



**EGR 353 – Green Architectural Engineering**  
**Project 2 – LEED Platinum Building Design & Construction**

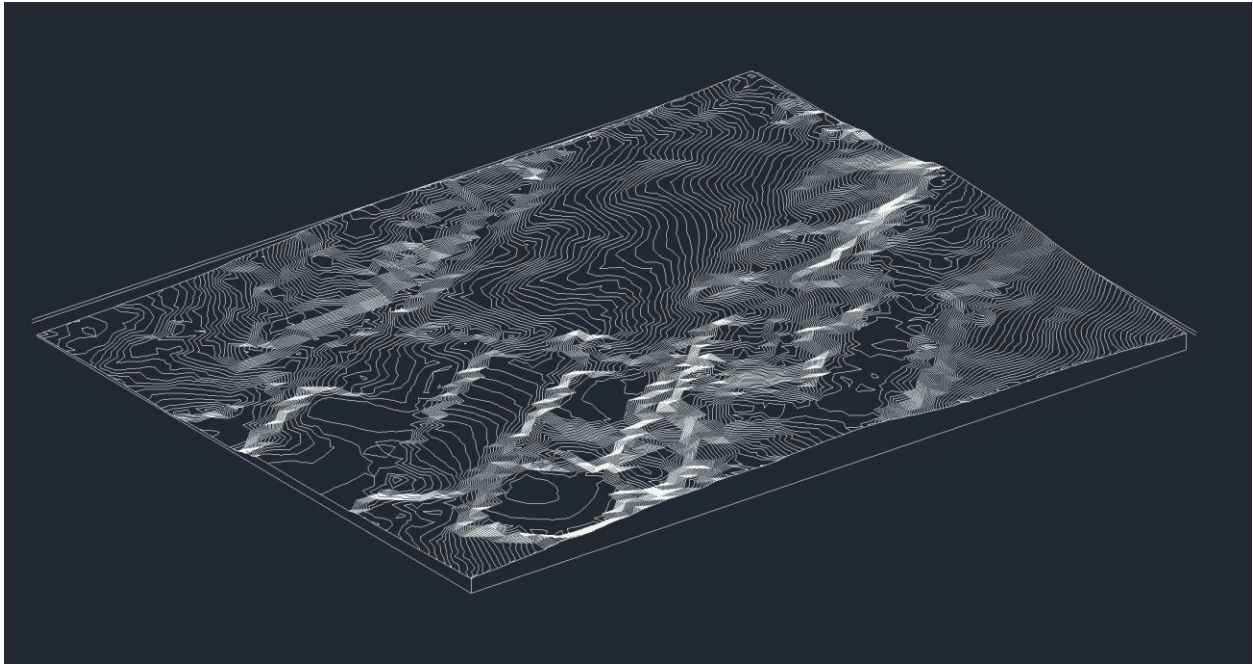
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May 6th, 2026

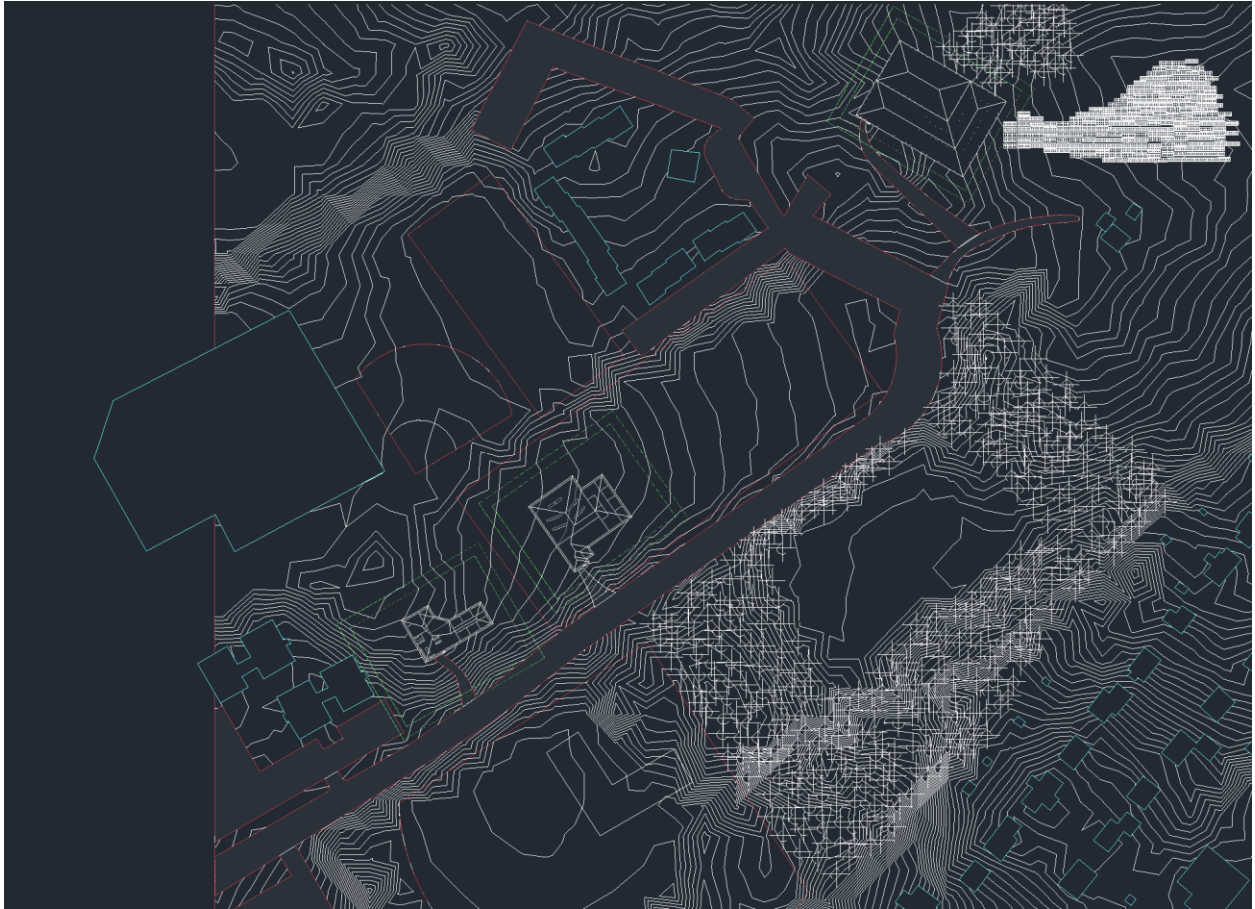
# 1) Photos of Revit Footprint



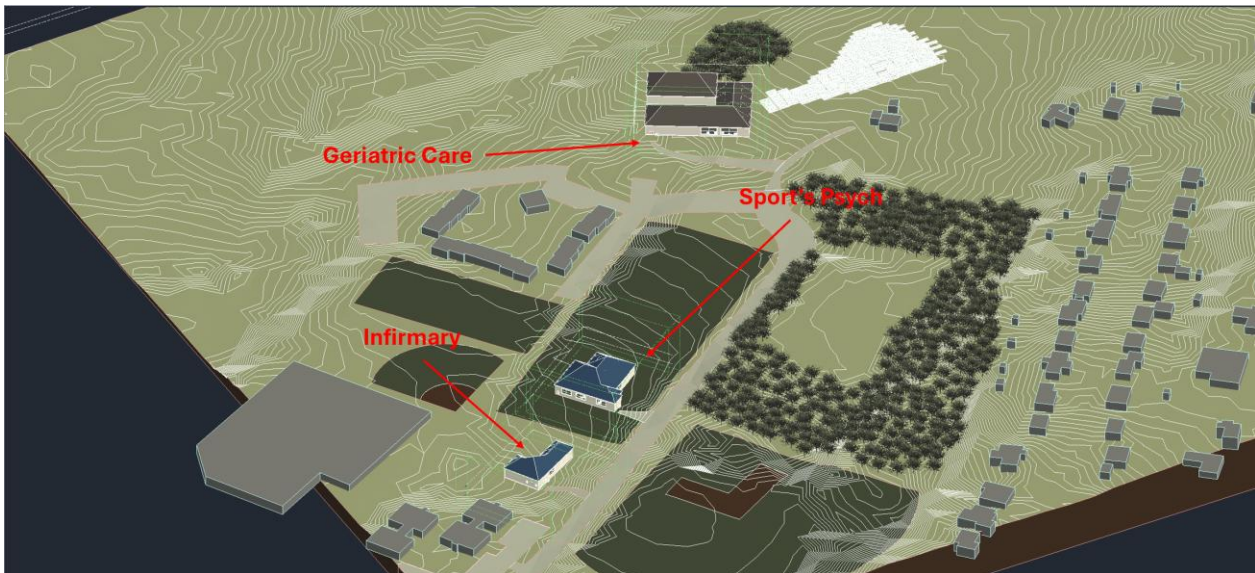
*Figure 1 - Eastern Site Analysis*



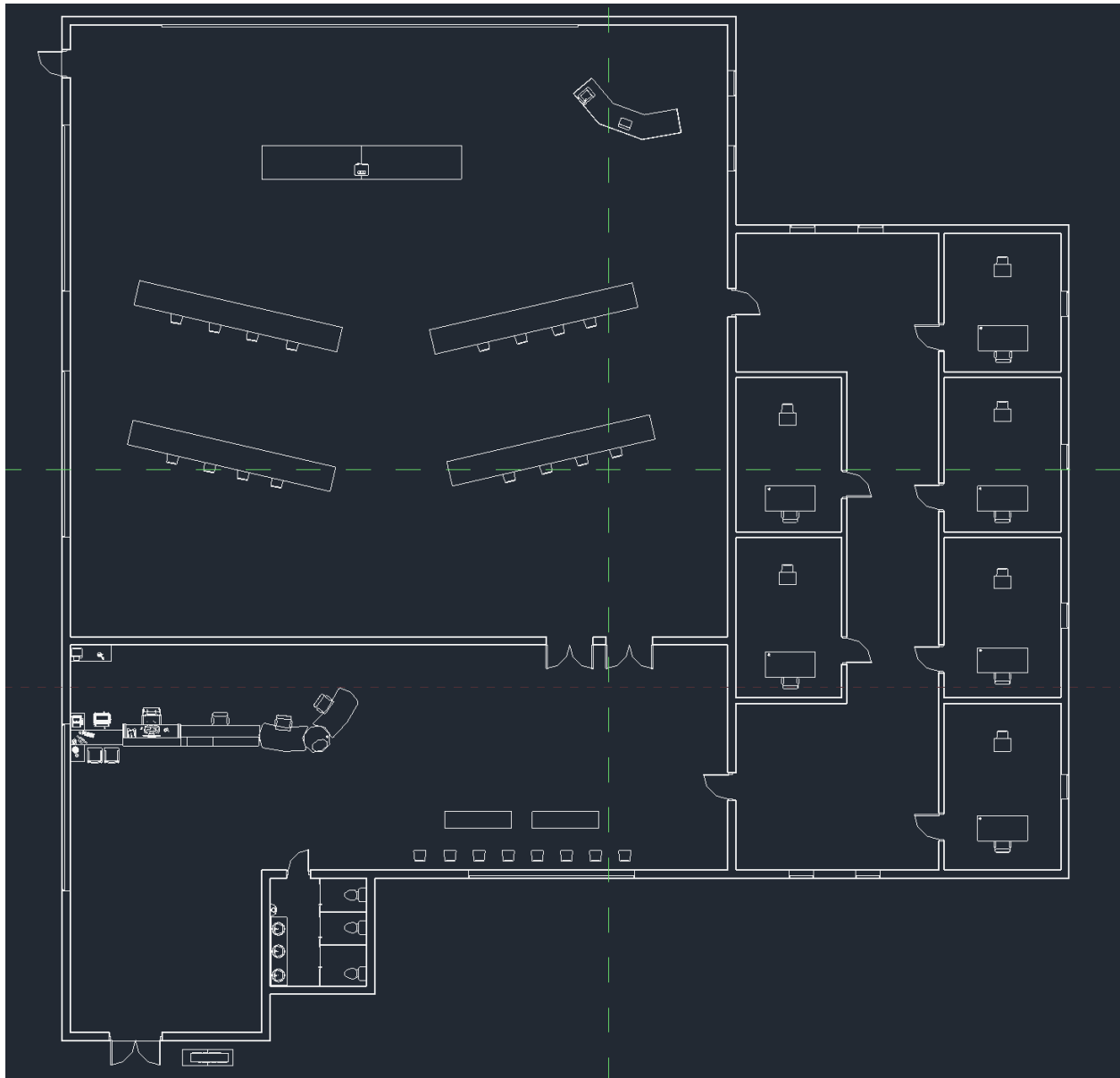
*Figure 2 – Topographic Map*



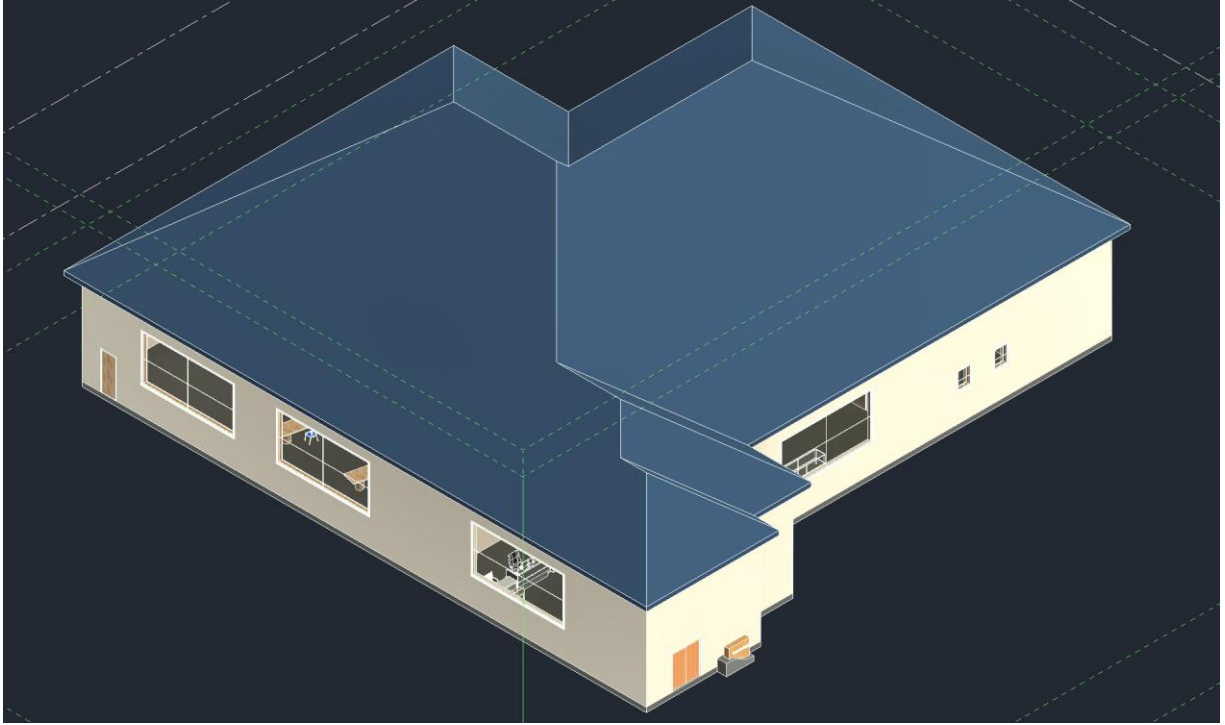
*Figure 3 – Topographic Map: Top View*



*Figure 4 – Eastern Site: Isometric View*



*Figure 5 – Sport's Psych Building: Floor Plans*



*Figure 6 – Sport's Psych Building: Isometric View*

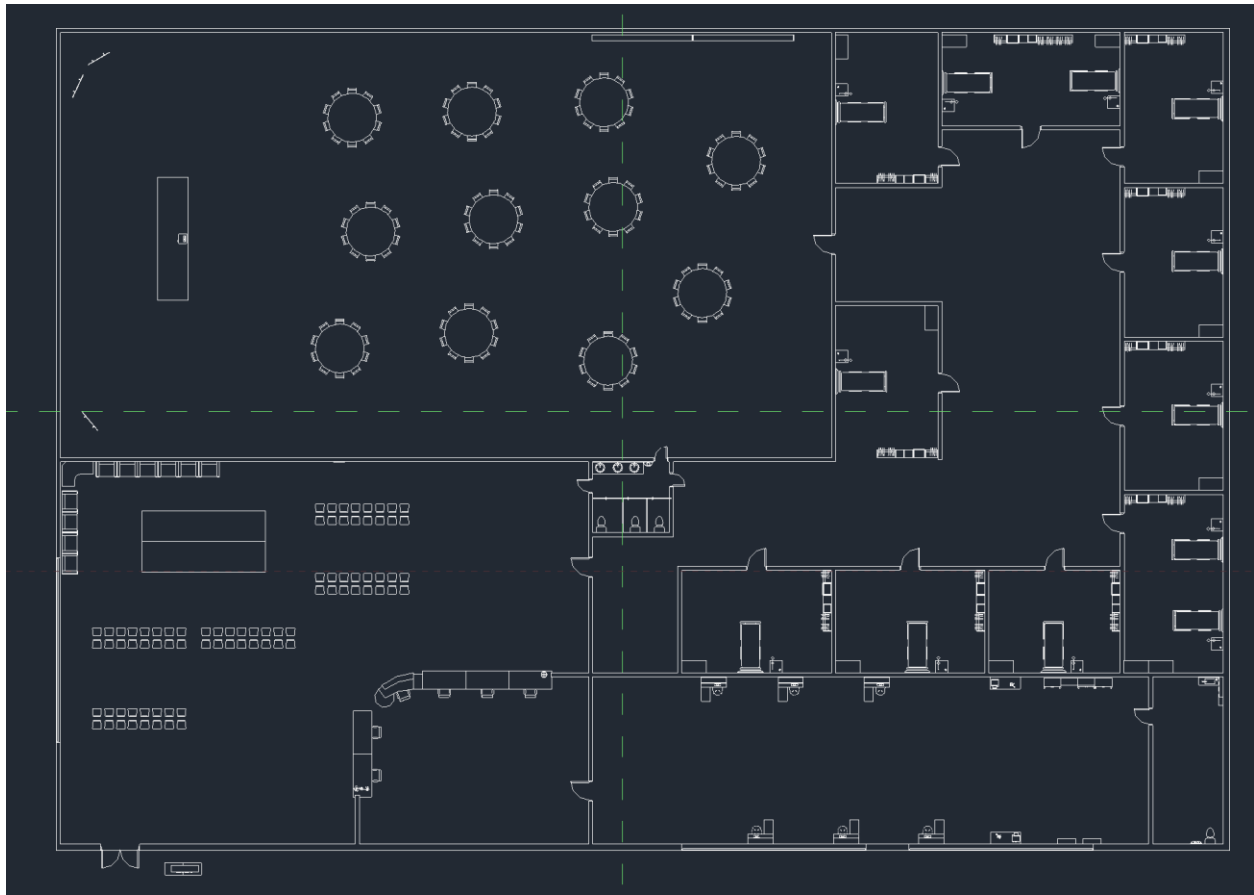
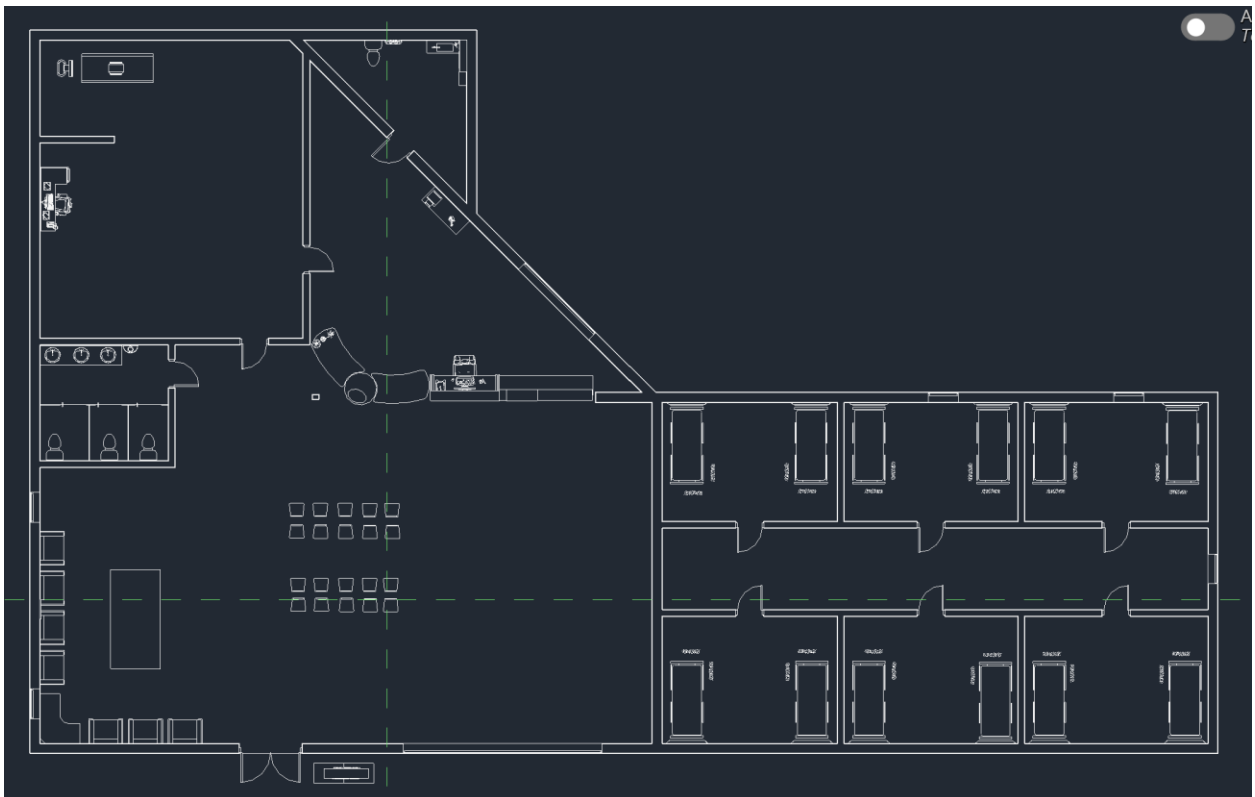


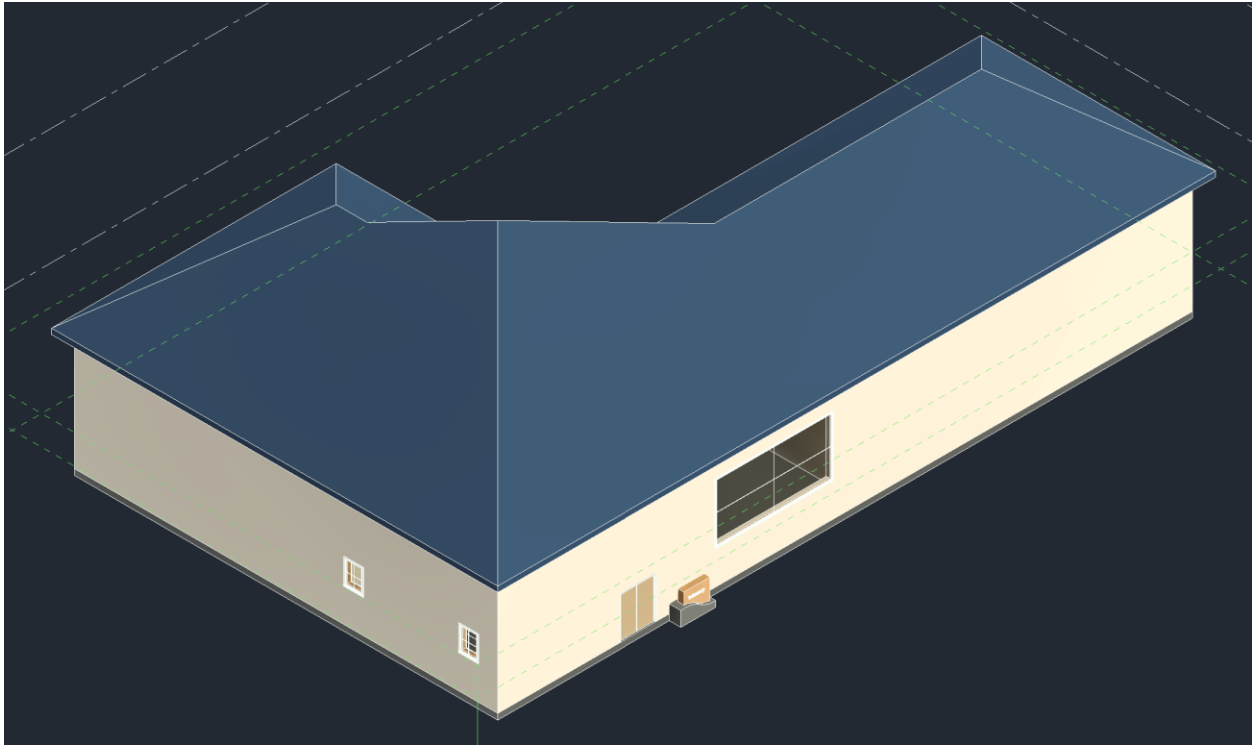
Figure 7 – Geriatric Care Center: Floor Plans



Figure 8 – Geriatric Care Center: Isometric View



*Figure 9 – Infirmary: Floor Plans*



*Figure 10 – Infirmary: Isometric View*

## 2) LEED Check Sheet

LEED v4 for Neighborhood Development Plan Project Checklist				Project Name: LEED ND Date: 4/12			
Yes	?	No		Yes	?	No	
0	0	0	<b>Smart Location &amp; Linkage</b> 28	0	0	0	<b>Green Infrastructure &amp; Buildings</b> 31
Y			Prereq Smart Location Required	Y			Prereq Certified Green Building Required
Y			Prereq Imperiled Species and Ecological Communities Required	Y			Prereq Minimum Building Energy Performance Required
Y			Prereq Wetland and Water Body Conservation Required	Y			Prereq Indoor Water Use Reduction Required
Y			Prereq Agricultural Land Conservation Required	Y			Prereq Construction Activity Pollution Prevention Required
Y			Prereq Floodplain Avoidance Required		X		Credit Certified Green Buildings 5
X			Credit Preferred Locations 10	X			Credit Optimize Building Energy Performance 2
	X		Credit Brownfield Remediation 2		X		Credit Indoor Water Use Reduction 1
		X	Credit Access to Quality Transit 7		X		Credit Outdoor Water Use Reduction 2
		X	Credit Bicycle Facilities 2		X		Credit Building Reuse 1
X			Credit Housing and Jobs Proximity 3		X		Credit Historic Resource Preservation and Adaptive Reuse 2
X			Credit Steep Slope Protection 1	X			Credit Minimized Site Disturbance 1
X			Credit Site Design for Habitat or Wetland and Water Body Conservation 1			X	Credit Rainwater Management 4
		X	Credit Restoration of Habitat or Wetlands and Water Bodies 1			X	Credit Heat Island Reduction 1
	X		Credit Long-Term Conservation Management of Habitat or Wetlands and Water Bodies 1		X		Credit Solar Orientation 1
					X		Credit Renewable Energy Production 3
0	0	0	<b>Neighborhood Pattern &amp; Design</b> 41	X			Credit District Heating and Cooling 2
Y			Prereq Walkable Streets Required	X			Credit Infrastructure Energy Efficiency 1
Y			Prereq Compact Development Required		X		Credit Wastewater Management 2
Y			Prereq Connected and Open Community Required		X		Credit Recycled and Reused Infrastructure 1
X			Credit Walkable Streets 9		X		Credit Solid Waste Management 1
X			Credit Compact Development 6	X			Credit Light Pollution Reduction 1
	X		Credit Mixed-Use Neighborhoods 4				
		X	Credit Housing Types and Affordability 7	0	0	0	<b>Innovation &amp; Design Process</b> 6
		X	Credit Reduced Parking Footprint 1		X		Credit Innovation 5
X			Credit Connected and Open Community 2		X		Credit LEED® Accredited Professional 1
		X	Credit Transit Facilities 1				
		X	Credit Transportation Demand Management 2	0	0	0	<b>Regional Priority Credits</b> 4
		X	Credit Access to Civic & Public Space 1	X			Credit Regional Priority Credit: Region Defined 1
X			Credit Access to Recreation Facilities 1	X			Credit Regional Priority Credit: Region Defined 1
X			Credit Visibility and Universal Design 1	X			Credit Regional Priority Credit: Region Defined 1
X			Credit Community Outreach and Involvement 2	X			Credit Regional Priority Credit: Region Defined 1
		X	Credit Local Food Production 1				
X			Credit Tree-Lined and Shaded Streetscapes 2				
		X	Credit Neighborhood Schools 1	0	0	0	<b>PROJECT TOTALS (Certification estimates)</b> 110
							Certified: 40-49 points, Silver: 50-59 points, Gold: 60-79 points, Platinum: 80+ points
							52 18 40

Figure 6 – LEED Check Sheet

Our LEED check sheet reflects a design strategy focused on maximizing sustainability performance by targeting large impact credit categories and site-specific advantages. A major strength of our project lies in its location-based credits, where we achieved strong performance in ideal location, walkable streets, and compact development. These parts contribute the most to reducing transportation emissions, encouraging walkway activity, and promoting efficient land use. By setting the project within a well-connected and dense environment, we were able to capture valuable LEED points while also supporting broader community sustainability goals. We thought that this would be our best strategy considering we are new to the concept of LEED neighborhood development, as we are considering the students and those in Masonic Homes first.

In developing the check sheet, we made a conscious decision to prioritize categories that offer higher point values. Rather than spreading efforts evenly across all credits, we focused on those with the greatest potential for gaining a higher score. This approach allowed us to efficiently think about our design effort while still maintaining a well-rounded sustainable neighborhood development. Emphasis was placed on credits that align naturally with our project criteria, ensuring that our design decisions were both practical and impactful for students.

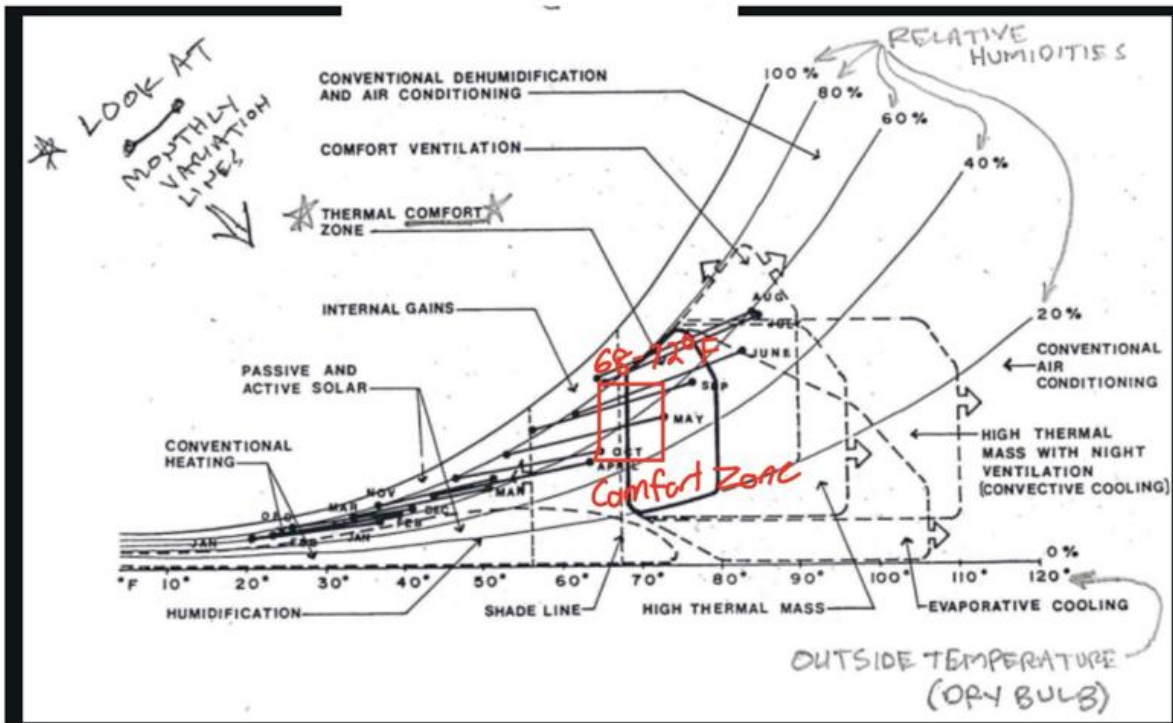
Building orientation and daylighting strategies were also major considerations, specifically for the school’s program needs. For the infirmary building, we prioritized access to sunlight to promote healing, comfort, and overall well-being. Increased natural light can enhance patients that are there to experience and align with LEED goals related to indoor environmental quality.

On the other hand, the occupational therapy building was designed with reduced sunlight exposure in mind. Recognizing that some children may be sensitive to bright light, we intentionally minimized direct daylight in certain areas to create a more controlled and comfortable environment. This demonstrates a thoughtful balance between our sustainability goals and those attending the building.

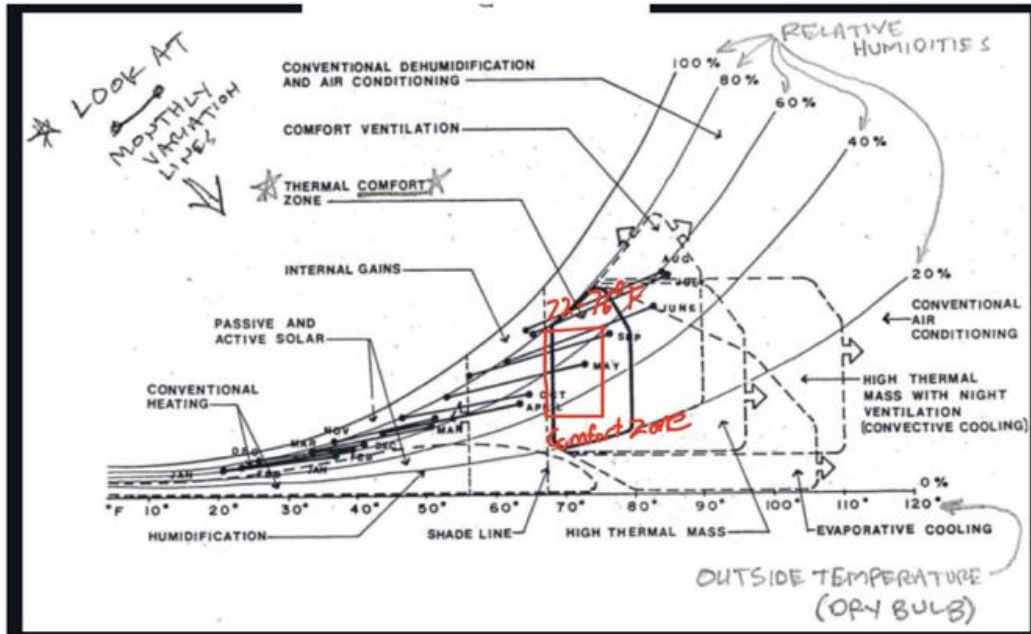
As this is our first experience considering LEED as a criterion for building development, our main priorities were the students. If we were to develop these buildings in the future for the campus and Masonic Homes, this would be a huge investment on the campus's part. We wanted to ensure that these buildings make the campus look aesthetically pleasing, consider LEED values, while also expanding the educational value for students within health departments. The convenience of these buildings through walkways while also considering the sunlight exposure to each is what allowed us to come to these conclusions. Overall, we want our new University to be a place where students want to attend because of these benefits, while also considering LEED to be of value when considering the architecture itself.

### 3) Psychometric Charts

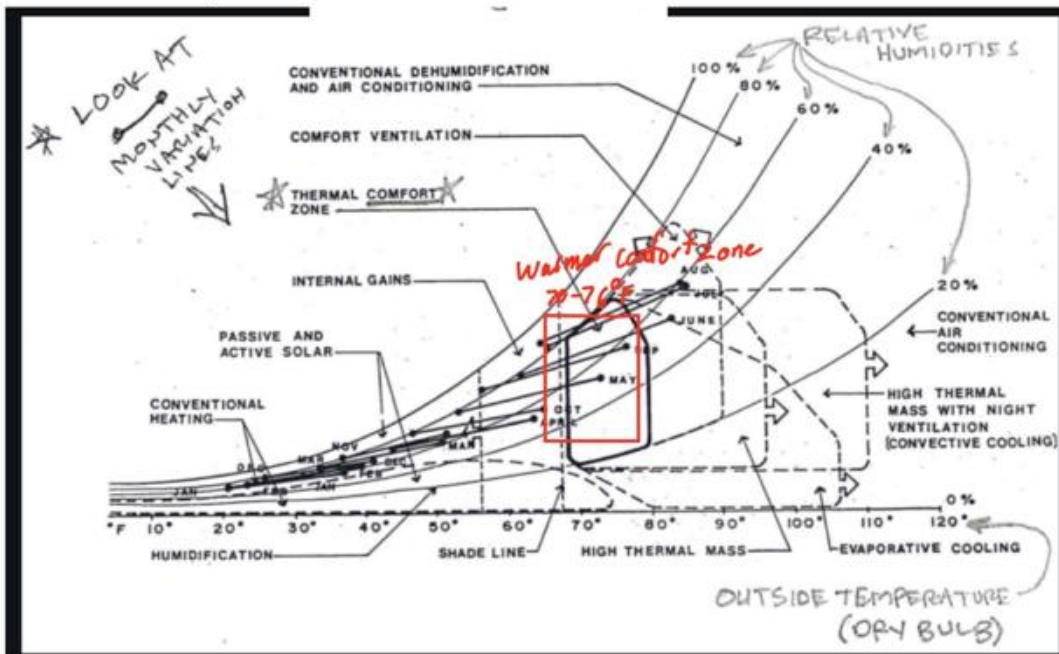
Infirmary



# Geriatric Center



# Psychology



For the infirmary, the comfort zone will be cooler and drier than the other building's comfort zone, with the temperature between 68 and 72 degrees. This is because of the sterile nature of the work that is done in the building. This helps with the safety of all of the patients and the other staff member that will be in the building. This comfort zone will be drier with the humidity in the building being lower than in other buildings for the same reasons stated before. We also want the temperature to be as consistent as it can be to facilitate an environment that can benefit everyone inside, so it is not another variable they have to tend to. With this in mind, there will be no passive strategy because of the consistency required for the building.

For the Geriatric Center, it will be slightly warmer than a normal comfort zone. Sitting between 72 and 76 degrees. It is a little warmer because older people have a harder time regulating their own body temperature, so a warmer environment is better for them. This can lead to a longer heating time period than the other building due to the higher required heating. In the heat of the summer, AC and dehumidifiers will be important to the health and comfort of the people there. Similarly, the passive strategies are limited but can be slightly used.

For the Psychology Building, this building has the widest range of comfort zones. With the temp wanting to be between 70 and 76 degrees but having a varying amount of humidity, less strict than the other two buildings. This building can use the thermal mass to help with the heating of the building. That can be used to help make up passive plans that can be used to help with the efficiency of the building.

#### **4) Differences in Sunlight**

For each of our buildings, sunlight throughout the year was an important factor in both natural daylight and thermodynamics. The sun angle changes between summer and winter, which affects how much light and heat each building receives. Due to this, we adjusted building orientation and exposure based on the needs of each space.

The infirmary was designed to receive more sunlight, especially during the winter months when the sun is lower in the sky. This allows more natural light to enter the building, reducing the need for artificial lighting, and improving comfort for patients. The added sunlight also helps warm the building, which reduces heating needs and improves overall energy efficiency.

The occupational therapy building was designed with less direct sunlight. Some users may be sensitive to bright light, so we limited how much direct sun enters the space. This helps prevent glare and overheating, especially in the summer when the sun is stronger. The lighting is more controlled and diffused. This keeps the space more comfortable while still allowing natural light in.

The Penn Center and psychology building was designed with a balance of sunlight throughout the year. These buildings receive moderate sunlight, which provides consistent daylight without too much heat gain. This helps maintain stable indoor temperatures. This also helps to reduce both heating and cooling demands.

The geriatric building was designed to have steady access to sunlight, but not too much direct exposure. Older users benefit from natural light, but too much heat or glare can be uncomfortable. Due to this, the building orientation allows for good daylight lighting. It also minimizes overheating during warmer months.

Overall, sunlight plays a major role in both lighting and thermal performance. By adjusting how each building receives sunlight throughout the year, we were able to improve comfort, reduce energy use, and better match each space to the needs of its users.

## References

- [1] N. Lechner, "SOLAR GEOMETRY," in *HEATING, COOLING, LIGHTING*, [Online]. Available: [https://users.etown.edu/w/wunderjt/Architecture%20Lectures/Bookstore%206%20EGR343 Green Arch Engr CH 6 LECTURE Solar Geometry.pdf](https://users.etown.edu/w/wunderjt/Architecture%20Lectures/Bookstore%206%20EGR343%20Green%20Arch%20Engr%20CH%206%20LECTURE%20Solar%20Geometry.pdf)
- [2] N. Lechner, "CLIMATE," in *HEATING, COOLING, LIGHTING*, [Online]. Available: [https://users.etown.edu/w/wunderjt/Architecture%20Lectures/BOOKSTORE%205%20EGR343 Green Arch Engr CH 5 11 LECTURE Weather and Design for Site MERGED%20.pdf](https://users.etown.edu/w/wunderjt/Architecture%20Lectures/BOOKSTORE%205%20EGR343%20Green%20Arch%20Engr%20CH%205%2011%20LECTURE%20Weather%20and%20Design%20for%20Site%20MERGED%20.pdf)

## **Appendix A – Revit File**

[https://elizabethtown-my.sharepoint.com/personal/reillyc\\_etown\\_edu/Documents/S26/Green%20Architectural%20Engineering/Project%201.rvt](https://elizabethtown-my.sharepoint.com/personal/reillyc_etown_edu/Documents/S26/Green%20Architectural%20Engineering/Project%201.rvt)

## **Appendix B – LEED Check Sheet**

[\\*LEED Checksheet.pdf](#)