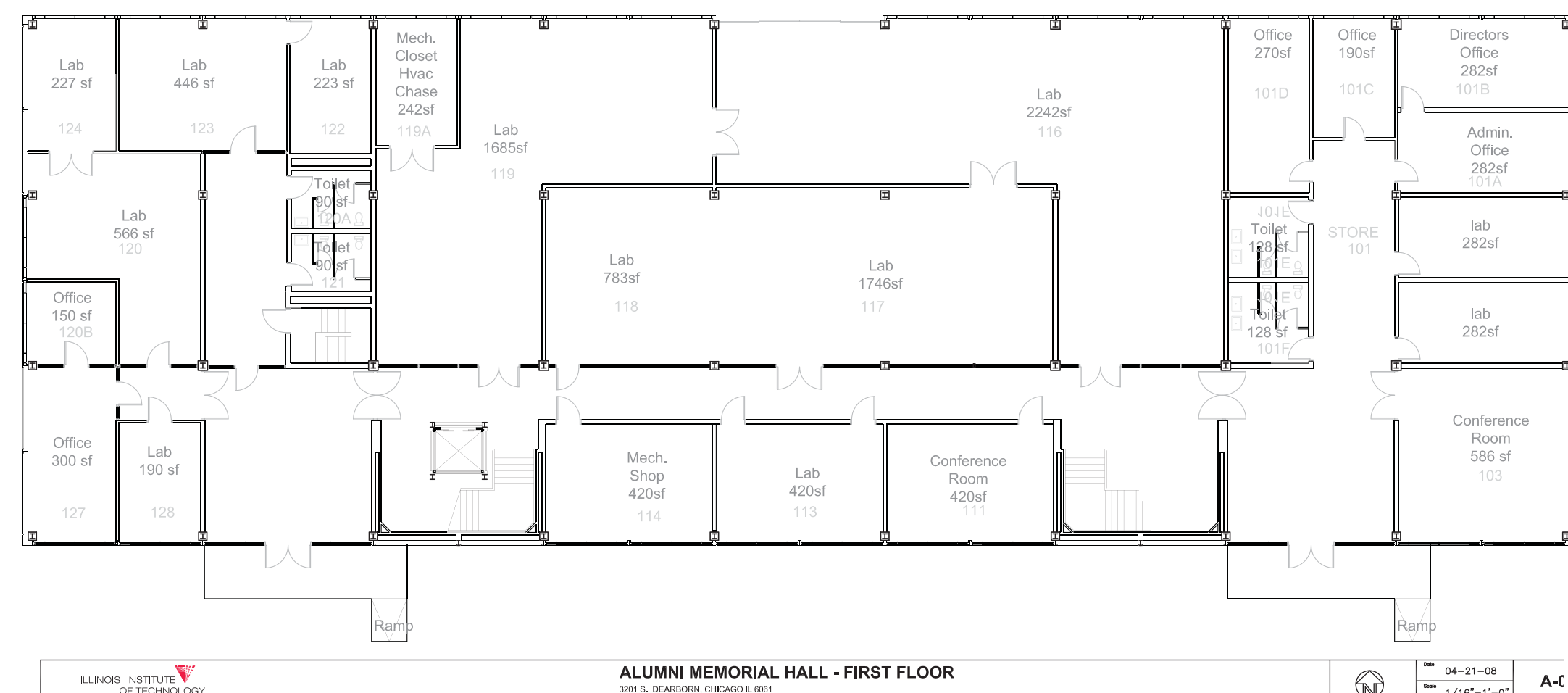
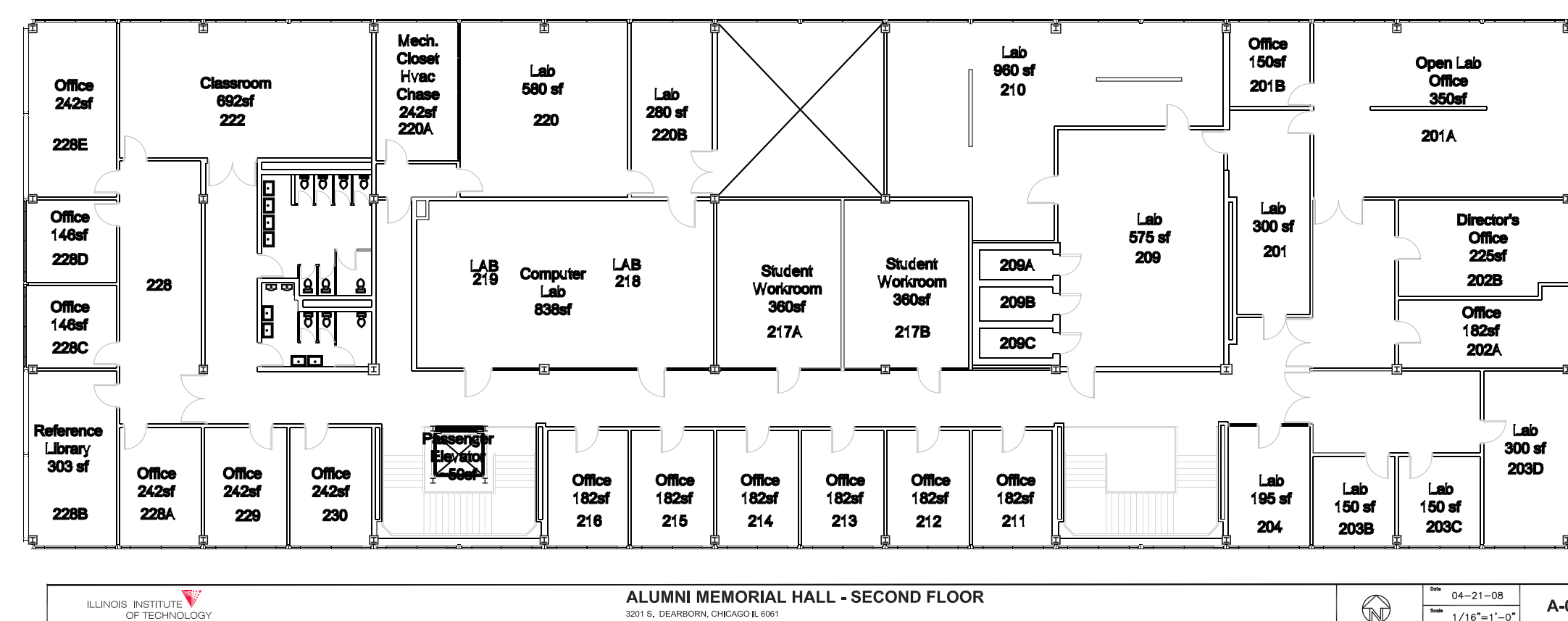


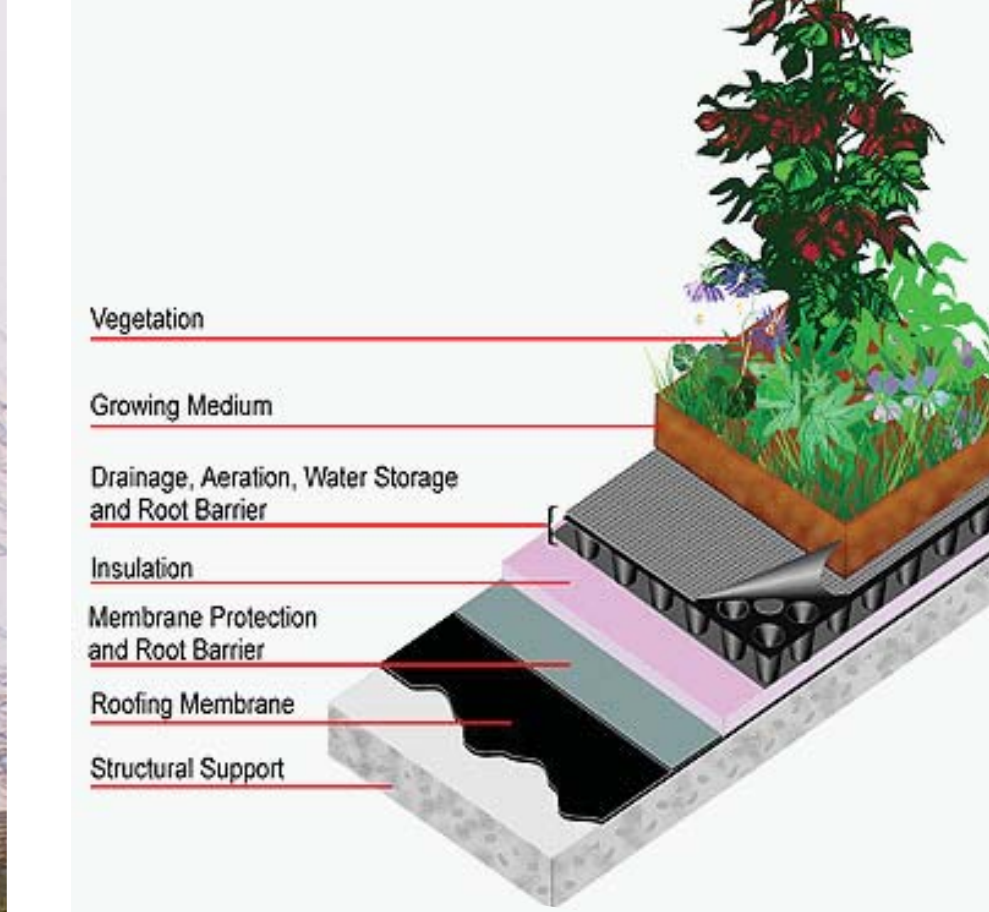
Alumni Hall Renovation

I PRO 335 Spring Semester 2008 Illinois Institute of Technology



Green-roof Addition And Stormwater Reduction

Typical Cross-Section

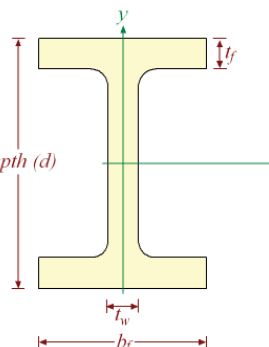


- Cover 50% of roof with green roof
- Roof to show reduction of at least 15% stormwater management
- Impervious area on site will be reduced to 43% from 64 %
- Stormwater runoff reduced 17%; LEED point available
- Total volume of water leaving site will be reduced from 3252 cubic feet to 2686 cubic feet

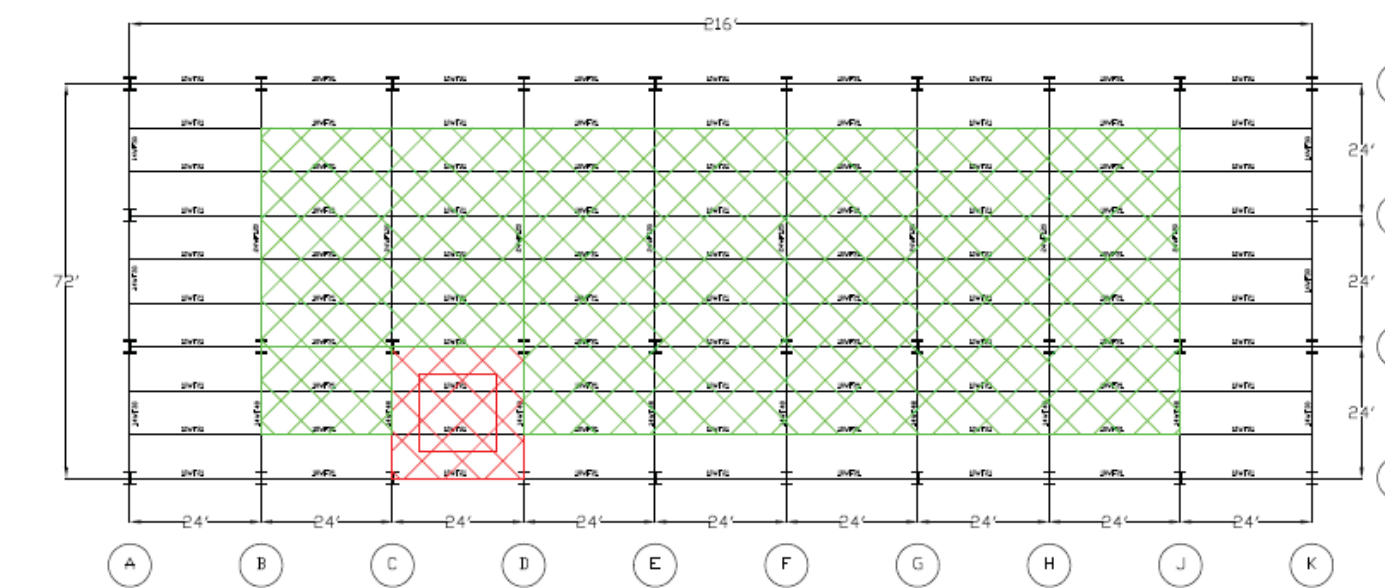


Checking Available Strength

- Loads
 - Dead: decking and green roof
 - Live: Rain
- Member Capacity
 - Ultimate Load vs. Design Strength
 - Beams: bending strength
 - Columns: axial strength



Roof Plan With Green Area



Lighting Systems



Qualify for the following LEED credits

- Sustainable Sights
- Light Pollution Reduction
- Energy & Atmosphere
- Minimum Energy Performance
- Optimize Energy Performance
- Measurement and Verification
- Indoor Environmental Quality
- Controllability of Systems-Perimeter
- Innovation & Design Process

Fixture Quantity	kW 2007	kWh 2007	Cost 2007
0.51	2,040	\$153.00	
0.116	464	\$34.80	
0.058	232	\$17.40	
1.044	4,176	\$313.20	
0.44	1,760	\$132.00	
19.03	76,120	\$5,709.00	
6.27	25,080	\$1,881.00	
0.928	3,712	\$278.40	
4.07	16,280	\$1,221.00	
2.146	8,584	\$643.80	
0.18	720	\$54.00	
Total	368	34,792	\$10,437.60

Fixture Quantity	Fixture Type	W/h 2008	kW 2008	Hrs/Yr 2008	kWh 2008	Cost 2008
245	Edapt	106	25.97	3,000	77,910	\$5,843.25
54	Retrofit-ref. 2 T-8s	58	3.132	4,000	12528	\$939.60
Total			29.1		90,438	\$6,782.85

*Savings does not include reduced costs from day-light sensors

Renvation of a Landmark

Alumni Memorial Hall is Mies van der Rohe's first classroom building on the I.I.T. campus. While the building as a whole is not under historical preservation status the exterior element, are and the University has decided to extend the historic status of the campus as a whole to the treatment of all the existing buildings of the original Mies master plan.



Renovation Issues Addressed:

- Design of green roof system
- Design of rain water run off and retention
- Design of efficient HVAC system
- Design of elevator for ADA compliance
- Design of building and space access for ADA compliance
- Design of building layout to client specifications
- Design of electrical and lighting systems for code compliance
- All system design to fulfill requirements for Silver Certification from LEED EB

Cost Estimating

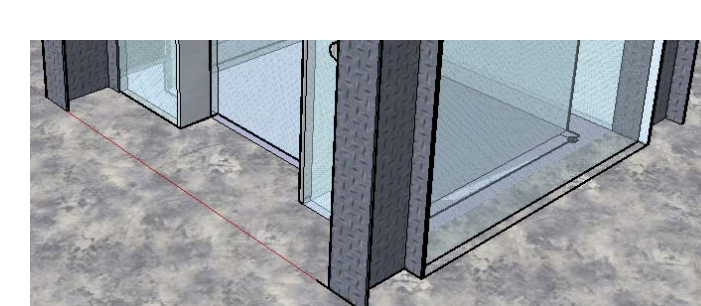
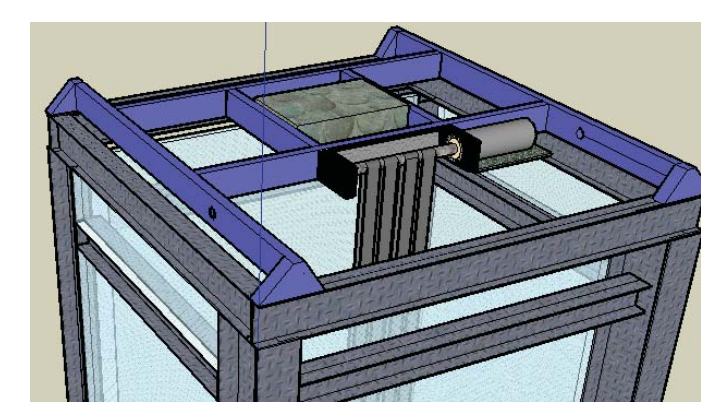
501700 S.F. COSTS	UNIT COSTS			
	1/4	MEDIAN	3/4	
0010 COLLEGES Classrooms and Administration	\$109	\$144	\$196	- First Floor
0090 COLLEGES Science, Engineering, Laboratories	\$185	\$216	\$263	- Second Floor

Div.	Description	Items Included	Total Cost (including O&P)
01	General Requirements	Exterior Scaffolding	\$32,776.20
02	Existing Conditions	Interior building demolition, disposal, and removal	\$74,560.20
04	Masonry	Exterior masonry cleaning, Interior CMU Partition walls	\$54,410.94
05	Metals	Exterior steel resurfacing and cleaning	\$4,351.16
06	Woods, Plastics, and Composites	Interior wood door frames	\$5,628.70
07	Thermal and Moisture Protection	Roofing selective demolition and extensive green roof	\$204,576.00
08	Openings	Window glazing removal, re-glazing windows, doors	\$280,309.13
09	Finishes	Ceilings, ACT, carpet, terrazzo, VCT, interior painting and exterior steel painting	\$313,363.04
13	Special Construction	Darkroom shell	\$10,822.50
14	Conveying Equipment	Magnetic Elevator system (price provided by elevator subgroup)	\$130,000.00
22,23,26	Plumbing, HVAC, and Electrical	A parametric estimate was used for schematic line item estimate.	\$2,472,768.00

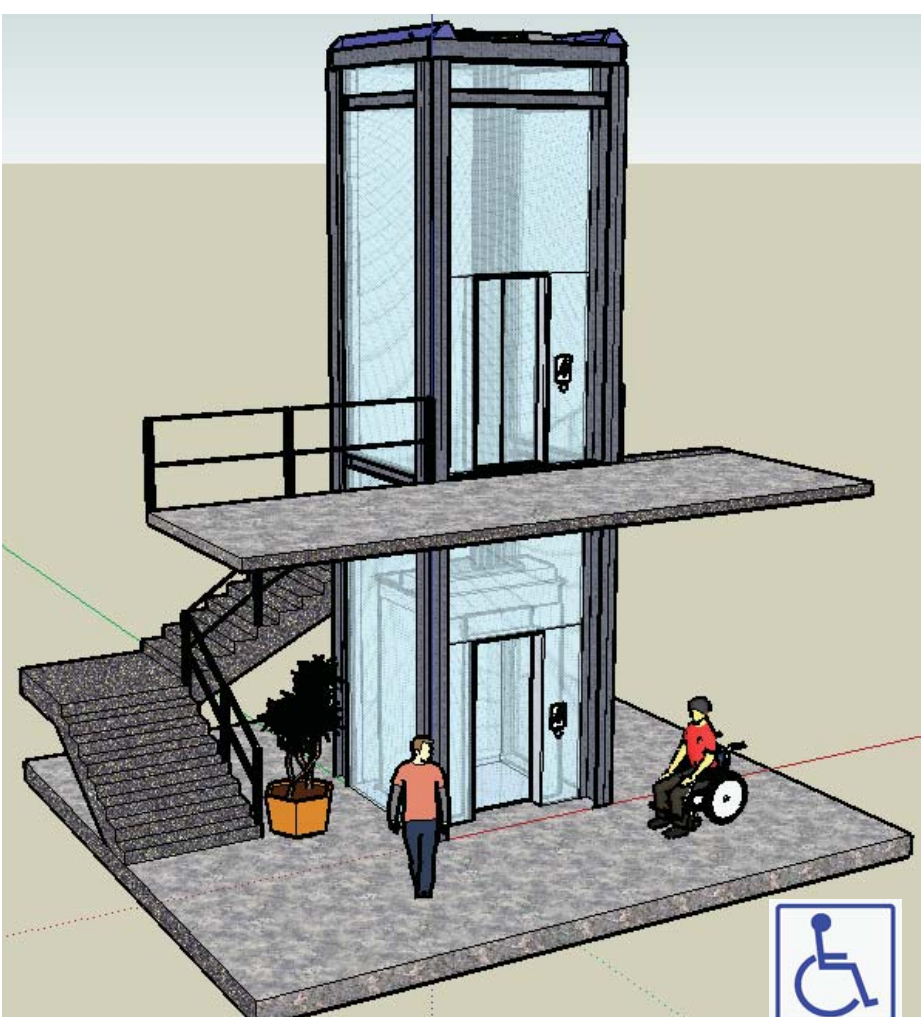
Total Cost of Alumni Memorial Renovation = \$4,037,542.79

Elevator Design Development

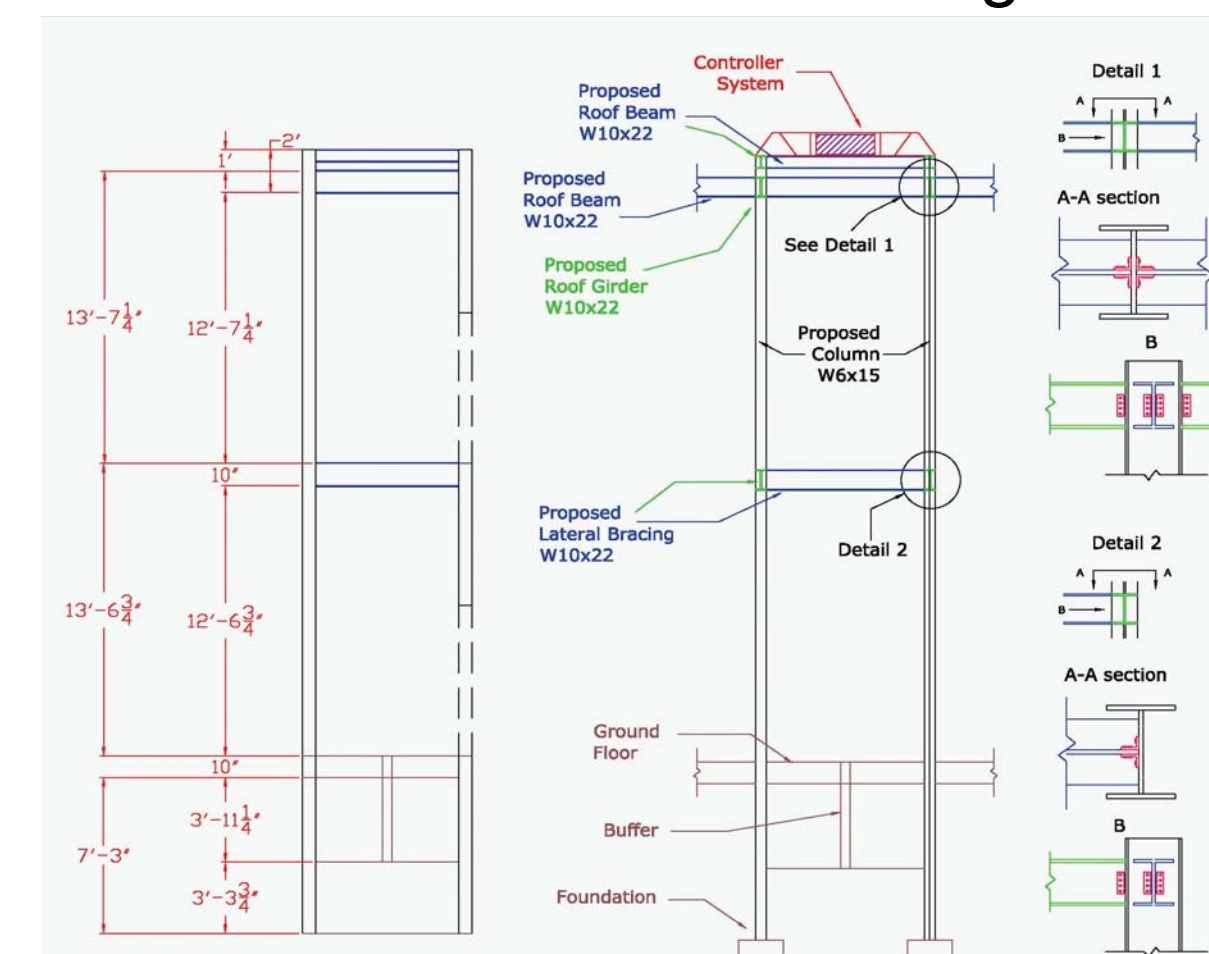
- Design a 2-story glass elevator that satisfies American Disability Act (ADA)
- Research on elevator technologies that can minimize energy consumption
- Find a suitable location for elevator
- Design the curtain wall surrounding the elevator



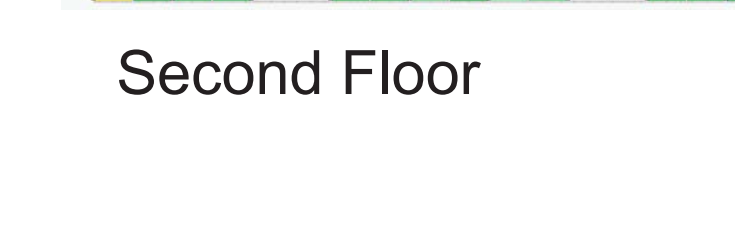
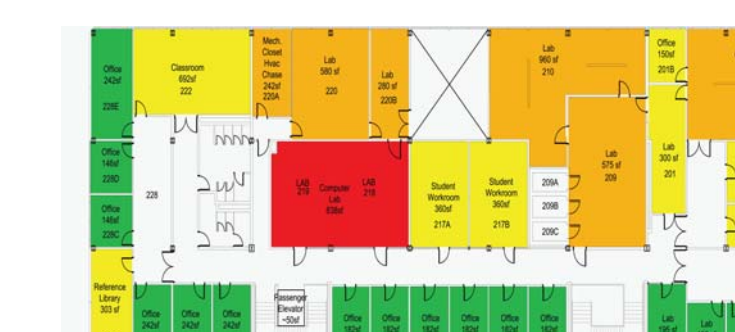
3D Gen2 Elevator Model



Column and Beam Design

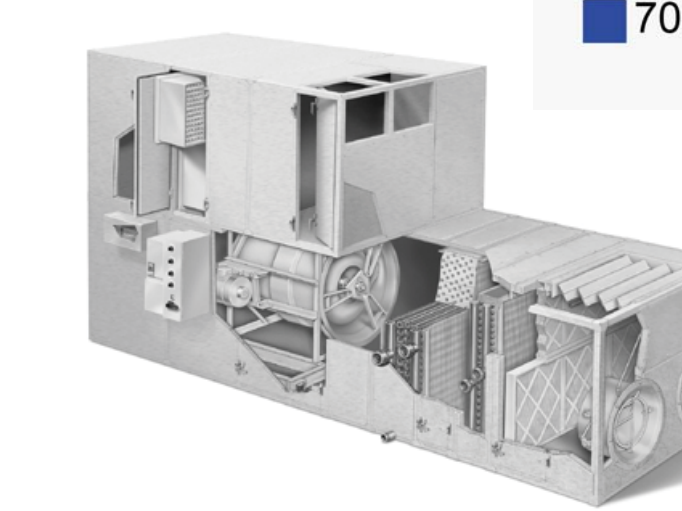


HVAC Redesign



- Currently
 - Heated hydronically by steam
 - Entire building is not air conditioned
- Needed
 - Updated heating and air conditioning system to improve comfort and balance temperature throughout the building
- Process
 - Room loads were calculated
 - Duct sizes were determined

The building was divided into zones. Loads for each room were calculated using computer software. The air handler must be able to push 100 tons of air through the building.



Recommended Air Handler:
Trane M Series 100 ton capacity