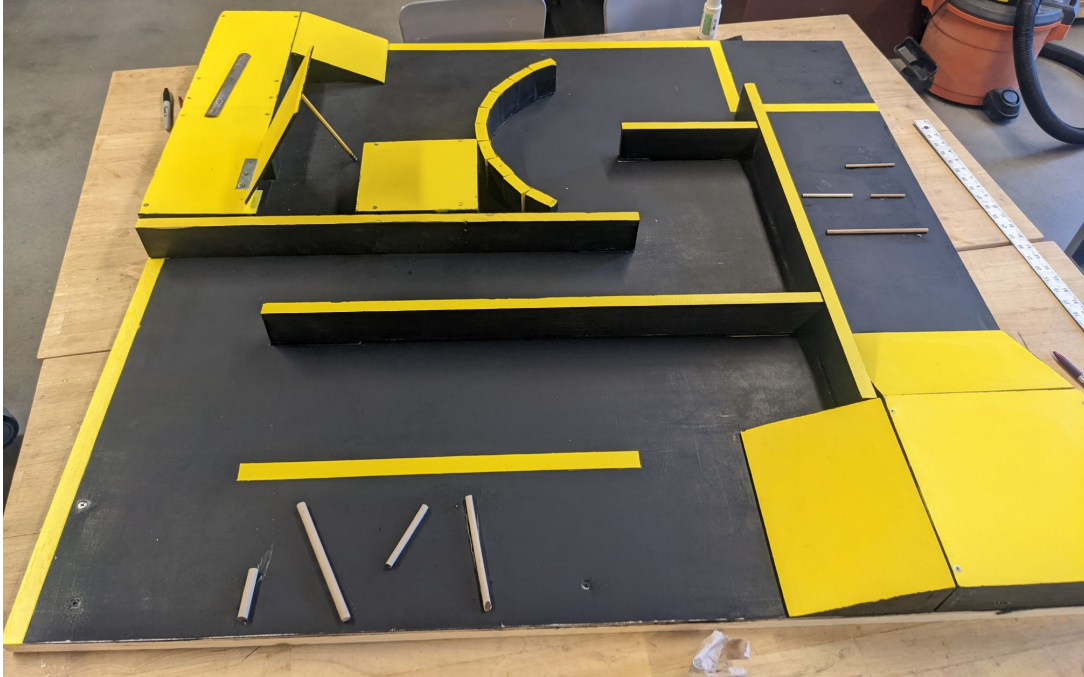


***A Bridge Too Far* Build Instructions:**



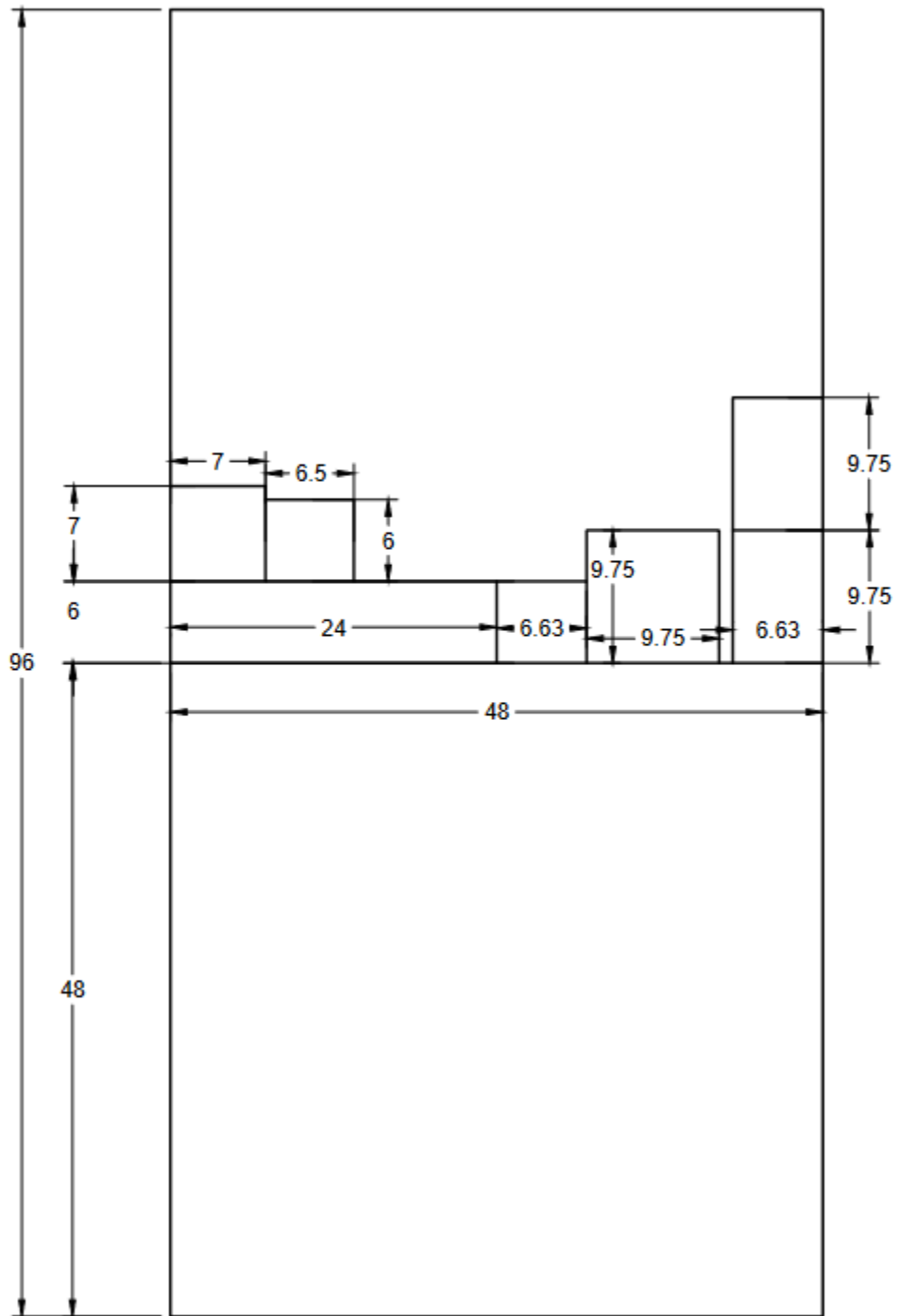
Description

This course is the pinnacle of lego obstacle design. It's got it all: ramps, bumps and bridges. The main challenge of this course is *The Tight Squeeze* in the center, and beyond that, a drop bridge that needs to be triggered before a perilous ledge preceding the finish.

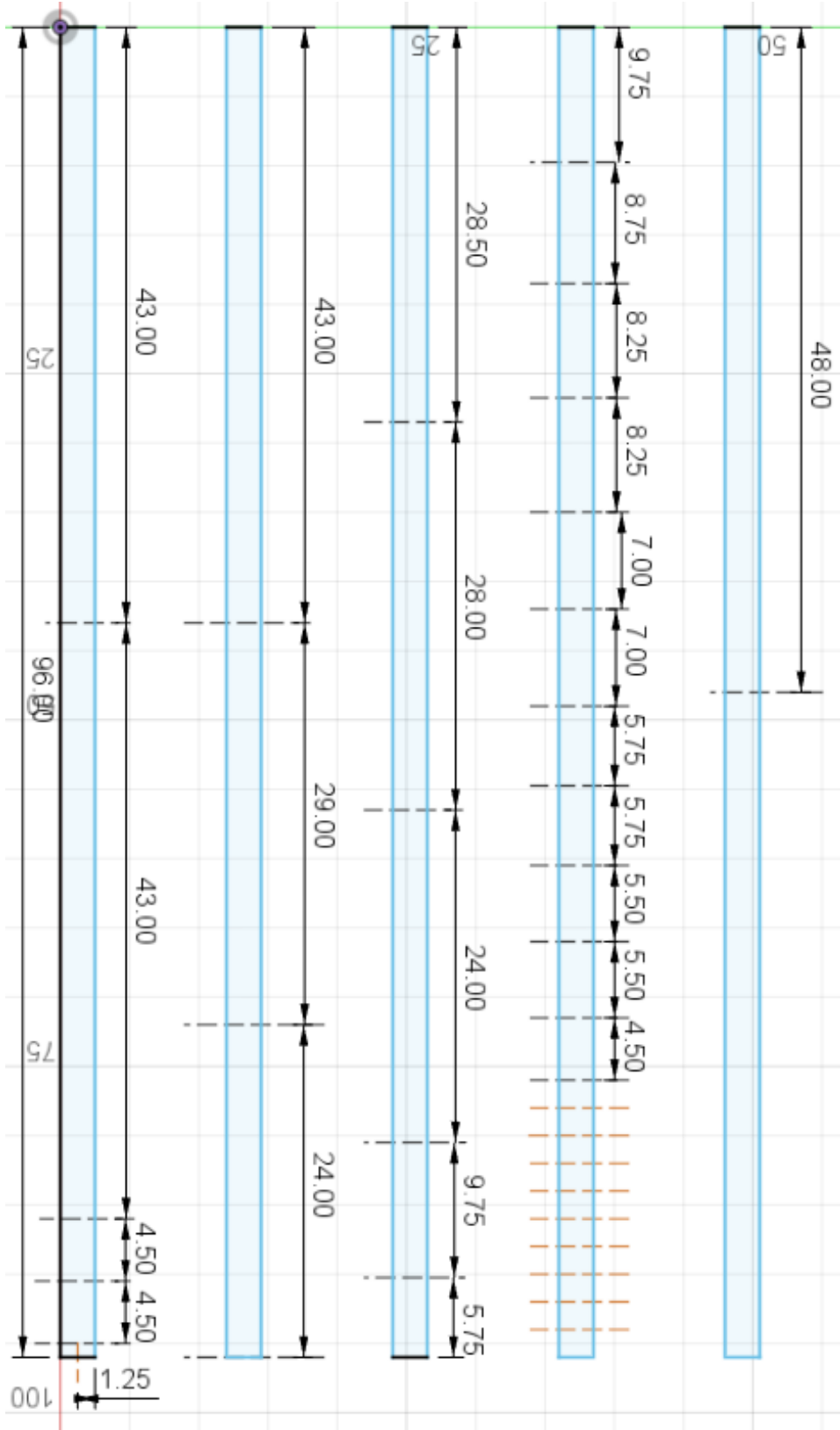
Supply list:

Material	Quantity	Availability	Unit Cost (Tax not included)	Total Cost (Tax not included)
2 inch Flat Brush	1	Home Depot	\$1.28	\$1.28
1/4 Inch 4x8 plywood sheet	1	Home Depot	\$29.92	\$29.92
1" wide Painter's Tape	1	Home Depot	\$2.98	\$2.98
1x3in 8 ft board	5	Home Depot	\$4.41	\$22.05
#8 x 3/4 flat screw (pack of 35)	1	Home Depot	\$4.22	\$4.22
#8 x 1.5 flat screw (pack of 25)	1	Home Depot	\$2.75	\$2.75
5ft x 3/4 Sticky velcro	2	Home Depot	\$7.47	\$14.94
Door hinge	1	Home Depot	\$2.98	\$2.98
Paint sample yellow	1	Home Depot	\$4.98	\$4.98
Paint sample black	2	Home Depot	\$4.98	\$9.96
Dowel 1/4	1	Home Depot	\$1.14	\$1.14
Dowel 3/8	1	Home Depot	\$1.14	\$1.14
Dowel 1/8	1	Home Depot	\$1.14	\$1.14
Wood Glue, 4 oz.	1	Home Depot	\$2.97	\$2.97
Sanding paper 100-150 grit	1	Home Depot	\$4.27	\$4.27
Brown paper sack bag	1	Home Depot	\$2.67	\$2.67
			Total	\$109.39

Cut Diagrams
¼ cut diagram, cut the lines out.



1"x3"x8' Cut Diagram



Note: the yellow cut lines are spaced 2". All dimensions are in inches.

Attachment methods:

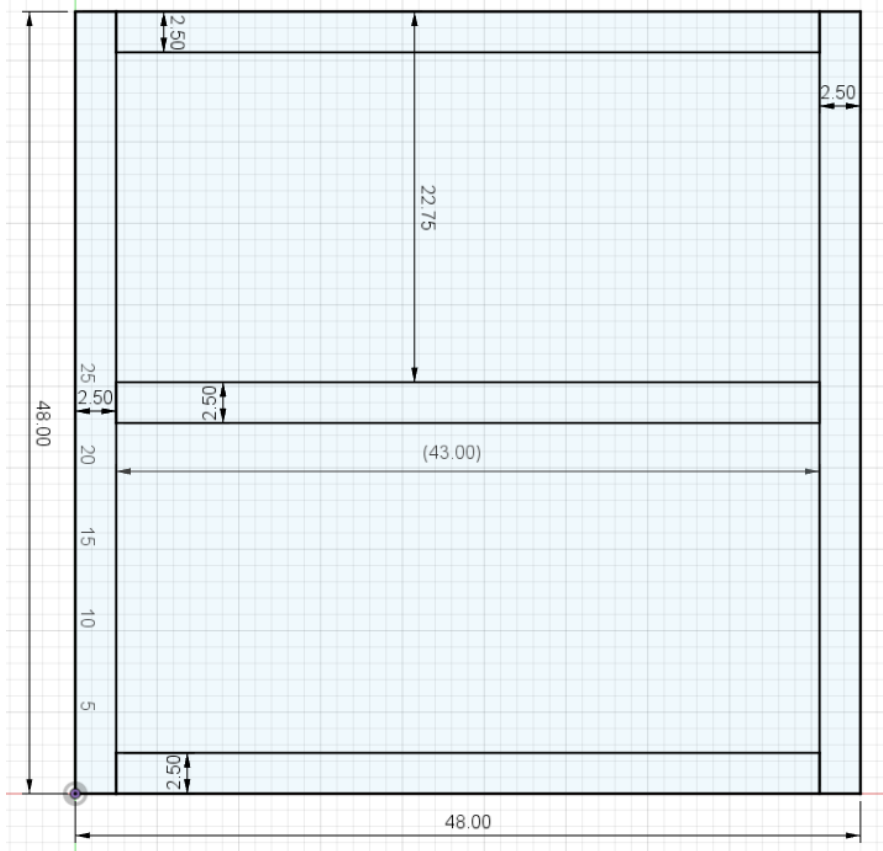
There are many options that you can use based on your skill and tools available. Most methods will work as long as they are flush to the surface of the course. Some examples of attachment that work are listed below

- Pre drilling and using screws
- Clamps and wood glue.

Course Base

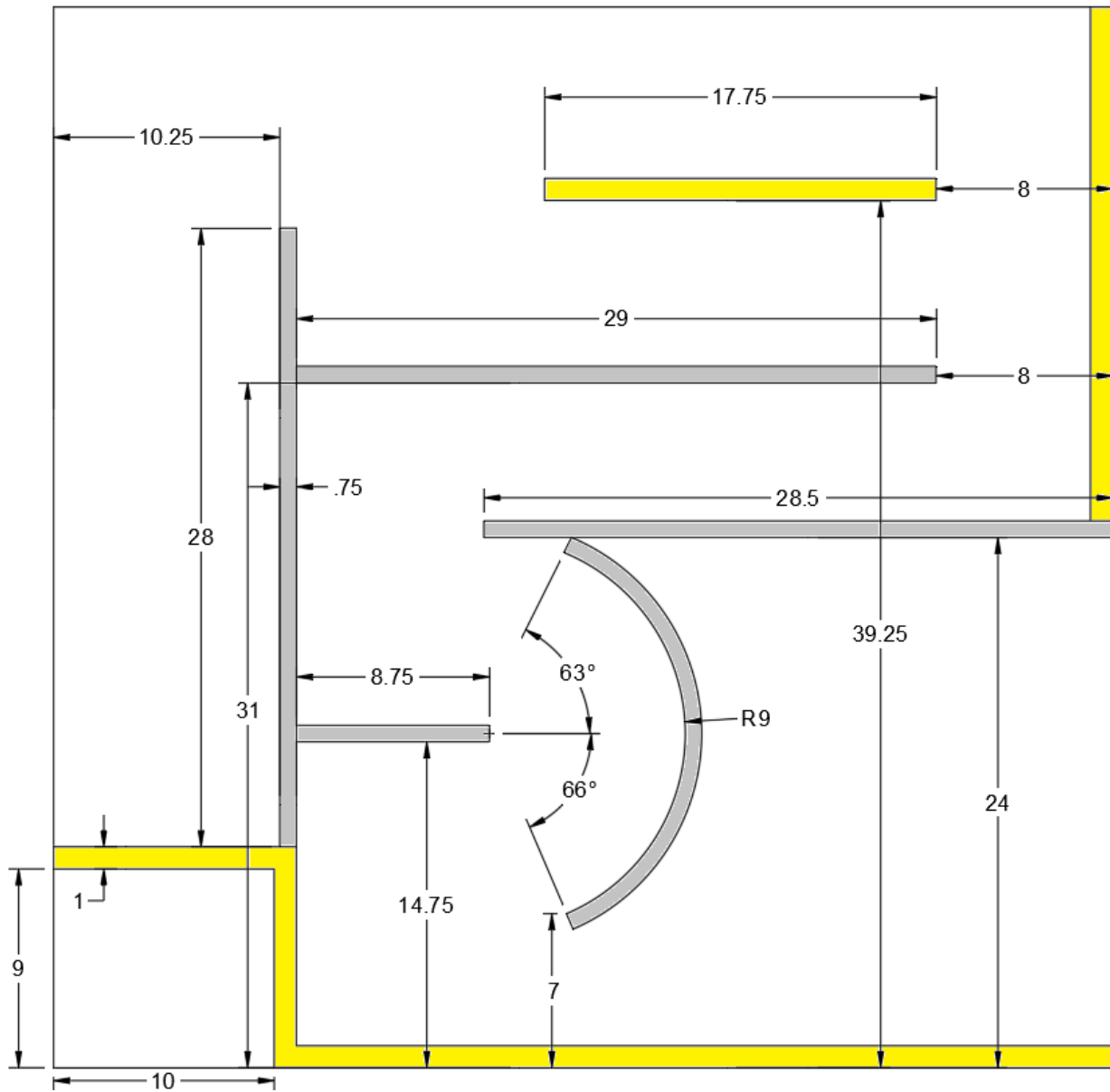
Base Component List		
Component Name	Quantity	Size
Plywood Sheet	1	4'x8'
Long Support	2	48"
Short Support	3	43"
3/4" Long Screw	15	3/4"

1. Cut the 4'x8' sheet of 1/4" plywood in half to make it a 4'x4' sheet.
2. Cut 5 pieces of 1"x3" to make the support frame underneath
3. Arrange as in the picture below.



Base Frame Arrangement; Bottom Left is Starting Area

Paint/Wall Locations



Note: The yellow boxes are painted lines, the gray boxes are the walls. The tops of the walls were painted yellow, but are gray in the picture for clarity.

Base paint:

Paint Component List:
2in Brush
Yellow paint sample
Black paint sample
.94in masking tape
Sanding paper

1. Tape off yellow areas and tops of wall sections
2. Paint Black over the entire base, ours required 3 coats to get an even finish. More or less might be necessary depending on paint.
3. Sand down paint to create an even matt finish surface finish
4. Remove Tape
5. Tape off black areas
6. Paint yellow sections of the base
7. Place a small mark 15 ¼" from the "Y" edge and 37" from the "X" edge (refer to last page). This marks the location of the pencil that holds up the falling bridge.

Raised Pads and Falling Bridge:

Pad Component List	
Component Name	Quantity
24" Support	2
4 ½" Support	3
24"x6" Plywood	1
Hinge	1
6 ½" x 6" Bridge Platform	1
Glue	N/A
1"x1 ¼" Bridge Support (the size isn't very important)	2
Pencil Support	1
7" Support	2
5 ½" Support	2
7"x7" Plywood	1
9 ¾" Support	2
8 ¼" Support	2
9 ¾" x 9 ¾" Plywood	1
1 ½" Screw	22-26
¾" Screw	15

1. Cut the Pad Supports
 - a. **Note:** the center support for Pad A isn't necessary, we had to splice our plywood platform
2. Screw supports together like drawings below
3. Cut the plywood a little larger than required
 - a. use sandpaper or a wood plane to bring the plywood down to the exact size
4. Screw the plywood to the top of the supports

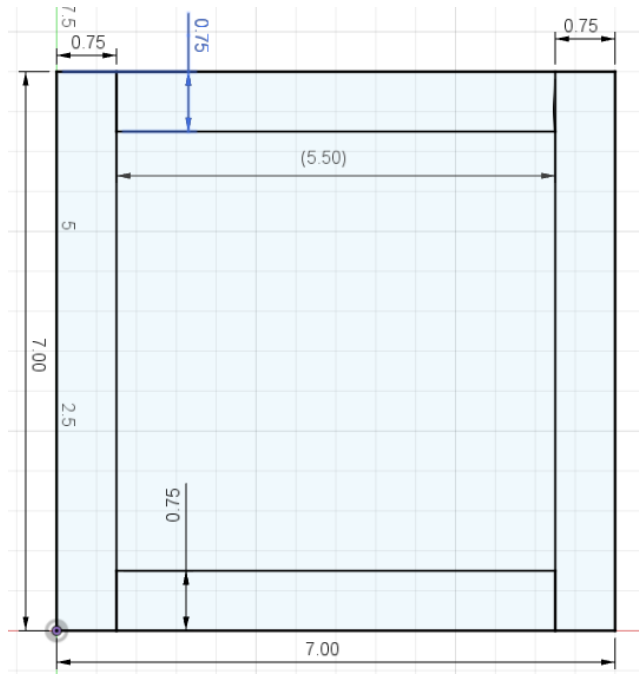
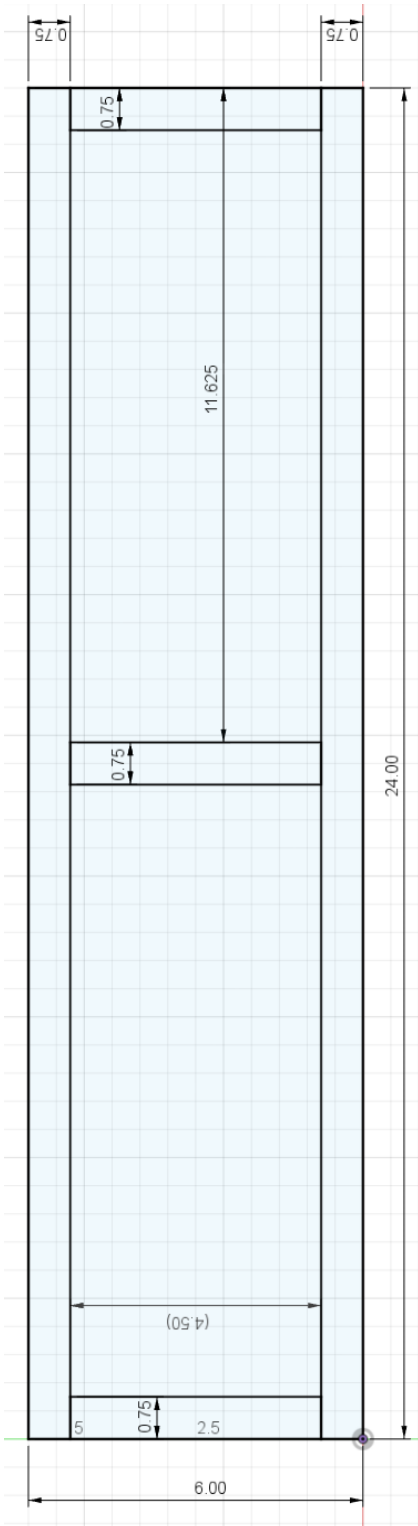
Pad A Bridge Installation

1. Glue the hinge to the Bridge Platform on the short side with the pin facing down
 - a. The hinge should be centered on the Bridge Platform
2. Offset the the Bridge Platform from Pad A's short edge 2.2 inches
 - a. Trace the outline of the free side of the hinge onto Pad A
3. Use a utility knife, chisel, or razor blade to cut out a few layers of Pad A's plywood such that the hinge will be flush with the top of Pad A.
4. Screw the hinge into Pad A's support
5. Rest the Falling Bridge on Pad B
6. Mark the vertical position where the Bridge Support Blocks need to rest such that the bridge stays flat.
7. Secure the Bridge Support Blocks with screws or glue
8. Glue a small rectangle of plywood that is $\frac{3}{4}$ " long at 3" from the hinge and $\frac{3}{4}$ " from the side, like pictured below.

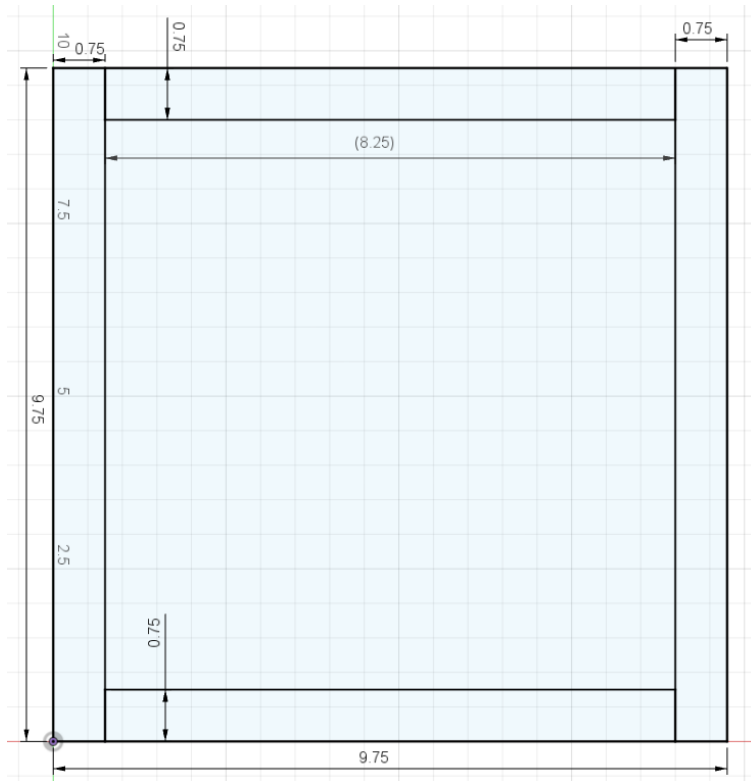


Pad Support Drawings

Pad A



Pad B

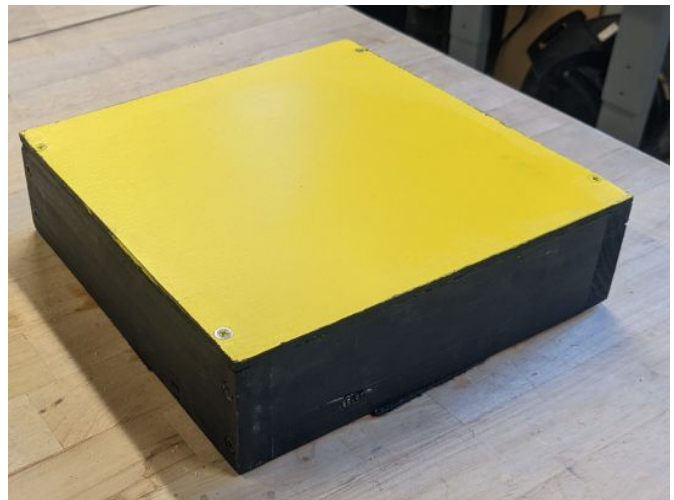


Pad C

Finished Pads

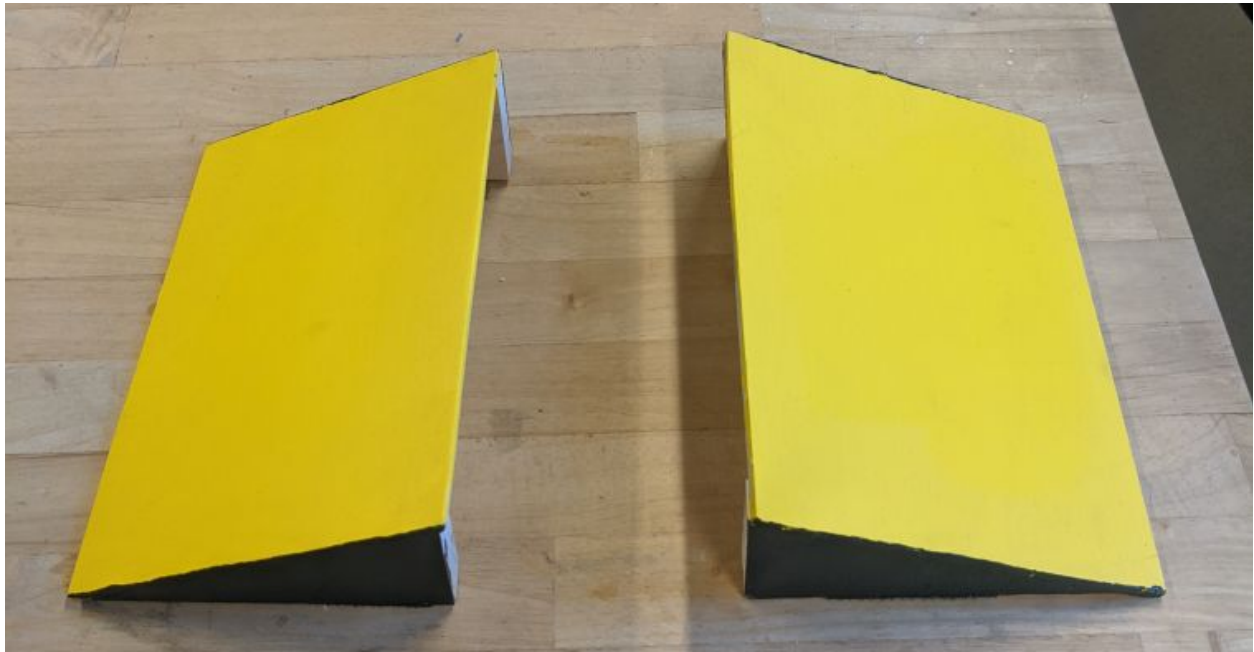


Pad A



Pads B and C

Ramps:



Ramp Component List	
Component Name	Quantity
Ramp Support	6
6 $\frac{5}{8}$ "x 6" Plywood	1
6 $\frac{5}{8}$ "x 9 $\frac{1}{2}$ " Plywood	2
Wood Glue	N/A

1. Take a 1" x 3" board and place a mark at $5 \frac{3}{4}$ " on one edge. Draw a line connecting the mark to the opposite edge's corner making a right triangle like shown below.



2. Cut along the line drawn
3. If done correctly, you should be able to make a straight cut on the remaining portion of the board and end up with 2 ramp blocks of the correct dimensions.
 - a. We found it easiest to make the cuts with a bandsaw
4. Repeat until you have 6 blocks
5. Sand/plane all of the blocks to be consistent sizes/shapes
6. Glue the Ramp Supports parallel to the $6 \frac{5}{8}$ " edge of the plywood sheets (2 supports per ramp)
 - a. You can offset the supports about an inch from the edge of the plywood to make removing the ramps easier

Walls:

Wall Component List	
Component Name	Quantity
28 ½" inch 1x3	1
28 inch 1x3	1
29 inch 1x3	1
8 ¾" inch 1x3	1
2 inch 1x3	10
Cardboard paper 3" x 22"	1

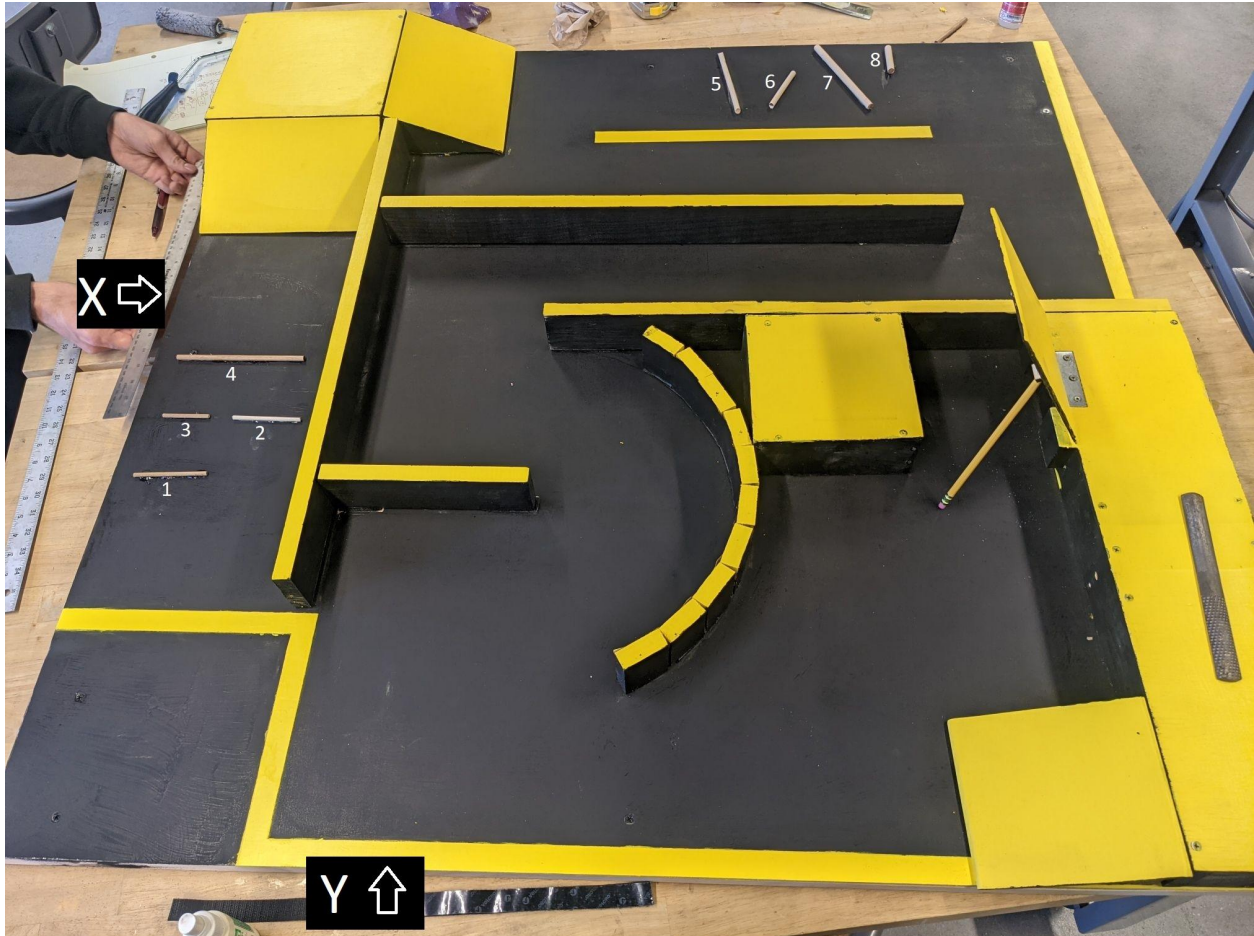
1. Cut the listed boards to their respective sizes
2. Paint the tops of the walls yellow and the sides black
3. Apply short strips of Velcro to the bottom of the wall sections
 - a. 2 strips per section should be enough, one at each end
4. Locations of the walls are shown on page 5

Curved wall



1. Lay all 2" blocks in a line side by side.
2. Glue cardboard paper to the 3" side.
3. Allow wood glue to set up for a few minutes, then move the blocks to an upright curved position. It should look like the picture above, This avoids glueing the blocks together.
4. Allow to dry completely before moving again.
5. Paint the top of the wall yellow, and the sides black
6. For positioning the curved wall, we put a temporary screw at the end of the 8 $\frac{3}{4}$ " wall. We then measured out 9 inches on a string, wrapped it around the screw, and marked out radially.
7. Place the curved wall such that the interior edge is on the mark. There should be a 7" gap from the edge of the base to the end of the curved wall.

Dowels:



Dowel locations:

X and Y are defined from the left side and bottom of the course respectively as marked in the picture.

Dowel Number	Diameter	Length	x1 (in)	x2 (in)	y1 (in)	y2 (in)
1	3/16"	3.50	1	4.5	16.5	16.5
2	3/16"	2.25	1.5	3.75	20	20
3	3/16"	3.00	5	8	20	20
4	1/4"	6.25	1.25	7.5	23.5	23.5
5	1/4"	5.34	29.25	28.25	41.75	47
6	1/4"	3.13	31	32.5	42.25	45
7	3/8"	5.71	36.5	34.25	47.25	42
8	3/8"	2.00	38.5	38.5	47.25	45.25

1. The dowels are glued in place.