Sustainable Built Environment Learning and Exhibition Center

CEE 220B Advanced Building Modeling Workshop

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AGENDA

Project Overview
Introduction of the Project Background, Goal, & Overview

01

Key Design Features
Building Layout , Envelope, Structural, HVAC & Plumbing System Design

02

Successes & Challenges
What Worked Well & What Was Difficult

03

Lessons Learned
Main Takeaways & Suggestions for Upcoming Students

04

Project Background

Location:
The Stanford Dish, Stanford, CA

Purpose:
Provide exhibition space and resources for visitors to explore sustainable building practices

Target Users:
Families and school groups, Design professionals, Anyone who is interested in sustainable technologies and living opportunities

Project Goals

01
Functionality
Design with the intended purpose in mind

02
Sustainability
Achieve the Architecture 2030 target and even become a net-zero project

03
Accessibility
Ensure building accessibility for all occupants, regardless of physical ability

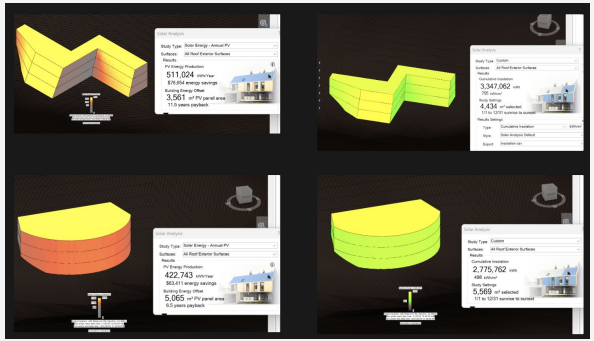
04
Aesthetics
Visually appealing and contribute positively to the surrounding environment

05
Comfort
Provide comfortable conditions, with appropriate ventilation, lighting, and temperature control

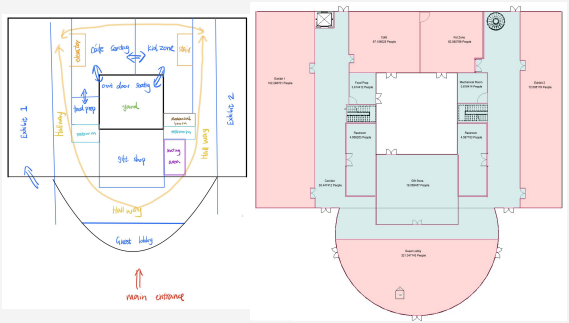
06
Learn!!!
Understand how BIM and Revit are used to design, analyze, and model building systems

Project Overview

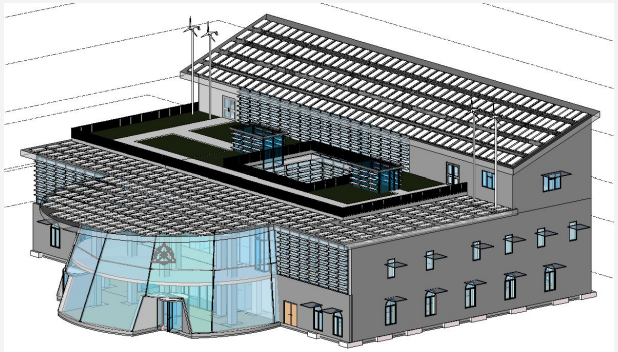
1. Conceptual Design



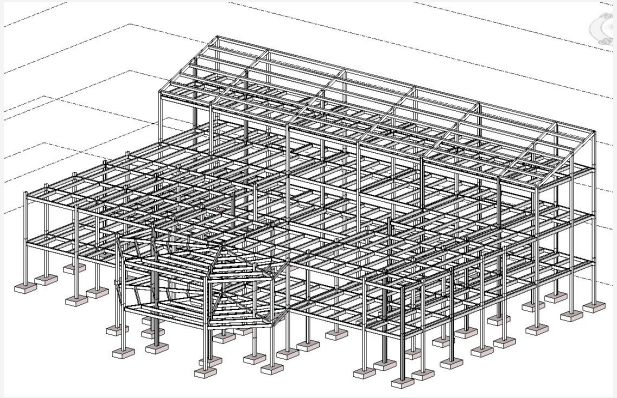
2. Building Layout



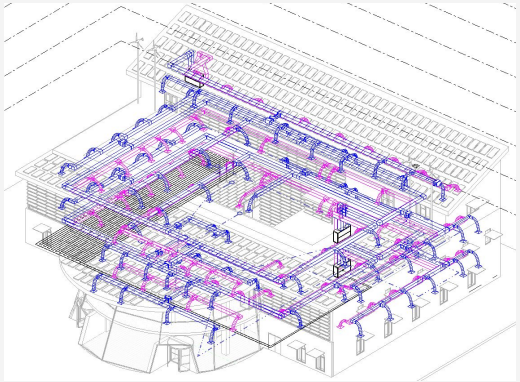
3. Building Envelope



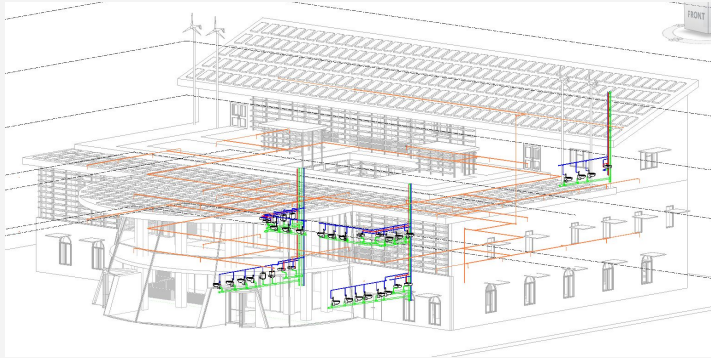
4. Structural Systems



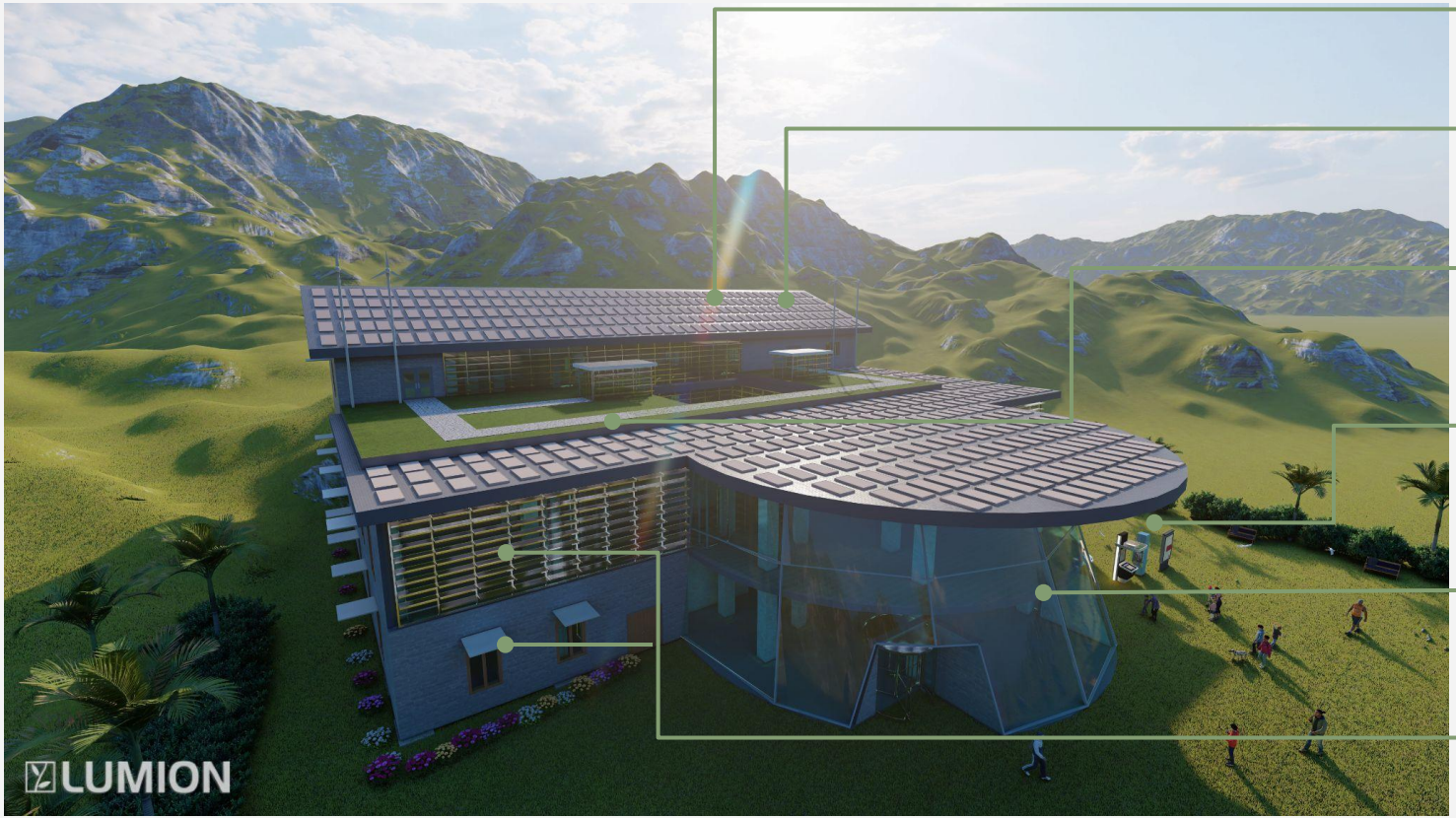
5. HVAC Systems



6. Plumbing Systems



Key Features



Solar PV panels

Sloped Roof

Green Roof

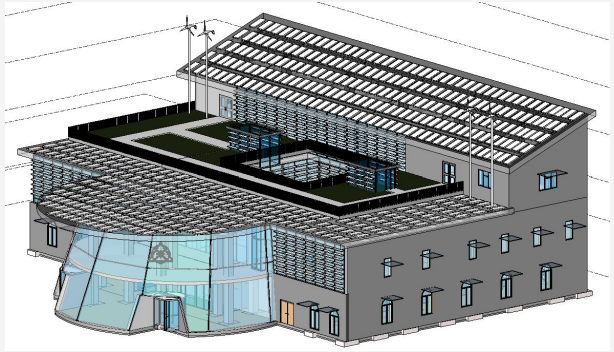
Roof Overhangs

Curtain Walls

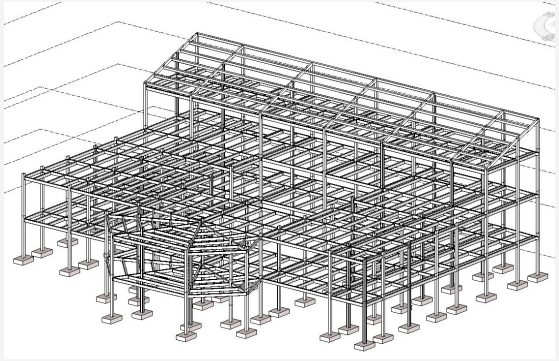
Light Shelves

Key Features

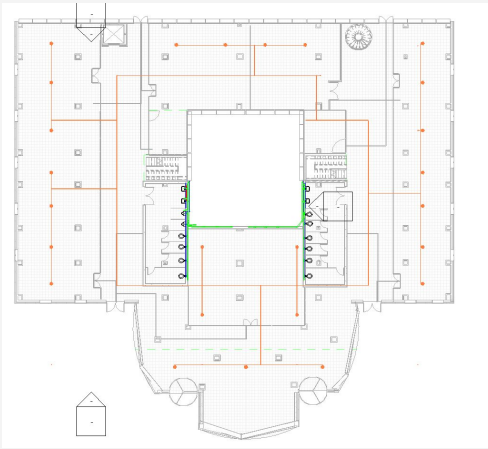
Central Atrium



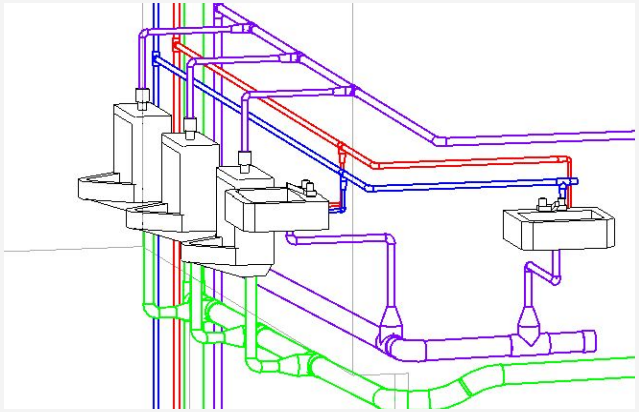
High R-value Wall & Floor Building Materials



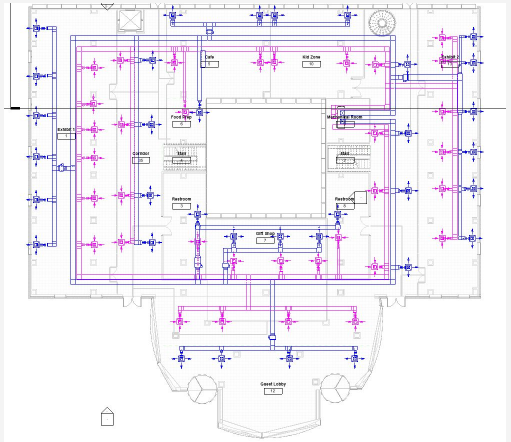
Steel Structural Framing Systems



Fire Sprinkler System



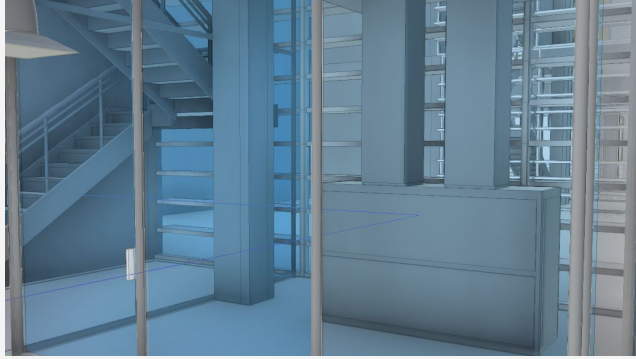
Greywater System



VAV Units

Elevator

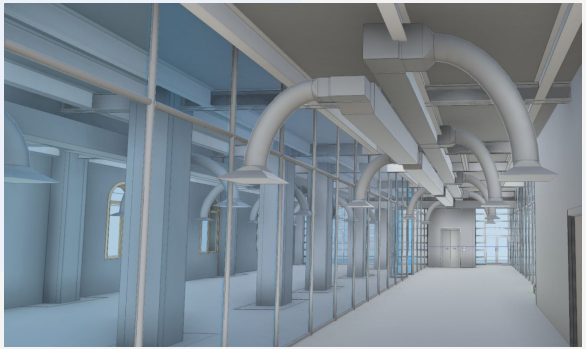
Stairs



Mechanical Rooms

Quick Walkthrough! More Key Features!

Exhibition Space



Corridor

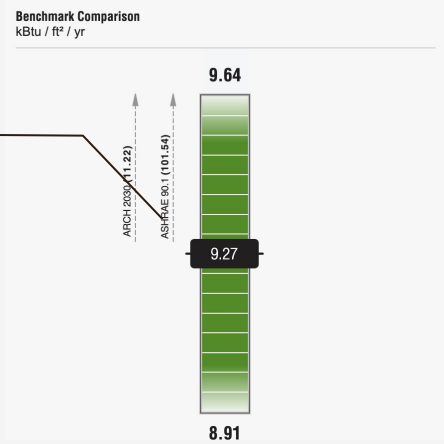
Restrooms

Big Success

01

Achieve ARCH 2030

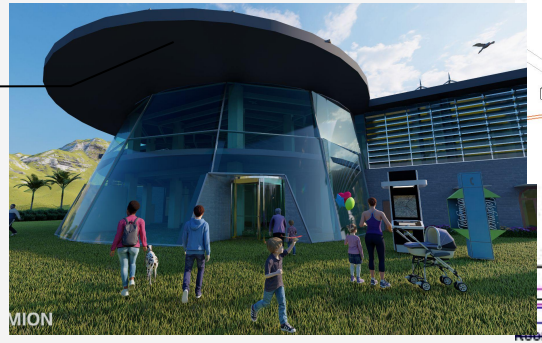
EUI value finally drops to 9.27, as I added more and more design improvements.

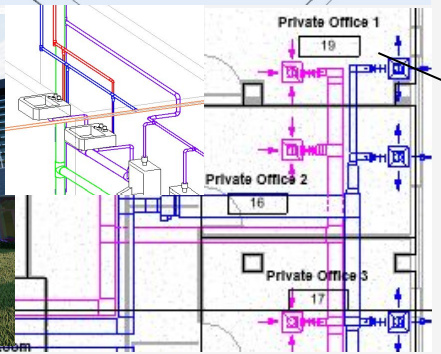


02

Visually appealing

Used curtain wall to improve aesthetics, energy efficiency, and natural light

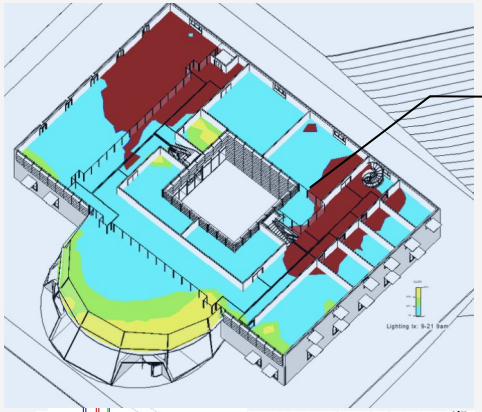




03

Analytical Design Process

Used tools offered in Revit to analyse the design decisions



04

Incorporate sustainable system design

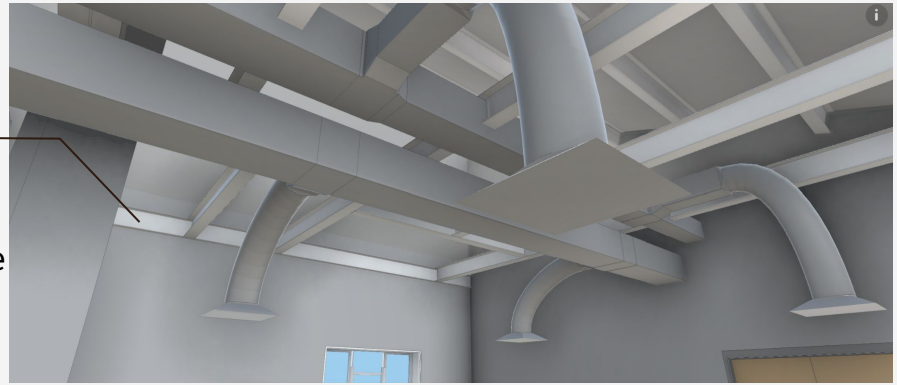
Ex. greywater collection systems, green roofs, VAV units in HVAC systems, etc.

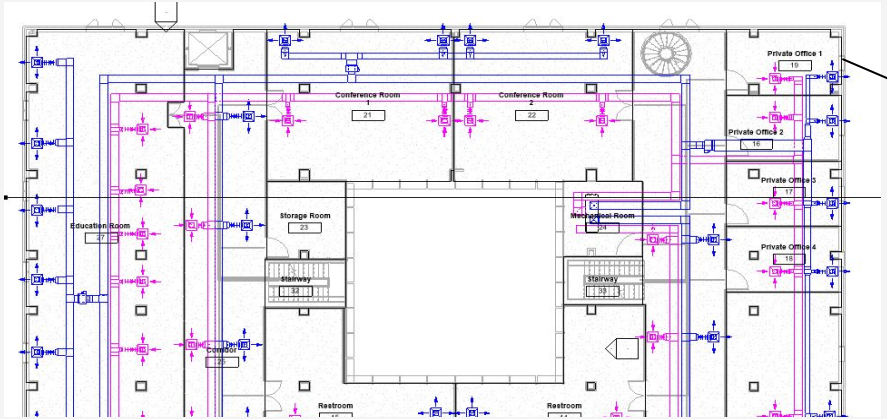
Big Challenges

01

System Coordination

Coordinate systems to make sure they would not collide with each other





02

Optimize the size of ducts in HVAC System

Use Duct Sizing in Revit and get getting an error about some flow in the section is 0

Lessons Learned

1 Building Modeling

Learned how to use Revit and coordinate different systems in the BIM 360

2 Time Management

Break the project down into smaller milestones and phases to help manage the project

3 Trial and Error

Learn from mistakes and use that knowledge to inform future designs

4 Balance Between the Big Picture & Details

In the initial stages of the design process, it is important to clearly define the design plan

Thank You for Listening My Design Journey!!!

Thank you to Professor Glenn,Edward, Donatien, and Daniel for assisting me throughout this entire process, as well as my classmates!!!