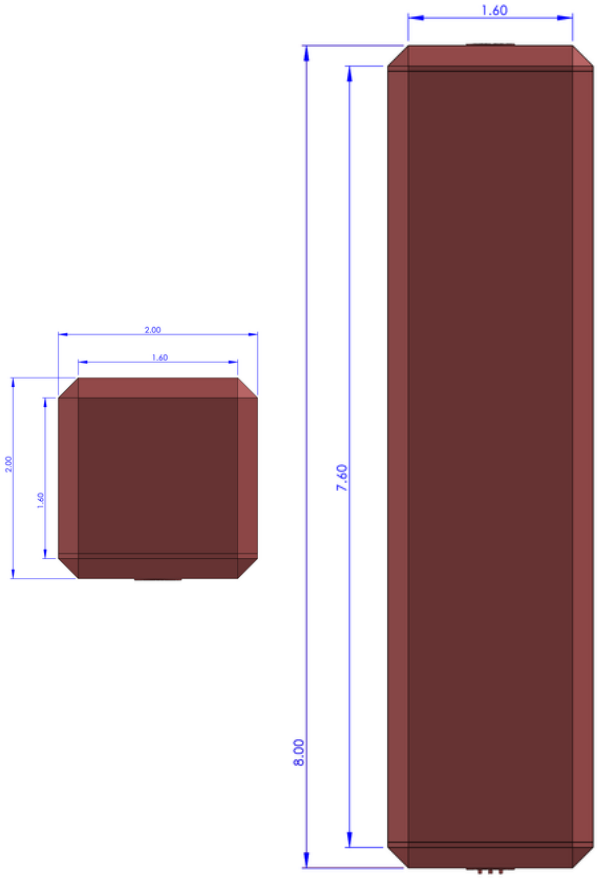
The wind turbine bases are printed in a single piece and include a pogo pin support to establish the connection. The concrete bases are hollow and are not anchored to the base.



Wind Turbine Base



Concrete base



Dimensions of wind turbine blocks

4. WIND POWER PLANT

4.7 ASSEMBLY

The main assembly steps of the Wind Power Plant can be summarized as follows:

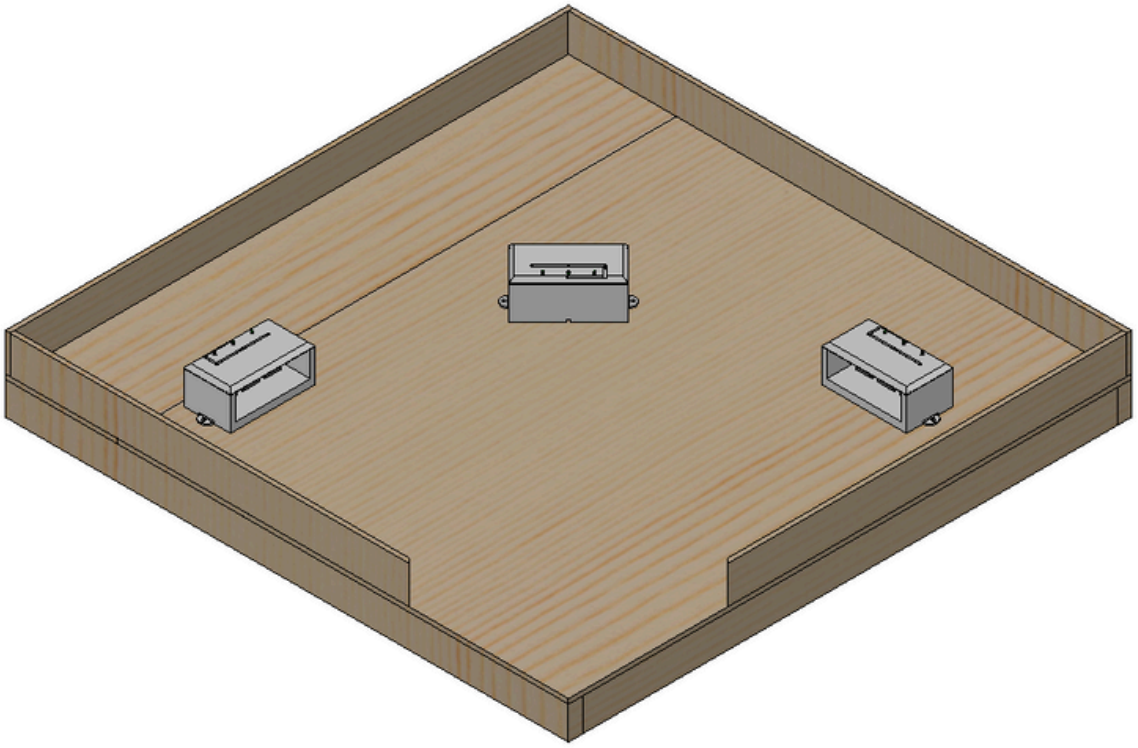
- Cut the 2x4s and assemble the mountain support with the required screws
- Fasten the support to the floor, as shown in the plans
- Cut the plywood, drill the required holes, and assemble the mountain, the plywood sides, and the ramp on top of the mountain support, as shown in the plans
- Insert the rail supports into the openings and fasten them with the required screws to the contour plywood
- Install the rails on the rail supports as shown in the plans
- The rails are installed in the same way as in the hydroelectric power plant, i.e., with 1 1/2” flat head screws (18x)
- Install the bases on the mountain, as indicated in the plans
- If not already done, insert the pogo pins into their bases
- Place the blocks in their starting zone

5. SOLAR POWER PLANT

5.1 INTRODUCTION

Here is the material required for the construction of the solar section:

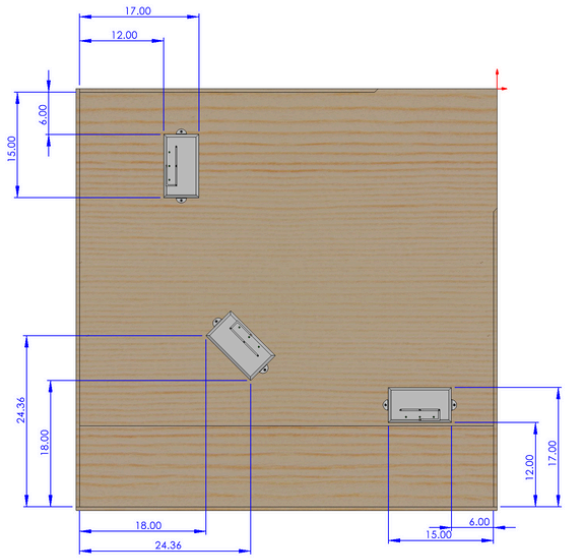
- **PLA filament**
- **Photoresistors (x9)**
- **LEDs (x18)**
- **⅝” (16 mm) round head screws (6x)**



5. SOLAR POWER PLANT

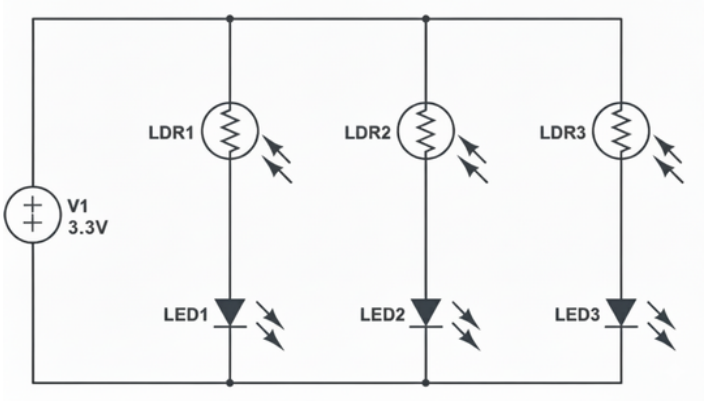
5.2 ASSEMBLY

First, simply print the CAD files of the solar section provided with the construction rulebook. These CAD files contain the panels and will allow you to assemble the circuit.



Top-down vue of the solar section

Next, the circuit of each panel can be assembled. The following circuit describes how the different components must be connected for a single panel. The symbols LDRx represent the different photoresistors, and the symbols LEDx represent the validation LEDs. The photoresistors must be placed under the solar panels, and the validation LEDs must be placed on the top, facing upward.

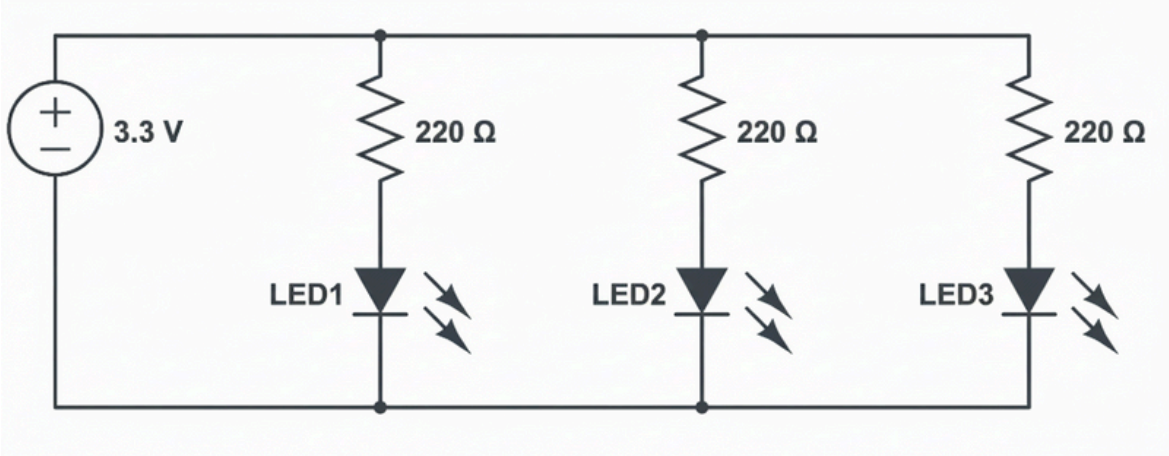


Panel cleaning detection electrical circuit

5. SOLAR POWER PLANT

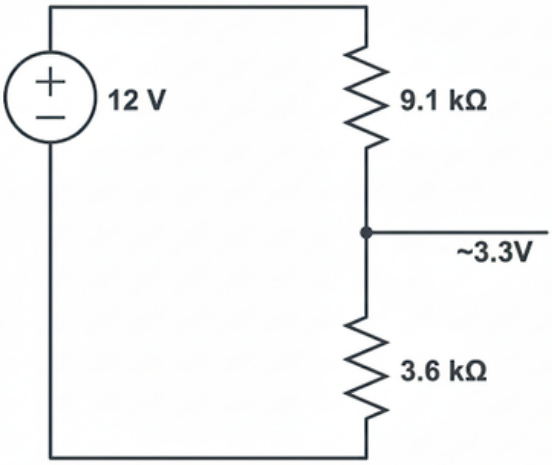
5.2 ASSEMBLY (CONTINUED)

As for the LEDs used to simulate sunlight, they are included in the circuit shown below.



The panels already have designated spots for passing the wires of the different LEDs and photoresistors. The positions of the panels on the field are indicated in the plans.

It is important to mention that the power source in the presented circuits is a 3.3V source. Since the power supply provided for each section is 12V, it will be necessary to reduce the voltage to 3.3V using a voltage divider. Here is the circuit of a voltage divider that reduces the voltage from 12V to 3.3V. Note that other resistor values can be used if you do not have these exact ones. For example, values of 220 Ohms and 100 Ohms are more common and can be used to replace the 9.1 kOhm and 3.6 kOhm resistors.

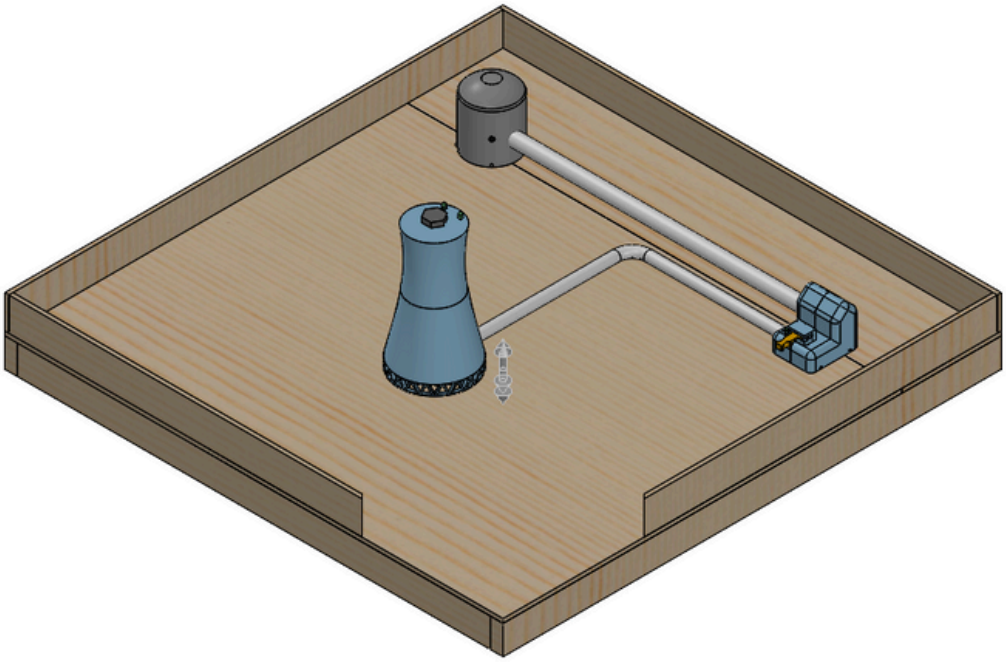


6. NUCLEAR POWER PLANT

6.1 INTRODUCTION

Here is the material required for the construction of the nuclear section:

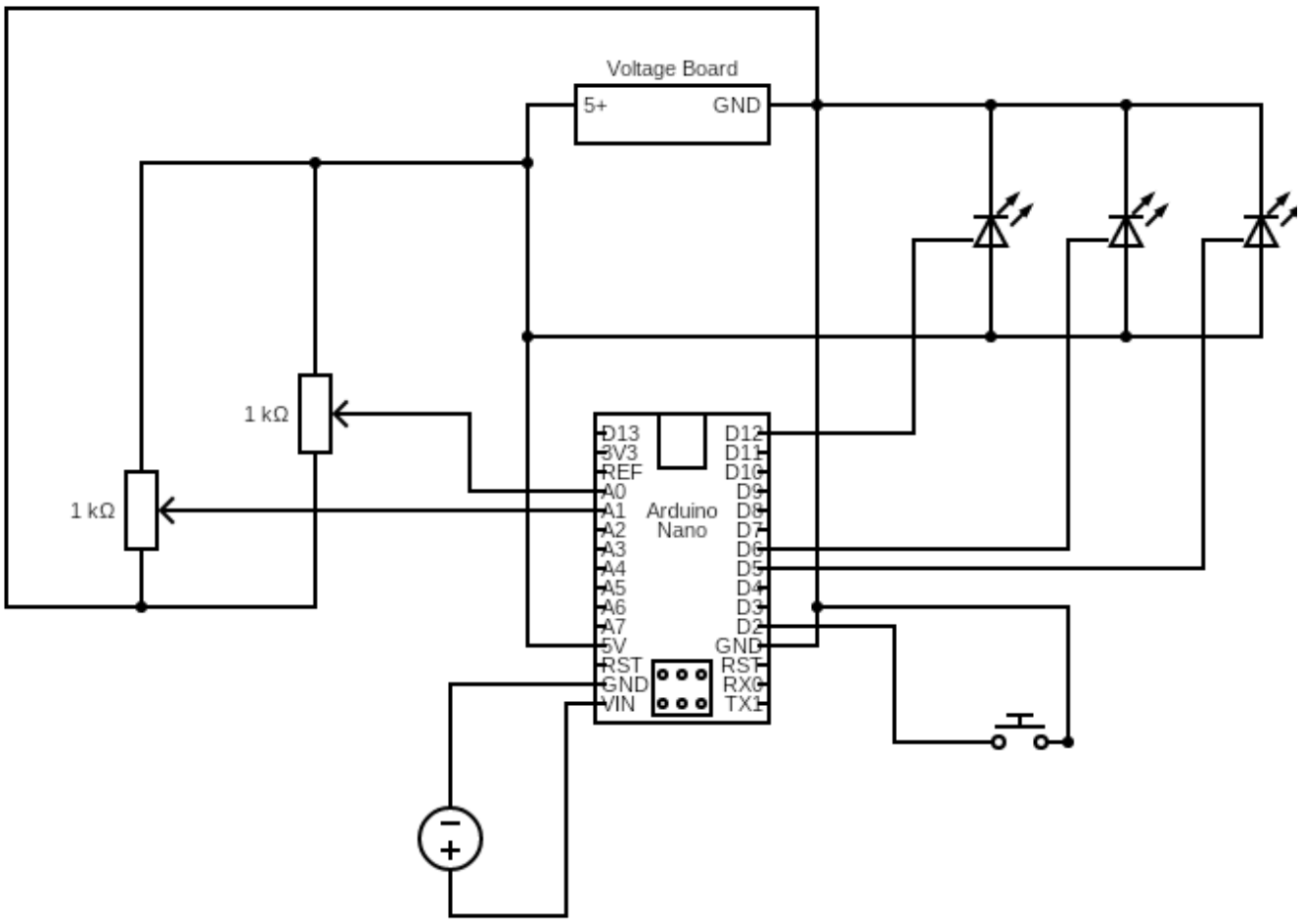
- **22-gauge two-conductor cable (15 m)**
- **18-gauge two-conductor cable (15 m)**
- **WS2811 RGB LED light (x2)**
- **Arduino Nano (x1)**
- **SPST push button (x1)**
- **B10K potentiometer (x2)**
- **Universal double-sided PCB 3x7 cm (x1)**



6. NUCLEAR POWER PLANT

6.2 ELECTRICAL CIRCUIT

The electrical circuit corresponding to the Nuclear Power Plant is provided by the OC. However, if a breakdown occurs during construction, it can be replicated using the following diagram:

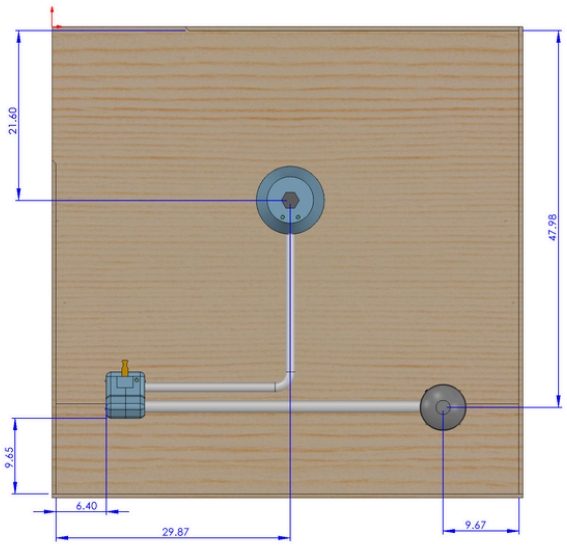


6. NUCLEAR POWER PLANT

6.3 ASSEMBLY

The assembly steps can be summarized as follows:

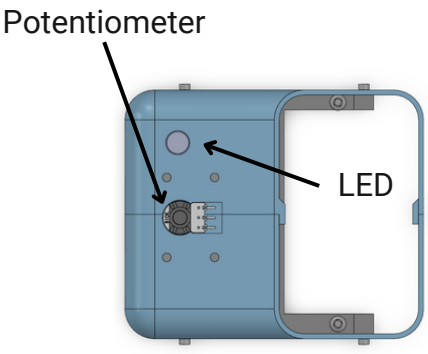
- Start the required prints of the field
- It is recommended to extend the Vin and GND cables of the Arduino and attach the 2x2 connector
- Pass the component cables under the field. It is possible to pass them on the surface. If so, make sure to properly secure the cables with adhesive tape to avoid touching them during your tests
- Place the different components on the field
- Place the 56” wire connecting the push button in the boiler



Top-down view of the nuclear plant

Next, simply:

- Install the base of the boiler at the designated spot and screw it into the wood
- Screw the boiler onto its base using M3 inserts and M3x6 screws
- Place the potentiometer and the WS2811 LED, each connected to a 56’’ cable, into the generator
- Install the base of the generator at the spot indicated on the plan
- Install the potentiometer on the crank as shown in the following picture

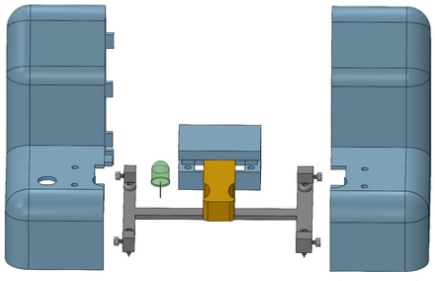


Sectional view of the generator

6. NUCLEAR POWER PLANT

6.3 ASSEMBLY (CONTINUED)

- Place the two walls of the generator around the crank and screw them onto the base using M3 inserts and M3x6 screws
- Screw on the potentiometer cover et put the LED on top of it
- Place the Arduino and the PCB inside the chimney
- Pass the potentiometer connected to the 1’ cable through the opening provided at the top of the chimney
    - Place the two LEDs linked to a 1' cable on top of the chimney. Glue may be added to prevent them from falling
- Solder the potentiometer wires to the Arduino.
    - 18-gauge red wire or 5+ to the positive line of the printed circuit board
    - 18-gauge black wire or GND to the negative line of the printed circuit board
    - 22-gauge wire (can be red or black) to the A0 input of the Arduino Nano
- Install the two 1-inch LEDs (press fit) above the chimney. You can add glue to prevent them from falling off:
- Glue the cap onto the potentiometer.
- Screw the base of the chimney with wood screws at the spot indicated on the plan
- Drill a circular hole in the wood at the base of the chimney to pass the Arduino power cables (Vin and GND) through
- Assemble the two parts of the chimney together



Exploded view of the generator

Side view of the chimney

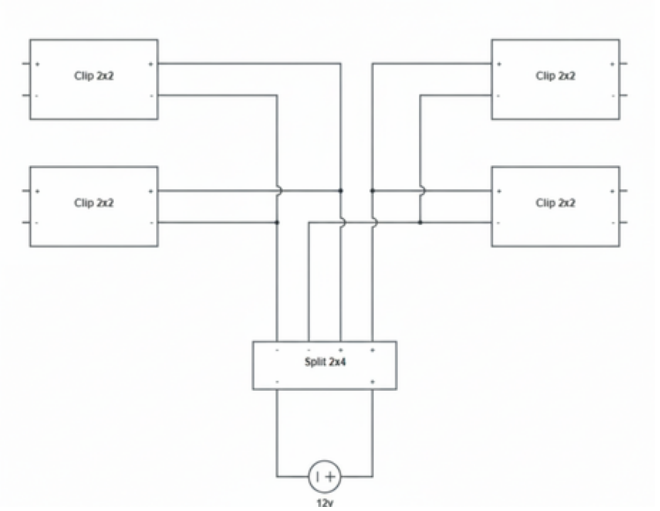
7. POWER SUPPLY

Here is the material required for powering the course:

- **DC 12V 3A adapter cable (x1)**
- **18-gauge cable (3')**
- **Compact terminal 2-input 4-output (x1)**
- **Compact terminal 2-input 2-output (x4)**

To power the circuit, simply:

- Cut the DC connector
- Strip the two wires
- Place the negative wire on the blue terminal of the compact 2-input 4-output terminal.
- Place the positive wire on the red terminal of the compact 2-input 4-output terminal.
- Cut two 3’ lengths of the 18-gauge cable
- Short-circuit the two red wires of the two cable lengths together. Repeat with the black cable as shown in the following picture
- Connect the red wires to a red output of the compact 2-input 4-output terminal
- Connect the black wires to a black output of the compact 2-input 4-output terminal.
- Repeat for each cable
- Install one compact 2-input 2-output terminal per wire
- Place the cables underneath the central section, then position each cable toward a section of the challenge



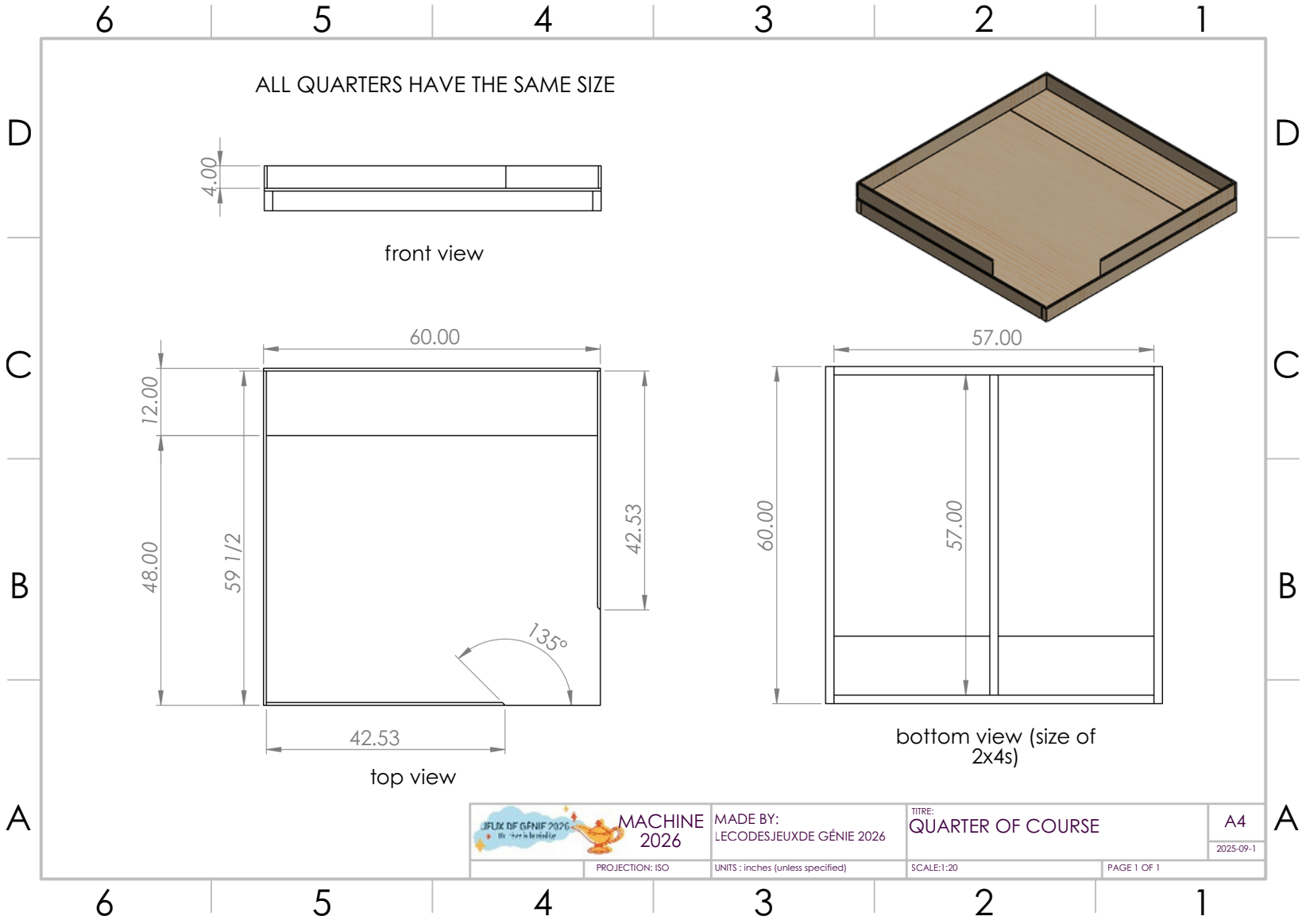
The sections can therefore be powered one at a time or all 4 at the same time.

8. GENERAL INFORMATION

A few additional points regarding the official course should be mentioned:

- All modules, except for the deposit sites, will be covered with two coats of paint. This will be a standard indoor latex paint in dark gray color
- The modules will be fastened to the platform to prevent them from being displaced by the robotic solutions
- It is possible that the front border of the platform, the one facing the public, will be built from a transparent material in order to maximize visibility. If a team foresees an issue with this decision, it is invited to contact the organizing committee
- The plywood that will be used during the competition is of the “SELECT” type to provide a uniform rolling surface. However, it is more expensive. It is up to you to decide which type you wish to purchase. “Fillers” are available at hardware stores to make the surface more uniform
- Any element provided by the OC cannot be used to design the robotic solution.

9. PLANS


ALL QUARTERS HAVE THE SAME SIZE
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front view
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top view
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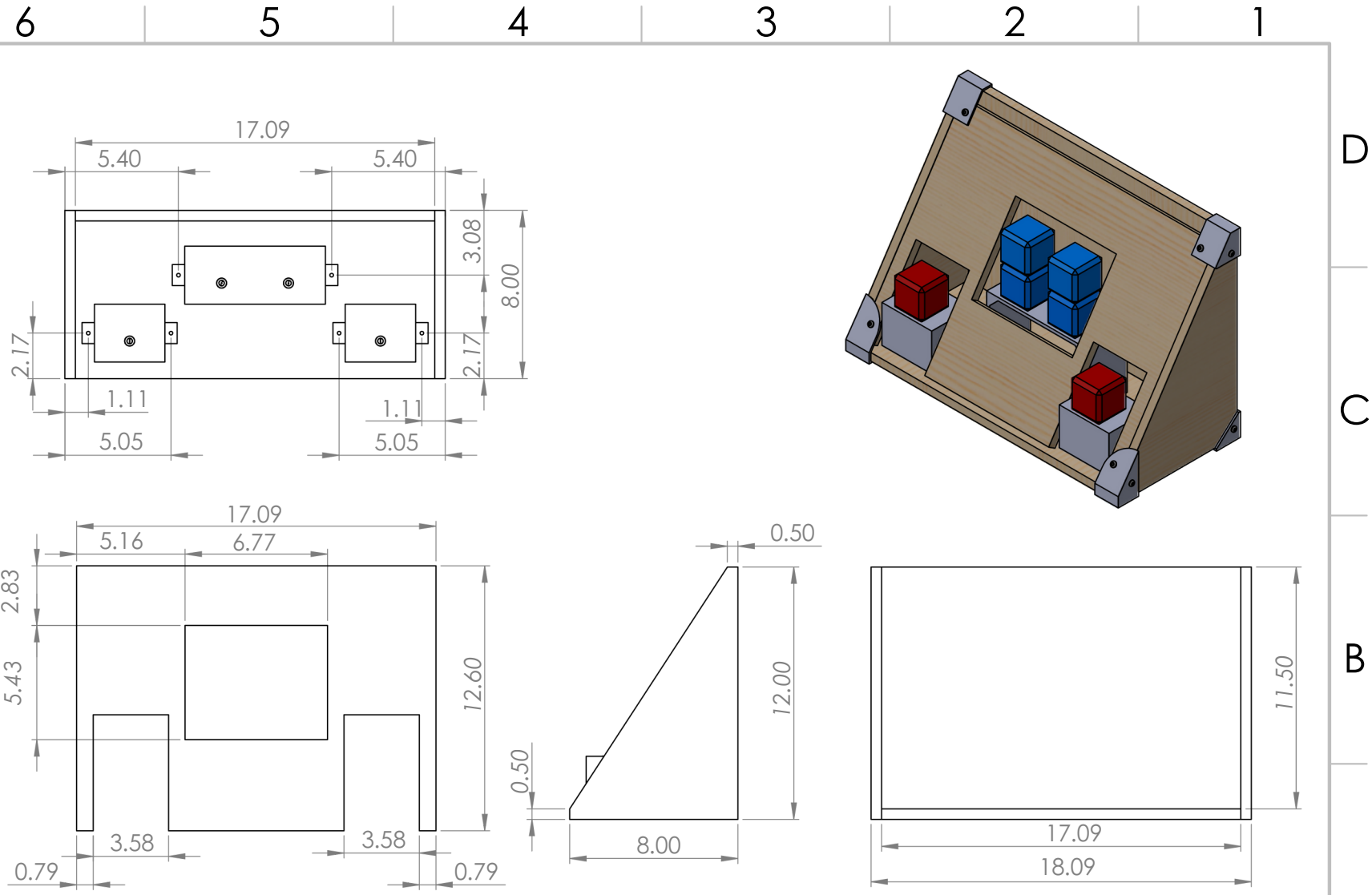
bottom view (size of 2x4s)
MACHINE 2026
MADE BY:
LECODESJEUXDE GÉNIE 2026
TITRE:
QUARTER OF COURSE
A4
2025-09-1
PROJECTION: ISO
UNITS : inches (unless specified)
SCALE:1:20
PAGE 1 OF 1

9. PLANS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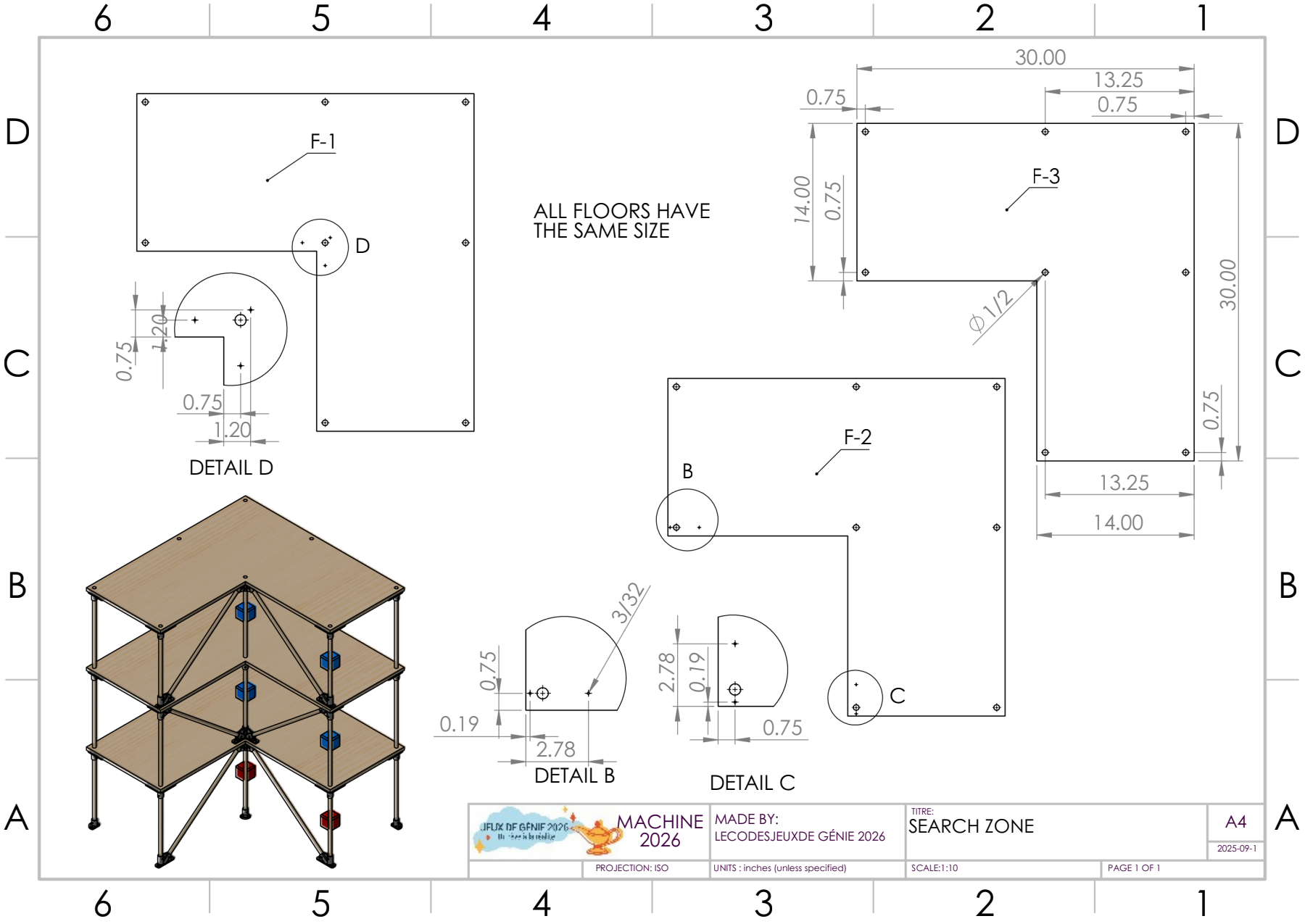
MACHINE 2026
MADE BY:
LECODESJEUXDE GÉNIE 2026
TITRE:
DAM
A4
2025-09-1
PROJECTION: ISO
UNITS : inches (unless specified)
SCALE:1:6
PAGE 1 OF 1

9. PLANS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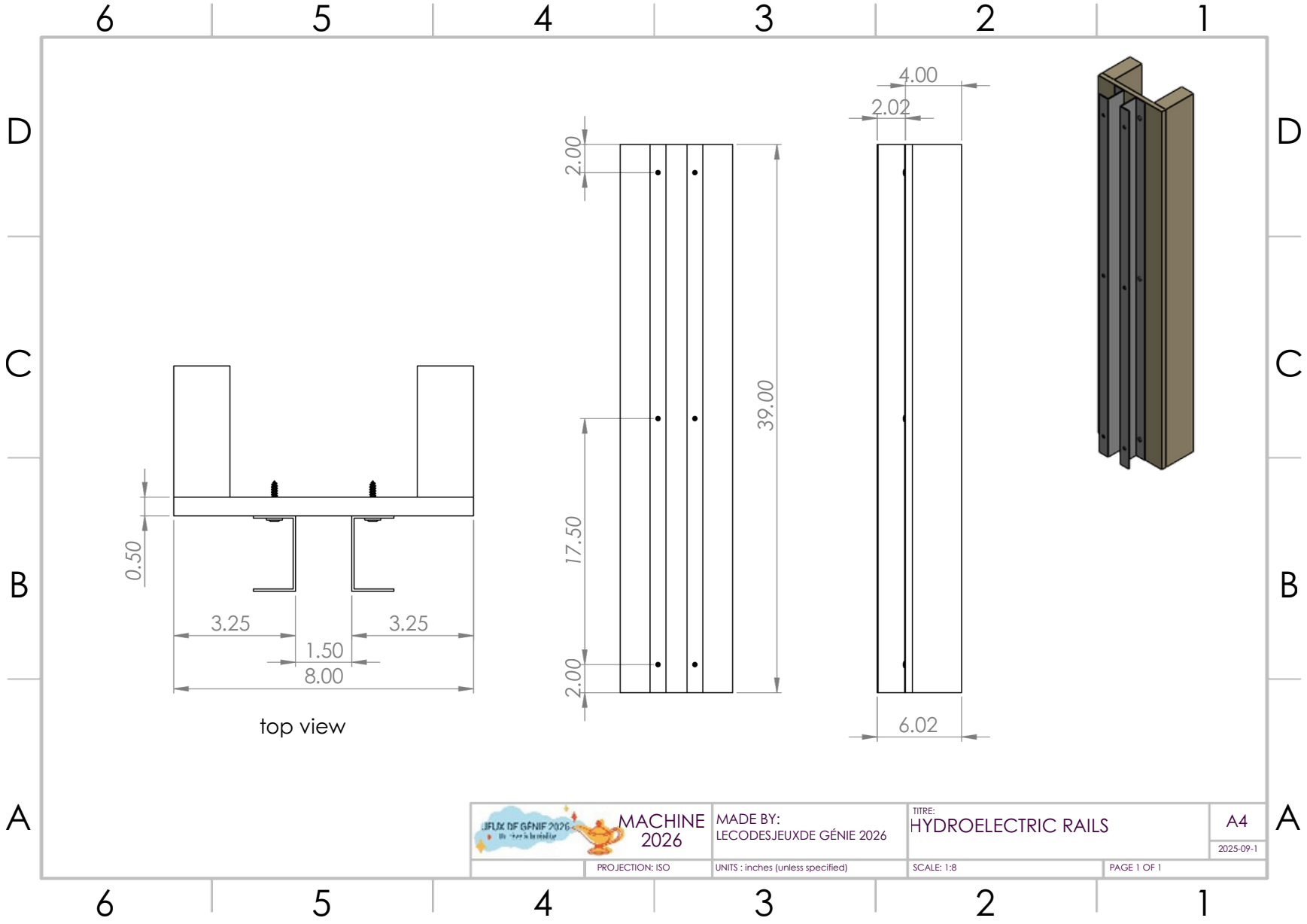
DETAIL C
MACHINE
2026
MADE BY:
LECODESJEUXDE GÉNIE 2026
TITRE:
SEARCH ZONE
A4
2025-09-1
PROJECTION: ISO
UNITS : inches (unless specified)
SCALE:1:10
PAGE 1 OF 1

9. PLANS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top view
2.00
17.50
2.00
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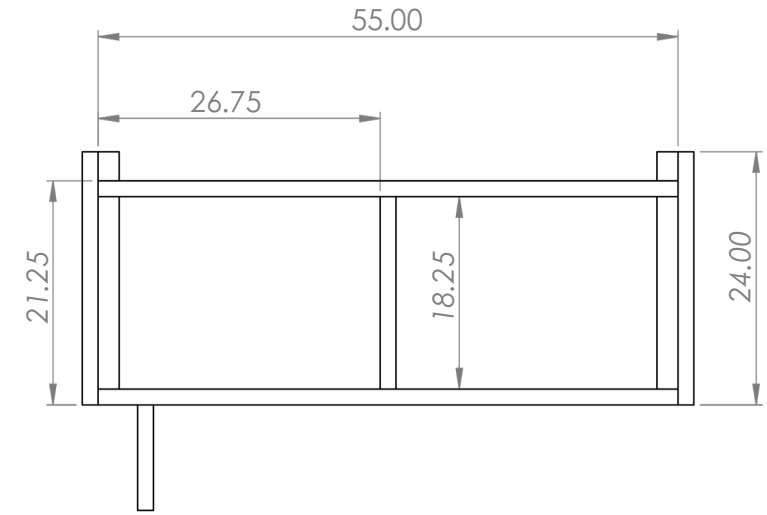
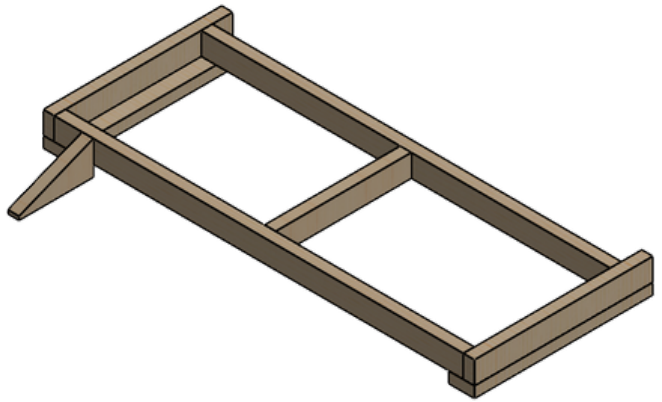
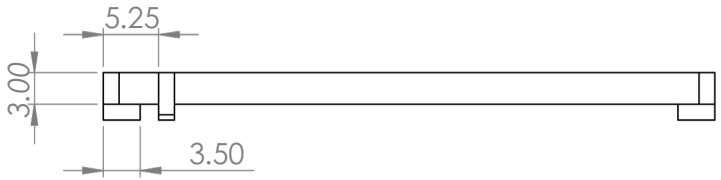
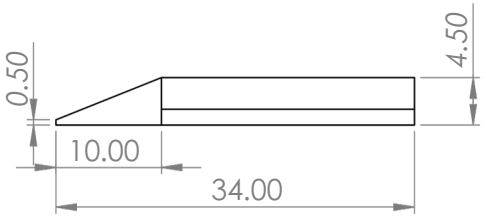
4.00
2.02
6.02
MACHINE 2026
MADE BY:
LECODESJEUXDE GÉNIE 2026
TITRE:
HYDROELECTRIC RAILS
A4
2025-09-1
PROJECTION: ISO
UNITS : inches (unless specified)
SCALE: 1:8
PAGE 1 OF 1

9. PLANS



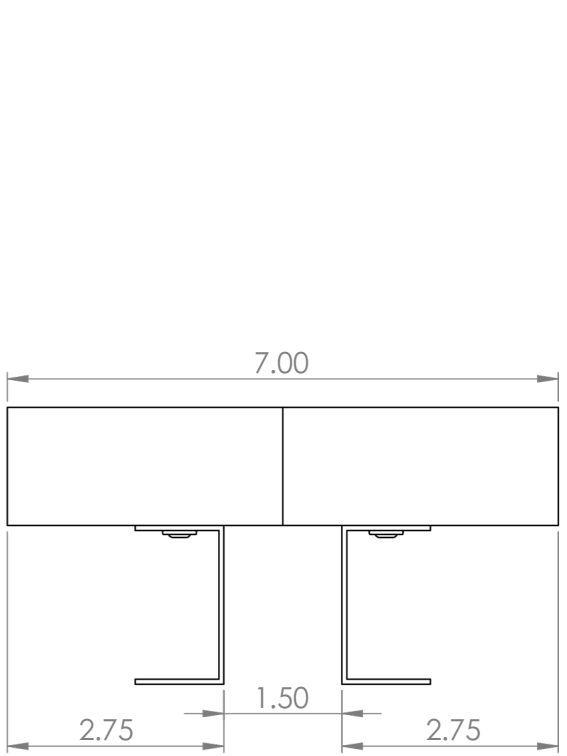


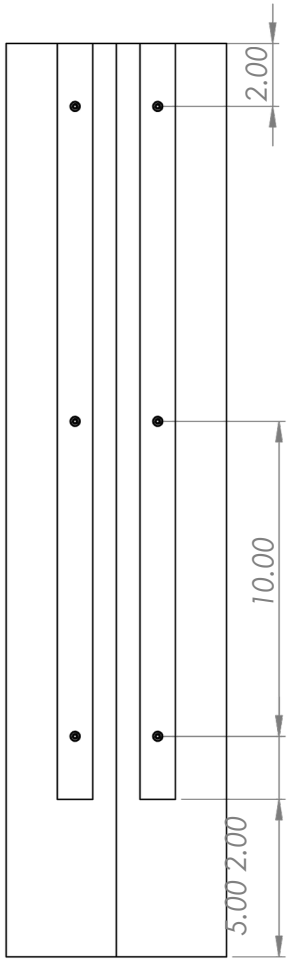


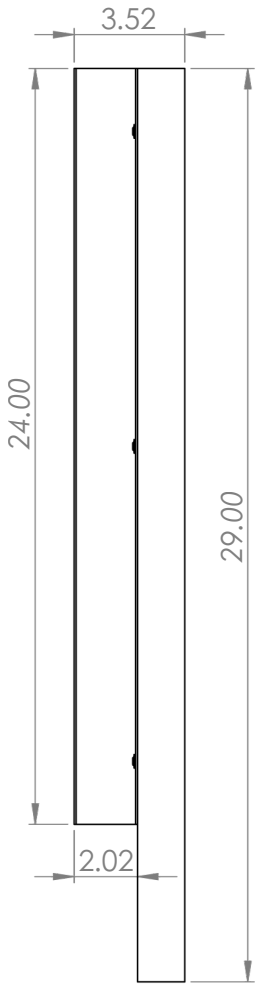


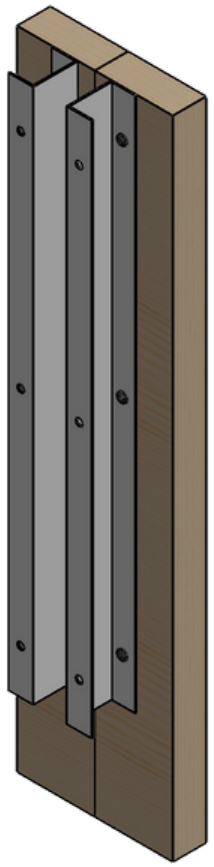
MACHINE 2026	MADE BY: LECODESJEUXDE GÉNIE 2026	TITRE: MOUNTAIN SUPPORT	A4
			2025-09-1
PROJECTION: ISO	UNITS : inches (unless specified)	SCALE: 1:15	PAGE 1 OF 1

9. PLANS



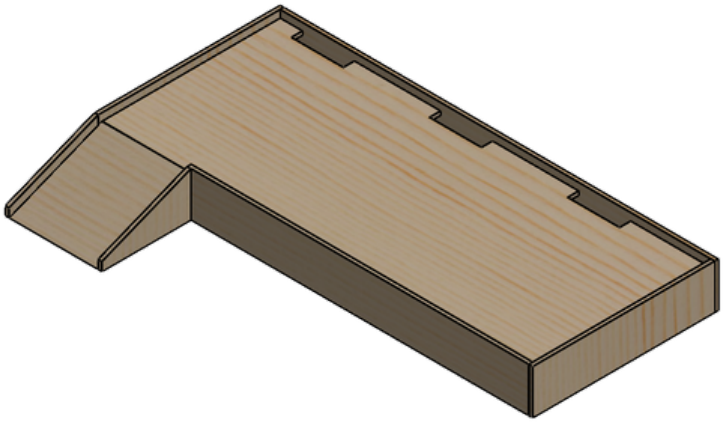


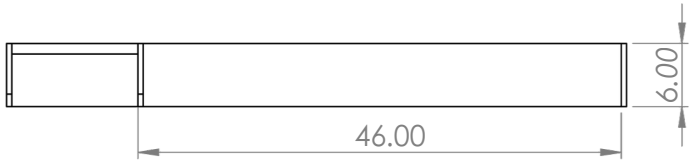


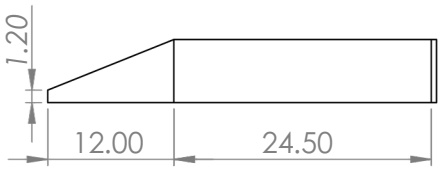


MACHINE 2026	MADE BY: LECODESJEUXDE GÉNIE 2026	TITRE: WIND POWER RAILS	A4
			2025-09-1
PROJECTION: ISO	UNITS : inches (unless specified)	SCALE: 1:5	PAGE 1 OF 1

9. PLANS







JEUX DE GÉNIE 2026 — MACHINE 2026	MADE BY: LECODESJEUXDE GÉNIE 2026	TITRE: MOUNTAIN	A4
			2025-09-1
PROJECTION: ISO	UNITES : inches (unless specified)	SCALE: 1:15	PAGE 1 OF 1

QUESTIONS AND ORGANIZING COMMITTEE

For any questions or comments regarding the challenge, you may contact the Machine team.

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