

# 2019 USITT

## Midwest Regional Section

### Stage Machine Design

### Competition

Proposal for the theatrical drop designed and built by the  
Northern Illinois University Technical Direction Team.

Team Members:  
Chris Stoutjesdyk  
Brysen Hannappel  
George Hook  
Alejandro Treccani



## **Design requirements and considerations as understood by the design team**

1. The effect initiates during the wedding scene during Much Ado About Nothing and involves the “rainfall” of flower petals over the lovers
2. The effect takes place center stage
3. The effect should cover an area of approximately a *three foot diameter circle*
4. The petals used for this effect will be silk flower petals, approximately *1½” x 1½” in size*.
5. The effect should be able to include a range of speeds and density for the falling of the flower petals in order to be adjusted as desired by the director/design team
6. The effect must allow the petals to fall no less than *15 feet* from drop to floor
7. The physical drop for the effect must be able to hang on a *1½” Schedule 40 batten*, and must have a footprint not greater than *20” by 20”*.
8. The effect must be reloadable from the ground by a ground team without the aid of a ladder or lift.
9. The effect must be operational from *25 feet offstage* of the fall zone; the operator will be on a level *15 feet below* the level of the petal drop device.
10. The effect must be reloadable in under *10 minutes*
11. The effect should be silent to accommodate a low level of noise during the operating scene
12. The device of the effect should be versatile enough to possibly include other substances for future uses including but not limited to snow, confetti, and ping pong balls.

## Design Process

-Initially the team had decided the most efficient effect would be to create a ground loadable mount that could then be hung on a batten and flown out. We decided to not go with this method because it would violate the restriction that the drop device would be inaccessible to floor crew.

-The next idea the team had was to create a lightweight and wireless device that could be loaded and unloaded while the batten was at its trim height. A stagehand would use a pole to lift the entire device on and off of the batten to refill it. However, we felt that this violated the spirit of the rules, even if it might be the best solution.

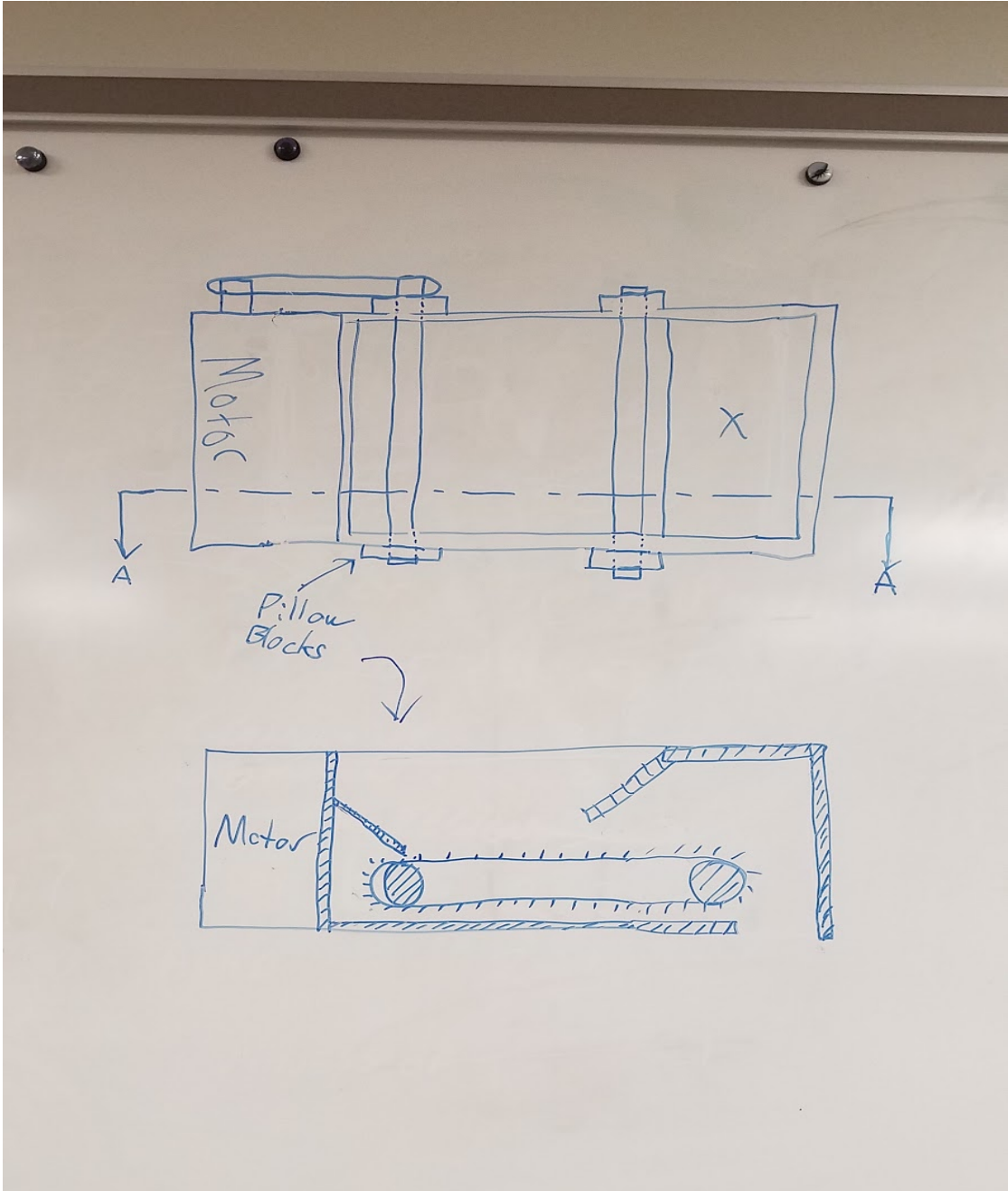
-The main hurdle then became the issue of how to load the petals into the drop device, we then explored methods to have an automatic reloadable system that brought the different droppable items to the device from offstage, such as a conveyor belt, but decided against this as it would violate the rule that the effect must be contained within a 20" by 20" area.

-The group decided that the best solution that wouldn't violate the spirit of any of the restrictions would be a ground technician loading the device using a "pool cleaner" type extension arm that could hold and deposit whatever items needed to be dropped.

-We then discussed the method the device would use to drop the given items at a variable speed over the longest possible amount of time. Initially we thought about using an archimedes screw to push the items out of a hole in the bottom of the box, but decided that such a device would potentially damage any items it was pushing.

-Finally we decided to construct the box in a similar manner to the design with the archimedes screw but instead use a simple motor driven conveyor belt with a ribbed conveyor to push the items out the hole.

Original Concept Sketch



### **How it works**

1. Machine is loaded with desired items
  - a. Stagehand uses a “pool cleaner” to dump items into top of the machine
  - b. Items land on conveyor belt
2. DMX signal from light board turns on the motor
  - a. Does not need to be a light board can be another device
  - b. DMX signal is sent with a que
3. Motor turns the drive roller, causing the conveyor to move
4. Conveyor dumps items out of hole on the bottom of the device.
5. DMX signal turns off motor, stopping all movement in the device, causing no more items to fall.

### **Pricing**

12”-Wide Ribbed Conveyor Belt 3’ length- \$48.96

DMX Controlled Mirror Ball Motor- From stock-Approx \$130.00

15” Drive Roller with groove- \$16.07

12” Idler Roller- From Stock- Approx \$10.00

Frame-Plywood or Steel- TBD

Drive Belt-TBD

Pool Skimmer- \$17.00

Pool Pole- \$25.00

Grand Total (without TBD items): \$247.03

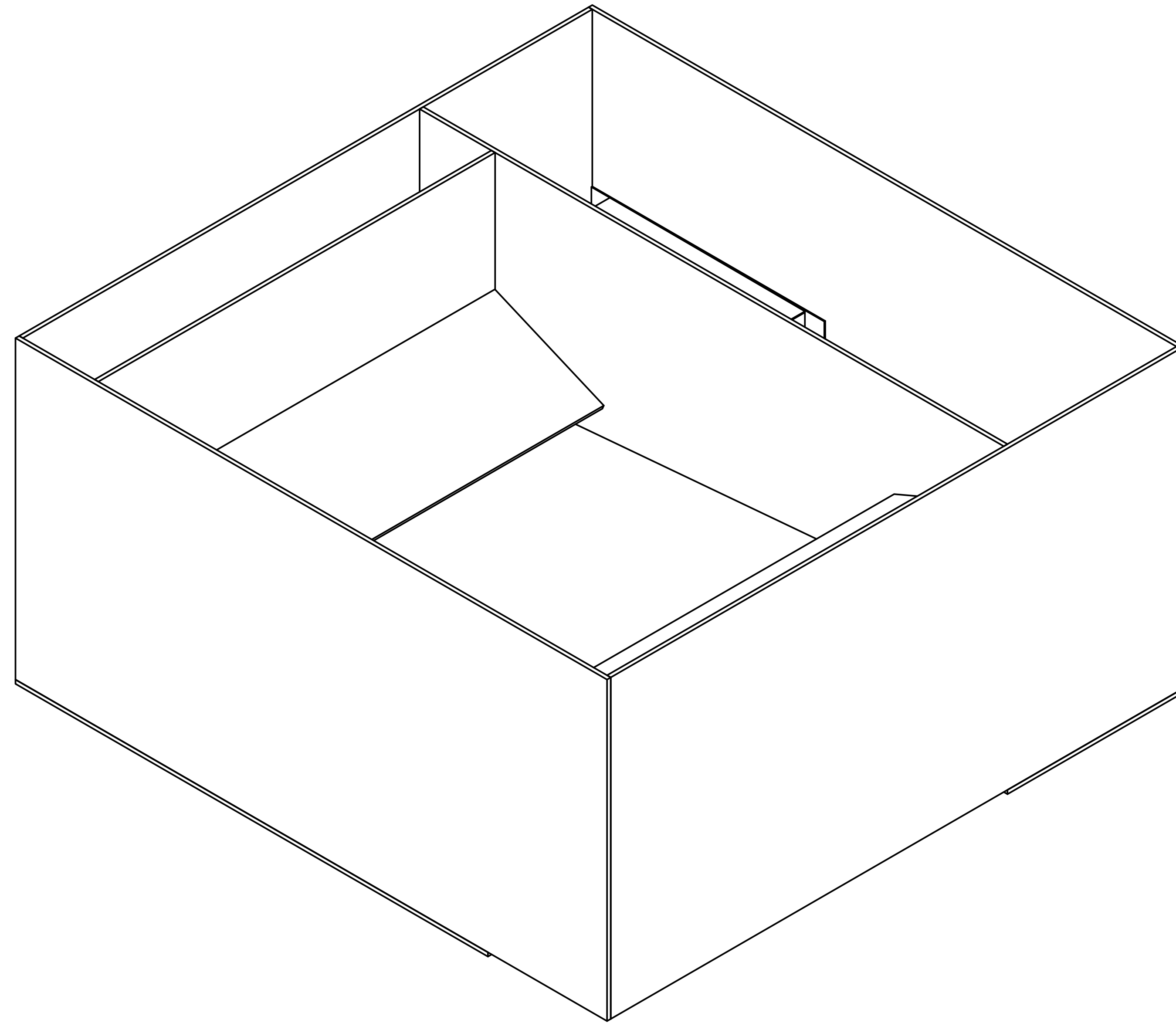
Total to purchase: \$92.03

**Instruction manual for set up crew:**

1. C-clamp onto batten
2. Connect DMX (motor control) and power
3. Set up control (board, switch)
4. Send cue test on ground
5. Fly batten out
6. Load items into top of machine with “pool cleaner”

**Instruction manual for run crew:**

1. Load items into top of machine with pool net
2. Effect is initiated from command on lighting console



PRODUCED BY AN AUTODESK STUDENT VERSION

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NOTES:

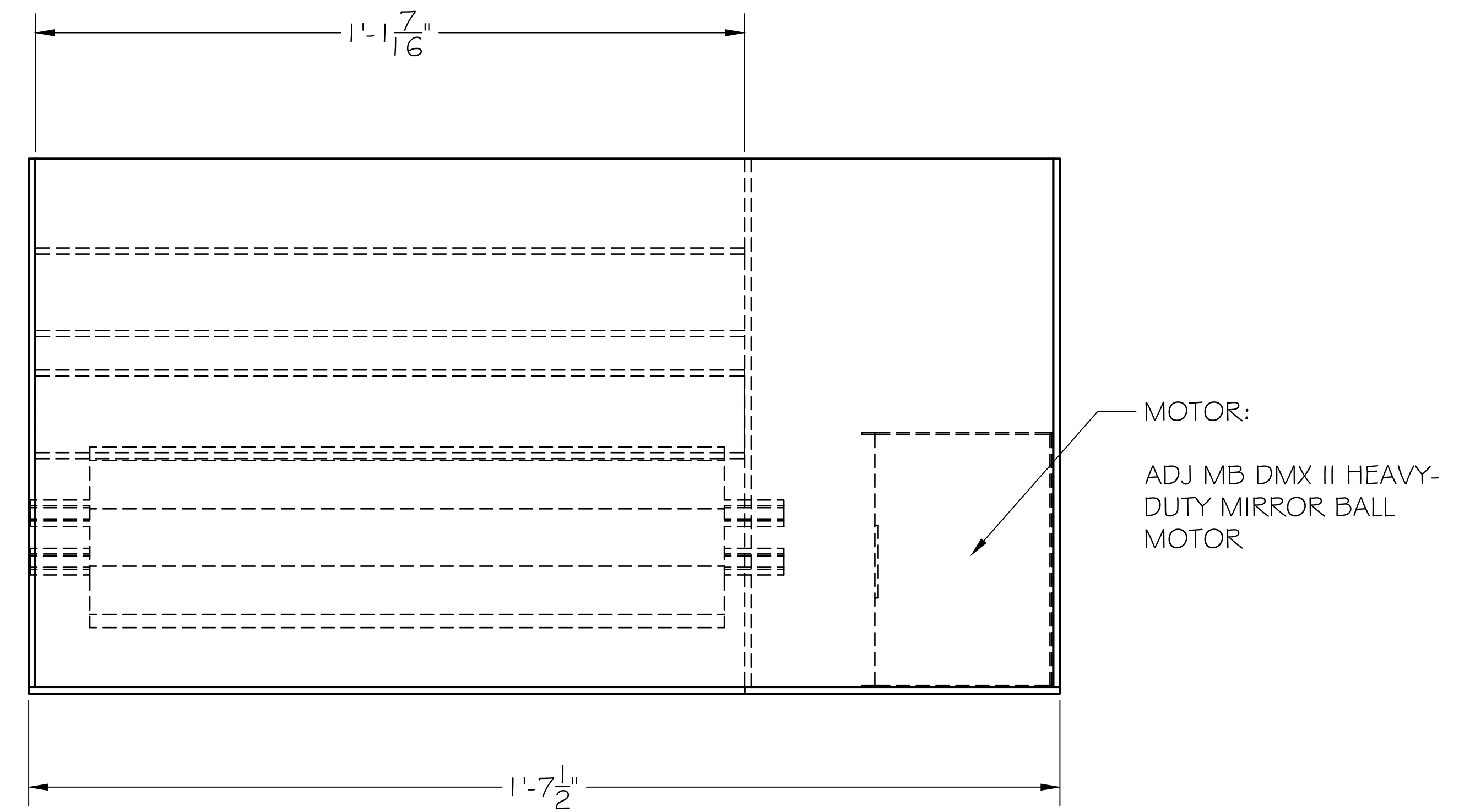
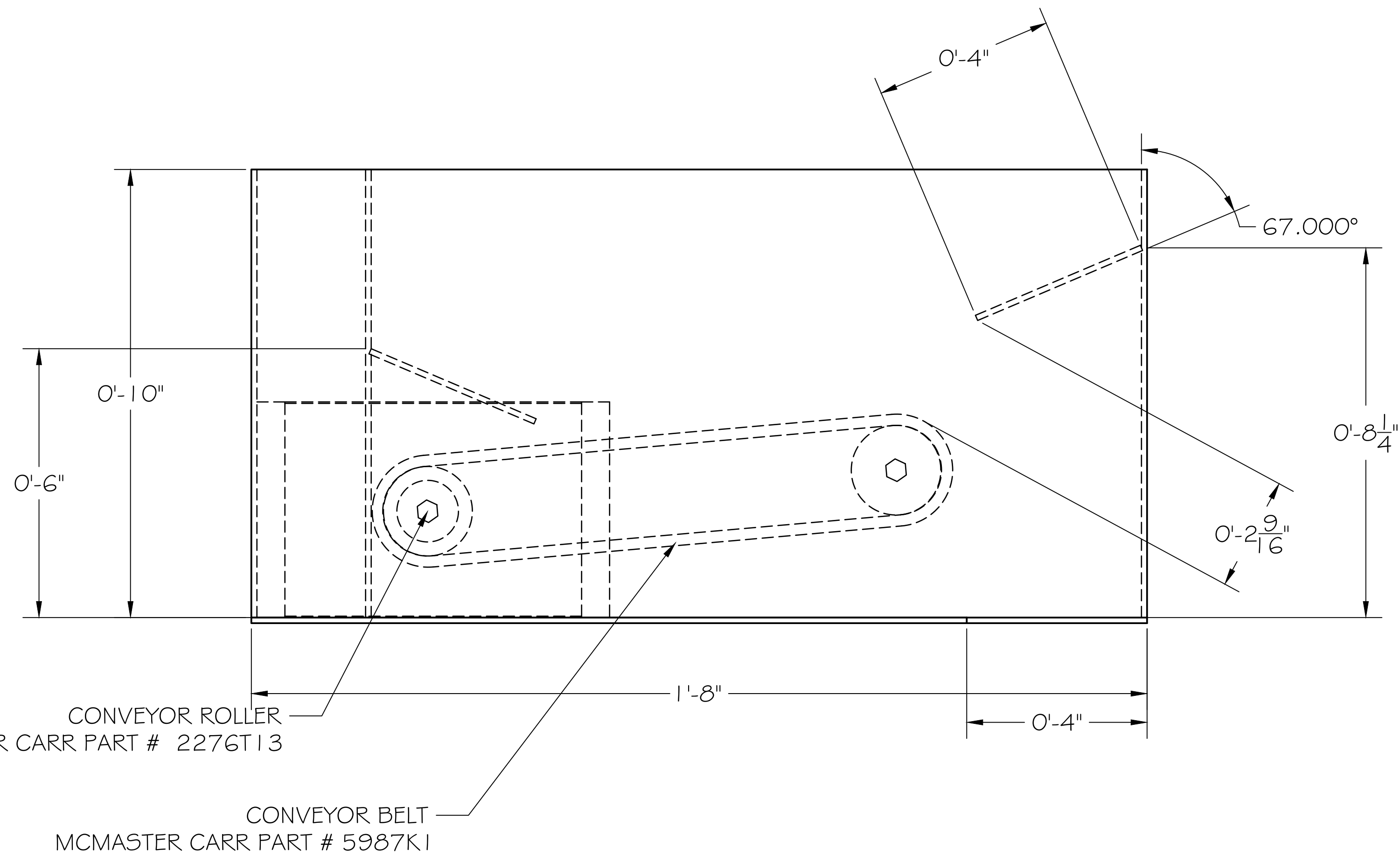
# MIDWEST DESIGN COMPETITION (NIU) ISOMETRIC

DRAFTED BY GEORGE HOOK	DESIGNERS: GEORGE HOOK
VERSION #1	ALJEANDRO TRECCANI
DATE: 4/12/2019	BRYSEN HANNAPPEL
SCALE: 0'-6" = 1'-0"	CHRIS STOUTJESDYK

# # 1

# SIDE

# FRONT



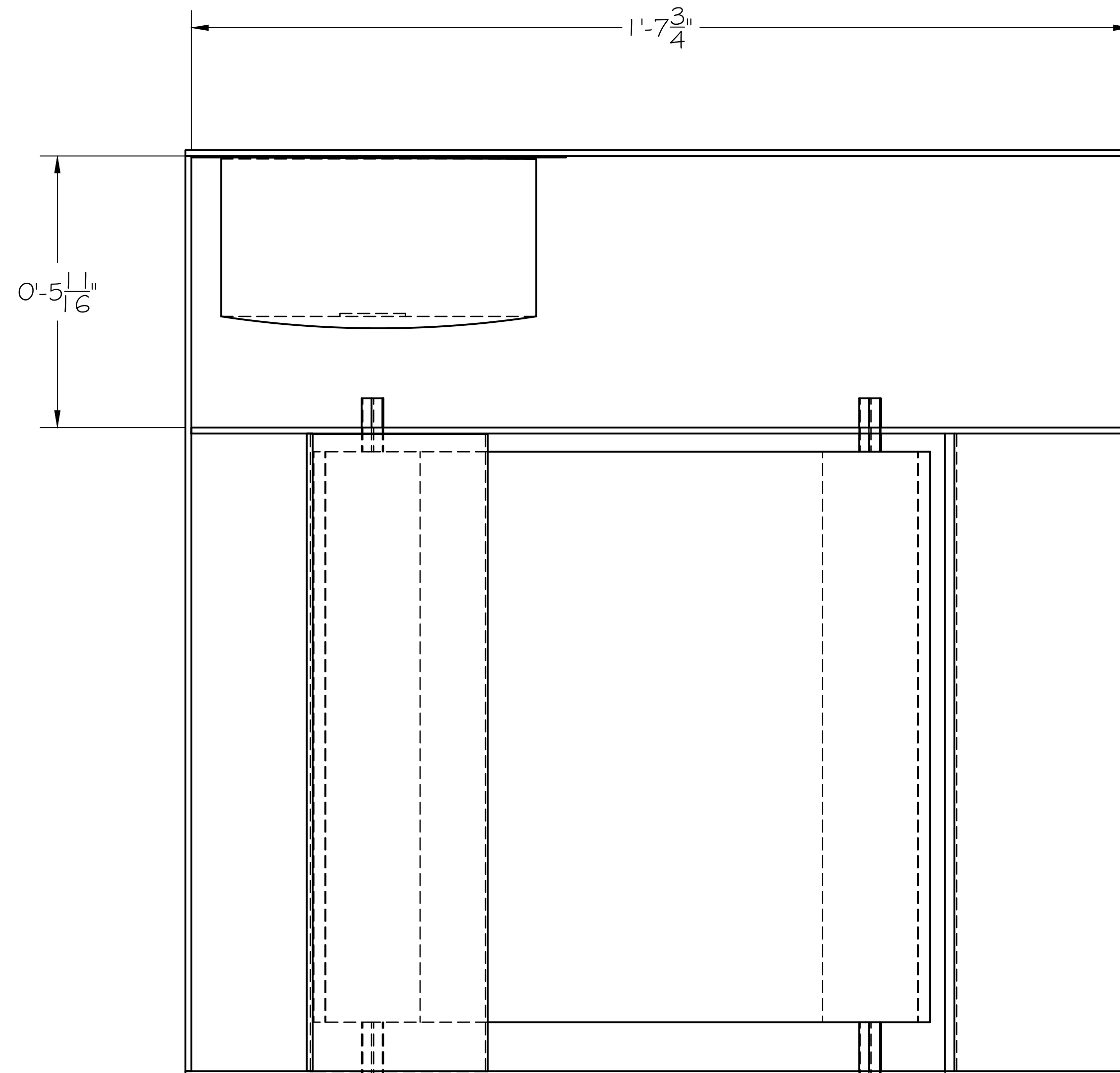
NOTES:  
MATERIAL TO BE DETERMINED.

## MIDWEST DESIGN COMPETITION (NIU) FRONT AND SIDE VIEW

DRAFTED BY GEORGE HOOK	DESIGNERS: GEORGE HOOK
VERSION #1	ALJEANDRO TRECCANI
DATE: 4/12/2019	BRYSEN HANNAPPEL
SCALE: 0'-6" = 1'-0"	CHRIS STOUTJESDYK

# #2





NOTES:

# MIDWEST DESIGN COMPETITION (NIU) TOP VIEW

DRAFTED BY GEORGE HOOK	DESIGNERS: GEORGE HOOK
VERSION #1	ALJEANDRO TRECCANI
DATE: 4/12/2019	BRYSEN HANNAPPEL
SCALE: 0'-6" = 1'-0"	CHRIS STOUTJESDYK

# #3