

**TEAM**  
ATLANTIC



STANFORD PBL LAB  
05/11/2012

**SQ**

# TEAM ATLANTIC

FERNANDO  
CASTILLO

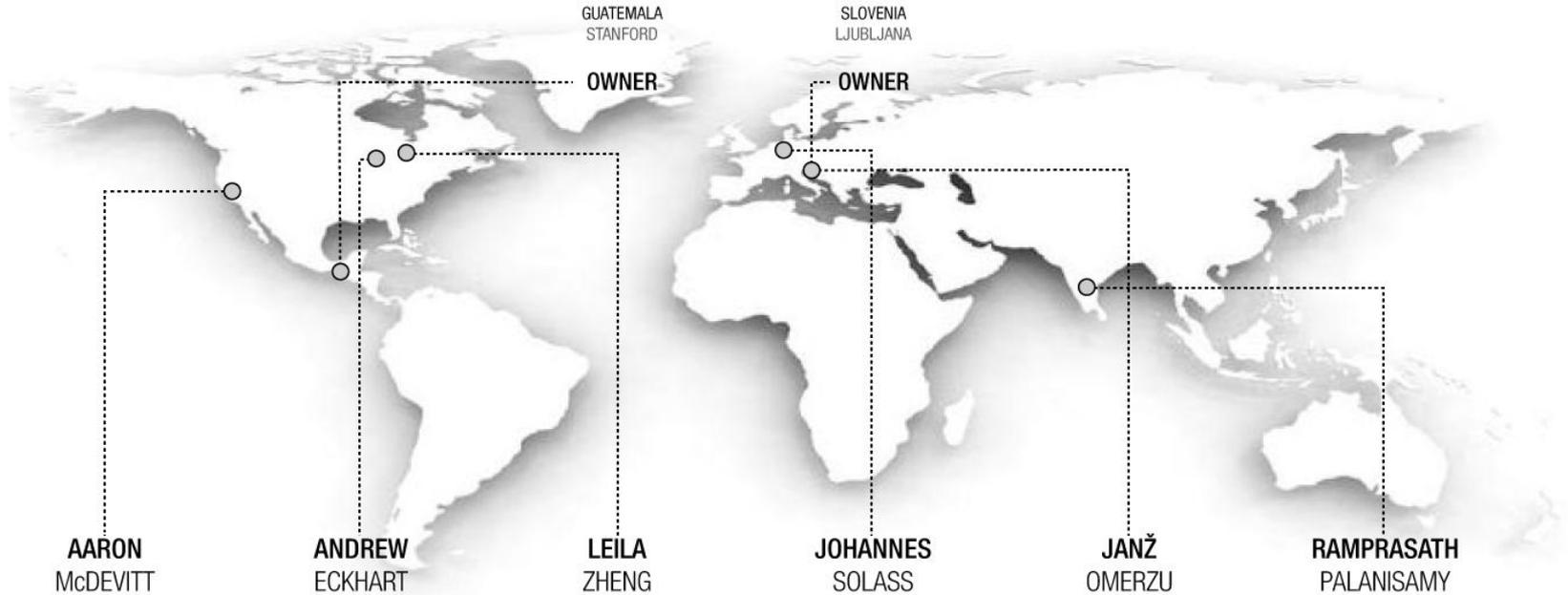


GUATEMALA  
STANFORD

ANJA  
JUTRAŽ



SLOVENIA  
LJUBLJANA



USA  
STANFORD

SE



USA  
WISCONSIN

MEP



CANADA  
STANFORD

SE



GERMANY  
BAUHAUS

SE



SLOVENIA  
LJUBLJANA

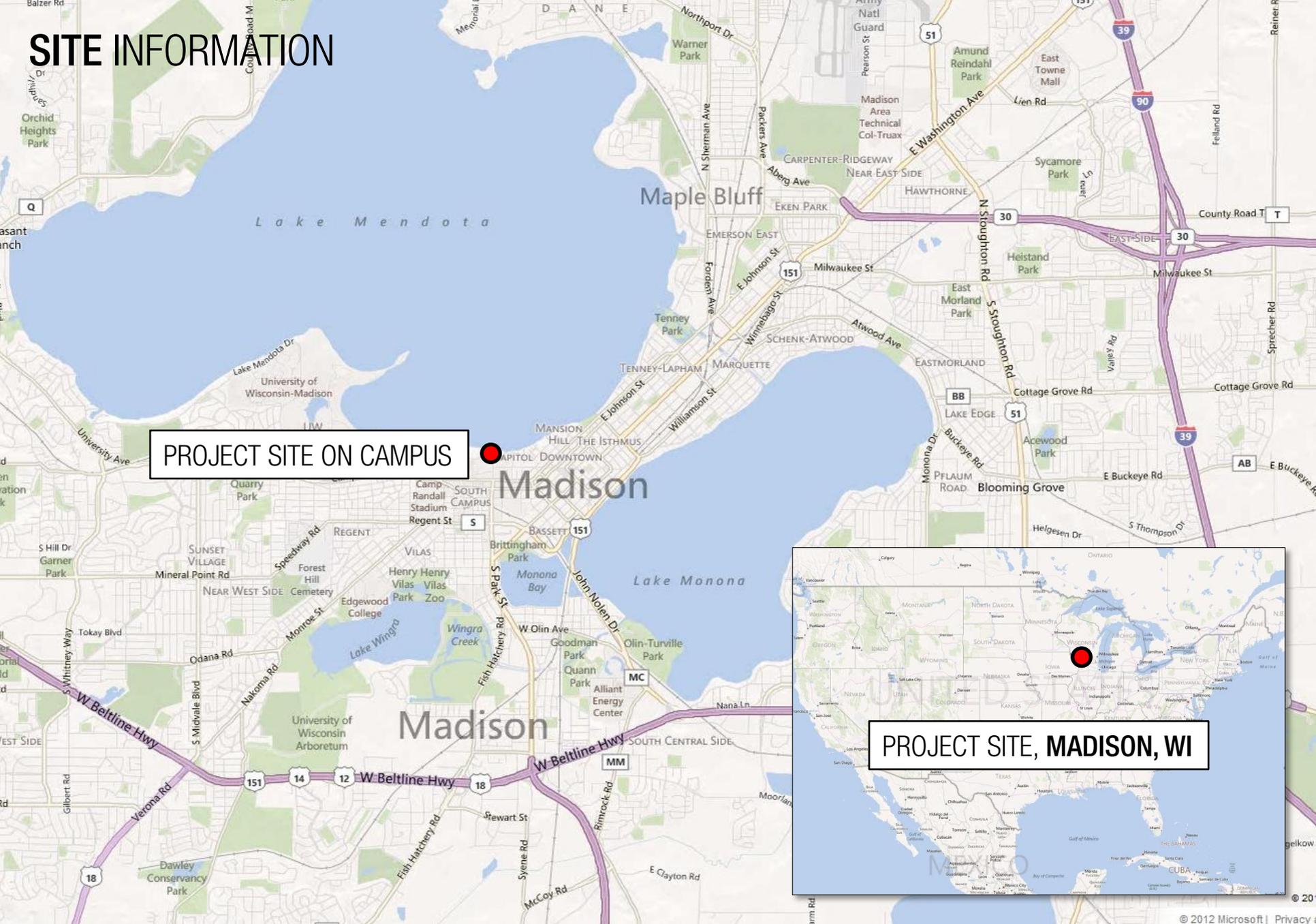
A



INDIA  
STANFORD

CM

# SITE INFORMATION



PROJECT SITE ON CAMPUS

PROJECT SITE, MADISON, WI

# SITE ACCESS

LAKE MENDOTA



LAKESHORE PATH

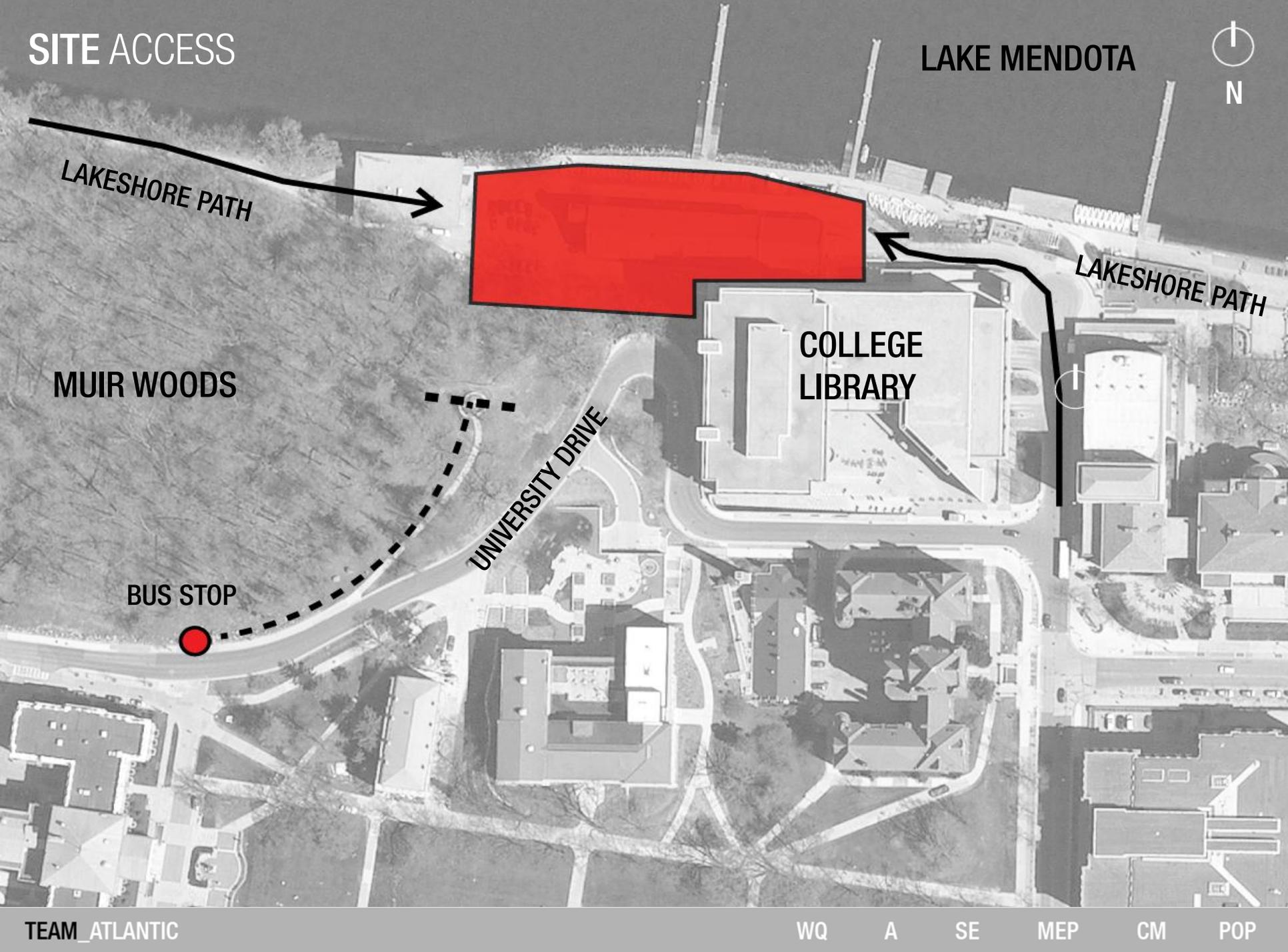
MUIR WOODS

BUS STOP

UNIVERSITY DRIVE

COLLEGE LIBRARY

LAKESHORE PATH



# SITE GUIDELINES

LAKE MENDOTA



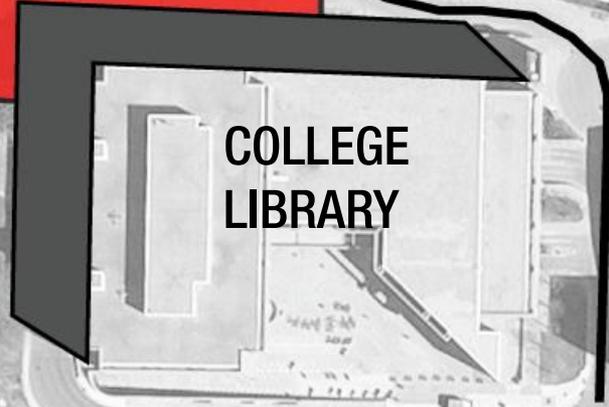
LAKESHORE PATH

LAKESHORE PATH

MUIR WOODS

UNIVERSITY DRIVE

COLLEGE LIBRARY





**LIMNOLOGY LAB CANTILEVERS OVER THE LAKE**

# SITE PHOTOS - WINTER



**NARROW ACCESS ROAD TO THE PROJECT SITE**

# SITE PHOTOS - WINTER



PANORAMIC VIEW OF THE SITE

# SITE PHOTOS - SUMMER



**PIERS PRESENT AN IMPORTANT ELEMENT OF THE LOCAL CONTEXT**

# SITE PHOTOS - SUMMER



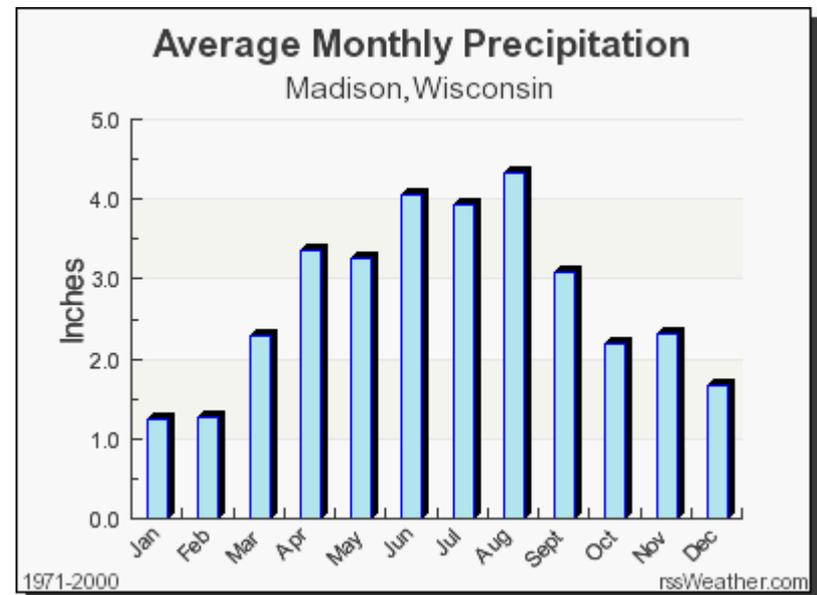
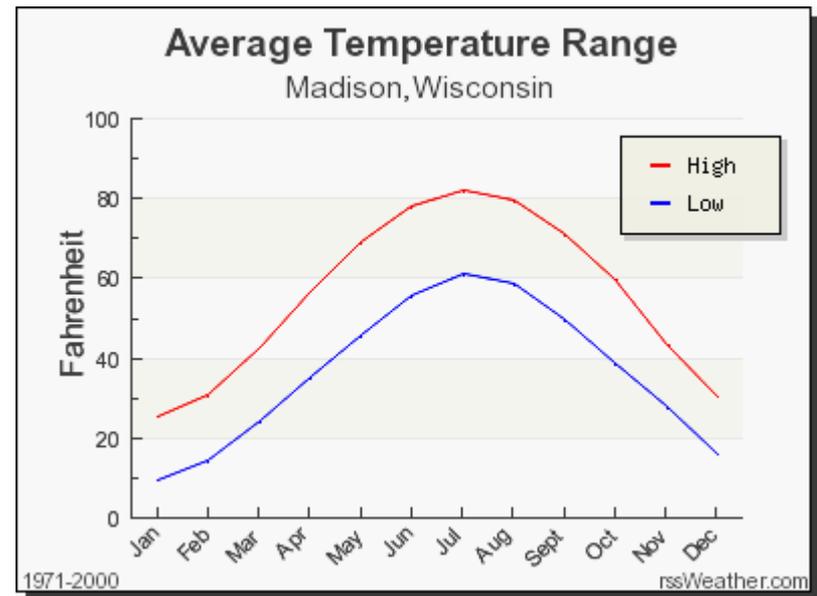
**LAKE MENDOTA WITH ITS PIERS IS ONE OF THE MOST POPULAR SPACES ON CAMPUS**

# CLIMATE CONDITIONS

Wisconsin's weather varies a lot  
Need to Consider both Heating and  
Cooling Loads

## Design Temperatures

- Summer Outside Air Temp. 90F
- Winter Outside Air Temp. -11F
- Space Temp.
  - 70F-Winter
  - 75F-Summer



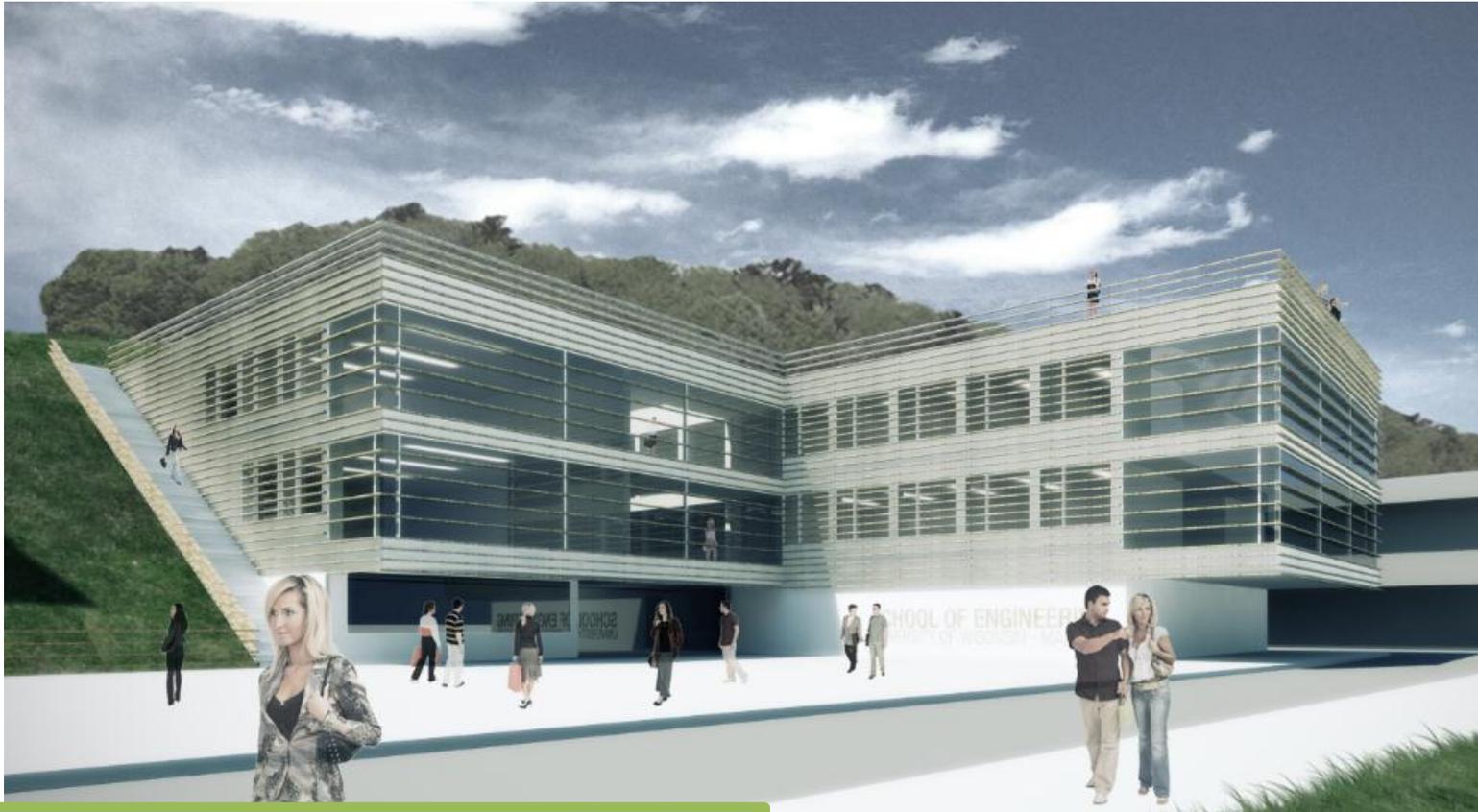
# DECISION MATRIX –BRAIN MERGE AND TEAM SURVEY

<b>Aaron McDevitt</b>	A: "I wanna be here!" (lighted, comfortable, stress free, relaxing space)	100	United States
<b>Ramprasath Palanisamy</b>	C: Cost	91	United States
<b>Yao Xiao</b>	O: LEED	65	Germany
<b>Ramprasath Palanisamy</b>	a: biomimicry	60	United States
<b>johannes solass</b>	O:is the building attractive to the peolpe?	59	Germany
<b>Leila Zheng</b>	A: easy to navigate	57	United States
<b>Yao Xiao</b>	M: Energy Saving	46	Germany
<b>johannes solass</b>	A:temperature and sound in the building(is it comfortable?)	46	Germany
<b>Aaron McDevitt</b>	A: fits in environment nicely	43	United States
<b>Ramprasath Palanisamy</b>	a: functionality	41	United States
<b>Ramprasath Palanisamy</b>	o:operation and maintenance	38	United States
<b>Ramprasath Palanisamy</b>	A: Safety	38	United States

<b>Students+coolness</b>	<b>40.00%</b>
<b>University/Owners+sustainability</b>	<b>30.00%</b>
<b>Team Atlantic</b>	<b>30.00%</b>

Decision Matrix	Building Concepts			
	Arch concept 1: Landscape		Arch concept 2: Leaf	
Category	Steel w TermoBuild	Concrete w normal HVAC	Steel w normal HVAC	Concrete w radiant heat
<b>Students</b>				
'I wanna be here!" (are you excited about this concept?, stress free, relaxing space)				
Functional-is the building easy to navigate? Do programs connect? Does the building promote learning?				
Is the building comfortable? - temperature, air quality, light				
<b>University/Owners</b>				
Cost, structural frame should cost less than \$ 850,000 (materials and				
Easy to operate and maintain, safety				

# DECISION MATRIX- BIOSCAPE RESULTS



Steel w TermoBuild

4.070401

Concrete w normal HVAC

4.011952

# DECISION MATRIX – THE LEAF RESULTS



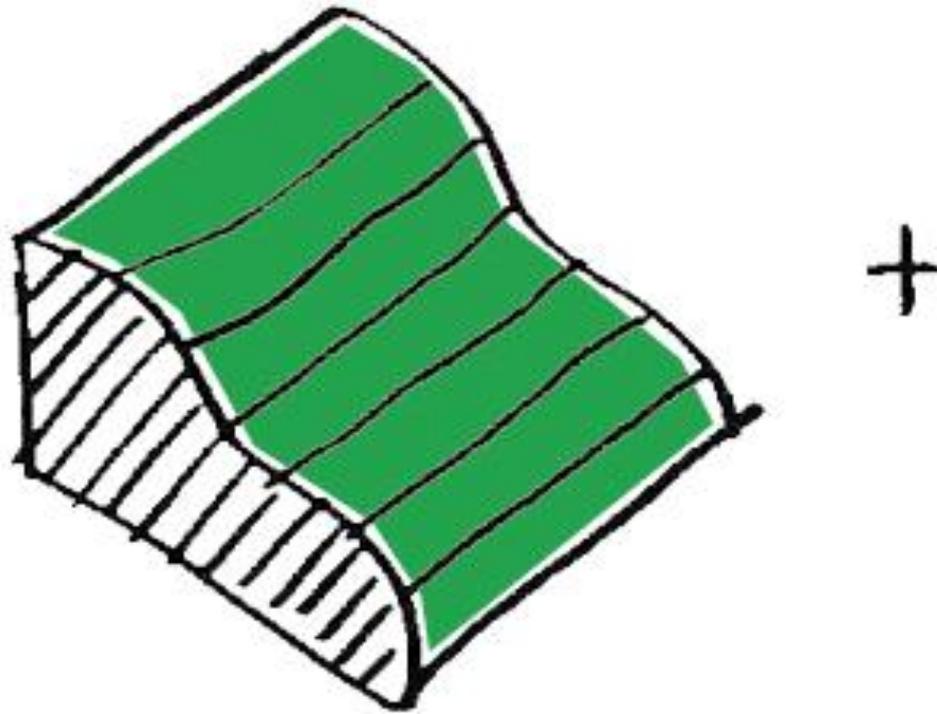
Steel w normal HVAC

3.973648

Concrete w radiant heat

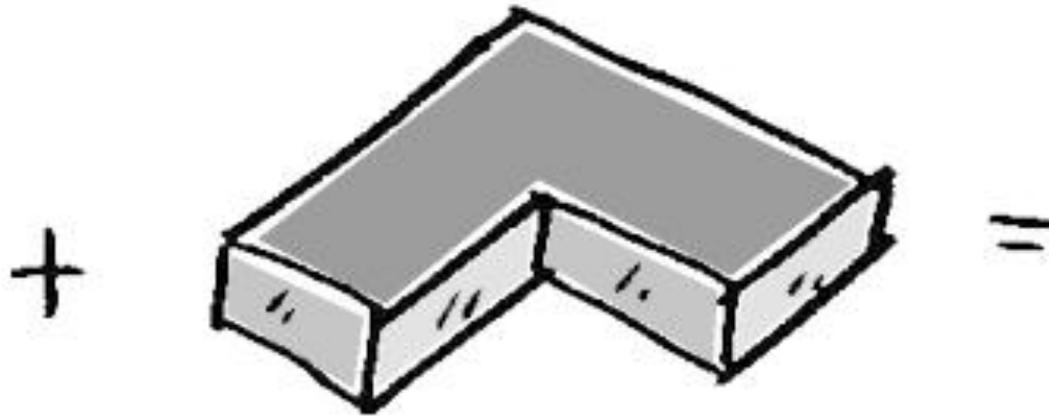
3.954205

# TERRAIN



- NARROW SITE
- STEEP TERRAIN CONFIGURATION

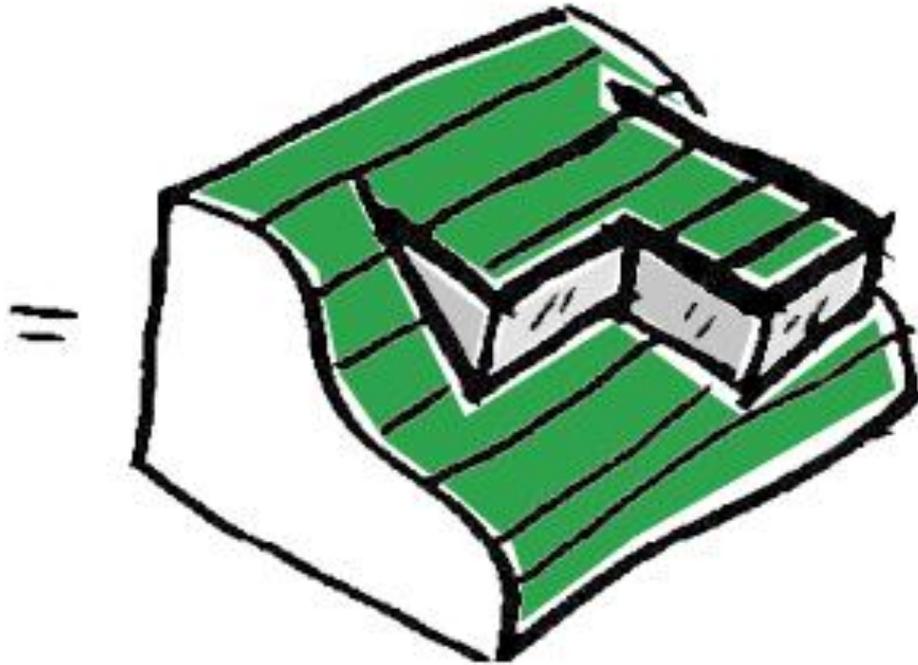
BUILDING



- **FUNCTIONAL** LAYOUT
- TAKE ADVANTAGE OF **SITE CONDITIONS** TO OPTIMIZE ENERGY USE

# BIG IDEA = BIOSCAPE

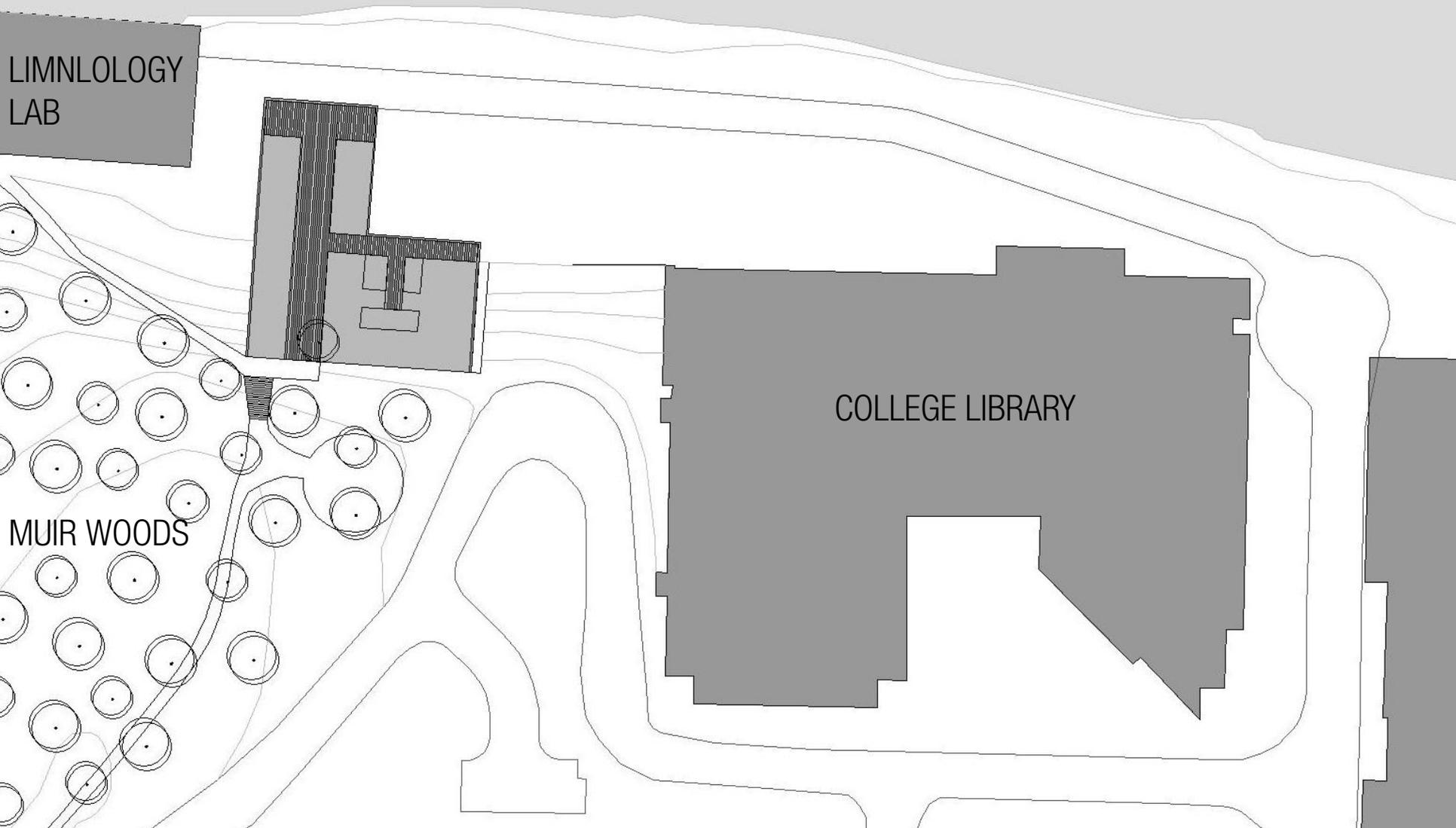
BIG IDEA!!



- **BUILDING** EMBEDDED IN THE TERRAIN – ENERGY EFFICIENT
- **EXTEND** LANDSCAPE ON THE ROOF AS A VIEWING POINT

# SITE PLAN - UPDATE

LAKE MENDOTA



LIMNOLOGY  
LAB

MUIR WOODS

COLLEGE LIBRARY

# BIOMIMICRY



# BIOMIMICRY

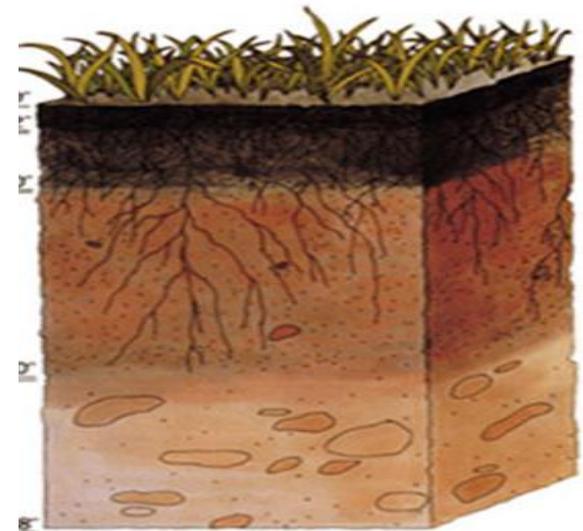
## Badger Burrow "Sett"



Reach 30 ft deep

Ground Temperature is Constant

Large  $\Delta T$



Small  $\Delta T$

# BIG IDEA LEAN\_3R<sup>S</sup> CONSTRUCTION PRINCIPLES

- Reuse

- Formwork
- Machinery effective utilization
- Materials from Demolished Building



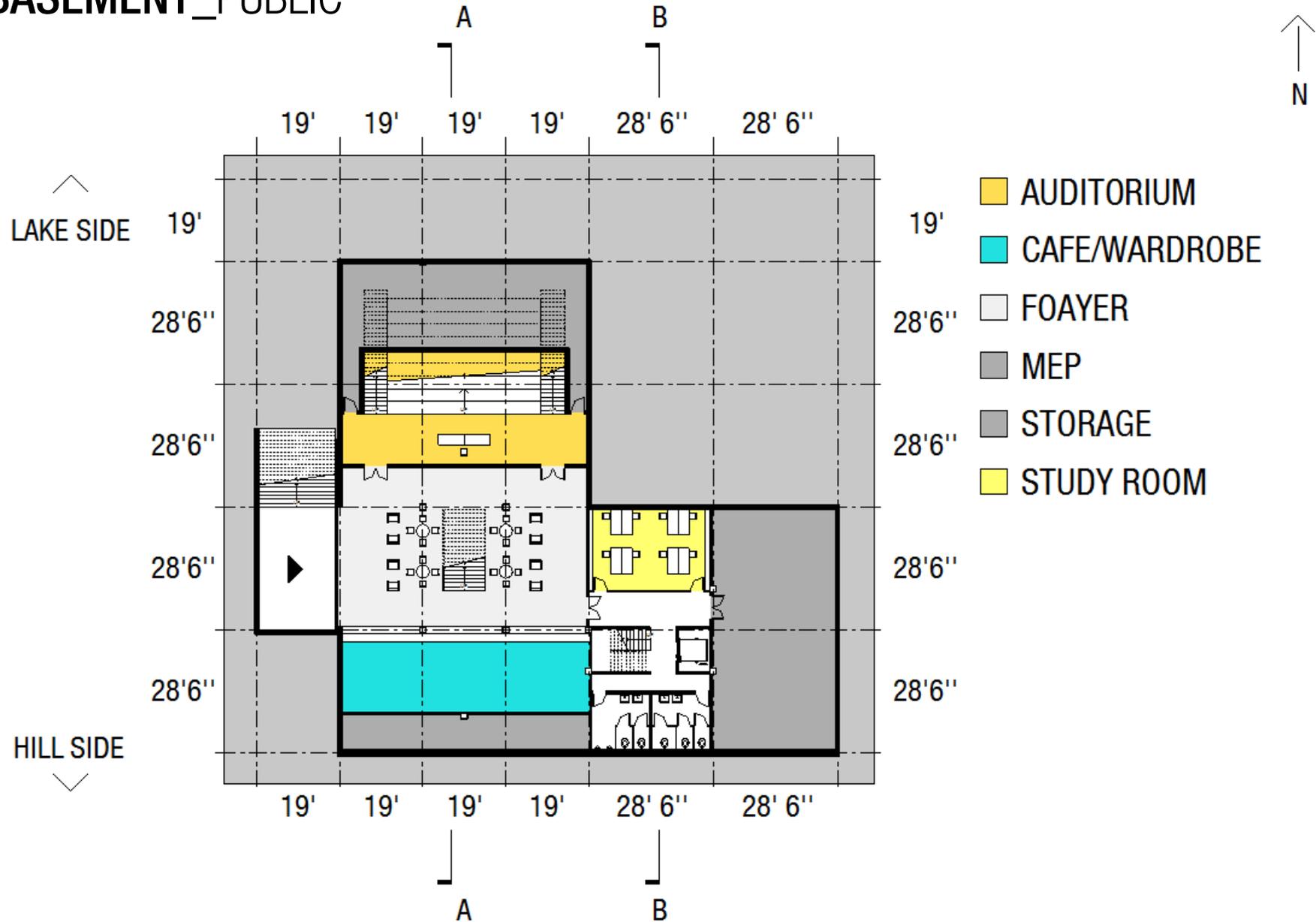
- Reduce

- Just in time delivery
- Eliminating Salvage Material
- Pre-Fabrication
  - Hollow-Core Slabs
  - Façade
  - Reinforcement

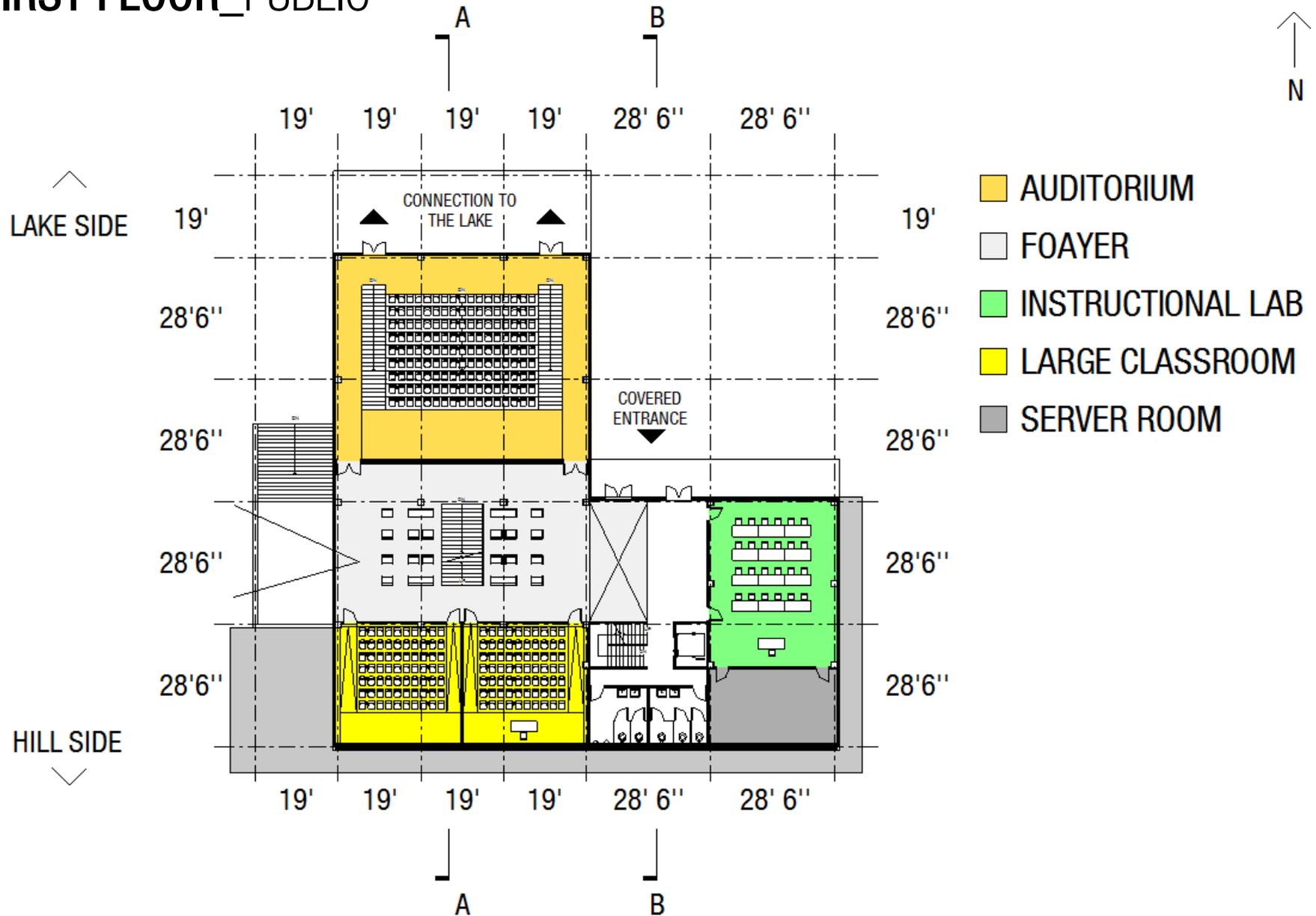
- Recycle

- Wood
- Concrete
- Façade
- Construction Waste

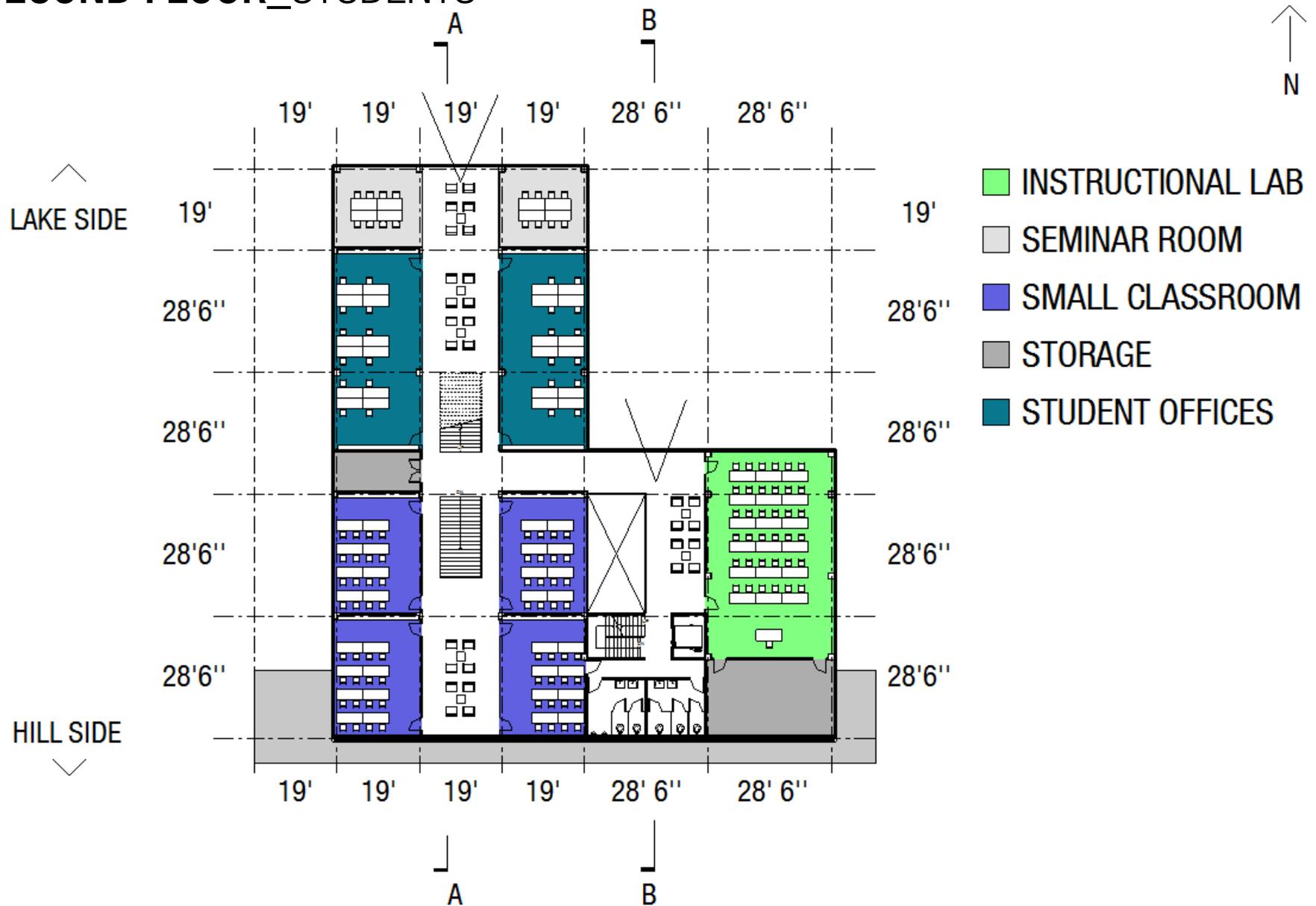
# BASEMENT\_PUBLIC



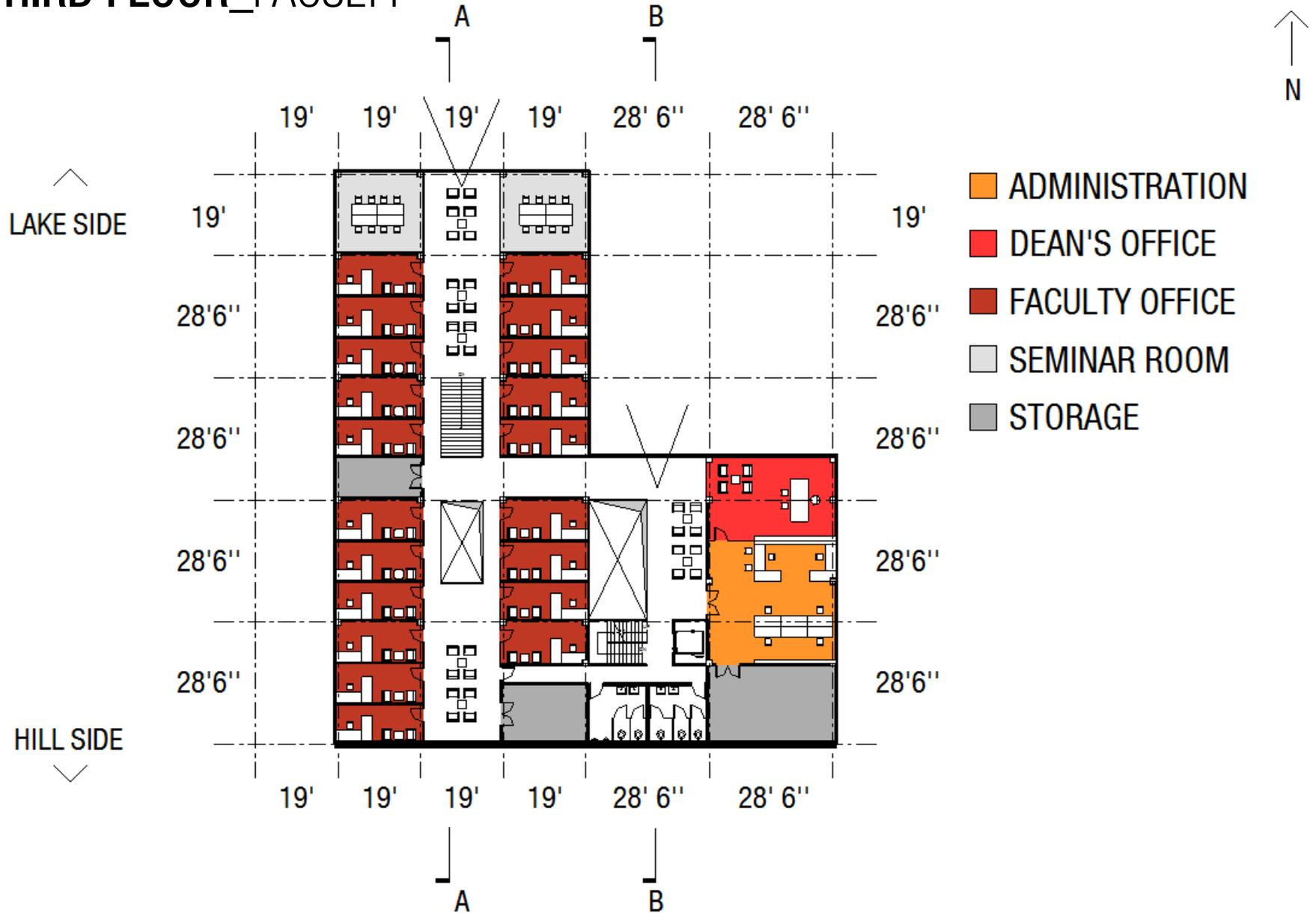
# FIRST FLOOR\_PUBLIC



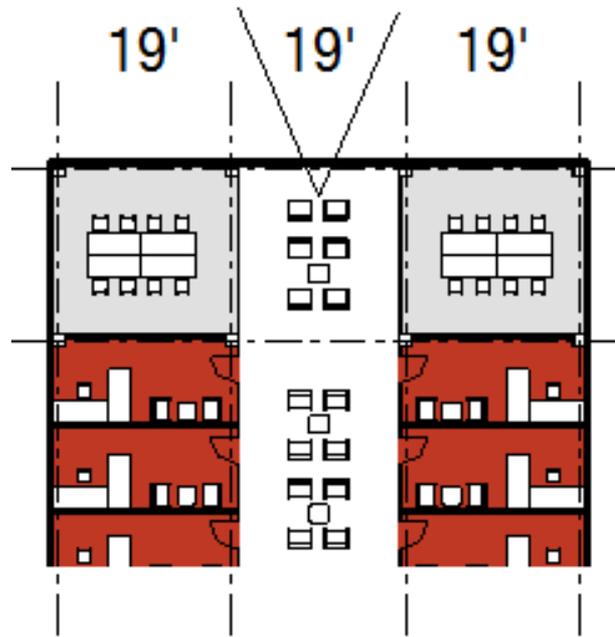
# SECOND FLOOR\_STUDENTS



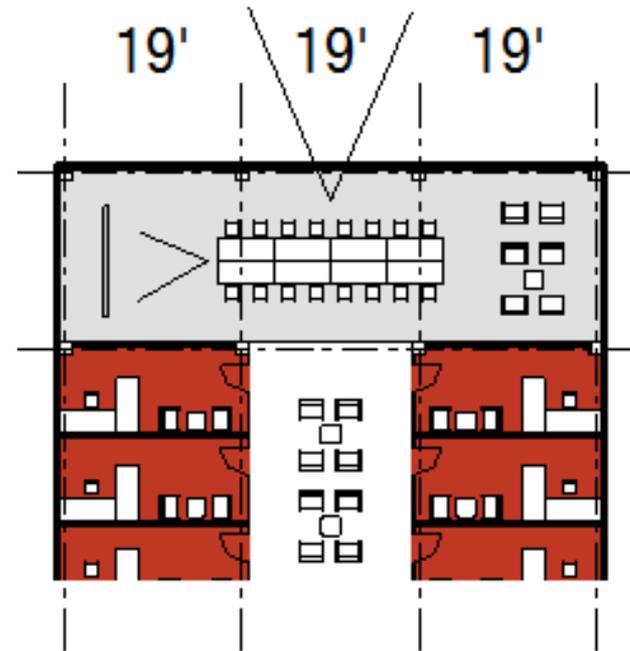
# THIRD FLOOR\_FACULTY



# FIX - FLEX

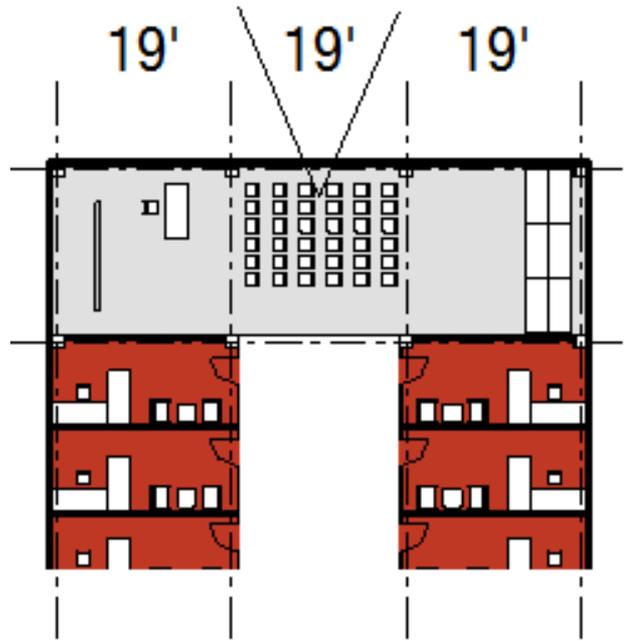


2 SEMINAR ROOMS

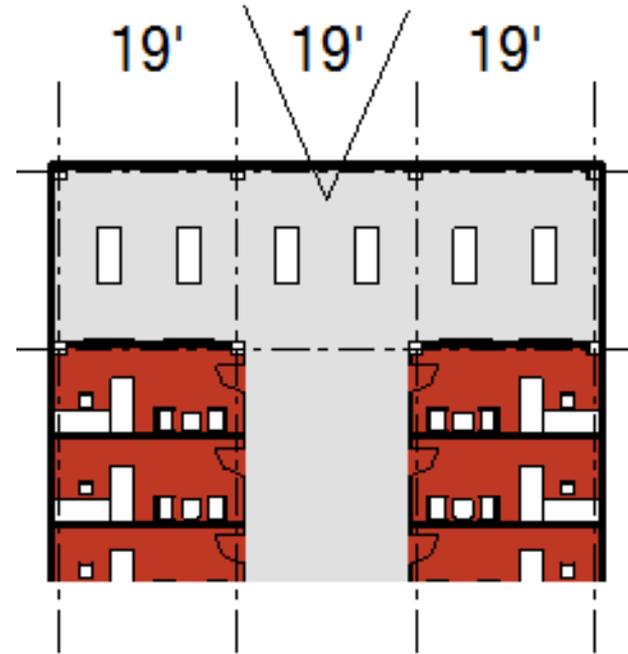


1 **BIG** SEMINAR ROOM

# FIX - FLEX



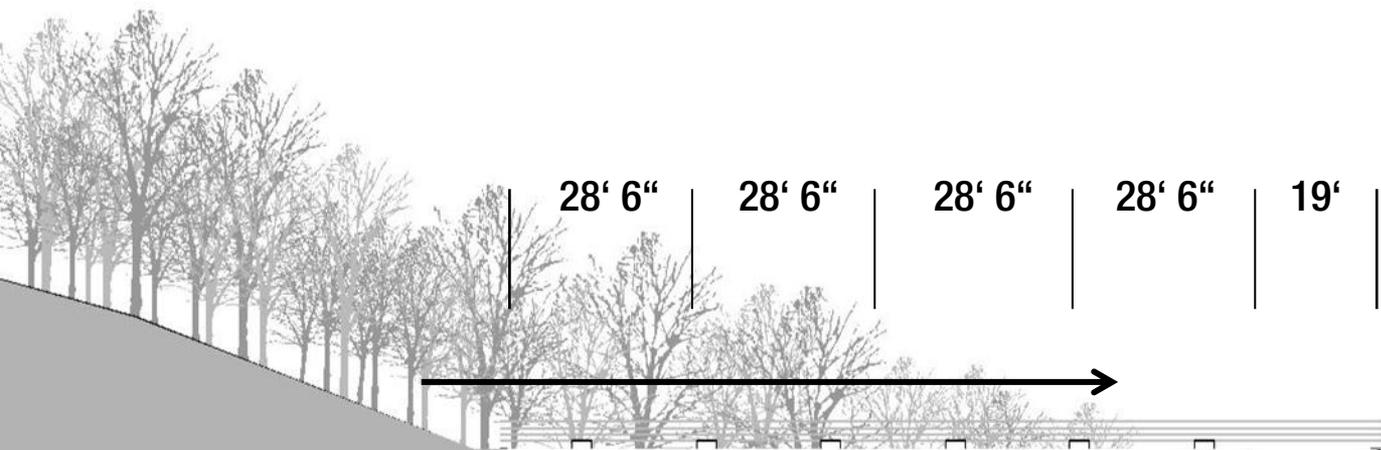
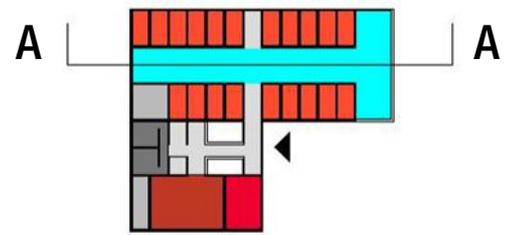
**SMALL LECTURES**



**GALLERY WITH A VIEW**

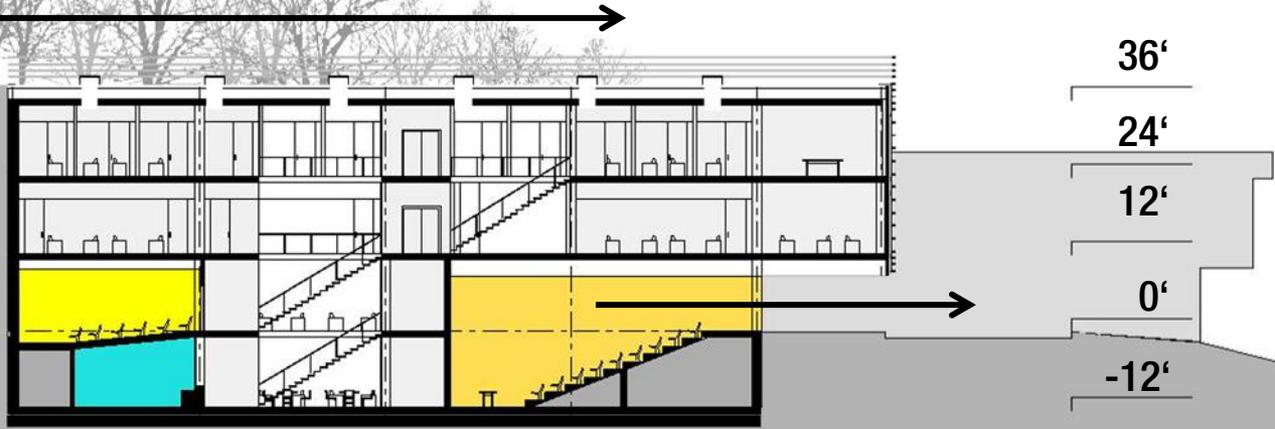
# A-A SECTION

SOUTH  
MUIR WOODS



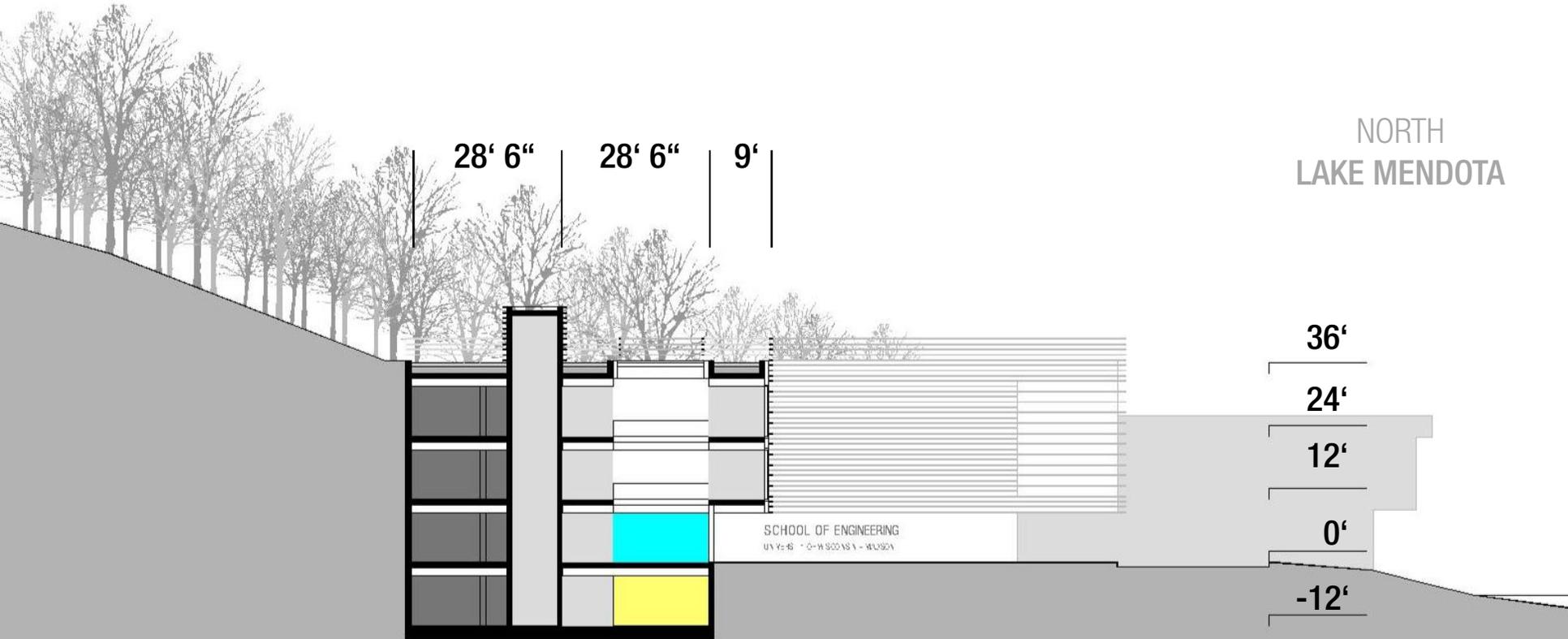
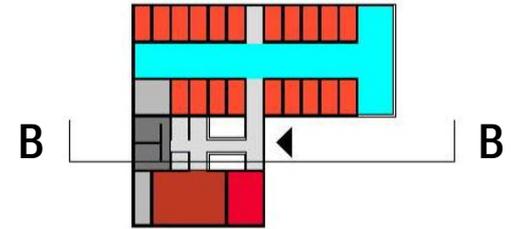
28' 6" | 28' 6" | 28' 6" | 28' 6" | 19'

NORTH  
LAKE MENDOTA



# B-B SECTION

SOUTH  
MUIR WOODS

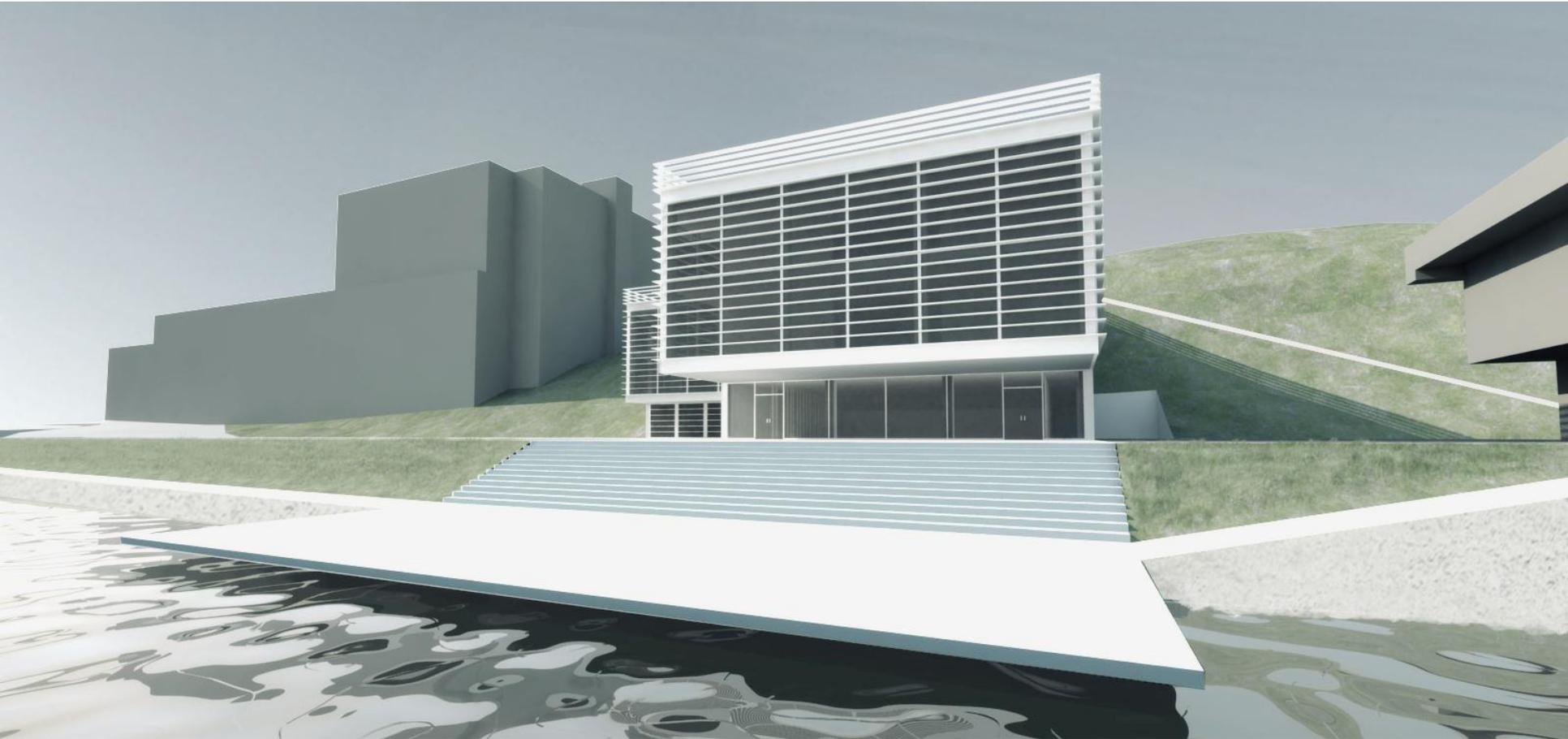


# ENTRANCE PLAZA



BUILDING GEOMETRY IS A RESPONSE TO THE EXISTING LIMNOLOGY LAB IN THE BACKGROUND

# OUTSIDE AUDITORIUM



BUILDING EXTENDS TO THE LAKE WITH AN OUTSIDE AUDITORIUM AND RECEPTION AREA

# AUDITORIUM



AUDITORIUM GETS NATURAL LIGHT FROM THE NORTH SIDE, OVERLOOKING THE LAKE

# LOUNGE AREA



STAIRCASE IS THE MAIN ARCHITECTURAL ELEMENT OF THE LOUNGE, LINK BETWEEN FLOORS

# SEMINAR ROOMS



FLEXIBLE SEMINAR ROOMS SHOW AN EXAMPLE OF A COLLABORATIVE OPEN FLOOR USAGE

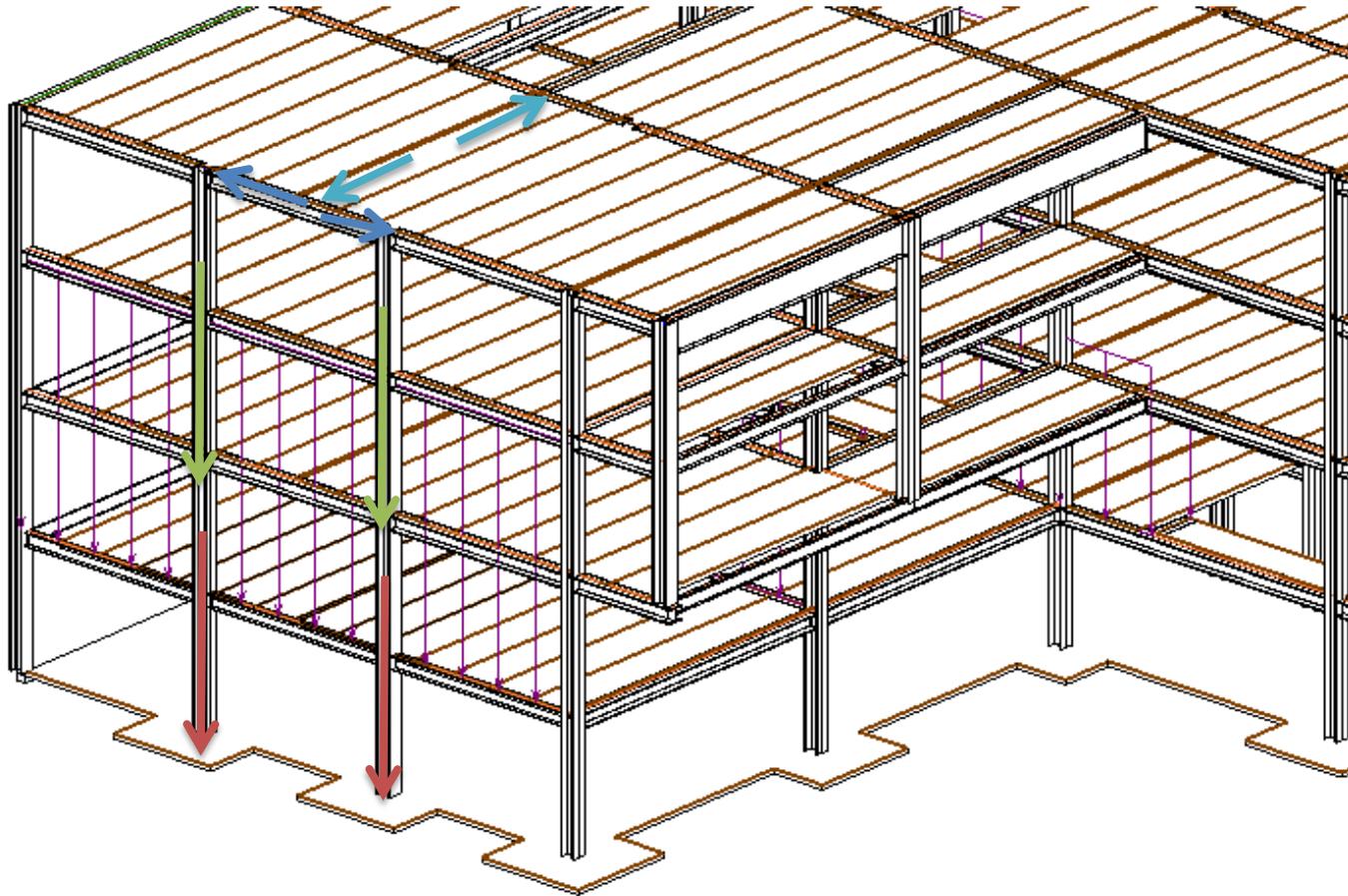
# ROOF AREA



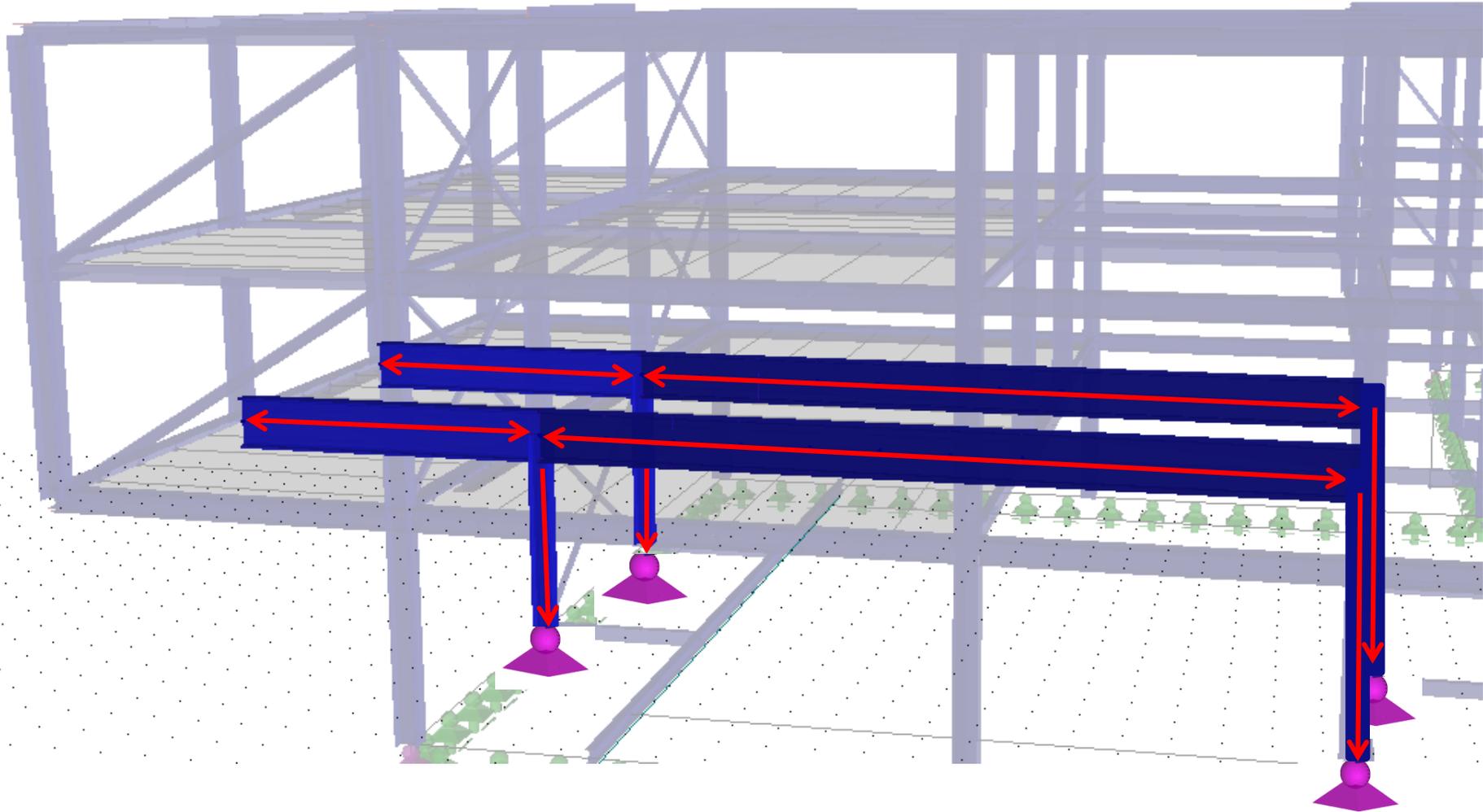
GREEN ROOF PRESENTS AN ADDED VALUE FOR THE ENTIRE CAMPUS AREA

# MODEL OVERVIEW

- Steel beams and columns
  - 4 Beam sizes – WT beam
  - 2 Column sizes
- Precast floors simply supported

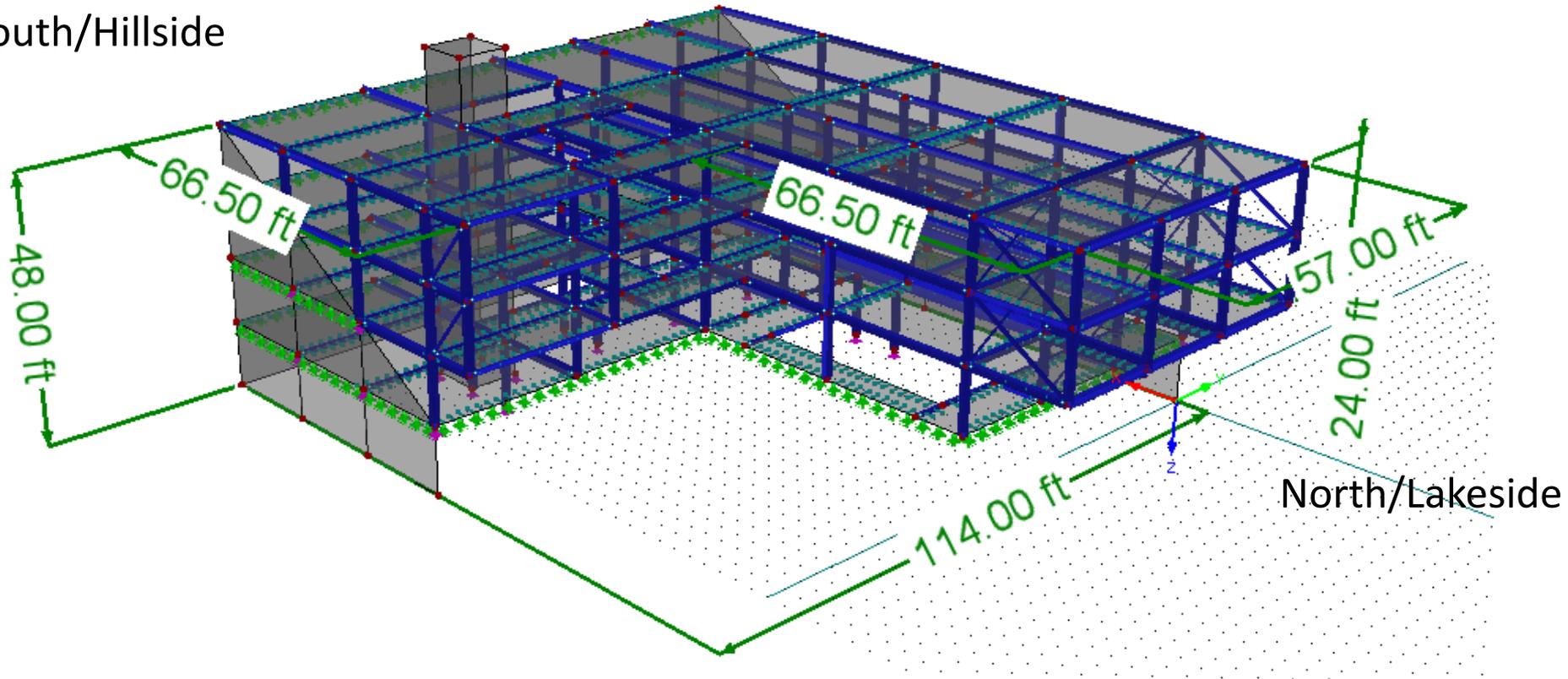


# LOADPATH UNIFORMLY DISTRIBUTED LIVE LOAD



# STRUCTURAL MODEL – 3D VIEW

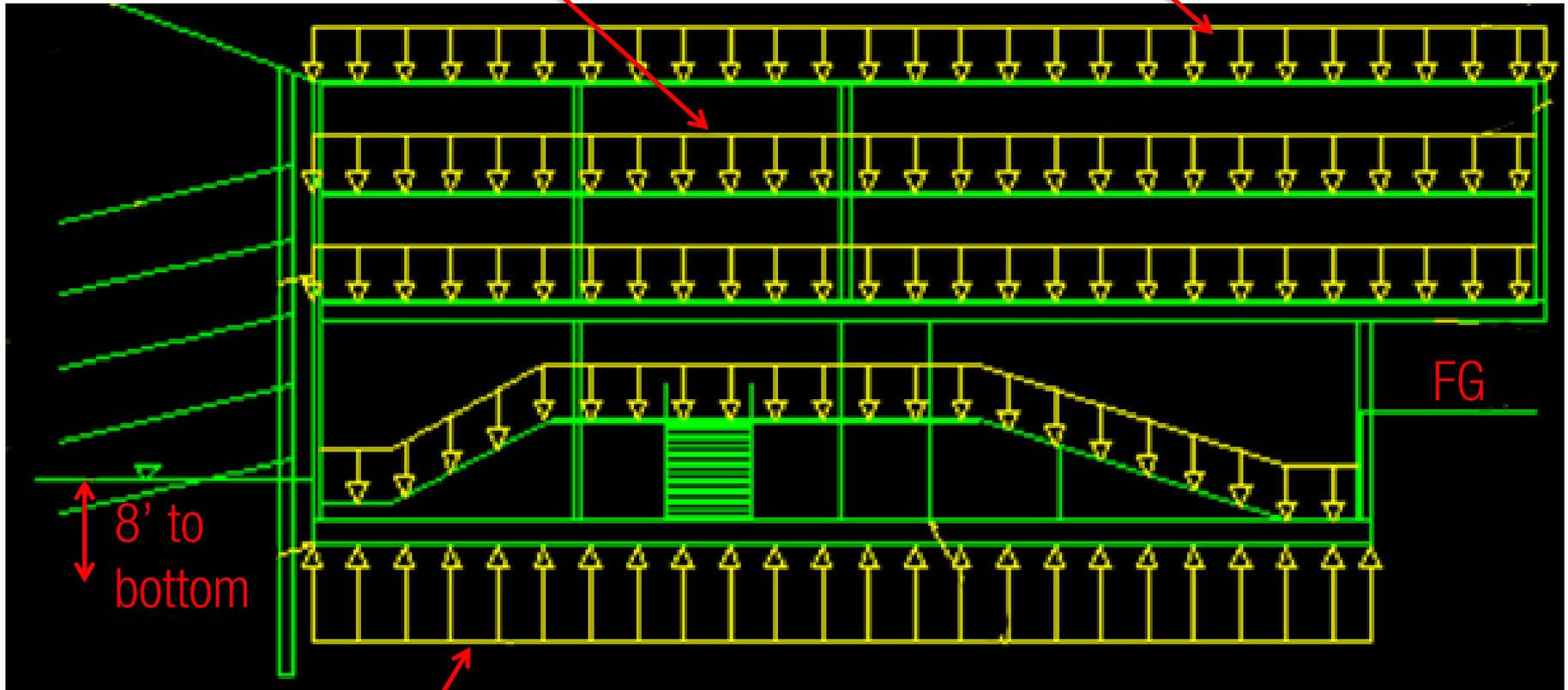
South/Hillside



# WATER TABLE CONCERN

103 psf

143 psf



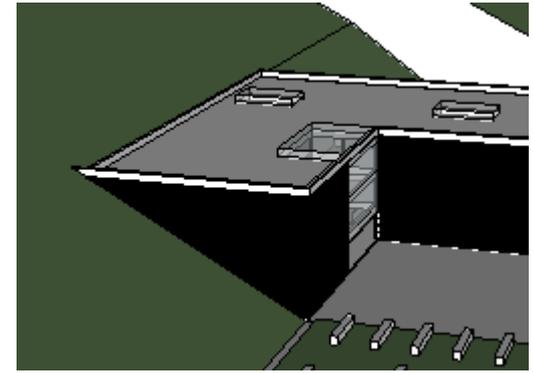
FG

8' to  
bottom

Static pore pressure  
648 psf

uplift < gravity loads

# FOUNDATIONS



Excavated terrain  
220,000 cubic  
feet

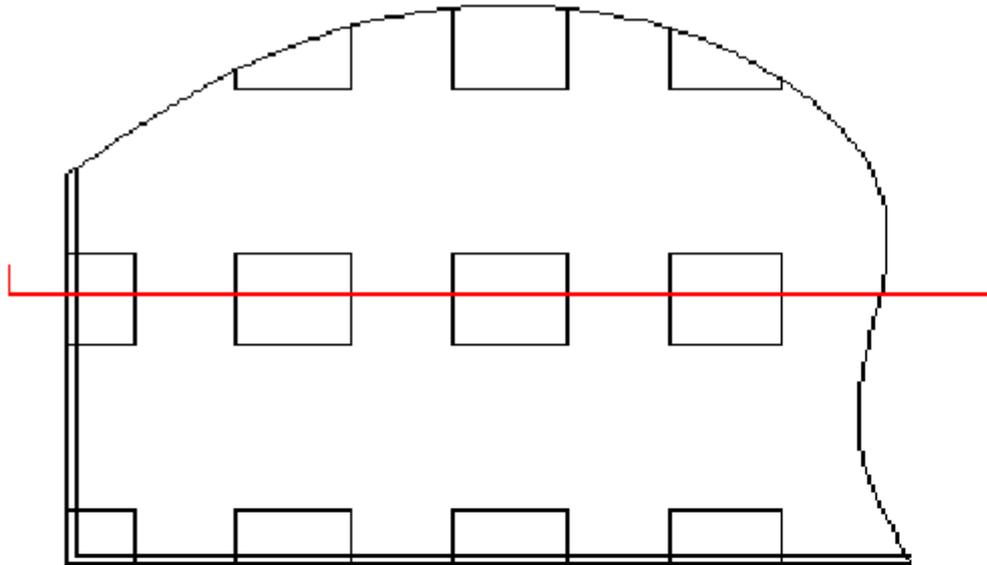
12' tall  
retaining wall

Basement  
below water  
table

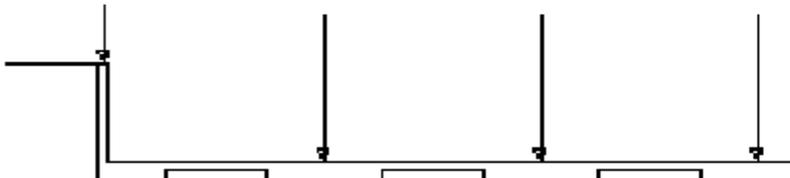
48' tall  
retaining wall



# FOUNDATIONS – MAT FOUNDATION PRESSURES



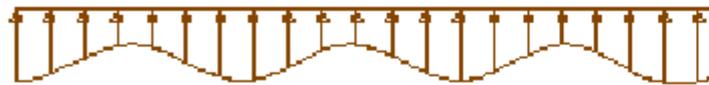
REPRESENTATIVE AREA



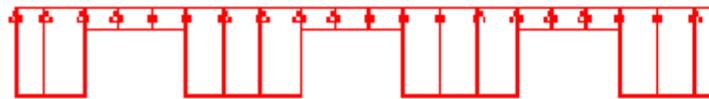
CONSTANT WATER PRESSURE



ACTUAL SOIL PRESSURE



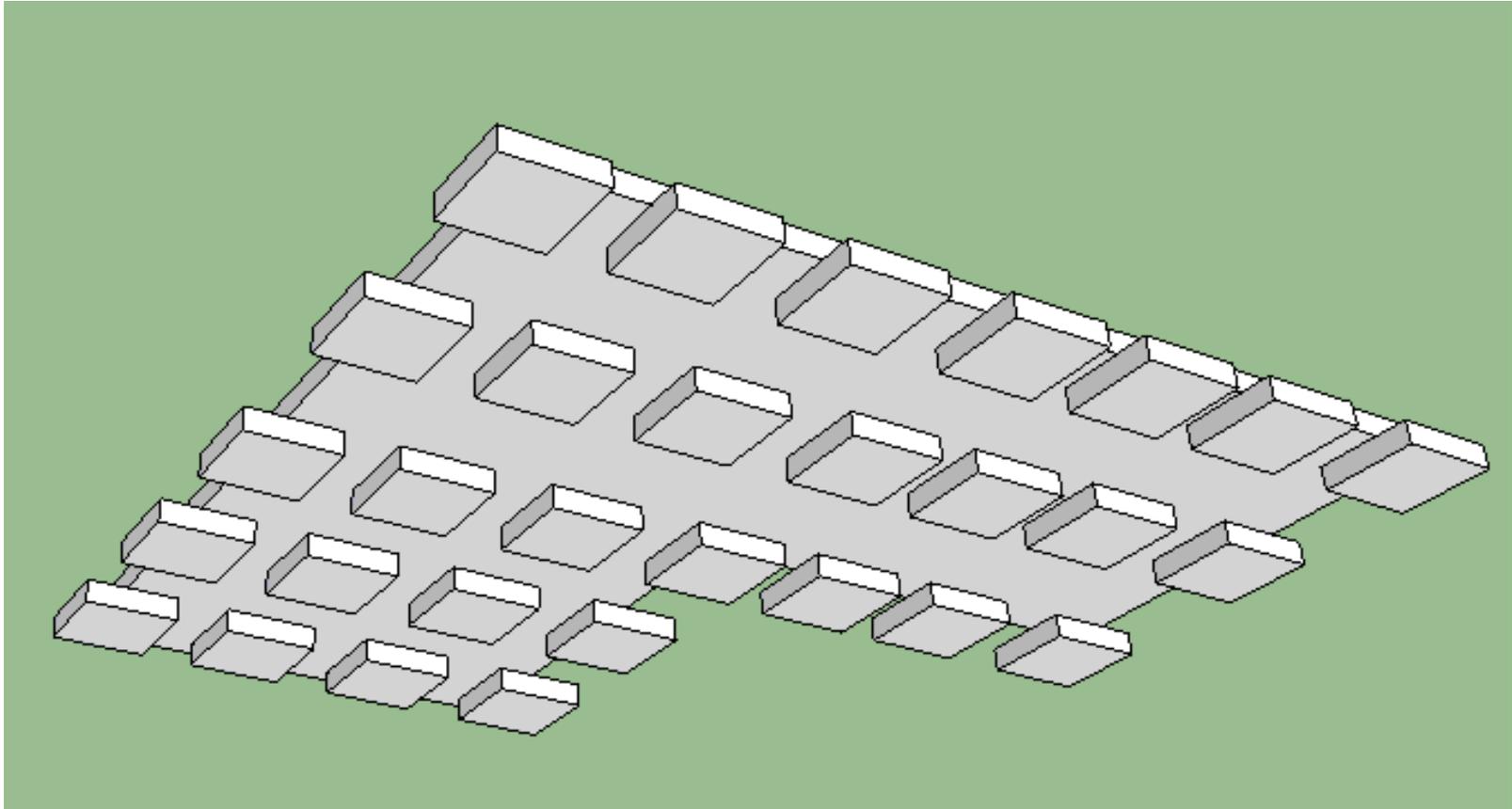
ASSUMED SOIL PRESSURE



3/4 LOAD AT COLUMN LINES

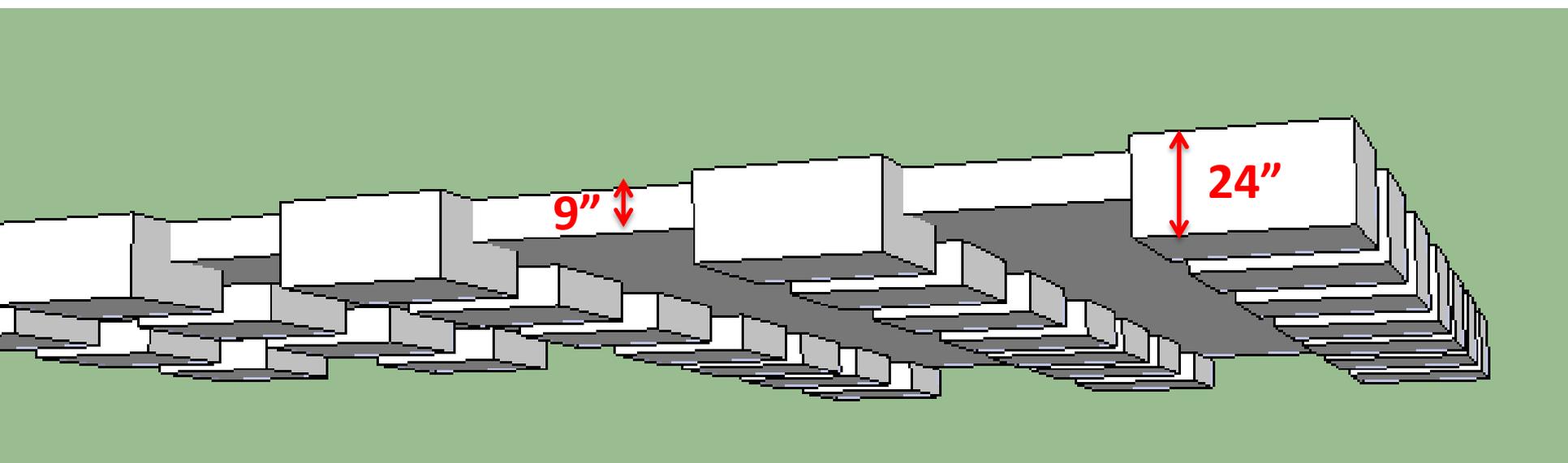
1/4 LOAD BETWEEN COLUMNS

# FOUNDATIONS –MAT FOUNDATION IN 3D

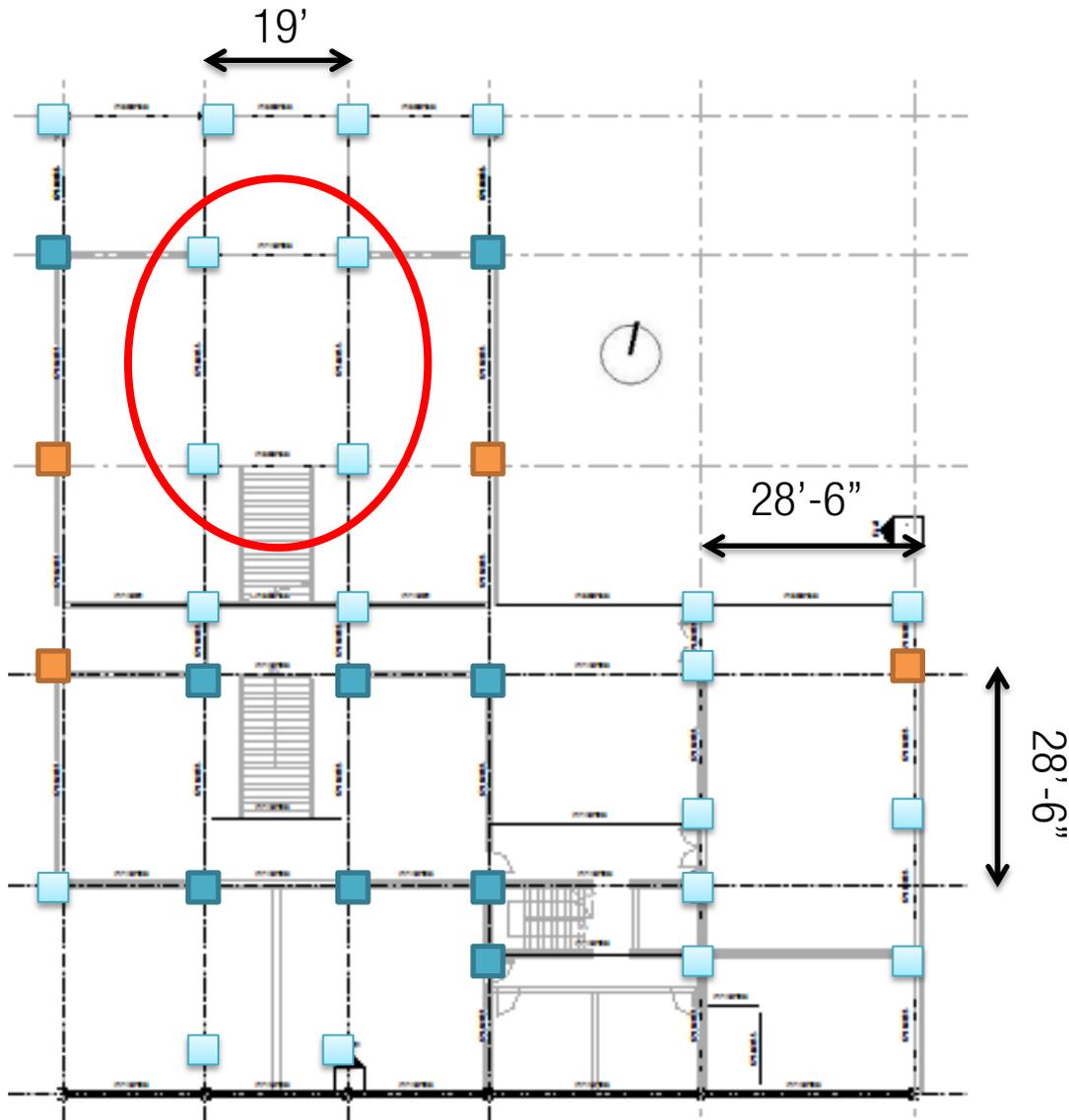


- Spread footings below columns
- Need mat foundation everywhere due to water table

# FOUNDATIONS –MAT FOUNDATION IN 3D

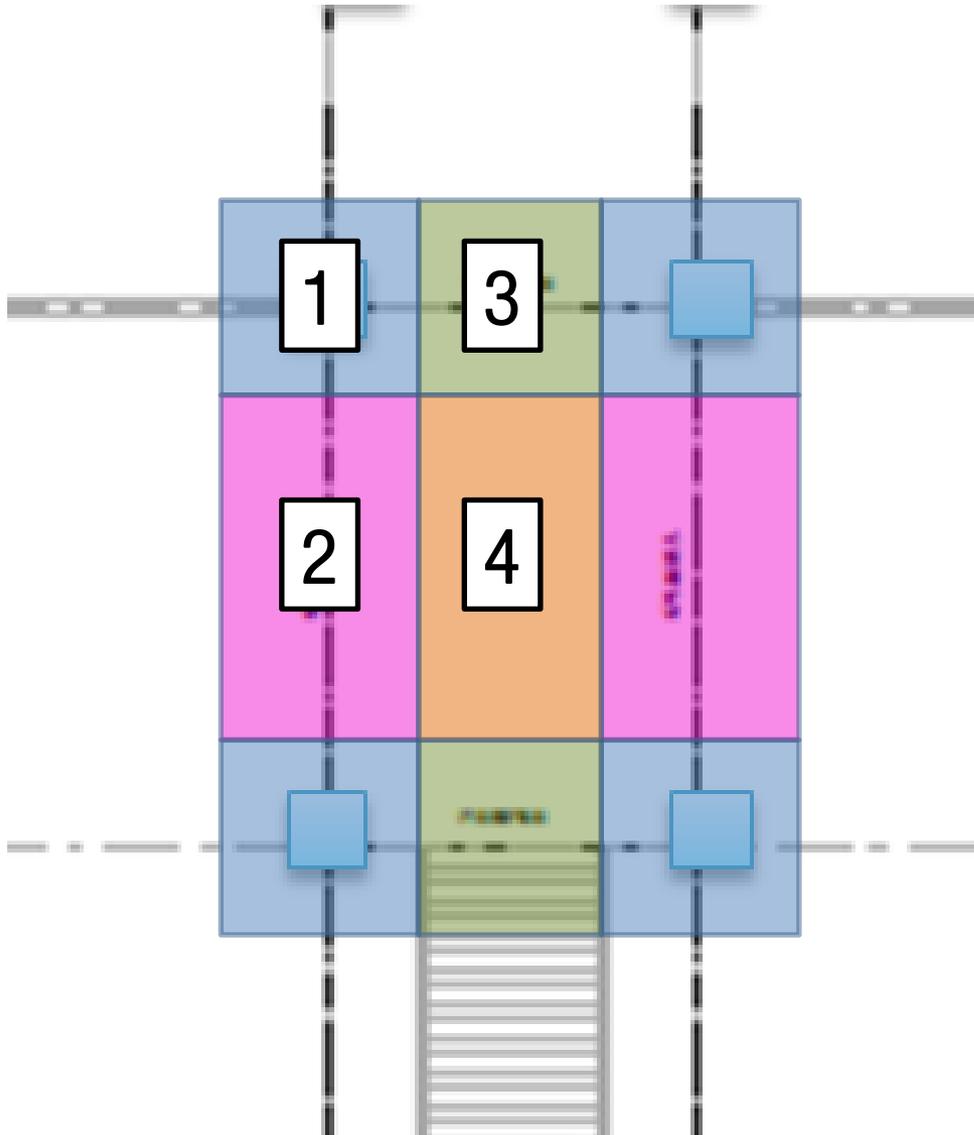


# COLUMN LAYOUT

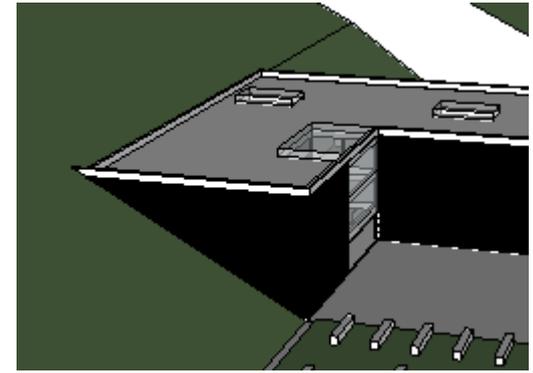


- W14x90
- W14x53 (not on all floors)
- W14x53

# FOUNDATIONS – 4 DIFFERENT PREFAB REBAR LOCATIONS



# FOUNDATIONS



Excavated terrain  
220,000 cubic  
feet

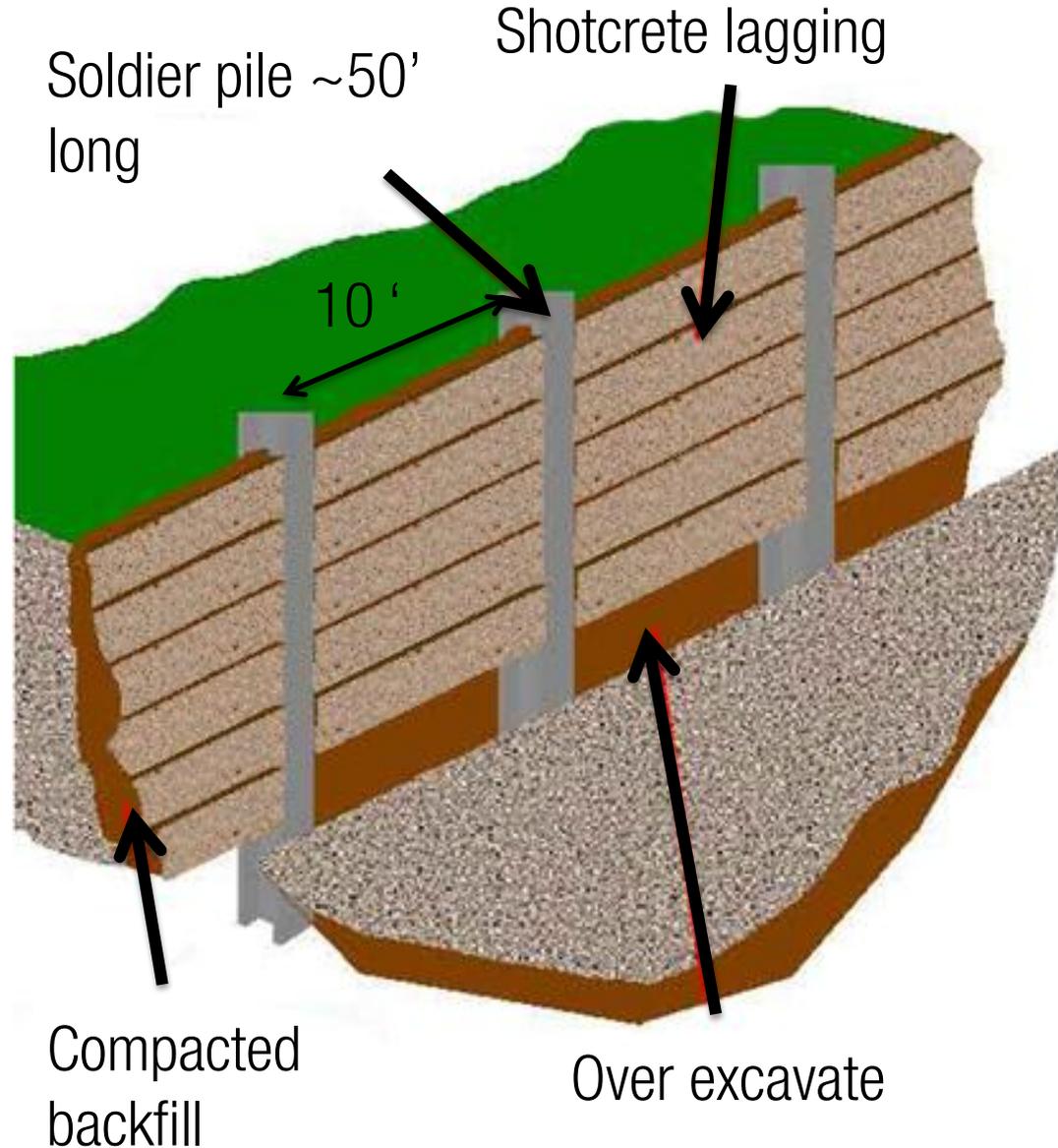
12' tall  
retaining wall

Basement  
below water  
table

48' tall  
retaining wall



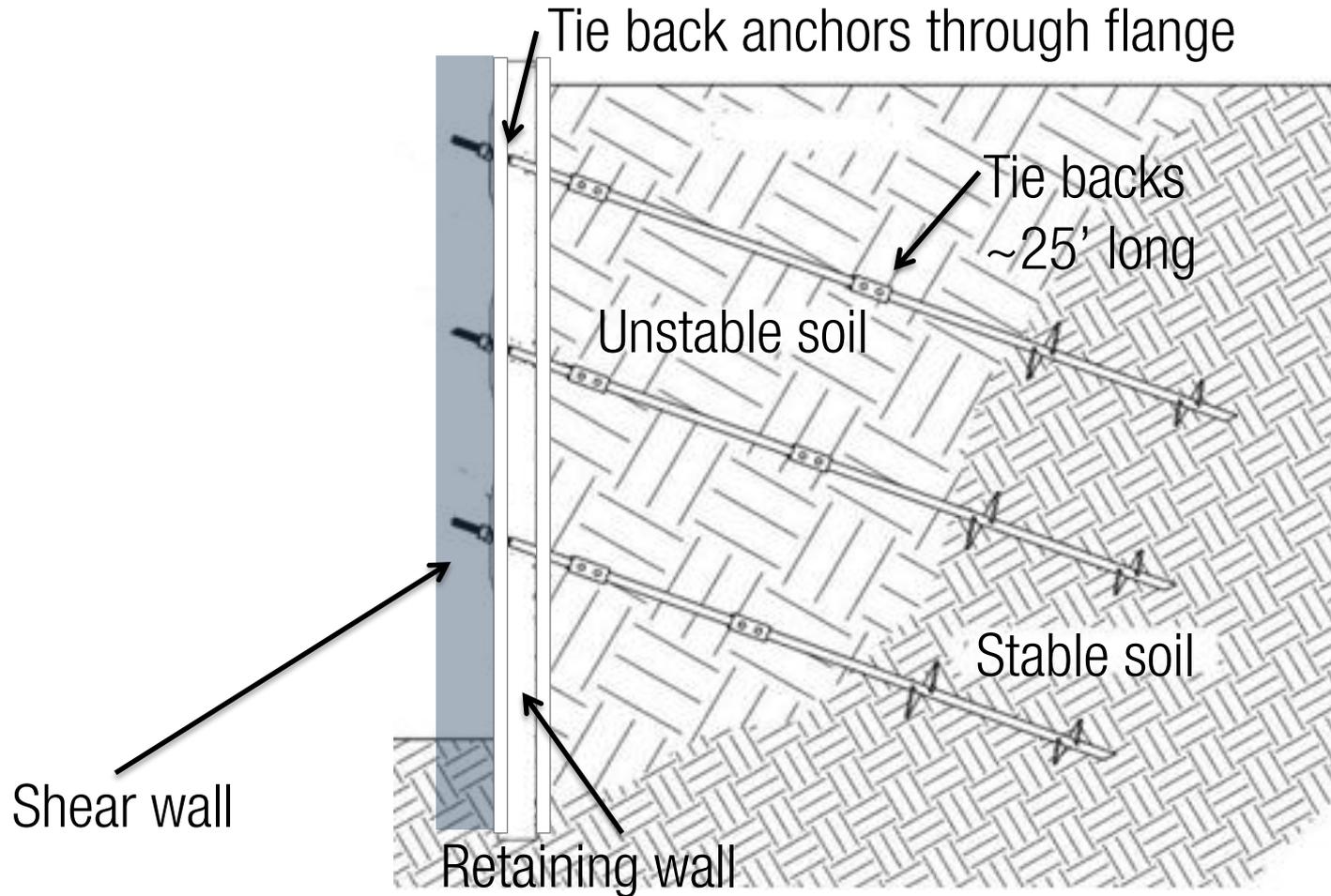
# RETAINING WALL SOLUTION: TOP DOWN CONSTRUCTION TIE BACK WALL



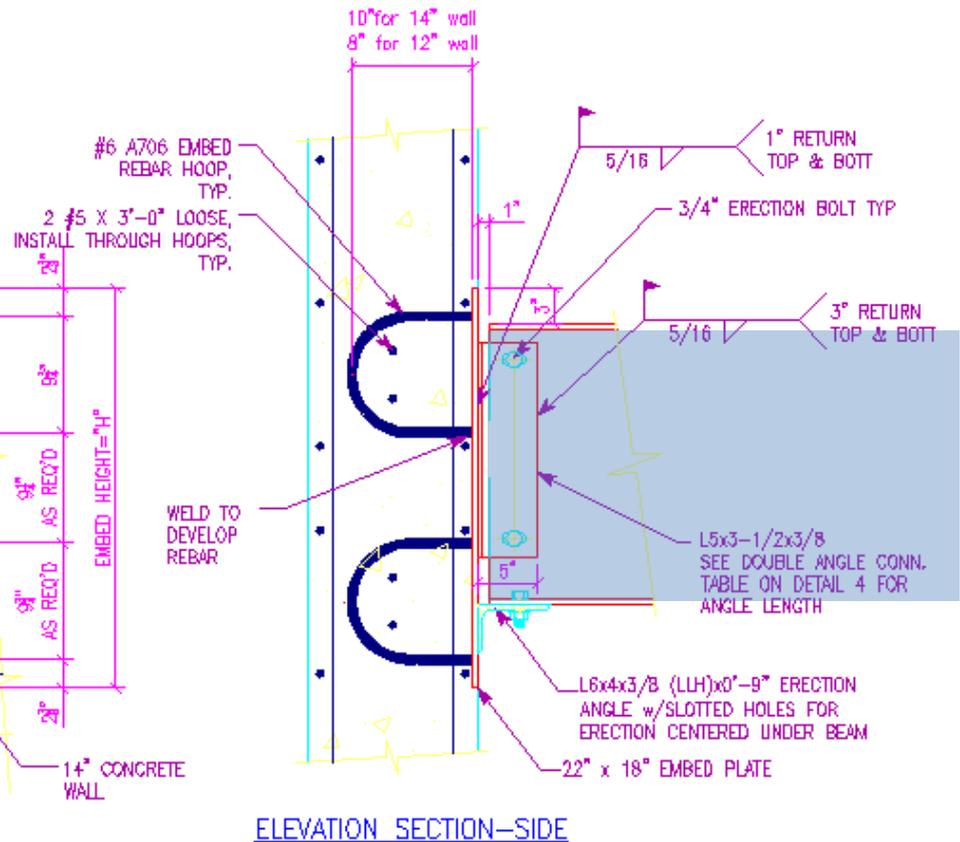
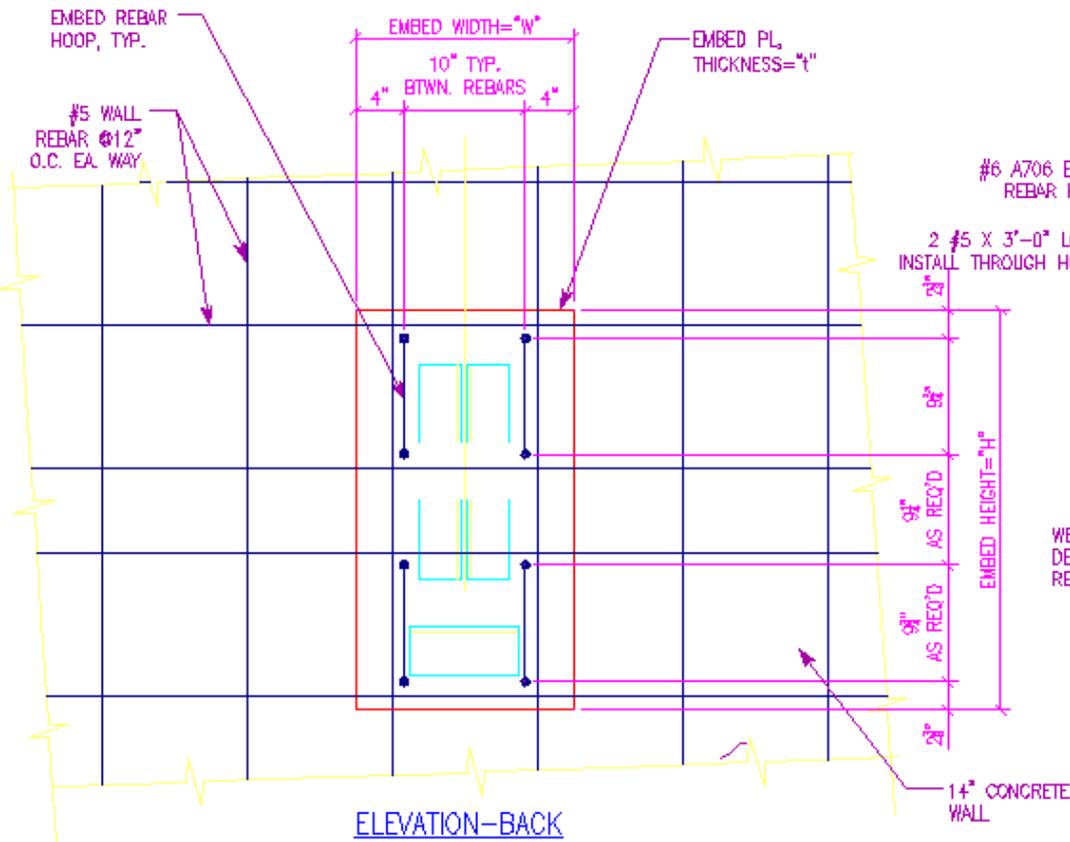
# RETAINING WALL SOLUTION: SIMILAR TO WALL SEEN OUTSIDE Y2E2



# RETAINING WALL SOLUTION: BUILDING WALL ATTACHED FORMING RETAINING/SHEAR WALL



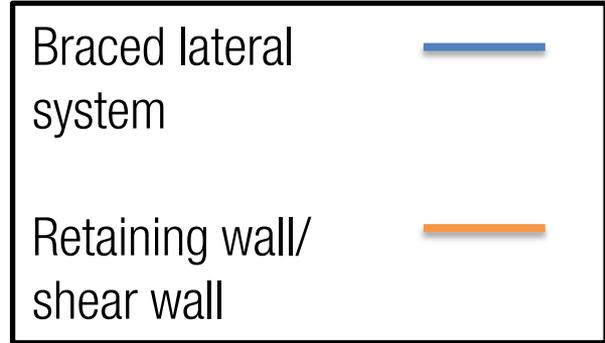
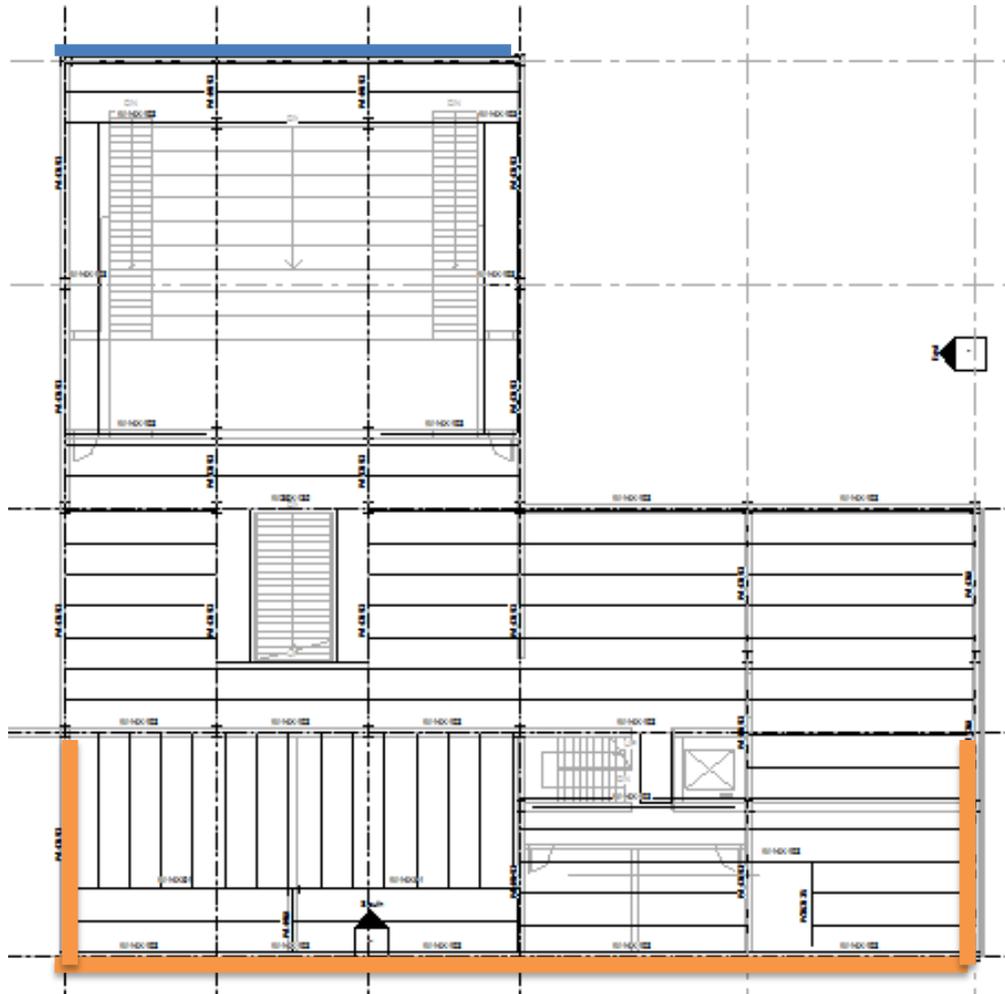
# FOUNDATIONS- CONNECTION FROM RETAINING WALL TO BEAM



# FOUNDATIONS- CONNECTION FROM RETAINING WALL TO BEAM

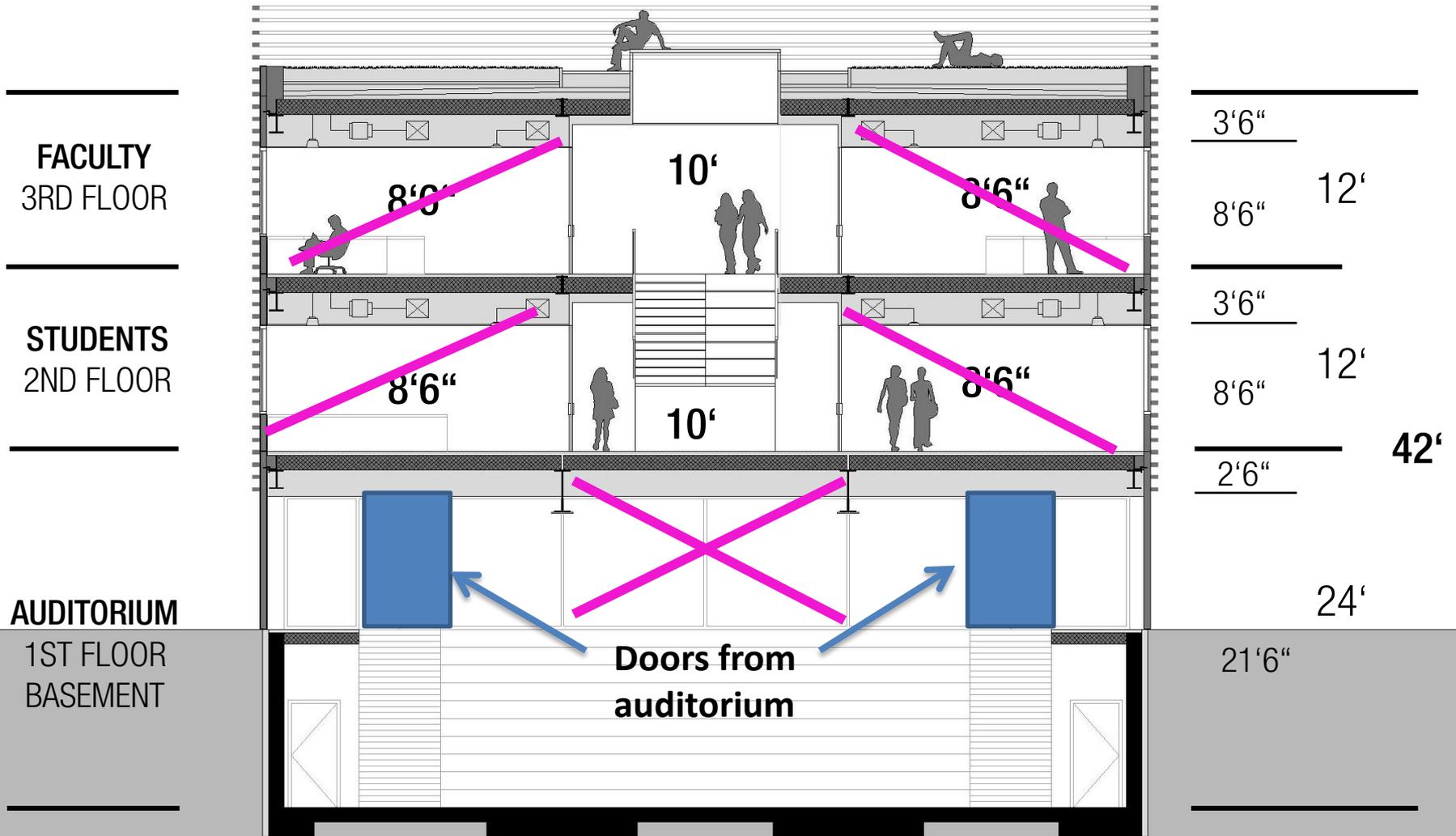


# LATERAL SYSTEM

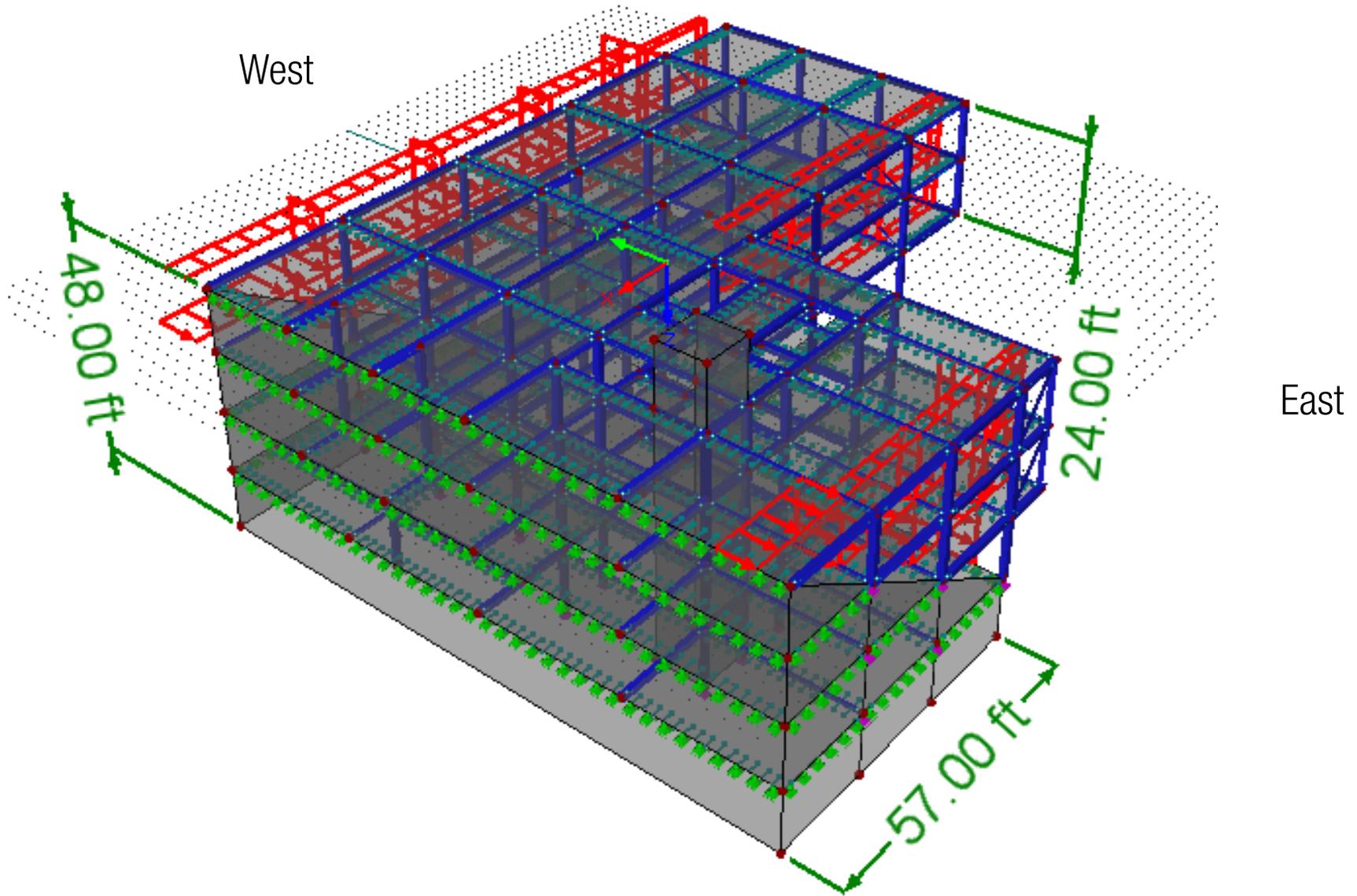


# LATERAL SYSTEM

HSS 4X4X1/4

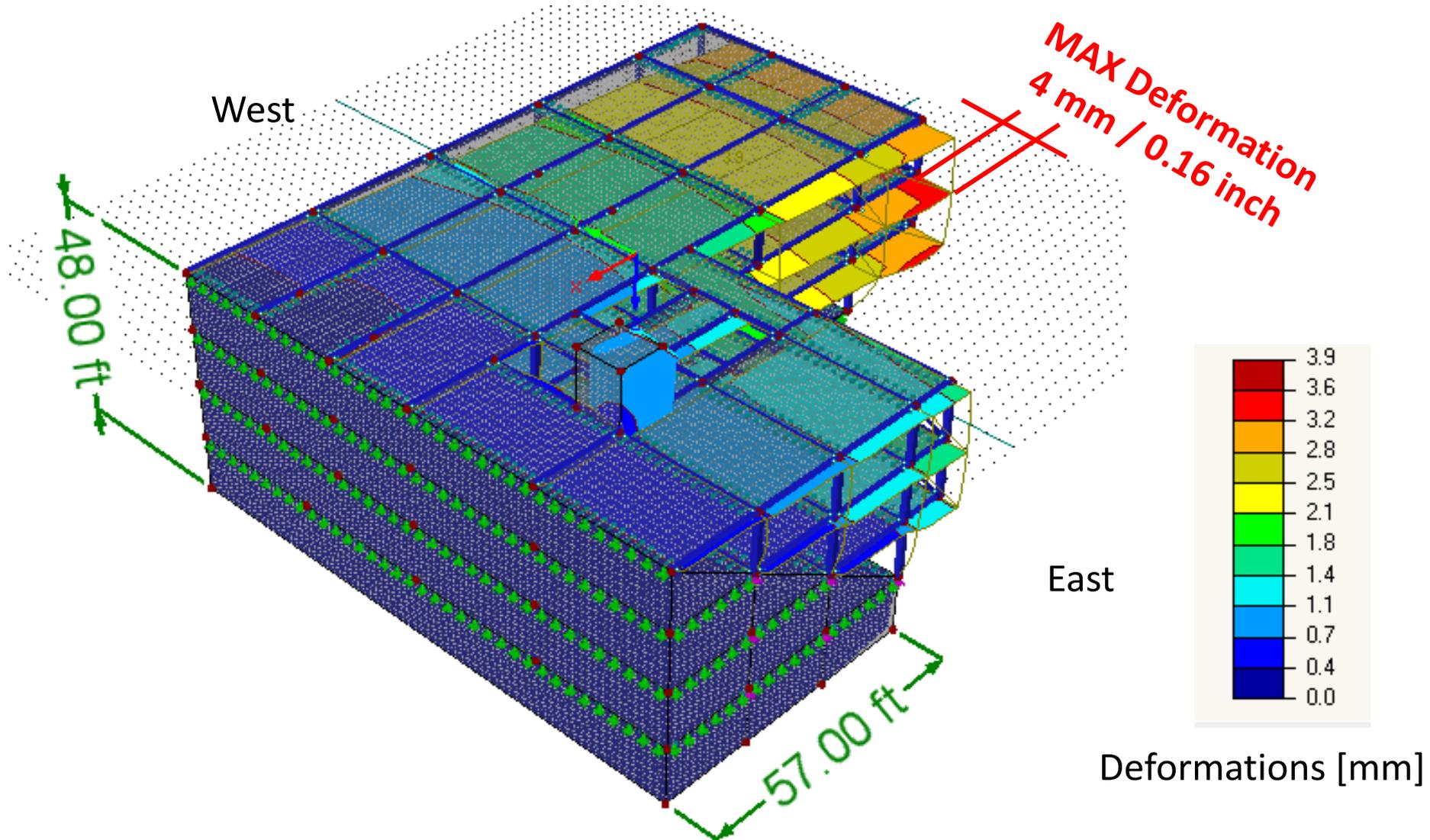


# STRUCTURAL MODEL WIND EAST WEST

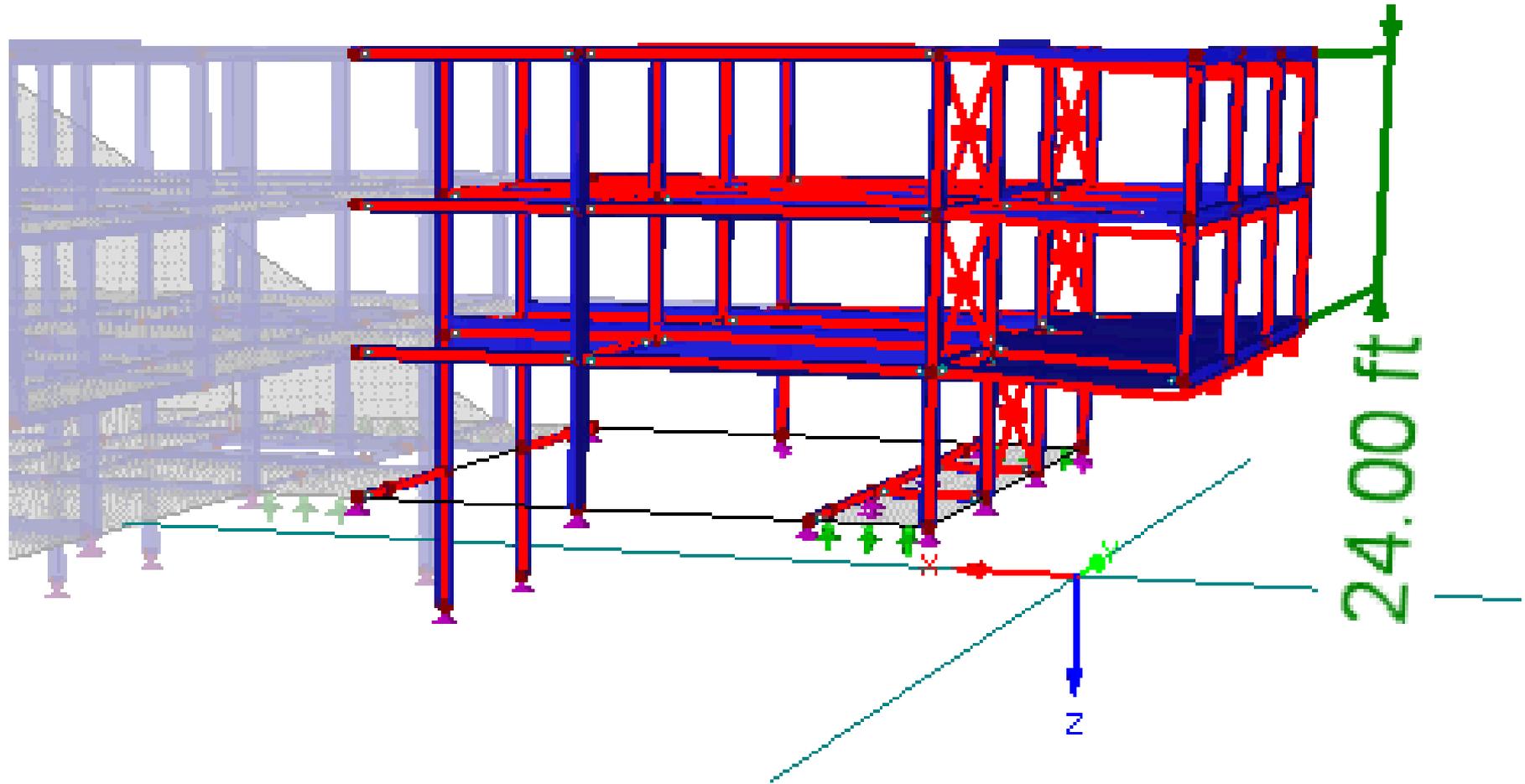


# STRUCTURAL MODEL WIND EAST WEST

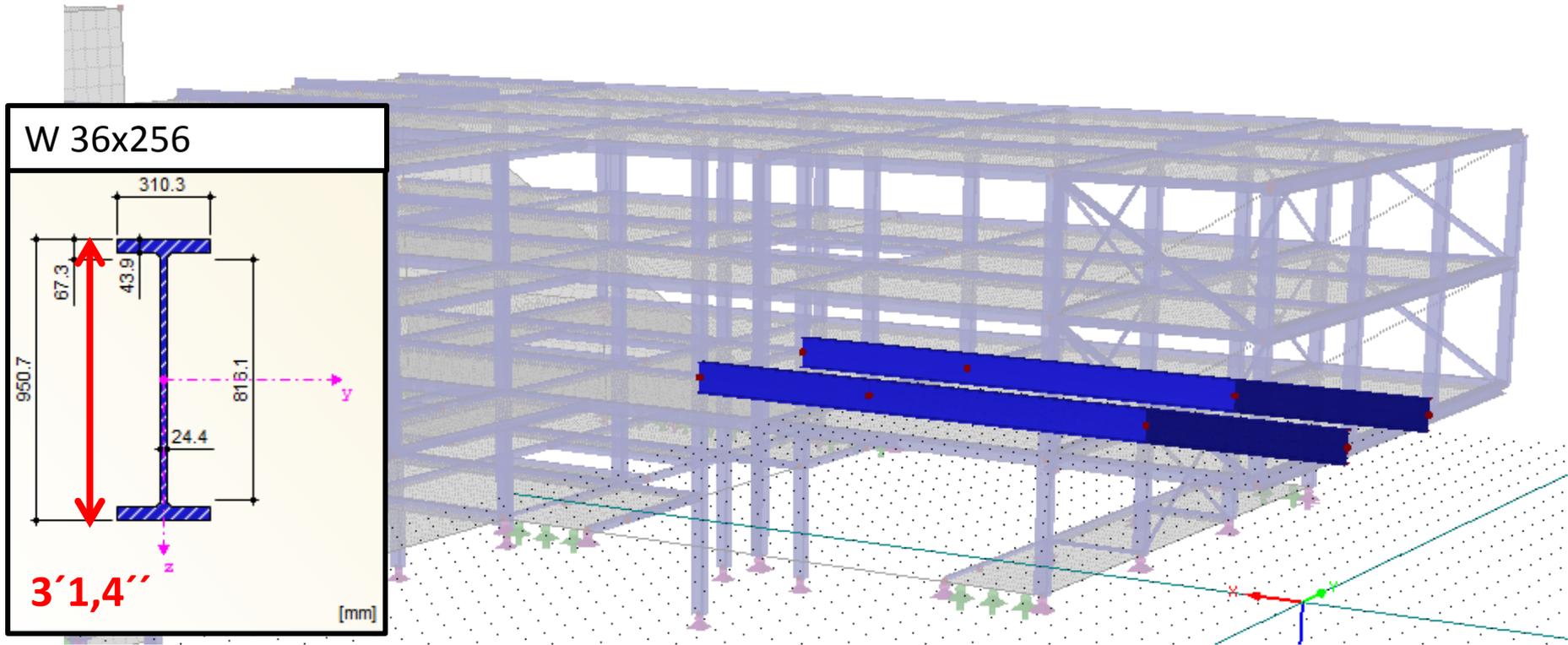
Nonlinear Analyses 10 Timesteps- Deformation Result



# 1<sup>ST</sup> EIGENFREQUENCY 4.54 Hz



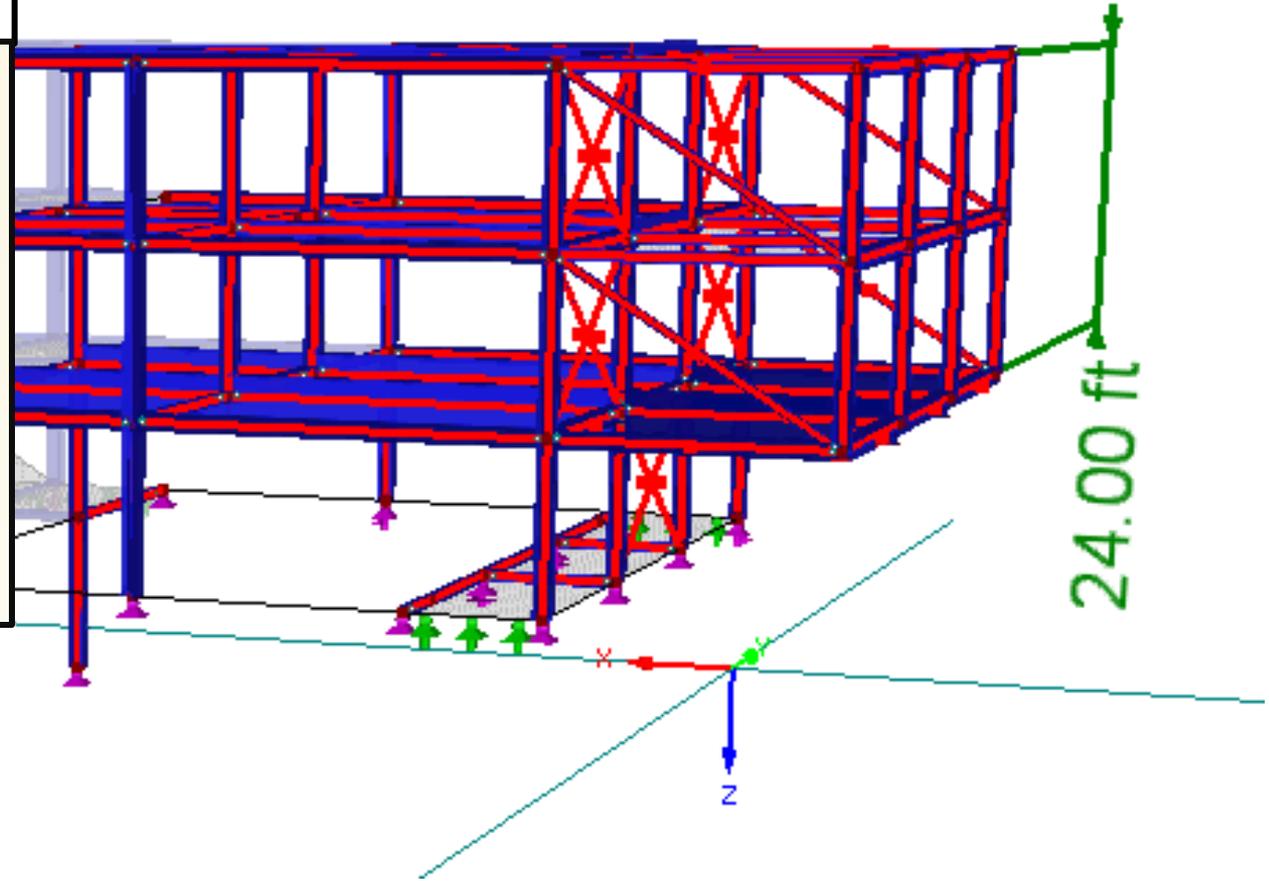
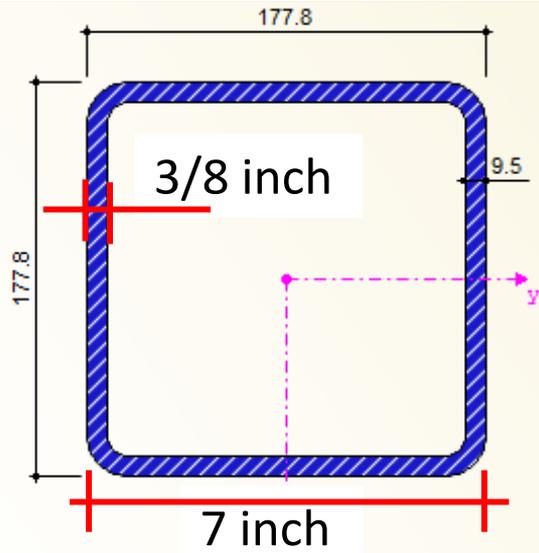
# EIGENFREQUENCY CHECK



- Prevent the building from vibrating
- Need to avoid frequencies in the range 1 to 4.5 Hz
- A lot of uncertainties (live load mass, damping)

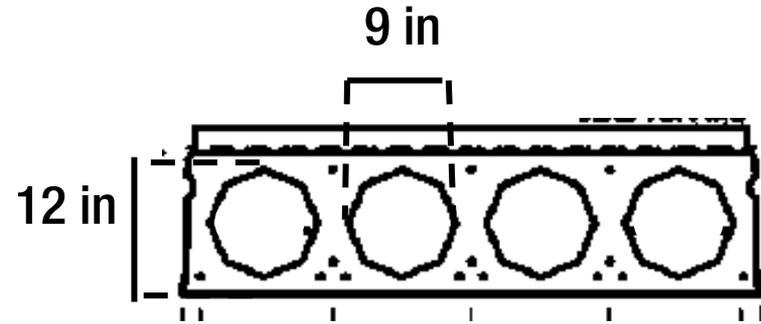
# 1<sup>ST</sup> EIGENFREQUENCY 3.19 Hz

SHS 7x3/8

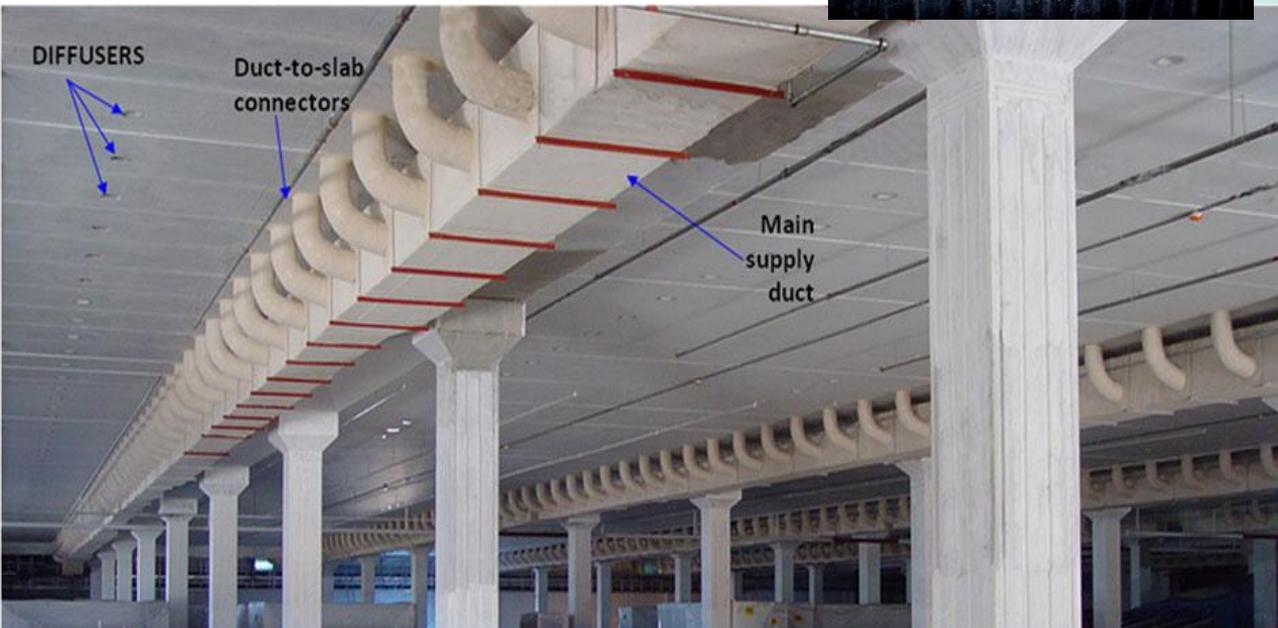
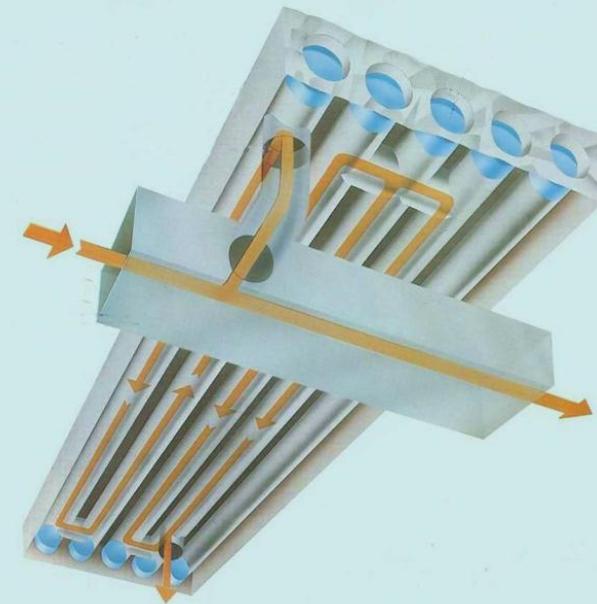


# INTEGRATION = OPTIMIZATION: TERMOBUILD SLABS

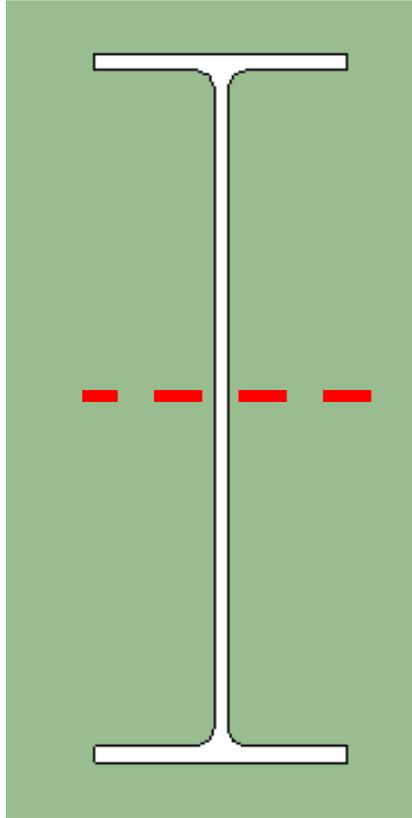
- Structural precast, prestressed slabs
- Voids used to transport air into room
- Can also implement concealed electrical wiring into voids
- Fire rating of up to 3 hours



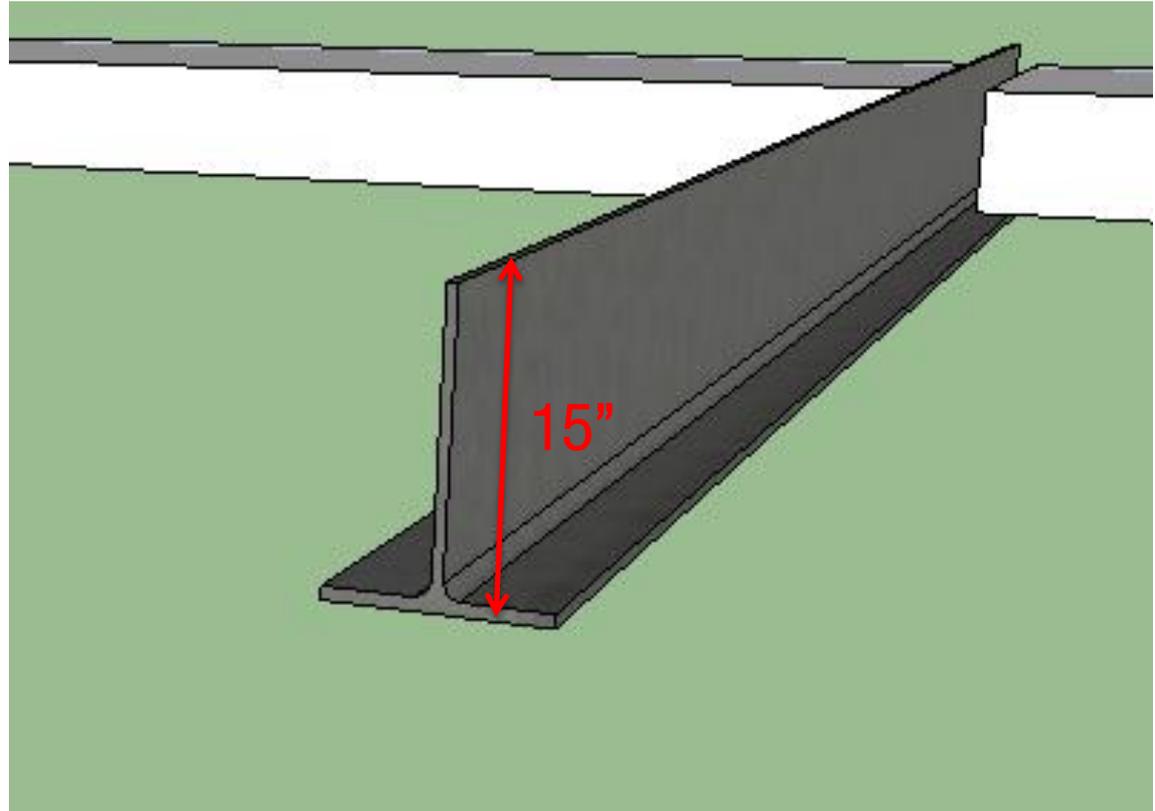
TermoDeck slab



# WT SLAB CONSTRUCTION

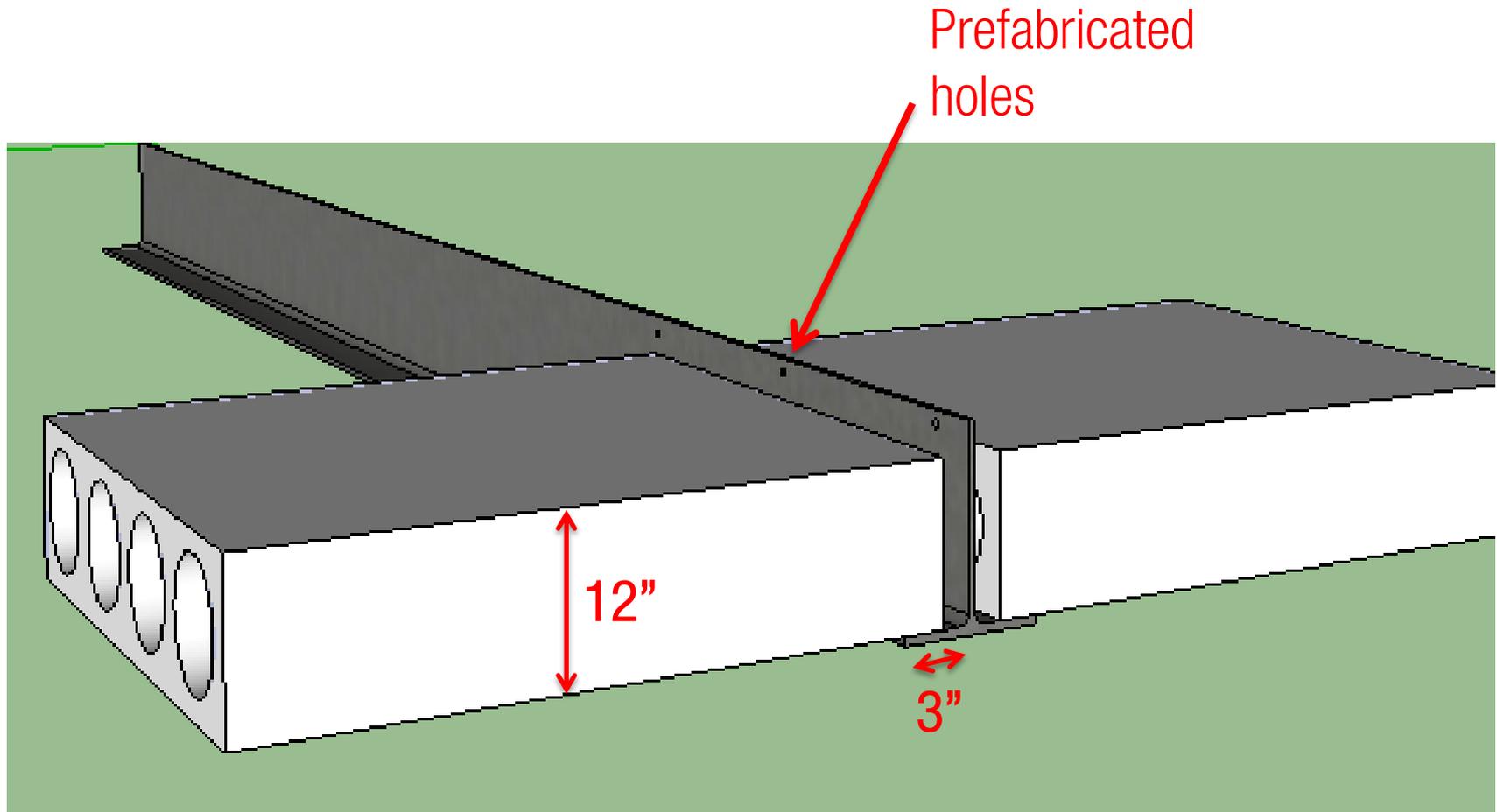


W30x90

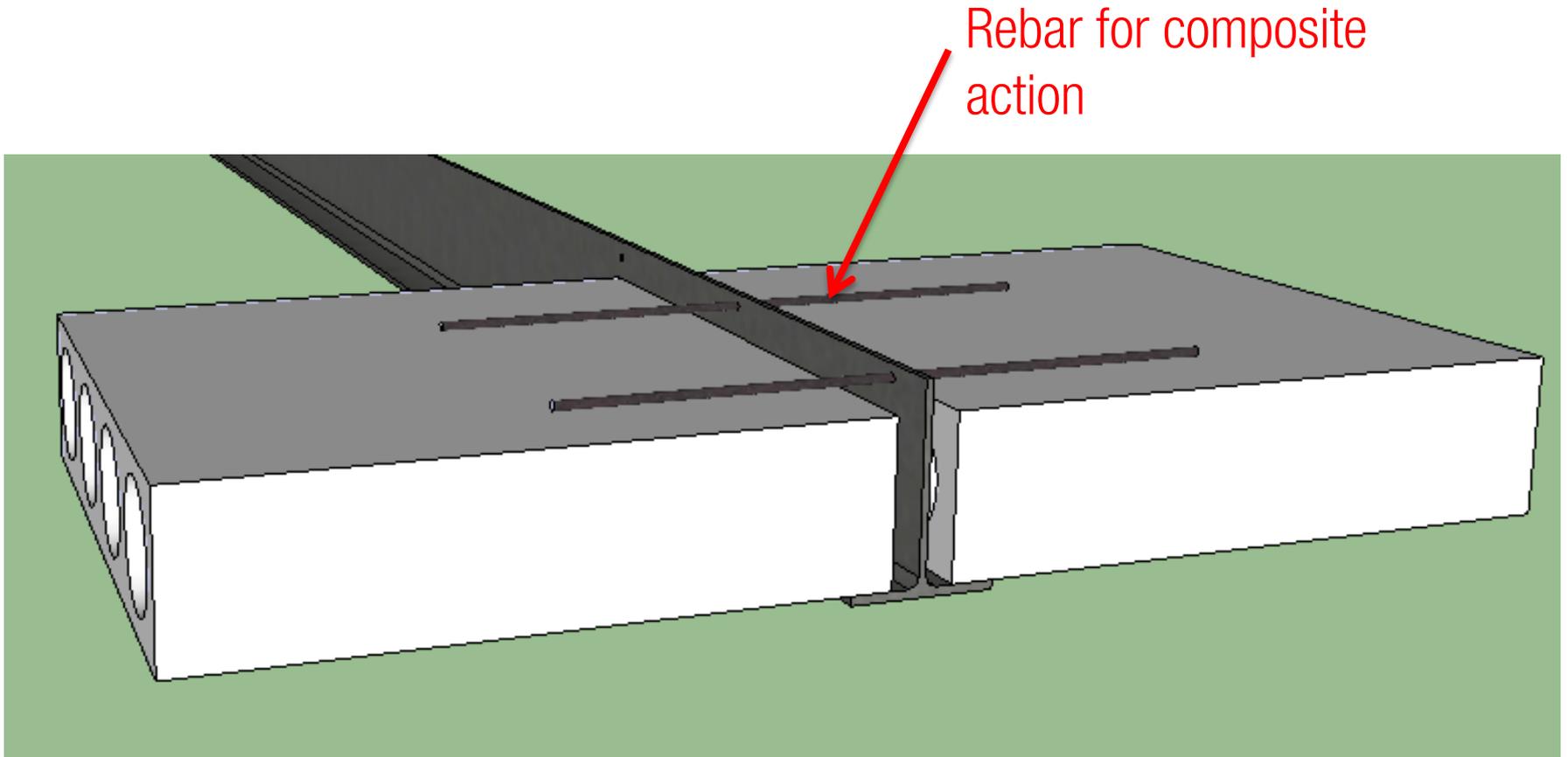


WT beam

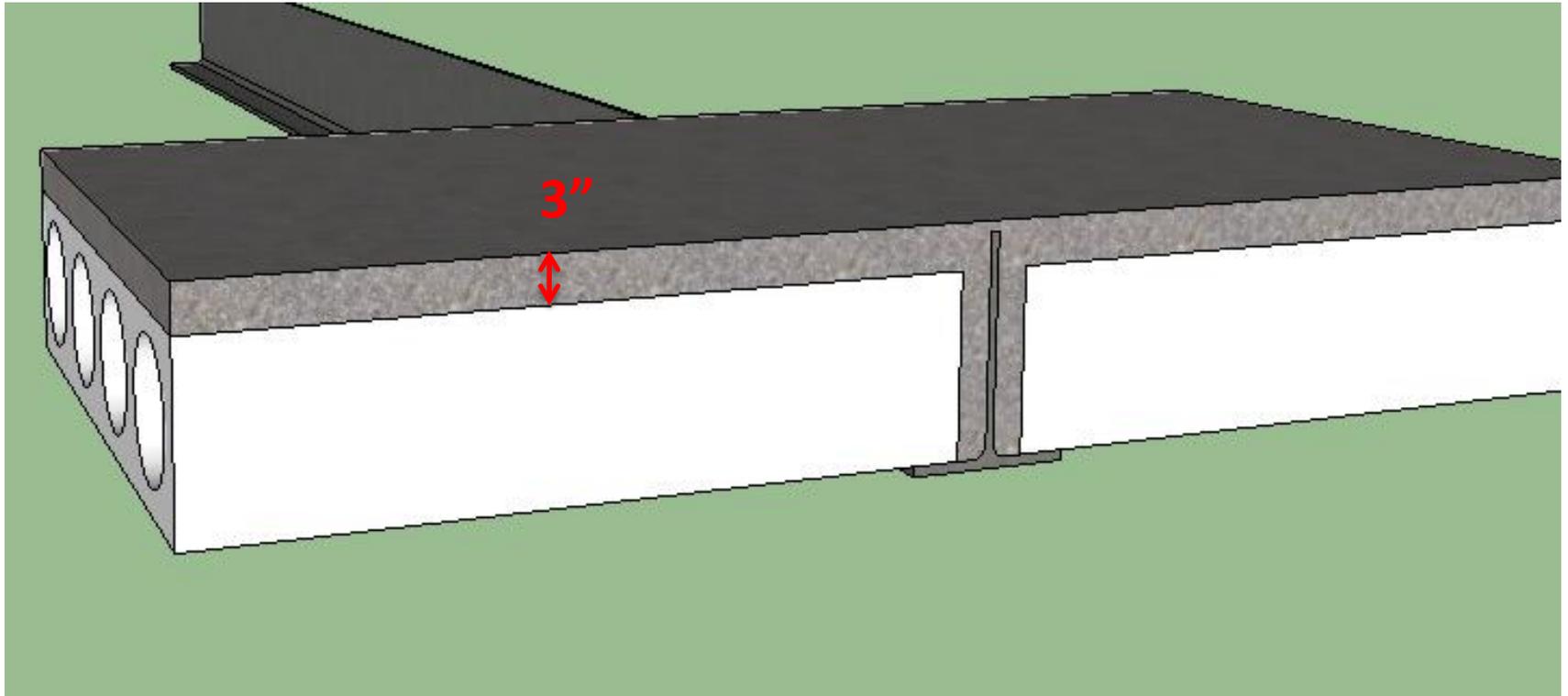
# WT SLAB CONSTRUCTION



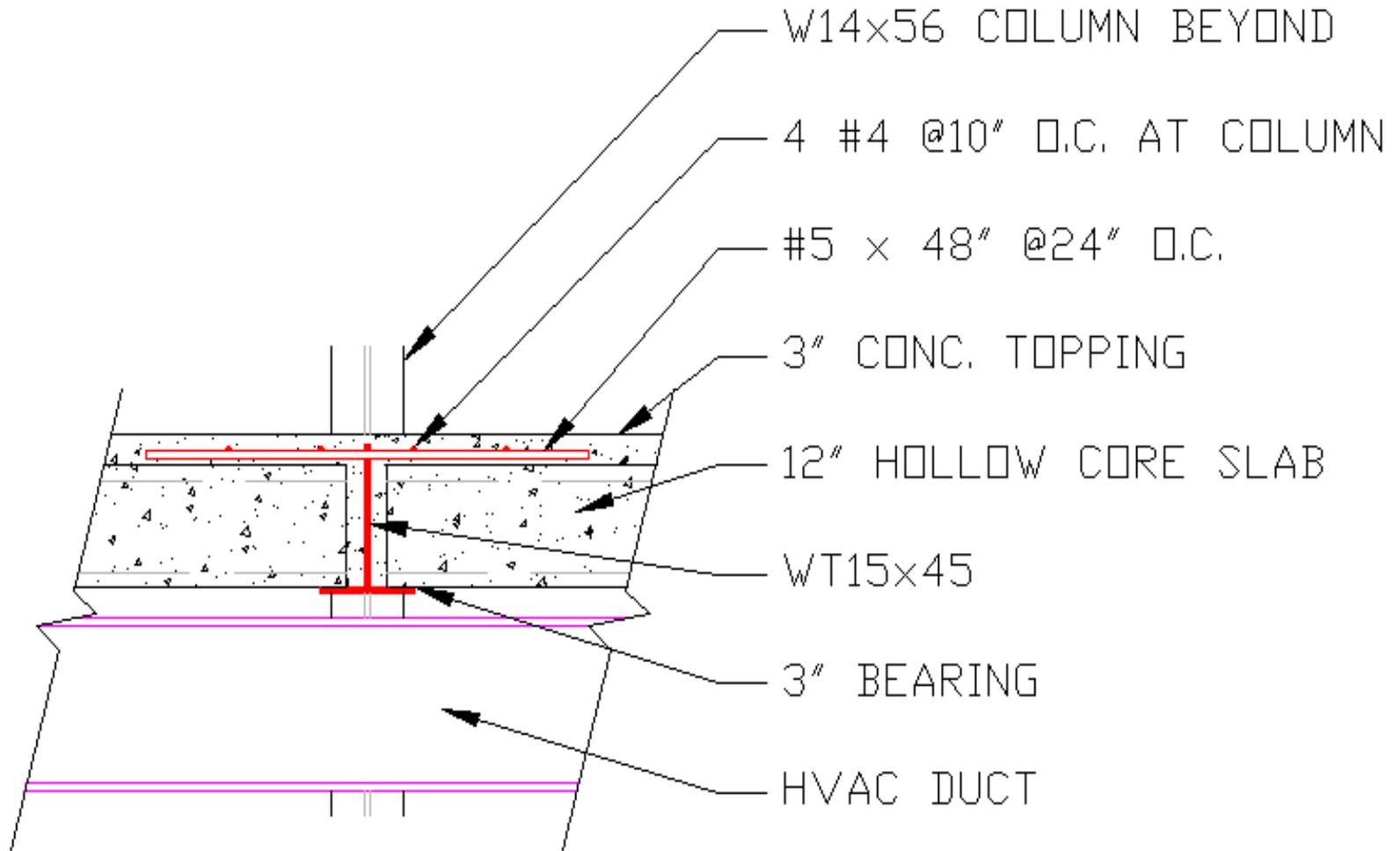
# WT SLAB CONSTRUCTION



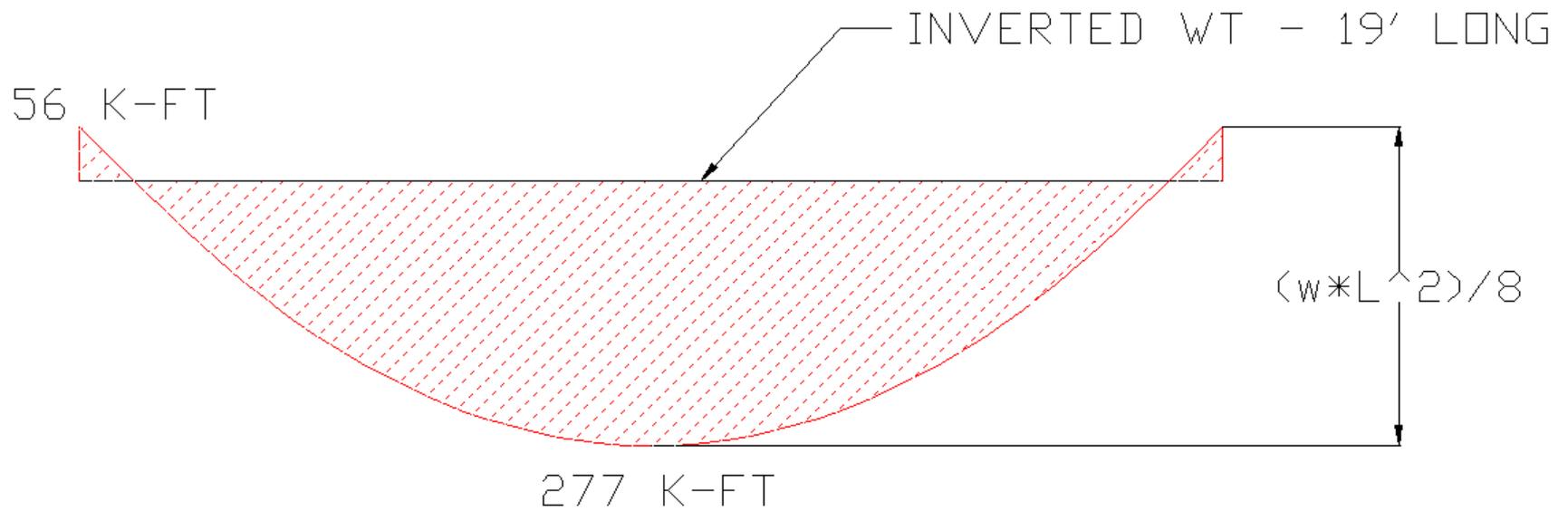
# WT SLAB CONSTRUCTION



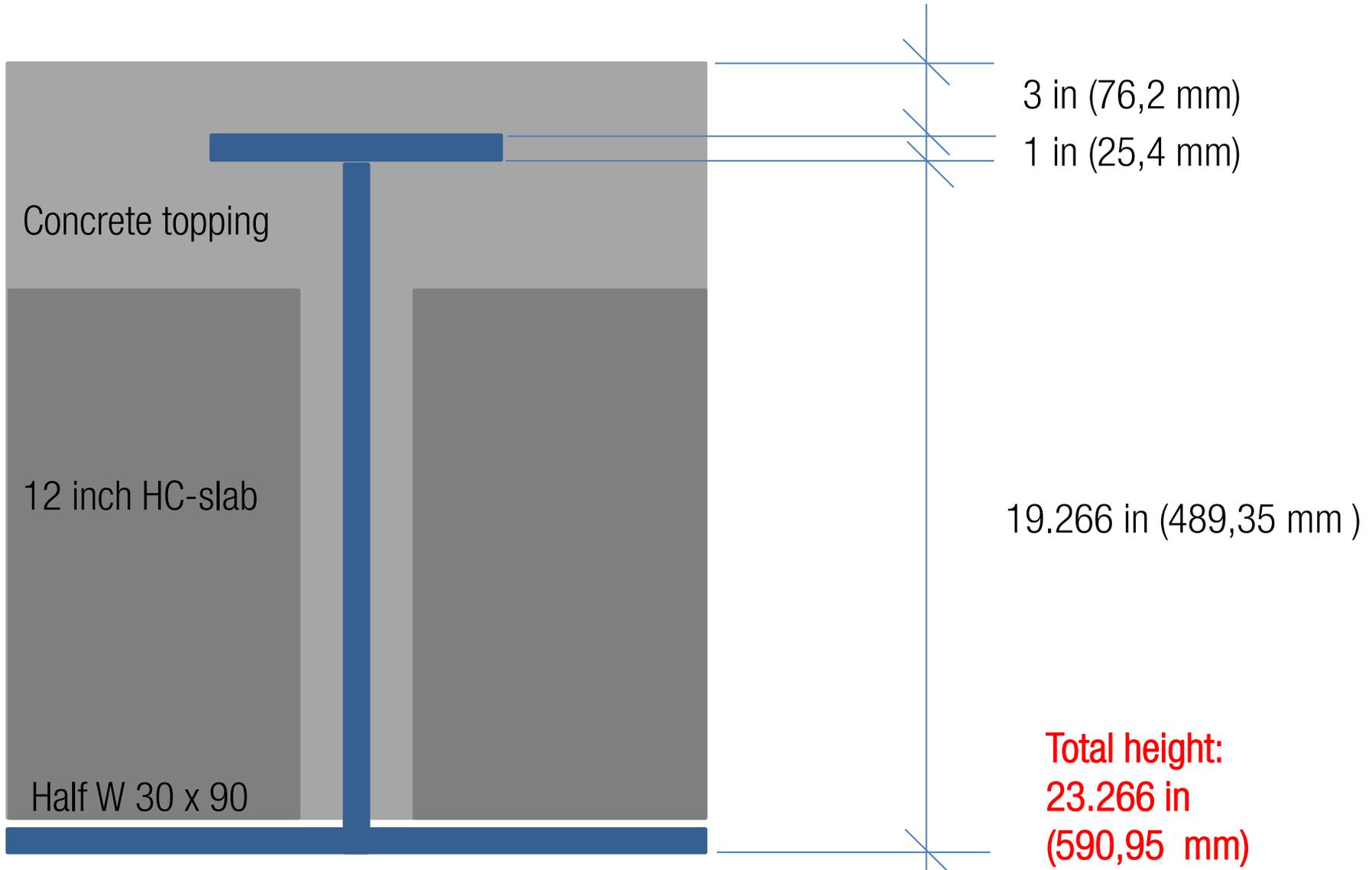
# WT DETAIL



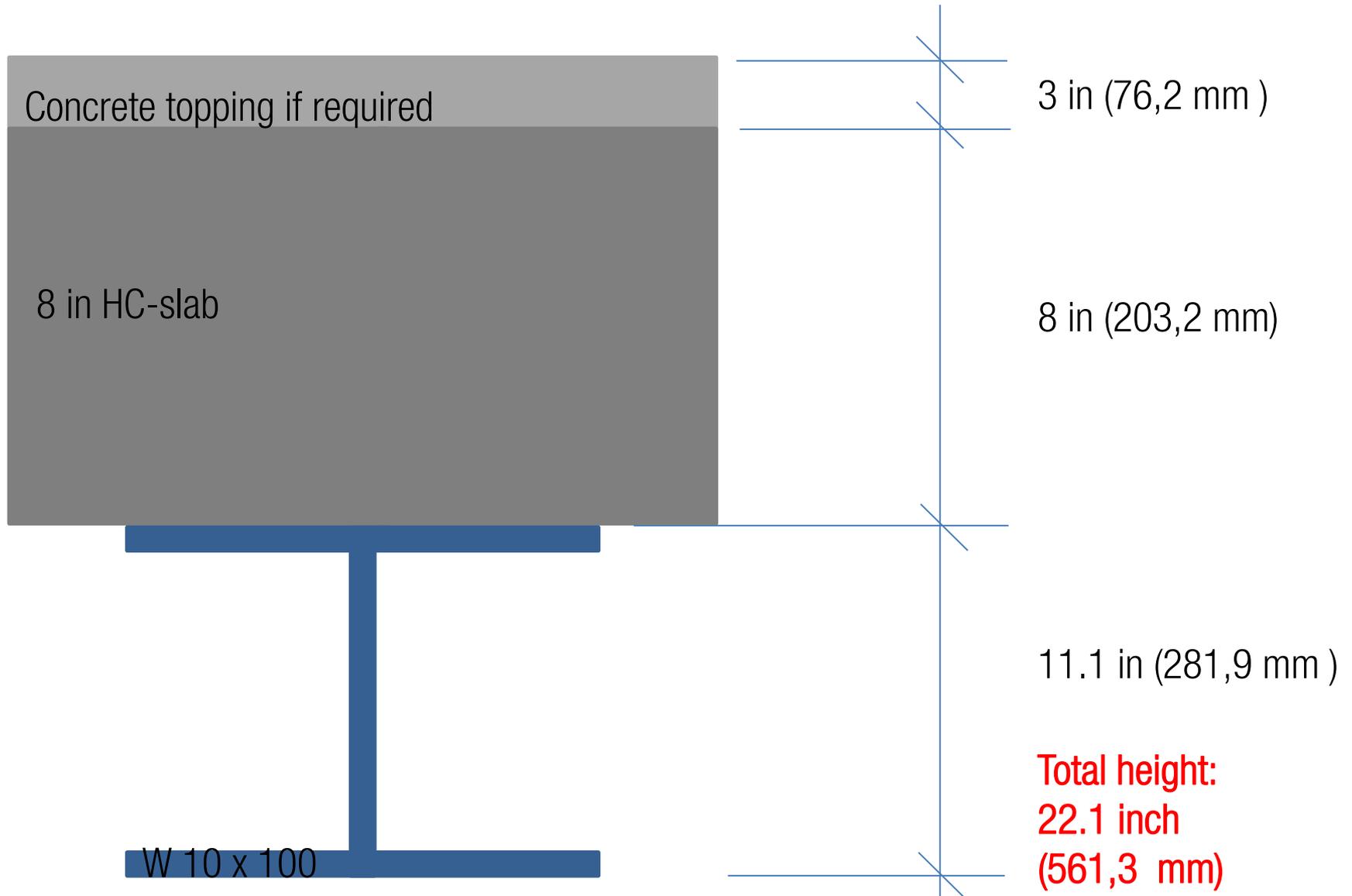
# WT PLASTIC MOMENT DISTRIBUTION (EXTREME CASE)



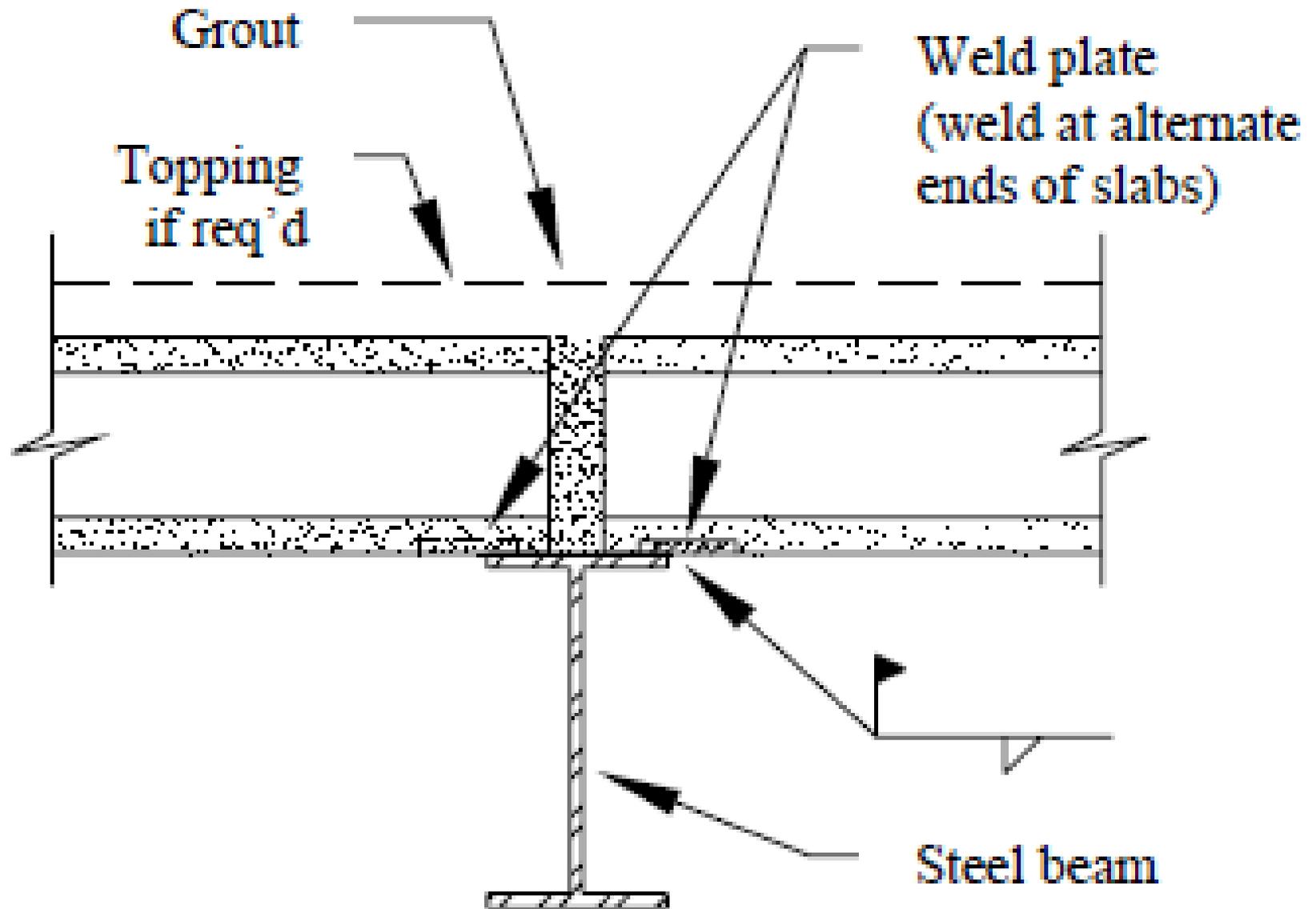
# SANDWICH HEIGHT CONSIDERATIONS SLABS BETWEEN THE FLANGES



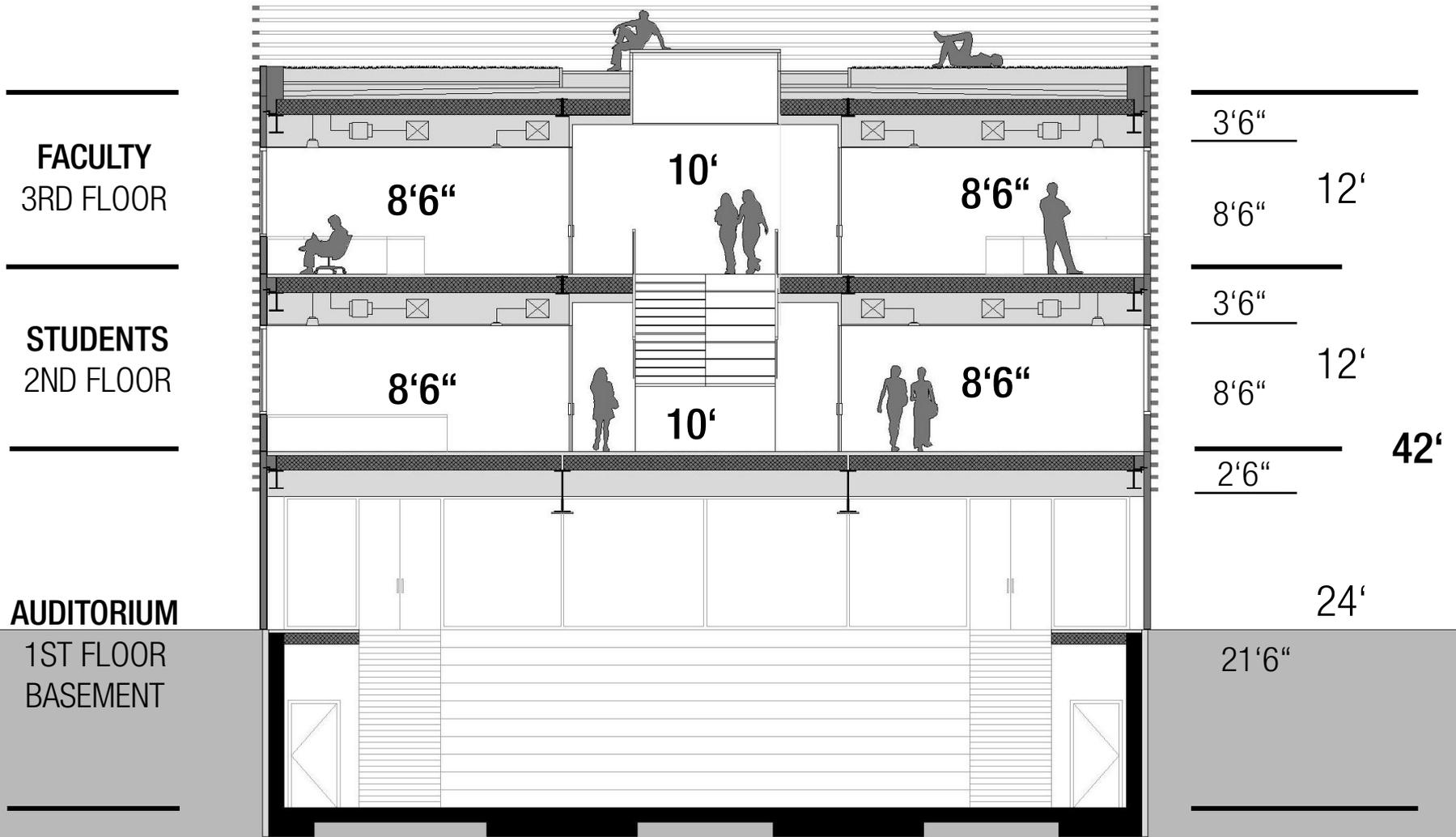
# SANDWICH HEIGHT CONSIDERATIONS SLABS ON TOP OF BEAM



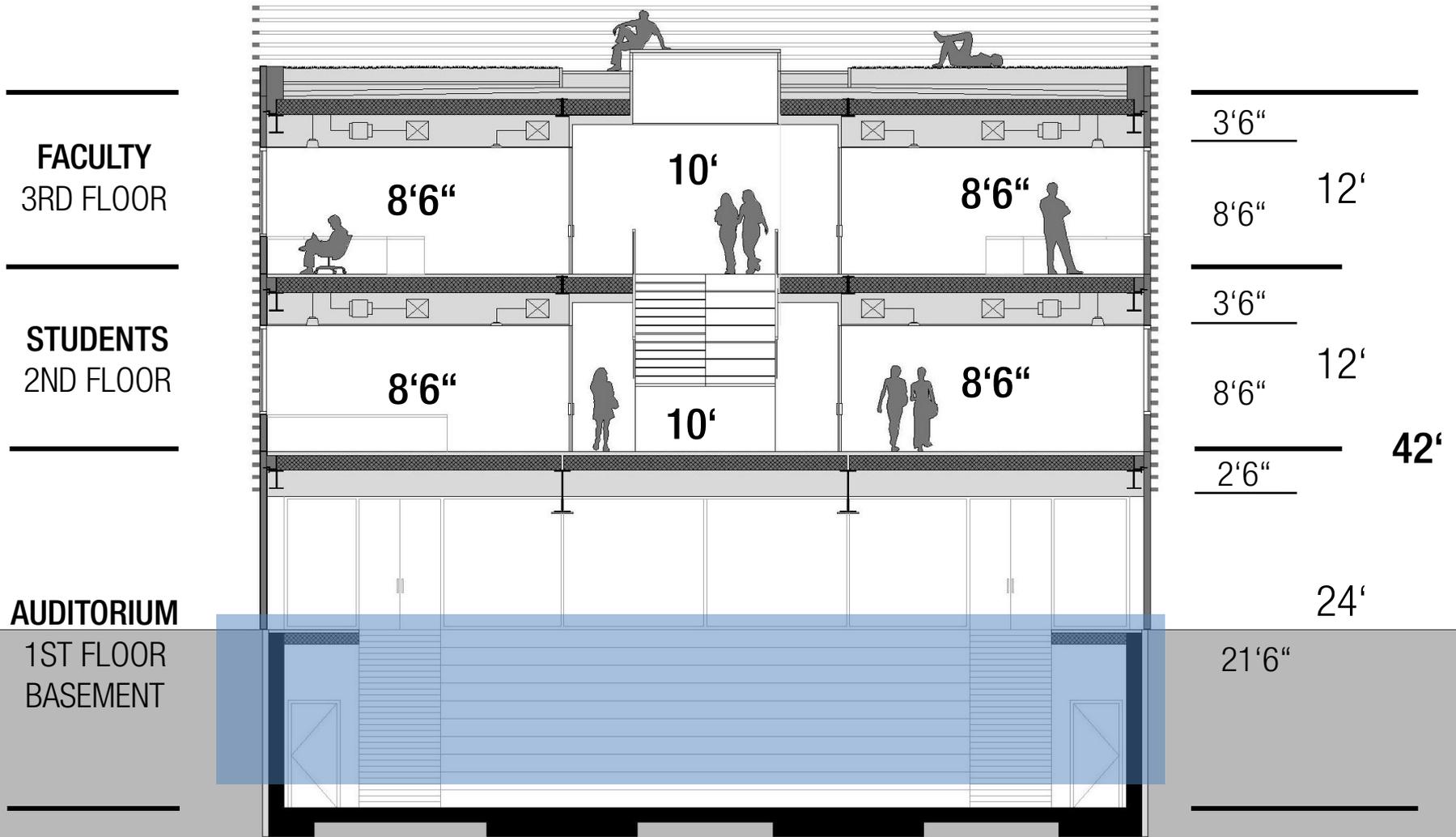
# SLAB ON BEAM DETAIL



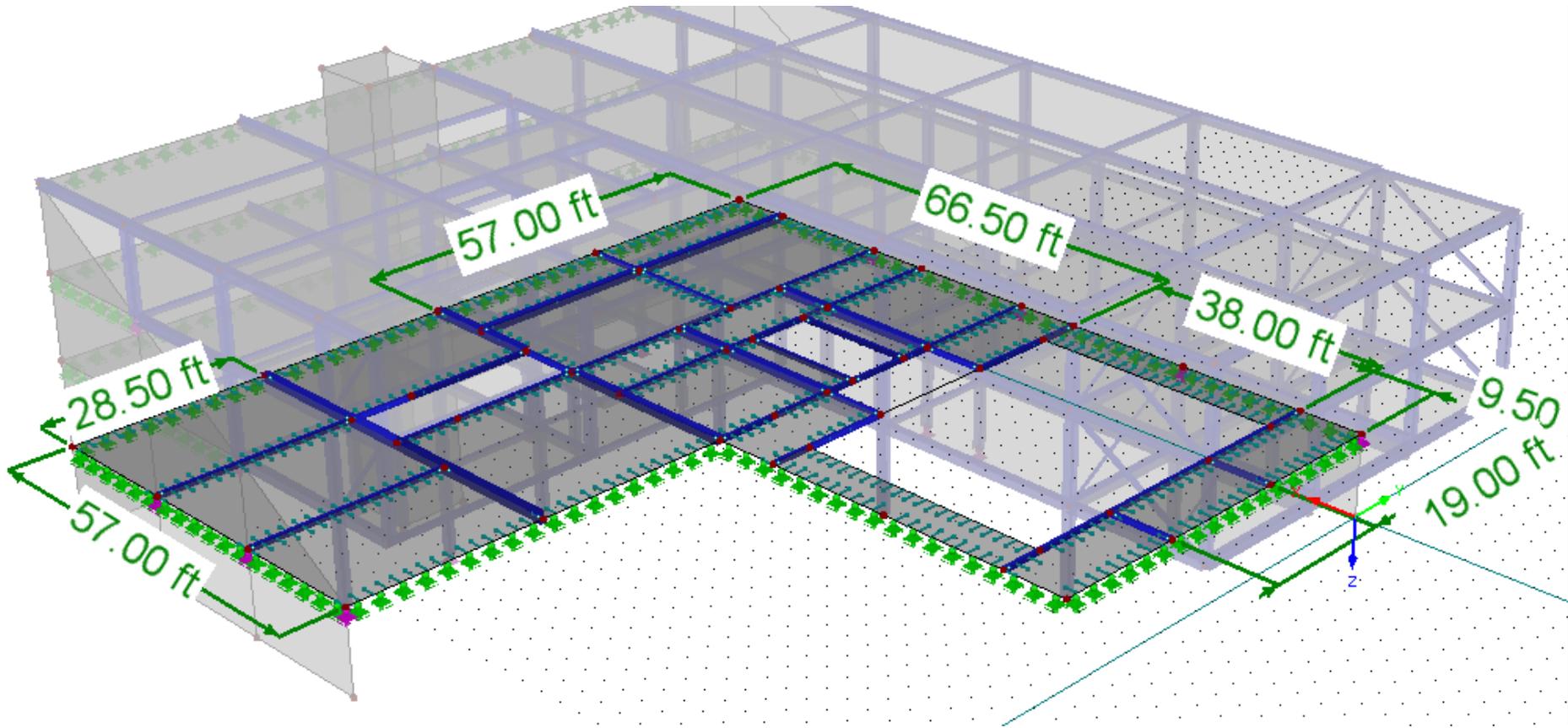
# SANDWICH SECTION



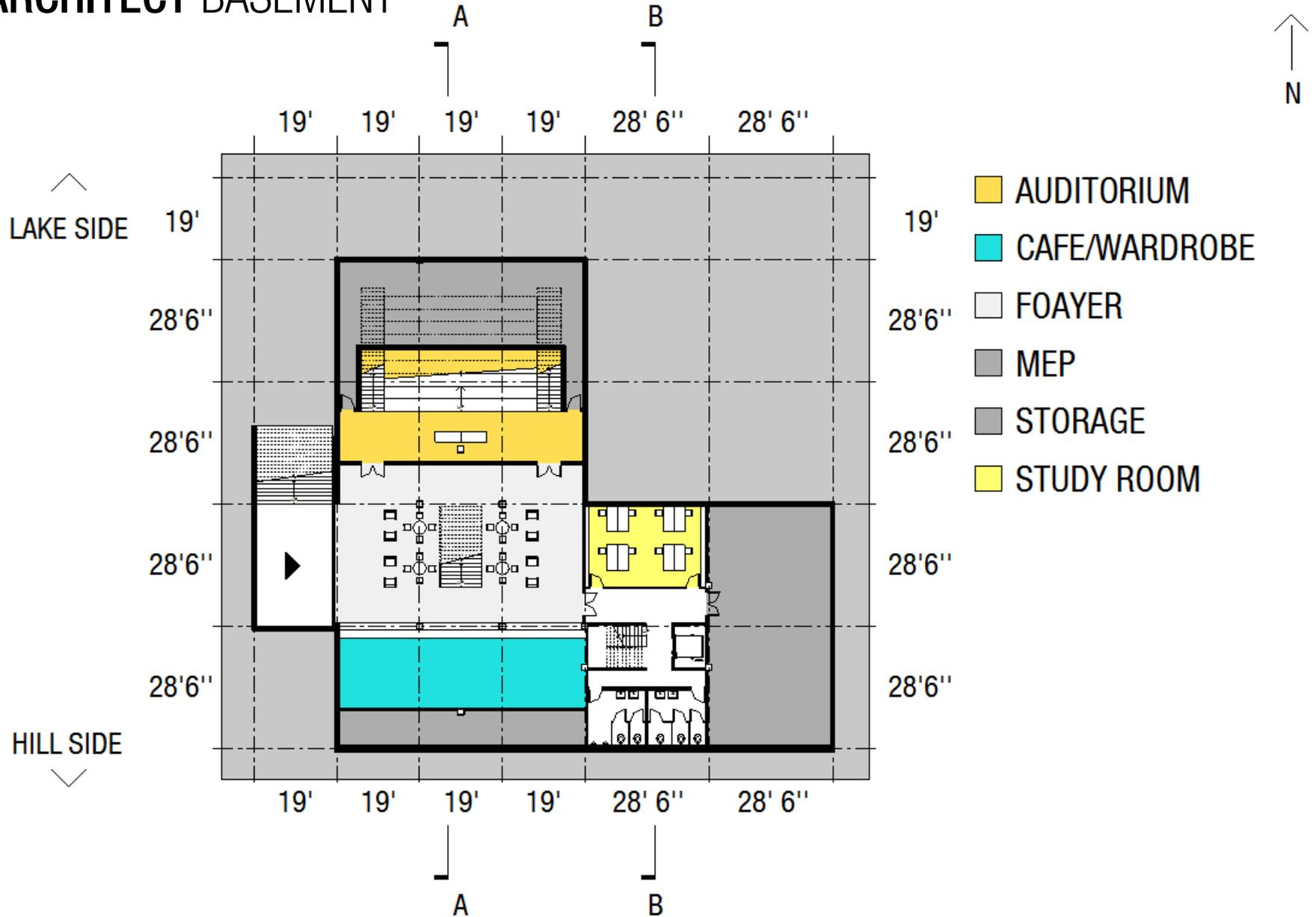
# SANDWICH SECTION REFERENCE



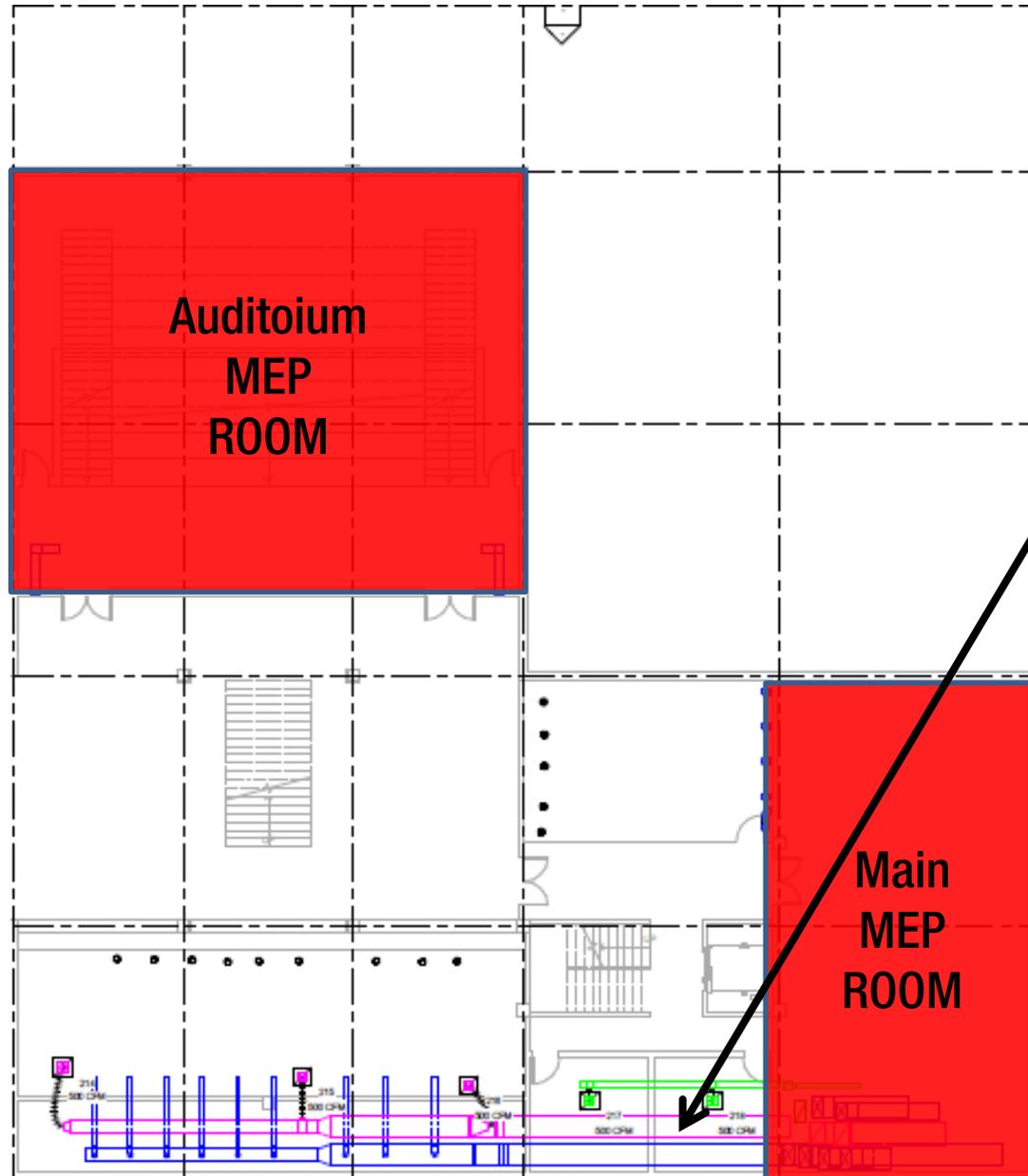
# STRUCTURAL 1ST FLOOR



# ARCHITECT BASEMENT



# MEP BASEMENT



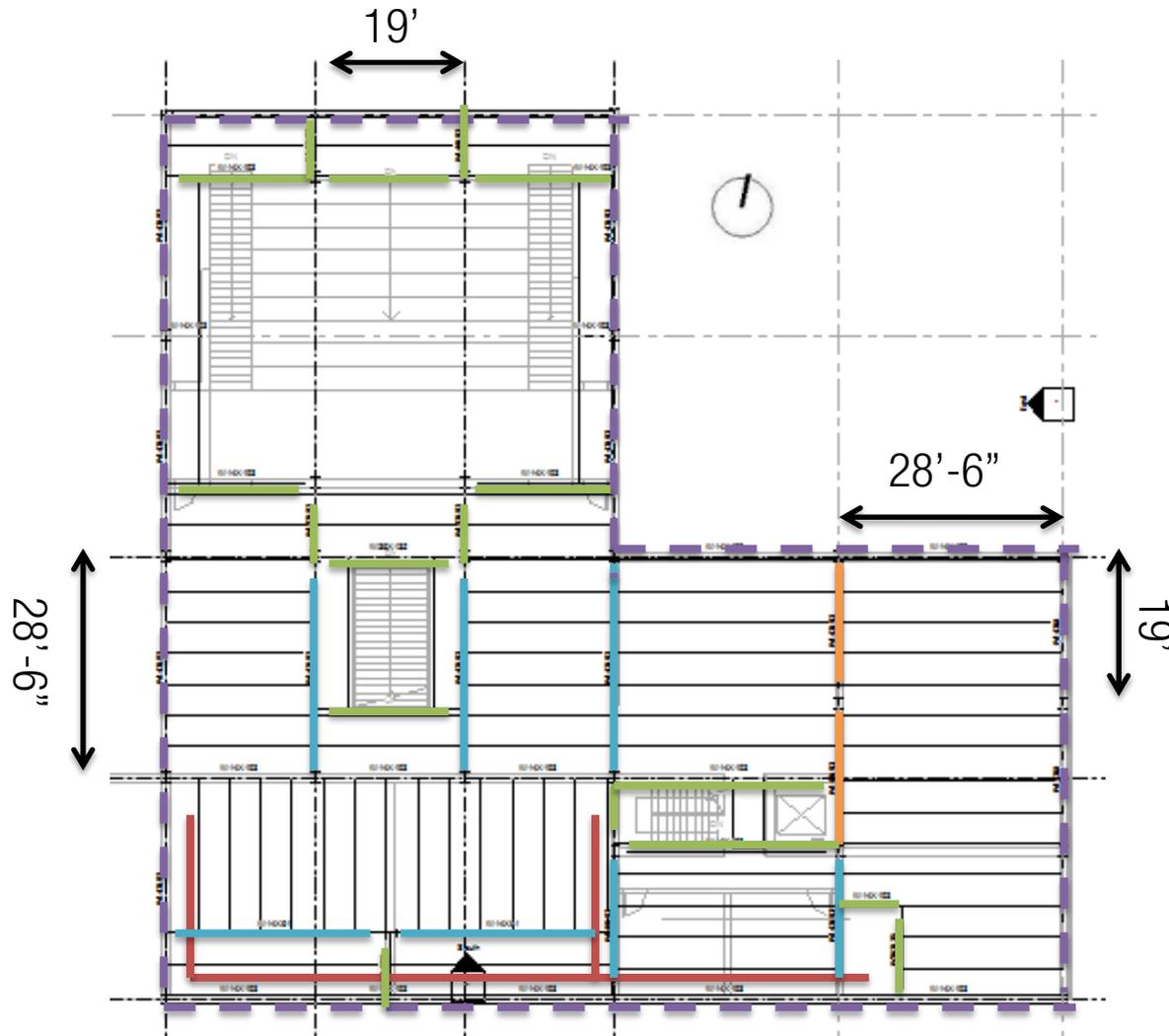
Largest Duct:  
30x15in

- Supply Air
- Return Air
- Exhaust Air

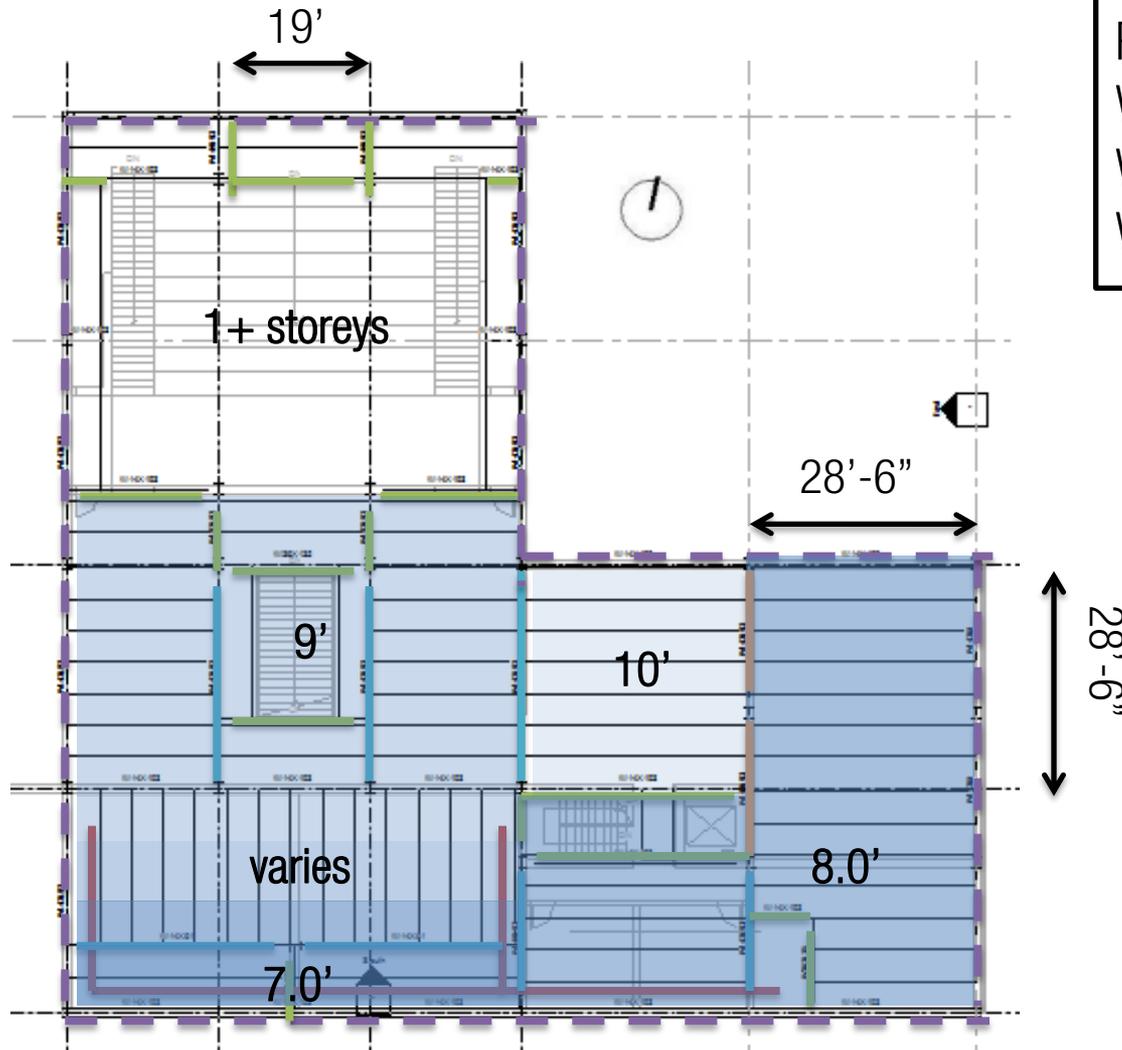
# STRUCTURAL 1ST FLOOR/ MEP BASEMENT

**Legend:**

- MEP main ducts 
- D-beams (W30x90) 
- Retaining wall 
- W14x90 
- W10x22 
- W36x256 



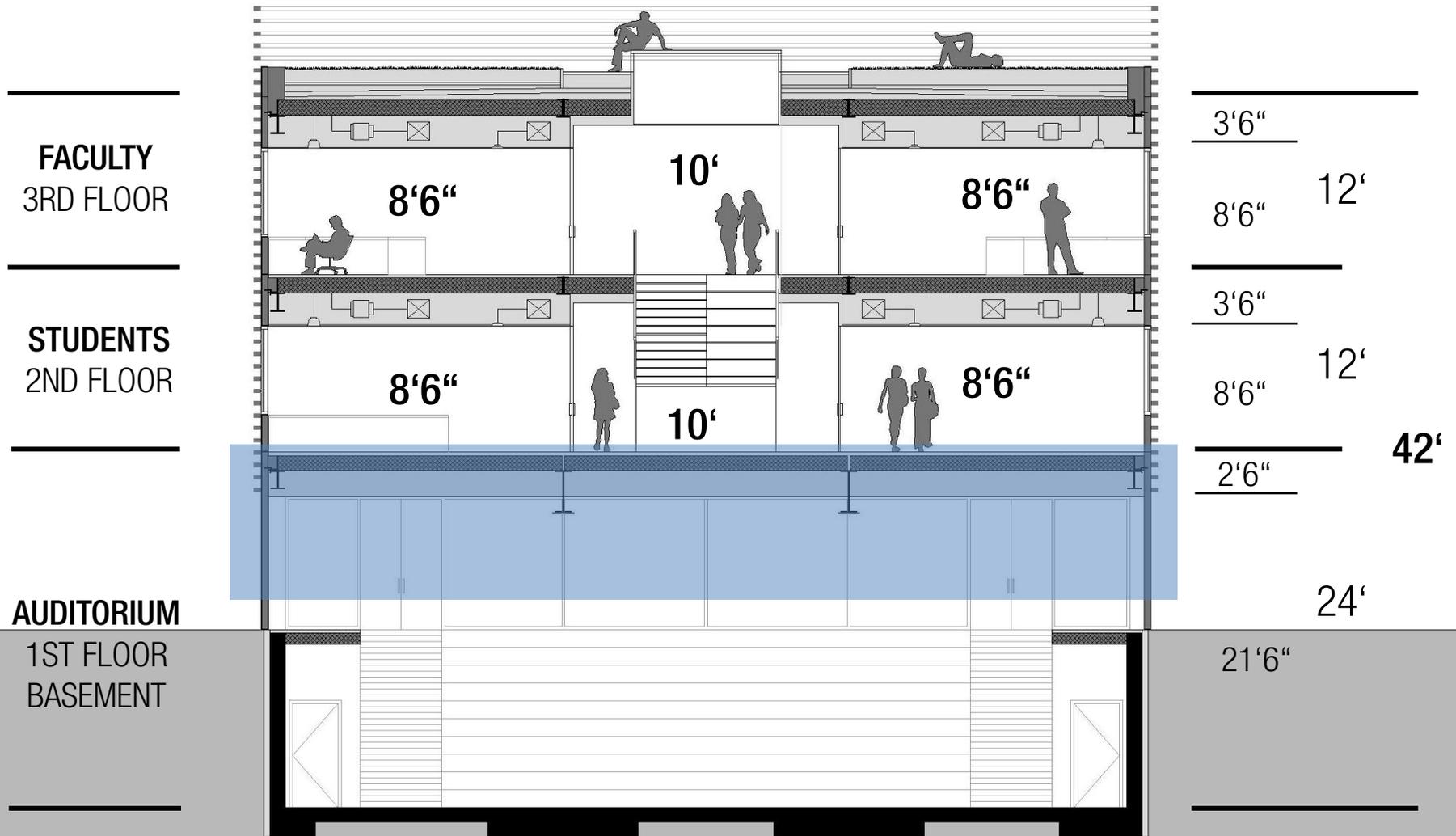
# CEILING HEIGHTS BASEMENT



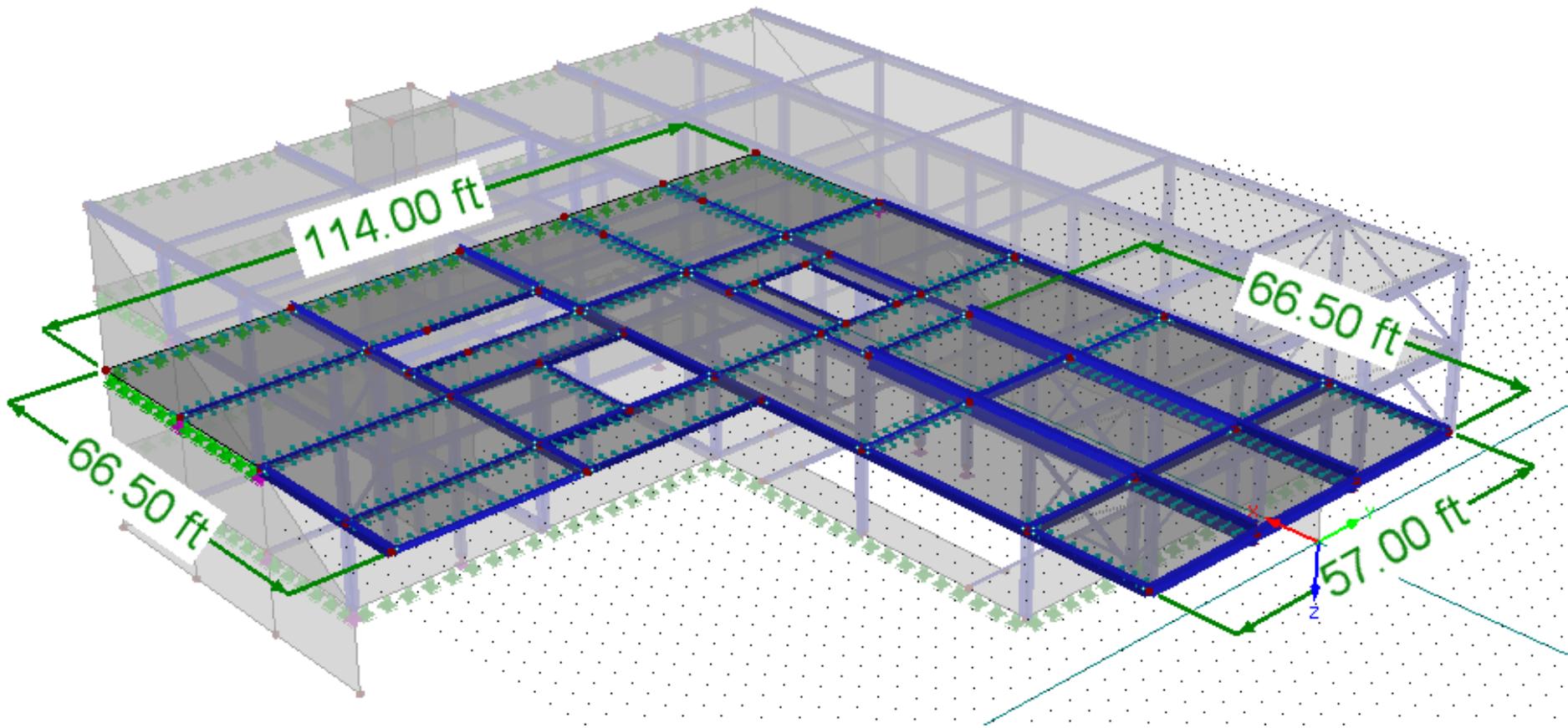
**Legend:**

- MEP main ducts 
- D-beams (W30x90) 
- Retaining wall 
- W14x90 
- W10x22 
- W36x256 

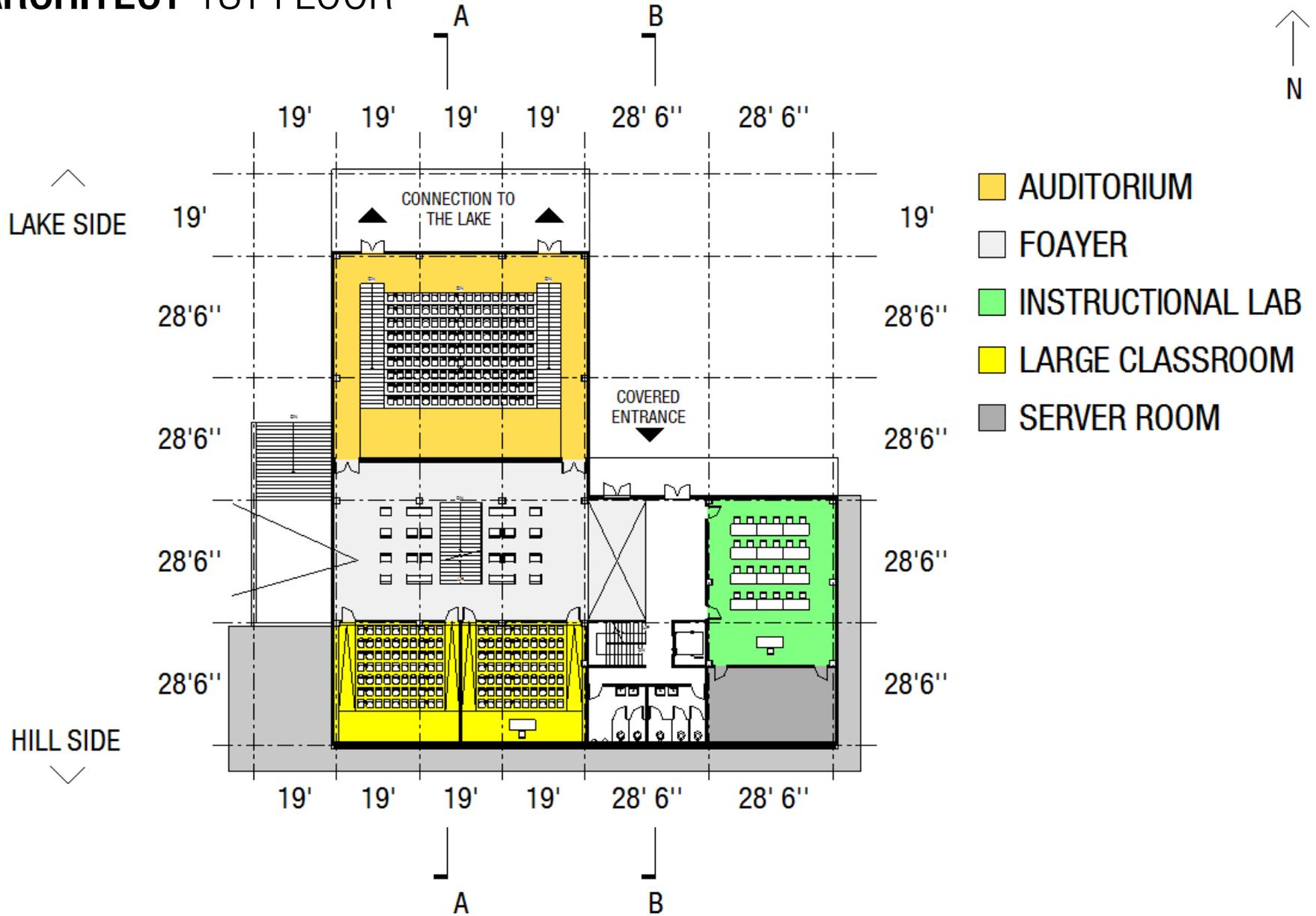
# SANDWICH SECTION REFERENCE



# STRUCTURAL 2ND FLOOR

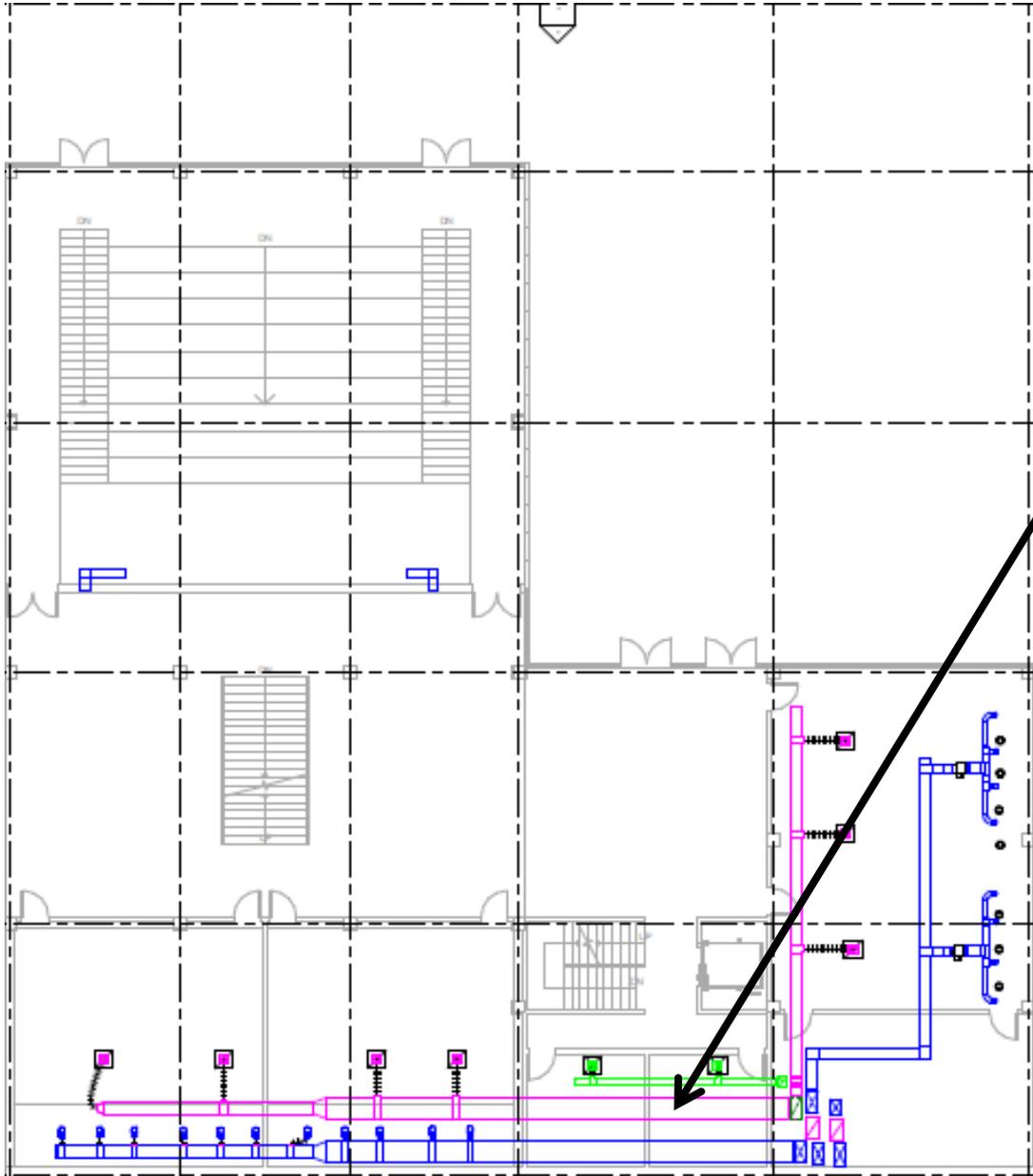


# ARCHITECT 1ST FLOOR



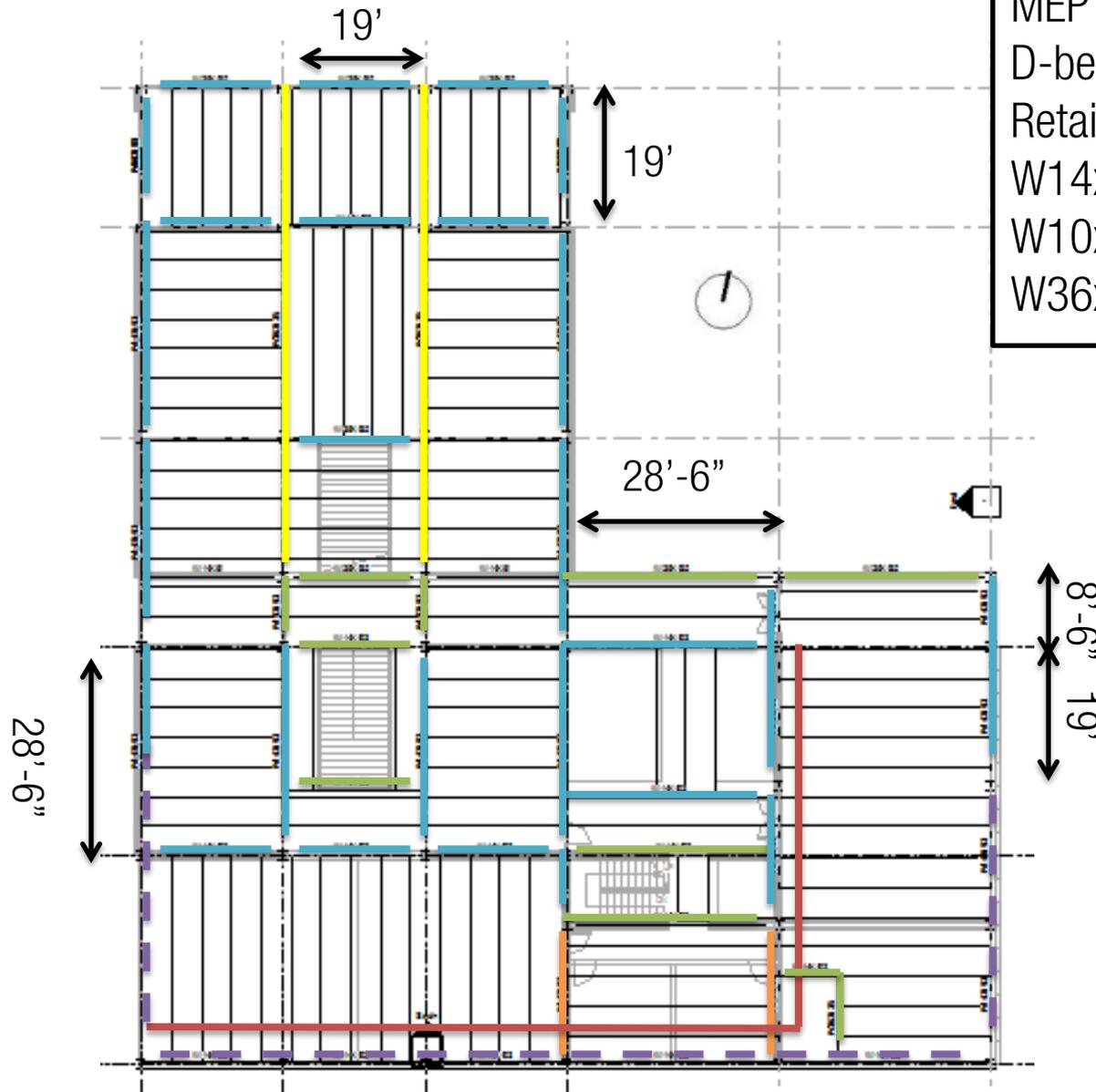
# MEP 1ST FLOOR

-  Supply Air
-  Return Air
-  Exhaust Air



Largest Duct:  
30x15in

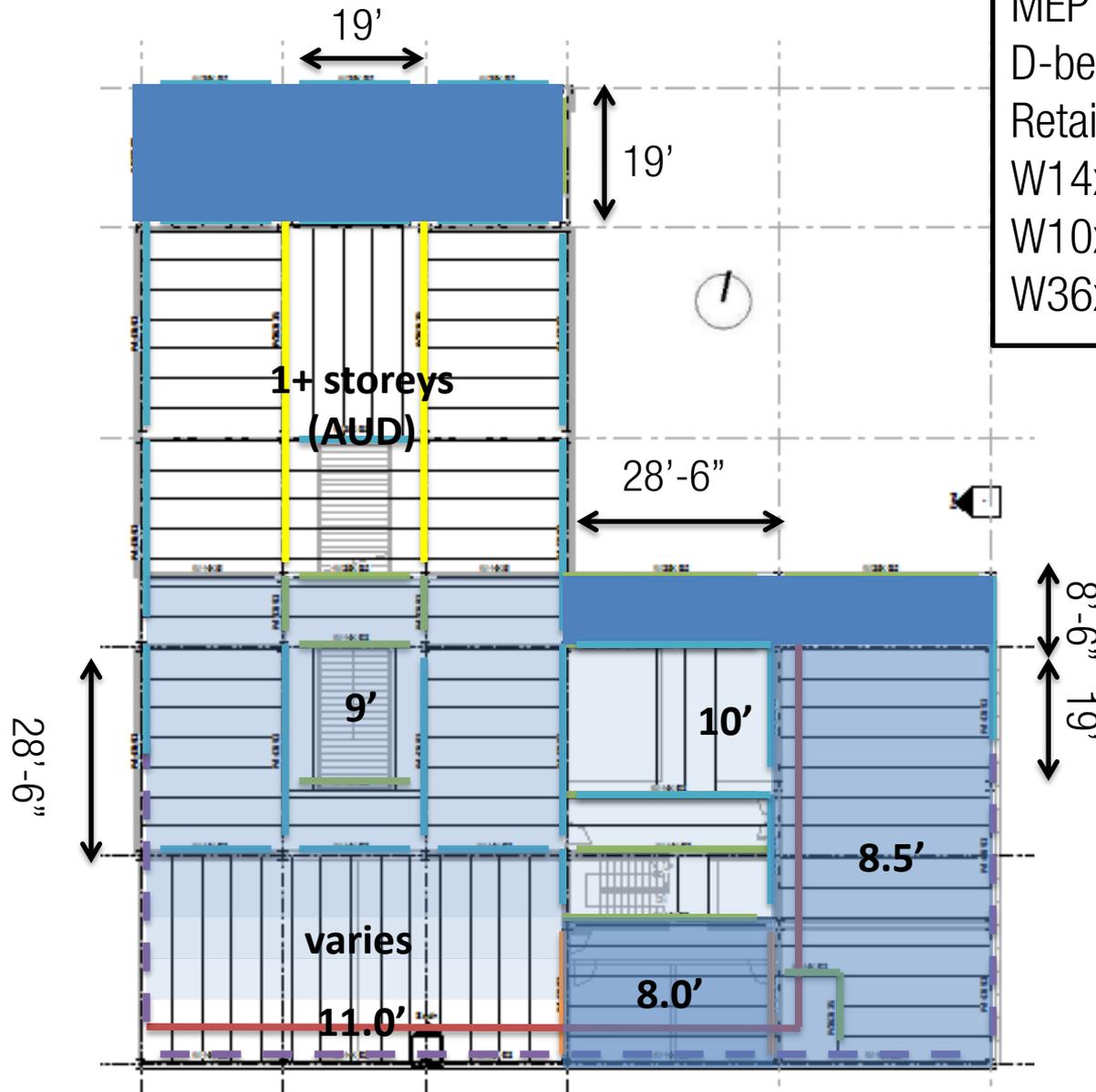
# STRUCTURAL 2ND FLOOR/ MEP 1ST FLOOR



**Legend:**

- MEP main ducts
- D-beams (W30x90)
- Retaining wall
- W14x90
- W10x22
- W36x256

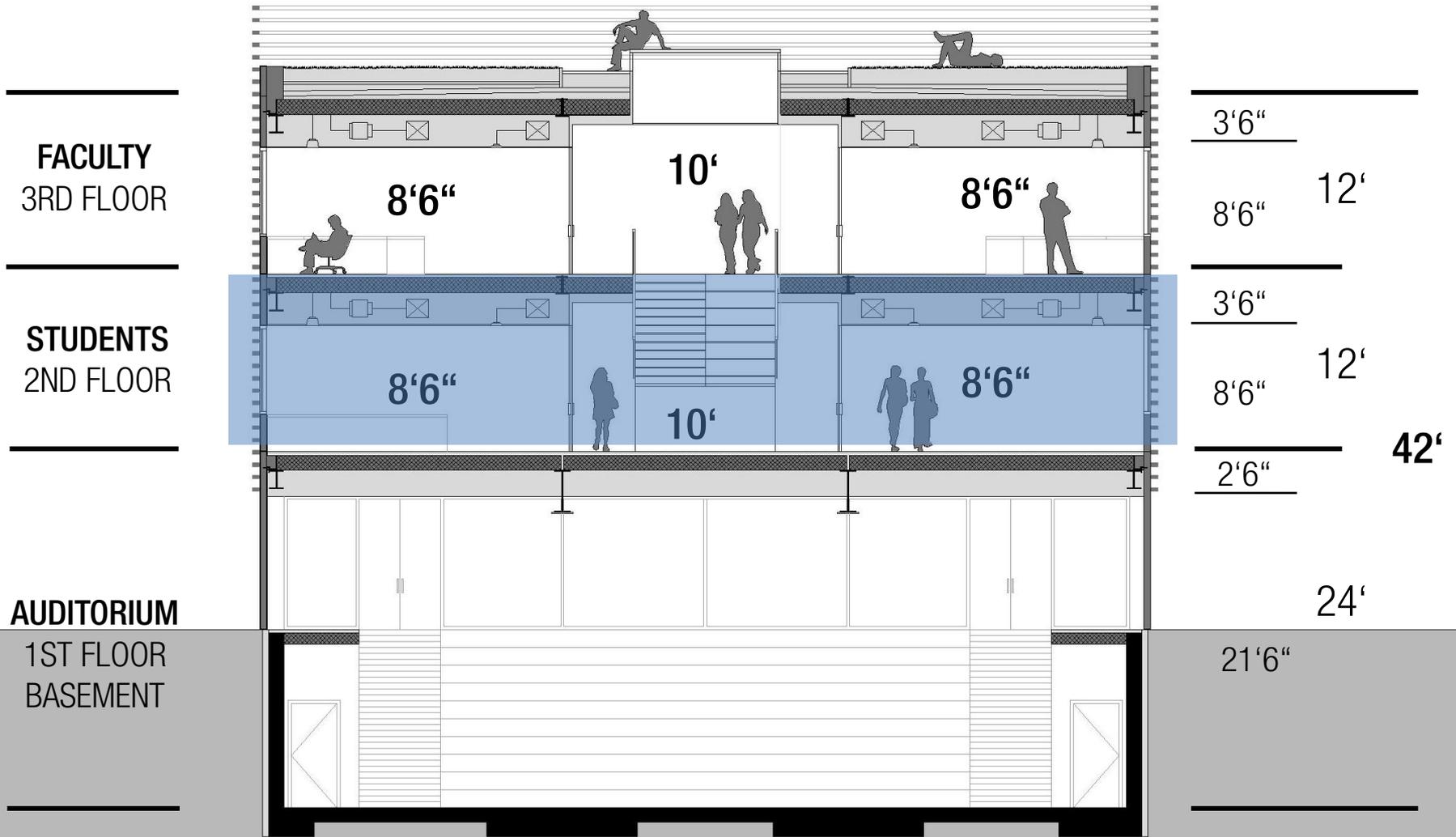
# CEILING HEIGHTS 1ST FLOOR



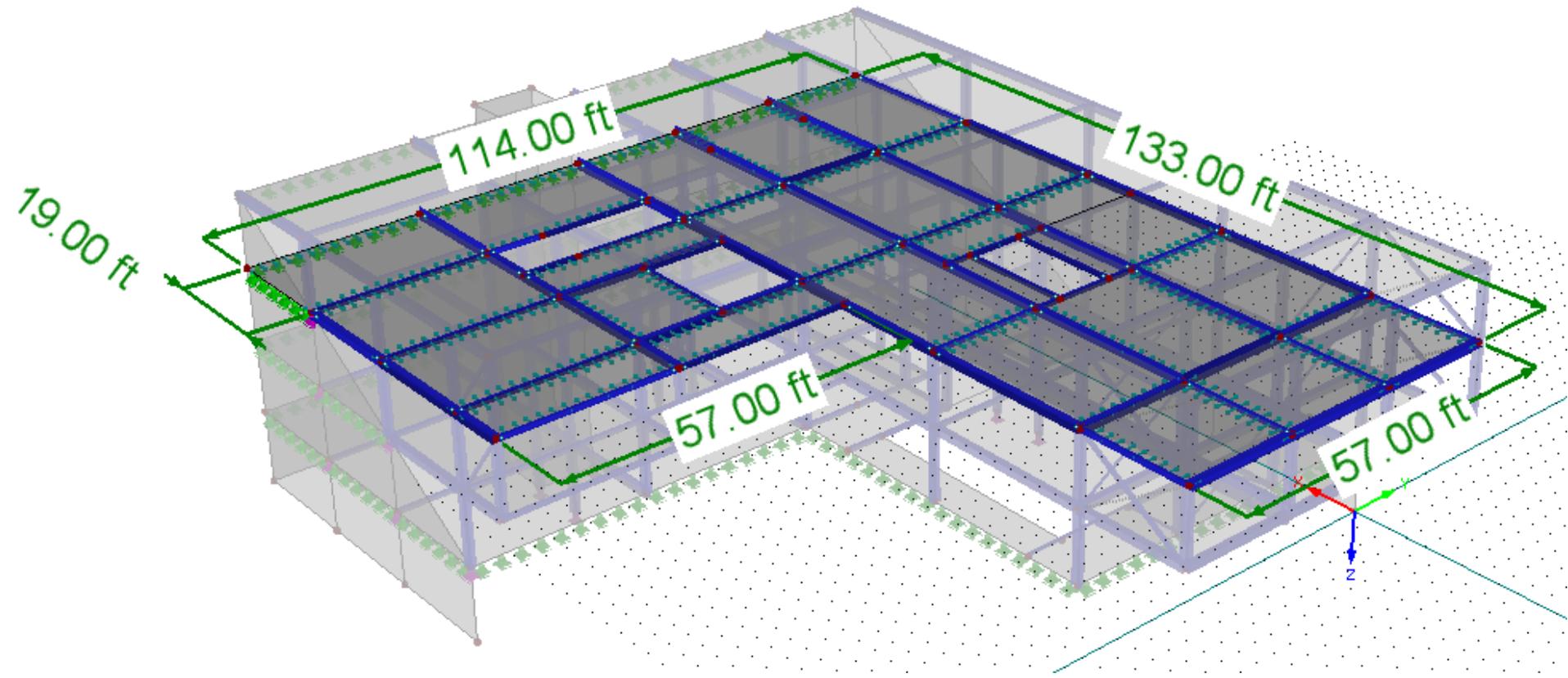
## Legend:

- MEP main ducts —
- D-beams (W30x90) —
- Retaining wall - - -
- W14x90 —
- W10x22 —
- W36x256 —

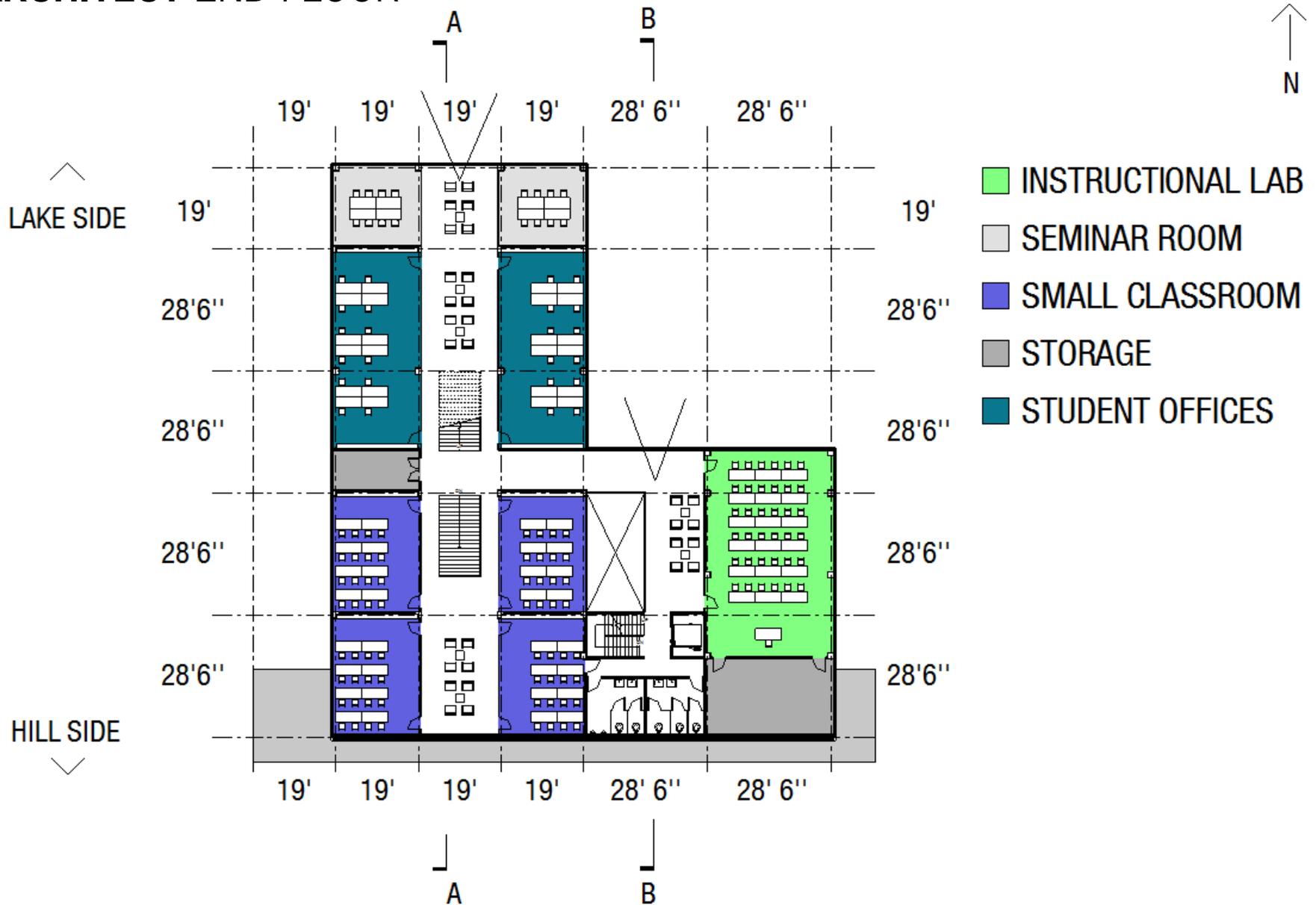
# SANDWICH SECTION REFERENCE



# STRUCTURAL 3RD FLOOR



# ARCHITECT 2ND FLOOR

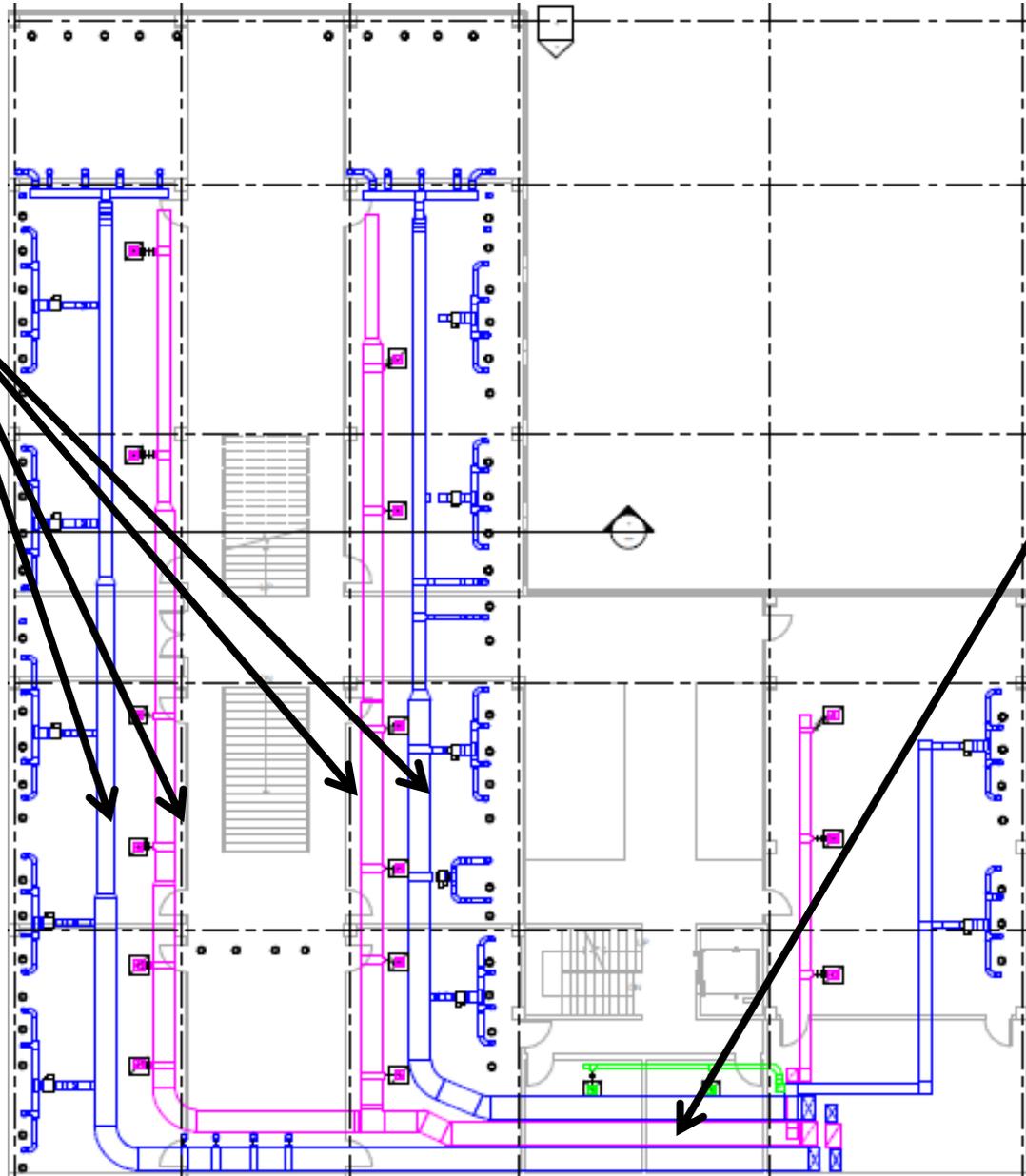


# MEP 2ND FLOOR

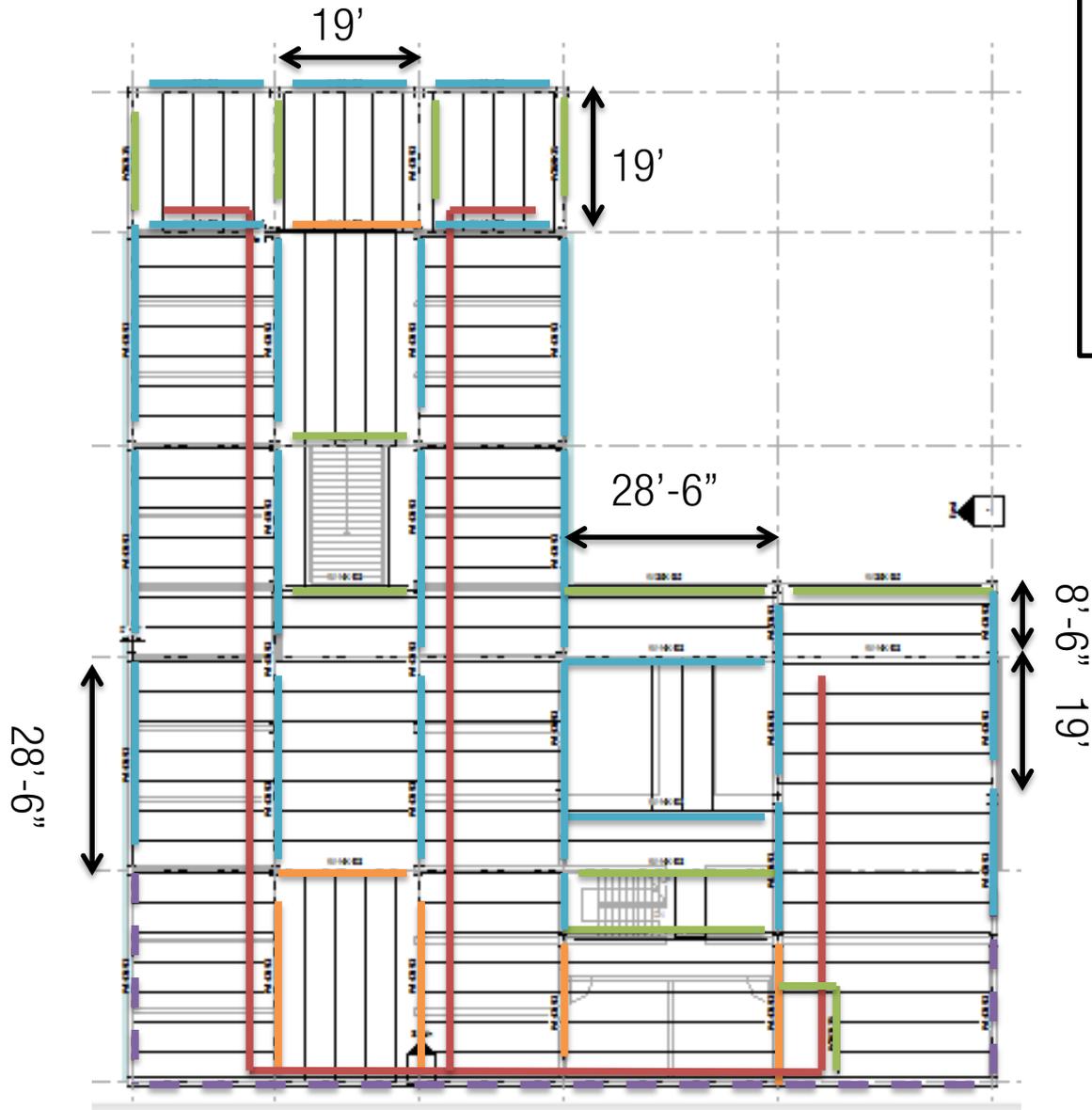
Main Duct Height:  
15in

Largest Duct:  
30x20in

- Supply Air
- Return Air
- Exhaust Air



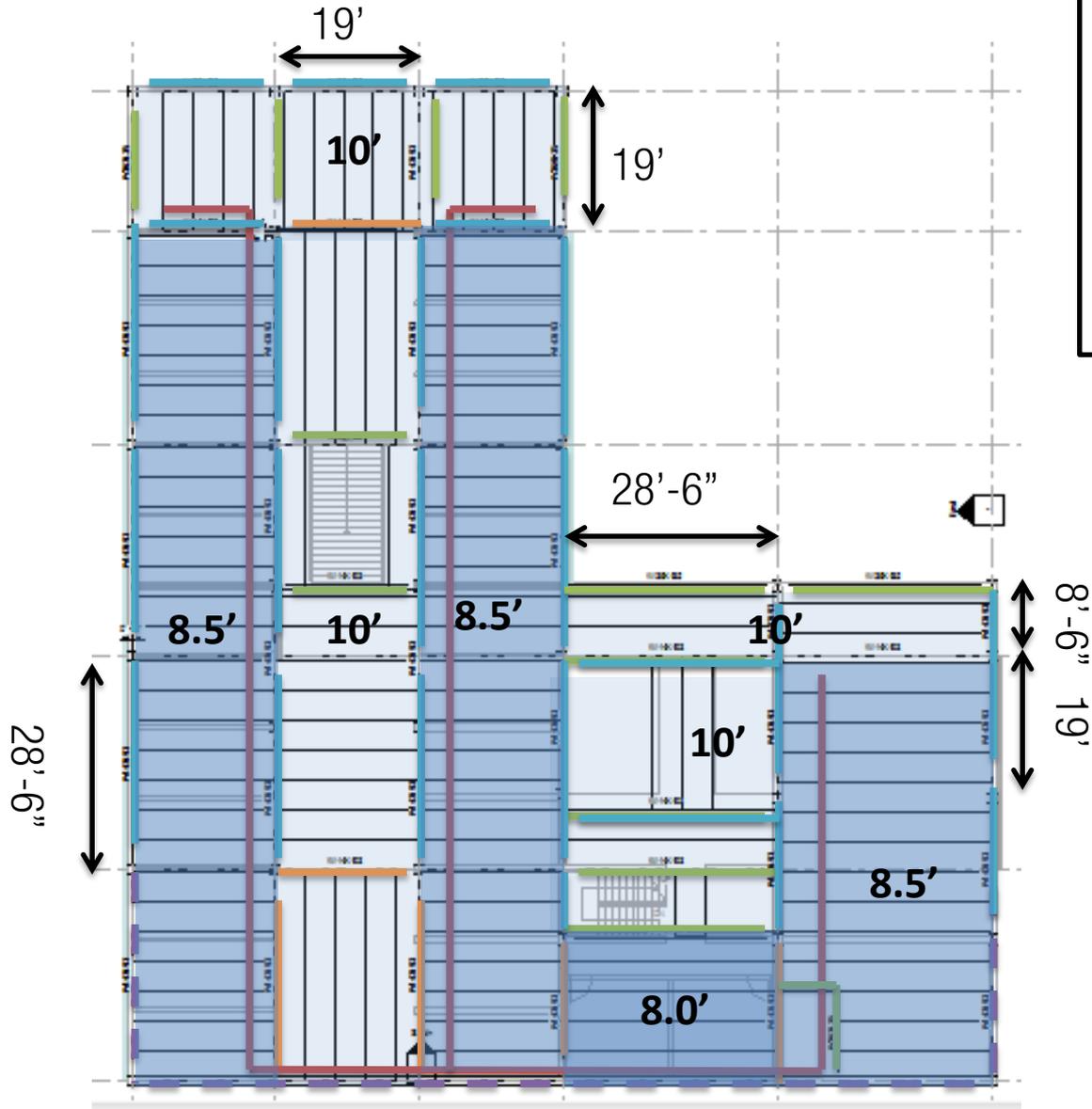
# STRUCTURAL 3RD FLOOR/ MEP 2ND FLOOR



**Legend:**

- MEP main ducts —
- D-beams (W30x90) —
- Retaining wall - - -
- W14x90 —
- W10x22 —
- W36x256 —

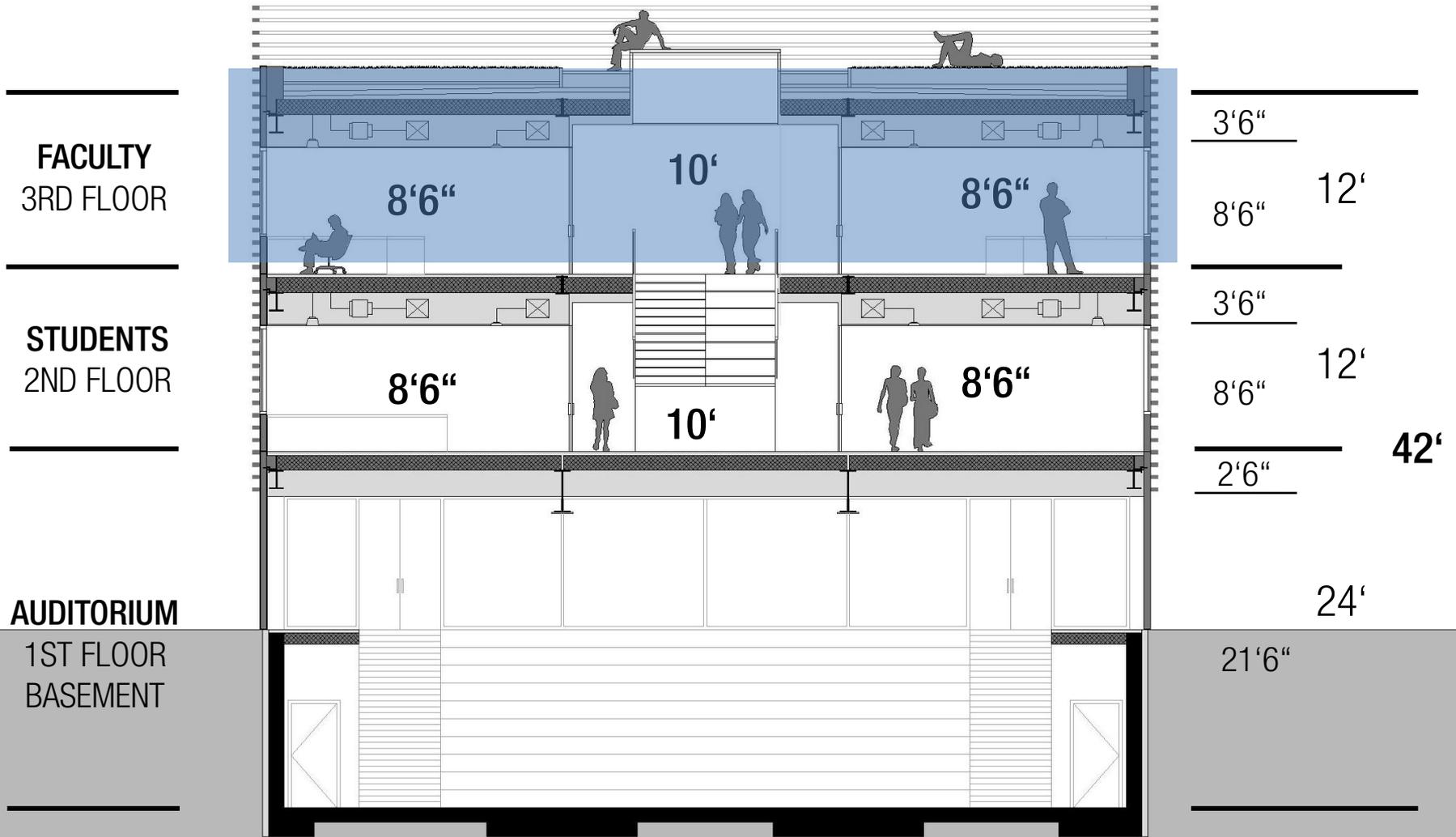
# CEILING HEIGHTS 2ND FLOOR



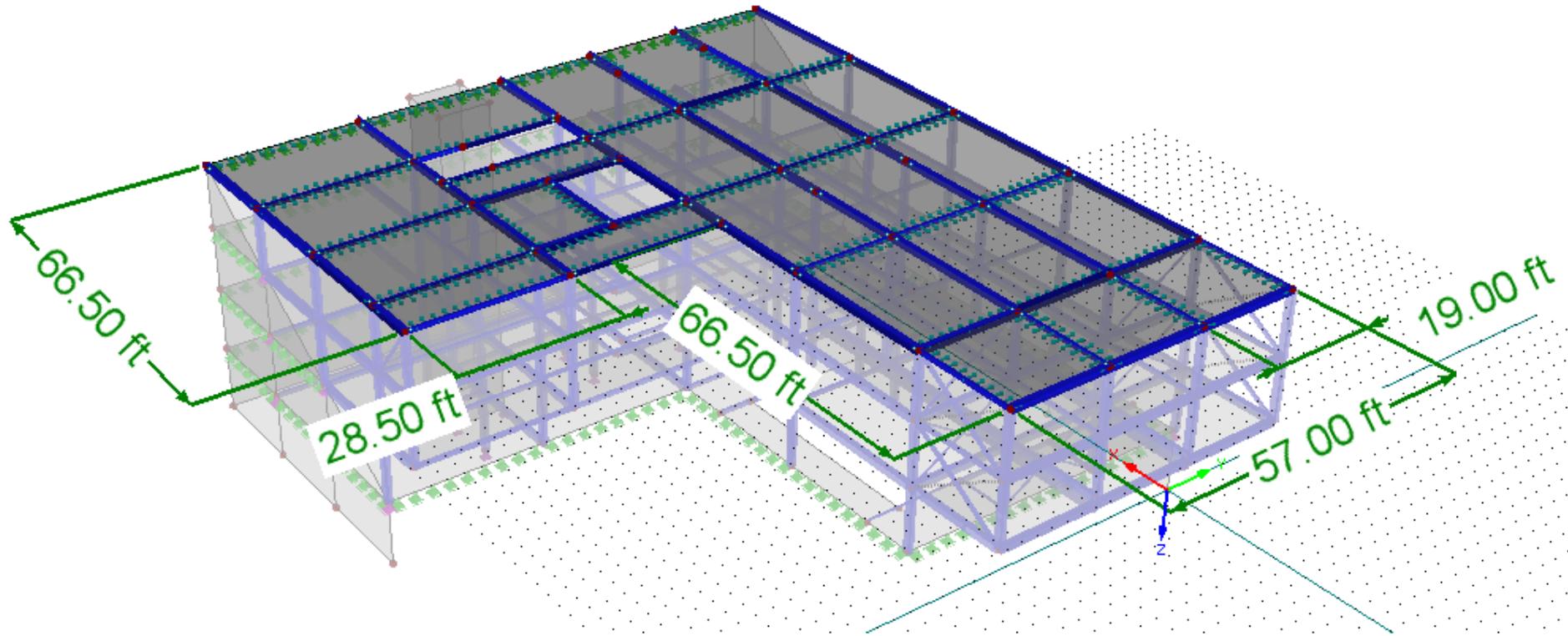
**Legend:**

- MEP main ducts —
- D-beams (W30x90) —
- Retaining wall - - -
- W14x90 —
- W10x22 —
- W36x256 —

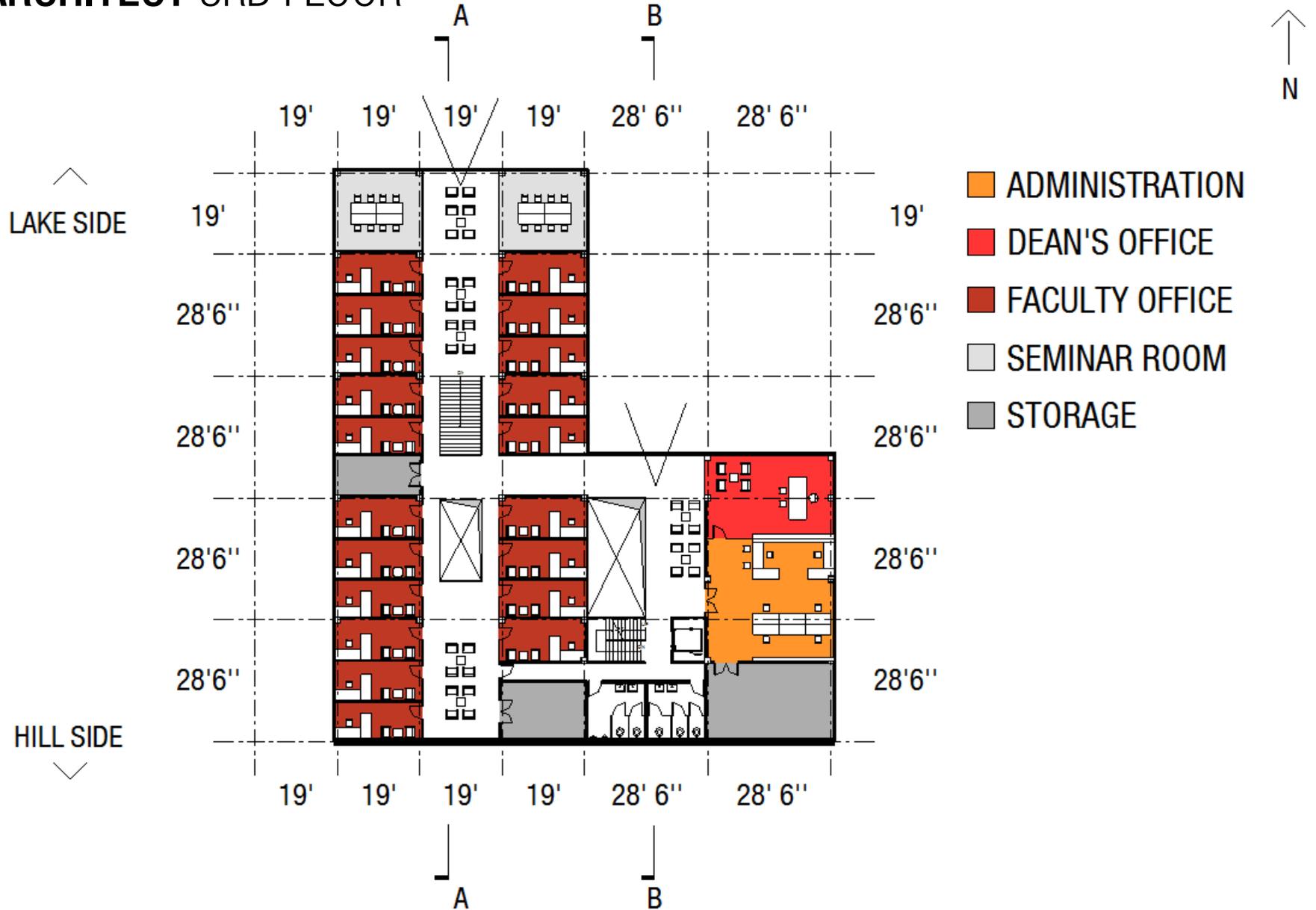
# SANDWICH SECTION REFERENCE



# STRUCTURAL ROOF

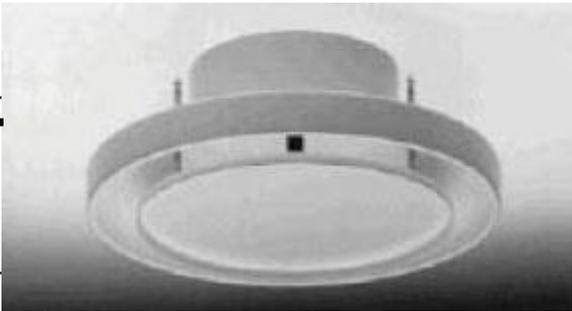


# ARCHITECT 3RD FLOOR



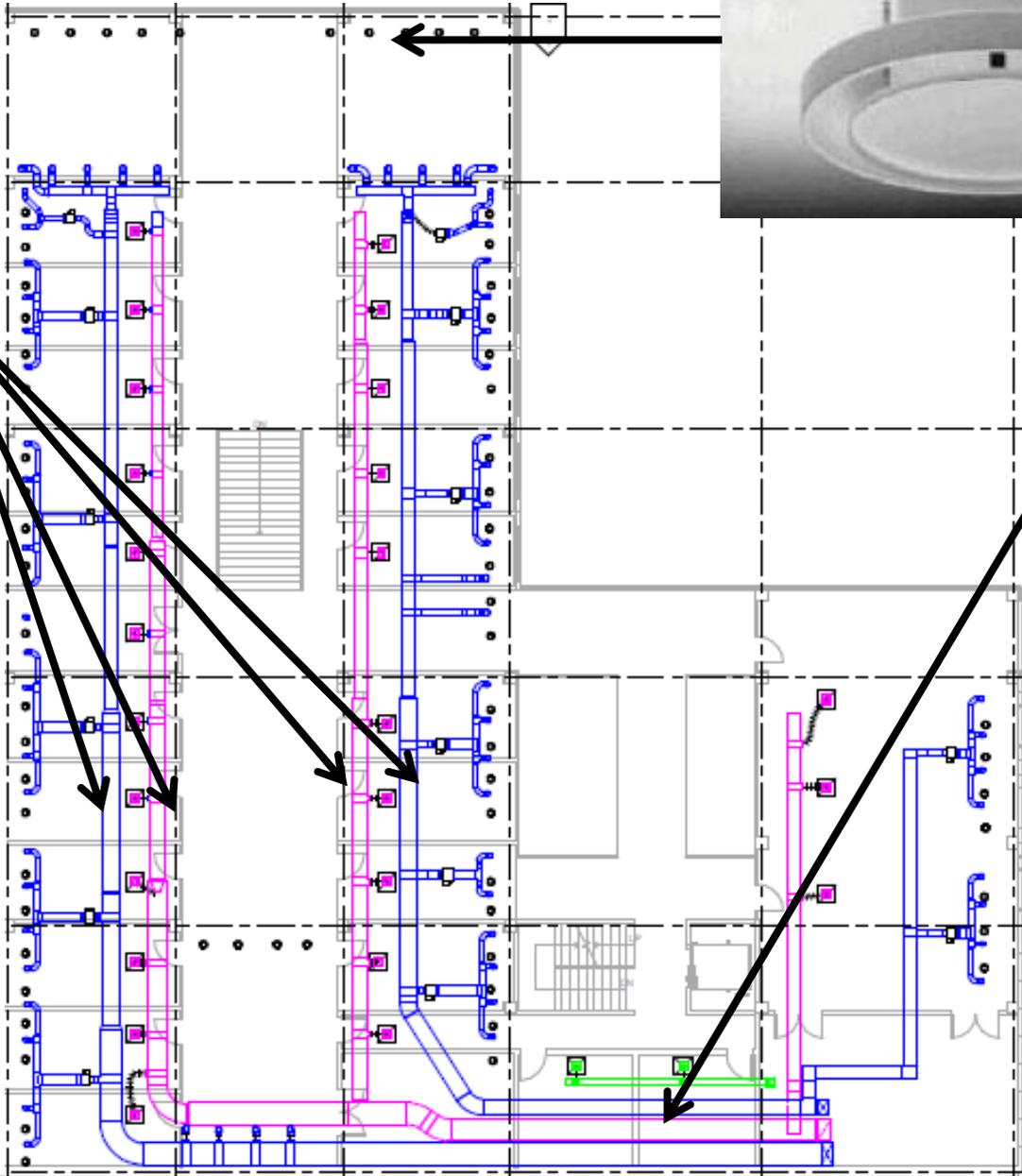
# MEP 3RD FLOOR

Main Duct Height:  
15in

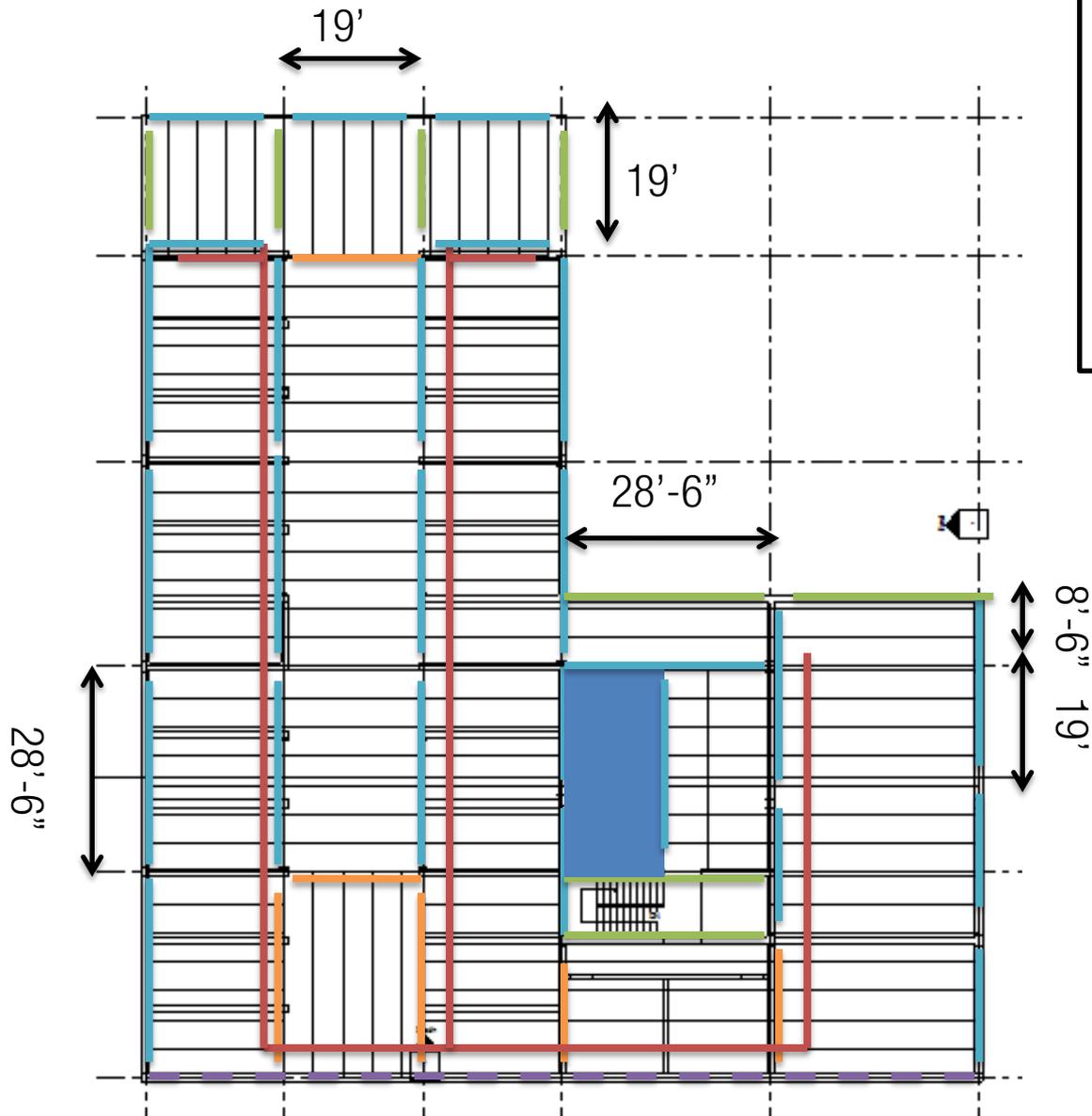


Largest Duct:  
30x20in

-  Supply Air
-  Return Air
-  Exhaust Air



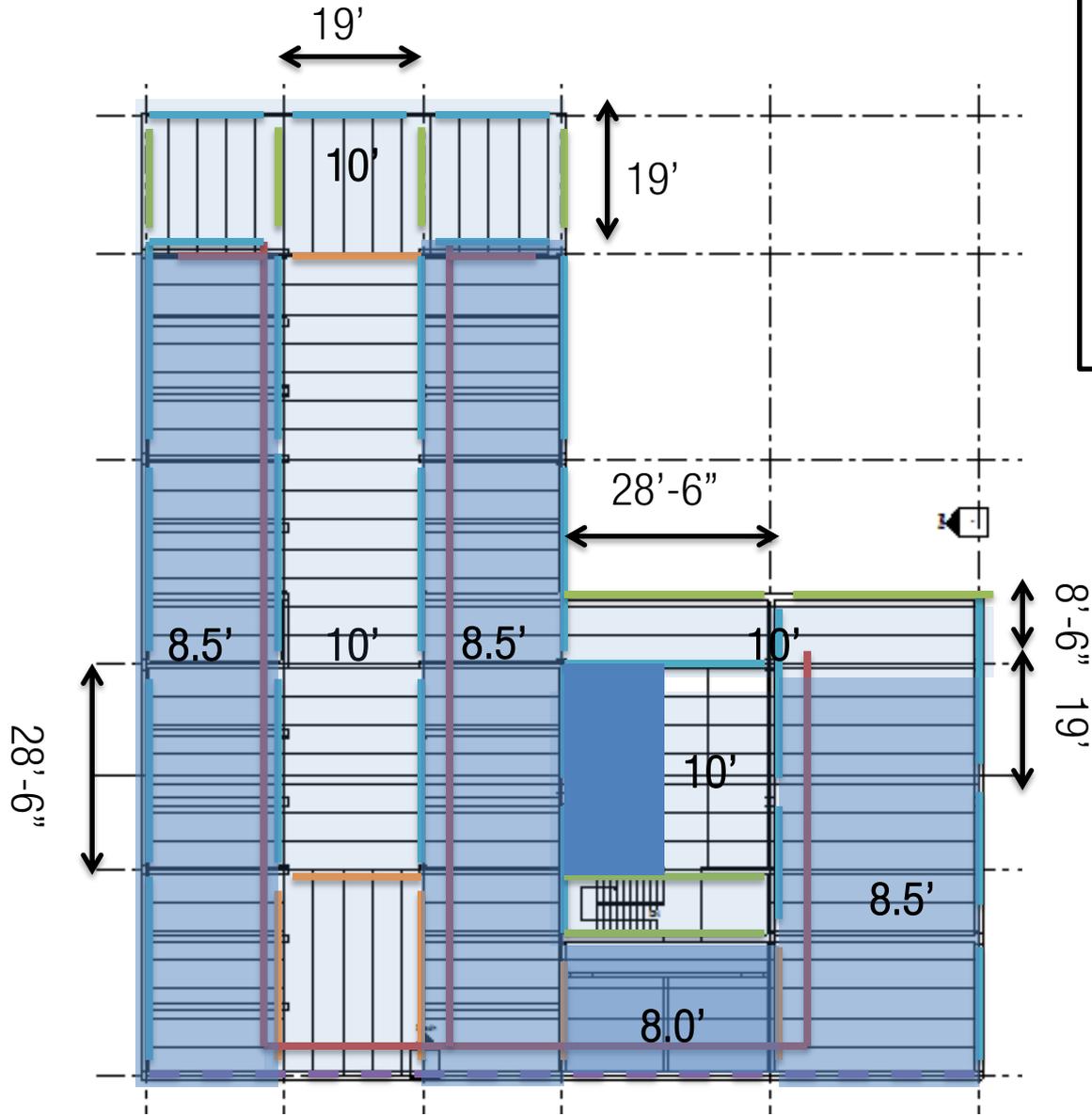
# STRUCTURAL ROOF/ MEP 3RD FLOOR



**Legend:**

- MEP main ducts 
- D-beams (W30x90) 
- Retaining wall 
- W14x90 
- W10x22 
- W36x256 

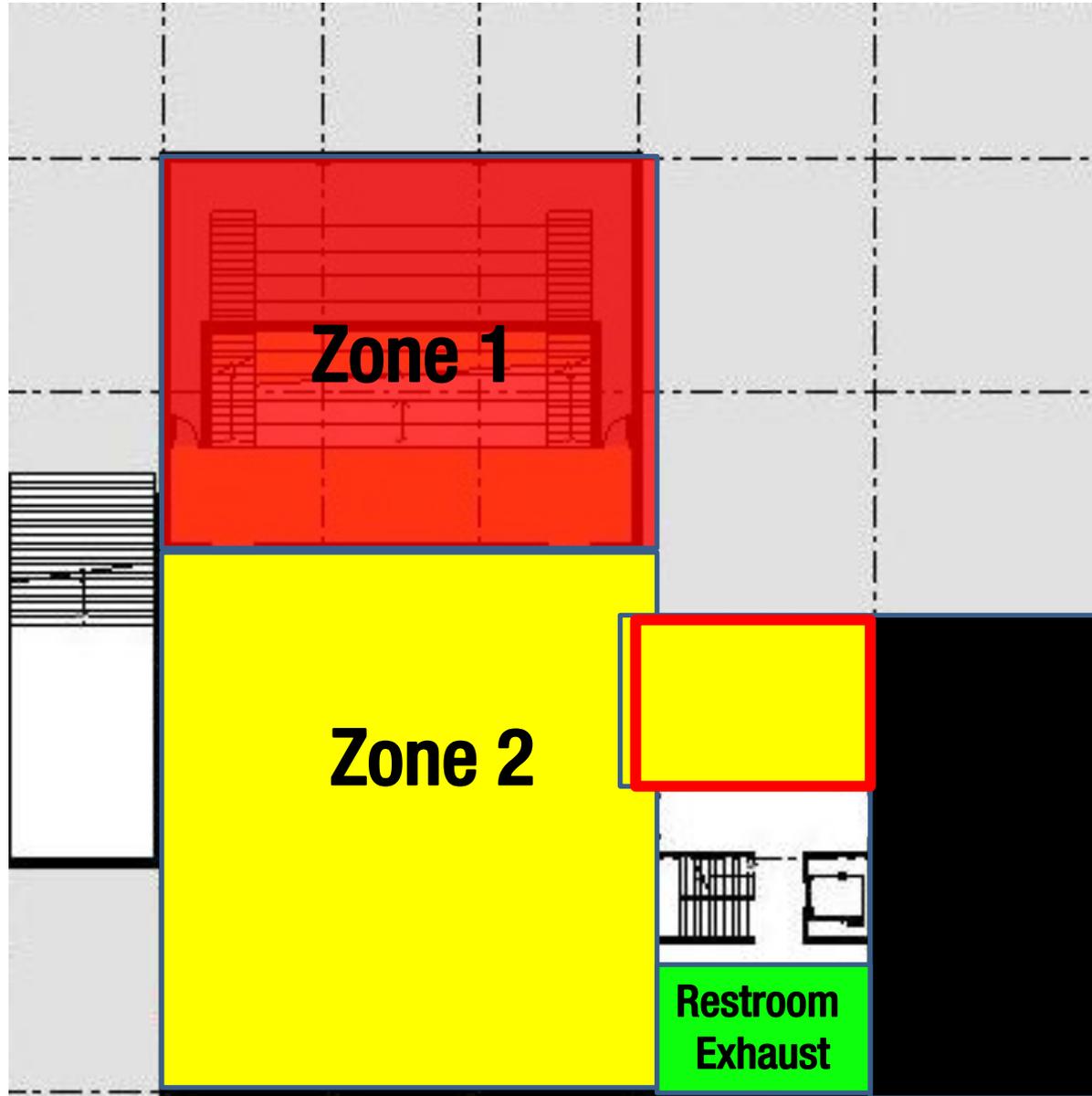
# CEILING HEIGHTS 3RD FLOOR



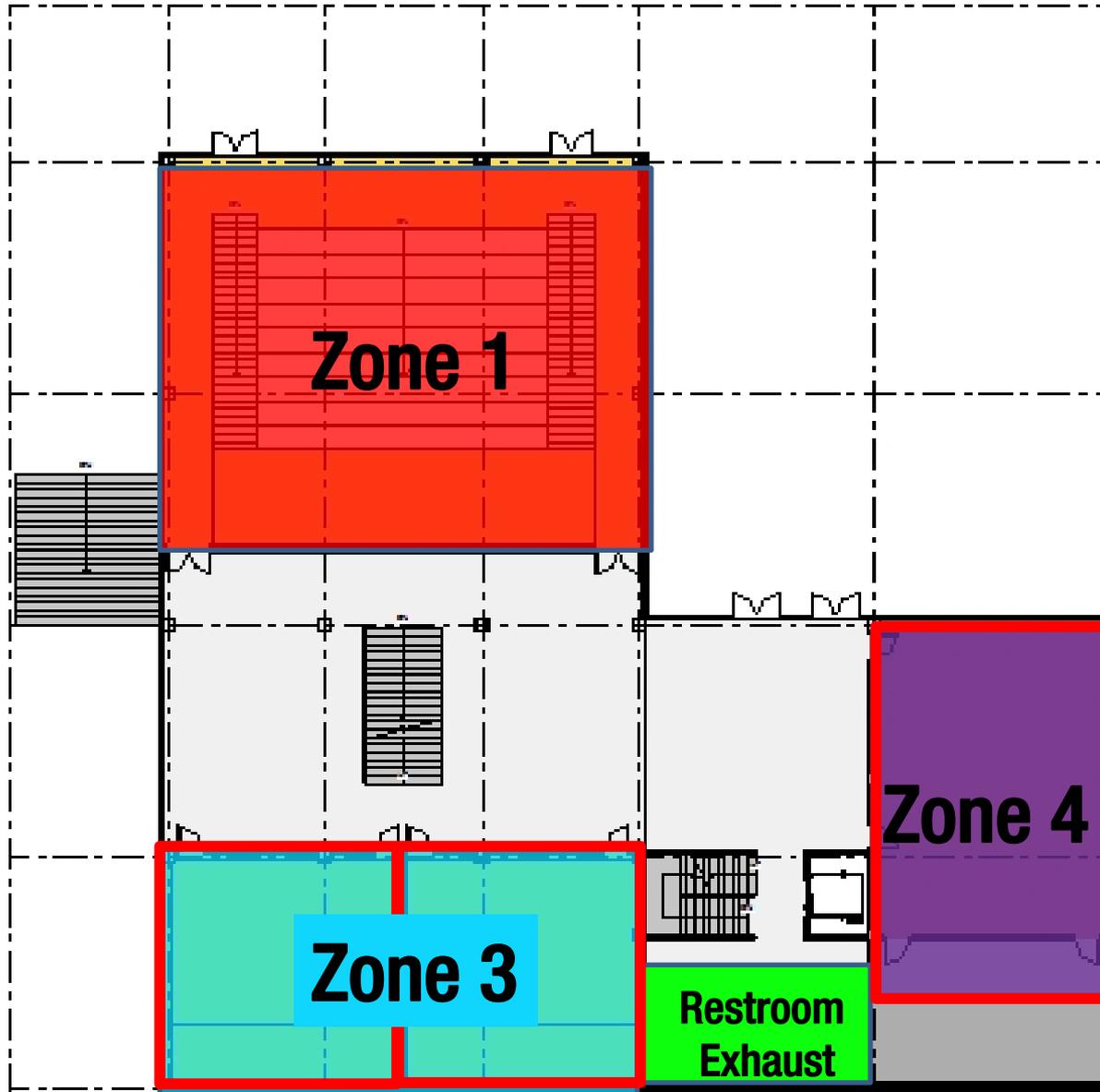
**Legend:**

- MEP main ducts —
- D-beams (W30x90) —
- Retaining wall - - -
- W14x90 —
- W10x22 —
- W36x256 —

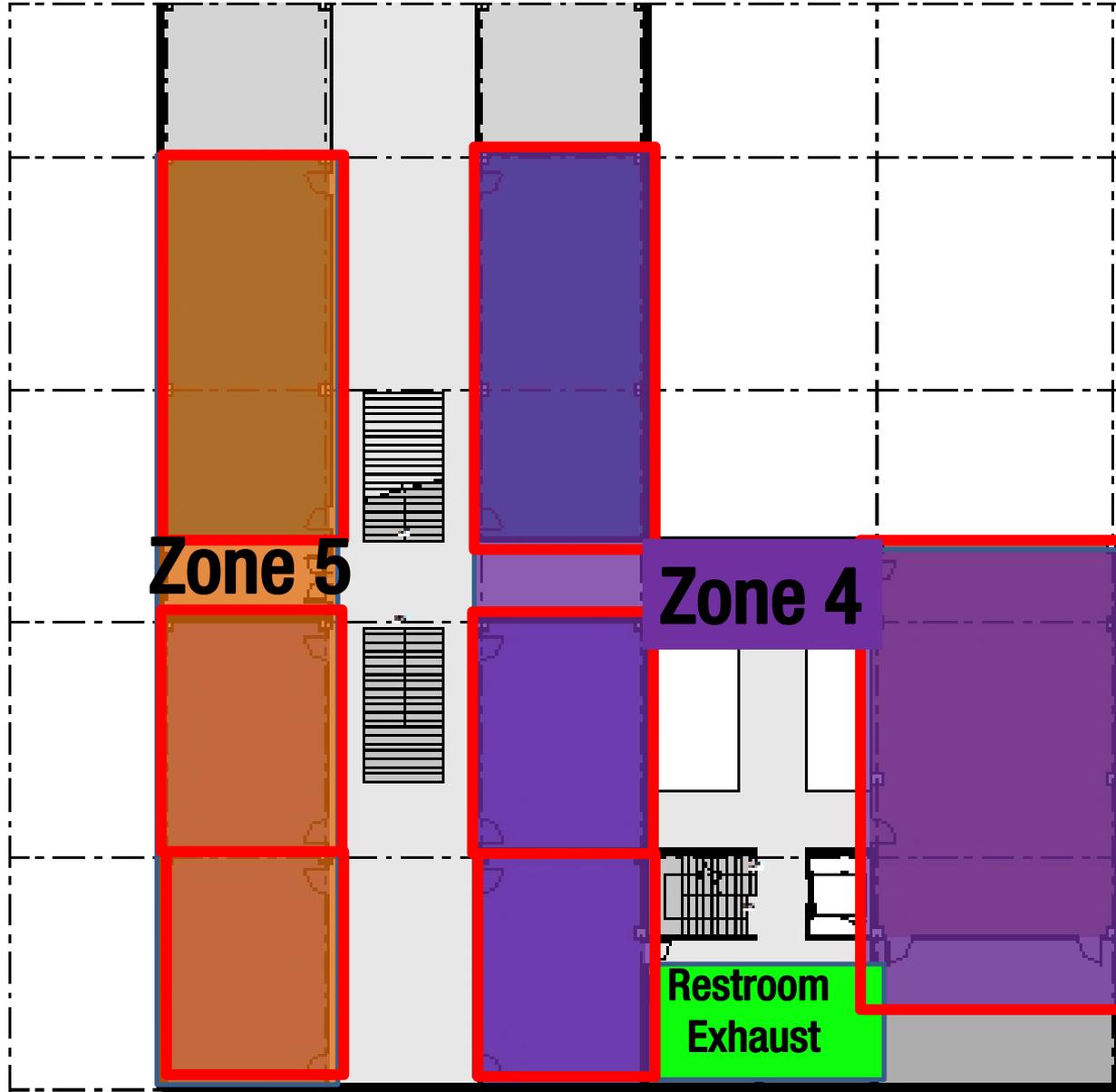
# ZONING BASEMENT



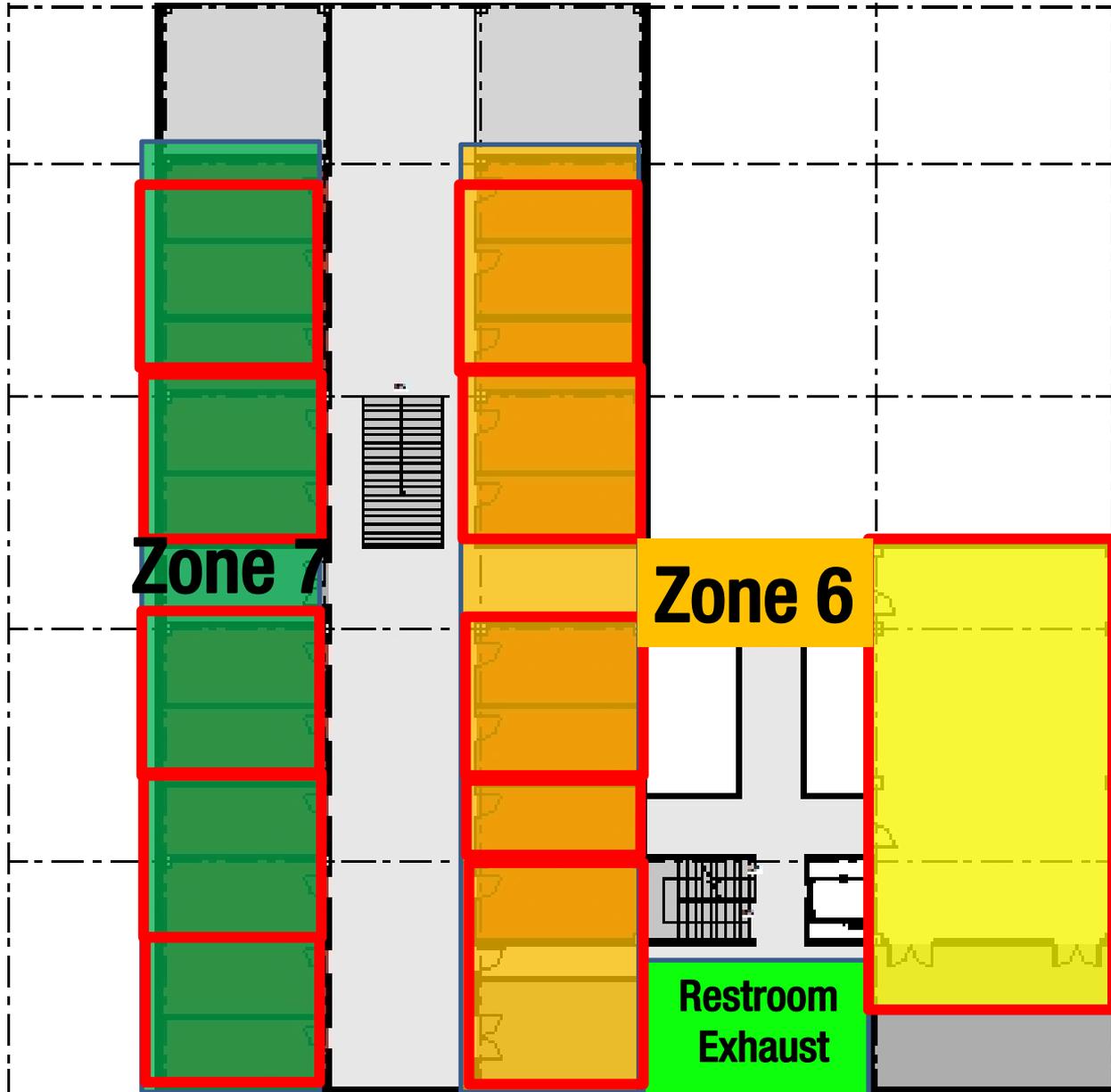
# ZONING 1ST FLOOR



# ZONING 2ND FLOOR



# ZONING 3RD FLOOR



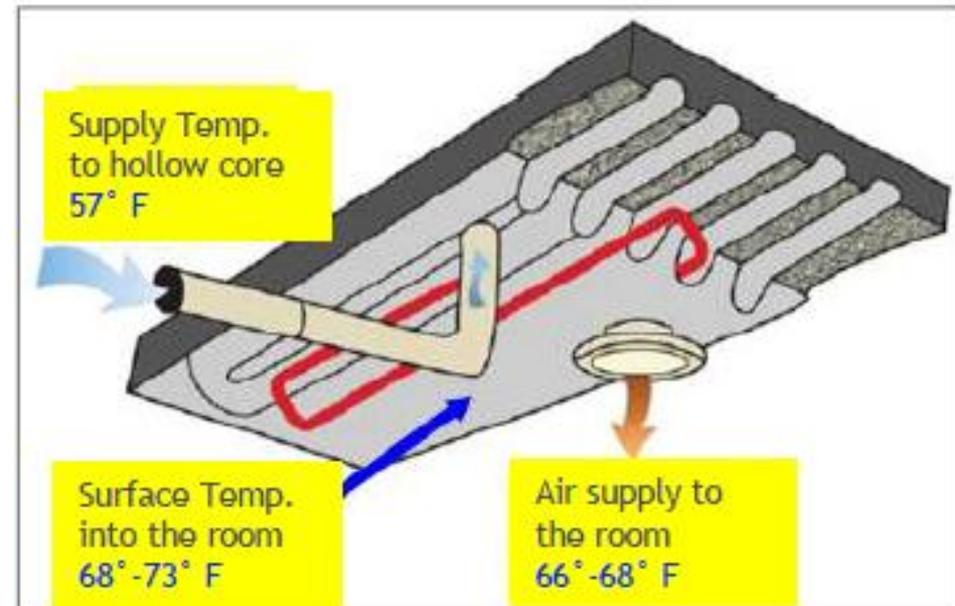
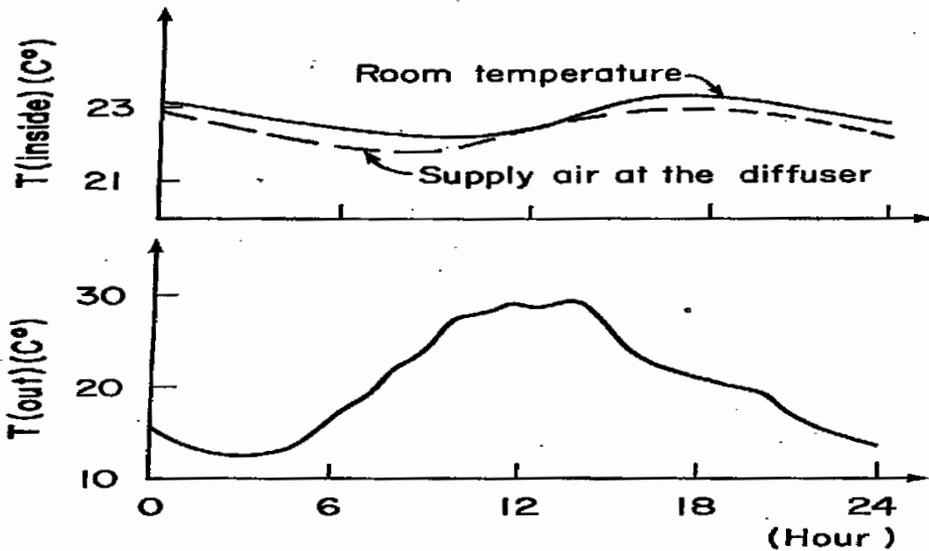
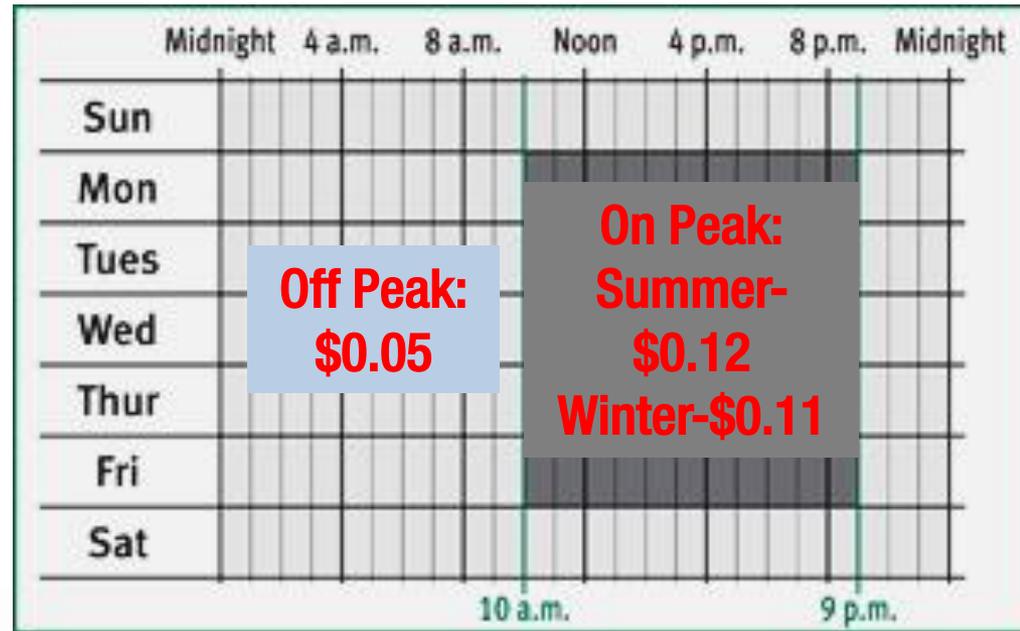
# COMFORT NEST

- Thermo Comfort
- Saves Energy
- Tenants Control Temperature
- Remembers Temperature Settings

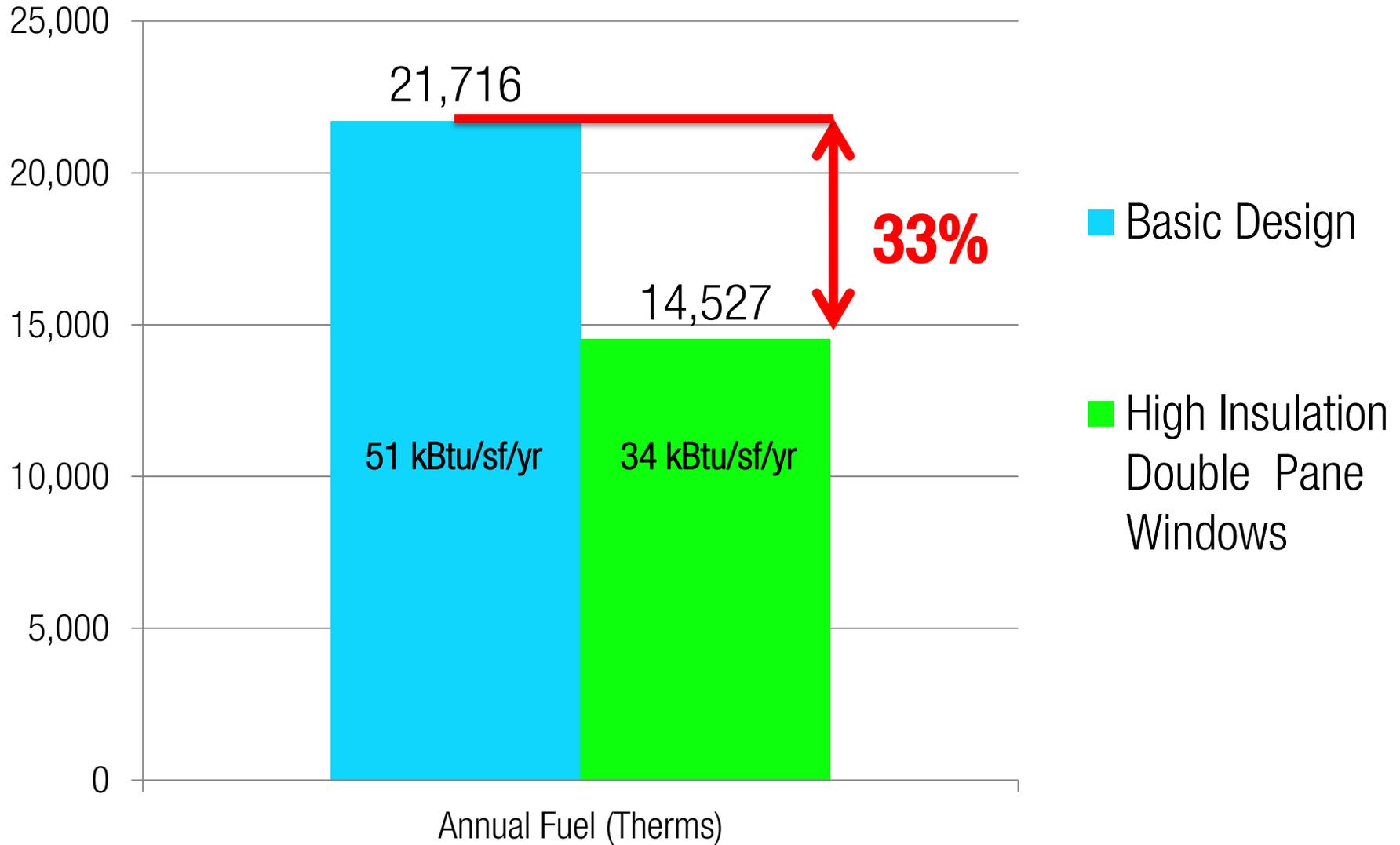


# TERMOBUILD ENERGY SAVINGS

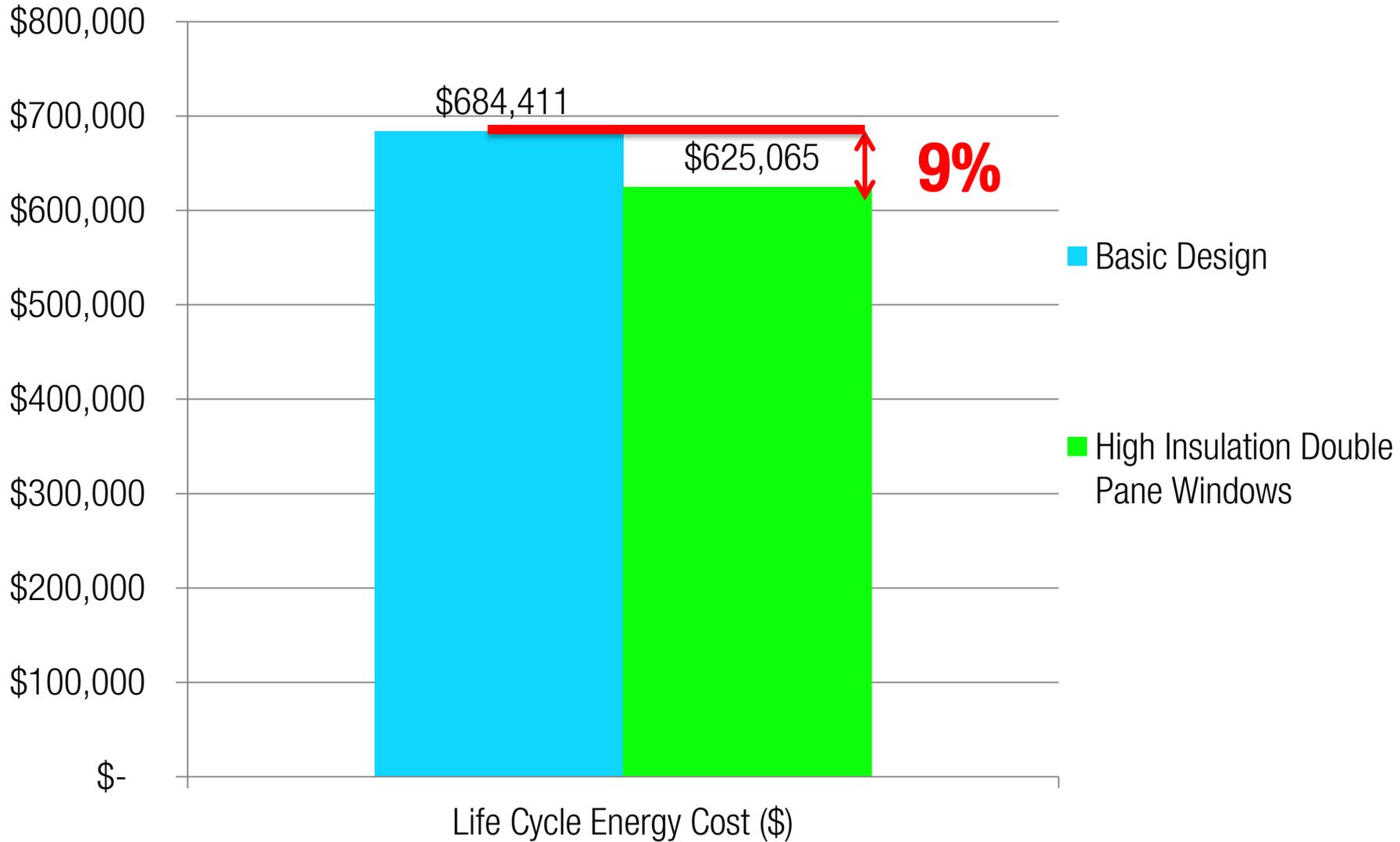
- Jack Laken-TermoBuild contact
- Energy Savings 20% to 45%
- Lower supply Air Temp.
  - 57°F Summer
  - 64°F Winter



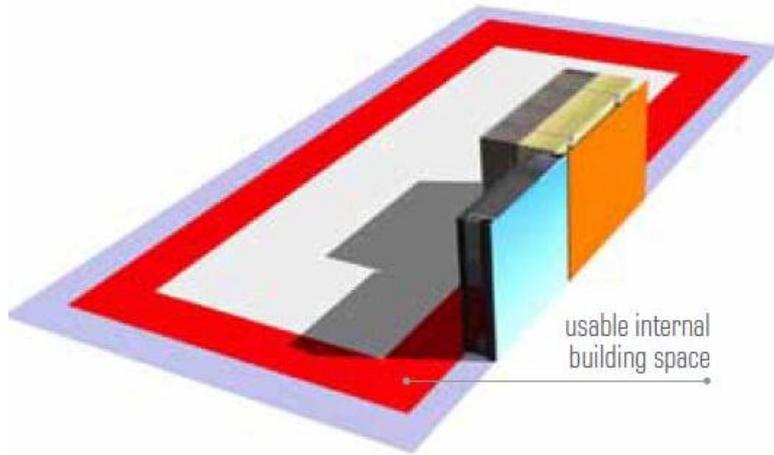
# ENERGY ANALYSIS – VASARI Fuel Savings



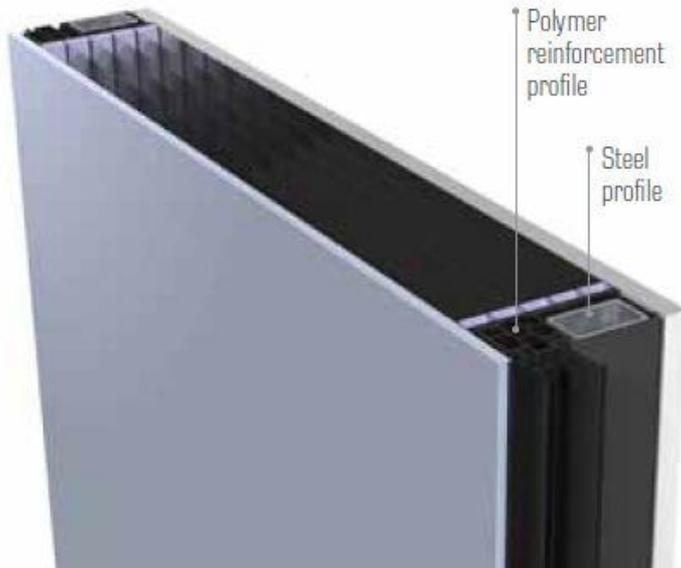
# ENERGY ANALYSIS – VASARI Life Cycle Energy Cost



# QBISS FACADE

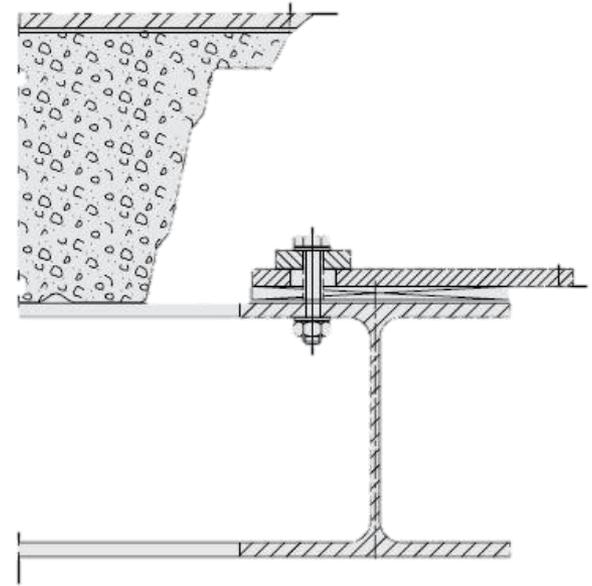
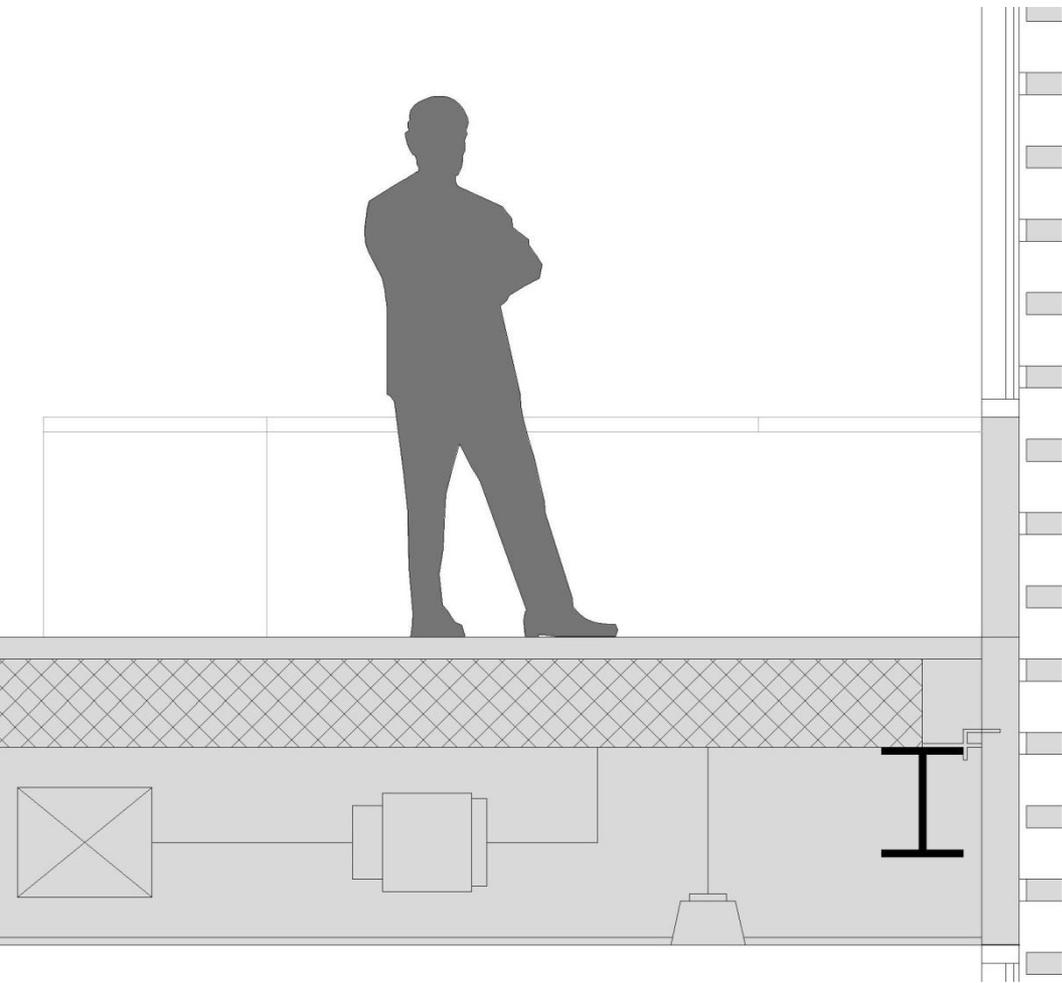


Qbiss Air unit – composition

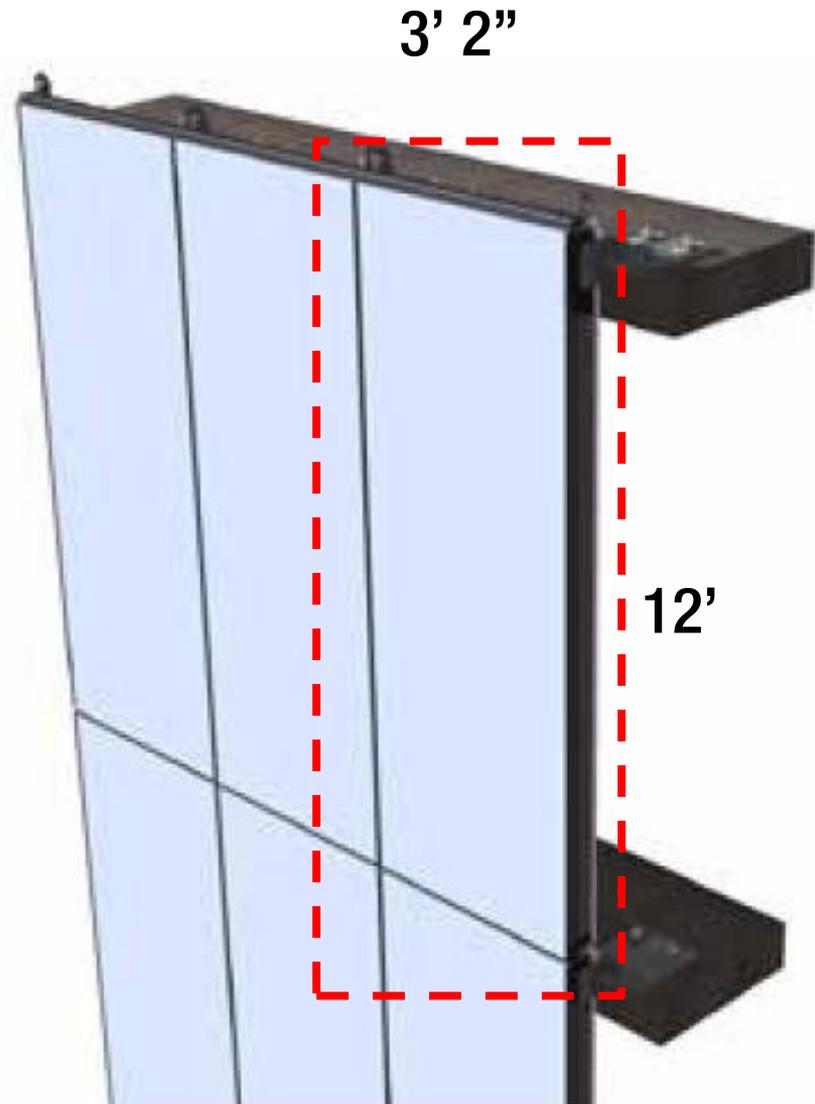
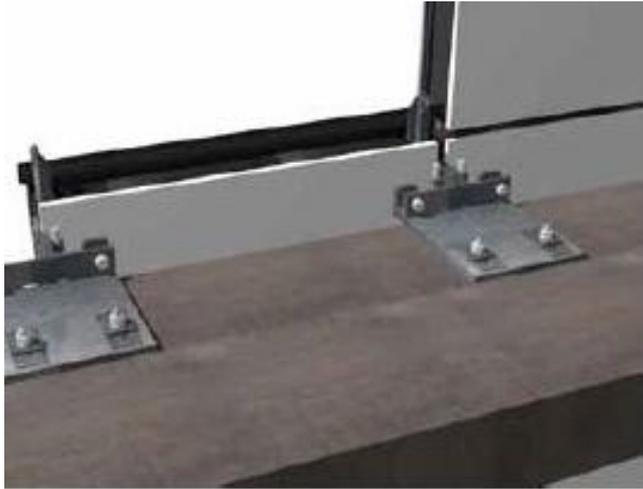


- **96% RECYCLABLE**
- **LIGHTWEIGHT** (49 kg/m<sup>2</sup>)
- **MAXIMISED USABLE SPACE**
- **MINIMISED CONSTRUCTION TIME**

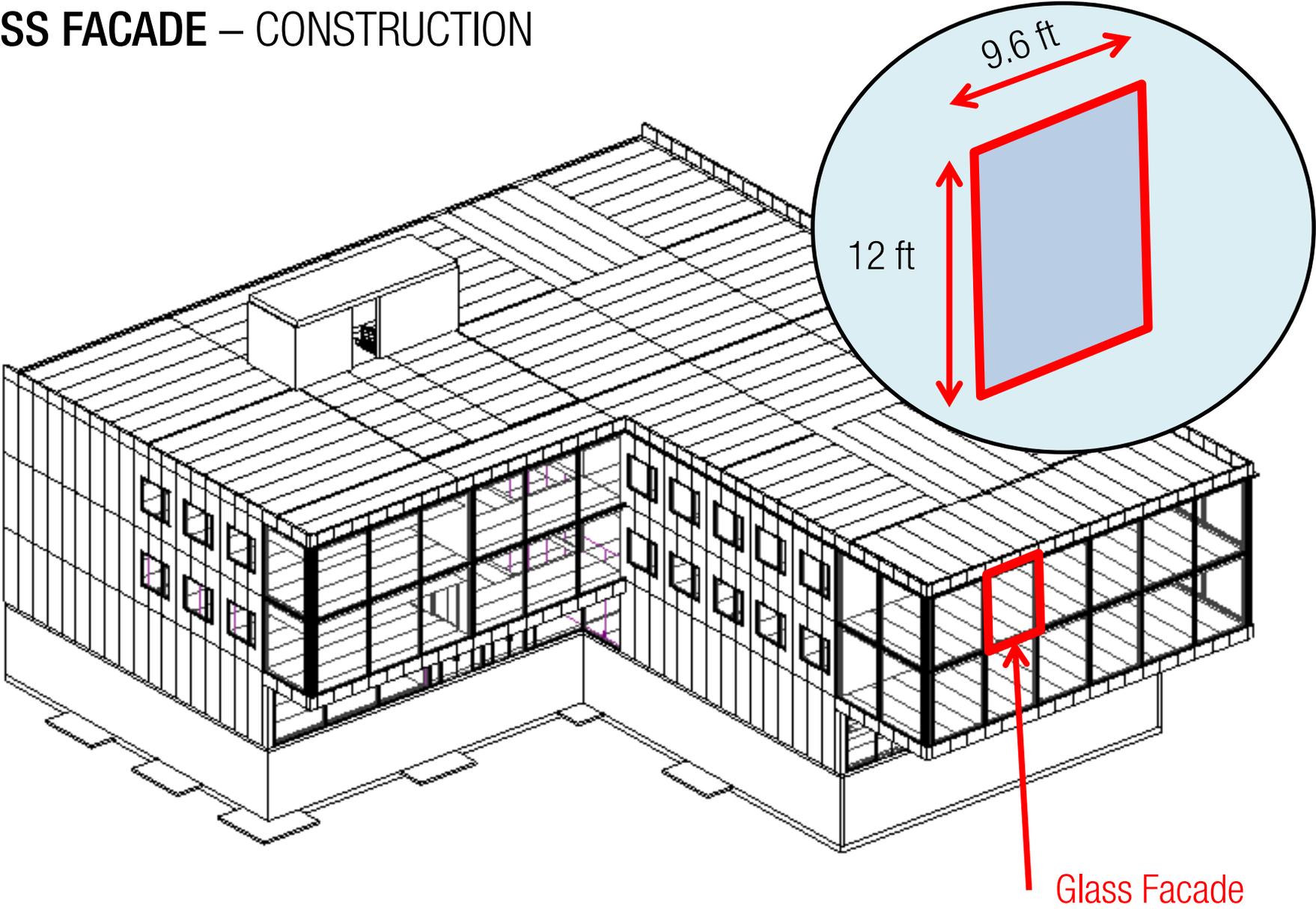
# QBISS FACADE – CONNECTION DETAIL



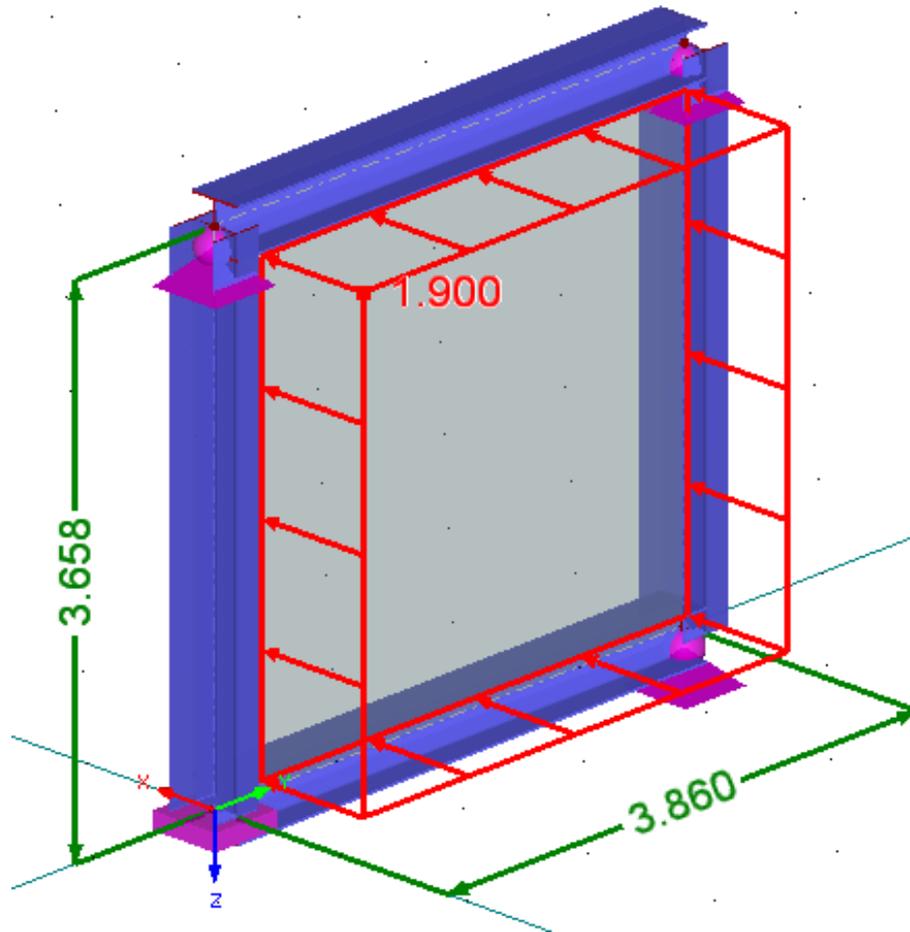
# QBISS FACADE – CONSTRUCTION



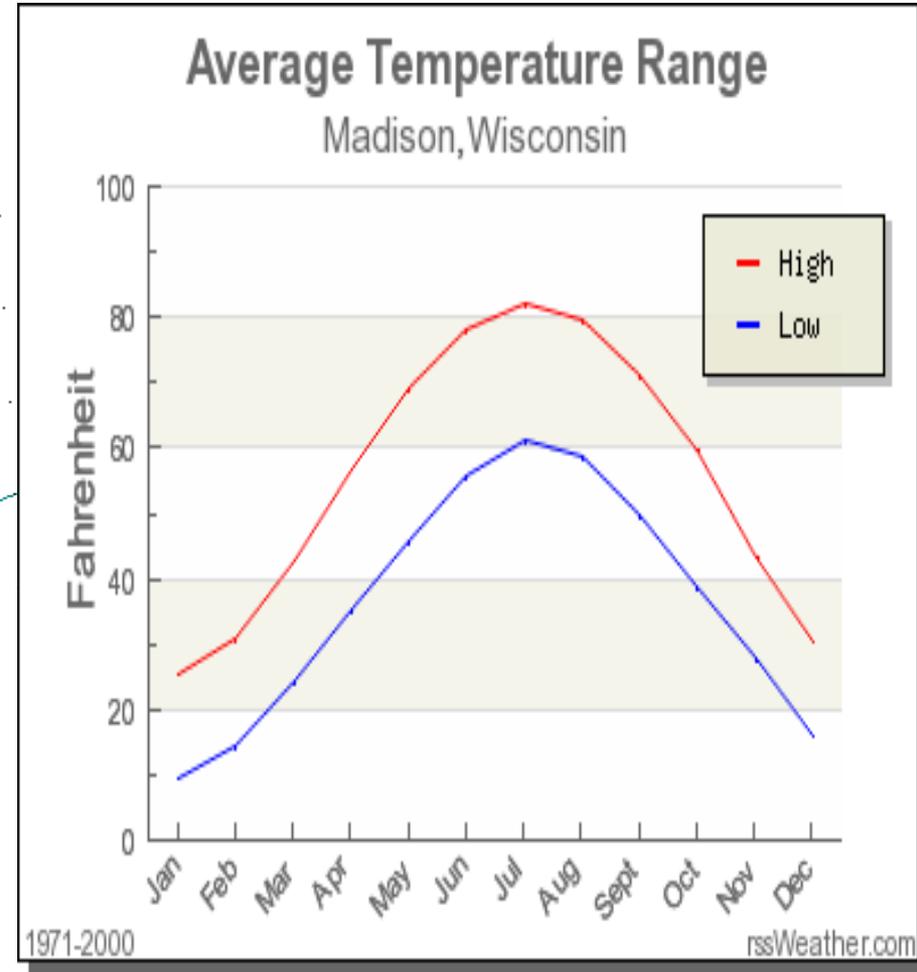
# GLASS FACADE – CONSTRUCTION



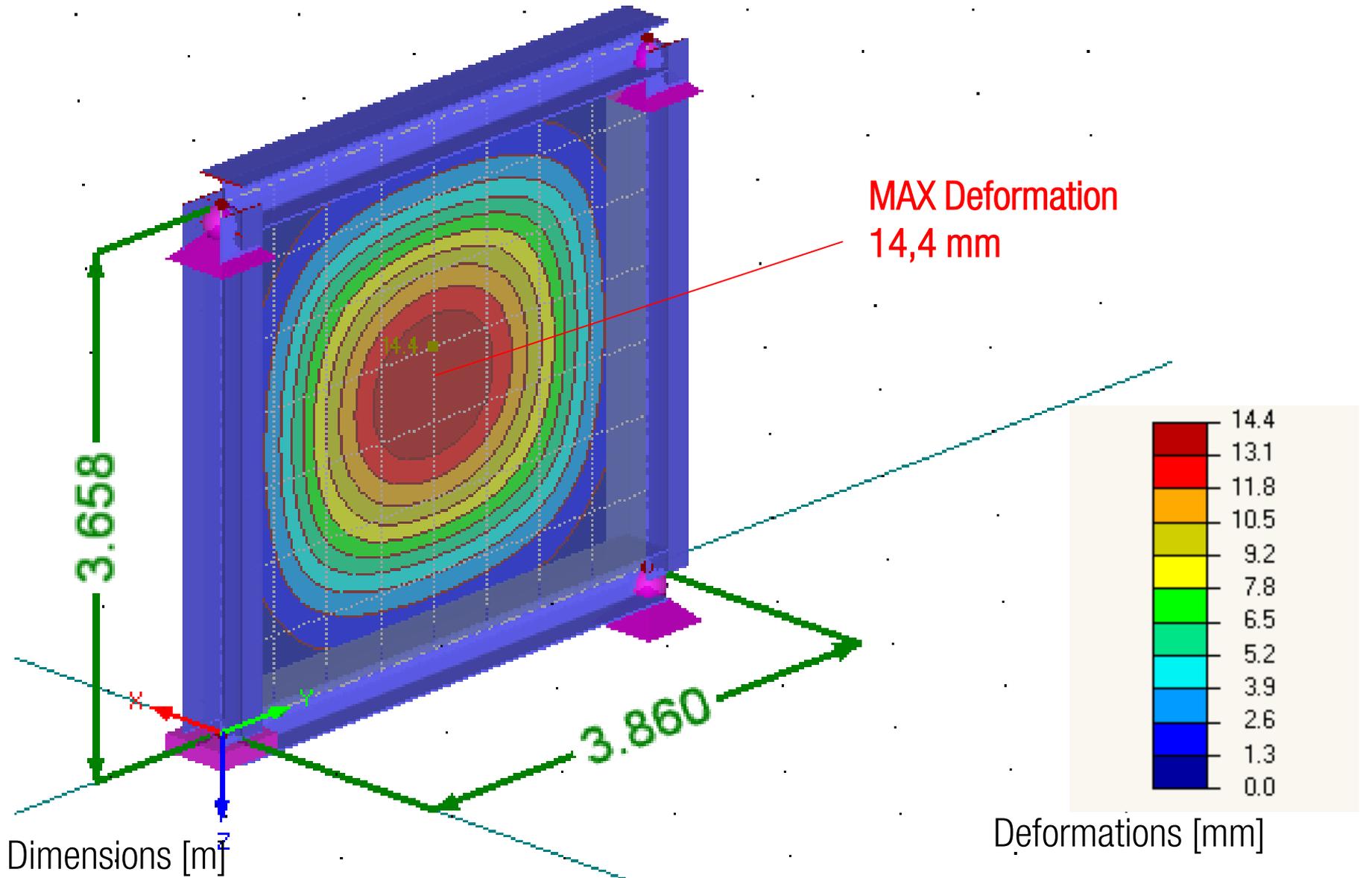
# GLASS FACADE – STRUCTURAL MODEL



Loads [ $\text{kNm}^{-2}$ ]  
Dimensions [m]



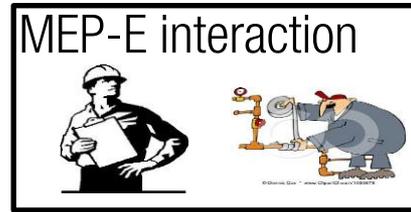
# GLASS FACADE – STRUCTURAL MODEL



# GLASS FACADE – STRUCTURAL MODEL

summer calculation:

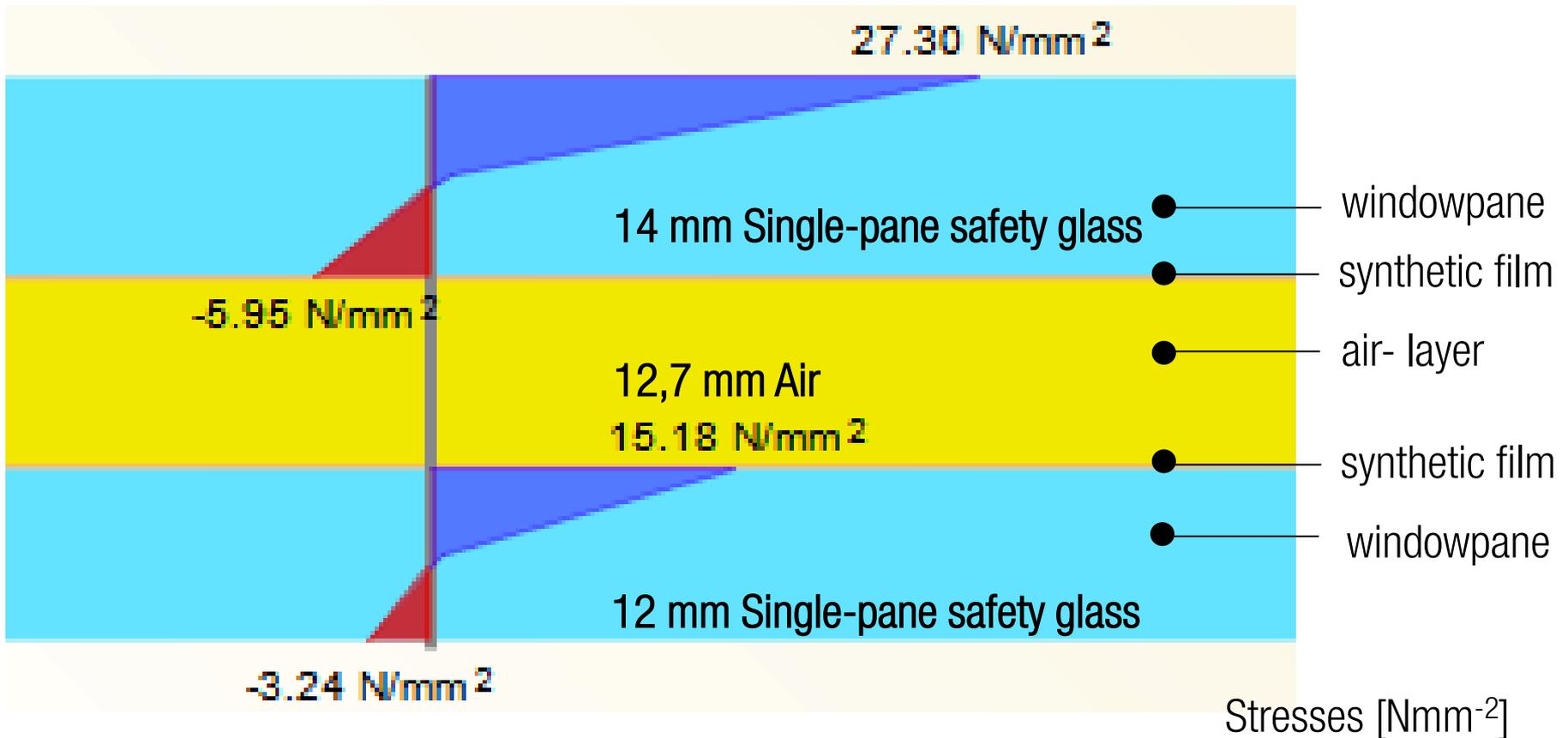
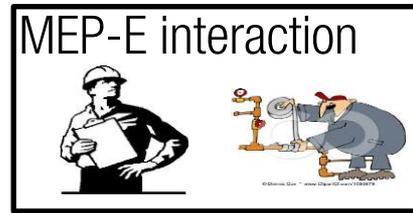
load situation: temperature difference 20 Kelvin  
wind load (optional)



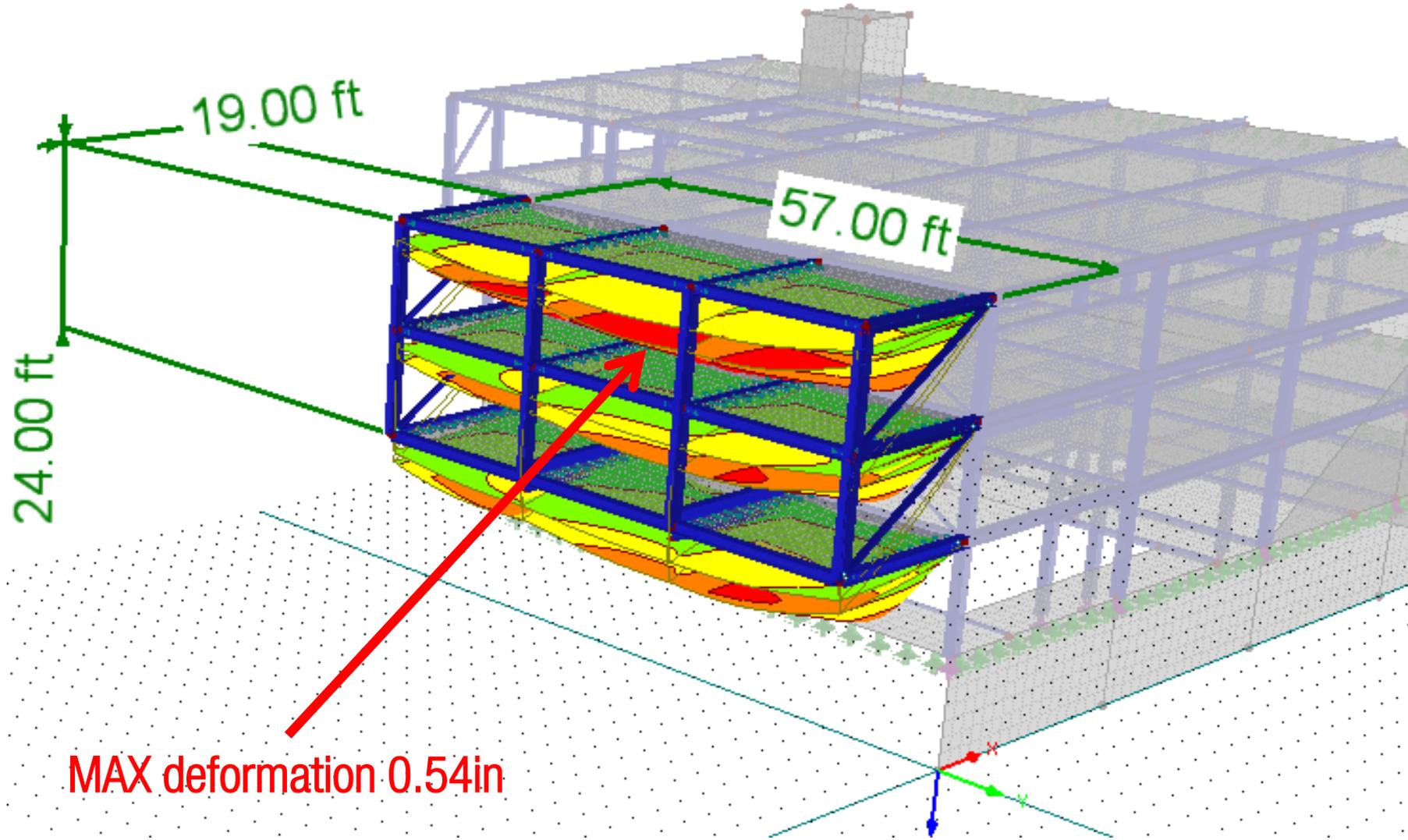
# GLASS FACADE – STRUCTURAL MODEL

winter calculation:

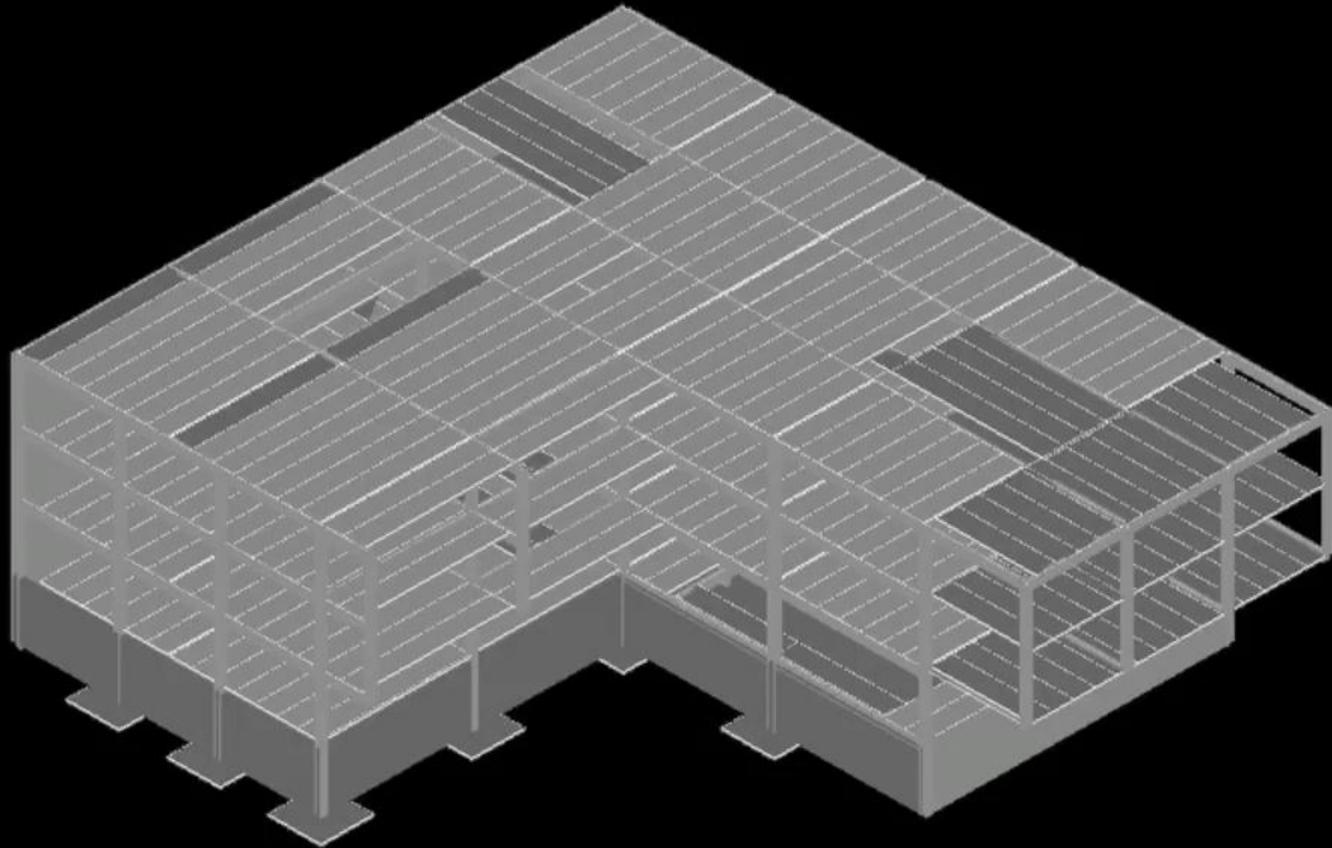
load situation: temperature difference 25 Kelvin  
wind load (optional)



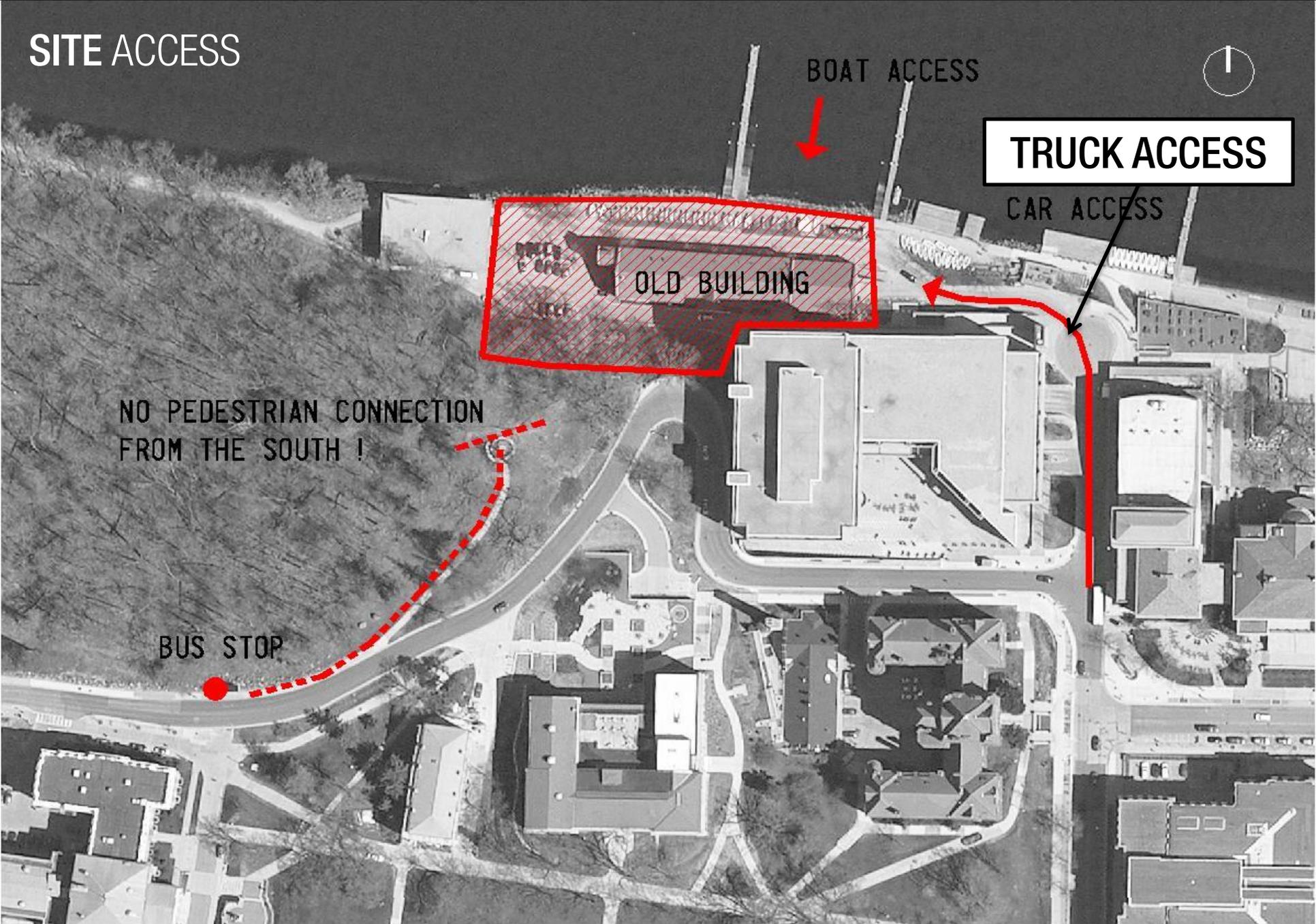
# DEFORMATIONS CANTILEVER



# SCHEDULE FACADE



# SITE ACCESS



BOAT ACCESS

**TRUCK ACCESS**

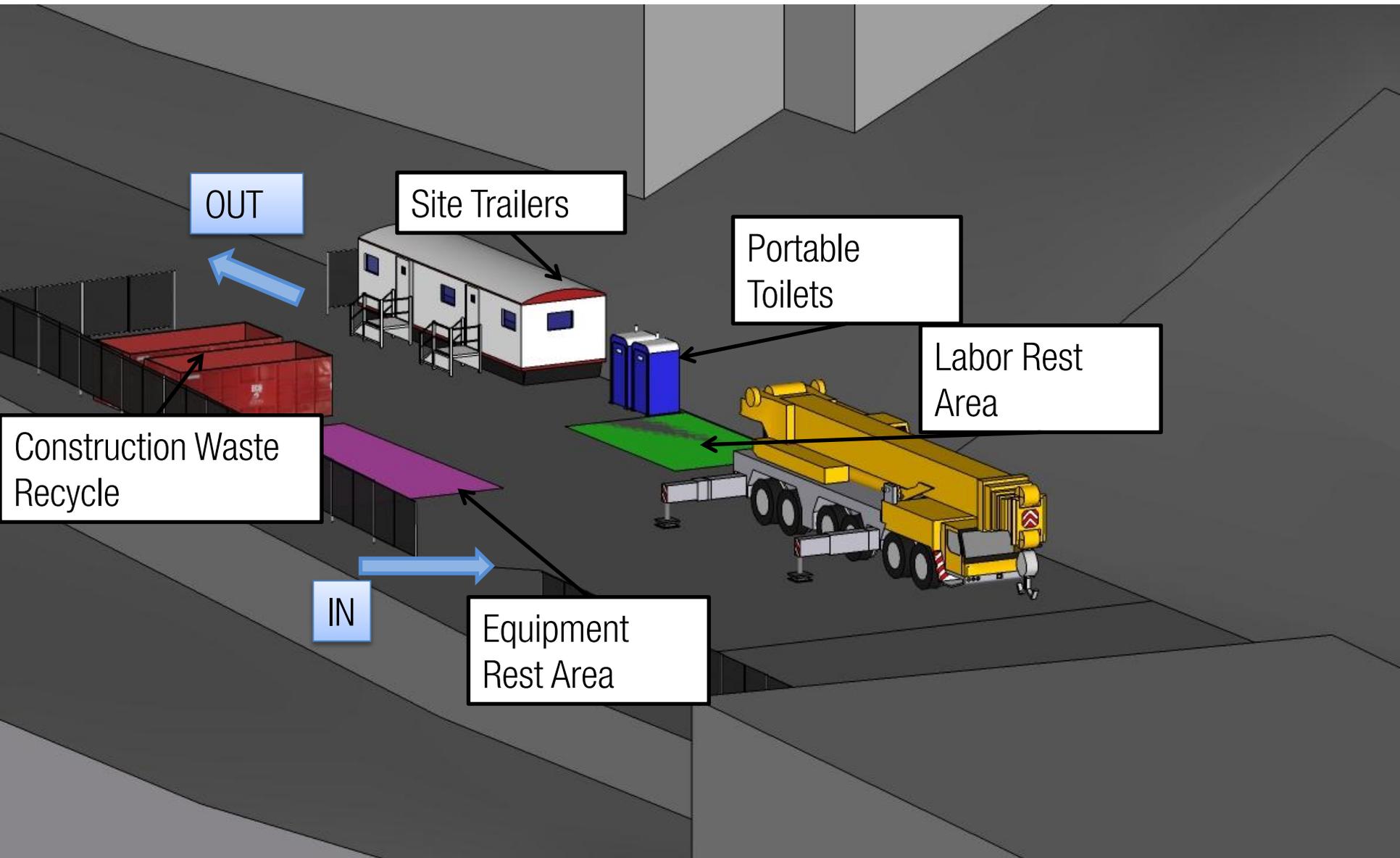
CAR ACCESS

OLD BUILDING

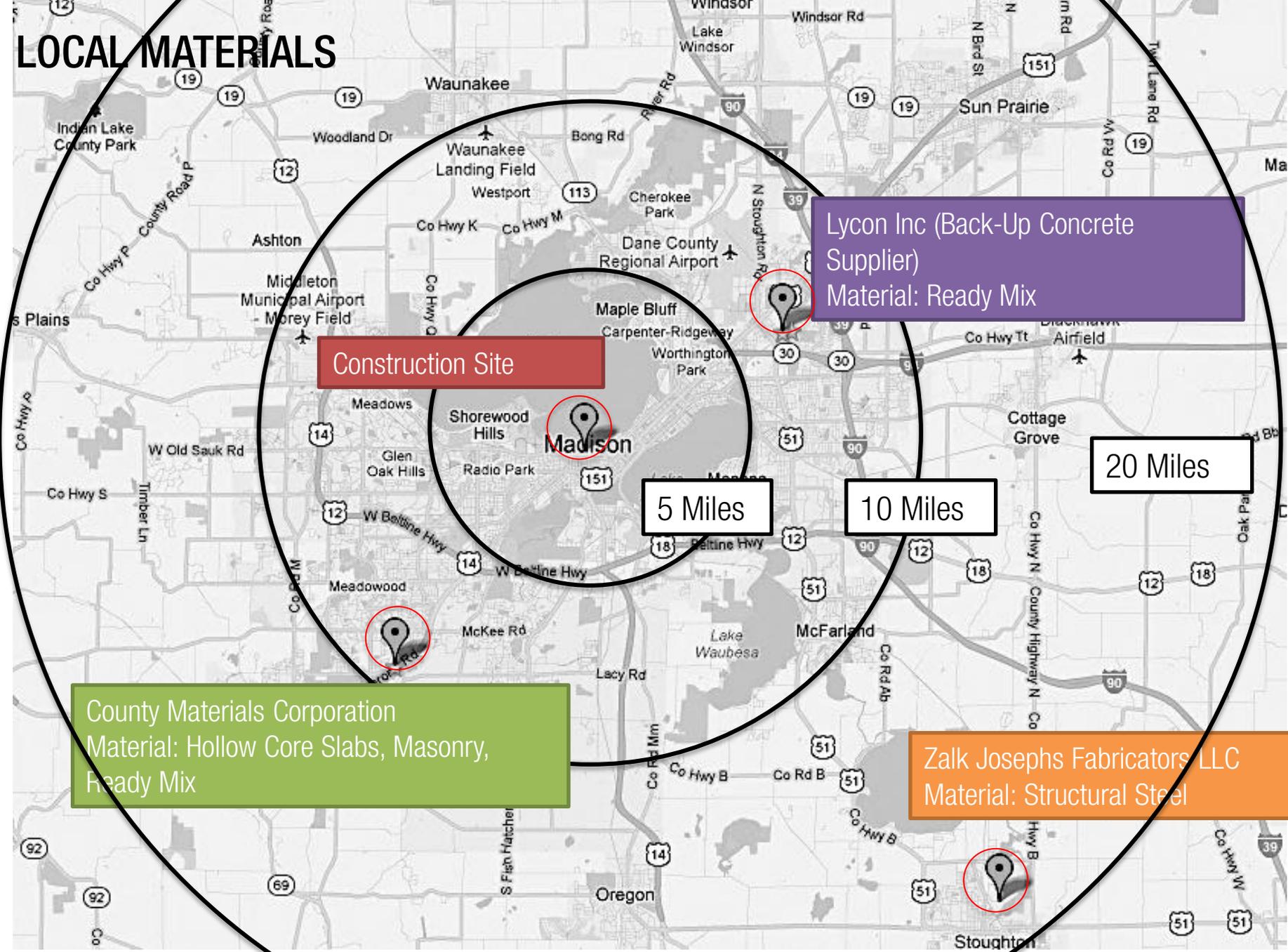
NO PEDESTRIAN CONNECTION  
FROM THE SOUTH !

BUS STOP

# SITE ACCESS



# LOCAL MATERIALS



Construction Site

Lycon Inc (Back-Up Concrete Supplier)  
Material: Ready Mix

5 Miles

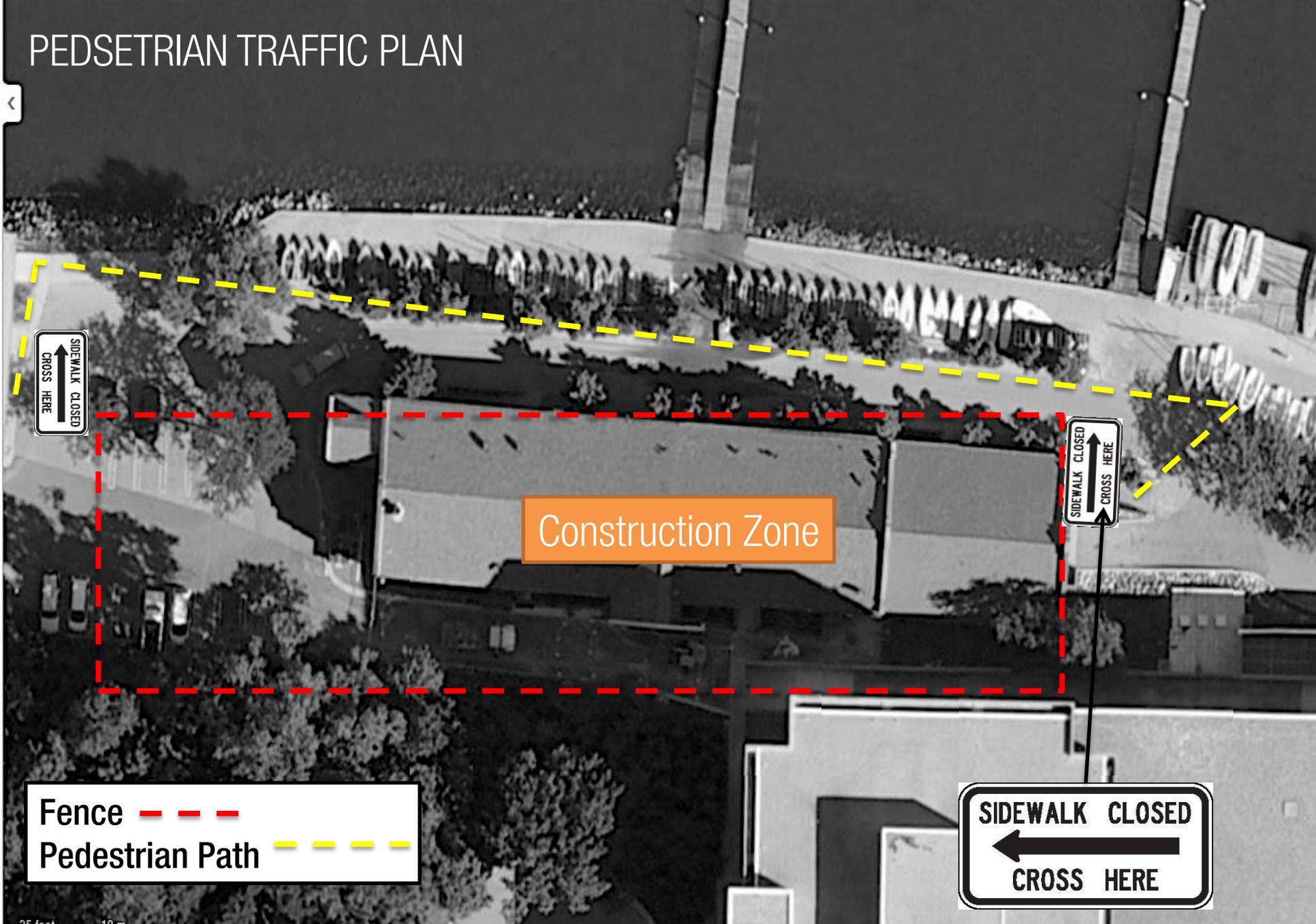
10 Miles

20 Miles

County Materials Corporation  
Material: Hollow Core Slabs, Masonry, Ready Mix

Zalk Josephs Fabricators LLC  
Material: Structural Steel

# PEDSETRIAN TRAFFIC PLAN



Construction Zone

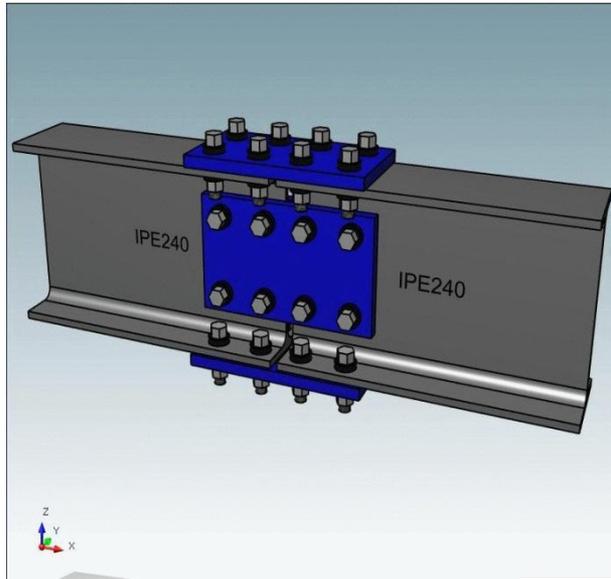
Fence - - -  
Pedestrian Path - - -

SIDEWALK CLOSED  
↑  
CROSS HERE

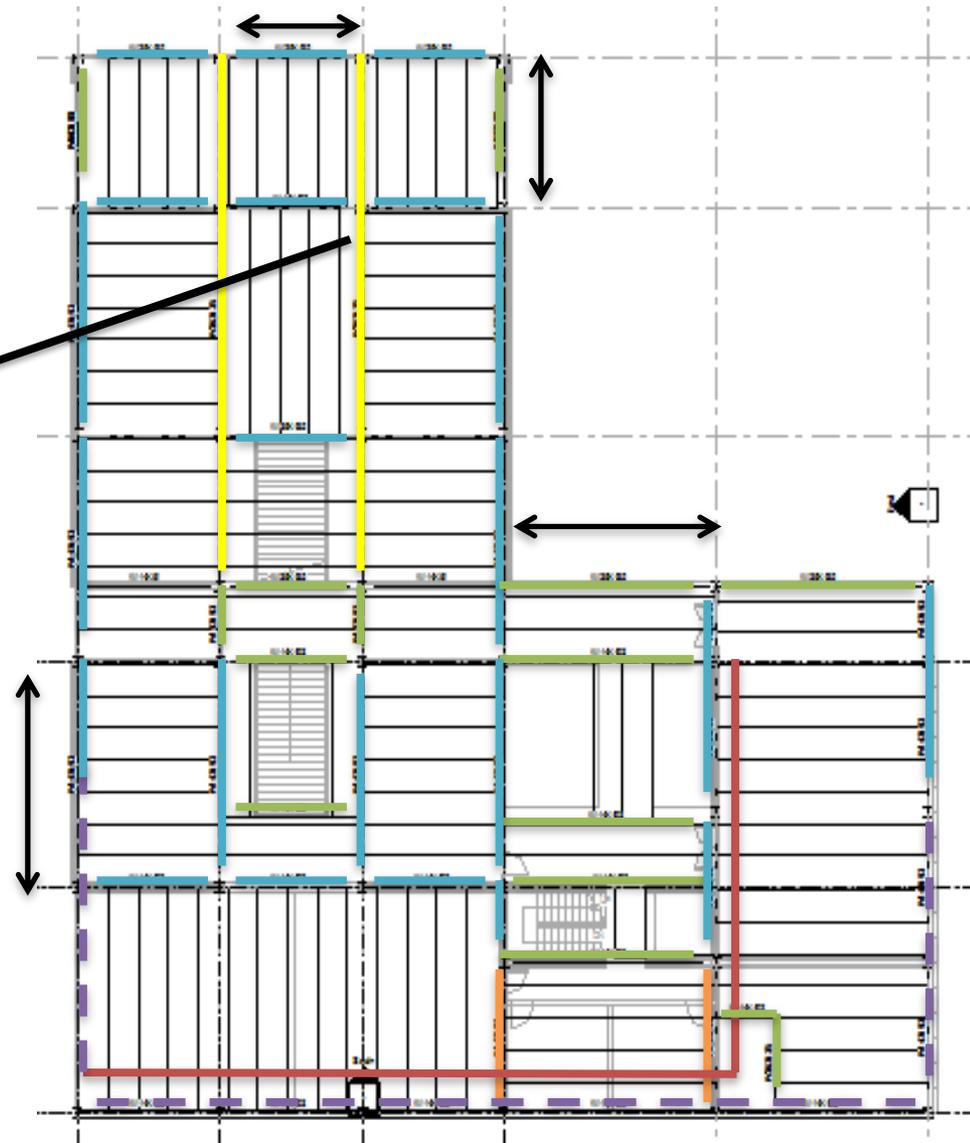
SIDEWALK CLOSED  
↑  
CROSS HERE

SIDEWALK CLOSED  
←  
CROSS HERE

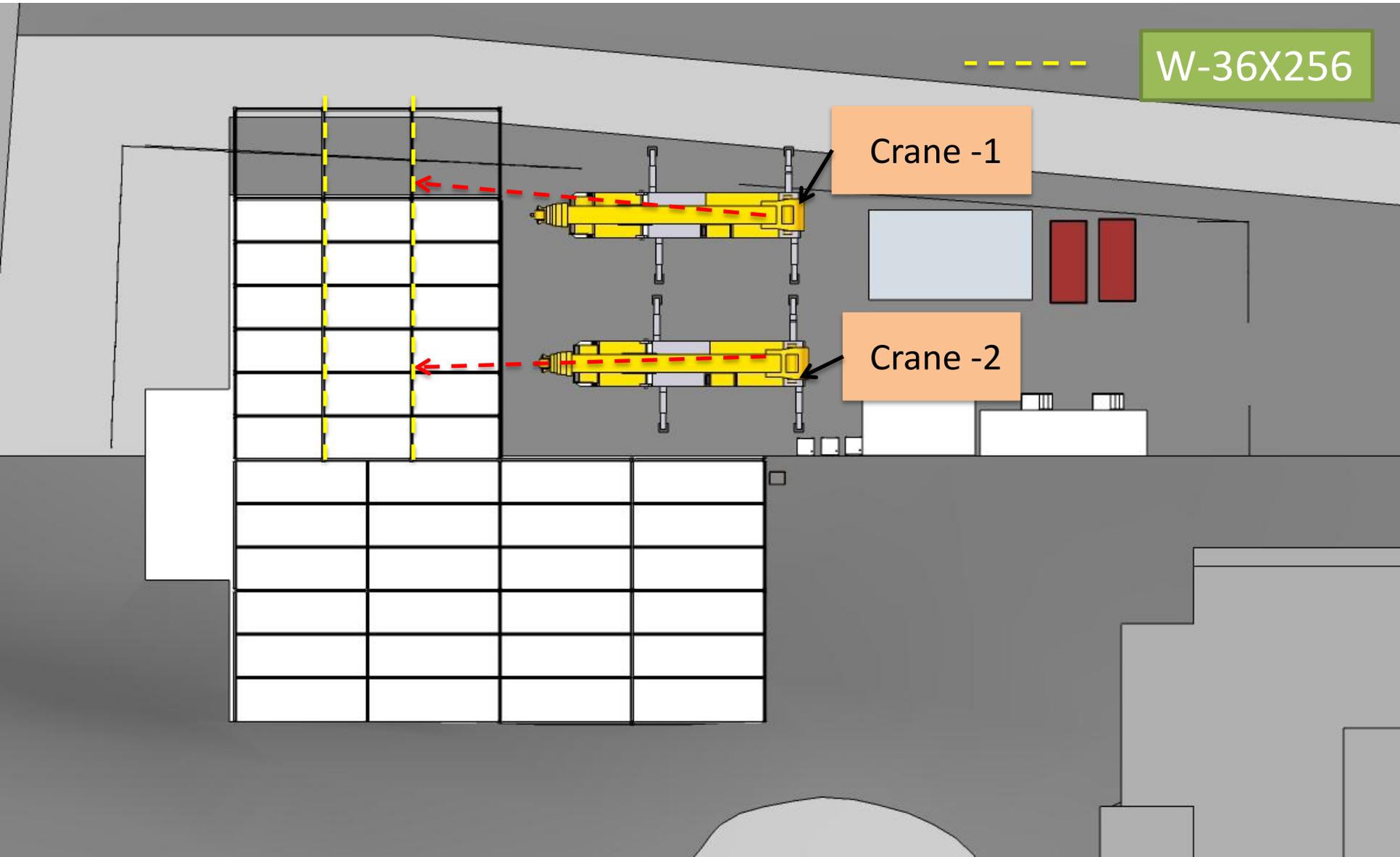
# CONSTRUCTABILITY TWO CRANE LIFT



W36x256 – 66.5 ft



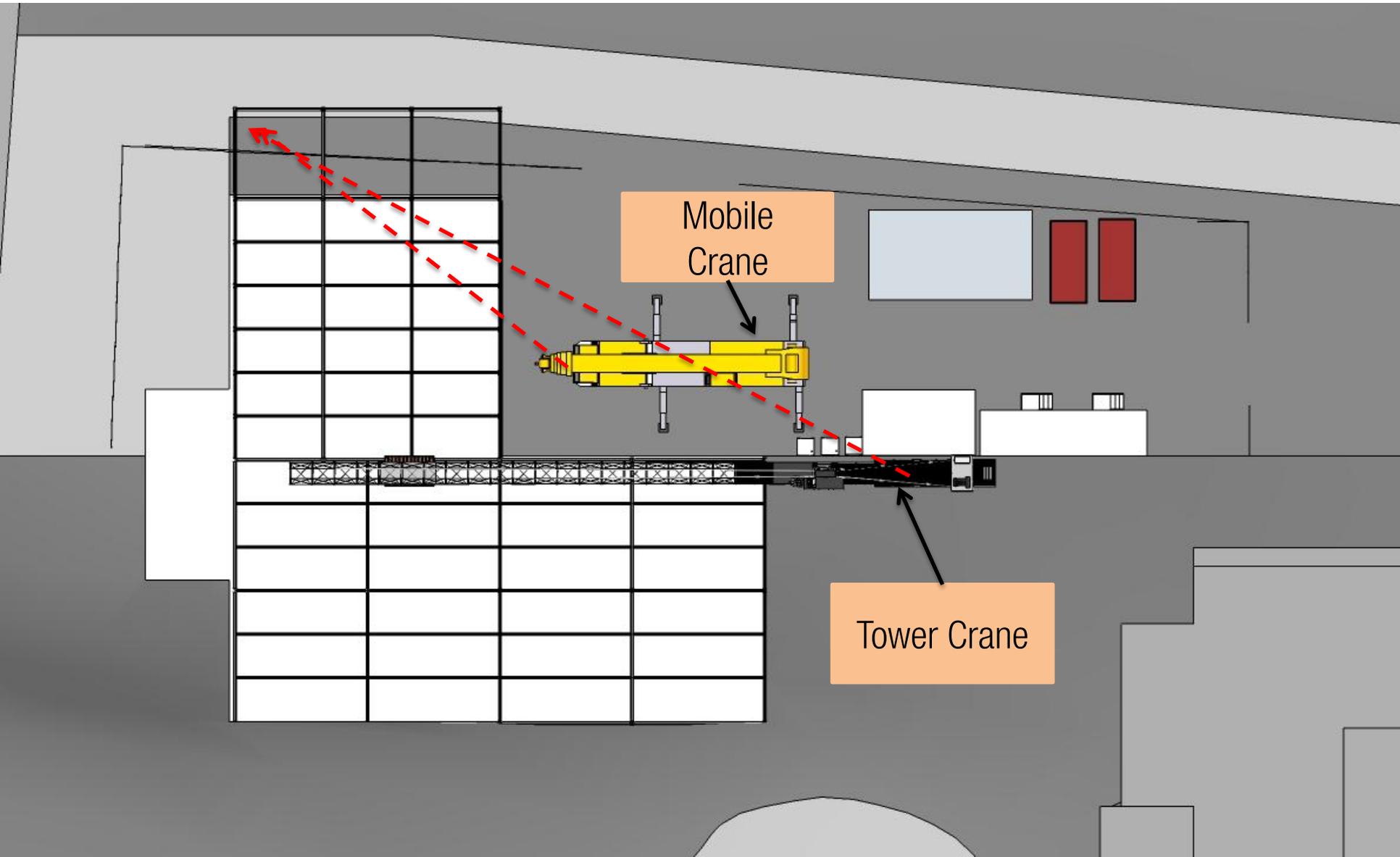
# CONSTRUCTABILITY TWO CRANE LIFT



# CONSTRUCTABILITY TWO CRANE LIFT



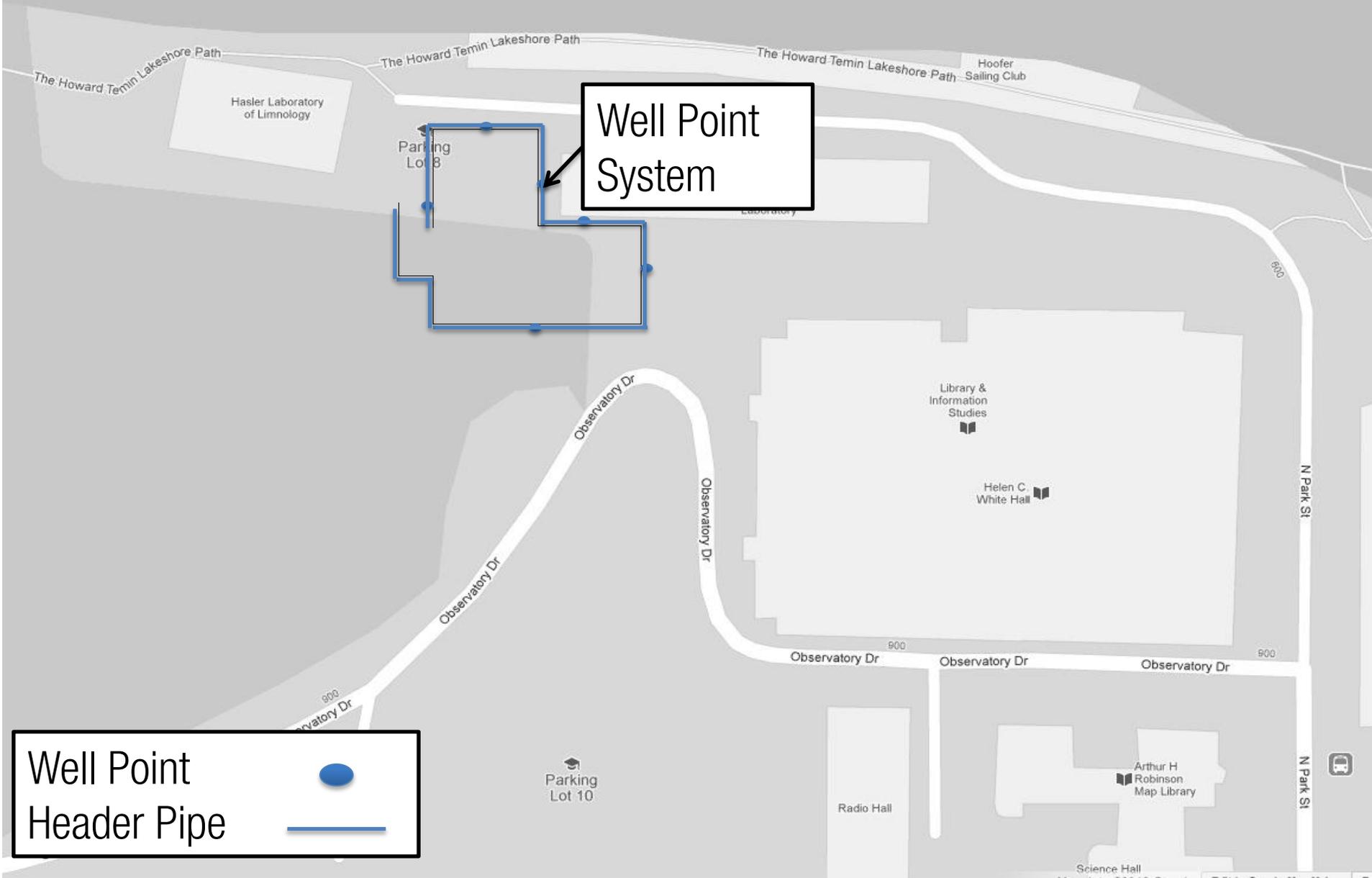
# CONSTRUCTABILITY MOBILE CRANE VS TOWER CRANE



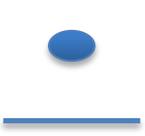
# CONSTRUCTABILITY MOBILE CRANE VS TOWER CRANE

Tower Crane vs Mobile Crane : Duration Required July - November		
Crane Type	Tower Crane	Mobile Crane
Crane Model	Terex SK 575-32	Terex T-560
Rent Per Day	\$ 2068.80	\$ 2109.20
Mobilization	Yes	No
Flexibility	Low	High

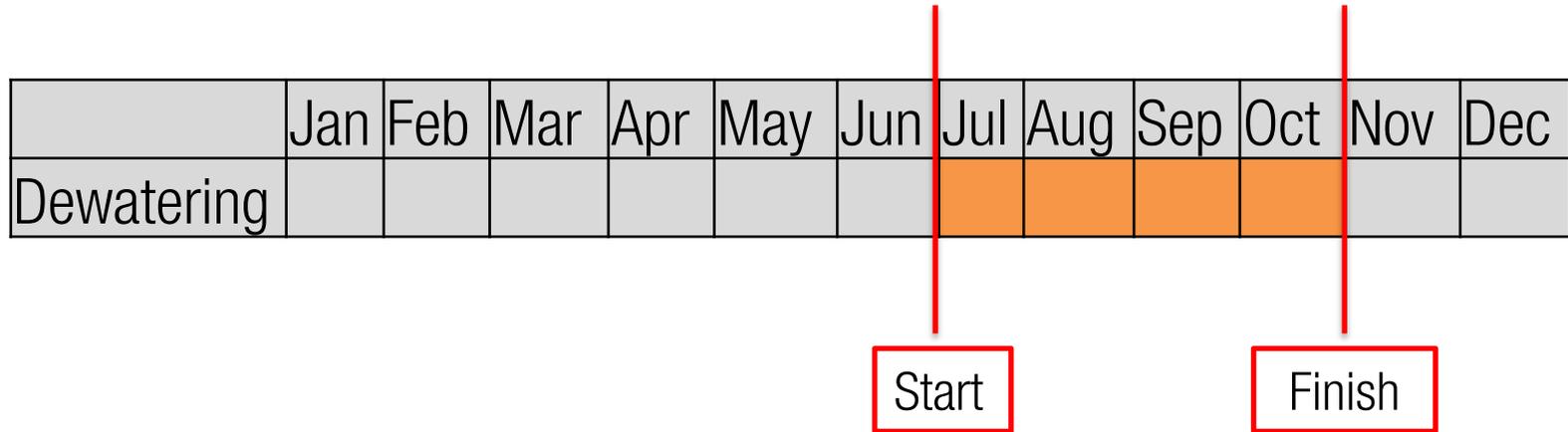
# CONSTRUCTABILITY DEWATERING



Well Point  
Header Pipe



# CONSTRUCTABILITY DEWATERING

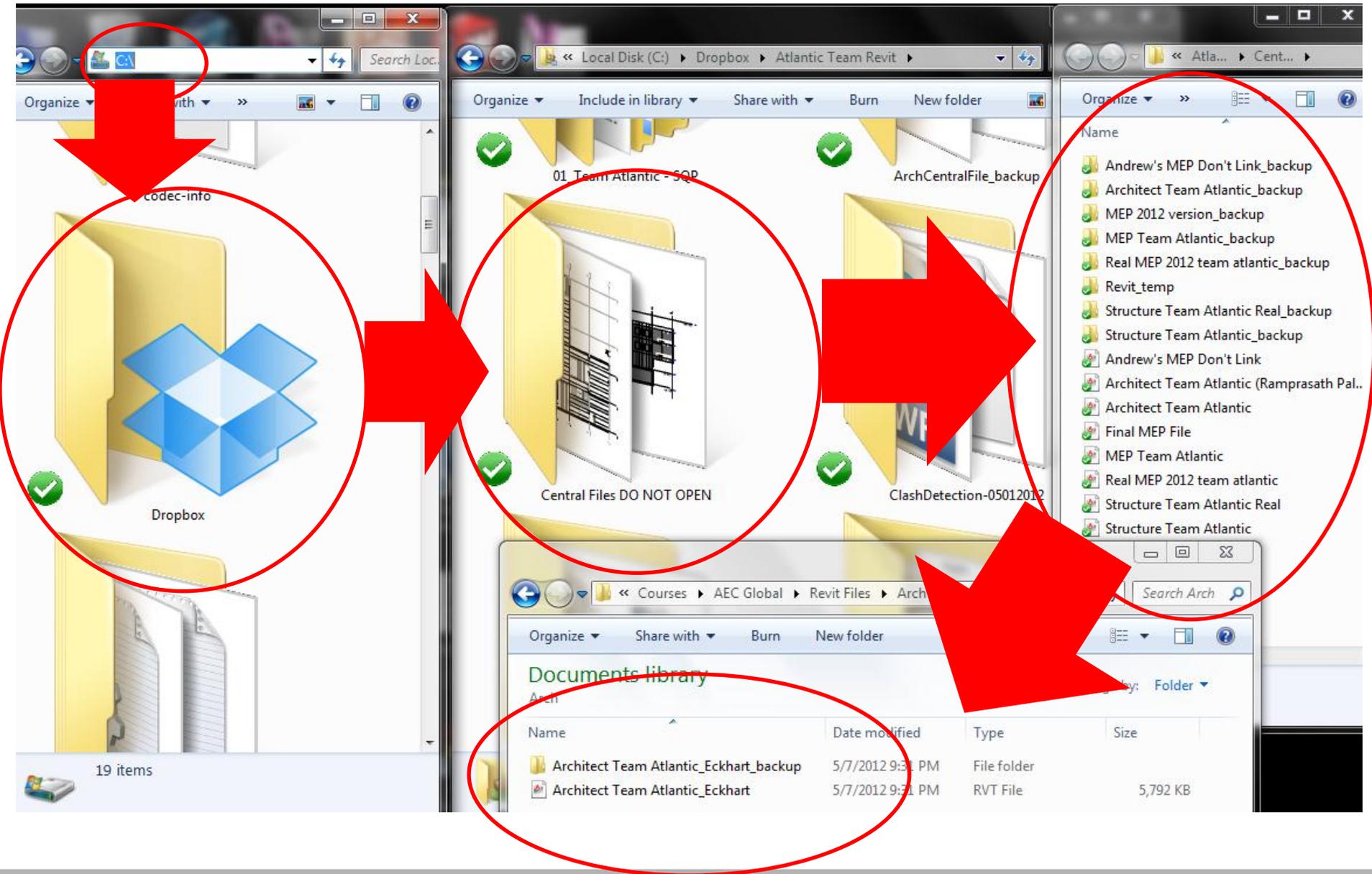


<b>Start</b>	Excavation Commencement
<b>Finish</b>	Erection of Hollow Core Slabs on the 3 <sup>rd</sup> Floor
<b>Cost</b>	\$ 162500
<b>Duration</b>	15 Weeks

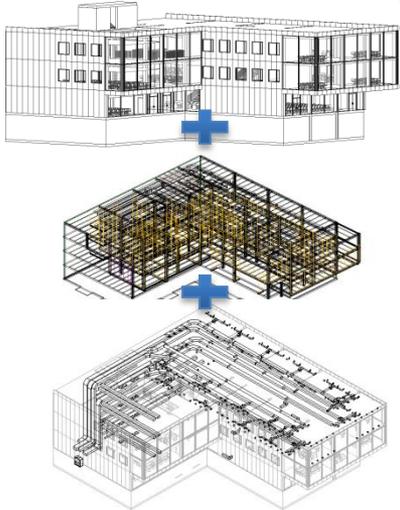
# BIM COORDINATION

The screenshot displays the Autodesk Revit Architecture 2010 software interface. The title bar indicates the project is "Autodesk Revit Architecture 2010 - [Project1 - Floor Plan: Level 1]". The ribbon is set to the "Collaborate" tab, with the "Worksets" panel selected. Two red circles highlight the "Worksets" icon on the left and the "Synchronize with Central" button in the middle. The "Synchronize" panel also includes "Reload Latest" and "Relinquish All Mine" buttons. The "Coordinate" panel includes "Copy/Monitor", "Coordination Review", and "Interference Check" buttons. The Project browser on the left shows a tree view with categories like Views (all), Floor Plans, Ceiling Plans, Elevations (Building Elevation), Legends, Schedules/Quantities, Sheets (all), Families, Groups, and Revit Links. A "Worksharing" dialog box is open in the foreground, containing the following text: "You are about to enable Worksharing. Note: Sharing a project cannot be undone and requires careful planning and management. Click OK to enable Worksharing or Cancel to return to your project without enabling Worksharing." Below the text are two input fields: "Move Levels and Grids to Workset:" with the value "Shared Levels and Grids", and "Move remaining elements to Workset:" with the value "Workset1". At the bottom of the dialog are "OK" and "Cancel" buttons.

# BIM COORDINATION



# IDENTIFYING AND RESOLVING CLASHES



A, E, MEP  
REVIT  
Models

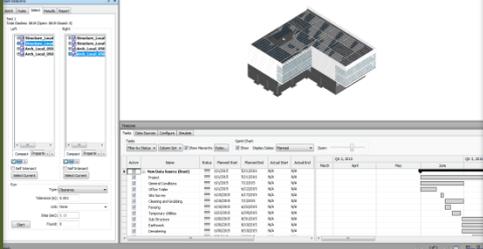
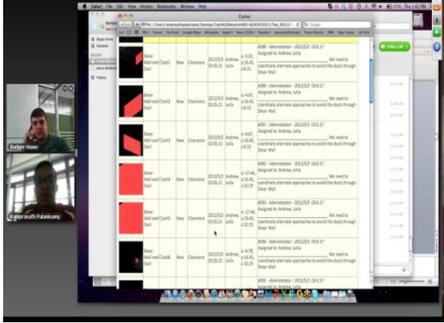


Image	Clash Group	Clash Name	Status	Description	Date Found	Assigned To	Comments
	MEP Shaft Clashes	New Clearance	2012/5/6 08:50:07	Andrew			
	MEP Shaft Clashes	New Clearance	2012/5/6 08:50:07	Andrew	#1 - Administrator - 2012/5/6 08:54:29 Assigned to Andrew MEP Shaft clashes with the Duct		
	MEP Shaft Clashes	New Clearance	2012/5/6 08:50:07	Andrew	#2 - Administrator - 2012/5/6 08:54:29 Assigned to Andrew MEP Shaft clashes with the Duct		
	MEP Shaft Clashes	New Clearance	2012/5/6 08:50:07	Andrew	#3 - Administrator - 2012/5/6 08:54:29 Assigned to Andrew MEP Shaft clashes with the Duct		
	MEP Shaft Clashes	New Clearance	2012/5/6 08:50:07	Andrew	#4 - Administrator - 2012/5/6 08:54:29 Assigned to Andrew MEP Shaft clashes with the Duct		
	MEP Shaft Clashes	New Clearance	2012/5/6 08:50:07	Andrew	#5 - Administrator - 2012/5/6 08:54:29 Assigned to Andrew MEP Shaft clashes with the Duct		

NAVISWORKS  
Integration, Clash  
Detection



Clash Detection  
resolving Meeting

Approved

Image	Clash Group	Clash Name	Status	Description	Date Found	Assigned To	Clash Point	Comments
	Shear Wall and Duct	Approved Clearance	2012/5/2 02:05:21	2012/5/6 02:25:29	Administrative	x=6.02, y=6.51	#389 - Administrator - 2012/5/2 03:01:17 Assigned to Andrew, Lella	
	Shear Wall and Duct	Approved Clearance	2012/5/2 02:05:21	2012/5/6 02:25:29	Administrative	x=5.02, y=16.45	We need to coordinate alternate approaches to avoid the ducts through Shear Wall	
	Shear Wall and Duct	Approved Clearance	2012/5/2 02:05:21	2012/5/6 02:25:29	Administrative	x=4.87, y=16.45	We need to coordinate alternate approaches to avoid the ducts through Shear Wall	
	Shear Wall and Duct	Approved Clearance	2012/5/2 02:05:21	2012/5/6 02:25:29	Administrative	x=4.87, y=16.53	We need to coordinate alternate approaches to avoid the ducts through Shear Wall	
	Shear Wall and Duct	Approved Clearance	2012/5/2 02:05:21	2012/5/6 02:25:29	Administrative	x=17.44, y=16.45	We need to coordinate alternate approaches to avoid the ducts through Shear Wall	

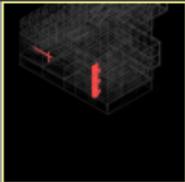
or

Image	Clash Group	Clash Name	Status	Description	Date Found	Assigned To	Clash Point	Comments
	Beam and Ducts	Resolved Clearance	2012/5/2 02:05:21	2012/5/6 11:24, y=16.06, z=8.06	Andrew	x=11.24, y=16.06, z=8.06	#378 - Administrator - 2012/5/2 02:59:11 Assigned to Andrew Clash Between Beams and the Ducts	
	Beam and Ducts	Resolved Clearance	2012/5/2 02:05:21	2012/5/6 11:28, z=8.06	Andrew	x=11.28, y=17.38, z=8.06	#379 - Administrator - 2012/5/2 02:59:11 Assigned to Andrew Clash Between Beams and the Ducts	
	Beam and Ducts	Resolved Clearance	2012/5/2 02:05:21	2012/5/6 11:28, z=8.87	Andrew	x=11.28, y=17.38, z=8.87	#380 - Administrator - 2012/5/2 02:59:11 Assigned to Andrew Clash Between Beams and the Ducts	
	Beam and Ducts	Resolved Clearance	2012/5/2 02:05:21	2012/5/6 11:28, z=8.87	Andrew	x=11.28, y=17.38, z=8.87	#381 - Administrator - 2012/5/2 02:59:11 Assigned to Andrew Clash Between Beams and the Ducts	
	Beam and Ducts	Resolved Clearance	2012/5/2 02:05:21	2012/5/6 11:28, z=8.87	Andrew	x=11.24, y=15.86, z=8.87	#382 - Administrator - 2012/5/2 02:59:11 Assigned to Andrew Clash Between Beams and the Ducts	

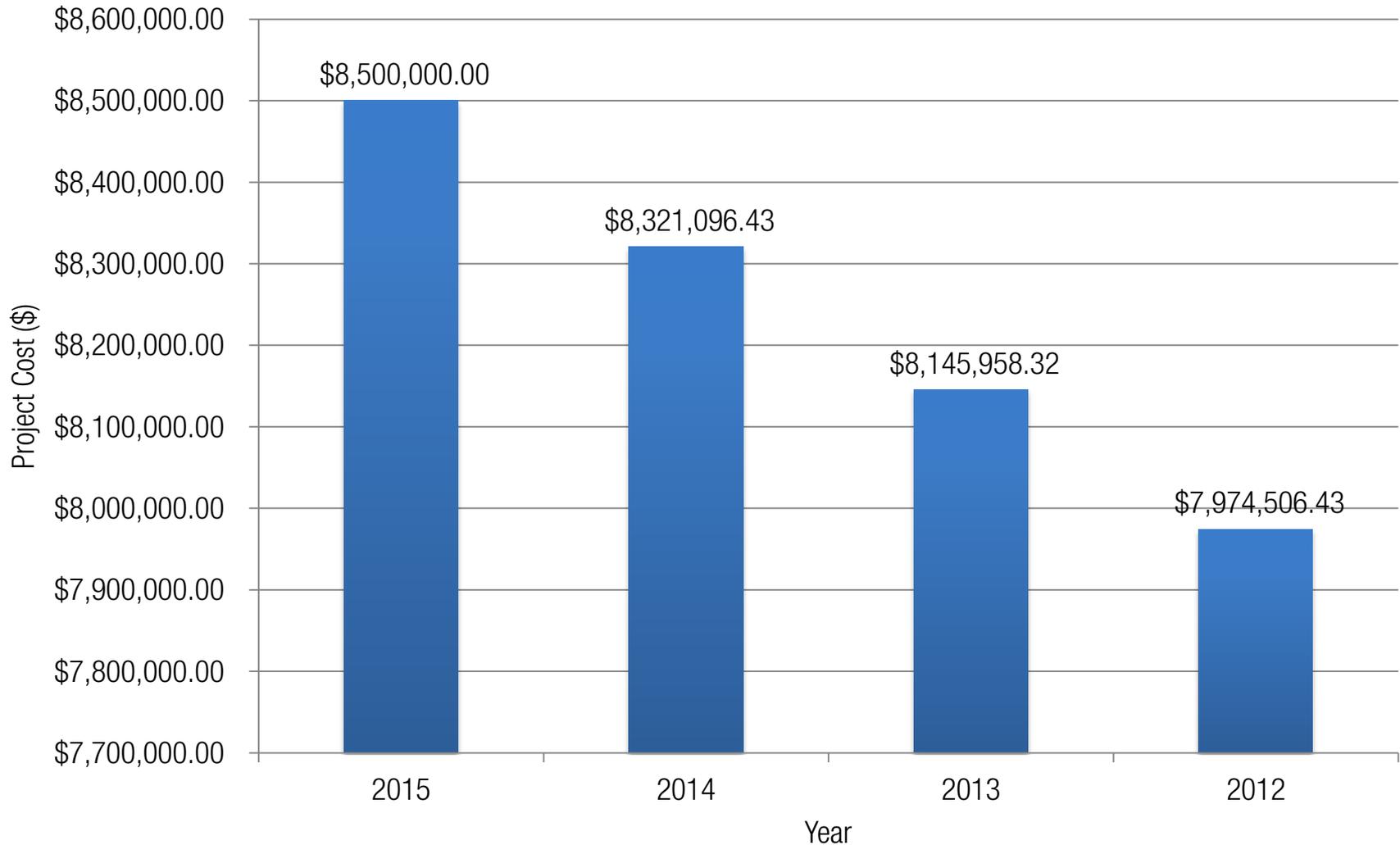
Resolved

# TRACKING CLASHES

Item 1

Image	Clash Group	Clash Name	Status	Description	Date Found	Assigned To	Comments
		MEP Shaft Clashes	New	Clearance	2012/5/6 08:50.07	Andrew	
	MEP Shaft Clashes	Clash1	New	Clearance	2012/5/6 08:50.07	Andrew	#1 - Administrator - 2012/5/6 08:54.19 Assigned to: Andrew _____ MEP Shaft clashes with the Duct
	MEP Shaft Clashes	Clash2	New	Clearance	2012/5/6 08:50.07	Andrew	#2 - Administrator - 2012/5/6 08:54.19 Assigned to: Andrew _____ MEP Shaft clashes with the Duct
	MEP Shaft Clashes	Clash3	New	Clearance	2012/5/6 08:50.07	Andrew	#3 - Administrator - 2012/5/6 08:54.19 Assigned to: Andrew _____ MEP Shaft clashes with the Duct
	MEP Shaft Clashes	Clash4	New	Clearance	2012/5/6 08:50.07	Andrew	#4 - Administrator - 2012/5/6 08:54.19 Assigned to: Andrew _____ MEP Shaft clashes with the Duct
	MEP Shaft Clashes	Clash5	New	Clearance	2012/5/6 08:50.07	Andrew	#5 - Administrator - 2012/5/6 08:54.19 Assigned to: Andrew _____ MEP Shaft clashes with the Duct

# HOW MUCH MONEY DO WE ACTUALLY HAVE ?



**DONATION IN 2015 = \$8,500,000**

**PROJECT BUDGET = \$7,97,4506**

**PROJECT BUDGET = \$7,974,506**

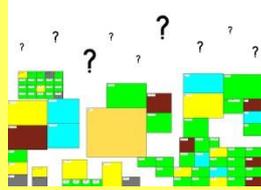
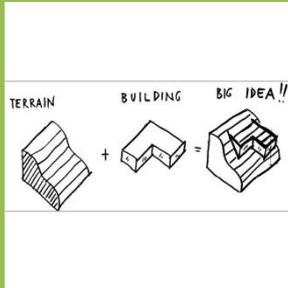
**TARGET VALUE = \$7,535,000**

# HOW DID WE ARRIVE AT A TARGET VALUE ?



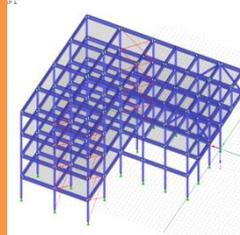
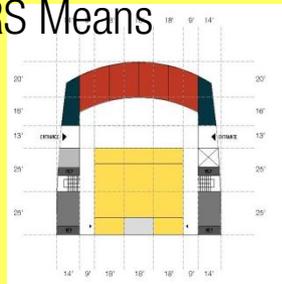
Conceptualization

Estimate Type: SF  
Estimates- RS  
Means



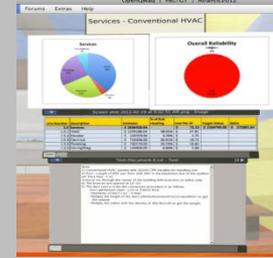
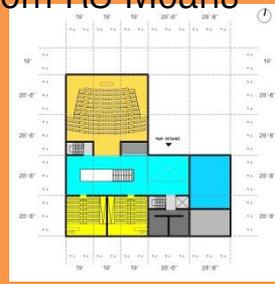
Program  
Development,  
Initial Design

Estimate Type:  
Similar Projects +  
RS Means



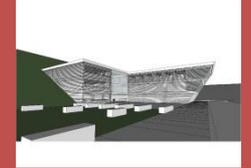
Schematic Design

Estimate Type:  
Level -3 Estimate  
from RS Means



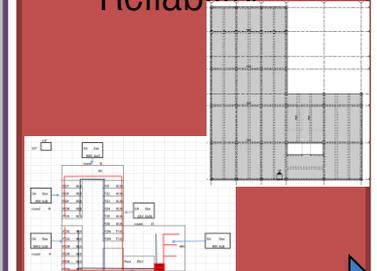
Set Target Value  
through  
Discussion

		Target Value	
Description	Cost		%
1.1 General Condition	\$ 605000.00	8.03%	
1.2 Sub Structure	\$ 605000.00	8.03%	
1.3 Shell	\$ 2300000.00	30.52%	
1.4 Interiors	\$ 1000000.00	13.27%	
1.5 Services	\$ 2640000.00	35.04%	
1.6 Special Construction	\$ 385000.00	5.11%	
<b>Total</b>	<b>\$ 7535000.00</b>		



Detailed Design

- Eliminate Contingency
- Design to Target
- Interdisciplinary Negotiation
- Improve Reliability



# HOW DID WE ARRIVE AT A TARGET VALUE ?



# IMPLEMENTATION TARGET VALUE DESIGN

Description

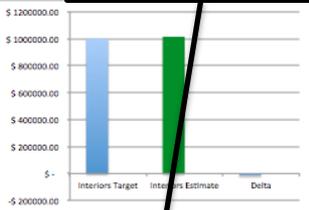
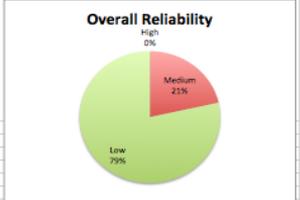
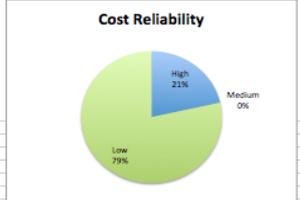
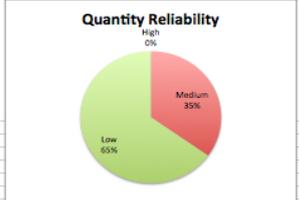
Current Estimate

Quantity Reliability

Cost Reliability

Overall Reliability

Interiors																
Line Number	Description	Unit	Quantity	Material	Labor	Equipment	Total	Ext Total	Quantity	MPL+E	Ext Total	Quantity Reliability	Cost Date Reliability	Overall Reliability	Target Value	Delta= Target Value-Current Estimate
1.4	Interiors							\$ 1014222.99								
1.4.1	Flooring							\$ 89742.78								
1.4.1.1	Tile or terrazzo base, scratch coat only	S.F	28054	\$ 0.42	\$ 2.15	\$ -	\$ 2.57	\$ 72098.78	35000	5.11	178850	1	1	1		
1.4.1.2	Carpet Tile, tufted nylon, 24 oz., 18" x 18" or 24" x 24"	S.Y	550	\$ 28.00	\$ 4.08	\$ -	\$ 32.08	\$ 17644.00	700	32.08	22456	1	1	1		
1.4.2	Partitions							\$ 216607.00								
1.4.2.1	Metals Studs & Gypsum Board	S.F	21660	\$ 1.54	\$ 3.44	\$ -	\$ 10.00	\$ 216600.00				2	3	2		
1.4.3	Painting							\$ 32601.80								
1.4.3.1	Paints & coatings, interior latex, zero voc, doors, flush, both sides, roll & brush, primer + 2 coats, incl. frame & trim	Ea	110	\$ 16.35	\$ 61.00	\$ -	\$ 77.35	\$ 8508.50				1	1	1		
1.4.3.2	Paints & Coatings, walls & ceilings, interior, concrete, drywall or plaster, zero voc latex, primer or sealer coat, sand finish, roller	S.F	57365	\$ 0.12	\$ 0.30	\$ -	\$ 0.42	\$ 24093.30				2	1	1		
1.4.4	Opening							\$ 178244.36								
1.4.4.1	Door, single leaf, kd steel frame, hollow metal, commercial quality, flush, 3'-0" x 7'-0" x 1-3/8"	SF	42238	\$ -	\$ -	\$ -	\$ 4.22	\$ 178244.36	39000	4.22	164580	1	1	1		
1.4.5	Ceiling							\$ 111624.23								
1.4.5.1	Complete suspended ceilings, mineral fiber, lay-in board, 2' x 2' x 3/4", on 15/16" T bar susp., incl. standard susp. system, excl. 1-1/2" carrier channels	S.F	32927.5	\$ 2.37	\$ 1.02	\$ -	\$ 3.39	\$ 111624.23	36280	9.8	355544	2	1	1		
1.4.6	Stair Construction							\$ 122490.20								
1.4.6.1	Stairs, steel, cement filled metal pan & picket rail, 20 risers, with landing	S.F	42238				2.9	\$ 122490.20	39000	2.9	113100	1	1	1		
1.4.7	Fittings							\$ 178666.74								
1.4.7.1	wood frame & chalktrough, Cabinets, school counter, wood, 32" high	S.F	42238				4.23	\$ 178666.74	39000	4.23	164970	1	1	1		
1.4.8	Auditorium Seating							\$ 79200.00								
1.4.8.1	Auditorium chair, veneer back, padded seat	Ea	300	\$ -	\$ -	\$ -	\$ 264.00	\$ 79200.00				1	1	1		



Reliability

Last Estimate

# RELIABILITY TRACKING

Quantity

Cost

Low Reliability - 1

9956 - SF

RSMeans  
Square Foot  
Costs

Residential • Industrial • Commercial  
Institutional

2010 ANNUAL EDITION



2010

Medium Reliability - 2



RSMeans  
Building  
Construction  
Cost Data

2010 ANNUAL EDITION



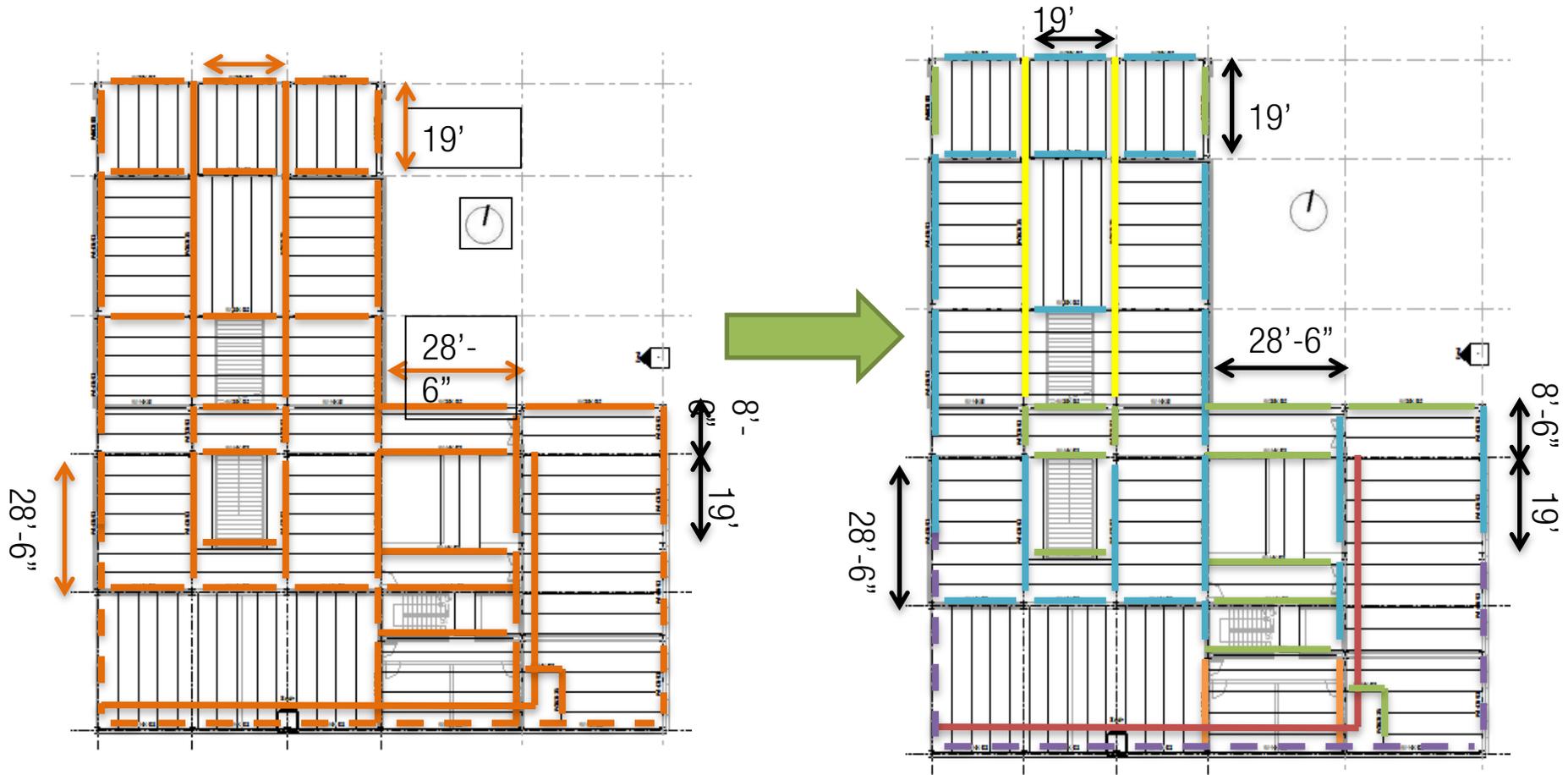
2010

High Reliability - 3





# TARGET VALUE DESIGN AT IT'S BEST

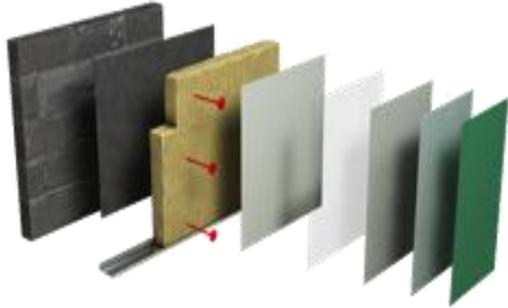


Shell Estimate = \$ 2,953,405

Shell Estimate = \$ 2,404,202

Target Value = \$ 7,535,000

# TARGET VALUE DESIGN AT IT'S BEST



Conventional Façade System  
\$34/SF



Metal Ceiling  
\$9.8/SF

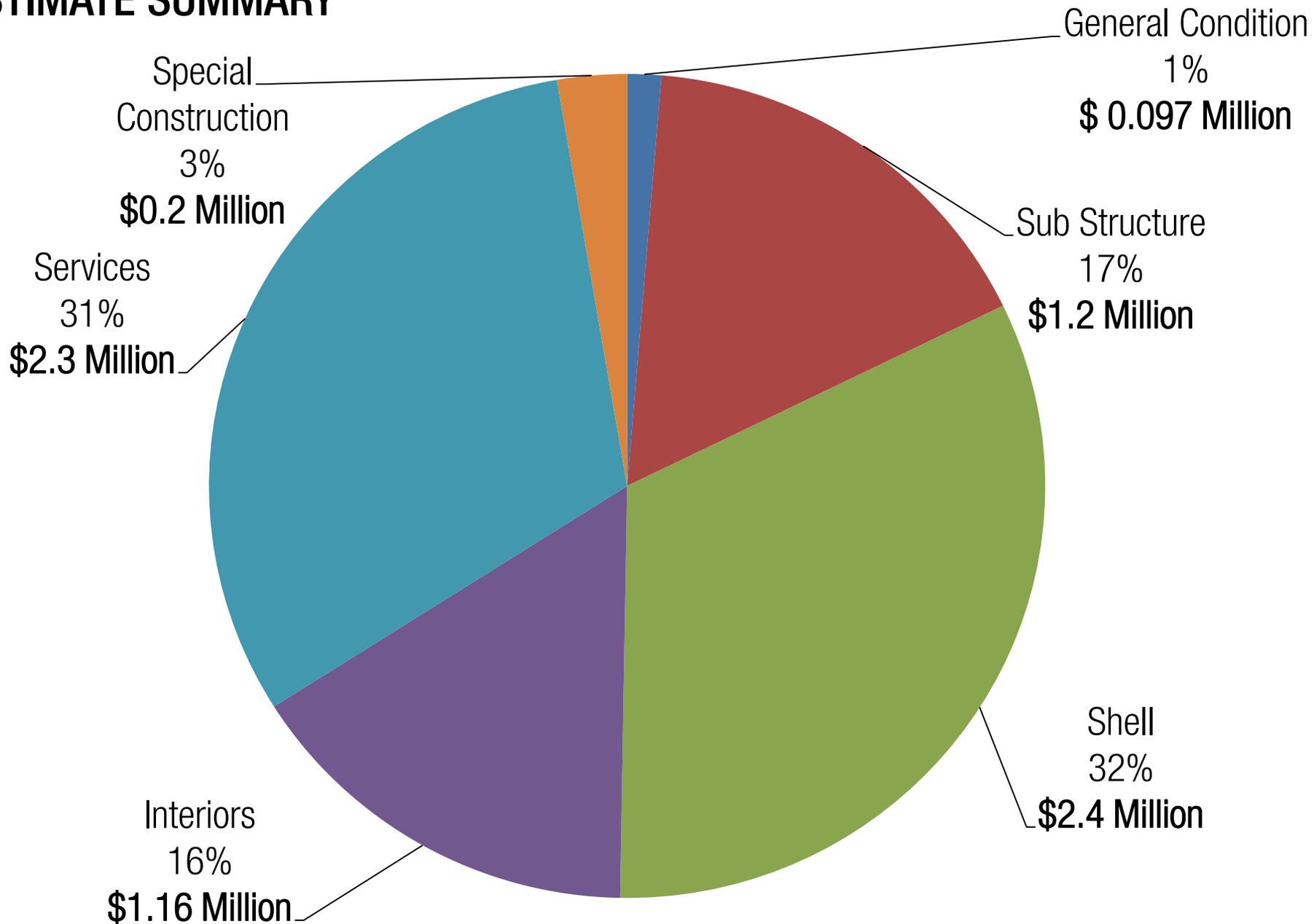


Qbiss Façade System  
\$60/SF

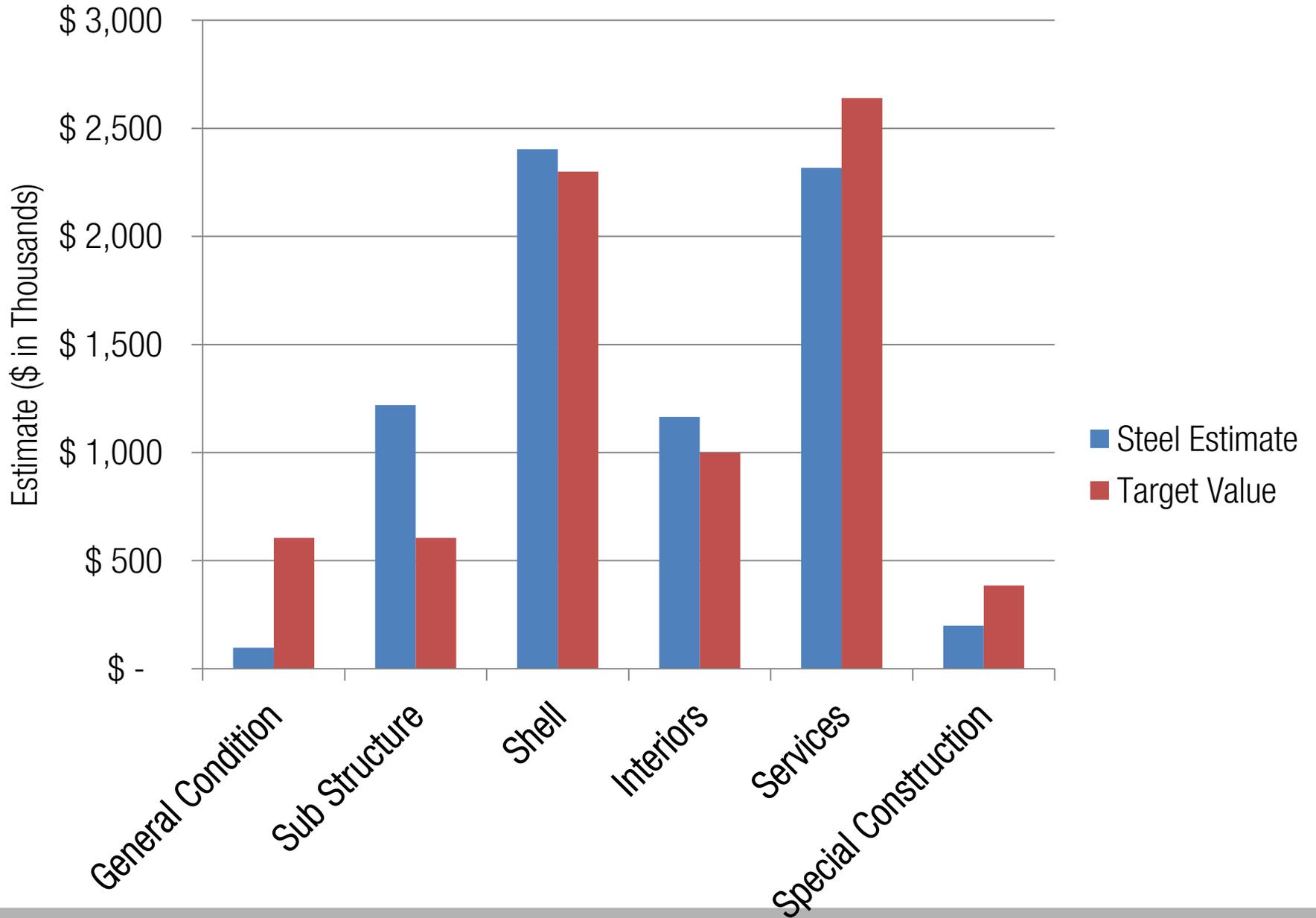


Mineral Fiber Ceiling  
\$3.9/SF

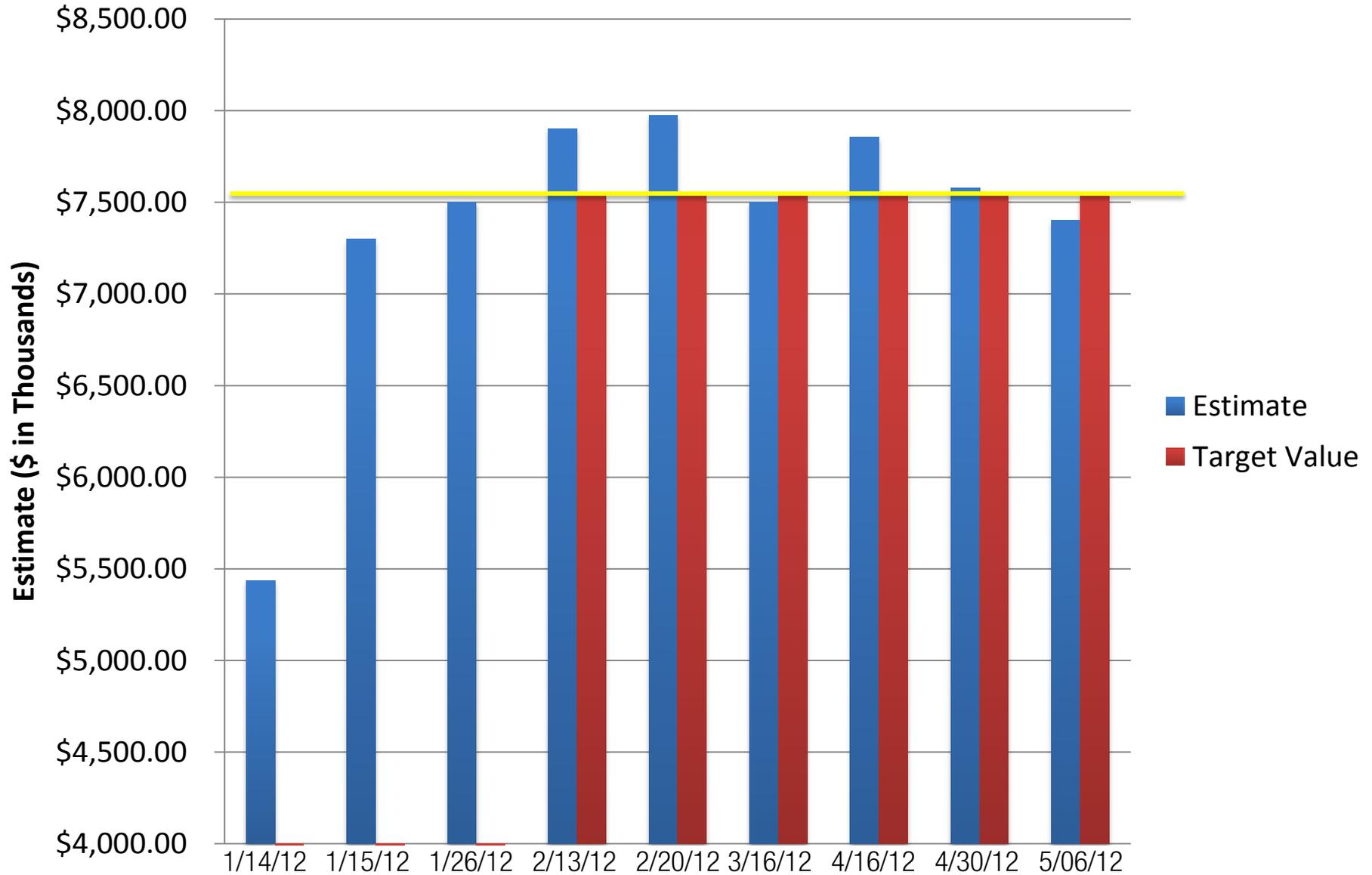
# ESTIMATE SUMMARY



# ESTIMATE VS TARGET VALUE

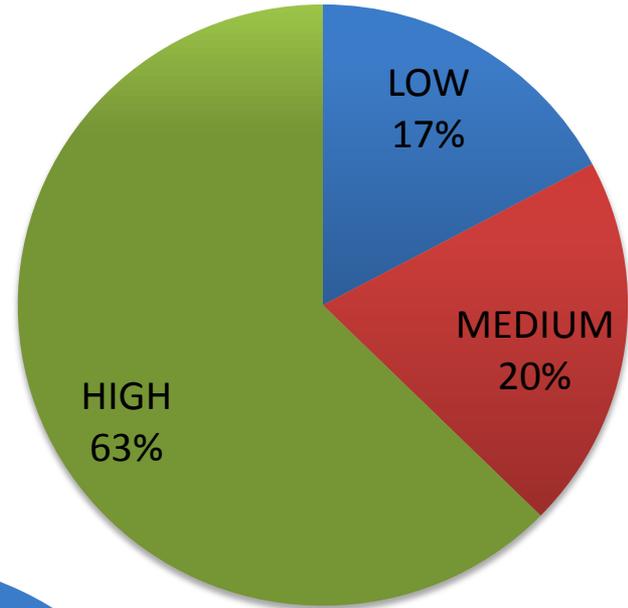
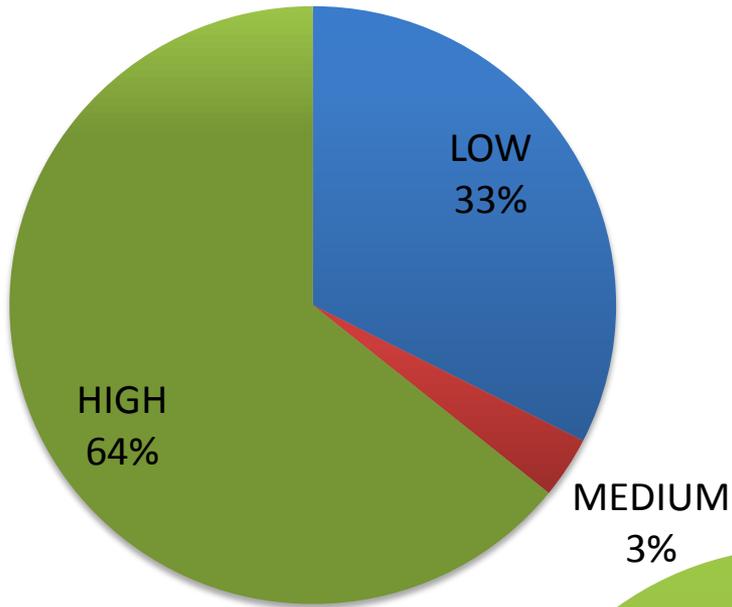


# FIXED TARGET VALUE

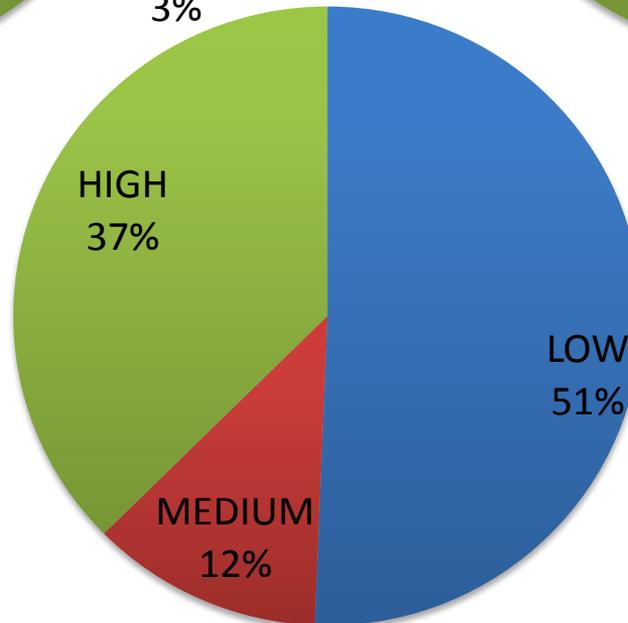


# RELIABILITY SUMMARY

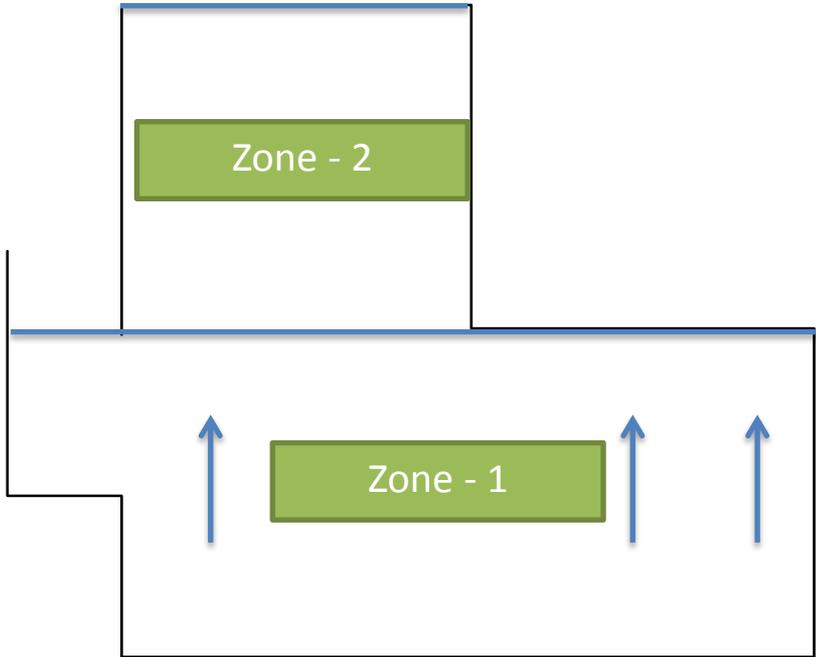
Quantity Reliability



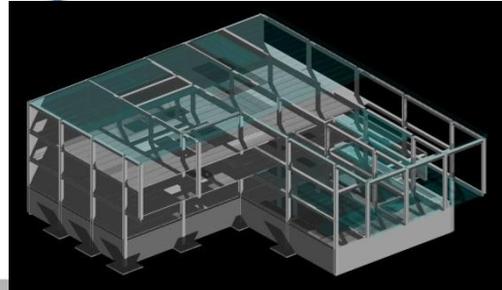
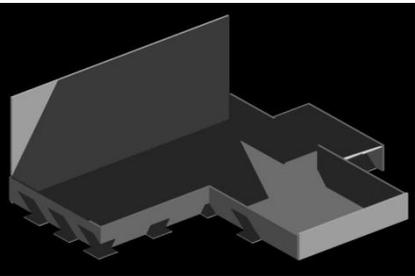
Overall Reliability



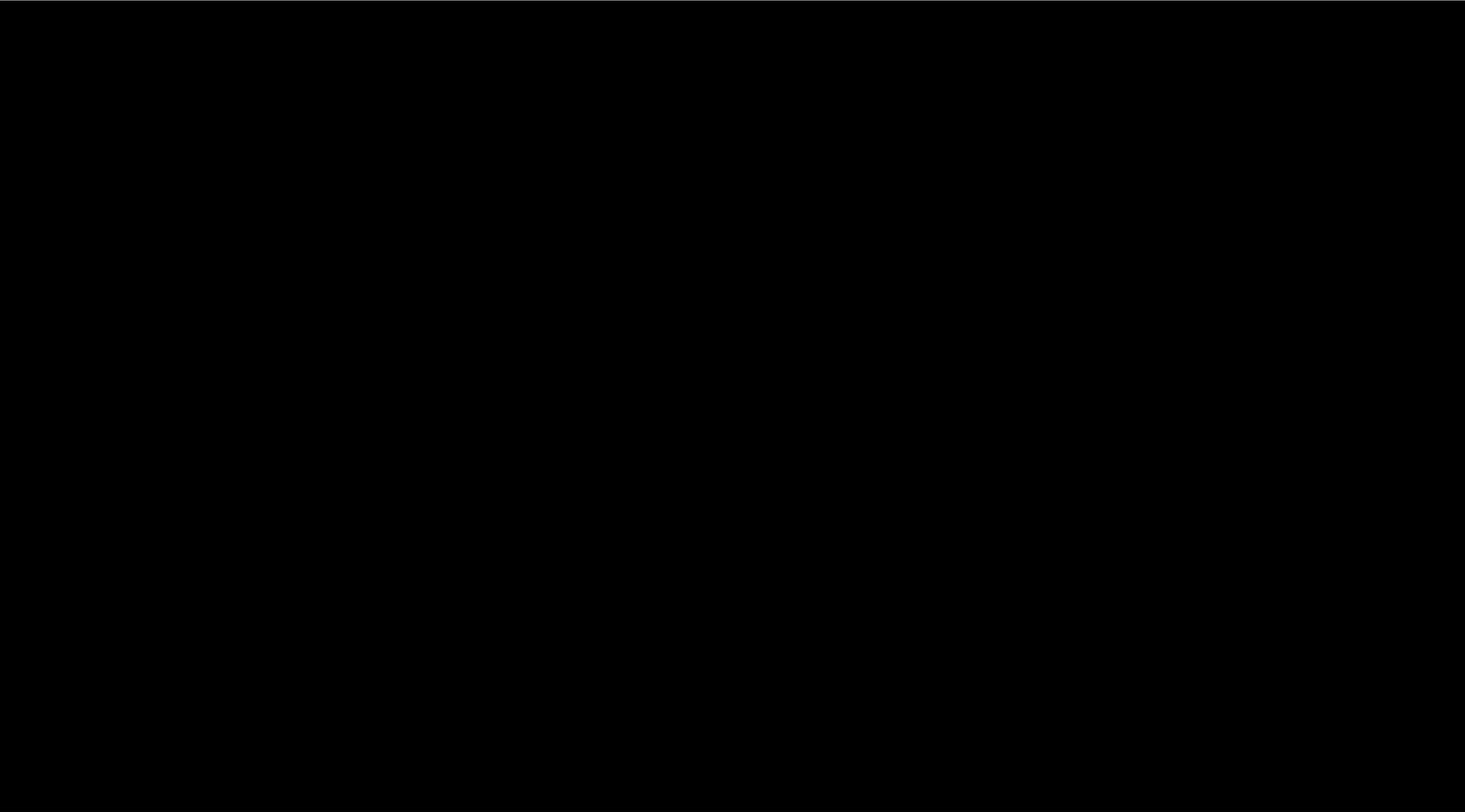
# SCHEDULE ZONING



# SCHEDULE SHELL

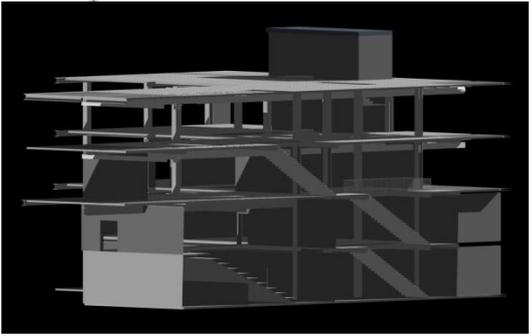
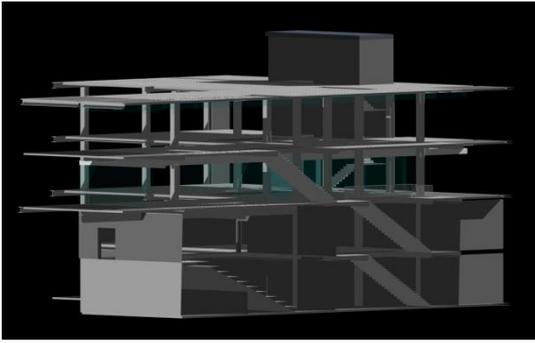


# SCHEDULE SHELL

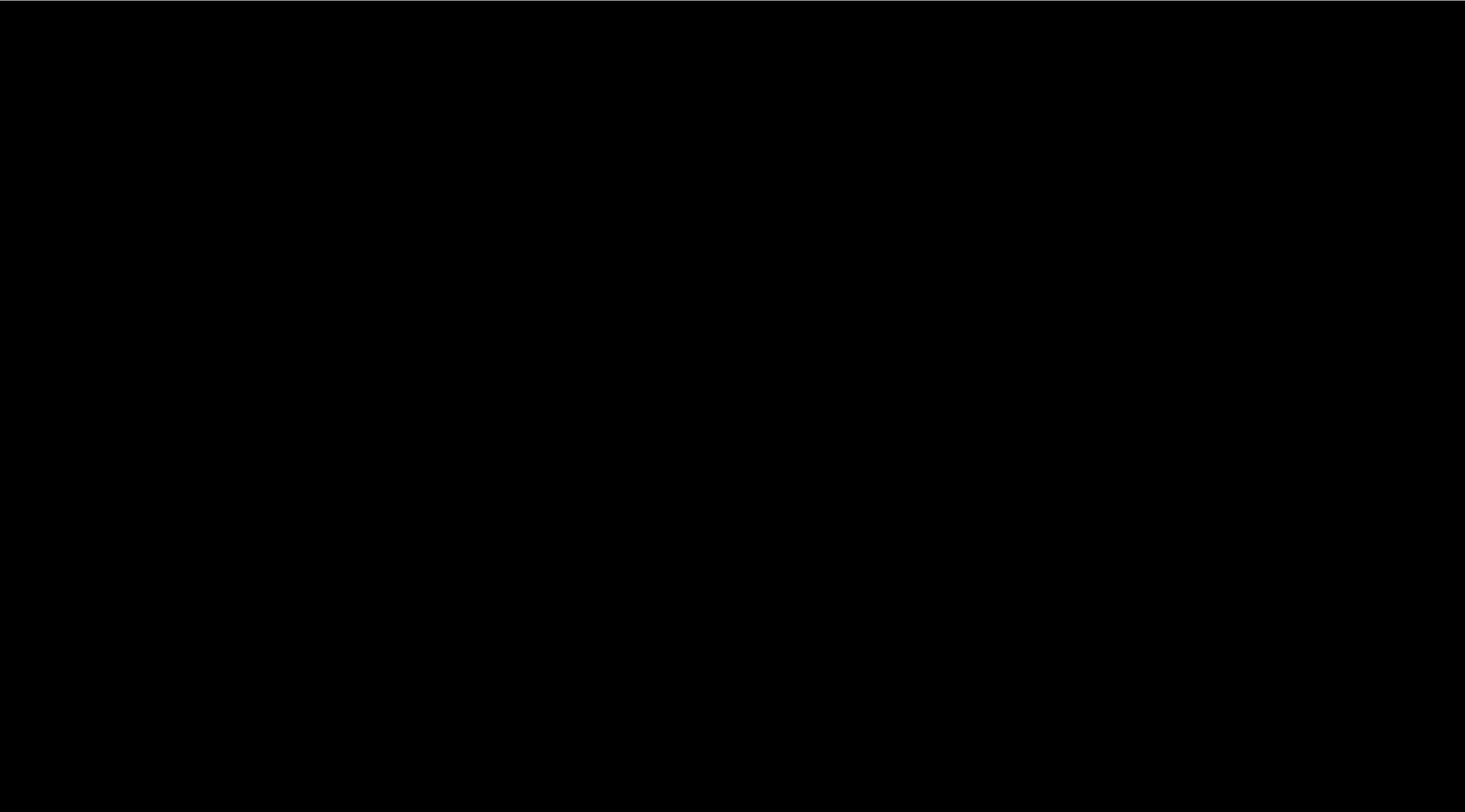


# SCHEDULE INTERIORS AND SERVICES

Task Name	Duration	Start	Finish	Oct '15					Nov '15					Dec '15					Jan '16					Feb '16					Mar '16					Apr '16					May '16									
				27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	6	13	20	27	3	10	17	24	1	8	15	22										
<input type="checkbox"/> Interiors	115 days	Tue 10/6/15	Mon 3/14/16	[Gantt bar spanning from Oct 6 to Mar 14]																																												
<input type="checkbox"/> + Basement	55 days	Tue 10/6/15	Mon 12/21/15	[Gantt bar spanning from Oct 6 to Dec 21]																																												
<input type="checkbox"/> + 1st Floor	55 days	Tue 11/3/15	Mon 1/18/16	[Gantt bar spanning from Nov 3 to Jan 18]																																												
<input type="checkbox"/> + 2nd Floor	55 days	Tue 12/1/15	Mon 2/15/16	[Gantt bar spanning from Dec 1 to Feb 15]																																												
<input type="checkbox"/> + 3rd Floor	55 days	Tue 12/29/15	Mon 3/14/16	[Gantt bar spanning from Dec 29 to Mar 14]																																												
<input type="checkbox"/> Services	155 days	Tue 9/29/15	Mon 5/2/16	[Gantt bar spanning from Sep 29 to May 2]																																												
<input type="checkbox"/> + Basement	28 days	Tue 9/29/15	Thu 11/5/15	[Gantt bar spanning from Sep 29 to Nov 5]																																												
<input type="checkbox"/> + 1st Floor	38 days	Tue 10/13/15	Thu 12/3/15	[Gantt bar spanning from Oct 13 to Dec 3]																																												
<input type="checkbox"/> + 2nd Floor	43 days	Tue 11/3/15	Thu 12/31/15	[Gantt bar spanning from Nov 3 to Dec 31]																																												
<input type="checkbox"/> + 3rd Floor	48 days	Tue 11/24/15	Thu 1/28/16	[Gantt bar spanning from Nov 24 to Jan 28]																																												
<input type="checkbox"/> + Interconnection	30 days	Tue 3/15/16	Mon 4/25/16	[Gantt bar spanning from Mar 15 to Apr 25]																																												
<input type="checkbox"/> + MEP Equipment	35 days	Tue 3/15/16	Mon 5/2/16	[Gantt bar spanning from Mar 15 to May 2]																																												
<input type="checkbox"/> + Elevator	15 days	Tue 4/12/16	Mon 5/2/16	[Gantt bar spanning from Apr 12 to May 2]																																												



# SCHEDULE INTERIORS AND SERVICES



# SCHEDULE SUMMARY

Start Date: June 01, 2015

Finish Date : May 11, 2016

Total Duration : 50 Weeks

	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
General Conditions												
Sub Structure												
Shell												
Interiors												
Services												
Landscaping												
Commissioning												

<b>LEED</b>	<b>Possible Points</b>	<b>Landscape-Steel with TermoBuild</b>
Sustainable Sites	26	19
Water Efficiency	10	6
Energy and Atmosphere	35	20
Material and Resources	14	3
Indoor Environment Quality	15	14
Innovation and Design Process	6	4
Regional Priority Credits		5
<b>Total</b>		<b>71</b>

# PRODUCT



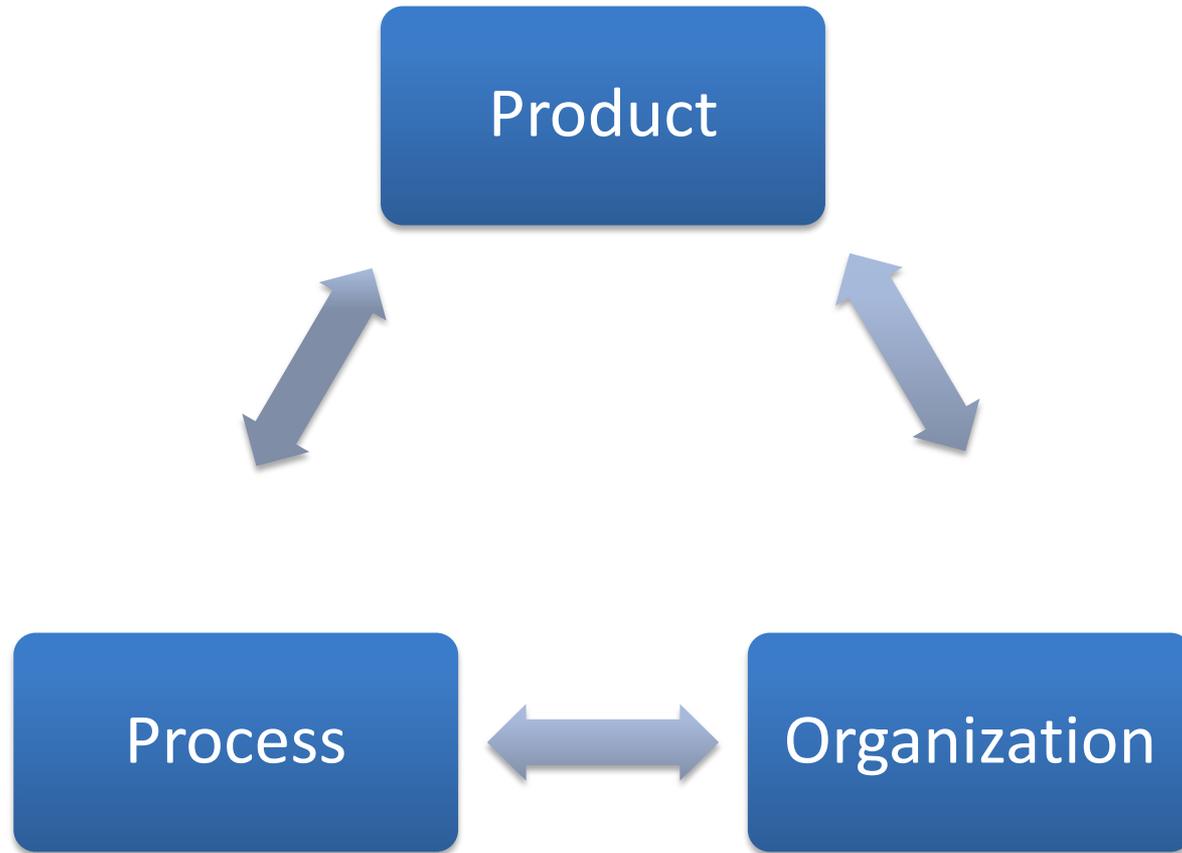
# ORGANIZATION



# PROCESS



# PRODUCT ORGANIZATION PROCESS (POP)

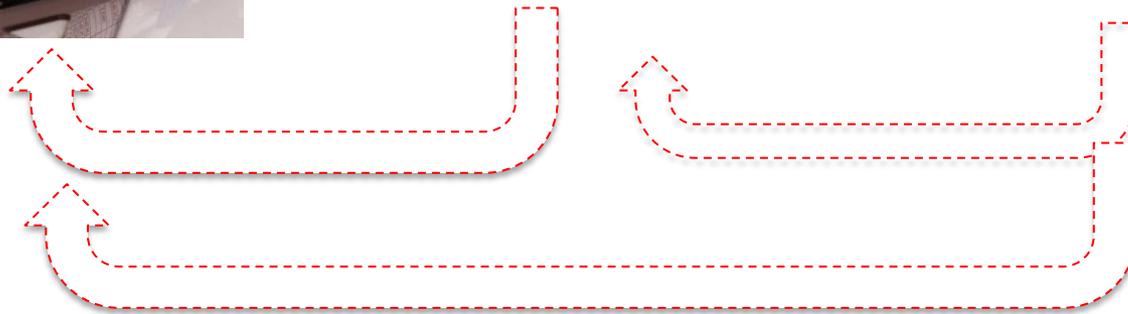
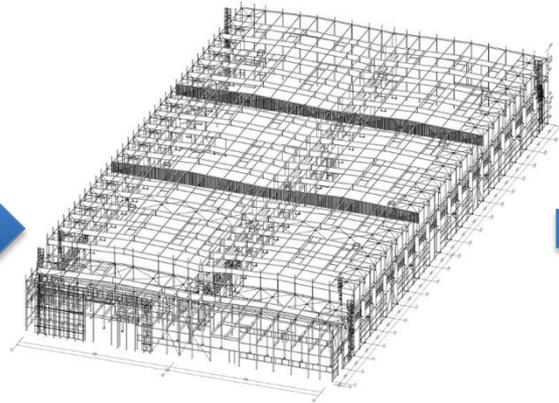


# TRADITIONAL PROJECT DELIVERY

Architect

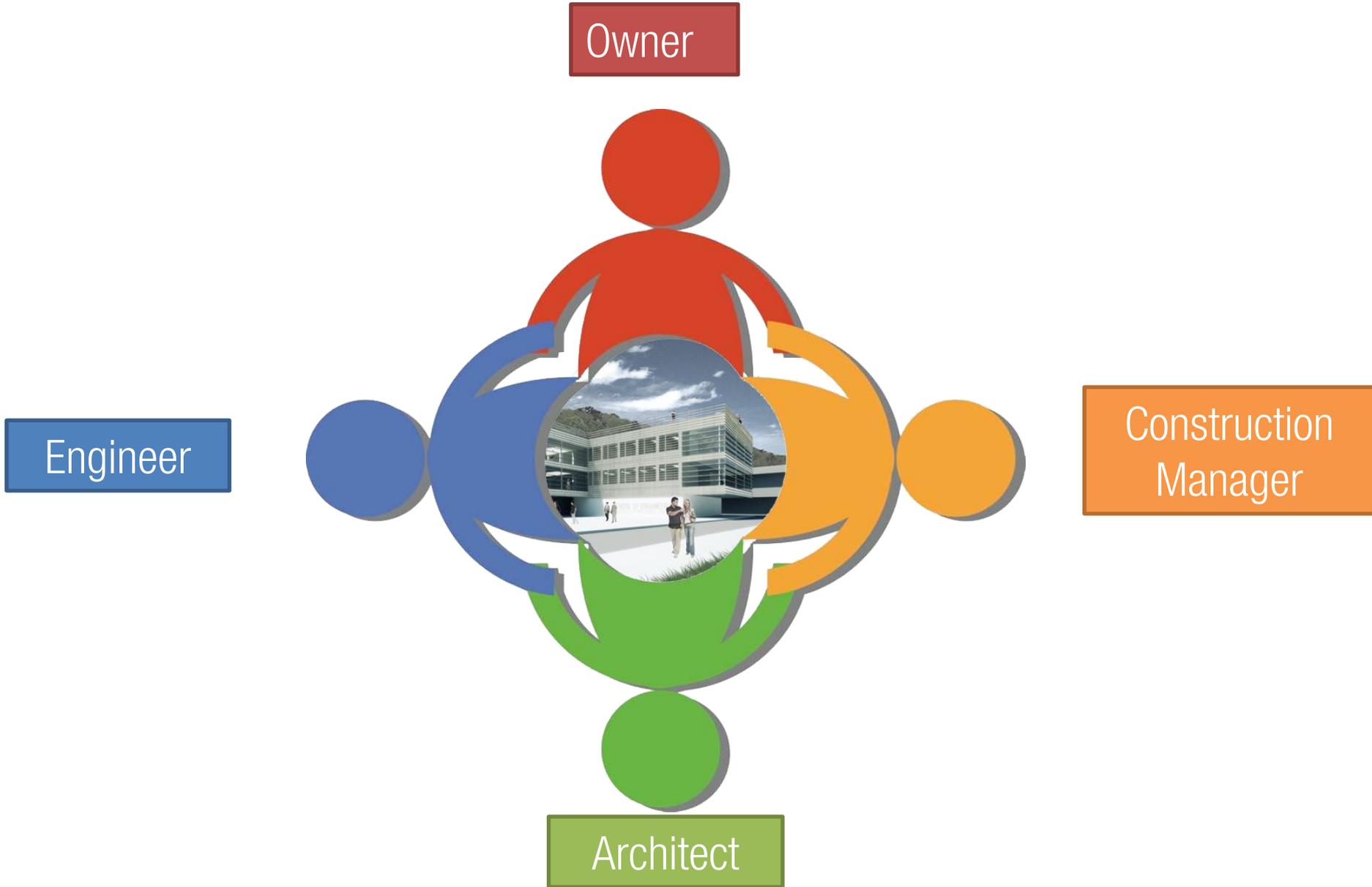
Engineer

Construction  
Manager



REWORK

# INTEGRATED PROJECT DELIVERY



# COLOCATED



# DISTRIBUTED SKYPE CONVERSATION

Skype

Ramprasath Palanisamy  
Add Credit

Q Search

+ Video Call

03:00pm Andrew: Hey found a solution for the Zoning our Owners Wanted in the meeting yesterday

Erwin Münster, Janz O...  
▼ 5 people

Aaron McDevitt

Andrew Eckhart  
hey found a solution for the zoning that our owners wanted 2:01 PM

zheilaleng  
ohh do tell! 2:03 PM

05:00pm Ram: What is Zoning? 2:07 PM

Ramprasath Palanisamy  
What is Zoning? 2:08 PM

Andrew Eckhart  
2:08 PM

06:00 pm Leila: Andrew told us more than 5 times!! during the meeting 2:09 PM

zheilaleng  
hahaha =P 2:09 PM

geeze ram, andrwe only told us 5 times 2:10 PM

Andrew Eckhart  
so now we will have a total of 6 small AH units for the main building 2:10 PM

plus the one for the auditorium 2:10 PM

zheilaleng

# POP WHY WE NEED IT

- Evaluation Tool



- Feedback tool

PLANNED  
TIME

Time: 11am PST  
Location: Cyber meeting (GoToMeeting Access Code)  
Agenda/Issues/Outcomes/Activities:

- 15 min (started ten minutes late) - Login 15 min
- 10 min (**2 min**) - Standup round

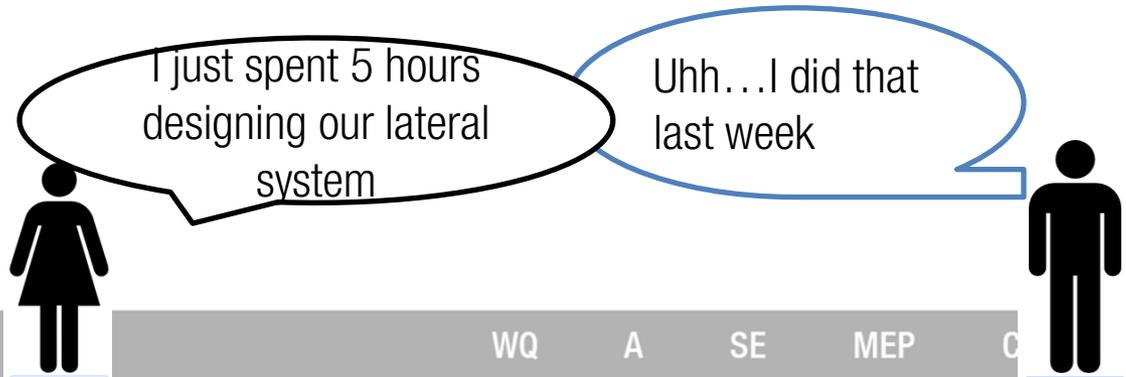
Andrew-started report

- 30 min (**20 min**) - Basic ideas for each chapter of how each chapter will look like and it's content (the report)

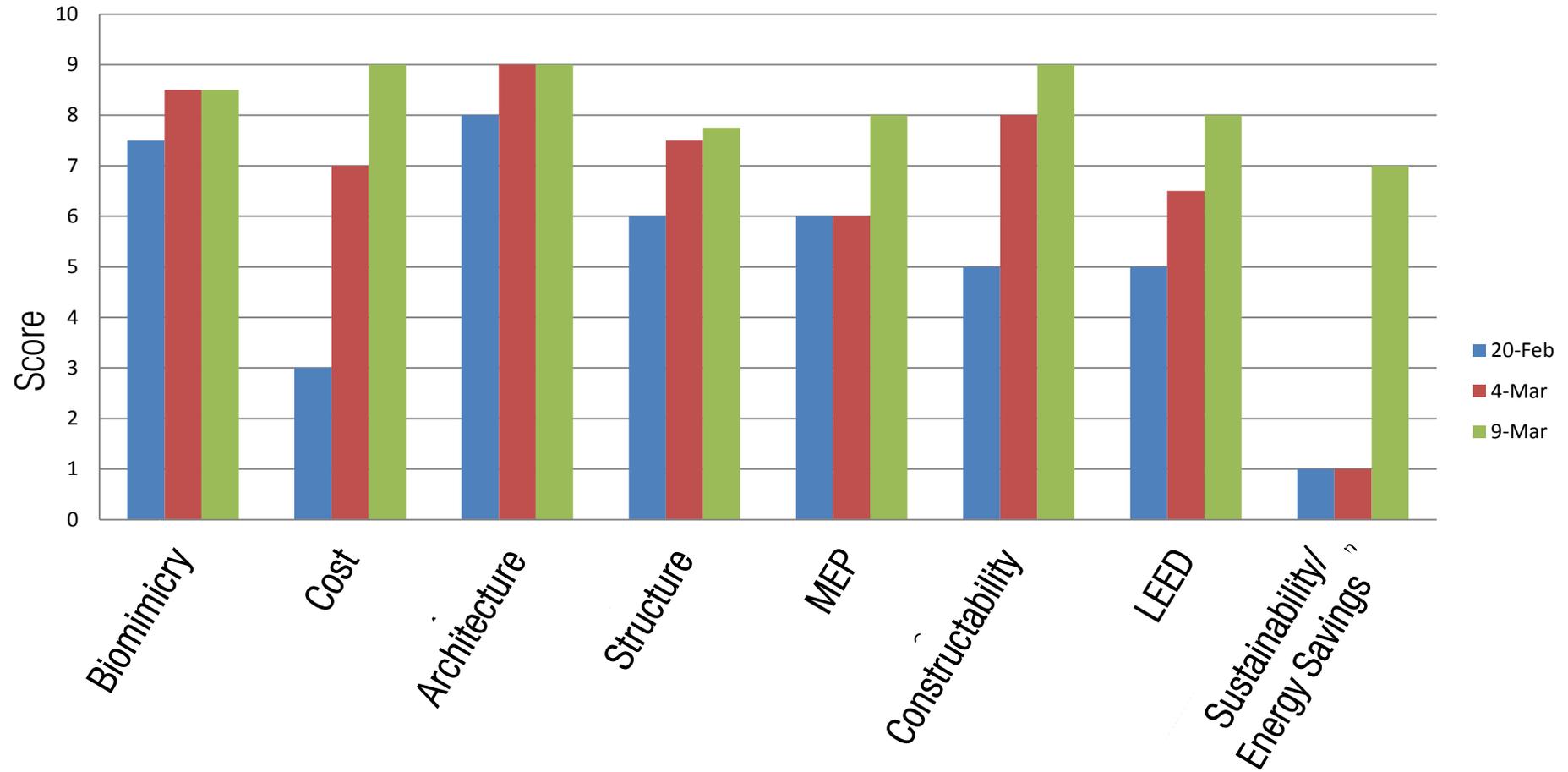
-johanness-renate said to focus on problems and p

ACTUAL  
TIME

- Transparency



# POP PRODUCT EVALUATION FROM SPRING QUARTER –STEEL W THERMOBUILD

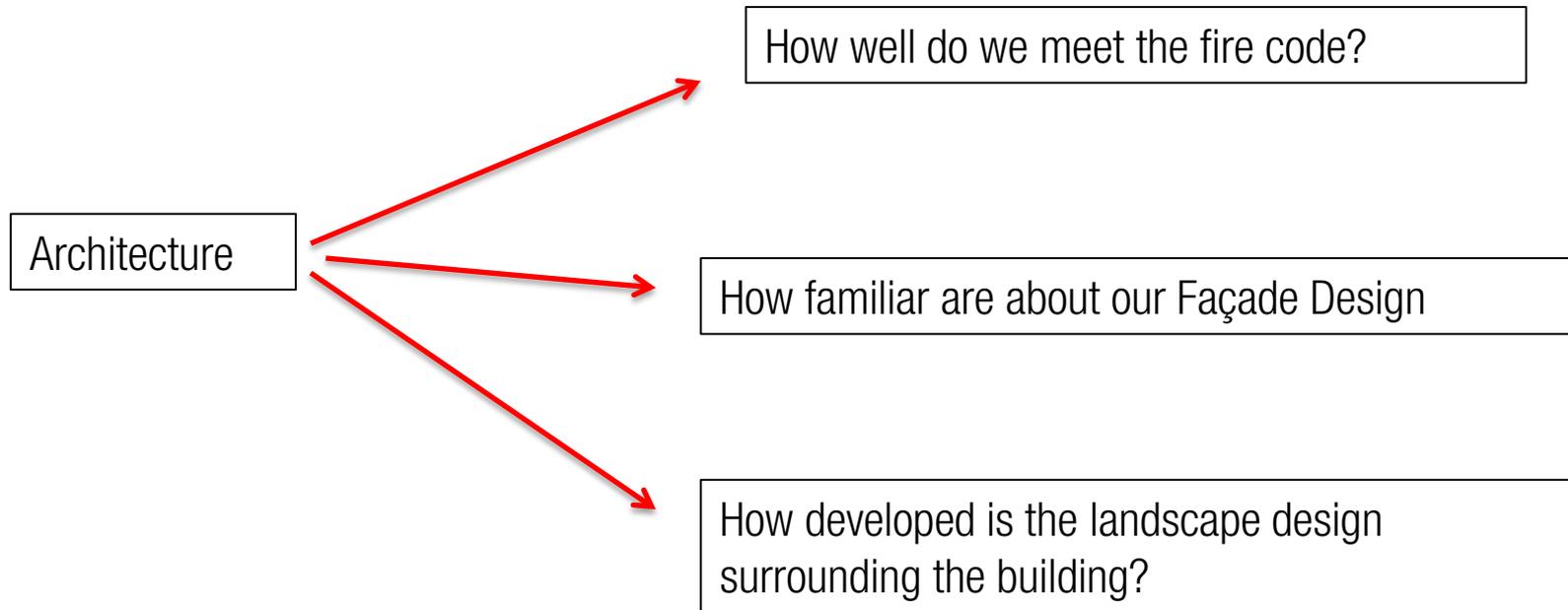


Scoring system

- lower if lots of uncertainty
- lower if dislike design
- 1 lower, 10 highest

# POP PRODUCT EVALUATION-WINTER TO SPRING QUARTER

- More specific rating categories



# POP PRODUCT EVALUATION - WINTER TO SPRING QUARTER

- Anonymous feedback in survey form

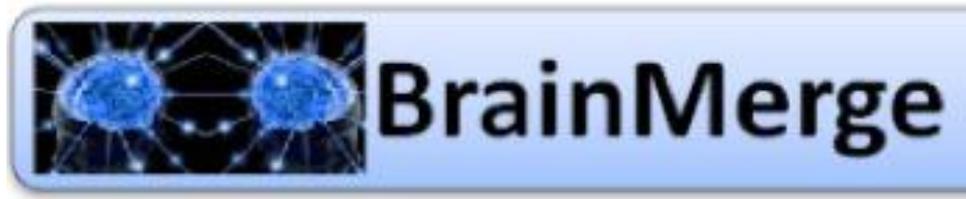
**POP survey Week 3** Exit this survey

**1. WHAT UP TEAM ATLANTIC? You know how a survey works. Do it! Here's how the numbers correspond:**  
**1-not at all; 2-slightly; 3-moderately; 4-very; 5-extremely; 0-we super suck**

	1	2	3	4	5	0
1. How well do you work with our owners?	<input type="radio"/>					
2. How well do you work with our mentors??	<input type="radio"/>					
3. How responsive are you to discussions in Box/Skype/Meeting/Email?	<input type="radio"/>					
4. How well do members of your team share responsibility for tasks?	<input type="radio"/>					
5. How well do our meetings meet its objectives?	<input type="radio"/>					
6. How often does our team meet its deadlines?	<input type="radio"/>					
7. How well do we make/act on decisions?	<input type="radio"/>					
8. This next week, how	<input type="radio"/>					



# POP SURVEY- BRAINSTORMING




  
 Compliance with local building codes ✗
  
 Use of alternate sources of energy ✗
  
 The MEP/Structural clash detection ✗
  
 User comfort ✗
  
 Ramprasath Palanisamy  
 Stanford, CA


  
 Actually getting significant structural design work done!!
   
 Aaron McDevitt  
 Mountain View, CA


  
 Facade design - all disciplines
   
 Go into detail with the fire code - see if we meet it
   
 Janz Omerzu  
 Medvode

- Waterproofing of Roof
- LEED compliance
- The change in public spaces with the new stair positioning
- Geothermal possibility
- Compliance with local building codes
- Use of alternate sources of energy
- The MEP/Structural clash detection
- Sequencing of construction
- The use of just in time delivery?
- Tower Crane vs Mobile Crane for construction
- Retaining wall construction
- Energy Savings
- MEP and Structural communication
- LEED
- How developed and integrated is our BIM model?
- How developed is our biomimicry idea?
- How confident are we on sandwich heights throughout the building

Number of Votes Required  
7

# POP SURVEY- VOTING IN BRAINMERGE

## Voting Room Title: Product Evaluation

6 User(s) In Room :

[Johannes solass](#)  
[Leila Zheng](#)  
[Ramprasath](#)  
[Palanisamy \(Room Moderator\)](#)  
[Aaron McDevitt](#)  
[Andrew Eckhart](#)  
[Janz Omerzu](#)

[Manage ideas](#)  
[Return to Home Page](#)

The brighter (orange) the ideas are, the more popular they are !  
 6 people contributed their ideas.  
 5 people voted.

<a href="#">Ramprasath</a> <a href="#">Palanisamy</a>	Sequencing of construction	100	United States
<a href="#">Ramprasath</a> <a href="#">Palanisamy</a>	The MEP/Structural clash detection	85	United States
<a href="#">Johannes solass</a>	how is our design of the landscape surrounding the building?	80	Germany
<a href="#">Andrew Eckhart</a>	Energy Savings	72	
<a href="#">Janz Omerzu</a>	Facade design - all disciplines	72	Slovenia
<a href="#">Ramprasath</a> <a href="#">Palanisamy</a>	LEED complaince	70	United States
<a href="#">Johannes solass</a>	connection for the steel members? screws vs welded connections	68	Germany
<a href="#">Leila Zheng</a>	How integrated is the termobuild system in our product?	64	United States
<a href="#">Leila Zheng</a>	How developed is our biomimicry idea?	59	United States
<a href="#">Leila Zheng</a>	How confident are we on sandwich heights throughout the building	57	United States
<a href="#">Leila Zheng</a>	How sure are we on our MEP system? (geothermal, heat air exchanger, what?)	50	United States
<a href="#">Janz Omerzu</a>	Ceiling design/MEP system for the entire building	48	Slovenia

# POP SURVEY-PROCESS AND ORGANIZATION RELATED QUESTIONS

How well do you work with owners?

How well do you work with mentors

How responsive are you to discussions in Box/Skype/Email/Meeting?

How well do members of ur team share responsibility of tasks

How well do our meetings meet its objectives?

How often does our team meet its deadlines?

How well do we make/act on decisions

This week how aware were about tasks perfomed by others?

**How well do members of your team share  
responsibility of tasks?**

# POP SURVEY- PRODUCT RELATED QUESTIONS

How integrated is the thermobuild system in our product?

How confident are we on sandwich heights?

How developed is our biomimicry idea?

How developed and integrated is our BIM?

How well do we meet the fire code?

How knowledgeable are we on foundation design?

How sure are we on MEP?

How finalized is our Architectural Model?

How well do you understand the sequencing of construction

How confident are you about MEP/Structural Clashes?

How confident are you about our buildings Energy Savings Potential?

How familiar are about our Façade Design

How developed is the landscape design surrounding the building?

## How confident are we on sandwich Heights?

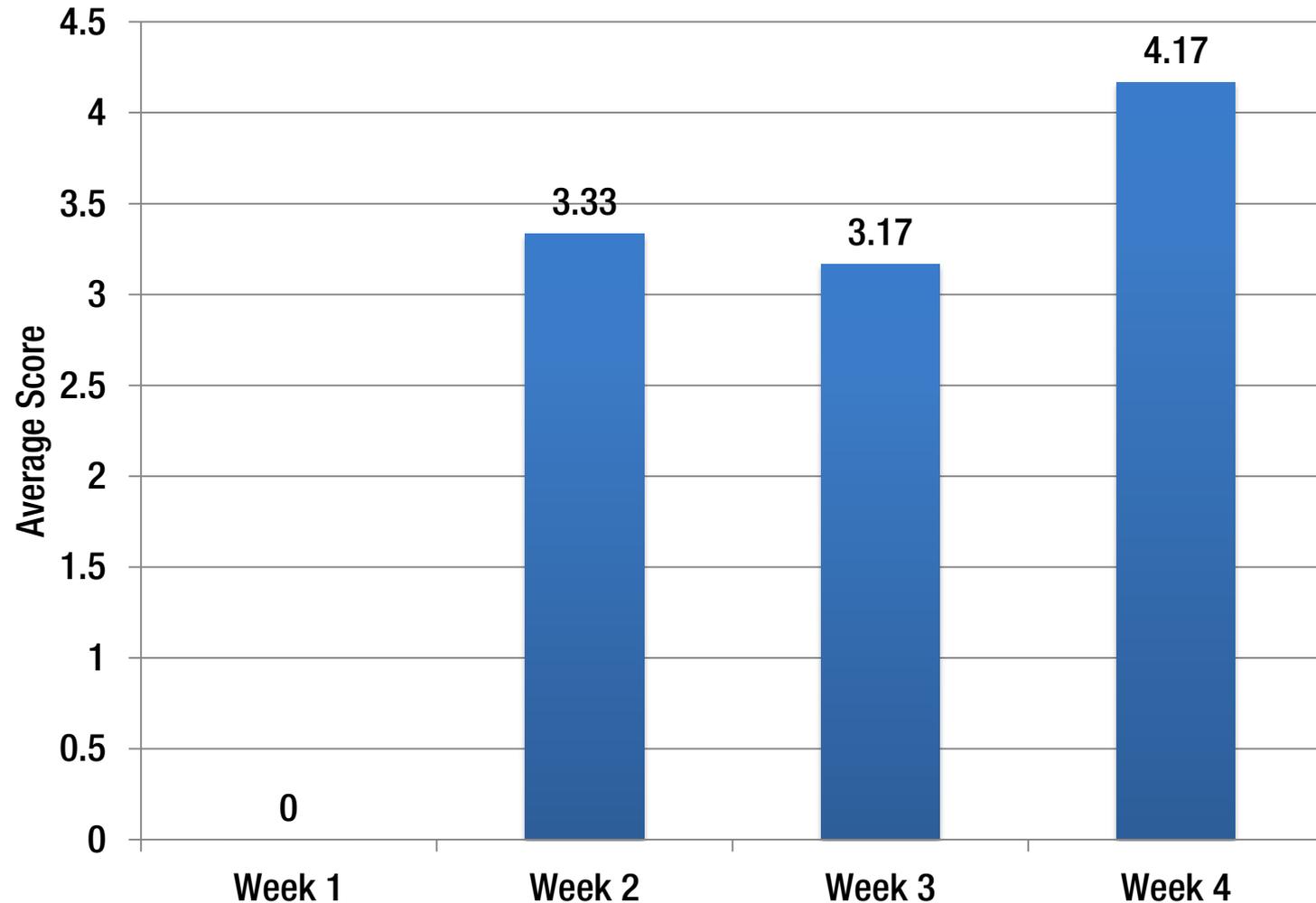
# POP SURVEY

## REVIEW SCORES WITH TEAM EACH WEEK –WHY ARE WE STILL NOT AT 5?

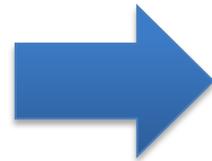
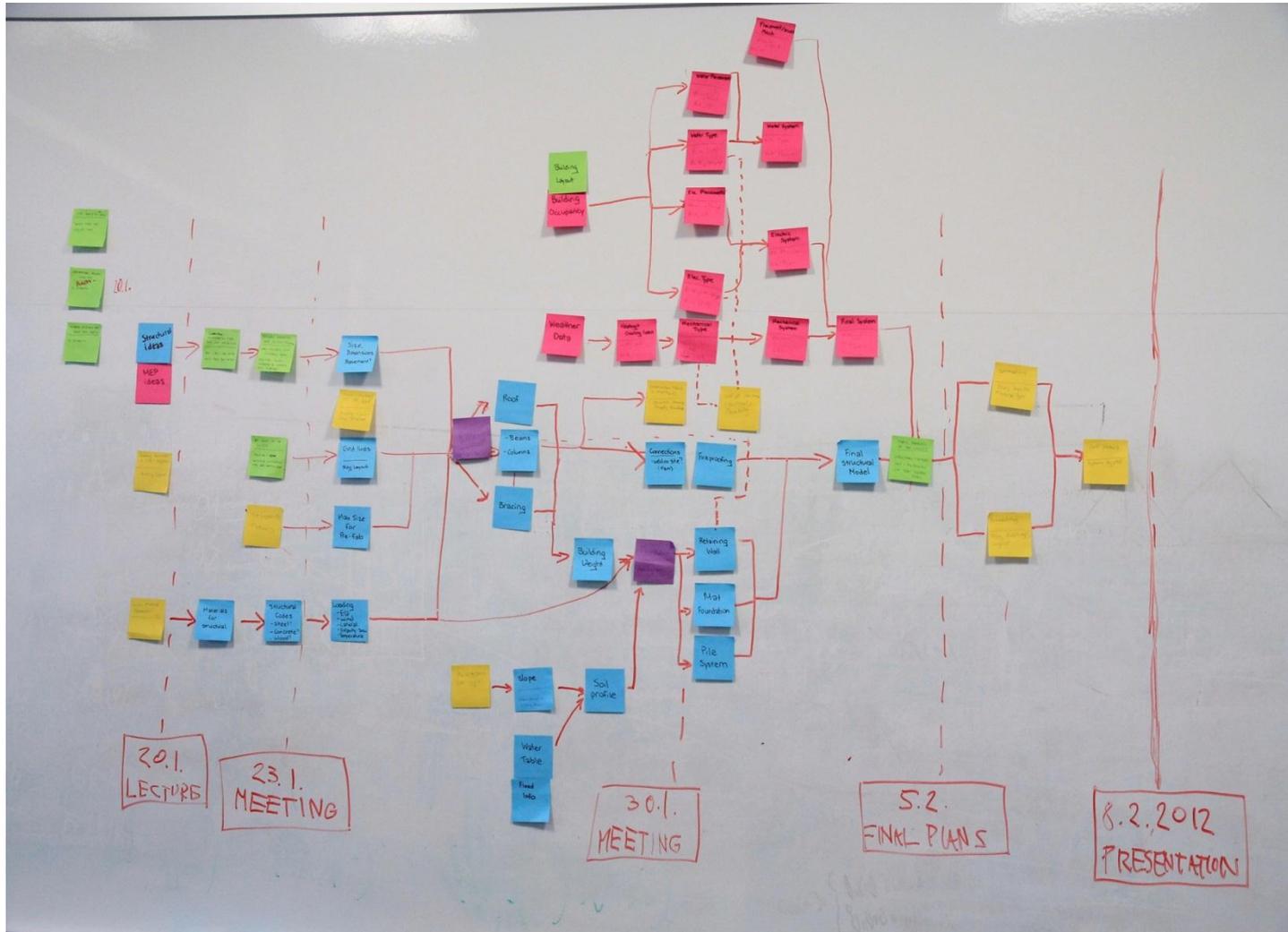
	Week 1	Week 2	Week 3	Week 4
How well do you work with owners?	4	3.17	3.50	4.17
How well do you work with mentors	2.75	3.67	3.83	4.17
How responsive are you to discussions in Box/Skype/Email/Meeting?	3.75	3.00	3.67	4.17
How well do members of ur team share responsibility of tasks	3.75	3.50	3.50	4.33
How well do our meetings meet its objectives?	3.75	3.00	4.00	4.17
How often does our team meet its deadlines?	1.25	1.67	3.33	3.83
How well do we make/act on decisions	3.5	2.83	3.50	3.83
This week how aware were about tasks performed by others?	2.5	2.33	3.83	4.33
How integrated is the thermobuild system in our product?	3.25	3.17	4.50	4.50
How confident are we on sandwich heights?	2.25	3.00	4.50	4.67
How developed is our biomimicry idea?	3.5	3.00	3.83	4.00
How developed and integrated is our BIM?	1	2.50	3.67	4.17
How well do we meet the fire code?	2.25	2.83	3.00	4.17
How knowledgable are we on foundation design?	3.5	2.83	3.83	4.00
How sure are we on MEP?	2.5	3.00	3.67	4.17
How finalized is our Architectural Model?	2.75	3.83	4.33	5.00
How well do you understand the sequencing of construction	N/A	2.83	3.00	4.50
How confident are you about MEP/Structural Clashes?	N/A	3.00	3.00	4.33
How confident are you about our buildings Energy Savings Potential?	N/A	3.33	3.17	4.17
How familiar are about our Façade Design	N/A	2.67	4.67	3.67
How developed is the landscape design surrounding the building?	N/A	3.33	3.00	3.50

# POP PRODUCT EVALUATION – EFFECTS OF SURVEY

How confident are you about our buildings Energy Savings Potential?



# KICKOFF – PULL SCHEDULING



Construction Manager

MEP Engineer

Architect

Structural Engineer

# DISTRIBUTED GOOGLE SPREADSHEET TASK LIST

01\_Schedule\_16Jan2012.gsheet

Sign in

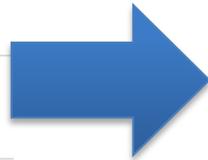


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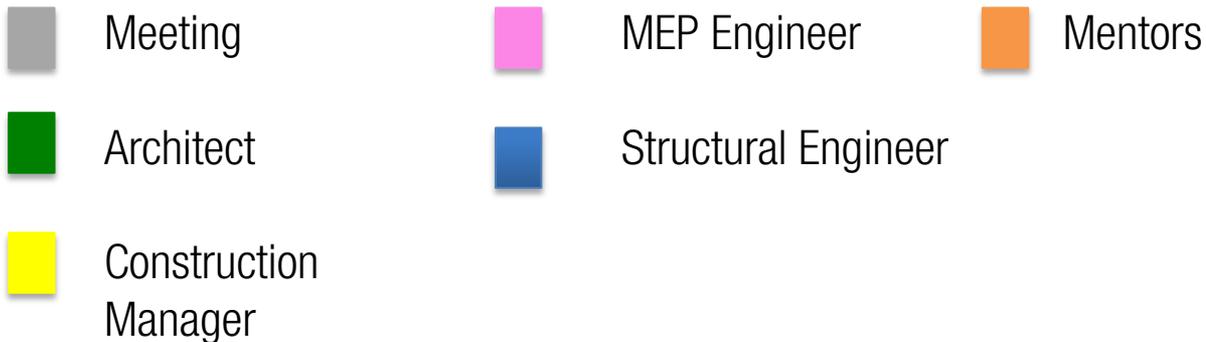
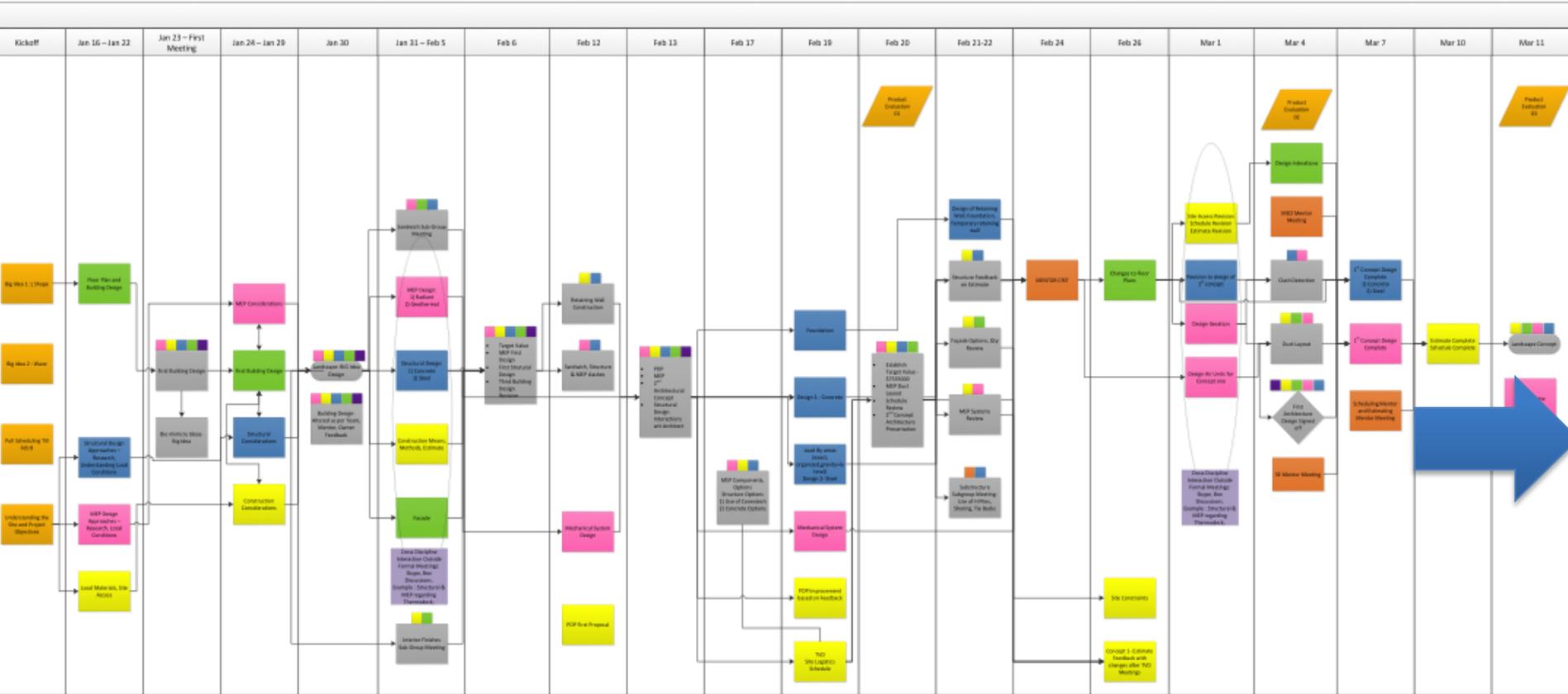


Show all formulas X

	A	B	C	D	E	F	G	H	I
1	What	By Date	By Whom	For Whom	For What	Priority	Inserted By?	Status	Estimated Time Needed
2	Intermediate Milestone - 01/20/2012								
3	Site Analysis and Meeting - Photos From Locations	1/20/2012	MEP	Team	Local Knowledge	1			
4	International Building Codes + US Codes	1/20/2012	E, C, MEP	A	General	1			
5	Programme Research And Ideas From Practice	1/20/2012	E, C, MEP	A	General	1			
6	Structural Ideas	1/20/2012	E	A	Incorporating the BIG Idea Into Design	1			
7	MEP Ideas	1/20/2012	MEP	A	Incorporating the BIG Idea Into Design	1			
8	Local Material Research	1/20/2012	C	A, E	Materials for Architectural, Structural	1			
9	Site Constraints, Max Size for Pre-Fab Materials	1/20/2012	C	E	Building Design	1			
10	Weather Data	1/20/2012	MEP	MEP	Heating Loads, Cooling Loads				
11									



# POP PROCESS PRODUCTION PLAN



# POP PRODUCTION PLAN DISCUSSION

GoToMeeting Viewer

Webcams Zoom: 68%

Now viewing Ramprasath Palanisamy's screen

Preview File Edit View Go Tools Bookmarks Window Help

Atlantic-Process02.png

Previous Next Zoom Move Text Select Annotate

Sidebar Search

Andrew Eckhart

Ramprasath Pala...

Ramprasath Pala...

Ramprasath Pala...

Big Idea 1: 1 Shape

Big Idea 2: Wave

Full Scheduling 101 Feb 8

Understanding the Site and Project Objectives

Floor Plan and Building Design

First Building Design

Bio mimicry Ideas - Big Idea

MEP Design Approaches - Research, Understanding Local Conditions

MEP Design Approaches - Research, Local Conditions

Local Materials, Site Access

MEP Considerations

First Building Design

Structural Considerations

Construction Considerations

Landscape: BIG Idea Design

Building Design Altered as per Team, Member, Owner Feedback

MEP Design 1) Rollout 2) Geothermal

Structural Design 1) Concrete 2) Steel

Construction Means, Methods, Estimate

Facade

Cross Discipline Interaction Outside Formal Meetings: Skips, Run Discussions. Example: Structural & MEP regarding Thermotech.

Interior Finishes

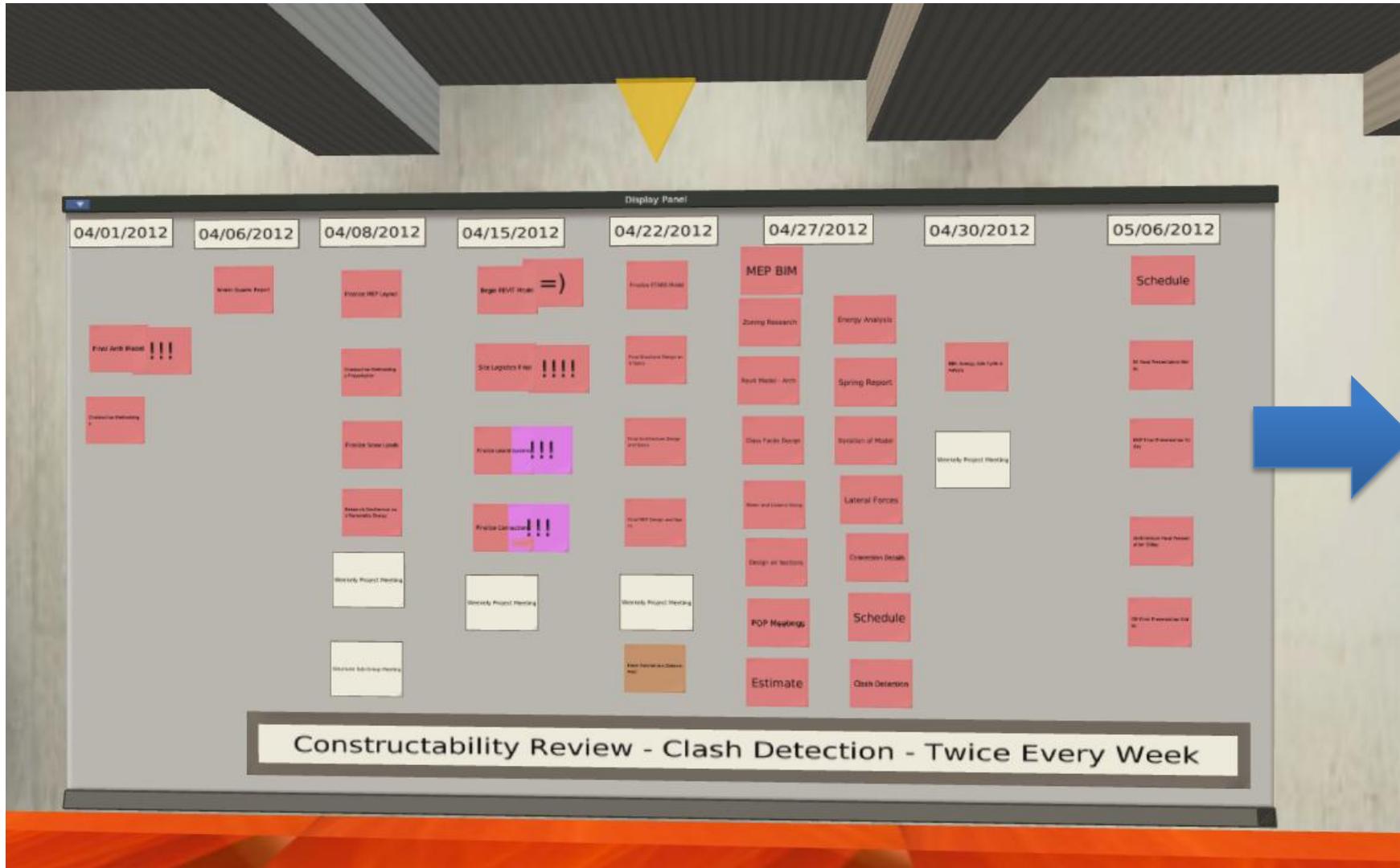
Retaining Wall Construction

Sandwich, Structure & Construction

- Target Value
- MEP First Design
- First Structural Design
- Third Building Design
- Design Revision

- Meeting
- MEP Engineer
- Construction Manager
- Architect
- Structural Engineer

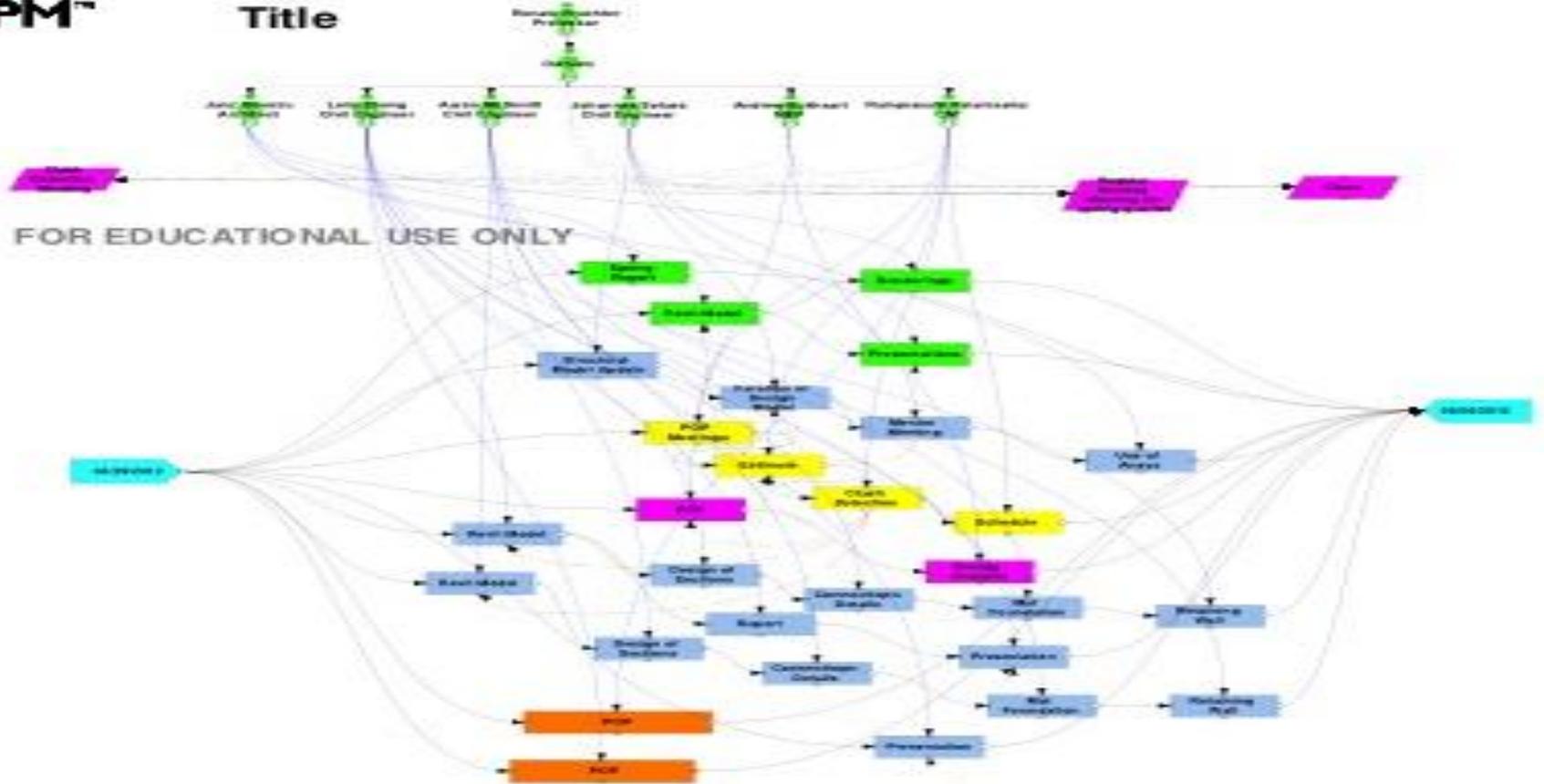
# PERSONALIZATION 3DICC



# INTEGRATION OF PROCESS AND ORGANIZATION



Title



Construction Manager



MEP Engineer

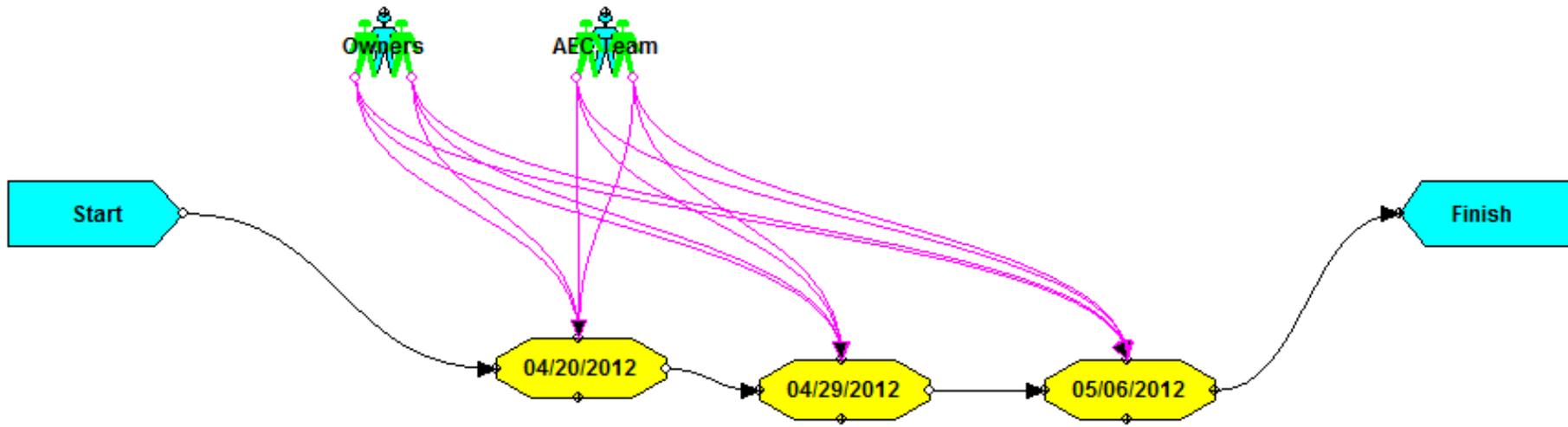


Architect



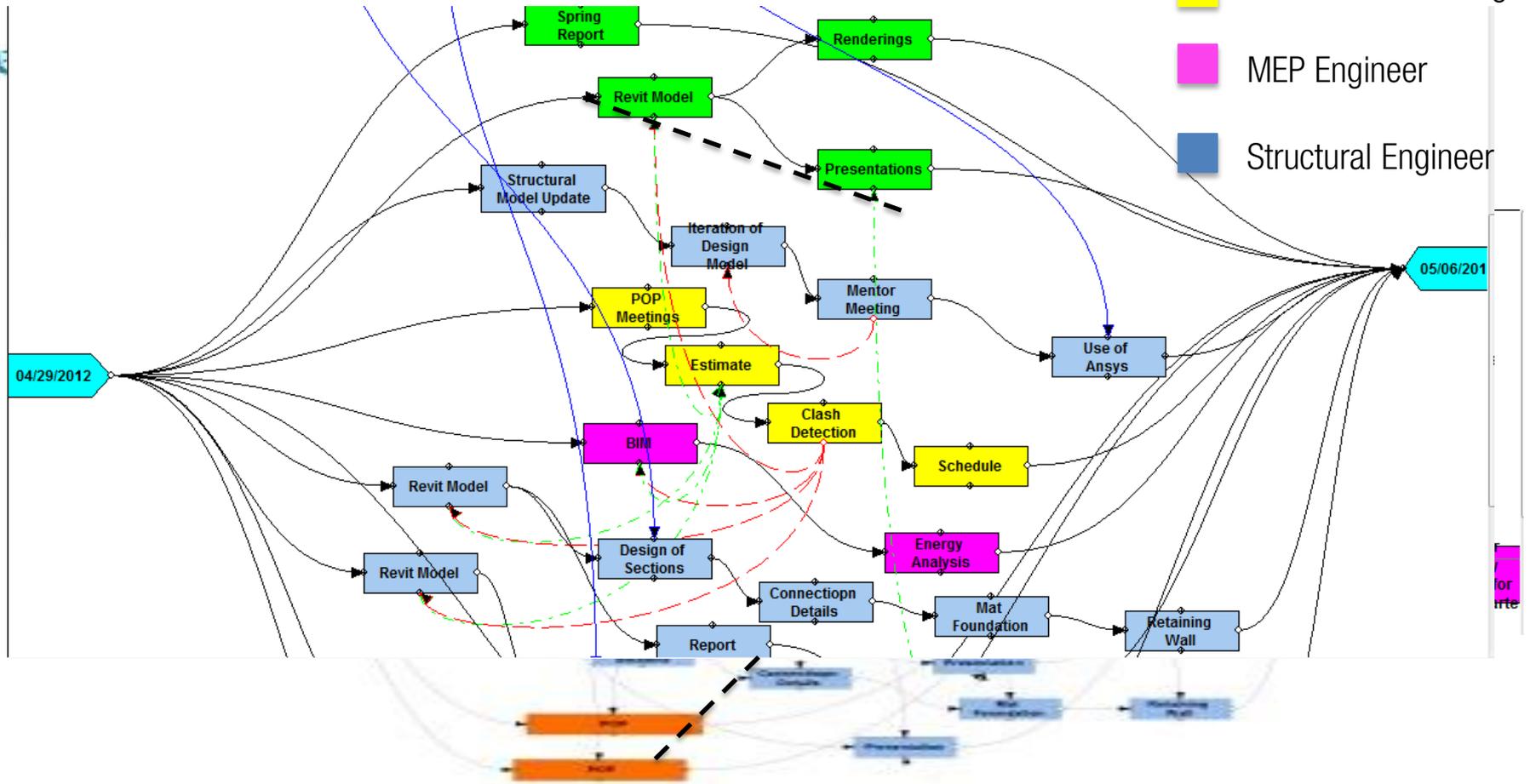
Structural Engineer

# SIM VISION



# SIM VISION

- Architect
- Construction Manager
- MEP Engineer
- Structural Engineer

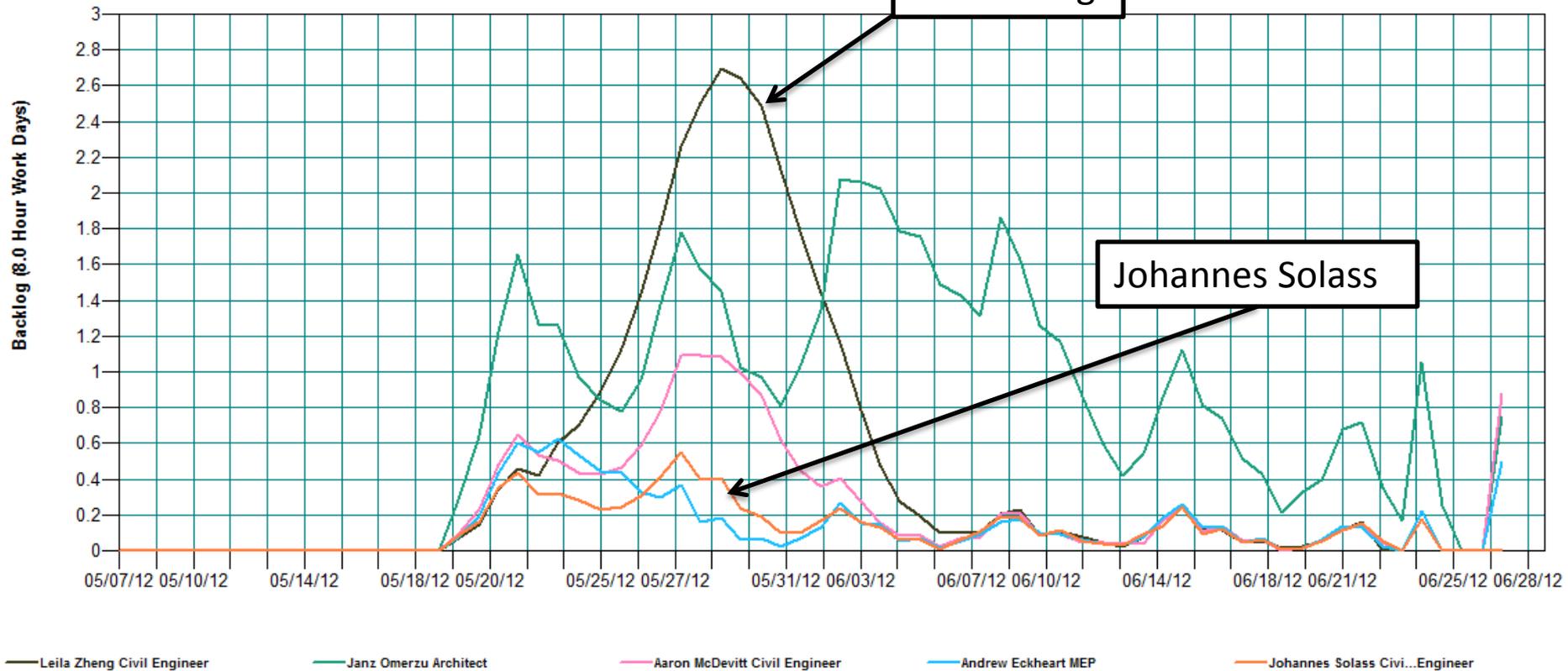


# POP POSITION BACKLOG

## Project Position Backlog

Case: AEC  
Project: 05/06/2012  
Program: Program

# Educational Version

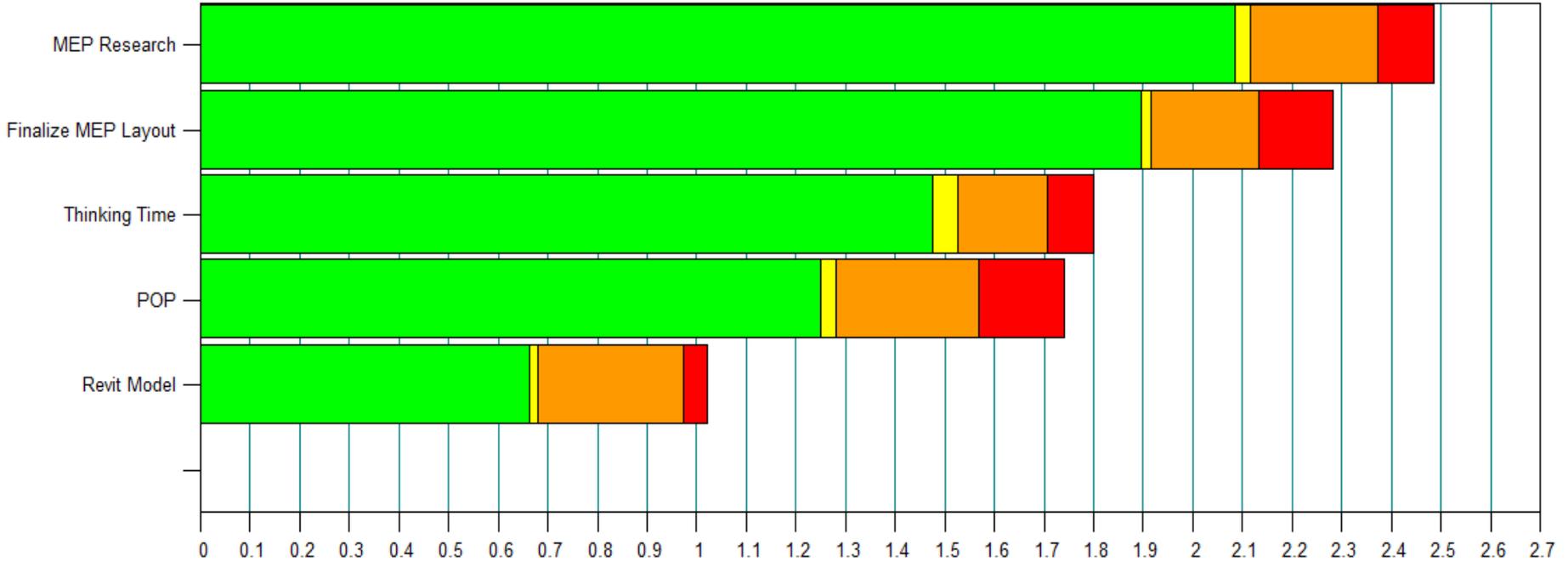


# DISTRIBUTED

## Project Work Breakdown

# Education | Version

Case: AEC  
Project: 04/20/2012  
Program: Program



Work Volume (FTE-days, 8.0 hours per day)

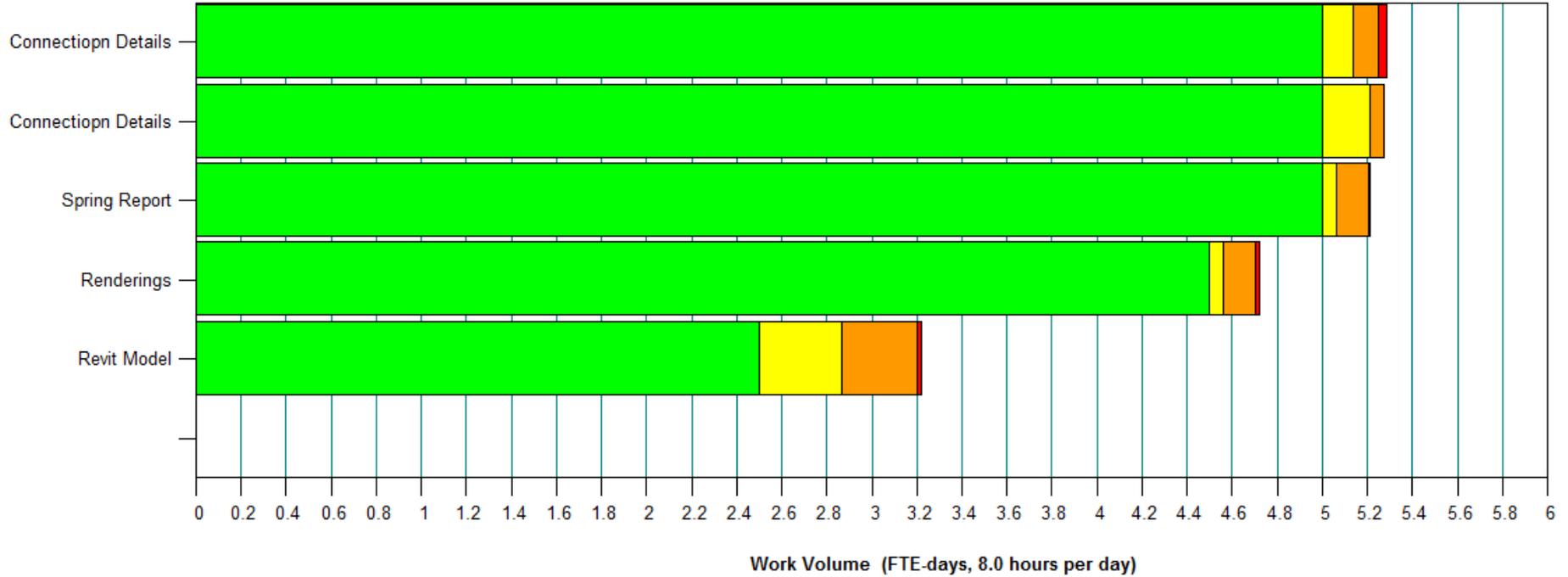


# COLOCATED

## Project Work Breakdown

Education | Version

Case: AEC  
Project: 05/06/2012  
Program: Program



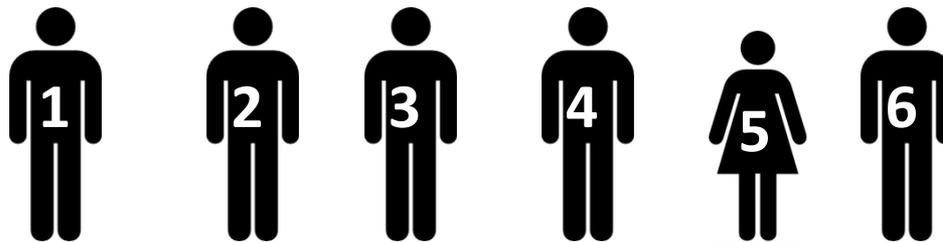
# POP –LESSONS LEARNED

## ABOUT OUR TEAM

- Very diverse -4 countries represented

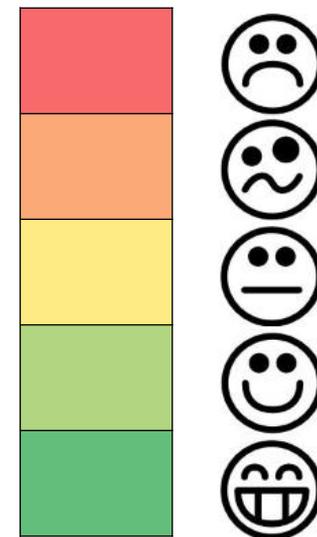
						EW direction			NS direction		
						Tributary area load (kips)			Tributary area load (kips)		
height	Kz	qz (psf)	qh (psf)	p (psf)	p (psf)	2nd floor	3rd floor	roof	2nd floor	3rd floor	roof
0	0,85	24,461	29,0654	28,9862	16,6335						
5	0,85	24,461	29,0654	28,9862	16,6335						
10	0,85	24,461	29,0654	28,9862	16,6335	11667			6694,96		
15	0,85	24,461	29,0654	28,9862	16,6335	16667,1			9564,24		
20	0,9	25,8998	29,0654	29,9647	17,6119	15506,7	1722,97		9114,15	1012,68	
25	0,94	27,0509	29,0654	30,7474	18,3946		17679,8			10576,9	
30	0,98	28,202	29,0654	31,5302	19,1774		18129,9			11027	
35	1,01	29,0654	29,0654	32,1172	19,7645		9233,71	9233,71		5682,28	5682,28
40	1,065	30,6481	29,0654	33,1935	20,8407			15269			9586,74
						43,8408	46,7663	24,5027	25,3734	28,2989	15,269
ea	6,5	trib area starts			per ft	0,28284	0,30172	0,15808	0,1637	0,18257	0,09851

# POP –DIFFICULTIES -COORDINATION



Coordination Tools	1	2	3	4	5	6
Facebook	Red	Green	Green	Green	Light Green	Green
Skype	Green	Green	Green	Green	Green	Green
Blog	Yellow	Light Green	Green	Yellow	Light Green	Red
Google Task list	Yellow	Green	Green	Red	Red	Green
3DICC	Orange	Green	Green	Red	Red	Green
Meeting Minutes	Yellow	Green	Green	Orange	Green	Green
Gotomeeting	Green	Green	Green	Green	Green	Green
When2meet	Green	Green	Green	Green	Green	Green
Box Updates	Light Green	Green	Green	Light Green	Green	Green
Revit	Light Green	Green	Green	Green	Green	Green
Brainmerge	Green	Green	Green	Green	Green	Green
Survey Monkey	Green	Green	Light Green	Green	Green	Green

## LEGEND

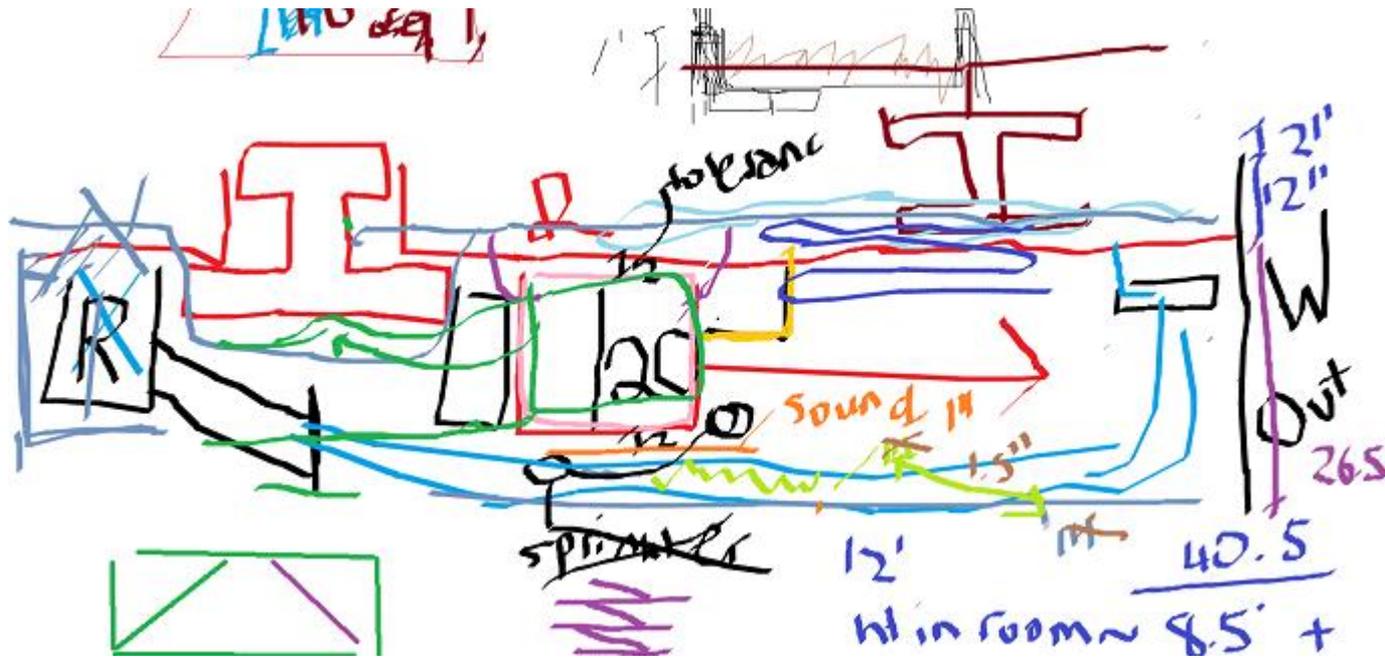


- Coordination Tools involve the buy-in of all team members

# POP – LESSONS LEARNED

## ABOUT TEAMWORK

- Important to ask feedback from EVERYONE
- True IPD project – you spend more time coordinating than doing work. It's best to have interactive work sessions
- Iteration



# POP –LESSONS LEARNED

Transparency applied to our building

Robert Alvarado

Derek Ouyang

Eric Thatcher

Kyle Halverson

John Nelson

Forest Olaf Peterson

Thomas R. Wooden

Justin Bocian

Renate Fruchter

Wafaa Sabi

# Thank you

Dan Gonzales

Ronnie Borja

Greg Luthe

Andy Meade

Kyle Adams

Fernando Castillo

Henry Tooryani

Afaan Naqvi

Eduardo Miranda

Eduardo Miranda

Riam Firouz

Nick Arenson