



Designing the Kautz Road Entrance

Luca Noventa, Gavin Melone, Destiny Lewis-Nelson

Final TARGET & JROTC Presentations

26 July 2024

Introductions

Luca Noventa:

- TARGET intern
- Rising junior
- Attends the Latin School of Chicago
- Applied to narrow down specific interests within STEM



Gavin Melone:

- VALOR Intern
- Rising senior
- Attends Rickover Naval Academy
- Applied to gain valuable experience in a scientific workplace



Destiny Lewis-Nelson:

- VALOR Intern
- Recent graduate
- Attended the Air Force Academy high school
- It seemed like a great opportunity



Our Team & Our Workspace

- Worked closely with many individuals in Environment Safety & Health
- Spent time outside Wilson Hall, but worked from a room on the 7th floor
- Worked in ISD on the 5th floor as well



Headquarters



Locking In...



The Team



Home Sweet Home

Project Objective:

Tasked with drawing up proposed designs for the new entrance on Kautz Road, which will:

- Provide access for construction vehicles to the PIP-II and LBNF/DUNE sites
- Prevent congestion at other access points (up to 1500 vehicles a day could use the gate)
- Keep other roads on-site in good shape

The Kautz Road Entrance



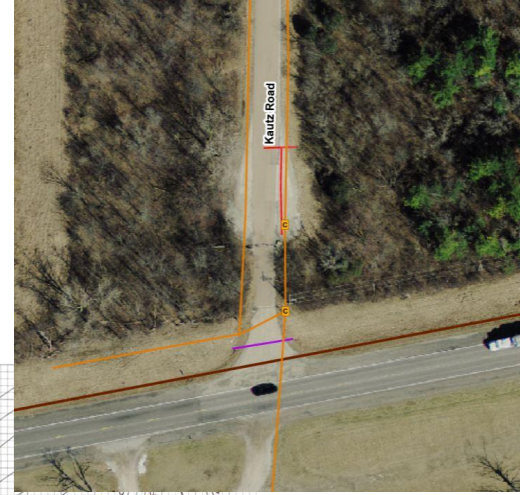
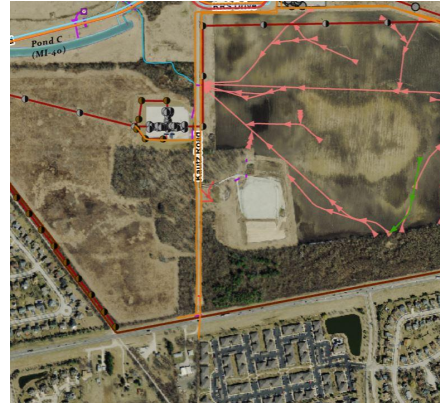
The current state of affairs...

Initial Steps

To begin, we:

- Surveyed the existing gate for context
- Took measurements
- Visited & took measurements at the Batavia Road gate for references
- Analyzed the Fermilab GIS system & CAD drawings for complications
- Started drawing up rough sketches

When starting the designs, we took inspiration off the Batavia Road gate and its design, adopting a rolling steel gate that shuts outside of work hours, as well as a similar guardhouse placement.



← Rough first sketch

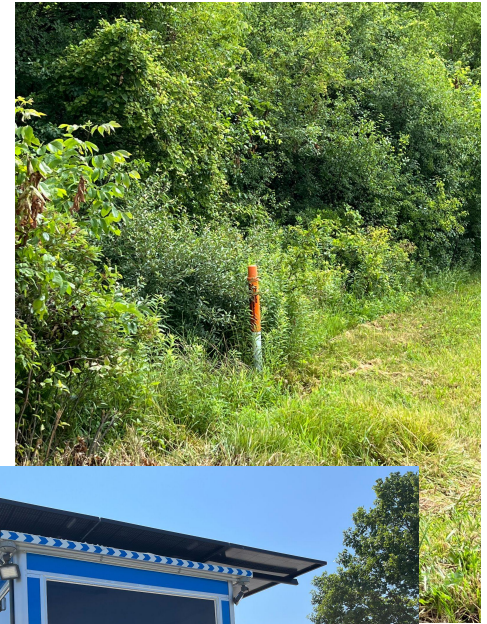
Proposals

Things that changed:

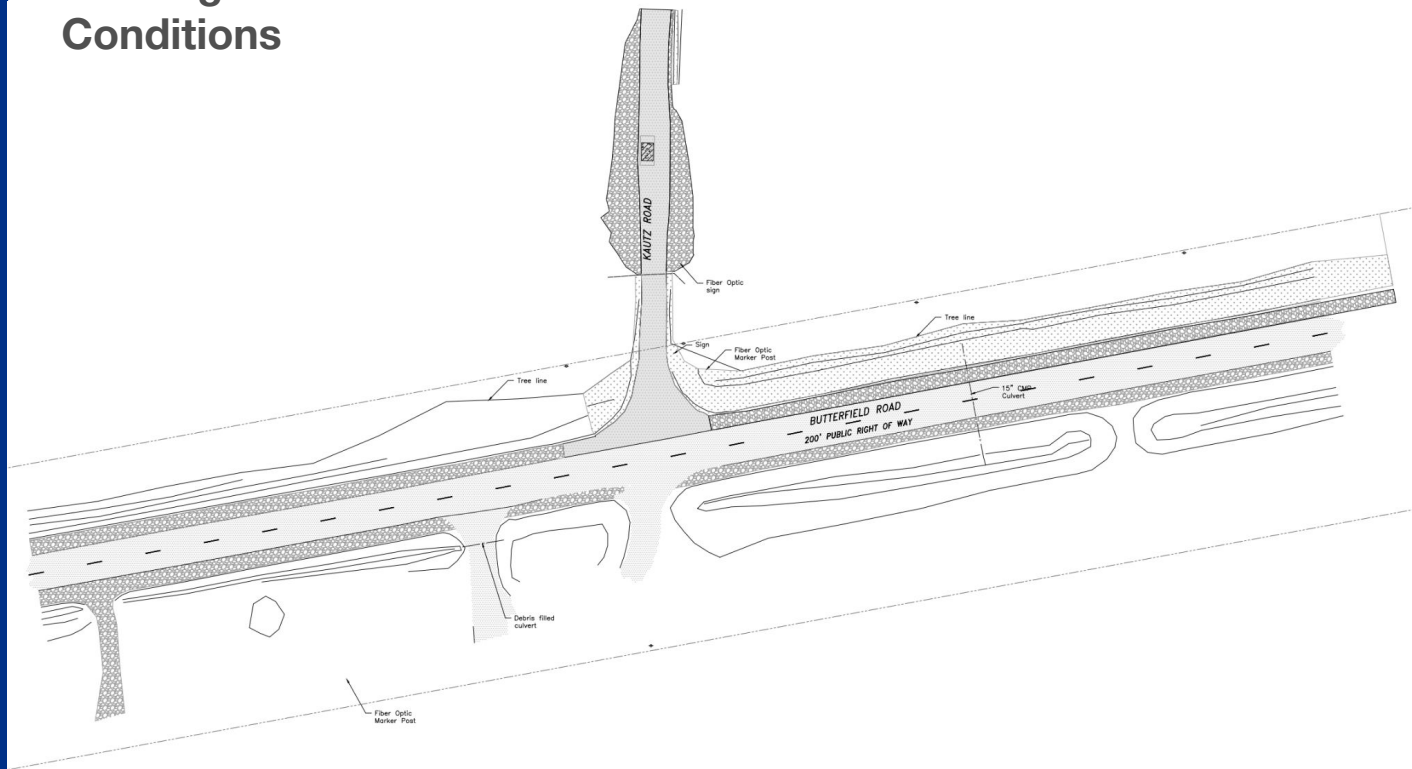
- Guardhouse moved closer to Butterfield Rd. due to regulations
- Turnaround moved closer for vehicles denied access
- Turn lane added to prevent lines on Butterfield Rd.
- Road expansion shifted to avoid communications lines
- Concrete pad lowered to level of asphalt to allow access to payloads on wider truck beds (magnets, dewars, etc.)
- Removable posts added for security
- Turn radii modified due to regulations
- Guardhouse sourced

Design Vehicle Type	Passenger Car	Single-Unit Truck	Intercity Bus (Motor Coach)		City Transit Bus	Conventional School Bus (65 pass.)	Large School Bus (84 pass.)	Articulated Bus	Inter-mediate Semi-Trailer	Inter-mediate Semi-Trailer
Symbol	P	SU	BUS-40	BUS-45	CITY-BUS	S-BUS36	S-BUS40	A-BUS	WB-40	WB-50
Minimum Design Turning Radius (ft)	24	42	45	45	42.0	38.9	39.4	39.8	40	45
Centerline Turning Radius (CTR) (ft)	21	38	40.8	40.8	37.8	34.9	35.4	35.5	36	41
Minimum Inside Radius (ft)	14.4	28.3	27.6	25.5	24.5	23.8	25.4	21.3	19.3	17.0

Design Vehicle Type	Large Semi-trailer	Semitrailer Interstate	"Double Bottom" Combination	Semi-trailer trailers	Tumpike Double Semi-trailer	Motor Home	Car with Camp Trailer	Car with Boat Trailer	Motor Home and Boat Trailer	Farm Tractor w/One Wagon	
Symbol	WB-55	WB-62*	WB-65** or WB-67*	WB67D	WB-100T	WB-105D*	MH	P/T	P/B	M/HB	TRW
Minimum Design Turning Radius (ft)	45	45	45	45	45	60	40	33	24	50	18
Centerline Turning Radius (CTR) (ft)	41	41	41	41	41	56					
Minimum Inside Radius (ft)	18.4	17.9	4.4	19.3	9.9	14.9					



Existing Conditions



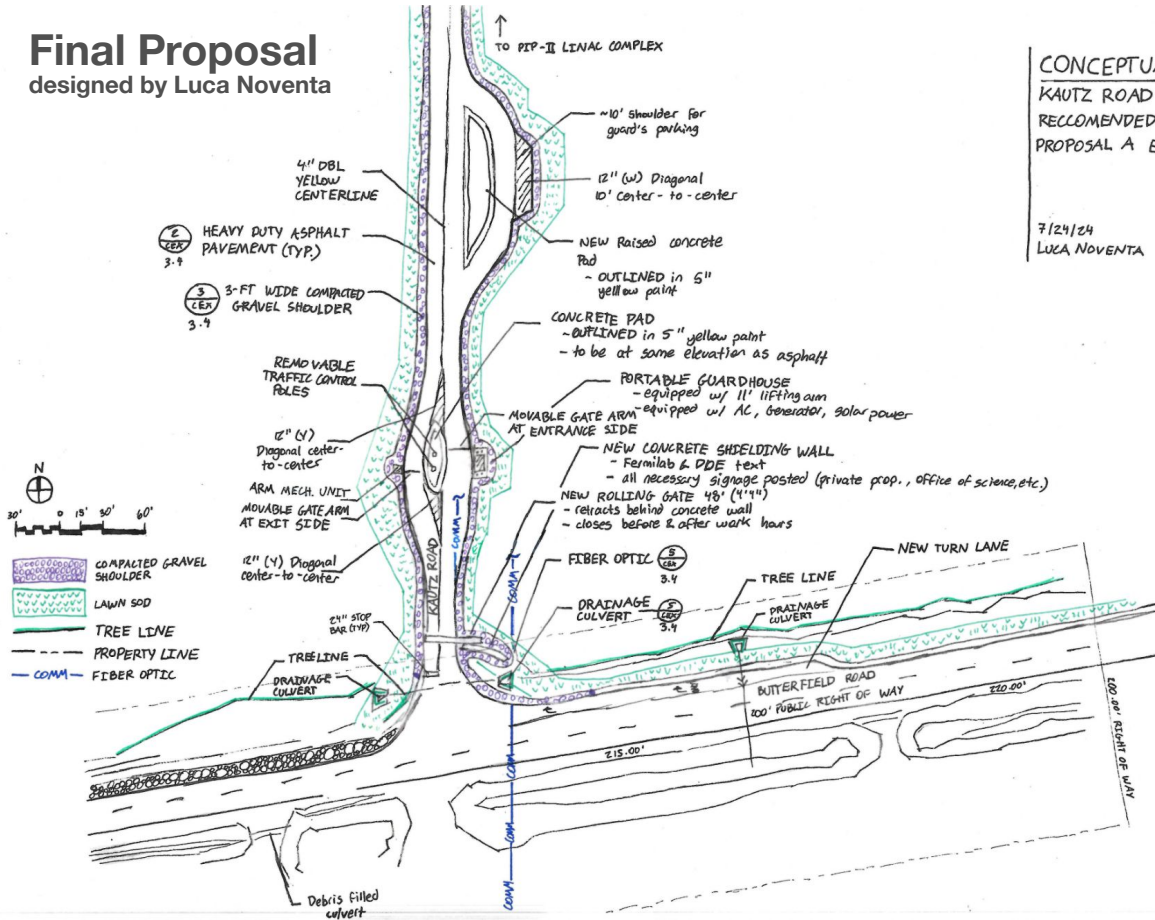
Final Proposal

designed by Luca Noventa

CONCEPTUAL LEVEL PLAN
 KAUTZ ROAD ENTRANCE
 RECOMMENDED CHANGES
 PROPOSAL A EXHIBIT

7/24/24
 LUCA NOVENTA

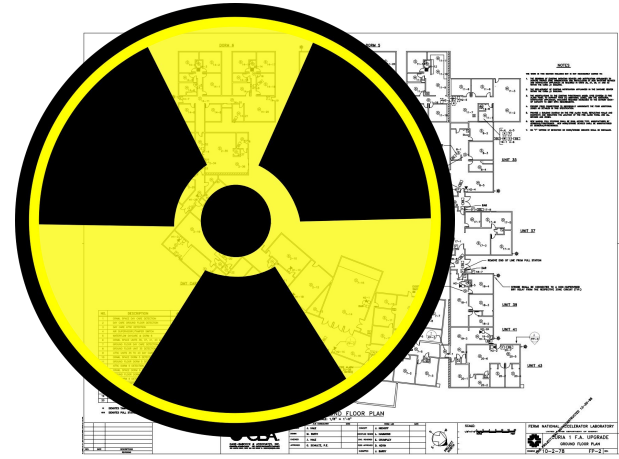
1.2



Other Activities

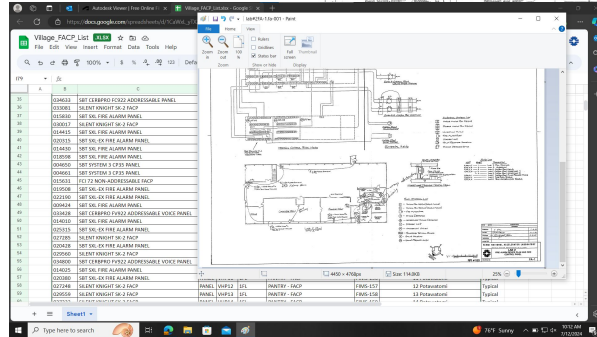
Radiation & Rad Safety:

- Met with Carmen Duvall from ES&H and discussed radiation safety
- Learned about the different kinds of radiation and safety devices
- Learned about dosimetry badges and rings, etc.



Fire Alarm Control Panels:

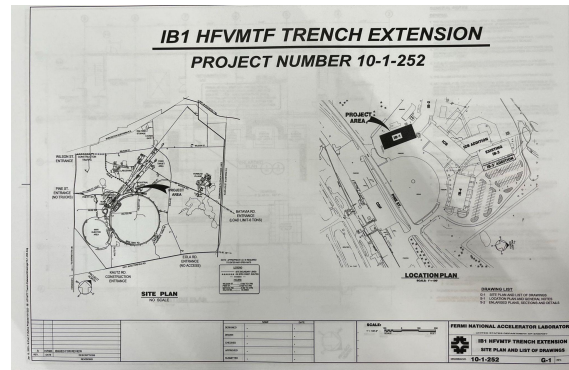
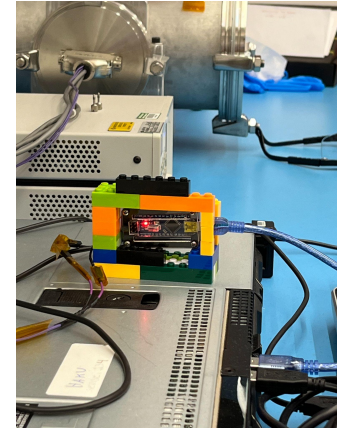
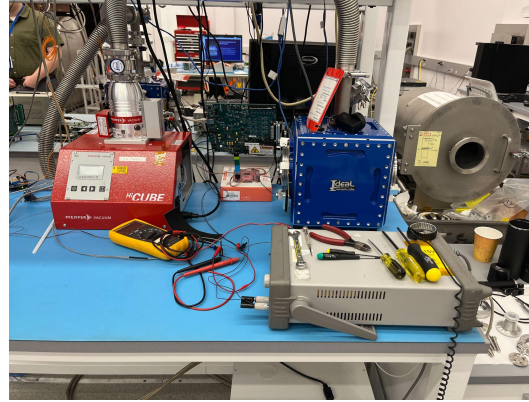
- Worked for Willy Ramos in ES&H on information gathering
- Sifted through lots of designs & files
- Highlighted all the FACP's for ease of access to subcontractor personnel
- Part of an ongoing project to update the village's fire safety systems



Structural, Electrical, and Mechanical Engineering

Before starting our project, we got to interact with engineers & specialists:

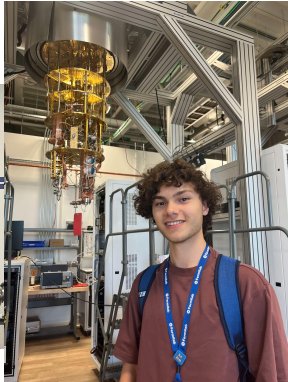
- Entered the clean rooms in IERC and learned about the ongoing projects involving CCDs there.
- Saw parts and prototypes for a satellite that will eventually search for dark matter from orbit.
- Learned with Bart Lipinsky about the preliminary phases of a construction project at the lab.
- Reviewed submittals and hazard analysis from subcontractors.
- Learned about Dave Mertz's education and career in electrical engineering



Favorite Tours

SQMS Tour - Luca

- Visited SQMS's Quantum Garage and its dilution fridges
- Learned about current quantum computing projects and future plans
- The tour made me want to delve further into quantum engineering.



Lederman Science Center- Destiny

- Visiting the Lederman Center was a great time
- Before I got there, I was able to walk through nature
- Once there, I was left to my device to explore the different activities there



Linear Accelerator - Gavin

- Visited the LINAC building
- Got to see the previous accelerators and bubble chambers
- Really enjoyed going through the underground tunnels
- Overall a very nice experience



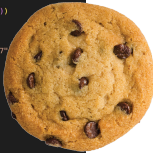
Favorite Workshops

Python Workshops - Luca

- Helped me recognize the importance of programming experience
- Learned how to write pseudocode, dissect algorithms, and have a good programming mindset
- Motivated me to learn more computer science
- Cookie Breaks!

```
(.) print('Solution to Challenge 2 goes here!')
import random, math
denom_list = [1, 2, 3, 4, 5, 6, 7, 8, 9, 0]
def generator():
    while(1==1):
        random.shuffle(denom_list)
        denominator = int(''.join(map(str, denom_list)))
        numerator = int(denominator*math.pi)
        numeratorFinal = str(int(denominator*math.pi))
        if len(str(numeratorFinal)) != 30:
            continue
        num_check = ['1', '2', '3', '4', '5', '6', '7', '8', '9', '0']
        for i in list(num_check):
            if i in numeratorFinal:
                num_check.remove(i)
            if len(num_check) == 0:
                continue
        print(numerator)
        print(denominator)
        print(numerator/denominator)
        break
generator()
```

print('Solution to Chal
factors = []
number = int(input("Wha
factors = []
for i in range(1, numbe
if number%i == 0:
factors.append(i)
print("The factors of y



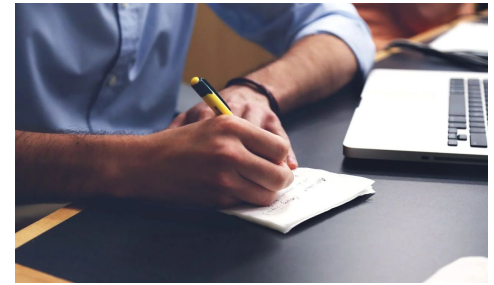
Vision Boards - Destiny

- We worked on creating what we want in are future.
- I choose what job I see myself having in the future. Where I want to travel, different quotes I found interesting, and vehicles I would like to have in the future.



Resume Workshop - Gavin

- Taught me a lot about what employers are looking for
- Told me that employers will sometimes use a sorting algorithm for resumes
- Taught me that a resume should take 6 seconds or less to read



Reflections

Luca:

- Learned how to read & work with CAD drawings
- Learned how to draw up proposals & conceptual designs
- Learned about all kinds of fields in physics & engineering from panels & lectures
- Learned how to play a very intense card game at lunch
- A very educational and rewarding experience, and I accomplished my goal of finding specific fields that interest me
- Definitely want to come back

Destiny:

- I did enjoy touring the different sites, designing the entrance on Kautz Road, and viewing different floor plans
- While I don't see myself doing this type of work in the future, it was to see the steps taking place in scientist and engineers work
- It was also good review of construction for me

Gavin:

- Saw what it was like to be a scientist
- I own a hard hat and a hi-vis vest now
- Taught me a lot about different fields of science and engineering
- Inspired me to want to come back next year and possibly apply after college

Special Thanks To:

Cortez Watkins

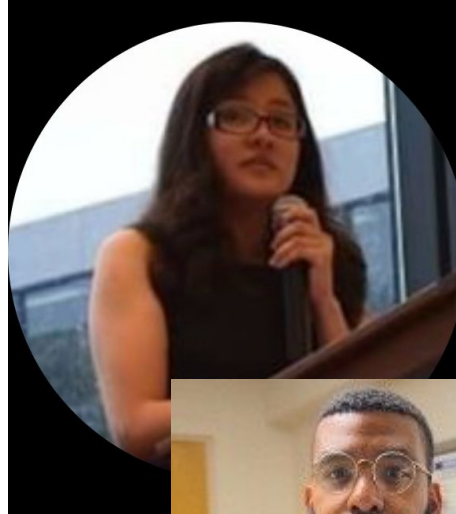


Cookie Monster



Anahi Ruiz Beltran

Monica Alvarez



Derek Picc



Azariah Israel



Rob Beebe

Thank you!

Here are some cool photos...

Dripped Out



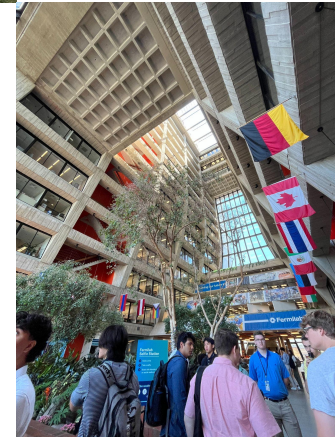
Bubble Chamber



Main Control Room



On a Walk



First Day!