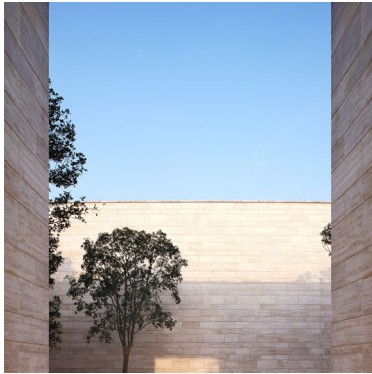


Final Presentation

Roy Zhang

Agenda



1. Design Concept
2. Project Goal
3. Building Design
4. Unique Design Features
5. Structural Layout
6. HVAC Strategy
7. Plumbing System
8. Building Performance

Design Concept

1. Location: Jasper Ridge Biological Preserve
2. Solar Panel Roof: Energy Efficient
3. Atrium System: get more natural lighting
4. Balcony and Shading System: prevent exceed natural lighting & natural ventilation

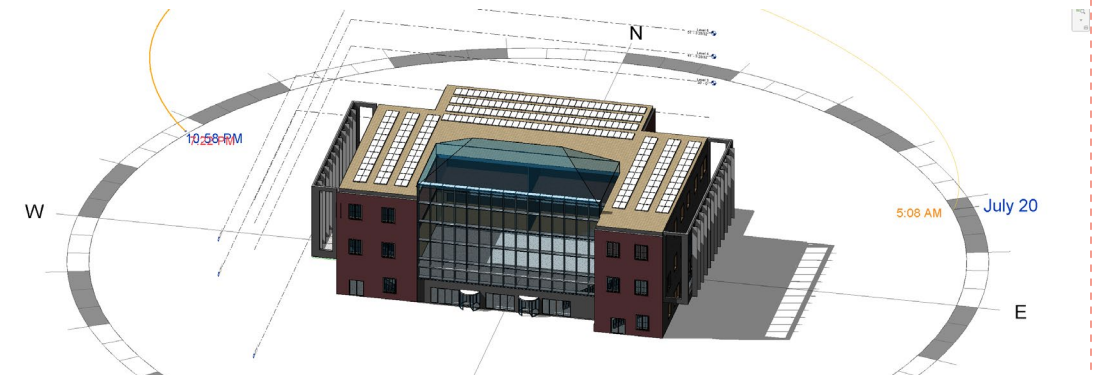
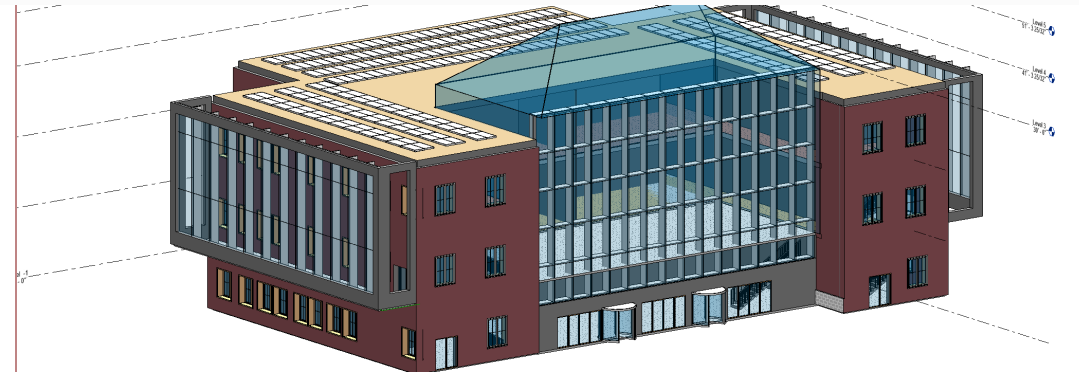


Project Goal

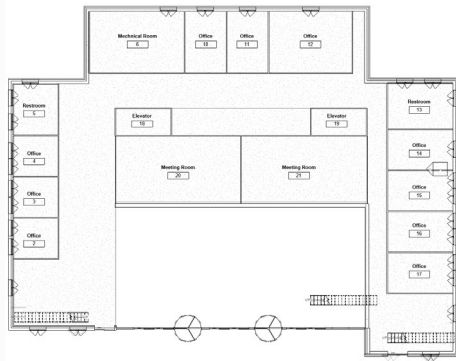
Goal 1: Building massing, orientation and programming

Goal 2: Good Building Envelop Design

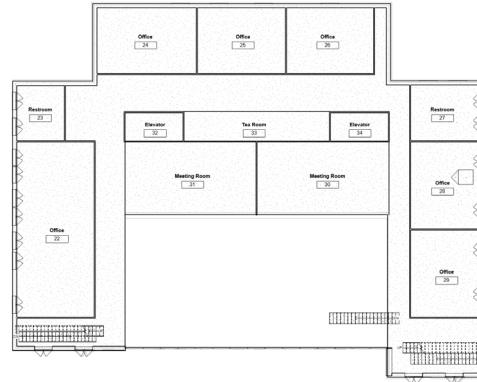
Goal 3: Net Zero Building



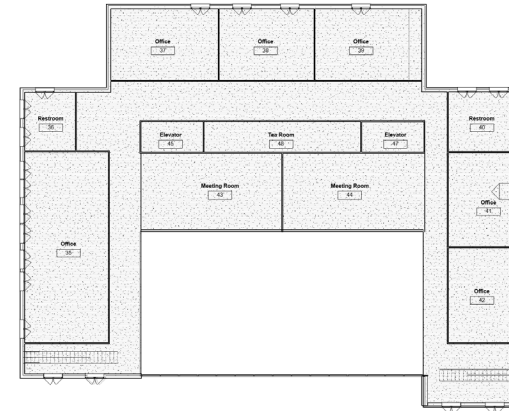
Building Design – Floor Plan



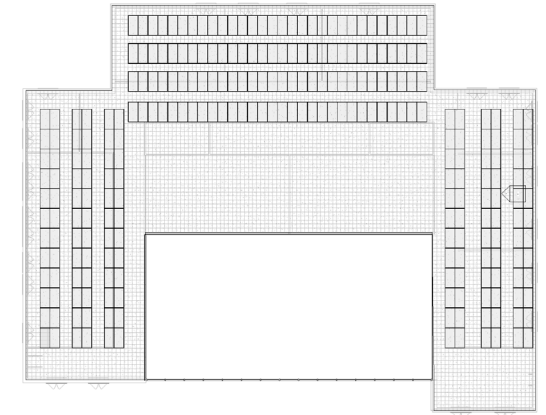
Level 1 Floor Plan



Level 2 Floor Plan



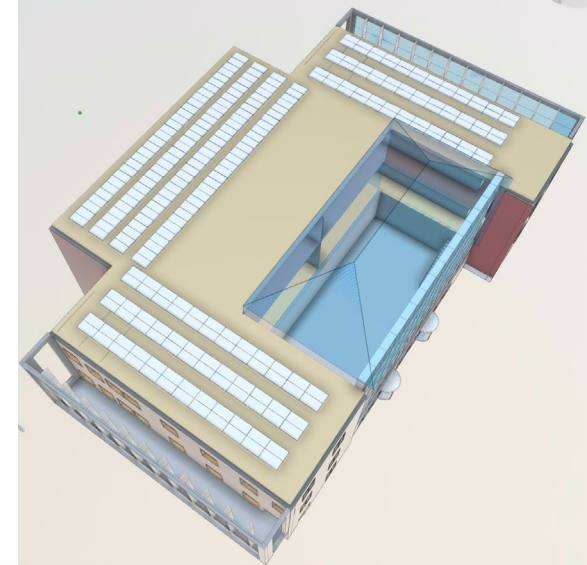
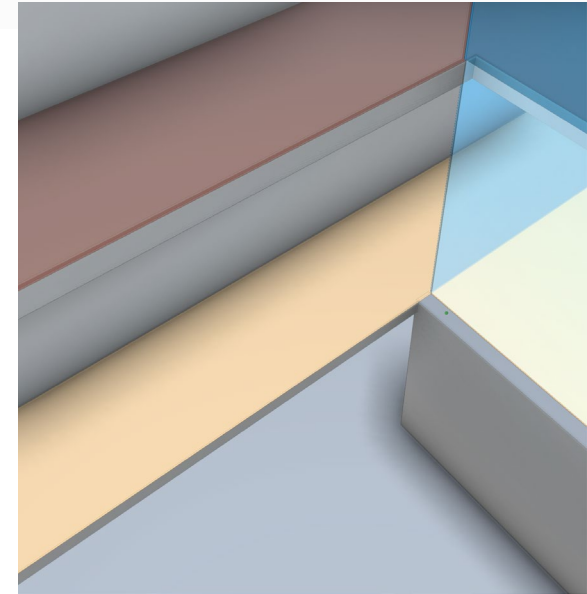
Level 3 Floor Plan



Level 4 Floor Plan

Building Design - Envelope

- Exterior Wall: Basic Wall- Brick on CMU
- Floor Material:
 - First Floor (Entrance and office): 3" LW Concrete 2" Metal Deck
 - Second Floor (Employee Office): "Wood Joist 10" Wood Finish
 - Third Floor (Manager Office): "Wood Truss Joist 12" Carpet Finish
- Building EUI: -1.41 EUI
 - Roof Construction: R 60
 - Infiltration: 0.17 ACH
 - Operation Schedule: 12/5
 - PV Panel Efficiency: 20.4%
 - PV payback Limit: 20-30 years
 - PV surface coverage: 90%



Building Design – Space Budget

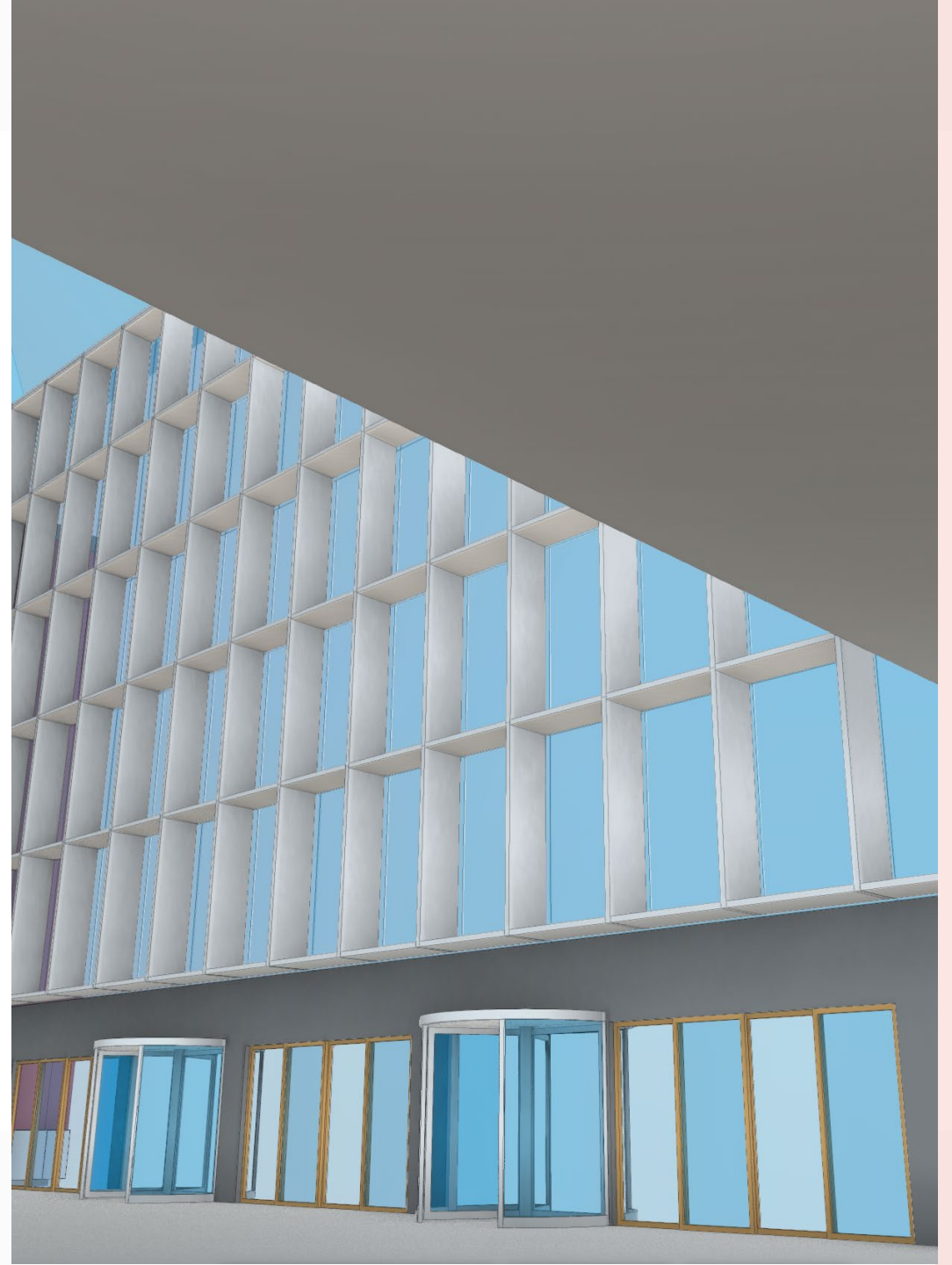
Function	Total Area	Design Features/Idea/Key Attribution
Front desk	160 Sqft	Natural Lighting, Best View across the glass curtain wall.
Café	1370 Sqft	Natural lighting; direct connect to the entrance of the building; VRF ventilation system + natural ventilation
Office	10230 Sqft	Natural Lighting; View to the outside; R-38 material for Wall; HVAC + Shading system; VRF ventilation + Natural Ventilation; Sound insulation materials
Conference Room	5184 Sqft	Natural Lighting; View to the outside; R-38 material for Wall; HVAC + Shading system; VRF ventilation + Natural Ventilation; Sound insulation materials
Elevator	384 Sqft	HVAC; access on the both side of the building
Tea Room	640 Sqft	Natural Lighting; access to all direction of the building; HVAC; VRF ventilation
Exhibition Spaces	320 Sqft	Natural Lighting; access to all direction of the building; HVAC; VRF ventilation
Hallway	6000 Sqft	Natural Lighting; View to the outside; glass curtain wall
Mechanical Room	504 Sqft	Natural Lighting; VRF ventilation system; high quality sound insulation materials
Restroom	1364 Sqft	Natural Lighting; VRF ventilation system
Stairway	912 Sqft	Natural Lighting; VRF ventilation system
Total Area		31640 Sqft

Unique Design Feature 1

Atrium Design

- Sun lighting
- Curtain Wall Mullions
- Revolving Entrance Door

Sunday, March 12, 2023

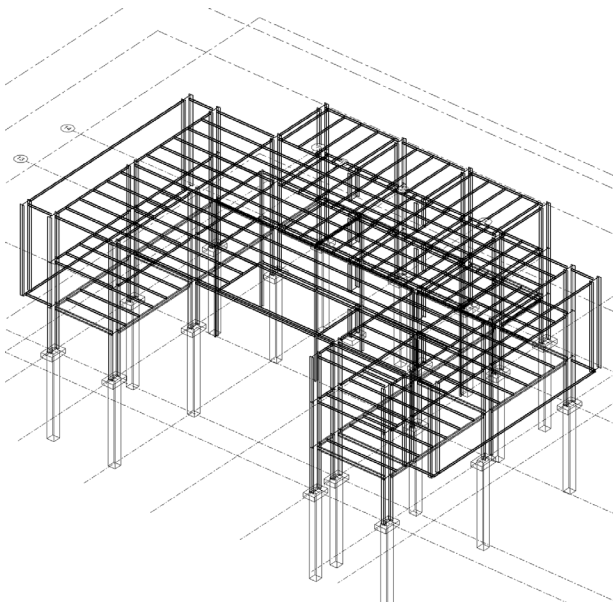
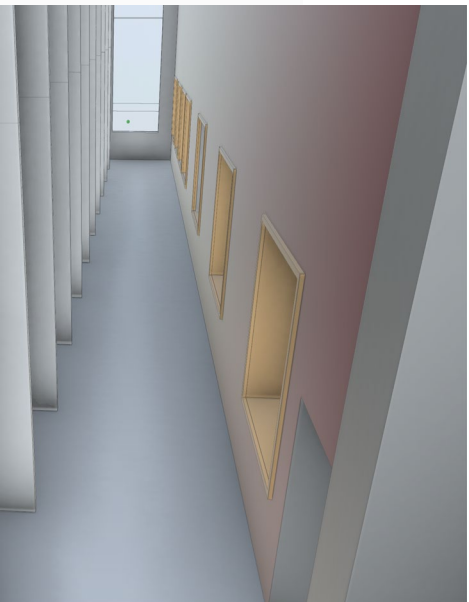
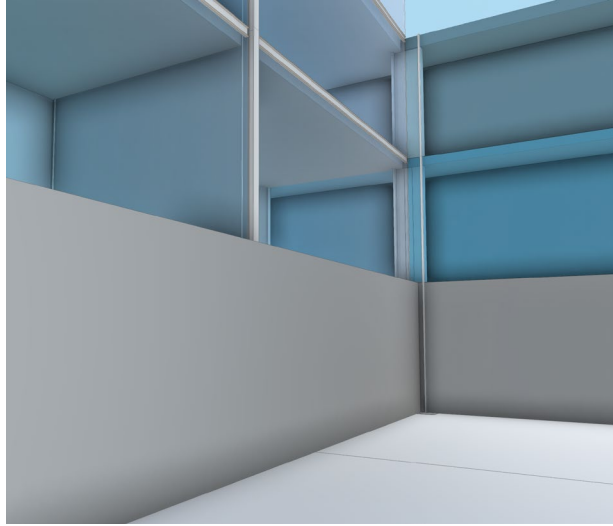


Unique Design Feature 2

Balcony

- Natural Ventilation
- Sun Lighting
- Adjustable Shading System



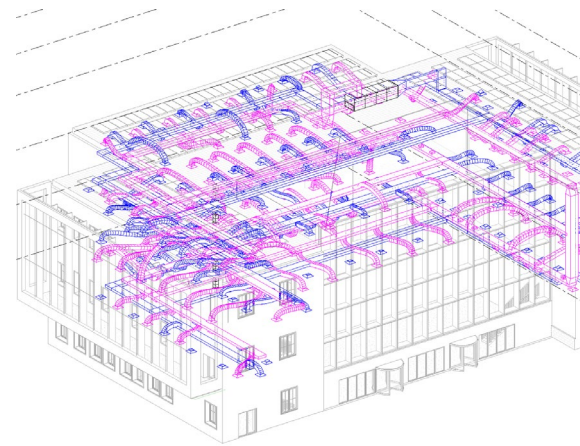
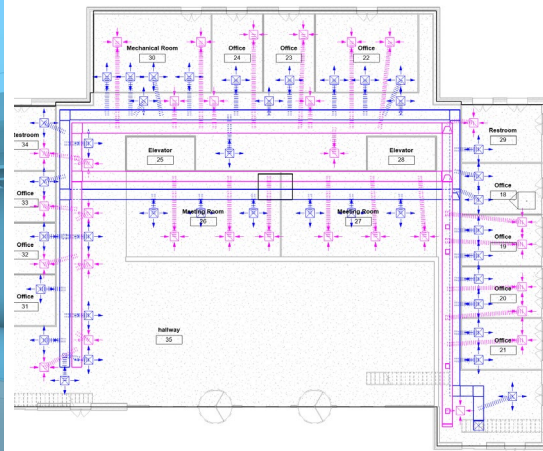
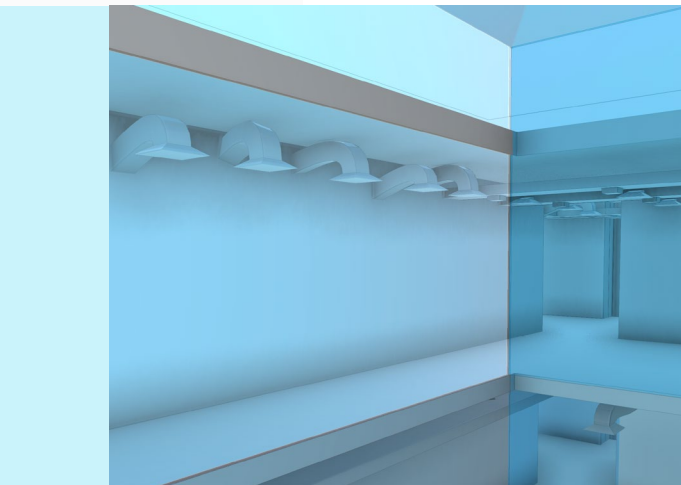


Structural Layout

- Beam: W Shapes W8 X 10
- Columns: W-Wide Flange -Column W40 X 503 (for the main structure)
- W Shapes- Column W12 X 40 (for the meeting room under the atrium)
- Beam System: W8 X10
- Foundation Slab: Concrete-square 30 X 30
- Isolated Foundation: Footing-Rectangular 72" X 48" X18"

HVAC Strategy

- AHU – Horizontal Air Handling Unit
- 32 x 40 Main Pipeline
- 16 x 10 Distribute Pipeline
- VRV Dual Zoning
- Space Analysis



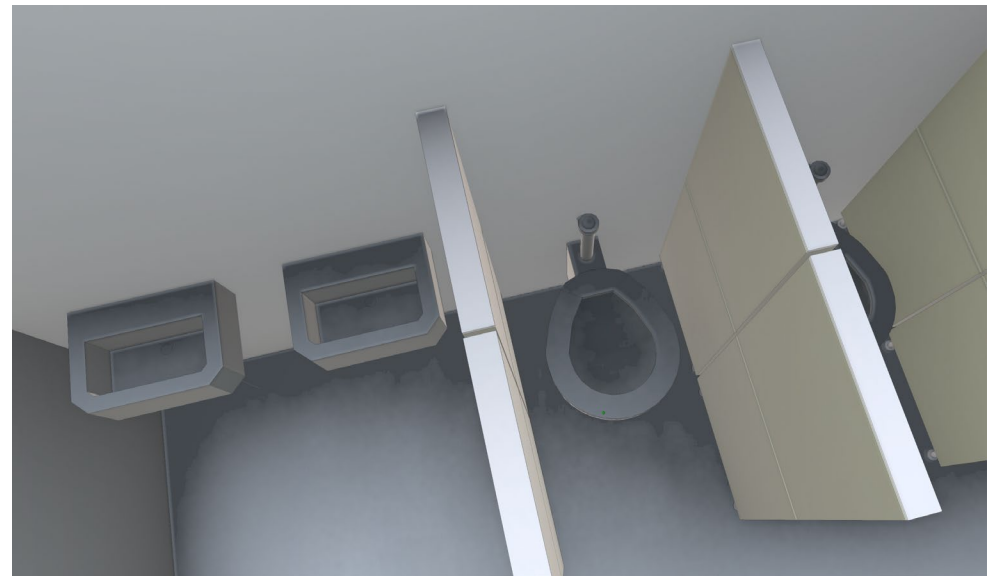
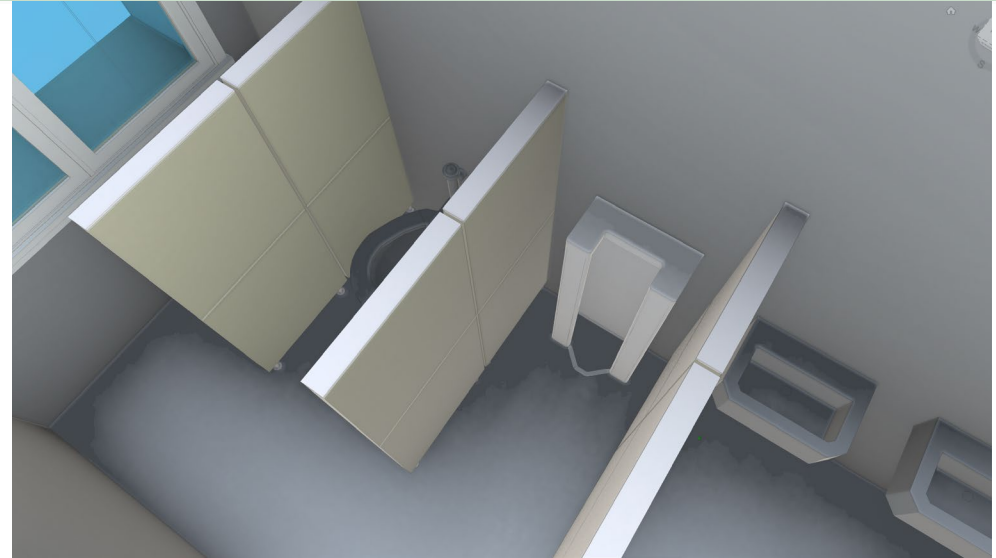
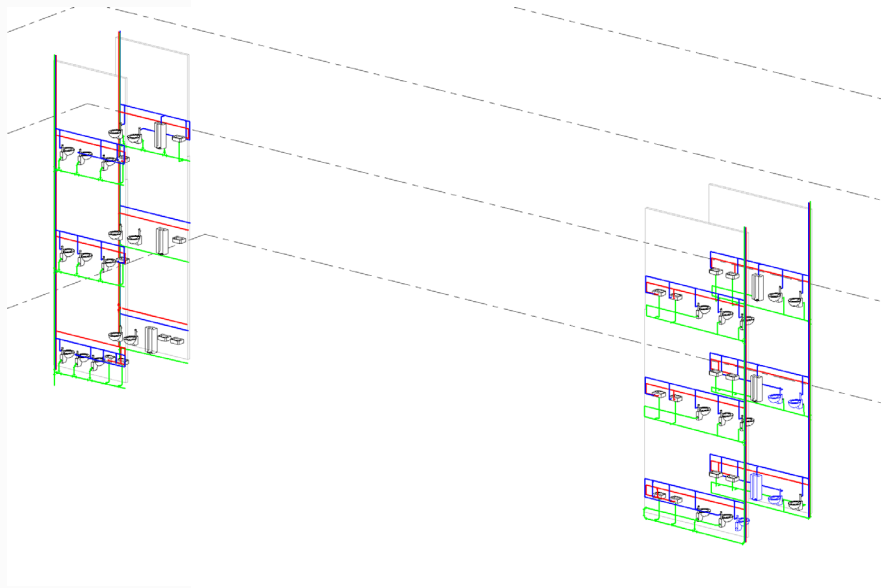
A	B	C	D	E	F	G	H	I	J
Area	Peak Cooling Load	Peak Heating Load	Reference Level	Space Type	Count	Name	Volume	Airflow per area	Occupancy Load
508 SF	31056 B Btu/h	20568 B Btu/h	Level -1	Lobby	1	hallway 26	166916.76 CF	1.92 CF/MSF	21879 Btu/h
732 SF	46276 B Btu/h	14514 B Btu/h	Level -1	Conference Meeting	1	Meeting Room 26	303414 CF	1.92 CF/MSF	23272 Btu/h
734 SF	46266 B Btu/h	14479 B Btu/h	Level -1	Conference Meeting	1	Meeting Room 25	302424 CF	1.92 CF/MSF	13335 Btu/h
1486 SF	105641 B Btu/h	40262 B Btu/h	Level -1	Lobby	1	hallway 15	26418.48 CF	1.85 CF/MSF	11445 Btu/h
719 SF	46808 B Btu/h	17191 B Btu/h	Level -1	Conference Meeting	1	Meeting Room 2	36114.68 CF	1.85 CF/MSF	7480 Btu/h
717 SF	46804 B Btu/h	17143 B Btu/h	Level -1	Conference Meeting	1	Meeting Room 3	36122.71 CF	1.85 CF/MSF	6499 Btu/h
1957 SF	139242 B Btu/h	124625 B Btu/h	Level -1	Conference Meeting	1	Meeting Room 50	277463.84 CF	3.14 CF/MSF	38815 Btu/h
716 SF	45966 B Btu/h	47891 B Btu/h	Level -2	Conference Meeting	1	Restroom 37	91341.61 CF	3.14 CF/MSF	7480 Btu/h
717 SF	45789 B Btu/h	47953 B Btu/h	Level -2	Conference Meeting	1	Restroom 38	91562.62 CF	3.14 CF/MSF	4897 Btu/h
225 SF	12837 B Btu/h	5379 B Btu/h	Level -1	Restrooms	1	Restroom 14	28055.54 CF	1.85 CF/MSF	341 Btu/h
217 SF	16837 B Btu/h	14265 B Btu/h	Level -2	Restrooms	1	Restroom 49	26524.62 CF	3.14 CF/MSF	469 Btu/h
205 SF	29885 B Btu/h	12965 B Btu/h	Level -1	Office - Open Plan	1	Office 9	6705.64 CF	1.85 CF/MSF	4733 Btu/h
532 SF	39891 B Btu/h	35531 B Btu/h	Level -2	Office - Open Plan	1	Office 42	9437.80 CF	3.14 CF/MSF	3789 Btu/h
452 SF	28874 B Btu/h	88716 B Btu/h	Level -1	Office - Open Plan	1	Office 22	51911.52 CF	1.92 CF/MSF	3932 Btu/h
207 SF	14336 B Btu/h	4486 B Btu/h	Level -1	Office - Open Plan	1	Office 23	2623.02 CF	1.92 CF/MSF	2048 Btu/h
227 SF	14339 B Btu/h	4486 B Btu/h	Level -1	Office - Open Plan	1	Office 24	2623.02 CF	1.92 CF/MSF	5048 Btu/h
482 SF	30291 B Btu/h	14749 B Btu/h	Level -1	ElectricalMechanic	1	Mechanical Room 3	6154.95 CF	1.92 CF/MSF	602 Btu/h
432 SF	25747 B Btu/h	10789 B Btu/h	Level -1	Office - Open Plan	1	Office 8	5796.34 CF	1.85 CF/MSF	4064 Btu/h
462 SF	29225 B Btu/h	15861 B Btu/h	Level -1	Office - Open Plan	1	Office 19	5834.82 CF	1.85 CF/MSF	3932 Btu/h
526 SF	39482 B Btu/h	35141 B Btu/h	Level -2	Office - Open Plan	1	Office 41	9411.00 CF	3.14 CF/MSF	3730 Btu/h
469 SF	34464 B Btu/h	30689 B Btu/h	Level -2	Office - Open Plan	1	Office 43	5589.05 CF	3.14 CF/MSF	3736 Btu/h
263 SF	15812 B Btu/h	6091 B Btu/h	Level -1	Restrooms	1	Restroom 6	3831.54 CF	1.85 CF/MSF	1101 Btu/h
209 SF	23158 B Btu/h	20028 B Btu/h	Level -2	Restrooms	1	Restroom 45	2693.20 CF	3.14 CF/MSF	2291 Btu/h
234 SF	14779 B Btu/h	4825 B Btu/h	Level -1	Office - Open Plan	1	Office 21	2472.02 CF	1.92 CF/MSF	1789 Btu/h
234 SF	14779 B Btu/h	4825 B Btu/h	Level -1	Office - Open Plan	1	Office 20	2985.51 CF	1.92 CF/MSF	3709 Btu/h
234 SF	14779 B Btu/h	4825 B Btu/h	Level -1	Office - Open Plan	1	Office 19	2989.72 CF	1.92 CF/MSF	3709 Btu/h
234 SF	14779 B Btu/h	4825 B Btu/h	Level -1	Office - Open Plan	1	Office 18	2764.94 CF	1.92 CF/MSF	2709 Btu/h
240 SF	19187 B Btu/h	27273 B Btu/h	Level -1	Restrooms	1	Restroom 29	3216.82 CF	1.92 CF/MSF	2001 Btu/h
207 SF	14779 B Btu/h	4825 B Btu/h	Level -1	Office - Open Plan	1	Office 4	4615.87 CF	1.85 CF/MSF	3969 Btu/h
234 SF	14779 B Btu/h	4825 B Btu/h	Level -1	Office - Open Plan	1	Office 18	2764.94 CF	1.92 CF/MSF	2709 Btu/h
410 SF	29817 B Btu/h	19813 B Btu/h	Level -1	Office - Open Plan	1	Office 7	9029.03 CF	1.85 CF/MSF	3759 Btu/h
471 SF	30292 B Btu/h	31423 B Btu/h	Level -2	Office - Open Plan	1	Office 44	6524.82 CF	3.14 CF/MSF	4236 Btu/h
466 SF	34813 B Btu/h	31098 B Btu/h	Level -1	Office - Open Plan	1	Office 46	5787.00 CF	3.14 CF/MSF	3790 Btu/h
189 SF	18875 B Btu/h	2341 B Btu/h	Level -1	Office - Open Plan	1	Office 33	2648.54 CF	1.92 CF/MSF	1254 Btu/h
199 SF	12573 B Btu/h	3034 B Btu/h	Level -1	Restrooms	1	Restroom 34	2991.86 CF	1.92 CF/MSF	533 Btu/h
169 SF	10679 B Btu/h	3341 B Btu/h	Level -1	Office - Open Plan	1	Office 32	2648.54 CF	1.92 CF/MSF	3124 Btu/h
186 SF	18875 B Btu/h	3341 B Btu/h	Level -1	Office - Open Plan	1	Office 31	2648.54 CF	1.92 CF/MSF	3124 Btu/h
128 SF	8072 B Btu/h	2298 B Btu/h	Level -1	Elevator Lobby	1	Elevator 28	1518.97 CF	1.92 CF/MSF	2304 Btu/h
128 SF	8068 B Btu/h	2513 B Btu/h	Level -1	Elevator Lobby	1	Elevator 25	1482.02 CF	1.92 CF/MSF	3199 Btu/h
128 SF	7298 B Btu/h	3058 B Btu/h	Level -1	Elevator Lobby	1	Elevator 4	1569.38 CF	1.85 CF/MSF	2304 Btu/h
200 SF	18240 B Btu/h	7846 B Btu/h	Level -1	Drivng Area	1	Tea Room 11	3964.26 CF	1.85 CF/MSF	11445 Btu/h
128 SF	7215 B Btu/h	3065 B Btu/h	Level -1	Elevator Lobby	1	Elevator 1	1525.41 CF	1.85 CF/MSF	2304 Btu/h
128 SF	9598 B Btu/h	8548 B Btu/h	Level -2	Elevator Lobby	1	Elevator 20	1518.97 CF	3.14 CF/MSF	2304 Btu/h
330 SF	23669 B Btu/h	21265 B Btu/h	Level -2	Tea Room	1	Tea Room 47	3796.47 CF	3.14 CF/MSF	11445 Btu/h
128 SF	9619 B Btu/h	8508 B Btu/h	Level -2	Elevator Lobby	1	Elevator 30	1462.82 CF	3.14 CF/MSF	3199 Btu/h
1019 SF	38124 B Btu/h	24268 B Btu/h	Level -1	Office - Open Plan	1	Office 13	14355.97 CF	1.85 CF/MSF	6774 Btu/h
1085 SF	81386 B Btu/h	72492 B Btu/h	Level -2	Office - Open Plan	1	Office 48	13745.42 CF	3.14 CF/MSF	3789 Btu/h
2951 SF							438184.18 CF		

Plumbing System

Male and Female Restrooms on each side

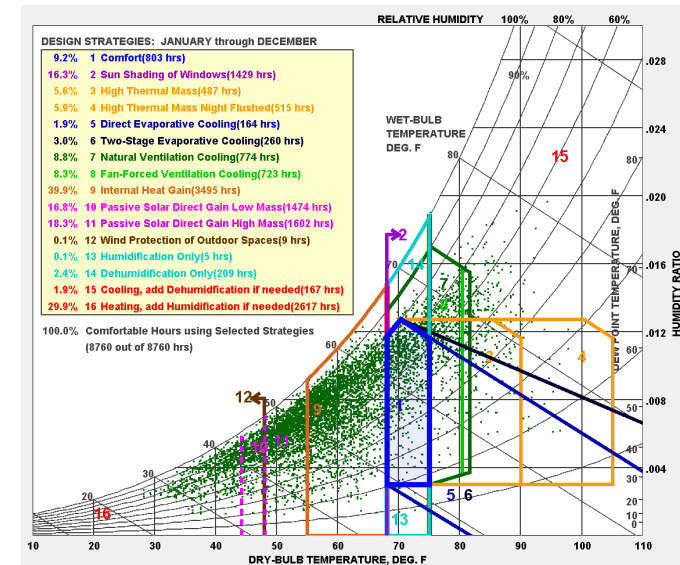
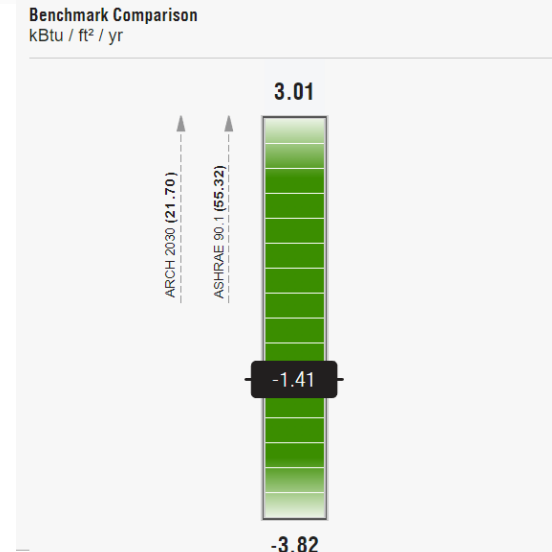
Male Restroom: 1 Urinal, 2 Water Closets, 2
Lavatories

Female Restroom: 3 water Closets, 2 Lavatories



Building Performance

Net Zero Building



Thank You

Roy Zhang

yiz564@stanford.edu

