



A

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MEP

C

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(1)

Ridge Team



Caroline SE



Justin SE



Annemarie SE ap



Fernando C



Maria C



Linette MEP

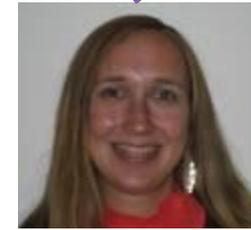


Sinan A



Josh Odelson

Owner



Anja Jutraz

Owner



Decision Matrix

Lego Concept



Core Concept



Shear Walls

ConXtech

Truss Systems

Cable System

Sustainability

Being Native

30 30 20 20

Building Envelope in terms of Energy Consumption

30 30 30 20

MEP systems's energy consumption

24 24 24 16

optimizing active systems

12 12 12 6

Economy

Estimate's compliance to target

20 20 20 20

Structural cost

15 15 5 10

Achievement of milestones

18 27 18 18

Discipline Based

Complexity Level

12 18 18 12

Clarity of Concept/Idea

20 20 30 10

Clarity of Program Organization

15 15 10 10

Additional Int&ext Social Space

15 15 5 5

Constructability

20 30 20 10

TOTAL

231

256

212

157



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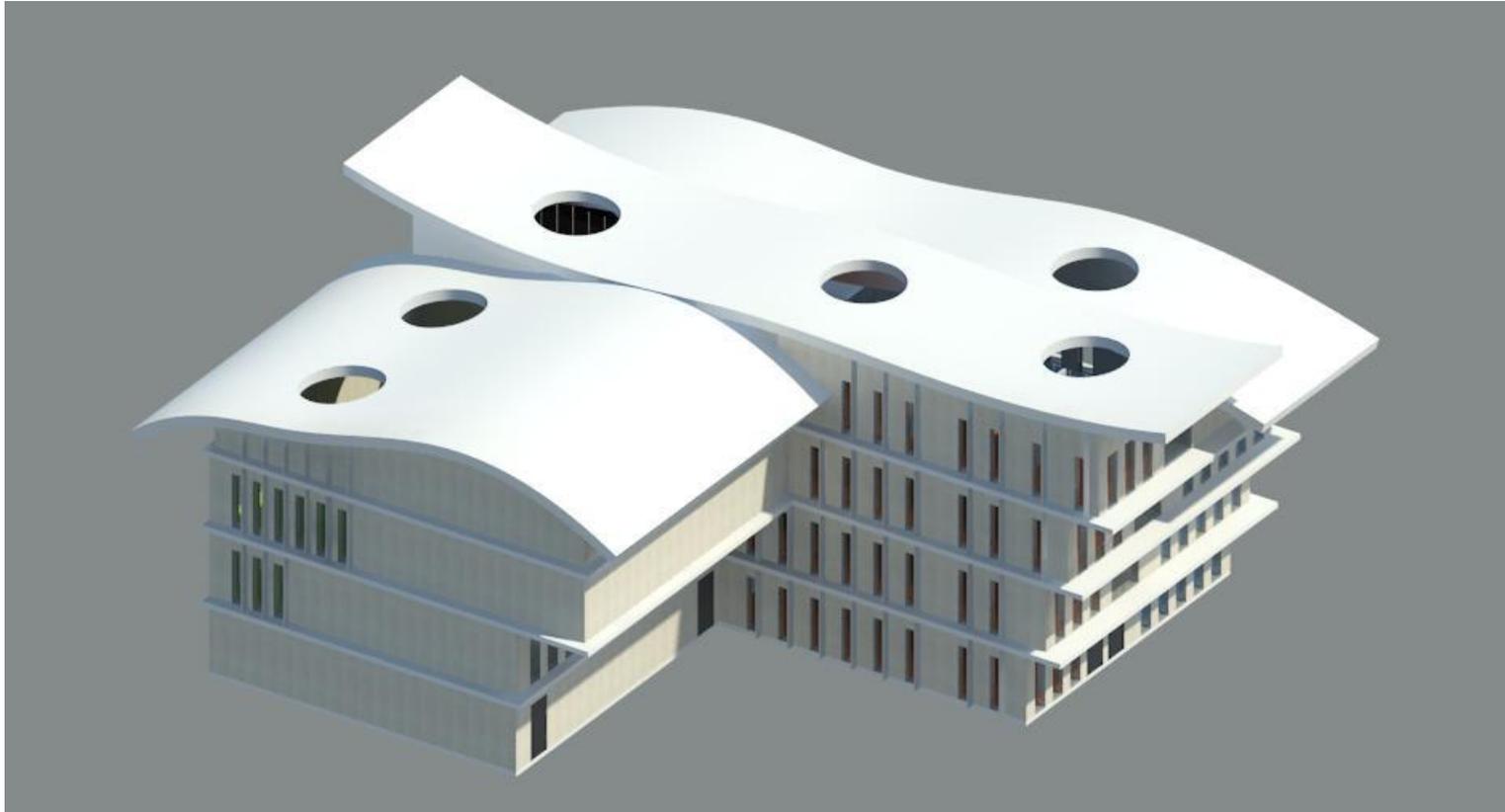
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Lego Concept



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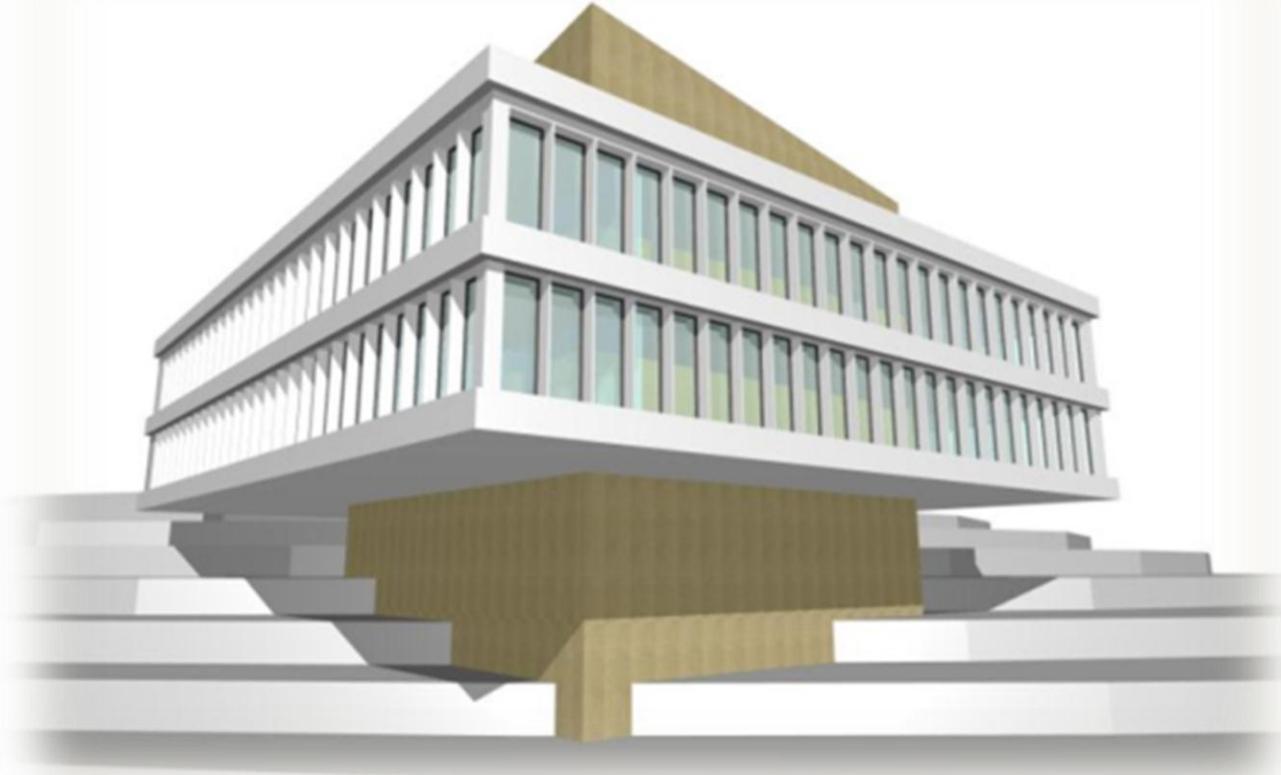
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Core Concept



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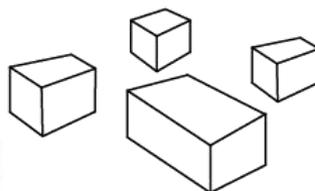
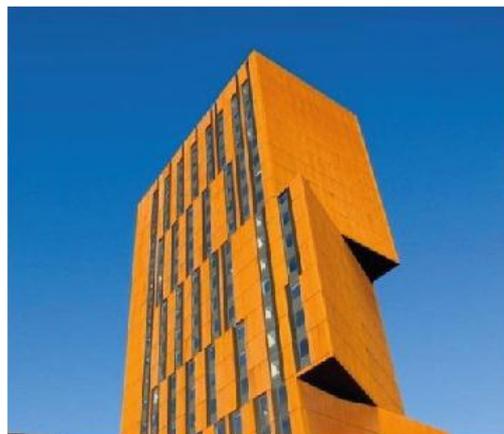
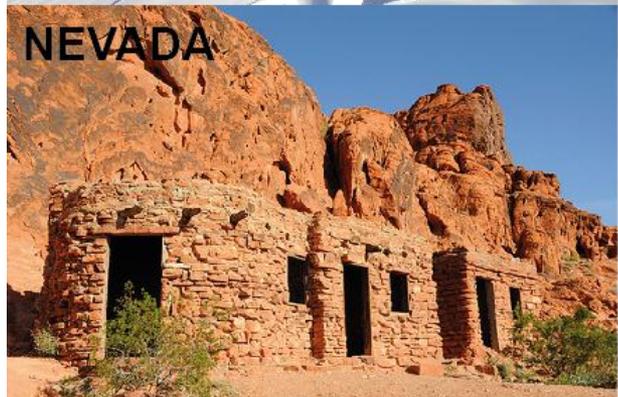
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Big Ideas



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A Building that Teaches



Kirsch Center ARUP



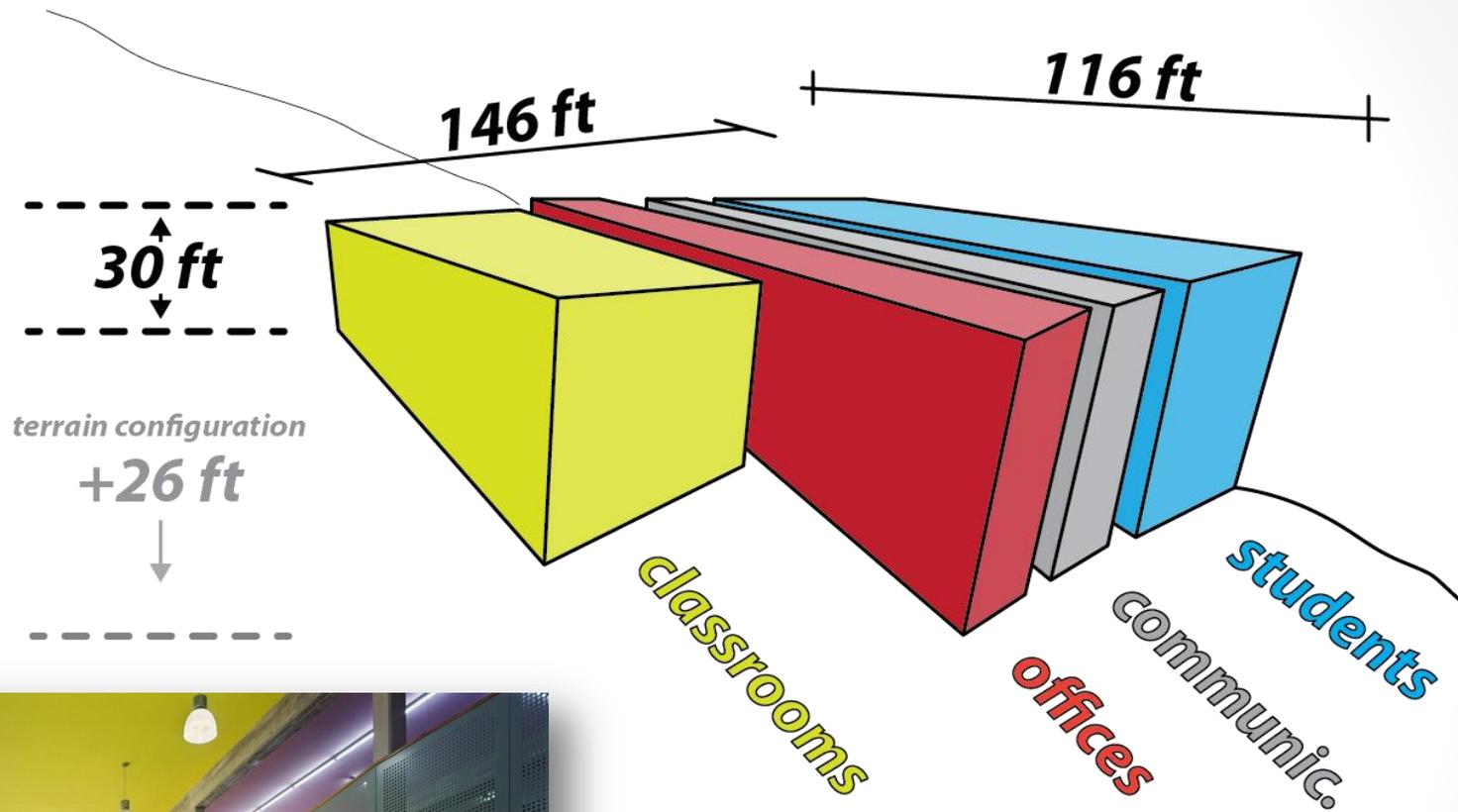
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*Slide from presentation from Cole Roberts; ARUP

Program Distribution



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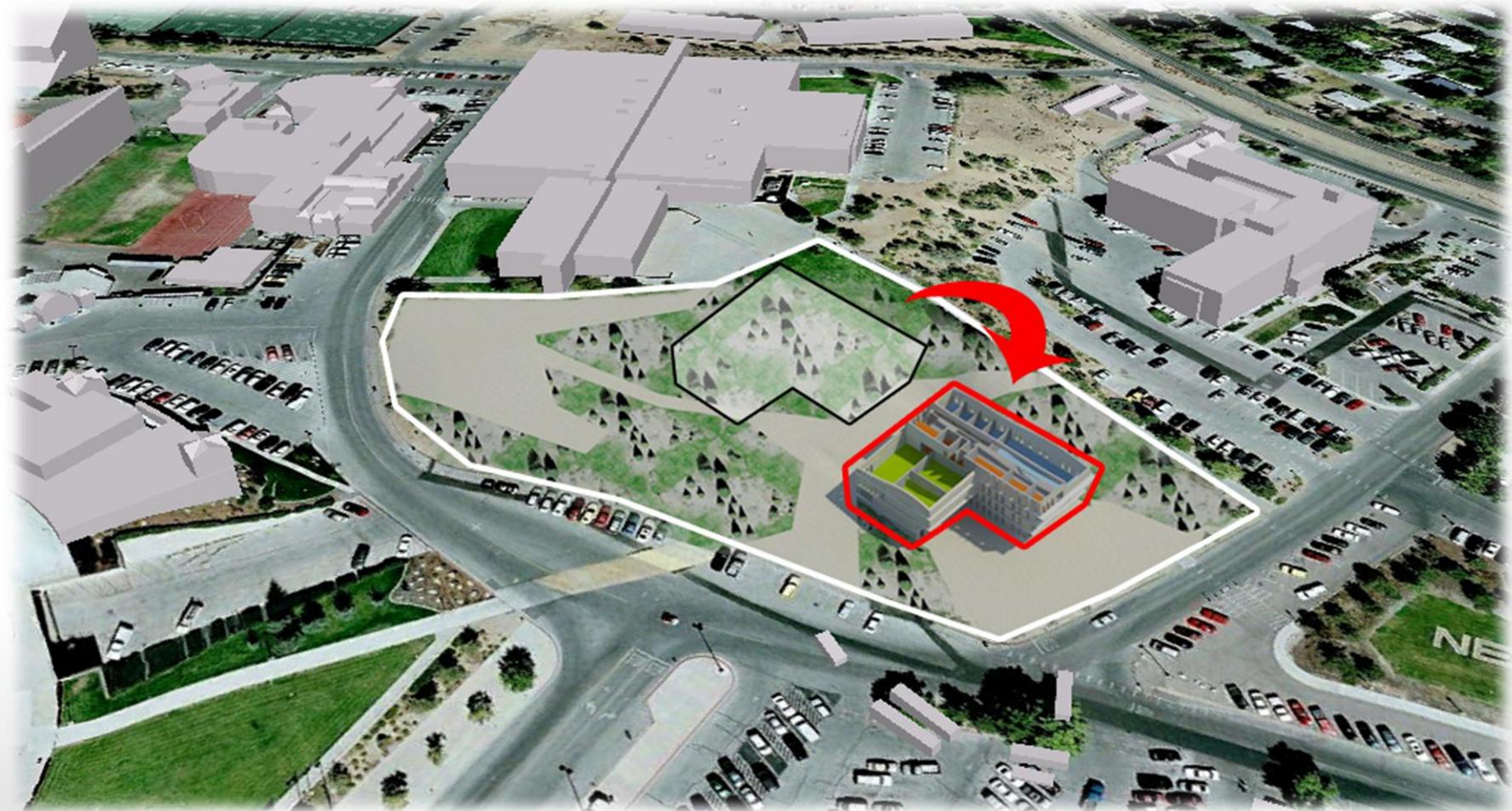
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Building Relocation

With client permission – we now have additional plazas



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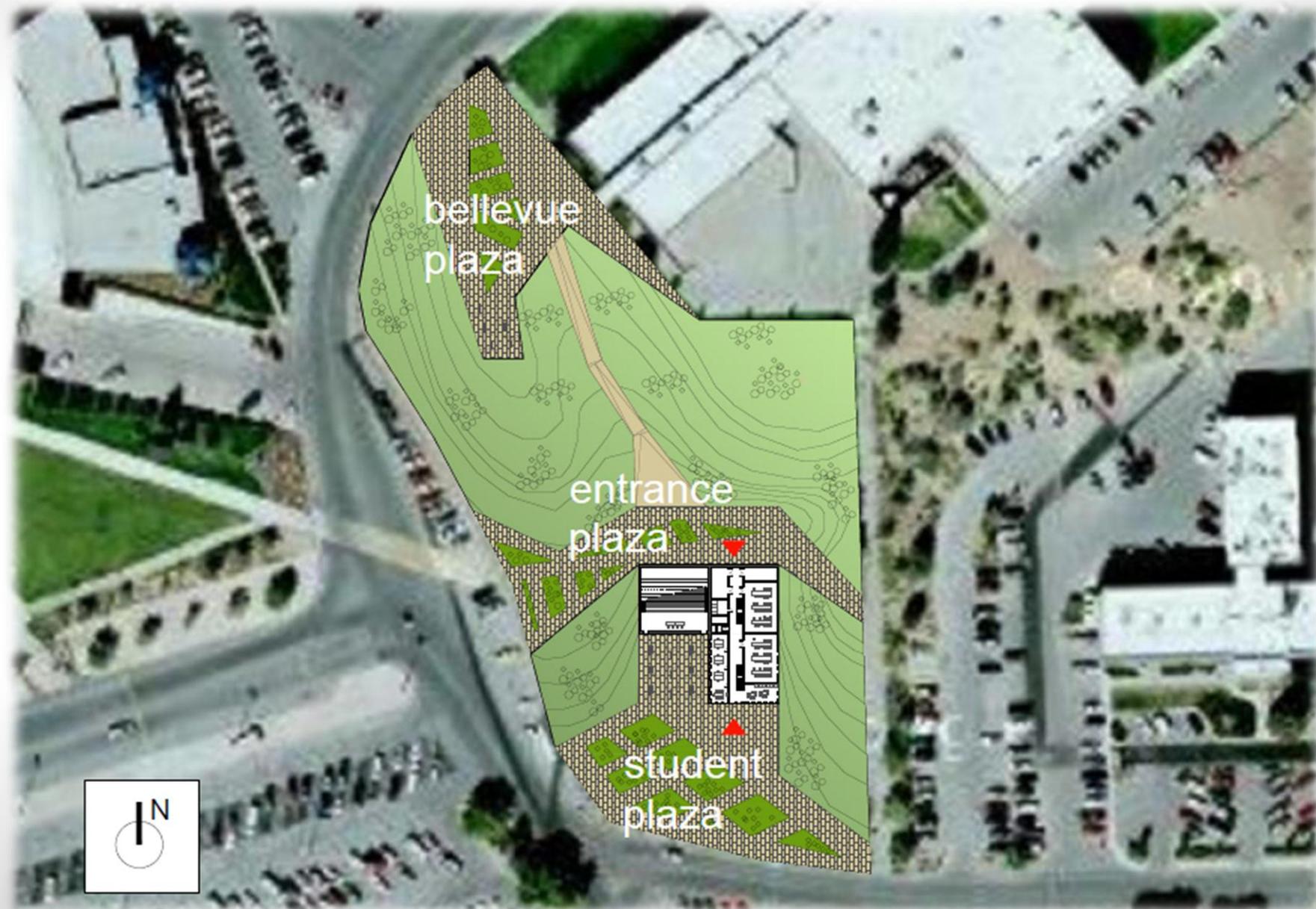
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New Plazas



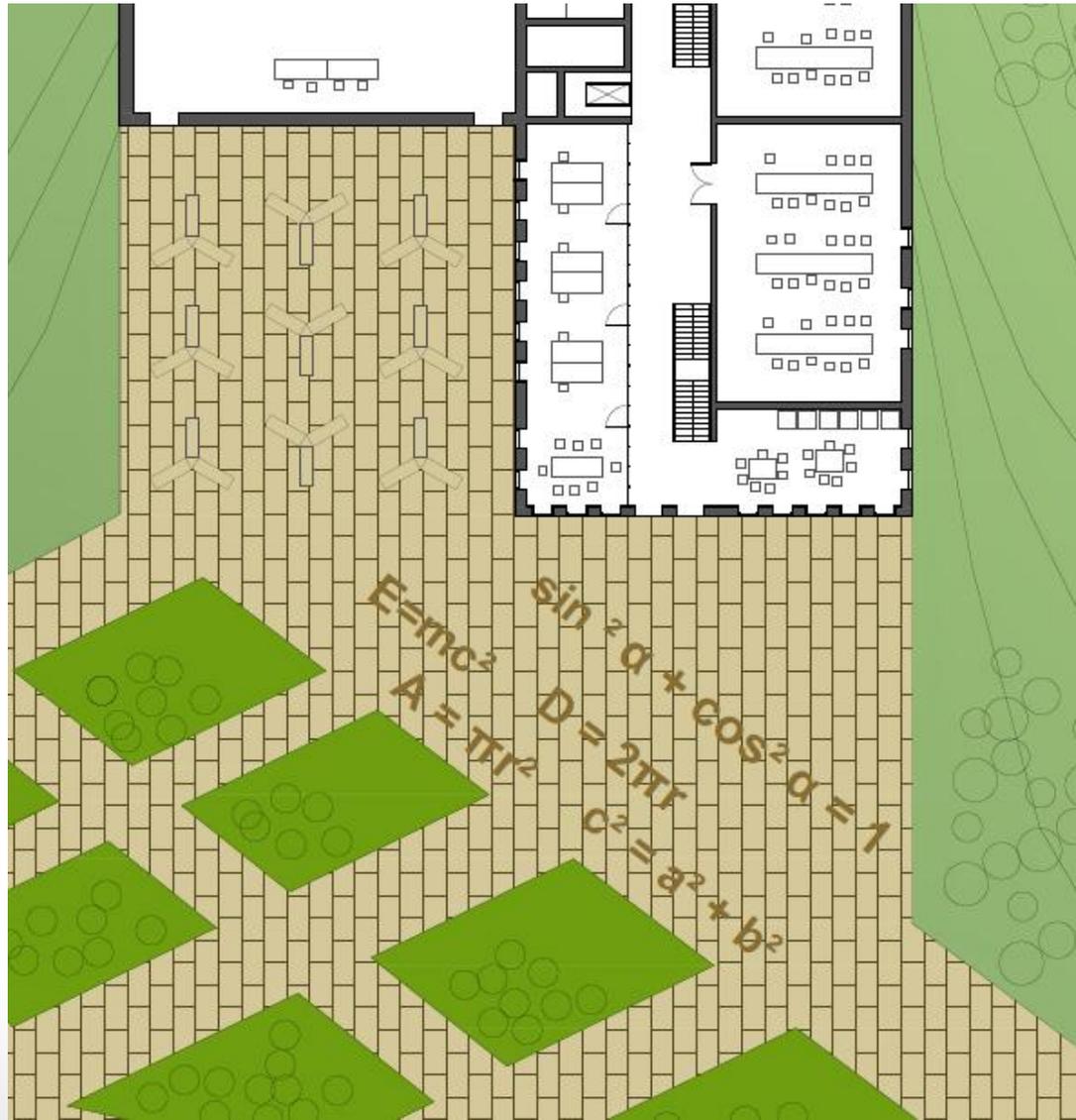
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Landscape that Teaches

Integration of formulas into landscape



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Native Landscape



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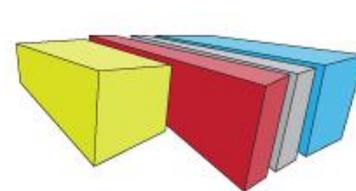
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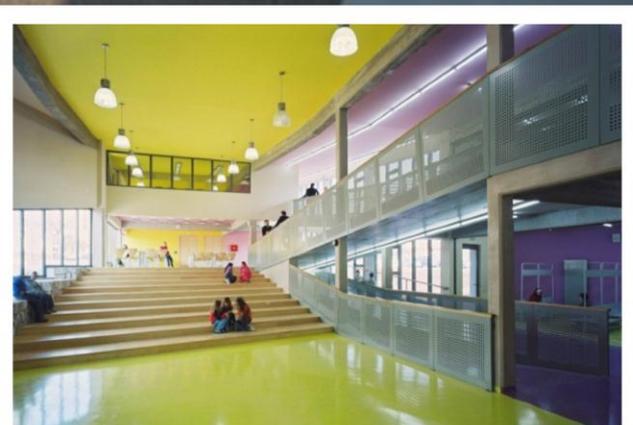


Floorplans Design

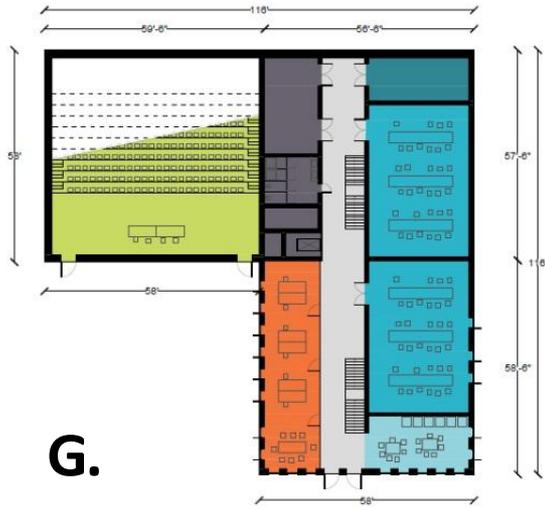
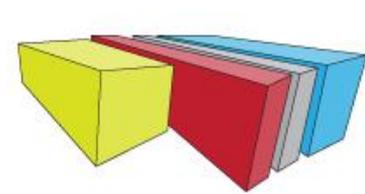
116 ft



116 ft



Floorplans 1 - 4



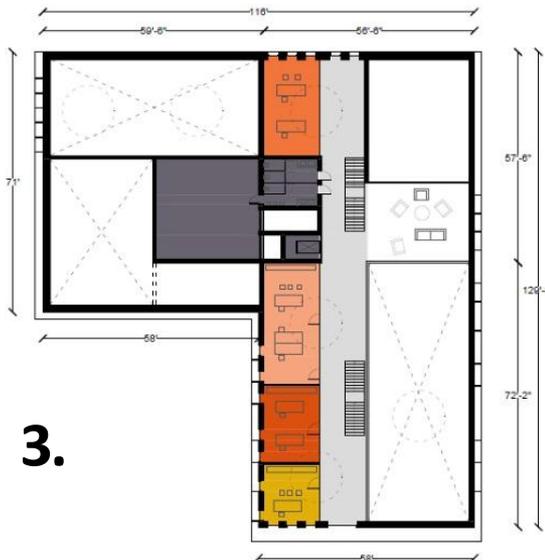
G.



2.

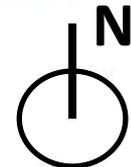


1.



3.

-  Small classrooms/
seminar rooms
-  seminar rooms
-  student offices/
research lounge
-  lounge area
-  auditorium/
large classroom
-  faculty offices
-  assistants offices
-  senior assistants office
-  faculty chief office
-  toilets and elevator
-  airspace
- hallways

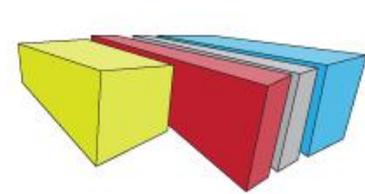


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Auditorium Section



A

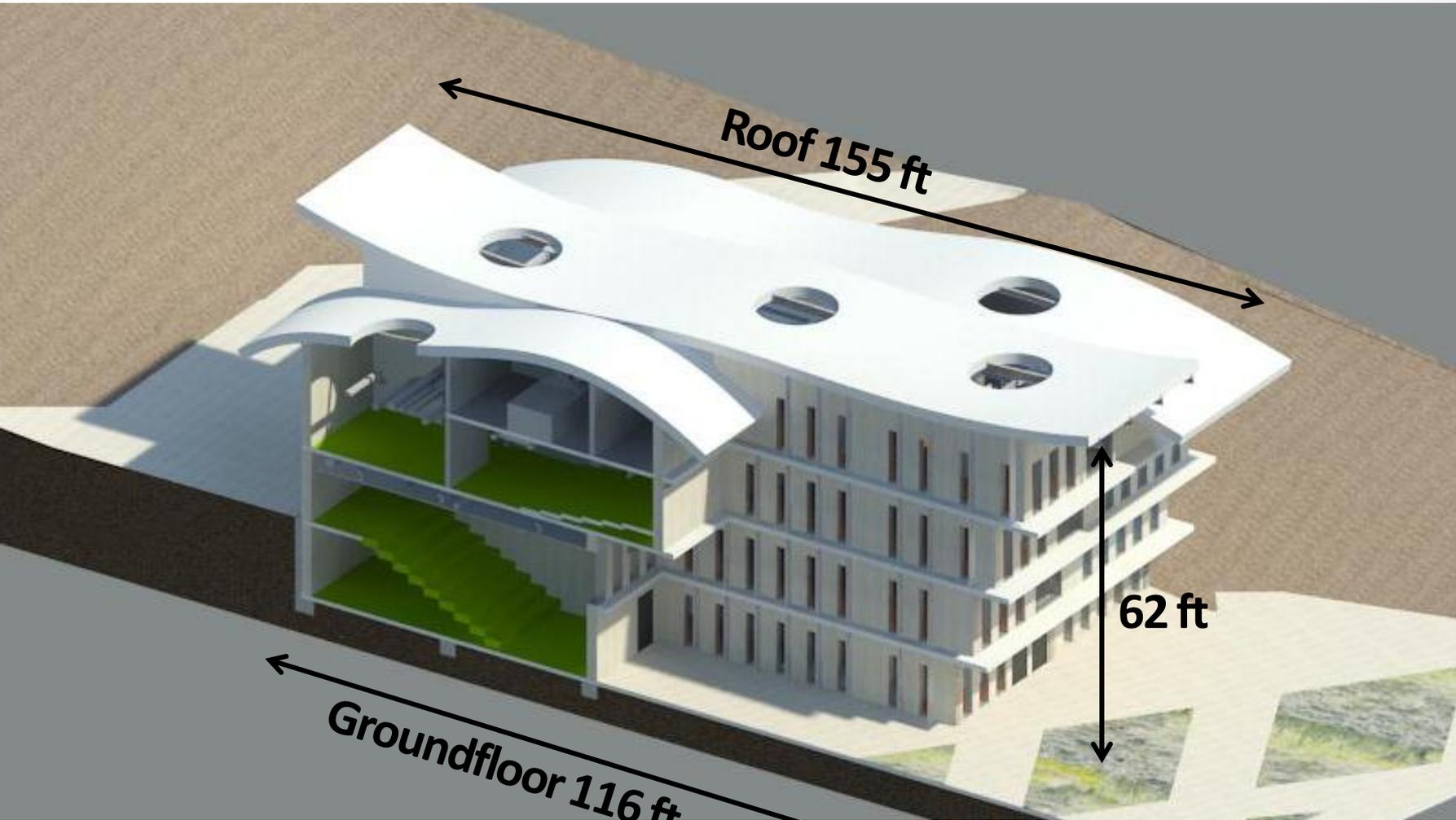
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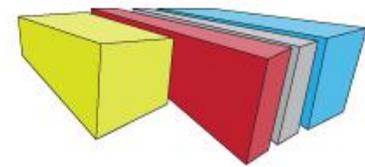
Roof 155 ft

62 ft

Groundfloor 116 ft



Office/Elevator Section



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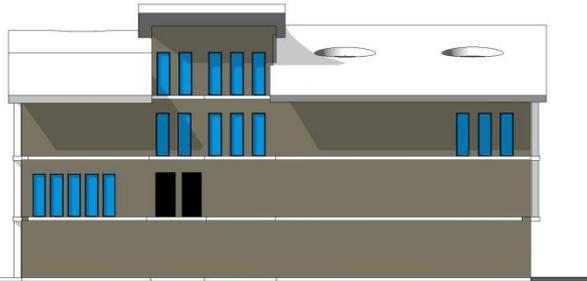
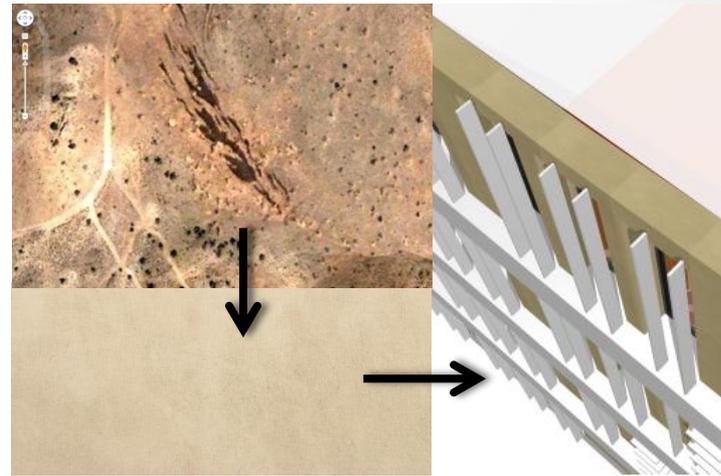
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Facades

Unified the windows and used local sand in concrete facade to get native colour

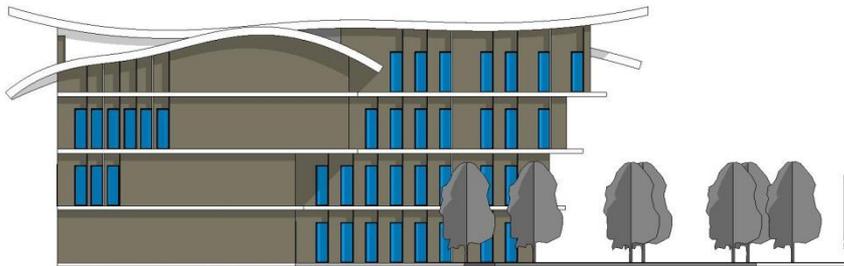


North

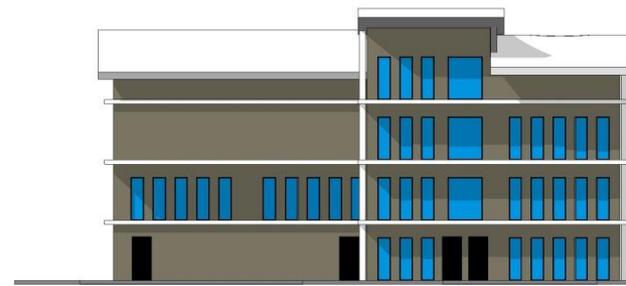


East

62'



West



South

62'



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Roof Adjustment



Fishbowl - 2011 Ridge Team

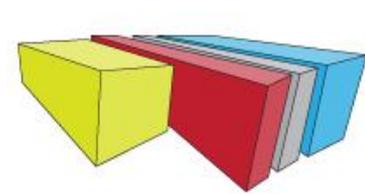
Architect: Sinan
Structural: Justin and Caroline
MEP: Linnete
CM: Maria and Fernando
Apprentice: Annemarie



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Interior Concept



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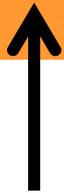
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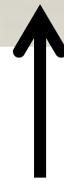
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Collaboration/communication



Faculty offices

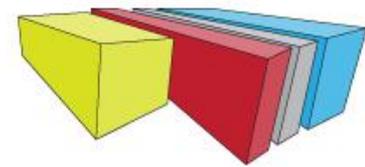


Hallways



Student labs

Interior – Student Room



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Skylight

Collaboration

Student offices and
research area

Faculty area

God is in the Details – Mies van der Rohe



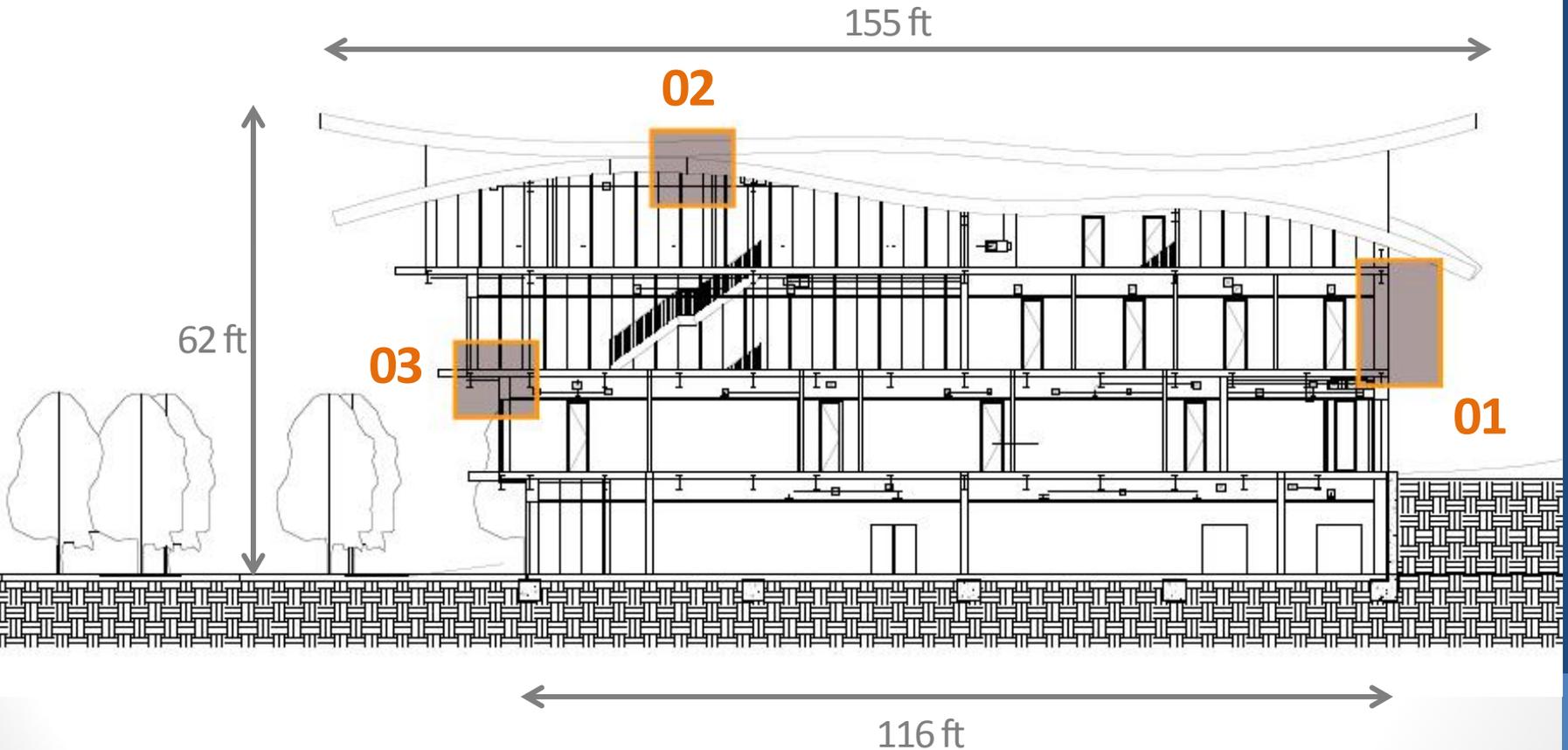
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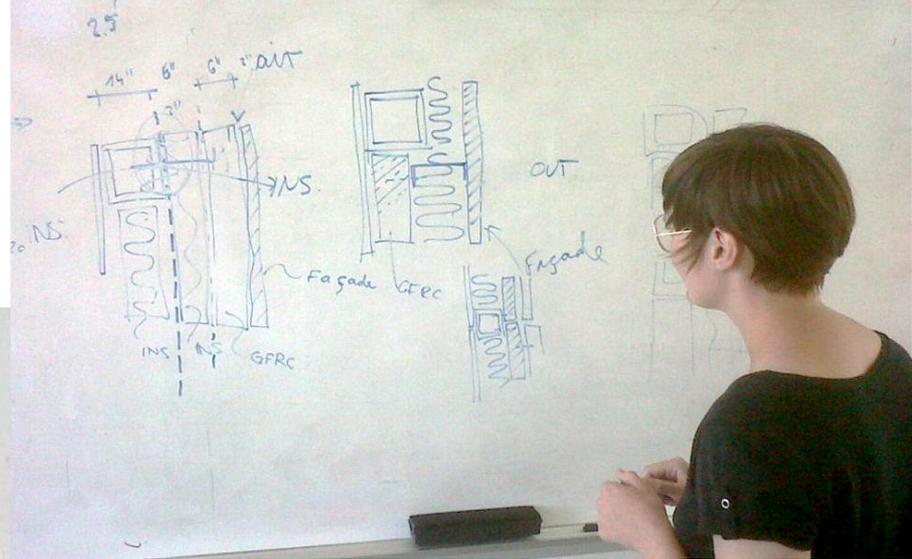
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Facade Detail



Structure - ConXtech

MEP – insulation thickness
– sunshade size

Architect & Management – Facade cost



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Skylight Detail



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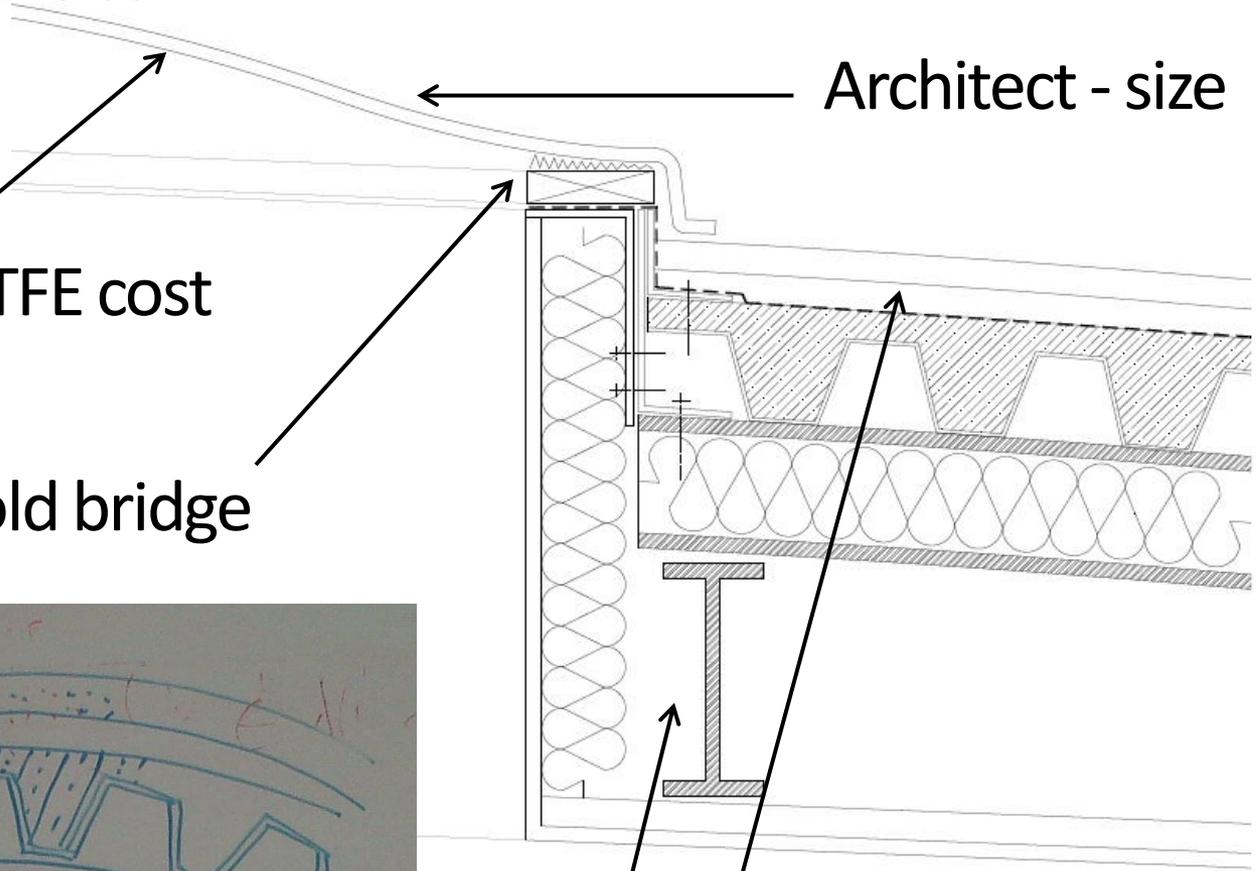
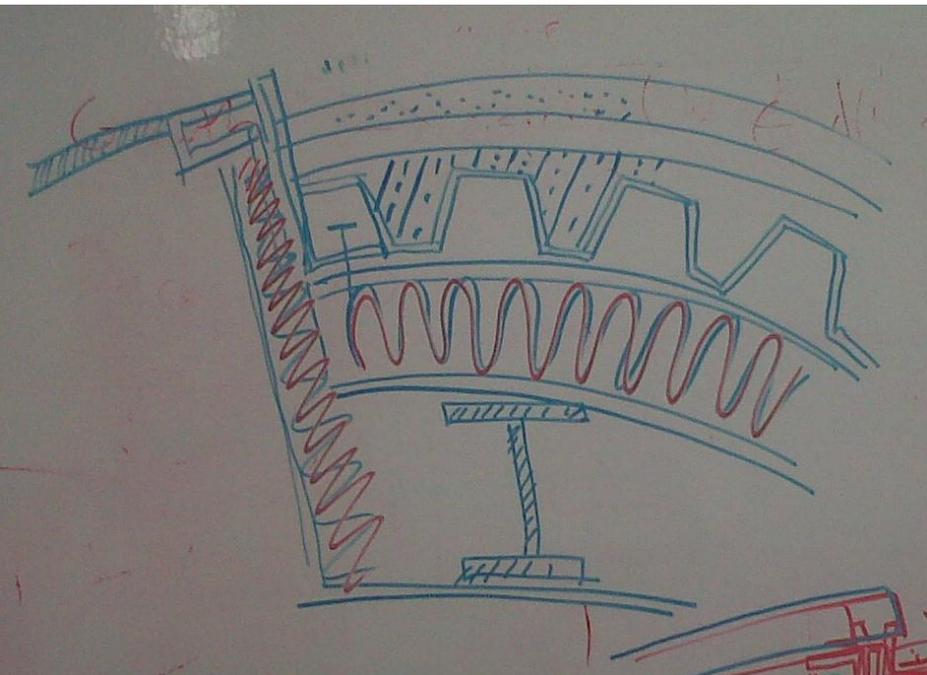
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Architect - size

Management – ETFE cost

MEP – cold bridge

Structure – dimensions, loads

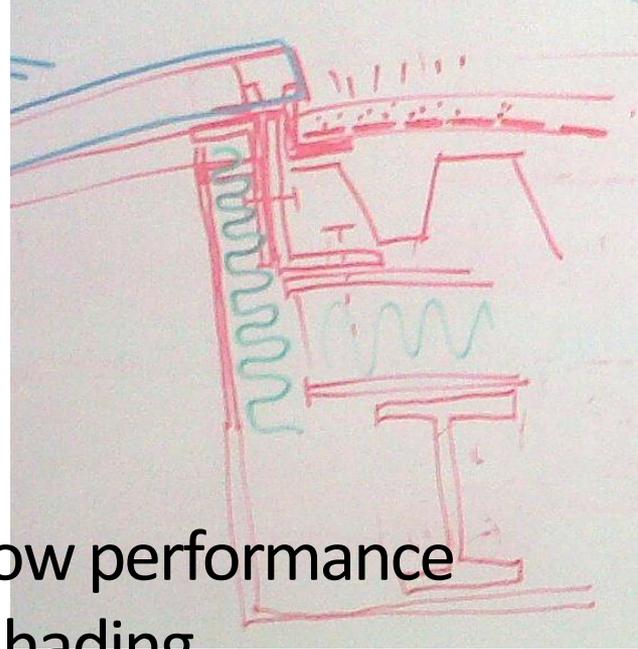
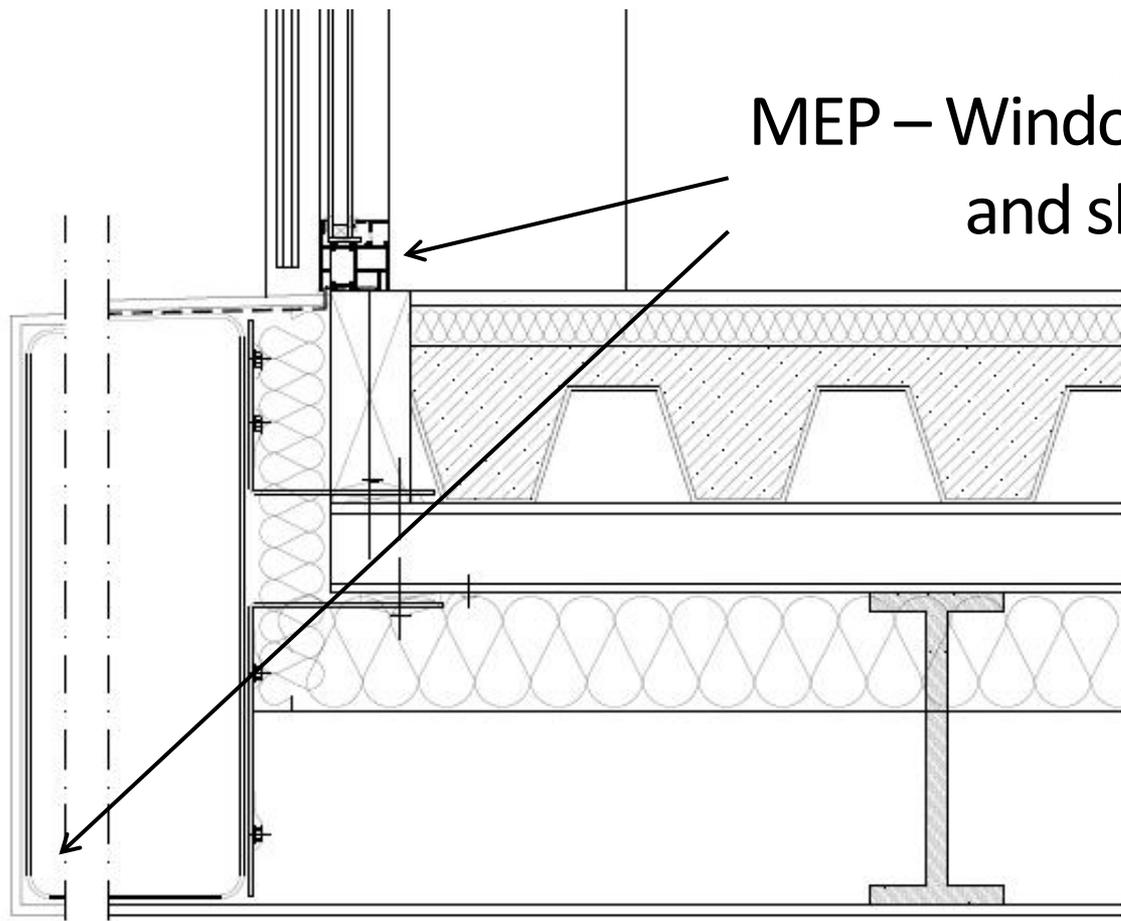


Cantilever Detail

CM – Cost



MEP – Window performance and shading



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Structural Development



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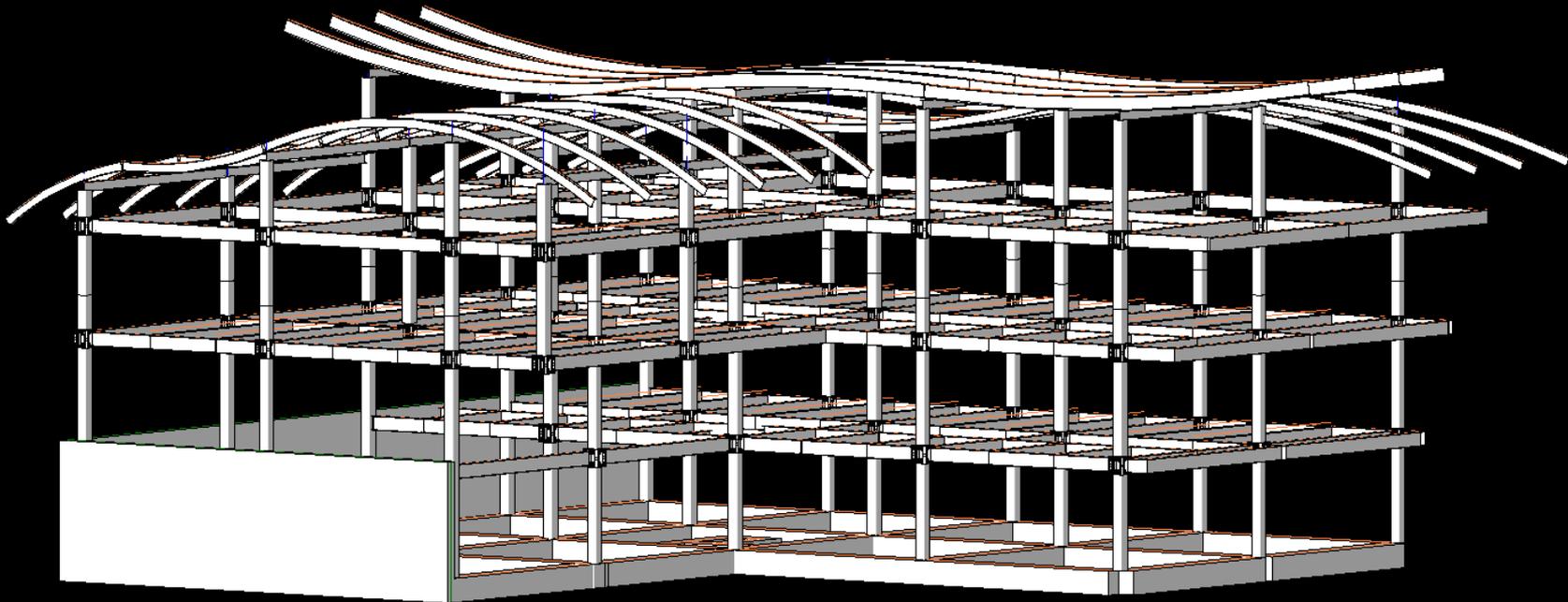
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Challenges

- A&E Integration
- Local materials
- Seismic resisting system

Solutions

- Modularity
- Regional companies
- ConXtech moment frame



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ConXtech



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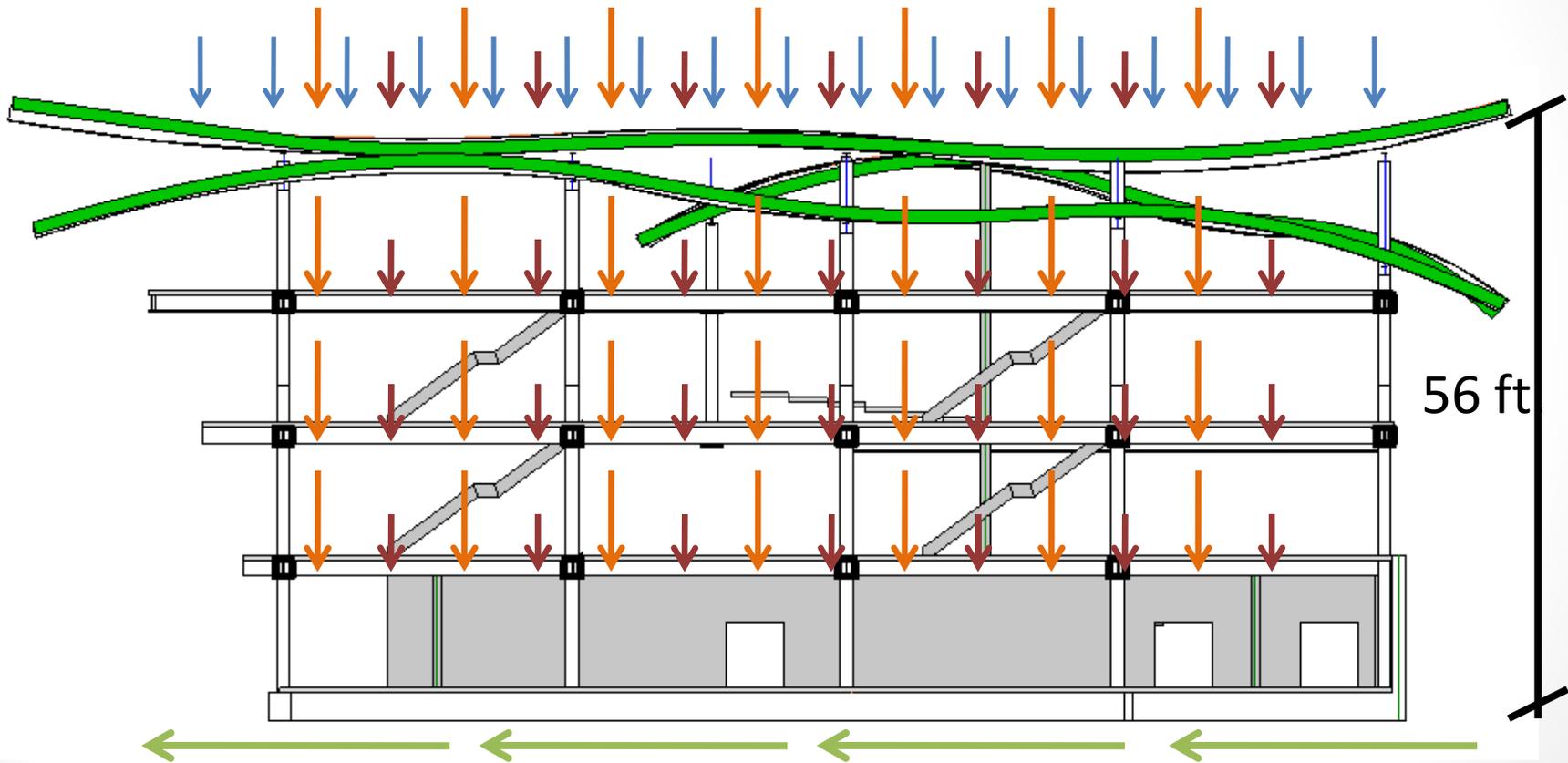
(26)

Loads

Live= 60psf

Dead= 100psf

Snow= 10psf



56 ft

EQ= 535kips



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ConXtech: 2nd Floor Framing



A

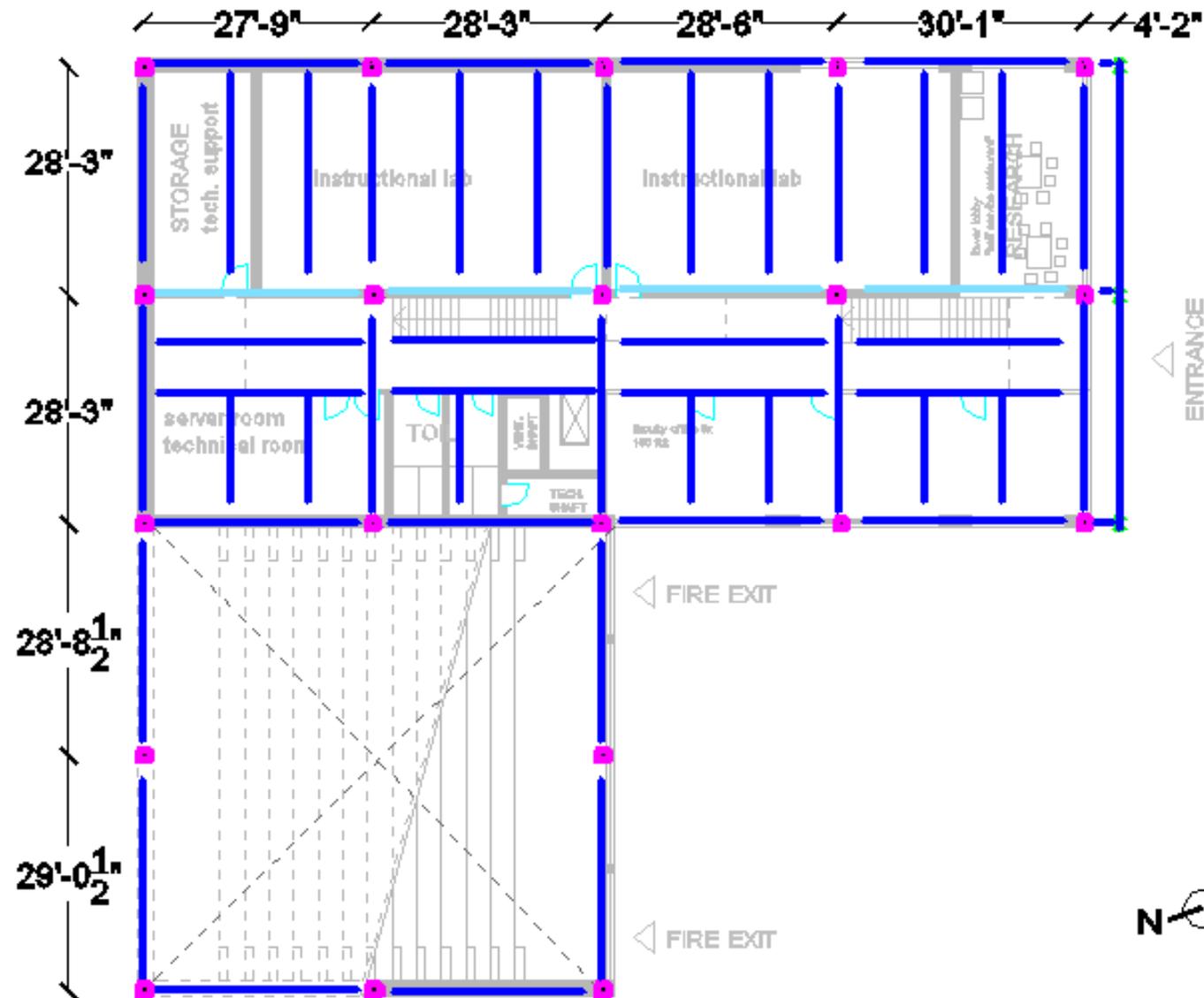
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Framing :

W21x55

W21x73

Column:

HSS 16x16x5/8



ConXtech: 3rd Floor Framing



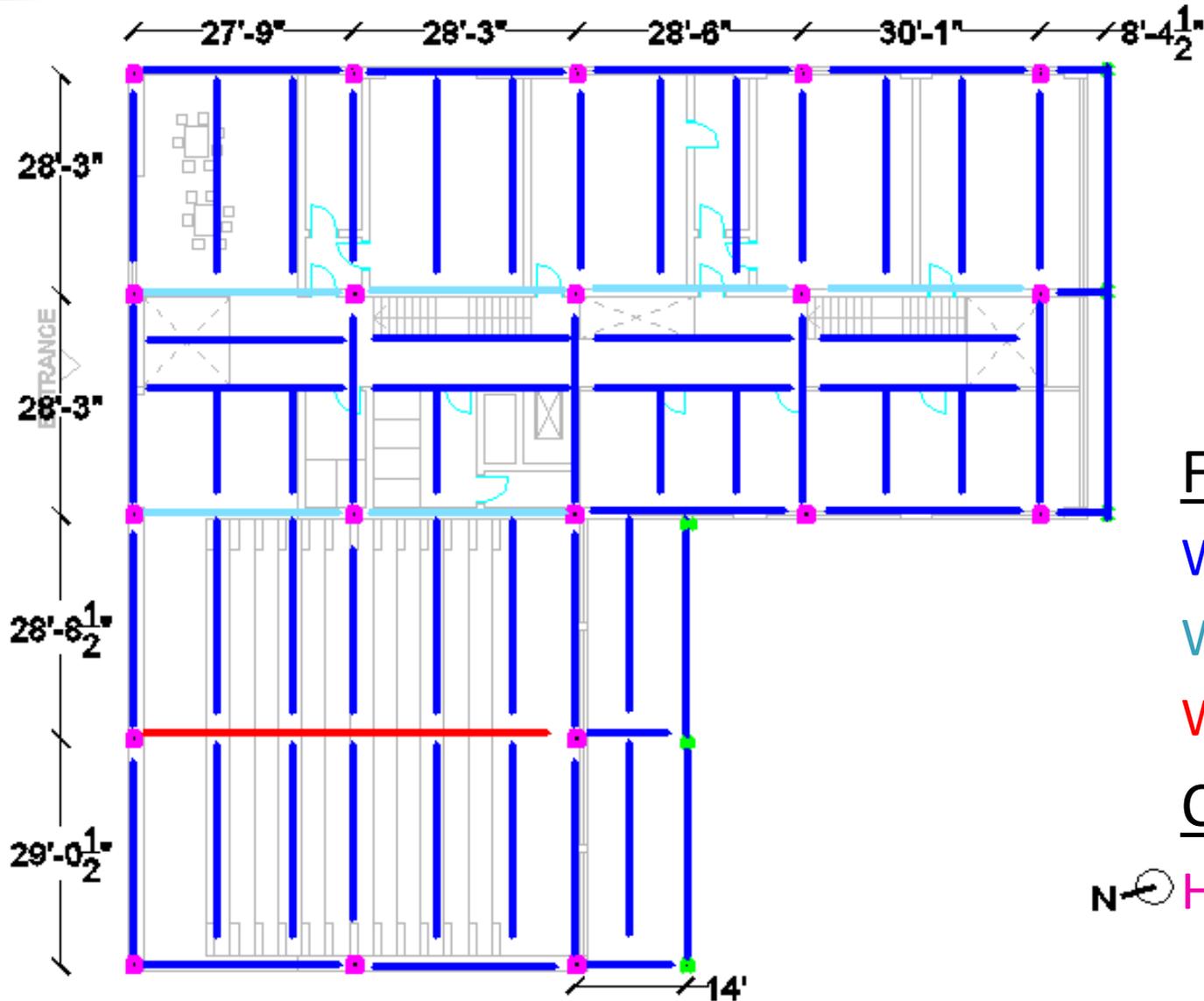
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Framing :

W21x55

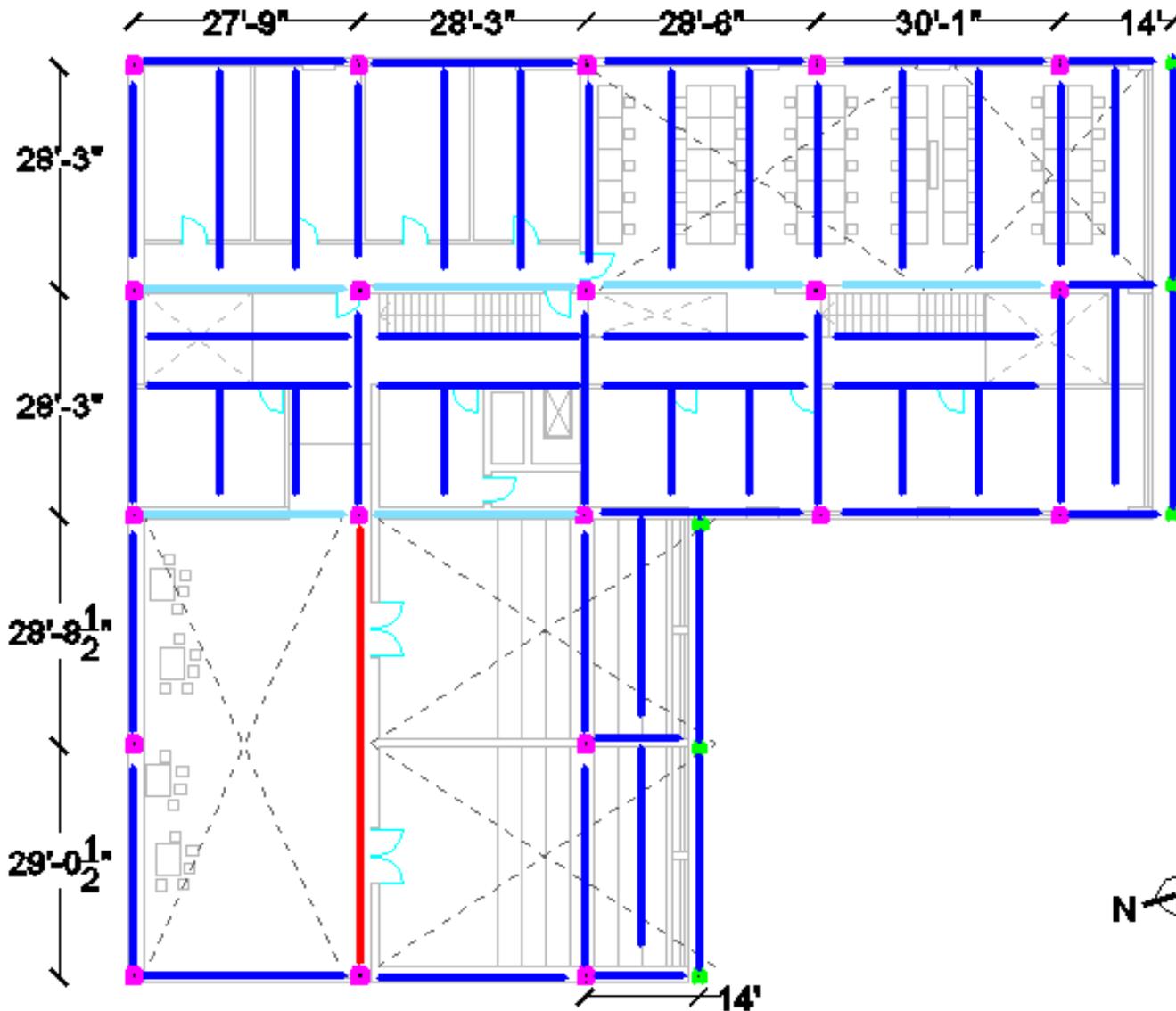
W21x73

W40x211

Column:

N  HSS 16x16x5/8

ConXtech: 4th Floor Framing



Framing :

W21x55

W21x73

W40x211

Column:

HSS 16x16x5/8



A

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MEP

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ConXtech: Roof Framing



A

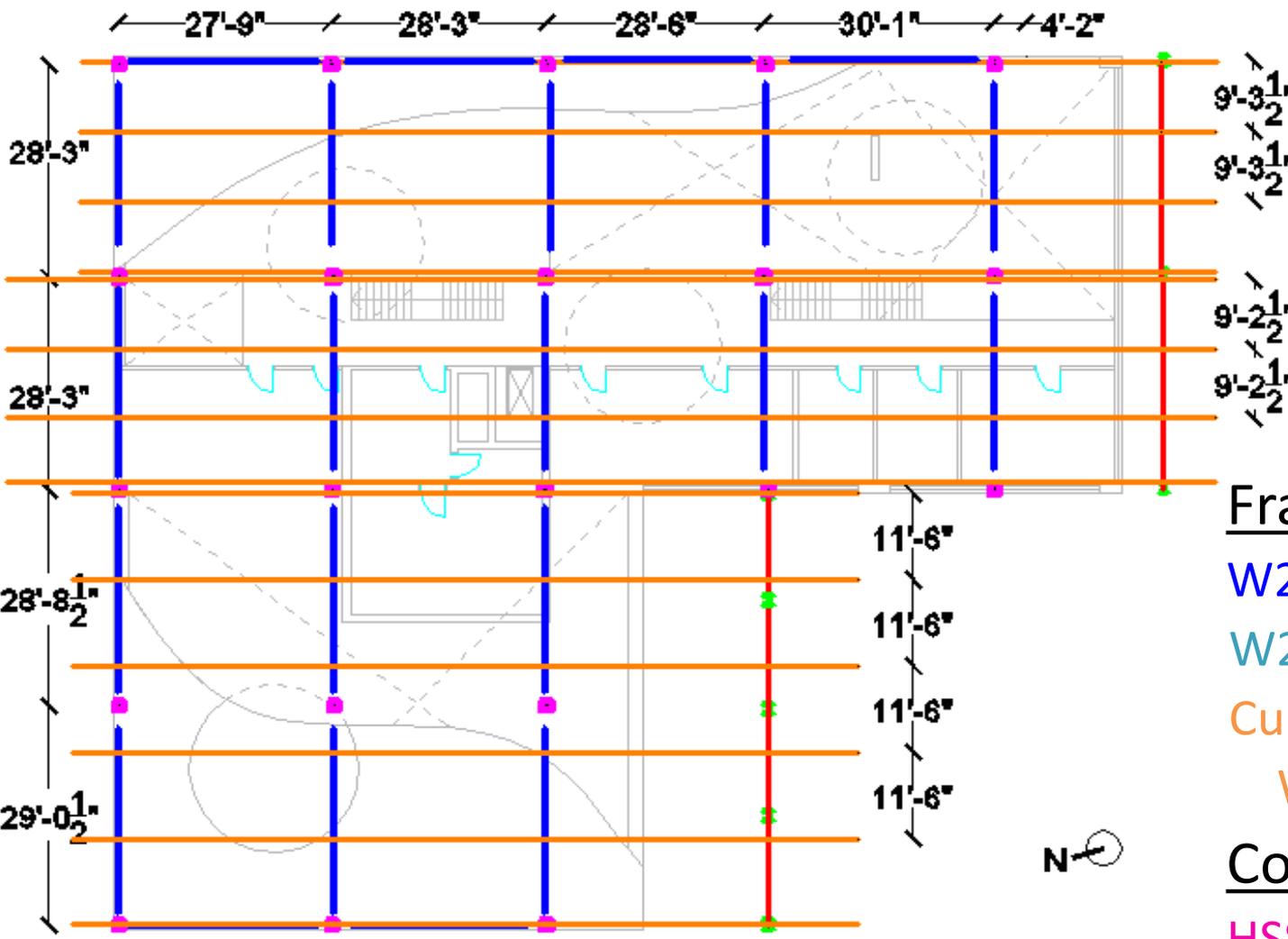
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MEP

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(31)



Framing :

W21x55

W21x73

Curved Beam:

W14x30

Column:

HSS 16x16x5/8



Soil Profile



A

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MEP

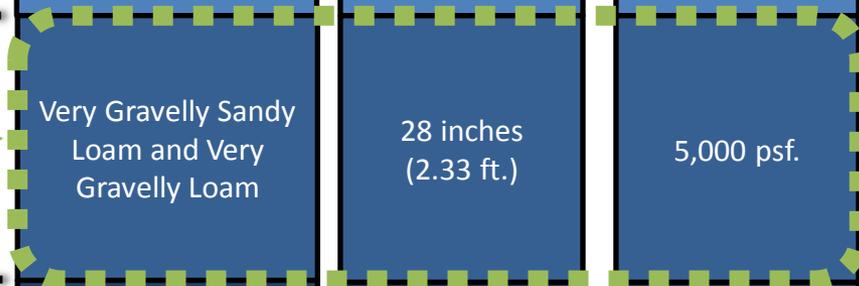
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| Depth of Excavation | Soil Type | Thickness | Bearing Capacity |
|--|---|----------------------|------------------|
| Grade at 4,580 ft. Elevation: 0 inches (0 ft.) | Stony Sandy Loam and Heavy Loam | 19 inches (1.58 ft.) | 1,500 psf. |
| 19 inches (1.58 ft.) | | | |
| 29 inches (2.42 ft.) | Sandy Clay Loam | 10 inches (0.83 ft.) | 1,500 psf. |
| 56 inches (4.67 ft.) | Clay and Clay Loam | 27 inches (2.25 ft.) | 1,500 psf. |
| 84 inches (7 ft.) | Very Gravelly Sandy Loam and Very Gravelly Loam | 28 inches (2.33 ft.) | 5,000 psf. |
| | Volcanic Rock | Unknown | 8,000 psf. |

Soil conditions at building foundation



Foundation System



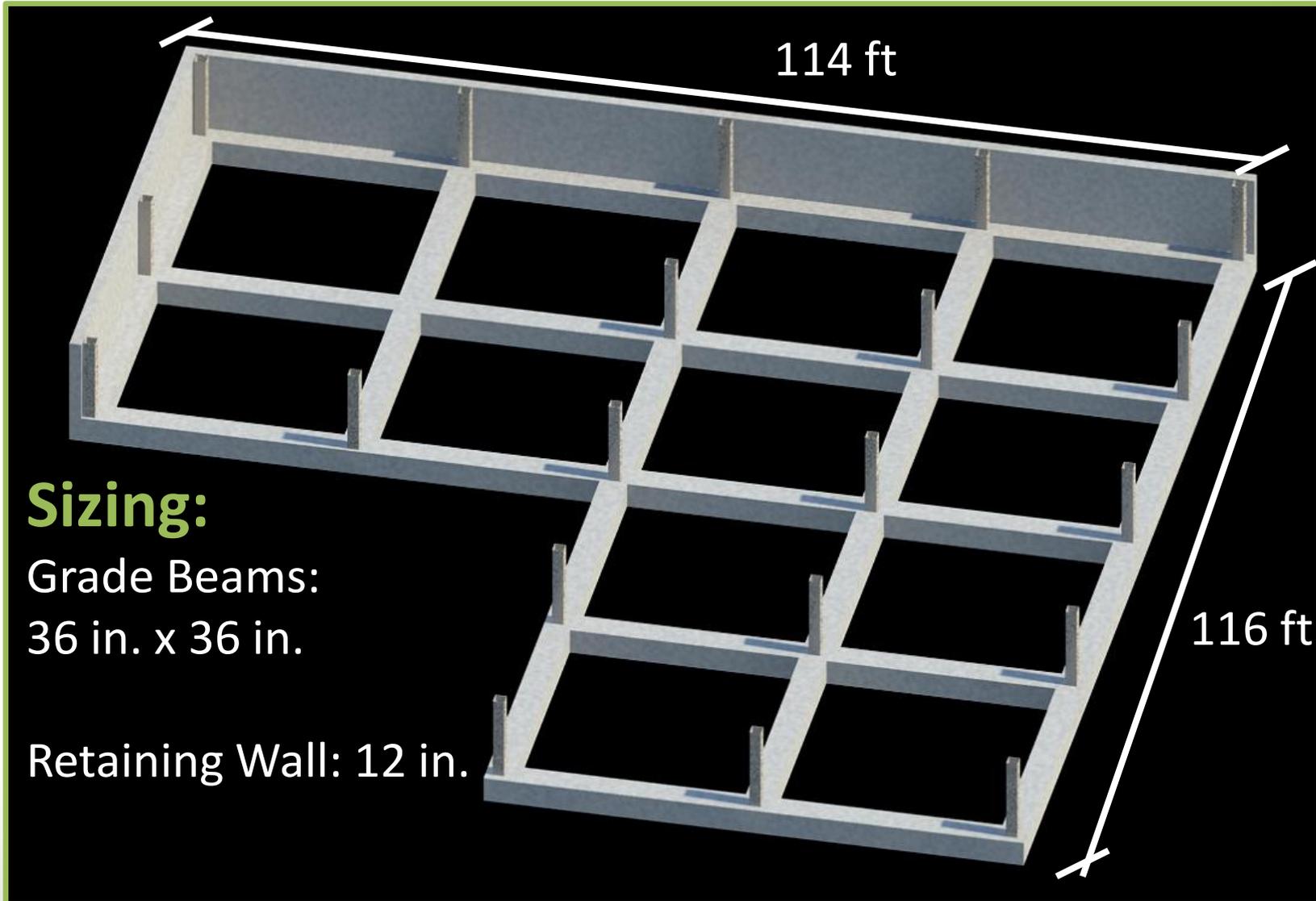
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Sizing:

Grade Beams:
36 in. x 36 in.

Retaining Wall: 12 in.

ConXtech Grade Beam Elevation



A

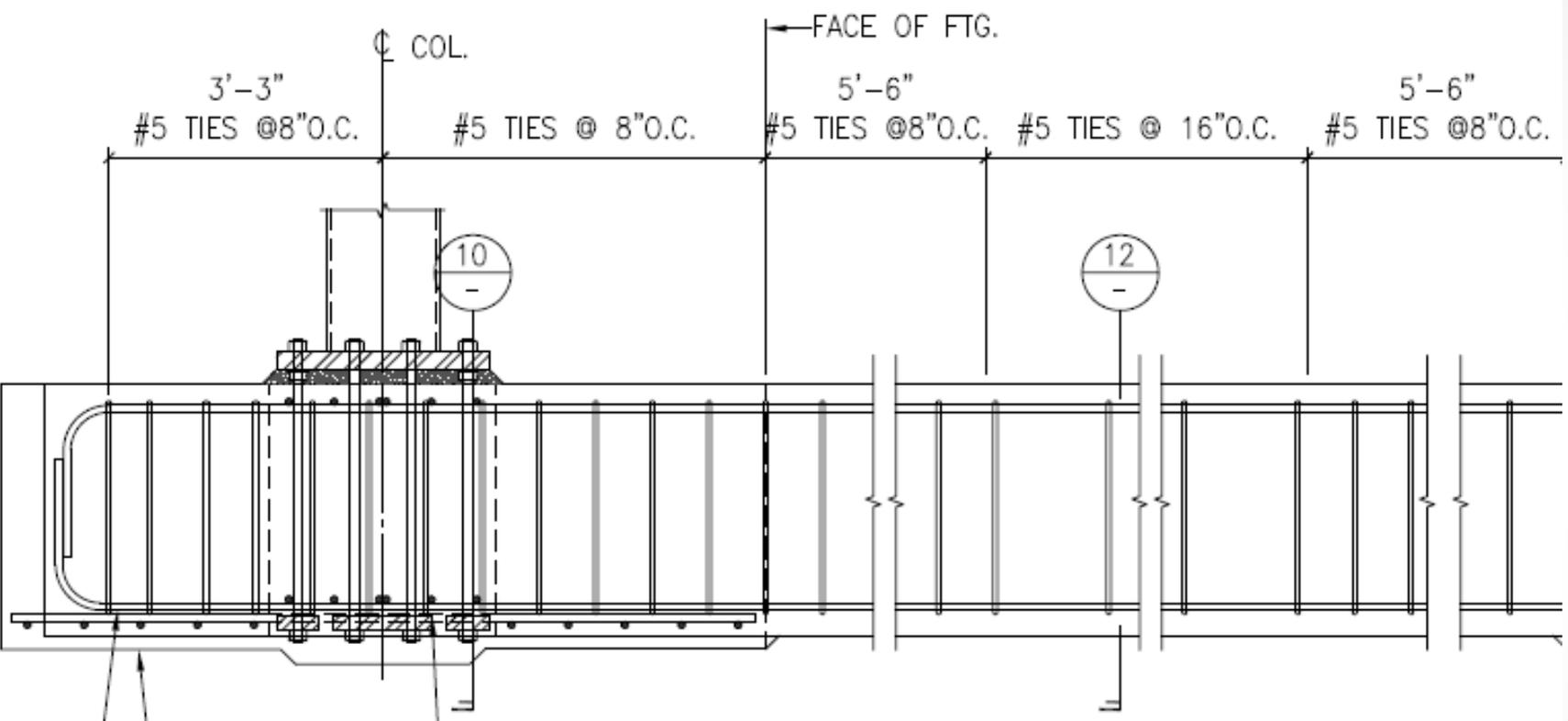
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FTG. SEE PLAN
EXTEND LONGITUDINAL
BARS 3'-3" BEYOND
C OF COLUMN

SEE DETAILS 10/- &
11/- FOR HOOPS
DETAIL WITHIN FOOTING

FTG. SEE

NOTE:

1. CENTER ALL LAP SPLICES @ MIDDLE OF GRDE BEAM
2. PROVIDE (5)#5 TIES @8"O.C. FOR FULL LENGTH OF ANY LAP SPLICE

Foundation System



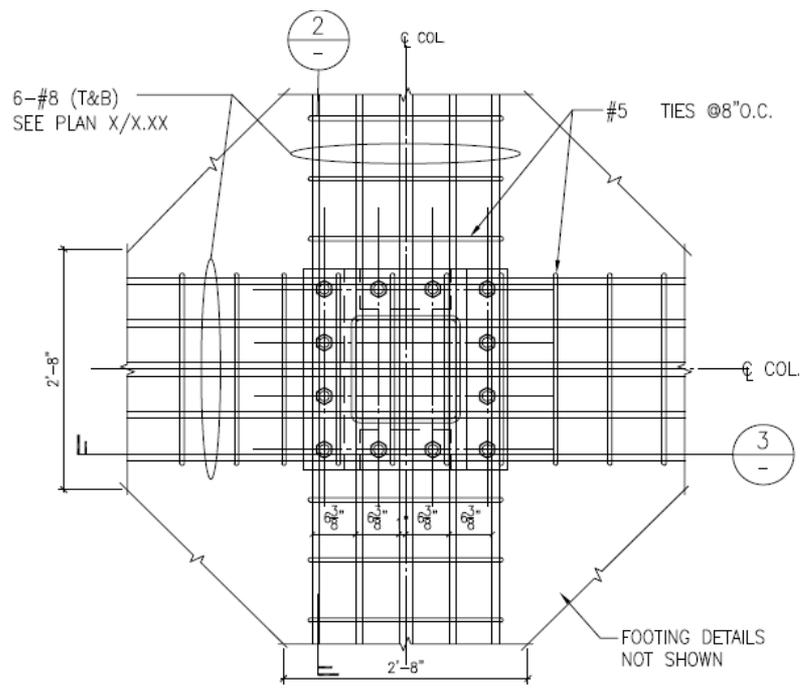
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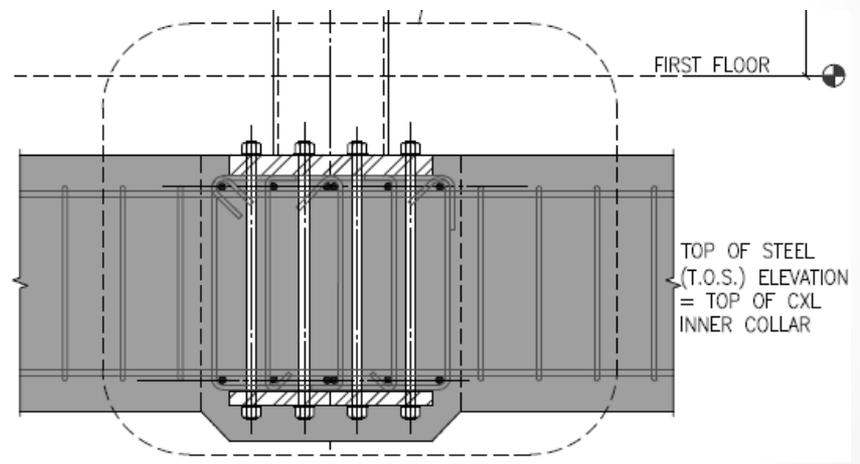
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Base Plate

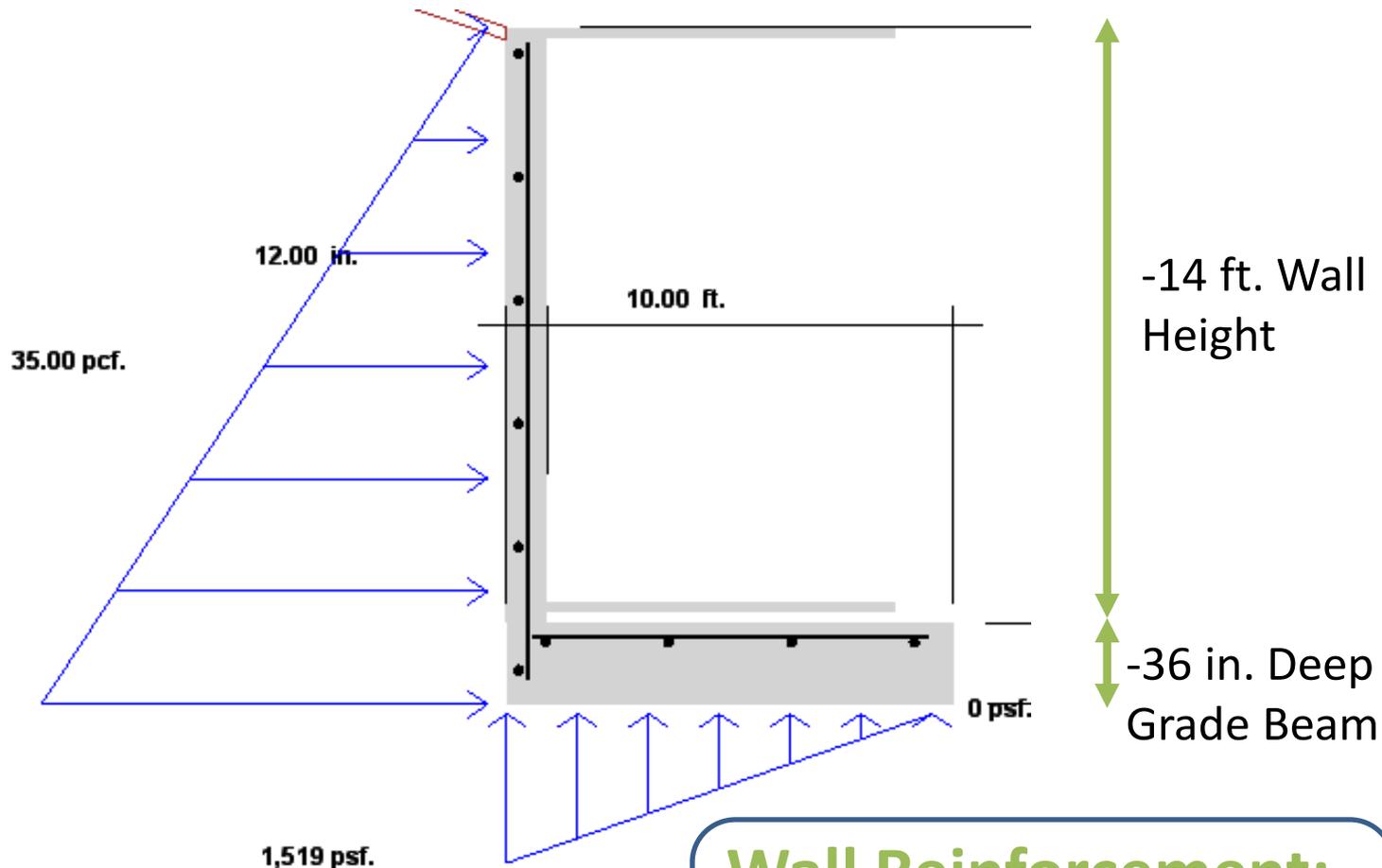


Moment Connection



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Retaining Walls



Wall Reinforcement:
12 in. Wall #5's at 4 in.
on center each way



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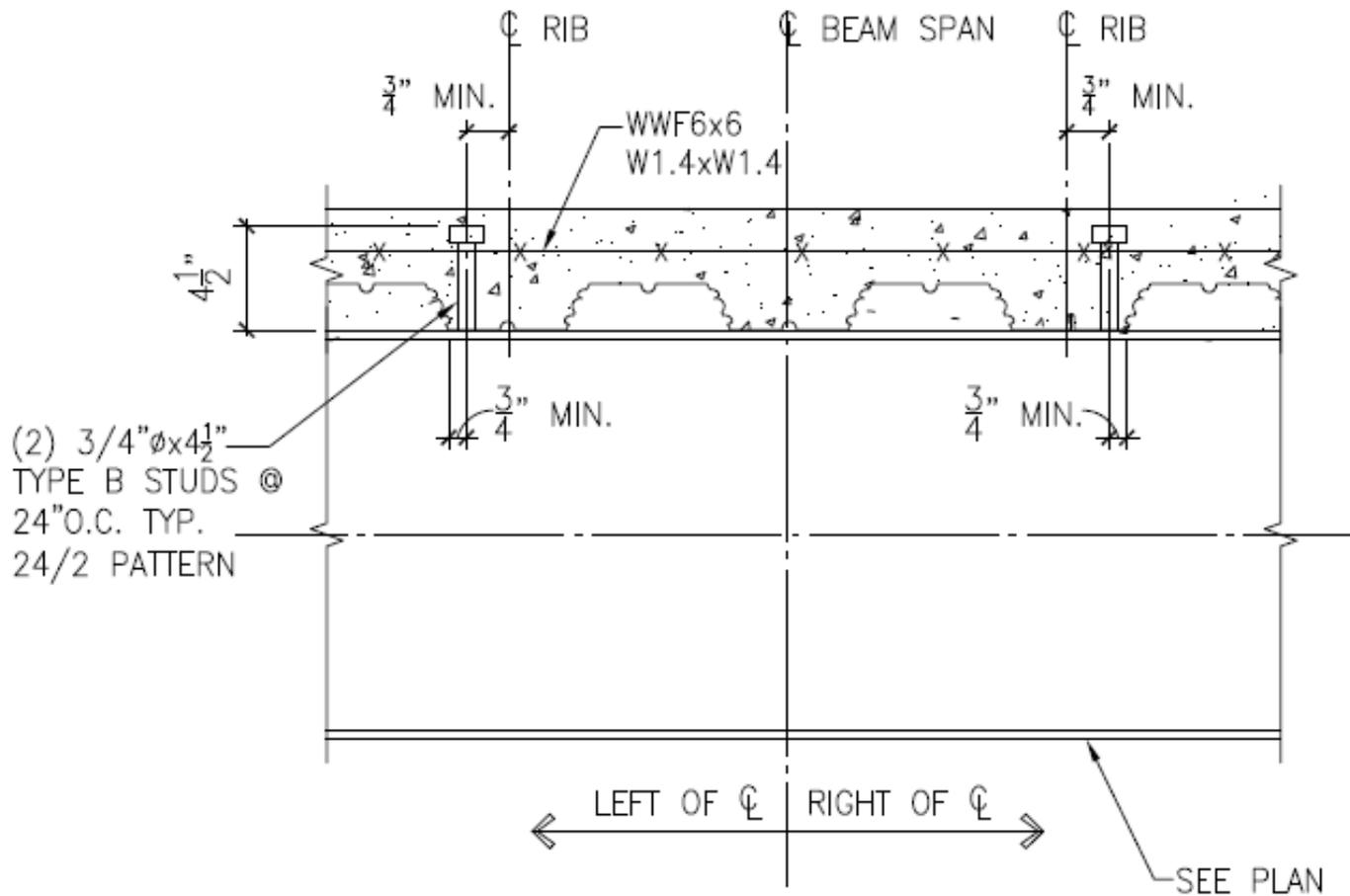
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ConXtech Composite Deck



NOTE:

STUDS TO THE RIGHT OF BEAM SPAN CL SHALL BE LOCATED IN THE RIGHT SIDE OF THE DECK RIB; AND STUDS TO THE LEFT OF BEAM SPAN CL SHALL BE LOCATED IN THE LEFT SIDE OF THE RIB.



A

E

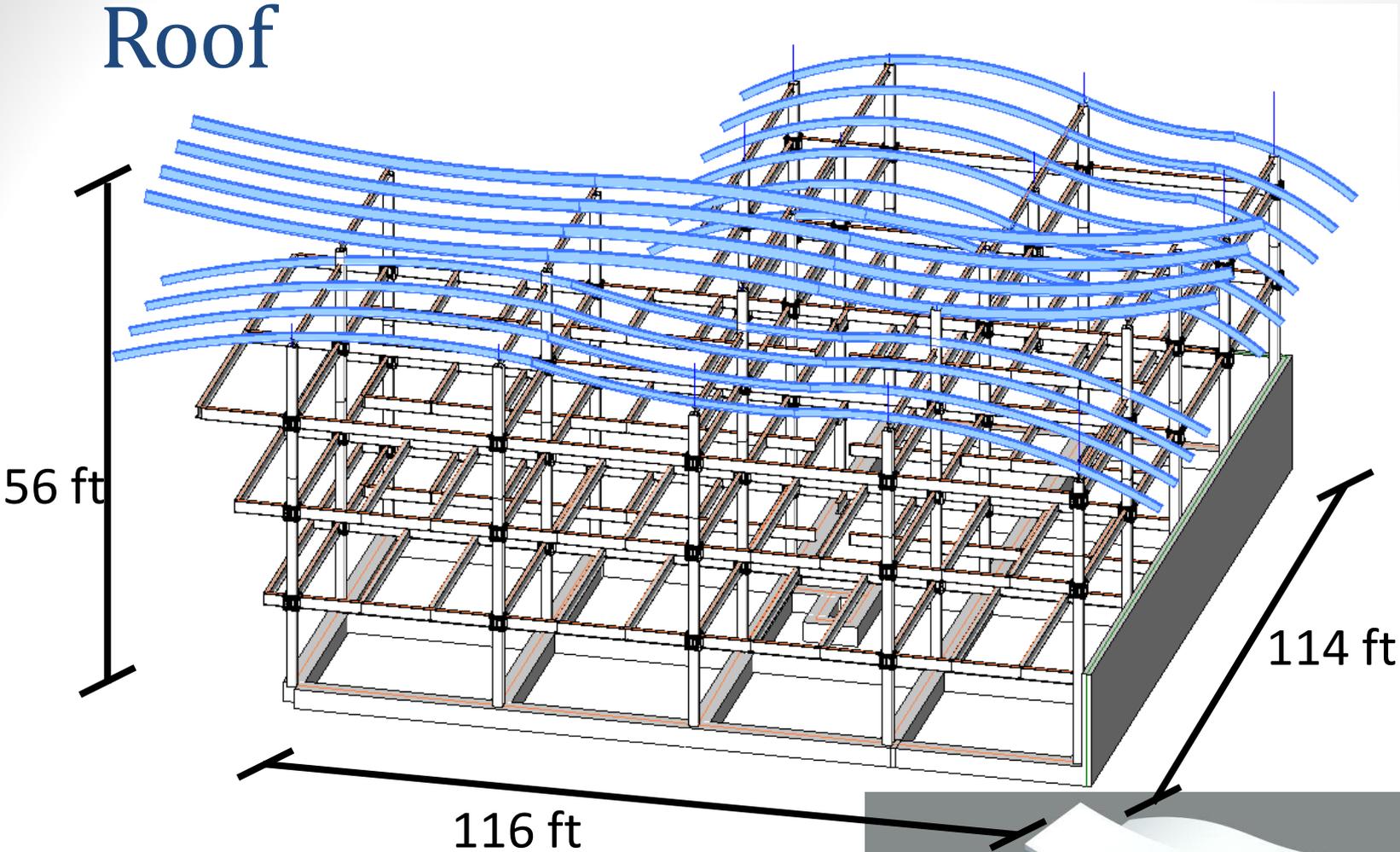
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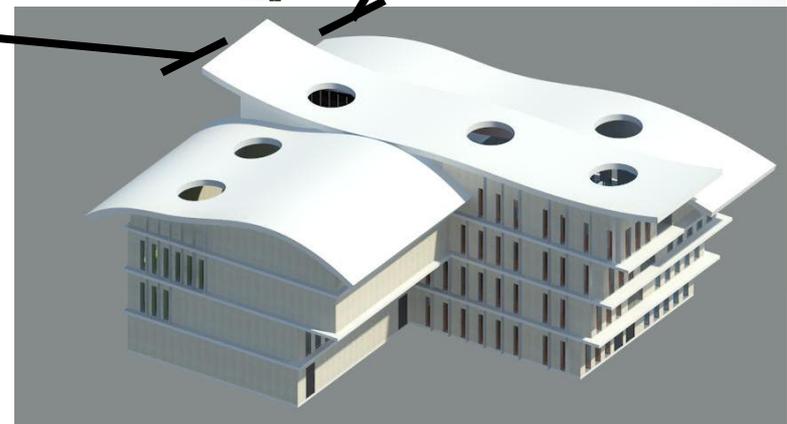
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Roof



- Single curvature to ease fabrication
- Spaced approx. 10 feet on center
- Steel decking perpendicular



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Cantilever Load Path



A

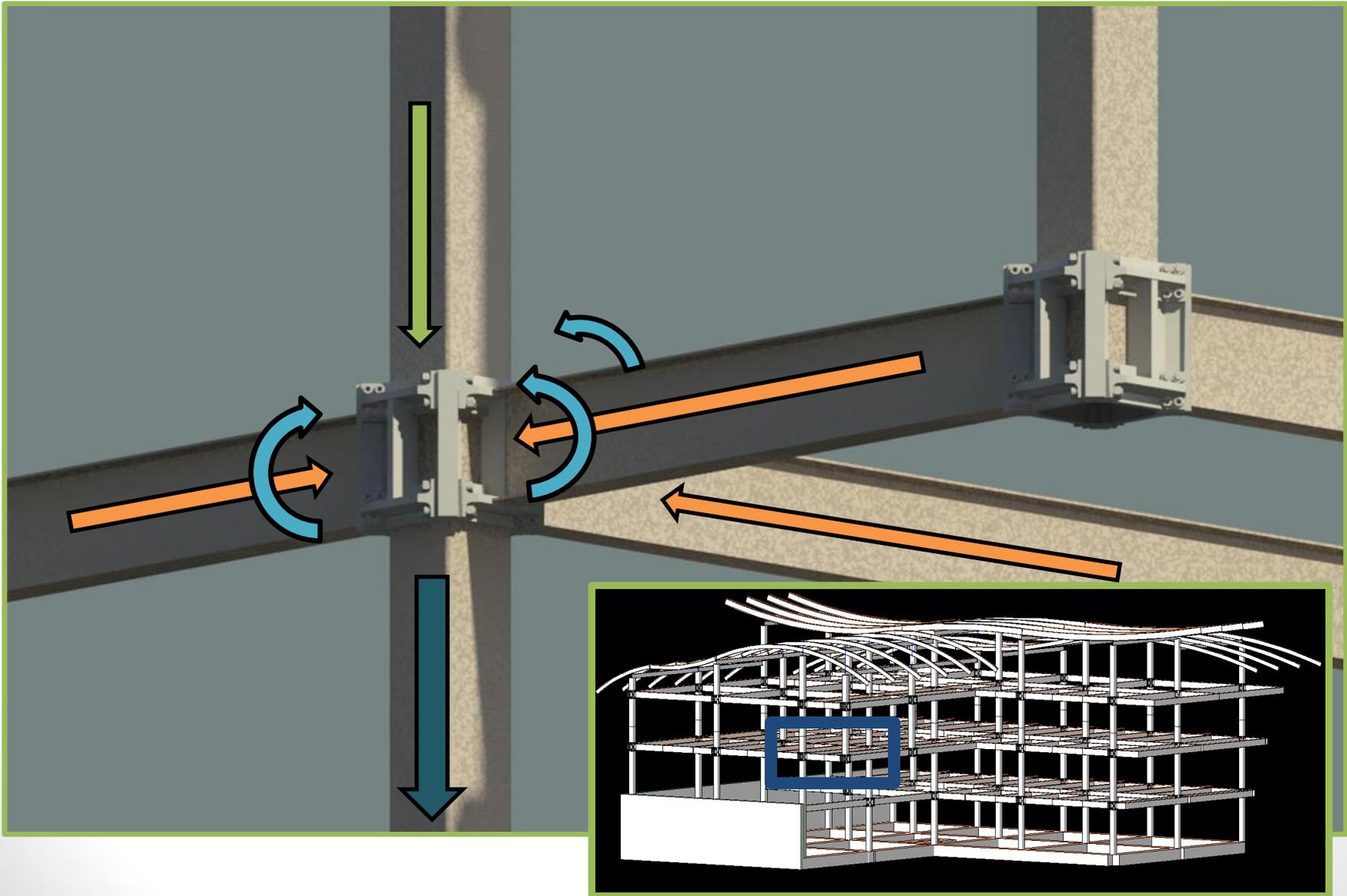
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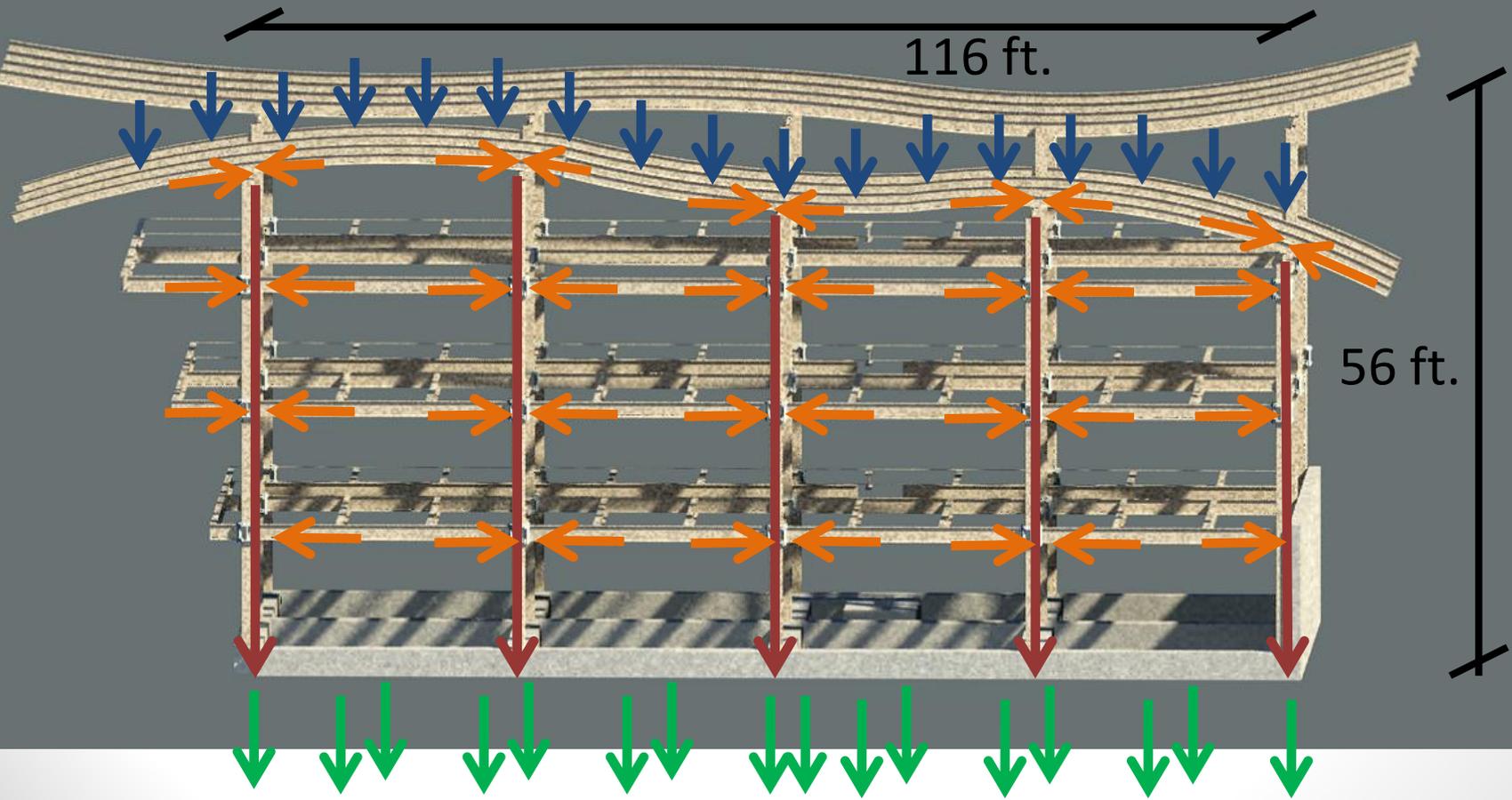
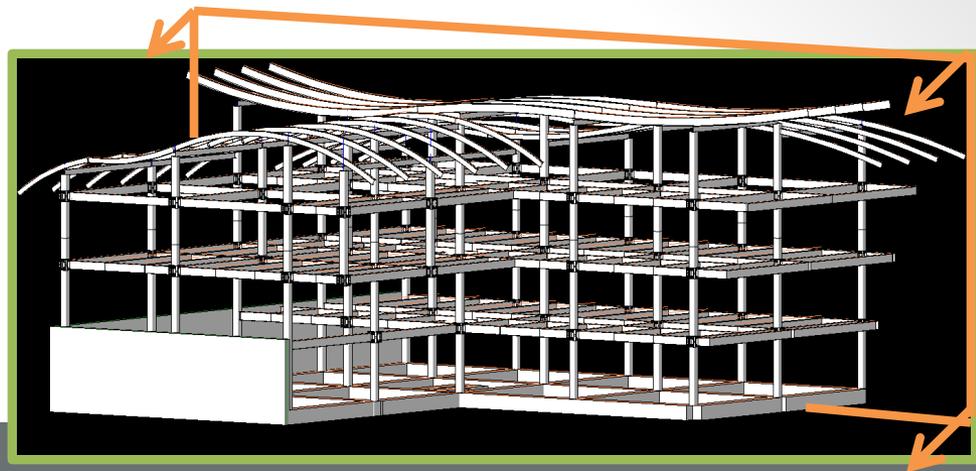
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Load Path



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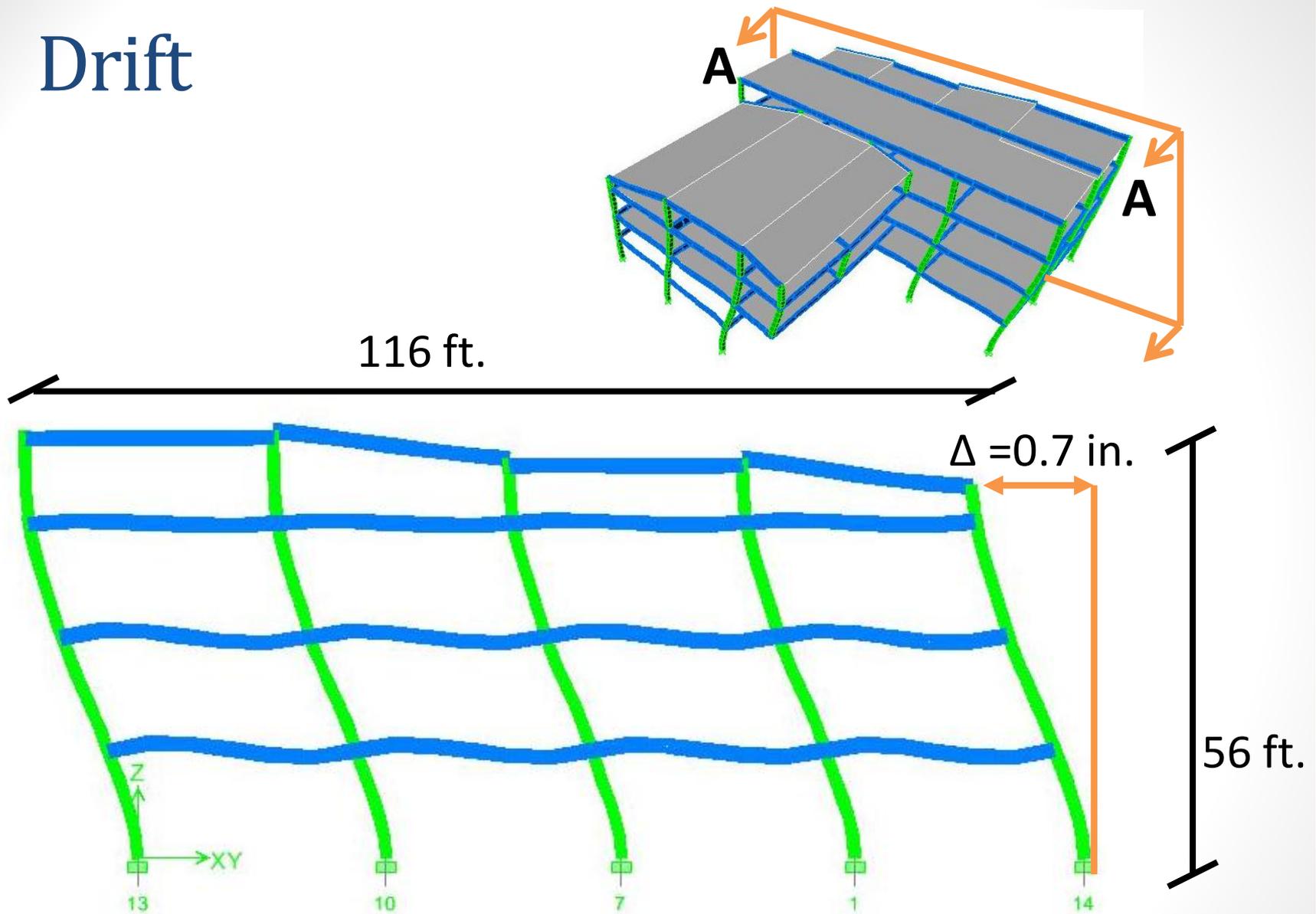
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Drift



Section A-A: Deflected Shape



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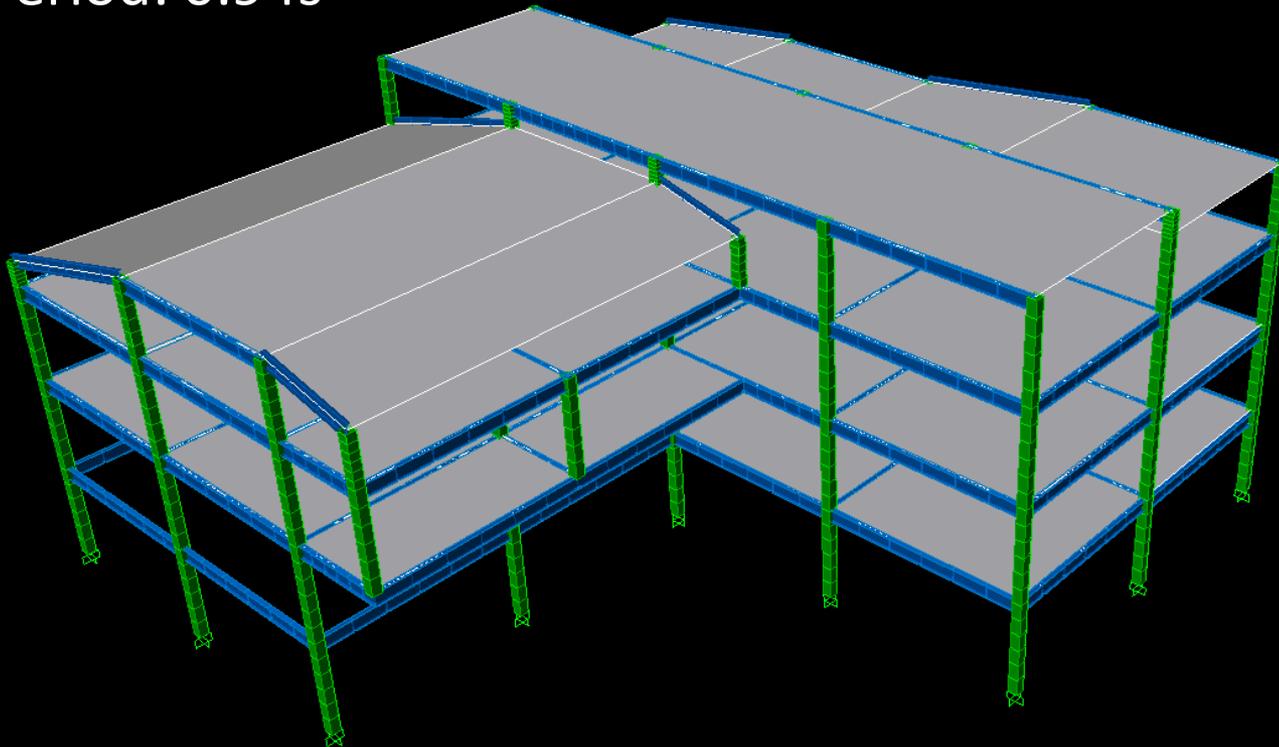
Dynamic Structural Model

Code Level Earthquake (DBE)

Max Amplified Deflection: 3.9 in. > 13 in.

Max Amplified Story Drift: 2.2 in. > 3.3 in.

Period: 0.94s



First Mode Shape (Scaled Animation)



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Structure 4D Video



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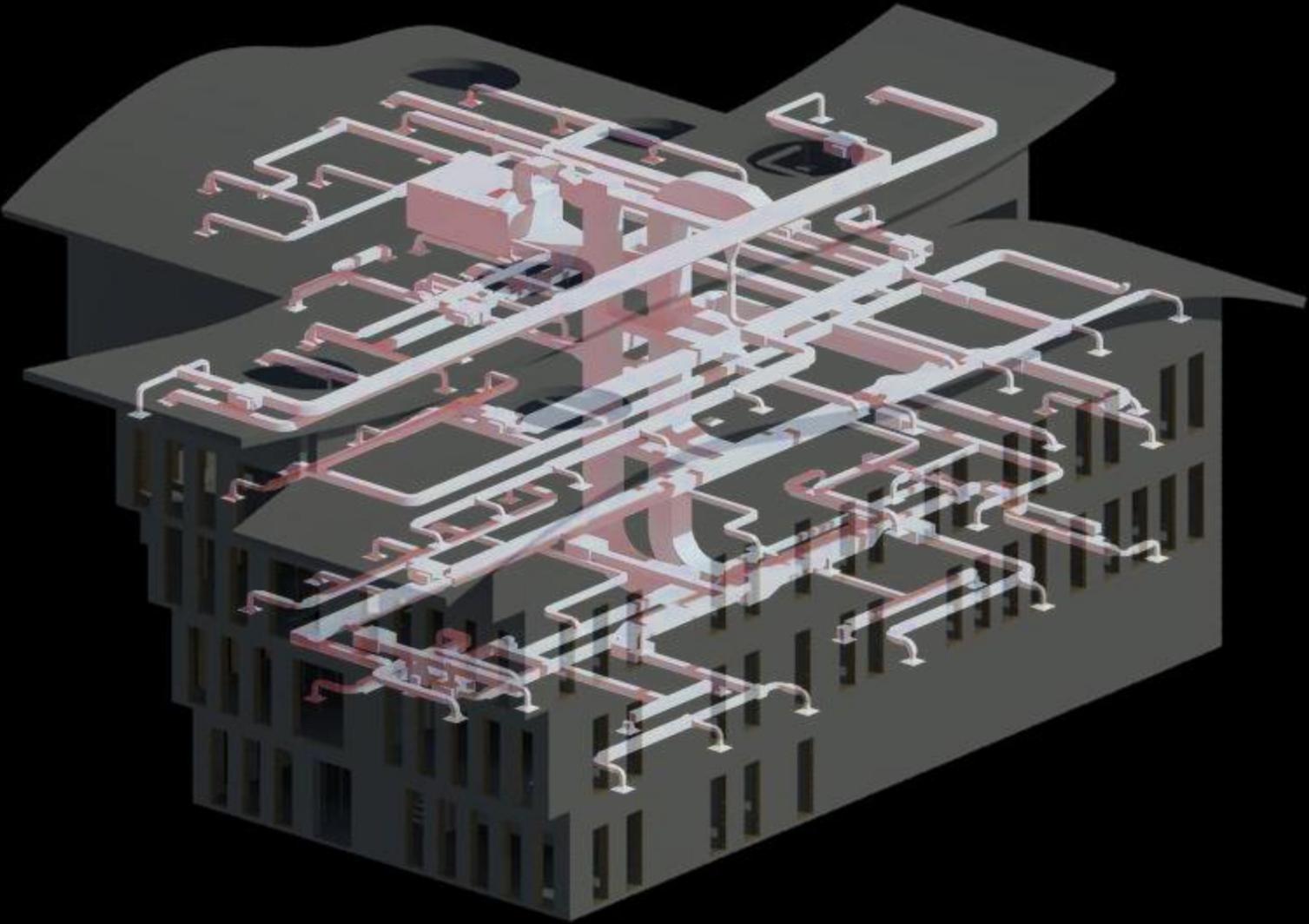


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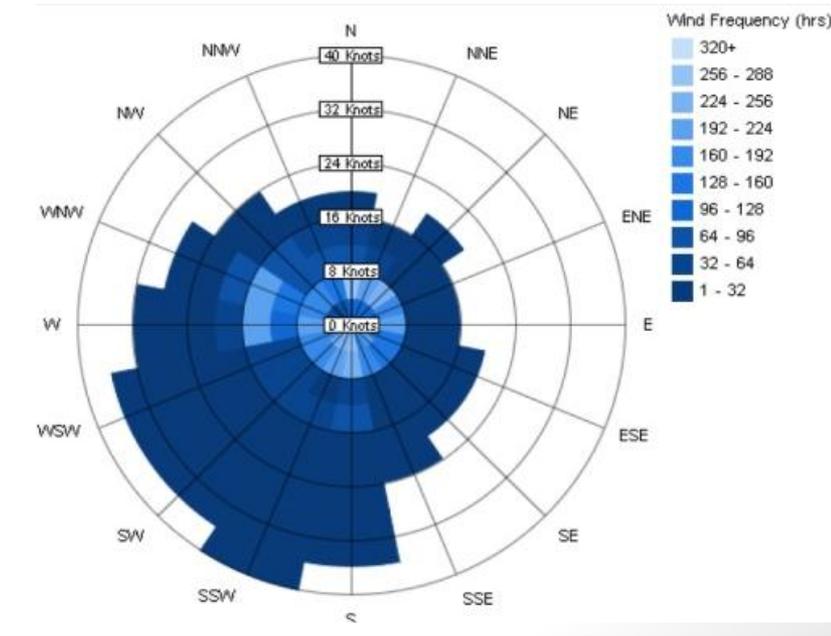
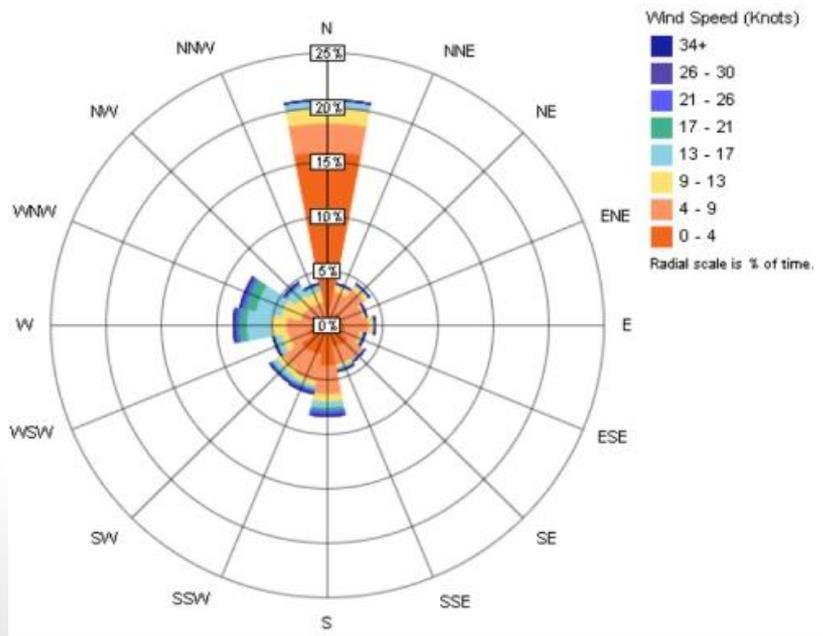
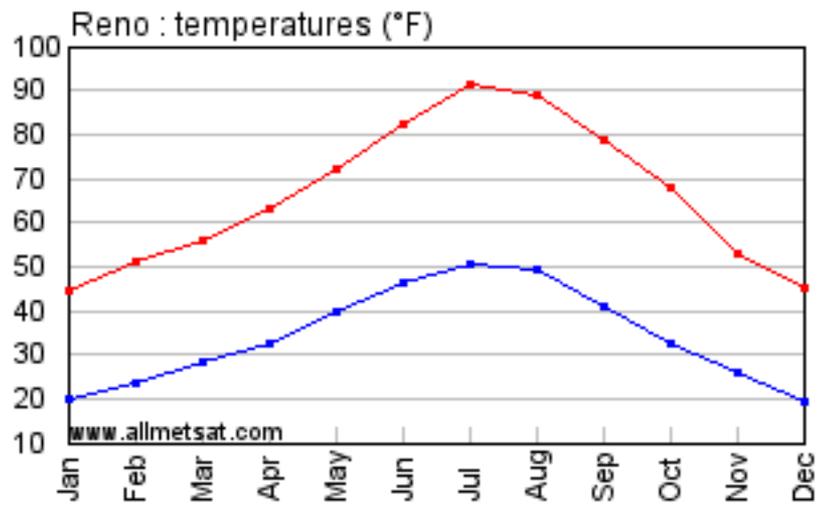
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Climate Data



Annual relative air humidity %

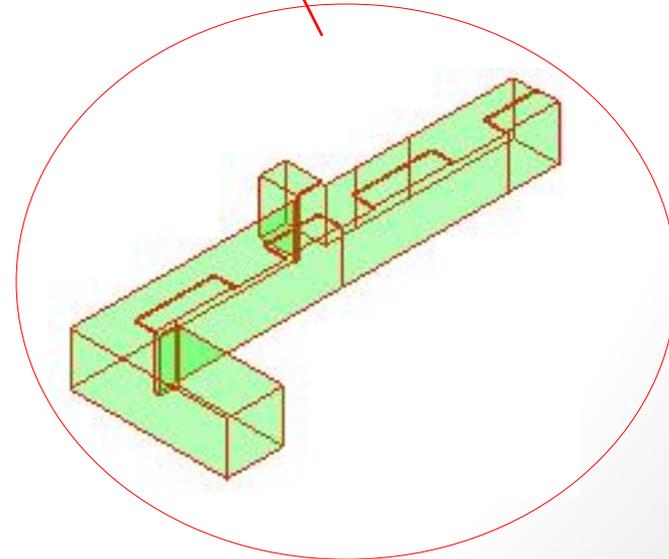
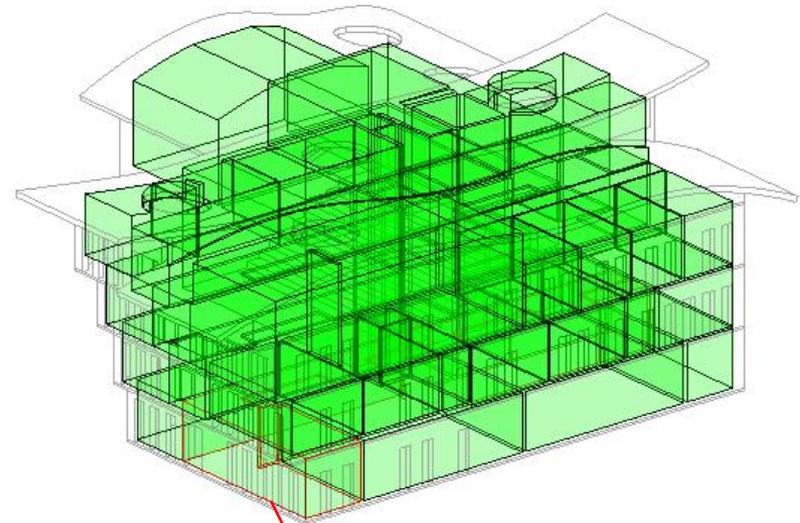
| | | |
|----------------|----------------|-------------|
| Highest | Morning | Noon |
| January | 79 | 50 |
| Lowest | Morning | Noon |
| September | 61 | 19 |



Analytical model

Building Summary

| Inputs | |
|--|--------------------|
| Building Type | SchoolOrUniversity |
| Area (m ²) | 2,716 |
| Volume (m ³) | 12,459.21 |
| Calculated Results | |
| Peak Cooling Total Load (W) | 178,056 |
| Peak Cooling Month and Hour | August 2:00 PM |
| Peak Cooling Sensible Load (W) | 137,186 |
| Peak Cooling Latent Load (W) | 40,87 |
| Maximum Cooling Capacity (W) | 204,795 |
| Peak Cooling Airflow (L/s) | 12,996.9 |
| Peak Heating Load (W) | 55,008 |
| Peak Heating Airflow (L/s) | 3,866.7 |
| Checksums | |
| Cooling Load Density (W/m ²) | 65.55 |
| Cooling Flow Density (L/(s·m ²)) | 4.78 |
| Cooling Flow / Load (L/(s·kW)) | 72.99 |
| Cooling Area / Load (m ² /kW) | 15.26 |
| Heating Load Density (W/m ²) | 20.25 |
| Heating Flow Density (L/(s·m ²)) | 1.42 |



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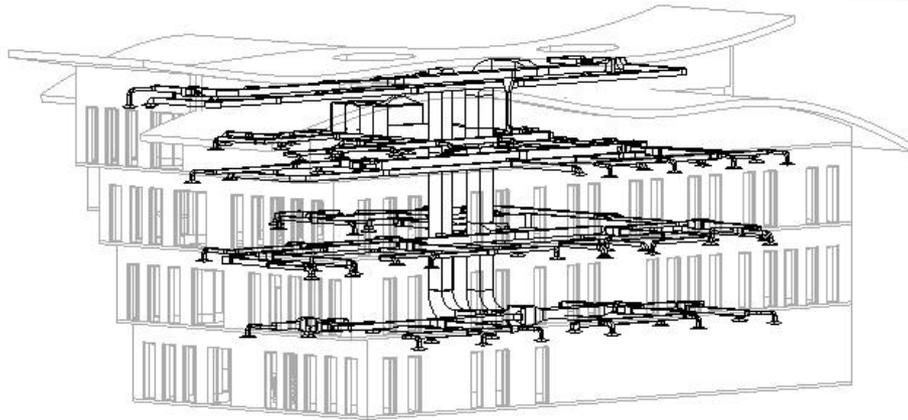
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5/6/2011

[46]

Ventilation



Distribution ducts in rooms: 2 - 3 m/s
 Distribution ducts between rooms: 3 - 6 m/s
 Main duct: 6 - 8 m/s

| Level 1 | | | | | |
|---------|----|-------|-----------|-----------|-----------|
| Level 1 | 76 | Space | 187.3 L/s | 0.0 L/s | 187.3 L/s |
| Level 1 | 81 | Space | 10.9 L/s | 0.0 L/s | 10.9 L/s |
| Level 1 | 82 | Space | 3.7 L/s | 0.0 L/s | 3.7 L/s |
| Level 1 | 83 | Space | 179.0 L/s | 180.0 L/s | -1.0 L/s |
| Level 1 | 84 | Space | 611.4 L/s | 600.0 L/s | 11.4 L/s |
| Level 1 | 85 | Space | 510.2 L/s | 500.0 L/s | 10.2 L/s |
| Level 1 | 86 | Space | 146.4 L/s | 160.0 L/s | -13.6 L/s |
| Level 1 | 87 | Space | 45.9 L/s | 50.0 L/s | -4.1 L/s |
| Level 1 | 88 | Space | 24.1 L/s | 0.0 L/s | 24.1 L/s |



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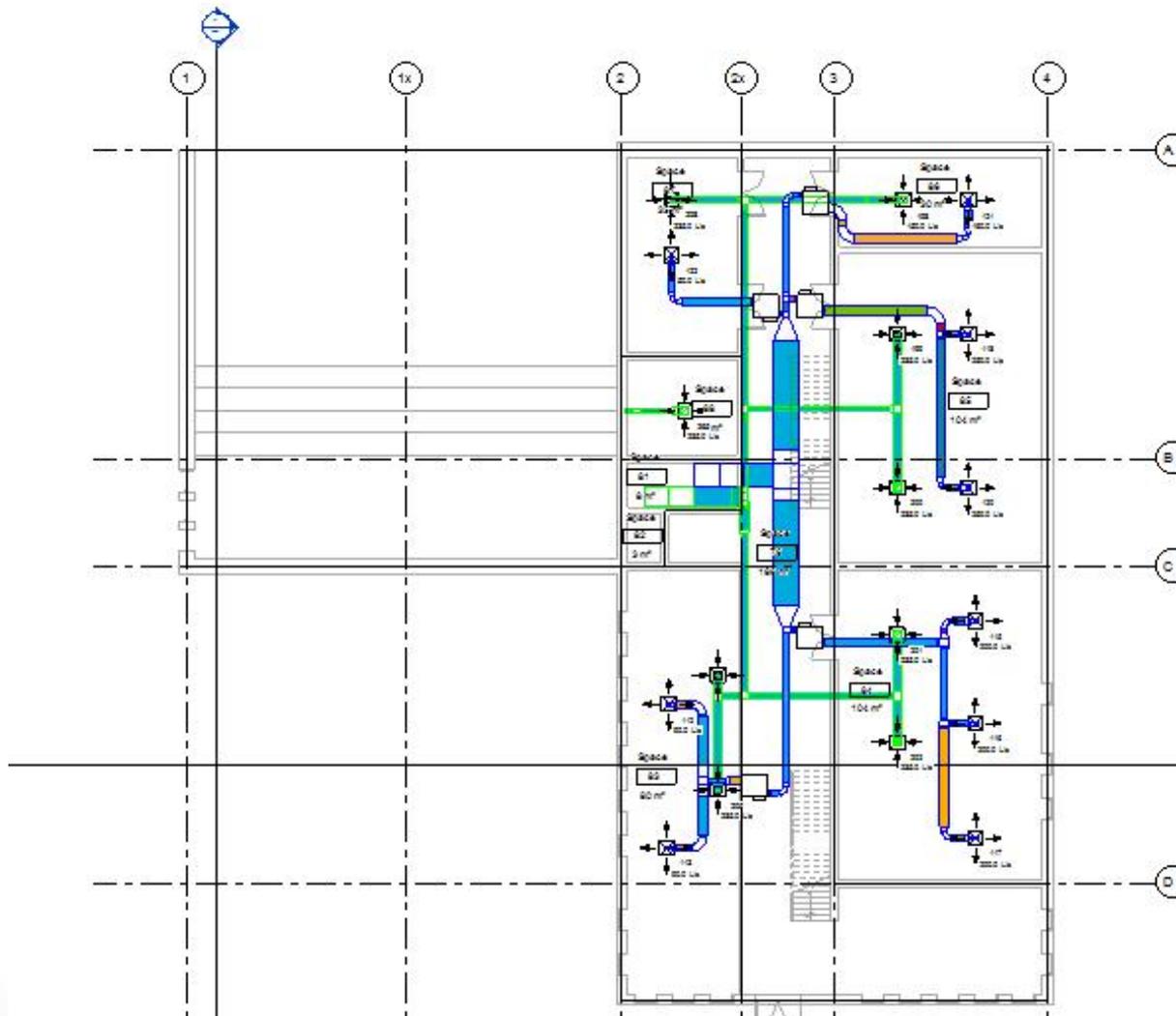
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5/6/2011

Duct Routing - Ground floor



- Less than 1.3 m/s
- 1.3 m/s - 2.5 m/s
- 2.5 m/s - 3.1 m/s
- 3.1 m/s - 3.8 m/s
- 3.8 m/s - 5.0 m/s
- 5.0 m/s - 10.0 m/s
- 10.0 m/s - 20.0 m/s
- 20.0 m/s or more



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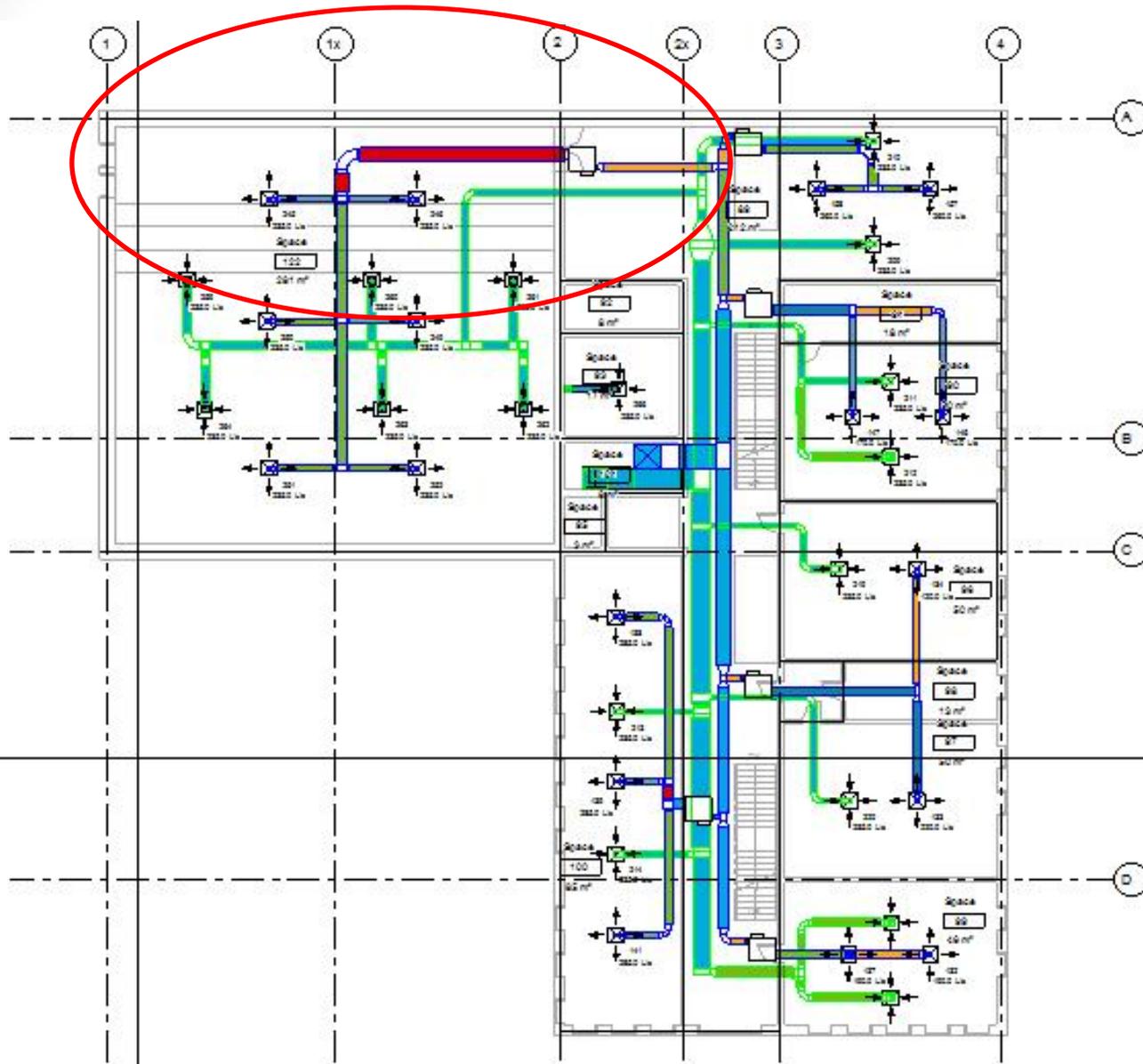
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Duct Routing - 1st floor



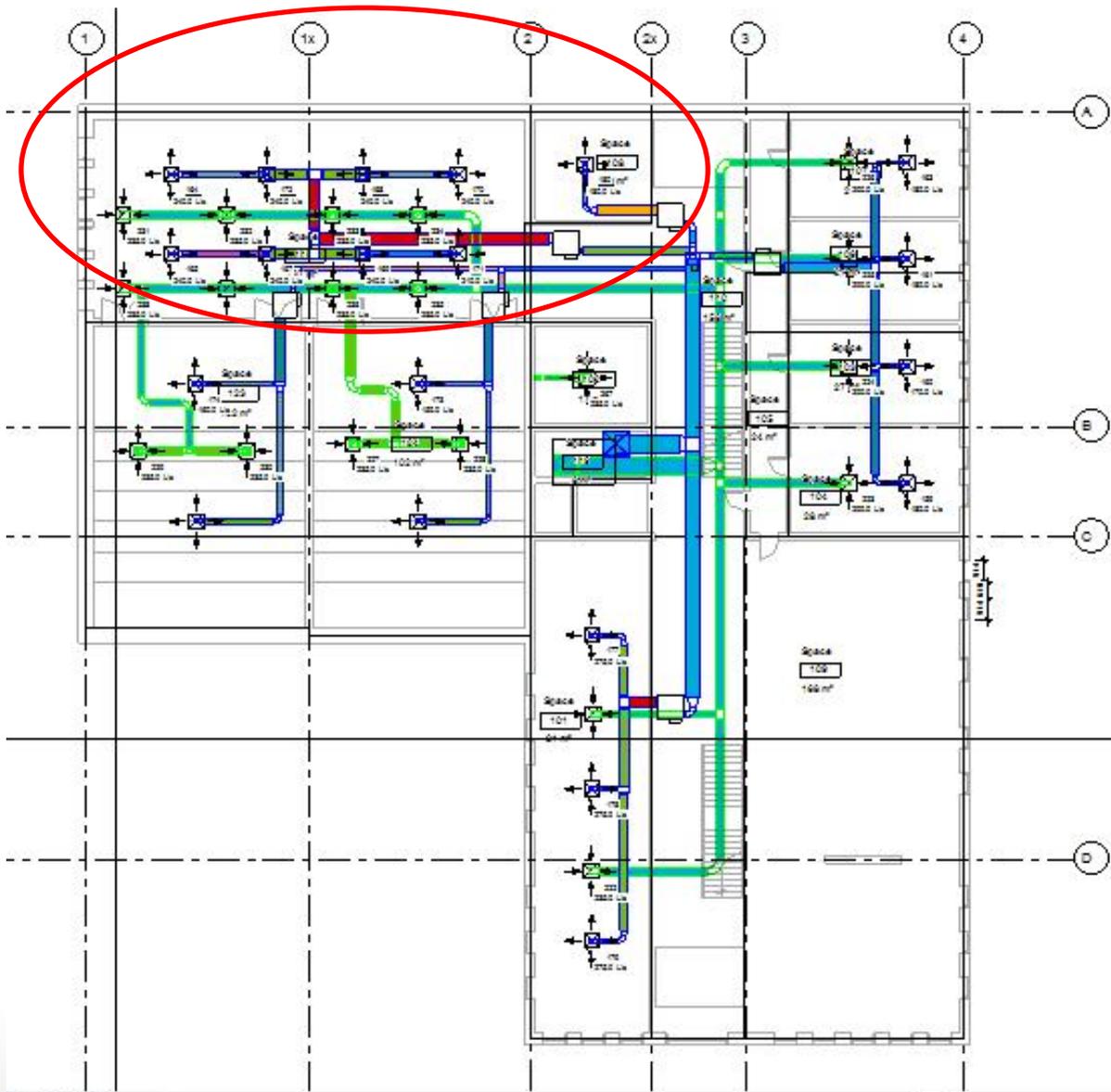
- Less than 1.3 m/s
- 1.3 m/s - 2.5 m/s
- 2.5 m/s - 3.1 m/s
- 3.1 m/s - 3.8 m/s
- 3.8 m/s - 5.0 m/s
- 5.0 m/s - 10.0 m/s
- 10.0 m/s - 20.0 m/s
- 20.0 m/s or more



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Duct Routing - 2nd floor



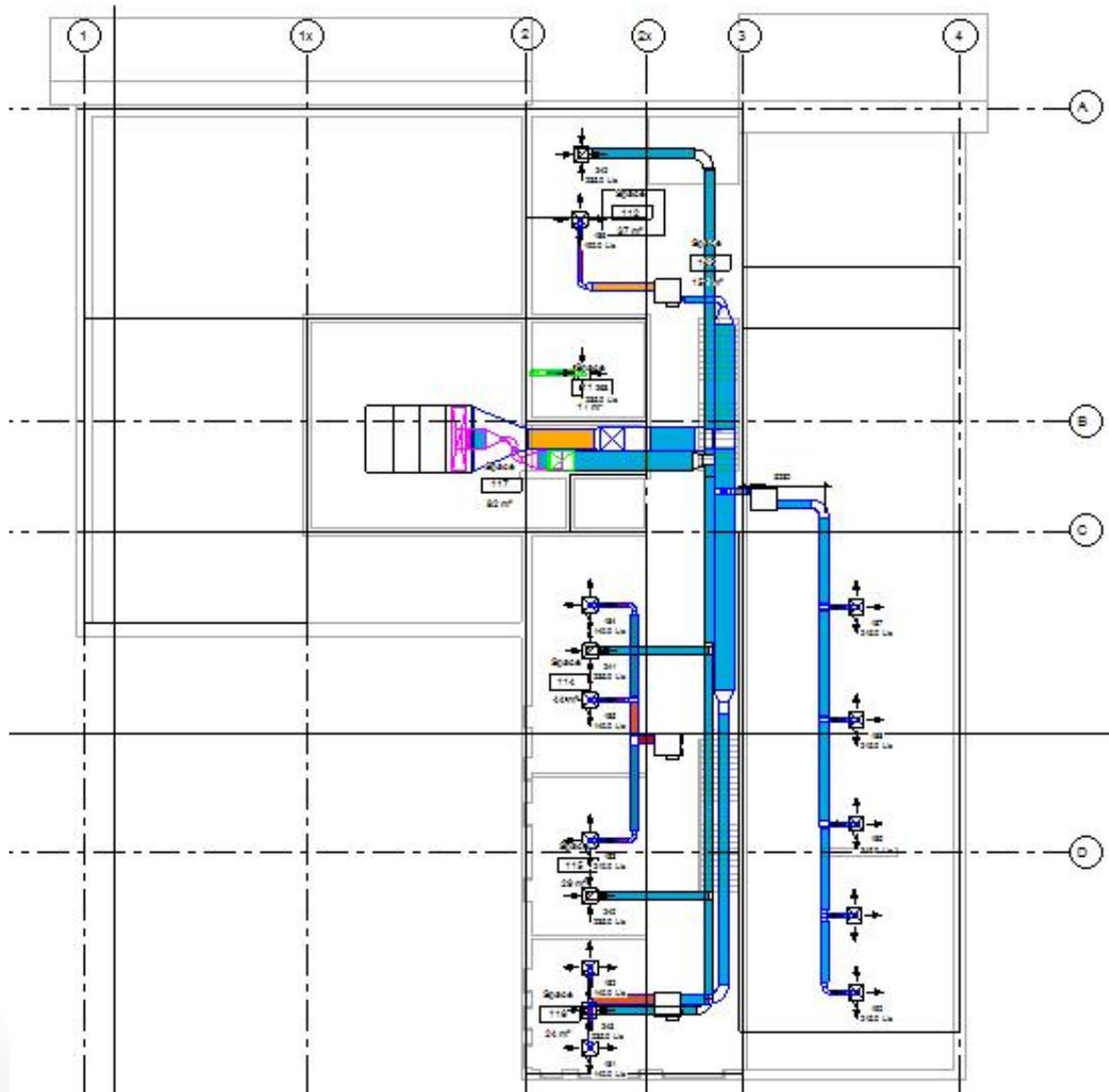
- Less than 1.3 m/s
- 1.3 m/s - 2.5 m/s
- 2.5 m/s - 3.1 m/s
- 3.1 m/s - 3.8 m/s
- 3.8 m/s - 5.0 m/s
- 5.0 m/s - 10.0 m/s
- 10.0 m/s - 20.0 m/s
- 20.0 m/s or more



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Duct Routing - 3rd floor



- Less than 1.3 m/s
- 1.3 m/s - 2.5 m/s
- 2.5 m/s - 3.1 m/s
- 3.1 m/s - 3.8 m/s
- 3.8 m/s - 5.0 m/s
- 5.0 m/s - 10.0 m/s
- 10.0 m/s - 20.0 m/s
- 20.0 m/s or more



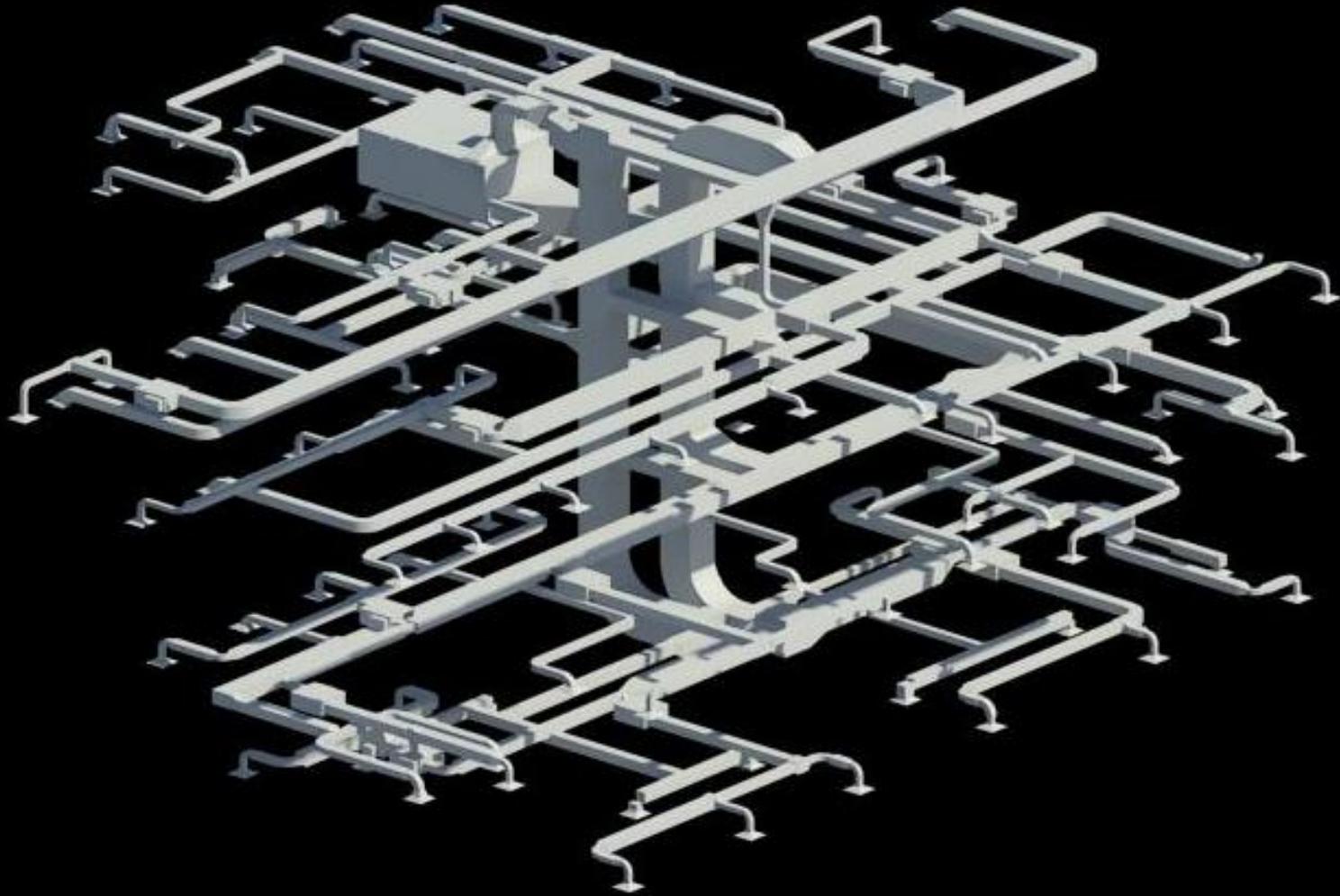
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(52)

IESVE simulation

- indoor climate analysis



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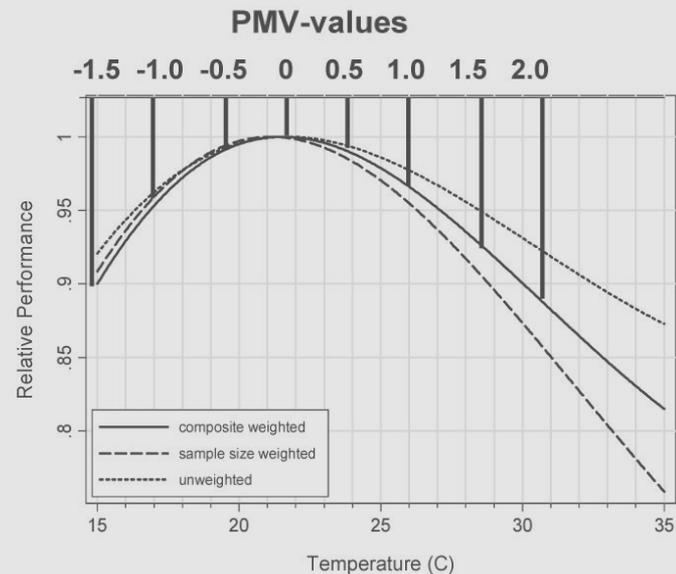
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| Thermal | | | | Atmospheric | | | | | | | |
|------------------------|--------|--------|----------|-------------|-----------------------|------------|-----------------|---|--------------------|---|------|
| Type of building/space | summer | winter | activity | category | Operative temperature | | Category | corresponding CO ₂ above outdoors [350 PPM] in PPM for energy calculations | | | |
| | [Clo] | [Clo] | [Met] | | Summer [F] | Winter [F] | | | | | |
| office | 0,5 | 1 | 1,2 | A | 75.2-77 | 69.8-73.4 | A | 350 | | | |
| | | | | B | 73.4-78.8 | 68-75.2 | | | | | |
| | | | | C | 71.6-80.6 | 66.2-77 | | | | | |
| | | | | | | | category | Summer [C°] | Winter [C°] | B | 500 |
| | | | | | | | A | 24-25 | 21-23 | C | 800 |
| | | | | | | | B | 23-26 | 20-24 | D | <800 |
| | | | C | 22-27 | 19-25 | | | | | | |

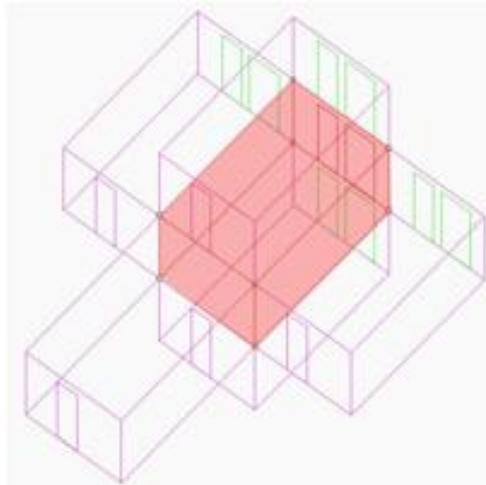
Performance



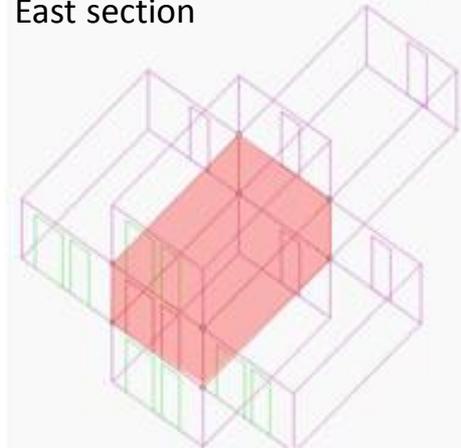
IESVE Simulation

- Indoor climate analysis

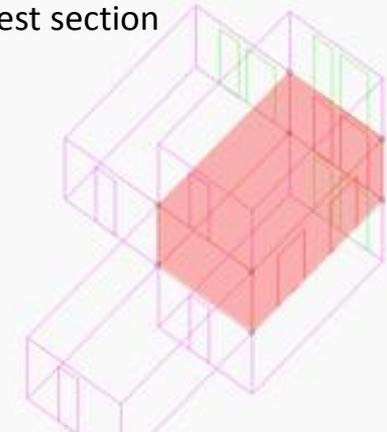
| Description | Amount | Profile |
|-------------------------------|-------------|--------------------------|
| Time set | 8 AM - 5 PM | |
| Facade [W/m ² K] | 0,3 | |
| Glazing [W/m ² K] | 1,03 | |
| Solar shading | | 50 % of time set |
| 2 People [W/P] | 100 | 80% of time set |
| Computers [W/m ²] | 10 | 100 % of time set |
| Lighting [W/m ²] | 5 | 100 % of time set |
| Infiltration [l/s] | 0,06 | on continuously |
| Ventilation | VAV | ramp(ta,69,8,0.4,73.4,1) |
| Cooling setpoint [F°] | 75,2 | 100 % of time set |
| Heating setpoint [F°] | 69,8 | 100 % of time set |



East section



West section



corner section



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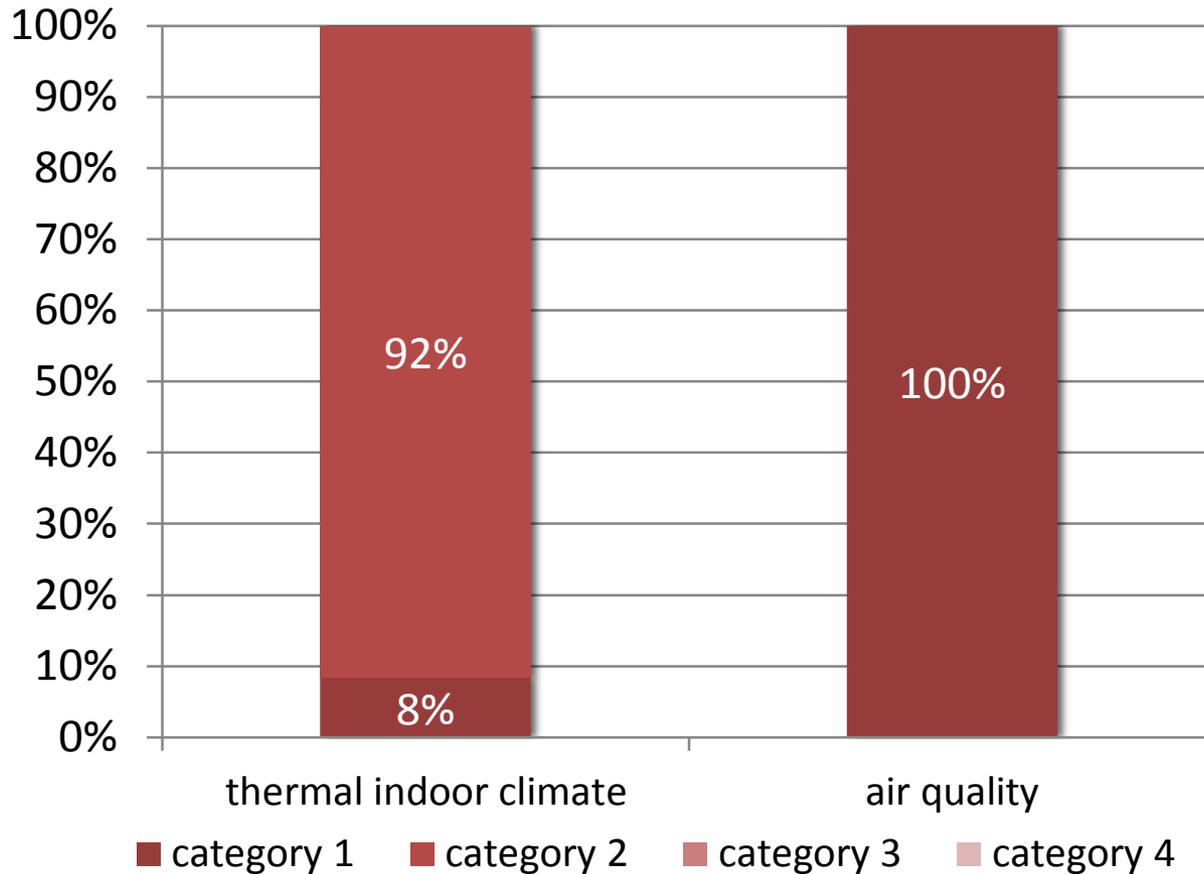
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(54)

IESVE Simulation

- Indoor climate analysis

East facing section placed in indoor climate categories



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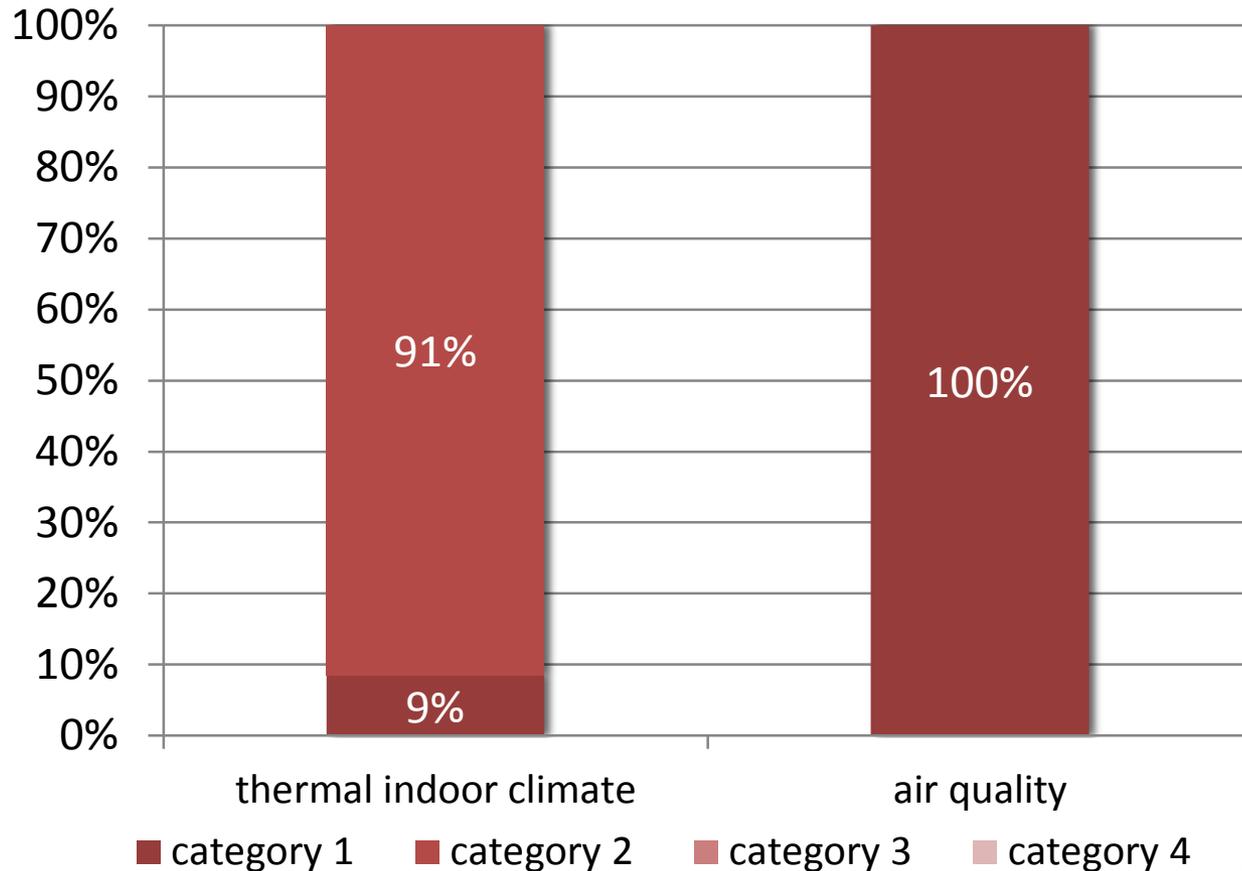
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(55)

IESVE simulation

- indoor climate analysis

west facing section placed in indoor climate category



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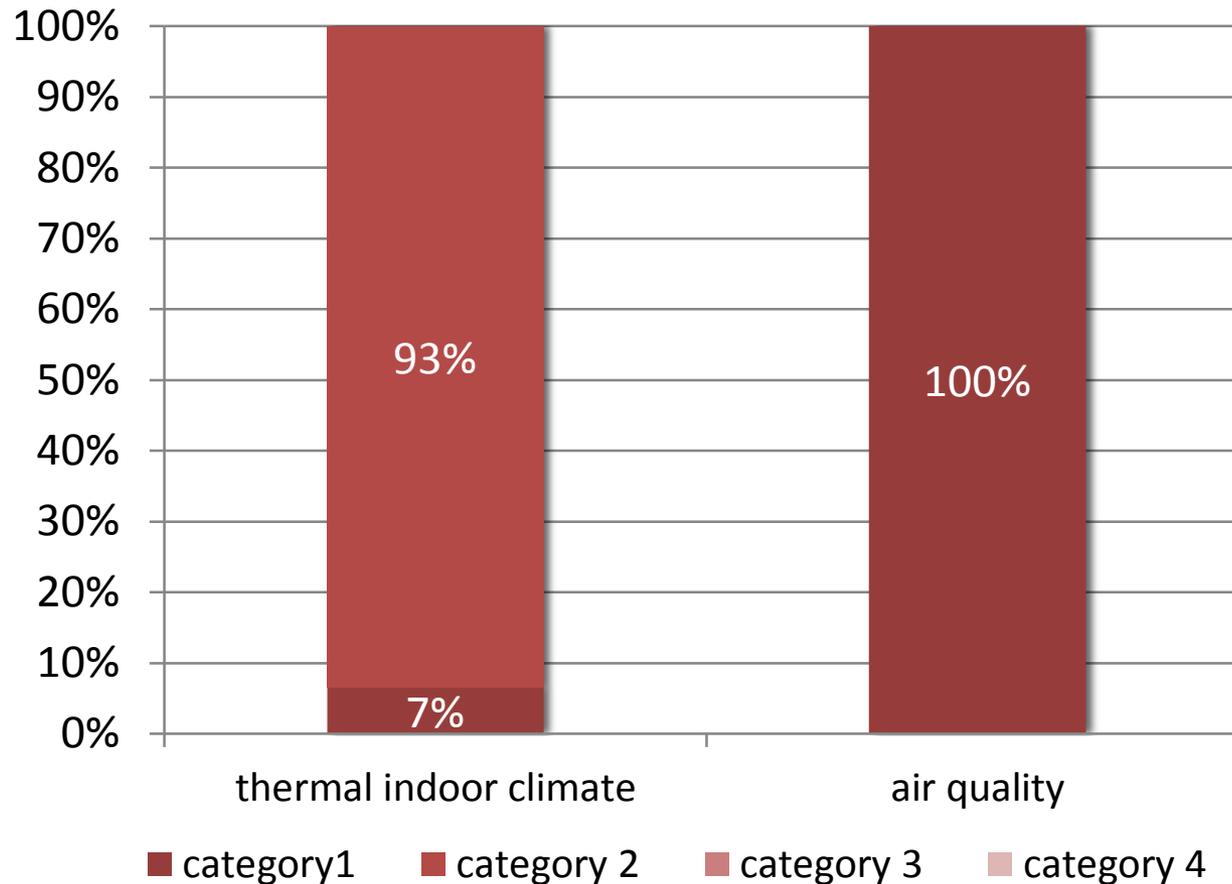
5/6/2011

(56)

IESVE Simulation

- Indoor climate analysis

corner section placed in indoor climate categories



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(57)

IESVE Simulation

- Indoor climate analysis



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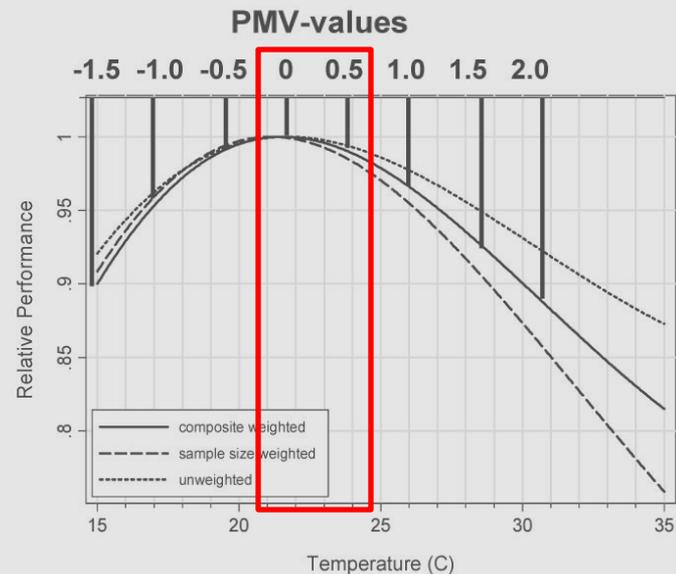
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| Thermal | | | | | | Atmospheric | | |
|------------------------|--------|--------|----------|----------|-----------------------|-------------|----------|---|
| Type of building/space | summer | winter | activity | category | Operative temperature | | Category | corresponding CO ₂ above outdoors [350 PPM] in PPM for energy calculations |
| | [Clo] | [Clo] | [Met] | | Summer [F] | Winter [F] | | |
| office | 0,5 | 1 | 1,2 | A | 75.2-77 | 69.8-73.4 | A | 350 |
| | | | | B | 73.4-78.8 | 68-75.2 | | |
| | | | | C | 71.6-80.6 | 66.2-77 | | |
| | | | | category | Summer [C°] | Winter [C°] | | |
| | | | | A | 24-25 | 21-23 | | |
| | | | | B | 23-26 | 20-24 | B | 500 |
| | | | | C | 22-27 | 19-25 | C | 800 |
| | | | | | | | D | <800 |

Performance

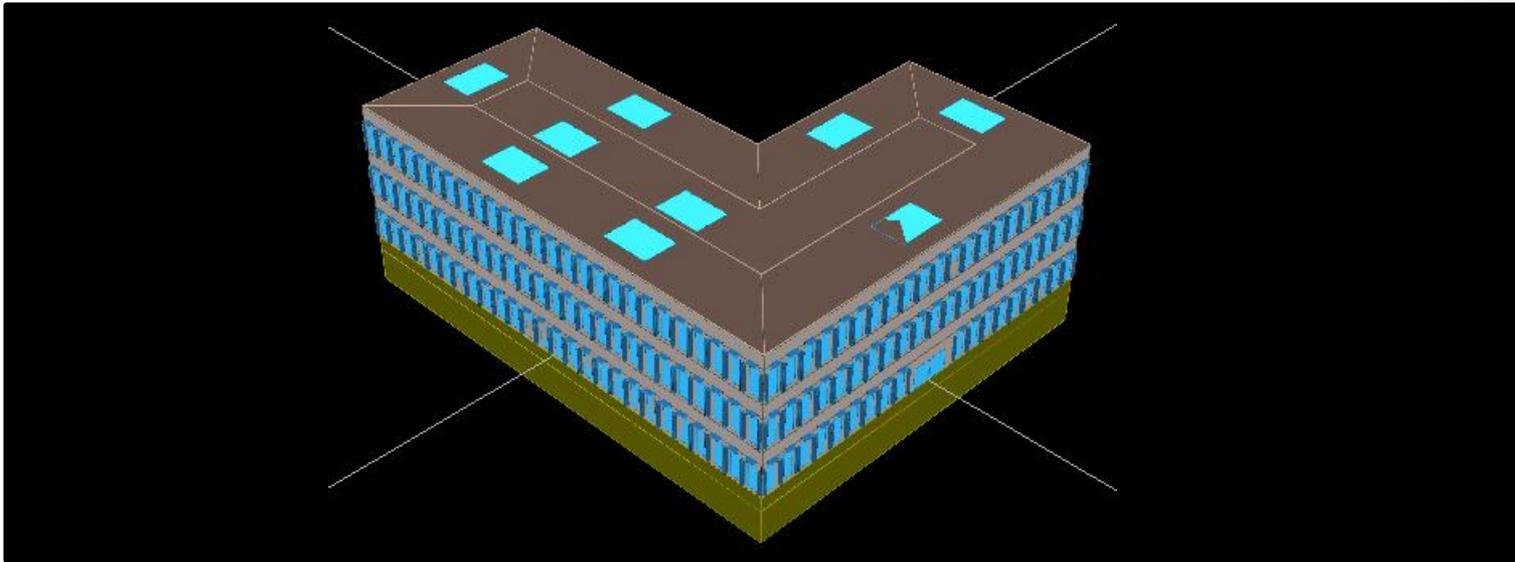


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(58)

Energy Consumption

-eQUEST simulation



| | | | |
|----------------|---|----------------|---|
| Project Name: | <input type="text" value="Project 2"/> | Code Analysis: | <input type="text" value="LEED-NC (Appendix G)"/> |
| Building Type: | <input type="text" value="School, College/University"/> | Code Vintage: | <input type="text" value="version 3.0"/> |
| Location Set: | <input type="text" value="All eQUEST Locations"/> | | |
| State: | <input type="text" value="Nevada"/> | Jurisdiction: | <input type="text" value="ASHRAE 90.1"/> |
| City: | <input type="text" value="Reno"/> | Region/Zone: | <input type="text" value="5B - Cool, Dry"/> |
| Utility: | | Rate: | |
| Electric: | <input type="text" value="- file -"/> | | <input type="text" value="- none -"/> |
| Gas: | <input type="text" value="- file -"/> | | <input type="text" value="- none -"/> |



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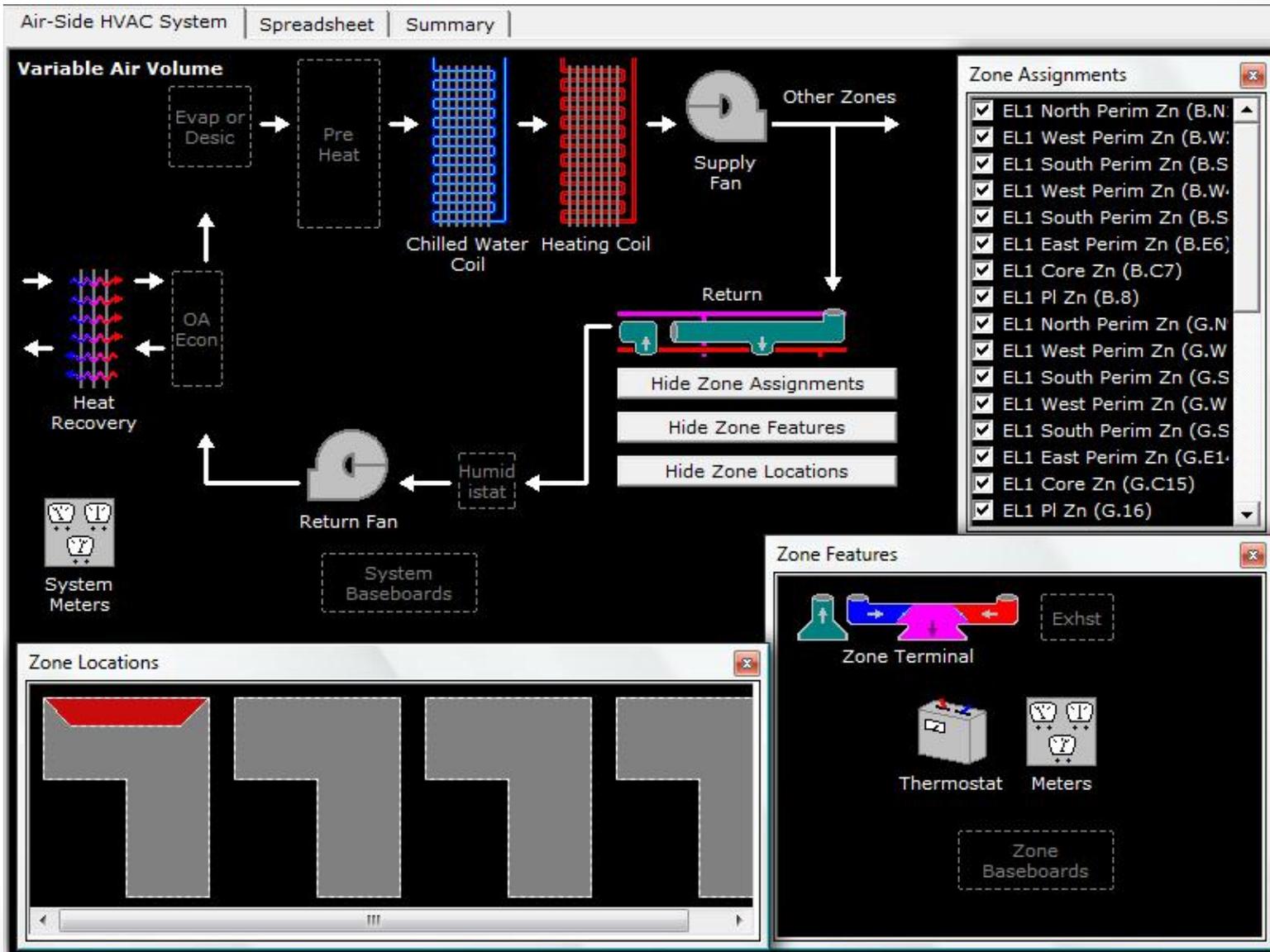
MEP

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5/6/2011

Energy Consumption

-eQUEST simulation



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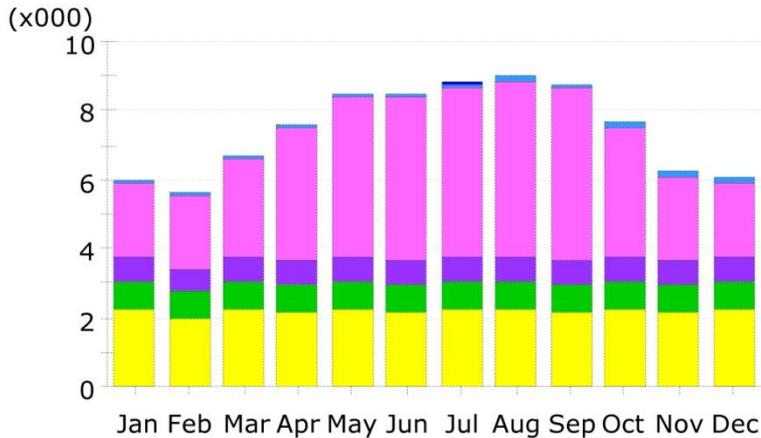
5/6/2011

Energy Consumption

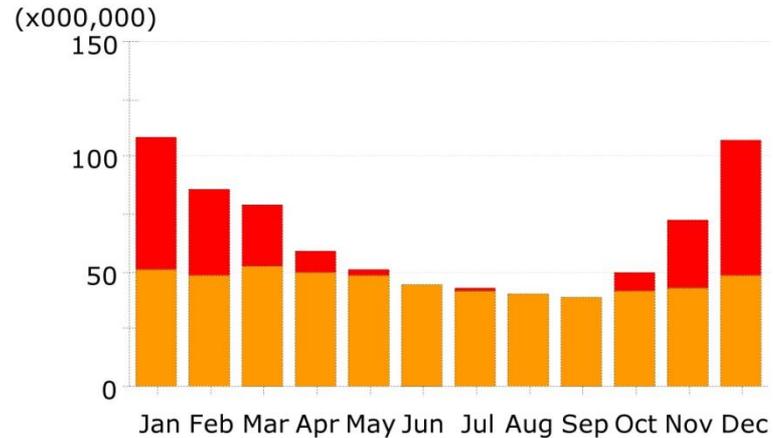
-eQUEST simulation

Total of 115 Kwh/m²

Electric Consumption (kWh)



Gas Consumption (Btu)



- | | | | |
|-----------------|------------------|---------------|----------------|
| Area Lighting | Exterior Usage | Water Heating | Refrigeration |
| Task Lighting | Pumps & Aux. | Ht Pump Supp. | Heat Rejection |
| Misc. Equipment | Ventilation Fans | Space Heating | Space Cooling |



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Energy Consumption

-eQUEST simulation

Total of 115 Kwh/m²

Electric Consumption (kWh x000)

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|
| Space Cool | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,08 |
| Heat Reject. | 0,12 | 0,11 | 0,12 | 0,12 | 0,12 | 0,12 | 0,12 | 0,12 | 0,12 | 0,12 | 0,12 | 0,12 | 1,43 |
| Refrigeration | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Space Heat | - | - | - | - | - | - | - | - | - | - | - | - | - |
| HP Supp. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hot Water | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Vent. Fans | 2,12 | 2,14 | 2,86 | 3,85 | 4,62 | 4,77 | 4,93 | 5,12 | 5,05 | 3,82 | 2,49 | 2,18 | 43,95 |
| Pumps & Aux. | 0,68 | 0,61 | 0,68 | 0,66 | 0,68 | 0,66 | 0,68 | 0,68 | 0,65 | 0,65 | 0,66 | 0,68 | 7,94 |
| Ext. Usage | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Misc. Equip. | 0,86 | 0,78 | 0,86 | 0,84 | 0,86 | 0,84 | 0,86 | 0,86 | 0,84 | 0,86 | 0,84 | 0,86 | 10,16 |
| Task Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Area Lights | 2,20 | 1,99 | 2,20 | 2,13 | 2,20 | 2,13 | 2,20 | 2,20 | 2,13 | 2,20 | 2,13 | 2,20 | 25,94 |
| Total | 5,99 | 5,64 | 6,73 | 7,60 | 8,49 | 8,52 | 8,80 | 8,99 | 8,79 | 7,66 | 6,24 | 6,05 | 89,50 |

Gas Consumption (Btu x000,000)

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---------------|---------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------|---------------|
| Space Cool | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Heat Reject. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Refrigeration | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Space Heat | 57,18 | 38,70 | 25,73 | 8,17 | 2,81 | 0,37 | 0,18 | 0,32 | 0,25 | 8,35 | 28,62 | 58,75 | 229,43 |
| HP Supp. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hot Water | 50,94 | 47,57 | 52,78 | 50,19 | 48,50 | 43,63 | 42,12 | 40,30 | 38,90 | 41,84 | 43,32 | 48,06 | 548,13 |
| Vent. Fans | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pumps & Aux. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ext. Usage | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Misc. Equip. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Task Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Area Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Total | 108,12 | 86,27 | 78,50 | 58,35 | 51,31 | 44,00 | 42,30 | 40,62 | 39,15 | 50,19 | 71,93 | 106,80 | 777,56 |



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MEP 4D Video



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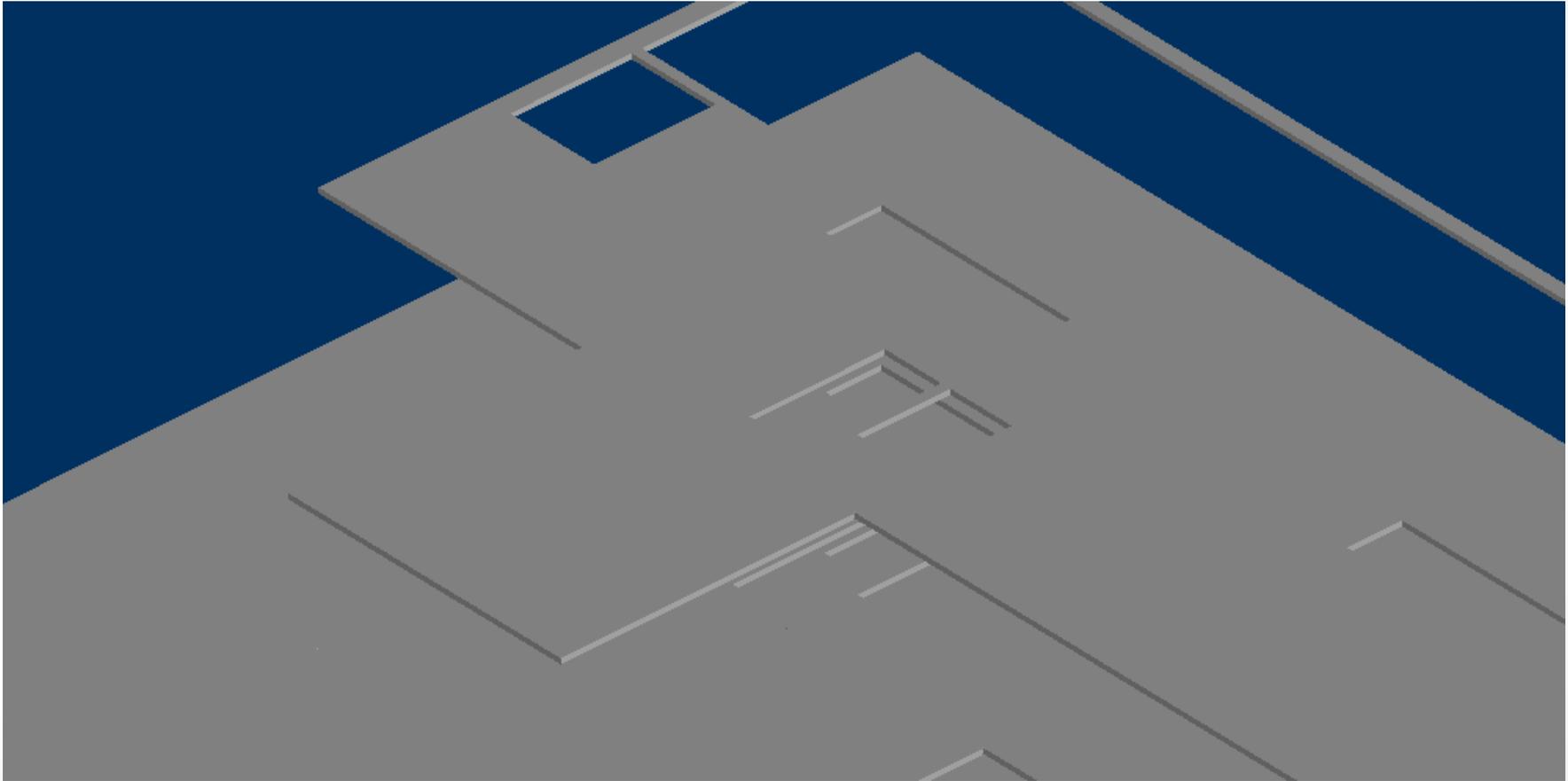
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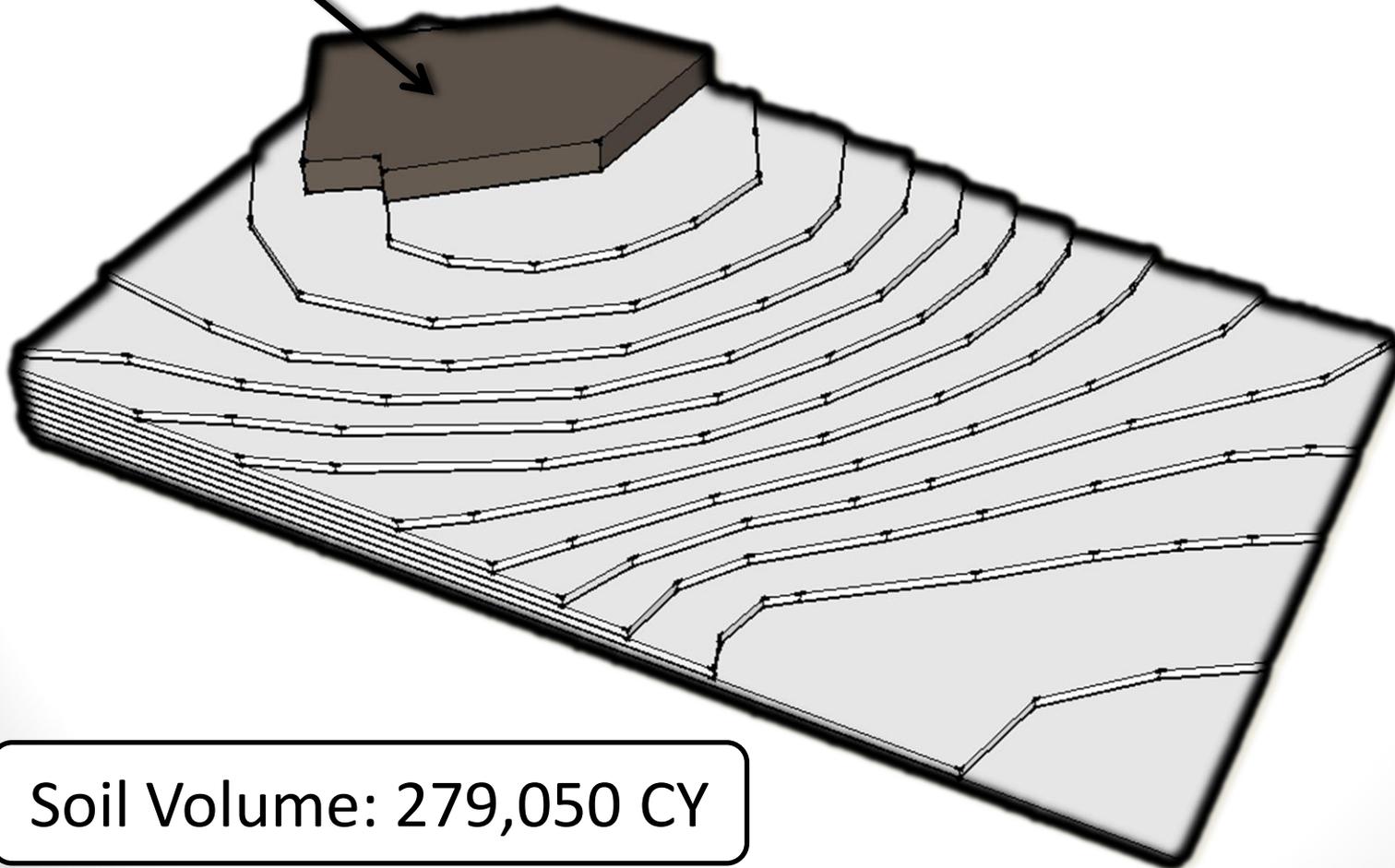
Ridge Team

63



Original Soil Conditions

Old Existing Building



Soil Volume: 279,050 CY



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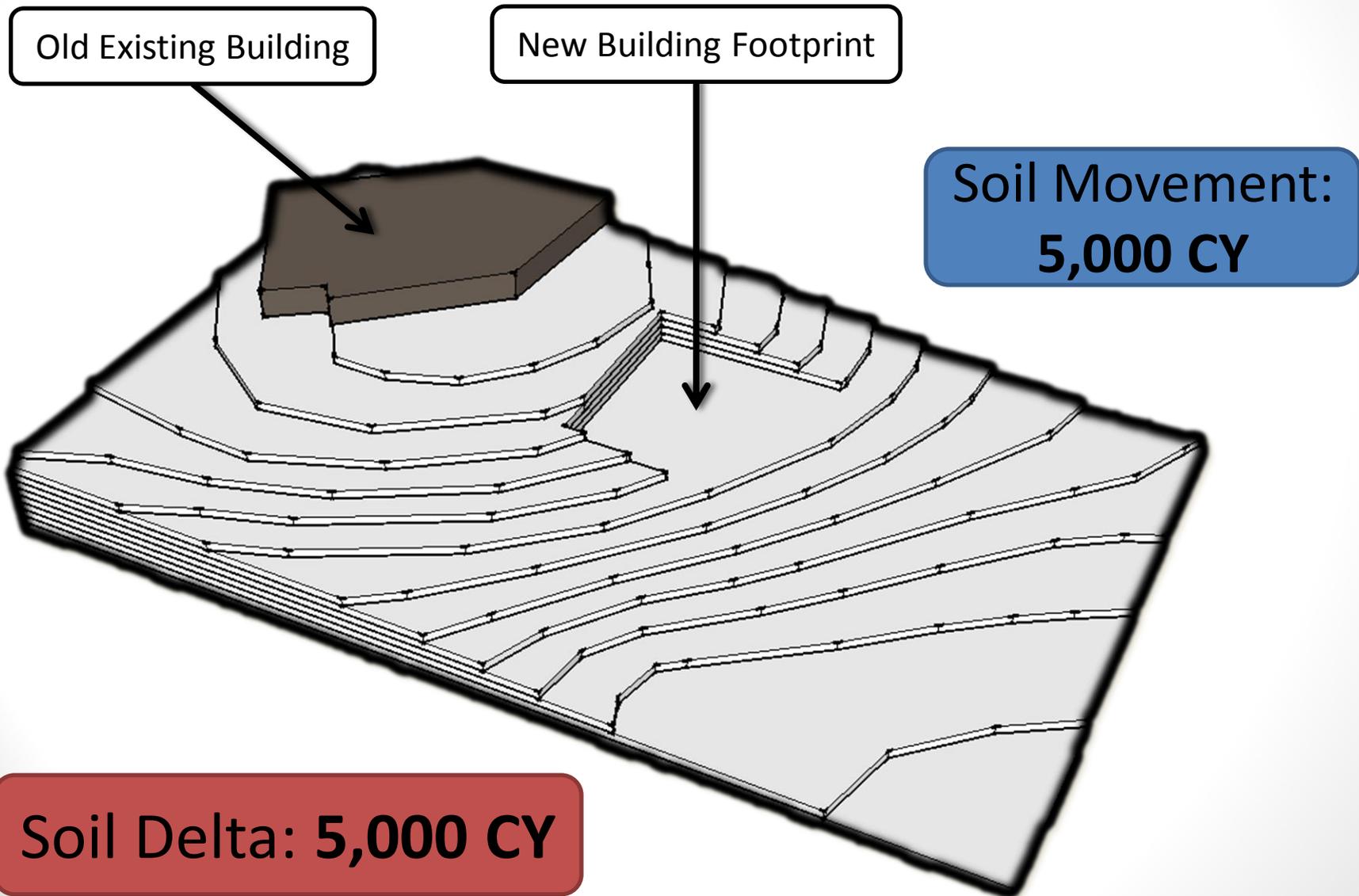
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Ridge Team

64

Simply Excavate (Winter)



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65

Add Value and Be Native (Spring)



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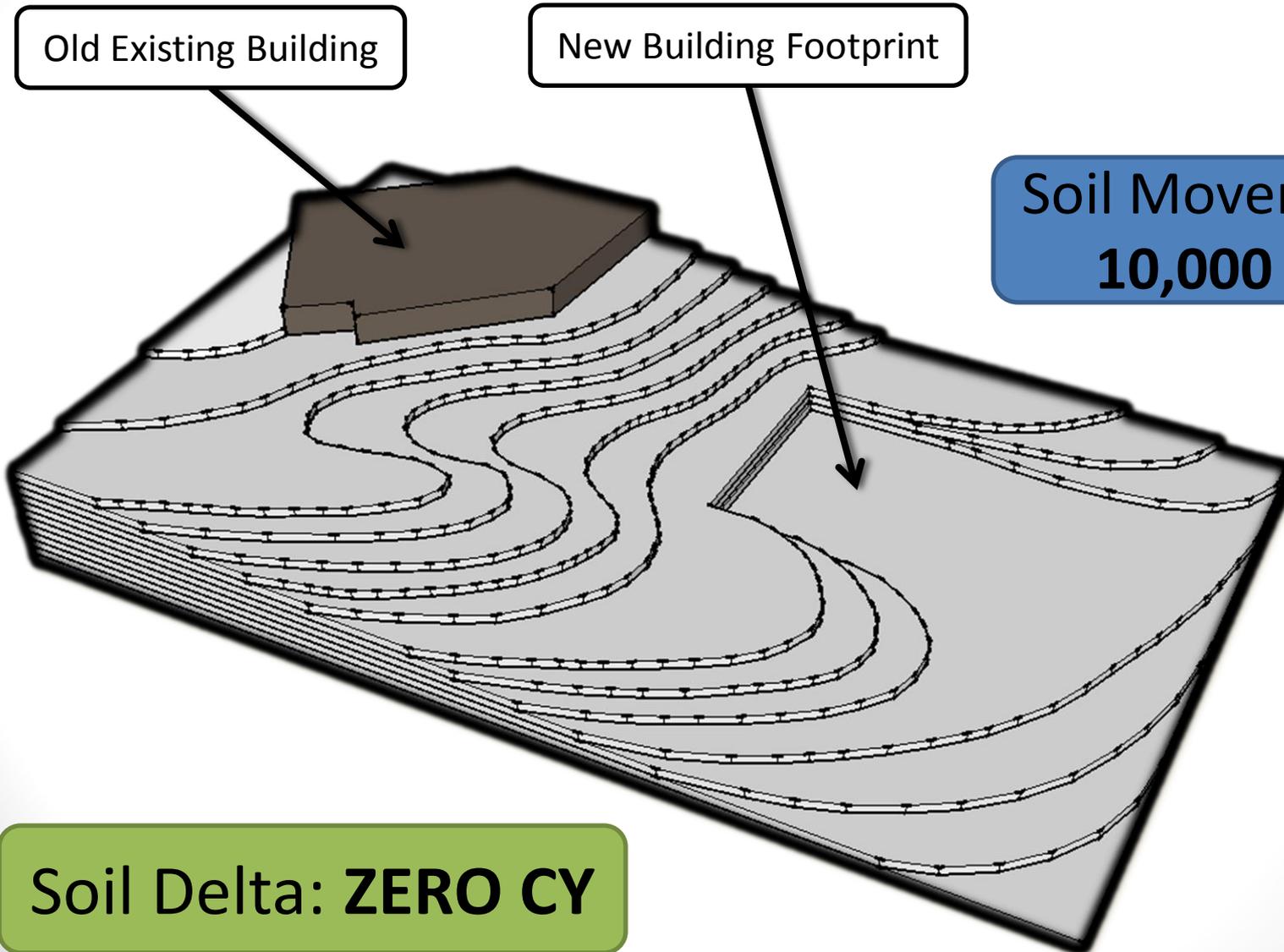
66

Old Existing Building

New Building Footprint

Soil Movement:
10,000 CY

Soil Delta: **ZERO CY**



Soil Stability



Very stable soil.
Approximately 50ft
of soil without a
retaining wall for
construction.

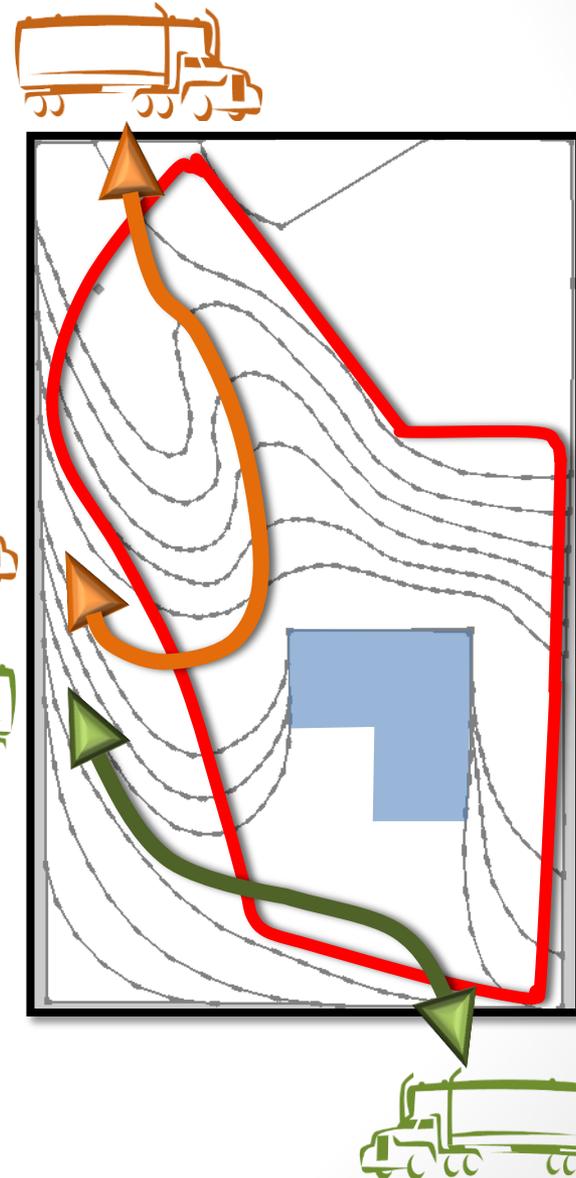
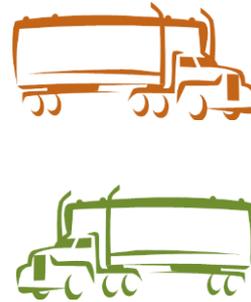
Backfill



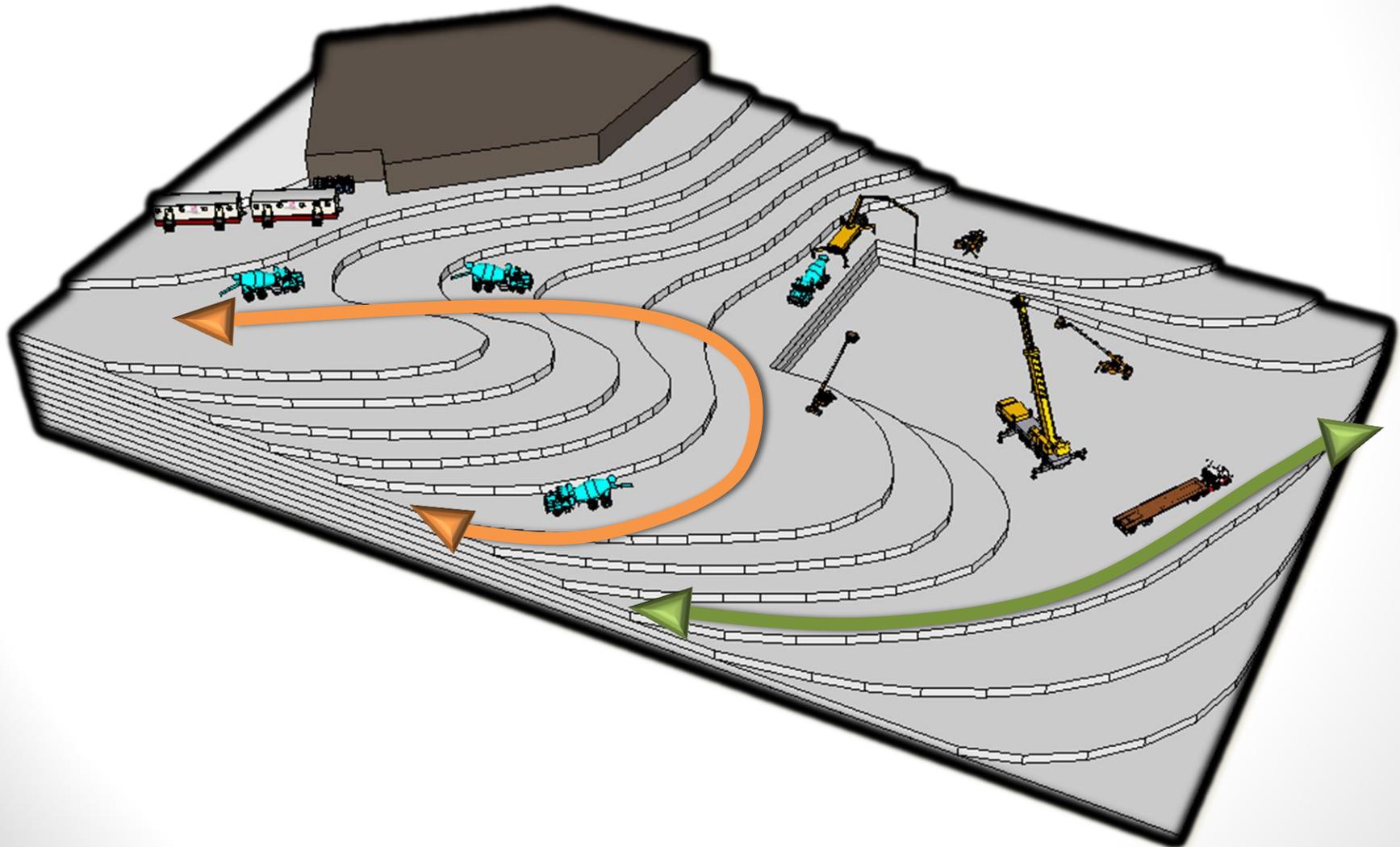
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Construction Site Access



Site Logistics: Structure and Shell



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Ridge Team 5/6/2011

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Site Logistics: Structure and Shell

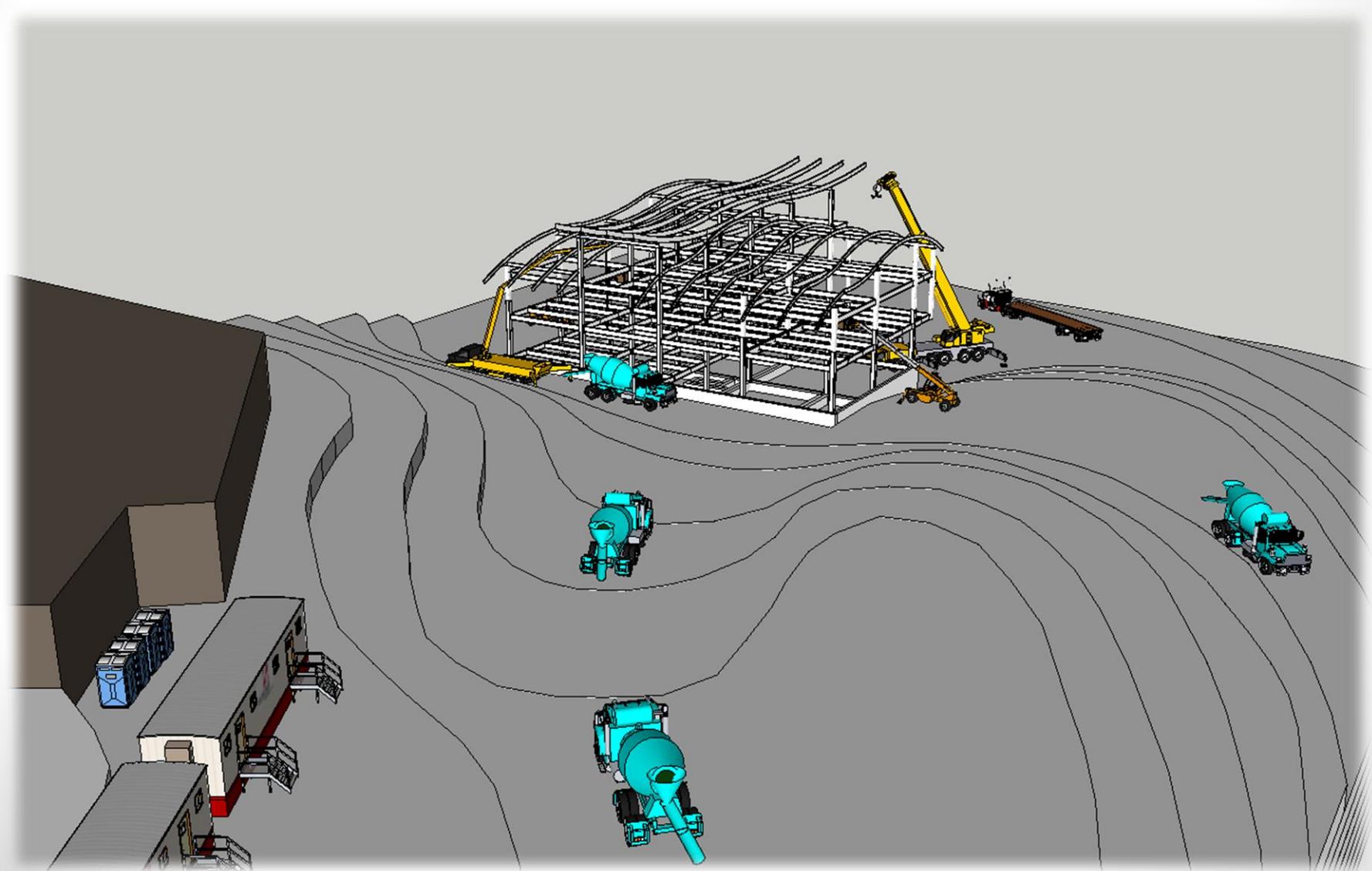


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Ridge Team

Site Logistics: Foundations



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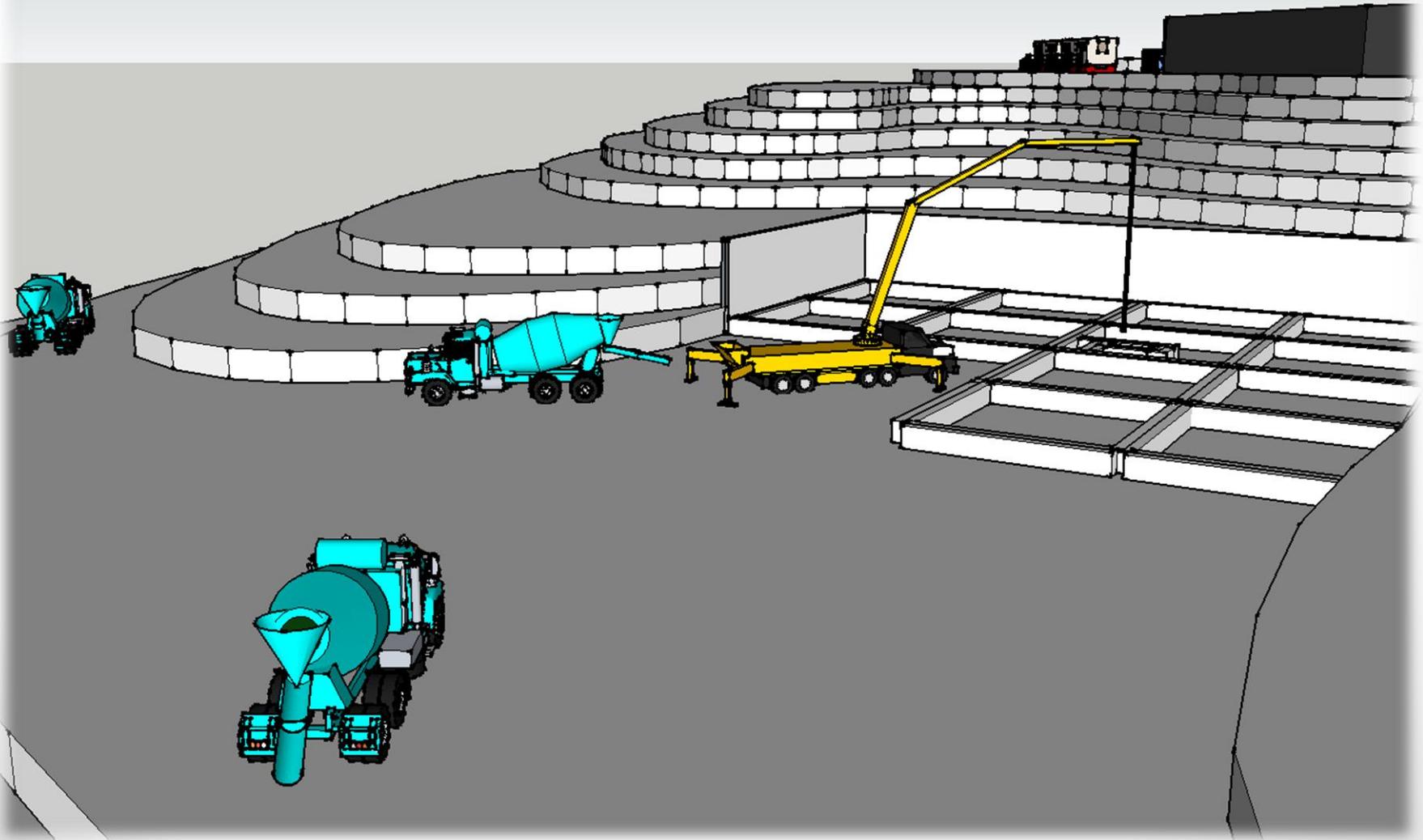
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Safety First!



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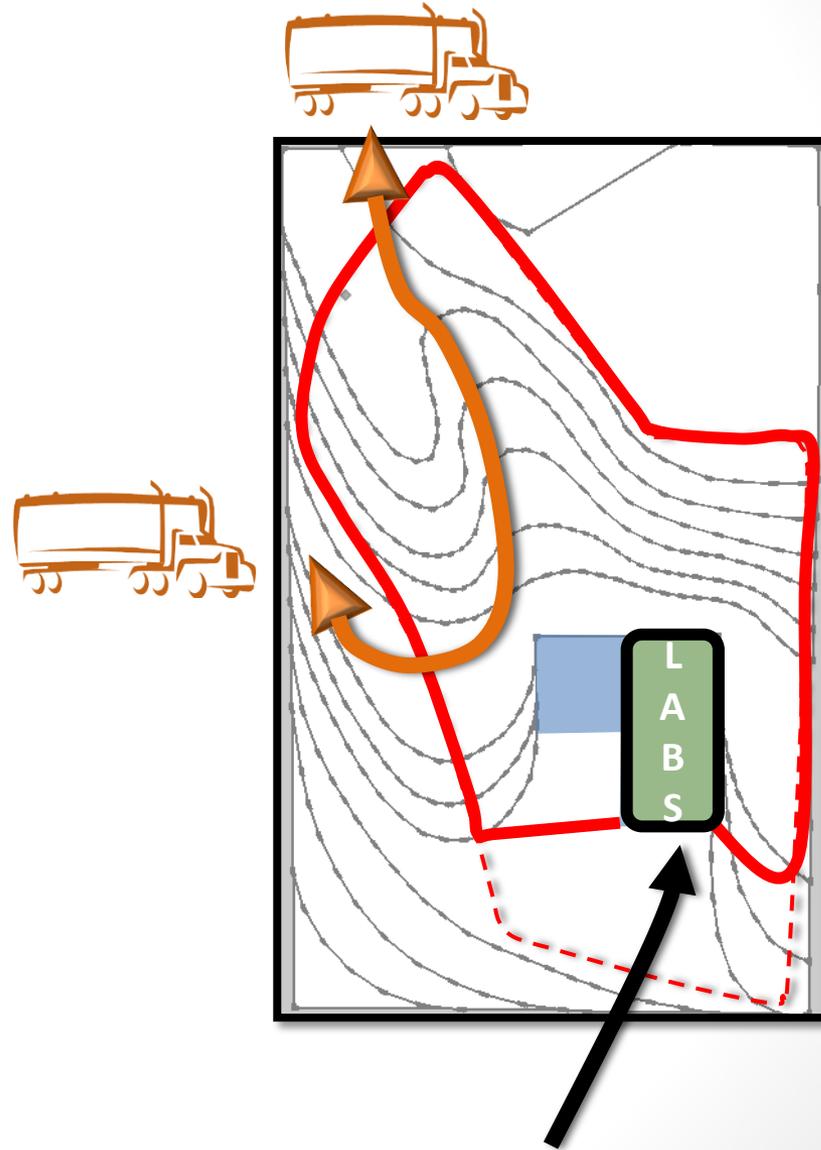
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Ridge Team

(72)

Site Logistics: Lab Access



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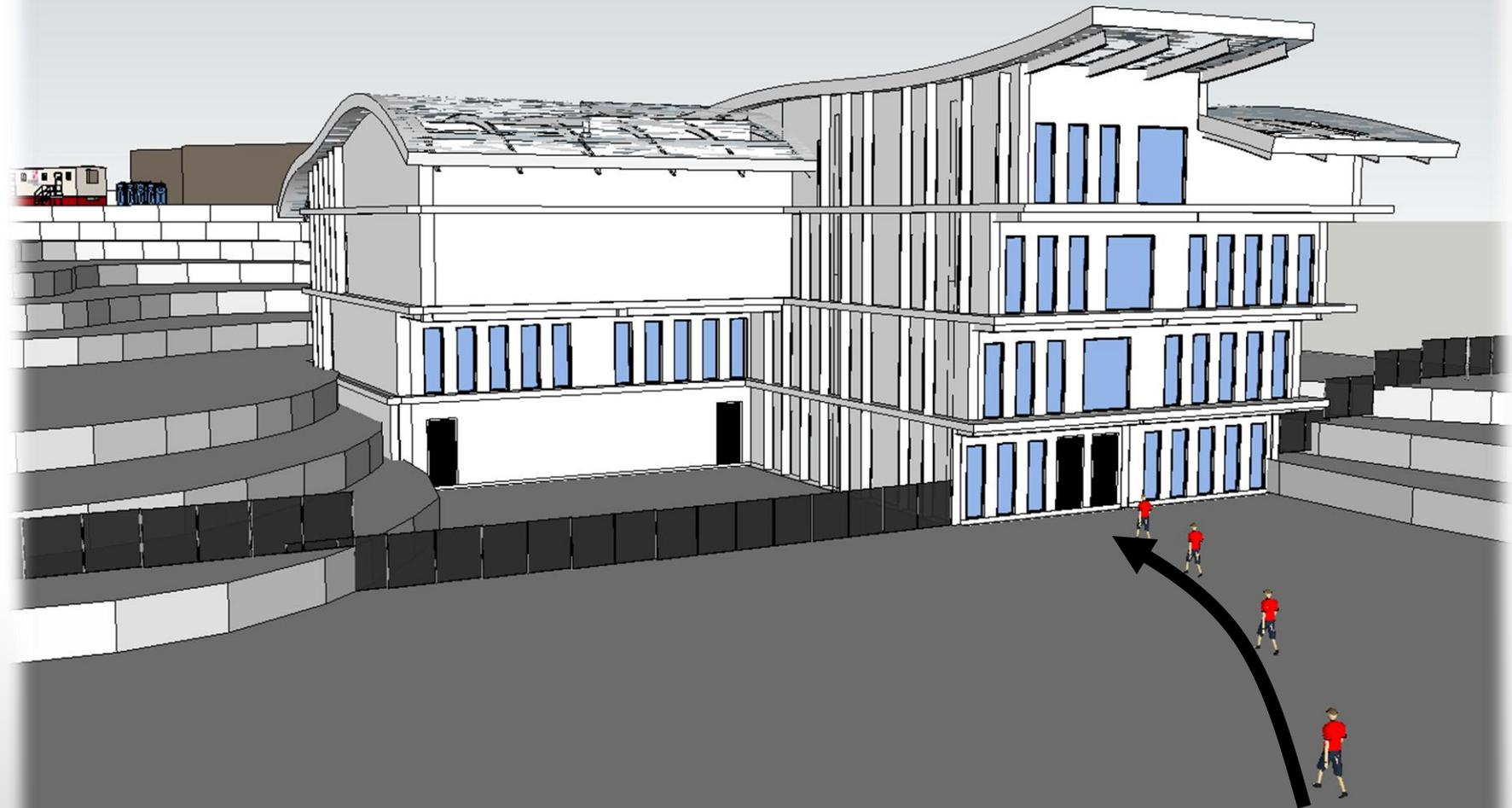
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Ridge Team 5/6/2011

(73)

Site Logistics: Lab Access



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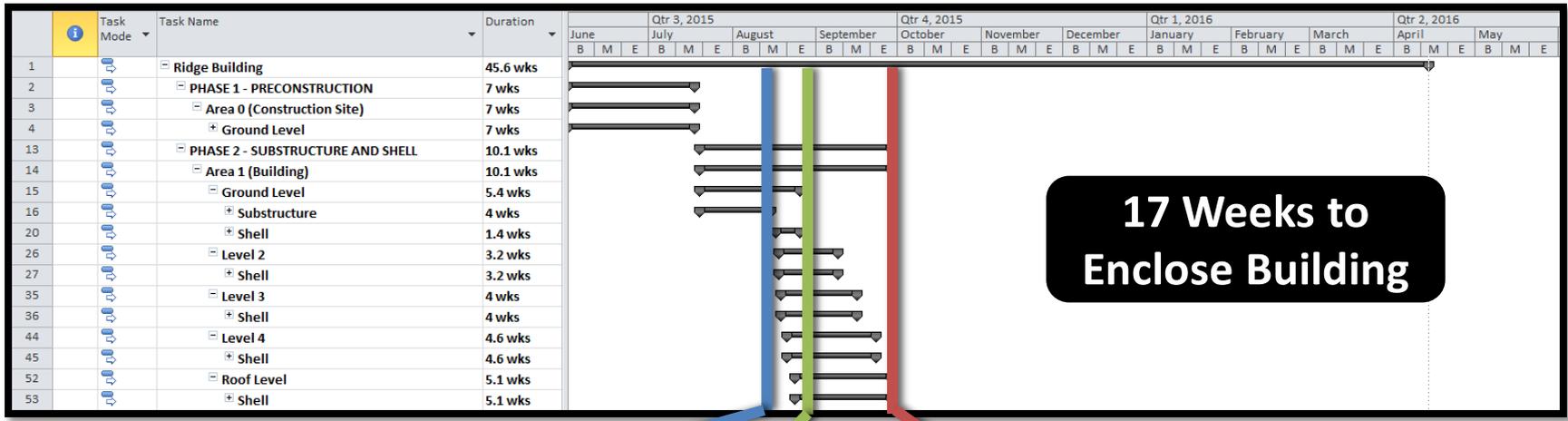
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Ridge Team 5/6/2011

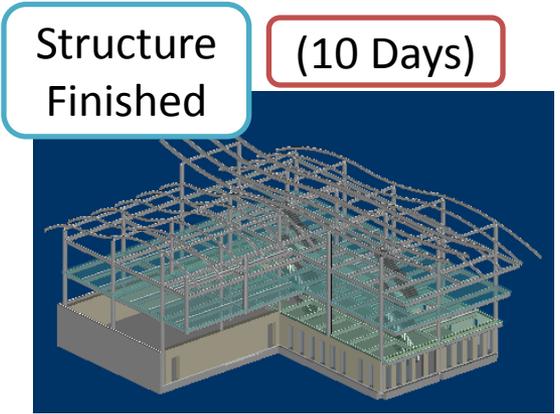
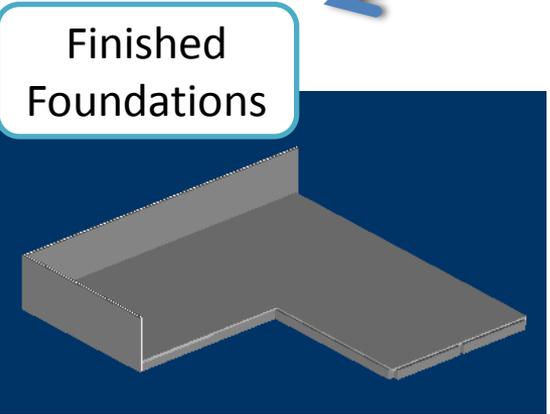
(74)

Schedule – Phases I and II

Preconstruction, Substructure, and Shell



17 Weeks to Enclose Building



Schedule – Phases III and IV

Services, Interiors, and Landscaping



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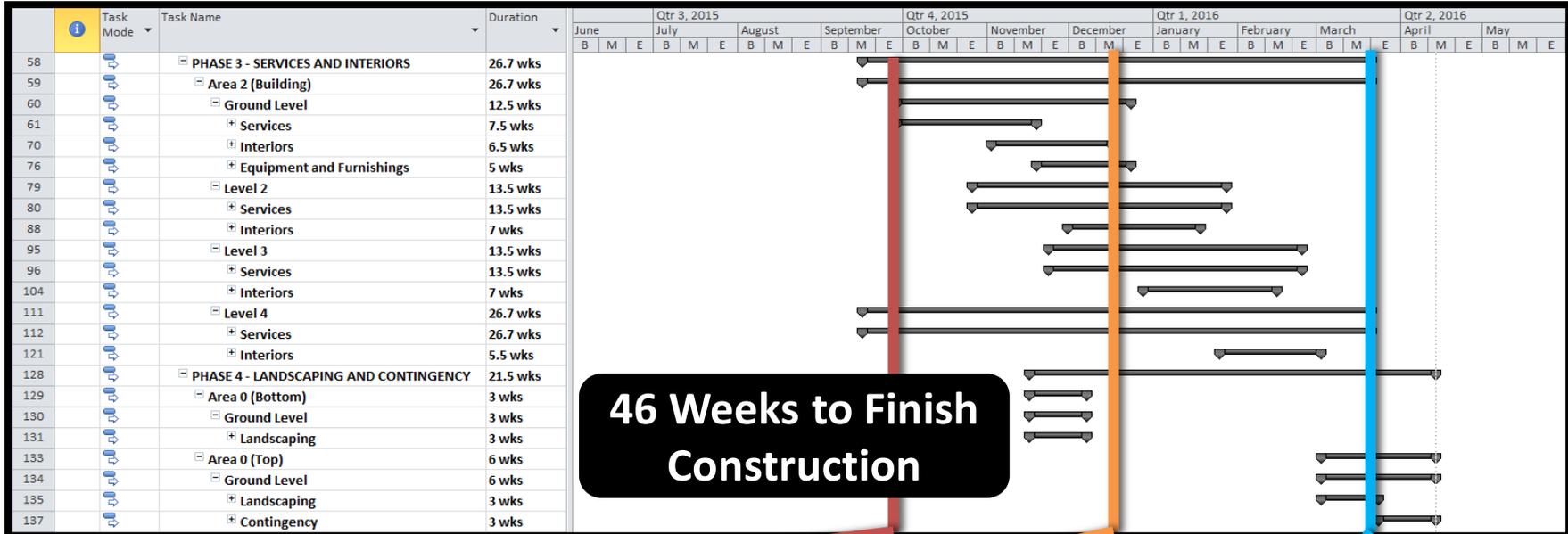
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Ridge Team

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46 Weeks to Finish Construction

Building Enclosed

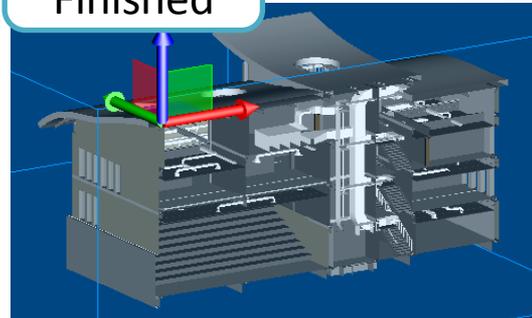


Early Lab Access



On time!

Building Finished



Construction 4D Video



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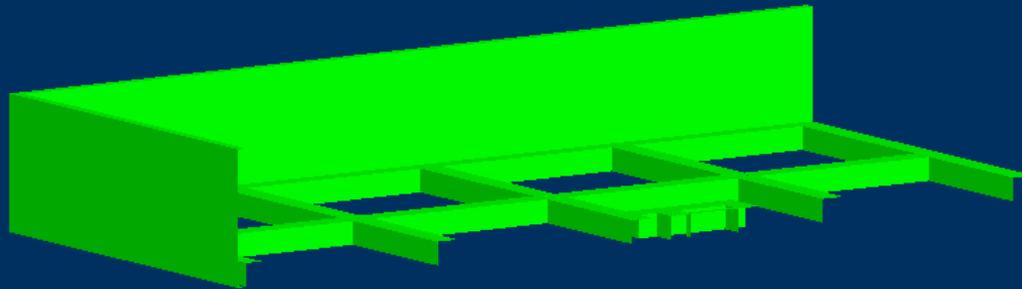
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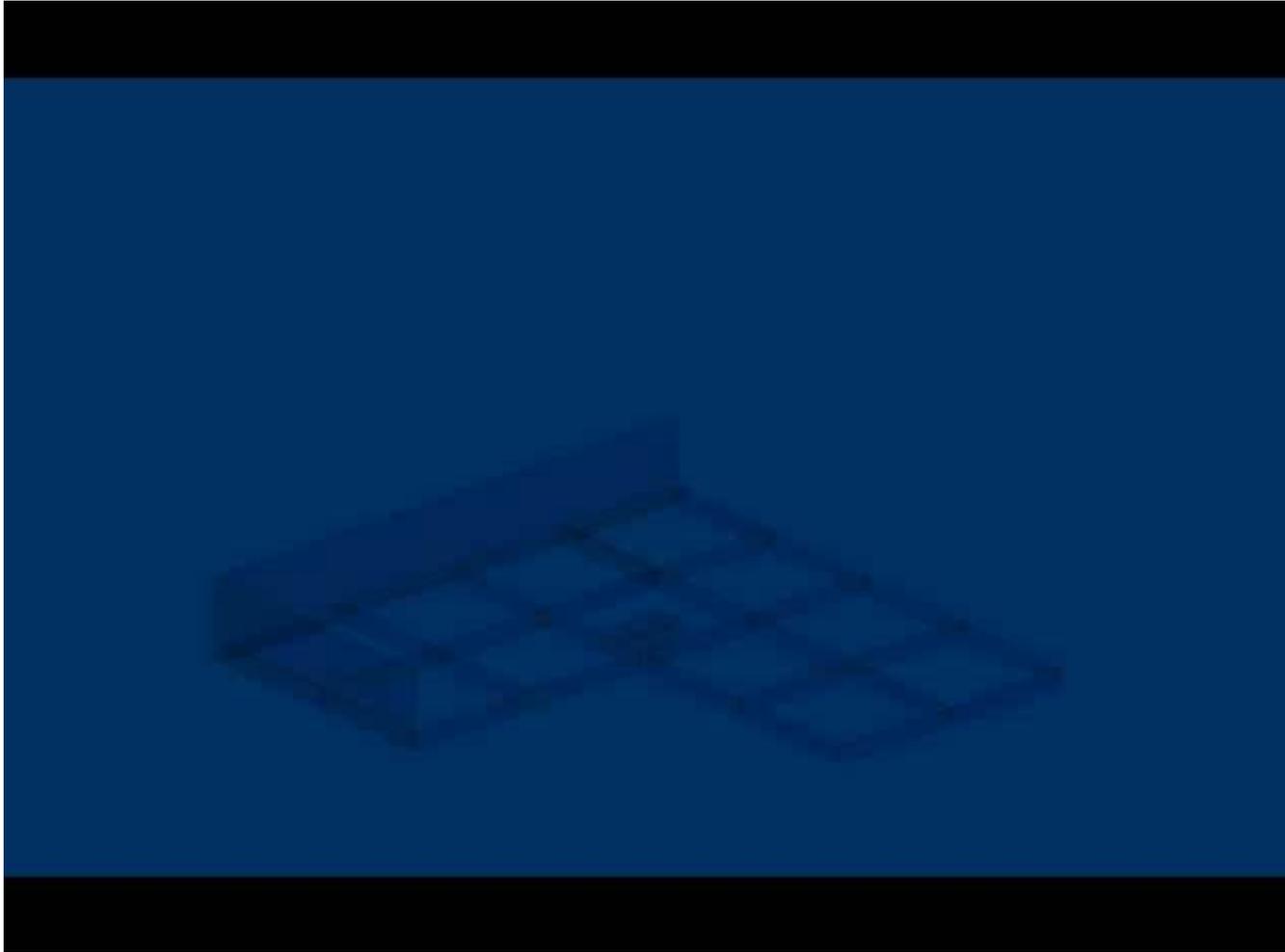
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5/6/2011

Ridge Team



Construction 4D Video



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(78)

4D Constructability Challenge

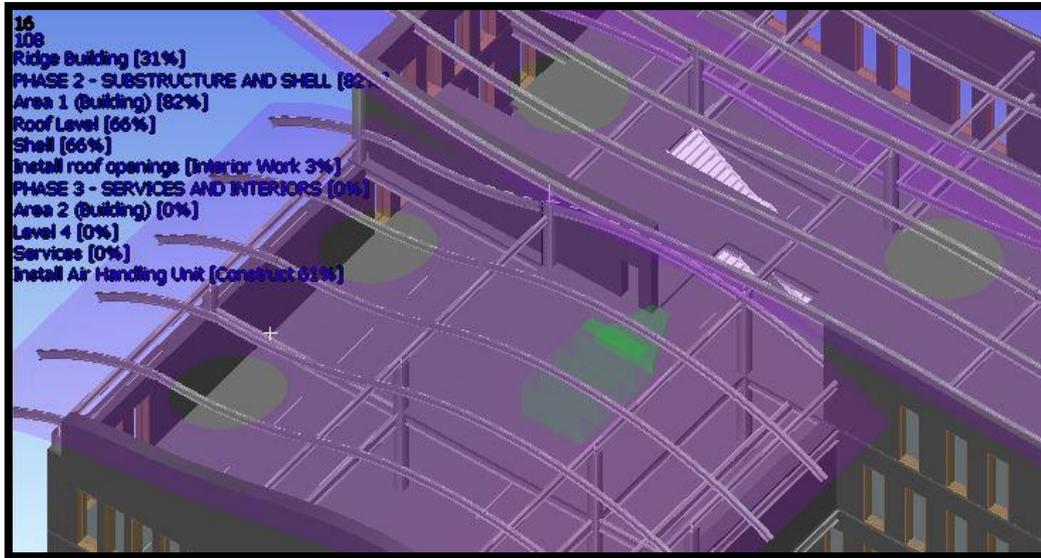


A

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MEP

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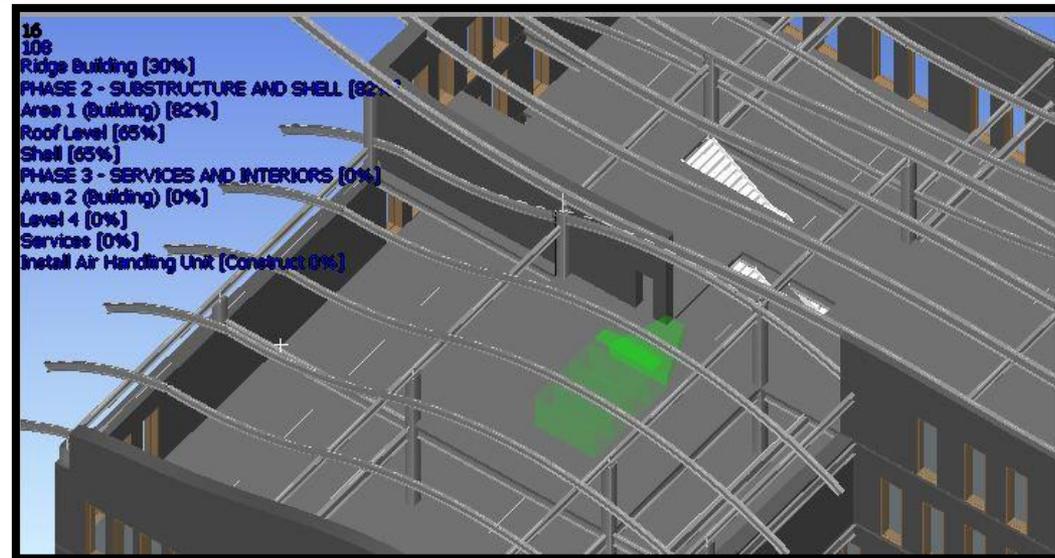


Roof Coverings
were placed
before the AHU
was installed

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Adjusted
Schedule to
install AHU first



4D Solving Schedule Errors

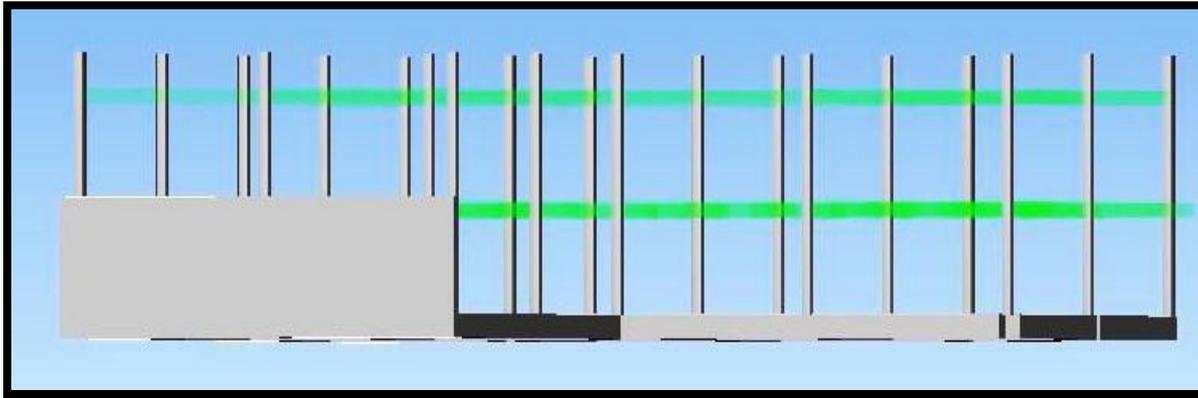


A

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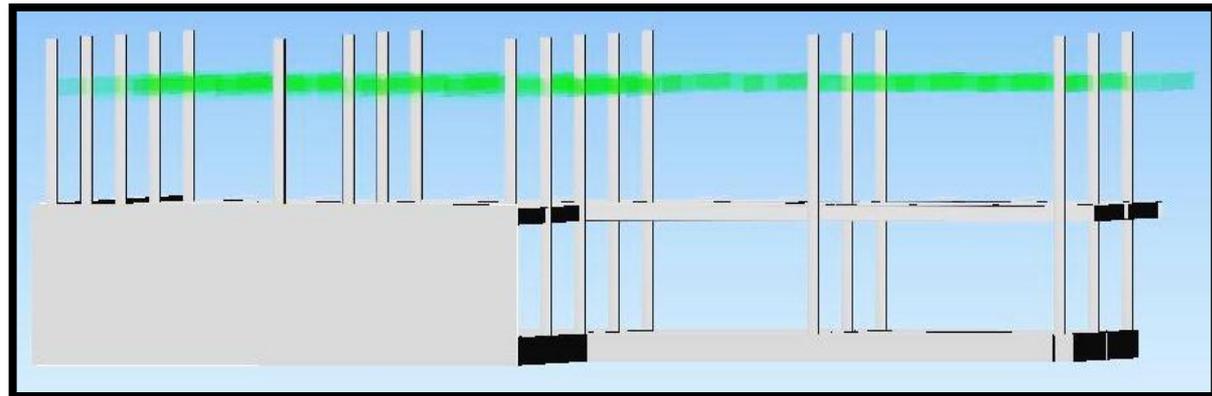
MEP

C



Two sets of beams built in parallel.

Adjusted Dependencies in Schedule

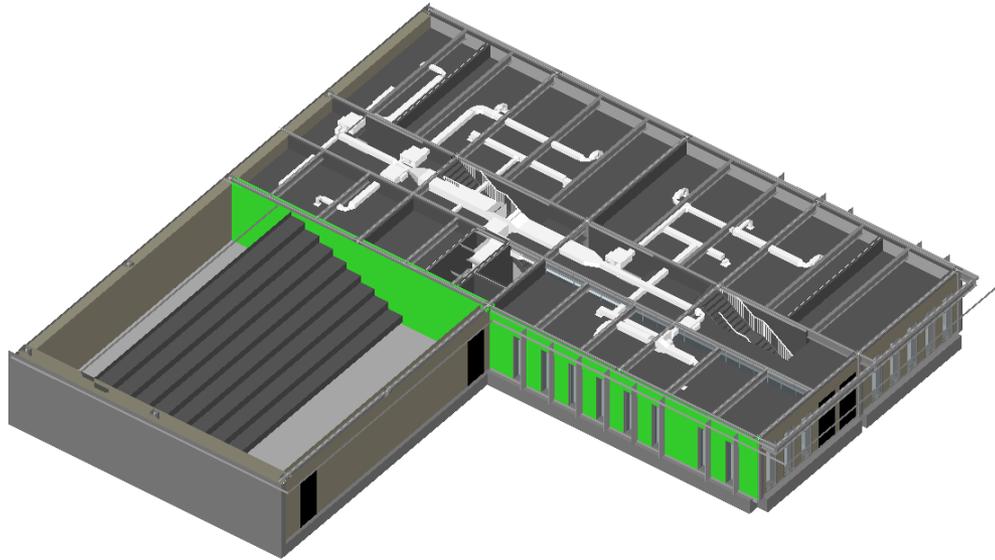


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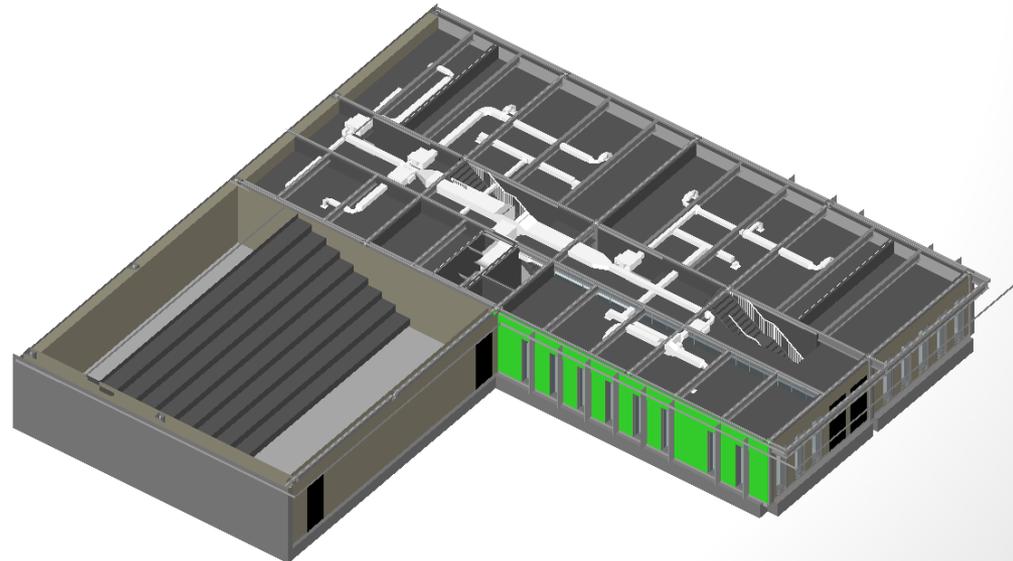
(80)

4D Modeling for Construction



Interior Wall
Modeled as
Exterior Wall

Remodeled the
Two Walls
Accordingly



A

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MEP

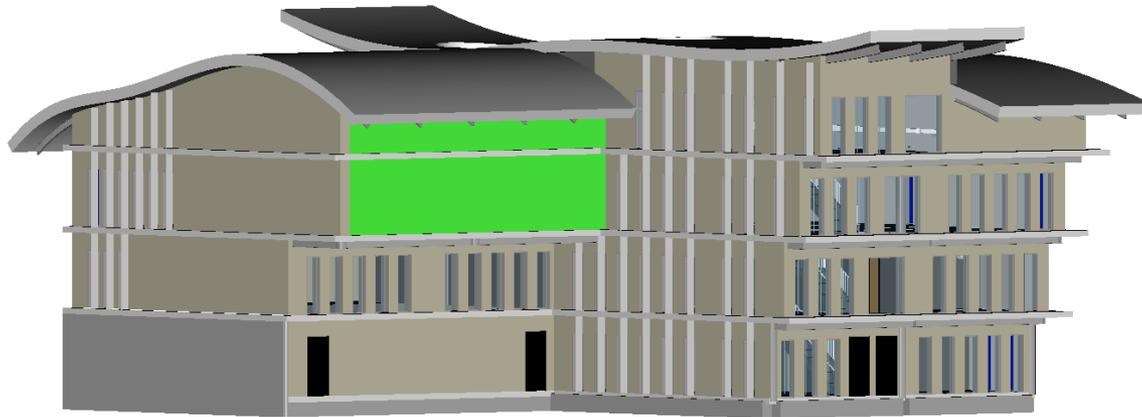
C

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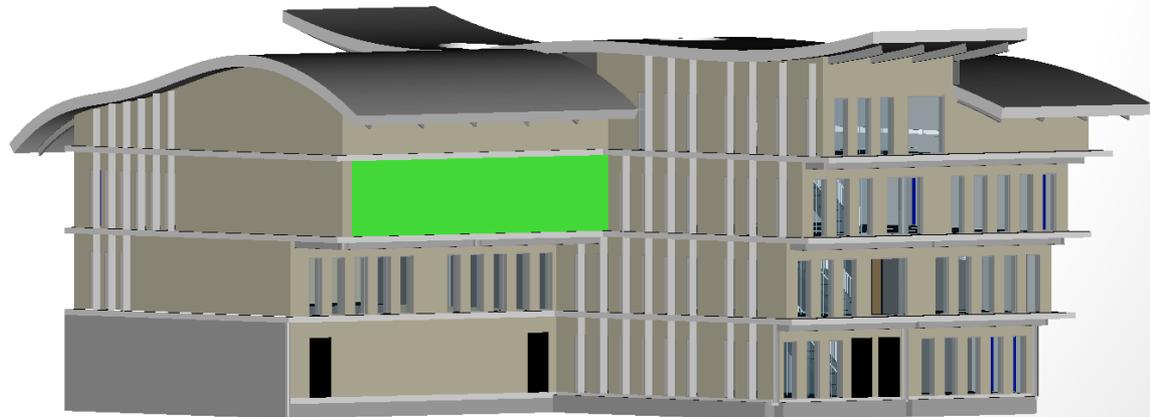
(81)

4D Modeling for Construction



Exterior Wall Built
to Double Height

Remodeled the
Wall Accordingly



A

E

MEP

C

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82

Clash Detection: Architecture and MEP

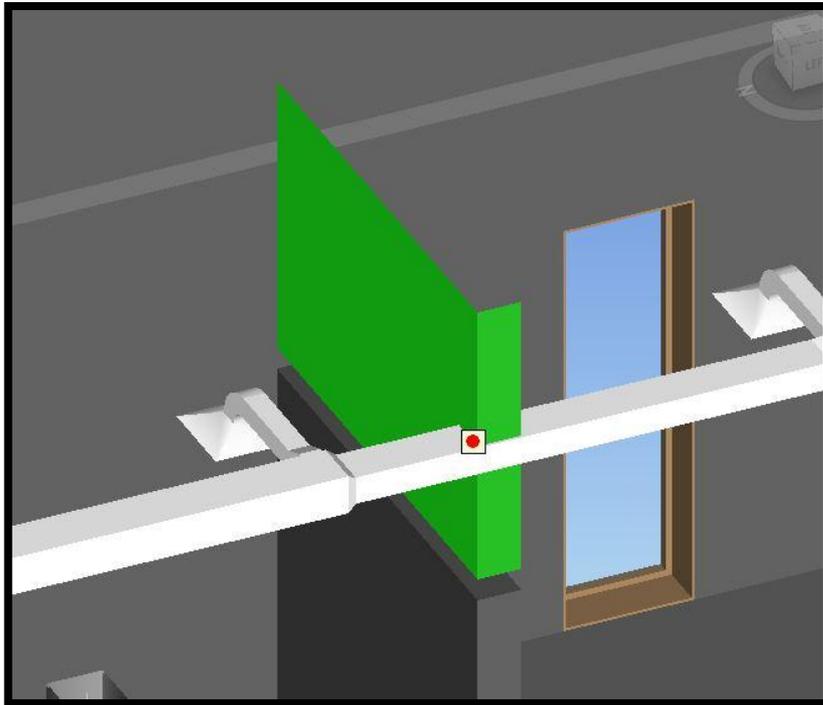


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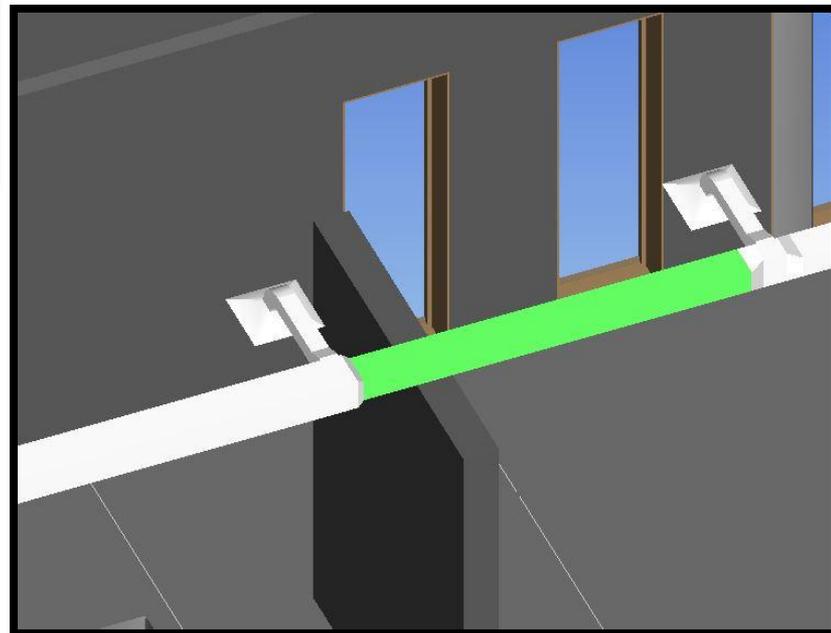
MEP

C



Wall and MEP
Duct Intersecting

Removed Wall to
allow MEP
through



Clash Detection: MEP and Structure

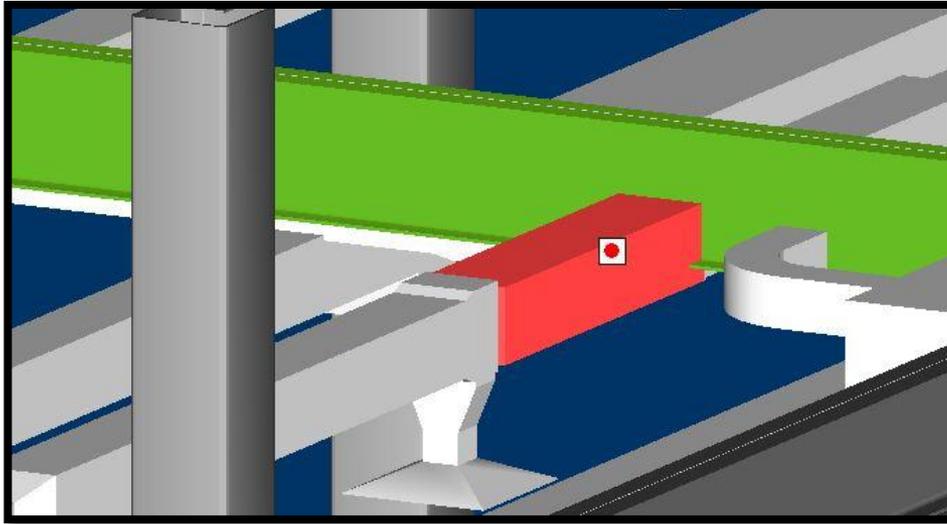


A

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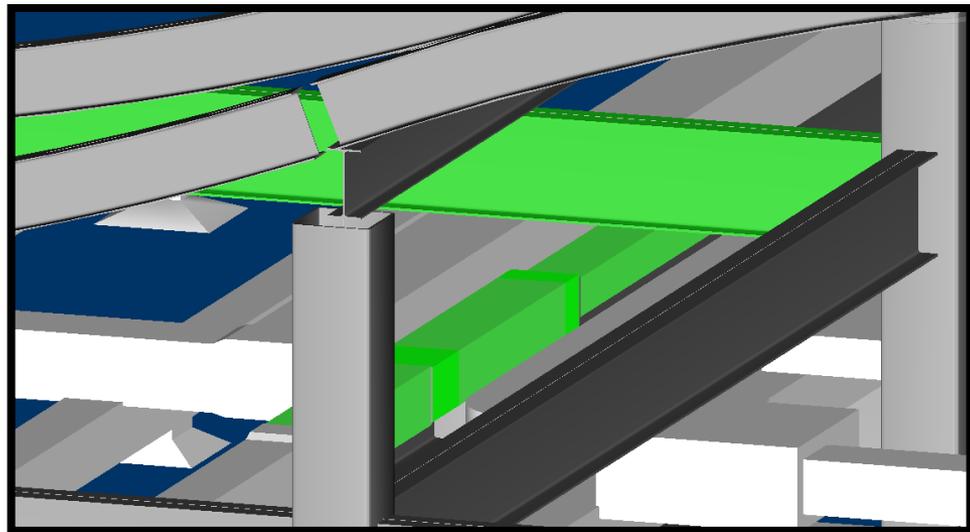
MEP

C



MEP Duct and
Structural Beam
Intersecting

Moved Structure
Up (Plenty of
room available)



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84

Clash Detection: Architecture and Structure

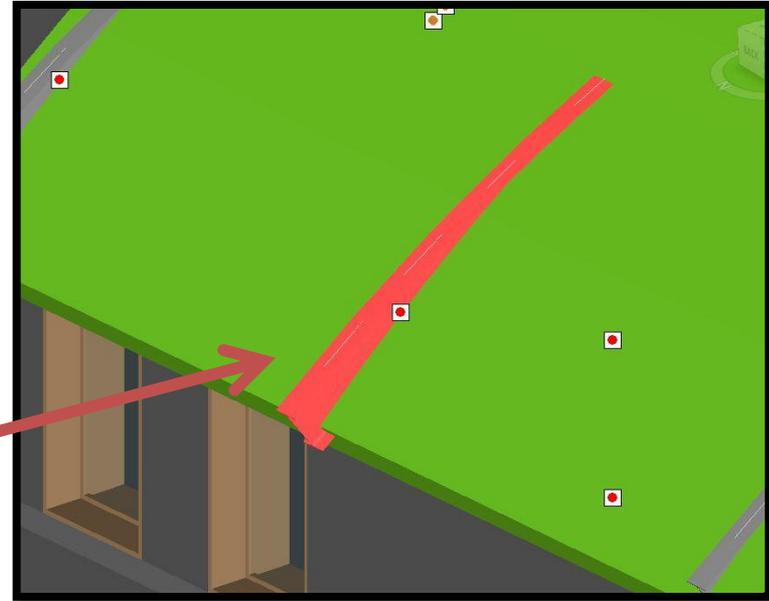
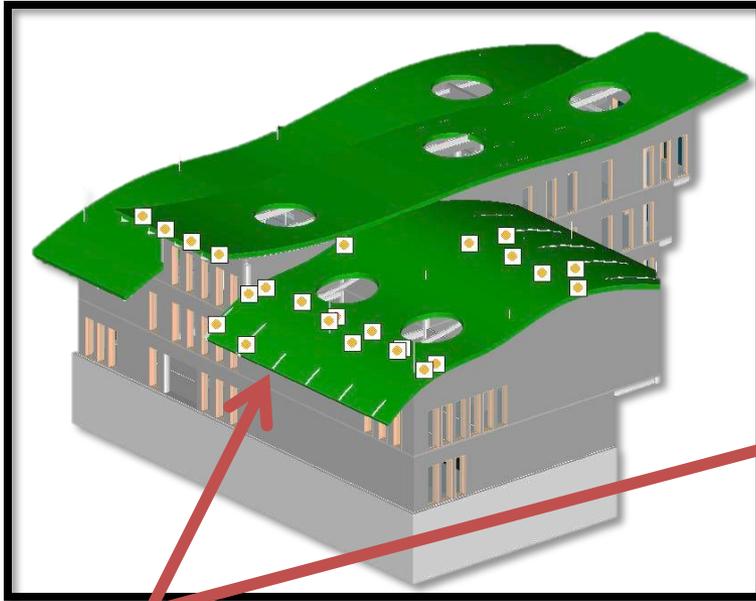


A

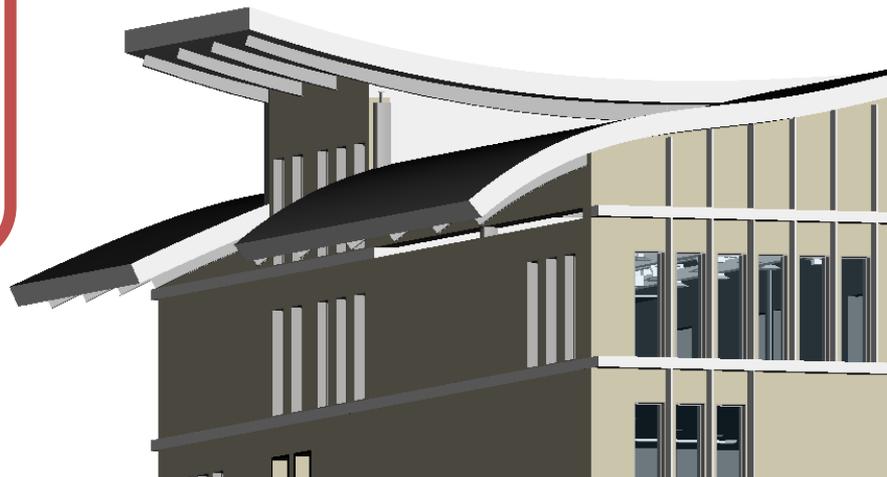
E

MEP

C



Architectural
and Structural
Curves did not
match



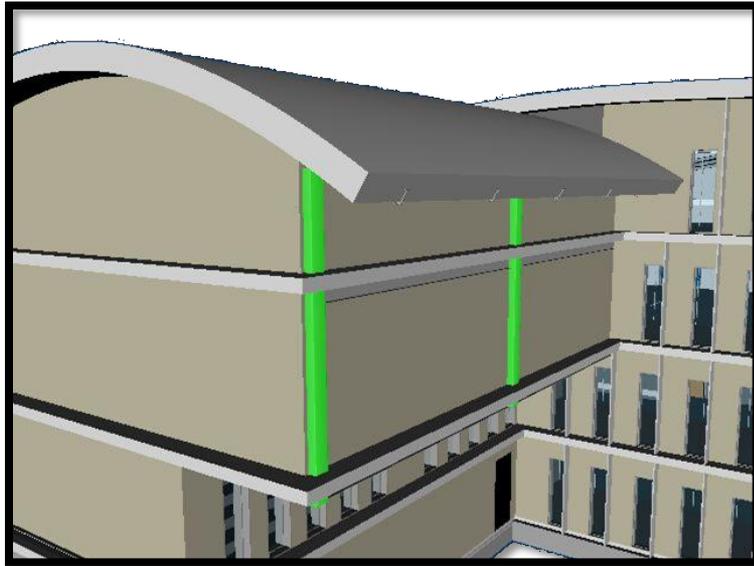
Architectural
Curves were
adjusted to
match

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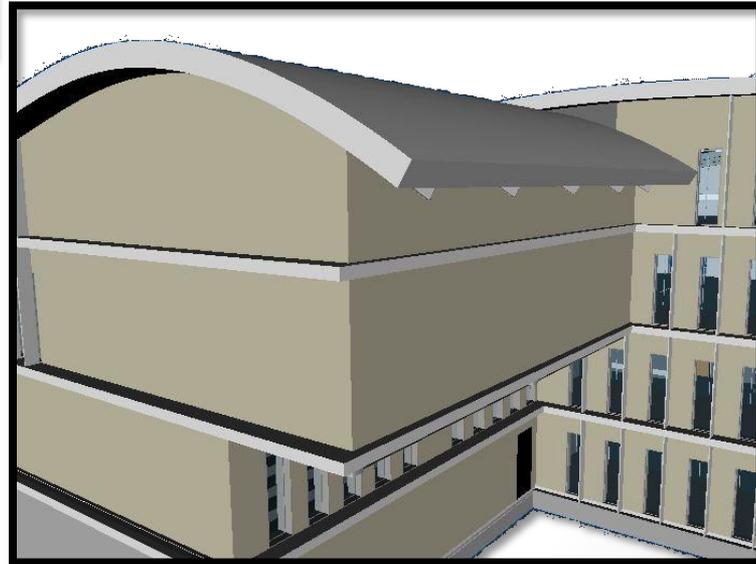
85

Clash Detection: Architecture and Structure



Columns Modeled
Outside Walls

Model Adjusted so
Columns are in
between Inner and
Outer Walls



A

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MEP

C

The Target

Donation (in 2011 Dollars): \$7,500,000

Budget (in 2011 Dollars): \$7,145,000

Construction starts in June 2015

Target Value: \$7,145,000



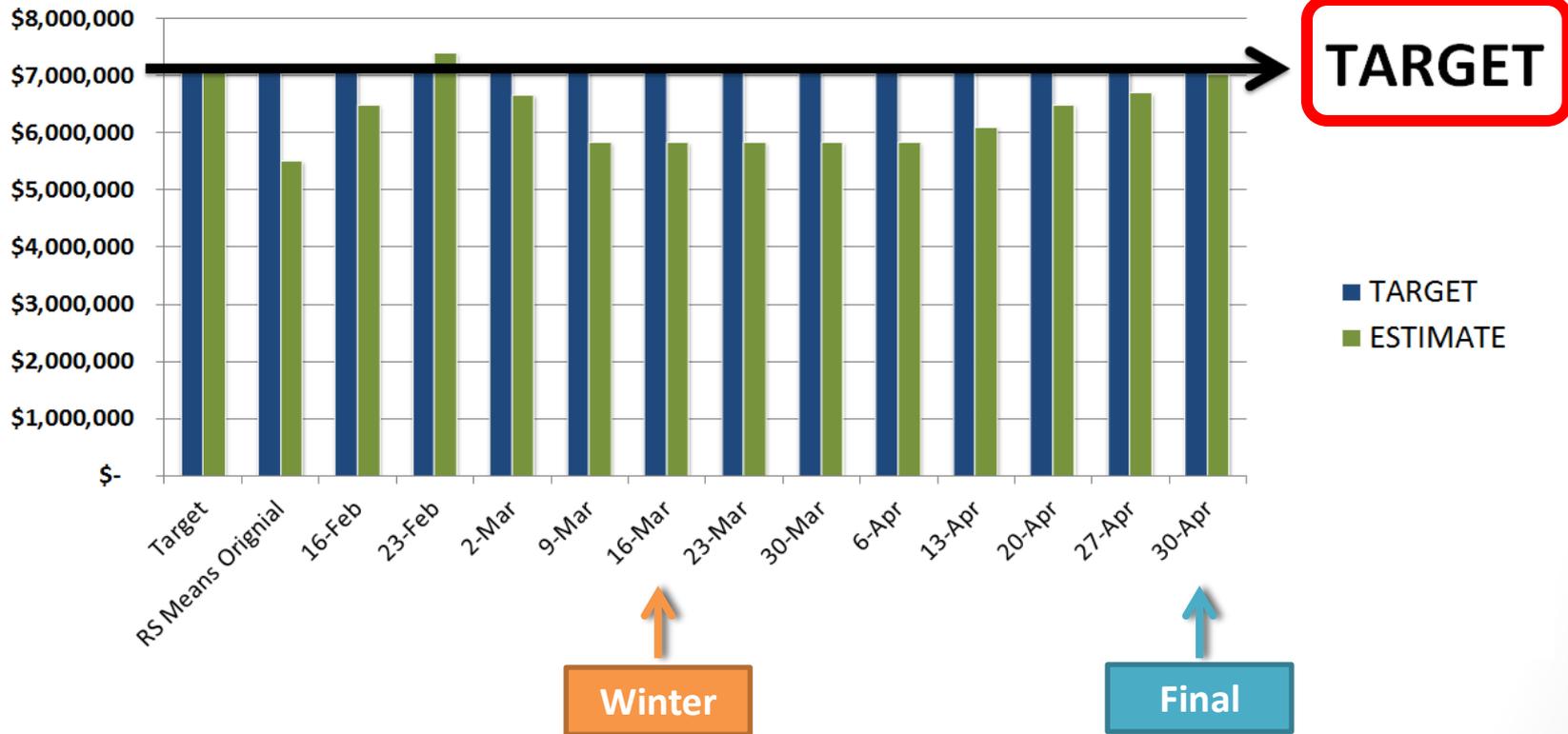
A

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MEP

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NOT a Moving Target...



...But there is Some Flexibility



A

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MEP

C

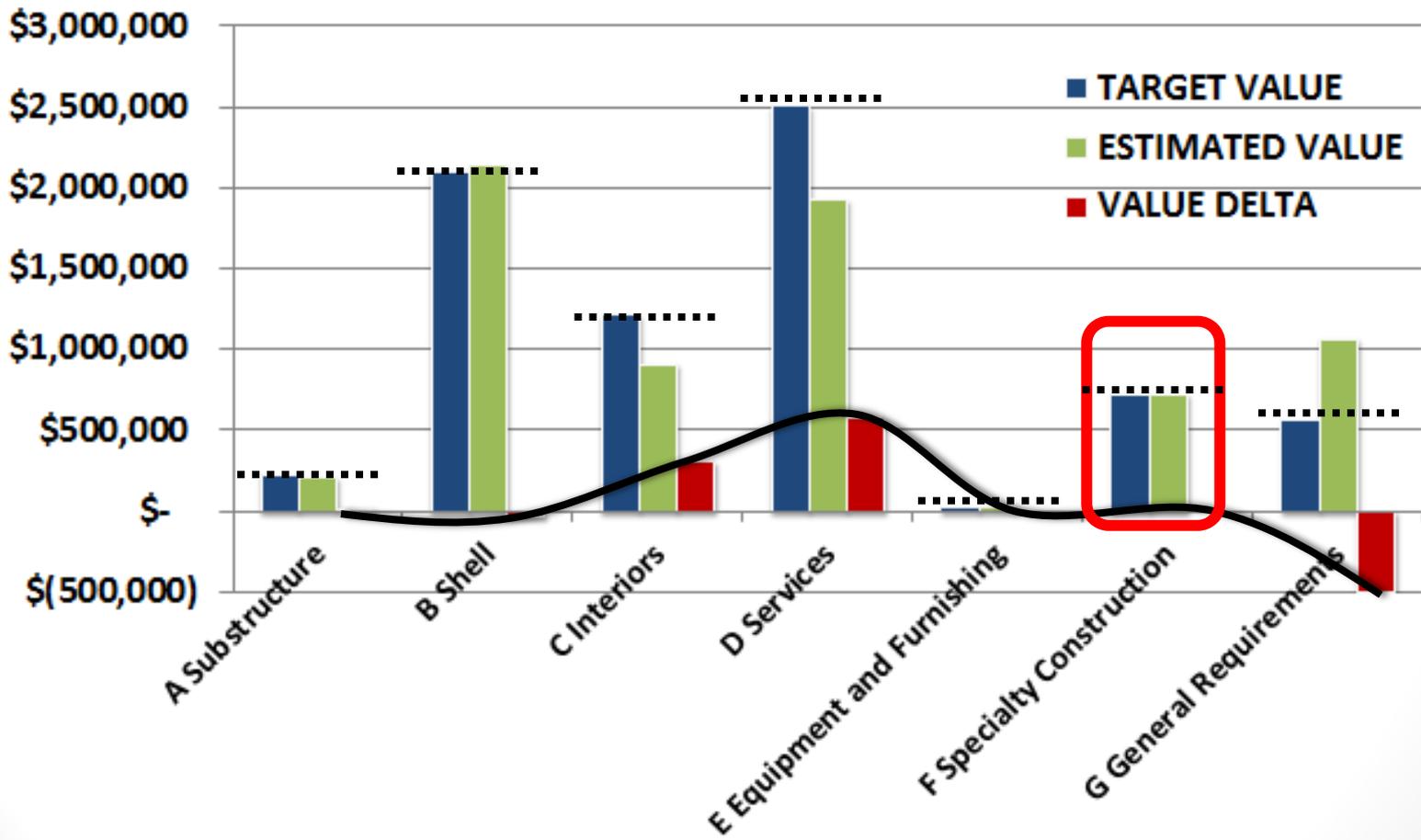
5/6/2011

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(88)

Detailed Targets (Winter)

TVD - TARGETS BY CLUSTER (Winter)

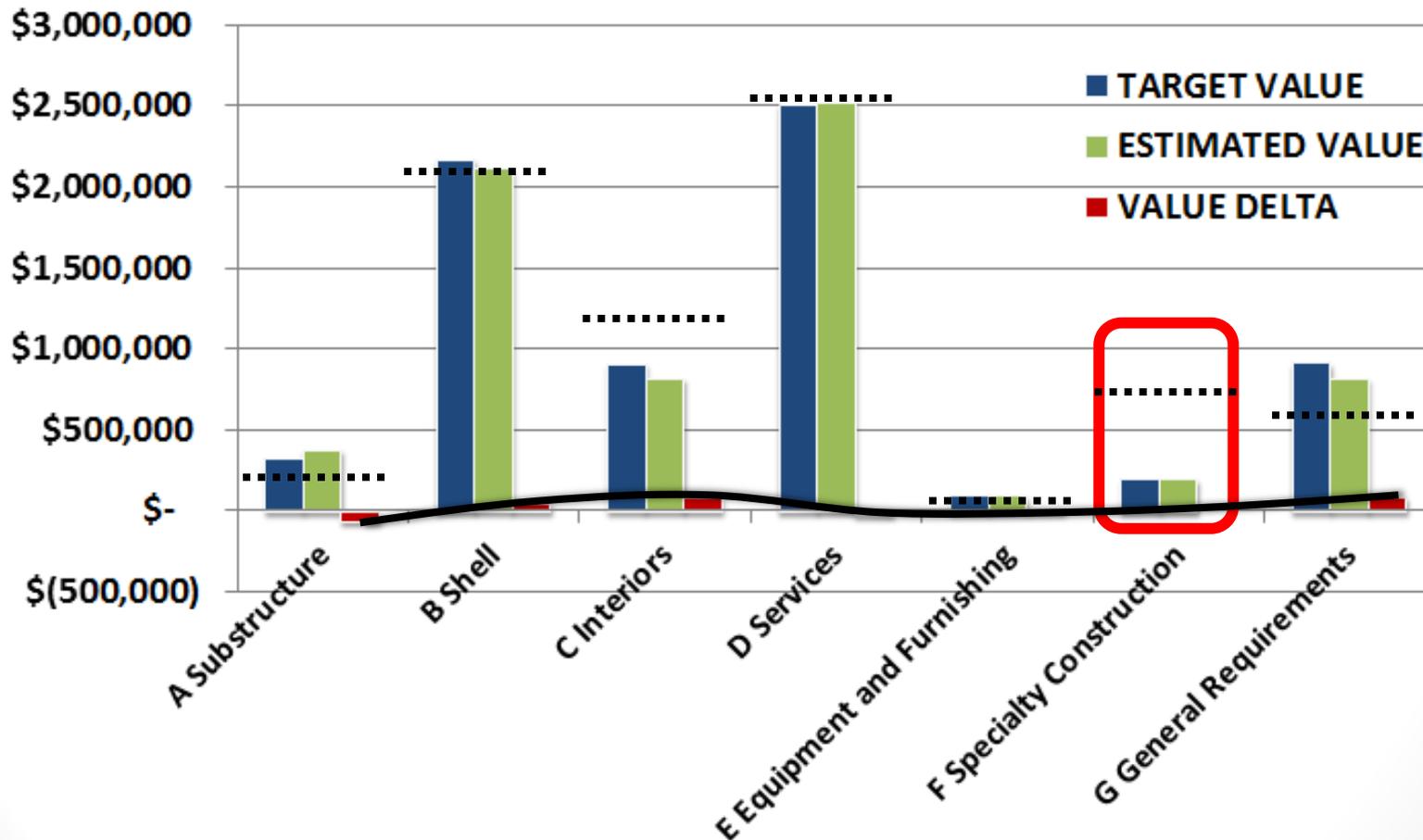


■■■■■■■■■■ Indicates Winter Targets

Target Value: \$7,145,000

Detailed Targets (Spring)

TVD - TARGETS BY CLUSTER (SPRING)



■■■■■■■■■■ Indicates Winter Targets

Target Value: \$7,145,000



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(90)

TVD – Influencing Design



A

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MEP

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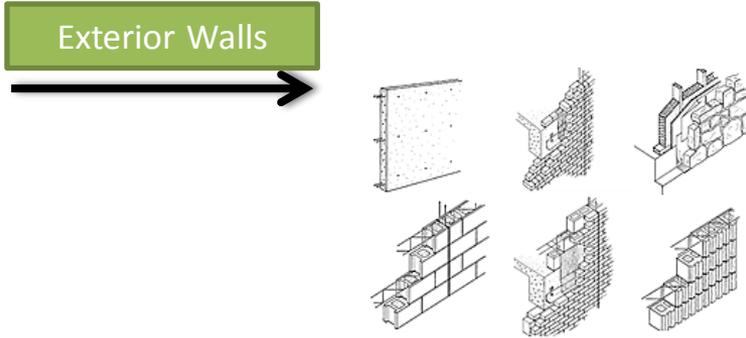
(91)

Detailed Options

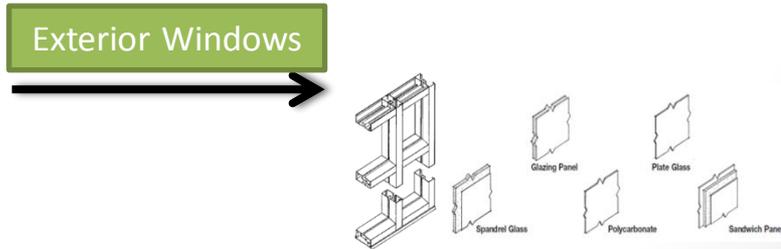
| Floor | | | | | | |
|------------------|-----------------|---|--------|--------------|------------------|-----------|
| Quantity | Assembly Number | Description | Unit | Material O&P | Installation O&P | Total O&P |
| 1 | B10102082800 | Steel column, W8, 100 KIPS, 10' unsupported height, 24 PLF | V.L.F. | \$ 35.24 | \$ 10.49 | \$ 45.73 |
| 1 | B10102083000 | Steel column, W8, 100 KIPS, 16' unsupported height, 31 PLF | V.L.F. | \$ 42.10 | \$ 7.89 | \$ 49.99 |
| 1 | B10102083200 | Steel column, W8, 100 KIPS, 20' unsupported height, 40 PLF | V.L.F. | \$ 51.40 | \$ 7.89 | \$ 59.29 |
| 1 | B10102084600 | Steel column, W10, 200 KIPS, 10' unsupported height, 45 PLF | V.L.F. | \$ 66.08 | \$ 10.49 | \$ 76.57 |
| 1 | B10102084800 | Steel column, W10, 200 KIPS, 16' unsupported height, 49 PLF | V.L.F. | \$ 66.57 | \$ 7.89 | \$ 74.46 |
| 1 | B10102085000 | Steel column, W12, 200 KIPS, 20' unsupported height, 58 PLF | V.L.F. | \$ 74.40 | \$ 7.89 | \$ 82.29 |
| 1 | B10102085200 | Steel column, W14, 300 KIPS, 10' unsupported height, 61 PLF | V.L.F. | \$ 89.58 | \$ 10.49 | \$ 100.07 |
| 1 | B10102085400 | Steel column, W12, 300 KIPS, 16' unsupported height, 72 PLF | V.L.F. | \$ 97.90 | \$ 7.89 | \$ 105.79 |
| 1 | B10102085600 | Steel column, W12, 300 KIPS, 20' unsupported height, 79 PLF | V.L.F. | \$ 101.82 | \$ 7.89 | \$ 109.71 |
| EXTERIOR WALLS | | | | | | |
| Quantity | Assembly Number | Description | Unit | Material O&P | Installation O&P | Total O&P |
| 1 | B20101012100 | Concrete wall, reinforced, 8" high, 6" thick, plain finish, 3000 PSI | S.F. | \$ 4.68 | \$ 12.20 | \$ 16.88 |
| 1 | B20101014550 | Concrete wall, reinforced, 8" high, 8" thick, aged wood liner, 3000 PSI | S.F. | \$ 6.76 | \$ 14.19 | \$ 20.95 |
| 1 | B20101015600 | Concrete wall, reinforced, 8" high, 10" thick, plain finish, 3000 PSI | S.F. | \$ 6.49 | \$ 12.86 | \$ 19.35 |
| 1 | B20101091200 | Concrete block (CMU) wall, regular weight, hollow, 4 x 8 x 16, 2000 PSI | S.F. | \$ 2.00 | \$ 4.65 | \$ 6.65 |
| 1 | B20101091450 | Concrete block (CMU) wall, regular weight, hollow, 8 x 8 x 16, 4500 PSI, perlite core fill | S.F. | \$ 4.31 | \$ 5.62 | \$ 9.93 |
| 1 | B20101131360 | Concrete block (CMU) wall, split rib, 16 ribs, regular weight, hollow, 6 x 8 x 16, perlite core fill | S.F. | \$ 5.66 | \$ 6.42 | \$ 12.08 |
| 1 | B20101251160 | Brick wall, standard, solid, single wythe, 4" thick, common bond | S.F. | \$ 7.49 | \$ 12.48 | \$ 19.97 |
| 1 | B20101264150 | Brick wall, standard, solid, double wythe, 8" thick, 1/2" thick collar joint | S.F. | \$ 11.98 | \$ 18.22 | \$ 30.20 |
| 1 | B20101321200 | Brick wall, composite double wythe, standard face/CMU back-up, 8" thick, perlite core fill | S.F. | \$ 10.42 | \$ 17.01 | \$ 27.43 |
| 1 | B20101282350 | Stone wall, ashlar veneer, 4" thick, 8" high, 8" CMU back-up, low priced stone | S.F. | \$ 16.36 | \$ 20.20 | \$ 36.56 |
| 1 | B20101355180 | Brick wall, core, standard face, 6" lightweight CMU back-up, 10" thick, perlite core fill | S.F. | \$ 9.81 | \$ 16.00 | \$ 25.81 |
| EXTERIOR WINDOWS | | | | | | |
| Quantity | Assembly Number | Description | Unit | Material O&P | Installation O&P | Total O&P |
| Frame | | | | | | |
| 1 | B20202102000 | Aluminum flush tube frame, thermo-break frame, 2.25" x 4.5", 5'x6" opening, no intermediate horizontals | S.F. | \$ 17.97 | \$ 9.38 | \$ 27.35 |
| 1 | B20202102050 | Aluminum flush tube frame, thermo-break frame, 2.25" x 4.5", 5'x6" opening, 1 intermediate horizontal | S.F. | \$ 23.84 | \$ 11.57 | \$ 35.41 |
| 1 | B20202102100 | Aluminum flush tube frame, thermo-break frame, 2.25" x 4.5", 5'x6" opening, 2 intermediate horizontals | S.F. | \$ 29.94 | \$ 13.71 | \$ 43.65 |
| Glazing Panels | | | | | | |
| 1 | B20202201000 | Glazing panel, insulating, 1/2" thick, 2 lites 1/8" float glass, clear | S.F. | \$ 11.48 | \$ 8.61 | \$ 20.09 |
| 1 | B20202201400 | Glazing panel, insulating, 1" thick units, 2 lites, 1/4" float glass, clear | S.F. | \$ 19.07 | \$ 10.87 | \$ 29.94 |
| 1 | B20202201700 | Glazing panel, insulating, 1" thick units, 2 lites, light and heat reflective glass, tinted | S.F. | \$ 36.04 | \$ 9.62 | \$ 45.66 |

Floor Systems

Exterior Walls



Exterior Windows



Estimating Method



Estimated Cost

Quantity

RSMMeans
Reed Construction Data

Cost Data

Quantity and Cost
RELIABILITY

Delta

Line Items

Target Source and
Target

| | Assembly Number | Description | Quantity | Unit | Material O&P | Installation O&P | Total O&P | OUR ESTIMATED VALUES | | | REFERENCE VALUES | | | TARGET VALUE | | VALUE DELTA | | |
|---------------------------------|-----------------|--|----------|--------|--------------|------------------|--------------|----------------------|---------------------|----------------------|------------------|-------------------------|---------------------|--------------|--------------|-------------|------------|--------------|
| | | | | | | | | % of Total | OUR ESTIMATED VALUE | ESTIMATE RELIABILITY | % of Total | RSMMeans SQ.FT Estimate | MAX ADJUSTED VALUES | % of Total | TARGET VALUE | VALUE DELTA | | |
| C Interiors | | | | | | | | 12% | \$ 824,284 | | | 15% | \$ 1,102,500 | 19% | \$ 1,381,993 | 13% | \$ 915,000 | \$ 90,716.28 |
| C1010 Partitions | | | | | | | | 4% | \$ 250,722 | | | 2% | \$ 141,500 | 2% | \$ 177,371 | 3% | \$ 200,000 | \$ (50,722) |
| | C10101242200 | Wood partition, 5/8" fire rated gypsum board face, 5/8" fire rated gypsum board base, 2 rows-2x4 framing, same opposite face, 2" fiberglass insulation | 17982 | S.F. | \$ 2.77 | \$ 5.10 | \$ 7.87 | 2% | \$ 141,518.34 | 3 | 2 | 2 | | | | | | |
| | C10101280560 | Wood studs including blocking, shoe and double top plate, 2"x4", 16" OC | 17982 | S.F. | \$ 0.38 | \$ 0.93 | \$ 1.31 | 0% | \$ 23,556.42 | 3 | 2 | 2 | | | | | | |
| | C10101202100 | Tile partition, 6" series S-173" x 12" tile, 4" thick, non-load bearing glazed 1 side | 3991 | S.F. | \$ 11.92 | \$ 9.54 | \$ 21.46 | 1% | \$ 85,646.86 | 3 | 2 | 2 | | | | | | |
| C1020 Interior Doors | | | | | | | | 0% | \$ 32,843 | | | 2% | \$ 176,000 | 3% | \$ 223,125 | 1% | \$ 50,000 | \$ 17,157 |
| | C10201022510 | Door, single leaf, wood frame, 3'-0" x 7'-0" x 1-3/8" birch, hollow core | 50 | Opng. | \$ 321.42 | \$ 166.13 | \$ 487.55 | 0% | \$ 24,377.50 | 3 | 2 | 2 | | | | | | |
| | C10203100400 | Locksets, heavy duty cylindrical, keyed, single cylinder function | 50 | Ea. | \$ 100.88 | \$ 46.59 | \$ 147.47 | 0% | \$ 7,373.50 | 3 | 2 | 2 | | | | | | |
| | C10203100180 | Hinges, full mortise, average frequency, steel base, 5" x 5" USP | 46 | Ea. | \$ 23.74 | \$ - | \$ 23.74 | 0% | \$ 1,092.04 | 2 | 2 | 2 | | | | | | |
| C1030 Fittings | | | | | | | | 0% | \$ 13,885 | | | 2% | \$ 163,500 | 3% | \$ 204,949 | 0% | \$ 25,000 | \$ 11,115 |
| | C10305200250 | Chalkboards, liquid chalk type, wood frame & chalktrough | 500 | S.F. | \$ 25.71 | \$ 2.06 | \$ 27.77 | 0% | \$ 13,885.00 | 1 | 2 | 1 | | | | | | |
| C2010 Stair Construction | | | | | | | | 2% | \$ 117,000 | | | 1% | \$ 102,000 | 2% | \$ 127,858 | 2% | \$ 125,000 | \$ 8,000 |
| | C20101000000 | ConXStairs | 6 | Flight | | | \$ 19,500.00 | 2% | \$ 117,000.00 | 3 | 3 | 3 | | | | | | |
| C3010 Wall Finishes | | | | | | | | 1% | \$ 43,516 | | | 2% | \$ 142,500 | 3% | \$ 178,625 | 1% | \$ 90,000 | \$ 46,484 |
| | C30102300100 | Painting, interior on plaster and drywall, brushwork, primer & 3 coats | 35964 | S.F. | \$ 0.23 | \$ 0.98 | \$ 1.21 | 1% | \$ 43,516.44 | 3 | 2 | 2 | | | | | | |
| C3020 Floor Finishes | | | | | | | | 3% | \$ 189,403 | | | 2% | \$ 163,000 | 3% | \$ 204,322 | 3% | \$ 200,000 | \$ 10,507 |
| | C30204100160 | Carpet, tufted, nylon, roll goods, 12" wide, 36 oz | 5000 | S.F. | \$ 8.46 | \$ 0.66 | \$ 9.12 | 1% | \$ 45,600.00 | 1 | 2 | 1 | | | | | | |
| | C30204100240 | Carpet, padding, add to above, maximum | 5000 | S.F. | \$ 0.94 | \$ 0.31 | \$ 1.25 | 0% | \$ 6,250.00 | 1 | 2 | 1 | | | | | | |
| | C30204100600 | Concrete topping, granolithic concrete, 1/2" thick | 33736 | S.F. | \$ 0.34 | \$ 3.74 | \$ 4.08 | 2% | \$ 137,642.88 | 3 | 2 | 2 | | | | | | |
| C3030 Ceiling Finishes | | | | | | | | 2% | \$ 176,825 | | | 3% | \$ 212,000 | 4% | \$ 265,744 | 3% | \$ 225,000 | \$ 48,175 |
| | C30302107400 | Acoustic ceilings, 3/4" mineral fiber, 12" x 12" tile, concealed 2" bar & channel grid, suspended support | 29179 | S.F. | \$ 2.56 | \$ 3.50 | \$ 6.06 | 2% | \$ 176,824.74 | 3 | 2 | 2 | | | | | | |



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5/6/2011

Ridge Team

(92)

TVD Wall – Teleplace (Winter)



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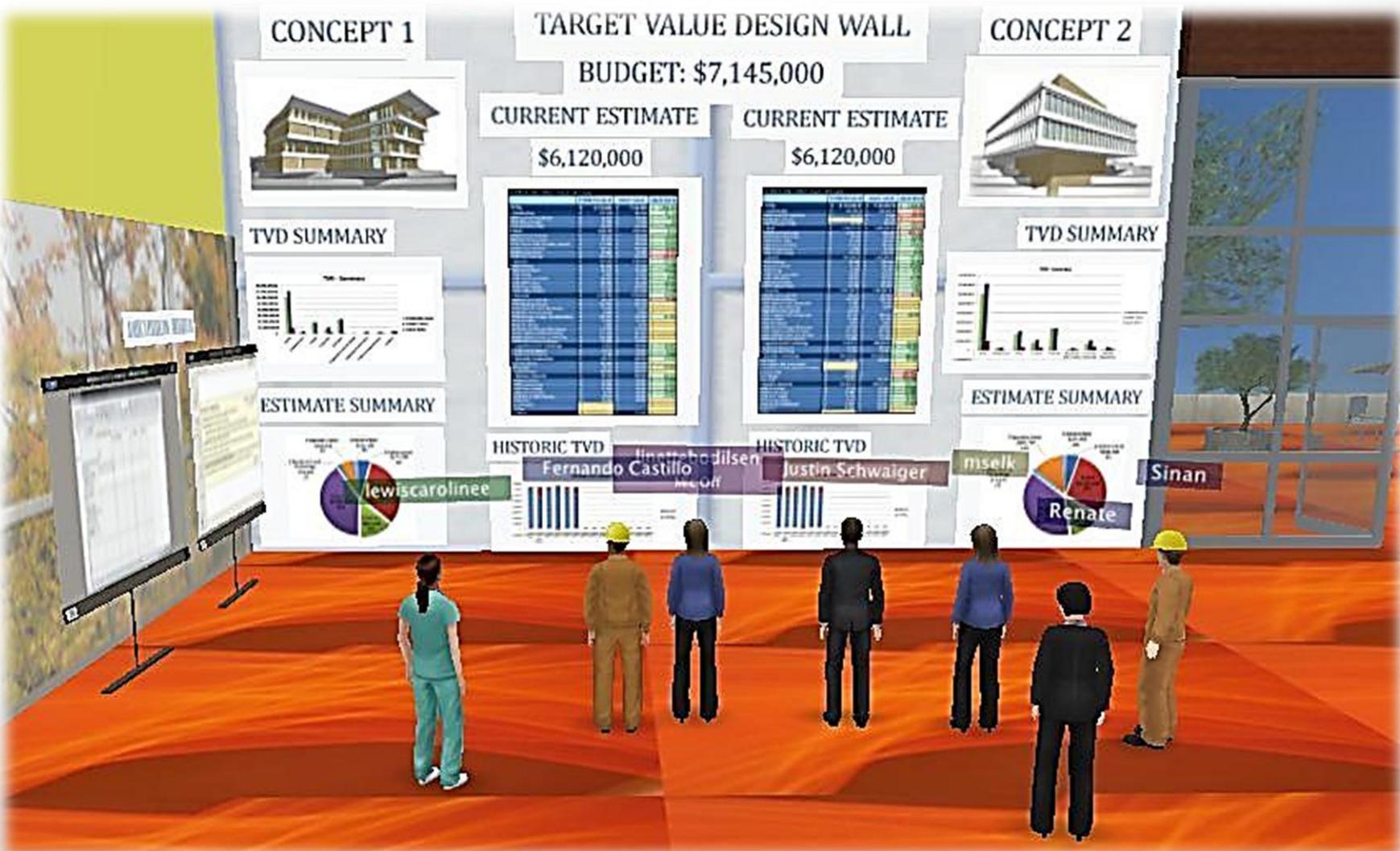
MEP

C

5/6/2011

Ridge Team

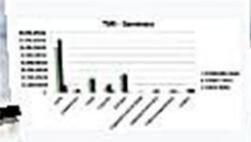
(93)



CONCEPT 1



TVD SUMMARY



ESTIMATE SUMMARY



TARGET VALUE DESIGN WALL

BUDGET: \$7,145,000

CURRENT ESTIMATE

\$6,120,000

HISTORIC TVD



CURRENT ESTIMATE

\$6,120,000

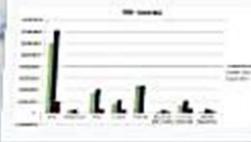
HISTORIC TVD



CONCEPT 2



TVD SUMMARY



ESTIMATE SUMMARY



Sinan

Renate

Justin Schwaiger

Fernando Castillo

lewis caroline

mseik

linette bodilsen

inc. Off

TVD Wall – Teleplace (Spring)



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C

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(94)



TVD Wall – The Real Deal



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MEP

C



5/6/2011

Ridge Team

TVD Wall – The Data

Budget = \$7,145,000



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MEP

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5/6/2011

Ridge Team

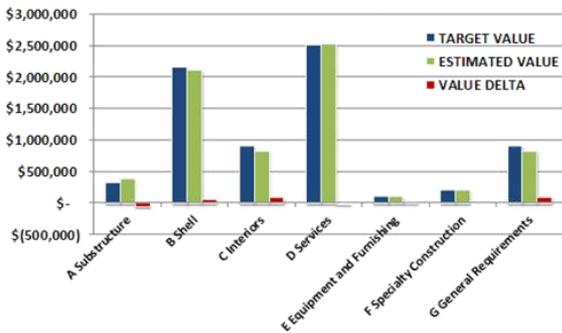
| | ESTIMATED VALUE | TARGET VALUE | VALUE DELTA |
|--------------|---------------------|---------------------|-------------------|
| TOTAL | \$ 6,979,943 | \$ 7,145,000 | \$ 165,057 |

RIDGE TEAM

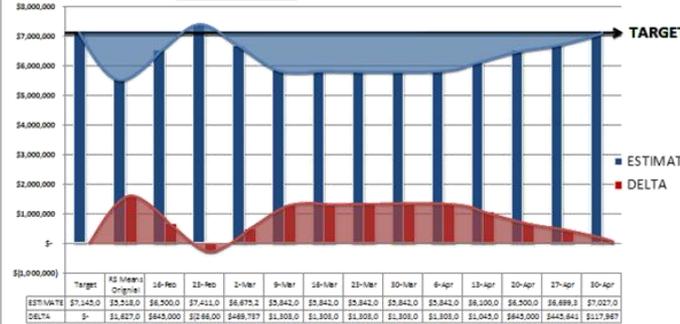
Gross Square Footage **33,736**

Price = **207 \$/SF**

TVD - TARGETS BY CLUSTER (SPRING)



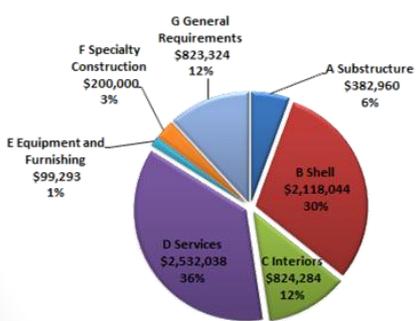
TRACKING TARGET OVER TIME



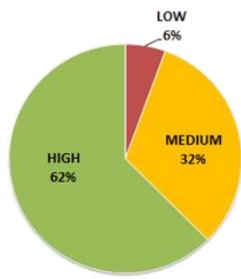
TVD - SUMMARY



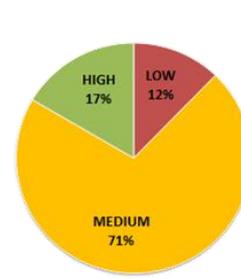
COST ESTIMATE



Estimate Quantity Reliability



Estimate Cost Data Reliability



TVD – Tracking Target



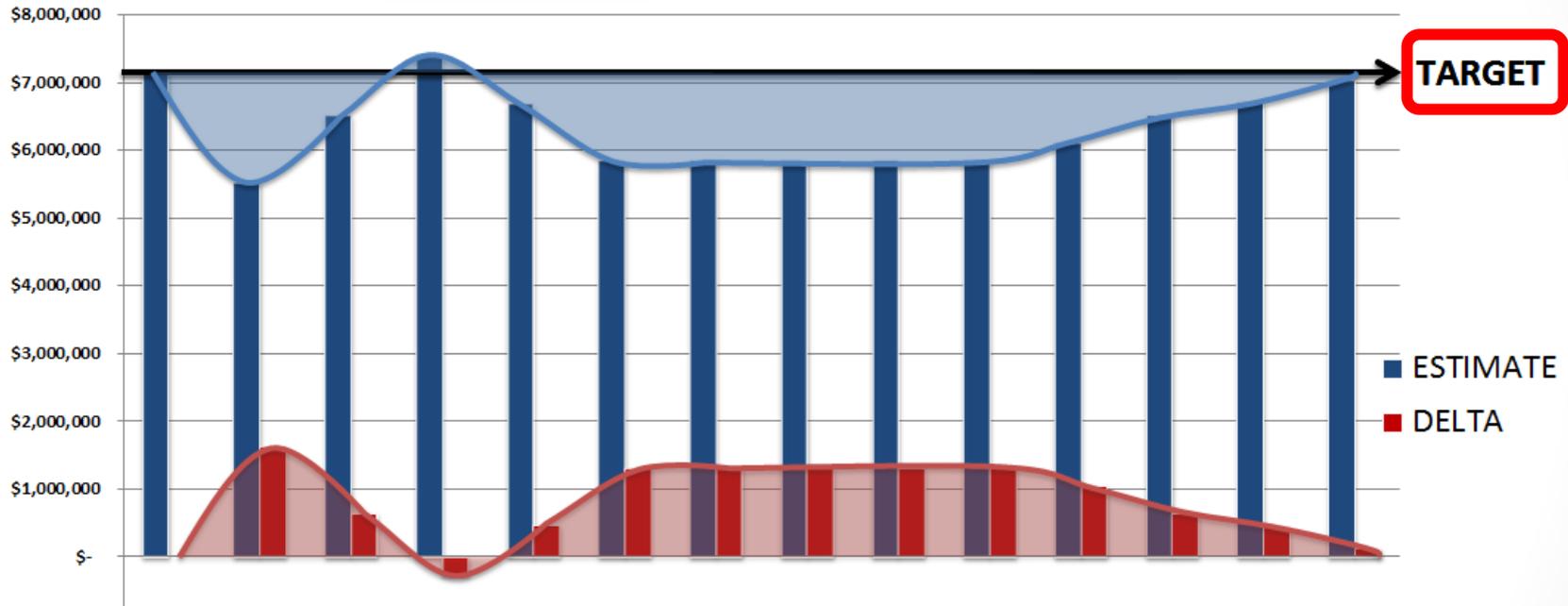
A

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MEP

C

TRACKING TARGET OVER TIME



| | Target | RS Means Original | 16-Feb | 23-Feb | 2-Mar | 9-Mar | 16-Mar | 23-Mar | 30-Mar | 6-Apr | 13-Apr | 20-Apr | 27-Apr | 30-Apr |
|----------|-----------|-------------------|-----------|------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| ESTIMATE | \$7,145,0 | \$5,518,0 | \$6,500,0 | \$7,411,0 | \$6,675,2 | \$5,842,0 | \$5,842,0 | \$5,842,0 | \$5,842,0 | \$5,842,0 | \$6,100,0 | \$6,500,0 | \$6,699,3 | \$7,027,0 |
| DELTA | \$- | \$1,627,0 | \$645,000 | \$(266,00) | \$469,737 | \$1,303,0 | \$1,303,0 | \$1,303,0 | \$1,303,0 | \$1,303,0 | \$1,045,0 | \$645,000 | \$445,641 | \$117,967 |

Ridge Team 5/6/2011

TVD – Visualize the Target



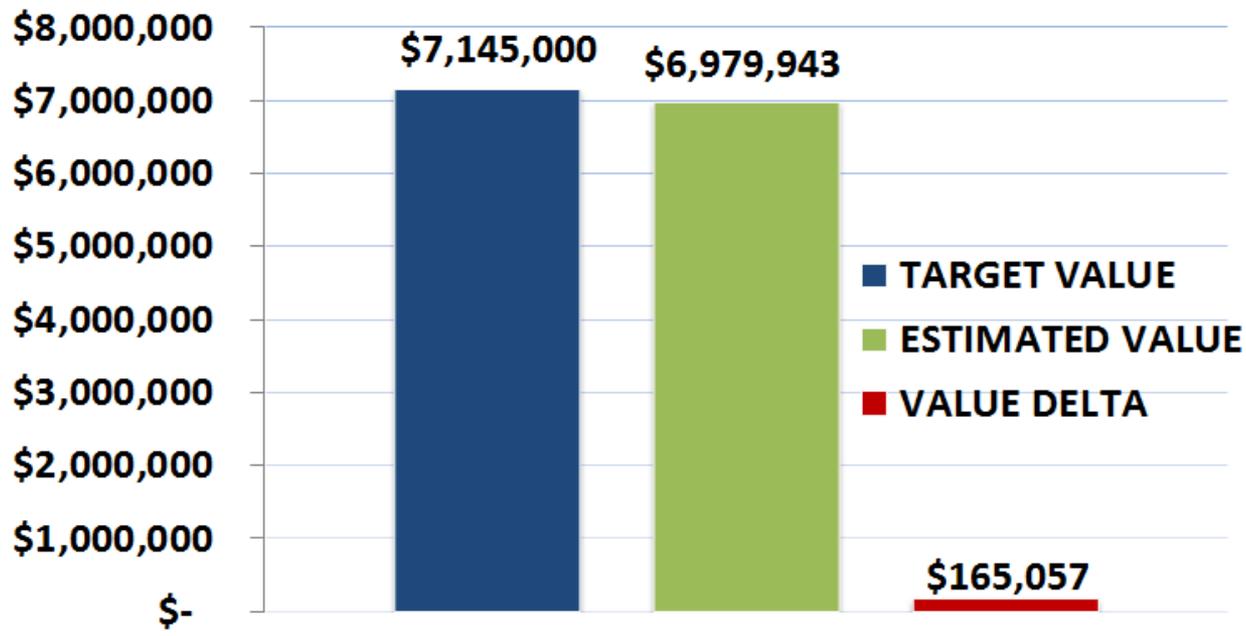
A

E

MEP

C

TVD - SUMMARY



5/6/2011

Ridge Team

TVD – Measuring Performance



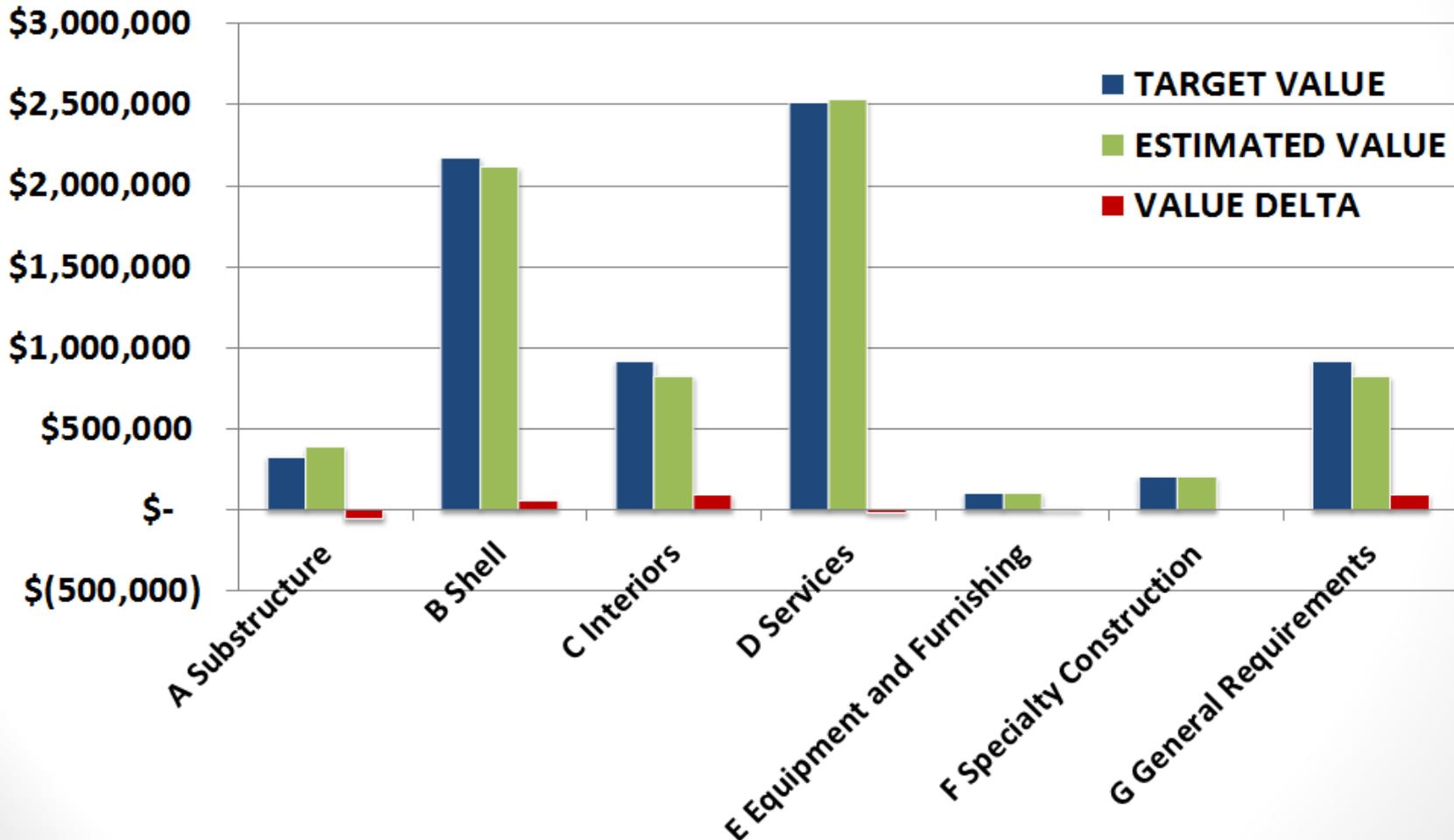
A

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MEP

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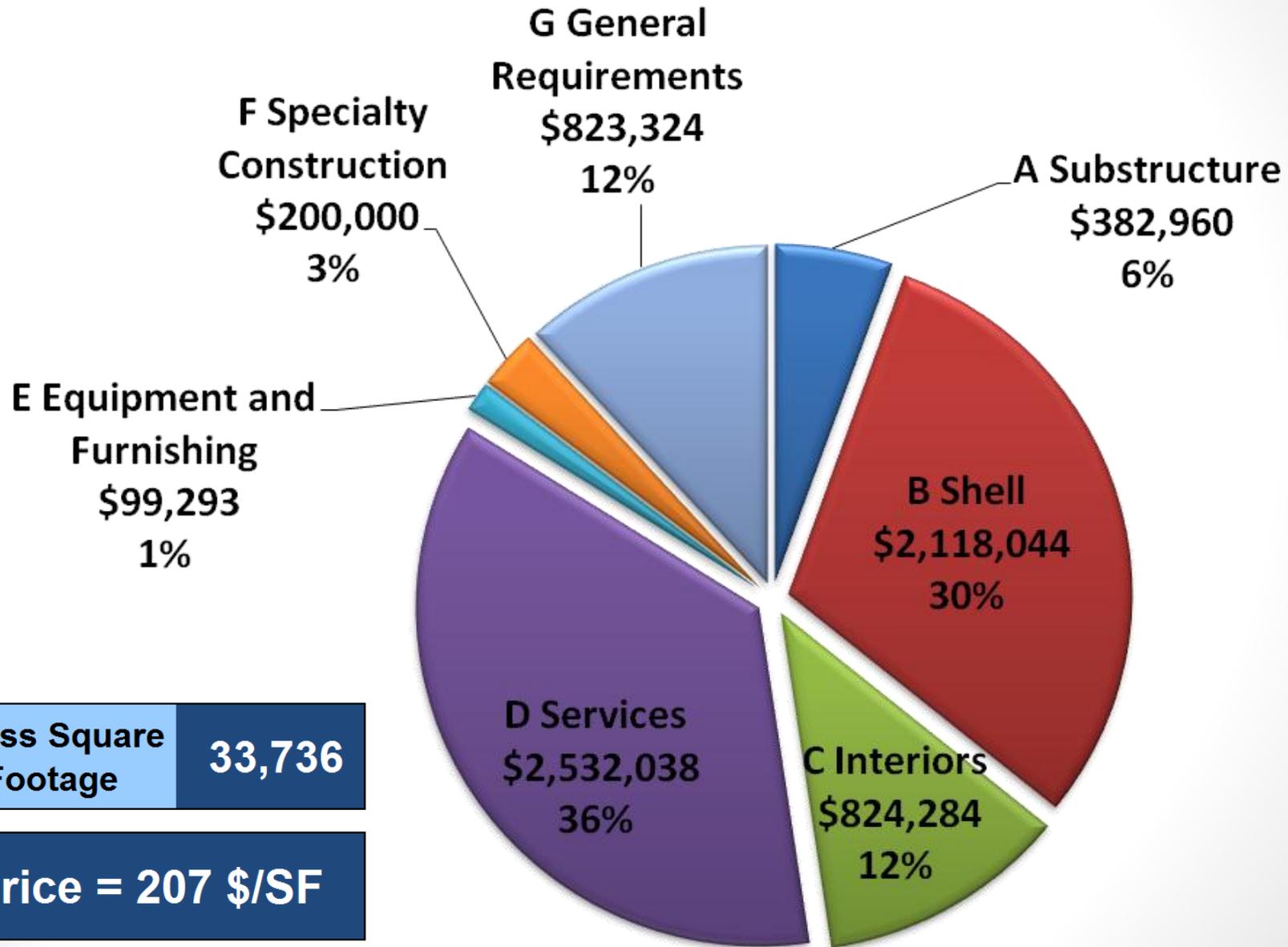
TVD - TARGETS BY CLUSTER (SPRING)



5/6/2011

Ridge Team

TVD – Estimate Results



Gross Square Footage **33,736**

Price = **207 \$/SF**



A

E

MEP

C

5/6/2011

Ridge Team

(100)

TVD – Measure Reliability



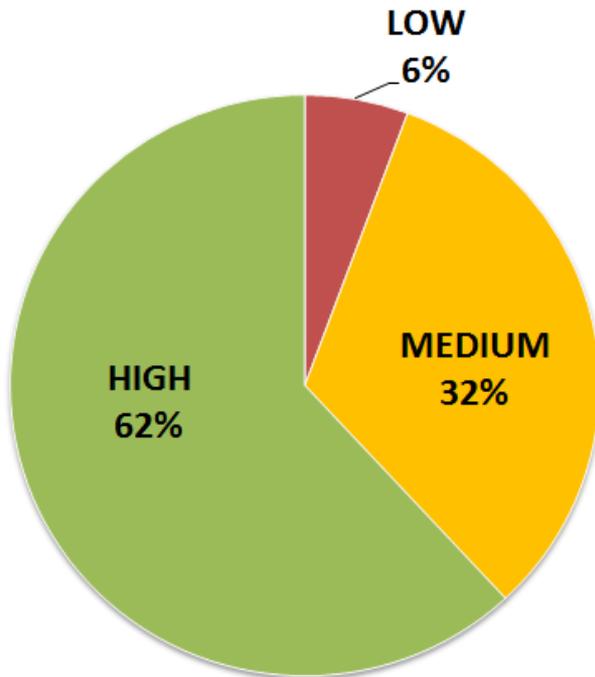
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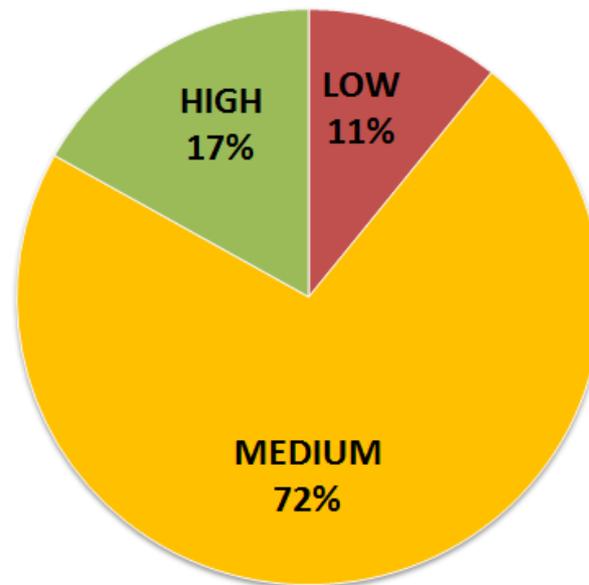
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Estimate Quantity Reliability



Estimate Cost Data Reliability





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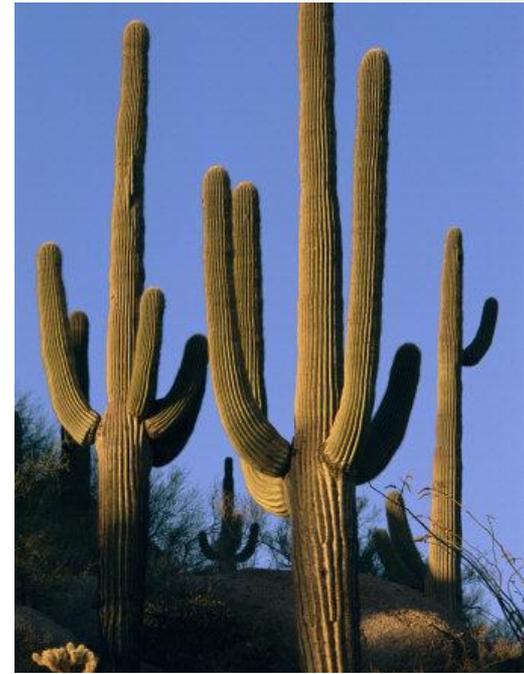
C

Being Native

5/6/2011

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Landscaping



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Local and Regional Providers



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University of Nevada, Reno

10 Miles

20 Miles

30 Miles



Steel Fabrication

Concrete

Cement



230 Miles

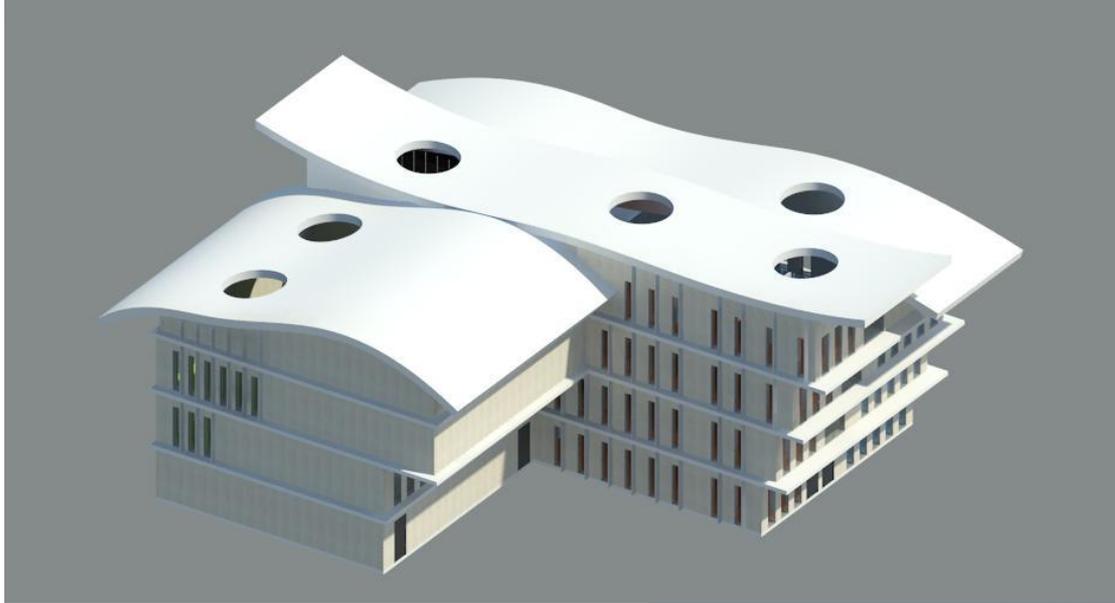


Quality Concrete Construction, LLC



(104)

Reflecting the Environment



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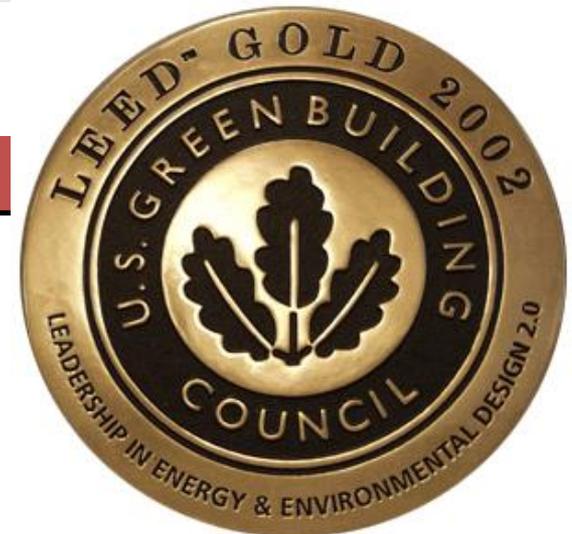
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(105)

LEED Gold

| Category | Max Possible Point | Points Earned |
|------------------------------|--------------------|---------------|
| Sustainable Sites | 14 | 6 |
| Water Efficiency | 5 | 4 |
| Energy & Atmosphere | 17 | 7 |
| Materials & Resources | 13 | 7 |
| Indoor Environmental Quality | 15 | 14 |
| Innovation & Design Process | 5 | 2 |
| Total | 69 | 40 |



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Water Conservation



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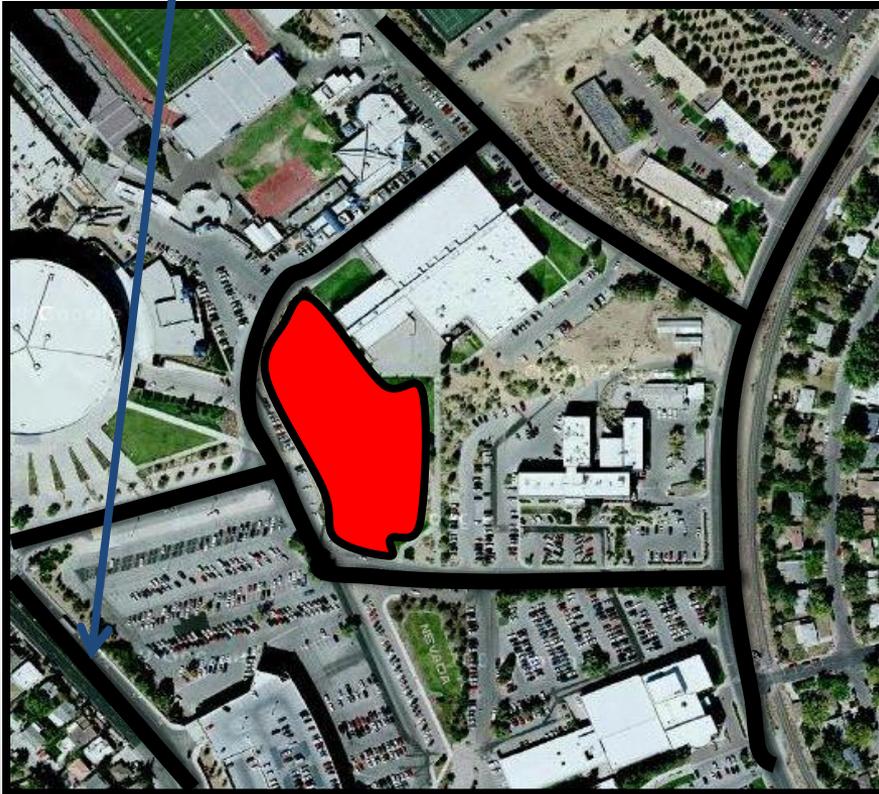
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Alternative Transportation

Line 395
Stop



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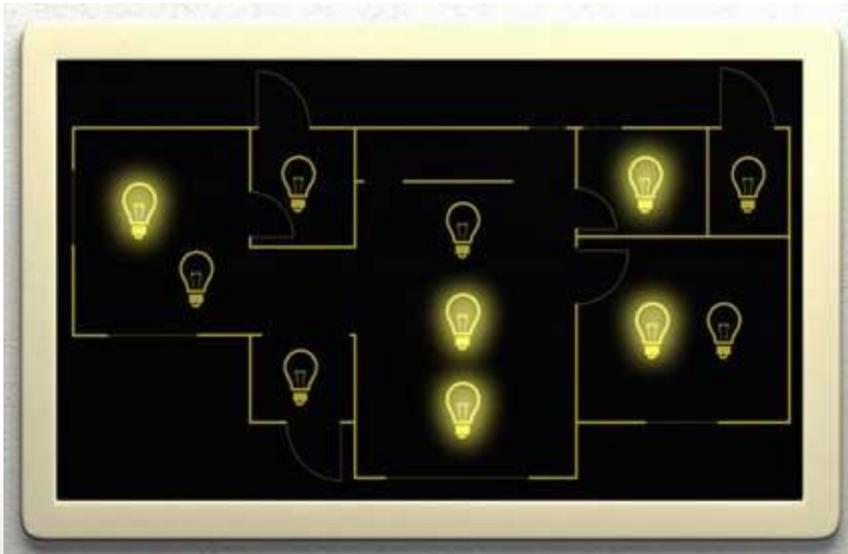
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(108)

Building Management Systems



A

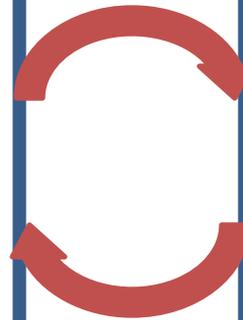
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Communications



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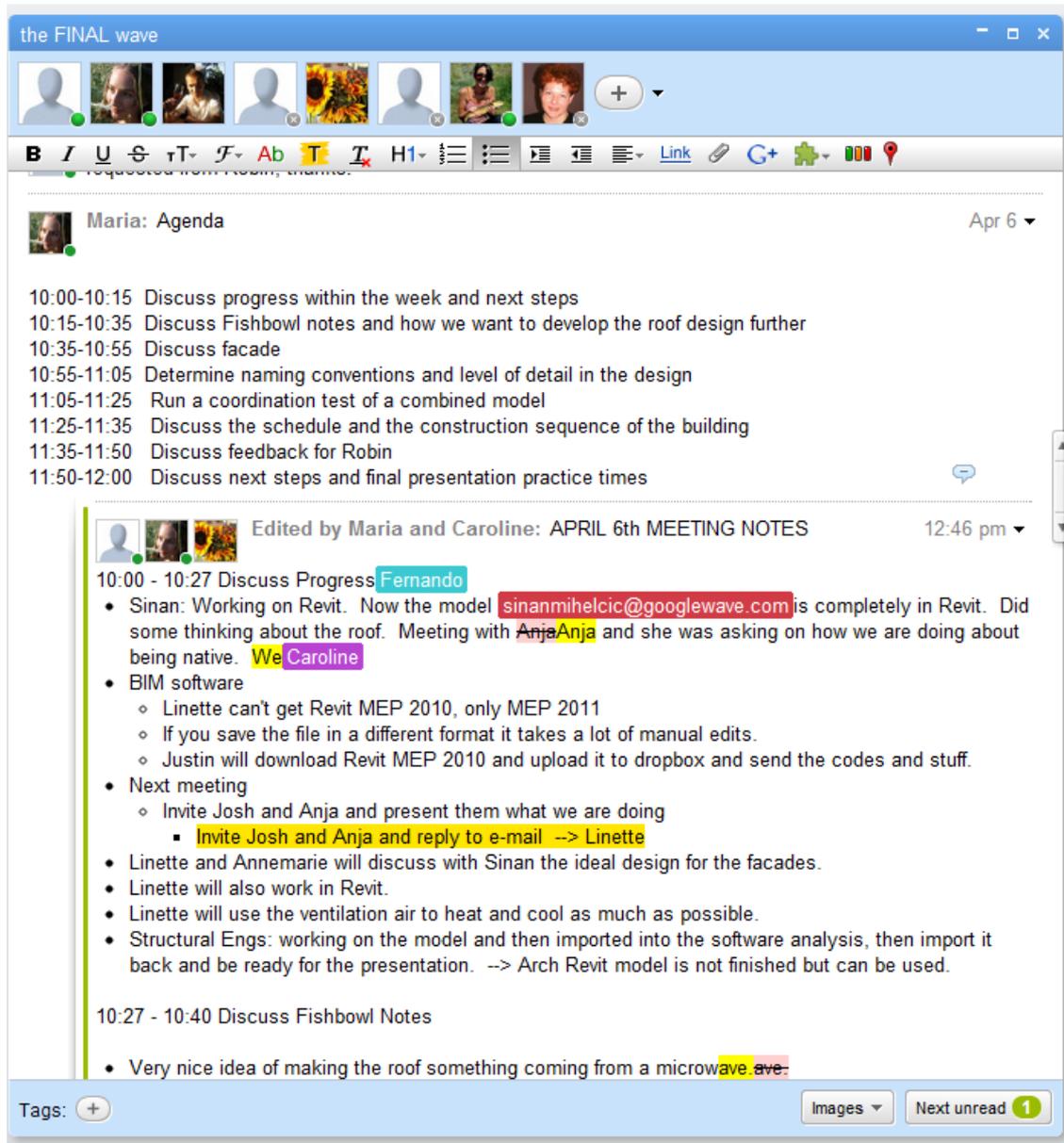
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Integrated Real Time Meeting Notes



the FINAL wave

Requested from Robin, theme:

Apr 6

Maria: Agenda

- 10:00-10:15 Discuss progress within the week and next steps
- 10:15-10:35 Discuss Fishbowl notes and how we want to develop the roof design further
- 10:35-10:55 Discuss facade
- 10:55-11:05 Determine naming conventions and level of detail in the design
- 11:05-11:25 Run a coordination test of a combined model
- 11:25-11:35 Discuss the schedule and the construction sequence of the building
- 11:35-11:50 Discuss feedback for Robin
- 11:50-12:00 Discuss next steps and final presentation practice times

Edited by Maria and Caroline: APRIL 6th MEETING NOTES 12:46 pm

10:00 - 10:27 Discuss Progress **Fernando**

- Sinan: Working on Revit. Now the model sinanmihelcic@googlewave.com is completely in Revit. Did some thinking about the roof. Meeting with **Anja** and she was asking on how we are doing about being native. **We Caroline**
- BIM software
 - Linette can't get Revit MEP 2010, only MEP 2011
 - If you save the file in a different format it takes a lot of manual edits.
 - Justin will download Revit MEP 2010 and upload it to dropbox and send the codes and stuff.
- Next meeting
 - Invite Josh and Anja and present them what we are doing
 - **Invite Josh and Anja and reply to e-mail --> Linette**
- Linette and Annemarie will discuss with Sinan the ideal design for the facades.
- Linette will also work in Revit.
- Linette will use the ventilation air to heat and cool as much as possible.
- Structural Engs: working on the model and then imported into the software analysis, then import it back and be ready for the presentation. --> Arch Revit model is not finished but can be used.

10:27 - 10:40 Discuss Fishbowl Notes

- Very nice idea of making the roof something coming from a microwave **ave. ave.**

Tags: + Images Next unread 1



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Use of Software



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(112)

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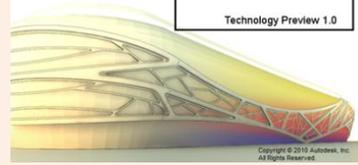
GRAPHISOFT.
ARCHICAD 10
a Virtual Building Solution



Google S



Autodesk®
Project Vasari
Technology Preview 1.0



MEP

File Tracking



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FILE SHARING FEB 3 - FEB 9

Next Reply Edit Playback Unfollow Archive Spam Read Unread

Maria: Feb 5

FILE SHARING FEB 3 - FEB 9

For the files you upload into Dropbox and want to share with the team please share the following:

- 1.) File Location and File Name
- 2.) Brief description of file contents.
- 3.) Who should look at the file.
- 4.) What kind of feedback do you expect and by when.
- 5.) Any additional notes or comments

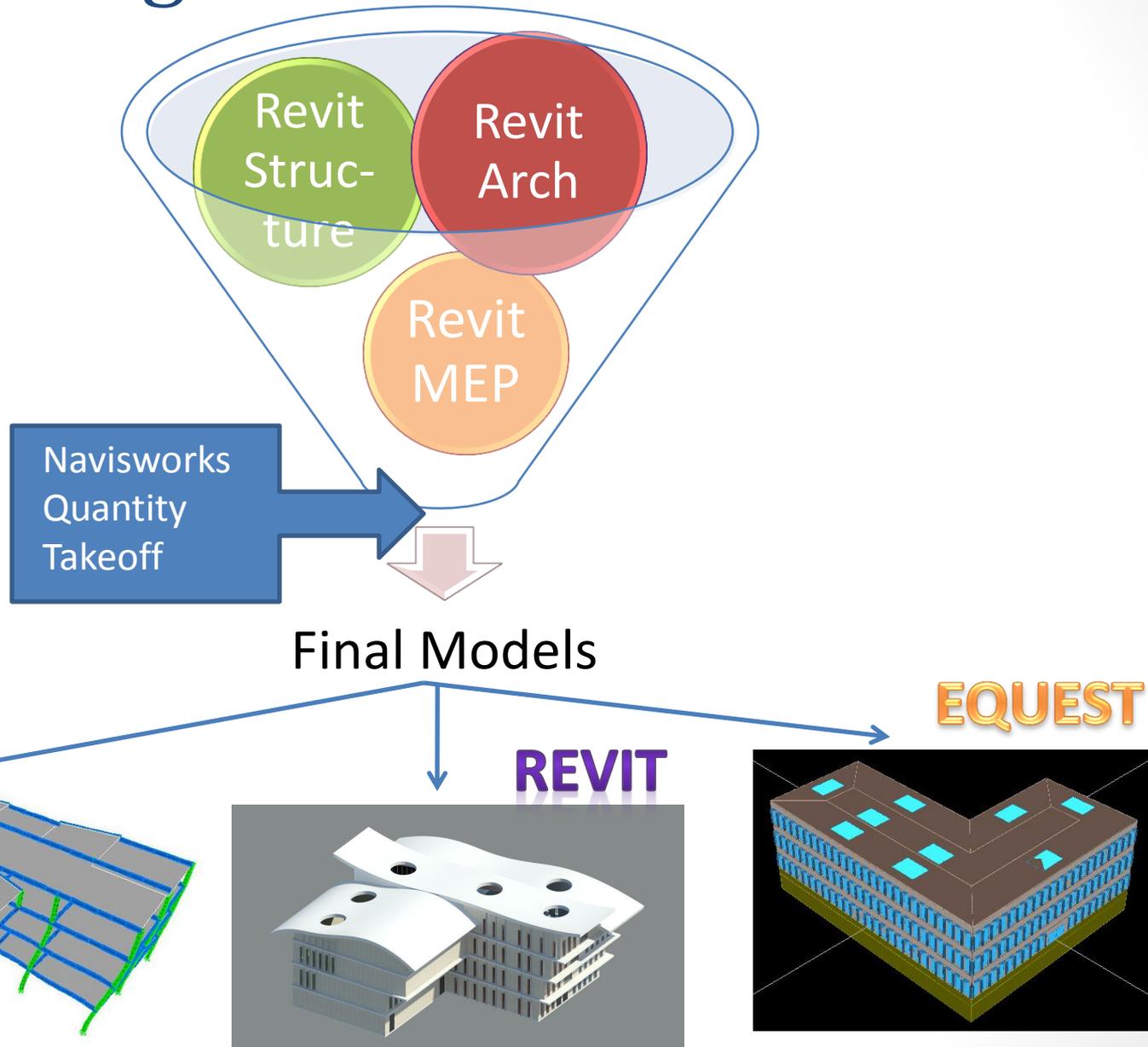
◊ To provide feedback please reply to the wave with you comments by the expected time.

Sinanmihelcic@googlewave.com: Feb 6

- 1) 01-01-autocad / SM-SCH-program&axis-01-020611
- 2) autocad dwg plan (also can be imported to revit or sketchup)
- 3) everyone
- 4) i did some changes into first idea, as we talked at the meeting, so in this file, you can find some sections and also all the required plans. ill do some pdfs also at the same folder.

Sketchup model is comming soon!

BIM Integration



A

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5/6/2011

Improvements from Winter Quarter

- More Frequent Communication
- More Efficient Communication
- Team Bonding
- More Subgroup Meetings



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Winter Quarter Latency: 4 days



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The screenshot shows a Google Wave interface. On the left is an inbox with a search bar containing "in:inbox" and 47 results. The selected message is from "Annemarie and Justin" with the subject "Annemarie - the roof trusses look great! I just added one more on the other side of the auditorium and shortened it to fit that span." The main window shows the conversation history:

- Justin added Pbrenate@googlewave.com Feb 23
- Caroline: Annemarie and Justin- Feb 4
- Annemarie - the roof trusses look great! I just added one more on the other side of the auditorium and shortened it to fit that span.
- Justin- If you want to add your details to the completed roof structure it would be the file in the Sketchup folder titled CL-V02-Roof Truss. Let us know how that goes.
- Justin: I added the lateral system to the roof truss model. See CL-V03-Roof Truss with Structure file in Dropbox. Feb 4
- The roof trusses look awesome! I think that will go over very well!
- Justin: I added a new folder to the structural folder for viscous damping systems as suggested by Erik from Degenkolb as they might be a cheaper option compared to base isolation. Feb 9

A timestamp "2/23/11 1:45 pm" is visible above a "Click here to reply" link.

Spring Quarter Latency: 3hrs



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Sinan hey guys, but maybe we could use a water from the sinks, to wahs the toilets 3:12 PM
like, when you wash your hands in the sinks, that watter is going to a reservoir and 3:12 PM
from there to the toilets?

Annemarie Golz thats another example of gray water usage, a good one too. linette's expertise is 3:13 PM
probably needed

Sinan of course,agree, its just a thought, what we could do 3:14 PM

Maria Selk hey guys, one of the orgs is actually designing something like that for individual toilets 3:54 PM
in El Salvador!

its really cool 3:54 PM

Fernando Castillo Guys, I have some quite exciting news! 10:58 PM
I've done the calculations from the original site and the new site configuration and the 11:00 PM
total amount of dirt that we are excavating is only 6,500 cubic yards, which is really
really little for all that we are doing

the total amount of dirt in the site is about 280,000 cubic yards, that means we are 11:00 PM
only taking out 2% of the dirt...

but even more interesting, I can adjust the site very easily so that it's actually the 11:01 PM
same!

so ZERO earth removal from our site! 11:02 PM

that can definetly go into our being native challenge! 11:02 PM

Sinan thats great fernando! 11:03 PM

Caroline Lewis For sure! 11:05 PM
I think we may have a chance at the Native one too! 11:05 PM

🕒 **Saturday, April 23, 2011**

Fernando Castillo Update on Teleplace.... I've been able to get the model and scaled it twice, but when 2:18 AM
I close it crashes and the model disappears 😞 I'll keep on trying

Sinan fernando i think i know what the problem is it happened to me before ill try to help 5:28 AM

🗨️ Share 🔄 Extras 📱 Group SMS

Type a message here

📩 Send message

Further Comparison

| | Winter | Spring |
|------------------------------------|-------------|------------|
| Avg Number Weekly Subgroup Meeting | 2 | 6 |
| Avg Weekly Meeting Length | 2hrs 10mins | 1hr 50mins |



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5/6/2011

Lessons Learned

“The Model isn’t done until its done.” -Fernando



“If Shakespeare made up words, I don’t see why you can’t”
-Caroline



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5/6/2011

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Lessons Learned

“A positive attitude is essential” -Justin



“Double check times when dealing in different time zones.” -Sinan



“Plan far ahead.” -Annemarie



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(120)

Thanks To: ConXtech

Erik Kneer John Nelson

Glenn Katz

Eduardo Mirana

Adhamina Rodrigez

Dennis Kwan

Greg Luth

Daniel Gonzales

Mark Barlett



A

E

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C

5/6/2011

(121)

Thanks To:

Renate Fruchter

Josh Odelson

Anja Jutraz

Mentors

Classmates



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Questions?



A

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