SUPPORTING Documents

REFERENCES:

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- Orihuela, Tomas. "Design of Monorail Systems." Web. Spring 2014

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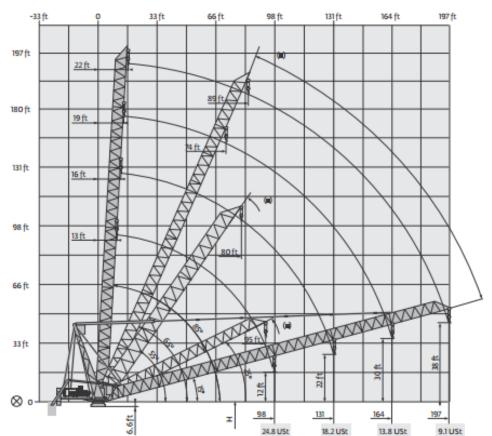
Reed Construction Data Inc. (2014). RSMeans Online Version 5.0.3. Spring 2014. Web. http://www.rsmeansonline.com/SearchData>.

CRANE SPECIFICATIONS:

A Potain MR 615 luffing jib tower crane with maximum radius of 197 feet was chosen based on site limitations and the critical lift for the splicing of the columns.

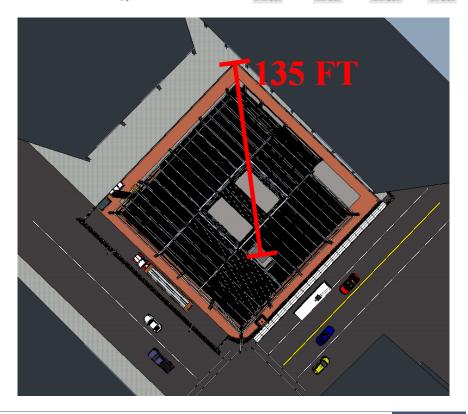
> Largest Column Size: W14 x 605 at 28 ft long (605)(28)

$$Weight = \frac{(003)(20)}{2000}$$
$$= 8.47 tons$$



Maximum Load for jib 135 ft:

 $\frac{164 - 131}{13.8 - 18.2} = \frac{164 - 135}{13.8 - x}$ 455.4 - 33x = -127.6 $x = 17.67 \ tons$



TYPICAL TOOLBOX TALK TEMPLATE:



Weekly Toolbox Topic Safety Training for the Construction Industry

Company Name: _____

Week of Month/Day/Year

(Fall Prevention)

- Keep your eyes open. Watch for fall hazards like cords, spills, other openings in the floor.
- Keep fall protection gear in good condition.
- Make sure that there are guardrails and toeboards around open-sided platform or floor that is 6 feet or higher above the
- Cover and label all floor holes and openings.
- Keep walkways and aisles free from tripping hazards.
- Never walk up to an unprotected edge.



Job Name:			
Meeting Date: Attendees:			
Attendees:			

*This template shows a typical toolbox talk layout which will be required by all contractors to submit one each week.

EVACUATION PLAN:

The evacuation plan is designed to reduce injury, keep employees safe and accounted for in case of an emergency were to happen.

NATURAL DISASTER PROCEDURES:

SAFETY GUIDELINES:

- 1) Assess your risk for natural disasters
- 2) Develop disaster response procedures
- 3) Understand specific natural disasters

EARTHQUAKES: Stay as safe as possible during an earthquake. Be aware that some earthquakes are actually foreshocks and a larger earthquake might occur. Minimize your movements to a few steps to a nearby safe place and if you are indoors, stay there until the shaking has stopped and you are sure exiting is safe.

FLOODS: Learn to recognize that flood-warning signs and your community's alert signals. Request information on preparing for floods and flash floods.

FIRE: California is known for their wildfires. Emergency egress or escape routes will be planned. Listen to the local emergency stations and follow there instruction and updates on the fire.

TORNADOES: Understand the difference between a tornado watch and warning. A watch is when conditions could lead to a tornado, whereas a warning is issued if a tornado has been sighted or indicated by weather radar. Designate an area in the building where all employees can go in the event of a tornado threat.

HURRICANES: Understand the difference between a hurricane watch and warning. A hurricane watch is issued when there is a threat of hurricane conditions within 24-36 hours. A hurricane warning is issued when hurricane conditions (winds of 74 miles per hour or greater or dangerously high water and rough seas) are expected in 24 hours of less.

THUNDERSTORMS: Postpone outdoor activities, Get inside a building or hard top car, Secure outdoor objects that could blow away or cause damage, Shut windows and secure outside doors, Use a cordless phone, Avoid contact with corded phones, electrical equipment, and plumbing, Stay away from windows and doors and Do not lie on concrete floors or lean on concrete walls

WORKPLACE IS THREATENED: If any employee is exhibiting violent behavior, call 911 immediately! Take all threats of workplace violence seriously. (1) Verify Information (2) Assess Risk (3) Contain Situation (4) Conduct a Thorough Investigation (5) Monitor and Reassess Situation

BOMB THREAT PROCEDURES: All bomb threats must be taken seriously. The threat can arrive over the phone, in the mail, or on a written message. (1) Call 911 (2) Be aware of your surroundings (3) Move or leave the area if you feel uncomfortable (4) Take precaution when traveling (5) Learn where emergency exits are located in the building (6) Take a headcount once in safe pre-designated location

OFF-SITE FIELD OFFICE:

LOCATION 1: 50 Beale Street, San Francisco, CA 2,200 SF Street Retail

http://www.loopnet.com/Listing/18171830/50-Beale-Street-San-Francisco-CA/

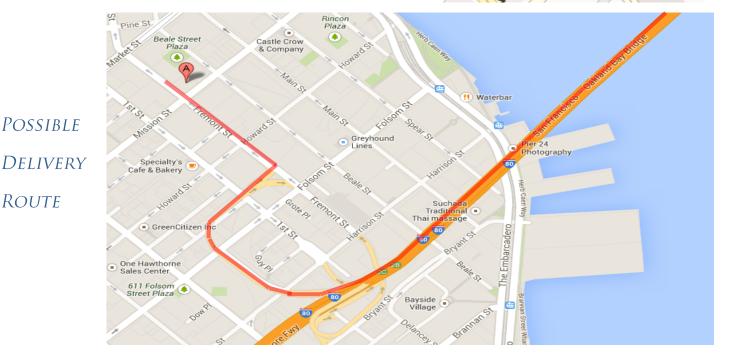


LOCATION 2: 50 Fremont Street, San Francisco, CA

2 Spaces available (6,070 SF and 1,227 SF) Restaurant

http://www.loopnet.com/Listing/17519774/50-Fremont-Street-San-Francisco-CA/

\$22,603/Month - 6458 SF \$20,670/Month - 5512 SF \$4159/Month - 1426 SF \$3923/Month - 1345 SF



WASTE MANAGEMENT PLAN:

In order to minimize construction waste, our team will formulate a waste management plan designed to maximize efficiency and material usage. It will ensure that all material is properly disposed of and transported for reuse if possible. In addition, it will include details on what materials will be recycled and how those materials will be contained and organized.

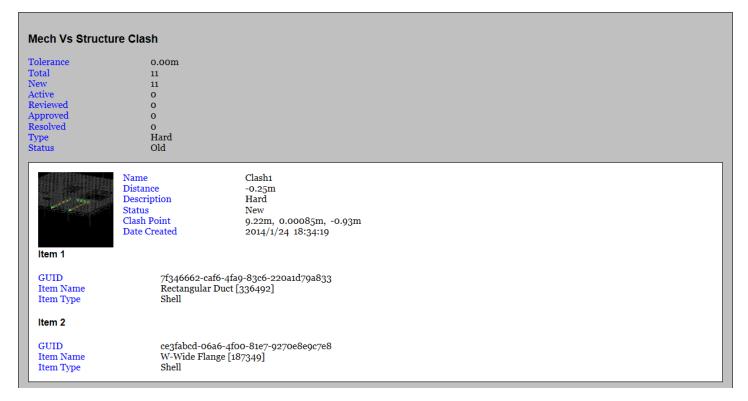
The goal for this project will be to recycle and/or salvage at least 75% of nonhazardous construction and demolition debris. Materials to be recycled are:

- Concrete
- Clean Wood
- Gypsum Wallboard
- Carpet
- Insulation
- Glass
- Cardboard
- Plastic
- Paper
- Metal

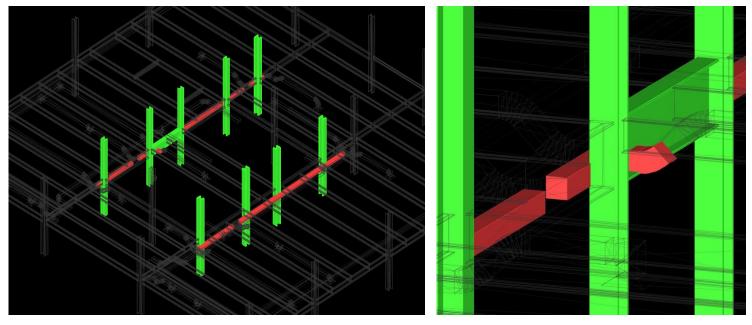
To achieve this goal our team plans on doing the following:

- Have containers on site for both waste and recycling.
- If the materials cannot be recycled on site, it will be sold to the proper company, who can utilize, dispose of, or reuse the material sustainably.
- Order materials in sizes or dimensions that are most suitable for use within the building. Sizes that will inherently decrease the unused material and maximize the used material.
- Designate specific areas for material storage, so that they can be properly protected.
- Cover materials, such as wood, mortar, and gypsum wallboard with a tarp in order to protect them from damage from the elements.
- Negotiate to have the supplier pickup and reuse delivery materials, such as packing or heavy pallets, before making future deliveries.

CLASH DETECTION:



Shown above is a screenshot of a clash report which was conducted by our team. Multiple clash tests were completed amongst the mechanical, electrical and structural disciplines. Below is an example of one of the clashes.



LEED:

	2009 for New Construction and Majo	or Renovations			Project Nam Dat
					Dat
1 Sustai	nable Sites Possib	le Points: 26	Y 2 N	ials and Resources, Continued	
Prereg 1	Construction Activity Pollution Prevention		2 C Credit 4	Recycled Content	1 to 2
1 C Credit 1	Site Selection	1	2 C Credit 5	Regional Materials	1 to 2
5 C Credit 2	Development Density and Community Connectivity	5	C Credit 6	Rapidly Renewable Materials	1
C Credit 3	Brownfield Redevelopment	1	C Credit 7	Certified Wood	1
	Alternative Transportation–Public Transportation Acces				
	Alternative Transportation-Bicycle Storage and Changing		12 Indoor	Environmental Quality Possible F	Points: 15
	Alternative Transportation-Low-Emitting and Fuel-Effic	-			onics. To
	Alternative Transportation-Parking Capacity	2	Y Prereq 1	Minimum Indoor Air Quality Performance	
	Site Development-Protect or Restore Habitat	1	Y Prereg 2	Environmental Tobacco Smoke (ETS) Control	
	Site Development-Maximize Open Space	1	1 M Credit 1	Outdoor Air Delivery Monitoring	1
	Stormwater Design-Quantity Control	1	Credit 2	Increased Ventilation	1
	Stormwater Design-Quality Control	1	1 C Credit 3.1	Construction IAQ Management Plan-During Construction	1
	Heat Island Effect-Non-roof	1		Construction IAQ Management Plan-Before Occupancy	1
	Heat Island Effect-Roof	1		Low-Emitting Materials-Adhesives and Sealants	1
1 E Credit 8	Light Pollution Reduction	1		Low-Emitting Materials—Paints and Coatings	1
				Low-Emitting Materials-Flooring Systems	1
8 Water	Efficiency Possib	le Points: 10		Low-Emitting Materials-Composite Wood and Agrifiber Pro	ducts 1
			Credit 5	Indoor Chemical and Pollutant Source Control	1
Prereg 1	Water Use Reduction-20% Reduction		1 E Credit 6.1	Controllability of Systems-Lighting	1
2 C Credit 1	Water Efficient Landscaping	2 to 4		Controllability of Systems-Thermal Comfort	1
2 M Credit 2	Innovative Wastewater Technologies	2		Thermal Comfort-Design	1
4 M Credit 3	Water Use Reduction	2 to 4	1 M Credit 7.2	Thermal Comfort-Verification	1
			1 E Credit 8.1	Daylight and Views-Daylight	1
0 Energ	y and Atmosphere Possib	le Points: 35	1 E Credit 8.2	Daylight and Views-Views	1
Prereg 1	Fundamental Commissioning of Building Energy Systems		6 Innova	ation and Design Process Possible F	Points: 6
Y Prereq 2	Minimum Energy Performance			Possible P	
Y Prereg 3	Fundamental Refrigerant Management		1 M Credit 1.1	Innovation in Design: Specific Title	1
9 M Credit 1	Optimize Energy Performance	1 to 19		Innovation in Design: Specific Title	1
2 E Credit 2	On-Site Renewable Energy	1 to 7		Innovation in Design: Specific Title	1
2 C Credit 3	Enhanced Commissioning	2		Innovation in Design: Specific Title	1
2 M Credit 4	Enhanced Refrigerant Management	2		Innovation in Design: Specific Title	1
B E Credit 5	Measurement and Verification	3	1 C Credit 2	LEED Accredited Professional	1
2 M Credit 6	Green Power	2			-
		-	4 Region	nal Priority Credits Possible	Points: 4
8 Mater	ials and Resources Possib	le Points: 14			
			1 C Credit 1.1	Regional Priority: Specific Credit	1
Y Prereq 1	Storage and Collection of Recyclables			Regional Priority: Specific Credit	1
C Credit 1.1	Building Reuse-Maintain Existing Walls, Floors, and Roo	f 1 to 3	1 C Credit 1.3	Regional Priority: Specific Credit	1
C Credit 1.2	Building Reuse-Maintain 50% of Interior Non-Structural	Elements 1	1 C Credit 1.4	Regional Priority: Specific Credit	1
2 C Credit 2	Construction Waste Management	1 to 2			
2 C Credit 3	Materials Reuse	1 to 2	89 Total	Possible	Points: 110
				40 to 49 points Silver 50 to 59 points Gold 60 to 79 points Platinum 80	

DETAILED ESTIMATE:

Detailed Estimate					
Scope of Work	Cost	Scope of Work	Cost		
General Conditions	\$10,500,566	Boilers	\$52,526		
Sitework		Mictoturbines	\$937,250		
Excavation	\$281,187	Chillers	\$1,191,170		
Dewatering	\$940,295	Raised Access Floor	\$10,666,586		
Foundation		Ductwork	\$2,414,135		
Slurry Wall	\$1,760,581	Electrical			
Mat Foundation	\$1,111,231	Switch Gear	\$106,490		
Mat Foundation Rebar	\$111,122	Generator	\$90,942		
Parking Garage	\$8,363,950	Transfer Switch	\$29,900		
Structure		Distribution Panel	\$152,490		
Metal Decking	\$1,252,359	Transformer	\$102,258		
Concrete	\$4,344,157	Panelboards	\$301,030		
Reinforcement	\$304,013	Wiring	\$4,775,284		
Formwork/Curing	\$225,257	Lighting Fixtures	\$8,693,575		
Steel		Receptacles	\$4,473,976		
Beams	\$7,612,926	Photovoltaic	\$718,000		
Columns	\$7,351,078	Services			
Built Up Columns	\$202,643	Gas Sprinkler System	\$8,954,485		
Brace Framing	\$4,095,231	Rain Water Collection	\$671,543		
Shear Connections	\$490,743	Plumbing Fixtures and Fittings	\$1,233,944		
Fireproofing	\$260,837	Elevator and Lifts	\$8,601,080		
Double Façade	\$15,566,226	Stair Construction	\$691,840		
Roof	\$120,659	Finishes			
Interiors	\$14,384,990	Ceiling Finishes	\$1,369,580		
Mechanical		Floor Finishes	\$2,834,763		
Cooling Tower	\$102,810	Wall Finishes	\$6,044,944		
Air Handling Units	\$3,604,618	Total	\$148,095,270		

GENERAL CONDITIONS ESTIMATE:

Staffing						
Personnel	Qty.	Unit	\$/Unit	Cost		
Project Manager	120	Week	\$3,275.00	\$393,000		
Engineer	120	Week	\$3,275.00	\$393,000		
Superintendent	120	Week	\$2,050.00	\$393,000		
Safety Superintendent	120	Week	\$1,638.00	\$393,000		
BIM Engineer	120	Week	\$900.00	\$108,000		
			Total	\$1,336,560		

Temporary Facilities							
Description	Qty.	Unit	\$/Unit	Cost			
On Site Trailer	25	Months	\$223.00	\$5,575			
Off Site Trailer	5	Months	\$4,200.00	\$21,000			
Temporary Fencing	630	LF	\$26.75.00	\$16,853			
Sanitary Facilities	30	Months	\$200.00	\$6,000			
			Total	\$49,428			

Temporary Utilities							
Description	Qty.	Unit	\$/Unit	Cost/month	Total Cost		
Dewatering System	208	VLF	\$3,931.00	-	\$817,648		
Temporary Power	160	CSF	\$110.00	\$17600	\$809,600		
Temporary Lighting	160	CSF	\$3.63	\$581	\$26,717		
Temporary Heating	160	CSF	\$31.78	\$5085	\$233,901		
Water	46	Months	\$65.00	-	\$2,990		
				Total	\$1,890,856		

Bonds, Insurance and Tax							
Description	Percentage	Project Cost	Cost				
Performance Bond	1%	\$137,594,704	\$1,375,947				
General Liability Insurance	0.50%	\$137,594,704	\$687,974				
Builder's Risk Insurance	0.25%	\$137,594,704	\$343,987				
Permits	0.50%	\$137,594,704	\$687,974				
Contingences	3%	\$137,594,704	\$4,127,841				
Tax	6%	\$137,594,704	\$8,255,682				
		Total	\$15,479,404				

ESTIMATE TAKEOFFS / DURATIONS:

Columns						
Item	Qty.	Unit	\$/Unit	Cost	Duration	
W 14 x 43	2.41	Tons	\$4,175.00	\$10,053	0.29	
W 14 x 53	10.76	Tons	\$4,175.00	\$44,919	1.30	
W 14 x 61	5.98	Tons	\$4,175.00	\$24,958	0.72	
W 14 x 68	0.95	Tons	\$4,175.00	\$3,975	0.11	
W 14 x 74	6.22	Tons	\$4,175.00	\$25,952	0.75	
W 14 x 82	6.89	Tons	\$4,175.00	\$28,757	0.83	
W 14 x 90	15.12	Tons	\$4,175.00	\$63,126	1.82	
W 14 x 99	10.40	Tons	\$4,175.00	\$43,399	1.25	
W 14 x 109	32.81	Tons	\$4,175.00	\$136,978	3.95	
W 14 x 120	15.12	Tons	\$4,175.00	\$63,126	1.82	
W 14 x 132	14.78	Tons	\$4,175.00	\$61,723	1.78	
W 14 x 145	18.27	Tons	\$4,175.00	\$76,277	2.20	
W 14 x 159	13.36	Tons	\$4,175.00	\$55,761	1.61	
W 14 x 176	29.57	Tons	\$4,175.00	\$123,446	3.56	
W 14 x 193	54.04	Tons	\$4,175.00	\$225,617	6.51	
W 14 x 211	29.54	Tons	\$4,175.00	\$123,330	3.56	
W 14 x 233	25.88	Tons	\$4,175.00	\$149,807	4.32	
W 14 x 257	107.94	Tons	\$4,175.00	\$450,650	13.00	
W 14 x 283	43.58	Tons	\$4,175.00	\$181,955	5.25	
W 14 x 311	45.72	Tons	\$4,175.00	\$190,868	5.51	
W 14 x 342	45.49	Tons	\$4,175.00	\$189,904	5.48	
W 14 x 370	124.32	Tons	\$4,175.00	\$519,036	14.98	
W 14 x 398	33.43	Tons	\$4,175.00	\$139,579	4.03	
W 14 x 426	11.93	Tons	\$4,175.00	\$49,799	1.44	
W 14 x 455	127.40	Tons	\$4,175.00	\$531,895	15.35	
W 14 x 500	157.50	Tons	\$4,175.00	\$657,563	18.98	
W 14 x 550	7.70	Tons	\$4,175.00	\$32,148	0.93	
W 14 x 605	332.75	Tons	\$4,175.00	\$1,389,231	40.09	
Built Up	191.24	Tons	\$4,175.00	\$798,410	23.04	
Concrete	316.80	CY	\$166.15	\$52,636	1.58	
Rebar	70.50	Tons	\$1,705.00	\$120,207	30.65	
Stirrups	1.62	Tons	\$2,075.00	\$3,368	1.08	
1			Total	\$6,568,453	217.63	

	Office Floors Framing						
Item	Qty.	Unit	\$/Unit	Cost	Duration		
W 14 x 53	13.58	Tons	\$3,449.00	\$46,837	0.98		
W 16 x 26	24.59	Tons	\$3,449.00	\$84,811	1.77		
W 18 x 35	16.55	Tons	\$3,449.00	\$57,081	1.19		
W 18 x 40	56.75	Tons	\$3,449.00	\$195,731	4.08		
W 21 x 44	104.04	Tons	\$3,449.00	\$358,834	7.49		
W 21 x 50	244.06	Tons	\$3,449.00	\$841,763	17.56		
W 24 x 55	932.35	Tons	\$3,449.00	\$3,215,675	67.08		
W 24 x 68	75.08	Tons	\$3,449.00	\$258,951	5.40		
W 27 x 102	96.48	Tons	\$3,449.00	\$332,760	6.94		
W 36 x 182	225.61	Tons	\$3,449.00	\$778,129	16.23		
			Total	\$6,170,571	128.73		

Restaurant & Equipment Room Framing						
Item	Qty.	Unit	\$/Unit	Cost	Duration	
W 8 x 10	0.67	Tons	\$3,449.00	\$2,311	0.05	
W 16 x 26	0.98	Tons	\$3,449.00	\$3,380	0.07	
W 18 x 35	0.66	Tons	\$3,449.00	\$2,276	0.05	
W 18 x 40	9.08	Tons	\$3,449.00	\$31,317	0.65	
W 21 x 50	7.48	Tons	\$3,449.00	\$25,799	0.54	
W 24 x 55	26.71	Tons	\$3,449.00	\$92,123	1.92	
W 27 x 102	5.79	Tons	\$3,449.00	\$19,970	0.42	
W 36 x 182	9.02	Tons	\$3,449.00	\$31,110	0.65	
			Total	\$208,286	4.35	

Penthouse Framing						
Item	Qty.	Unit	\$/Unit	Cost	Duration	
W 8 x 10	6.12	Tons	\$4,175.00	\$ 25,551	0.74	
W 12 x 14	0.38	Tons	\$4,175.00	\$ 1,587	0.05	
			Total	\$27,138	0.79	

Roof Framing						
Item	Qty.	Unit	\$/Unit	Cost	Duration	
W 10 x 12	0.13	Tons	\$3,449.00	\$448	0.01	
W 14 x 53	1.68	Tons	\$3,449.00	\$5,794	0.12	
W 16 x 26	1.48	Tons	\$3,449.00	\$5,105	0.12	
W 18 x 35	5.96	Tons	\$3,449.00	\$20,556	0.43	
W 21 x 44	29.74	Tons	\$3,449.00	\$102,583	2.14	
W 21 x 50	3.21	Tons	\$3,449.00	\$11,071	0.23	
W 24 x 55	6.95	Tons	\$3,449.00	\$23,971	0.50	
W 27 x 102	3.86	Tons	\$3,449.00	\$13,313	0.28	
W 36 x 182	9.02	Tons	\$3,449.00	\$31,110	0.66	
			Total	\$213,941	4.49	

Shear Studs							
Item	Qty.	Unit	\$/Unit	Cost	Duration		
Roof Framing	1199	EA	\$8.86	\$10,623	1.32		
Restaurant Framing	1140	EA	\$8.86	\$10,100	1.26		
Office Floors Framing	45,825	EA	\$8.86	\$406,010	50.64		
			Total	\$426,733	53.22		

Innovative Construction Design

	Brace Frames								
Item	Qty.	Unit	\$/Unit	Cost	Duration				
W 12 x 96	54.47	Tons	\$4,175.00	\$227,418	6.56				
W 12 x 103	39.11	Tons	\$4,175.00	\$163,278	4.71				
W 12 x 120	1.78	Tons	\$4,175.00	\$7,426	0.21				
W 12 x 210	49.25	Tons	\$4,175.00	\$205,600	5.93				
W 14 x 193	402.62	Tons	\$4,175.00	\$1,680,955	48.51				
W 14 x 233	62.22	Tons	\$4,175.00	\$259,758	7.50				
W 14 x 257	125.49	Tons	\$4,175.00	\$523,921	15.12				
W 14 x 283	42.50	Tons	\$4,175.00	\$177,451	5.12				
W 14 x 311	18.26	Tons	\$4,175.00	\$76,256	2.20				
W 14 x 342	22.53	Tons	\$4,175.00	\$94,059	2.71				
W 14 x 370	6.06	Tons	\$4,175.00	\$25,280	0.73				
W 14 x 398	6.68	Tons	\$4,175.00	\$27,882	0.80				
W 14 x 426	10.72	Tons	\$4,175.00	\$44,766	1.29				
W 14 x 455	3.82	Tons	\$4,175.00	\$15,938	0.46				
W 14 x 500	7.45	Tons	\$4,175.00	\$31,087	0.90				
			Total	\$3,561,070	102.77				

Concrete Slabs (with 10% Waste)								
Item	Qty.	Unit	\$/Unit	Cost	Duration			
Penthouse	81	CY	\$474.55	\$38,667	1.60			
Roof	245	CY	\$474.55	\$116,098	4.80			
Restaurant	163	CY	\$474.55	\$77,479	3.20			
Floors 5-12	2,391	CY	\$474.55	\$1,134,491	46.90			
Floors 14-21	2,391	CY	\$474.55	\$1,134,491	46.90			
Floors 22-30	2,690	CY	\$474.55	\$1,276,302	52.70			
Mat Found.	7,535	CY	\$128.24	\$966,288	18.84			
			Total	\$4,743,816	174.94			

Elevated Slabs Reinforcement (with 10% Waste)							
Item	Qty.	Unit	\$/Unit	Cost	Duration		
Penthouse	44	CSF	\$62.00	\$2,706	1.63		
Roof	132	CSF	\$62.00	\$8,125	4.89		
Restaurant	88	CSF	\$62.00	\$5,422	3.27		
Floors 5-12	1,291	CSF	\$62.00	\$79,394	47.81		
Floors 14-21	1,291	CSF	\$62.00	\$79,394	47.81		
Floors 22-30	1,452	CSF	\$62.00	\$89,318	53.79		
10% Added for Mat Foundation Rebar				\$96,628	-		
			Total	\$360,987	159.20		

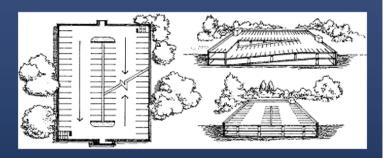
Fireproofing							
Item	Qty.	Unit	\$/Unit	Cost	Duration		
Spray on	68,498	SF	\$1.64	\$112,337	22.83		
Gypsum Board	38,675	SF	\$2.96	\$114,478	77.35		
			Total	\$226,815	100.18		

Excavation (With 10% Waste)							
Item	Qty.	Unit	\$/Unit	Cost	Duration		
Slurry Wall	46,675	CF	\$32.80	\$1,530,940	212.16		
Dewatering	52	VLF	\$75.60	\$3,931	1.06		
Dewatering	52	VLF	\$75.60	\$3,931	1.06		
Dewatering	52	VLF	\$75.60	\$3,931	1.06		
Dewatering	52	VLF	\$75.60	\$3,931	1.06		
Excavation	51,803	BCY	\$4.72	\$244,510	112.13		
			Total	\$1,791,174	328.53		

Metal Decking (with 10% Waste)							
Item	Qty.	Unit	\$/Unit	Cost	Duration		
Penthouse	4,400	SF	\$2.38	\$10,472	1.14		
Roof	13,211	SF	\$2.38	\$31,442	3.42		
Restaurant	8,817	SF	\$2.54	\$22,394	2.28		
Floors 5-12	129,096	SF	\$2.54	\$327,904	33.44		
Floors 14-21	129,096	SF	\$2.54	\$327,904	33.44		
Floors 22-30	145,233	SF	\$2.54	\$368,892	37.63		
			Total	\$1,089,008	111.36		

Building Parameters

Model:	Garage, Underground Parking with Reinforced Concrete / R/Conc. Frame
Location:	NATIONAL AVERAGE
Stories (Ea.):	2
Story Height:	14
Floor Area:	37,000
Basement:	No
Additive Cost:	\$69,376.00
Cost per S.F.:	\$98.28
Building Cost	\$3,636,500.00



Equipment								
Item	Qty.	Unit	\$/Unit	Cost	Duration			
Cooling Tower	1	EA	\$89,400	\$89,400	6.25			
AHU -1	1	EA	\$93,500	\$93,500	3.70			
AHU -2,3	2	EA	\$22,125	\$44,250	5.26			
AHU - 4	1	EA	\$42,150	\$42,150	1.85			
AHU -5-51	47	EA	\$60,675	\$2,851,725	151.6			
AHU – 52	1	EA	\$42,150	\$42,150	1.85			
AHU – 53	1	EA	\$60,675	\$60,675	3.23			
Boilers	3	EA	\$15,225	\$45,675	5.00			
Mictoturbines	10	EA	\$81,500	\$815,000	18.00			
Chillers	2	EA	\$517,900	\$1,035,800	25.00			
			Total	\$5,120,325	221.74			

	Gas Sprinkler System						
Item	Qty.	Unit	\$/Unit	Cost	Duration		
Lobby Area	64,000	SF	\$60.90	\$3,897,600	-		
Office Floors	403,425	SF	\$8.82	\$3,558,209	-		
8" Standpipe	2	EA	\$15,000	\$30,000	-		
Additional Floors	62	EA	\$4,850	\$300,700	-		
			Total	\$7,786,509	-		

Plumbing Fixtures								
Item	Qty.	Unit	\$/Unit	Cost	Duration			
Toilets	156	EA	\$2,315.00	\$361,140	22.29			
Urinals	52	EA	\$958.00	\$49,816	5.20			
Bathroom sinks	108	EA	\$1,976.00	\$213,408	13.50			
Service sinks	25	EA	\$3,775.00	\$94,375	3.13			
Shower Stalls	16	EA	\$2,751.00	\$44,016	3.33			
Water Fountains	51	EA	\$1,830.00	\$93,330	11.86			
ADA Water Fountains	51	EA	\$2,030.00	\$103,530	11.86			
			Total	\$959,615	71.17			

Raised Access Floor System							
Item	Qty.	Unit	\$/Unit	Cost	Dur.		
Lobby	64,000	SF	\$26.49	\$1,695,360	53.33		
Floors 5 - 12	110,400	SF	\$17.49	\$1,930,896	92.00		
Floors 14- 21	110,400	SF	\$17.49	\$1,930,896	92.00		
Floors 22 - 30	124,200	SF	\$17.49	\$2,172,258	103.50		
20% Added for Seismic Bracing				\$1,545,882	-		
			Total	\$9,275,292	340.83		

Double Facade							
Item	Qty.	Unit	\$/Unit	Cost	Dur.		
Single Pane	104,720	SF	\$15.30	\$1,602,216	150.00		
Double Pane	253,368	SF	\$47.10	\$11,933,633	150.00		
			Total	\$13,535,849	300.00		

Fittings						
Item	Qty.	Unit	\$/Unit	Cost	Duration	
Stalls	102	EA	\$900.00	\$91,800	12.75	
ADA Stalls	52	EA	\$415.00	\$21,580	6.5	
			Total	\$113,380	19.25	

Ductwork Estimate					
Item	Qty.	Unit	\$/Unit	Cost	Duration
Under 200 lbs	78,416	LB	\$7.94	\$622,623	333.67
200 – 500 lbs	50,882	LB	\$7.62	\$387,721	207.68
500 – 1000 lb	28,210	LB	\$7.33	\$206,779	110.63
Fittings				\$882,125	-
			Total	\$2,099,248	651.98

]	Elevat	ors and Lif	îts	
Item	Qty.	Unit	\$/Unit	Cost	Dur.
4000lbs, 30 FL	6	EA	\$964,500	\$5,787,000	120.00
2500lbs, 5 FL	1	EA	\$171,200	\$171,200	20.00
20,000 LB, 30 FL	1	EA	\$1,521,000	\$1,521,000	20.00
			Total	\$7,479,200	160.00

Rain Water Collection							
Item	Qty.	Unit	\$/Unit	Cost	Duration		
8" Water Drainage	15	EA	\$5,000	\$75,000	-		
Add. Footage	5850	EA	\$87.00	\$508,950	-		
			Total	\$583,950	-		

	Roof							
Item	Qty.	Unit	\$/Unit	Cost	Duration			
Asphalt base	16,010	SF	\$2.85	\$45,629	13.34			
Insulation	16,010	SF	\$1.90	\$30,419	13.34			
Base Flashing	507	LF	\$31.55	\$15,996	0.43			
Roof Edges	507	LF	\$25.40	\$12,878	0.43			
			Total	\$104,921	27.54			

Stair Construction					
Item	Qty.	Unit	\$/Unit	Cost	Duration
24 risers	32	EA	\$9,400.00	\$300,800	10.24
24 risers	32	EA	\$9,400.00	\$300,800	10.24
			Total	\$601,600	20.48

]	Lighti	ing Fixtur	es				Ceilin	g Finish	es	
Item	Qty.	Unit	\$/Unit	Cost	Duration	Item	Qty.	Unit	\$/Unit	Cost	Duration
4' Linear LED Pendant	1,750	EA	\$393.50	\$688,625	54.69	Acoustical Tile, Office	262,500	SF	\$3.97	\$1,042,125	194.44
4' Round LED Downlight	1,354	EA	\$452.50	\$612,685	42.31	Drywall, Restaurant	4,308	SF	\$1.24	\$5,342	1.20
4' Square LED Downlight	350	EA	\$452.50	\$158,375	10.94	Drywall, Lobby	9,950	SF	\$1.24	\$12,338	2.76
4' Linear LED Wall Washer	1,500	EA	\$932.50	\$1,398,750	46.88	Drywall, Lobby	11,225	SF	\$1.24	\$11,226	3.11
3' Curved T5	2,483	EA	\$1,665.00	\$4,134,195	77.59	Bathrooms					
2' Curved T5	350	EA	\$1,620.00	\$567,000	10.94	Drywall,	96,700	SF	\$1.24	\$119,908	26.86
			Total	\$7,559,630	243.35	Office Floors	,		Total	\$1,190,939	228.37

	Branch Wiring								
Item	Qty.	Unit	\$/Unit	Cost	Dur.				
Open Offices	262,500	SF	\$10.46	\$2,745,750	-				
Restaurant	4,308	SF	\$10.46	\$45,062	-				
Lobby	9,950	SF	\$10.46	\$104,077	-				
Elevator Lobby	12,298	SF	\$10.46	\$128,637	-				
Bathrooms	11,225	SF	\$10.46	\$117,414	-				
Closed Offices	96,700	SF	\$10.46	\$1,011,482	-				
			Total	\$4,152,421	-				

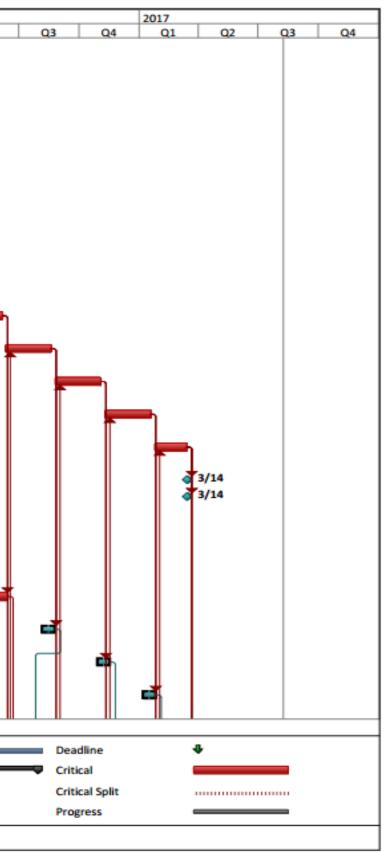
Floor Finishes							
Item	Qty.	Unit	\$/Unit	Cost	Duration		
Carpet, Office	35,556	SY	\$50.20	\$1,784,911	148.15		
Tiling, Restaurant	4,308	SF	\$25.76	\$110,974	26.93		
Marble , Lobby	12,010	SF	\$24.95	\$299,650	66.72		
Tiling, Bathrooms	11,225	SF	\$25.76	\$289,156	70.16		
Tiles, Elevator Lobby	12,298	SF	\$25.76	\$316,796	76.86		
	•	•	Total	2,801,488	388.81		

		Rece	ptacles		
Item	Qty.	Unit	\$/Unit	Cost	Dur.
Open Offices	262,500	SF	\$9.80	\$25,72,500	-
Restaurant	4,308	SF	\$9.80	\$42,218	-
Lobby	9,950	SF	\$9.80	\$97,510	-
Elevator Lobby	12,298	SF	\$9.80	\$120,520	-
Bathrooms	11,225	SF	\$9.80	\$110,005	-
Closed Offices	96,700	SF	\$9.80	\$947,660	-
			Total	\$3,890,414	-

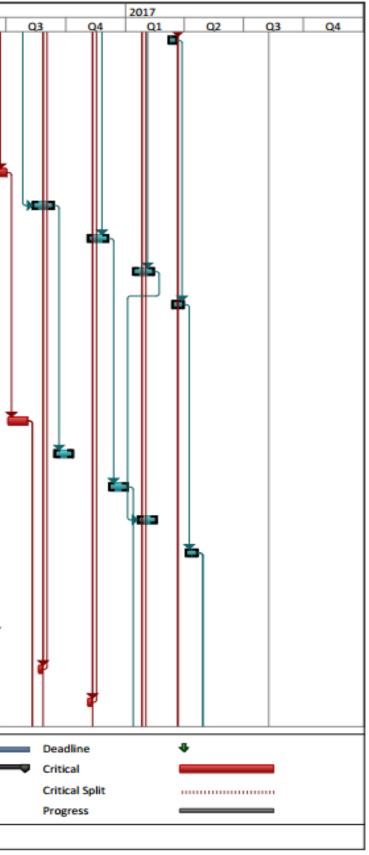
	El	ectrica	al Equipn	nent	
Item	Qty.	Unit	\$/Unit	Cost	Duration
Switchgear	1	EA	\$92,600	\$92,600	-
Generator	1	EA	\$79,080	\$79,080	-
Trans. Switch	1	EA	\$26,000	\$26,000	-
250 Amp Distribution Panel	3	EA	\$5,800	\$17,400	5.00
600 Amp Distribution Panel	16	EA	\$7,200	\$115,200	26.67
Transformer	13	EA	\$6,840	\$88,920	21.67
100 Amp Panel	54	EA	\$2,510	\$135,510	90.00
225 Amp Panel	27	EA	\$4,675	\$126,225	45.00
			Total	\$680,935	188.34

	Wall Finishes									
Item	Qty.	Unit	\$/Unit	Cost	Duration					
Gypsum Wall, Office	98,000	SF	\$4.10	\$401,800	35.64					
Glass Wall, Office	47,600	SF	\$76.05	\$4,169,760	238					
Gypsum, Restaurant	7,005	SF	\$4.10	\$28,721	2.55					
Stone , Lobby	11,748	SF	\$21.40	\$251,407	65.27					
Gypsum, Bathrooms	43,400	SF	\$4.10	\$177,940	15.78					
Gypsum, Elevator Lobby	55,328	SF	\$4.10	\$226,845	20.12					
		•	Total	\$5,256,473	377.36					

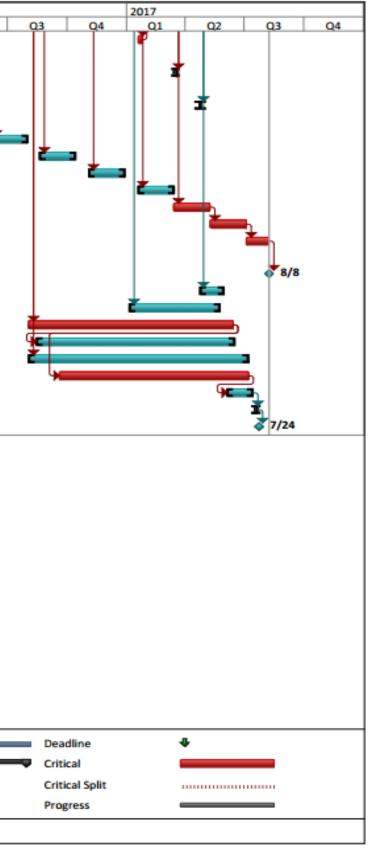
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2 * Mobilization 5 days Mon 2/0/14 Fri d/8/14 4 Demolition 40 days Mon 2/0/14 Fri d/8/14 5 Devention 40 days Mon 6/2/14 Fri d/8/14 6 Shoring 90 days Fri d/2/14 7 Decavation 90 days Fri d/2/14 8 Foundation 19 days Tou 2/1/15 7 Decavation 19 days Tou 2/1/15 10 Parking Garage 110 days Mon 4/2/15 11 Feet Carne 2 days Mon 4/2/15 12 Steel Erection -10or 5-8 S0 days True 1/12/16 13 Steel Erection -Floor 5-12 S0 days True 1/12/16 14 Steel Erection -Floor 50 S0 days True 1/12/16 15 Steel Erection -Floor 50 S0 days True 1/2/17 16 Steel Erection -Floor 50 S0 days True 1/2/16 17 Z Steel Erection -Floor 30 days True 3/2/17 True 3/14/17 18 Steel Erection -Floor 30 days True 1/2/16 True 3/14/17 19 Steel Erection -Floor 30 days		Mode						01	Q2	Q3	Q4		Q2	Q3	Q4			Q2
3 * Asbestos Removal 50 days Mon 2/10/14 Fri 4/18/14 4 Dewatering 4 days Mon 4/21/14 Fri 6/20/14 Fri 6/20/14 5 # Dewatering 4 days Mon 4/21/14 Fri 6/20/14 Thu 10/23/14 6 # Shoring 90 days Fri 6/20/14 Thu 30/23/14 7 # Escavation 10 days Mon 4/27/15 Fri 9/25/15 10 # Parking Garage 110 days Mon 4/27/15 Fri 9/25/15 112 # Fercet Crane 2 days Mon 9/27/15 Fri 9/25/15 12 # Fercet Crane 2 days Mon 9/27/15 Fri 9/25/15 12 # Steel Erection Floor 5-8 50 days Tue 1/13/16 13 # Steel Erection Floor 5-12 50 days Mon 3/28/16 Mon 6/6/16 14 # Steel Erection Floor 50 50 days Tue 1/13/16 Tue 3/14/17 17 # Steel Erection Floor 50 50 days Tu								€2/3										
4 * Demolition 40 days Mon 4/21/14 Fir 6/3/14 5 * Dewoltring 4 days Mon 6/3/6/14 Thu 6/3/14 6 * Shoring 90 days Fir 6/20/14 Thu 10/23/14 7 * Excavation 112 days Fir 10/24/14 Mon 3/30/15 8 * Foundation 10 days Mon 4/27/15 Fir 5/8/15 10 * Parking Garage 110 days Mon 4/27/15 Fir 5/8/15 10 * Parking Garage 110 days Mon 4/27/15 Fir 5/8/15 11 * Erect Crane 2 days Mon 3/28/15 Fir 9/29/15 12 * Steel Erection -Floor 5-S S0 days Thu 1/2/16 Tue 3/22/16 13 * Steel Erection -Floor 5-S S0 days Thu 3/28/16 Mon 6/6/16 14 * Steel Erection -Floor S0 days Thu 3/2/17 Tue 3/2/16 14 * Steel Erection -Floor S0 days Tue 3/2/16 Thu 11/2/16 15 * Steel Erection -Floor S0 days Tue 3/14/17		*					_	<u>1</u>	_									
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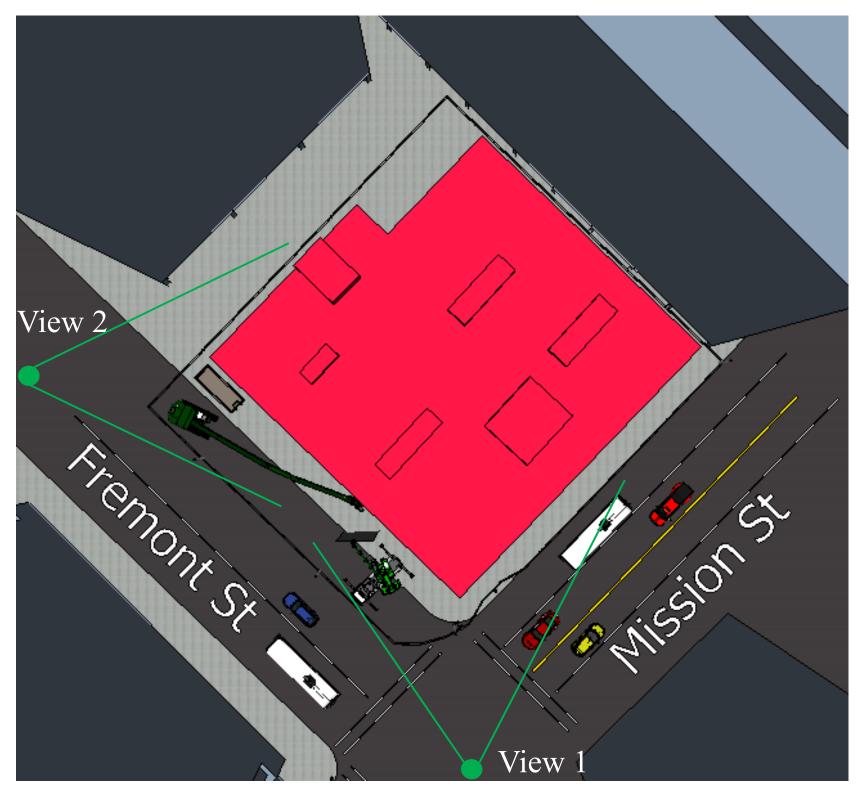
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29		Metal Decking -Floor 30/Roof/Penthouse	10 days	Tue 3/7/17	Mon 3/20/17														
30	*	Rebar/Formwork - Restaurant Level	6 days	Wed 11/11/15	Wed 11/18/15														
31	*	Rebar/Formwork -Floor 5-8	23 days	Thu 1/7/16	Mon 2/8/16														
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33	*	Rebar/Formwork -Floor 14-17	23 days	Wed 6/1/16	Fri 7/1/16												ſĽ	′ ┥	
34	*	Rebar/Formwork -Floor 18-21	23 days	Thu 8/11/16	Mon 9/12/16														
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36	*	Rebar/Formwork -Floor 26-29	23 days	Thu 1/12/17	Mon 2/13/17														
37	*	Rebar/Formwork -Floor 30/Roof/Penthouse	15 days	Mon 3/13/17	Fri 3/31/17														
38	*	Concrete Slab -Restaurar Level	t 5 days	Thu 11/19/15	Wed 11/25/15										Ť				
39	*	Concrete Slab -Floor 5-8	22 days	Fri 1/15/16	Mon 2/15/16											կես			
40	*	Concrete Slab -Floor 9-12			Wed 4/27/16												4	i I	
41	*	Concrete Slab -Floor 14-17	22 days	Mon 7/4/16	Tue 8/2/16														ľ
42	*	Concrete Slab -Floor 18-21	22 days	Tue 9/13/16	Wed 10/12/16														
43	*	Concrete Slab -Floor 22-25	22 days	Tue 12/6/16															
44	*	Concrete Slab -Floor 26-29	22 days	Thu 1/19/17	Fri 2/17/17														
45	*	Concrete Slab -Floor 30/Roof/Penthouse	15 days	Mon 4/3/17	Fri 4/21/17														
46	*	Pods Delivery -Restauran Level	t 0.5 days	Tue 1/12/16	Tue 1/12/16											2			
47	*	Pods Delivery -Floor 5-8	4 days	Tue 3/22/16	Mon 3/28/16												₹.		L
48	*	Pods Delivery -Floor 9-12	4 days	Mon 6/6/16	Fri 6/10/16													P	
49	*	Pods Delivery -Floor 14-17	4 days	Fri 8/19/16	Thu 8/25/16														
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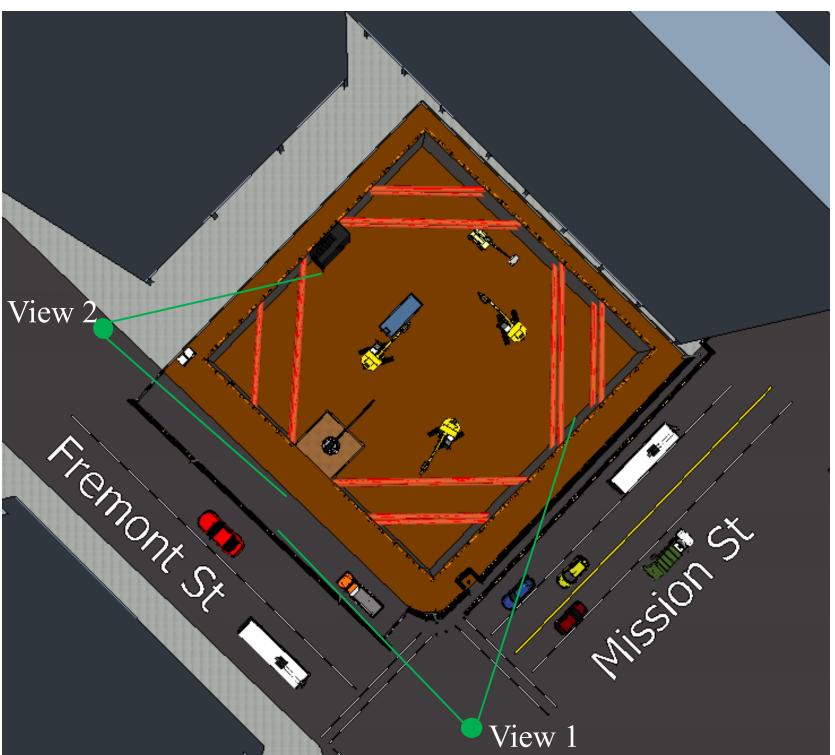
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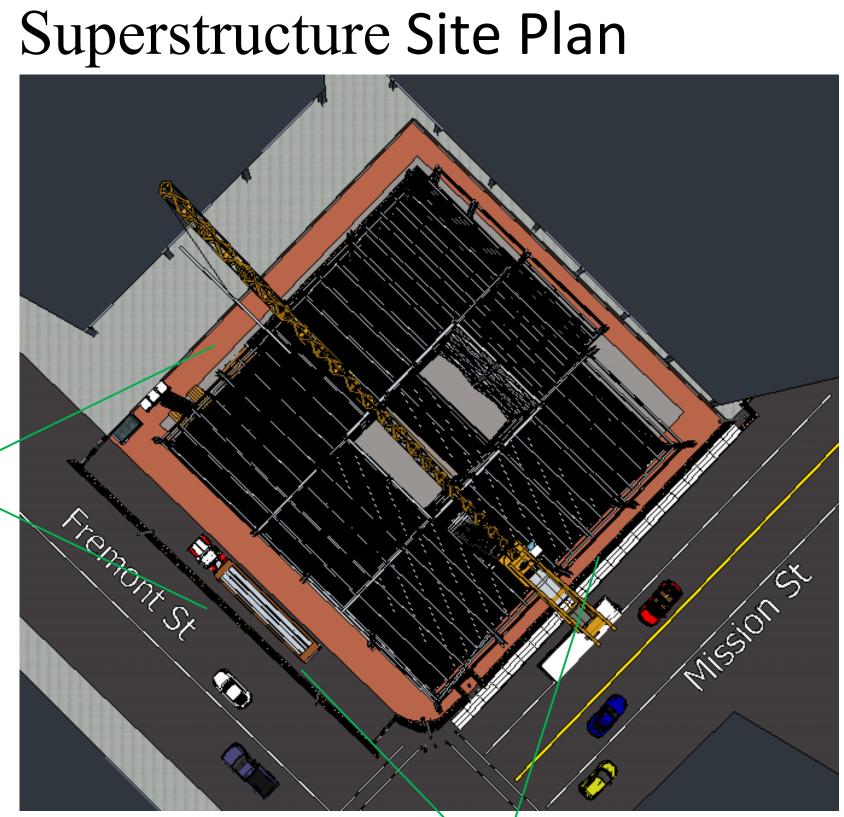


Demolition Site Plan



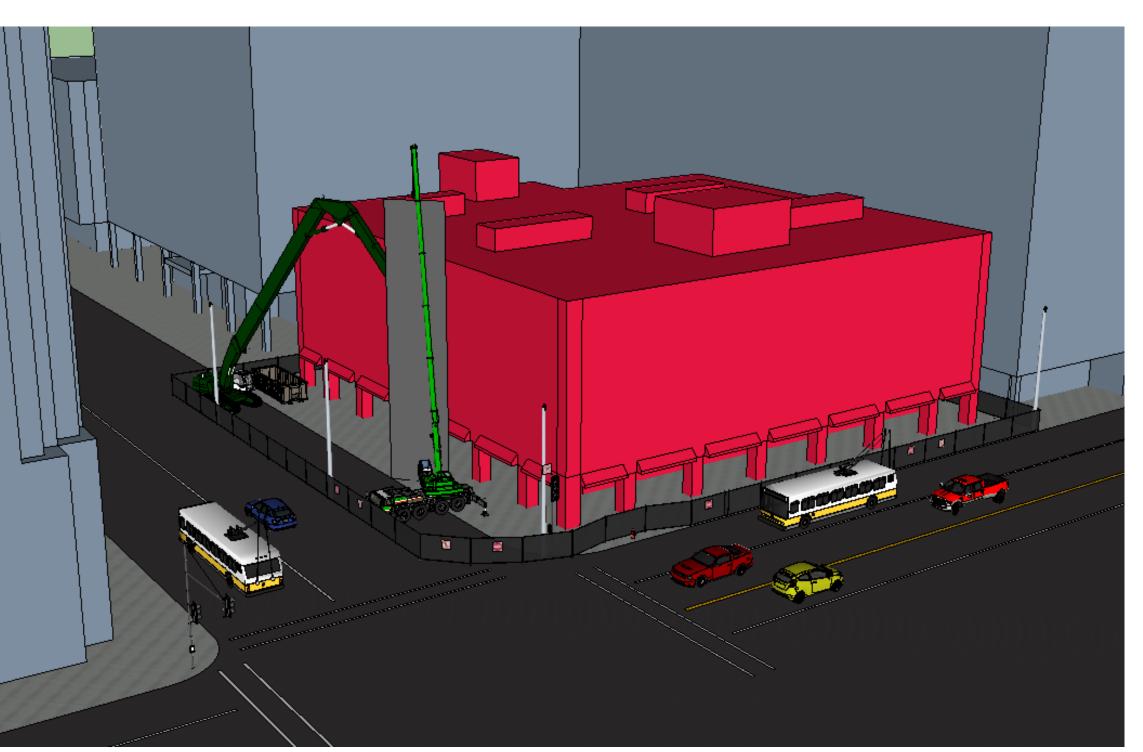
Excavation Site Plan



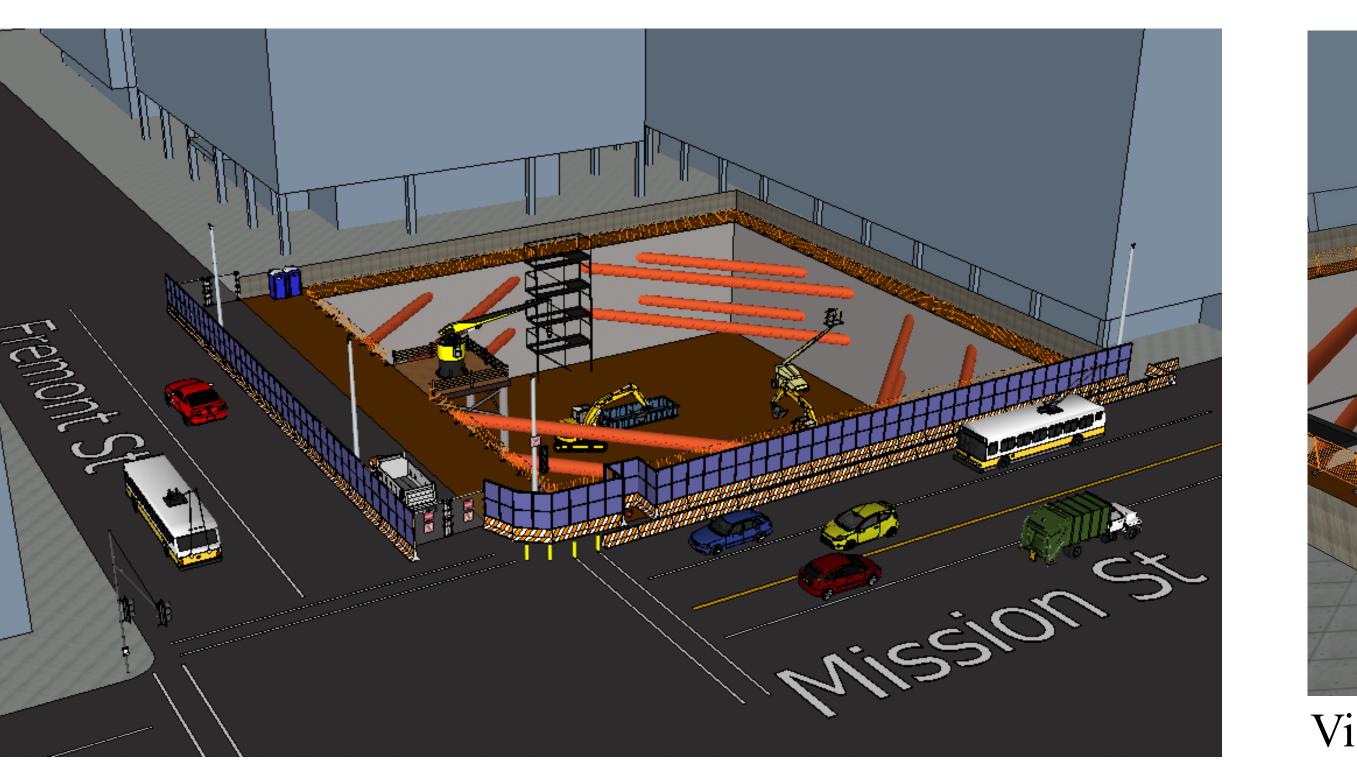


View 1

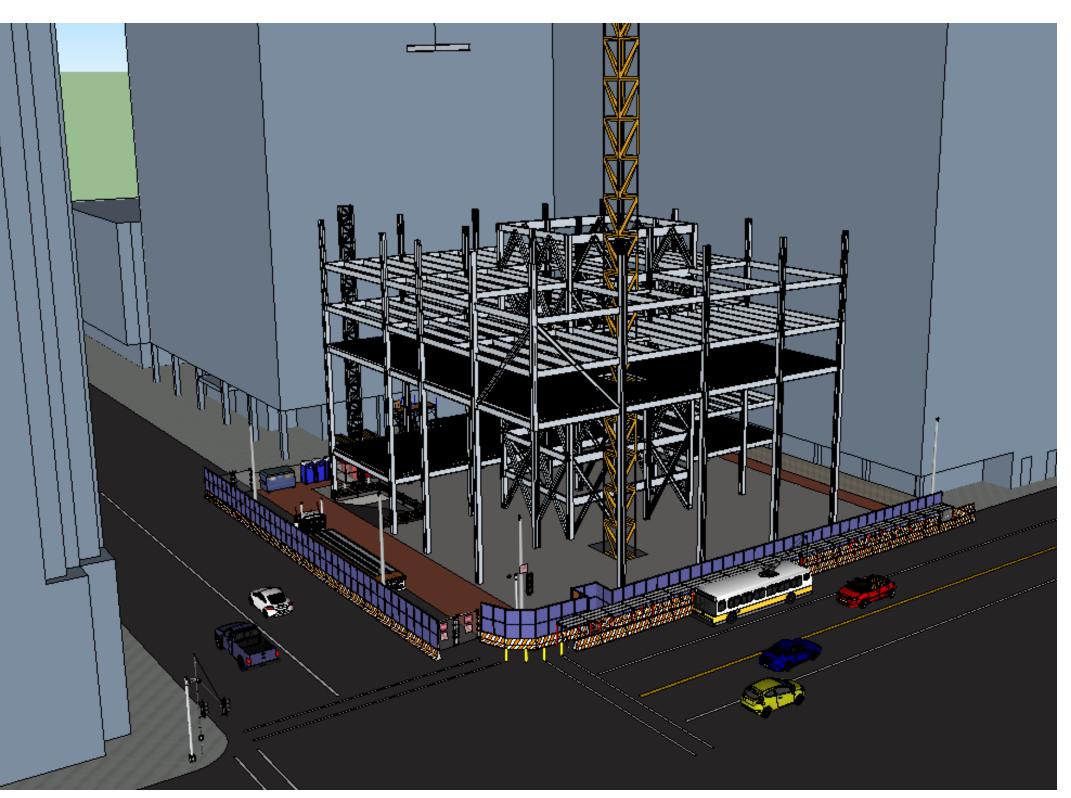
View 2



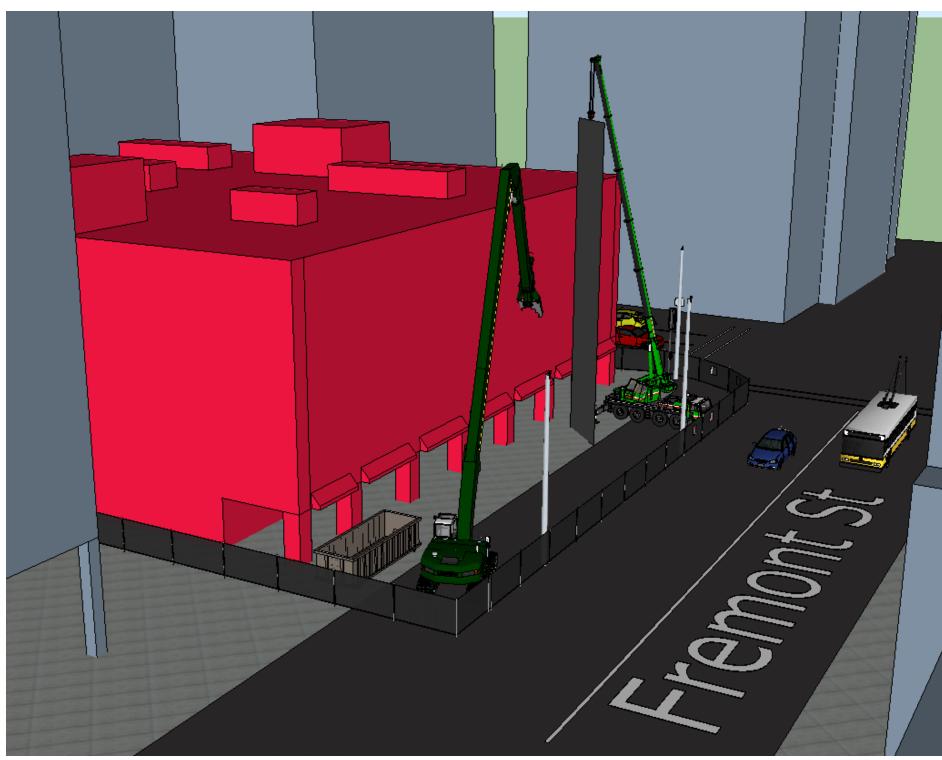
View 1: Demolition of Existing Building



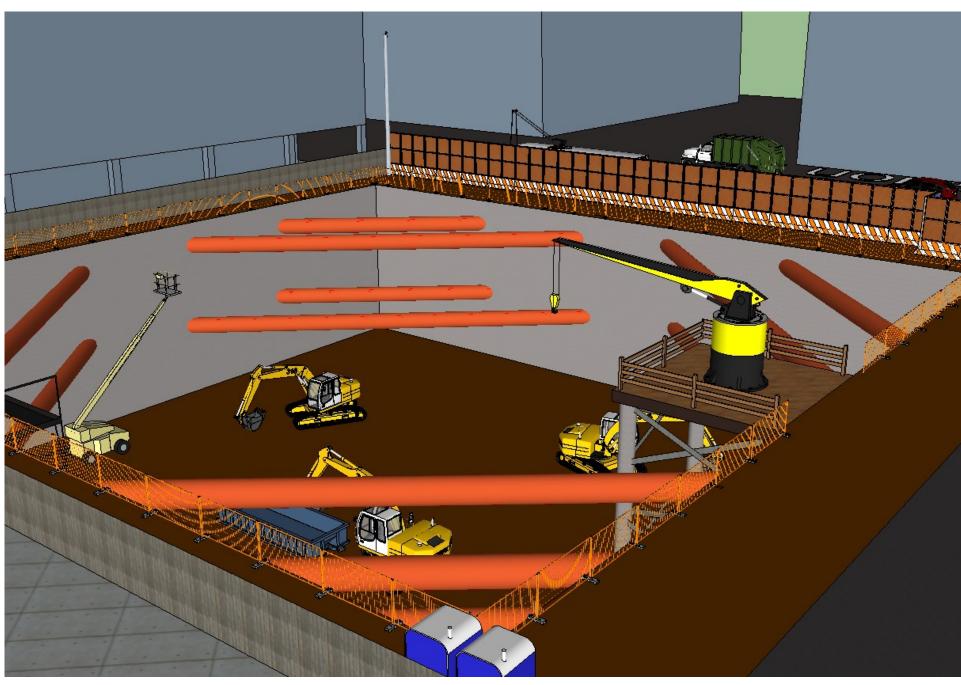
View 1: Excavation of Site



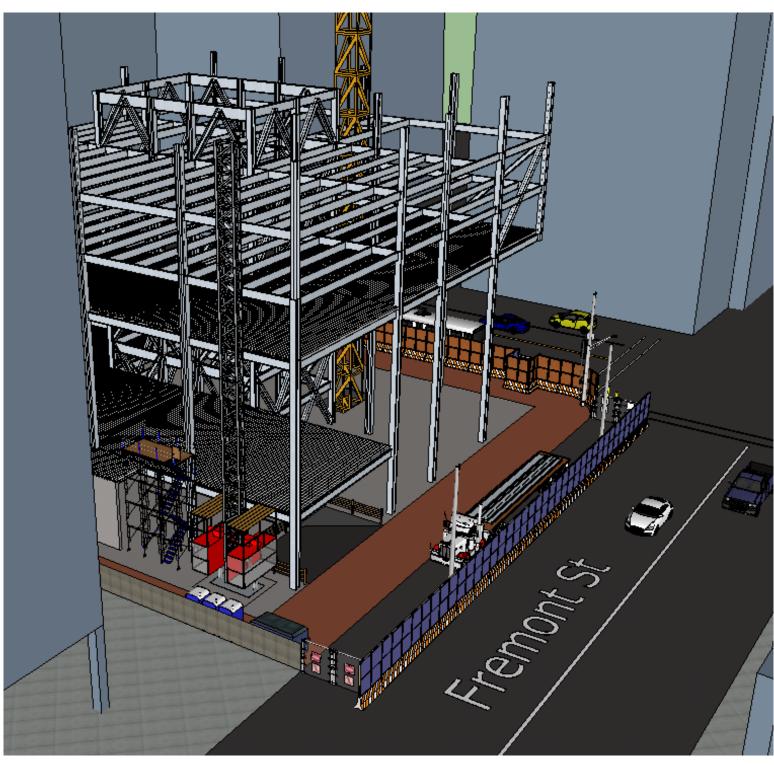
View 1: Steel Erection



View 2: Demolition of Existing Building



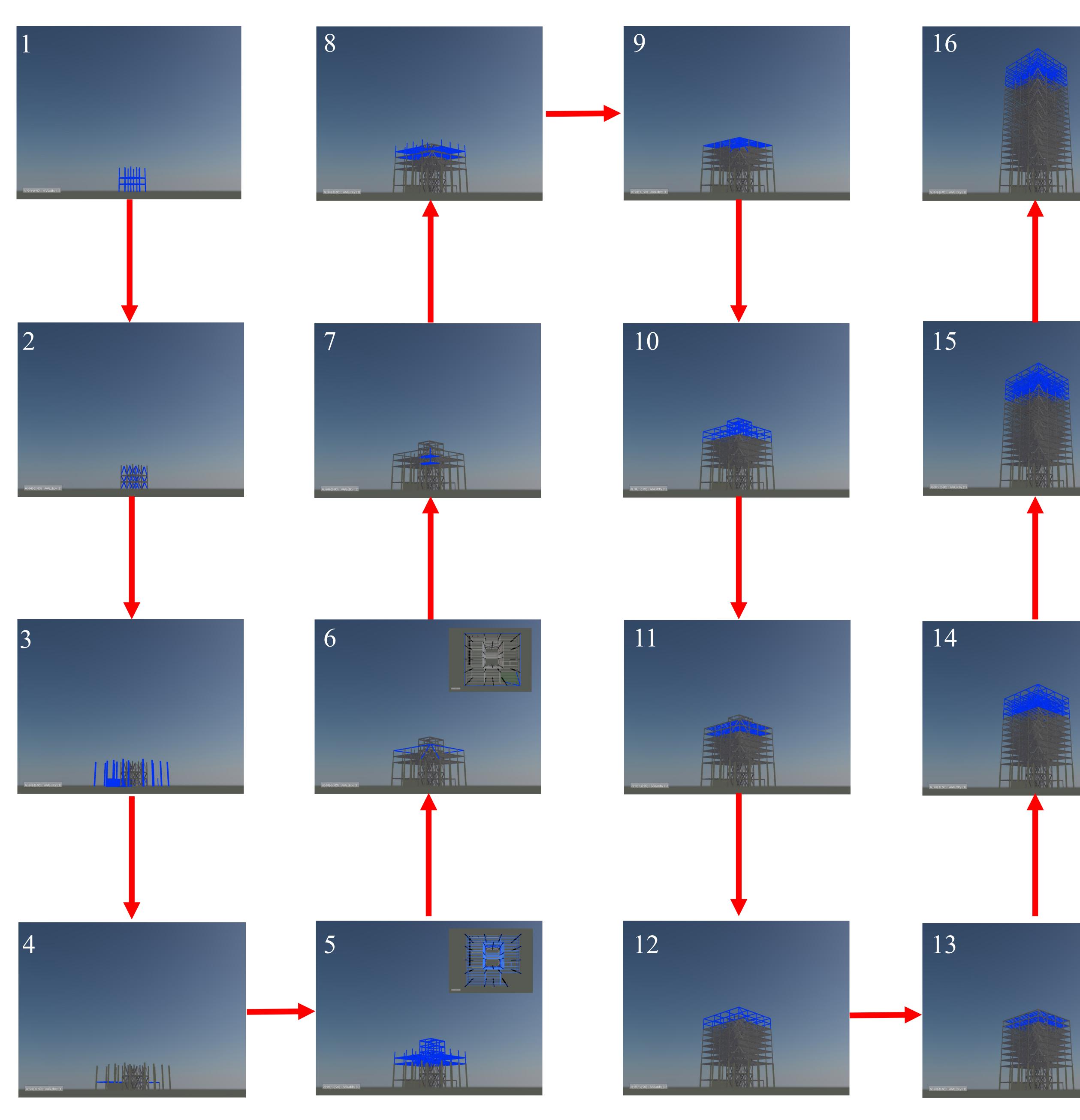
View 2: Excavation of Site



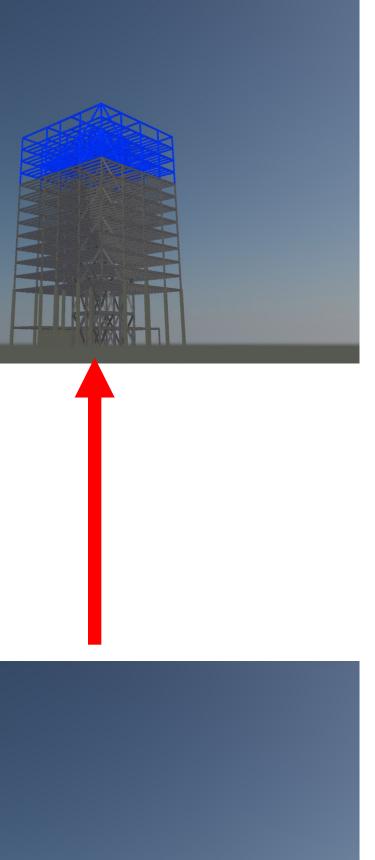
View 2: Steel Erection

Construction

	Description	Date					
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	AEI Team Numb 05-2014)er					
	Site Plan						
	C-101						



17 18 A(-94)-1(-90) : AAALotby (1) (-94)-1(-50) : AAALobby (1)



This is showing the sequencing of how the structural steel will be erected.

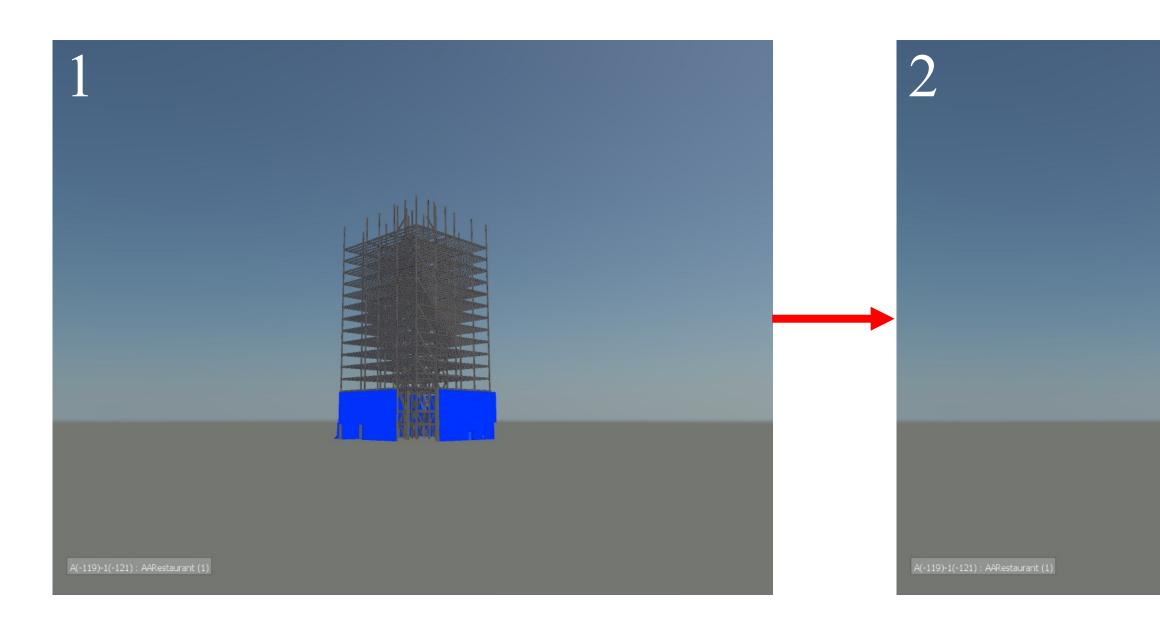
The structural steel will be separated into 8 zones which are broken up into Lobby, Floors 5-8, Floors 9-12, Floors 14-17, Floors 18-21, Floors 22-25, Floors 26-29, and Floor 30 with Roof and Penthouse.

The blue in each image is the steel which will be erected at that time.

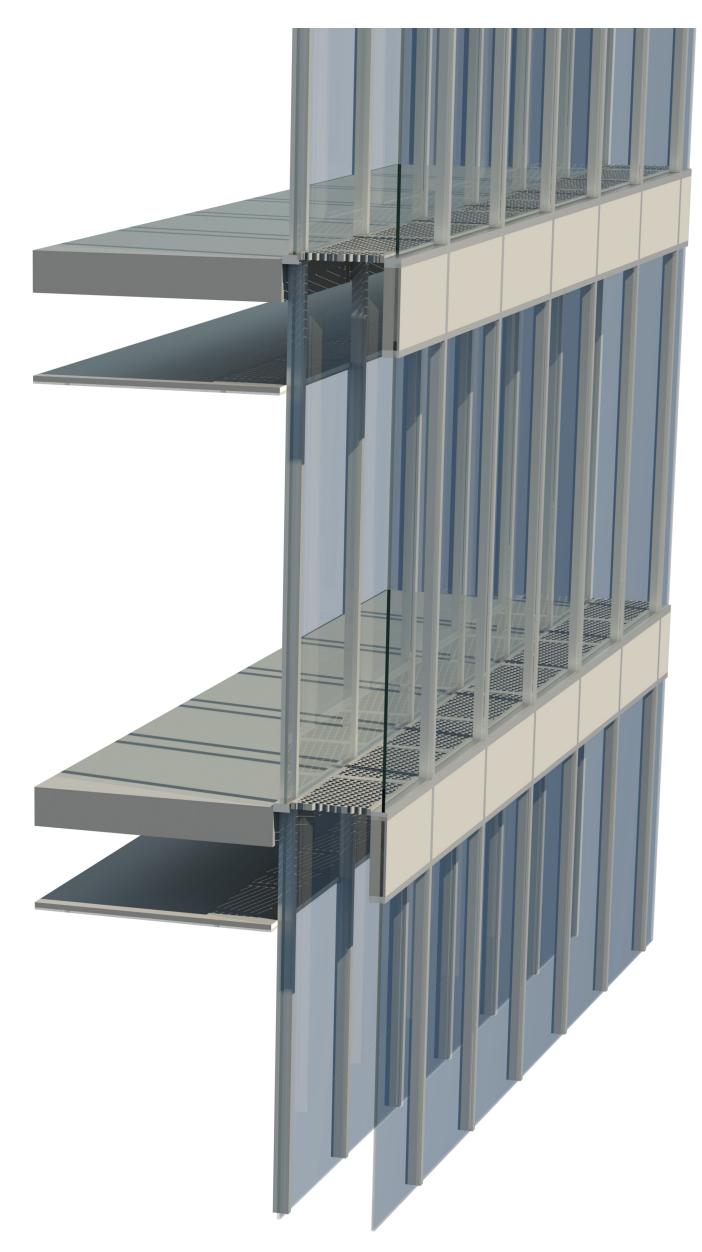
Figures 5 and 6 contain top views to help visualize the sequencing at that stage.

Construction

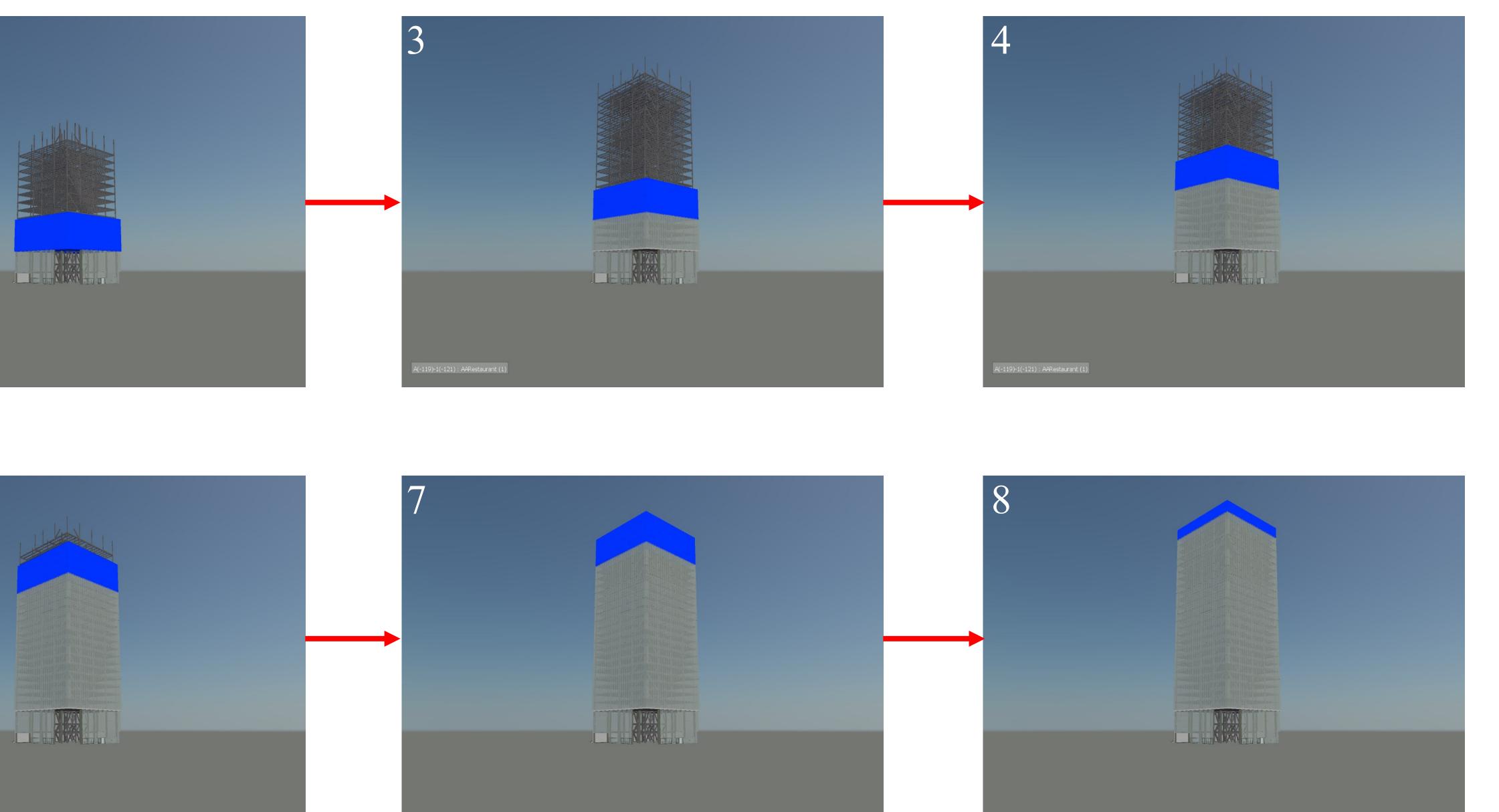
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Structural Stee Sequencing	el
C - 102	2

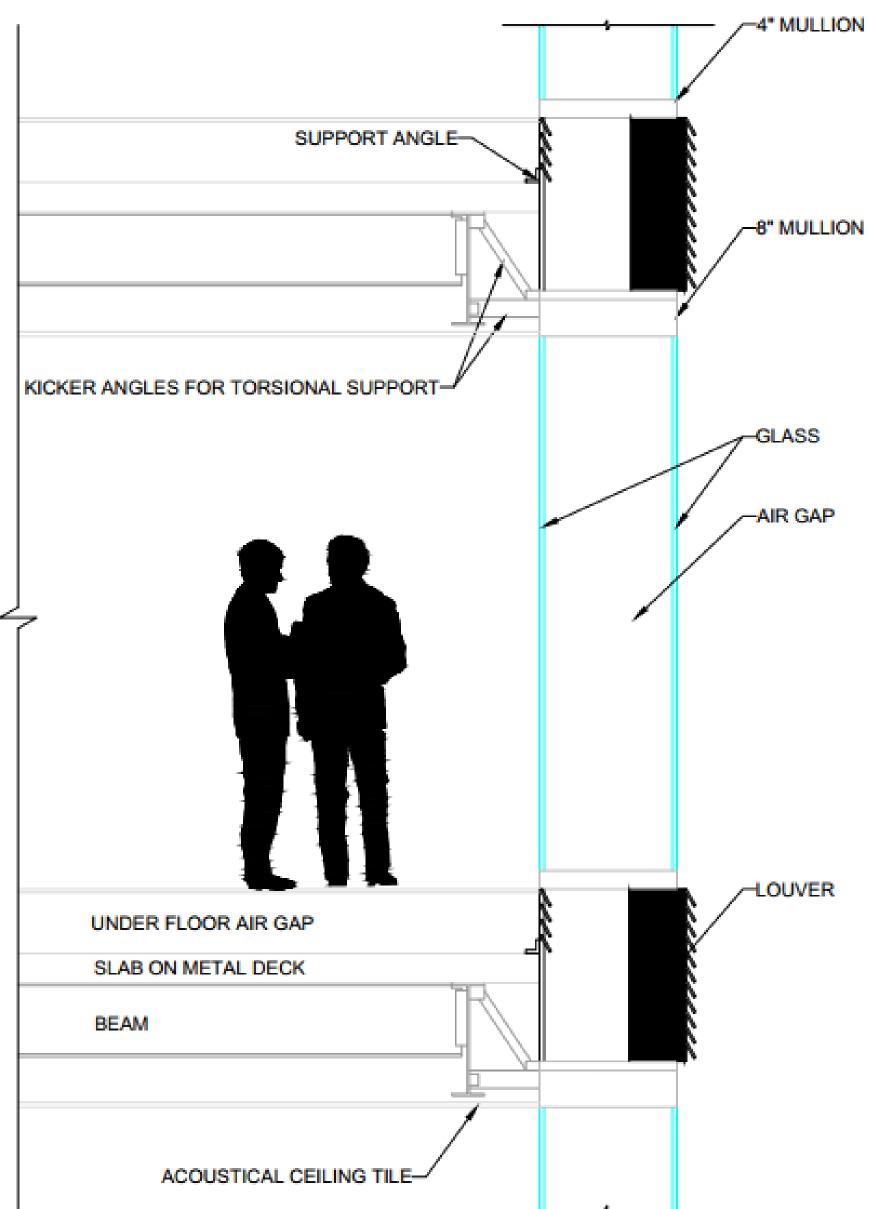






Perspective View of the Double Facade





Schematic Drawing of the Double Facade

This is showing the sequencing of how the double façade will be placed and installed.

The double façade will be separated similar to the steel structure into 8 zones which are broken up into Lobby, Floors 5-8, Floors 9-12, Floors 14-17, Floors 18-21, Floors 22-25, Floors 26-29, and Floor 30 with Roof and Penthouse.

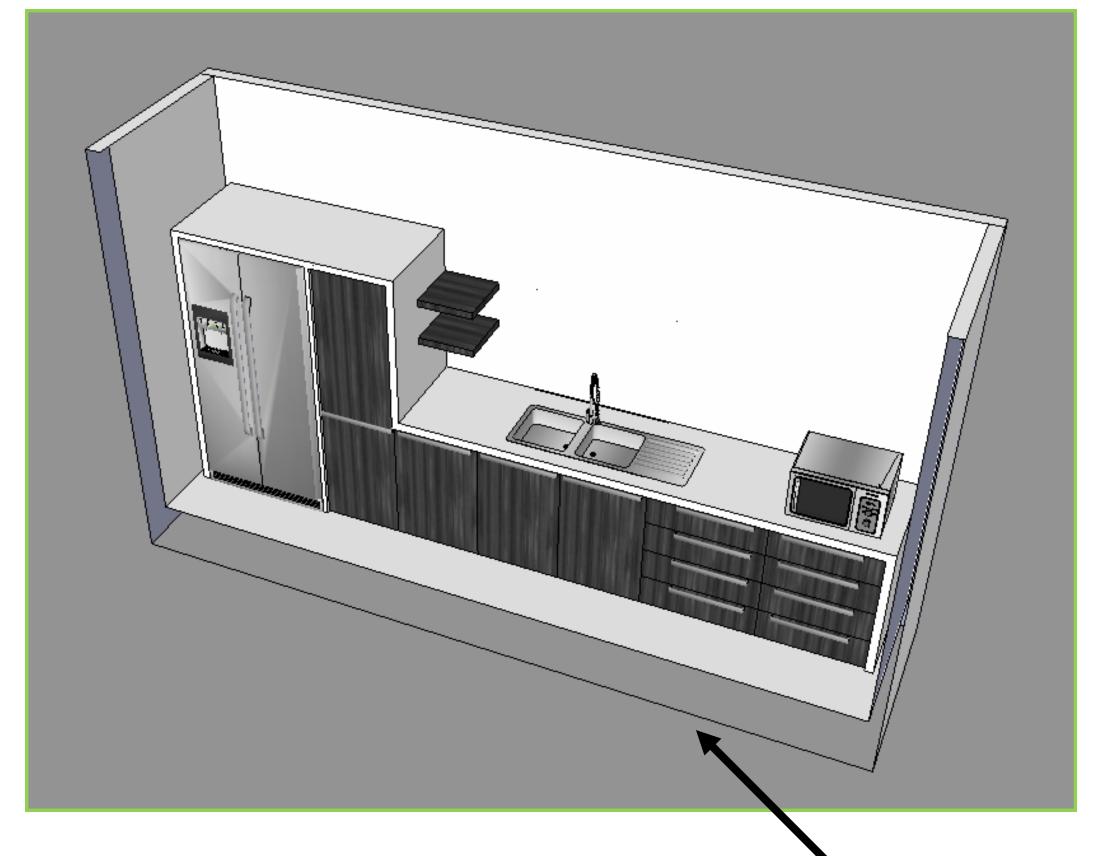
The blue in each image is the panels which will be erected at that time.

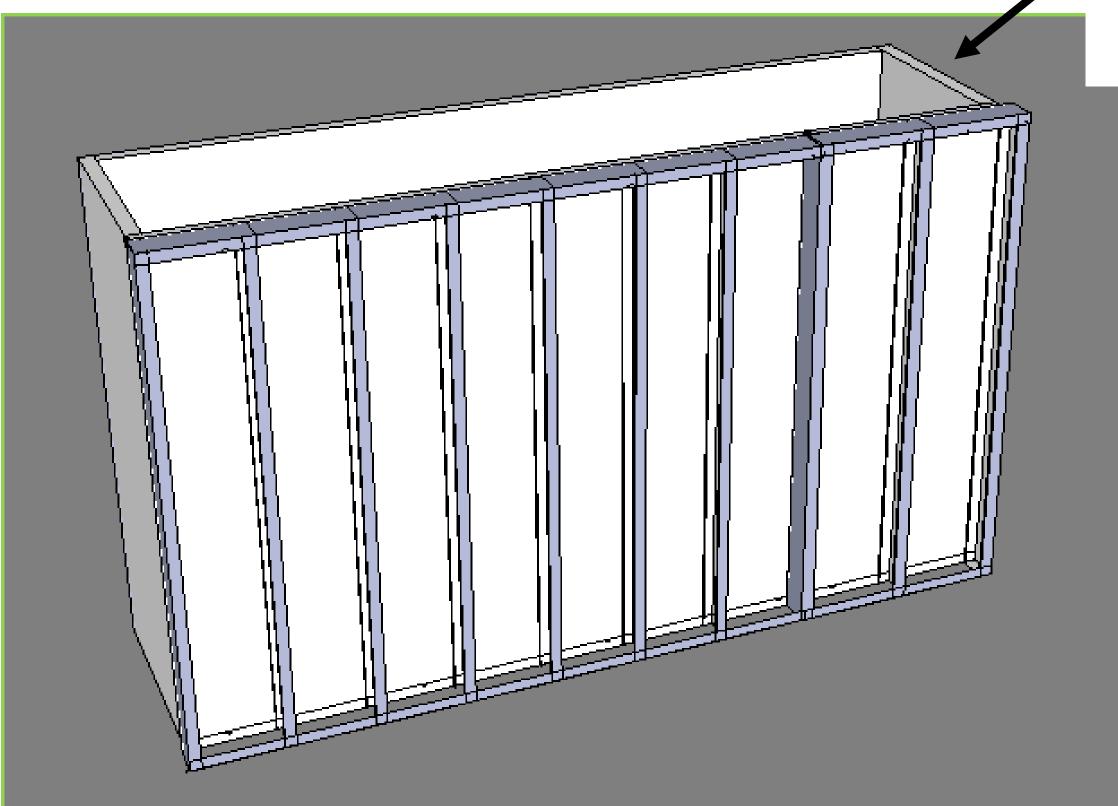
The enclosure will be started 6 months after the steel erection has begun. There will be a minimize separate of 8 floors separation between the top of the enclosure erection and the steel erection.

Construction

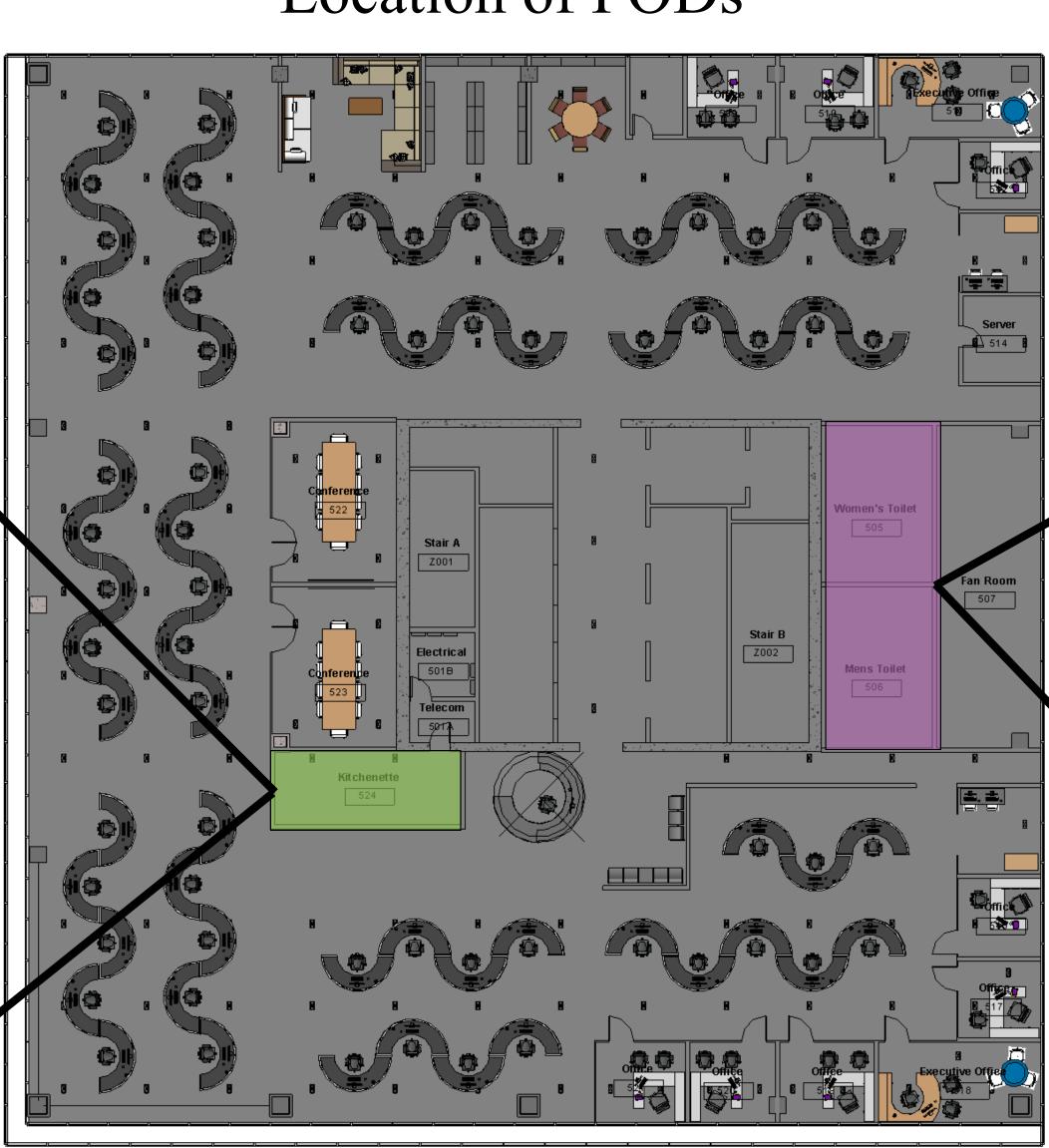
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Façade Sequenci Façade Details							
C - 103	C-103						

Kitchen Pods (Green)

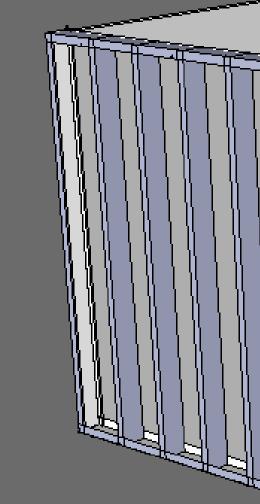


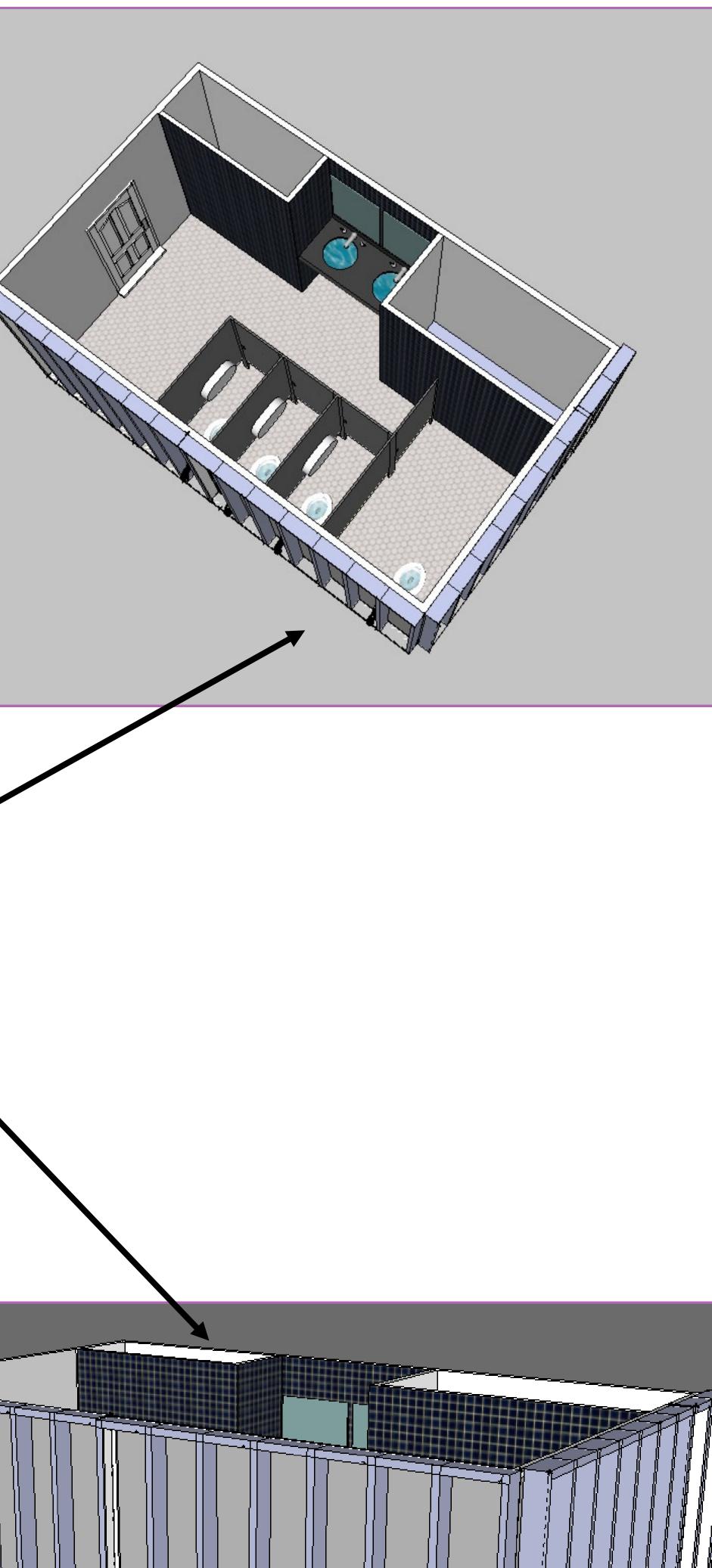


Bathroom Pods (Purple)



Location of PODs



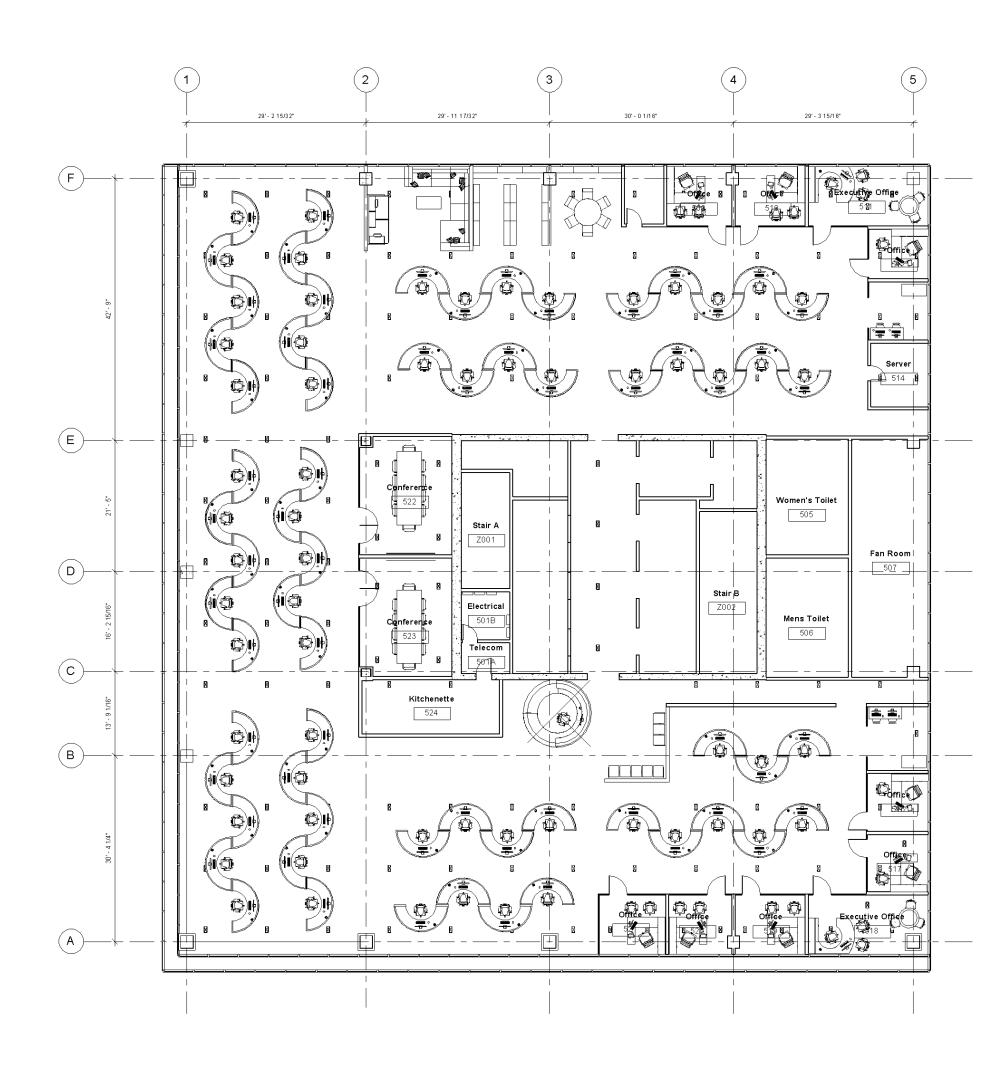


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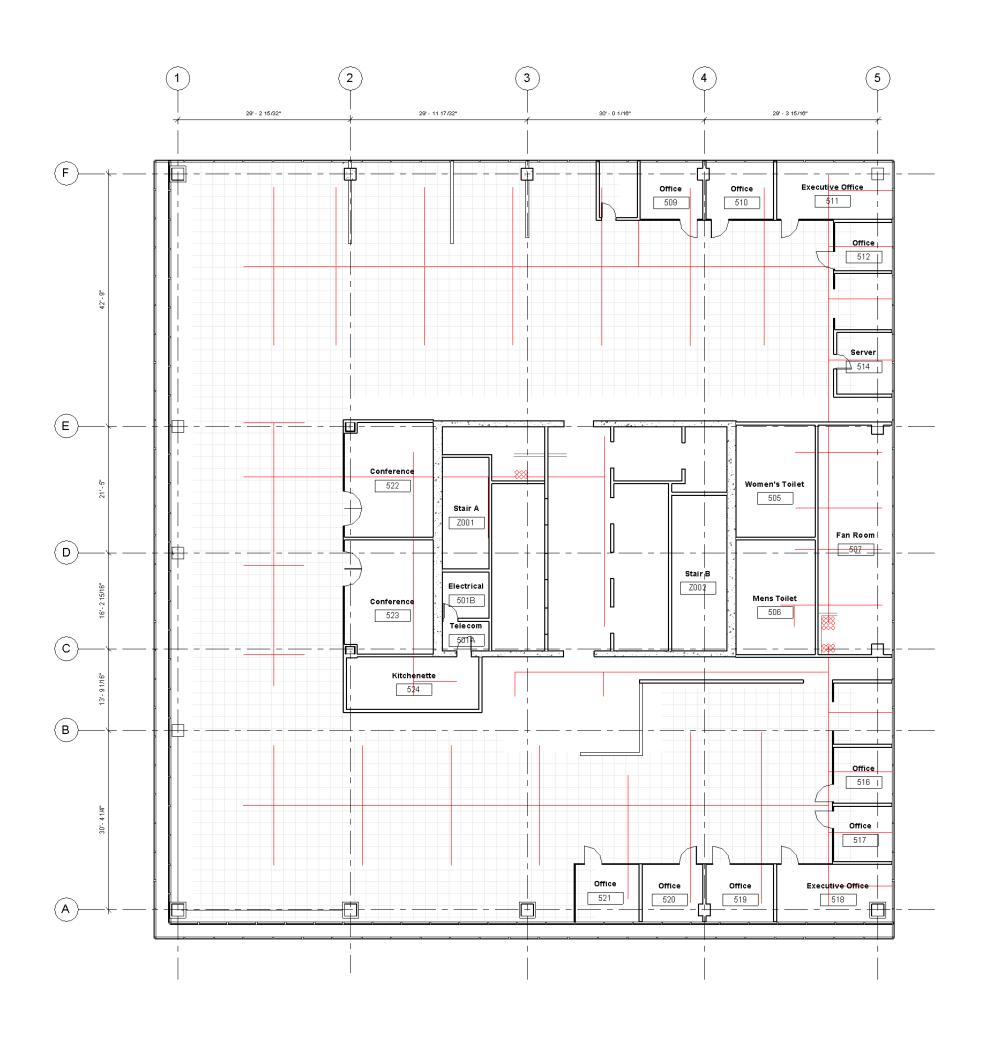
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Construction

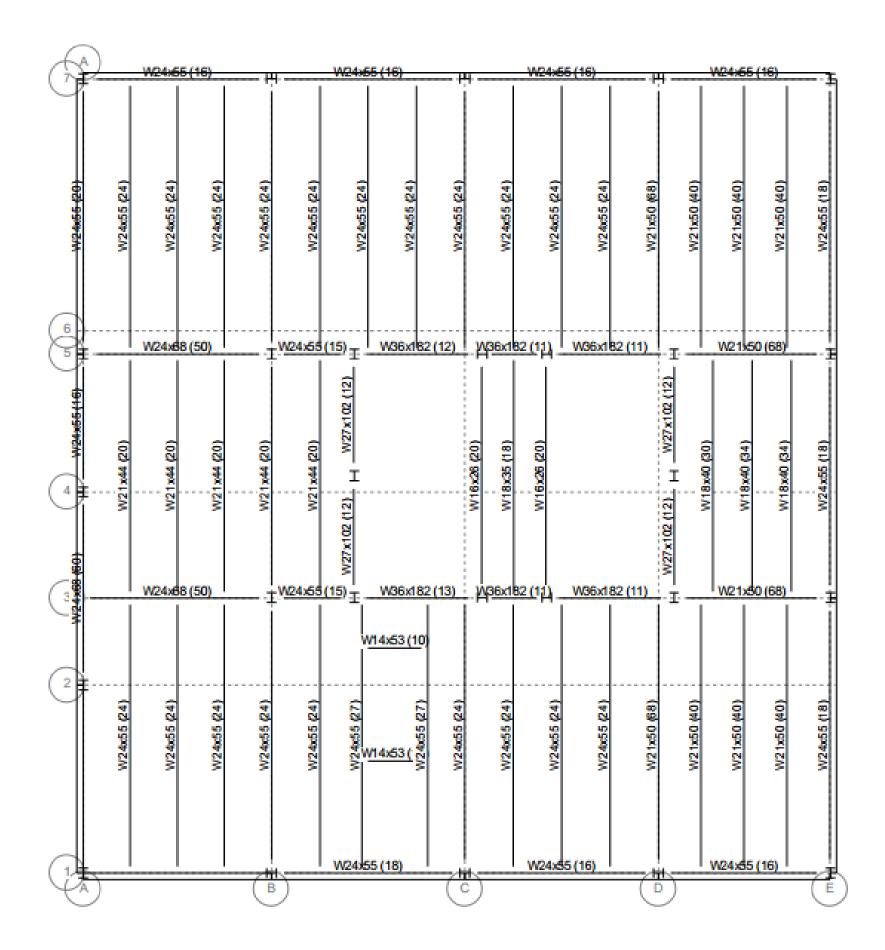
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Pods	Pods						
C-104							



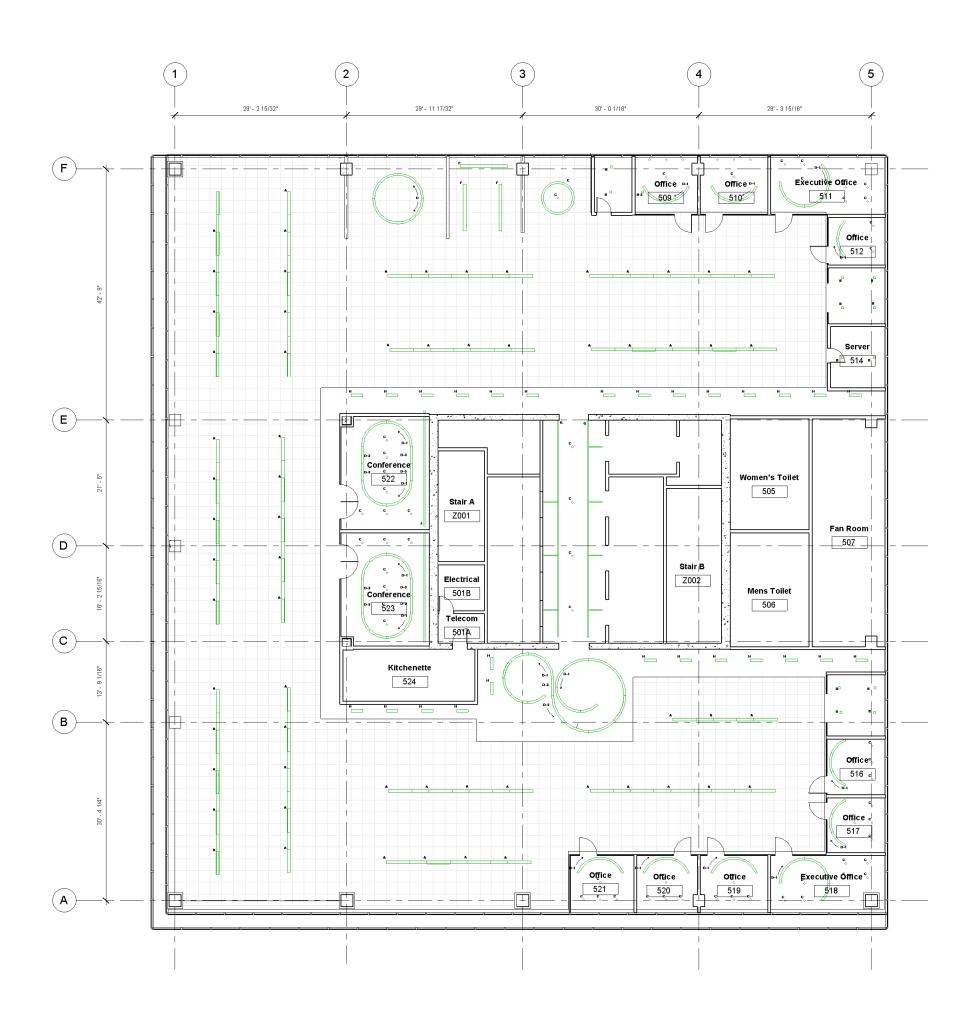
Typical Floor Plan



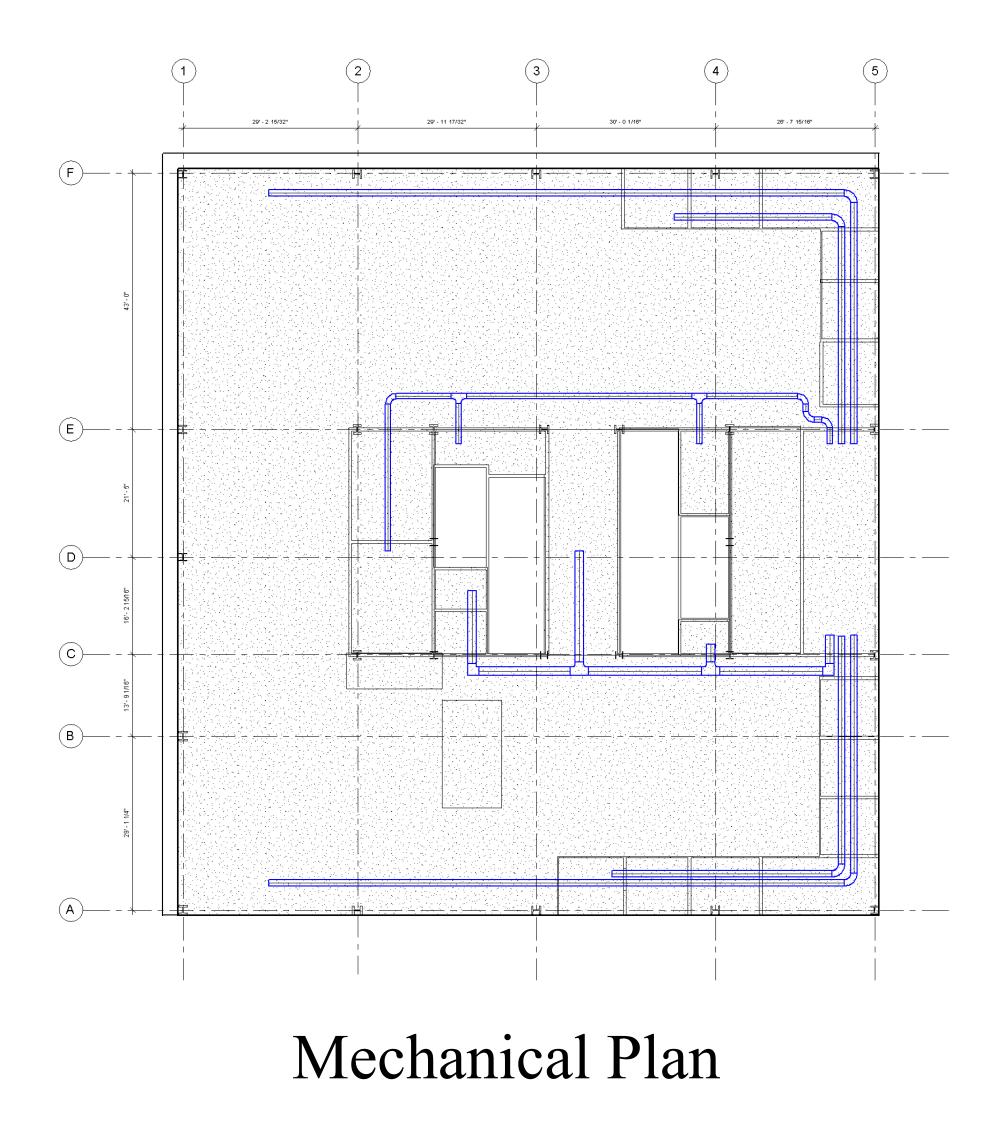
Sprinkler Plan







Lighting Plan

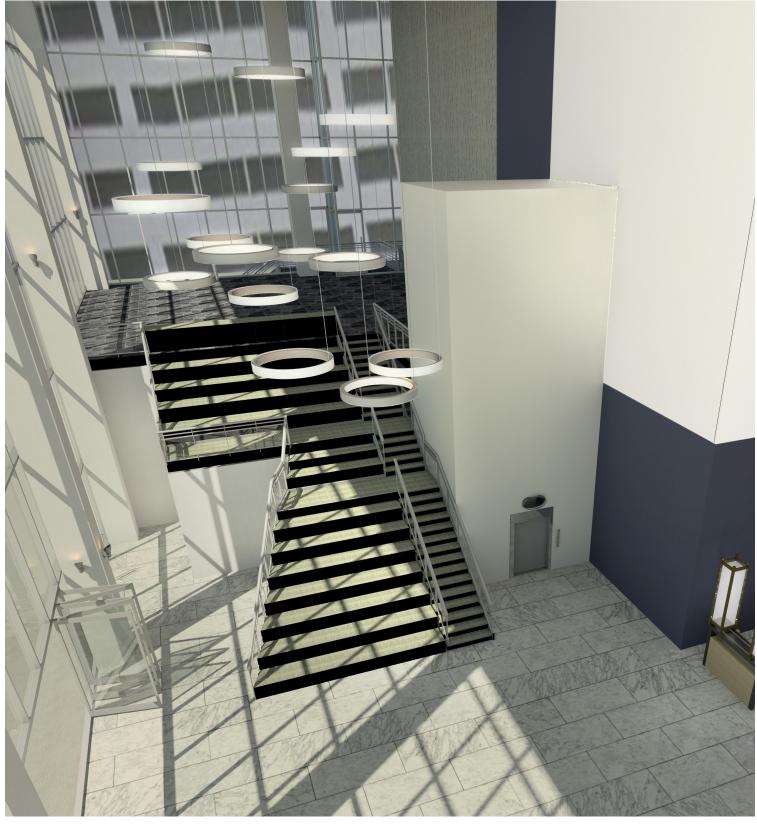




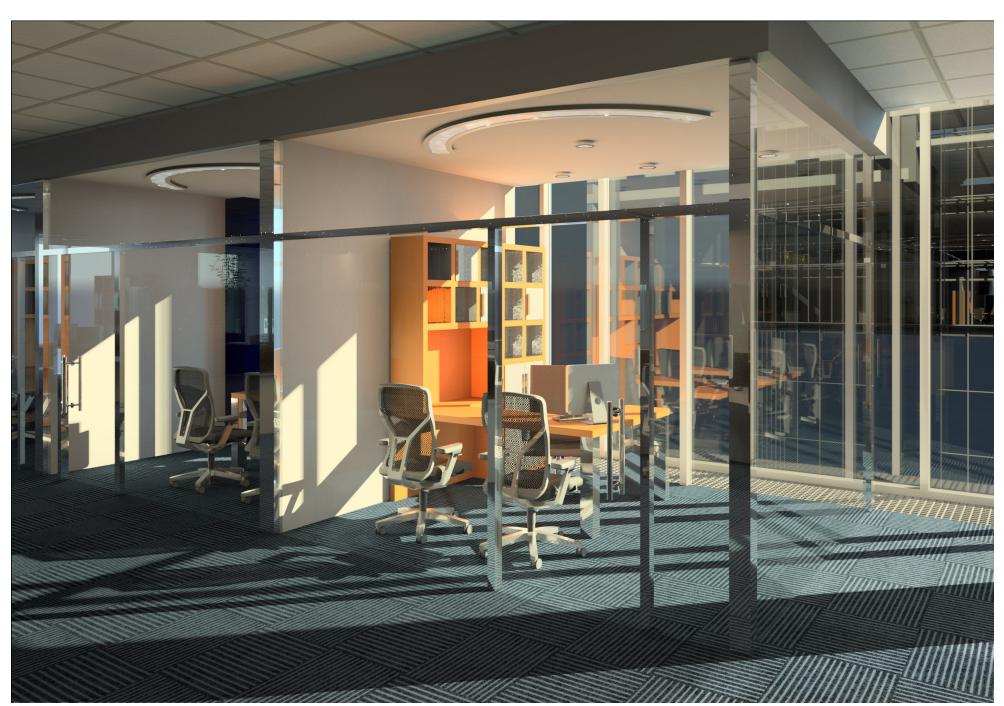
Electrical Plan

Construction

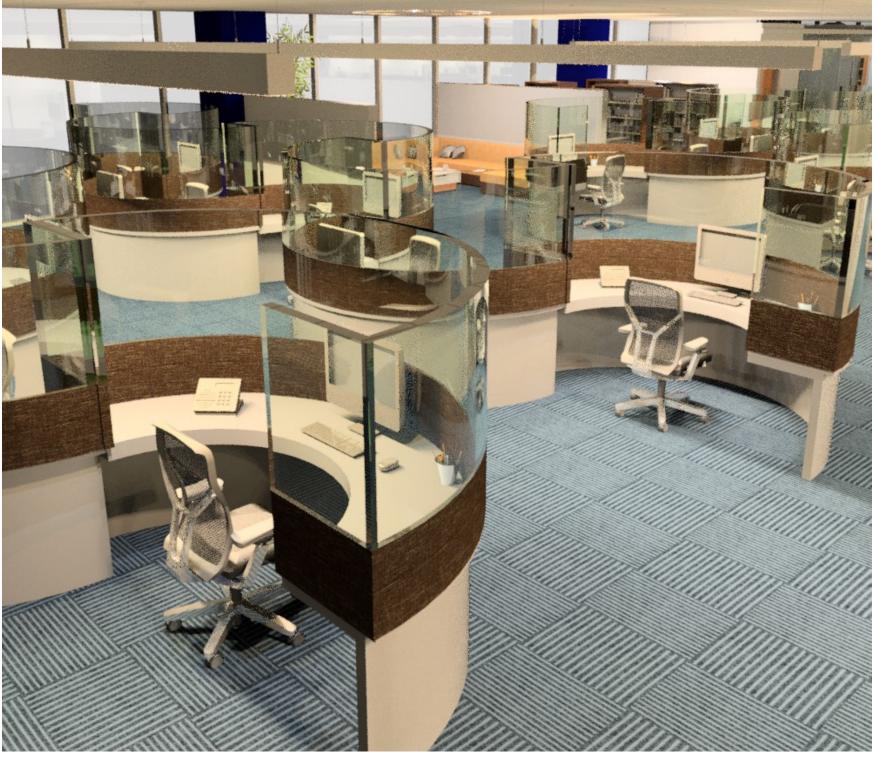
Description	Date					
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Office Floor Pla Level 5-30	an					
C-105						



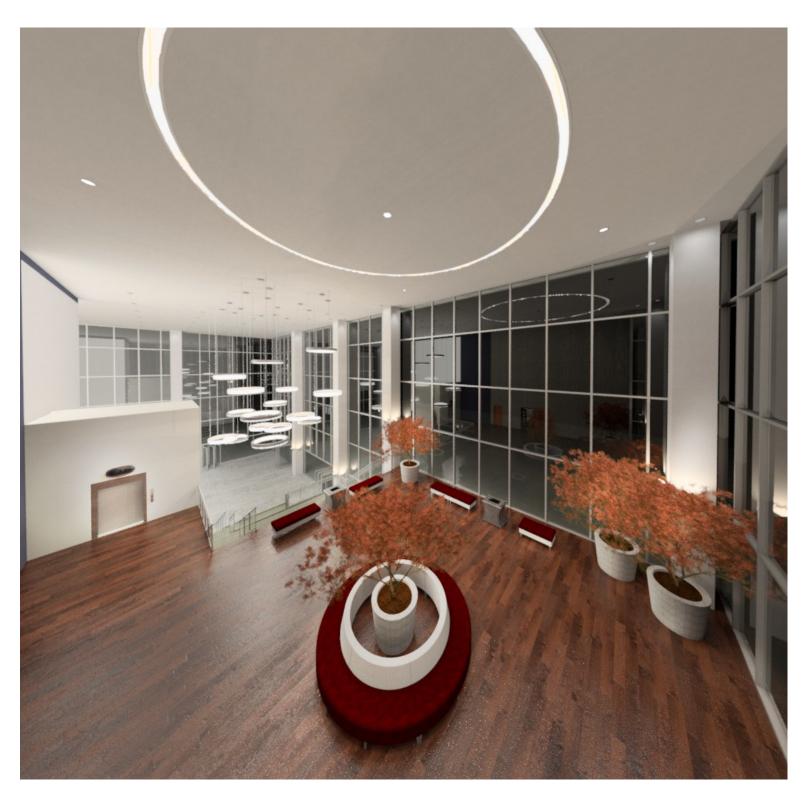
Lobby



Office Room



Office Desks



Upper Lobby





Break Room



Elevator Lobby

Reception Desk



Conference Room

No.

Construction

	Description	Date					
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1	AEI Team Number 05-2014						
	Renderings						
	C-106						