



Michael Zhang (Project Coordinator)

12/2/19

Octan Building

Introduction

As the human population grows, cities are accumulating more and more waste every year. Much of this comprises of bulky and heavy materials that are not easily disposable, such as concrete, asphalt from roofs and roads, plastic, bricks, glass, and metals. This detritus pollutes the environment and harms the health of the surrounding ecosystems. According to the United States Environmental Protection Agency, 548 million tons of construction and demolition waste were generated in 2015 (Figure 1). As a result, several green standards have been created in an effort to place constraints on the lack of environmentally conscientious construction and promote sustainability.

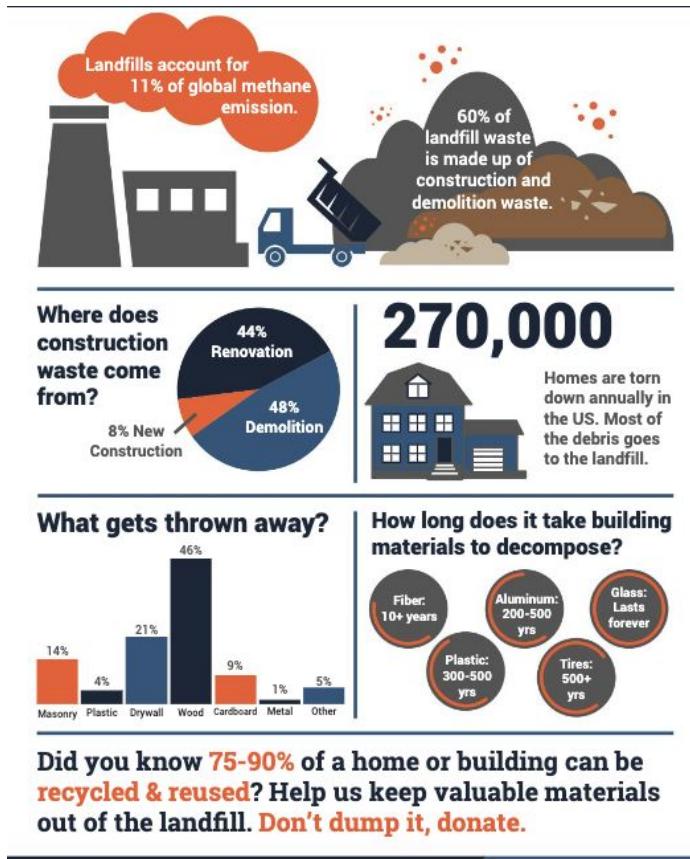


Figure 1: Construction and Demolition Waste Infographic

Leadership in Energy and Environmental Design (LEED) has grown to become one of the most globally accepted green building certification programs. Developed by the U.S Green Building Council (USGBC), a nonprofit organization, LEED has a rating system that critiques the design, operation, maintenance, and construction of buildings. LEED has a scale of qualifications ranging from Certified to Platinum, depending on the amount of points garnered due to a project satisfying certain criteria regarding its resourcefulness. A minimum of 40 points must be achieved to be Certified, and 80 to be Platinum Certified. Categories that LEED focuses on include location and transportation, sustainable sites, water efficiency, energy and atmosphere management, indoor environmental quality, and innovation. The goal of LEED is to promote the construction and design of green projects.

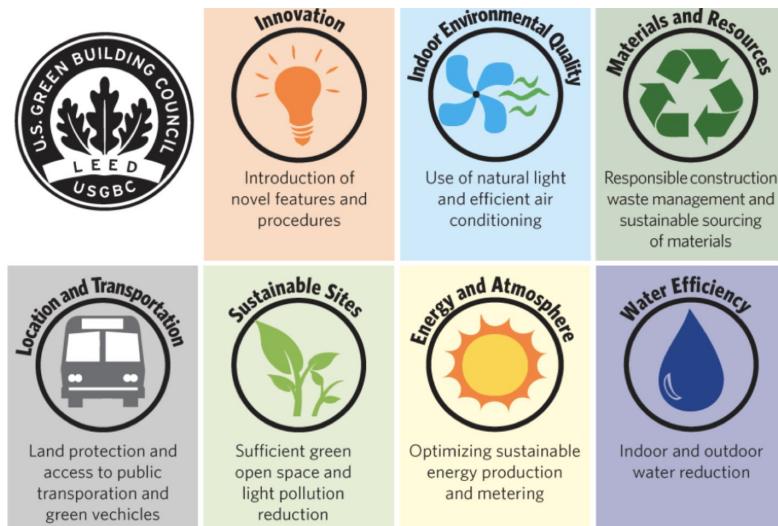


Figure 2: LEED Certification Requirements

En.Vision's goal is to renovate the Jacobs Academic Building to expand New York University's campus and set an example for aspiring engineers attending Tandon School of Engineering. The new building Octan will meet the standards for a LEED Platinum Certification and include classrooms that will comfortably seat 20-100 students, student accommodations and housing, and recreational spaces (most notably in the form of a rooftop lounge and cafeteria). The design will incorporate a beehive shape for the aesthetic and innovative shape that will allow for more sunlight to enter rooms and the use of photochromic windows due to the building's rounder shape. It will also include live plants such as trees in the welcoming area and on the rooftop lounge, which will reduce the need for heating in the building, provide cleaner air, and create a relaxing atmosphere.

LEED Certification is incredibly beneficial both ethically and business-wise. Creating sustainable buildings and neighborhoods that are LEED Certified can garner more fame and set an example for others to follow. People may be more inclined to use that company's services after learning of any certifications they've achieved, wanting to support environmentally conscious practices and therefore that business. Other contractors see this effect and wish to design their project in similar manners in hopes of acquiring similar additions to their line of customers. Additionally, more sustainable and open buildings have less need for maintenance and can conserve resources by disregarding the use of commonly poorly disposed materials that will need to be replaced or supplemented very quickly. This decreases operating costs and enhances consumer utility. LEED Certification requirements highly encourages the preservation

of natural resources and decrease in water wastage, positively influencing our climate and overall ecosphere. Lastly, they encourage the creation of environments and atmospheres that are very environmentally positive and therefore human positive, as the increased quality of life encourages people to be more productive as well as happier.

Overview

Location and Transportation	Where	Energy and Atmosphere	Where
Diverse Land Use	<ul style="list-style-type: none"> • Rooftop Garden • Cafeteria • Tennis Courts 	Optimize Energy Performance	<ul style="list-style-type: none"> • Low lighting and more natural lights with Electrochromic windows • Automated sinks, toilets, air dryers
Disability Access	<ul style="list-style-type: none"> • Elevators on all floors 	Advance Energy Metering	<ul style="list-style-type: none"> • Energy is on one metered system which is connected to AI
Bicycle and EV Facilities	<ul style="list-style-type: none"> • Bike Racks on Floor 1 	Demand Response	<ul style="list-style-type: none"> • Electrochromic windows optimize sunlight entering • IOT optimizes floor energy usage throughout day
Reduced Parking Footprint	<ul style="list-style-type: none"> • Trees and green plants • No garage 	Renewable Energy Production	<ul style="list-style-type: none"> • Solar Panels coverage on floor 11 and 10
Sustainable Sites	Where	Indoor Environmental Quality	Where
Open Space	<ul style="list-style-type: none"> • Rooftop Garden • Green space in cafeteria and roofs 	Air Quality Management	<ul style="list-style-type: none"> • IOT monitors and optimizes air quality • Trees are GMO so no pollen and fresh air • Smoke, Carbon monoxide detectors

Rainwater Management	<ul style="list-style-type: none"> • Rooftop Garden Harvests water • Reduces Runoff 	Interior lighting/daylight	<ul style="list-style-type: none"> • Electrochromic Windows automatically dim or can be controlled • Thousands of windows used
Heat Island Reduction	<ul style="list-style-type: none"> • Rooftop Garden reduces heat 	Thermal Comfort	<ul style="list-style-type: none"> • Floor is heated and temperature control
Light Pollution Reduction	<ul style="list-style-type: none"> • Electrochromic Windows less lights 	Acoustic Performance	<ul style="list-style-type: none"> • Soundproof acoustic panels used in tennis area, classrooms, and dorms to reduce noise
Water Efficiency	Where	Innovation	Where
Water Quality Management	<ul style="list-style-type: none"> • IOT system-real time monitoring • AI for quality water 	Connected Building	<ul style="list-style-type: none"> • IOT, AI is used to optimize internet on every floor • RFID for kitchen to track items and automation when buying items out of stock
Water Use Reduction	<ul style="list-style-type: none"> • Harvested rooftop water used as greywater 	Intelligent Inventory	<ul style="list-style-type: none"> • Security block and guard at each entrance • Security is connected over internet and IOT
Water Heating and Cooling	<ul style="list-style-type: none"> • Heating optimized with AI and IOT 	Security and safety	<ul style="list-style-type: none"> • Automatic contact police, fire emergencies
Advanced Water Metering	<ul style="list-style-type: none"> • irrigation, indoor plumbing, reclaimed water, boiler usage monitored with IOT system 	Sustainability	<ul style="list-style-type: none"> • Green gardens and spaces all floors and roof tops • Solar Panels • Grey water • Electrochromic windows

LEED Categories

Placing a strong emphasis on the ideals of LEED is a long term investment for the building. The current Jacob's building bathrooms are poorly ventilated and often subject to urinals and toilets perpetually flushing and wasting tons of water. A better plumbing system encouraged by LEED standards may use greywater, automated sinks, and water free urinals to reduce annual water utilities and conserve resources. Octan's bathrooms will also be equipped with ventilation to protect the health of students and faculty from airborne detriments.

A rooftop garden will absorb heat from the sun, reducing electrical and heating costs. A rooftop hydroelectric plant from water tanks and pool water will also be used to generate electricity in the daytime. These LEED additions will reduce the electrical utility bills and benefit the environment.

Electrochromic windows will also reduce electrical costs as eight percent of classrooms will have natural lighting from windows. Electrochromic glass will absorb sunlight as energy and can also be manually controlled to adjust the tonnage and amount of light entering a room. These windows can also be tinted so outsides cannot see in. Windows and automated light switches will also reduce light pollution in the dense New York City. LEED requirements that reduces lighting will benefit not only the environment; s wildlife health, but will also provide students better lighting and lower the costs of electric utilities.



Figure 3: Electrochromic Glass

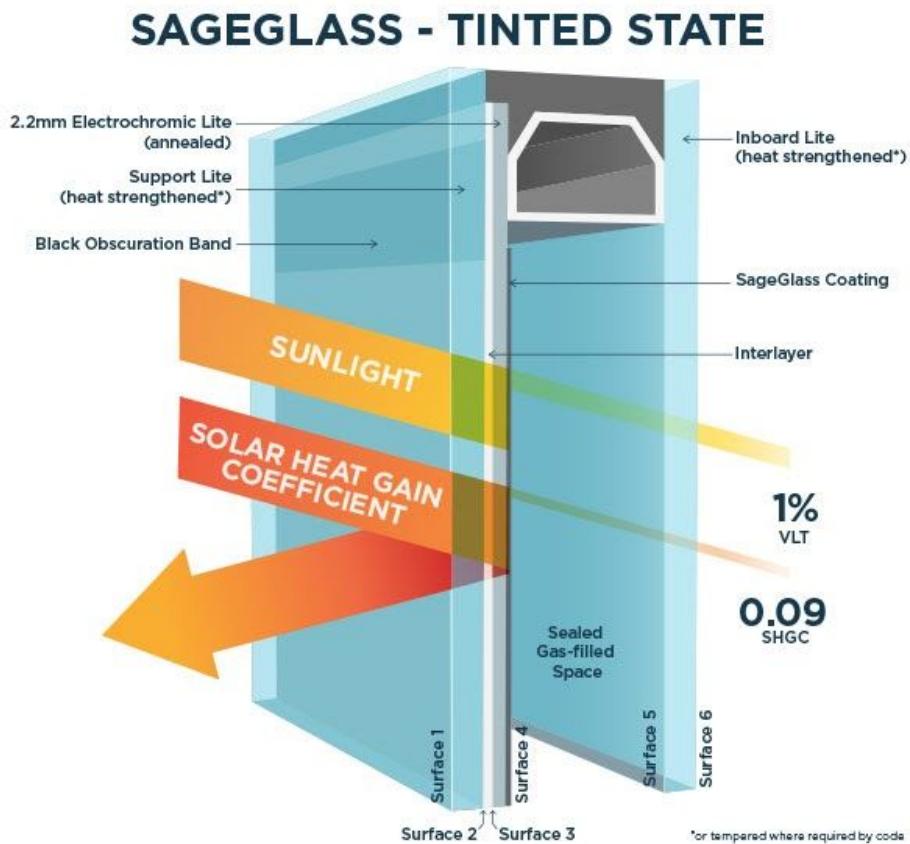


Figure 4: Electrochromic Glass

LEED also promotes minimization of materials and C&D wastes. By emphasizing the design process to use the exact amount of materials needed for construction, LEED specifications reduce the amount of heavy a produced during construction. This environmental practice will not only reduce C&Ds but also produce reduce construction costs.

Pictures

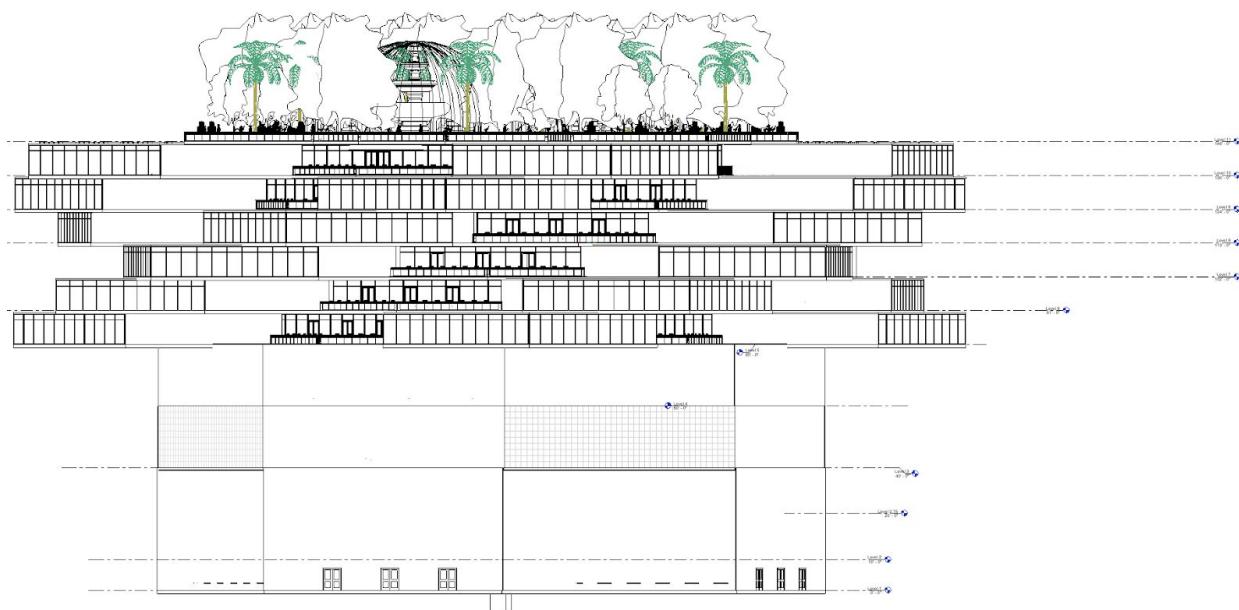


Figure 5: Revit Side View Elevation View

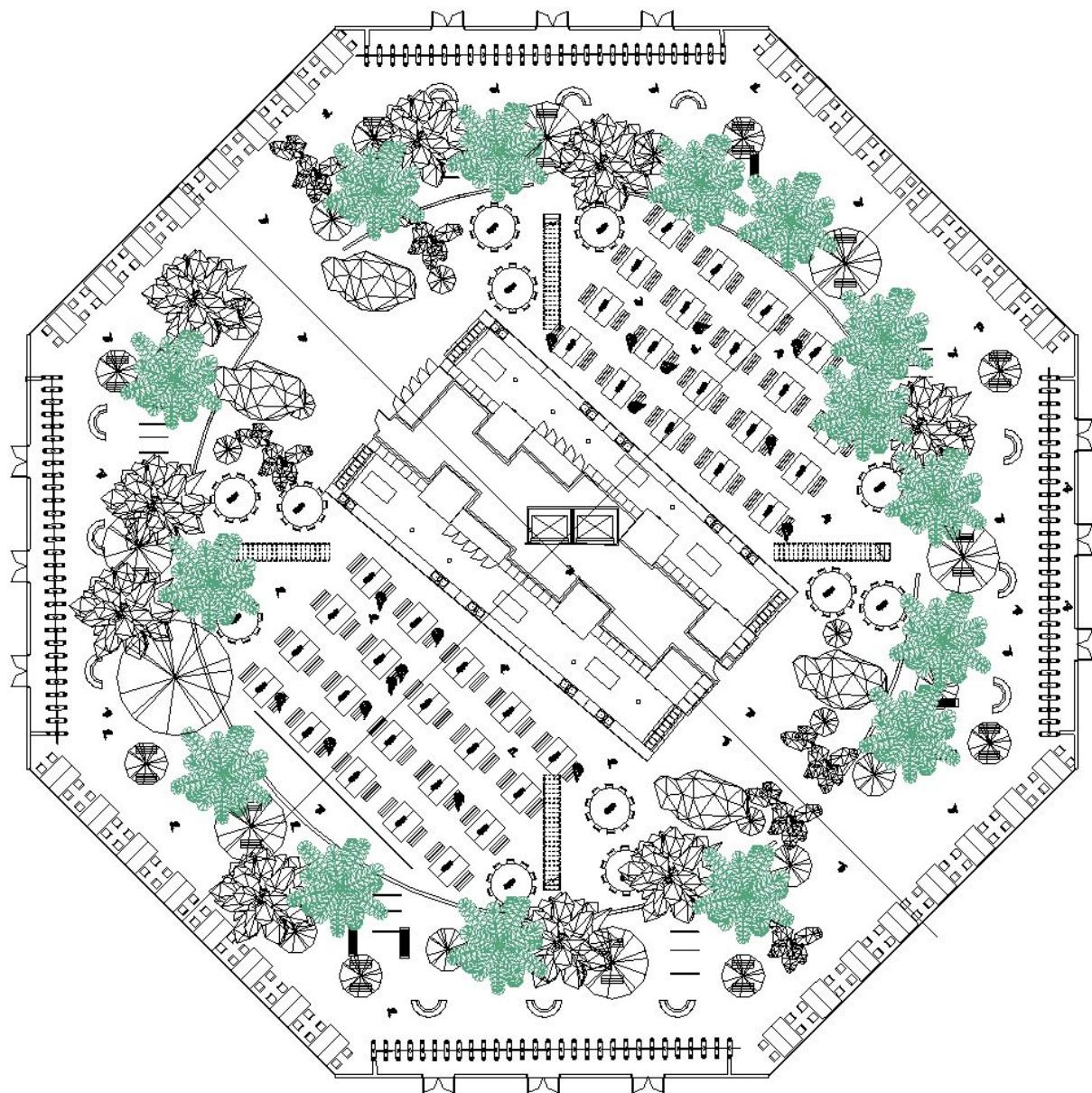


Figure 6: LEED green Cafeteria with trees



Figure 7: LEED Security and bike racks



Figure 8: Kitchen and tropical trees



Figure 9: Green Space cafeteria



Figure 10: Green Space cafeteria workspace



Figure 11: Green Space cafeteria workspace on second deck

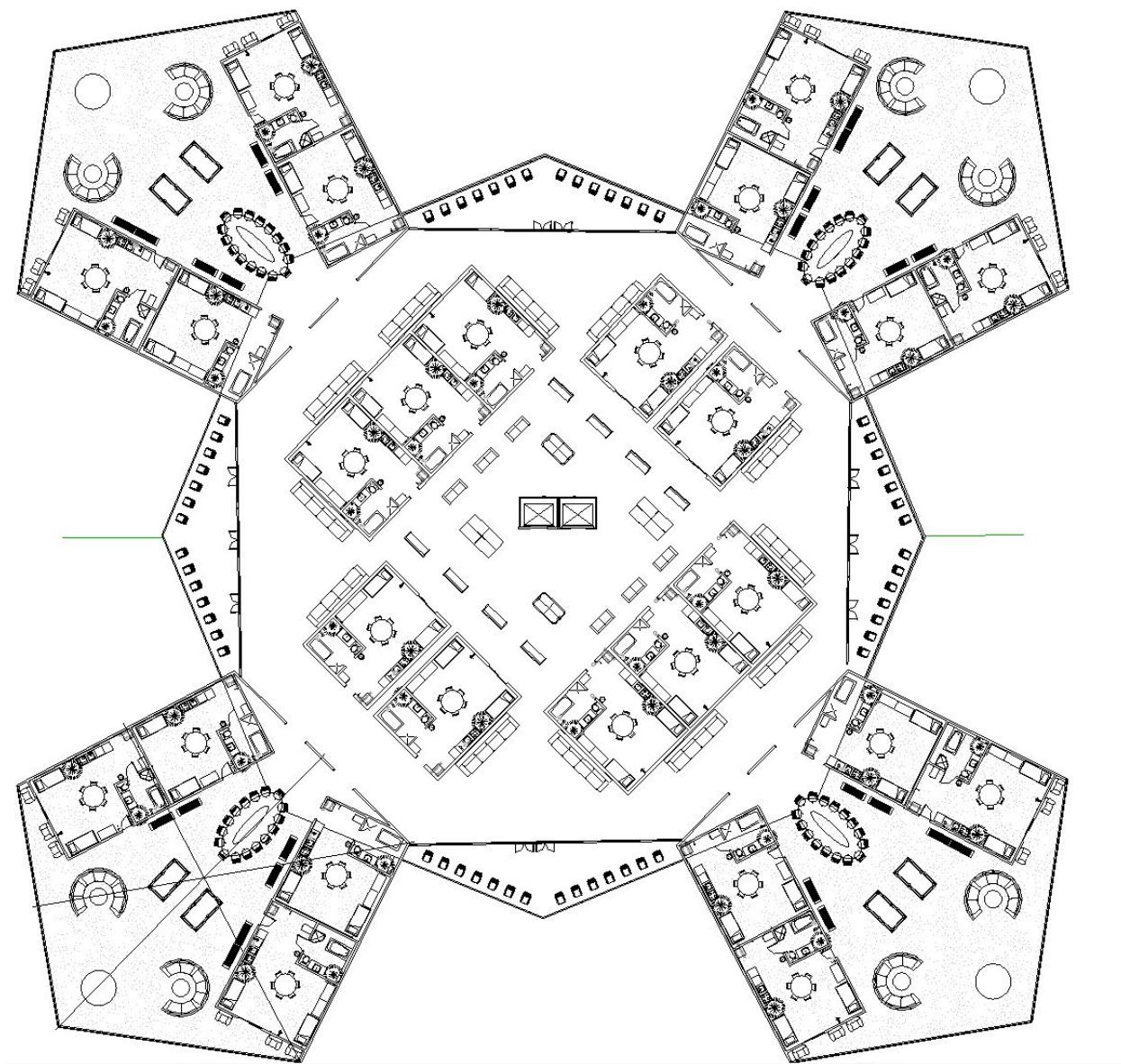


Figure 12: Dorm Room Floor Plan

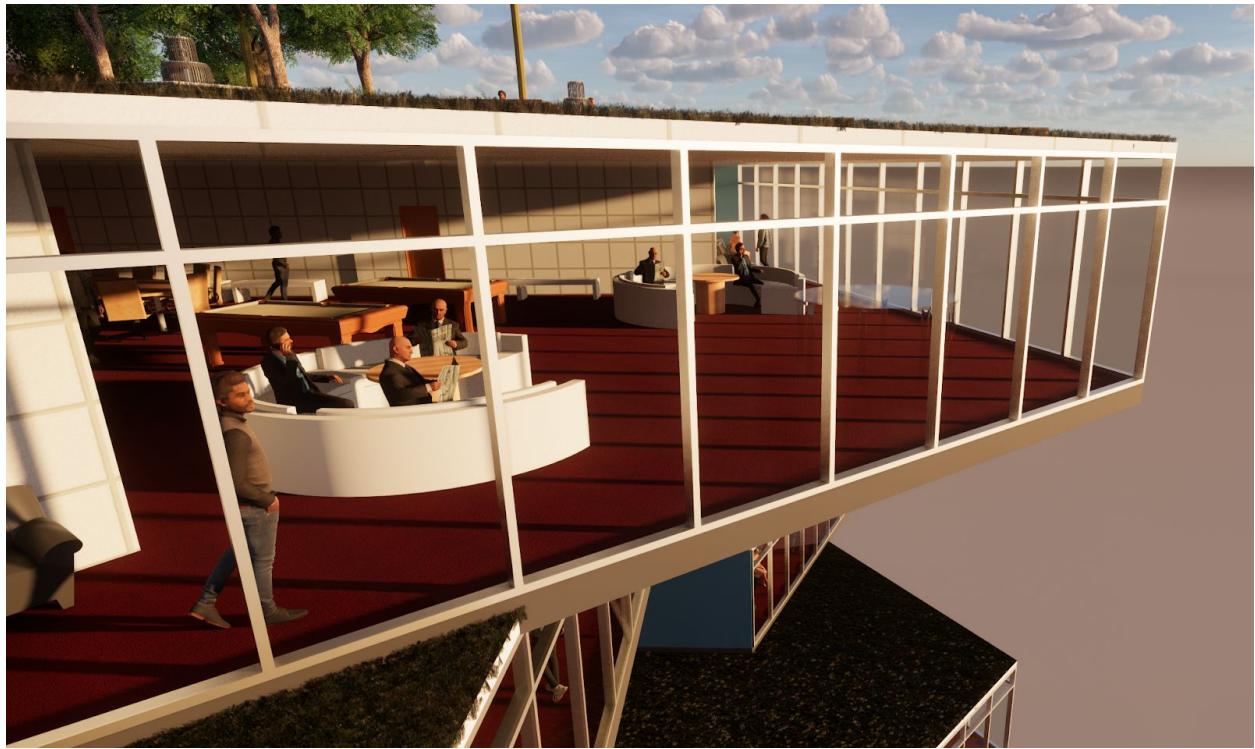


Figure 13: Dorm Room lounge 2



Figure 14: Dorm Room Floor Plan dorm facing in



Figure 15: Dorm Room Floor Plan bathroom dorm facing outwards



Figure 16: Dorm Room lounge 1

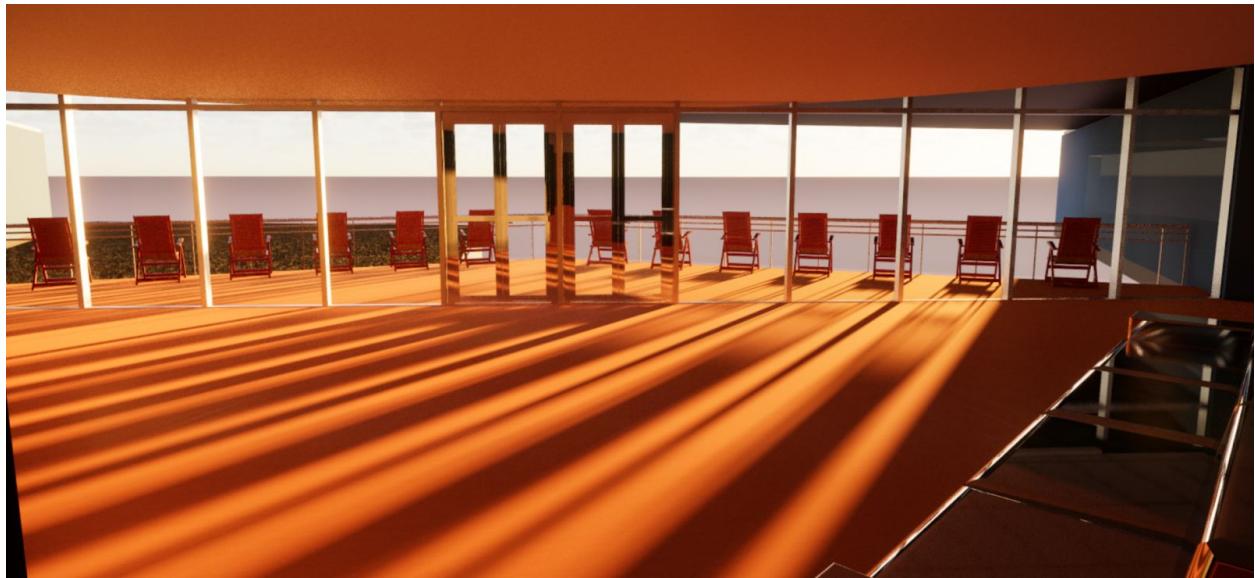


Figure 17: Dorm Room skydeck



Figure 18: Dorm Room skydeck

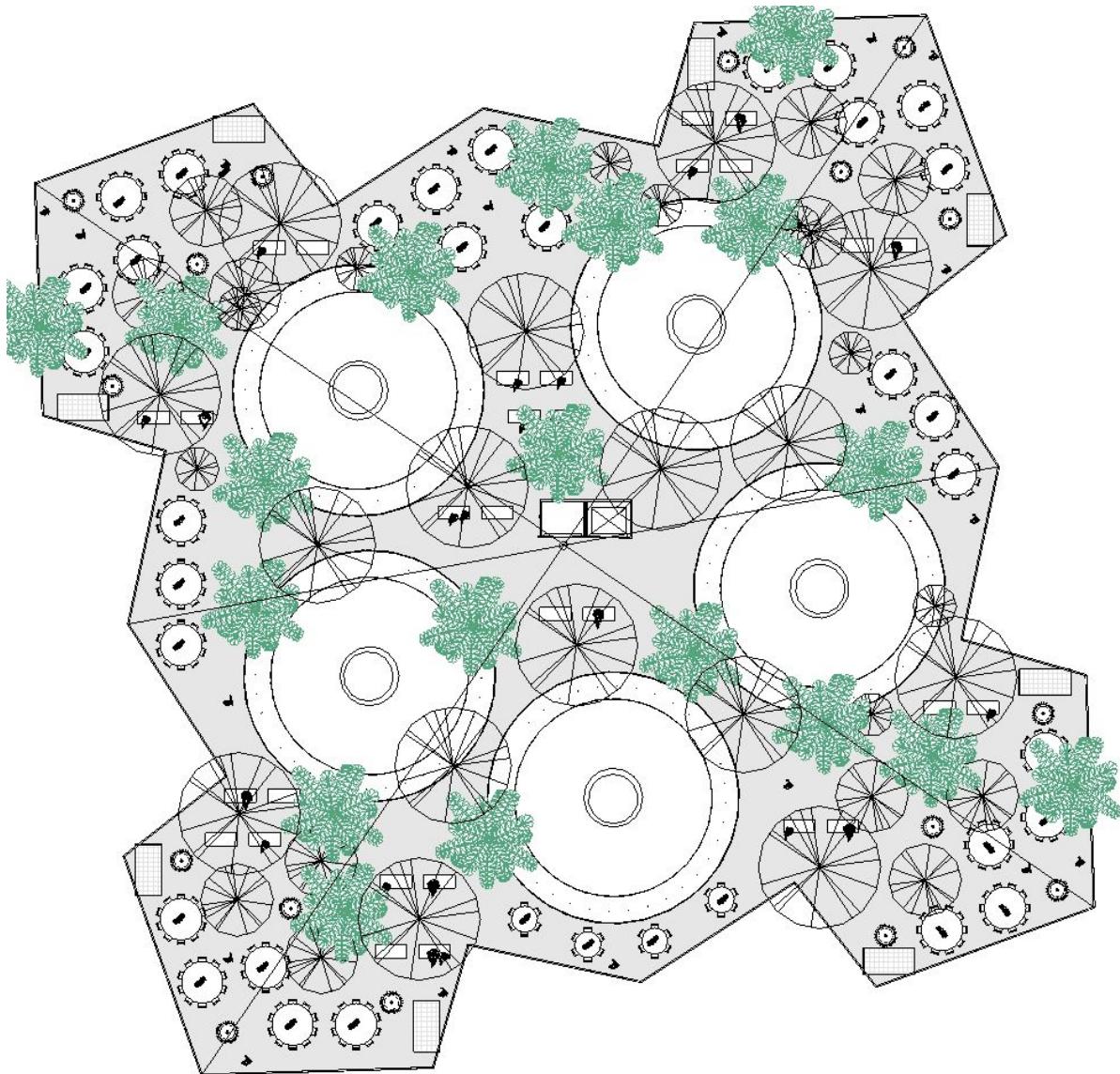


Figure 19: Garden 11th floor plan/Green LEED Garden



Figure 20: Garden 11th floor plan/Green LEED Garden floor View



Figure 21: Garden 11th floor plan/Green LEED Garden Top View



Figure 22: Garden 11th floor plan/Green LEED Garden top sunset



Figure 23: Garden 11th floor plan/Green LEED Garden top Grass Rooftop and Solar Panels

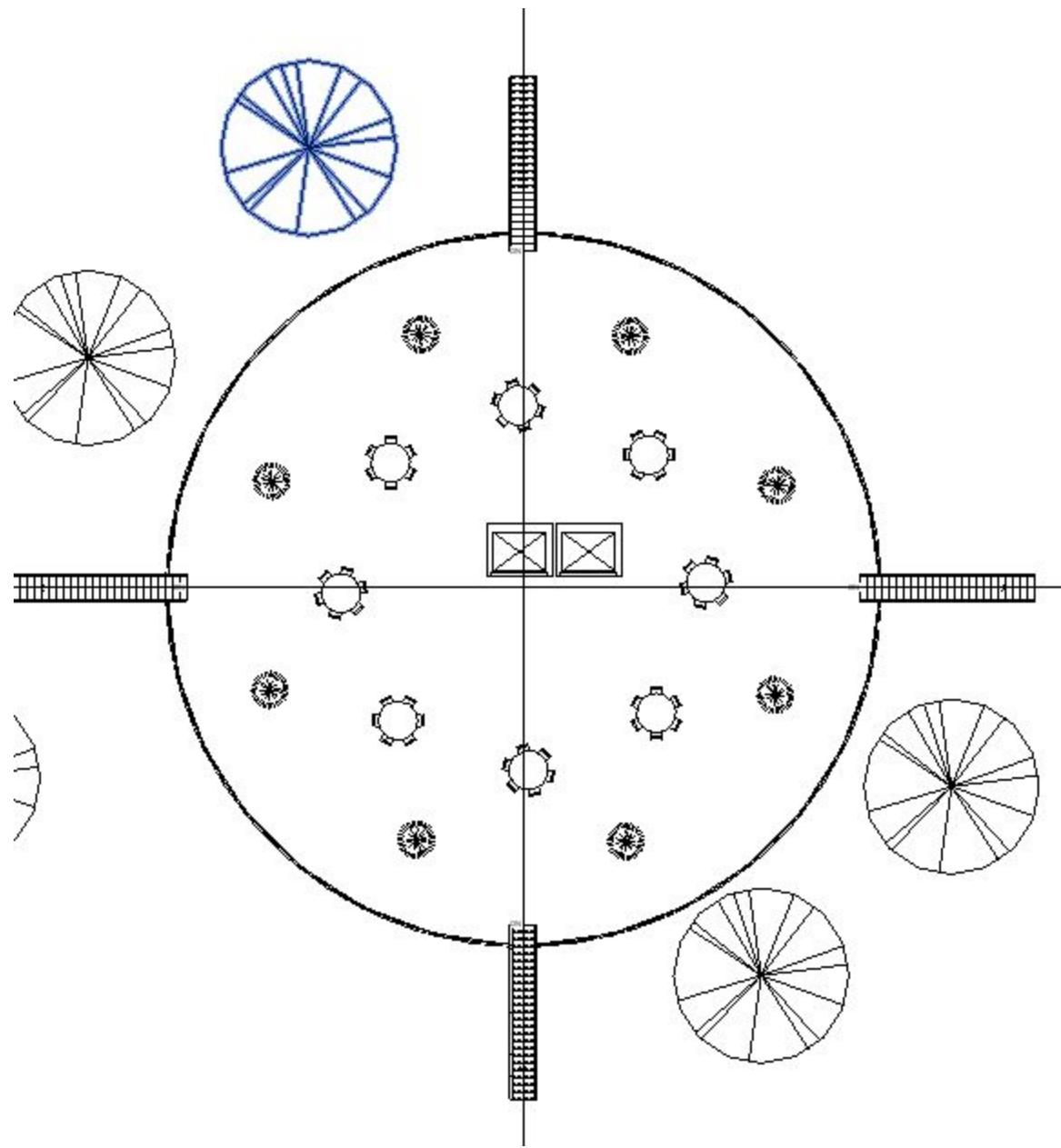


Figure 24: Floor 2.75 Lounge Space



Figure 25: Floor 2.75 Lounge Space real

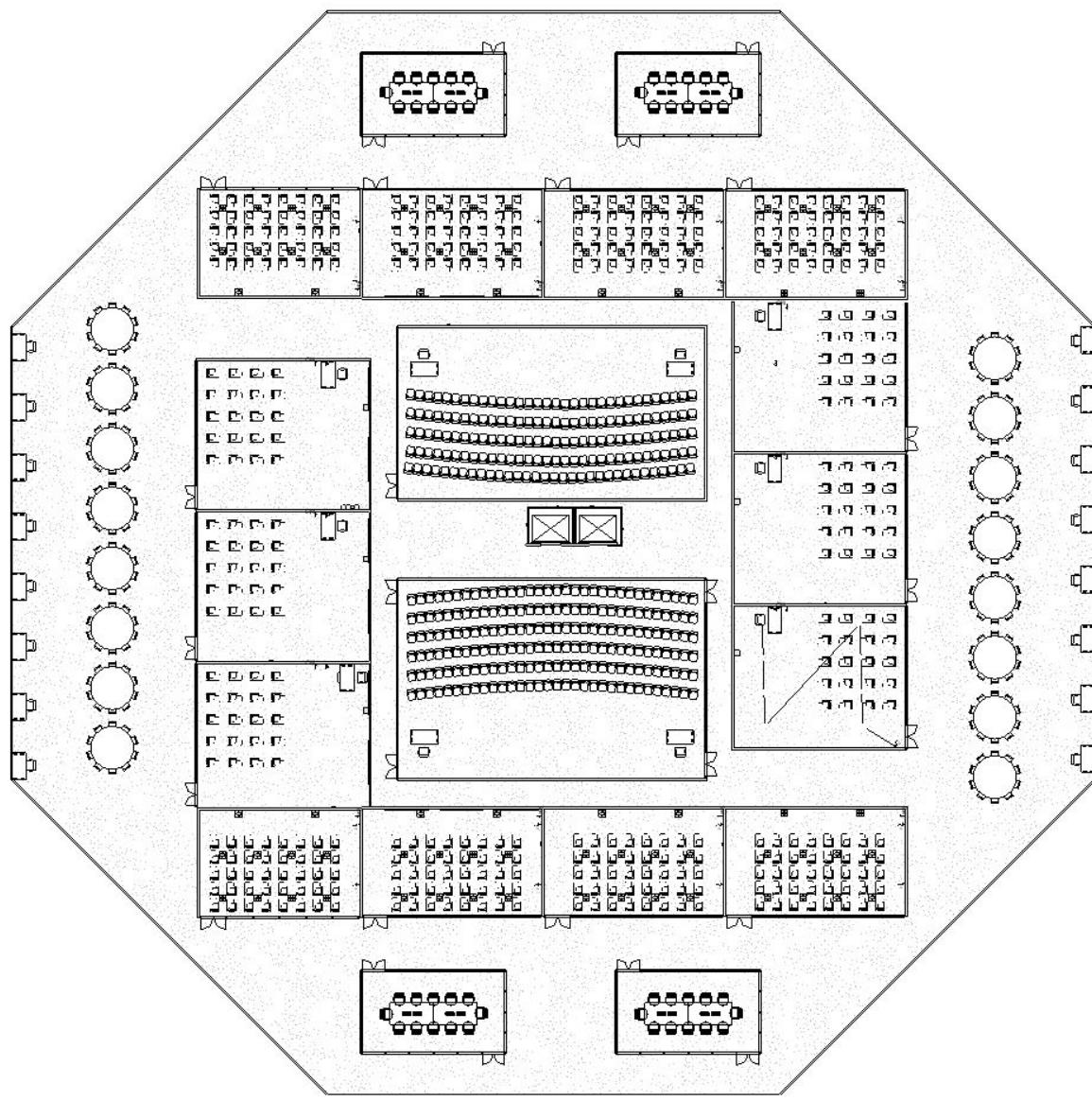


Figure 26: Floor 4 classrooms



Figure 27: Floor 4 classrooms

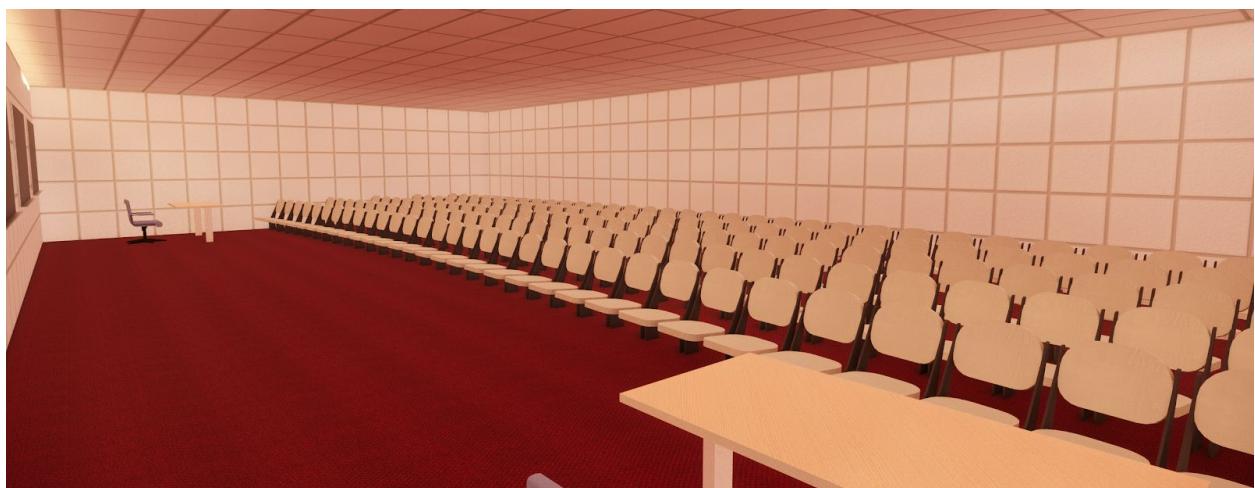


Figure 28: Floor 4 classrooms LEED Acoustic Walls

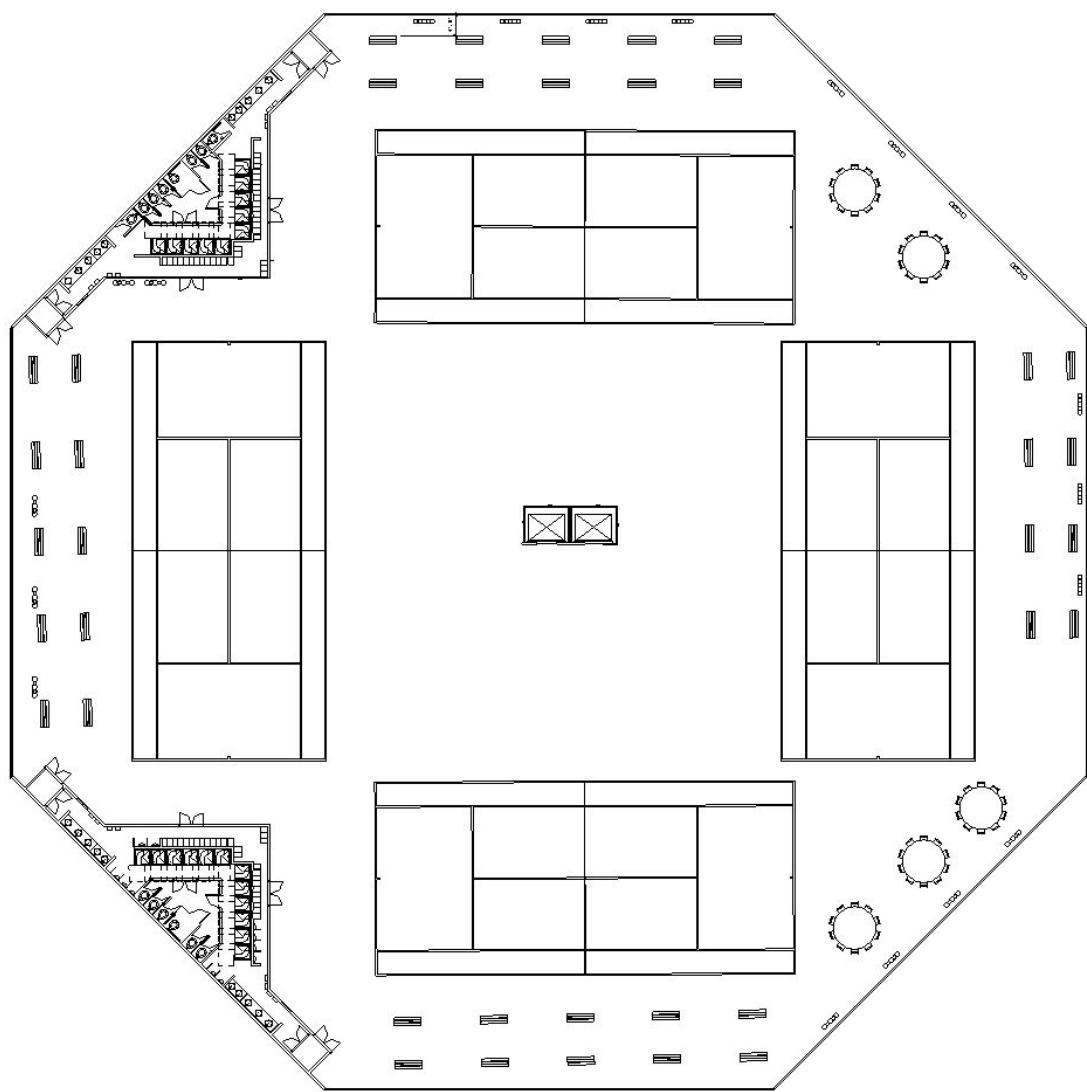


Figure 29: Floor 3 Tennis Courts

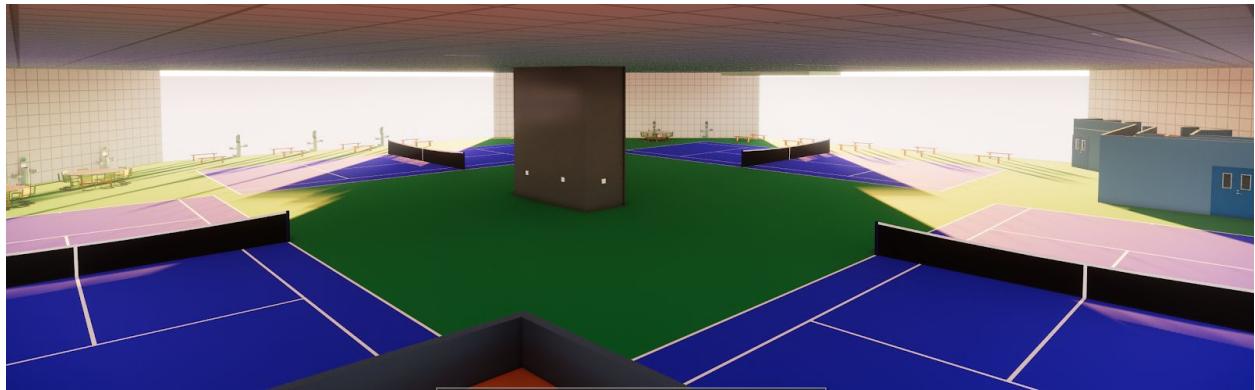


Figure 30: Floor 3 Tennis Courts

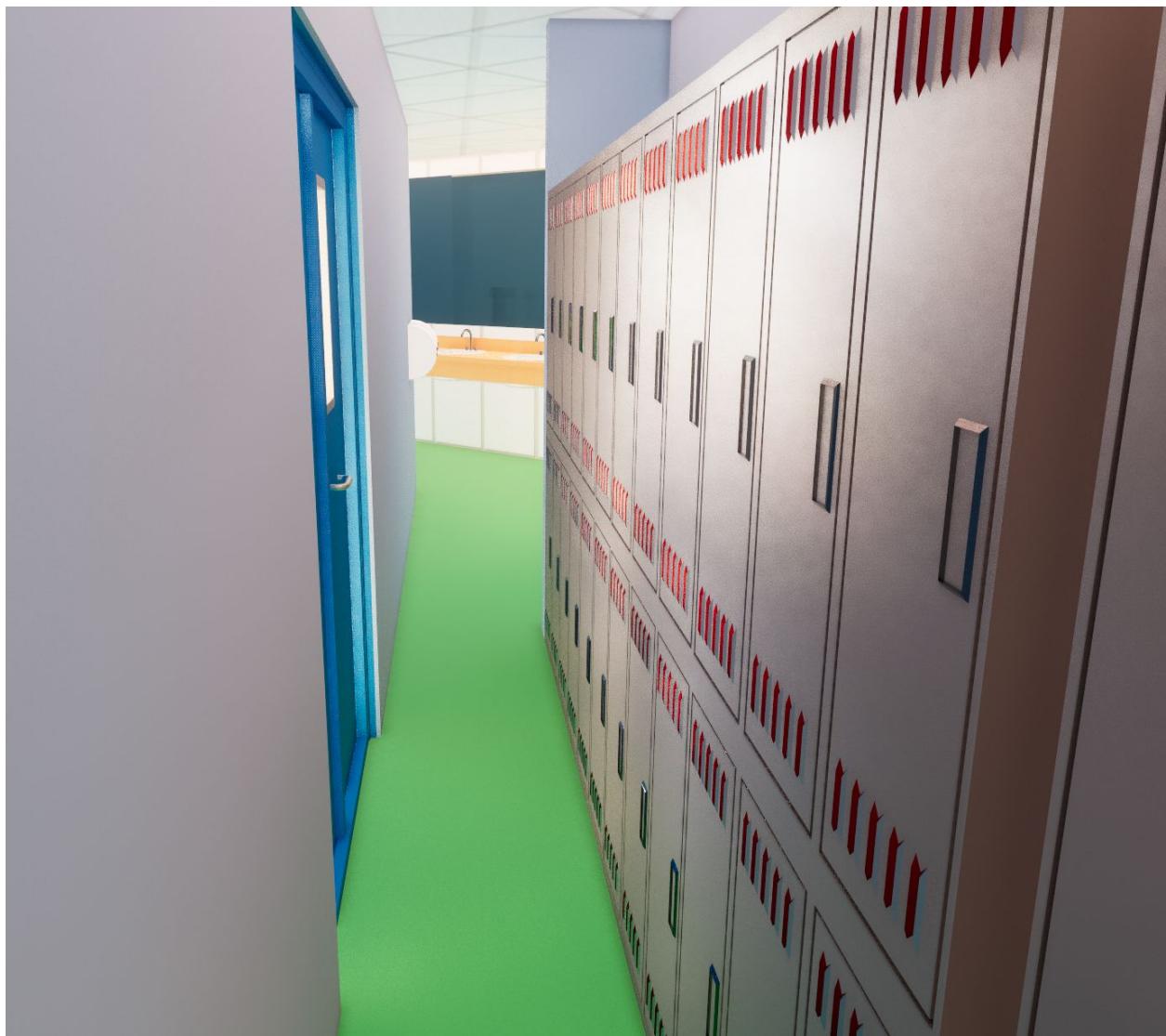


Figure 31: Floor 3 Tennis Courts locker rooms



Figure 32: Floor 3 Tennis Courts locker rooms LEED automated sinks and dryers



Figure 33: Floor 3 Tennis Courts locker Room Showers

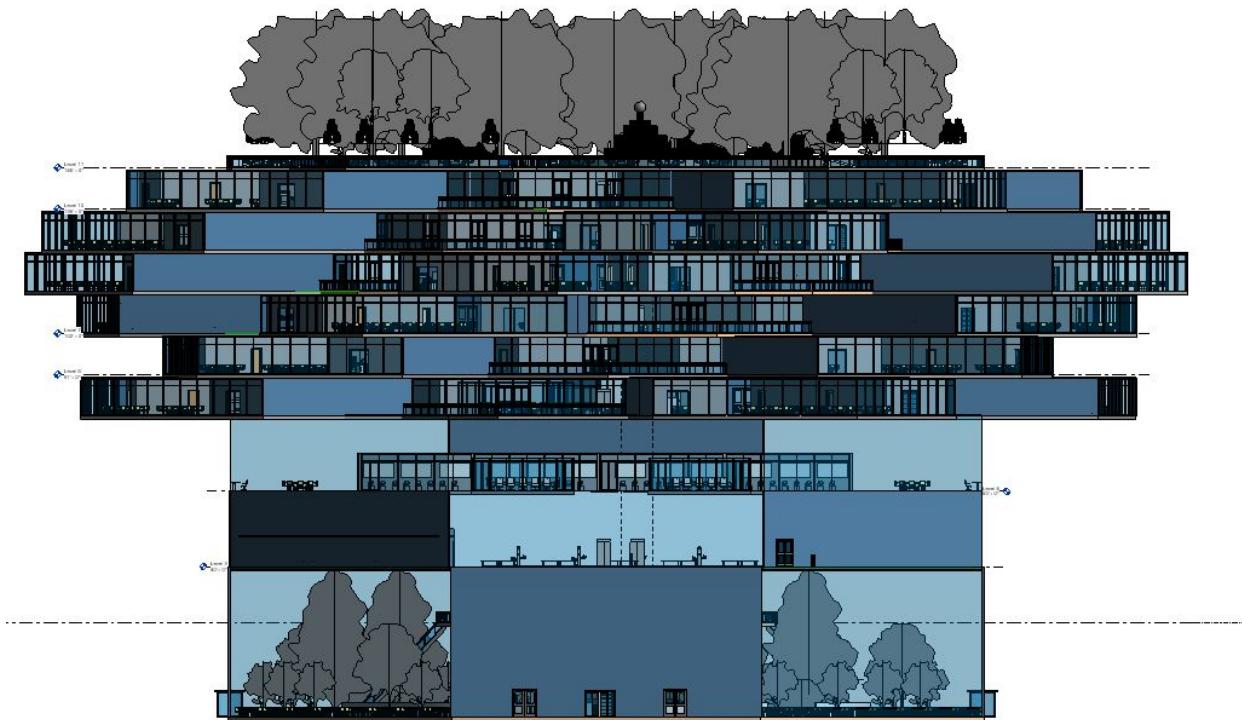


Figure 34: Side View in 3D view

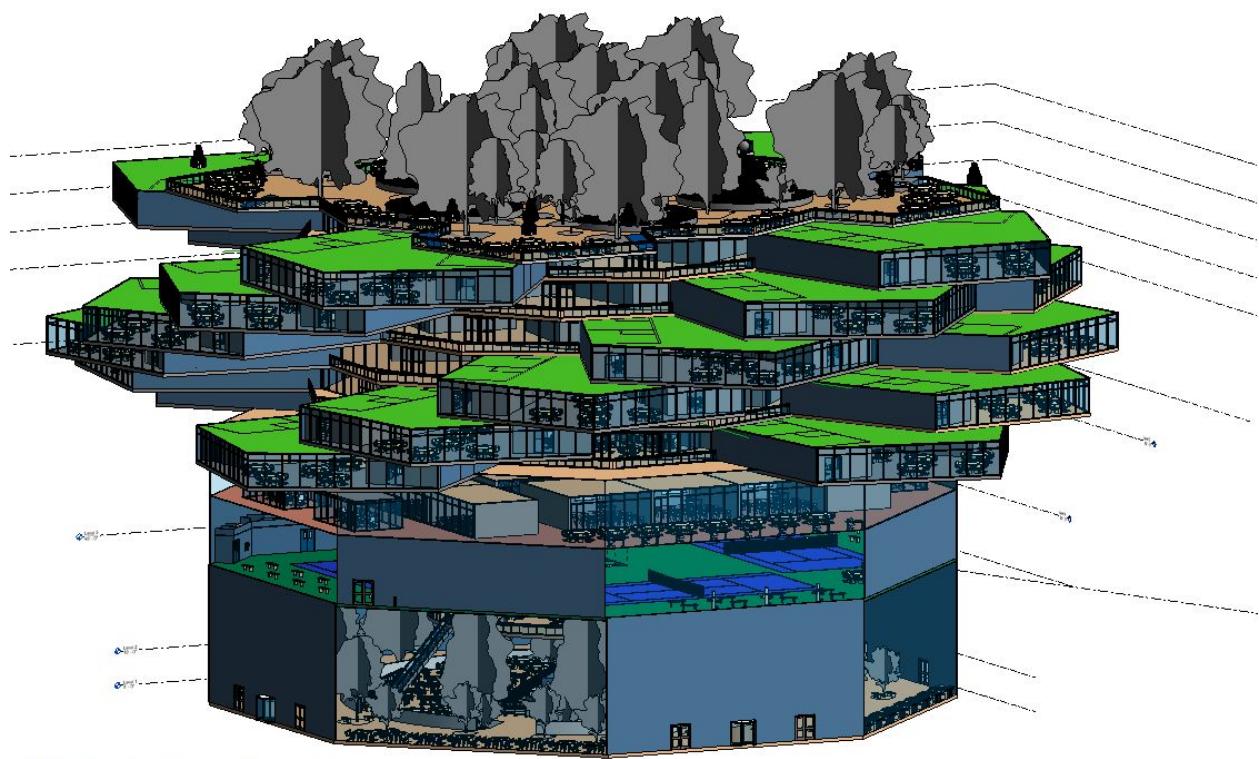


Figure 35: Isometric View of 3D

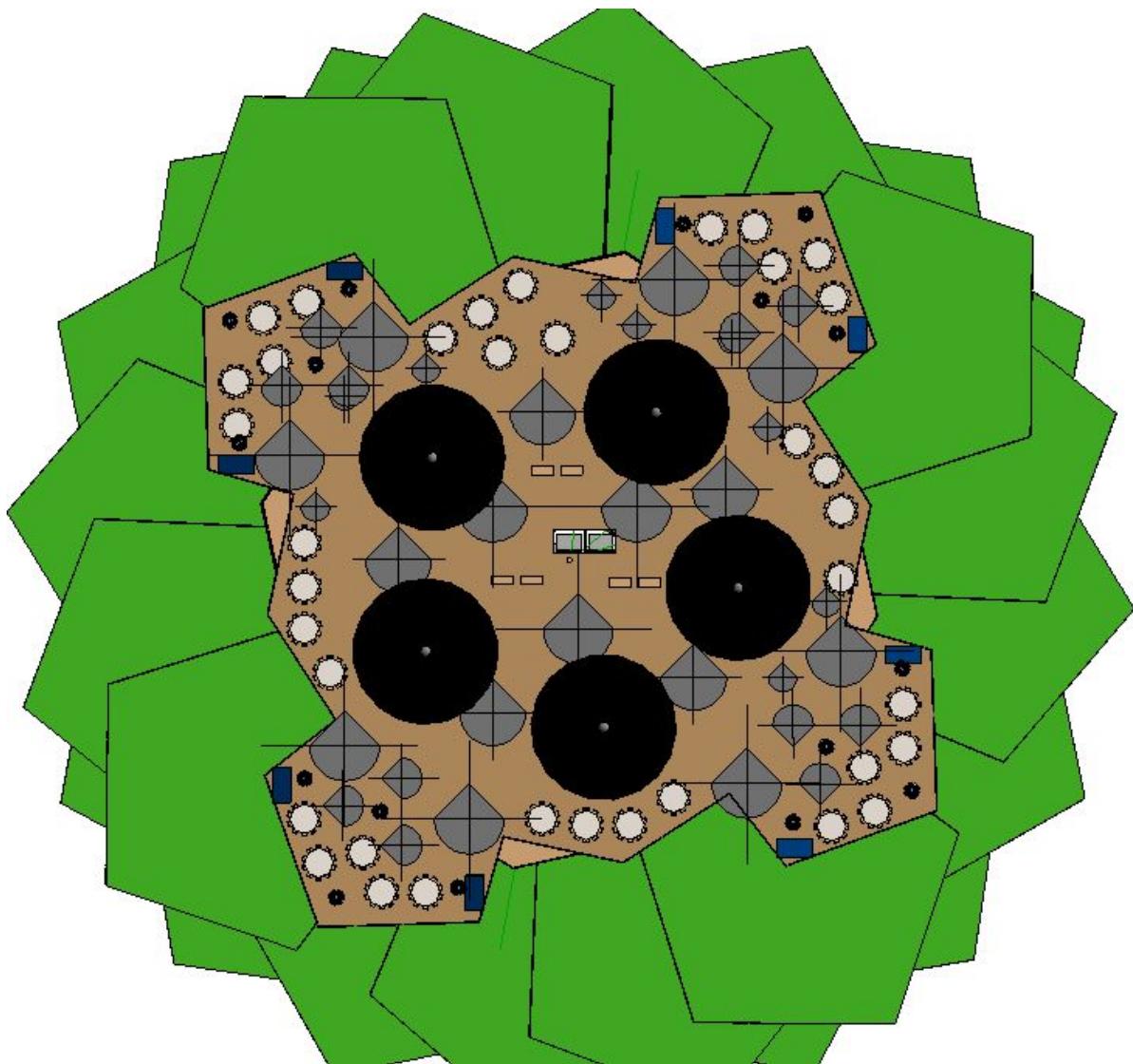


Figure 46: Isometric 3D top View

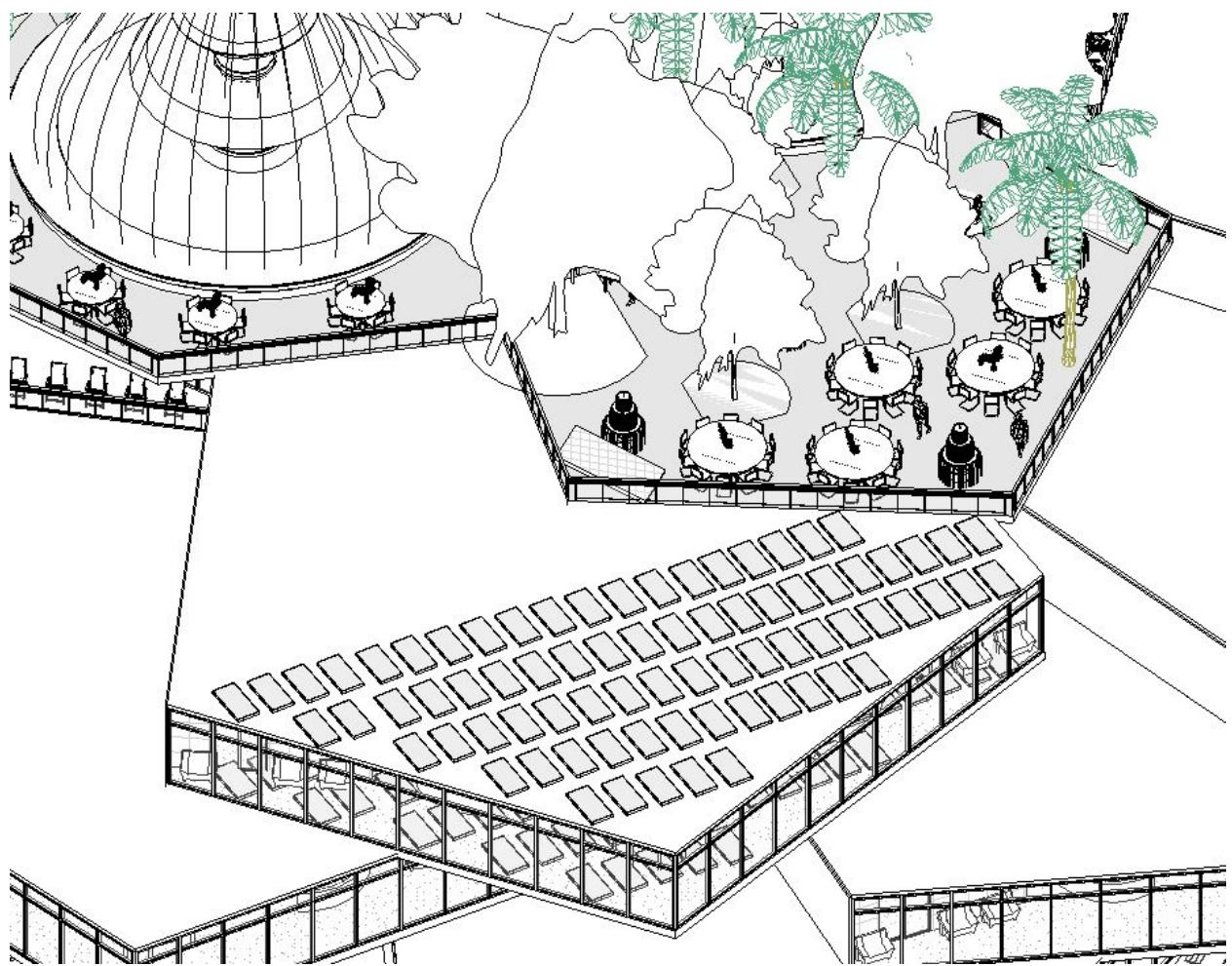


Figure 37: LEED solar Panels and Garden

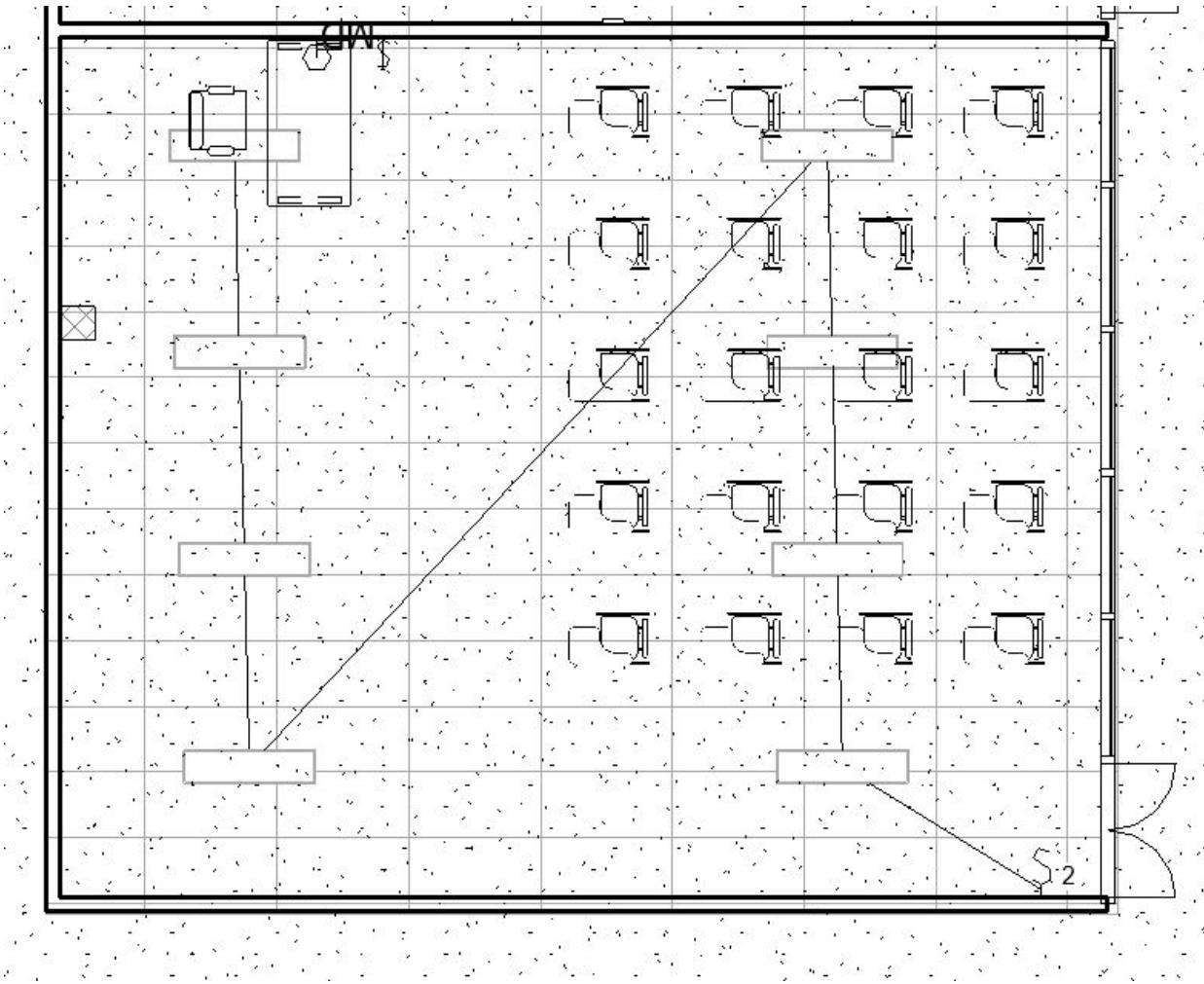


Figure 38: Electrical Classroom

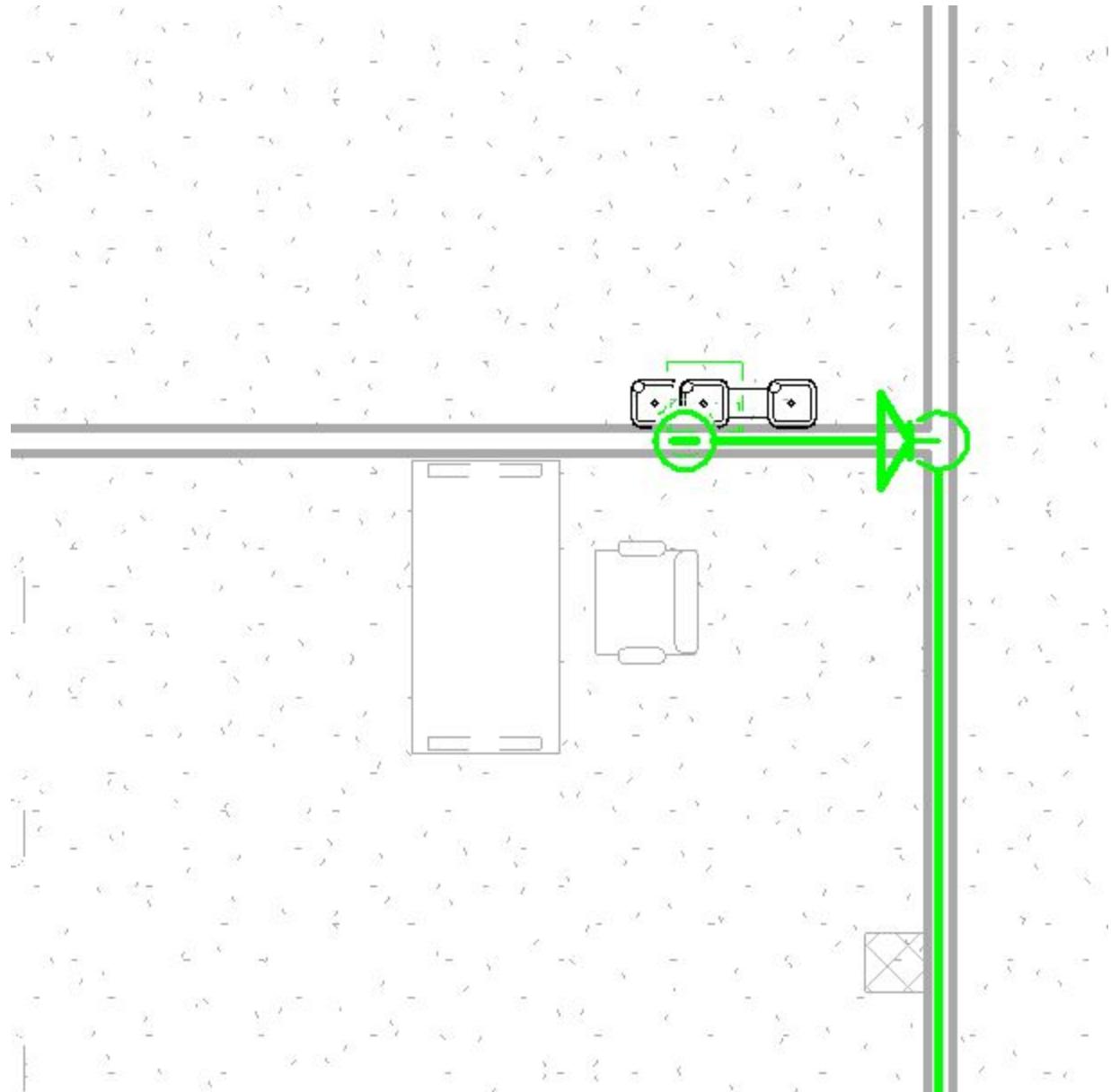


Figure 39: Plumbing Classroom

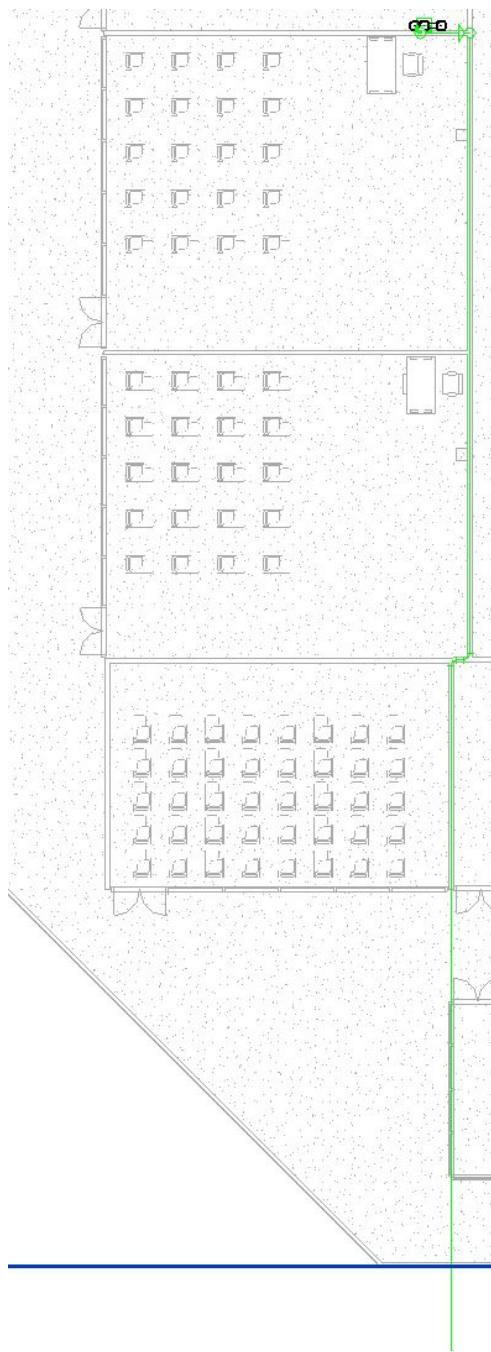


Figure 4o: Plumbing Classroom

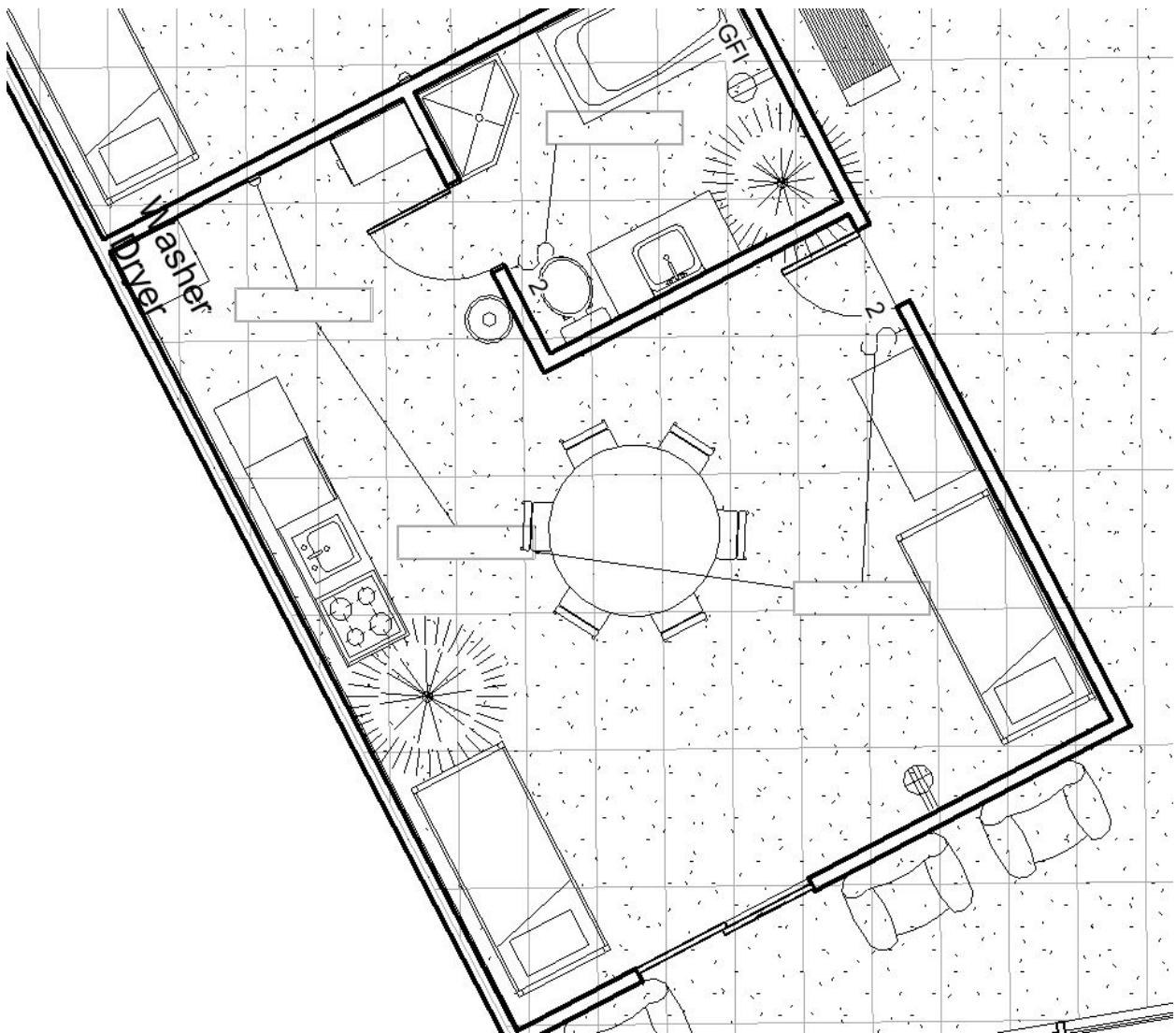


Figure 41: Electrical Dorm Room

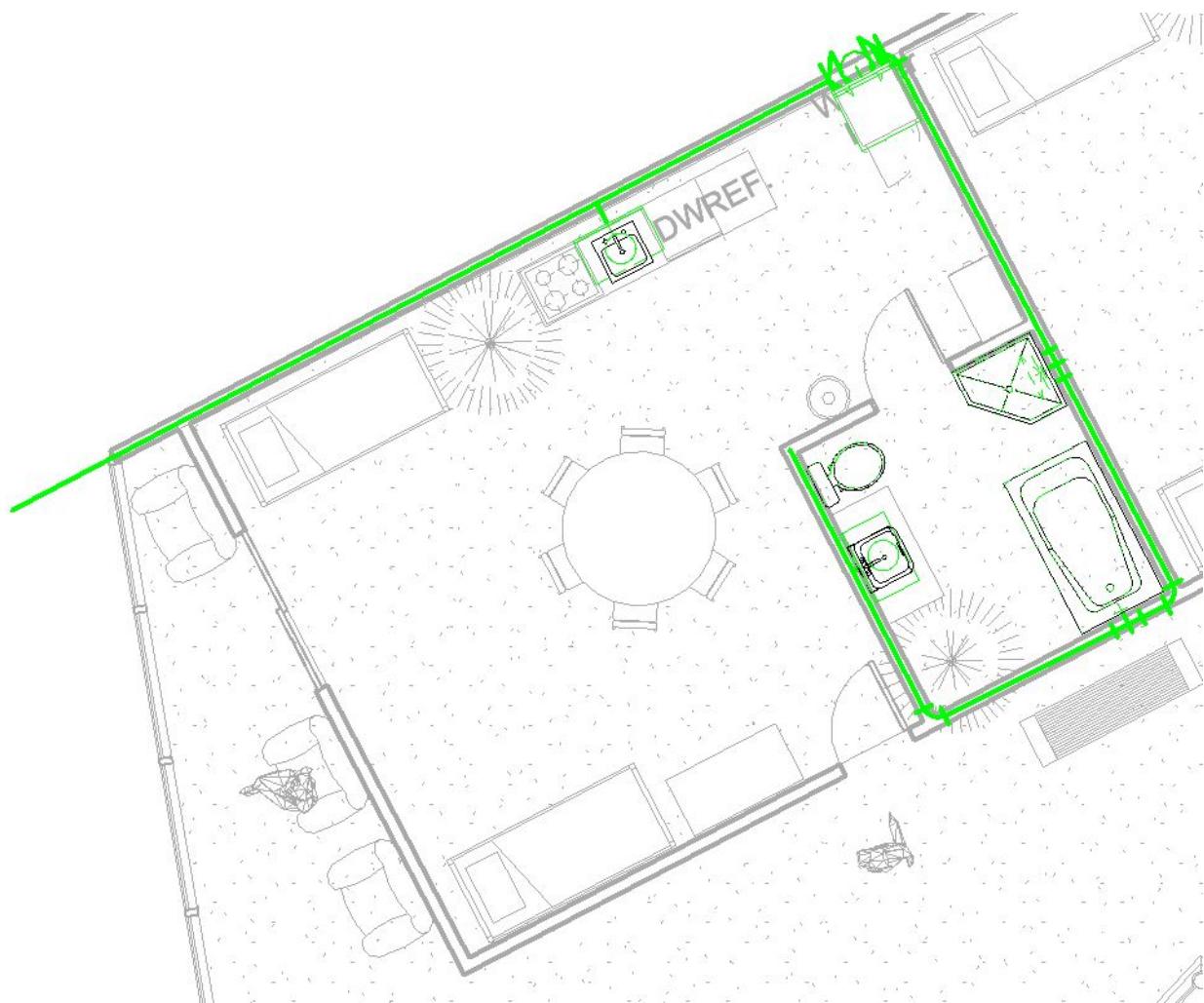


Figure 42: Plumbing Dorm Room

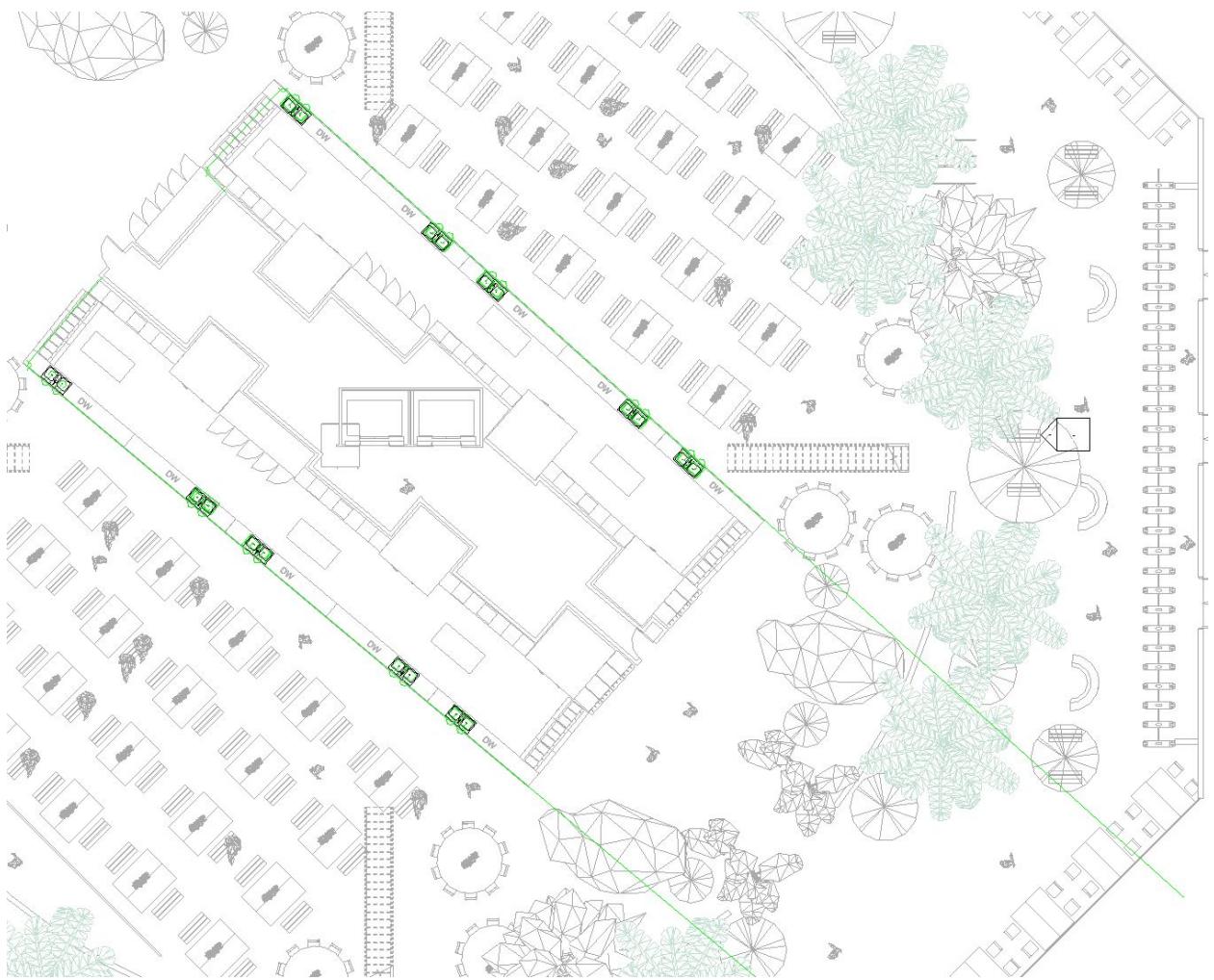


Figure 43: Plumbing Cafeteria Rec space

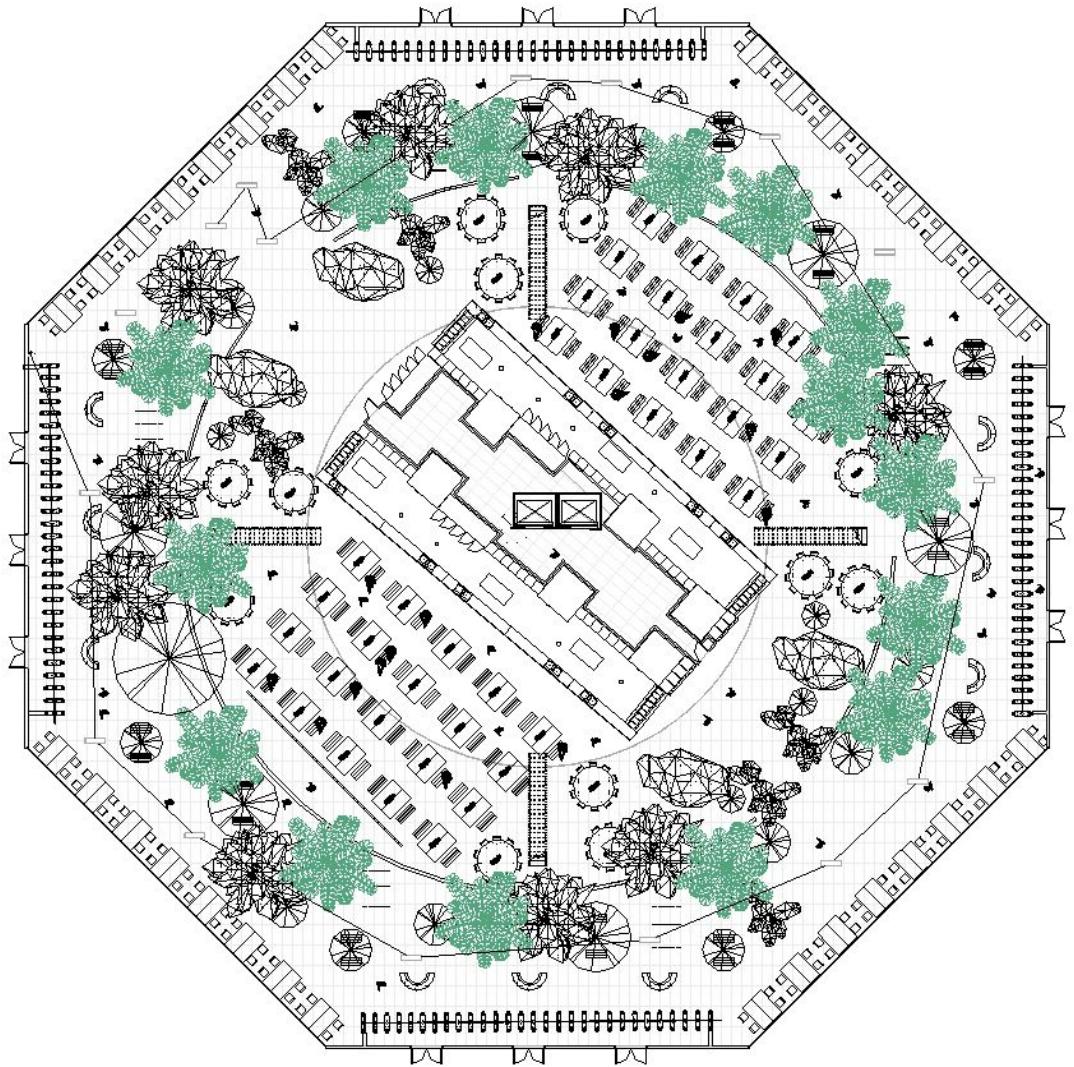


Figure 44: Electrical Cafeteria Rec space



Figure 44: 3D printed Logo

Advertisement

VERSION 1.0

11 - 12 - 2019

NYU TANDON

PROJECT OCTAN



EN.VISION

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EXECUTIVE SUMMARY



Problem Statement



Construction produces over 600 millions of tons of solid and gaseous pollutants into the atmosphere year, and cities like New York are becoming increasingly populated.

Problem Statement

NYU Tandon wishes to renovate the Jacobs Building to acquire LEED certifications for the health of its students and the environment. Tandon requires classrooms, recreational spaces, dormitories, and utilities.



Solution

En.Vision designs with the highest standards in green compliance and standards. With world renown artist, architects, engineers, and a vision that focuses on the environment in aspects of construction, we believe that En.Vision will design a building that will match or exceed the innovation at NYU's engineering campus Tandon



Sample projects



The Victoria's Classroom is a waterside school building based on modernist architecture. The design utilizes natural resources of water to generate its electricity and reaches a depth of 5 stories underwater. Gold Certified



Hotel Planetarius's themes challenges the idea using synthetic materials. All materials are recyclable and clean. Theme uses green garden, waterways and natural energy. Platinum Certified



Legaria Resorts is the work of a team of hundred artist architects that combined the natural organic curves and shapes with nature. The design advantage allows for dense growth of foliage and matches the harmony of water. Platinum Certified

LEED GOLD

- Location and Transportation Goal completed with rooftop garden, cafeteria, tennis courts and wheelchair accessible elevators.
- Sustainable Sites goal completed with rooftop garden to reduce rooftop heating and serves as a green space. Green cafeteria with trees reduces heat and CO2 wastes from kitchens
- Water Efficiency: Bathrooms are equipped with automated sinks, toilets, and air dryers. Internet of things (IOT) allows for real-time management
- Indoor Environmental Quality: plethora of windows, and trees allow for cleaner air and brighter work spaces

COMPLETED



En. Vision values prioritizes building practices that take care of the environment, reducing solid and gaseous pollution. With these goals, En. Vision plans to redefine the norms of building and respect towards the environment.

LEED PLATINUM

- Energy and Atmosphere: Octan uses low electricity due to the heat reducing rooftop forest and green cafeteria. The large use of electrochromic insulating windows allow more light and less electricity. In tandem, IOT with neural networks and AI will also be used to collect data on the building and optimize the level of lighting and heating in the building

- Innovation: Octan uses modern AI and neural networks to collect data and become more efficient in optimizing heating, lighting, and plumbing in New York's harsh weather conditions. Green technologies such as electrochromic windows can adjust for the amount of light allowed into the building and produce electricity from sunlight. Solar Panels in the garden produce electricity as well

COMPLETED



Deliverables

En.Vision Plans on Delivering a unique innovative green buildings that emphasizes the use of green spaces like gardens within and outside the buildings and the use of the most advance technology: electrochromic windows, IOT, AI, neural networks, solar panels, and automation for bathrooms



Timing

En.Vision works with the highest efficiency and plans to finish the building at the end of 2026. En.Vision prioritize worker safety, fair pay, and highest reduction of waste, so building will take loner than most buildings.



Dealines

En.Vision will start construction with all plans approved and commissioned by January 1st by the City of New York. Due to En.Visions high standards, commissioning is normally four month faster than other construction industries.



Inspections and Finish

The Building will pass all inspections: October 21, 2020 (structural and framing). December 20, 2021 (gas and heating), February 2022 (plumbing), November 2025 (living conditions and regulations). Finish Building by December of 2026.

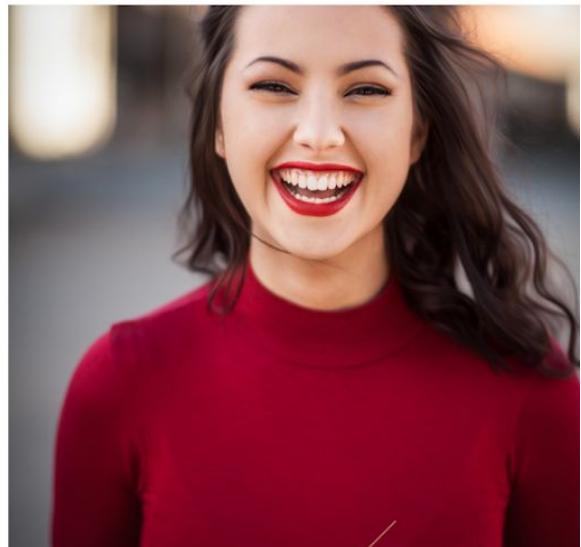
PRICING

Package	Work That's Done	Price
PACKAGE 1	LEED SILVER BUILDING (2 categories met) 6 floors	<i>\$1.2 billion</i>
PACKAGE 2	LEED Gold BUILDING (4 categories met) Green Cafeteria 8 floors	<i>\$1.62 Billion</i>
PACKAGE 3	LEED Platinum BUILDING (all 6 categories met) Green Cafeteria Tennis Courts IOT, Neural Networks 10 floors	<i>\$2.3 billion</i>
PACKAGE 4	LEED Platinum BUILDING (all 6 categories met) Rooftop Garden Electrochromic Windows Green Cafeteria Tennis Courts IOT, Neural Networks 11 floors	<i>\$2.8 Billion</i>

CLIENT TESTIMONIALS

Marrisa

"En. Vision Provided the perfect price for designing my office building in Costa Rica. They were highly flexible and respected not only the environment, but also there employees(construction and office) and the locals of Costa Rica. These qualities are very rare in industry and seeing the CEO Michael Zhang and Aidyn Wang visit the sites gave me tremendous respect to their care towards their projects. I will definitely recommend them for large office spaces!"



Mike

"I have been a desinger for over 20 years, and I have never seen a building designed in such an artistic and innovative fashion. En.Vision incorporated the highest levels of technology, art, and green practices when re-designing the Adobe Photoshop's new campus in San Jose, California. I was greatly impressed by their care towards their customers workers and to the medium of art. "



Clients We've worked with



Apple



Adobe



Facebook



Columbia University

Our Background



After thirty years of working in some of the fastest moving construction companies two large issues remained untouched, compassion towards the environmental and the people. Protest and questioning lead to no avail. Many professionals felt the same need, and from conferences to conferences top designers, world famous architect and the best project managers came together to form En.Vision, a construction company to prioritize the people and the environment over fast wasteful construction.

The ways We work



Smart, Efficient, Caring. Holding the highest ethical and environmental standards

Results We've driven



In the past 40 years En.Vision has constructed more than 30 LEED platinum buildings, and a total of 150 LEED buildings. We are renowned over the world for our capabilities of keeping the highest standards in construction, adjusting to new trends and technologies, and placing the highest respect on people and the environment

LET'S GET IN TOUCH



Michael Zhang



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www.EnVision.com
