



Pat Allen | Rachel Barrow | Alex Byard | Melanie Fonner | Brad Frederick | Brian LaChance | Mike Palmer

mission

nexus

foci

experience

community

education

conclusion

appendix



nexus

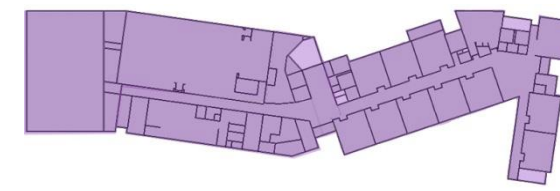
Our mission is to develop a design that merges education with the community in a facility that is safe and cost effective while functioning as a learning tool.

envelope

recreation

classrooms

envelope



nexus

foci

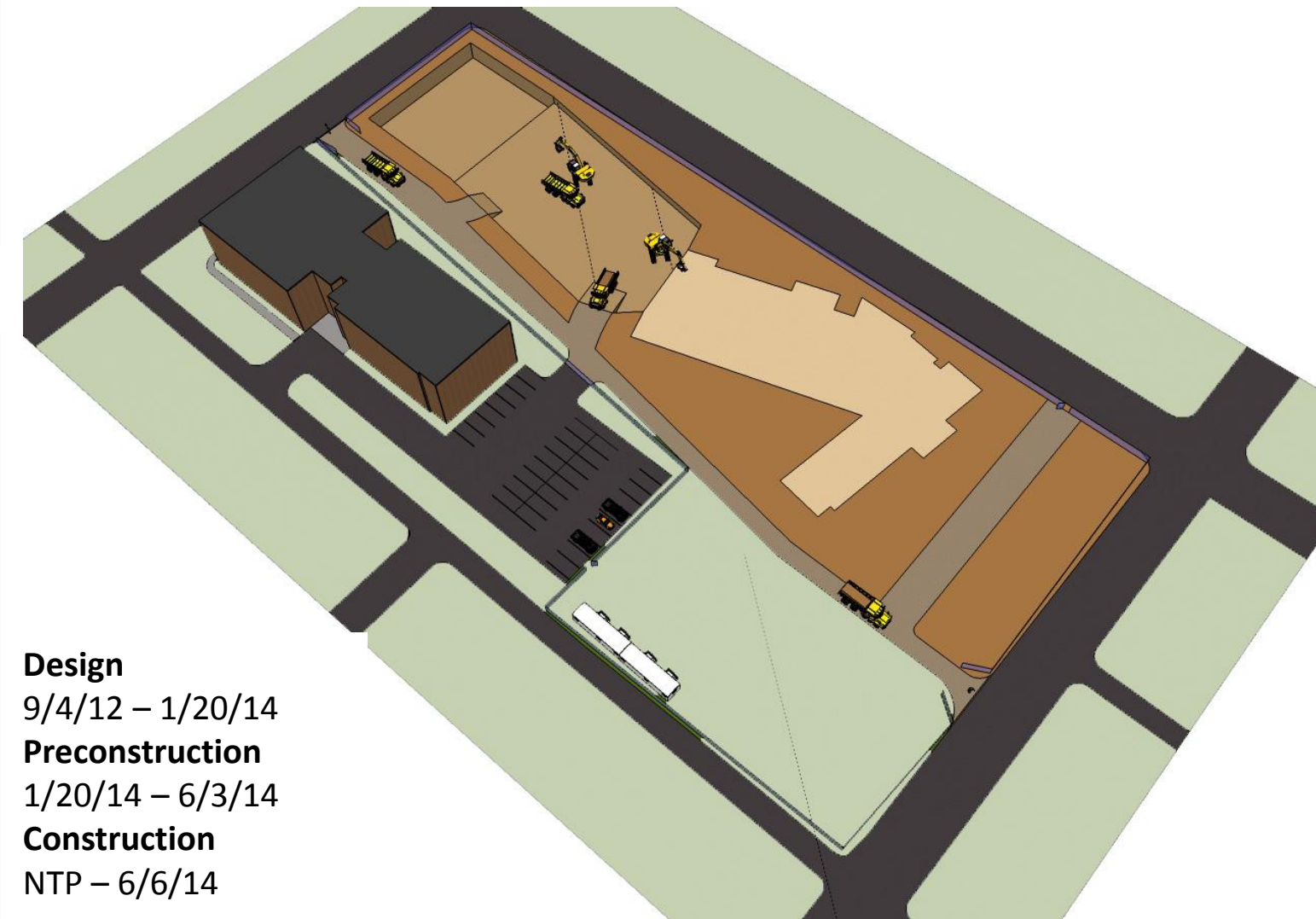
experience

community

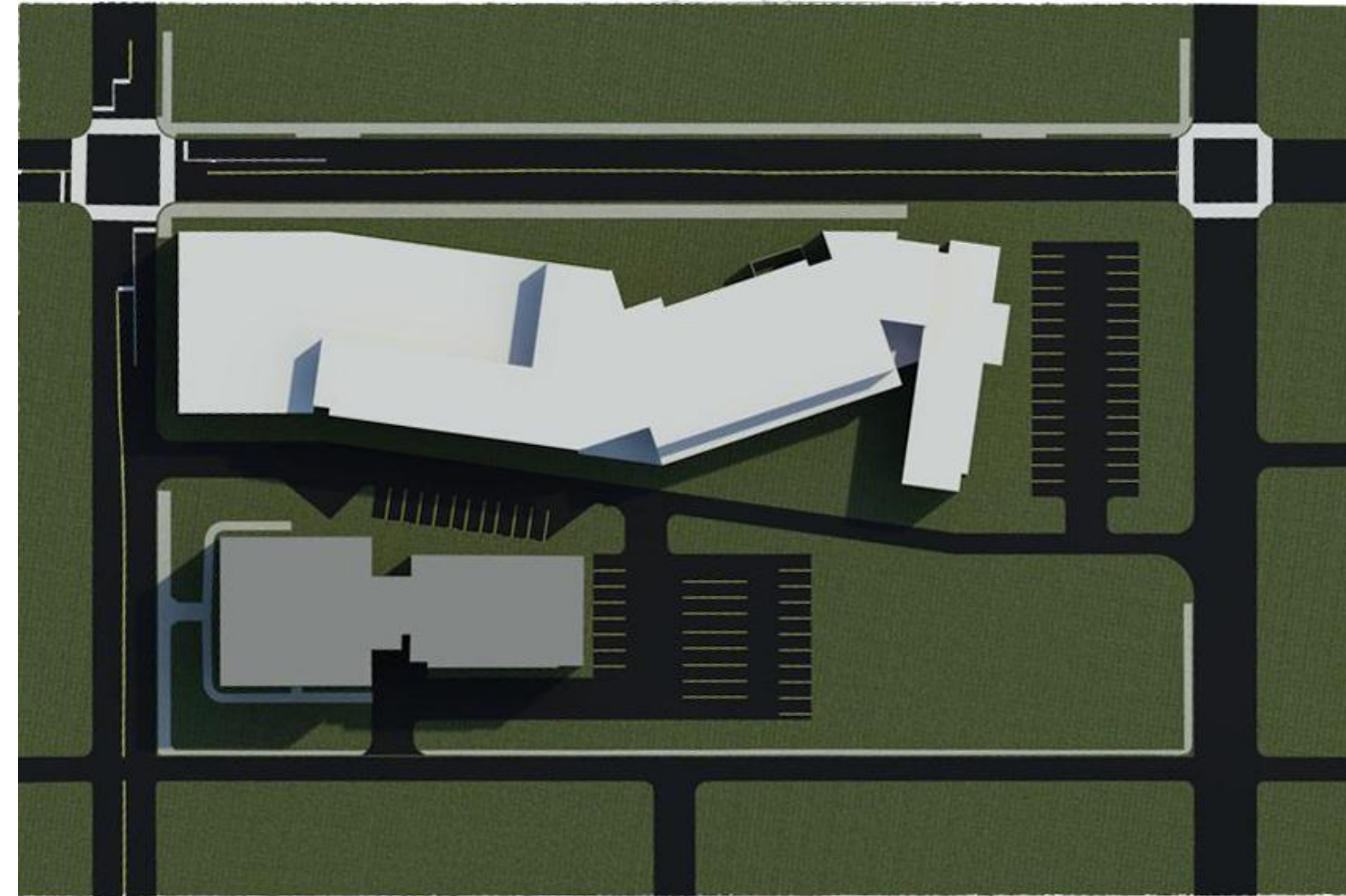
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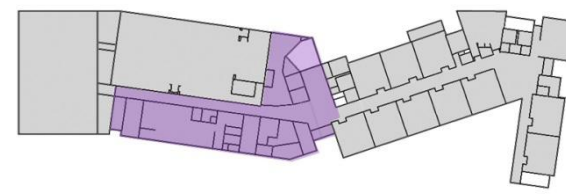
conclusion

appendix



Design
9/4/12 – 1/20/14
Preconstruction
1/20/14 – 6/3/14
Construction
NTP – 6/6/14





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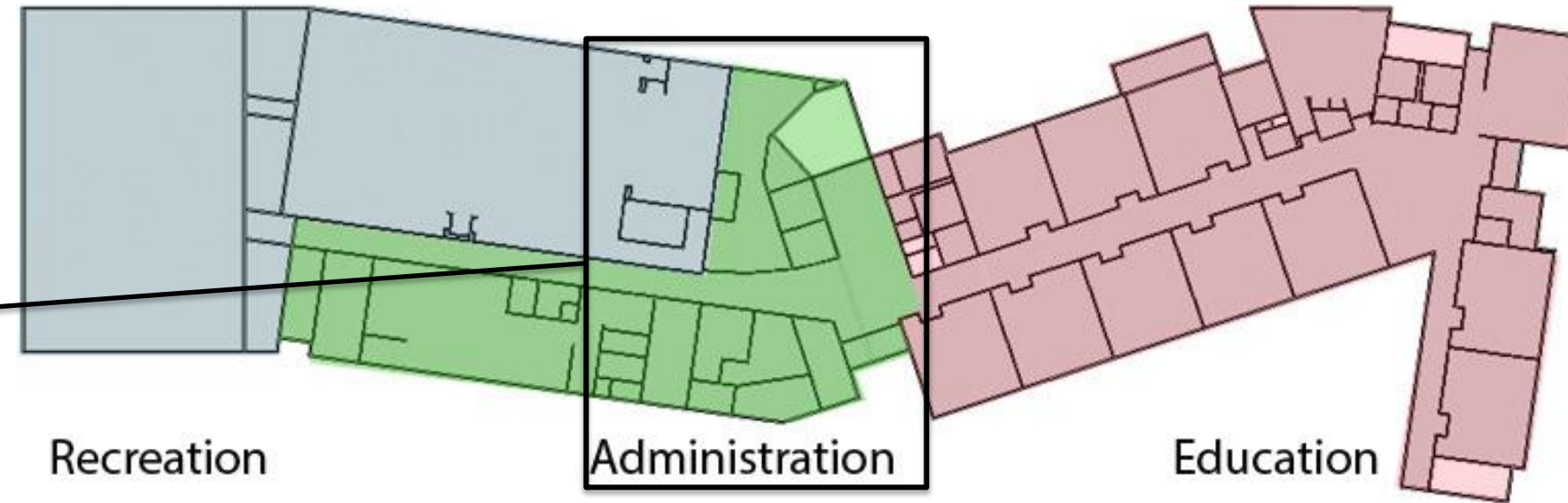
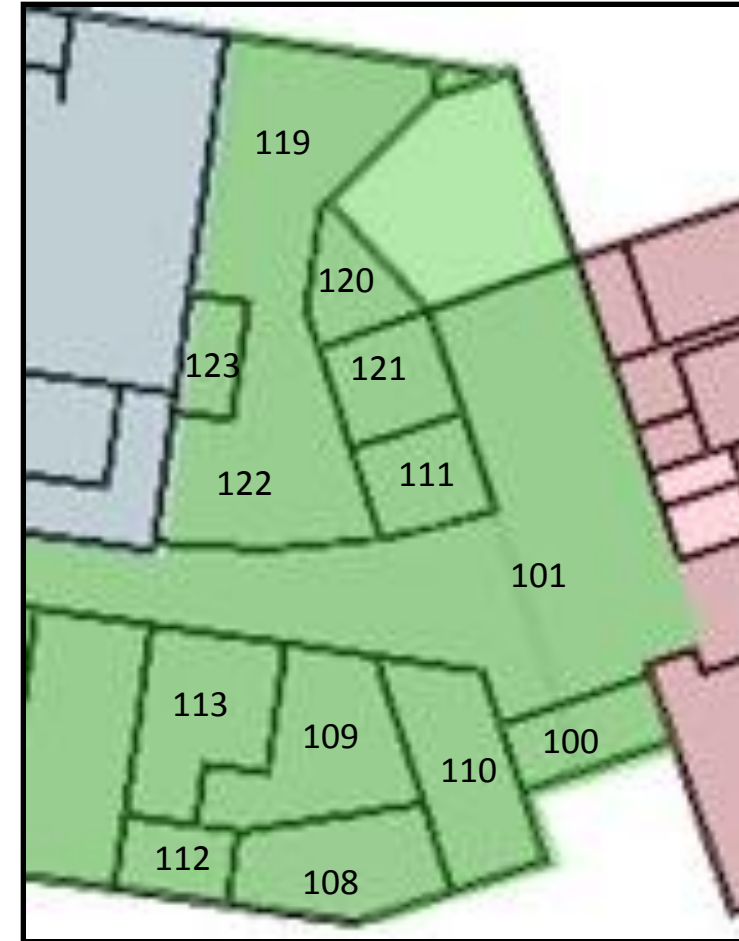
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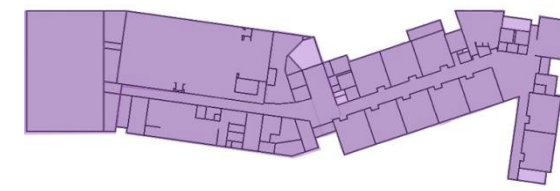
education

conclusion

appendix

- 100 – Vestibule
- 101 – Lobby
- 108 – Principal's Office
- 109 – Clerical
- 110 – Reception
- 111 – Community Office
- 112 – Toilet
- 113 – Workroom
- 119 – Treating / Waiting
- 120 – Nurse Office
- 121 – Exam
- 122 – Cots
- 123 – Toilet





nexus

foci

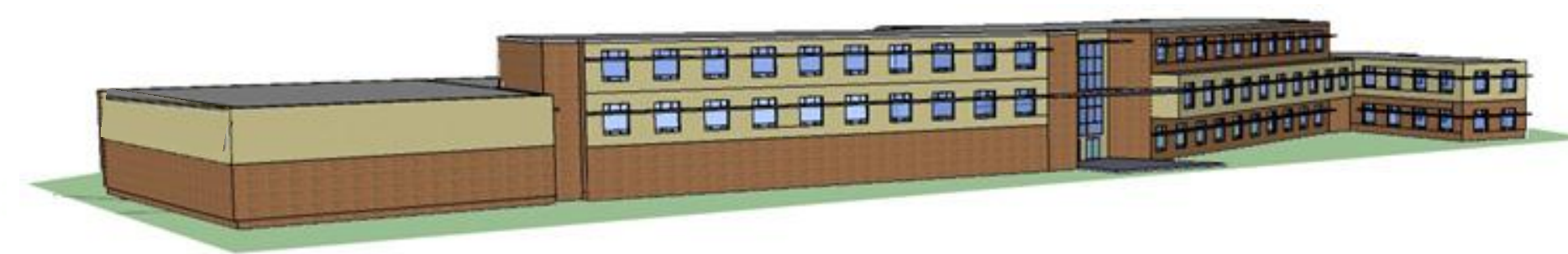
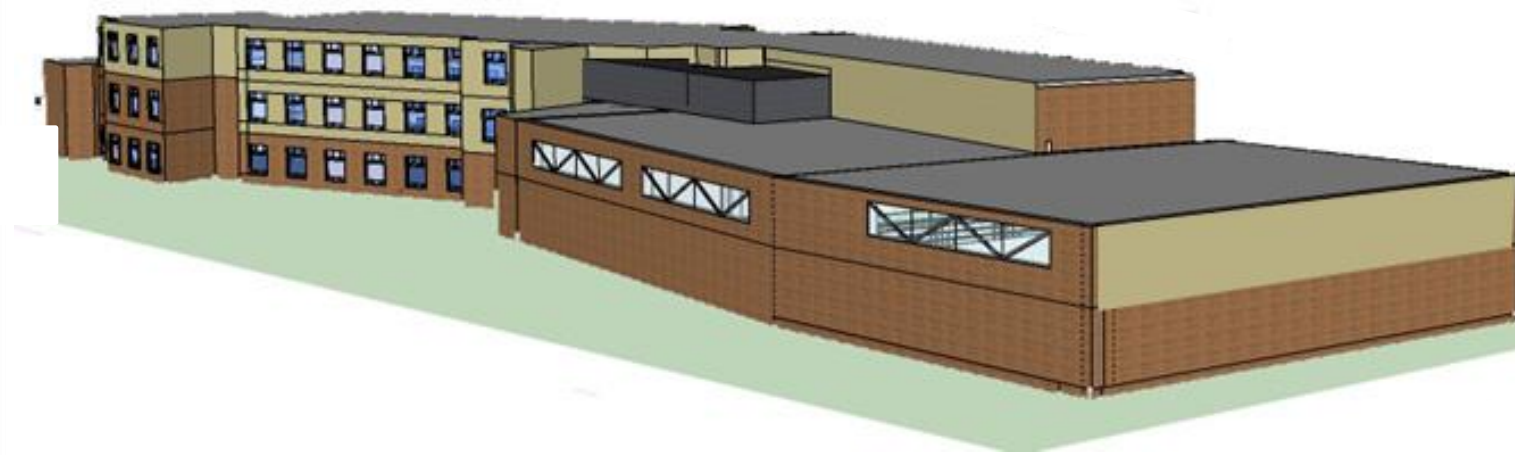
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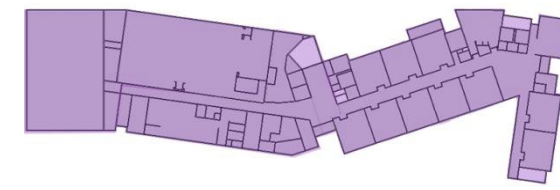
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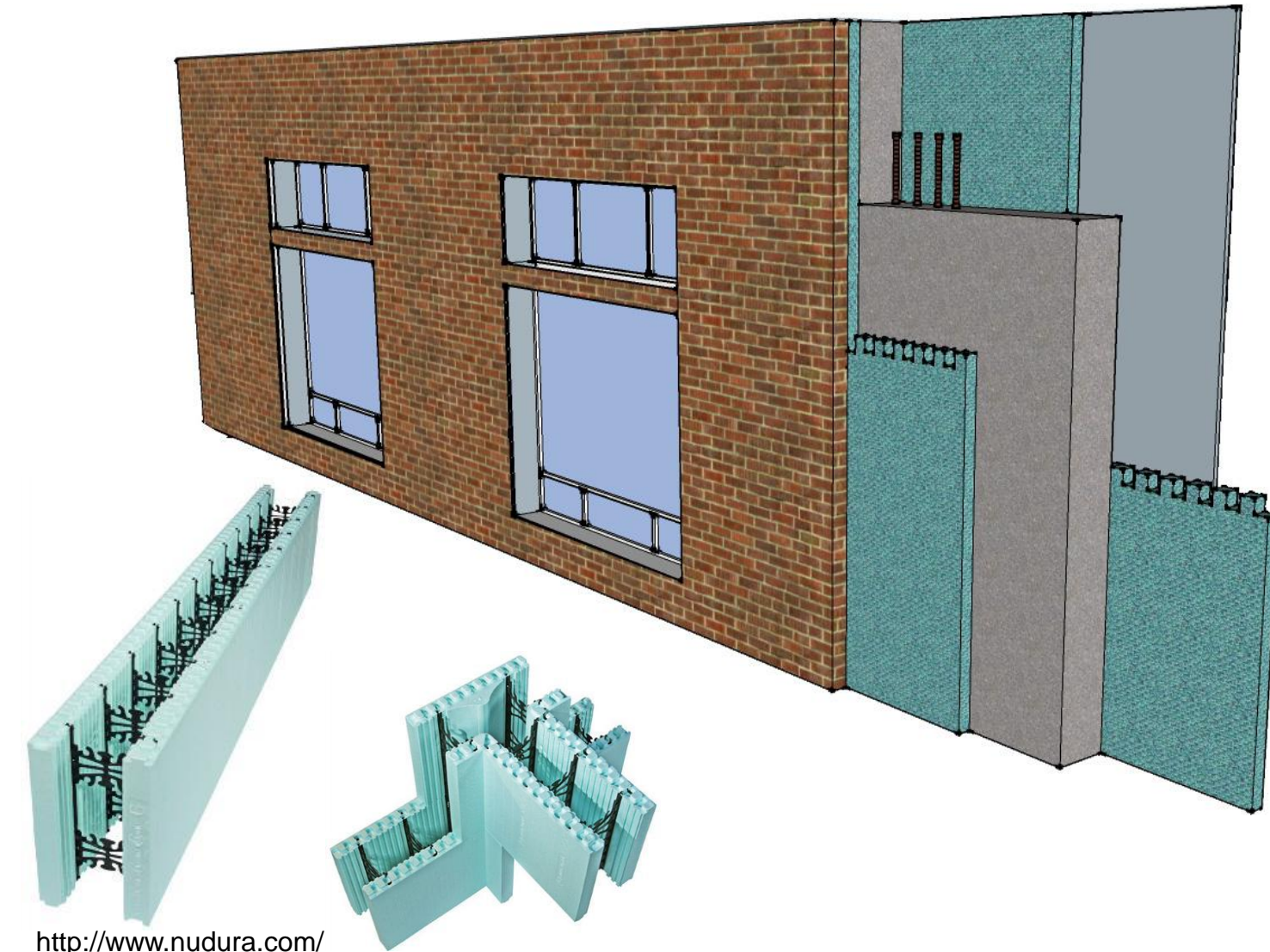
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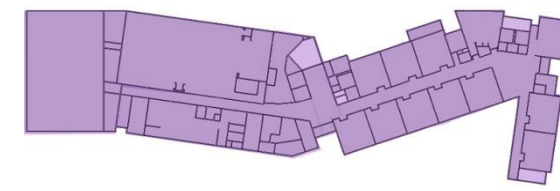


<http://www.dri-design.com/>

<http://www.nudura.com/>

Cost Breakdown				
		Cost/SF	% of Cost	Cost
Division 1	General Requirements	\$ 13.21	6%	\$ 1,281,000
Division 2	Existing Conditions	\$ 4.40	2%	\$ 427,000
Division 3	Concrete	\$ 37.42	17%	\$ 3,629,500
Division 4	Masonry	\$ 17.61	8%	\$ 1,708,000
Division 5	Metals	\$ 8.80	4%	\$ 854,000
Division 6	Wood, Plastics, and Composites	\$ 2.20	1%	\$ 213,500
Division 7	Thermal and Moisture Protection	\$ 6.60	3%	\$ 640,500
Division 8	Openings	\$ 11.01	5%	\$ 1,067,500
Division 9	Finishes	\$ 8.80	4%	\$ 854,000
Division 10	Specialties	\$ 2.20	1%	\$ 213,500
Division 11	Equipment	\$ 2.20	1%	\$ 213,500
Division 12	Furnishings	\$ 2.20	1%	\$ 213,500
Division 13	Special Construction	\$ 26.41	12%	\$ 2,562,000
Division 14	Conveying Equipment	\$ 2.20	1%	\$ 213,500
Division 21	Fire Supression	\$ 2.20	1%	\$ 213,500
Division 22	Plumbing	\$ 13.21	6%	\$ 1,281,000
Division 23	HVAC	\$ 35.22	16%	\$ 3,416,000
Division 26	Electrical	\$ 17.61	8%	\$ 1,708,000
Division 28	Electronic Safety and Security	\$ 4.40	2%	\$ 427,000
Division 32	Exterior Improvements	\$ 2.20	1%	\$ 213,500
		Cost / SF \$ 220.10		\$ 21,350,000
location factor 0.99			Total	\$ 21,136,500.00

ethylene-glycol runaround



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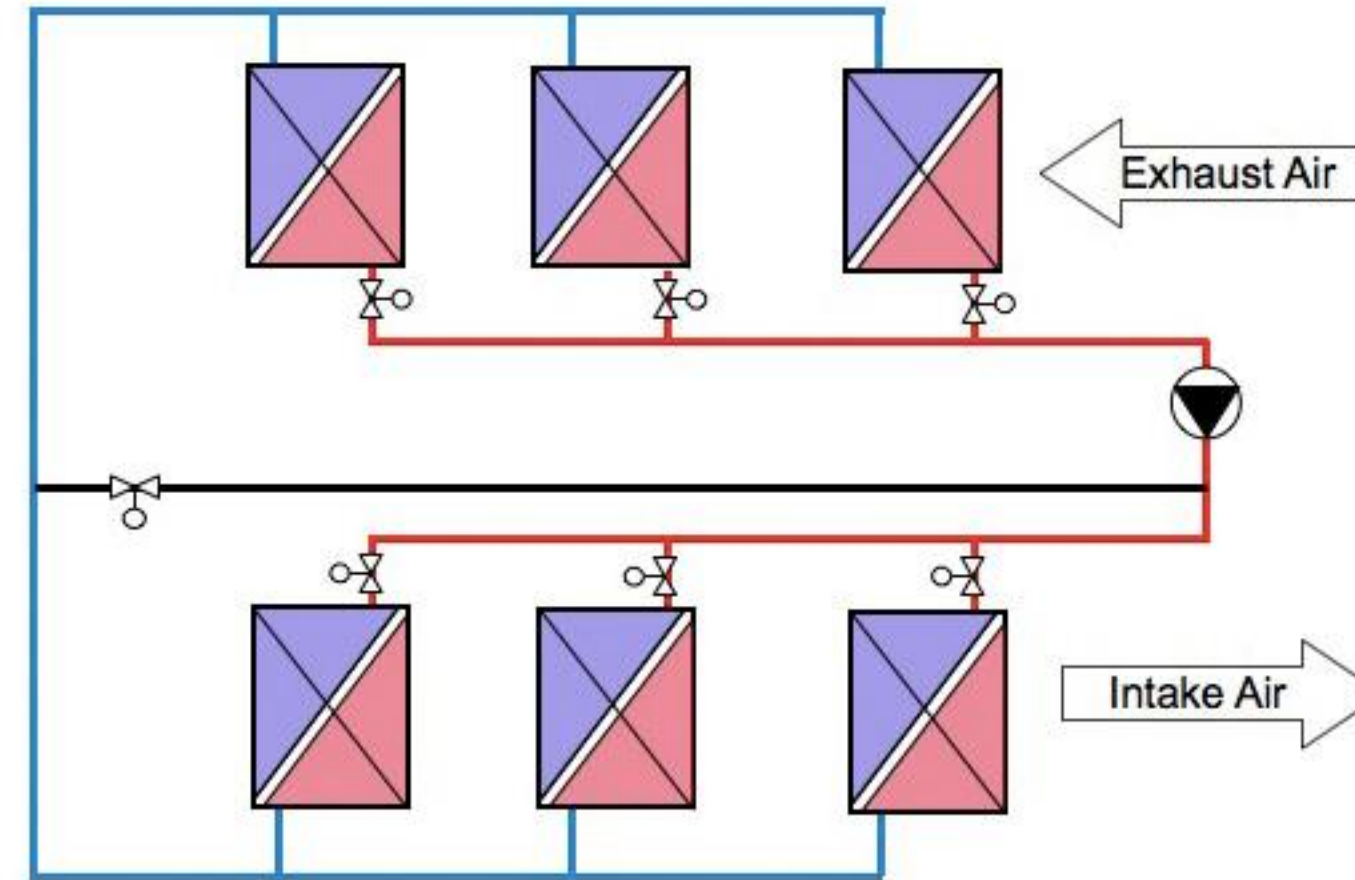
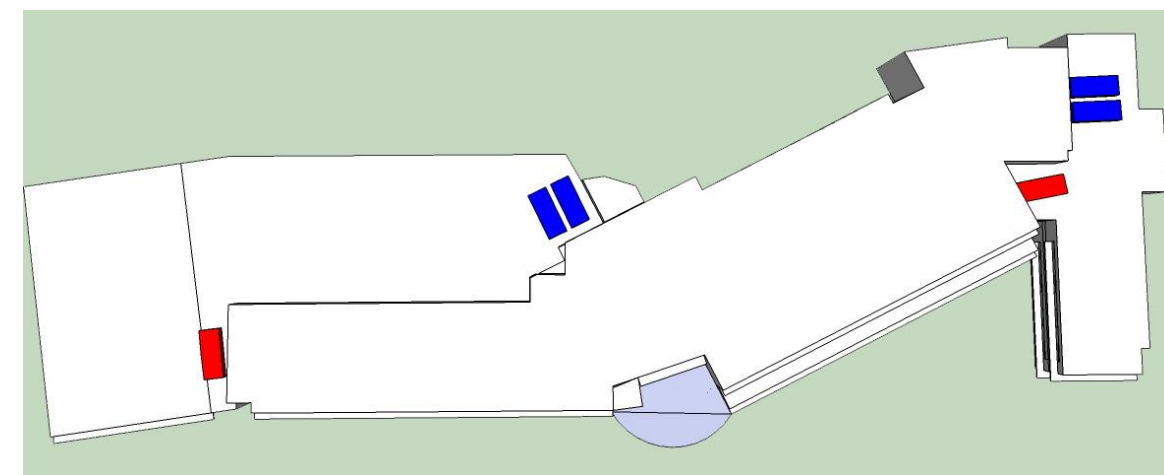
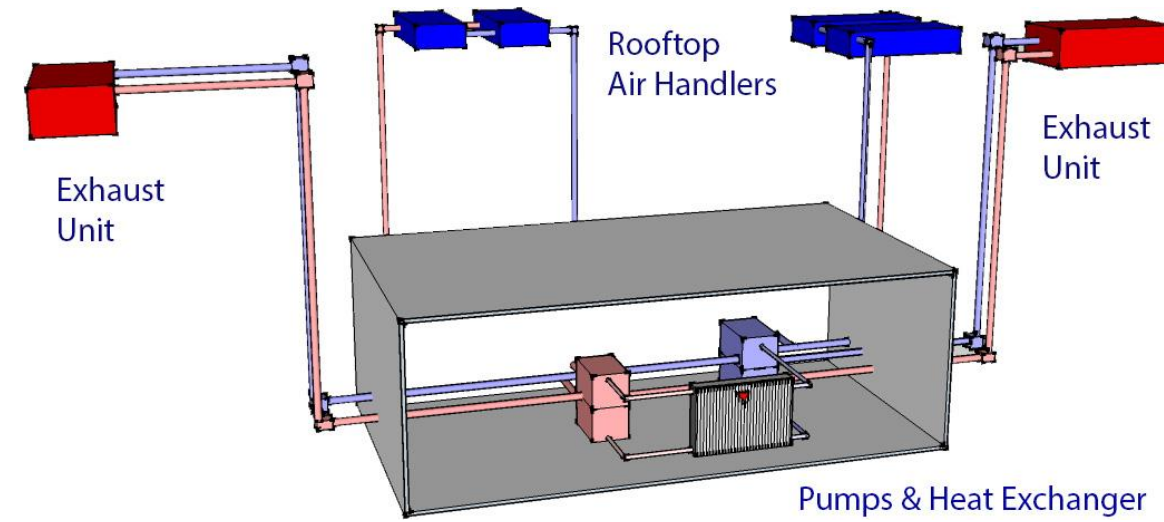
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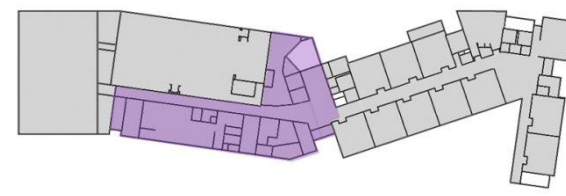
konvekta

Zone	Cooling Capacity [TONS]	Heating Capacity [TONS]	Airflow [CFM]
Pool	28.1	66.7	6,200
Multi-Purpose Room	25.5	2.4	8,600
Lobby/Admin Wing	58.4	6.0	18,200
Central Wing	63.4	6.1	21,700
Right Wing	58.8	5.9	20,200
TOTAL	236.1	85.1	79,300



<http://www.konvekta.com/>

lobby



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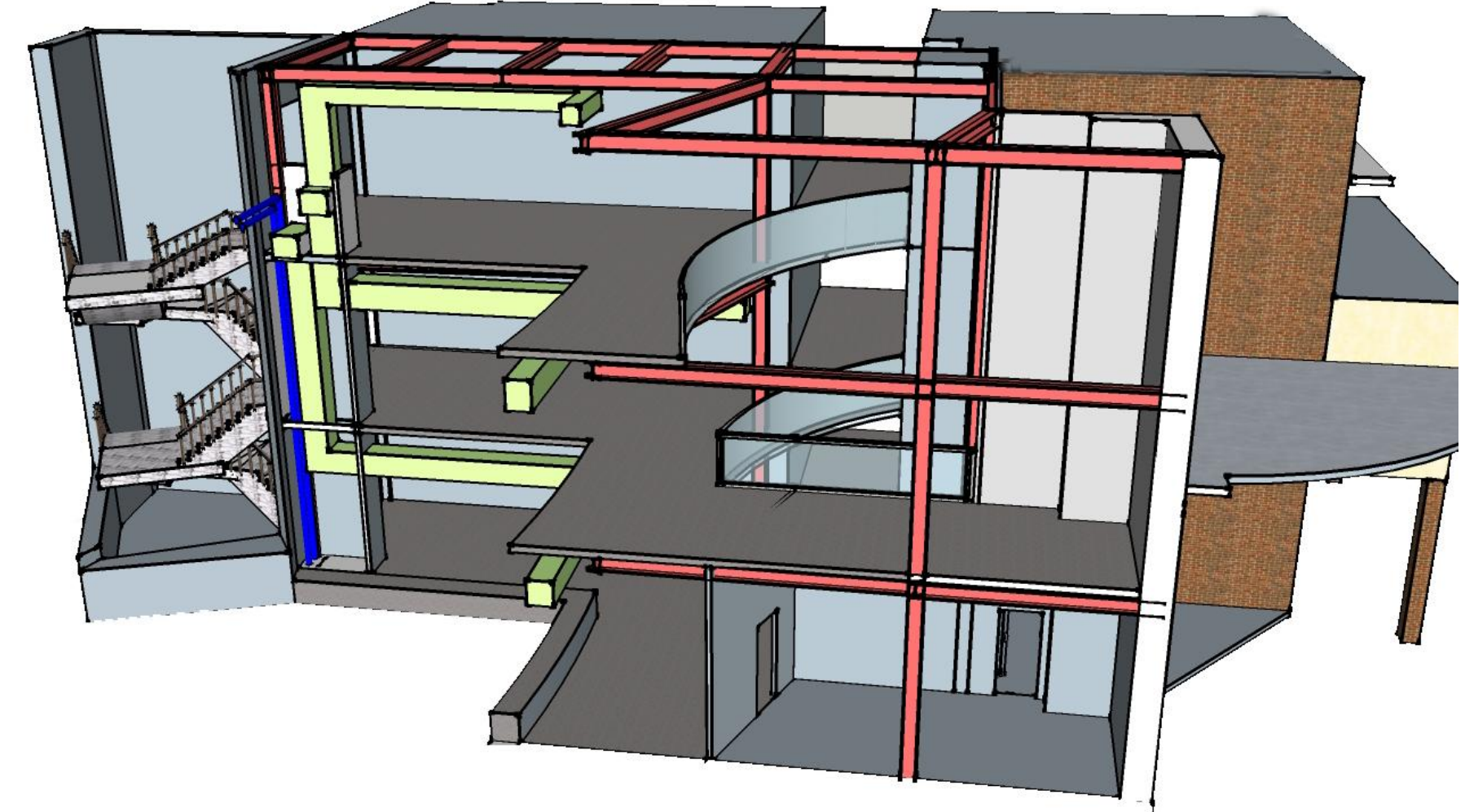
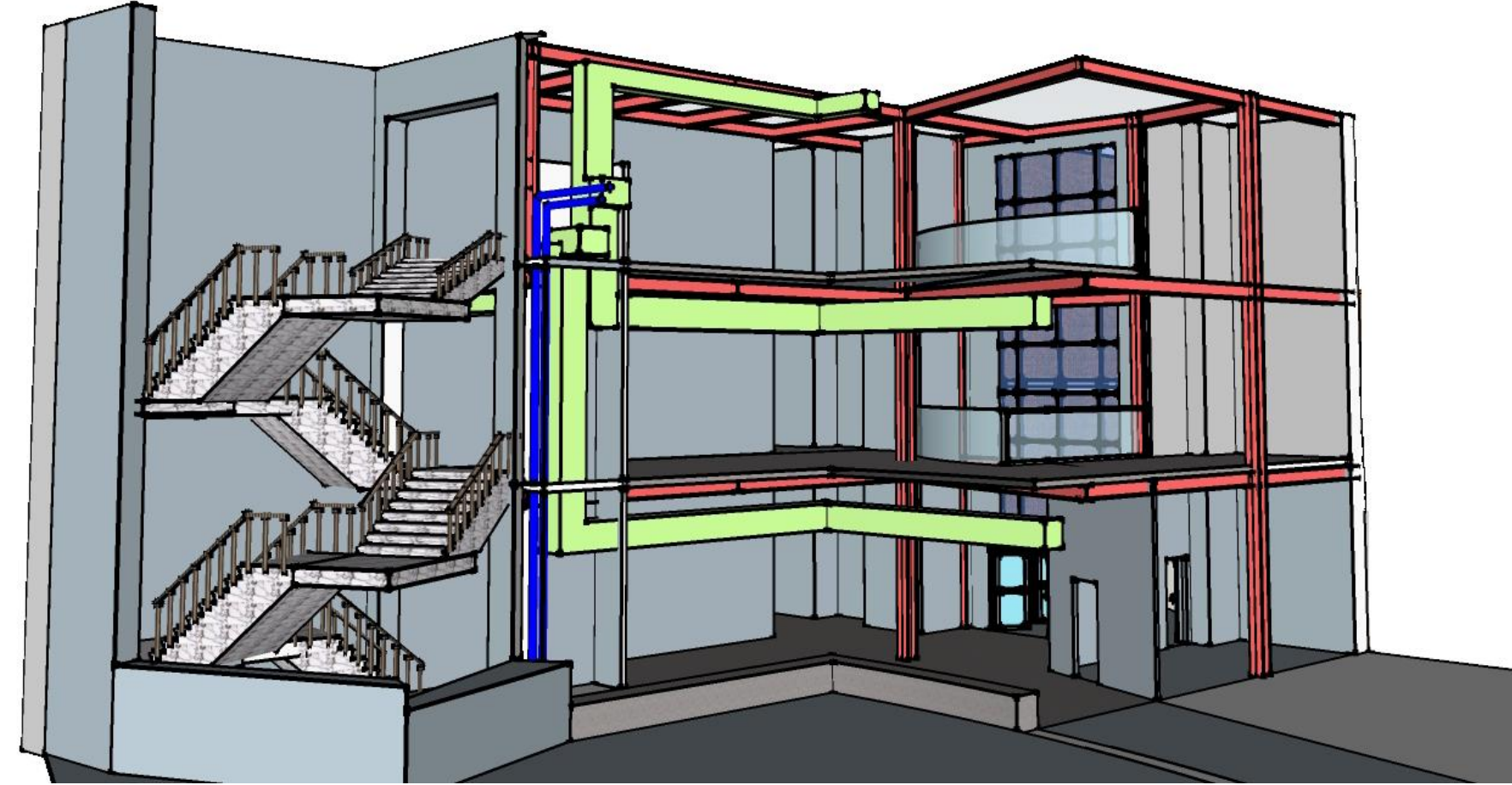
experience

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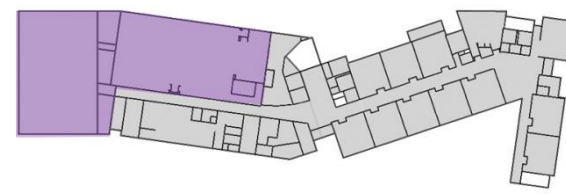
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recreation



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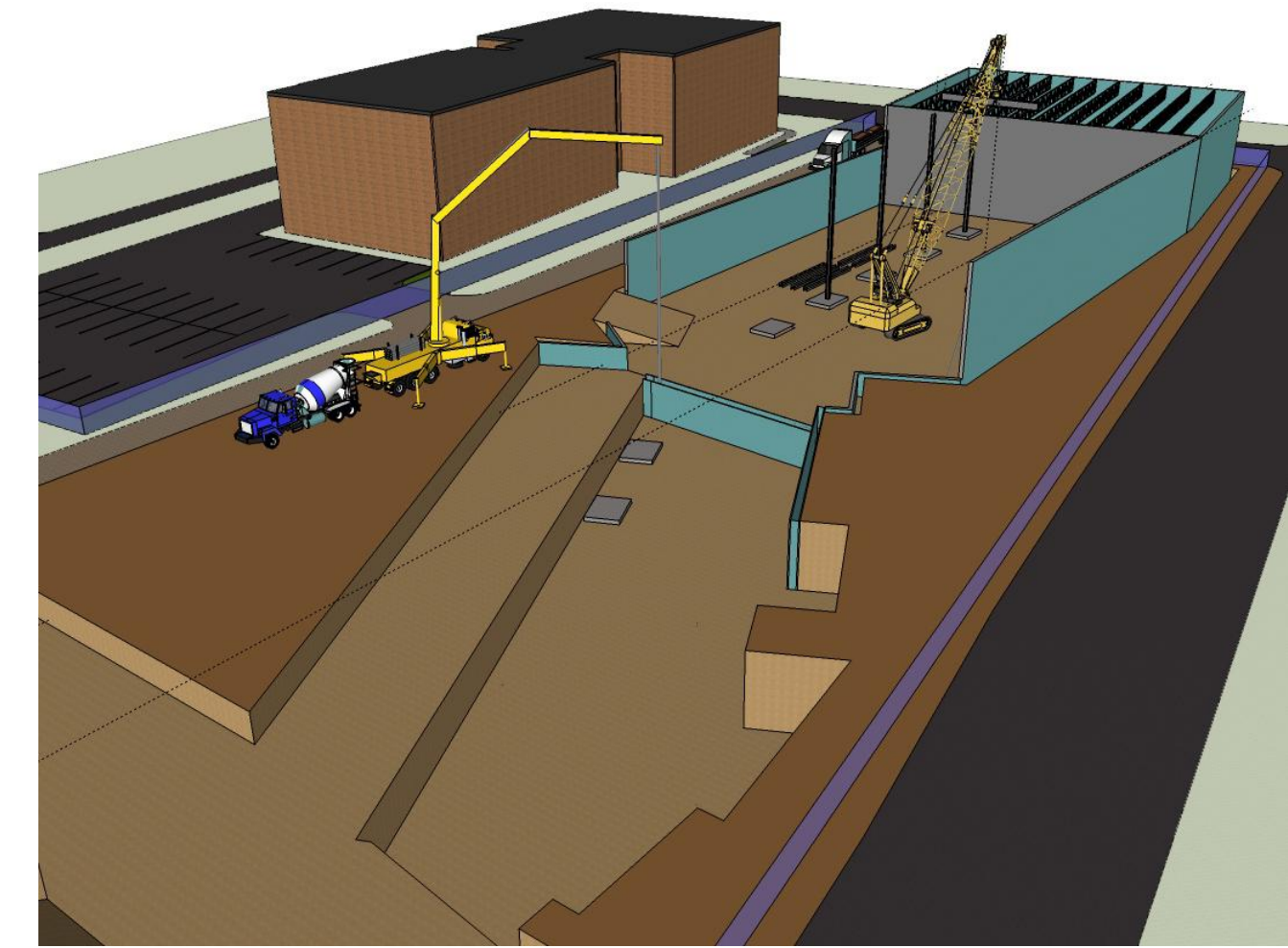
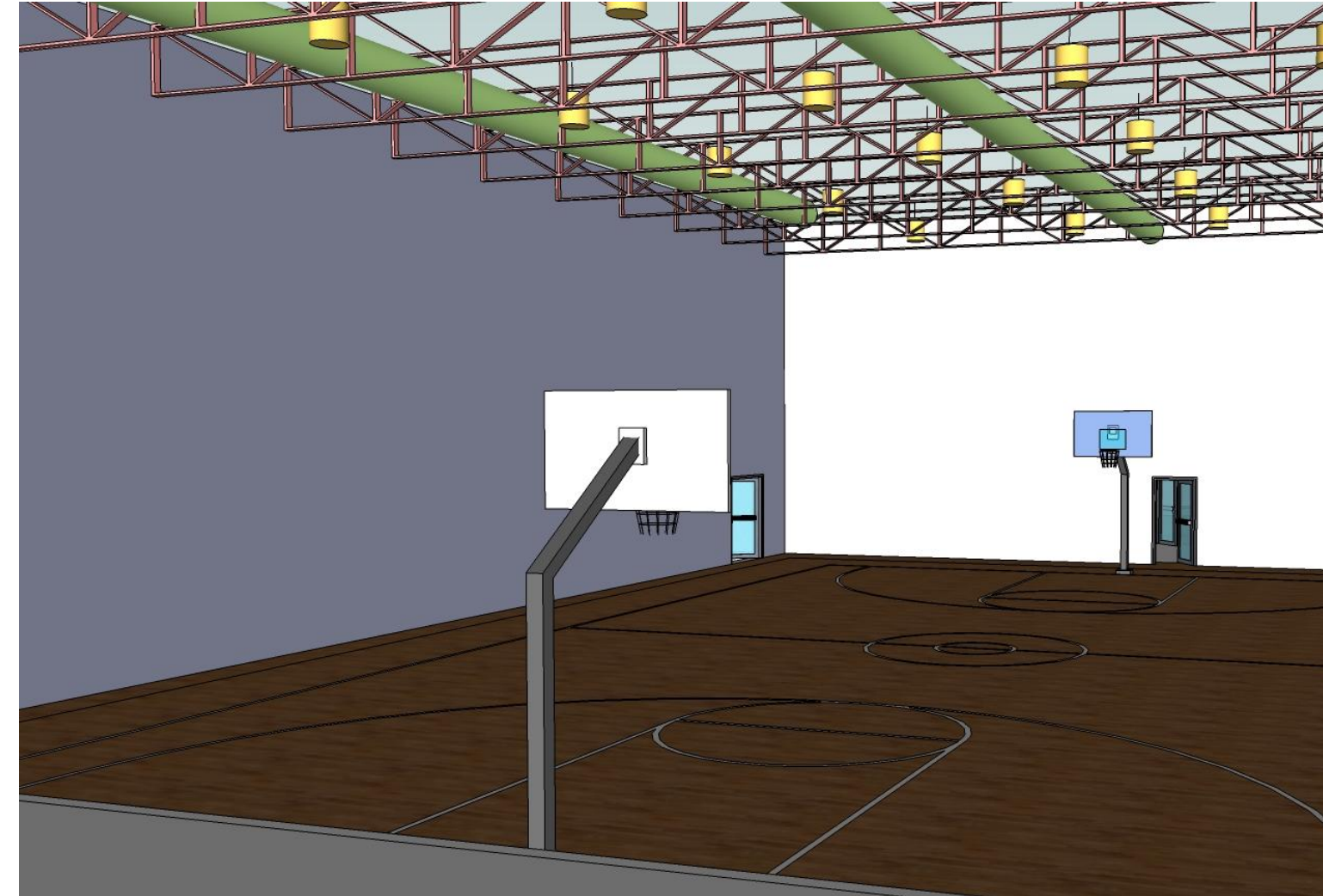
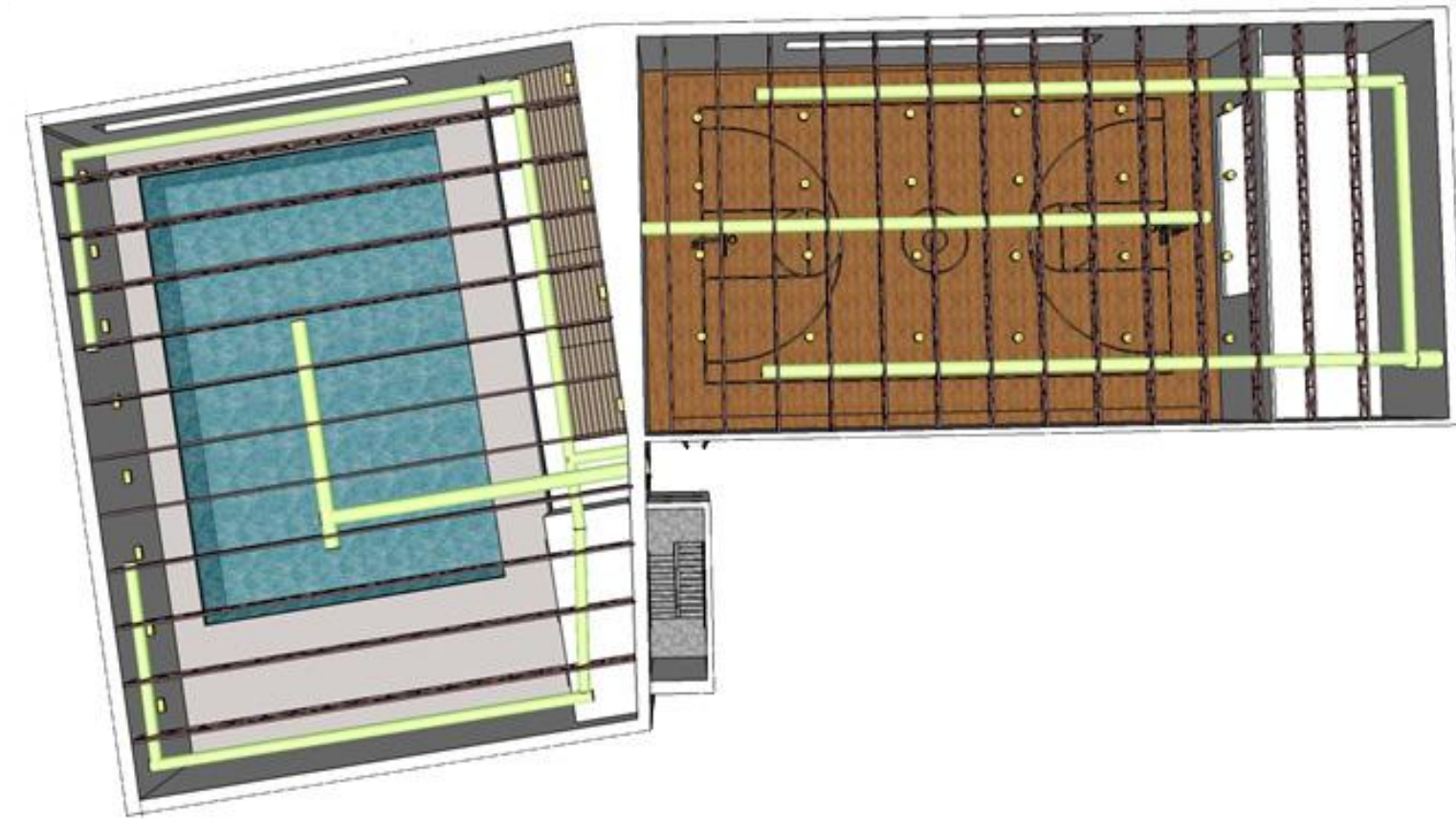
experience

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Structure

September – December

Water Tight

January

MEP Rough-In and Finishes

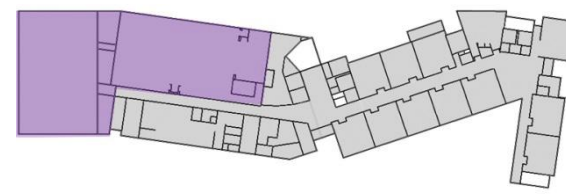
January – August

Owner Move-In

Last two weeks of August

First Day of School

8/24/15



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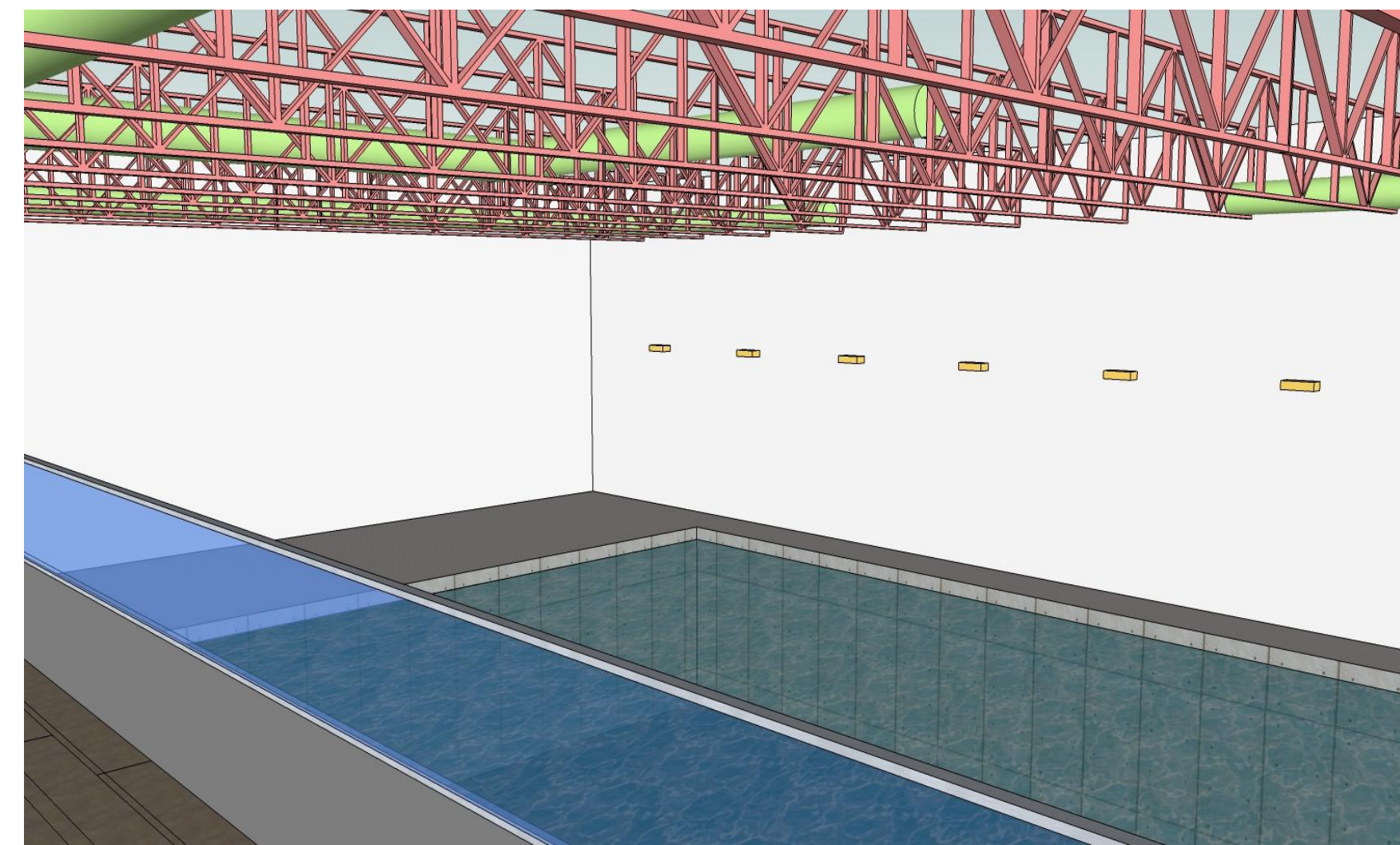
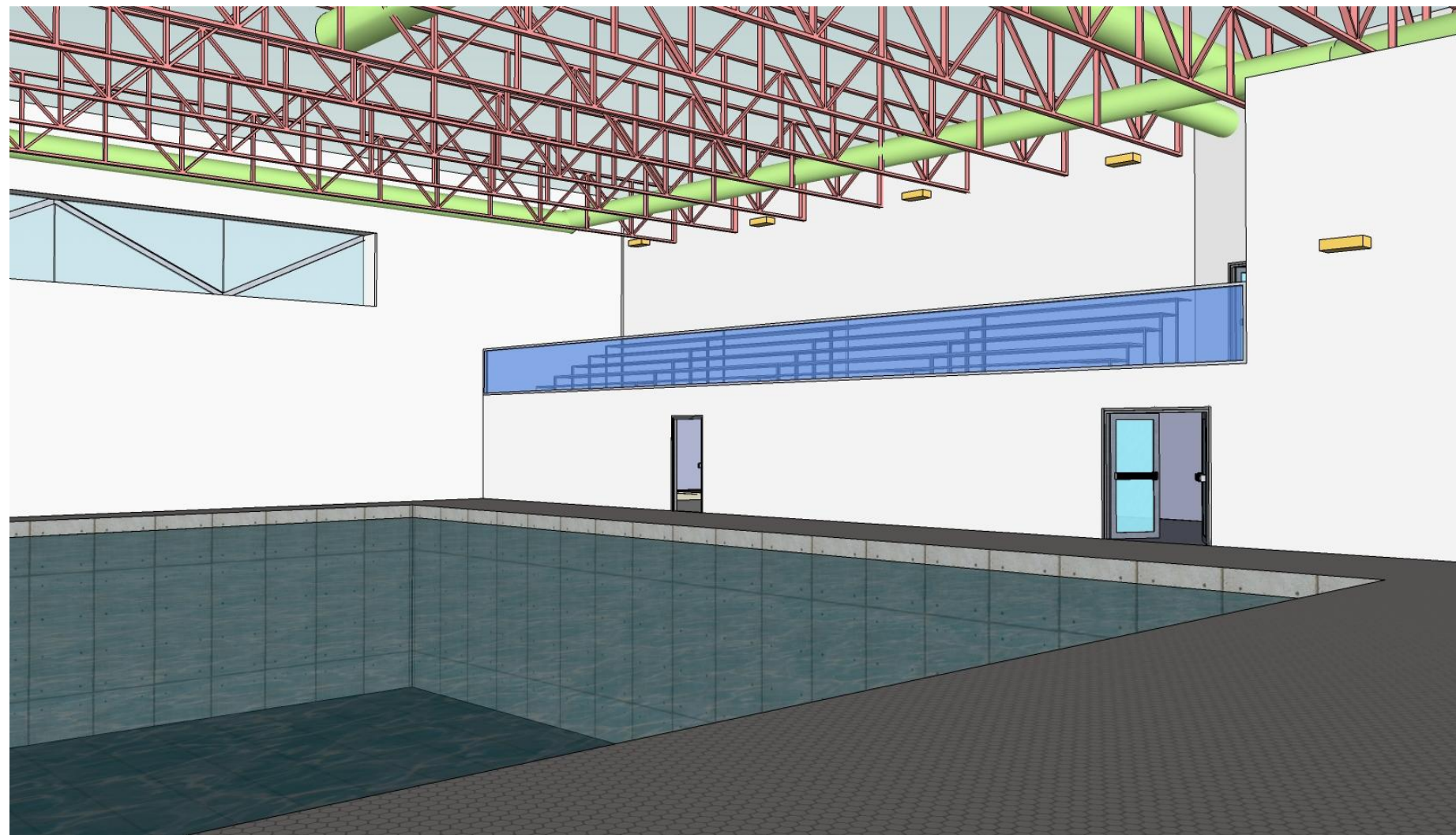
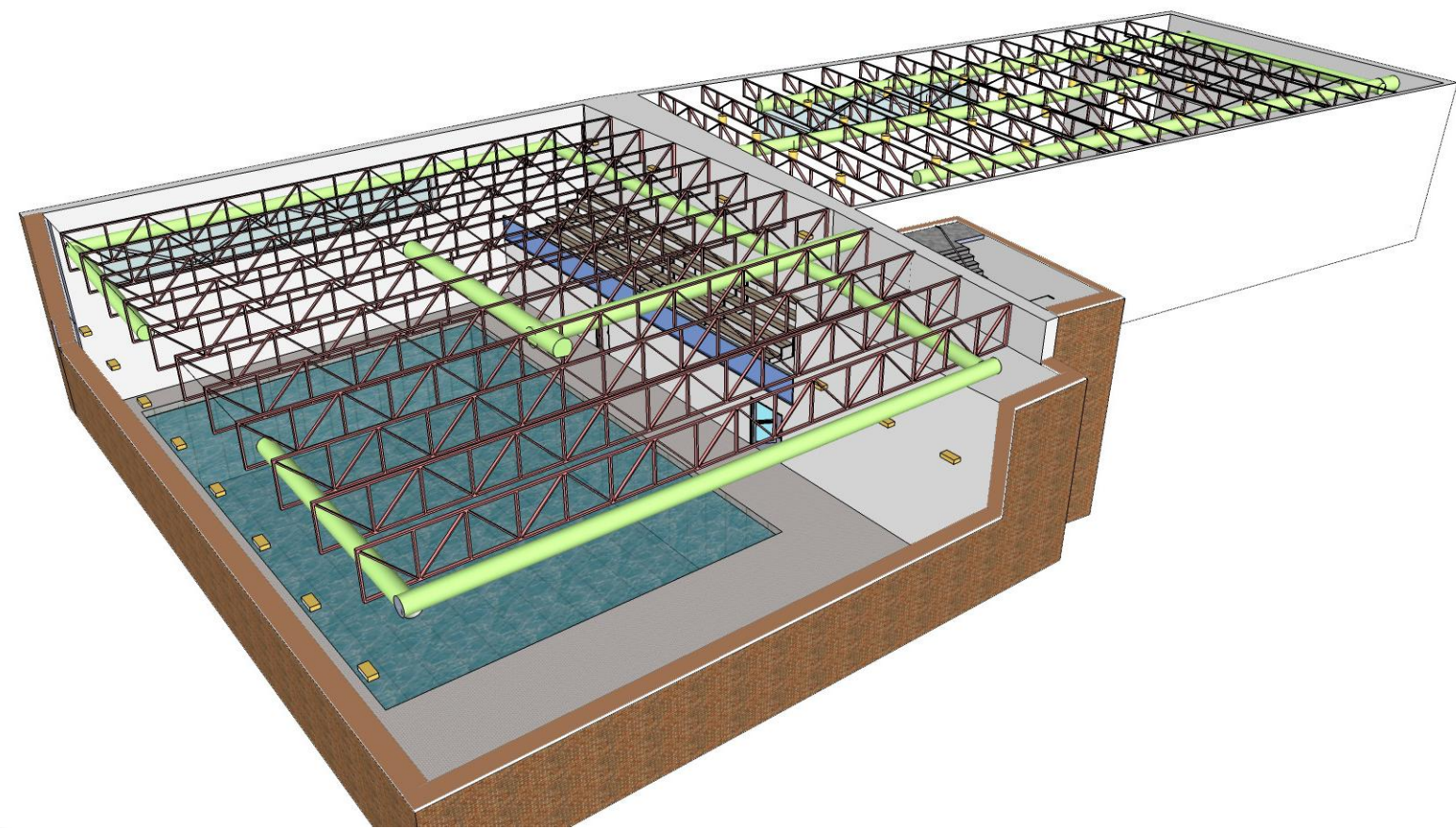
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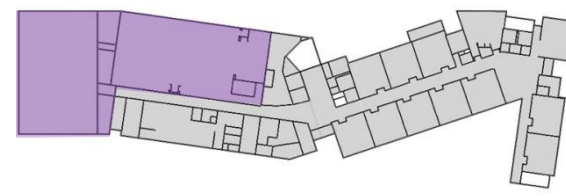
community

education

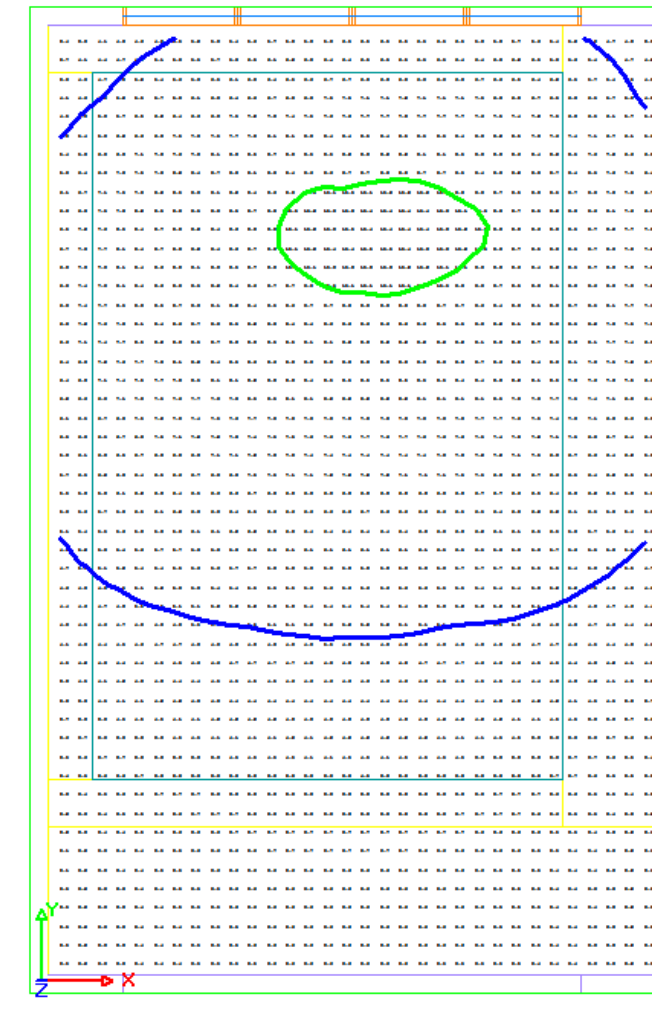
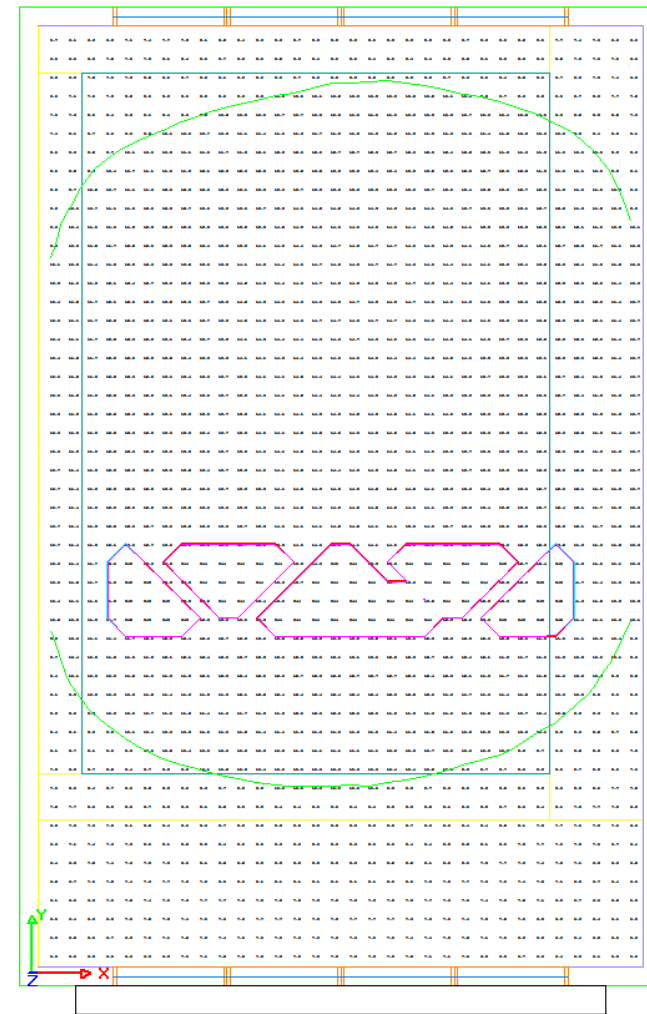
conclusion

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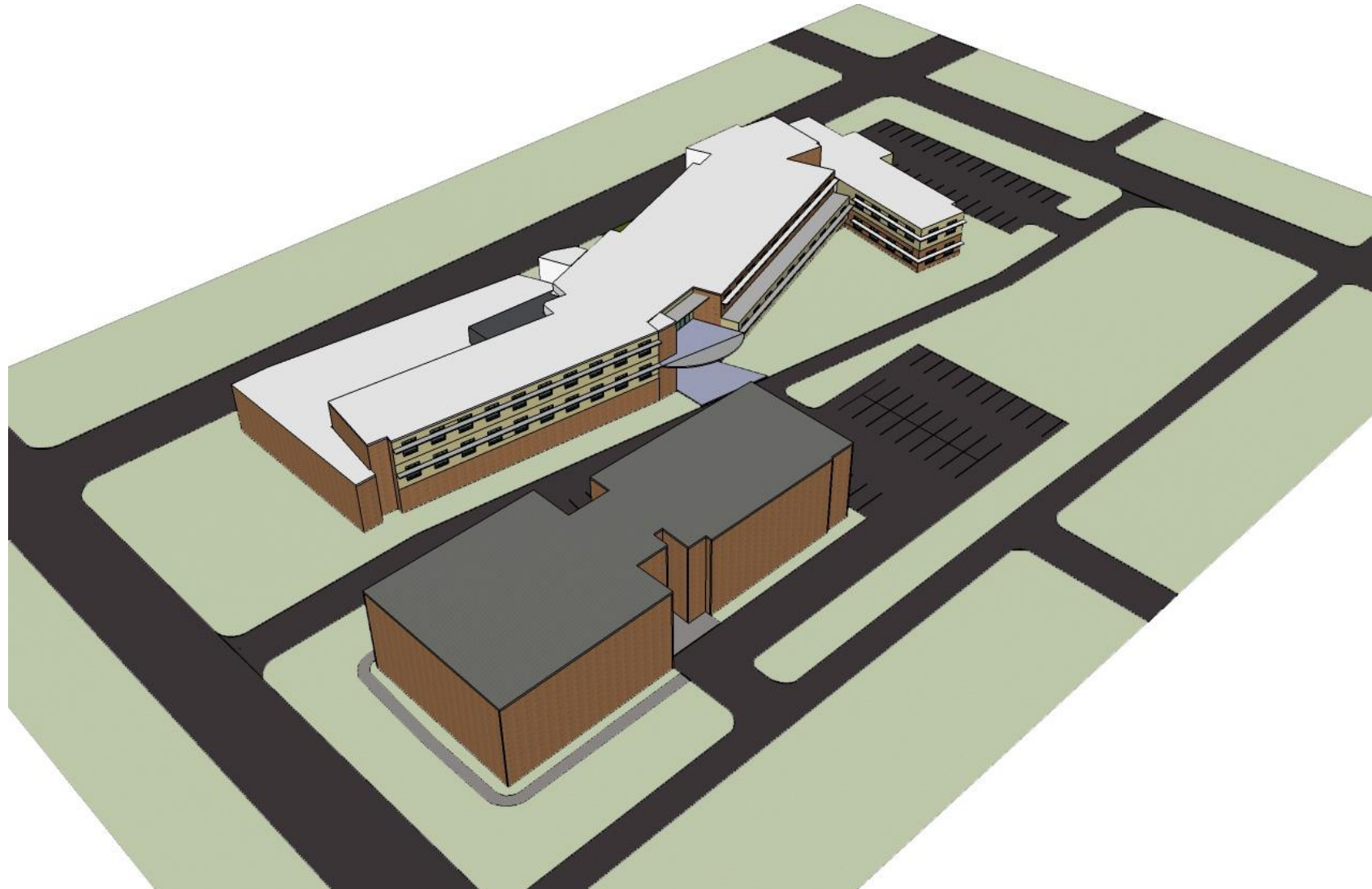
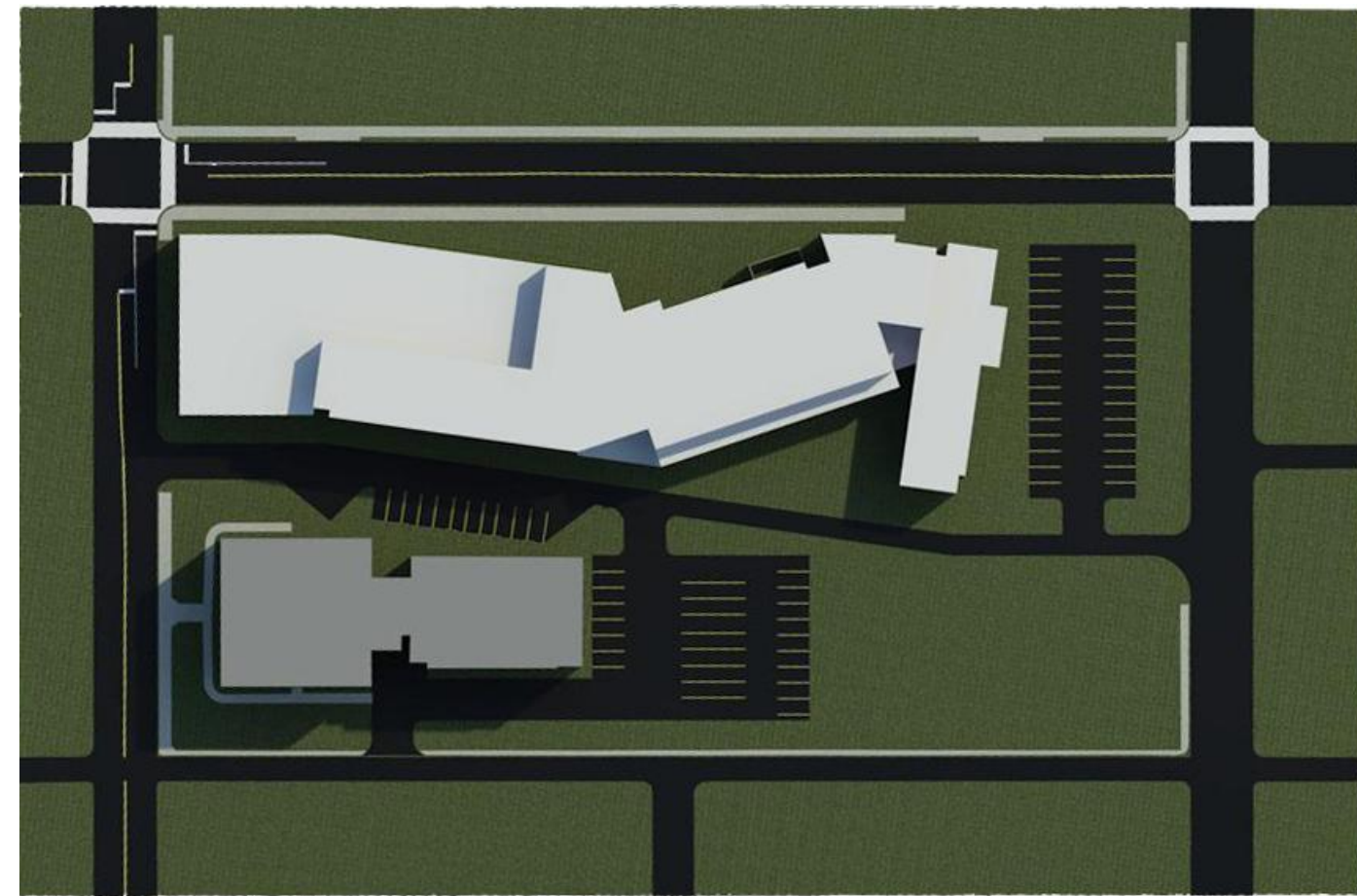
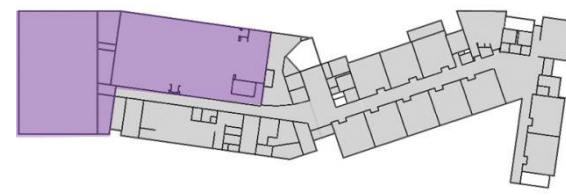




<http://www.poolpak.com/>



Cost Breakdown				
		Cost/SF	% of Cost	Cost
Division 1	General Requirements	\$ 13.21	6%	\$ 1,281,000
Division 2	Existing Conditions	\$ 4.40	2%	\$ 427,000
Division 3	Concrete	\$ 37.42	17%	\$ 3,629,500
Division 4	Masonry	\$ 17.61	8%	\$ 1,708,000
Division 5	Metals	\$ 8.80	4%	\$ 854,000
Division 6	Wood, Plastics, and Composites	\$ 2.20	1%	\$ 213,500
Division 7	Thermal and Moisture Protection	\$ 6.60	3%	\$ 640,500
Division 8	Openings	\$ 11.01	5%	\$ 1,067,500
Division 9	Finishes	\$ 8.80	4%	\$ 854,000
Division 10	Specialties	\$ 2.20	1%	\$ 213,500
Division 11	Equipment	\$ 2.20	1%	\$ 213,500
Division 12	Furnishings	\$ 2.20	1%	\$ 213,500
Division 13	Special Construction	\$ 26.41	12%	\$ 2,562,000
Division 14	Conveying Equipment	\$ 2.20	1%	\$ 213,500
Division 21	Fire Supression	\$ 2.20	1%	\$ 213,500
Division 22	Plumbing	\$ 13.21	6%	\$ 1,281,000
Division 23	HVAC	\$ 35.22	16%	\$ 3,416,000
Division 26	Electrical	\$ 17.61	8%	\$ 1,708,000
Division 28	Electronic Safety and Security	\$ 4.40	2%	\$ 427,000
Division 32	Exterior Improvements	\$ 2.20	1%	\$ 213,500
		Cost / SF \$ 220.10		\$ 21,350,000
location factor 0.99			Total	\$ 21,136,500.00



Cost Breakdown without Pool					
	Cost/SF	% of Cost	Cost	Variance	Variance
Division 1 General Requirements	\$ 11.01	5%	\$ 1,067,500	-1%	\$ (200,690)
Division 2 Existing Conditions	\$ 4.40	2%	\$ 427,000		
Division 3 Concrete	\$ 37.42	17%	\$ 3,629,500		
Division 4 Masonry	\$ 22.01	10%	\$ 2,135,000	+2%	\$ 444,080
Division 5 Metals	\$ 8.80	4%	\$ 854,000		
Division 6 Wood, Plastics, and Composites	\$ 2.20	1%	\$ 213,500		
Division 7 Thermal and Moisture Protection	\$ 6.60	3%	\$ 640,500		
Division 8 Openings	\$ 15.41	7%	\$ 1,494,500	+2%	\$ 437,675
Division 9 Finishes	\$ 11.01	5%	\$ 1,067,500	+1%	\$ 222,040
Division 10 Specialties	\$ 2.20	1%	\$ 213,500		
Division 11 Equipment	\$ 8.80	4%	\$ 854,000	+3%	\$ 642,635
Division 12 Furnishings	\$ 4.40	2%	\$ 427,000	+1%	\$ 215,635
<i>Division 13 Special Construction</i>	\$ 2.20	1%	\$ 213,500	-11%	\$ (2,322,880)
Division 14 Conveying Equipment	\$ 2.20	1%	\$ 213,500		
Division 21 Fire Supression	\$ 2.20	1%	\$ 213,500		
Division 22 Plumbing	\$ 13.21	6%	\$ 1,281,000		
Division 23 HVAC	\$ 37.42	17%	\$ 3,629,500	+1%	\$ 247,660
Division 26 Electrical	\$ 17.61	8%	\$ 1,708,000		
Division 28 Electronic Safety and Security	\$ 8.80	4%	\$ 854,000	+2%	\$ 431,270
Division 32 Exterior Improvements	\$ 2.20	1%	\$ 213,500		
	Cost / SF \$ 220.10		\$ 21,350,000		
location factor 0.99		Total	\$ 21,136,500.00		

nexus

foci

experience

community

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conclusion

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classrooms



nexus

foci

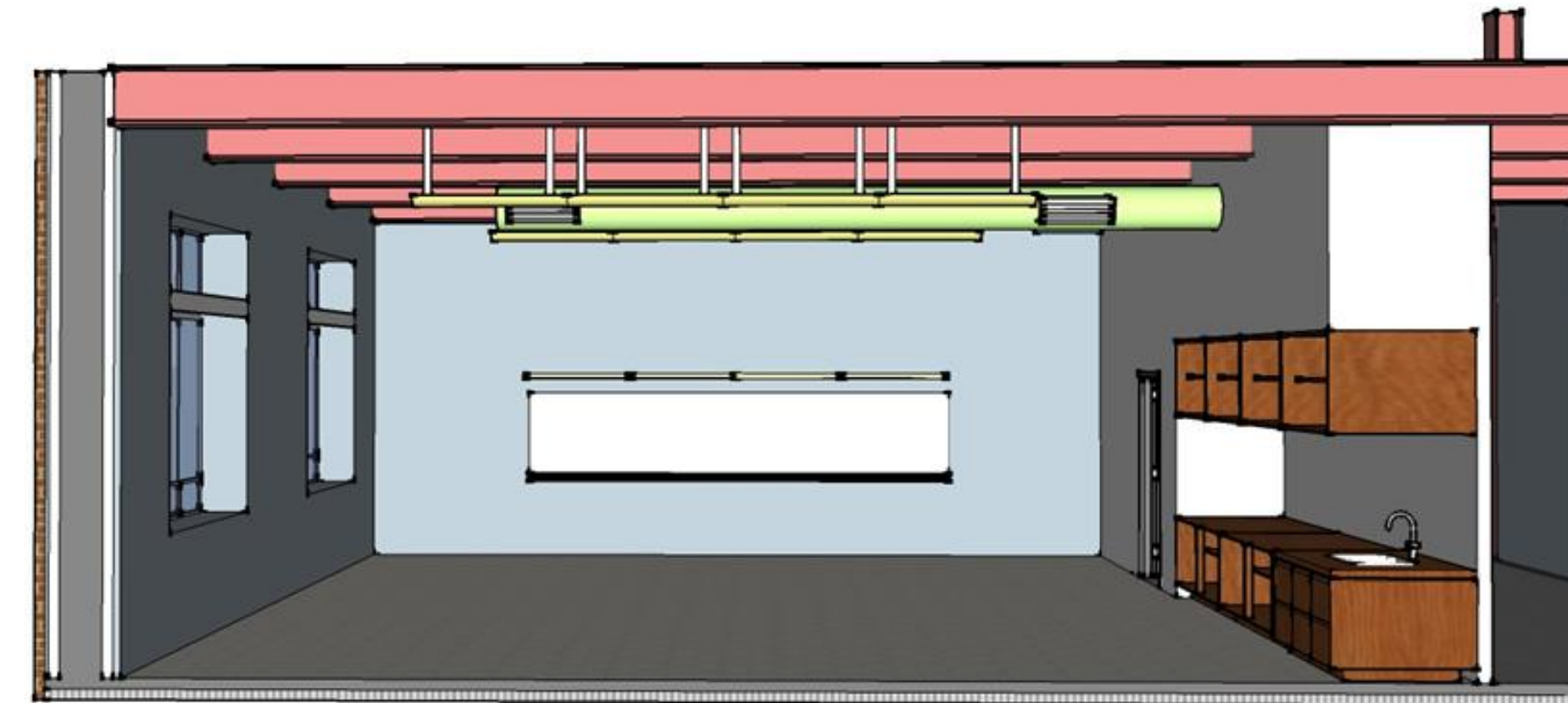
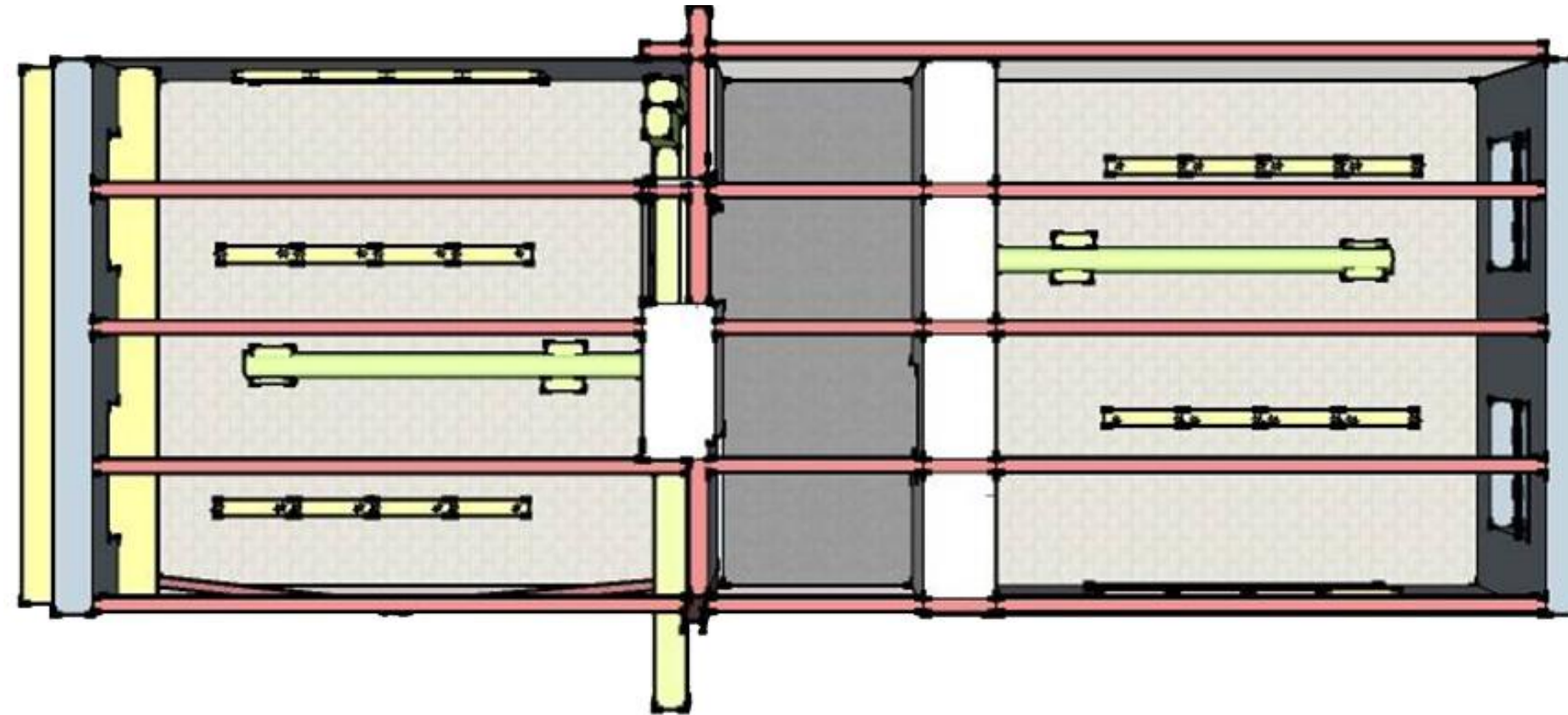
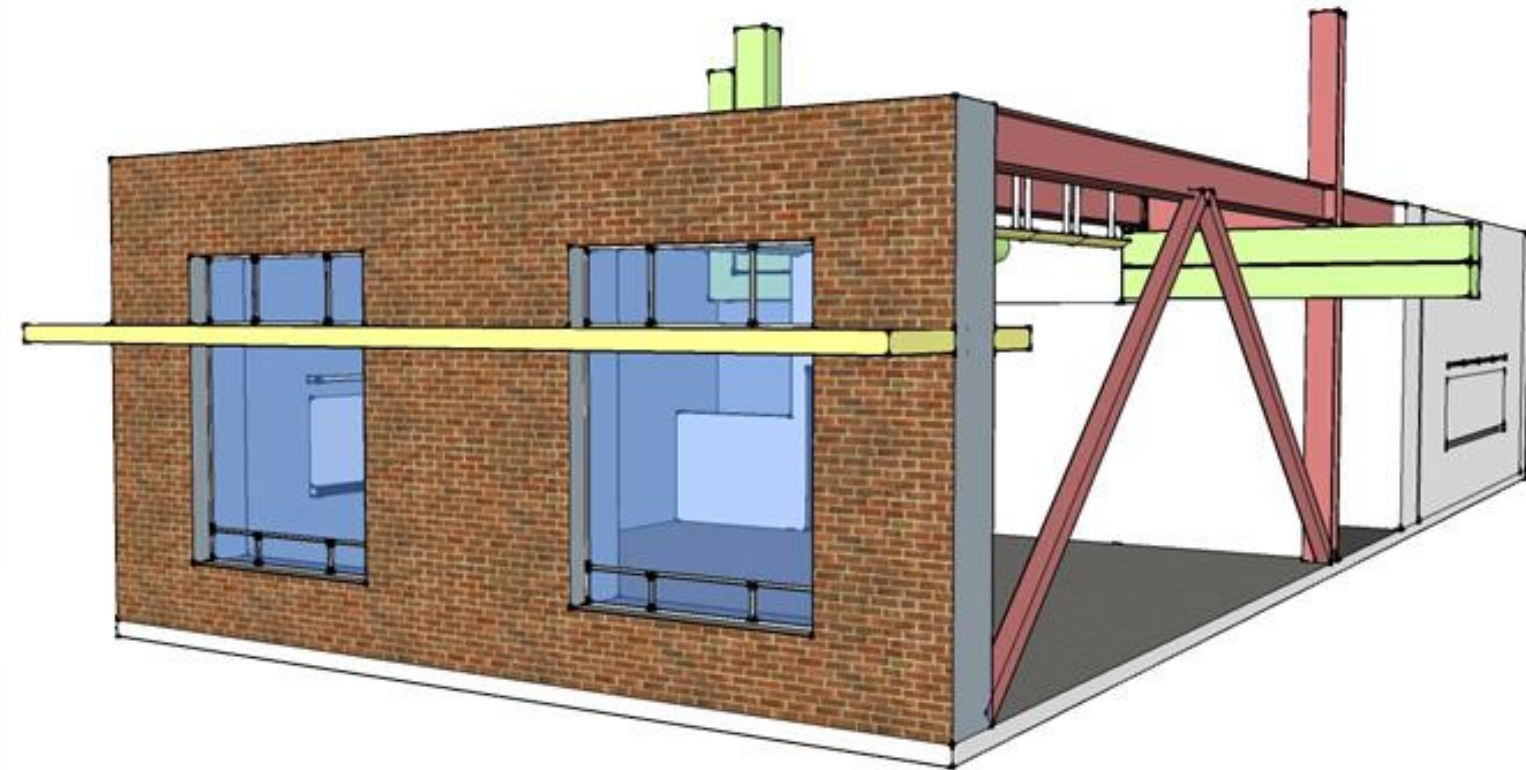
experience

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classroom



nexus

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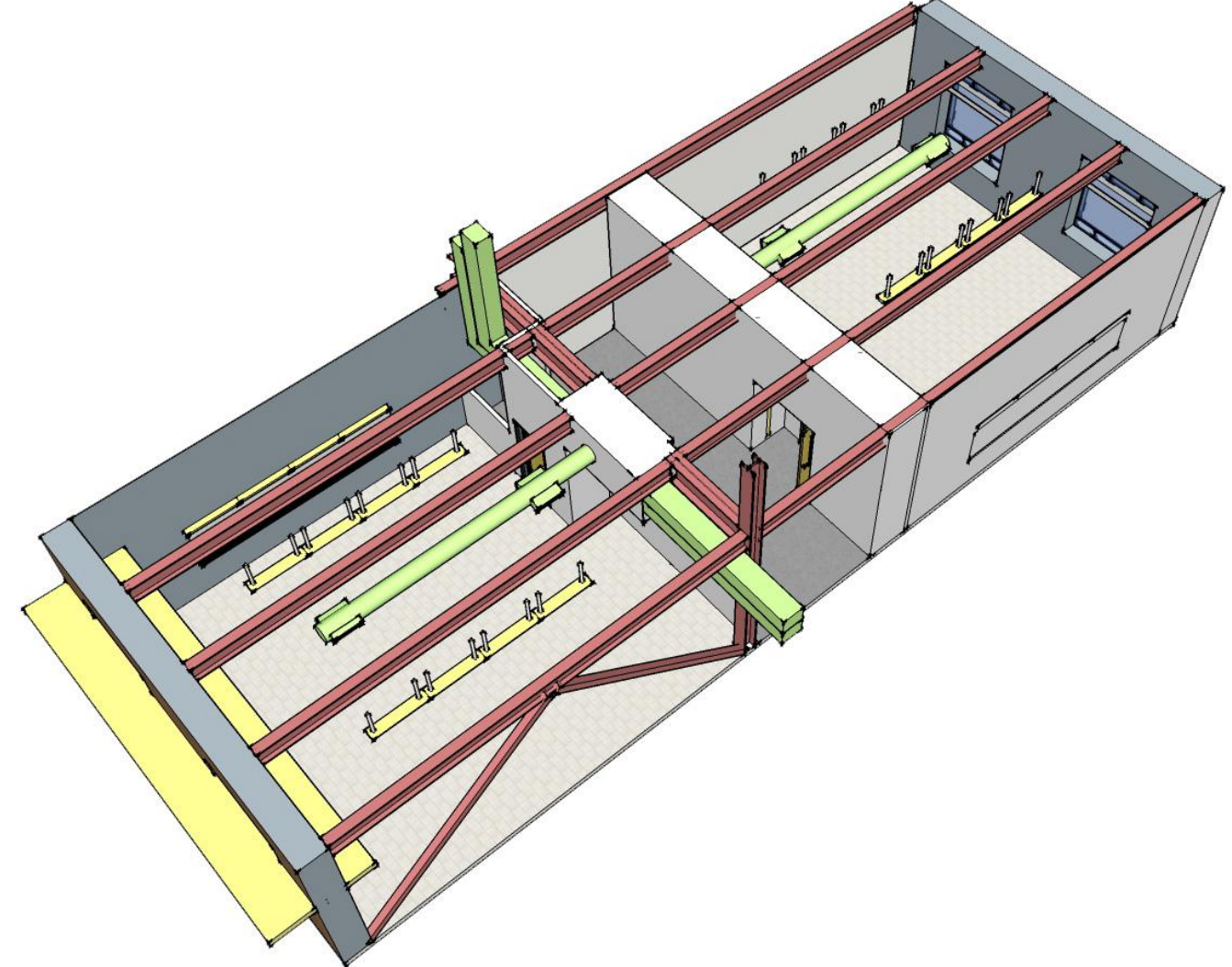
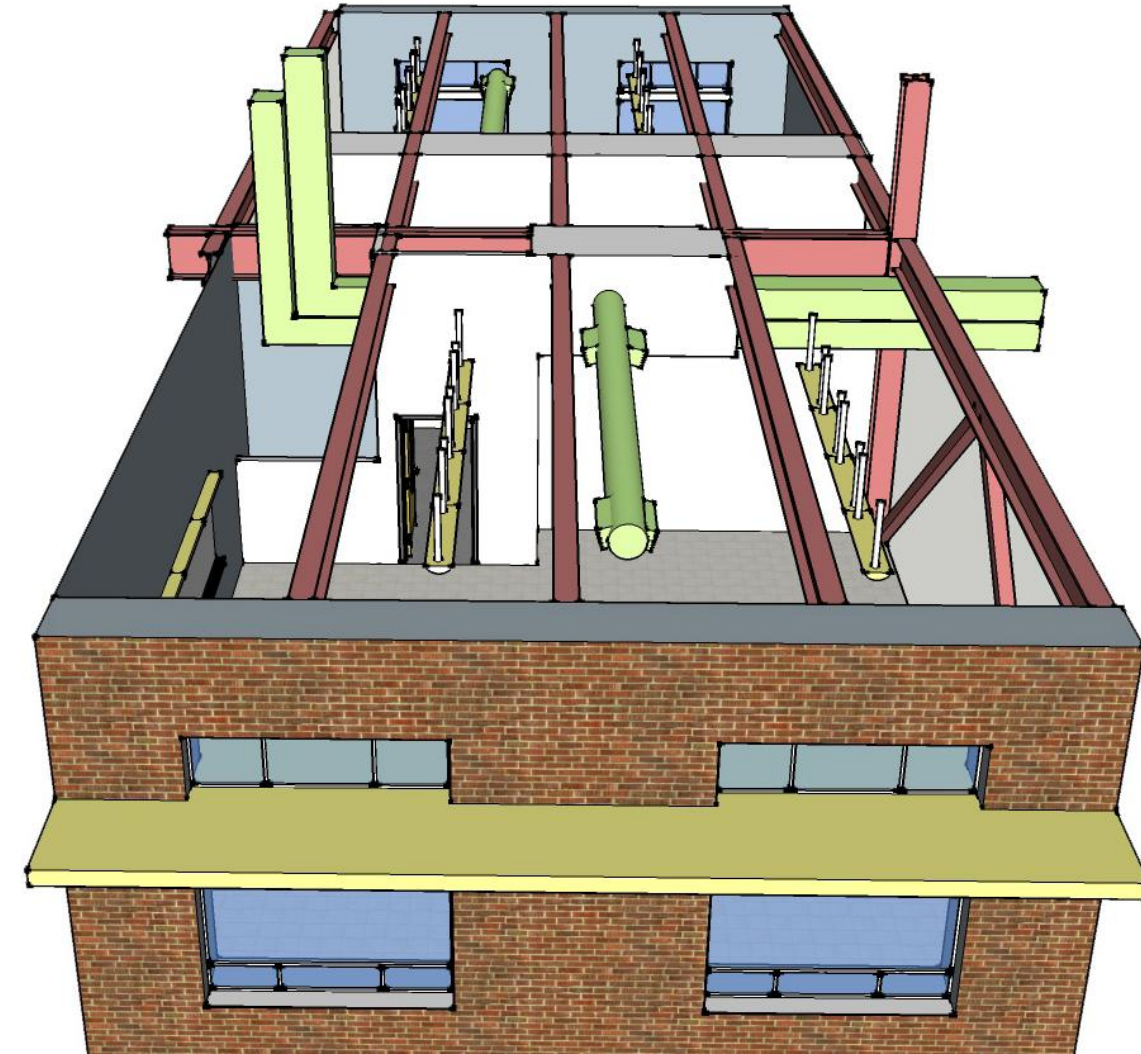
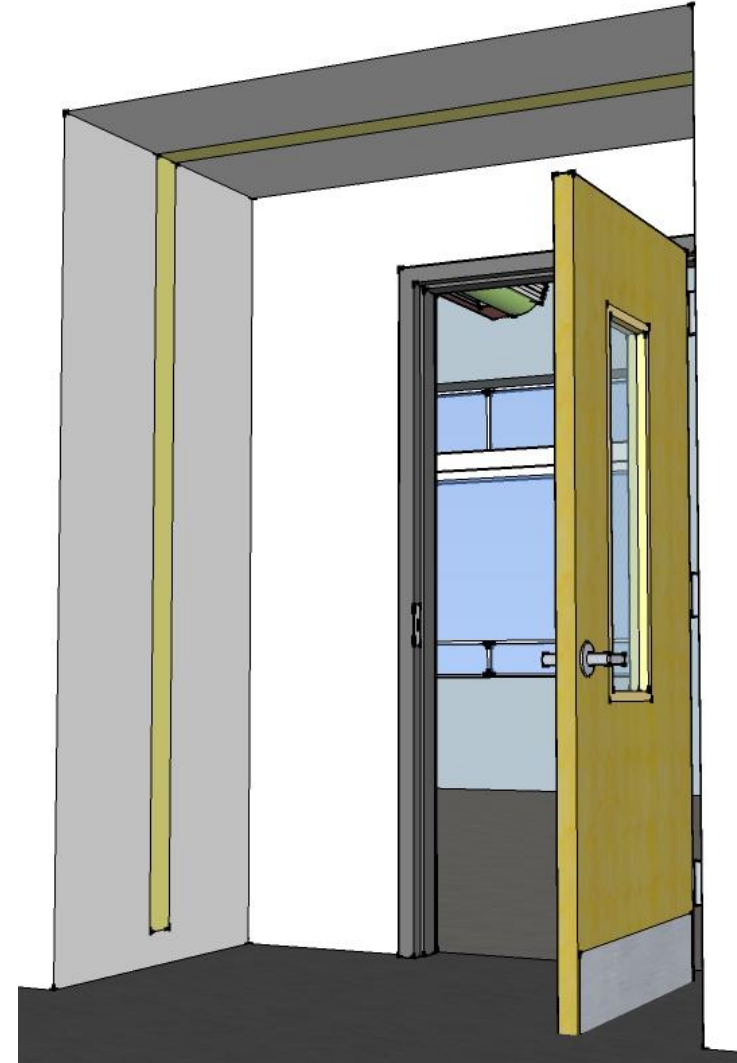
experience

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nexus

foci

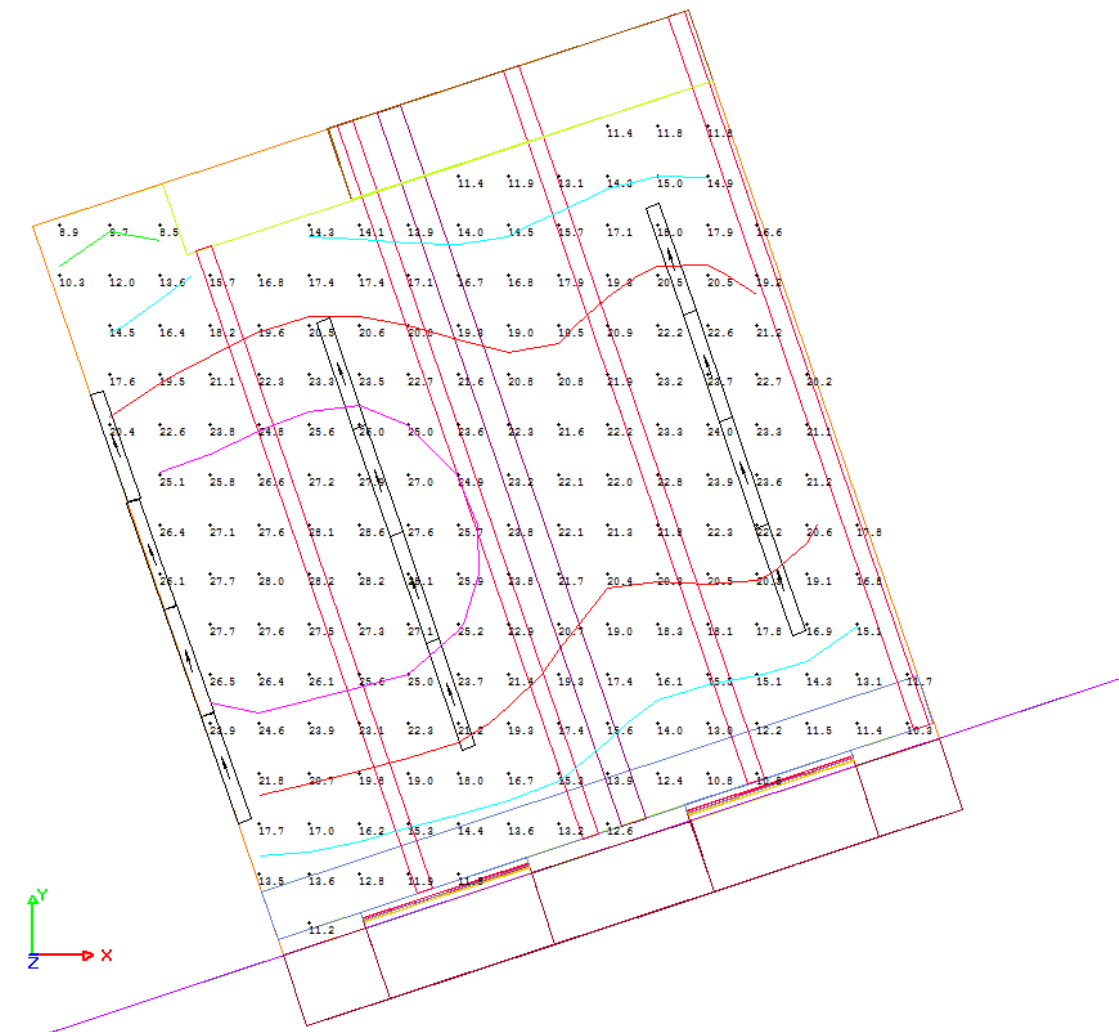
experience

community

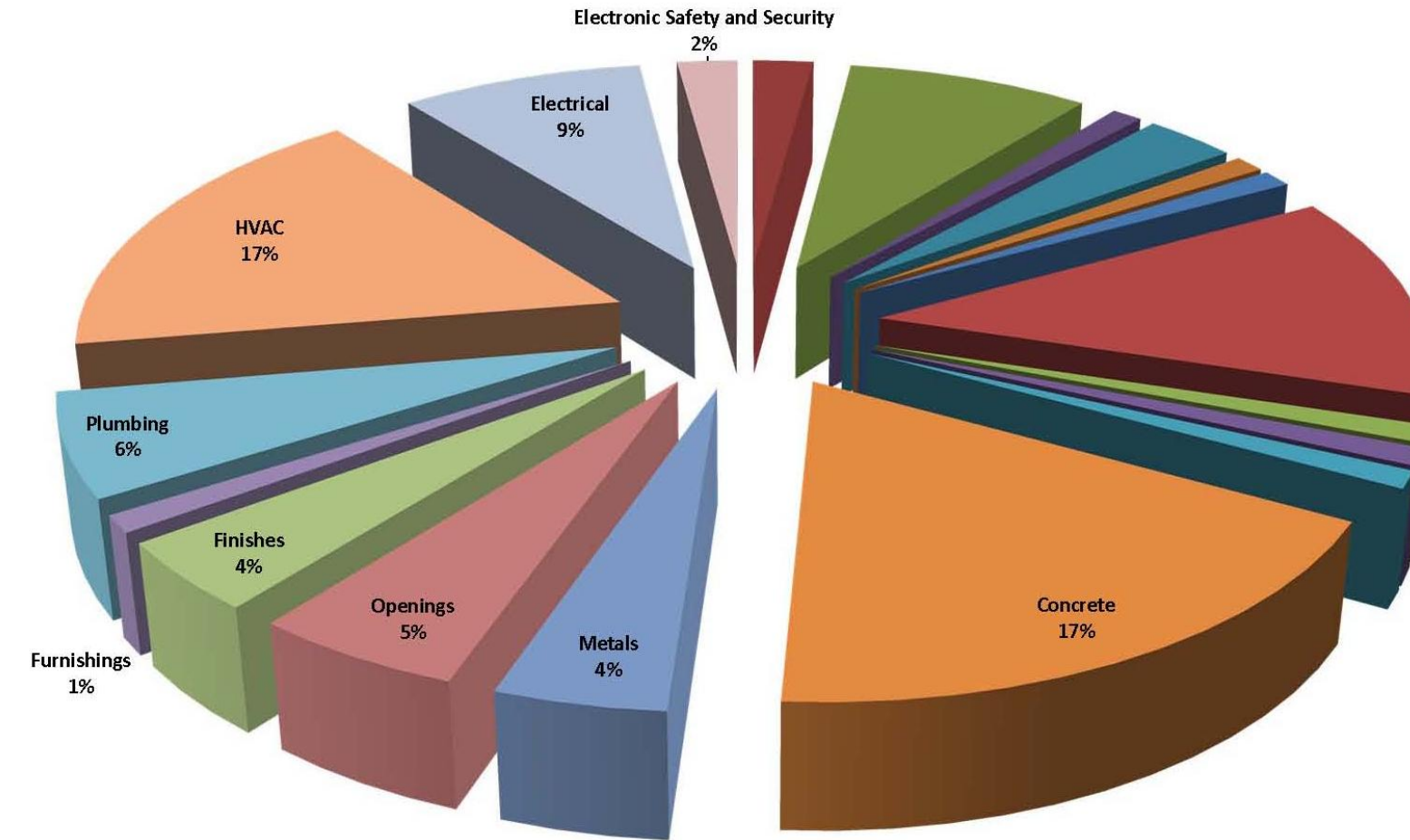
education

conclusion

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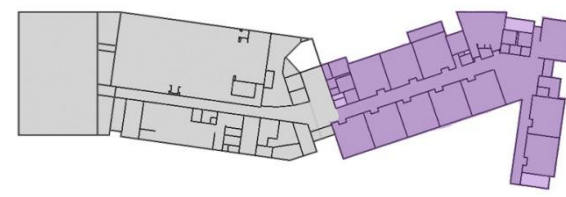


Cost Breakdown



Cost Breakdown

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Division 8	Openings	\$ 11.01	5%	\$ 1,067,500
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Division 12	Furnishings	\$ 2.20	1%	\$ 213,500
Division 13	Special Construction	\$ 26.41	12%	\$ 2,562,000
Division 14	Conveying Equipment	\$ 2.20	1%	\$ 213,500
Division 21	Fire Suppression	\$ 2.20	1%	\$ 213,500
Division 22	Plumbing	\$ 13.21	6%	\$ 1,281,000
Division 23	HVAC	\$ 35.22	16%	\$ 3,416,000
Division 26	Electrical	\$ 17.61	8%	\$ 1,708,000
Division 28	Electronic Safety and Security	\$ 4.40	2%	\$ 427,000
Division 32	Exterior Improvements	\$ 2.20	1%	\$ 213,500
		Cost / SF \$ 220.10		\$ 21,350,000
location factor 0.99			Total	\$ 21,136,500.00



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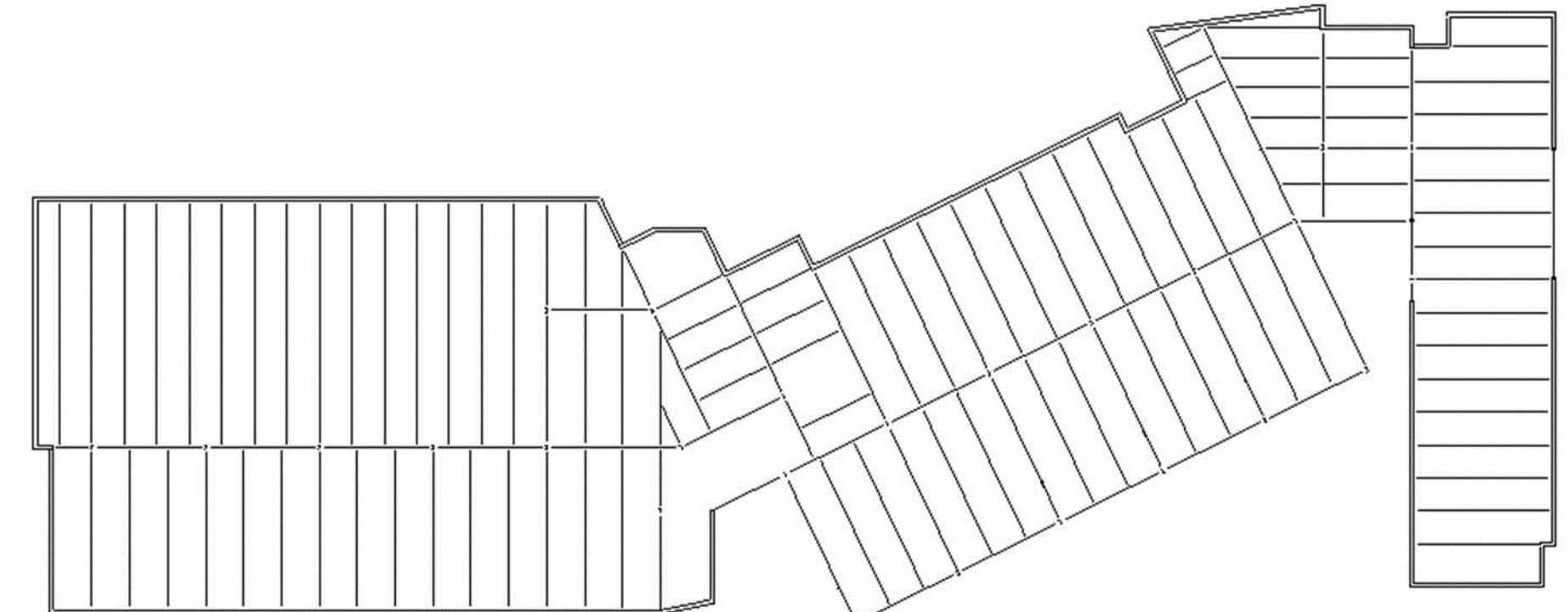
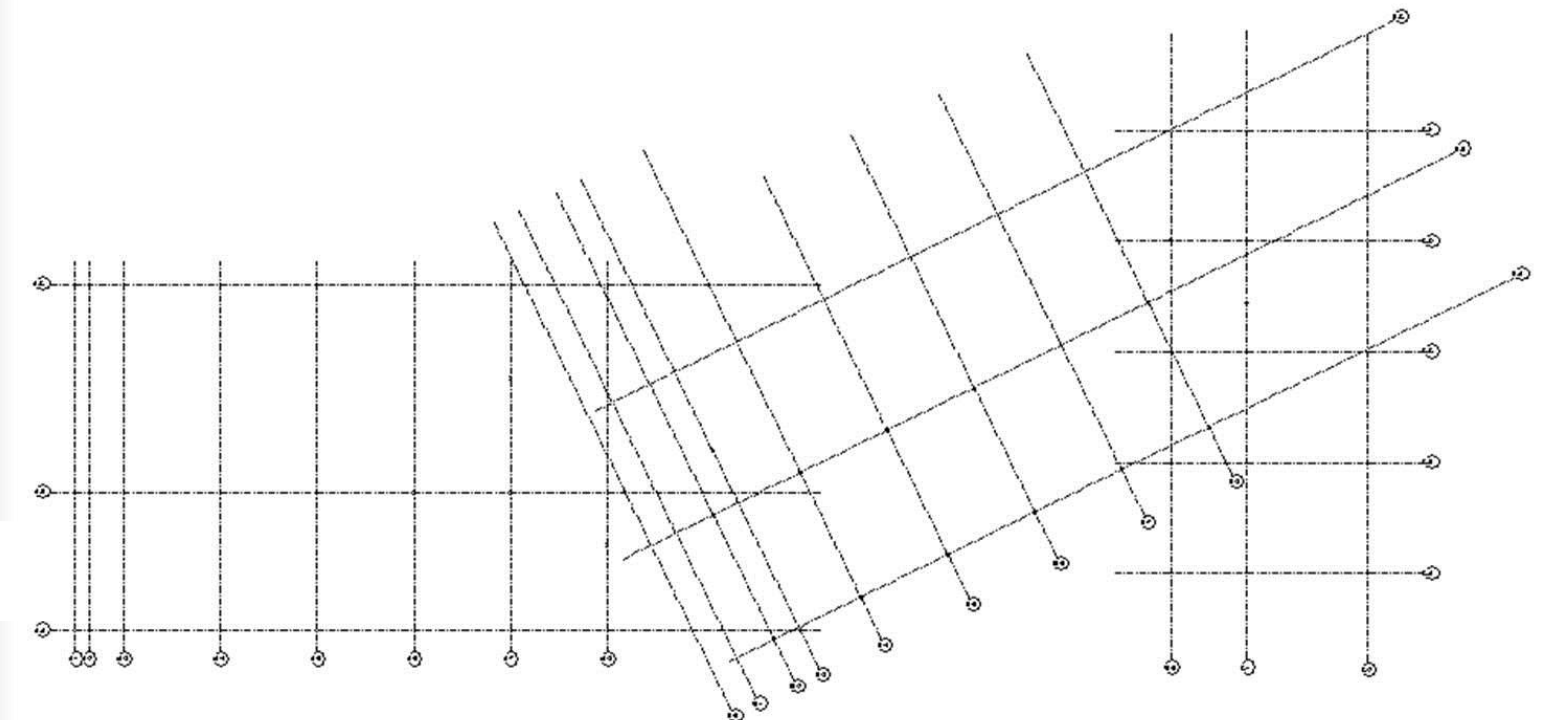
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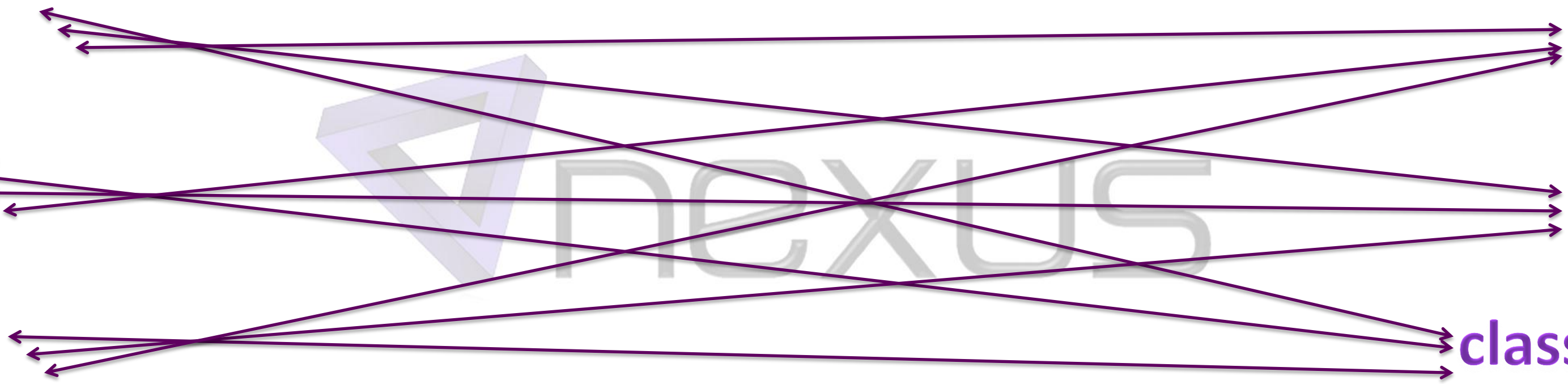
community

education

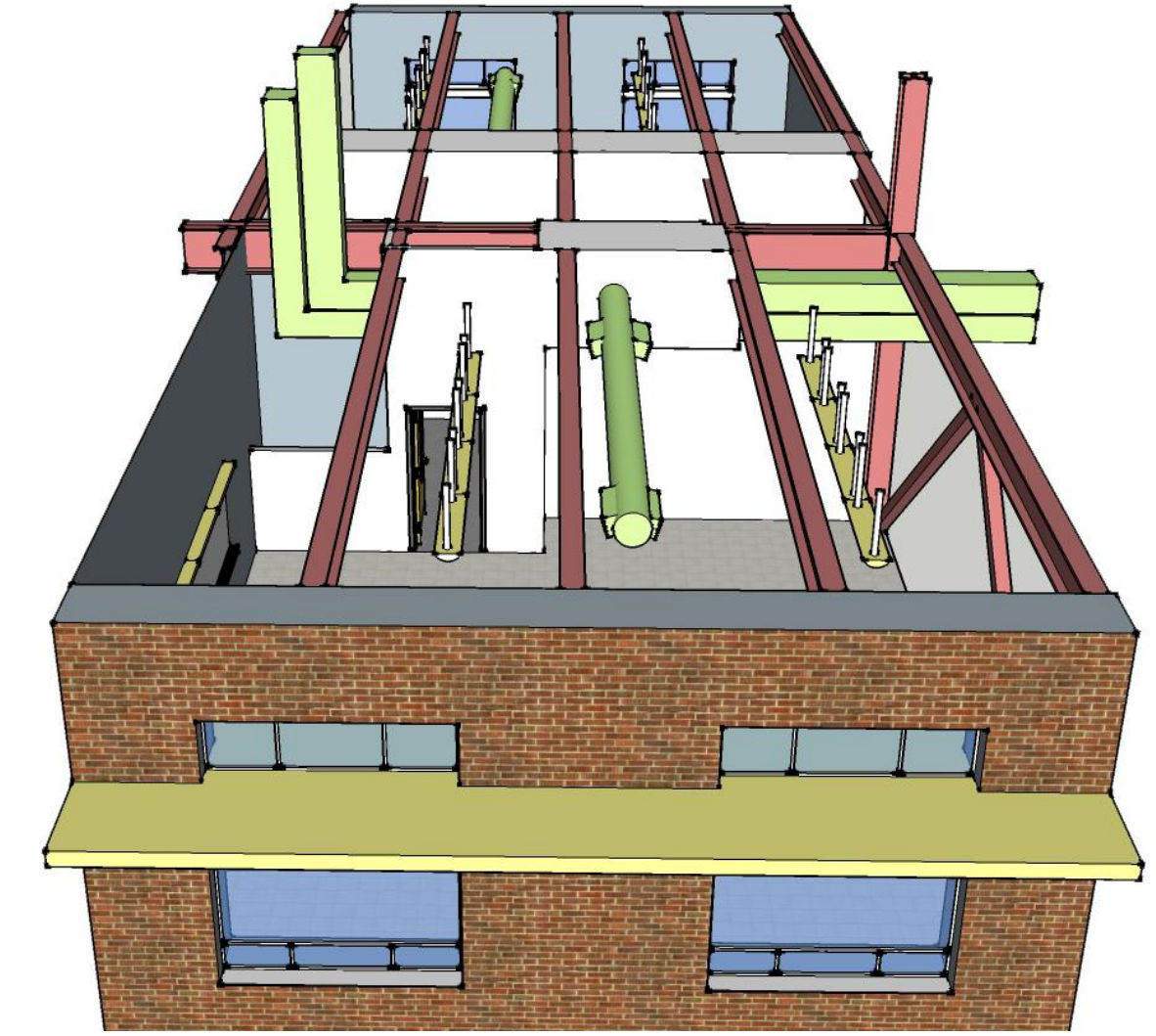
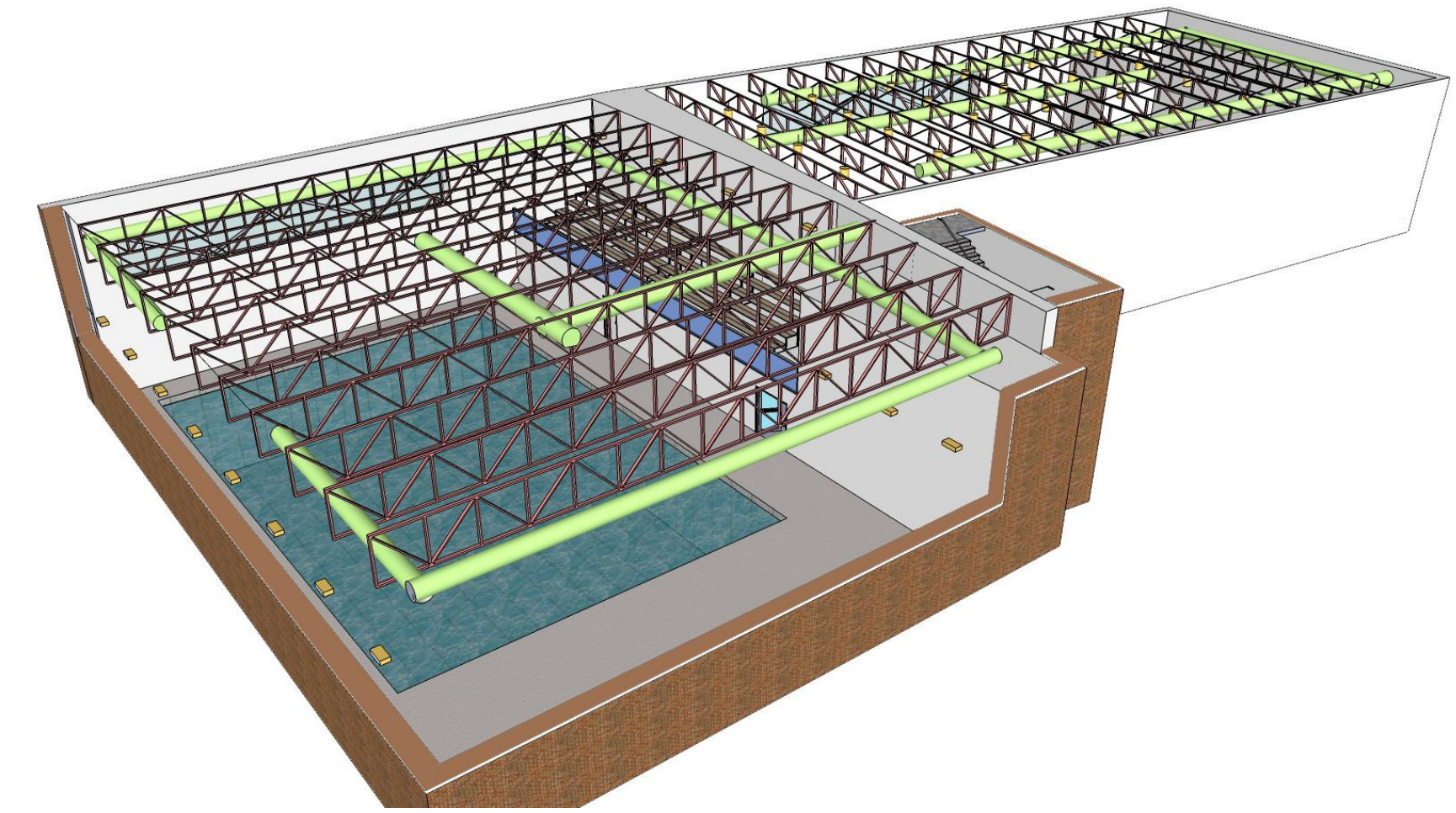
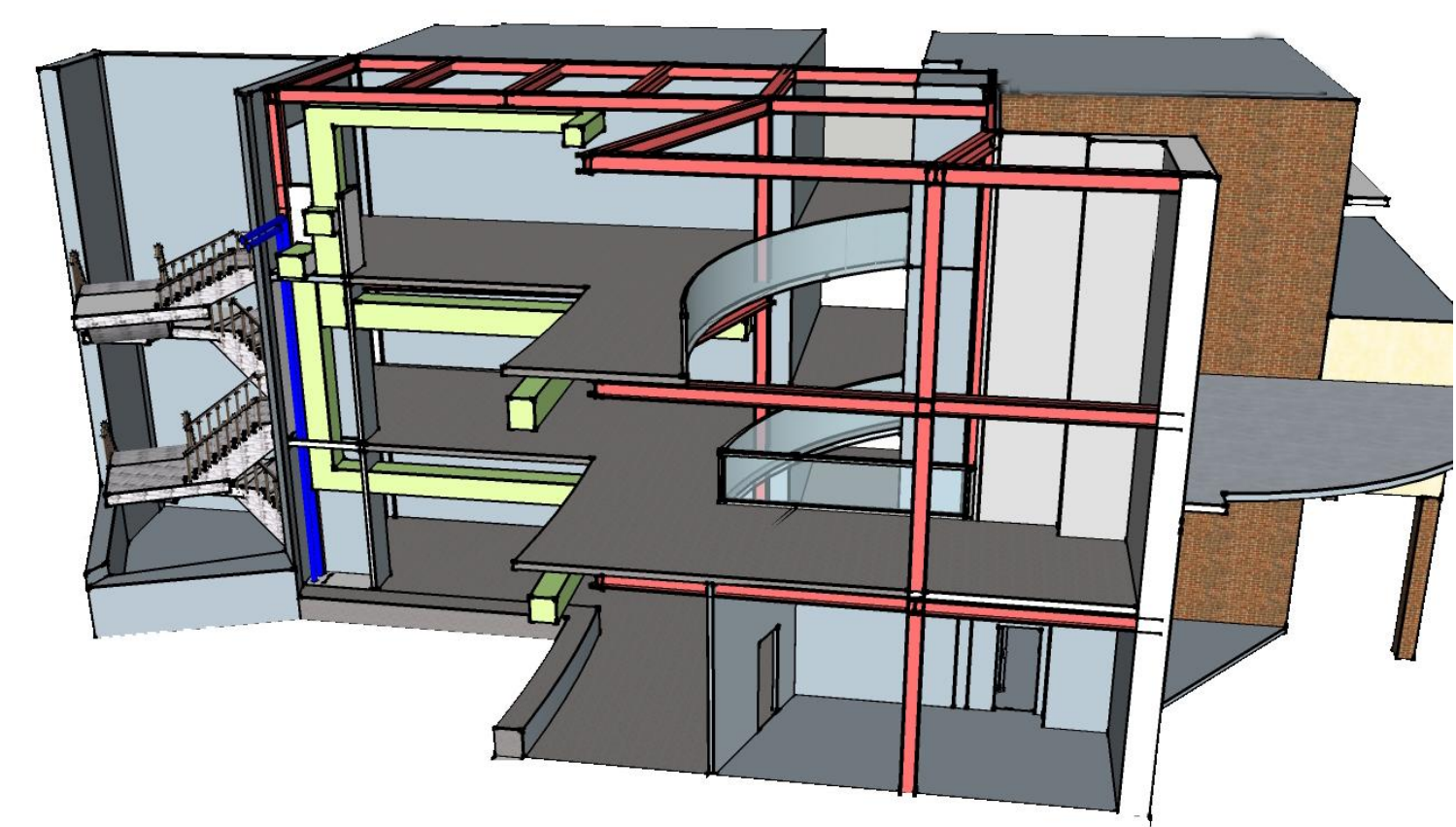
site/envelope/lobby

pool/gym/public facilities

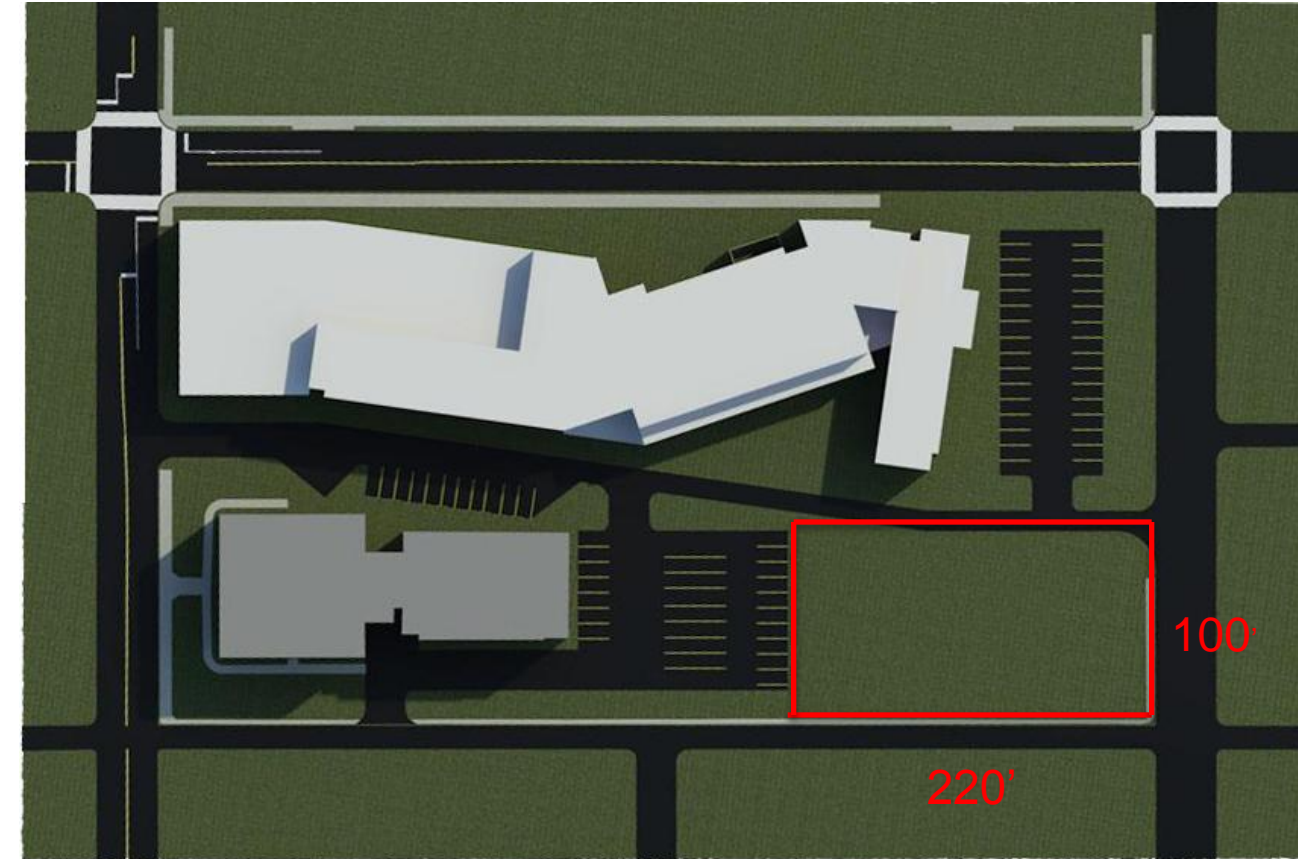
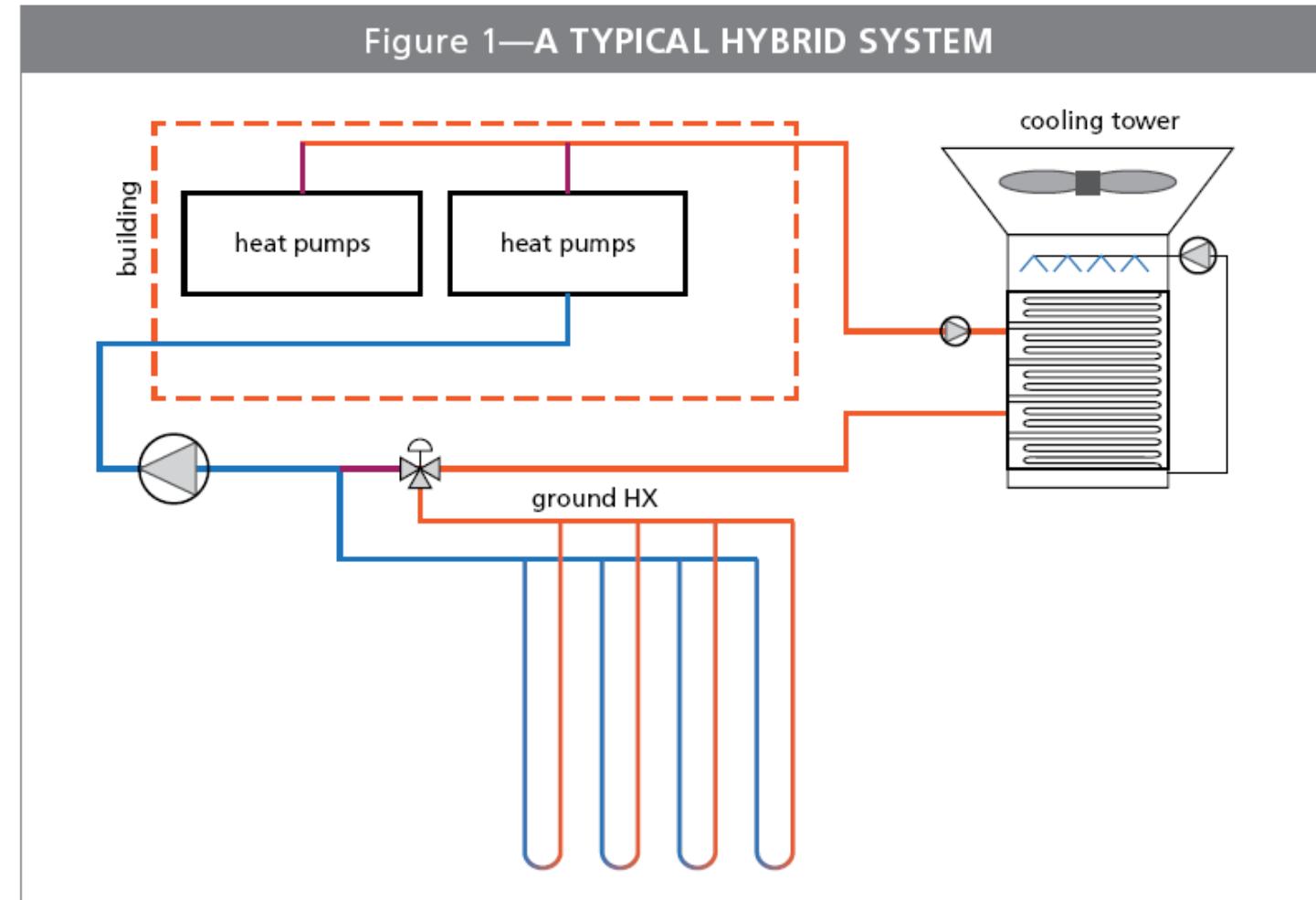
classrooms/learning tool/flexibility



conclusion



appendix



HYBRID GEOTHERMAL WELL FIELD SIZING:

According to the 2007 ASHRAE Handbook—HVAC Applications, hybrid geothermal systems are sized to meet the heating requirements.

Heating Coil Capacity: 1020 MBh = 85 tons

250' to 300' per ton of cooling = 25,500 ft of tubing needed

Bore depth of 300' = 43 bores needed

Bore configuration = 5 rows of 9

Spacing 20' apart

Well field area = 18,000 SF

Total field area available = 22,000 SF

POOL EVAPORATION RATE:

Equation 4.2 from the 2007 ASHRAE Handbook—HVAC Applications

$$w_p = 0.1 \cdot A \cdot (p_w - p_a) \cdot F_a$$

$$w_p = 0.1 \cdot 8400 \cdot (1.033 - 0.68) \cdot 1$$

$$w_p = 296.5 \text{ lb/hr}$$

w_p = evaporation of water [lb/hr]

A = pool surface area (8400 sf)

p_w = saturated vapor pressure of water at 80° F (1.033 in Hg)

p_a = saturated pressure of room air at 82° F (0.68 in Hg)

F_a = activity factor (1 for public use)

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1/16"=1'-0" FIRST FLOOR PLAN

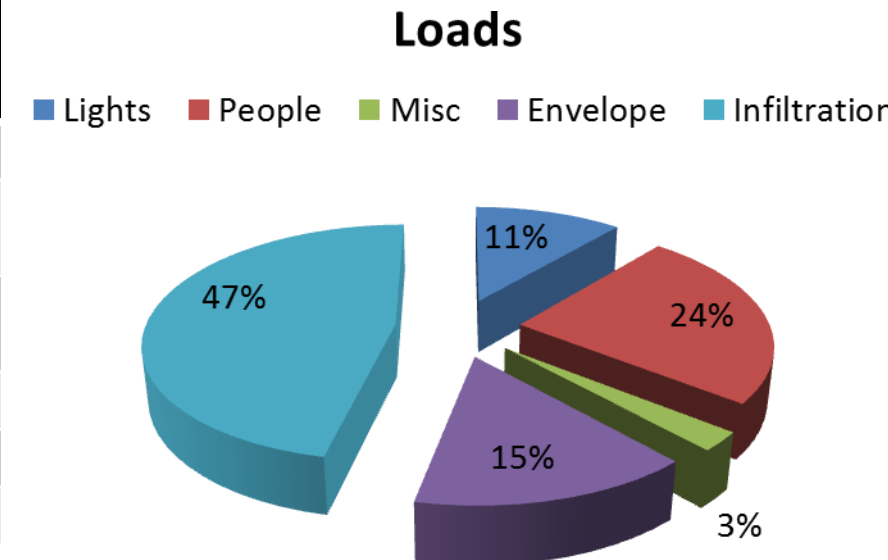
System - 001

System Checksums
By ACADEMIC

Single Zone Variable Air Volume

COOLING COIL PEAK				CLG SPACE PEAK				HEATING COIL PEAK				TEMPERATURES							
Peaked at Time: Mo/Hr: 7 / 15				Mo/Hr: 7 / 15				Mo/Hr: Heating Design				Cooling				Heating			
Outside Air: QADB/WS/HR: 88 / 72 / 94				QADB: 88				QADE: 9				SADB				Ra Plenum			
Space	Plenum	Net	Percent	Space	Plenum	Net	Percent	Space Peak	Coil Peak	Percent	SADB	Cooling	Heating	Return	Rel/OA	Fa M/RTD	Fa BidTD	Fa Frit	
Sens. + Lat.	Sens. + Lat.	Total	Of Total	Sens. + Lat.	Sens. + Lat.	Total	Of Total	Space Sens.	Tot Sens.	Of Total	80.2	55.0	80.2	75.0	70.0	75.9	71.8	77.3	71.8
Btu/h	Btu/h	Btu/h	(%)	Btu/h	Btu/h	Btu/h	(%)	Btu/h	Btu/h	(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Envelope Loads				Envelope Loads				Envelope Loads				AIRFLOWS							
SkyLite Solar	0	0	0	SkyLite Solar	0	0	0	SkyLite Solar	0	0	0	Diffuser	Cooling	Heating					
SkyLite Cond	0	0	0	SkyLite Cond	0	0	0	SkyLite Cond	0	0	0	Terminal	76,001	24,079					
Roof Cond	86,429	0	86,429	3	86,429	0	86,429	3	86,429	9.94	0	Main Fan	76,001	24,079					
Glass Solar	259,261	0	259,261	9	259,261	0	259,261	15	-101,525	0	0	See Fan	0	0					
Glass/Door Cond	29,689	0	29,689	1	29,689	0	29,689	2	-169,395	0	0	Nom Vent	8,957	0					
Wall Cond	12,293	0	12,293	0	12,293	0	12,293	1	-65,797	6.45	0	AHU Vent	8,957	0					
Partition/Door	0	0	0	0	0	0	0	0	0	0	0	Infil	48,449	48,449					
Floor	0	0	0	0	0	0	0	0	0	0	0	MinStop/Rh	24,079	24,079					
Adjacent Floor	0	0	0	0	0	0	0	0	0	0	0	Return	123,126	71,370					
Infiltration	1,199,923	0	1,199,923	42	622,141	0	622,141	37	-3,368,896	0	0	Exhaust	56,082	47,291					
Sub Total ==>	1,587,594	0	1,587,594	56	1,009,812	0	1,009,812	60	-3,705,612	-3,705,611	362.98	Rm Exh	1,324	1,158					
Internal Loads				Internal Loads				Internal Loads				ENGINEERING CKS							
Lights	288,173	10,224	298,397	11	288,173	10,224	298,397	11	0	0	0	% OA	11.8	0.0					
People	629,360	0	629,360	22	325,200	0	325,200	19	0	0	0	ofm/ft²	1.00	0.32					
Misc	65,720	0	65,720	2	65,720	0	65,720	4	0	0	0	ofm/ft	321.87	0.0					
Sub Total ==>	983,253	10,224	993,477	35	679,093	10,224	689,317	40	0	0	0	ofm/ft²	322.10	0.0					
Ceiling Load				Ceiling Load				Ceiling Load				AREAS							
Ventilation Load	0	0	0	0	0	0	0	0	0	0	0	Gross Total	76,055	0					
Adj Air Trans Heat	0	0	0	0	0	0	0	0	0	0	0	Part	0	0					
Dehumid. Ov Sizing	0	0	0	0	0	0	0	0	0	0	0	Int Door	0	0					
Ov/Undr Sizing	0	0	0	0	226	0	226	0	2,659,419	-260.50	0	ExFir	0	0					
Exhaust Heat	0	0	0	0	0	0	0	0	25,307	-2.48	0	Roof	33,675	0					
Sup. Fan Heat	23,198	0	23,198	1	0	0	0	0	0	0	0	Wall	37,226	9,522					
Rel. Fan Heat	1	0	1	0	0	0	0	0	0	0	0	Ext Door	126	0					
Duct Heat PkUp	0	0	0	0	0	0	0	0	0	0	0	Underfir Sup Ht PkUp	0	0					
Underfir Sup Ht PkUp	0	0	0	0	0	0	0	0	0	0	0	Supply Air Leakage	0	0					
Supply Air Leakage	0	0	0	0	0	0	0	0	0	0	0	Grand Total ==>	2,570,847	33,424					
Grand Total ==>	2,570,847	33,424	2,833,488	100.00	1,689,131	10,224	1,709,355	100.00	-1,046,193	-1,020,885	100.00								

Zone	Cooling Capacity [TONS]	Heating Capacity [TONS]	Airflow [CFM]
Pool	28.1	66.7	6,200
Multi-Purpose Room	25.5	2.4	8,600
Lobby/Admin Wing	58.4	6.0	18,200
Central Wing	63.4	6.1	21,700
Right Wing	58.8	5.9	20,200
TOTAL	236.1	85.1	79,300



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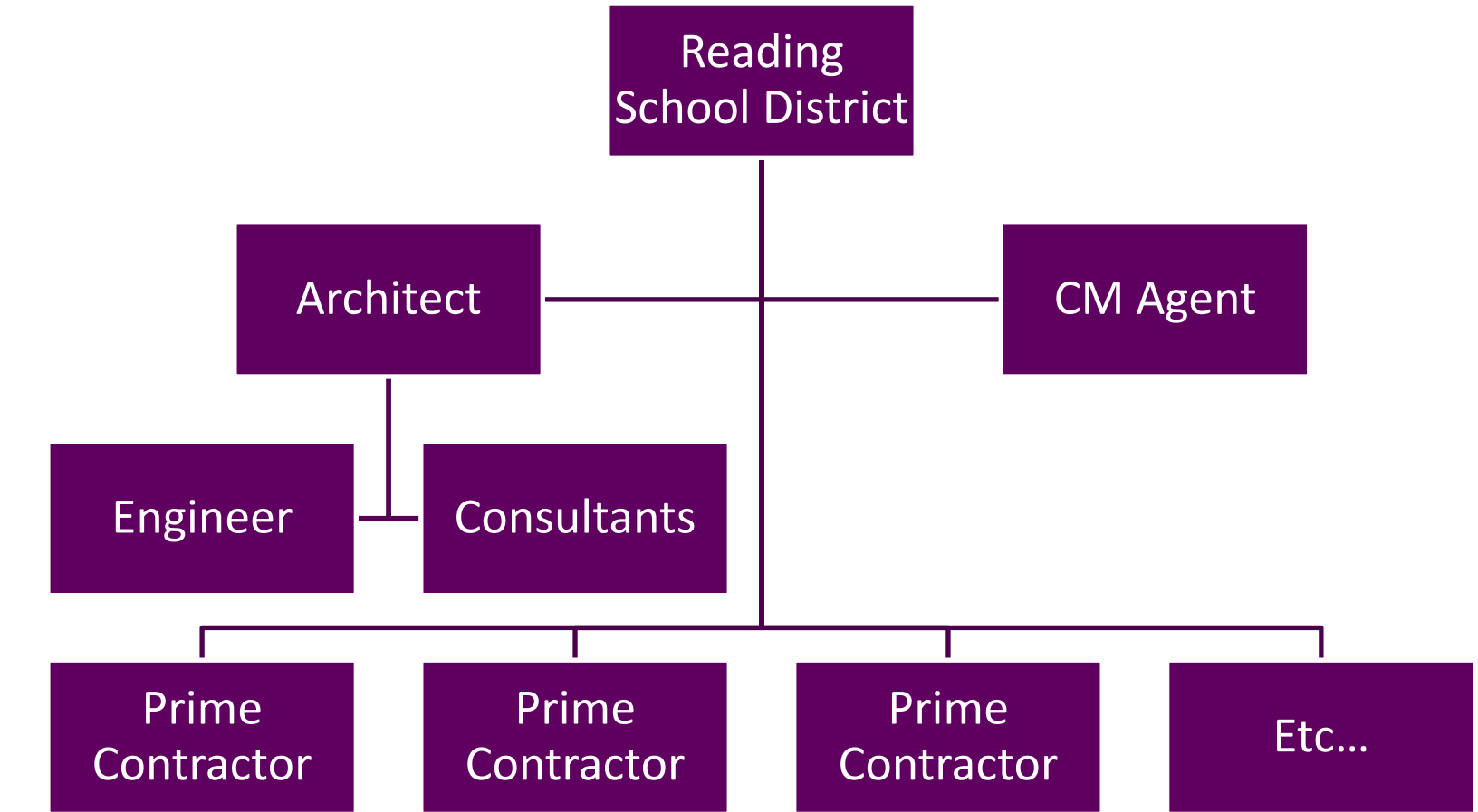
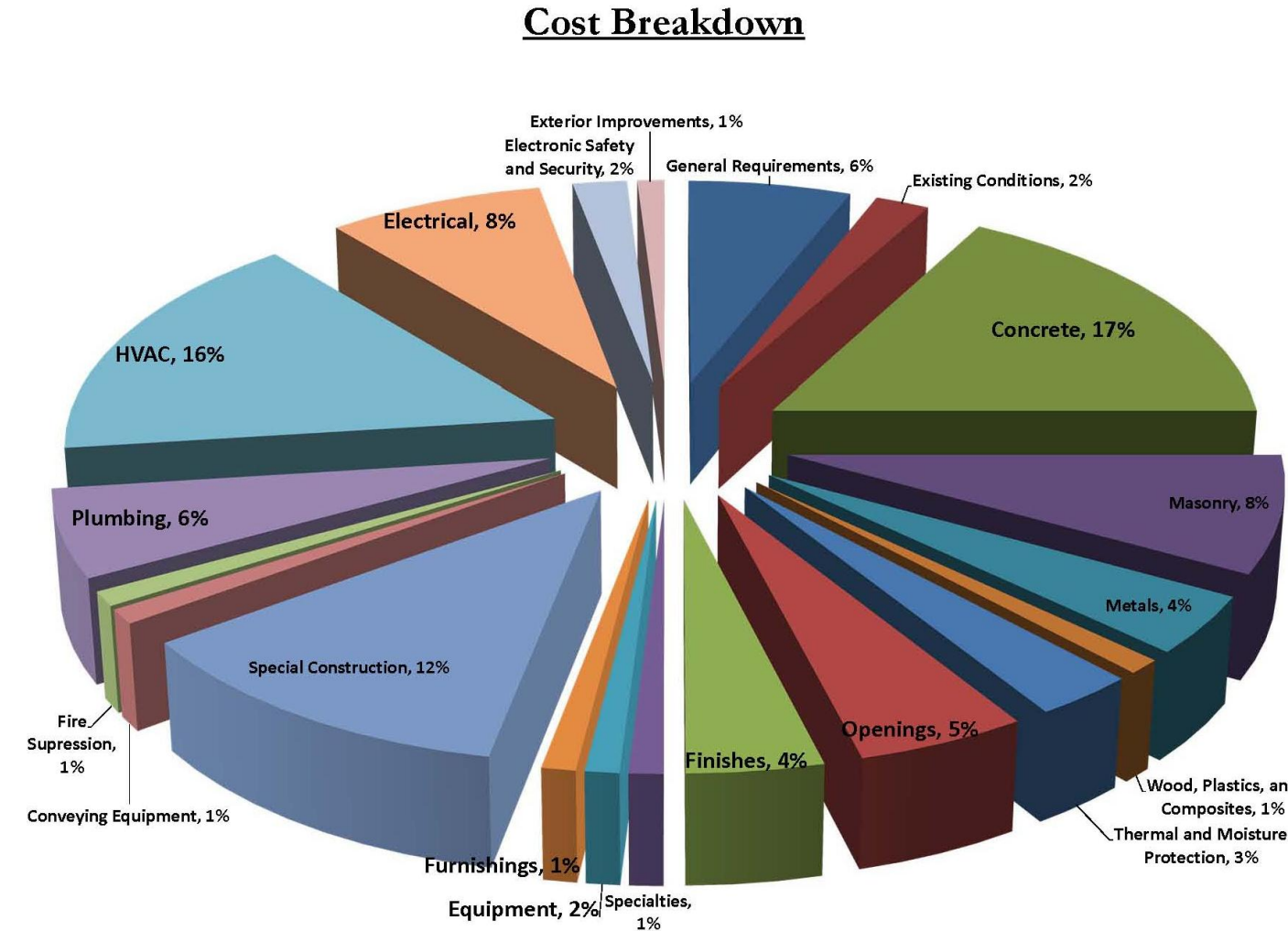
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Cost Breakdown				
	Cost/SF	% of Cost	Cost	
Division 1	General Requirements	\$ 13.07	6%	\$ 1,268,190
Division 2	Existing Conditions	\$ 4.36	2%	\$ 422,730
Division 3	Concrete	\$ 37.04	17%	\$ 3,593,205
Division 4	Masonry	\$ 17.43	8%	\$ 1,690,920
Division 5	Metals	\$ 8.72	4%	\$ 845,460
Division 6	Wood, Plastics, and Composites	\$ 2.18	1%	\$ 211,365
Division 7	Thermal and Moisture Protection	\$ 6.54	3%	\$ 634,095
Division 8	Openings	\$ 10.90	5%	\$ 1,056,825
Division 9	Finishes	\$ 8.72	4%	\$ 845,460
Division 10	Specialties	\$ 2.18	1%	\$ 211,365
Division 11	Equipment	\$ 2.18	1%	\$ 211,365
Division 12	Furnishings	\$ 2.18	1%	\$ 211,365
Division 13	Special Construction	\$ 26.15	12%	\$ 2,536,380
Division 14	Conveying Equipment	\$ 2.18	1%	\$ 211,365
Division 21	Fire Supression	\$ 2.18	1%	\$ 211,365
Division 22	Plumbing	\$ 13.07	6%	\$ 1,268,190
Division 23	HVAC	\$ 34.86	16%	\$ 3,381,840
Division 26	Electrical	\$ 17.43	8%	\$ 1,690,920
Division 28	Electronic Safety and Security	\$ 4.36	2%	\$ 422,730
Division 32	Exterior Improvements	\$ 2.18	1%	\$ 211,365
Cost / SF		\$ 217.90		\$ 21,350,000
location factor 0.99		Total		\$ 21,136,500.00



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