

Shivam Gaind

Report Out

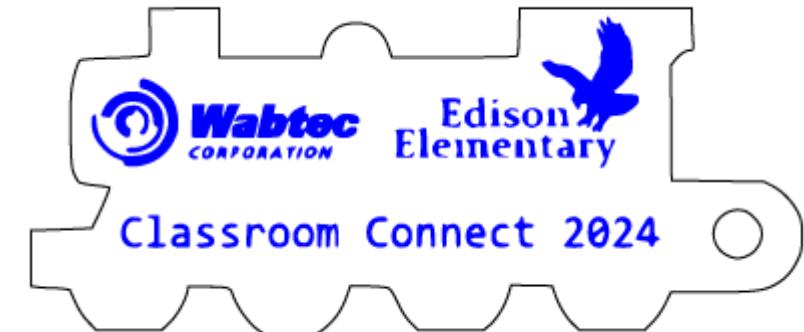
7.25.2024

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Edison Elementary Keychains

- My first project at Wabtec was with Grace to make keychains for the students of Edison Elementary!
- We designed the keychains in Adobe Illustrator and brought them to life with laser engraving on acrylic laminate. Over 50 students received this special gift!



Connector Blocks

- **Designed and 3D printed custom blocks** to securely hold various connector sizes during wire insertion in Building 12.
- **Replaced previous aluminum connector blocks** that were prone to theft due to their material value.
- **Improved worker safety** by mitigating the risk of hand injuries from exposed wires during manual insertion.
- **Reduced costs** by utilizing PLA, an inexpensive and readily available 3D printing material, for the new connector block design.



4X Scale Terminal Board

- **4X Scale Model:** Created a 4x scale model of **three different sizes** of crimped terminal lugs and washers.
- **Easy Transport:** Designed and attached a handle to the terminal board model for easy transport.
- **Educational Tool:** The model will be used at career fairs and STEM events to **demonstrate the various wiring procedures** used to connect wires to terminal boards.



4X Scale Hex Nut Screw

- **3D Printed Hex Nut Screwdriver**
- **Purpose:** Designed to easily remove hex nuts from terminal boards.
- **Printing Technique:** Line pattern with 70% infill for increased durability.
- **Possible Modifications:**
 - Design could be altered to accommodate different hex nut sizes.
 - Material choice could impact durability and functionality.



AutoHotKey Project

Non-Additive Related

- **Hotkey Trigger:** Starts the process with a customizable hotkey (e.g., Win+Ctrl+E)
- **Filename Prompt:** Asks the user for a filename
- **Excel Launch:** Opens Microsoft Excel
- **File Creation:** Navigates Excel to create a new file.
- **Save to Directory:** Automatically saves the new file to a default directory (e.g., Desktop) with the specified filename.



STEM Day Catapult Building Activity

- **Catapult Building Activity:** Worked with students to build catapults, introducing them to key scientific concepts.

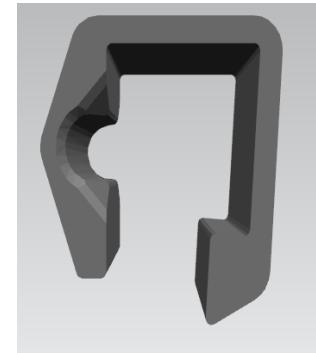
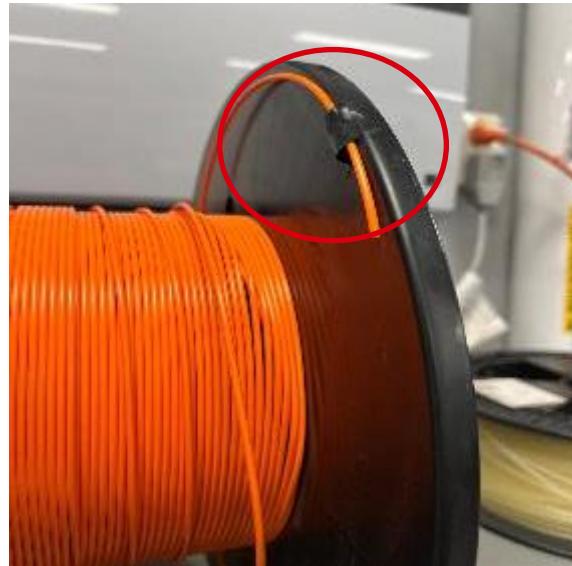
- **Concepts Explored:**

- **Gravity:** Observed how gravity affects the launched object's trajectory and landing.
- **Torsion:** Demonstrated torsion by holding the catapult arm down with a finger.
- **Tension:** Explored tension using rubber bands to launch the catapult's projectile



Additive Lab

- **Created Filament Clips:** Designed and fabricated clips to securely hold filament spools for **Big Rep** and **MakerBot** 3D printers.

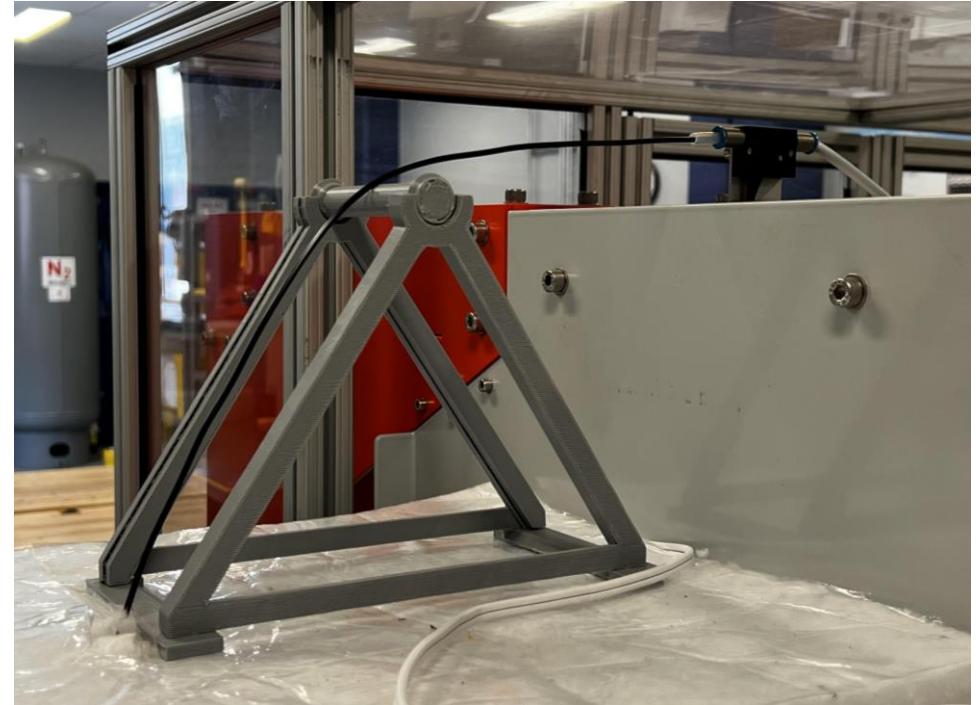
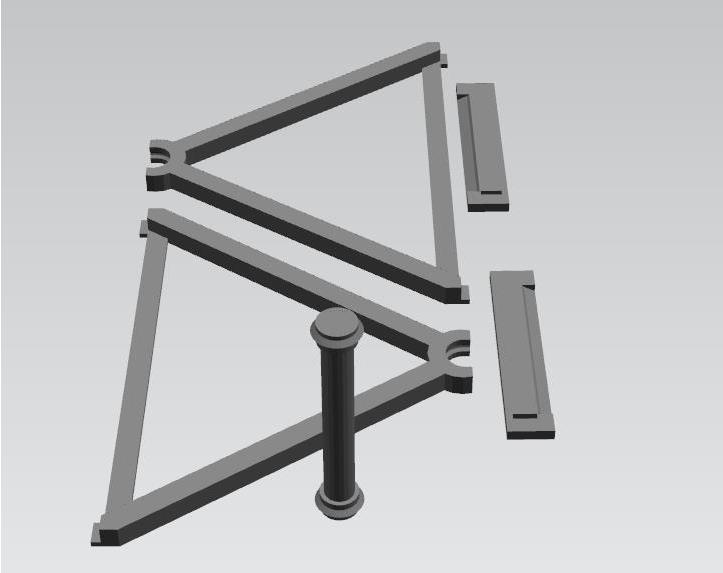


Additive Lab

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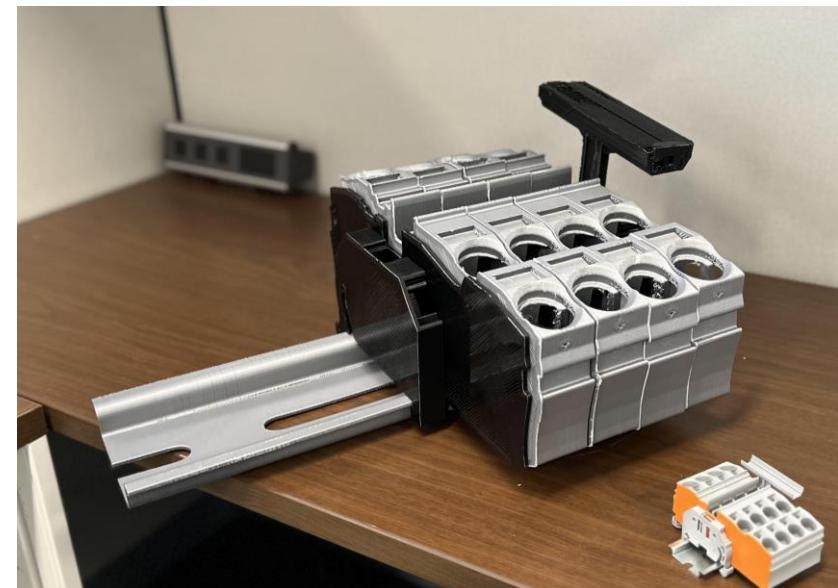
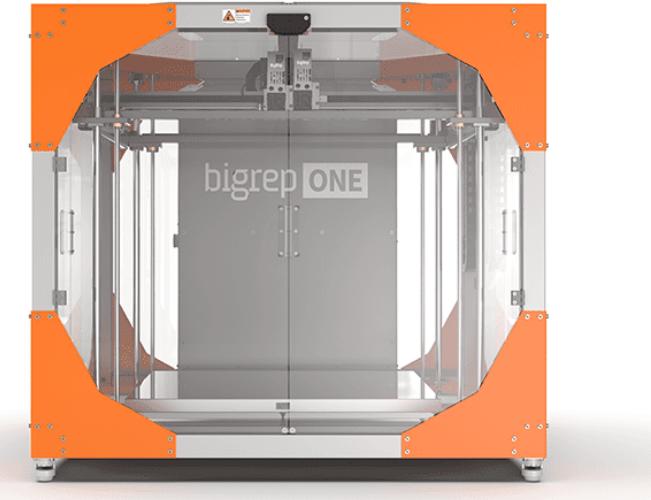
- **Created Support Structure**

Designed and implemented a support structure to alleviate tension on Big Rep filament, preventing warping and jamming issues within the printer



WAGO Terminal Board Assembly

- **Creation:** 4x models of an assembly of WAGO terminal boards were created using the BigRep 3D printer.
- **Modifications:**
 - **Fit:** WAGOs were adjusted to fit securely on a DIN rail.
 - **Expansion:** Holes were expanded along each terminal block for easier wire insertion..



Instron Tensile Tester

Non-Additive Related

- **Tensile Tester Situation:**
- **Original Tester: Uncalibrated since 2014, unsafe for use.**
- **New Instron Tester: Available but unused due to lack of knowledge within the department.**
- **Building 9**
 - Offers Instron testing services.
 - Requires test request form and payment.
 - Can take over two weeks for results.



Instron Tensile Tester

Continued

- **Completed Goals:**
- **Learned:** Successfully gained knowledge on how to operate the Instron tensile tester.
- **Independence:** Conducted tensile tests in-house without relying on external resources.
- **Instructions:** Created a guide for pull-testing cables to failure



Using NX to Create Formboards

- **Formboard Creation with Alex Ivanic**
- **Documentation:** Detailed steps for creating a formboard using NX were created.

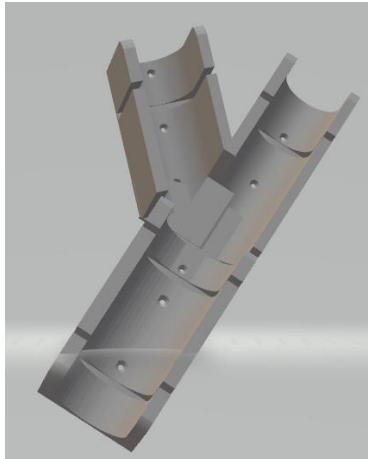


NX Formboard Creation

Building 12 Formboard Parts

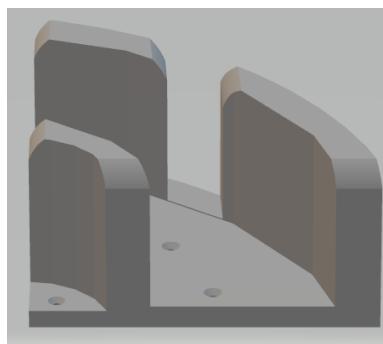
Current Situation:

- Form boards are built using screws and pins.
- Pins often get bent as wires are placed on these boards.
- Replacing screws and pins used in the form board is expensive for Building 12.



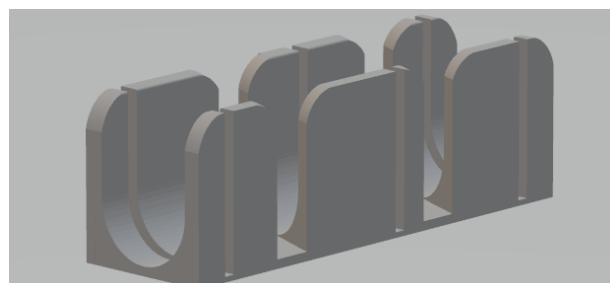
Problem:

- Building 12 seeks a unique solution to reduce their cost.



Proposed Solution:

- I designed parts that can be used to securely hold wires in place at different angles on the form board.



Wabtec CORPORATION AM Labs - Quotation Form

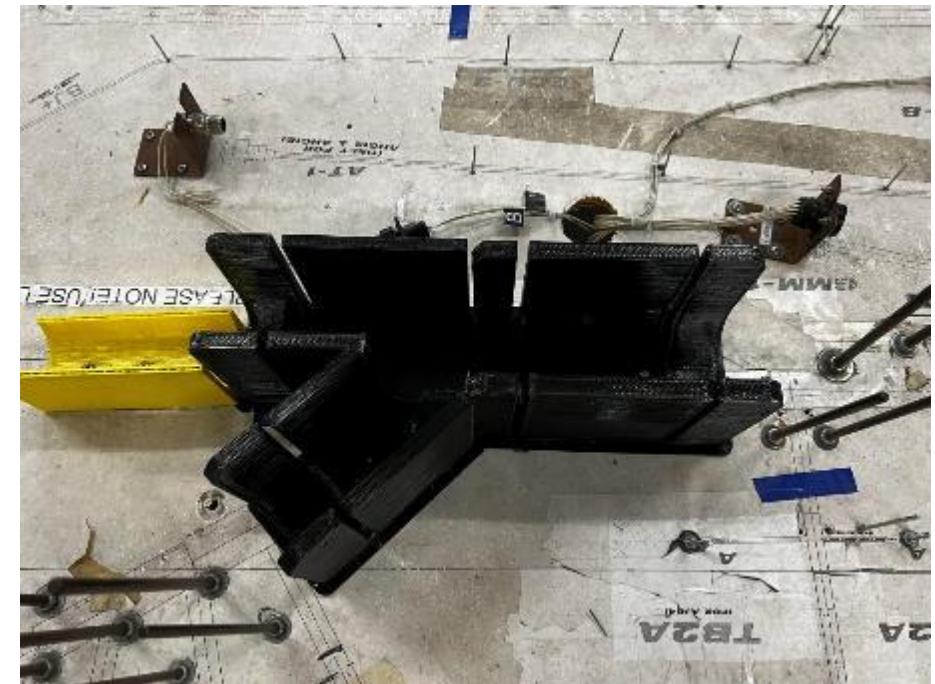
Quote Date	7/9/2024	Quote #	202407081-1				
Delivery	14 days ARO	Order #	202407081				
Customer		Shipping Address					
Customer	Wabtec	Address					
Name	Formboard	City					
Phone		State, Zip	Pickup				
Email		Country					
ITEM #	PART NAME	Process Steps:	QTY	TECHNOLOGY	MATERIAL	UNIT PRICE	TOTAL PRICE
1	Y Bracket	Material Cost Printing - BigRep One	2	FDM	ProFlex	\$93.75	\$187.50
2	12" Log	Material Cost	12	FDM	ProFlex	\$14.88	\$178.56
3	Quarter Circle	Material Cost	2	FDM	ProFlex	\$15.08	\$30.16
4							
Total Price: \$396.22							
Special Notes and Instructions							
a) Parts will be delivered "as-printed" with any support structure removed, and parts removed from the build plate (if necessary) unless otherwise noted. b) Quoted delivery is from time receipt of purchase request and may be updated depending on production queue. c) Any additional post-processing requirements such as surface finish treatments or machining must be listed to be assumed in the quote. d) Quote is valid for 30 days from quote date.							
Estimated Shipment Schedule							
a) Actual shipment is determined by production level at the time of order.							
Project Manager		AM LAB Manager					
Shivam Gaind		Grace Trott					

Building 12 Formboard Parts

Continued

Benefits:

- Reduced maintenance costs due to less frequent pin and screw replacements.
- Increased durability
- Improved wire organization and stability on form boards



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Questions?