



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

mission

nexus

foci

experience

community

education

conclusion

appendix



nexus

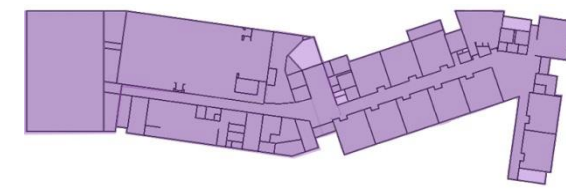
Our mission is to develop a design that merges education with the community in a facility that is safe and cost effective while functioning as a learning tool.

envelope

recreation

classrooms

envelope



nexus

foci

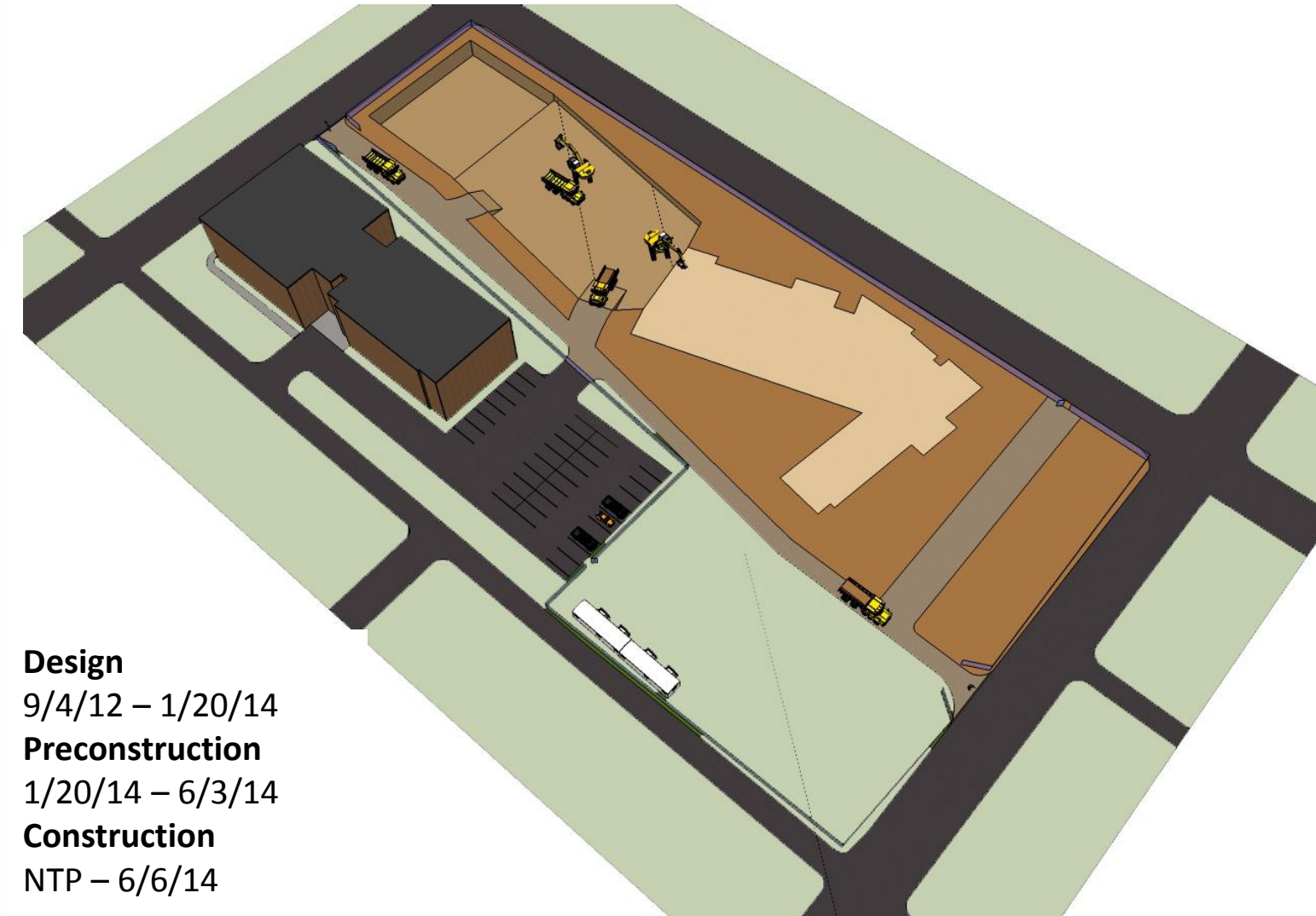
experience

community

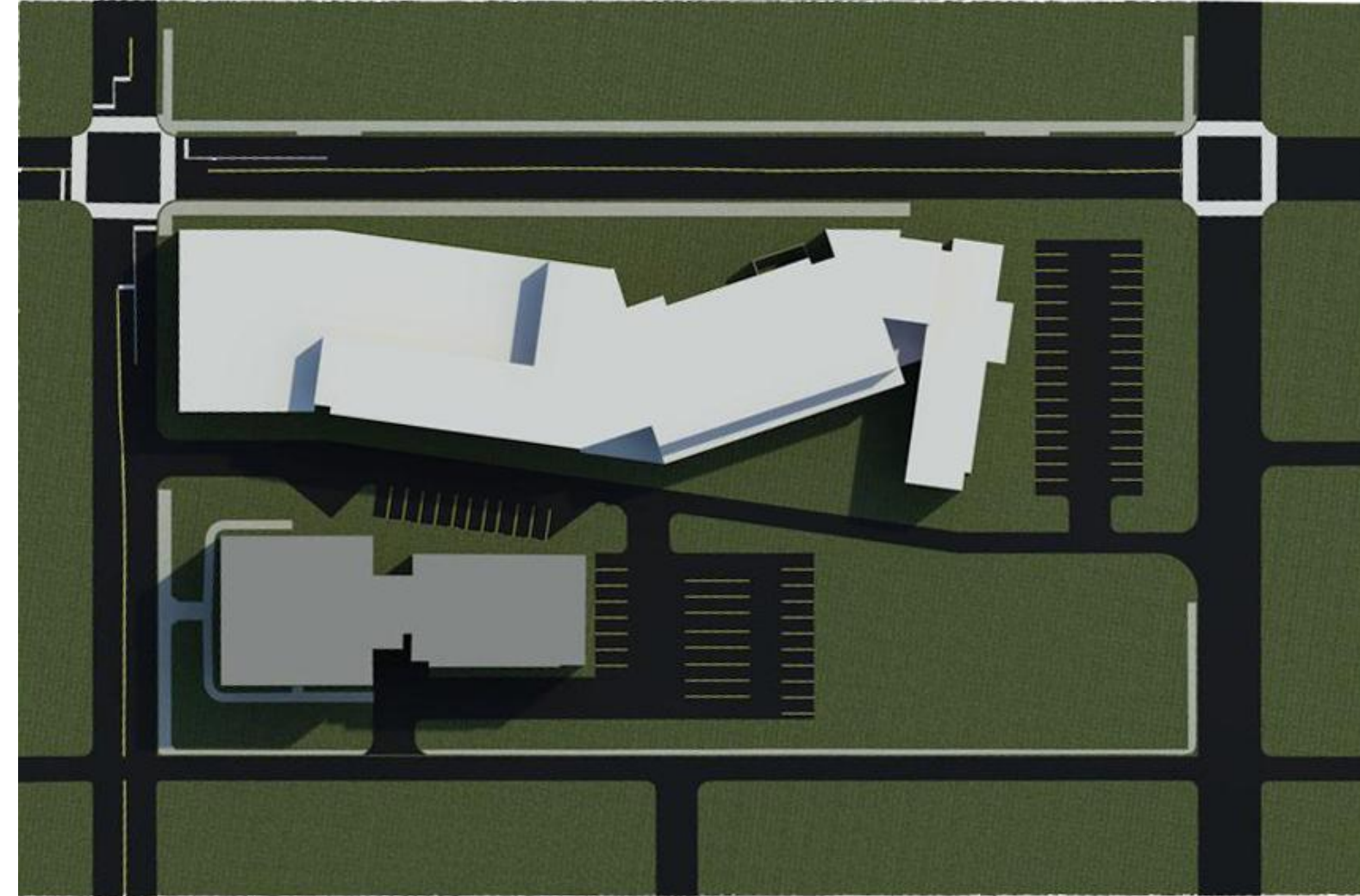
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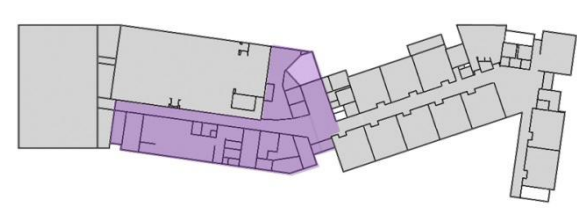
conclusion

appendix



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





nexus

foci

experience

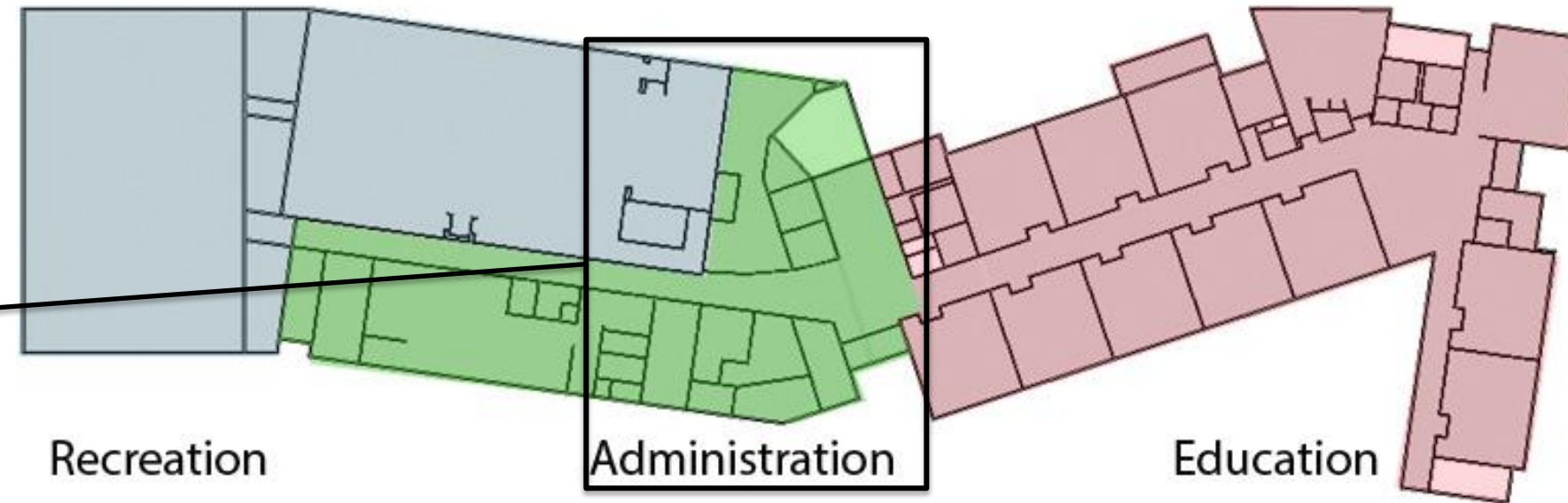
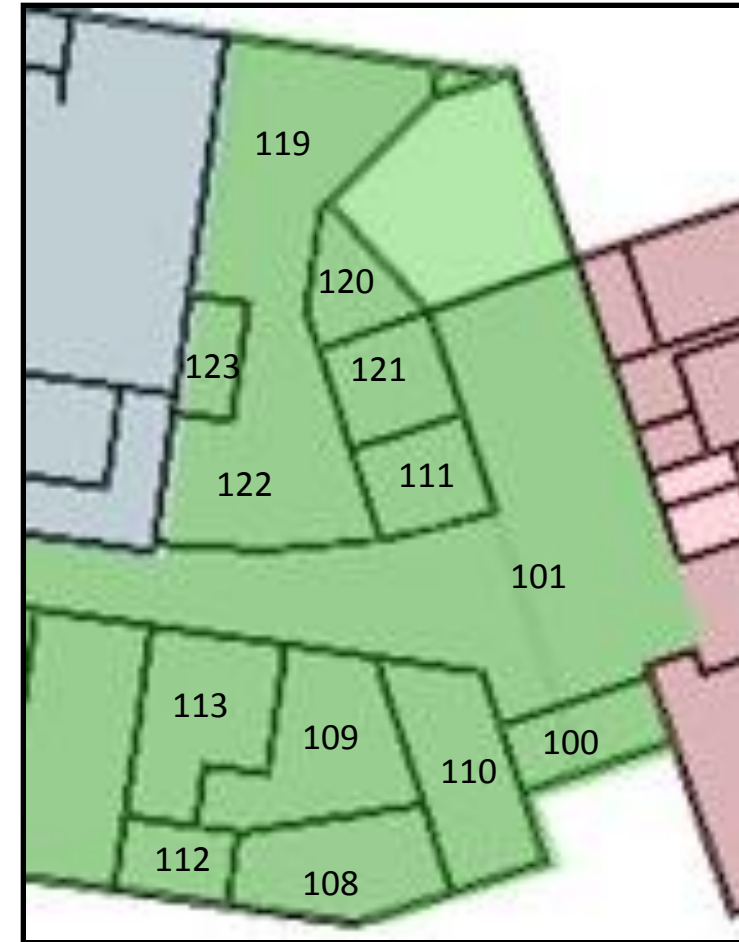
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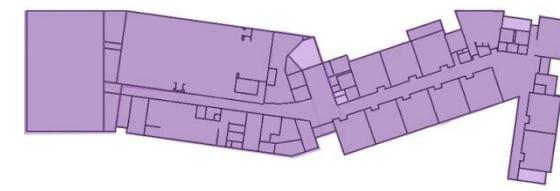
education

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

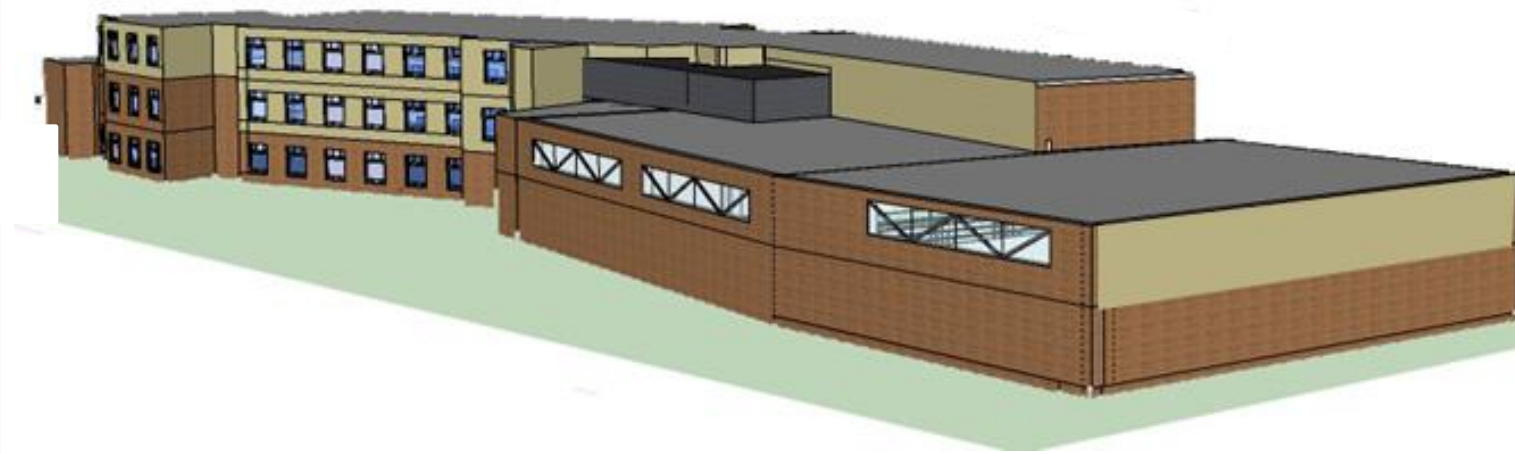
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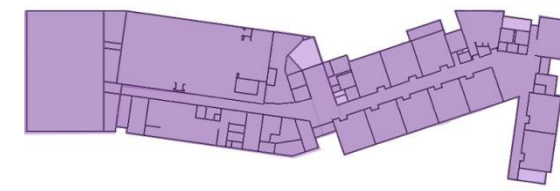
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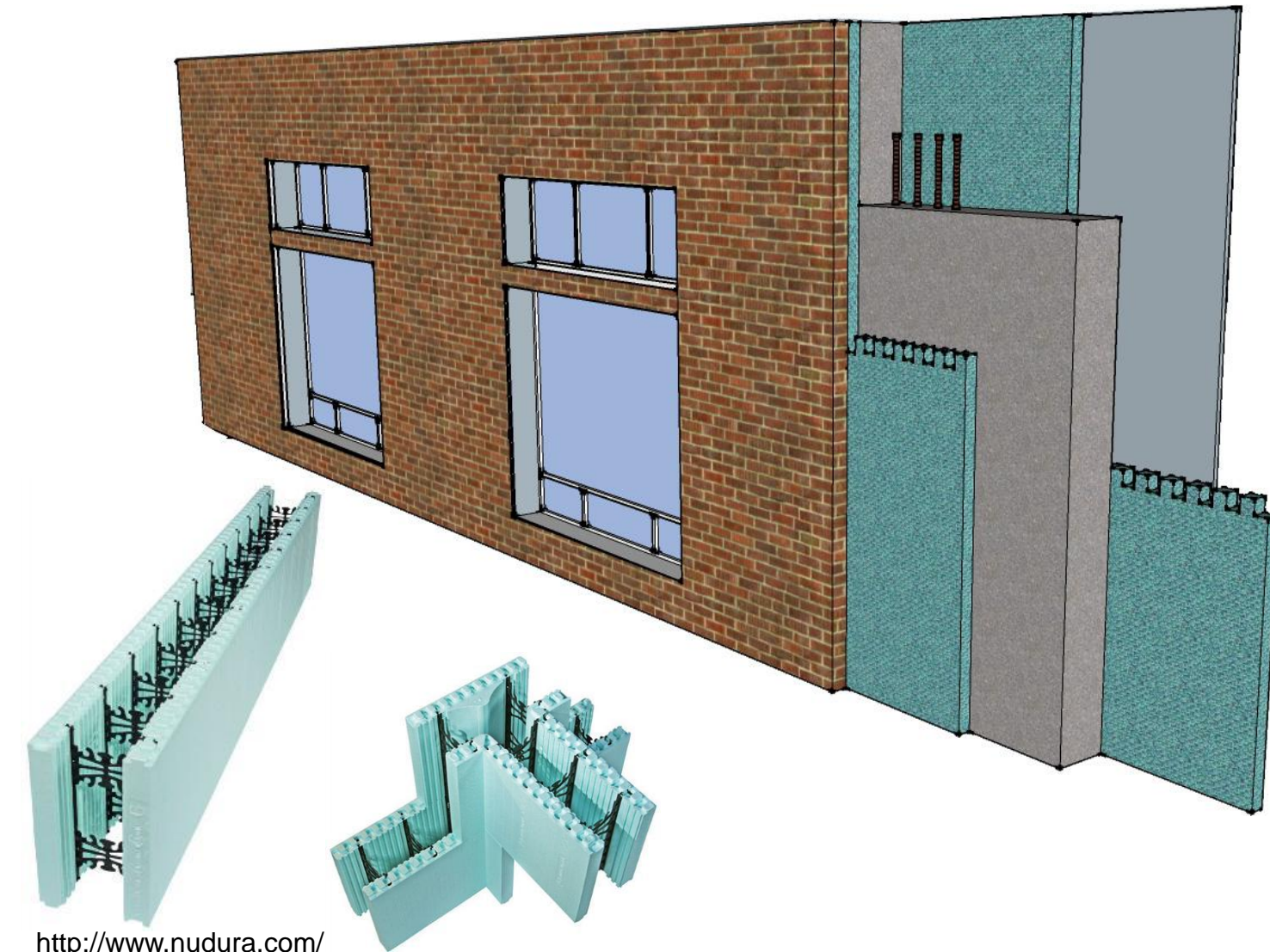
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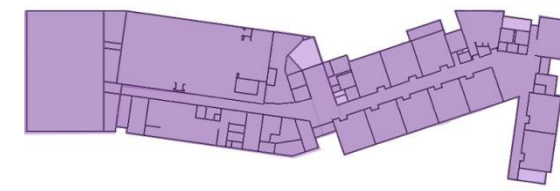
<http://www.nudura.com/>



<http://www.dri-design.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 |
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| Division 12 | Furnishings | \$ 2.20 | 1% | \$ 213,500 |
| Division 13 | Special Construction | \$ 26.41 | 12% | \$ 2,562,000 |
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| Division 21 | Fire Supression | \$ 2.20 | 1% | \$ 213,500 |
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| 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



nexus

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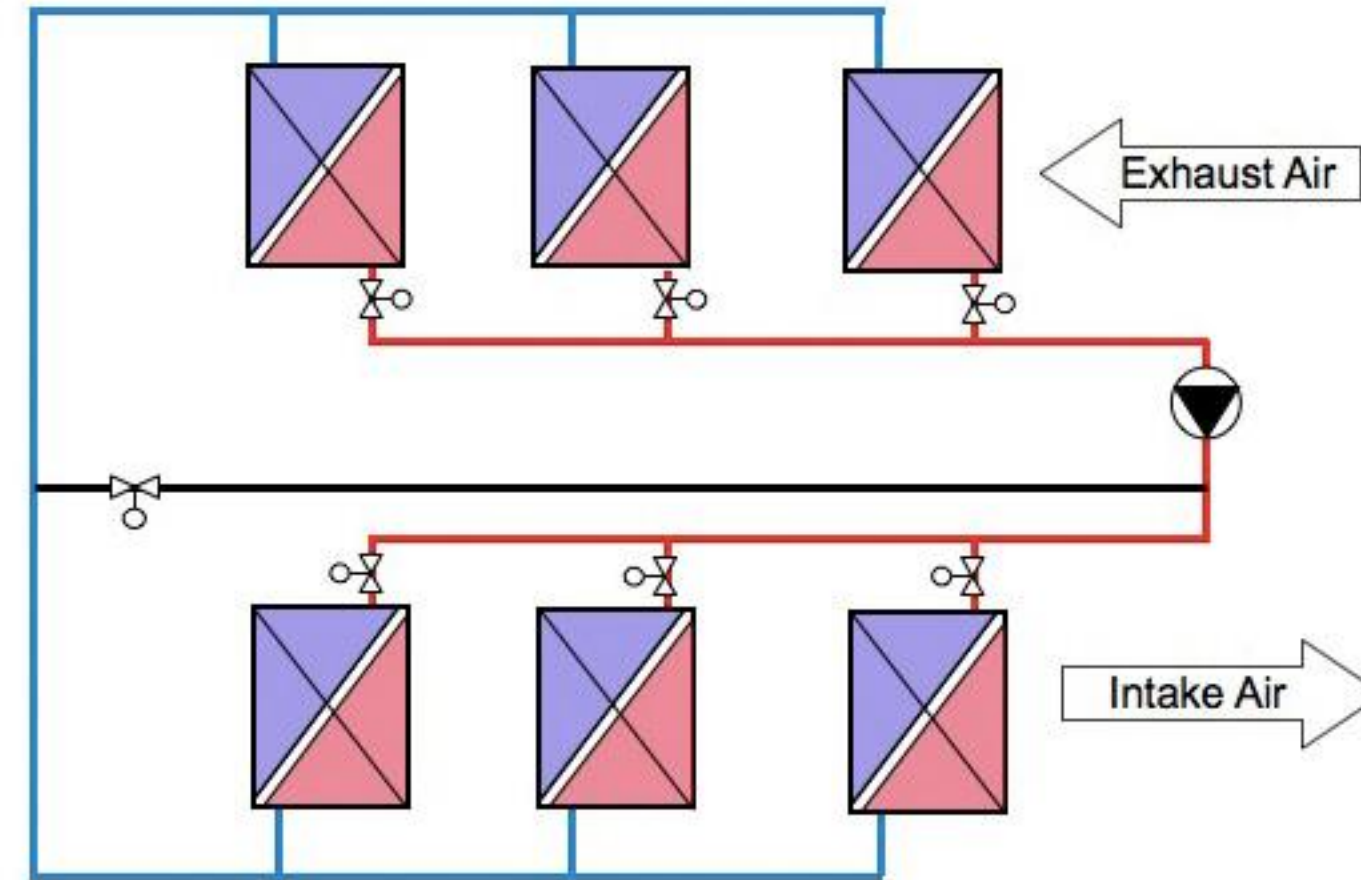
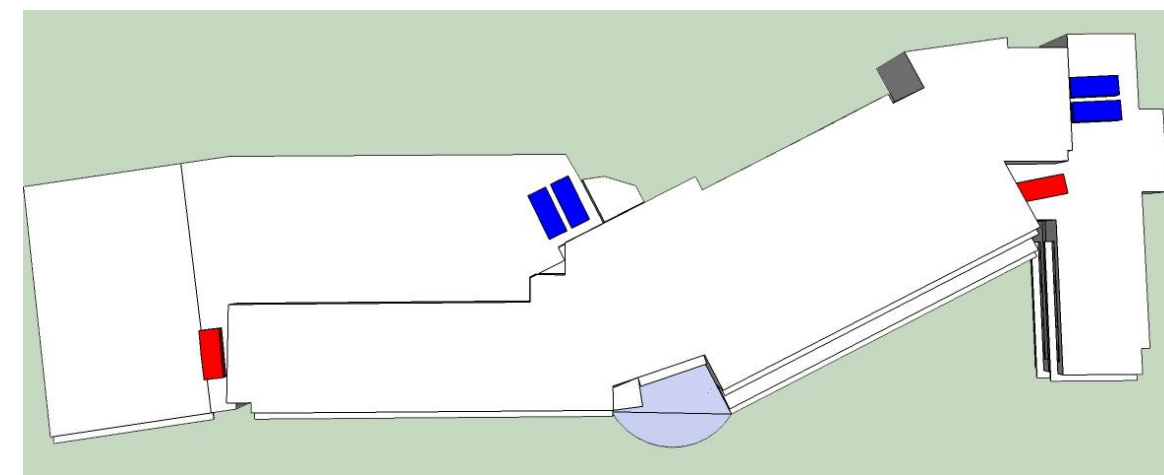
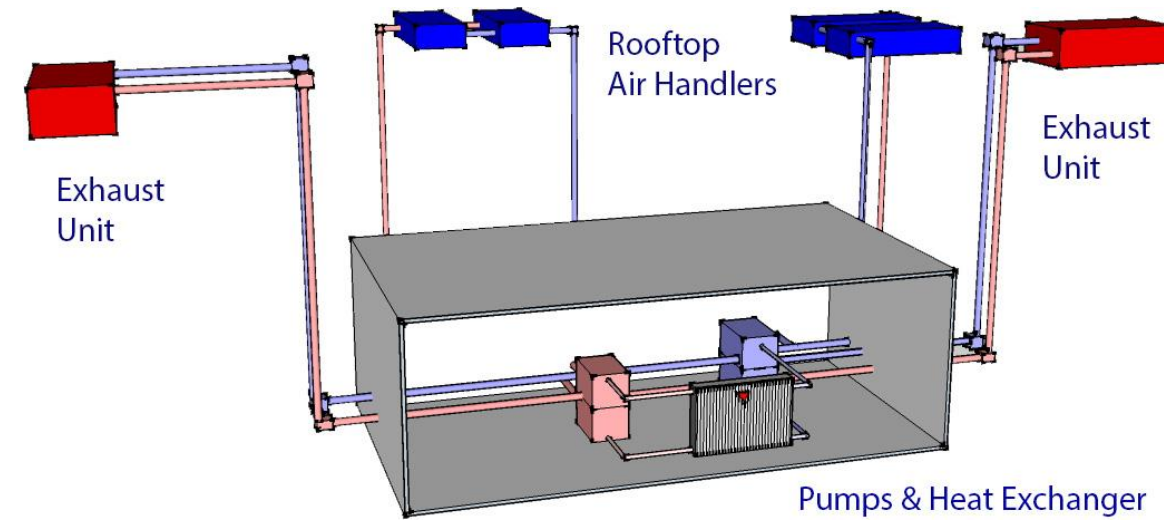
experience

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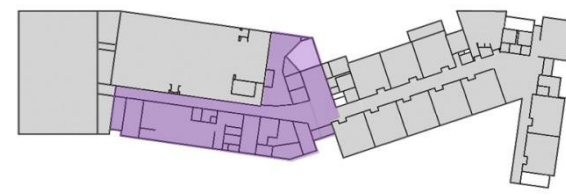


konvekta

| 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/>



nexus

foci

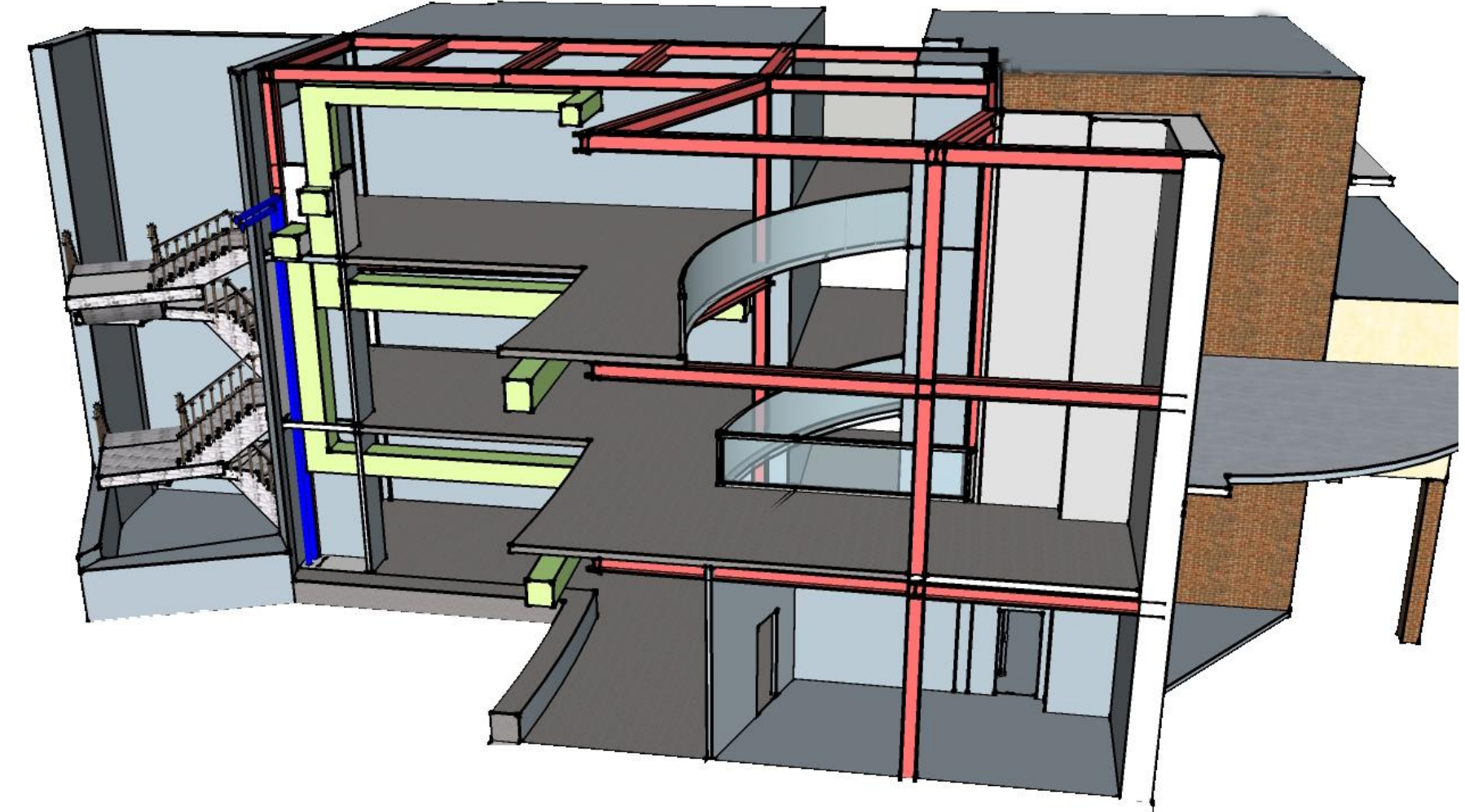
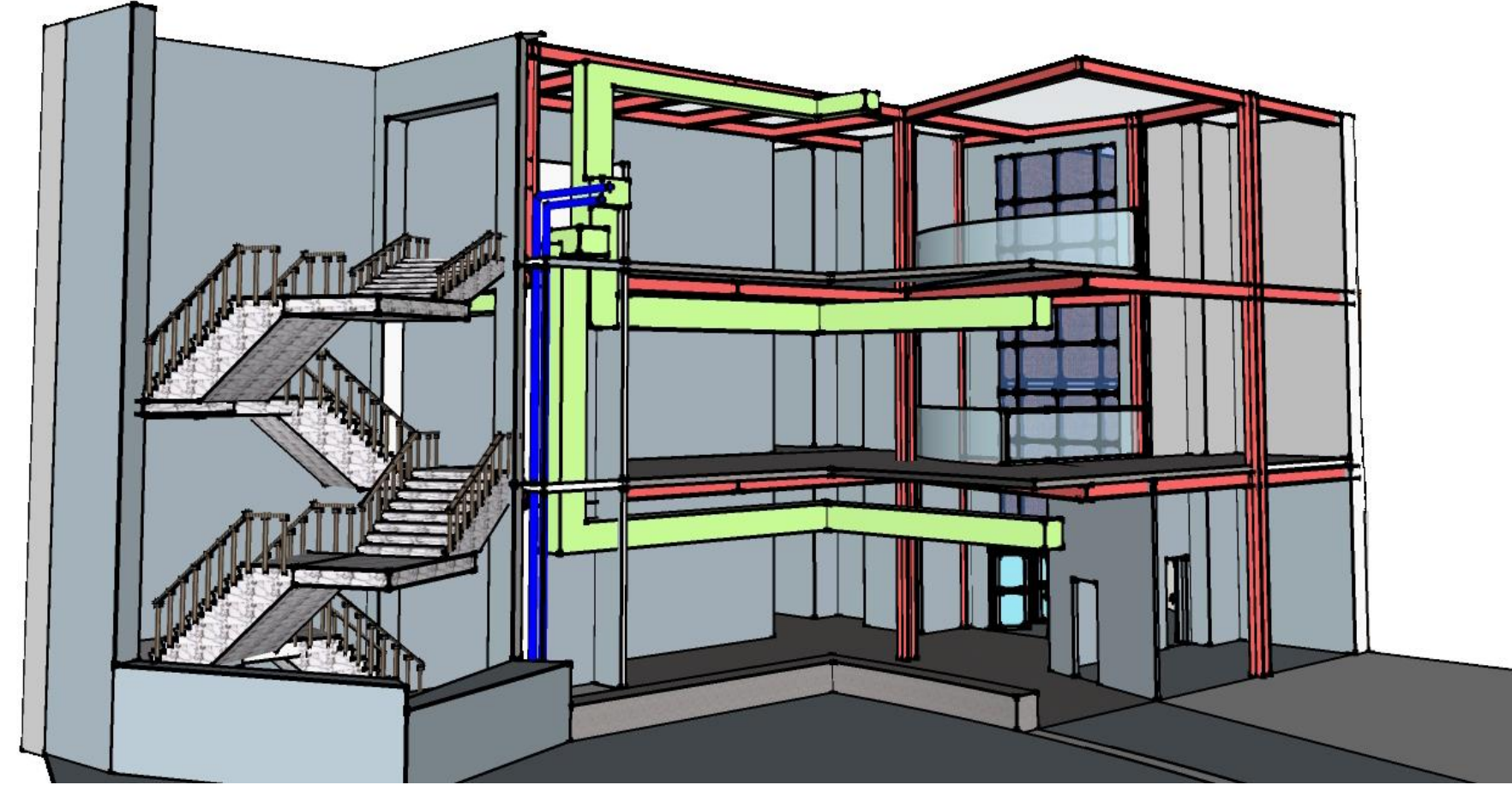
experience

community

education

conclusion

appendix



nexus

foci

experience

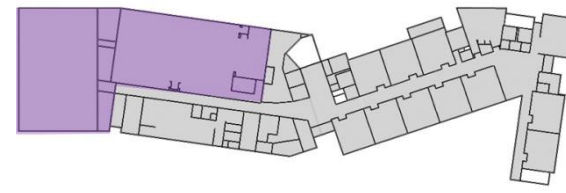
community

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recreation



nexus

foci

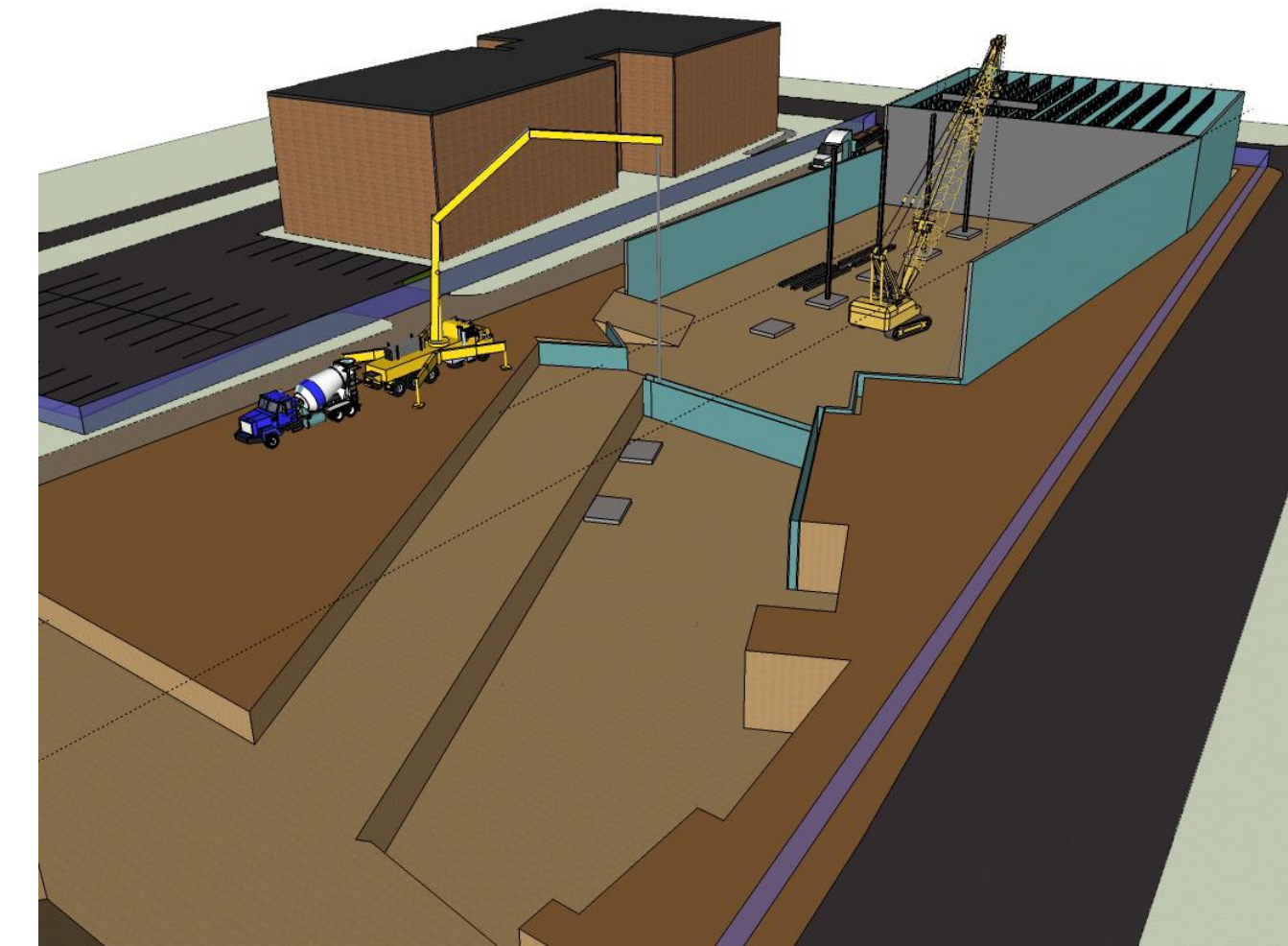
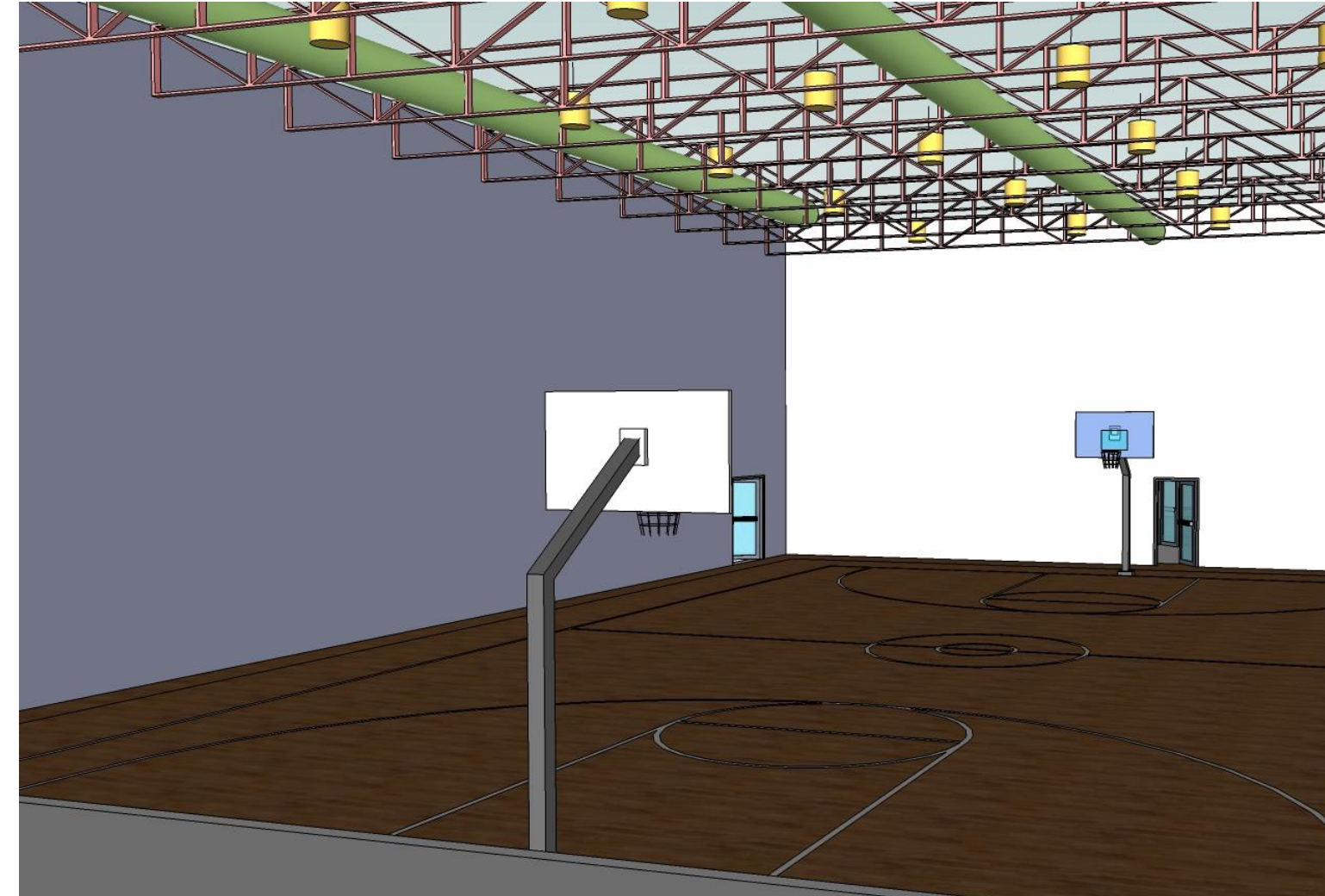
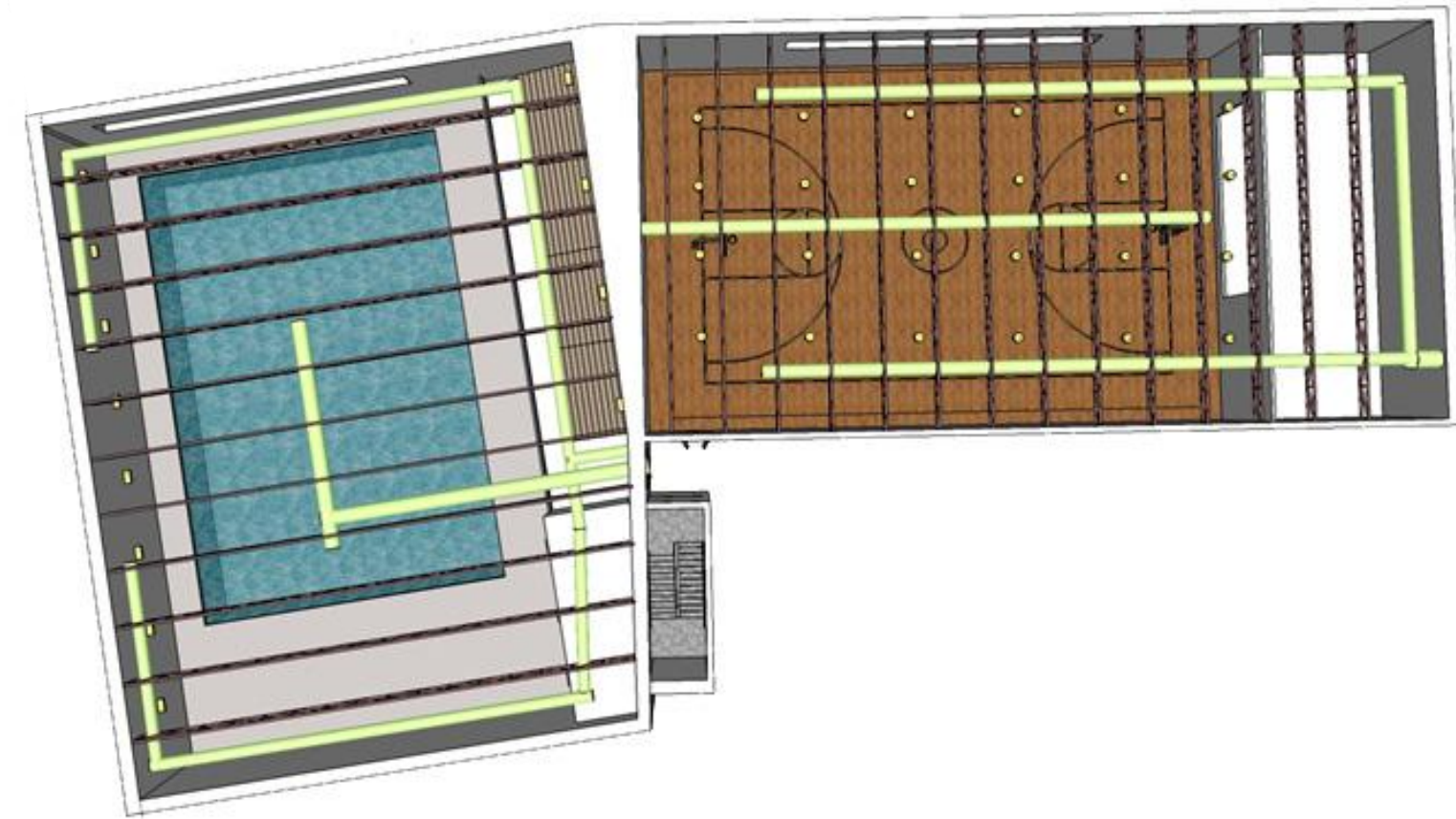
experience

community

education

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Structure

September – December

Water Tight

January

MEP Rough-In and Finishes

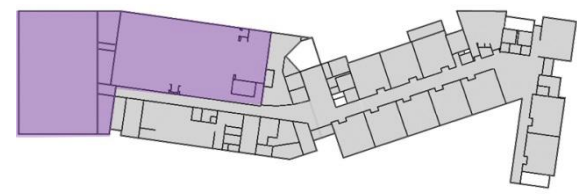
January – August

Owner Move-In

Last two weeks of August

First Day of School

8/24/15



nexus

foci

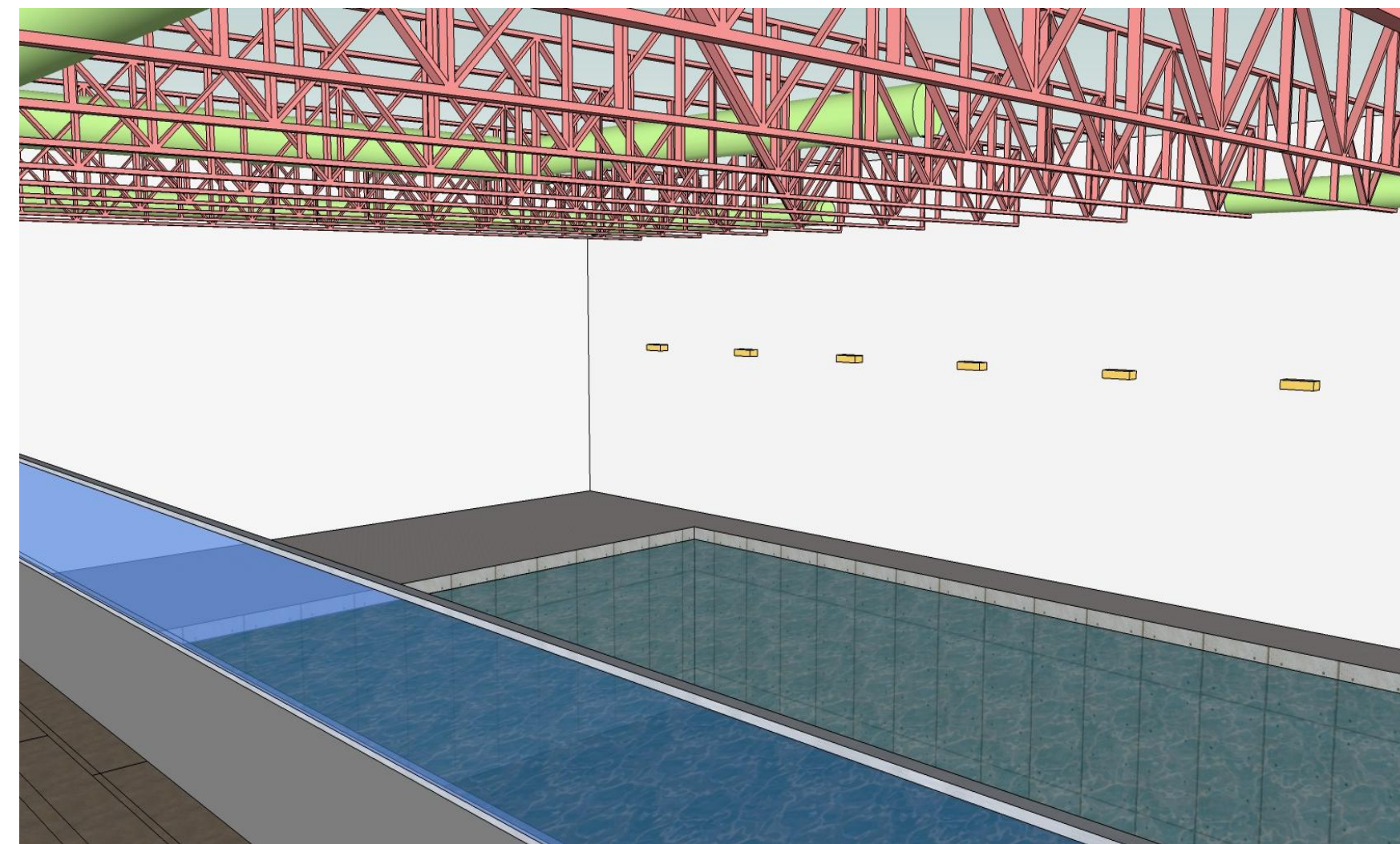
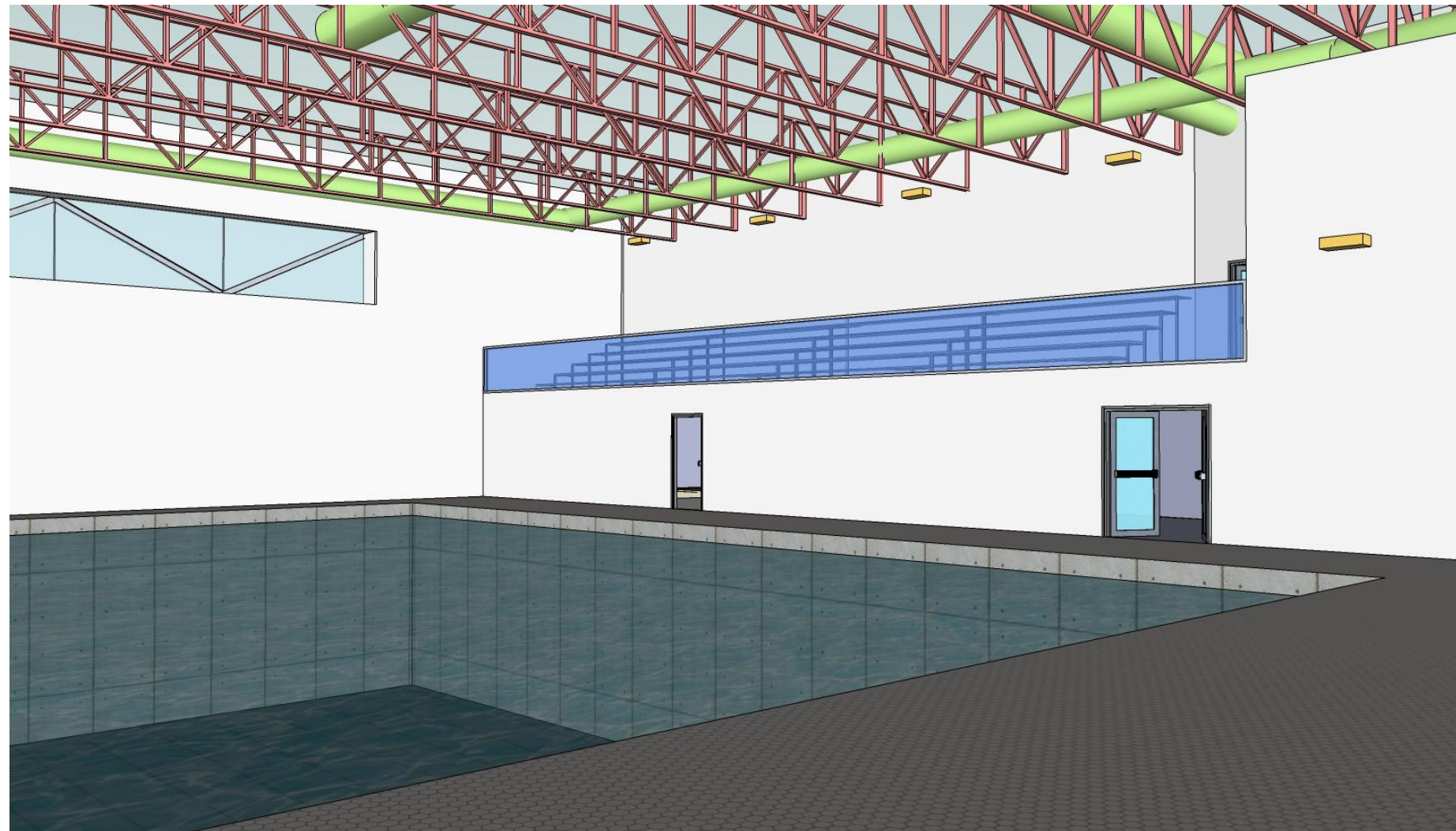
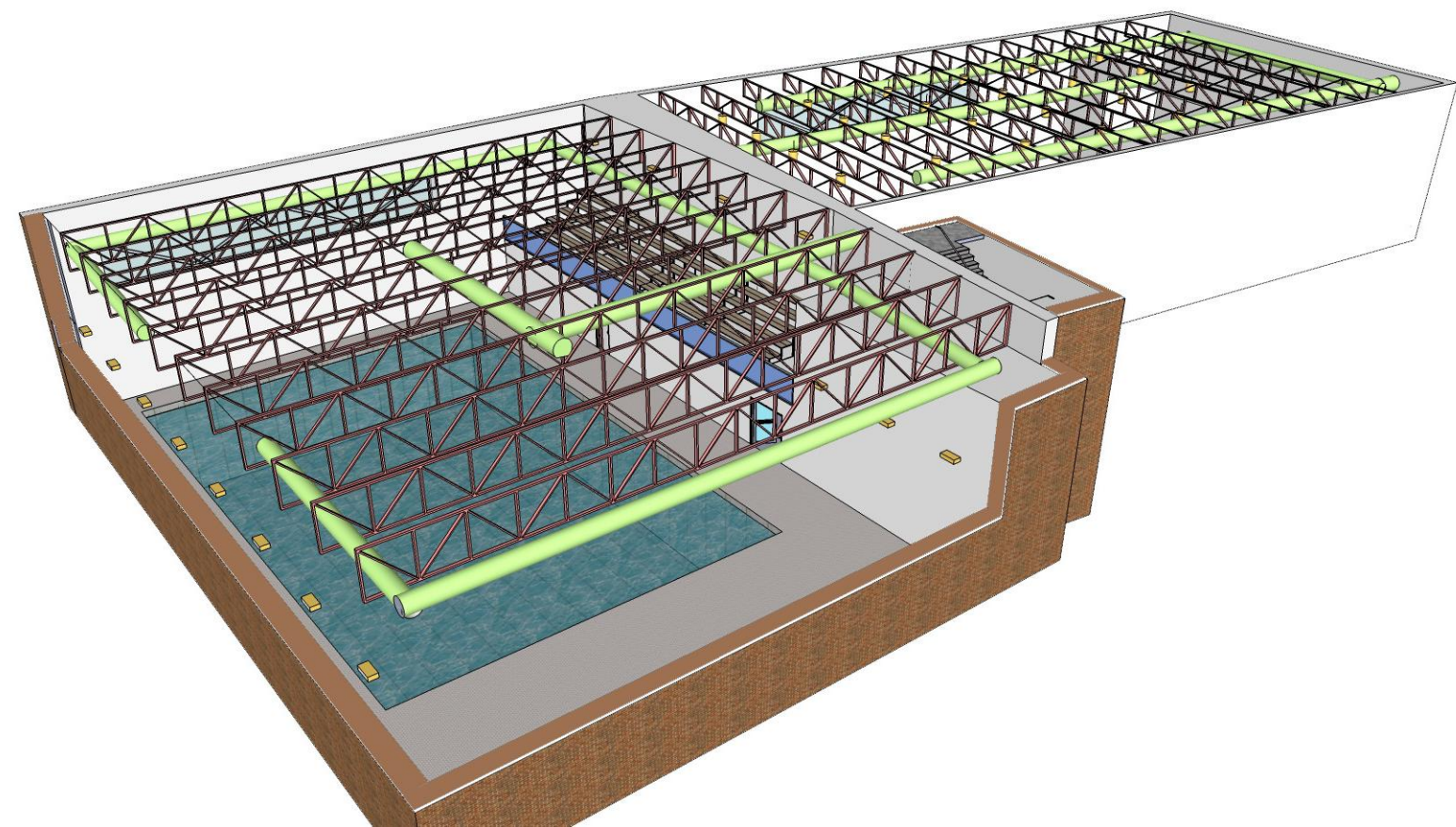
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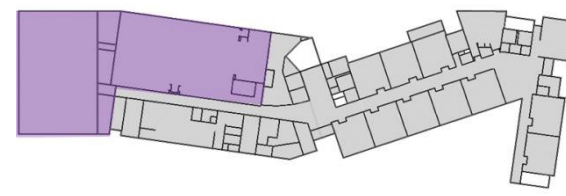
community

education

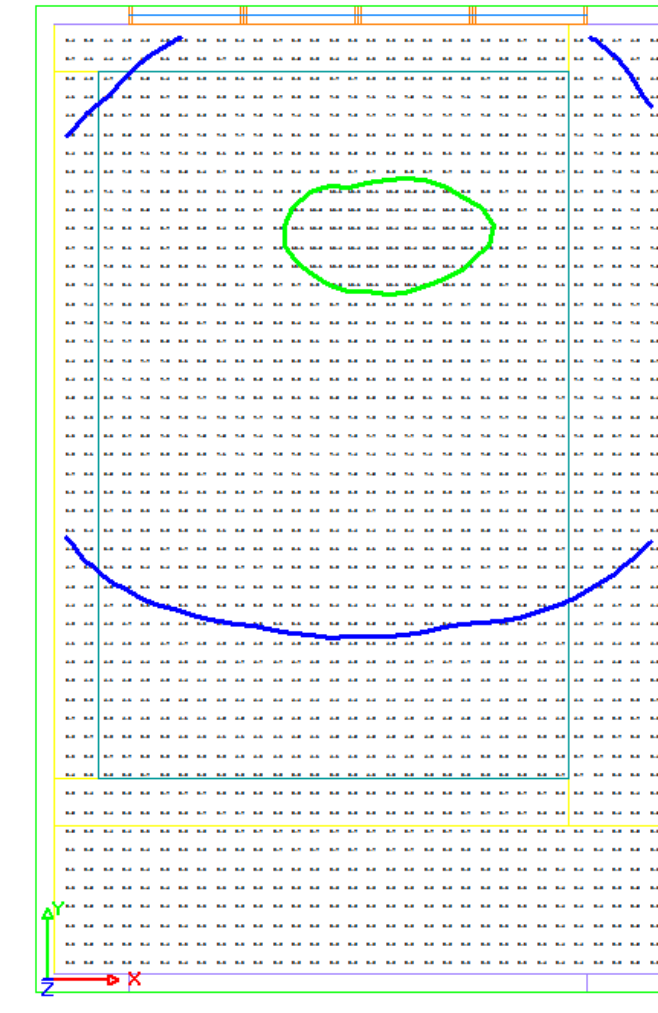
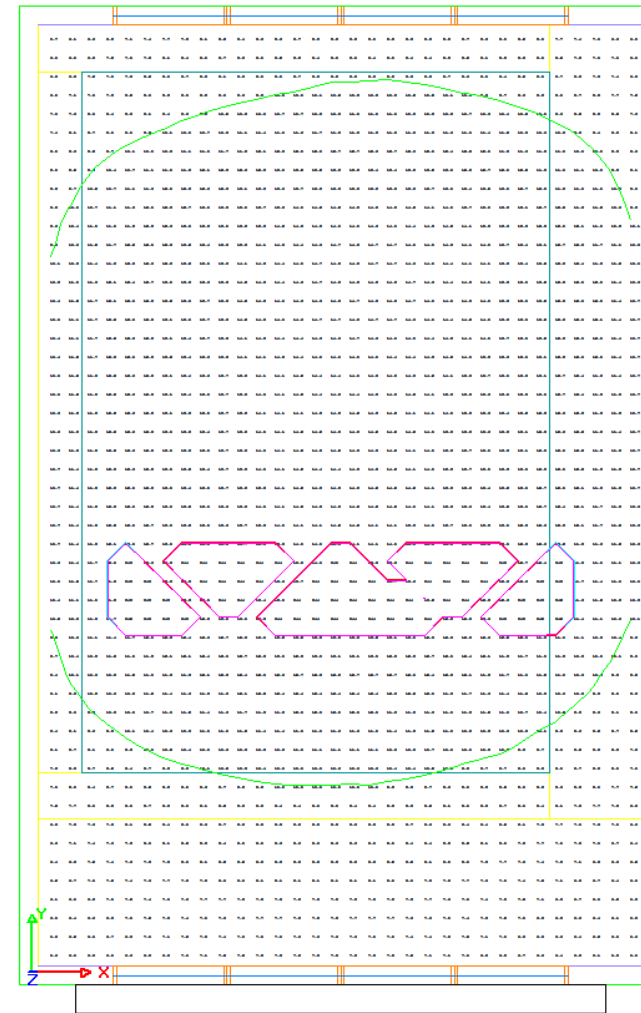
conclusion

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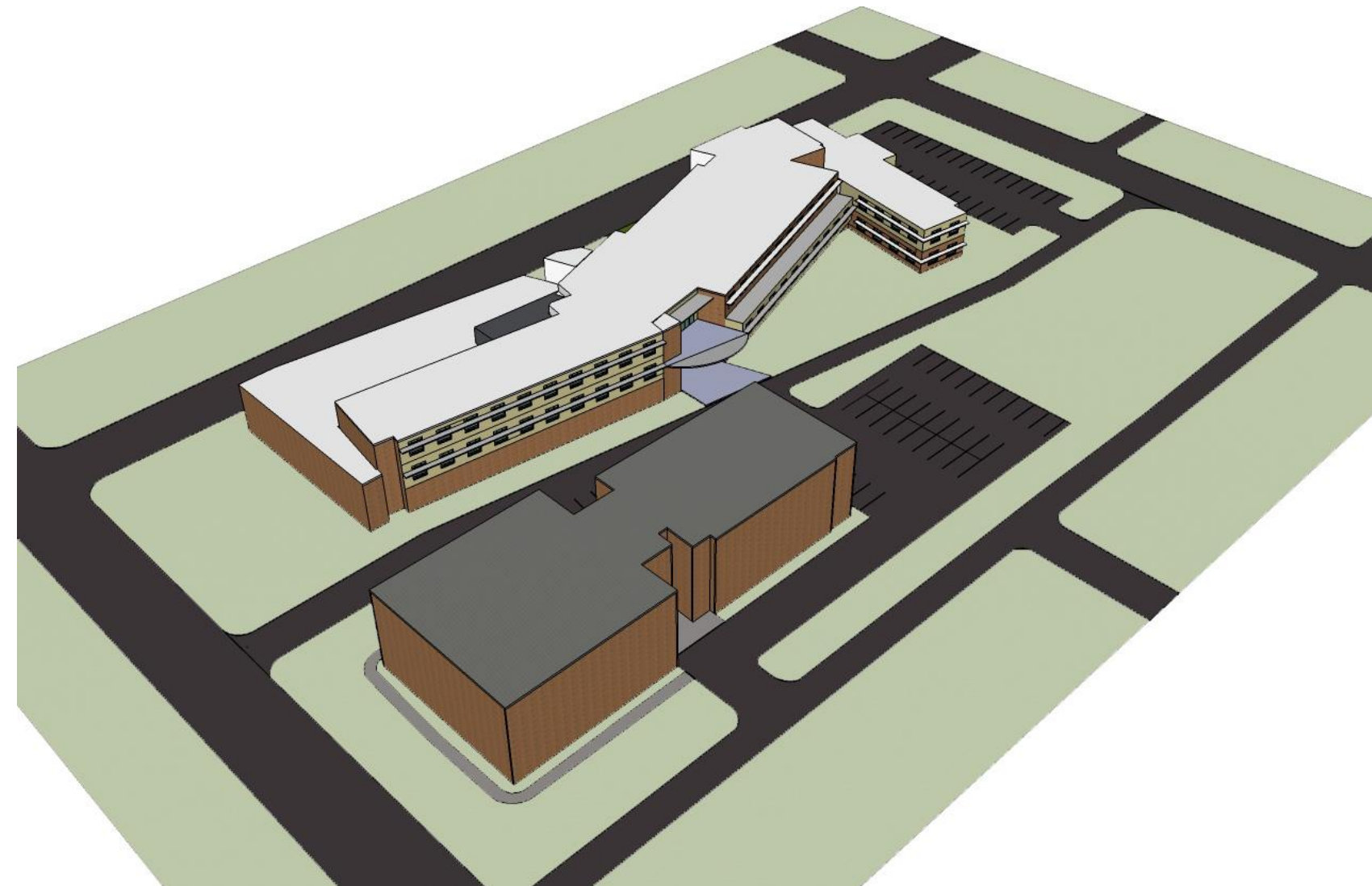
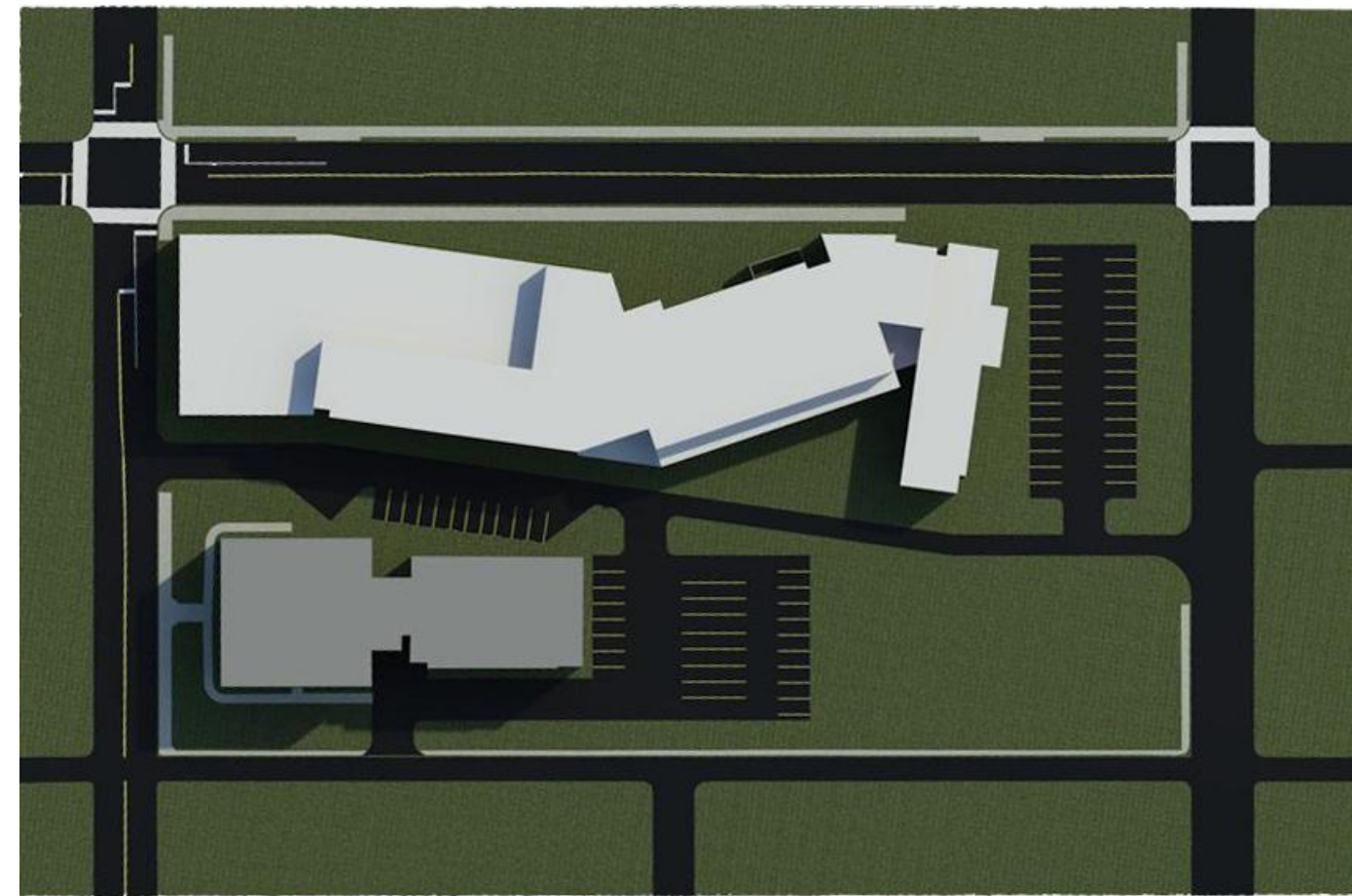
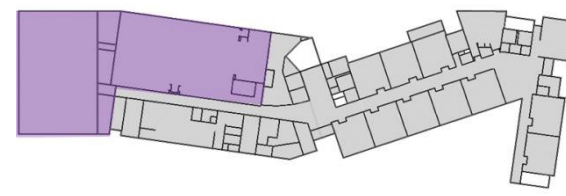




<http://www.poolpak.com/>



| 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

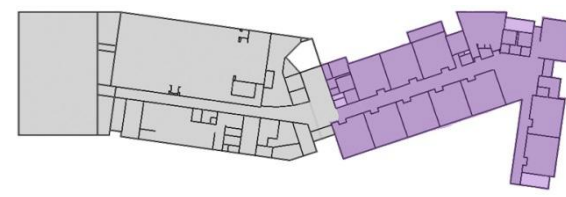
community

education

conclusion

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classrooms



nexus

foci

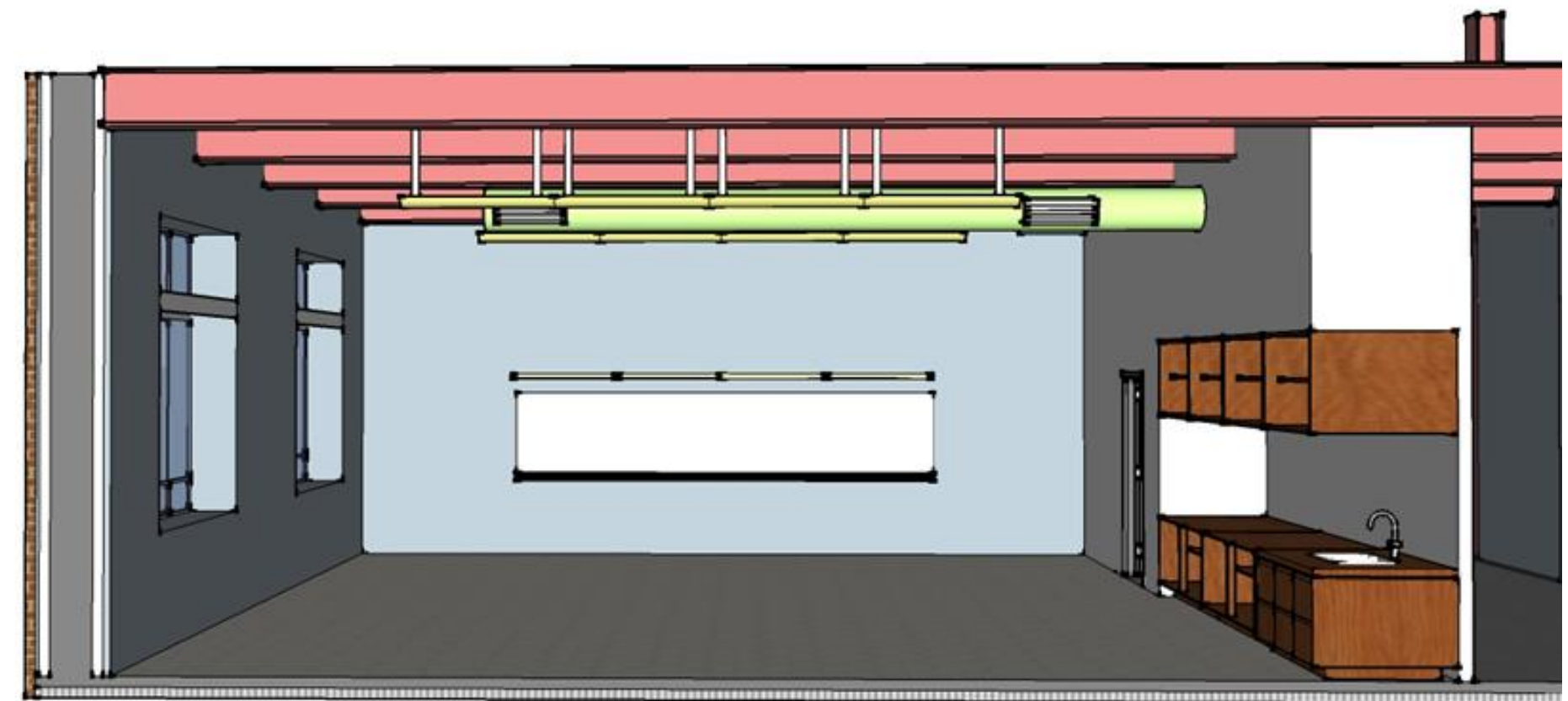
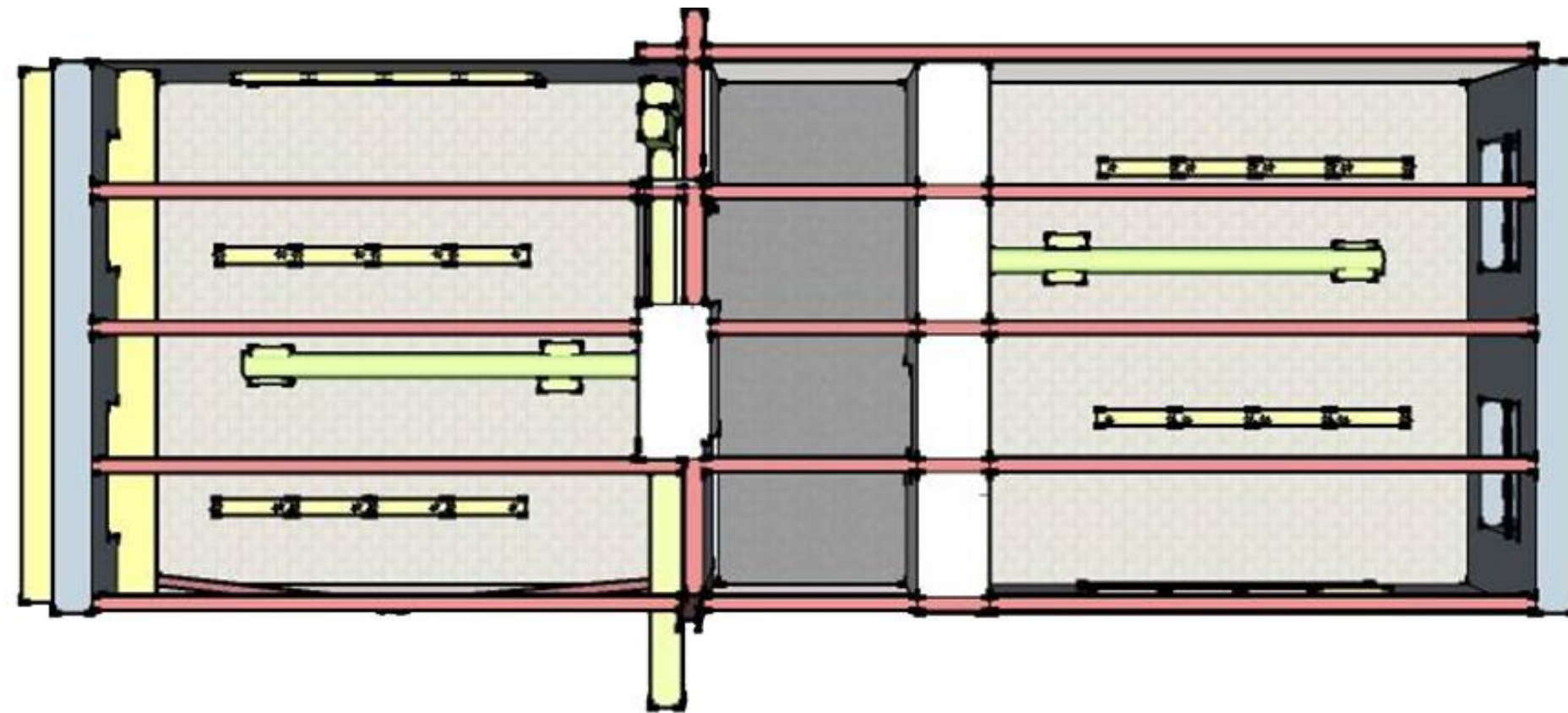
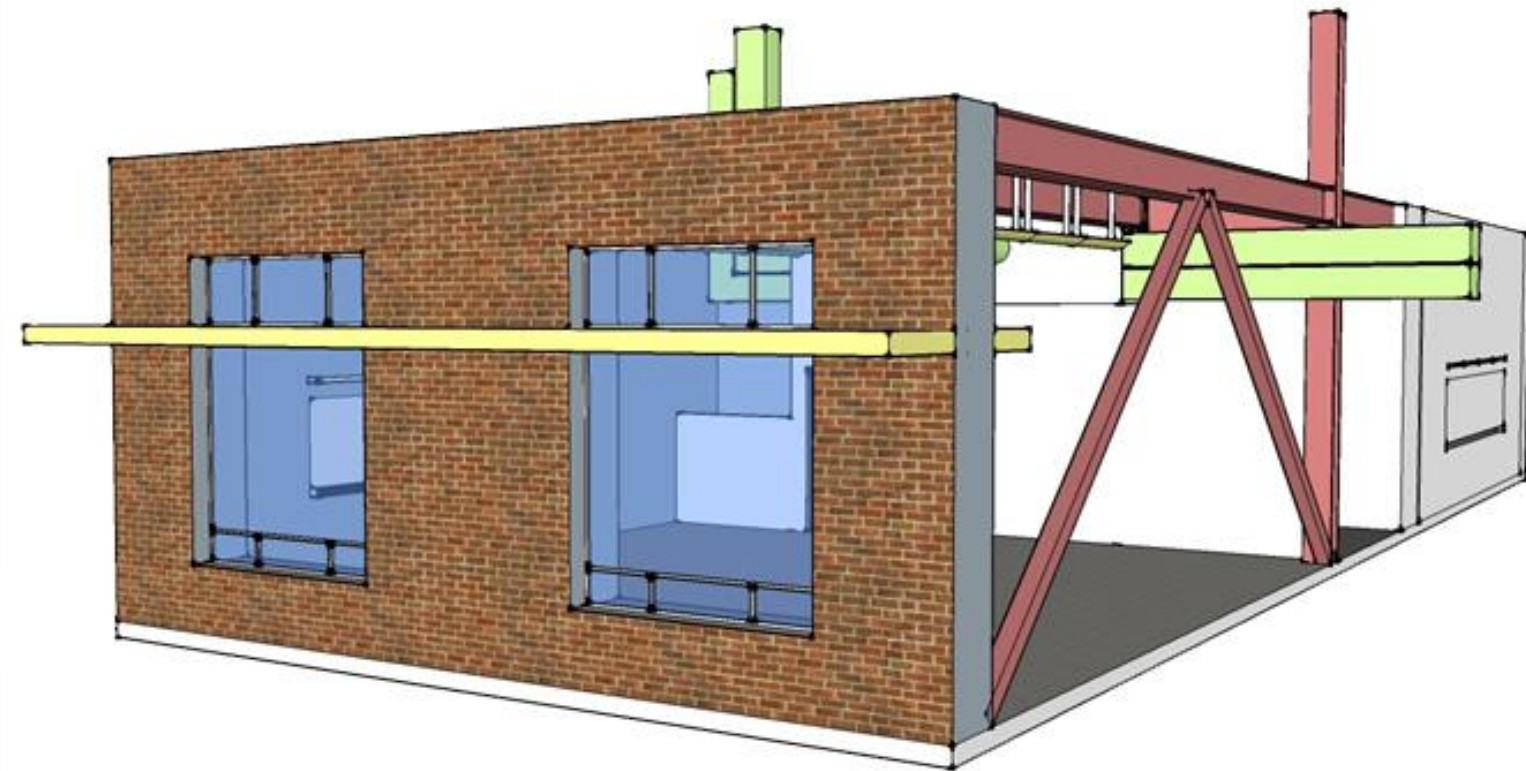
experience

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classroom



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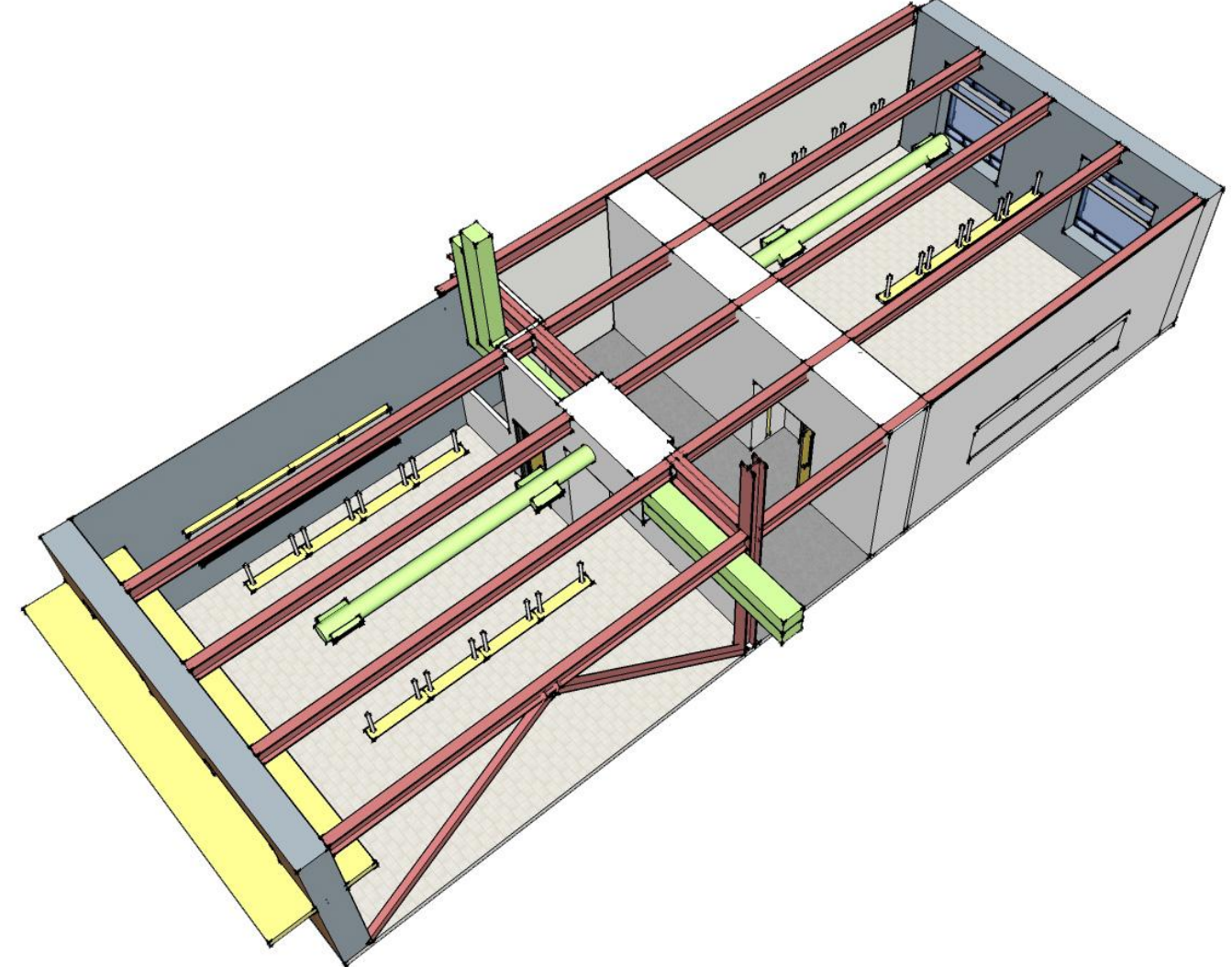
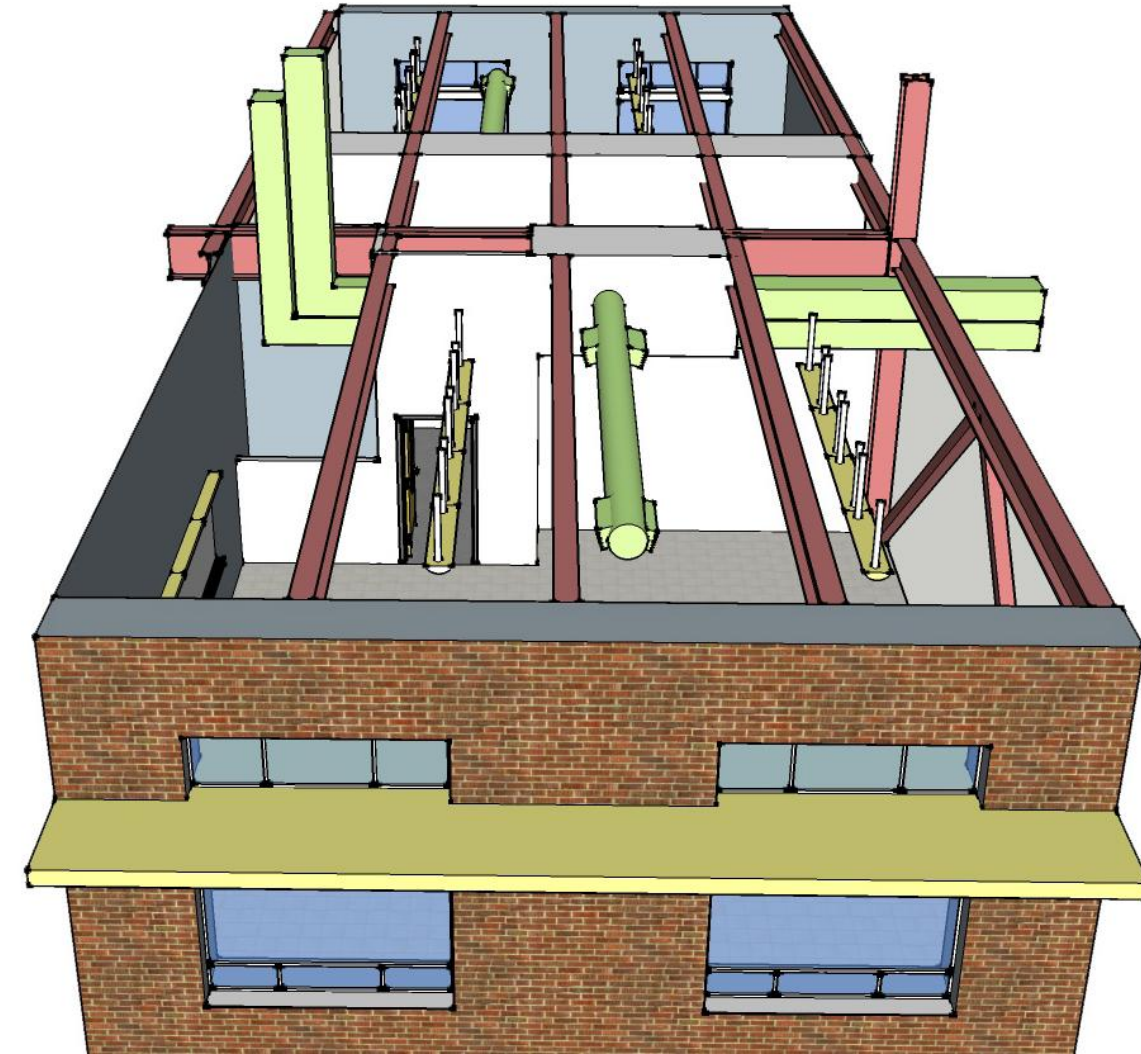
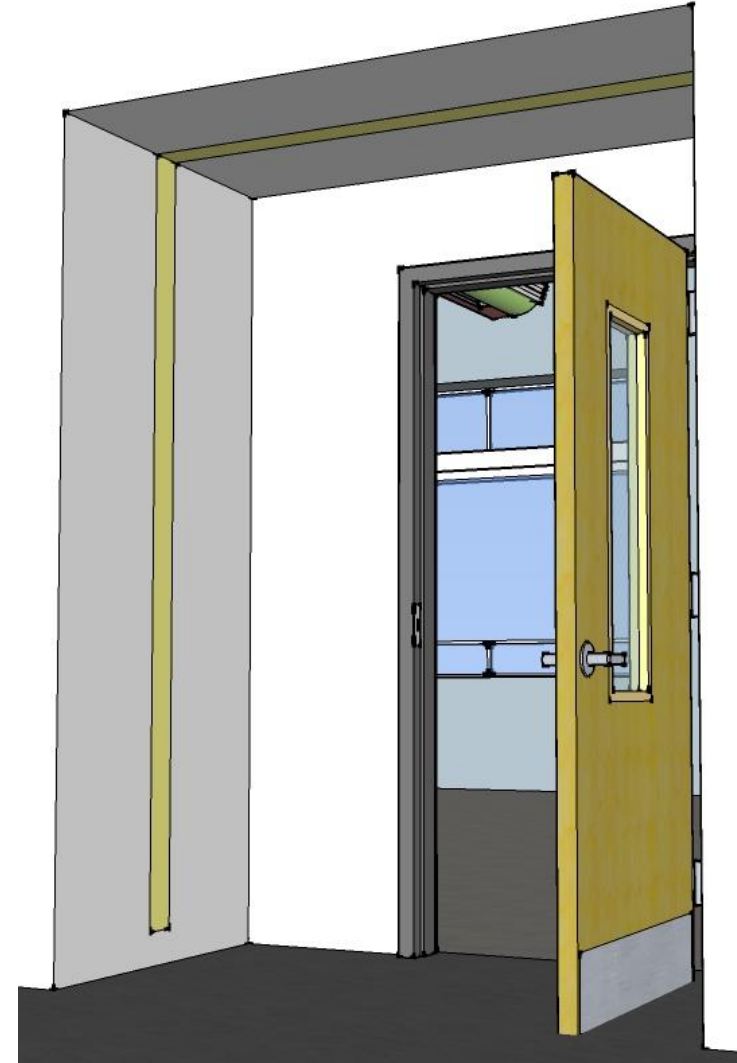
experience

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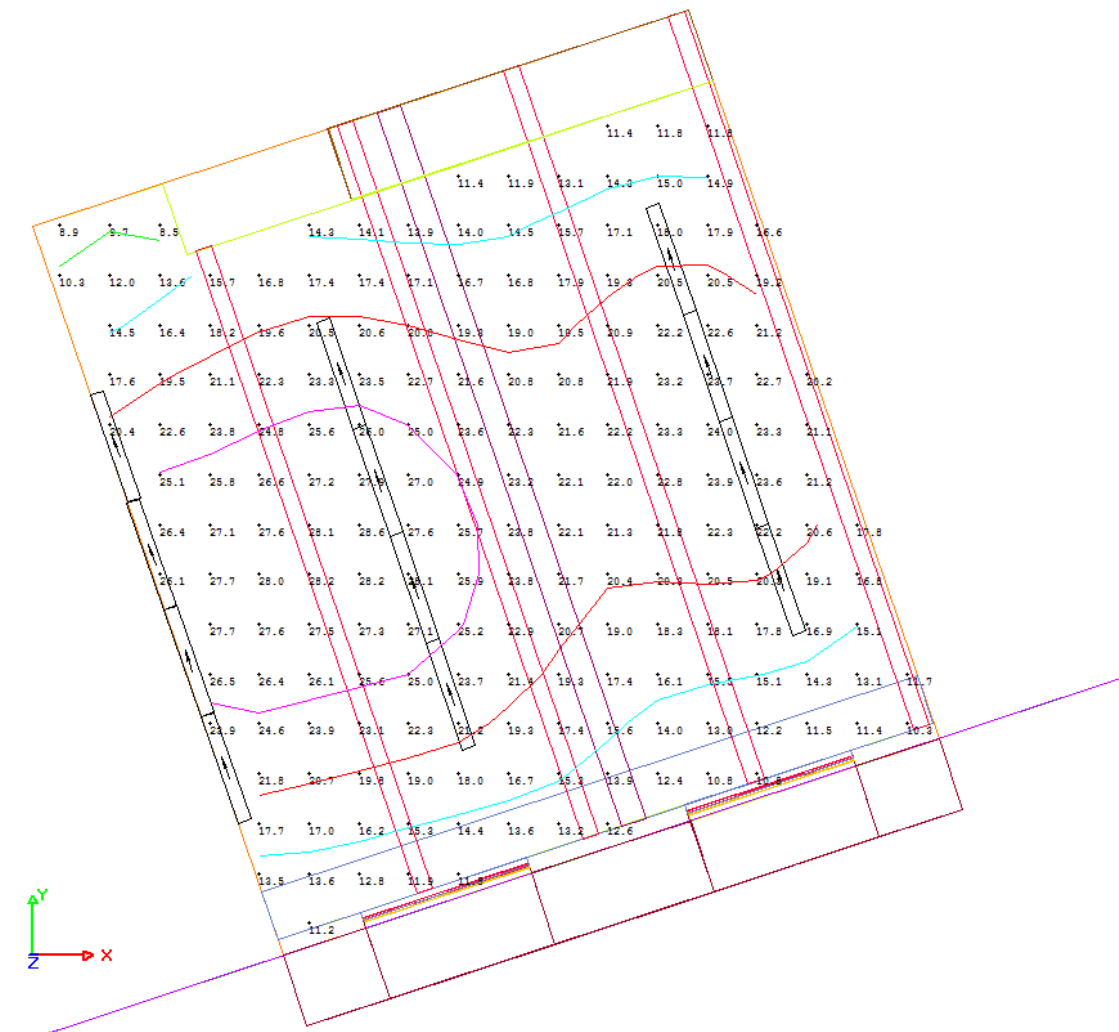
experience

community

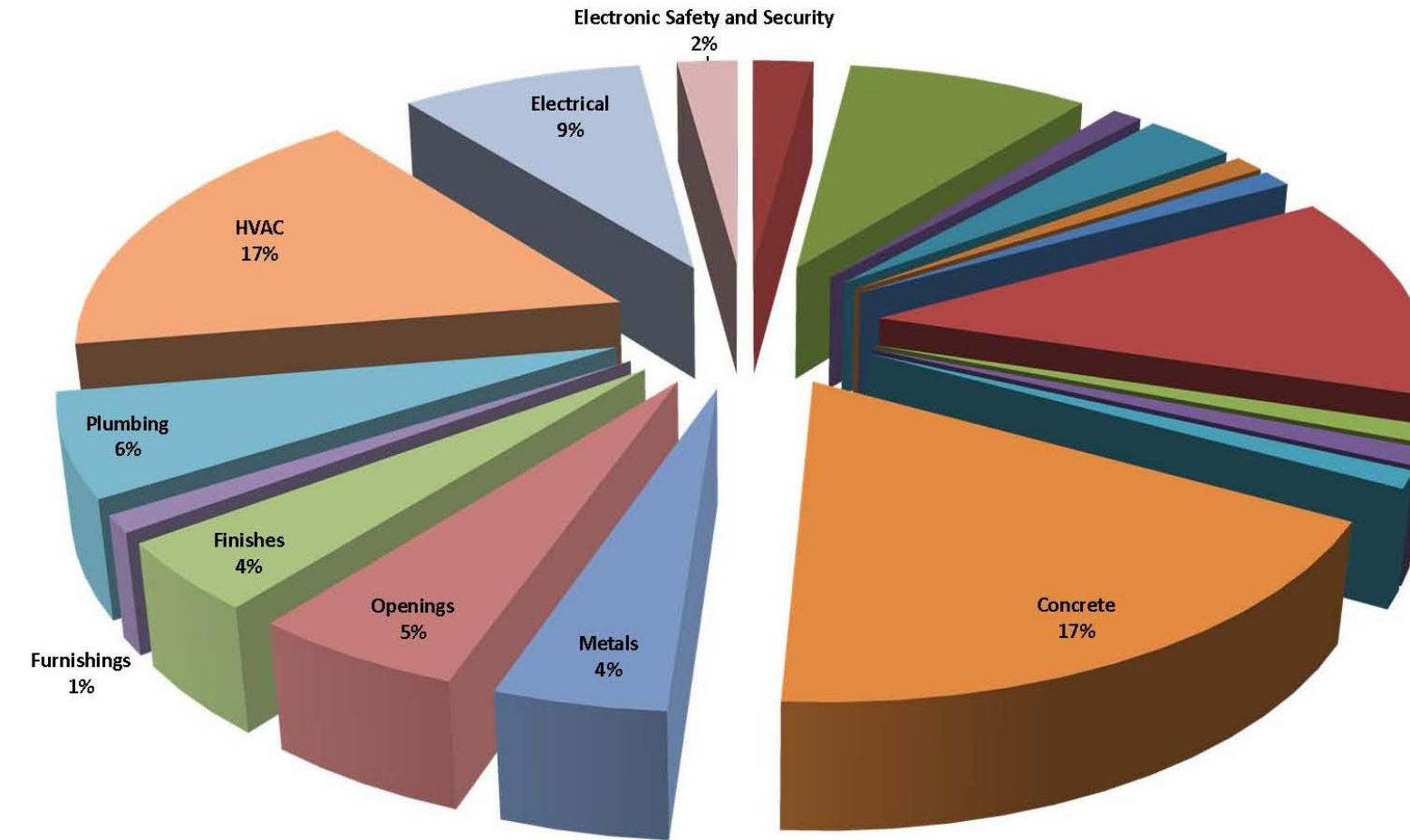
education

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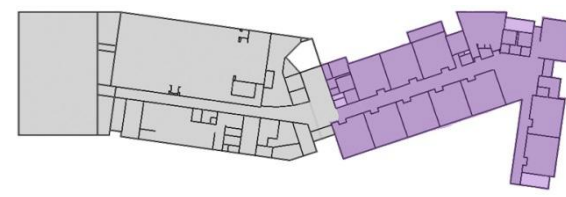


Cost Breakdown



Cost Breakdown

| | Cost/SF | % of Cost | Cost |
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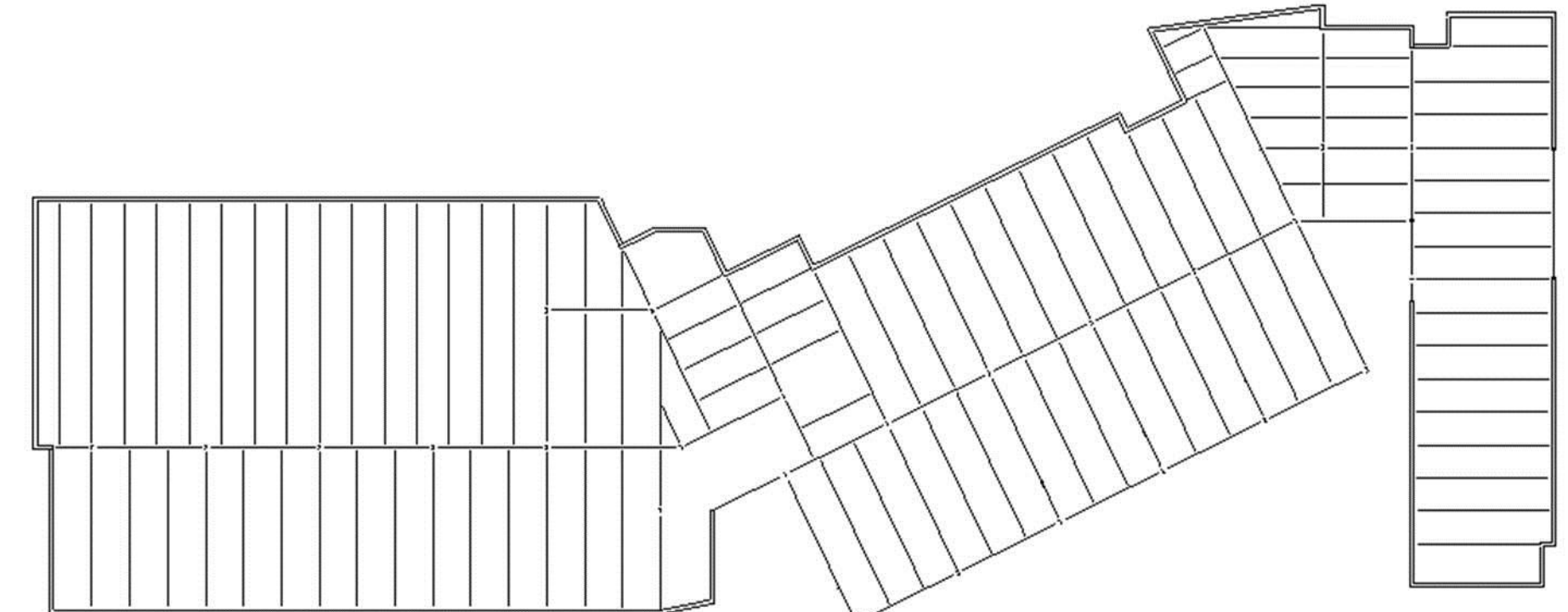
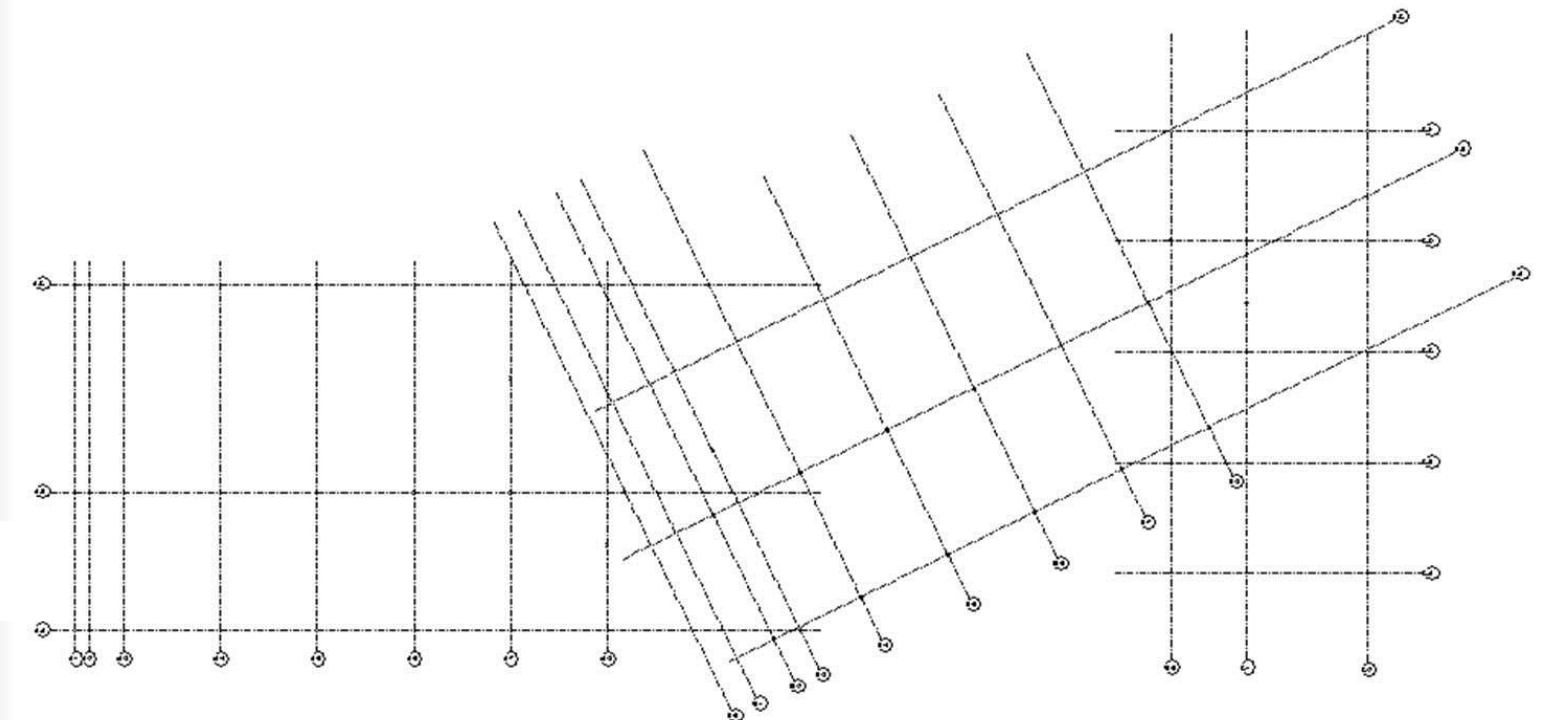
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experience

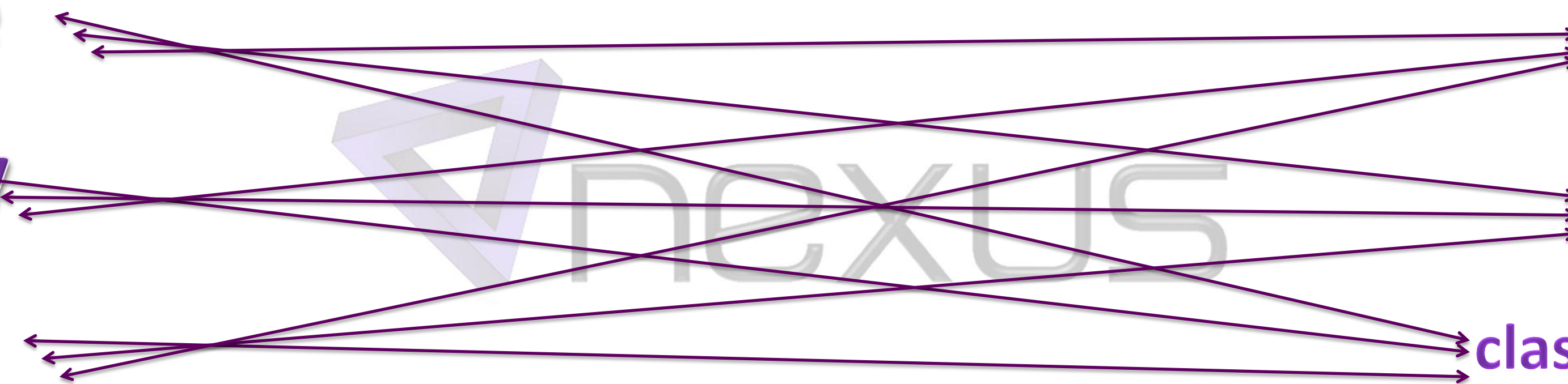
community

education

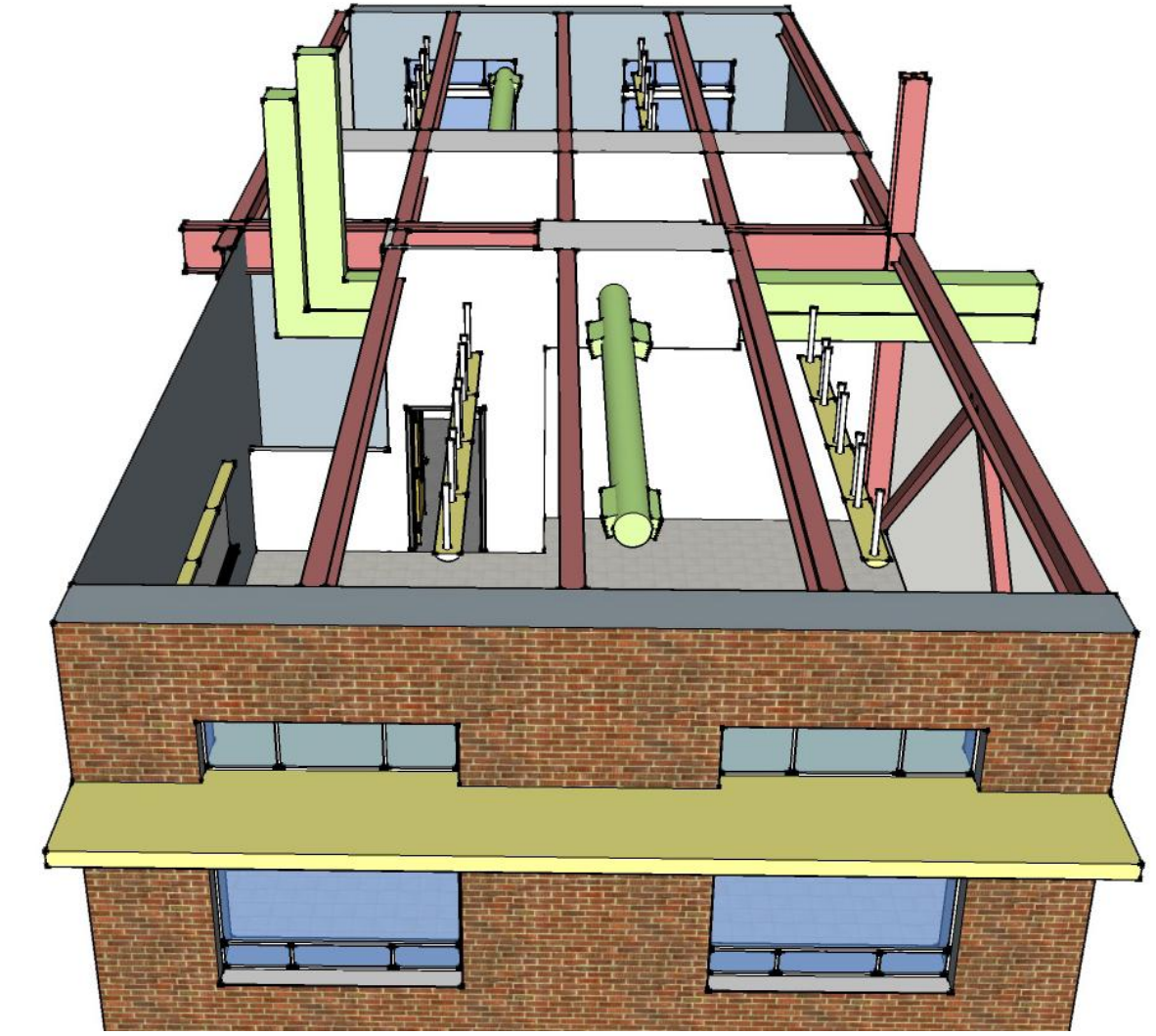
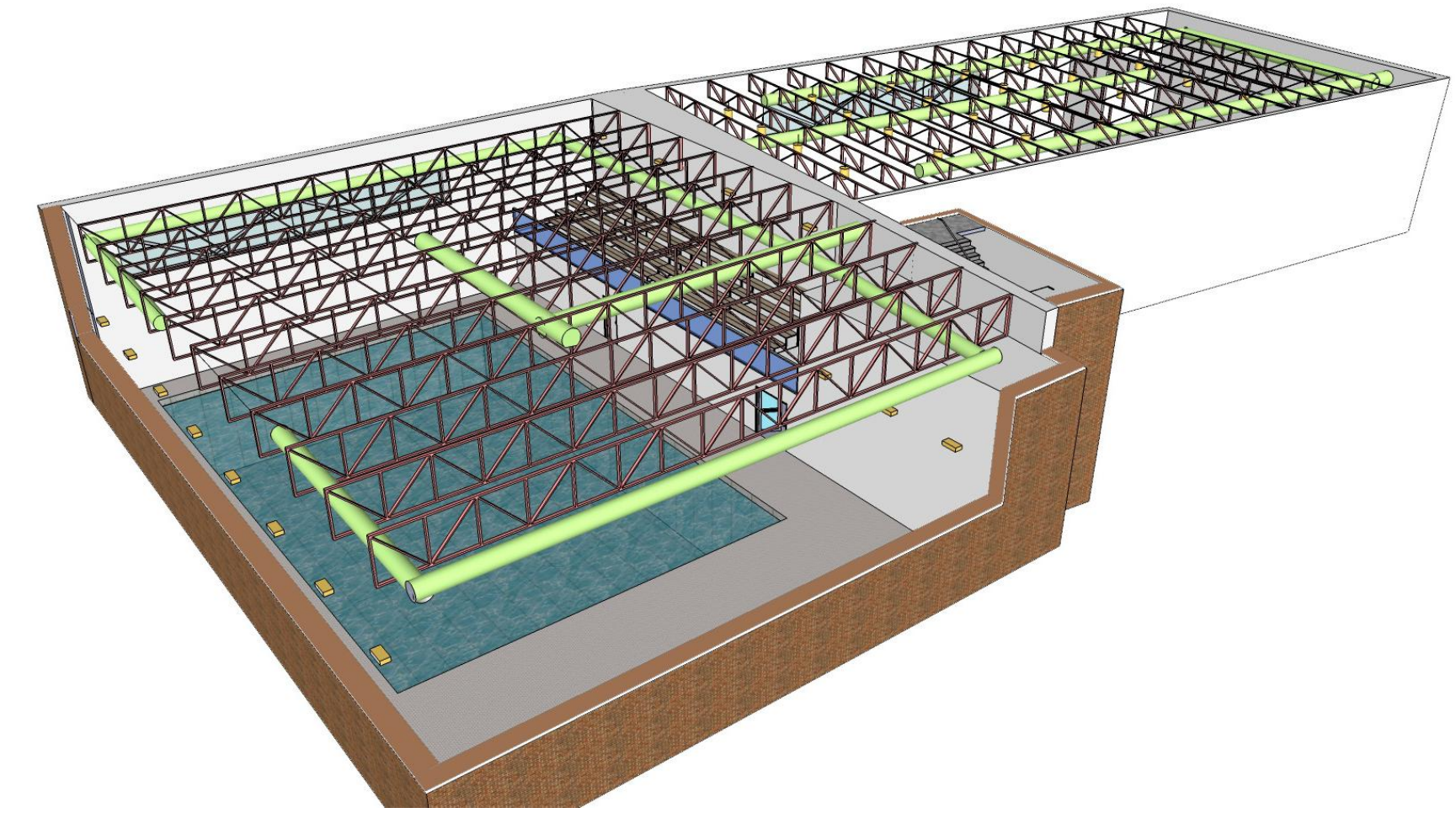
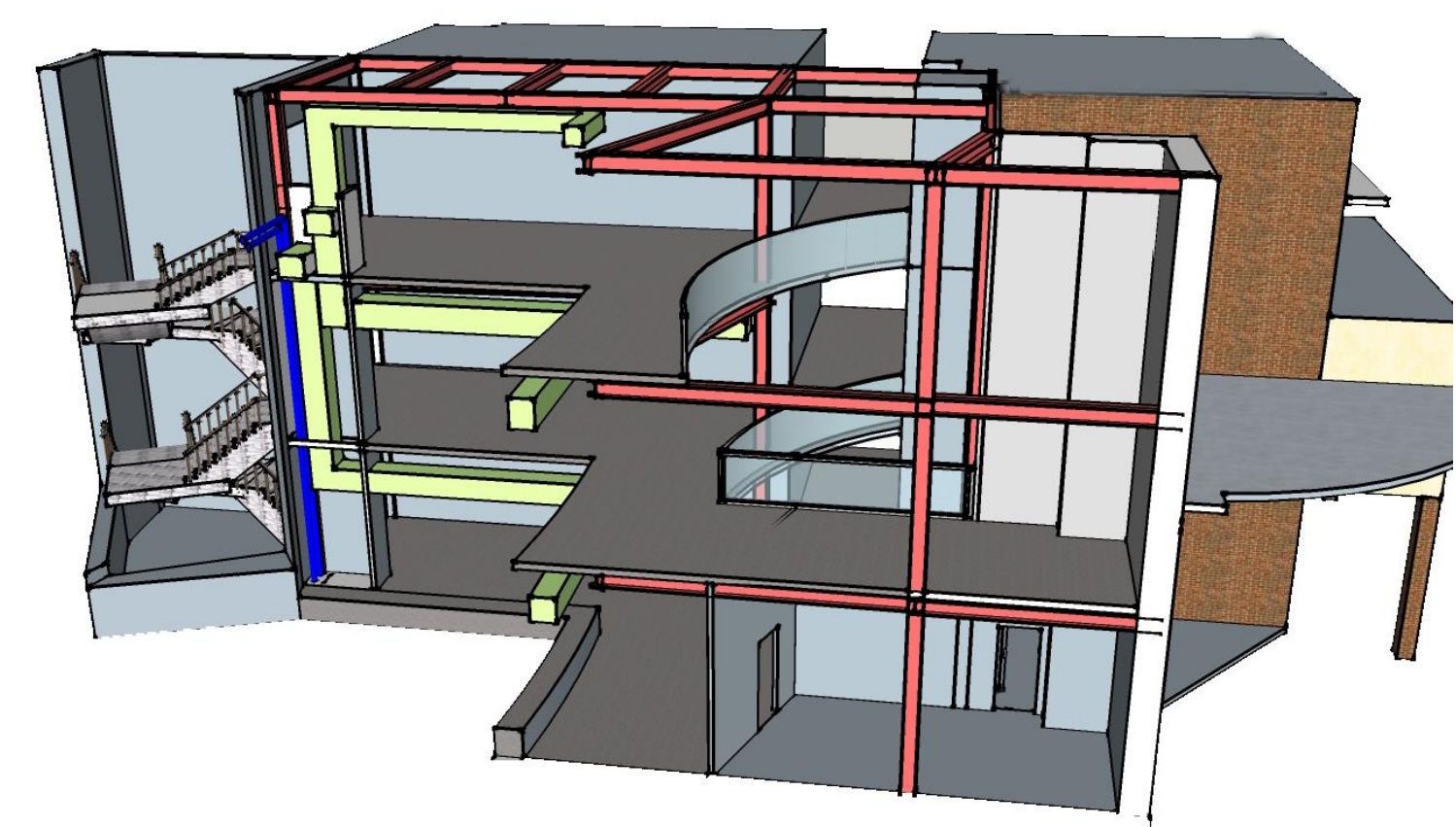
site/envelope/lobby

pool/gym/public facilities

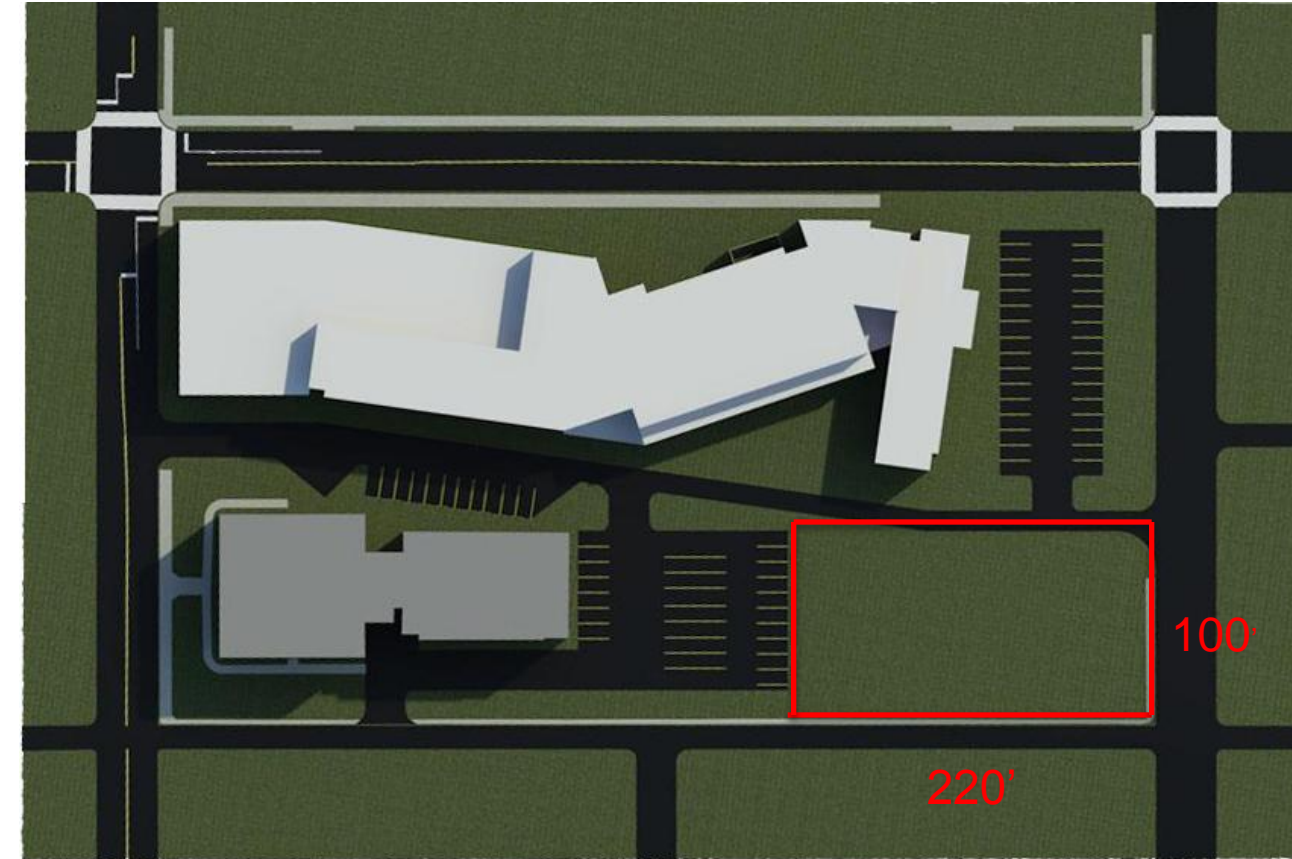
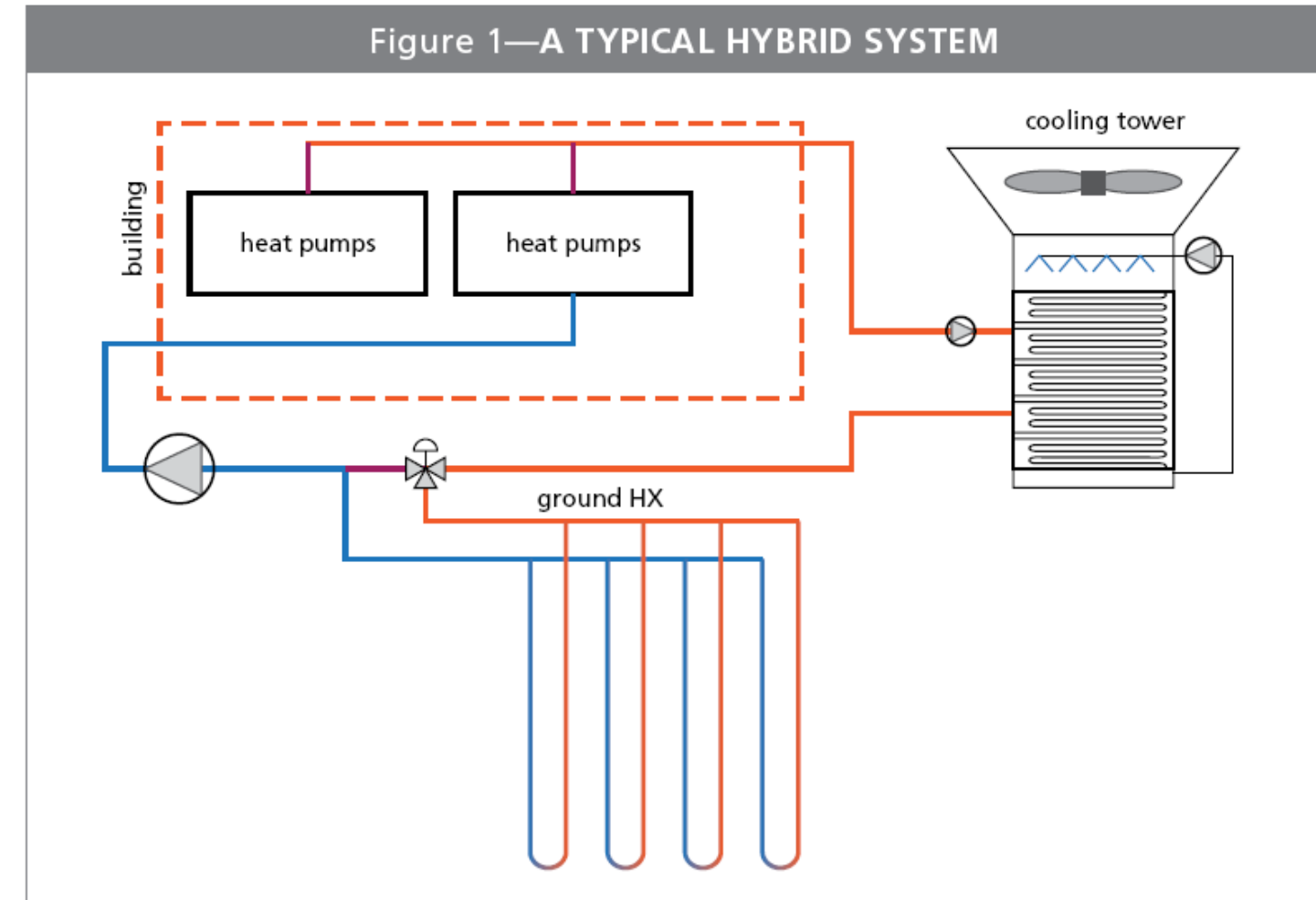
classrooms/learning tool/flexibility



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

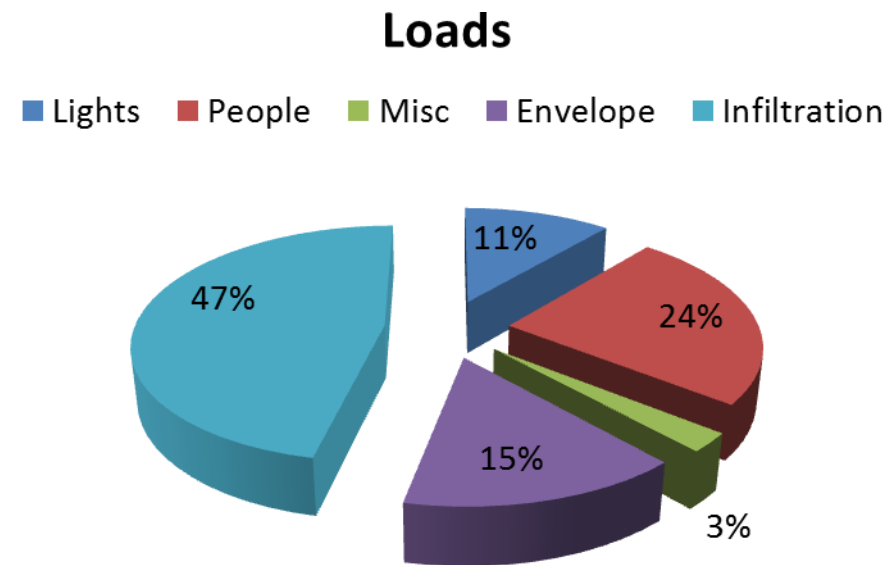
System - 001

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 | 9 | -101,525 | 0 | 0 | See Fan | 0 | 0 | | | | | | | |
| Glass/Door Cond | 29,689 | 0 | 29,689 | 1 | 29,689 | 0 | 29,689 | 1 | -169,395 | 0 | 0 | Nom Vent | 8,957 | 0 | | | | | | | |
| Wall Cond | 12,293 | 0 | 12,293 | 0 | 12,293 | 0 | 12,293 | 0 | -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 | Min/Stop/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 | -3,368,896 | 330.00 | 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 | 17 | 288,173 | 17 | Lights | 0 | 0 | 0.00 | % OA | 11.8 | 0.0 | | | | | | |
| People | 629,360 | 0 | 629,360 | 22 | 325,200 | 19 | 325,200 | 19 | People | 0 | 0 | 0.00 | out/In | 1.00 | 0.32 | | | | | | |
| Misc | 65,720 | 0 | 65,720 | 2 | 65,720 | 4 | 65,720 | 4 | Misc | 0 | 0 | 0.00 | Return | 321.87 | 0.00 | | | | | | |
| Sub Total ==> | 983,253 | 10,224 | 993,477 | 35 | 679,093 | 40 | 679,093 | 40 | Sub Total ==> | 0 | 0 | 0.00 | Exfil | 322.10 | 0.00 | | | | | | |
| Ceiling Load | | | | Ceiling Load | | | | Ceiling Load | | | | AREAS | | | | | | | | | |
| Ventilation Load | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Gross Total | Glass | Ent | Lvg | | | | | | | | | |
| Adj Air Trans Heat | 0 | 0 | 229,217 | 8 | 0 | 0 | 0 | 0 | Floor | 76,055 | 0 | 0 | Main Htg | -1,020.9 | 24,079 | 71.8 | 110.4 | | | | |
| Dehumid. Ov Sizing | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Part | 0 | 0 | 0 | Aux Htg | 0.0 | 0 | 0.0 | 0.0 | | | | |
| Out/Undr Sizing | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Int Door | 0 | 0 | 0 | Preheat | 0.0 | 0 | 0.0 | 0.0 | | | | |
| Exhaust Heat | 0 | 0 | 0 | 0 | 226 | 0 | 226 | 0 | ExFir | 0 | 0 | 0 | Humidif | 0.0 | 0 | 0.0 | 0.0 | | | | |
| Sup. Fan Heat | 23,198 | 23,198 | 1 | 0 | 0 | 0 | 0 | 0 | Roof | 33,675 | 0 | 0 | Opt Vent | 0.0 | 0 | 0.0 | 0.0 | | | | |
| Rel. Fan Heat | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | Wall | 37,226 | 9,522 | 26 | Total | -1,020.9 | 0 | 0 | 0.0 | | | | |
| Duct Heat PkUp | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Ext Door | 126 | 0 | 0 | | | | | | | | | |
| Underfir Sup Ht PkUp | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | |
| Supply Air Leakage | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | |
| Grand Total ==> | 2,570,847 | 33,424 | 2,833,488 | 100.00 | 1,689,131 | 100.00 | 1,689,131 | 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 |



construction

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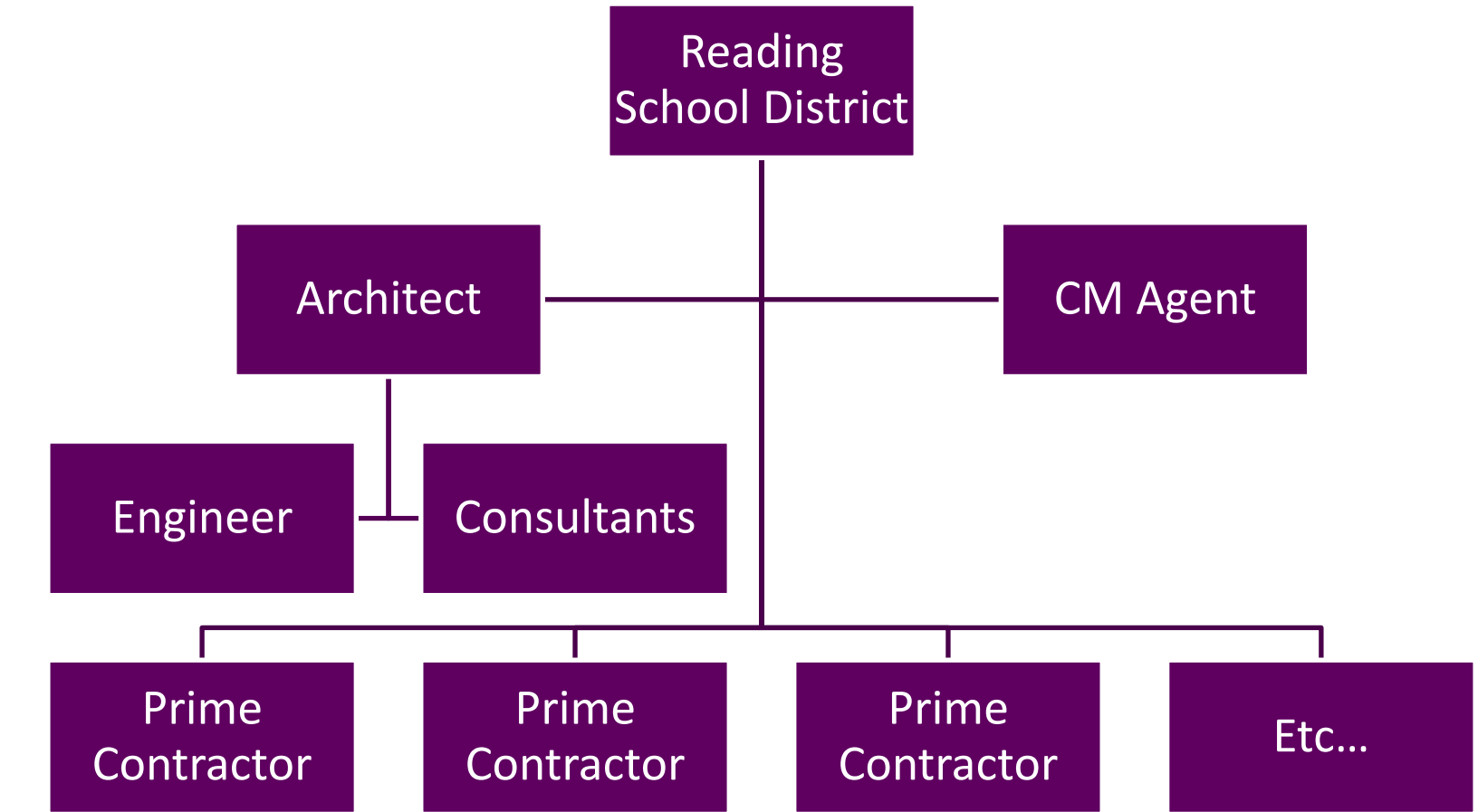
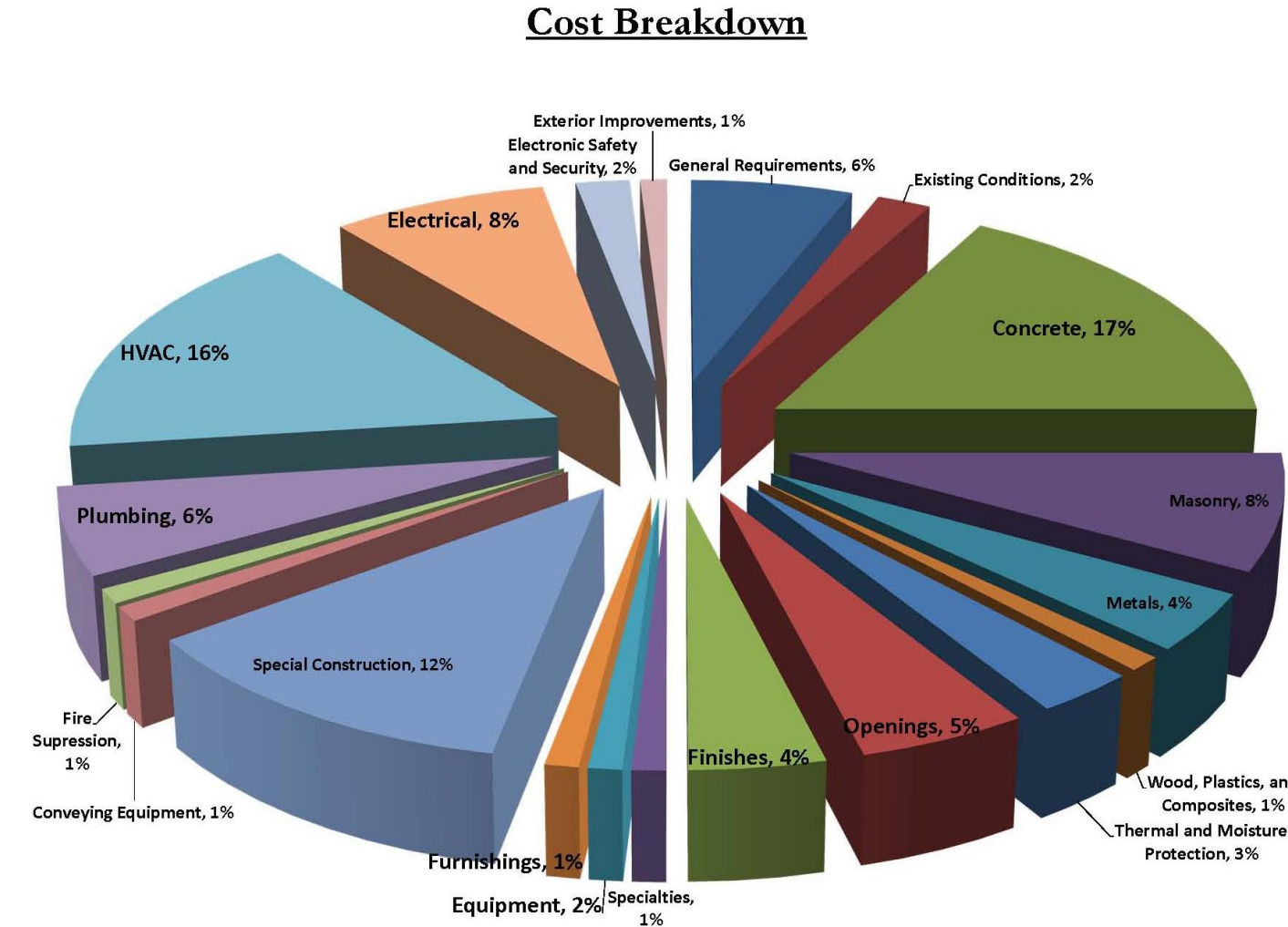
community

education

conclusion

appendix

| 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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appendix

