



Atlantic Team 2011

Winter Presentation

Owners



Eric

Lauren



Architect



Maria

Engineer



Colin

Riam



Travis

Construction



Kim

Mike



Sebastjan



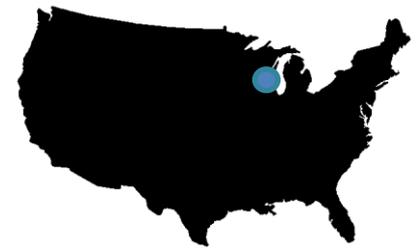
MEP



Anne-Laure

Site Location

University of Wisconsin, Madison



Existing Water Science & Engineering Lab

Site Conditions

Madison, Wisconsin

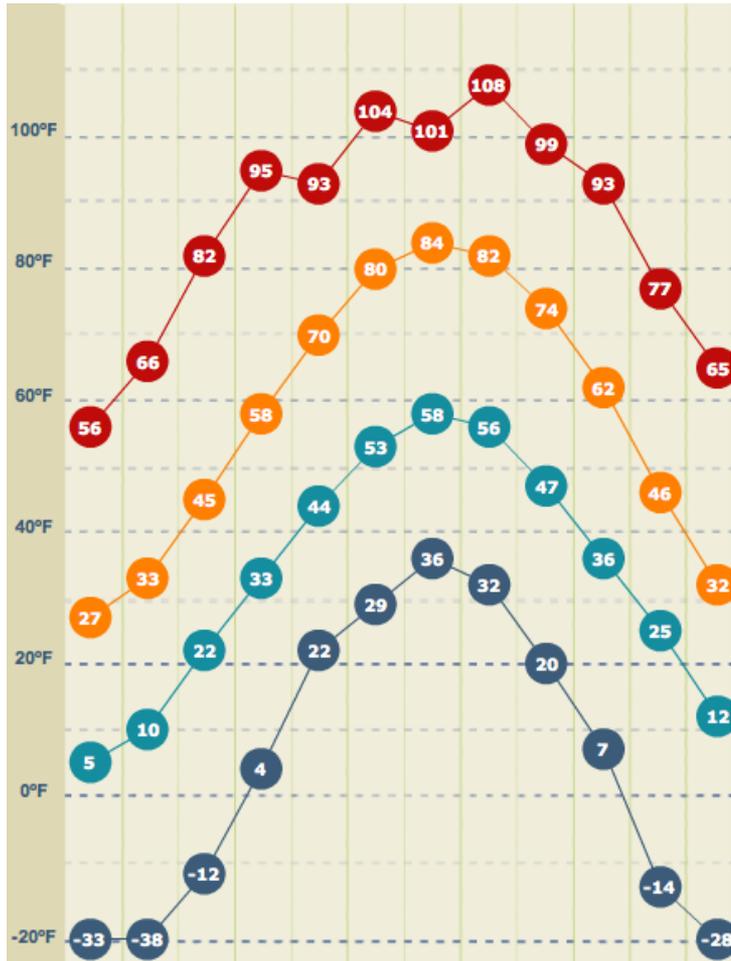


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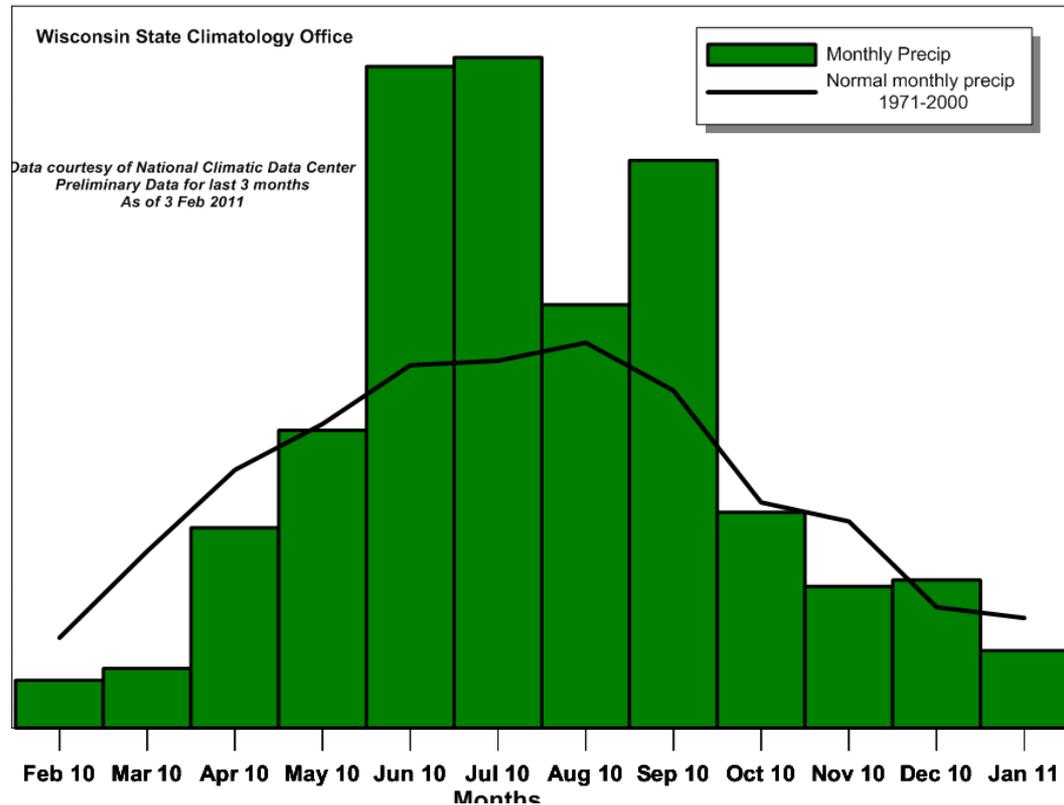


Weather & Climate

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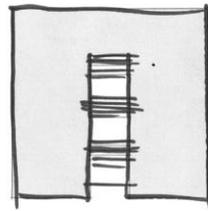


Wisconsin Last 12 Months Precipitation



Heavy Rain: June – August
Average High Temps: 84° F
Average Low Temps: 58° F

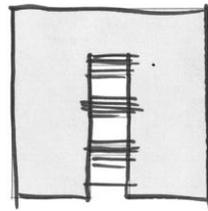
The Staircase Site



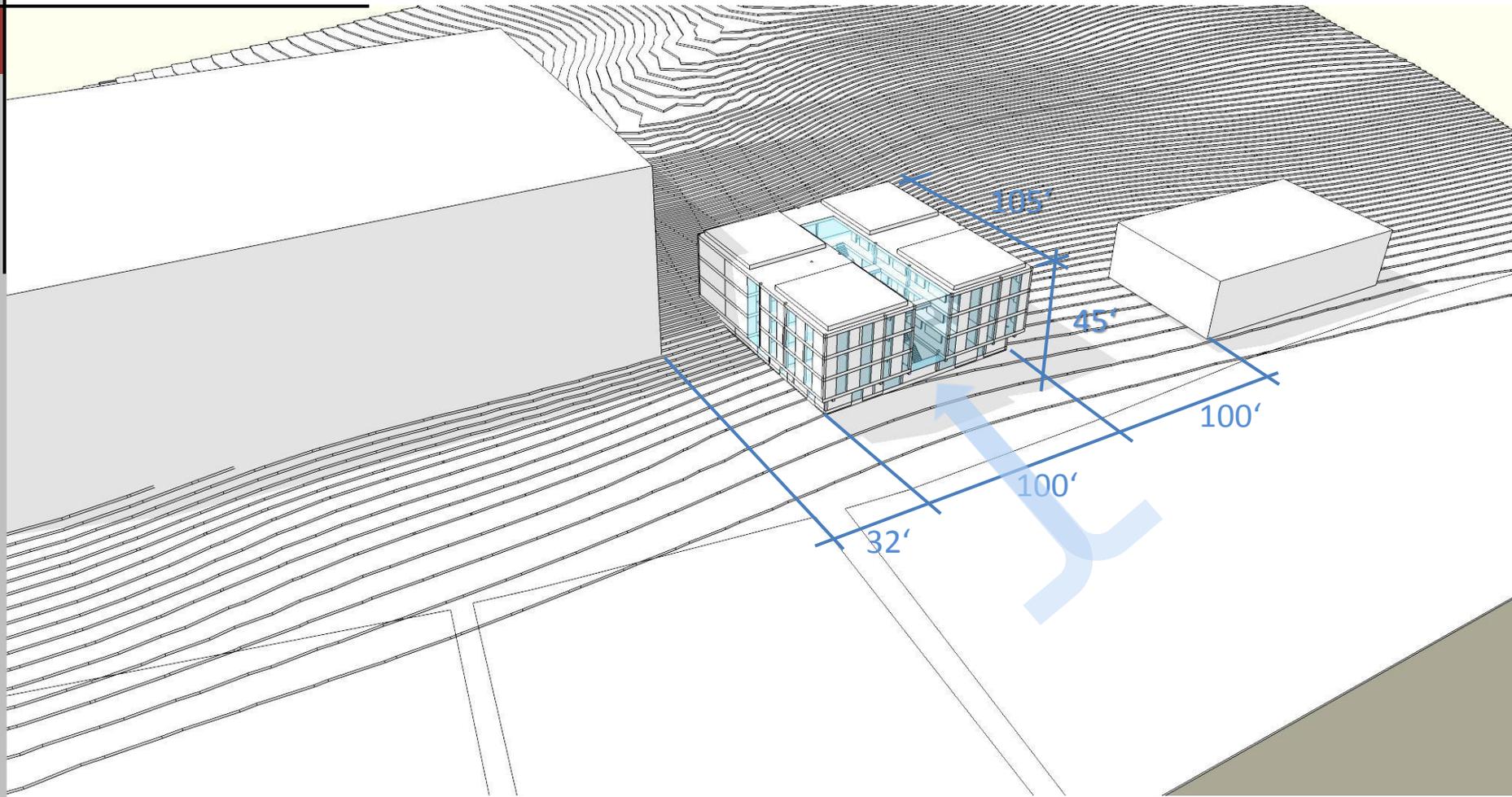
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The Staircase Site

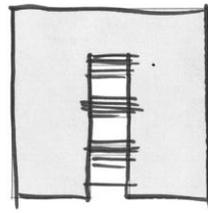


A
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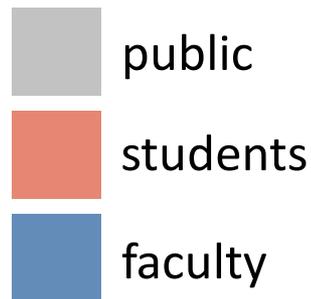
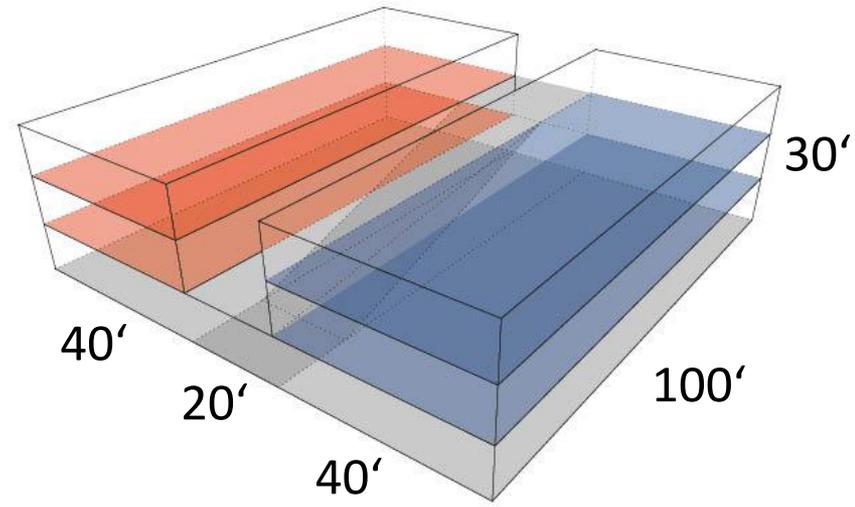
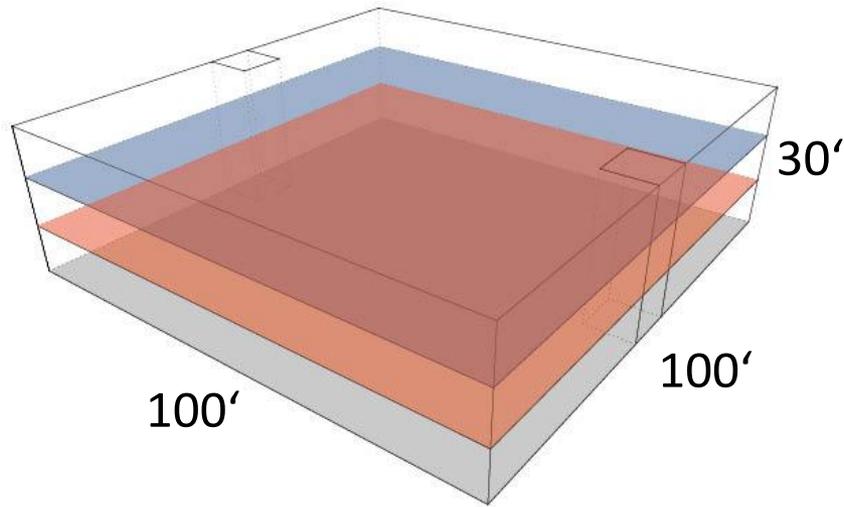


The Staircase

Interior Organization

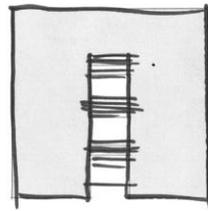


A
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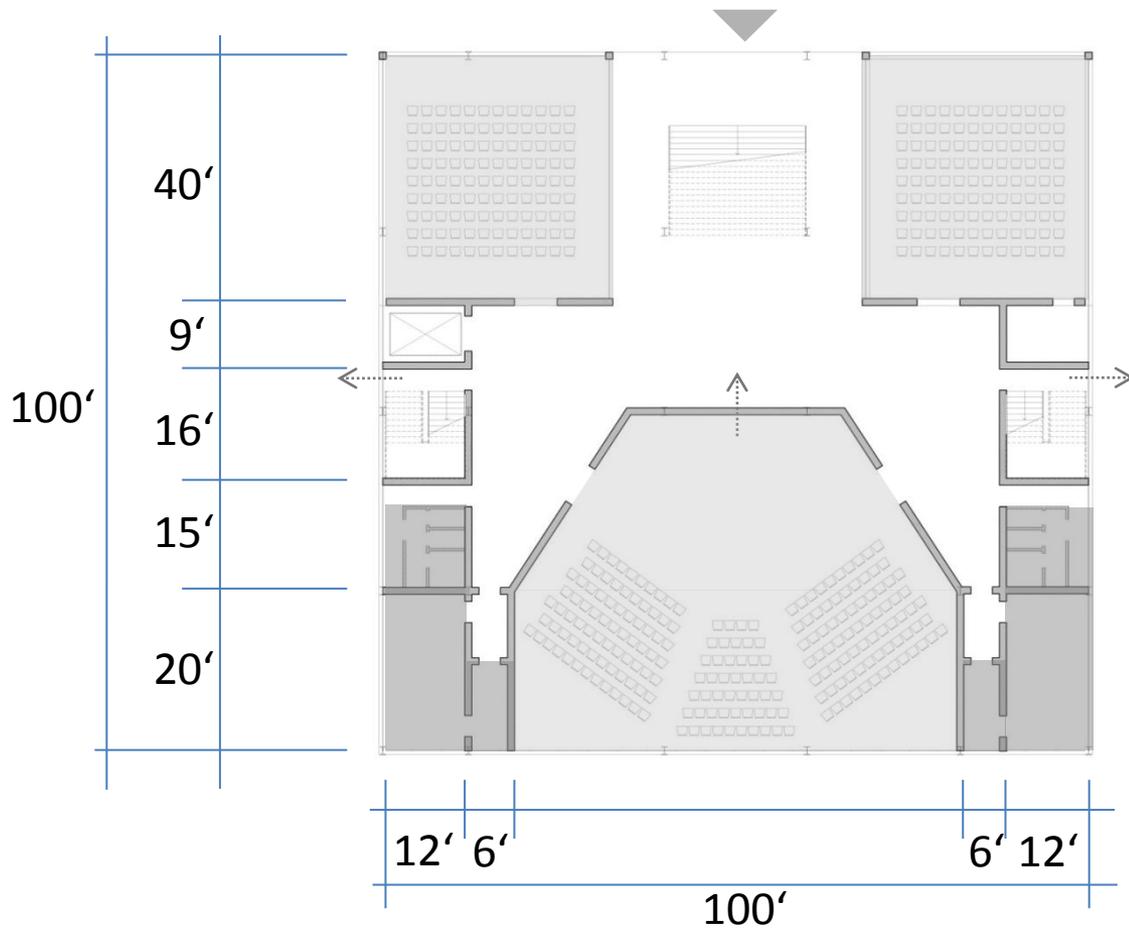


The Staircase

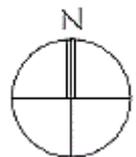
1st Floor



A
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M
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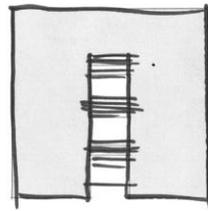


- Auditorium
- Large Classroom
- Restrooms
- Mechanical/Technical Room
- Storage
- MEP shafts

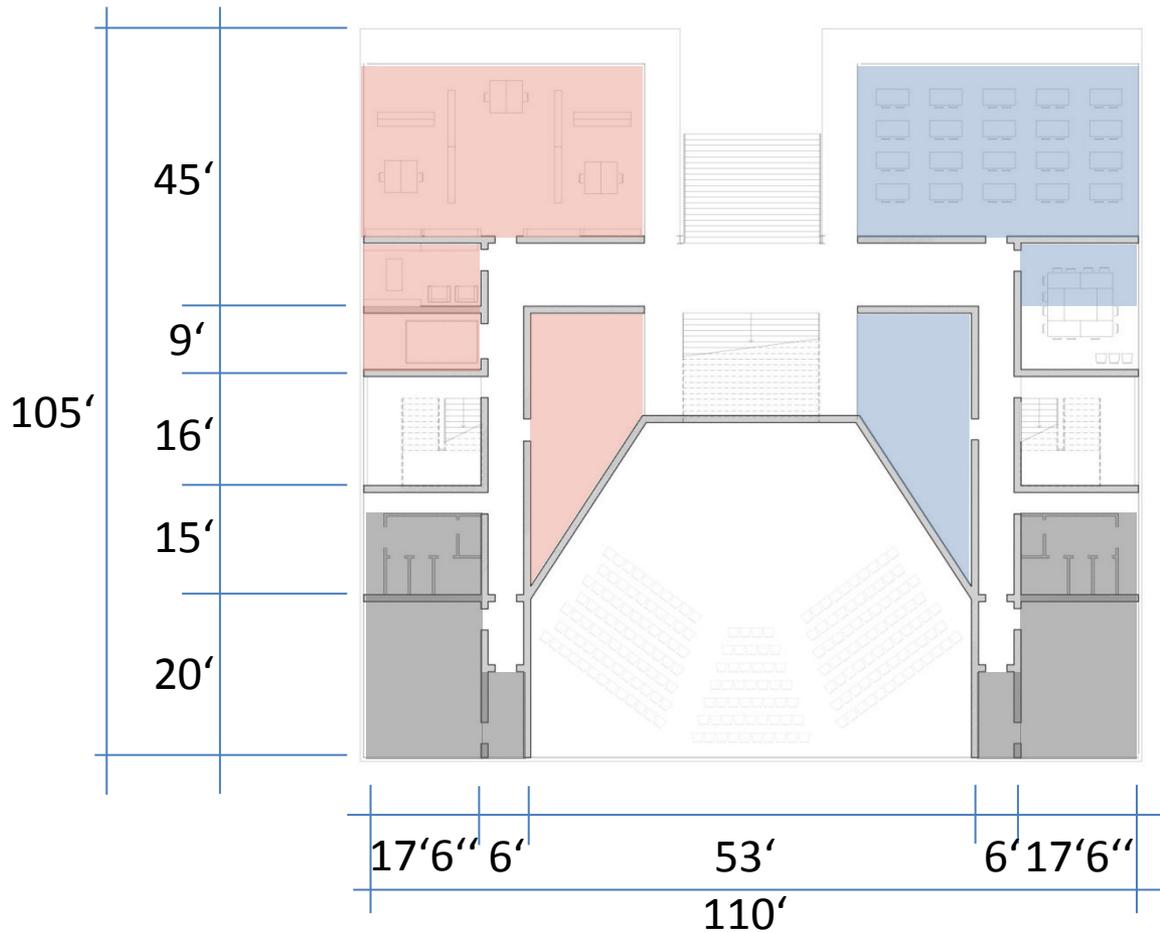


The Staircase

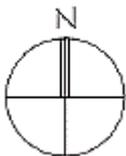
2nd Floor



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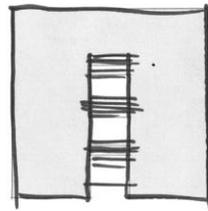


- Instructional Lab
- Server Room
- Seminar Room
- Small Classroom
- Student Offices
- Faculty Offices
- Faculty Lounge
- Senior Administration
- Administrative Assistants
- Restrooms
- Mechanical/Technical Room
- Storage
- MEP shafts

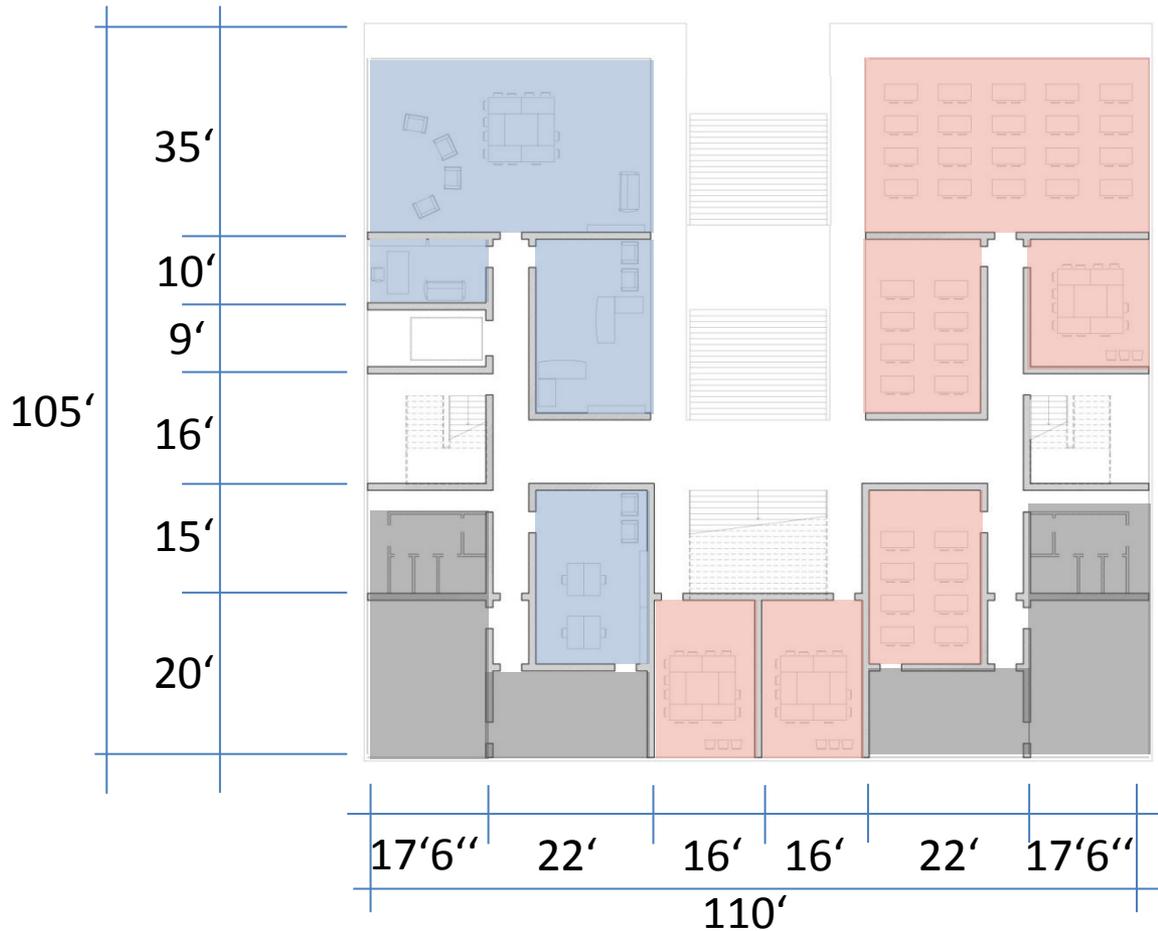


The Staircase

3rd Floor



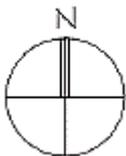
A
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- Instructional Lab
- Server Room
- Seminar Room
- Small Classroom
- Student Offices

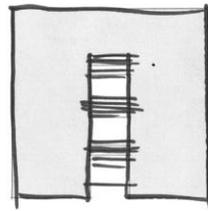
- Faculty Offices
- Faculty Lounge
- Senior Administration
- Administrative Assistants

- Restrooms
- Mechanical/Technical Room
- Storage
- MEP shafts

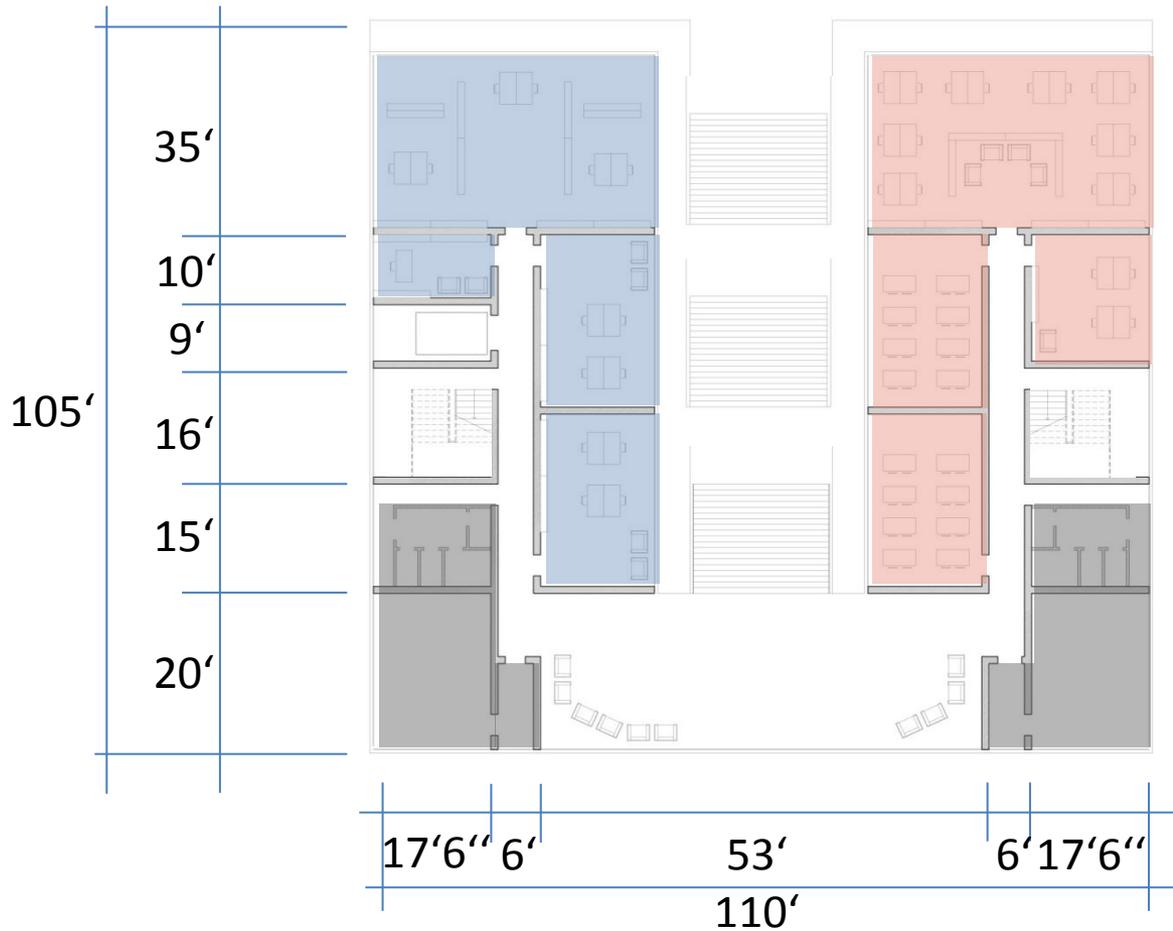


The Staircase

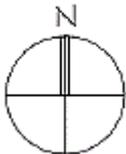
4th Floor



A
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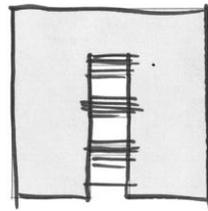


- Instructional Lab
- Server Room
- Seminar Room
- Small Classroom
- Student Offices
- Faculty Offices
- Faculty Lounge
- Senior Administration
- Administrative Assistants
- Restrooms
- Mechanical/Technical Room
- Storage
- MEP shafts

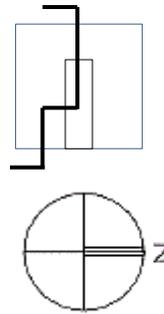
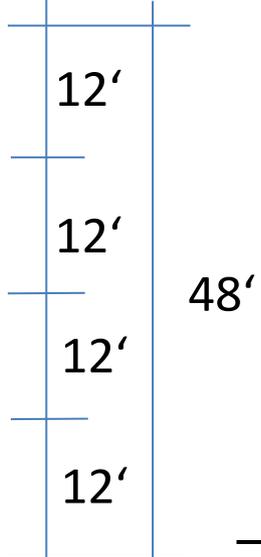
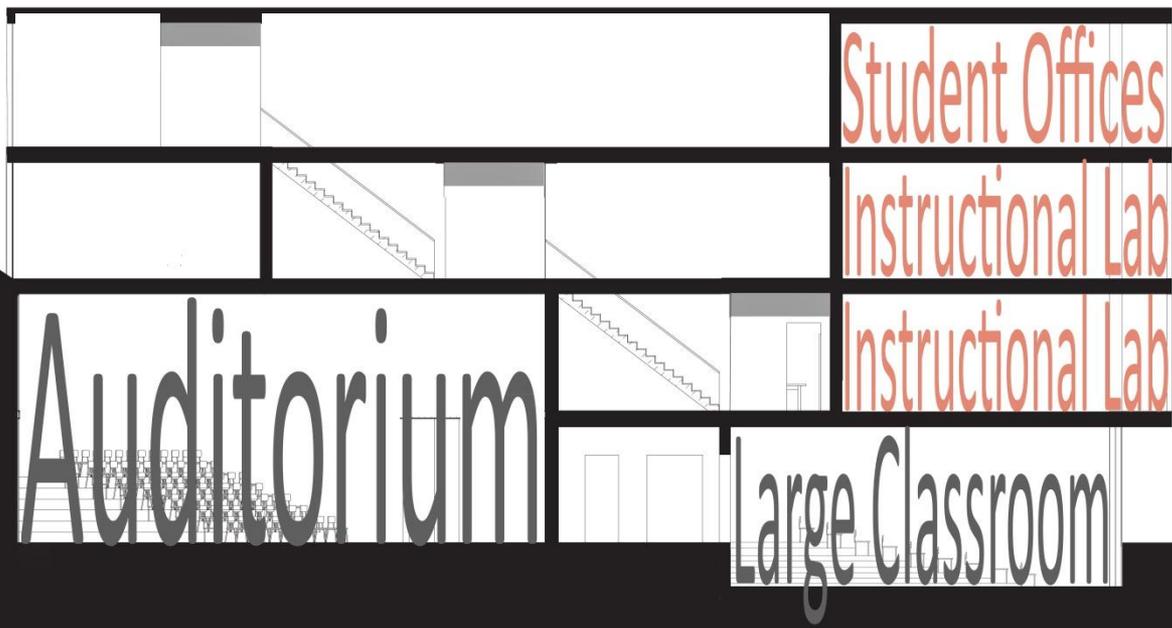


The Staircase

Section North-South

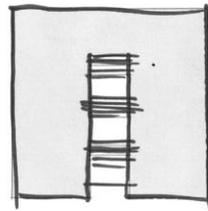


A
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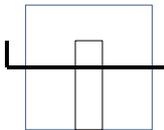
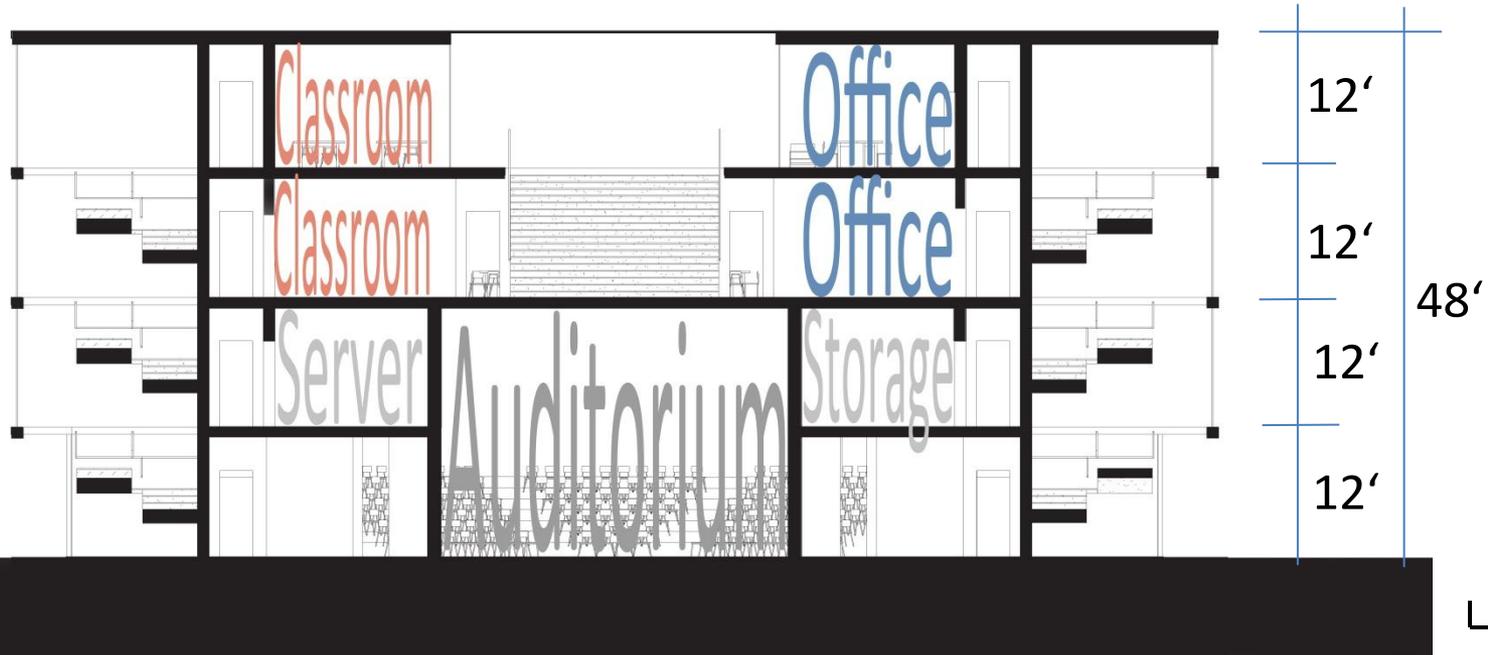


The Staircase

Section East-West

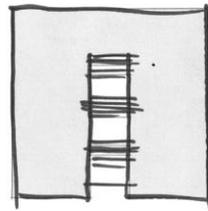


A
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M
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The Staircase

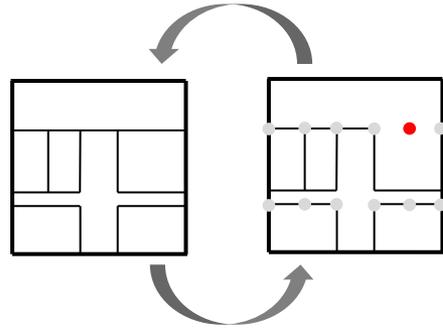
Influence of Other Disciplines



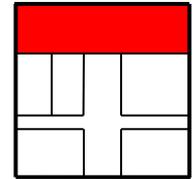
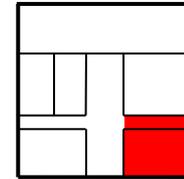
A
E
M
C

Engineers

floorplans
vs.
grid layout

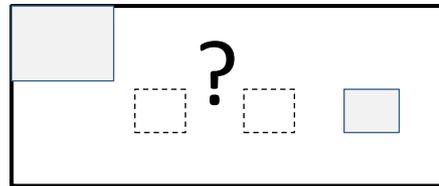


position
of the
auditorium

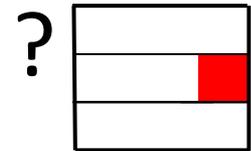
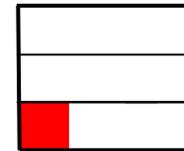


Construction Managers

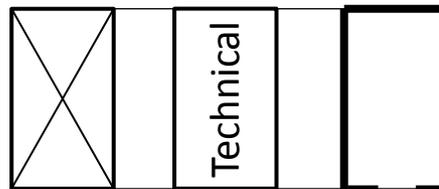
exact position
of the building



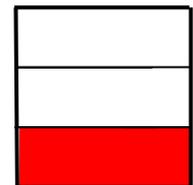
exact position
of the lab



MEP
positioning



adjustment
Floor-ceiling
height



Loading Considerations

A
E
M
C

- Dead Load **80-100 PSF**
 - Self Weight
 - MEP/Cladding/Flooring/Ceiling

- Live Load **100 PSF**
 - Corridor 80-100 PSF
 - Classroom 40 PSF
 - Auditorium 60 PSF
 - Tech Room 100 PSF
 - Office 50 PSF

- Wind Load **25 PSF**
 - Windward 15 PSF
 - Leeward 10 PSF
 - Sideward 15 SF

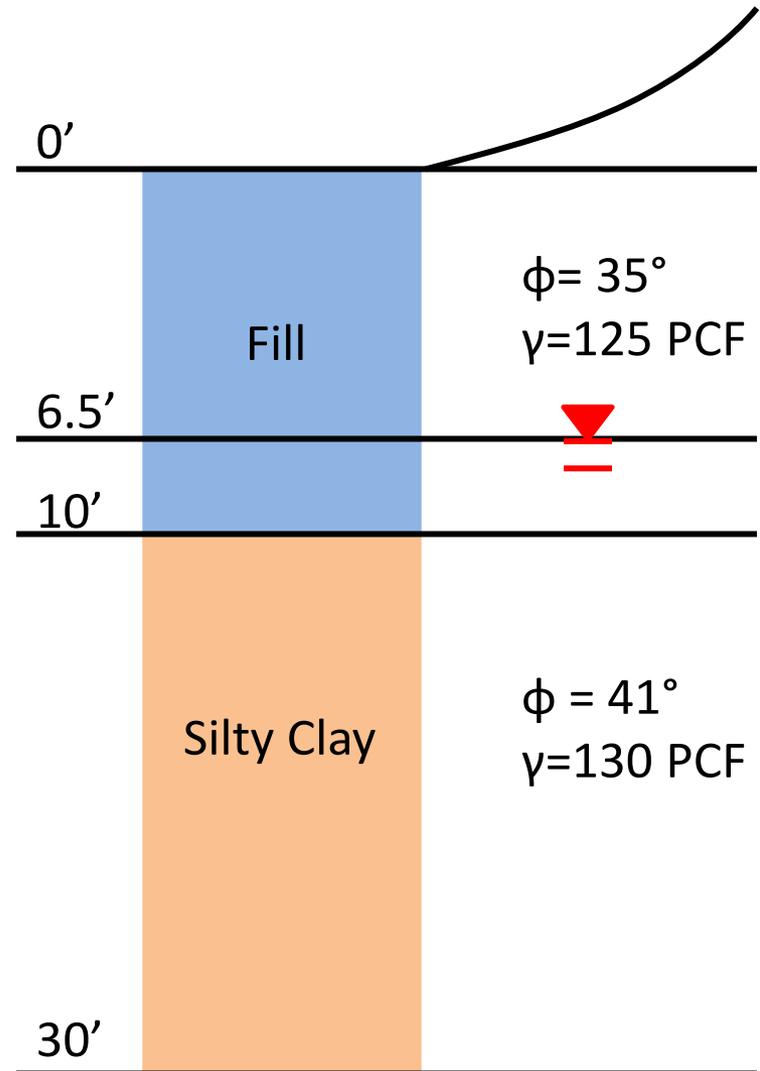
- Snow Load

20 PSF

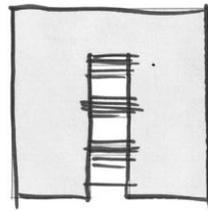
Soil Considerations

Soil Profile

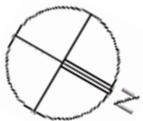
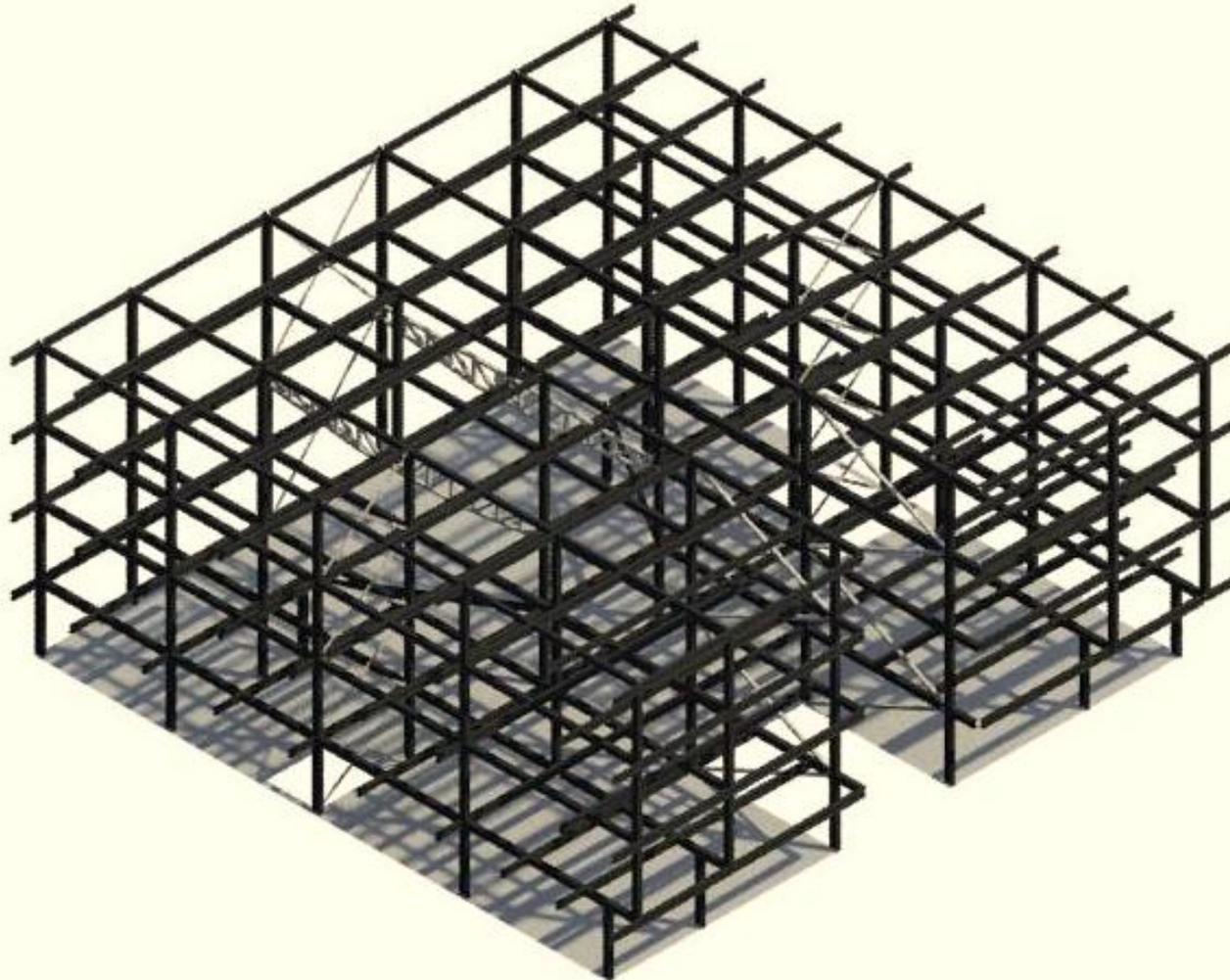
- Bearing Capacity 4 KSF
- High Water Table
- Excavation Needed



The Staircase

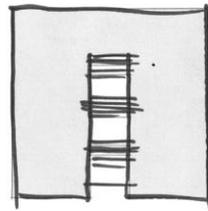


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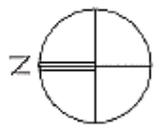
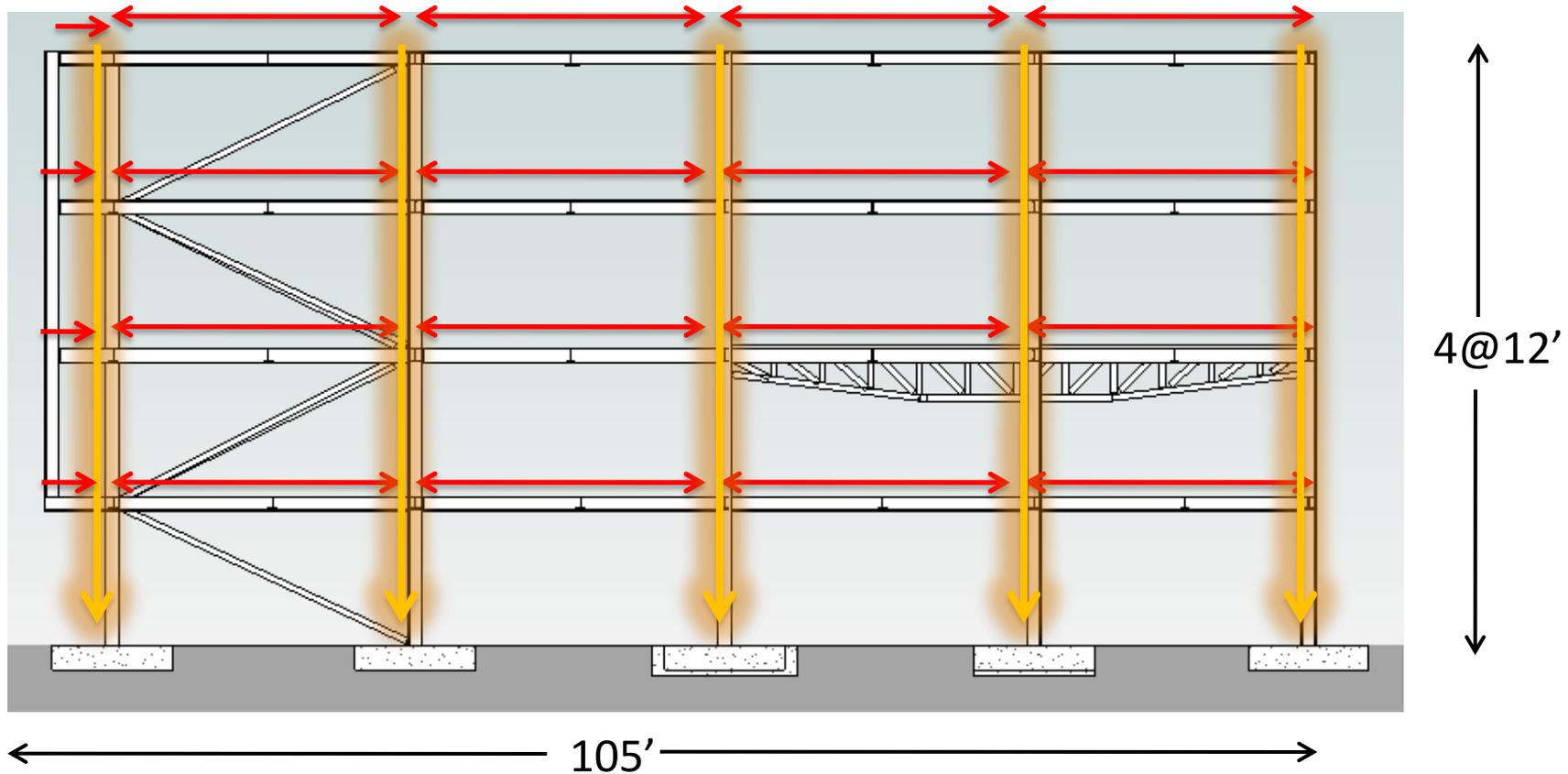


The Staircase

Load Path – Elevation View



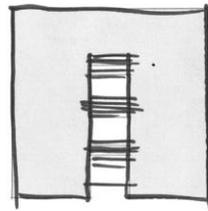
A
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 Beam to Column  Column to Foundation

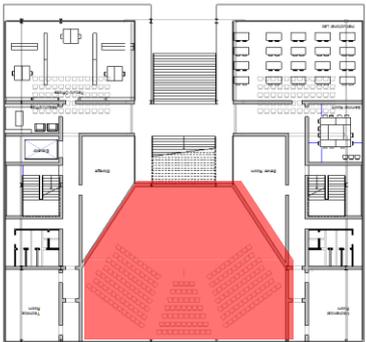
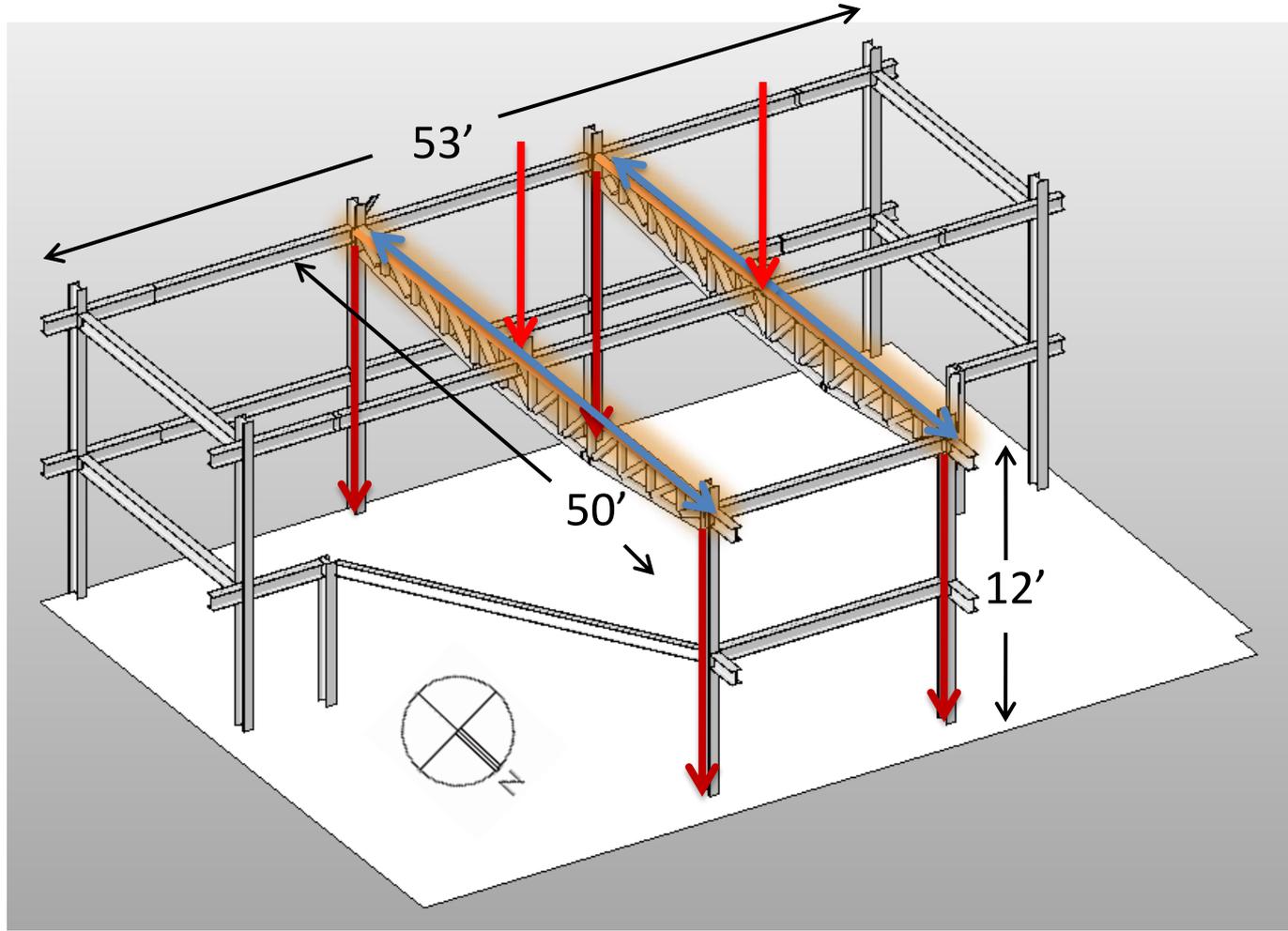
The Staircase

Load Path - Truss



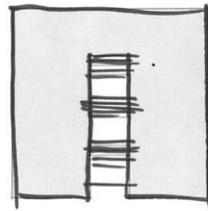
A
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M
C

-  Typ. column loads
-  Transfer girder loads
-  Transferred column loads

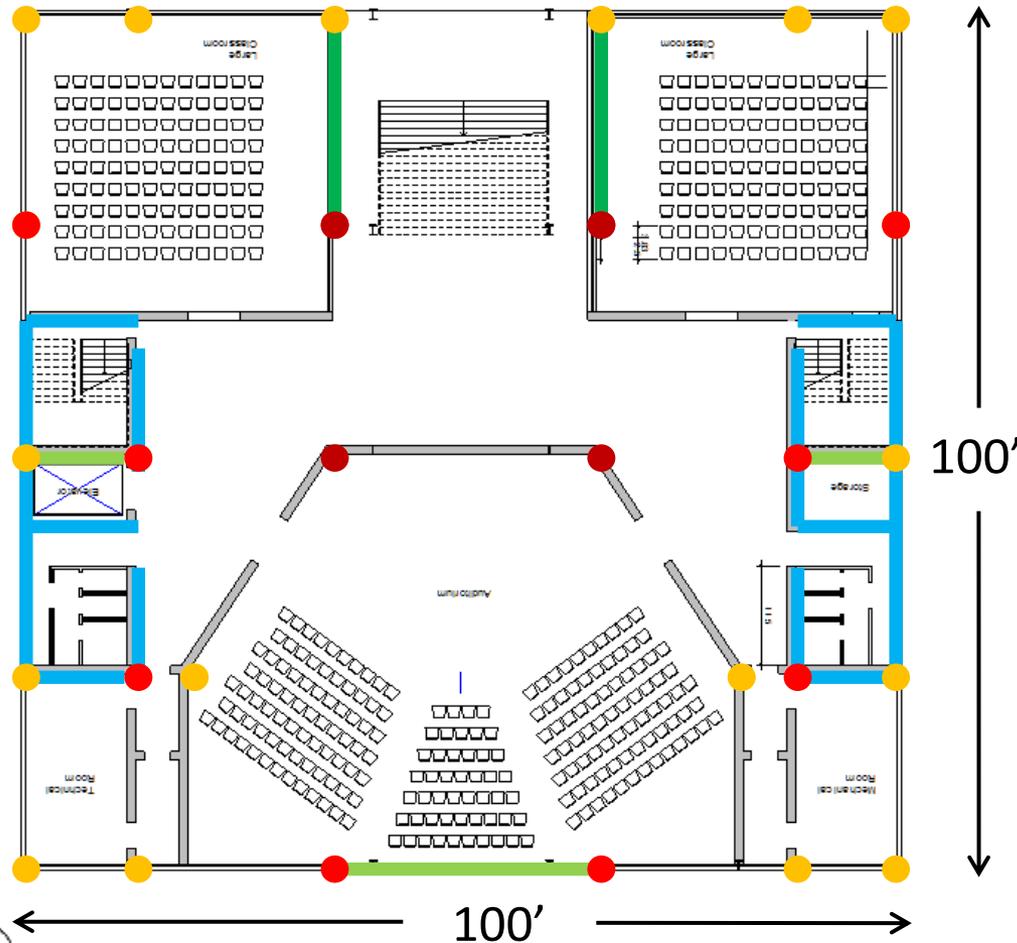


The Staircase

Structural Overlay – 1st Floor



A
E
M
C



Steel

Columns

- W12x40
- W12x65

Lateral System

- C5x9 Braced Frame
- HSS6x6x1/4 Braced Frame

Reinforced Concrete

Columns

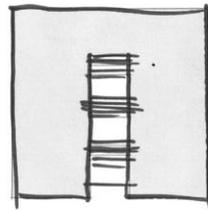
- 12"x12" (12#9s)
- 15"x15" (12#9s)

Lateral System

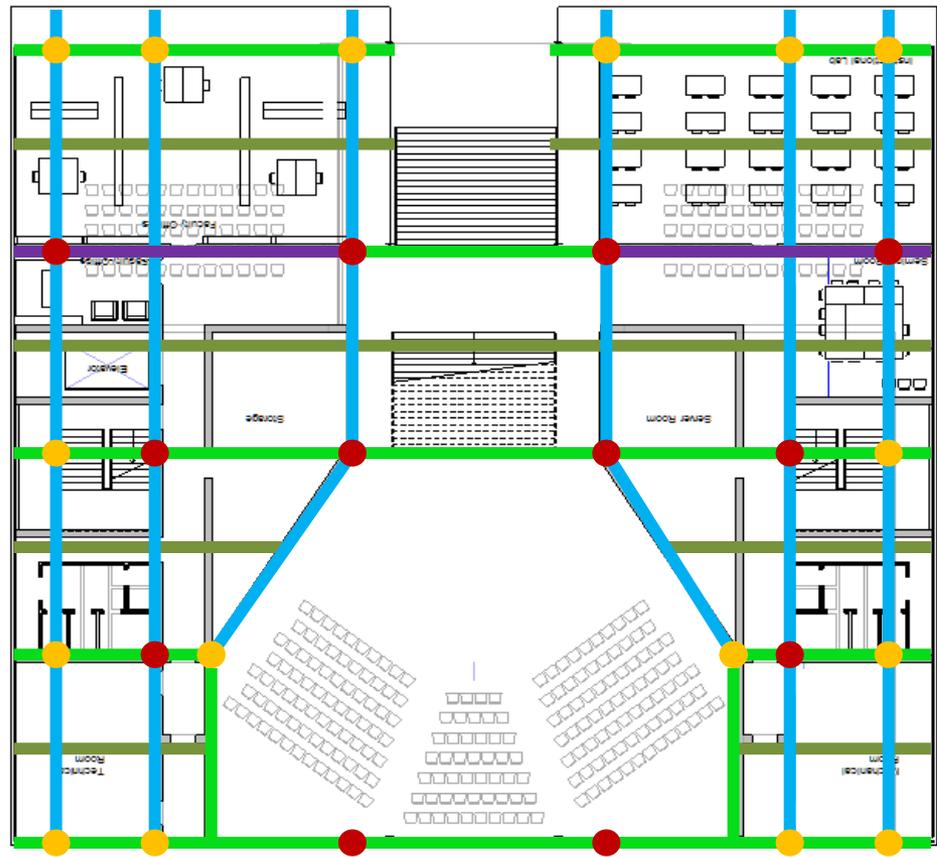
- 8" Shear Walls

The Staircase

Structural Overlay – 2nd Floor

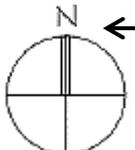


A
E
M
C



105'

110'



Steel

Columns

- W12x40
- W12x65

Beams and Girders

- W10x22
- W14x34
- W27x94

Reinforced Concrete

Columns

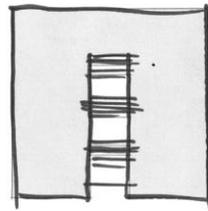
- 12"x12" (12#9s)
- 15"x15" (12#9s)

Beams and Girders

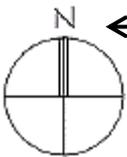
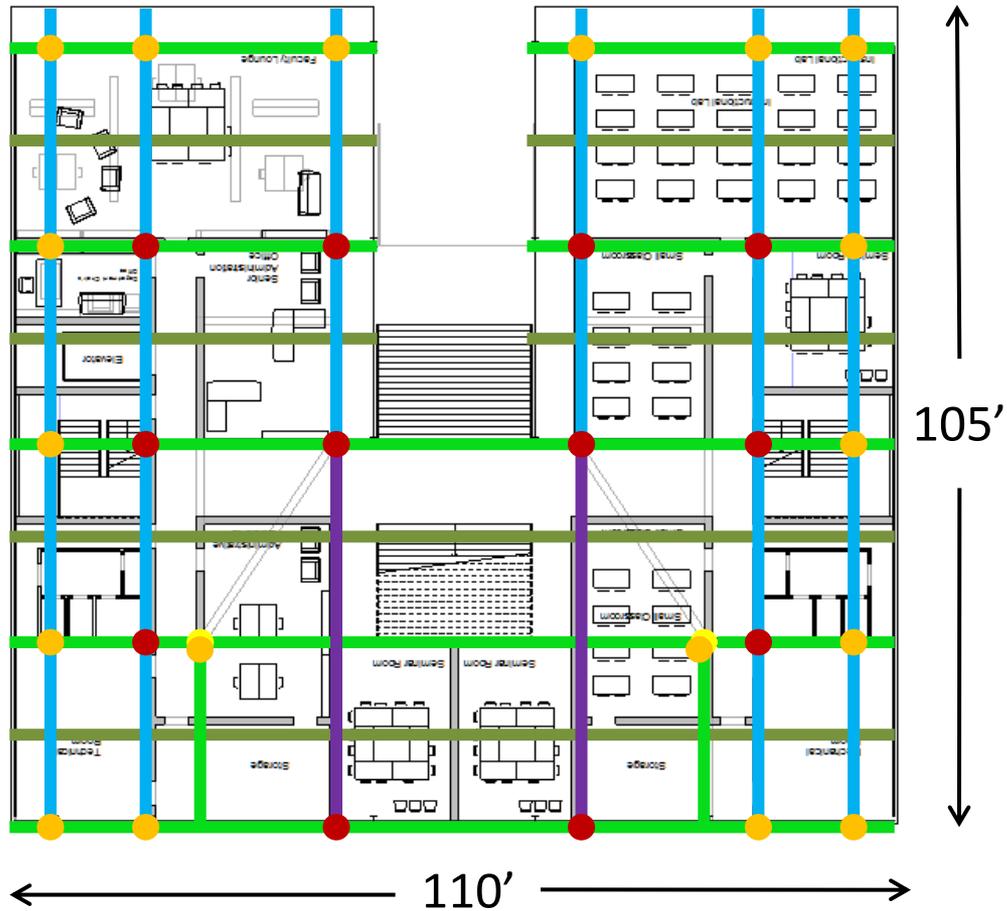
- 18"x12" (10#9s)
- 4'x12" (30#9s)

The Staircase

Structural Overlay – 3rd Floor



A
E
M
C



Steel

Columns

- W12x40
- W12x65

Beams and Girders

- W10x22
- W14x34
- 4' Deep Truss

Reinforced Concrete

Columns

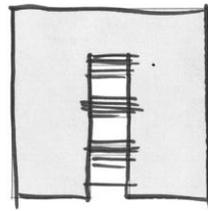
- 12"x12" (12#9s)
- 15"x15" (12#9s)

Beams and Girders

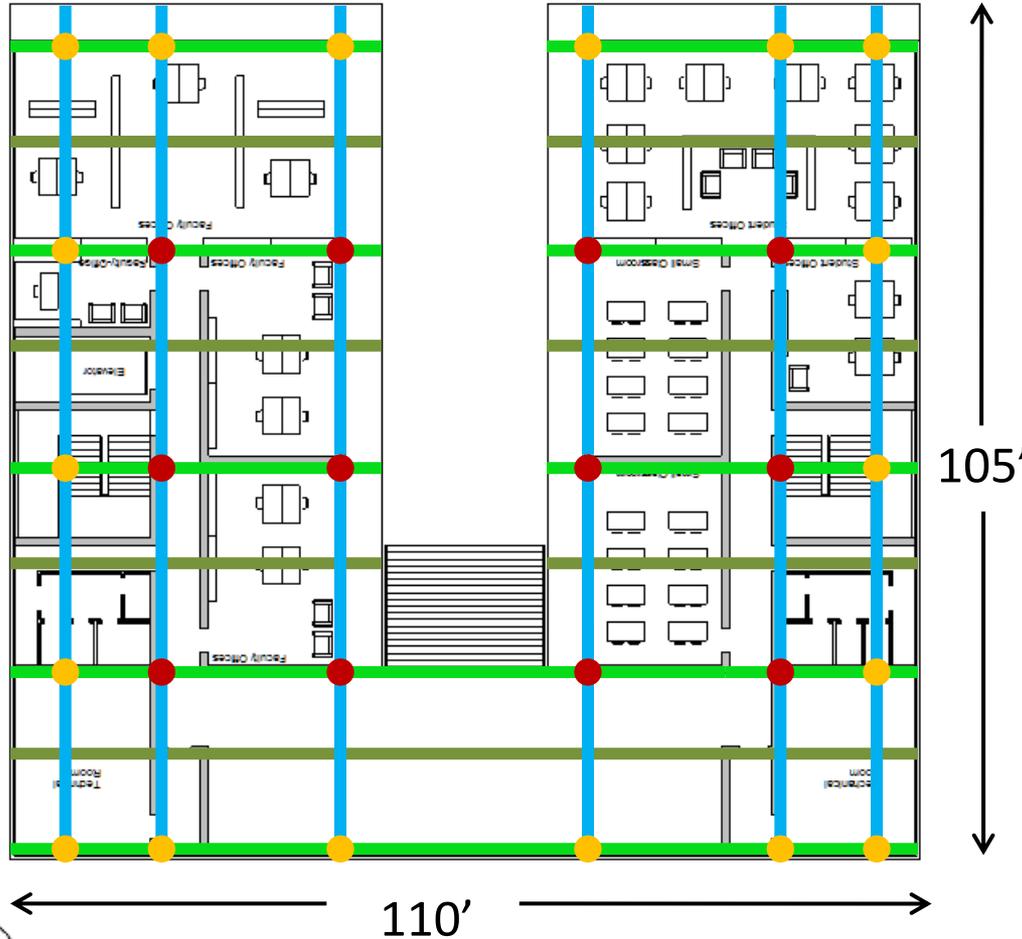
- 18"x12" (10#9s)
- 4'x12" (30#9s)

The Staircase

Structural Overlay – 4th Floor



A
E
M
C



Steel

Columns

- W12x40
- W12x65

Beams and Girders

- W10x22
- W14x34

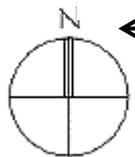
Reinforced Concrete

Columns

- ● 12"x12" (12#9s)

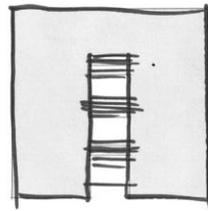
Beams and Girders

- ■ 18"x12" (10#9s)

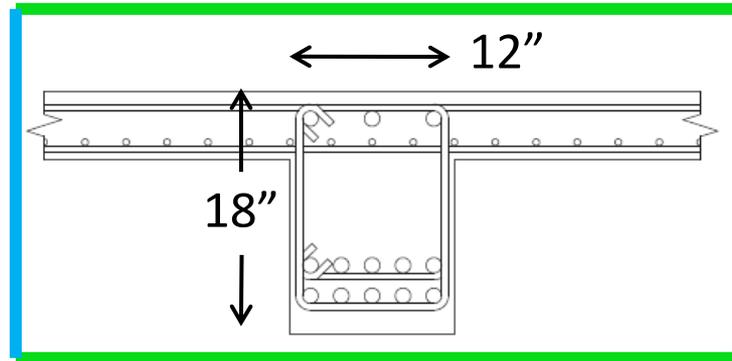
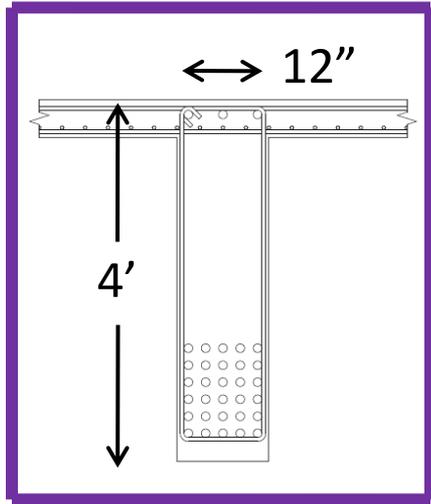


The Staircase

Member Details



A
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M
C



Columns

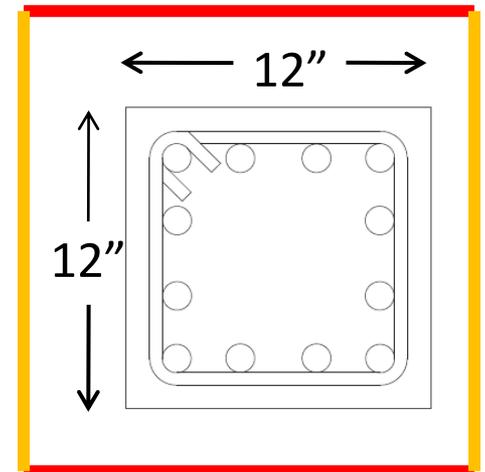
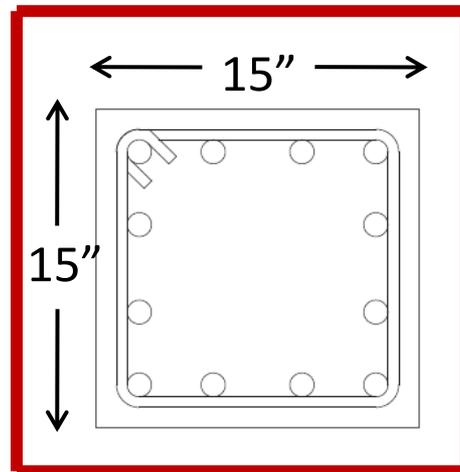
Reinforced Concrete

- 12"x12" (12#9s)
- 15"x15" (12#9s)

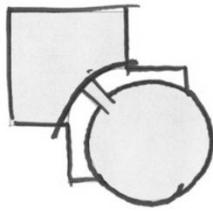
Beams and Girders

Reinforced Concrete

- 18"x12" (10#9s)
- 4'x12" (30#9s)



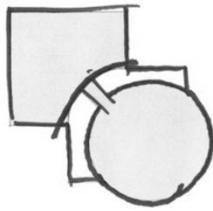
Contrast Site



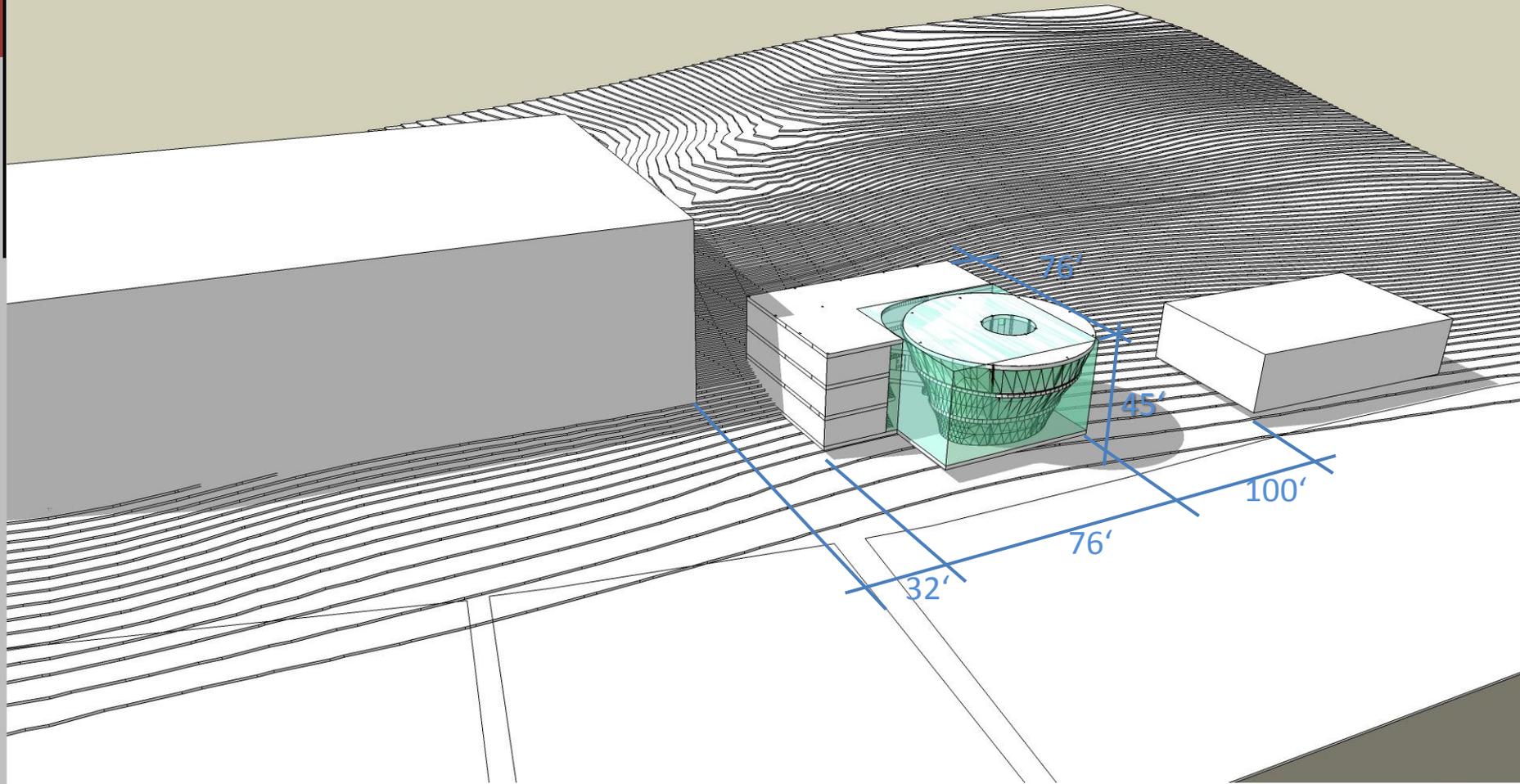
A
E
M
C



Contrast Site

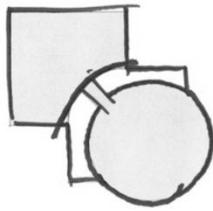


A
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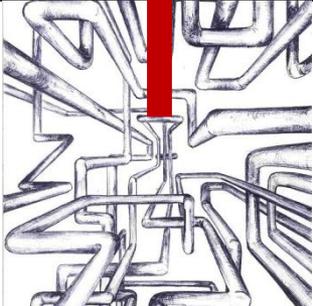


Contrast Ideas

Introducing water
...see how things work.



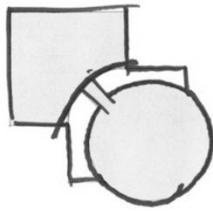
A
E
M
C



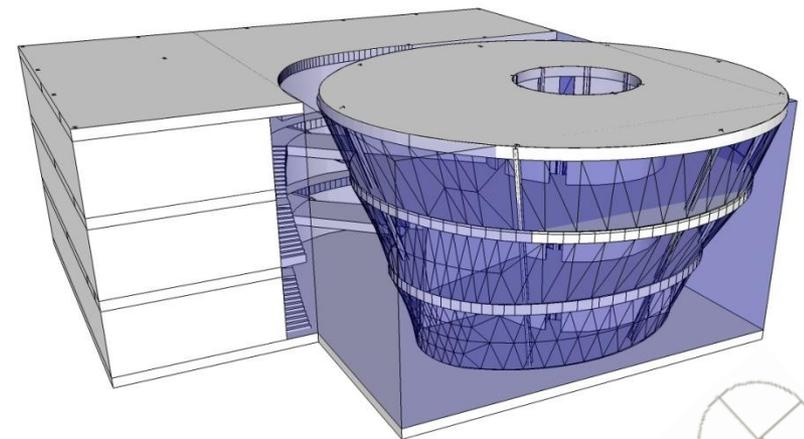
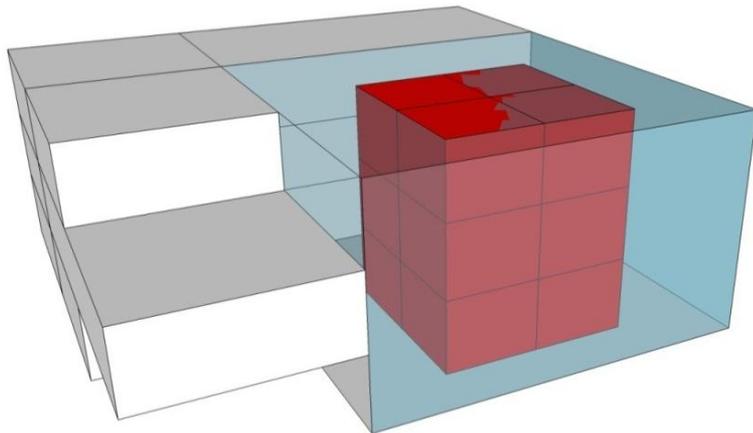
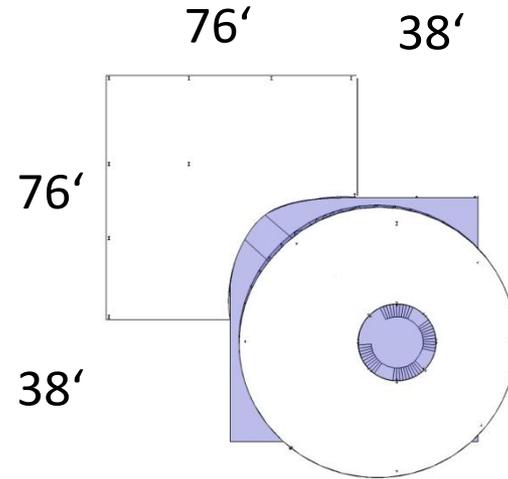
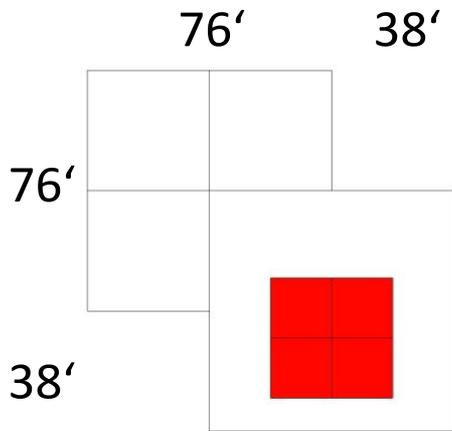
structure
within a structure

Contrast

Change In Shape

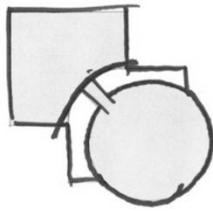


A
E
M
C

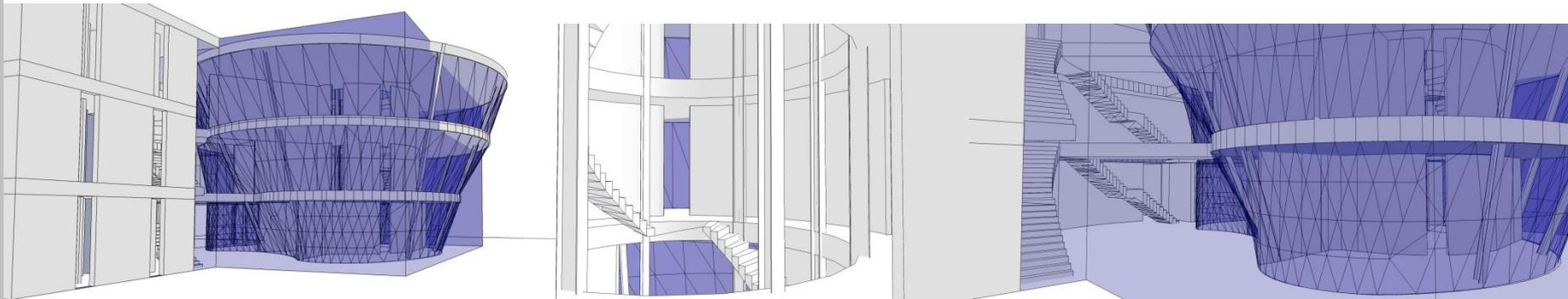
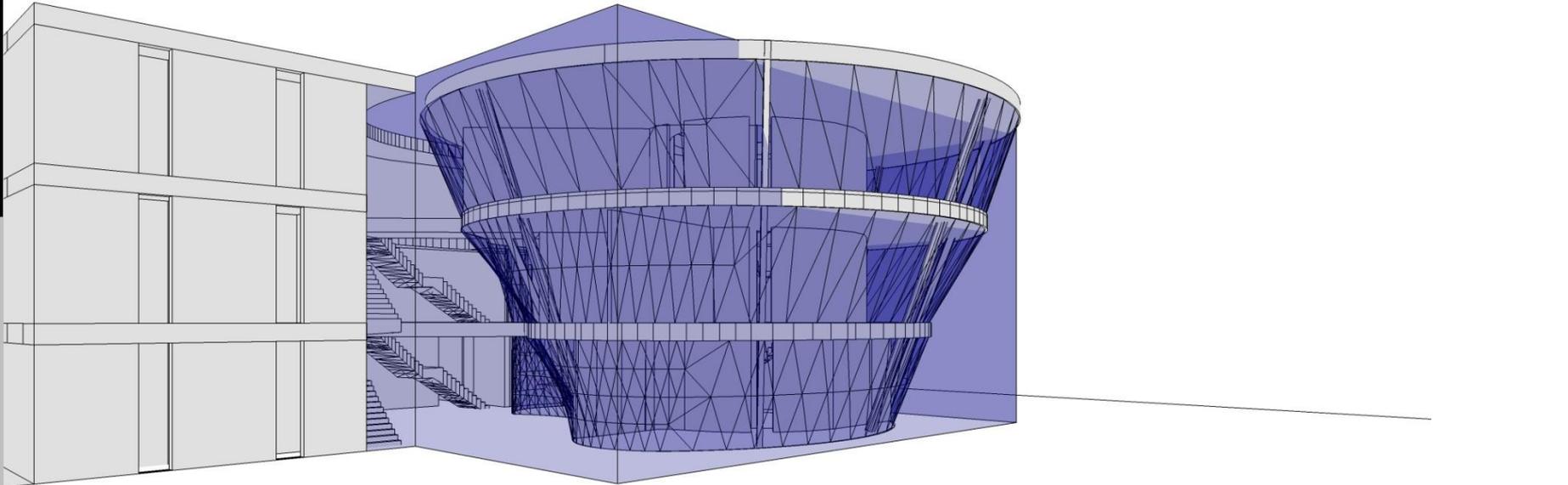


Contrast

Entrance – Pulling Back a Curtain

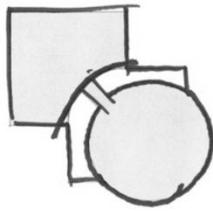


A
E
M
C

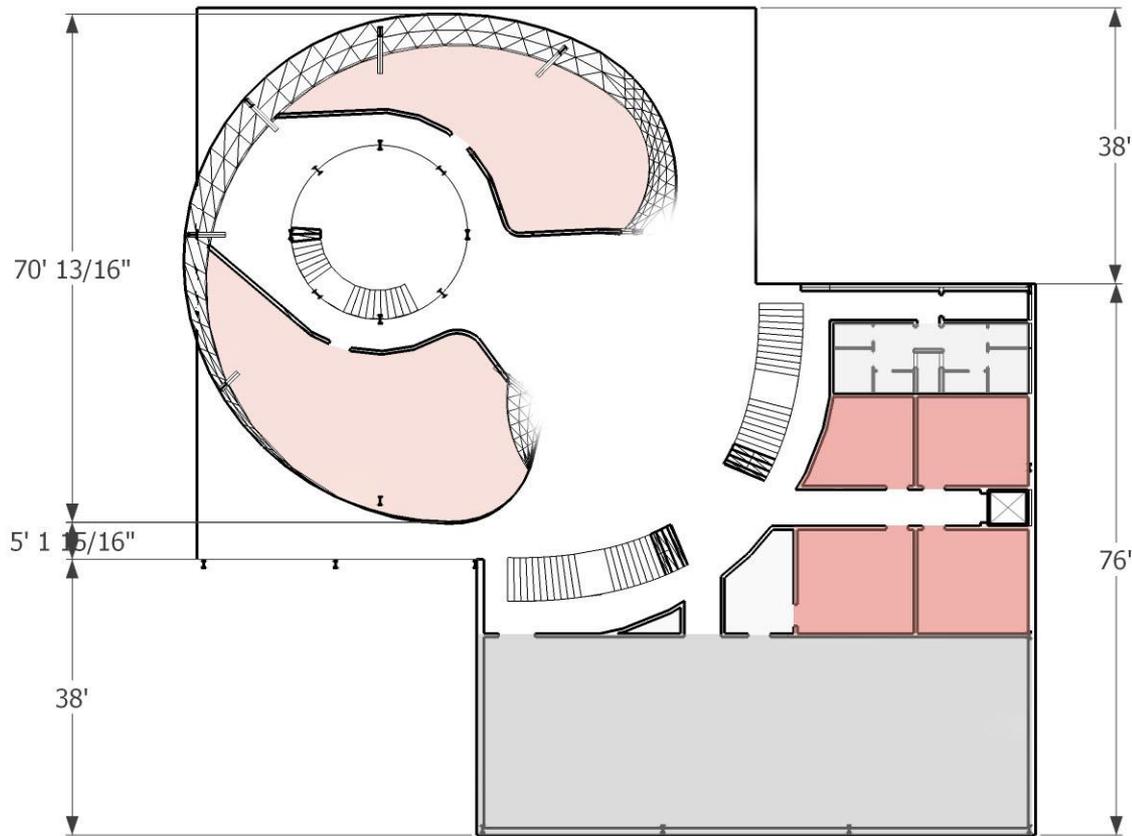


Contrast

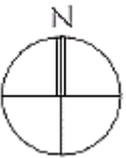
1st Floor



A
E
M
C

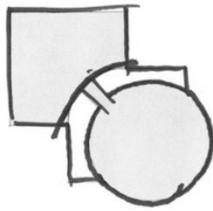


- Auditorium
- Large Classroom
- Seminar Room
- Technical Room
- Restrooms
- Storage

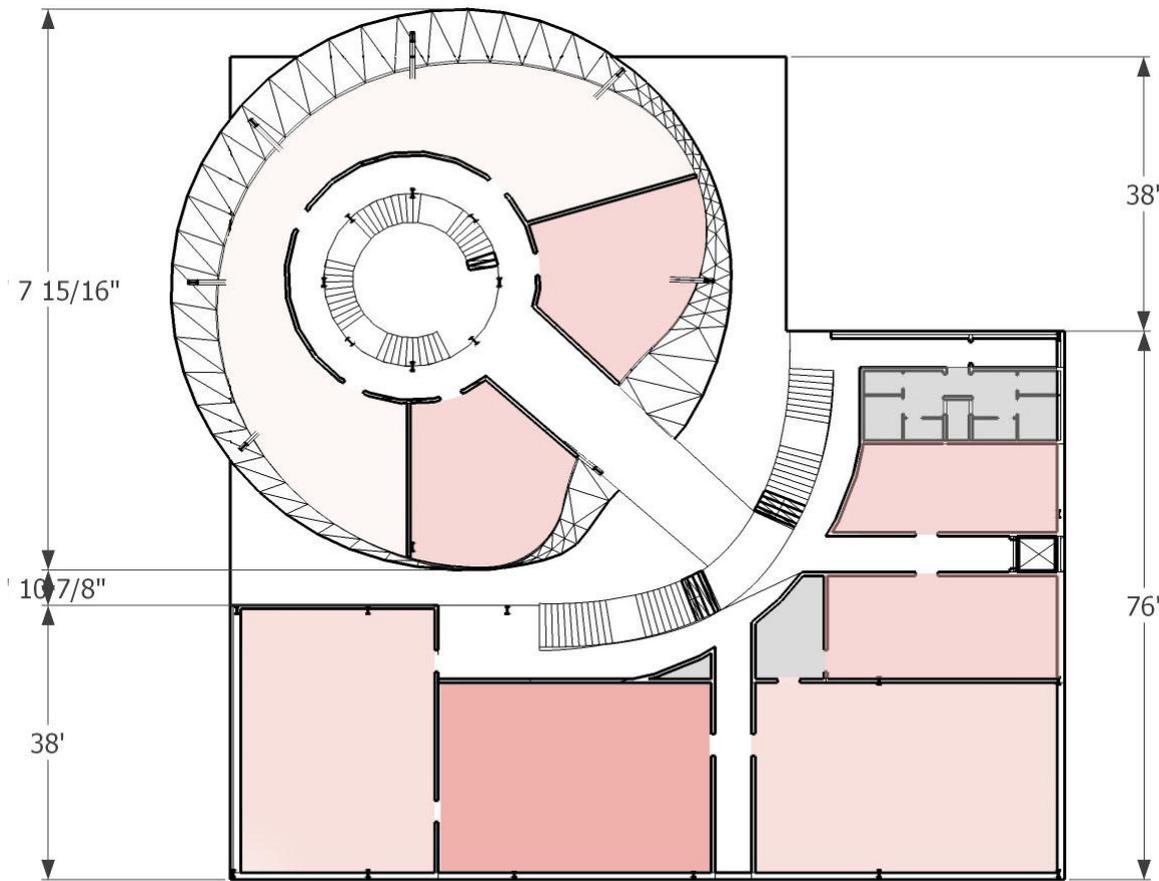


Contrast

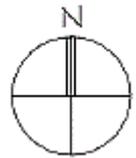
2nd Floor



A
E
M
C

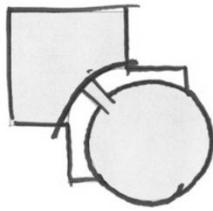


- Small Classrooms
- Instructional Lab
- Server Room
- Student Offices
- Mechanical Room
- Restrooms
- Storage

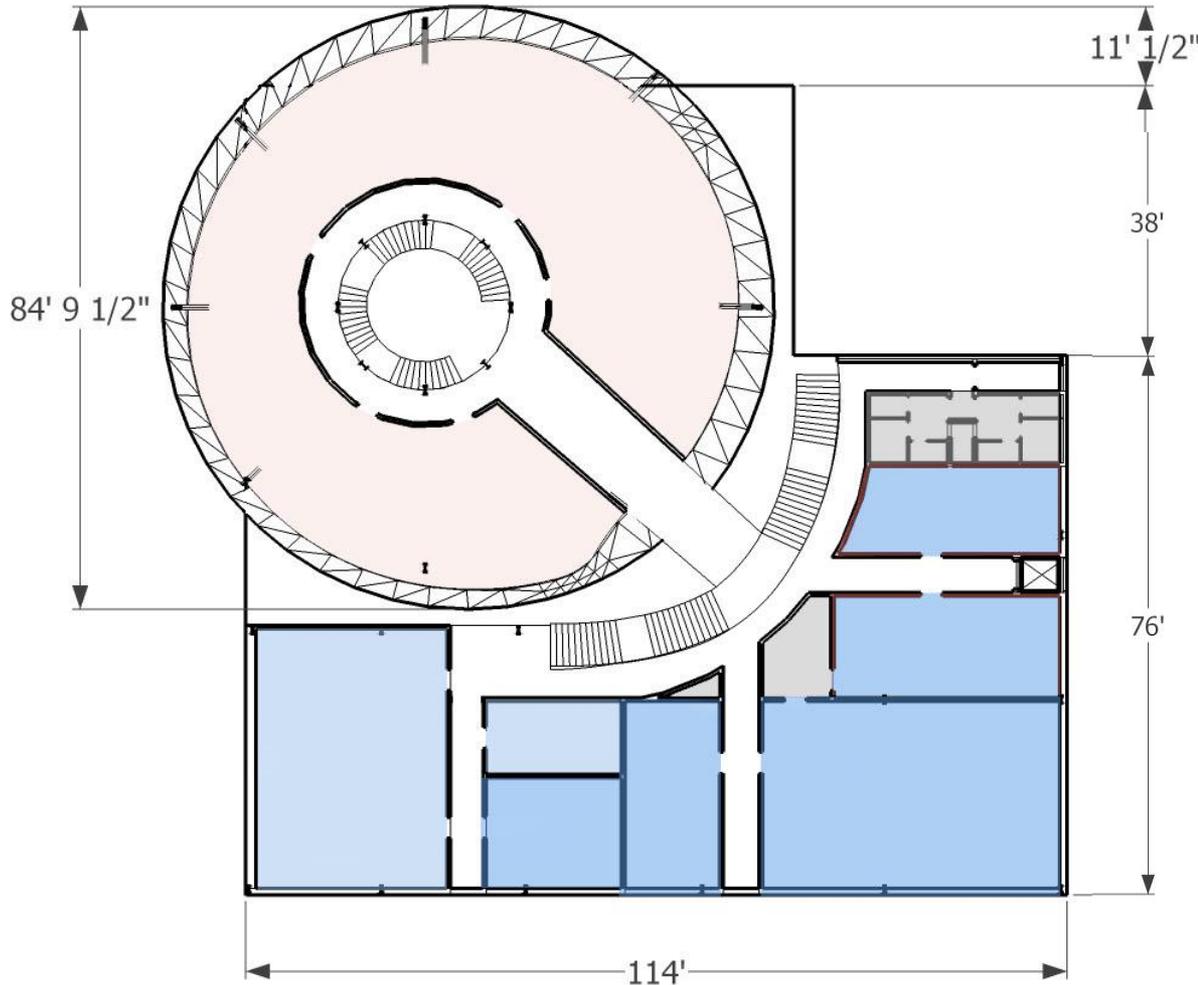


Contrast

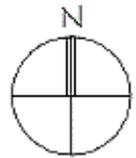
3rd floor



A
E
M
C

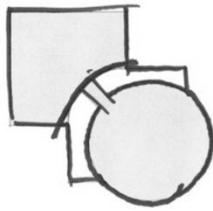


- Student Offices
- Faculty Offices
- Senior Administration
- Administrative Assistants
- Department's Office
- Faculty Lounge
- Mechanical Room
- Restrooms
- Storage

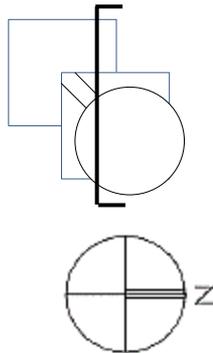
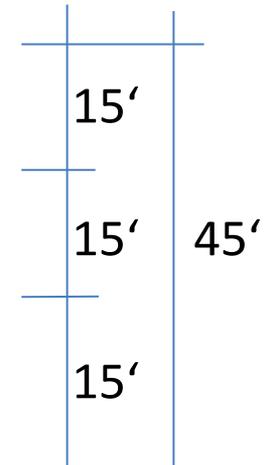
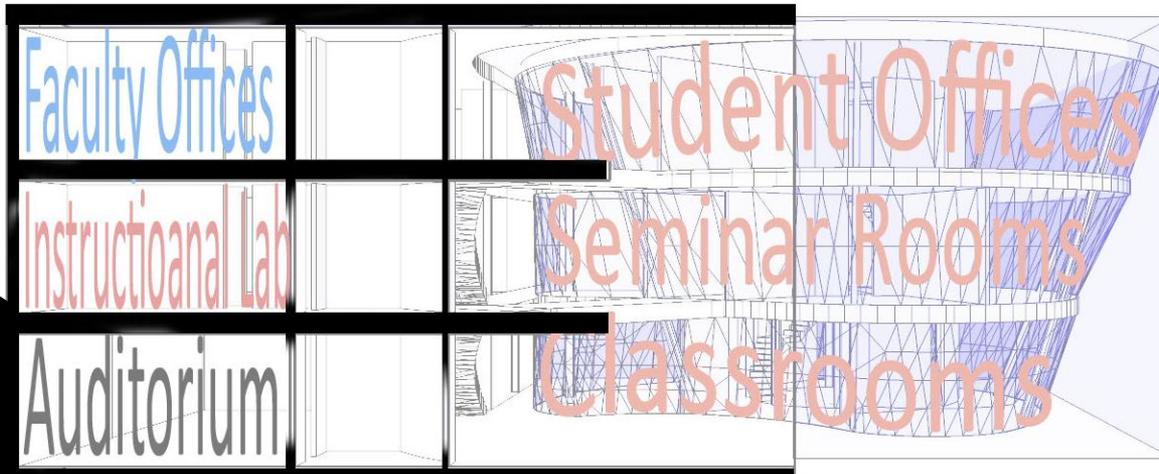


Contrast

Section North-South

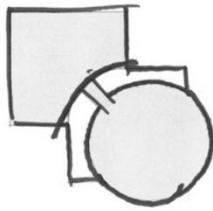


A
E
M
C

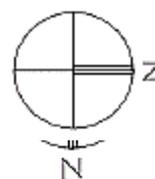
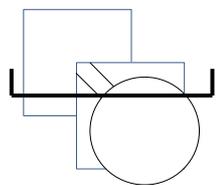
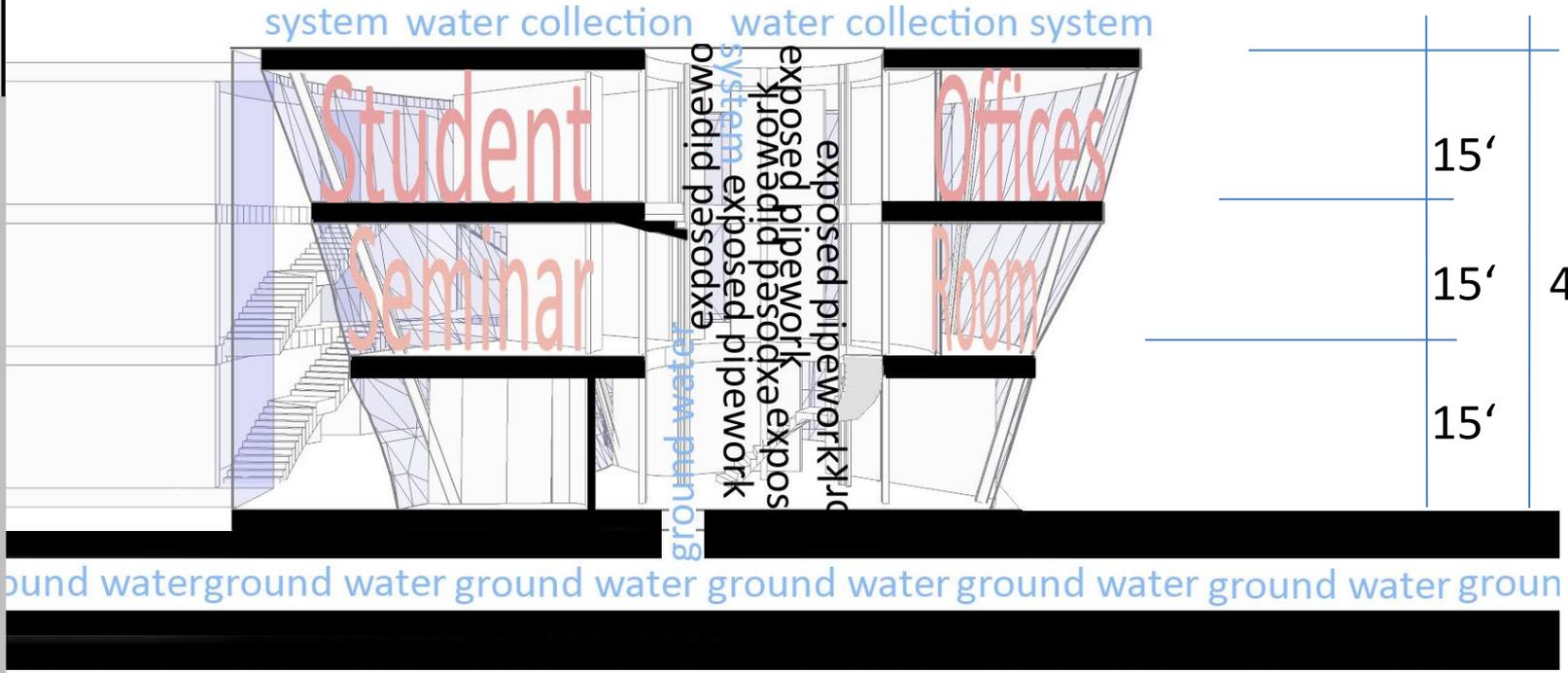


Contrast

Section East-West

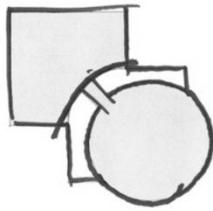


A
E
M
C



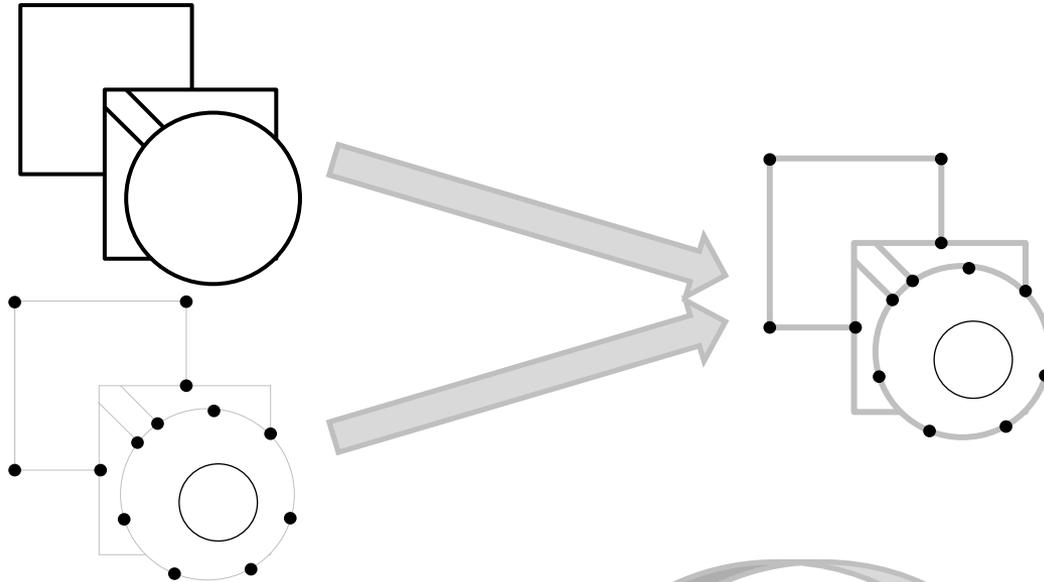
Contrast

Influence of Other Disciplines

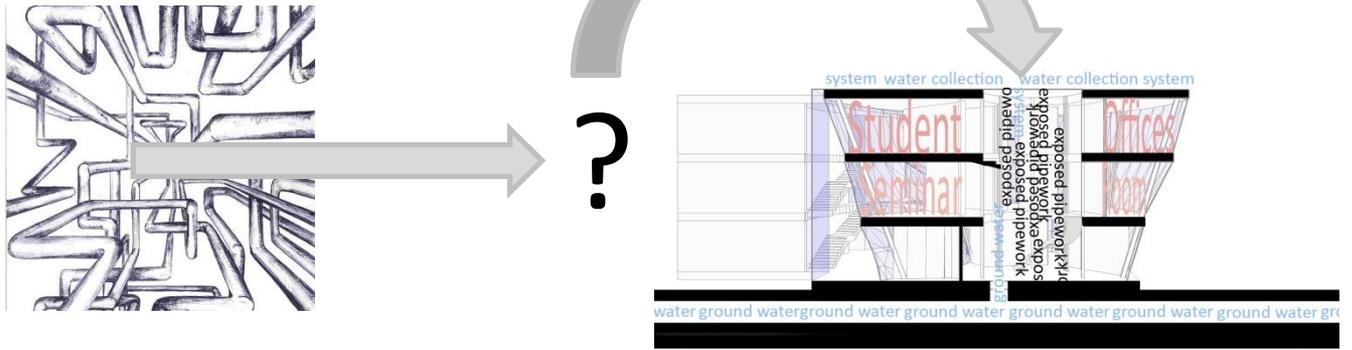


A
E
M
C

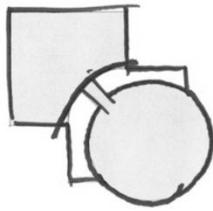
Engineers
common
decisions



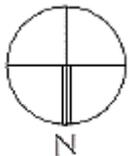
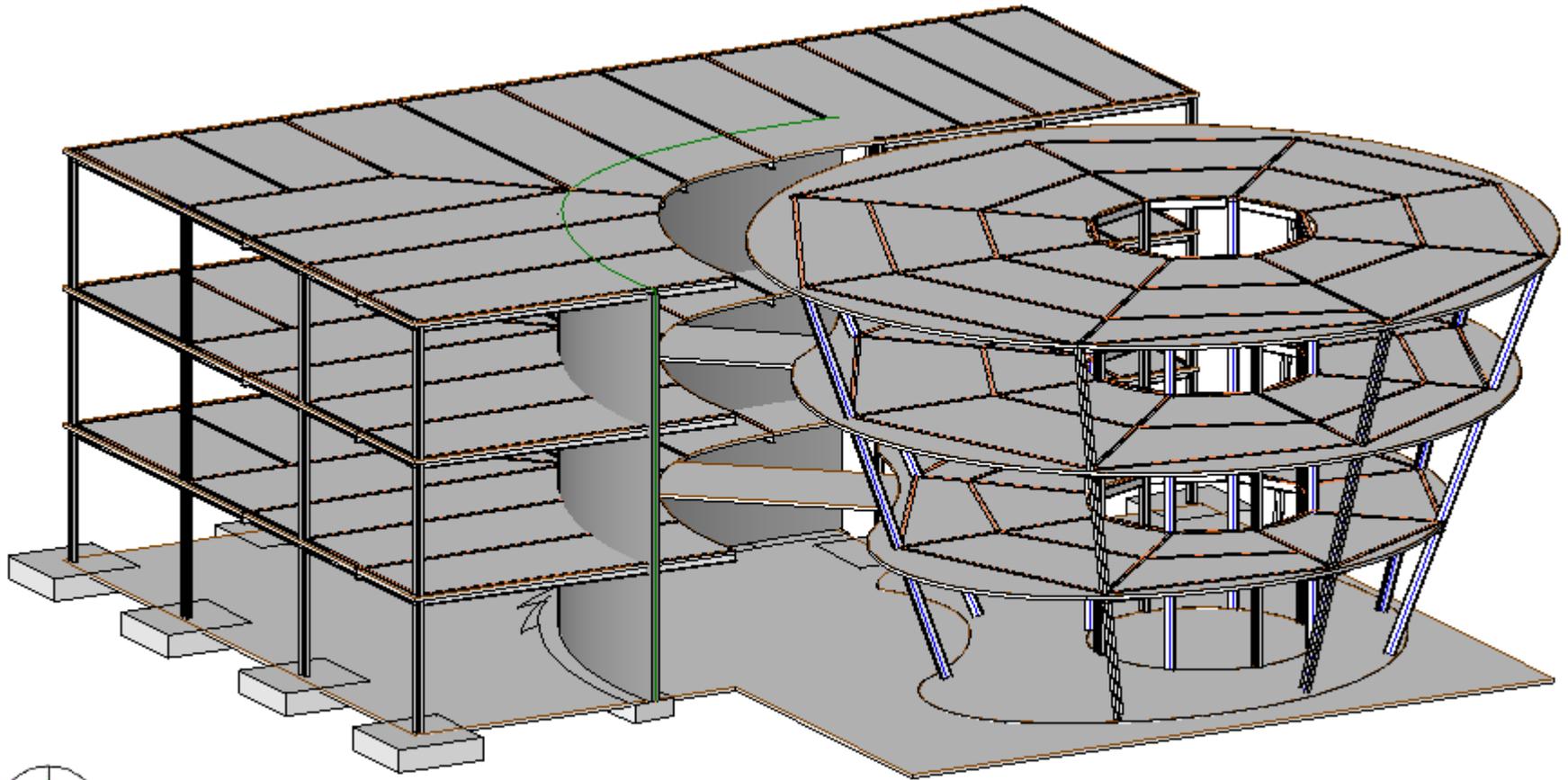
MEP
intensive
discussions



Contrast

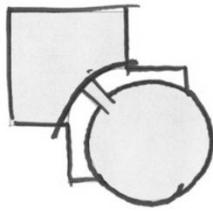


A
E
M
C

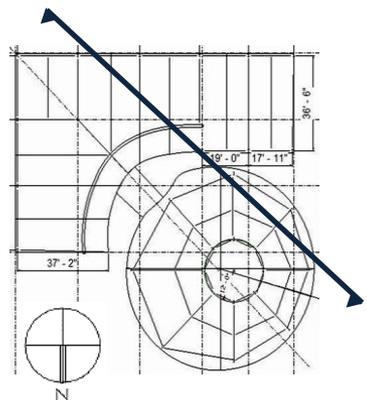
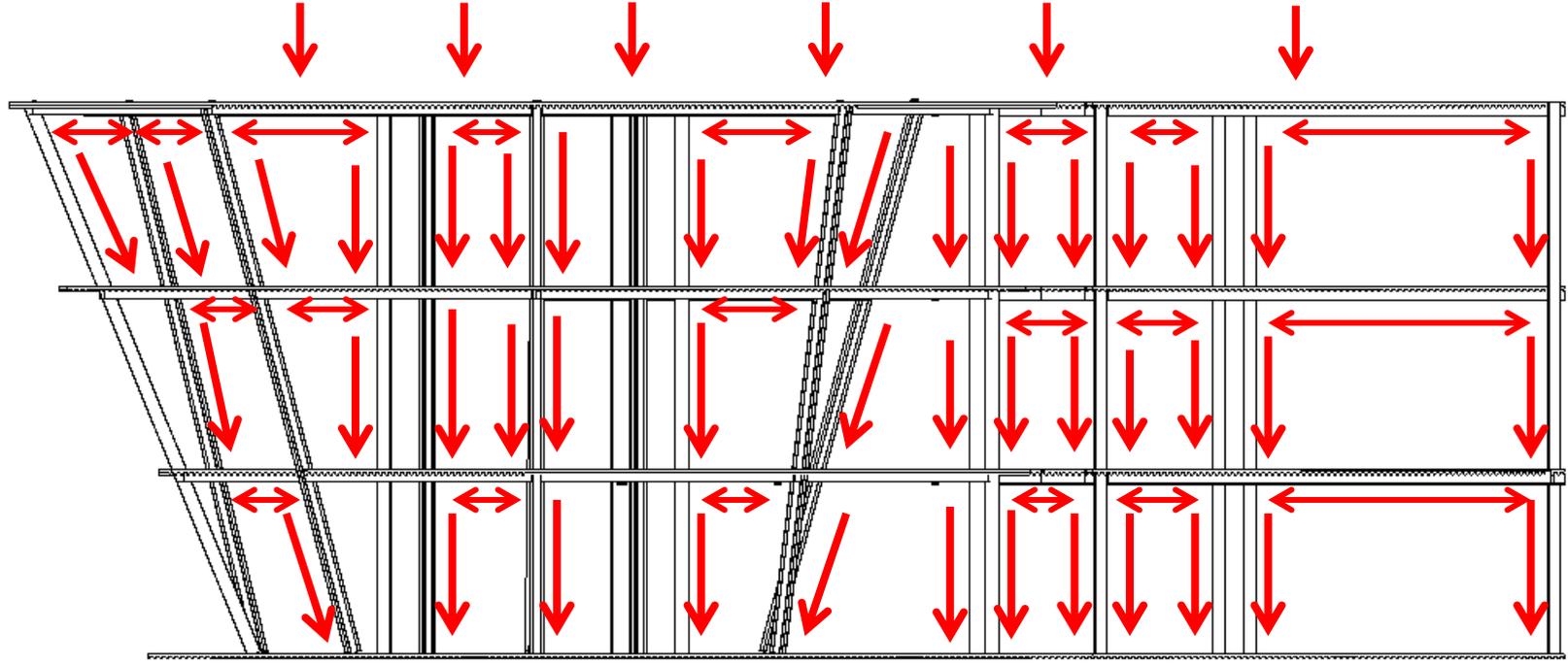


Contrast

Gravity Load Path

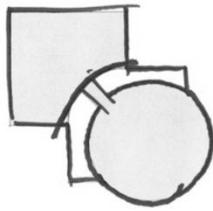


A
E
M
C

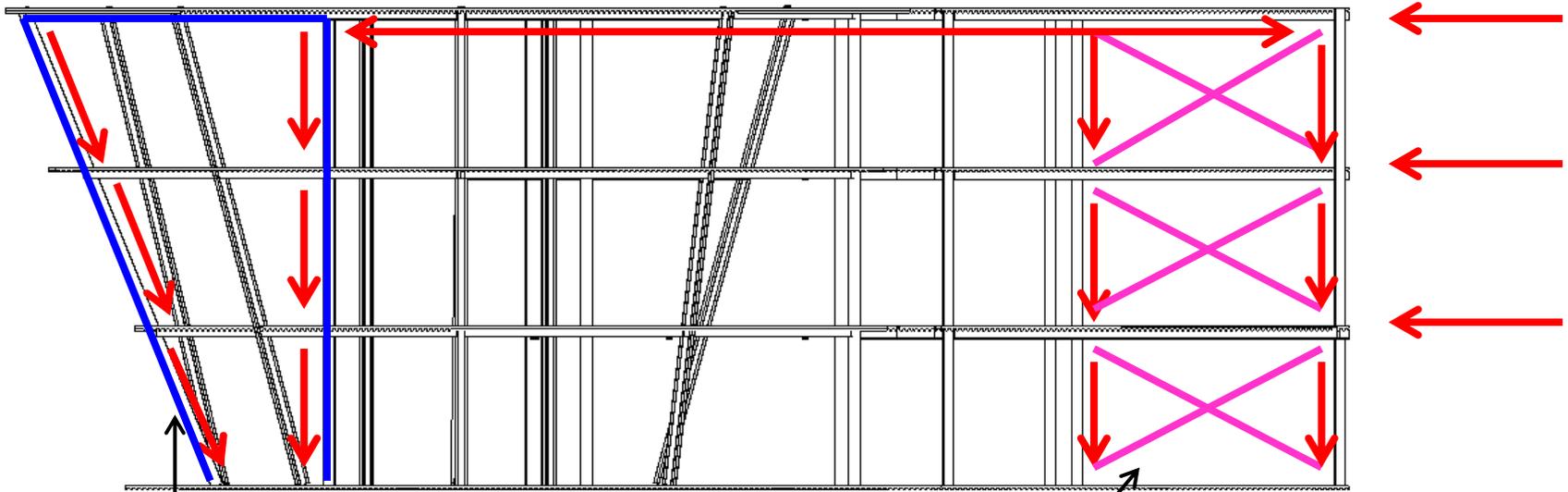


Contrast

Lateral Load Path – Steel

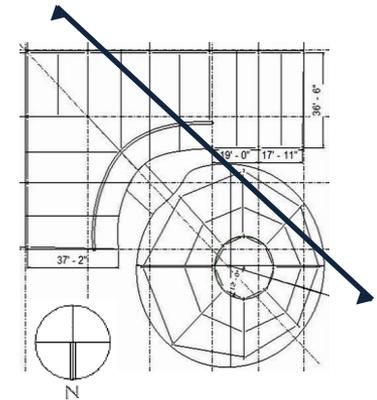


A
E
M
C



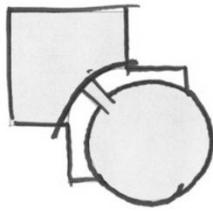
Moment
Frame

Braced
Frame

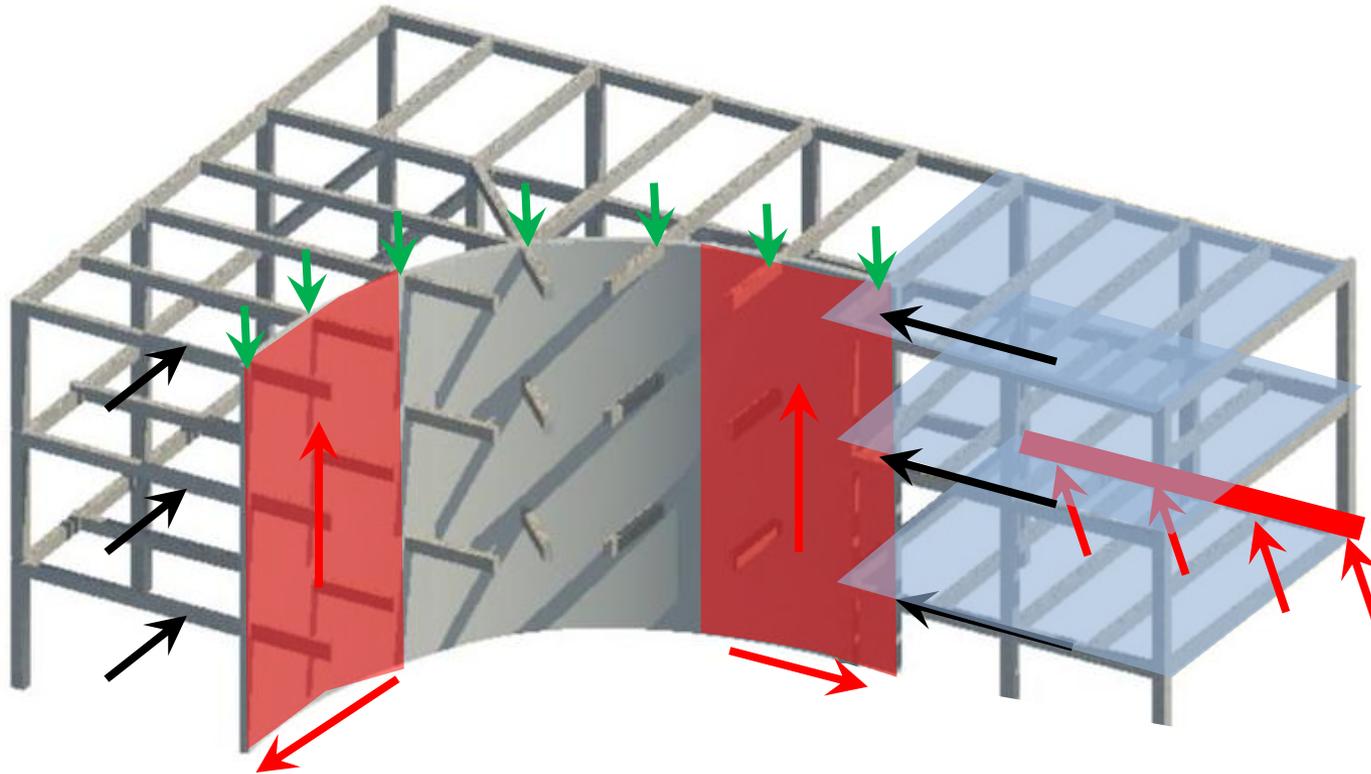


Contrast

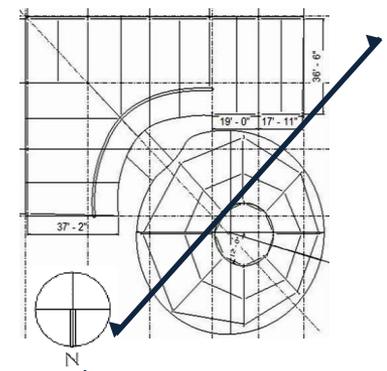
Load Path – Concrete



A
E
M
C

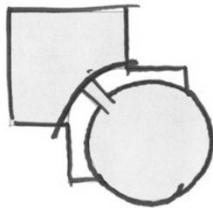


- Lateral Load
- Gravity Load
- Resisting Forces
- False Cantilever

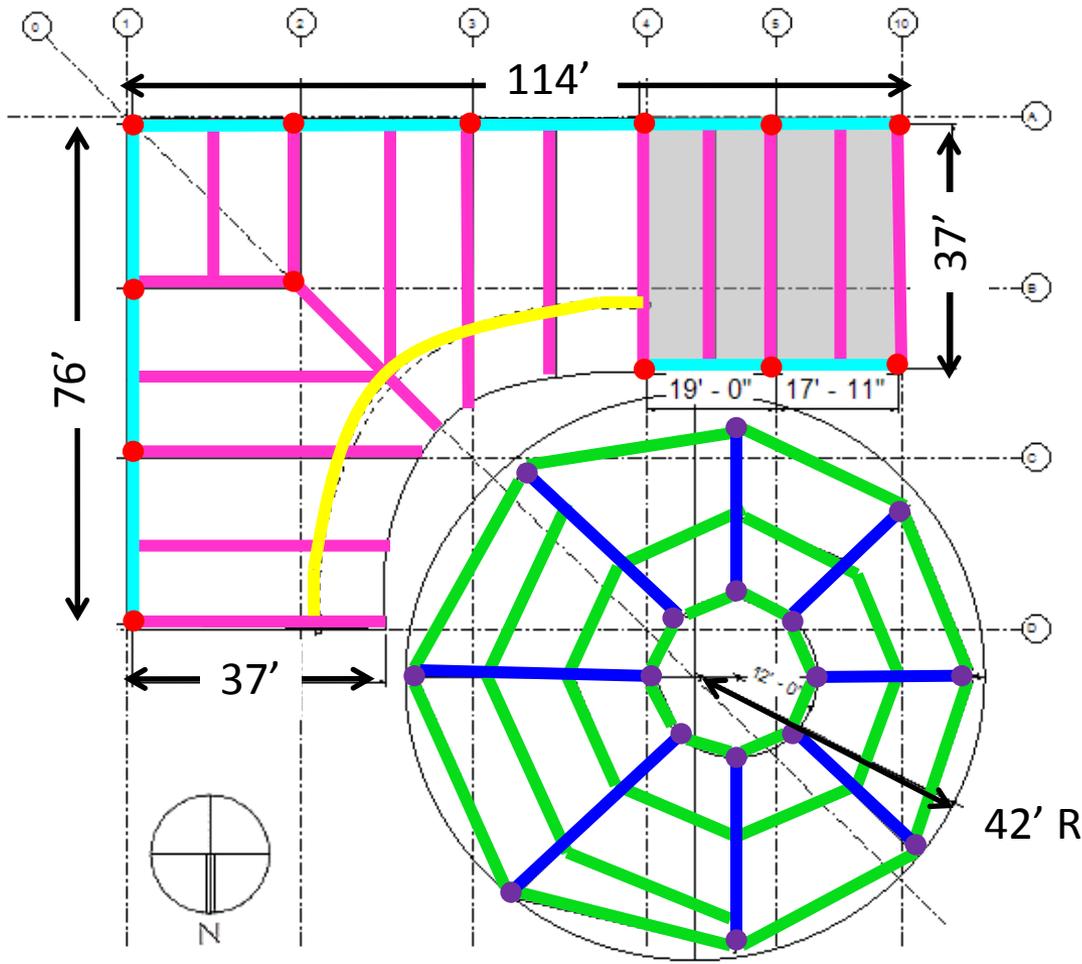


Contrast

Structural Overlay – Steel



A
E
M
C



The Box

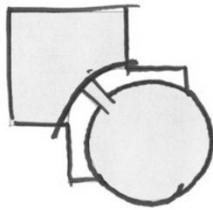
- W12 X 53
- W12 X 72
- W16 X 57
- 12" Concrete Wall
- False Cantilever

The Cone

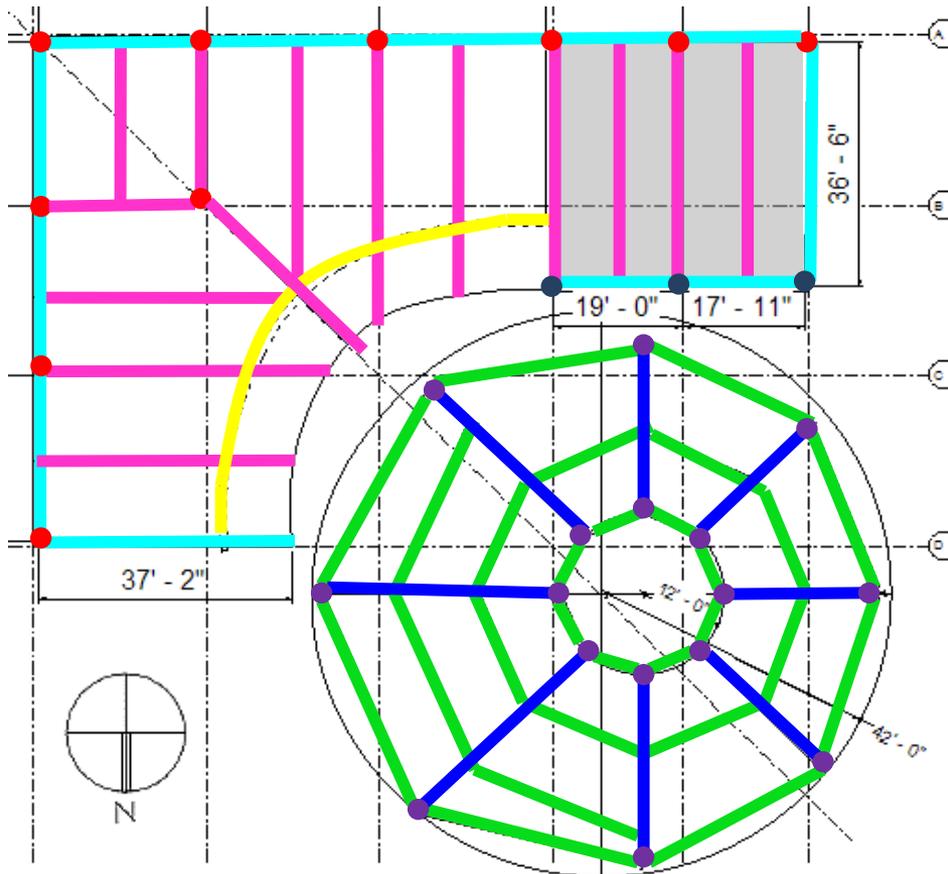
- W12 X 50
- W14 X 26
- W24 X 62

Contrast

Structural Overlay – Mixed



A
E
M
C



The Box (Concrete)

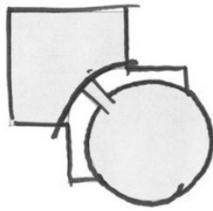
- 12" x 12"
- 16" X 16"
- 20" T Beam
- 24" Spandrel
- 12" Concrete Wall
- False Cantilever

The Cone (Steel)

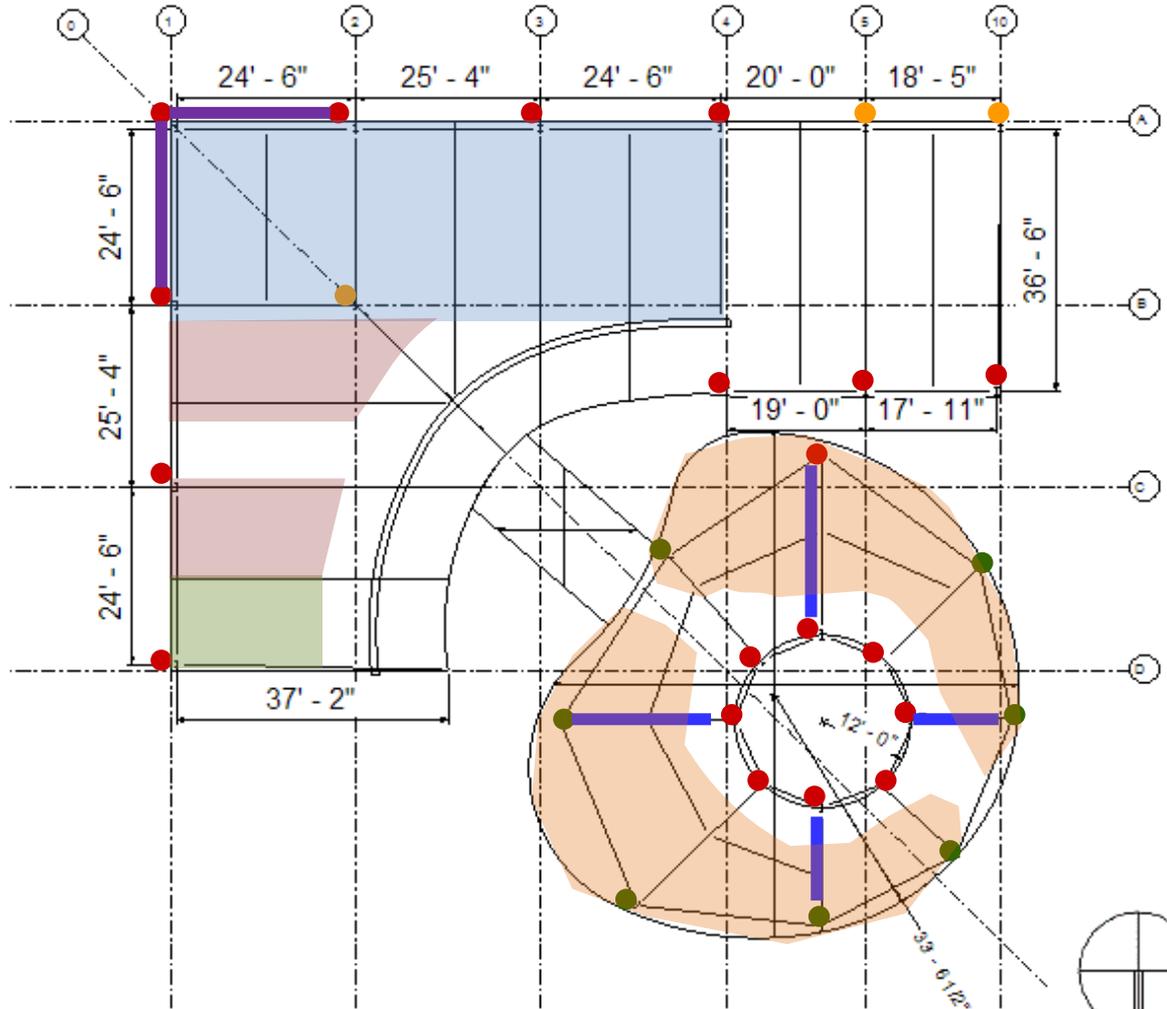
- W12 X 50
- W14 X 26
- W24 X 62

Contrast

Structural Overview – Steel

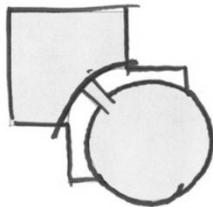


1st Floor



Contrast

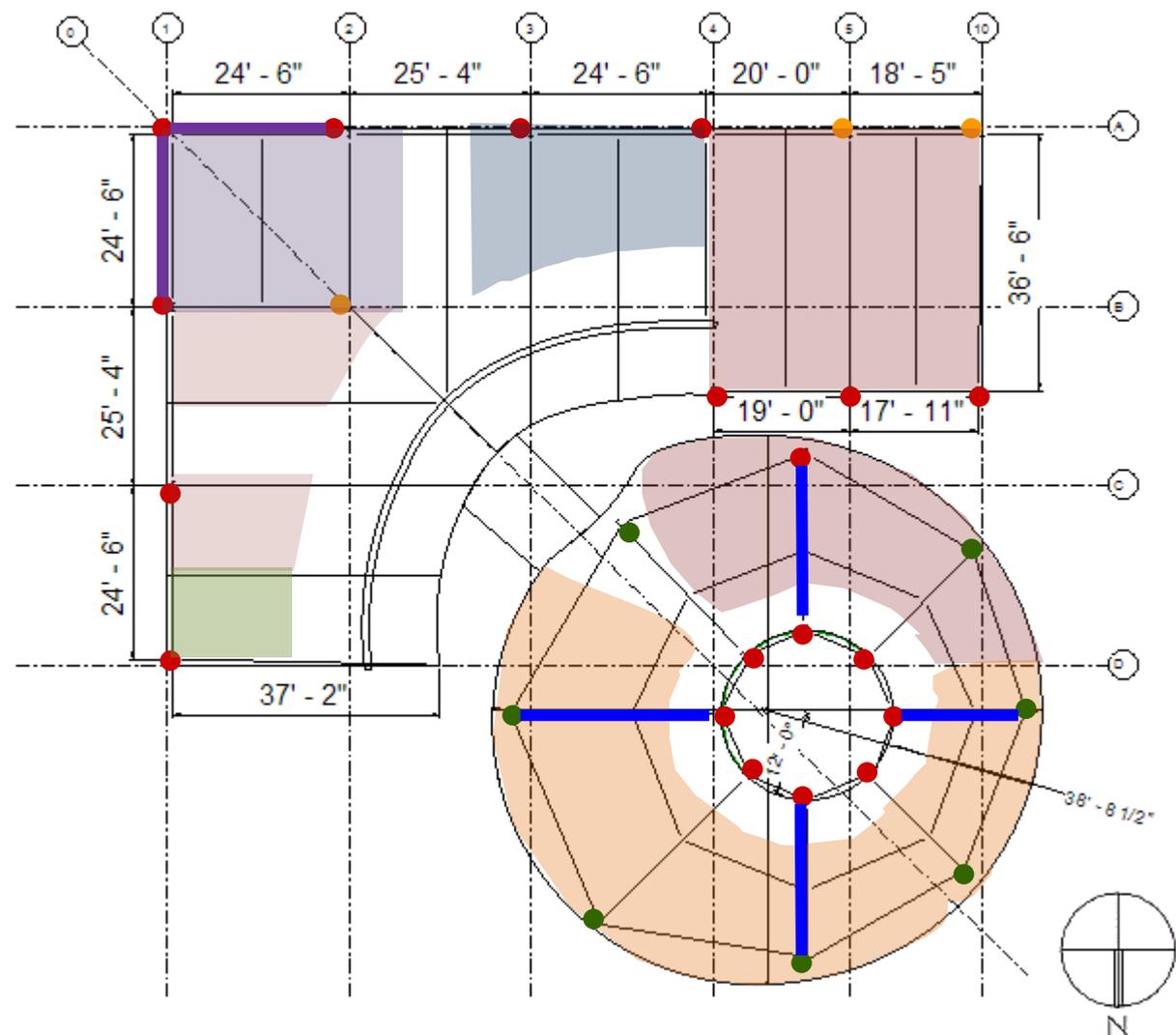
Structural Overview – Steel



A
E
M
C

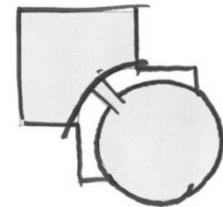
2nd Floor

- Straight Columns
- Slanted Columns
- Floating Columns
- Moment Frame
- Braced Frame



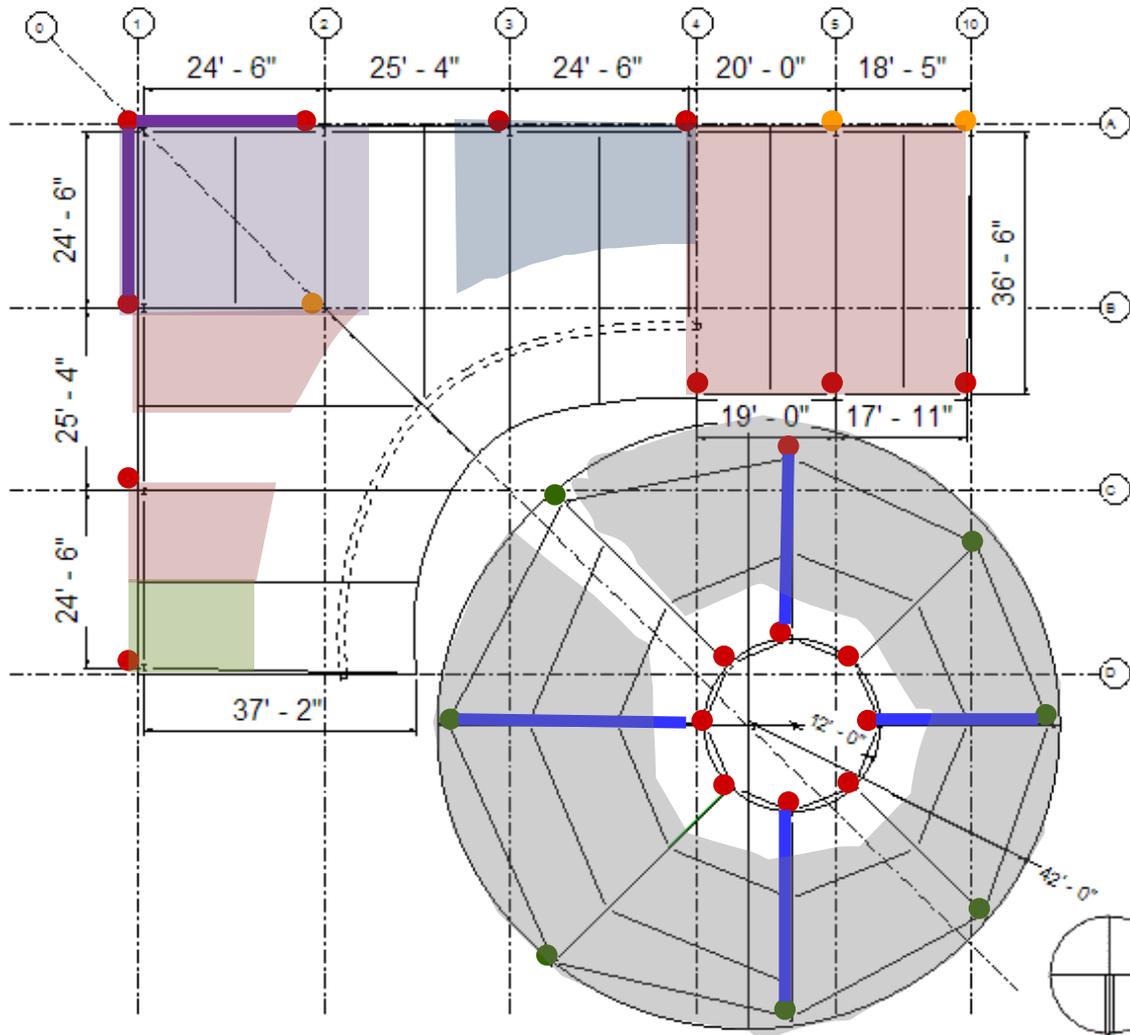
Contrast

Structural Overview – Steel

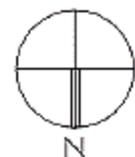


A
E
M
C

3rd Floor

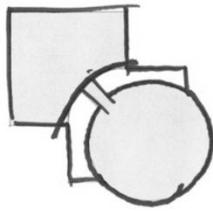


- Straight Columns
- Slanted Columns
- Floating Columns
- Moment Frame
- Braced Frame

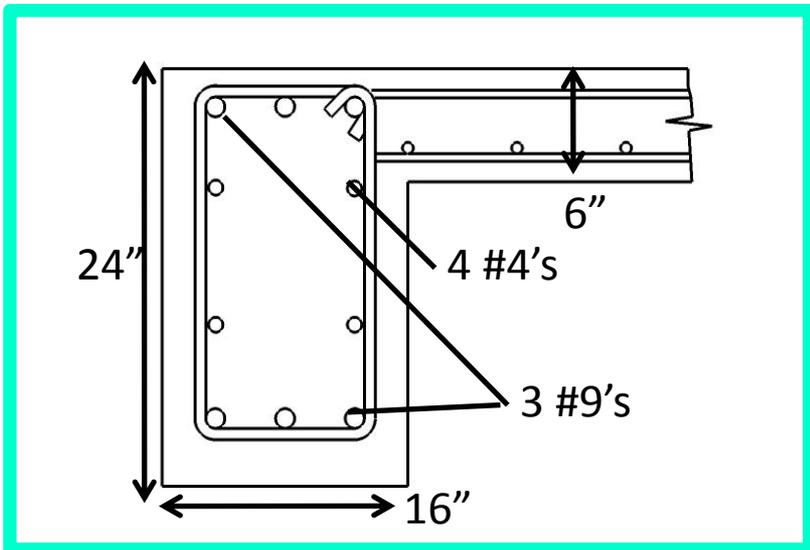
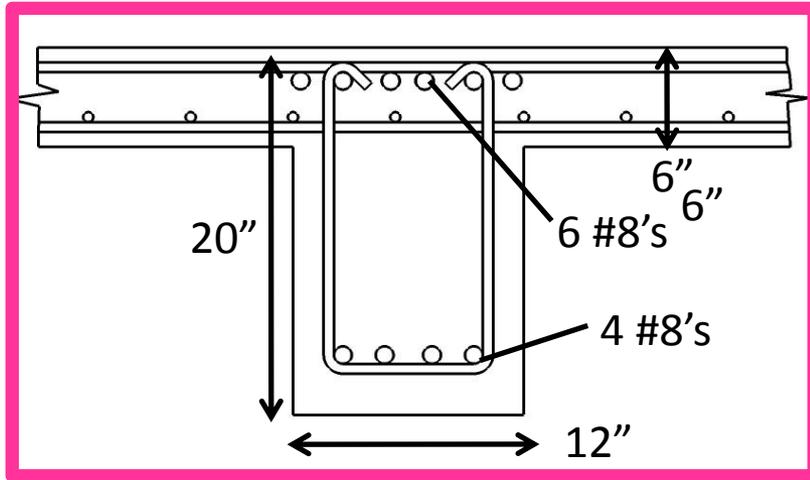


Contrast

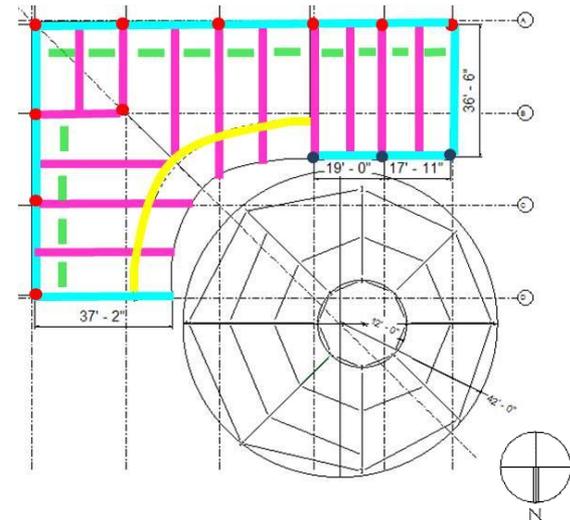
Member Details – Beams



A
E
M
C

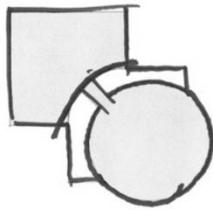


- 12x12
- 16 X 16
- 20" T Beam
- 24" Spandrel
- 12" Concrete Wall
- 6" One Way Slab

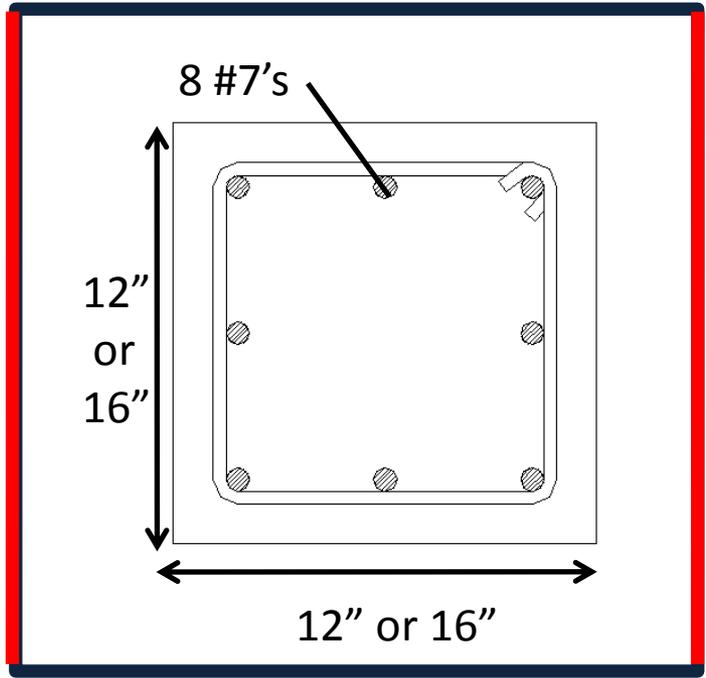


Contrast

Member Details – Columns and Slab

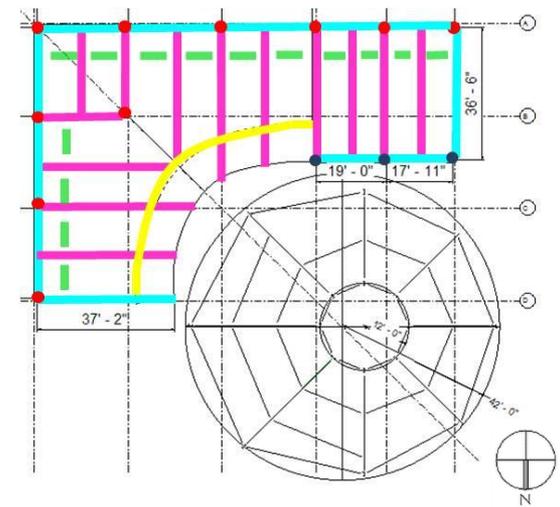
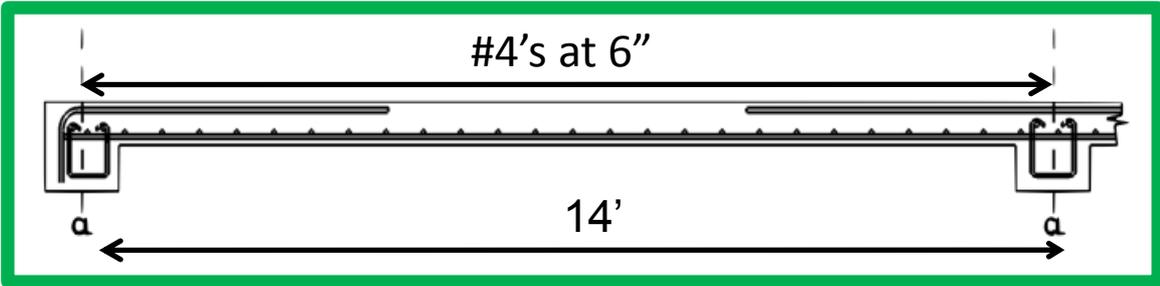


A
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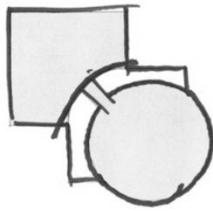


- 12x12
- 16 X 16

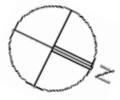
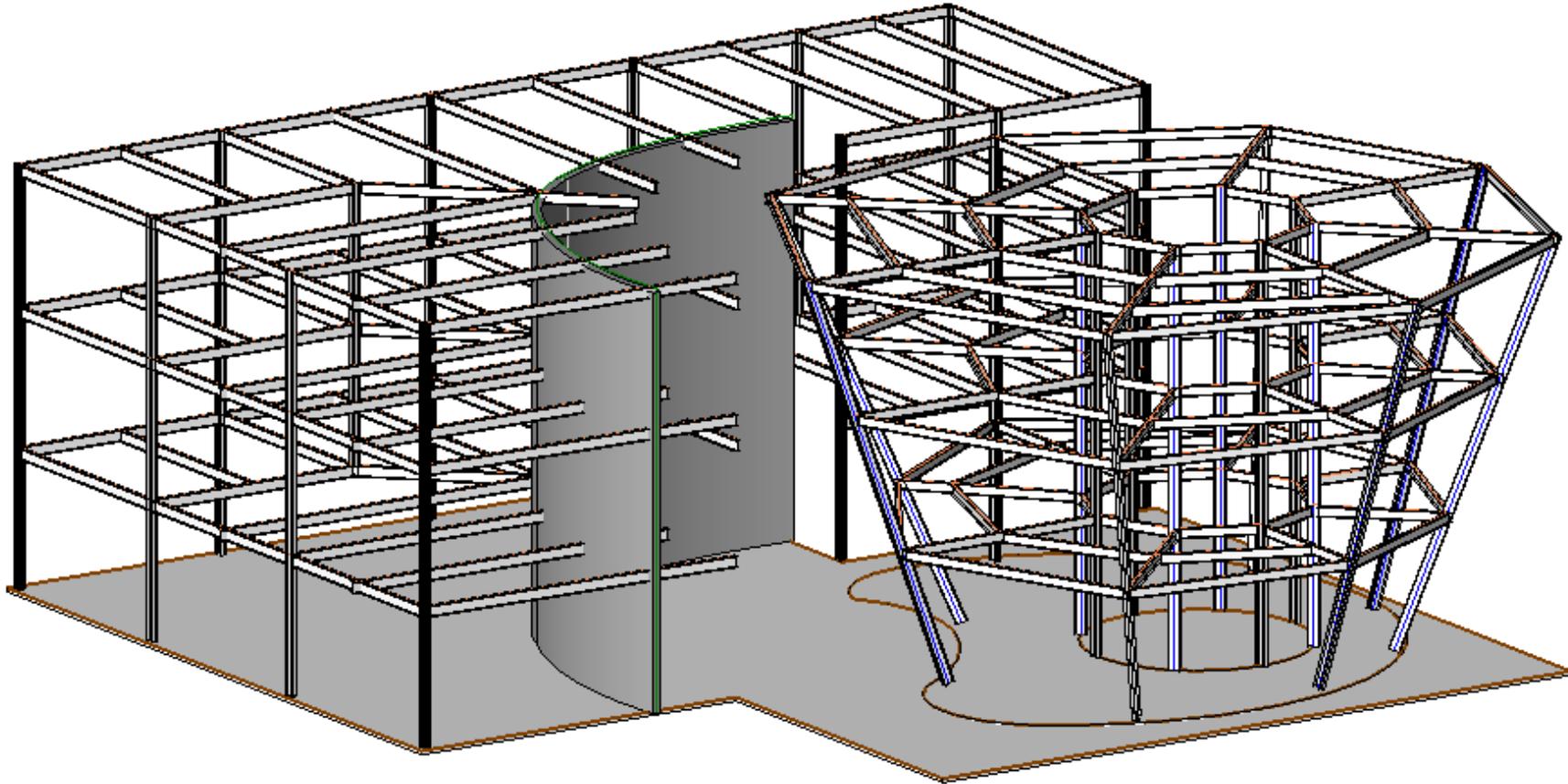
- 20" T Beam
- 24" Spandrel
- 12" Concrete Wall
- 6" One Way Slab



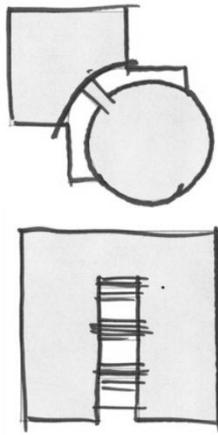
Contrast



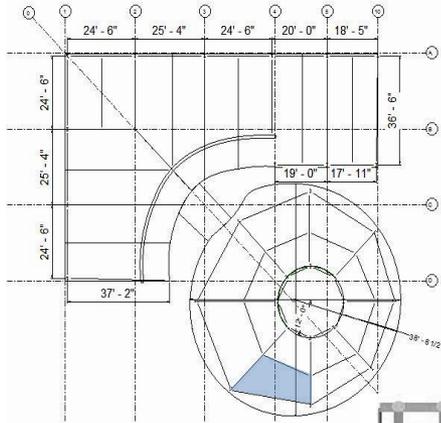
A
E
M
C



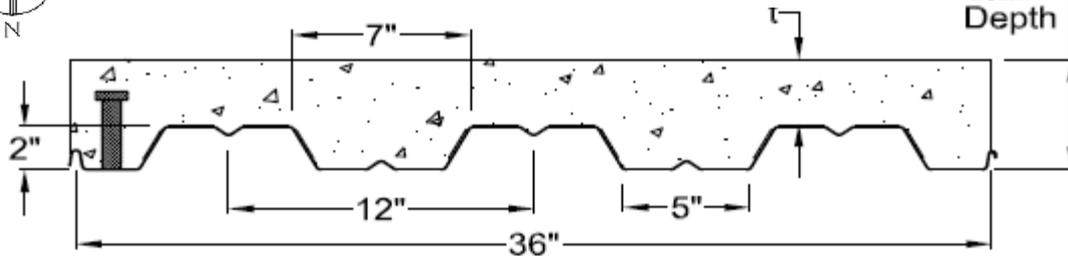
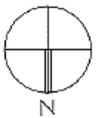
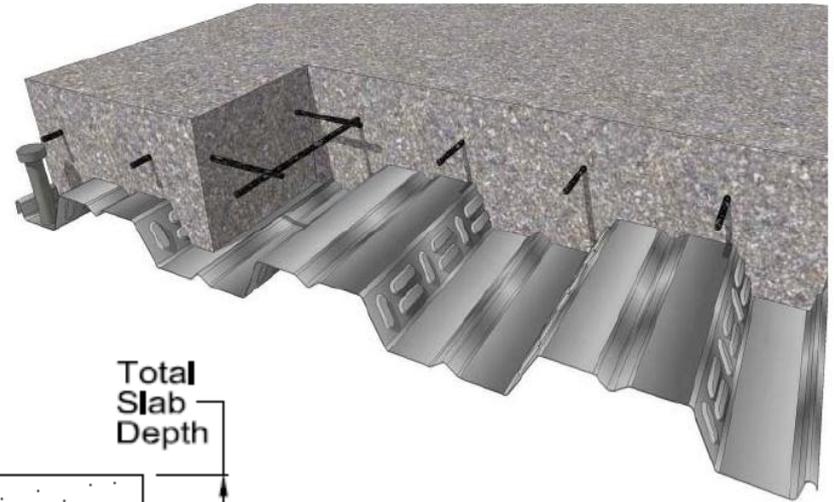
The Staircase & Contrast Steel Deck



A
E
M
C

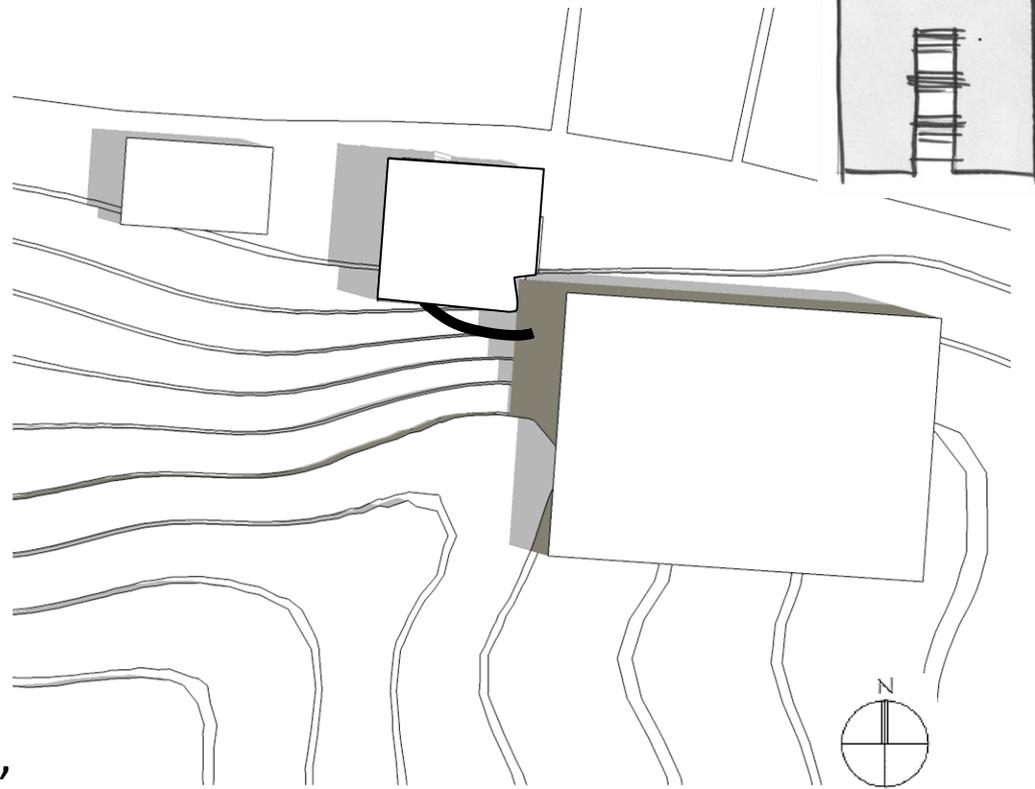
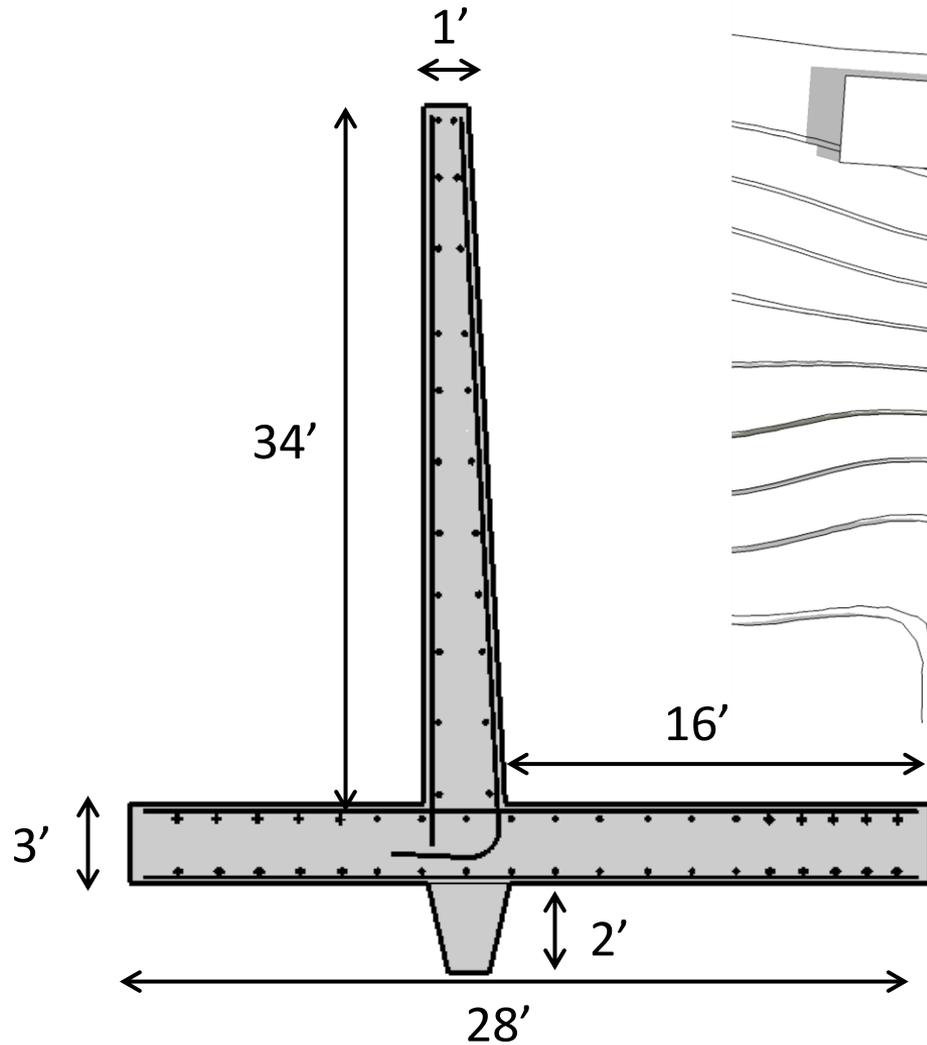


- Maximum Span 15 FT
- Superimposed Load 130 PSF
- 18 gage with 4.5 IN of LW Concrete



Retaining Wall

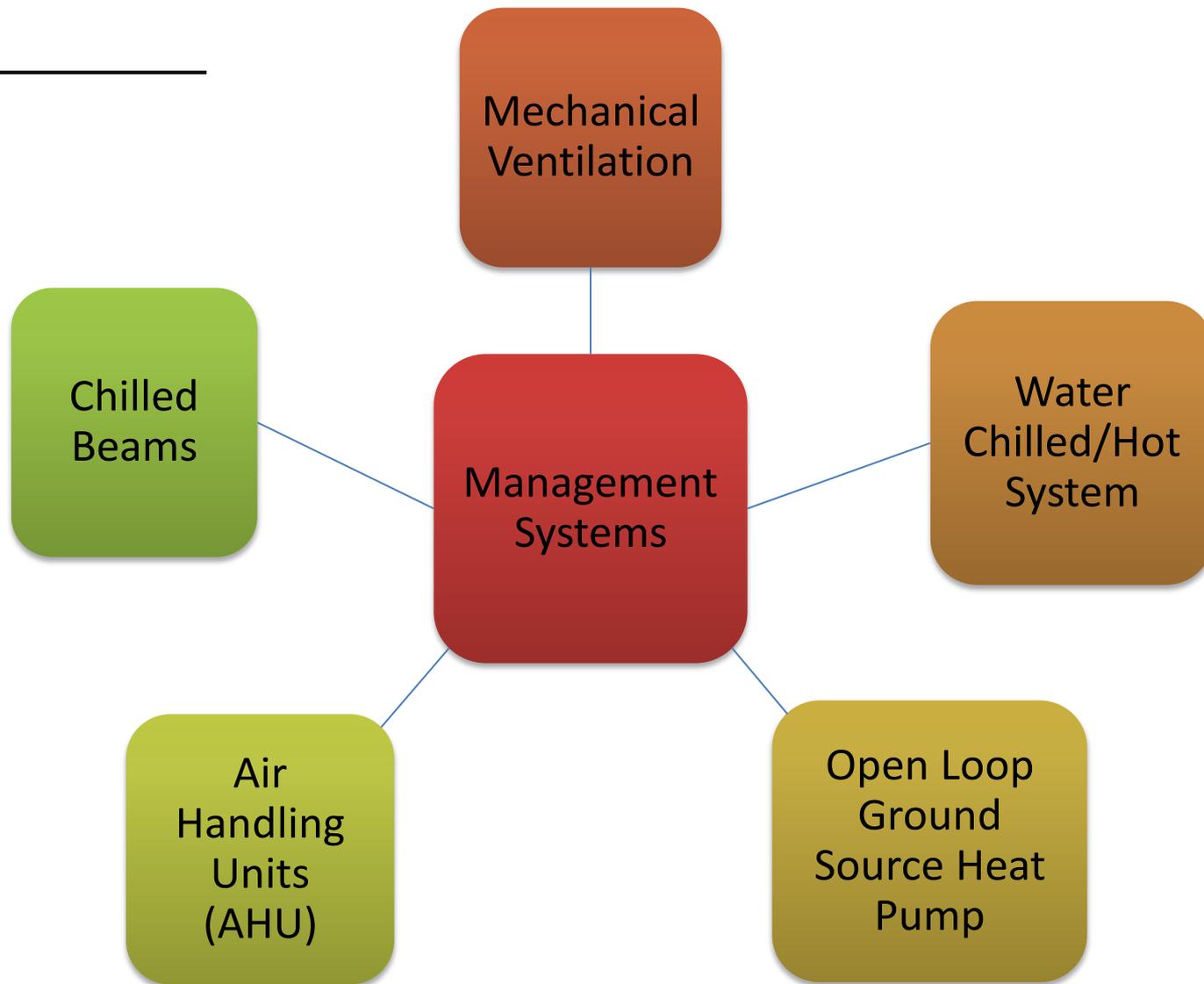
A
E
M
C



— Retaining Wall

Building Management Systems

A
E
M
C

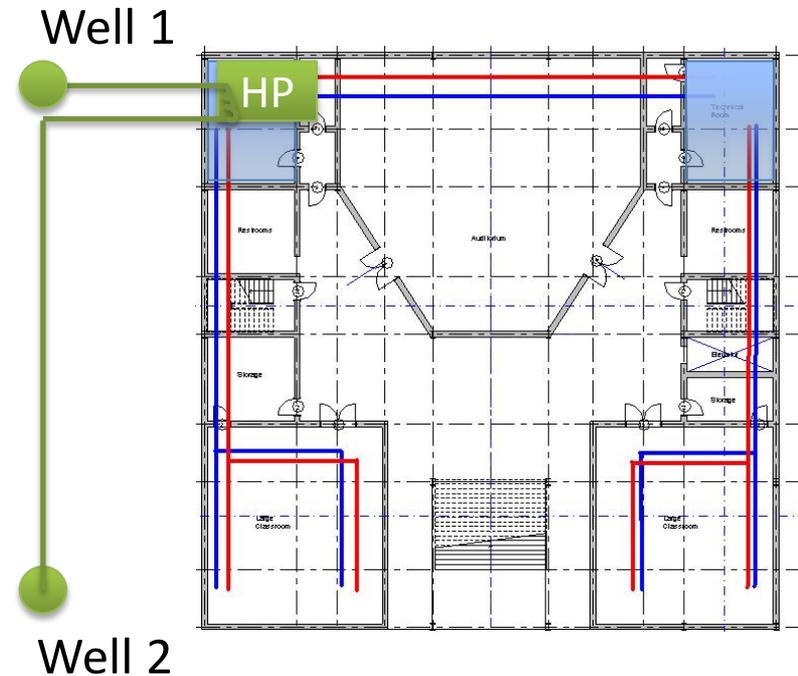
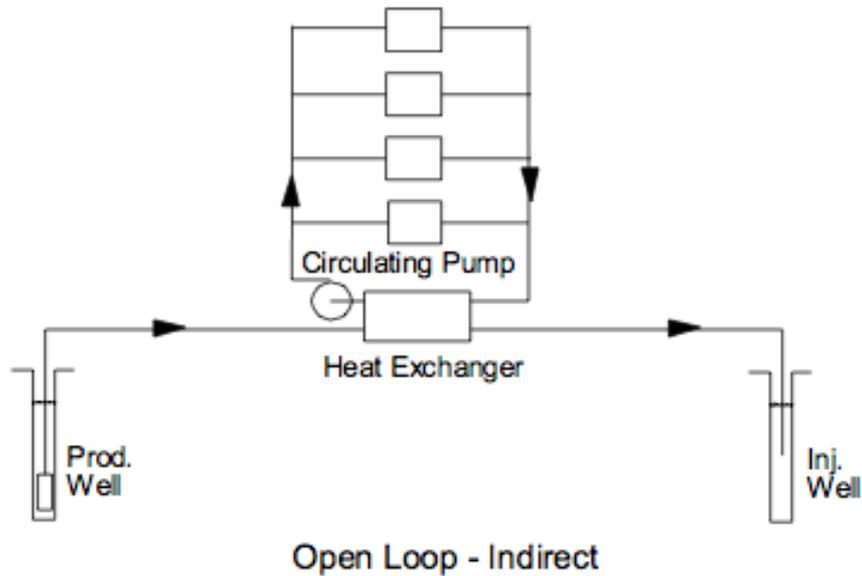


Heating and Cooling

Groundwater Heat Pump

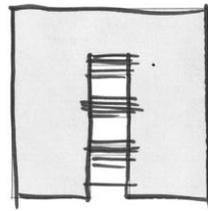
A
E
M
C

COP ~4

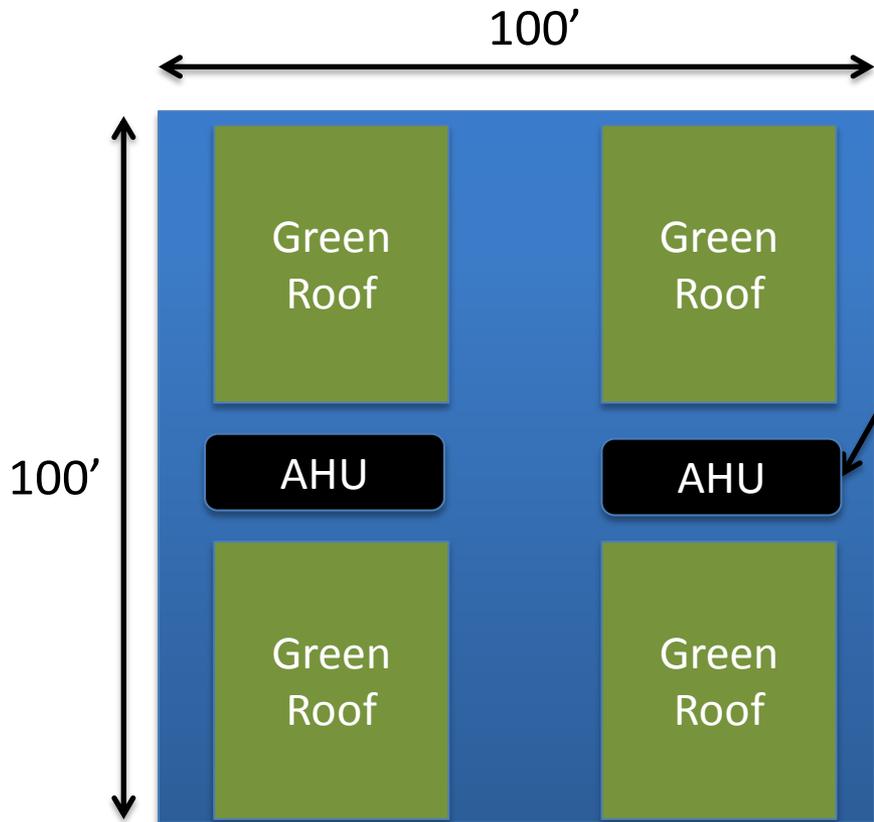


The Staircase

Air Handling Unit (AHU)

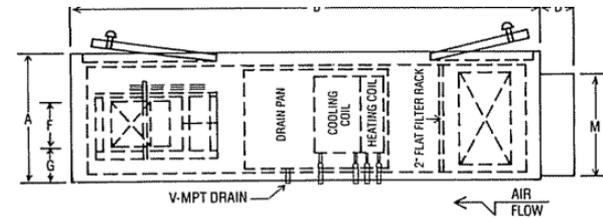


A
E
M
C

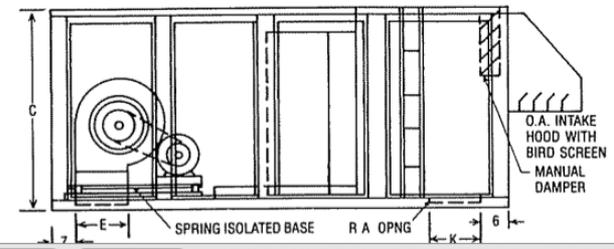
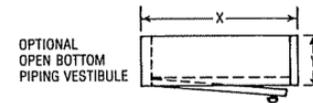


400''x94''

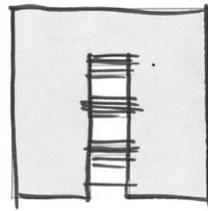
25000 CFM



35'

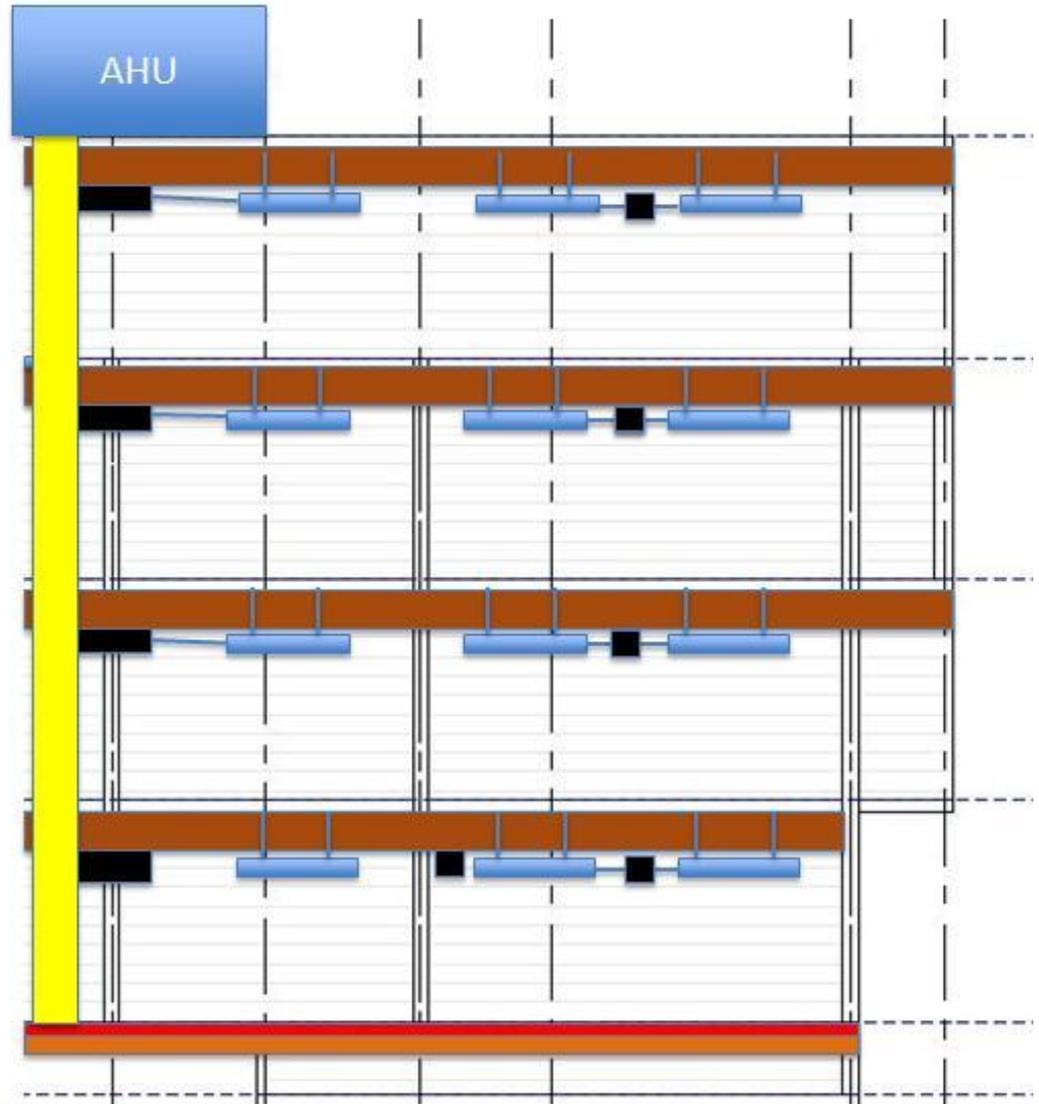


The Staircase Elevation



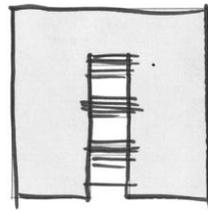
A
E
M
C

-  Structural system
-  MEP shaft
-  Piping system
-  Floor insulation
-  Heated slab
-  Chilled beam

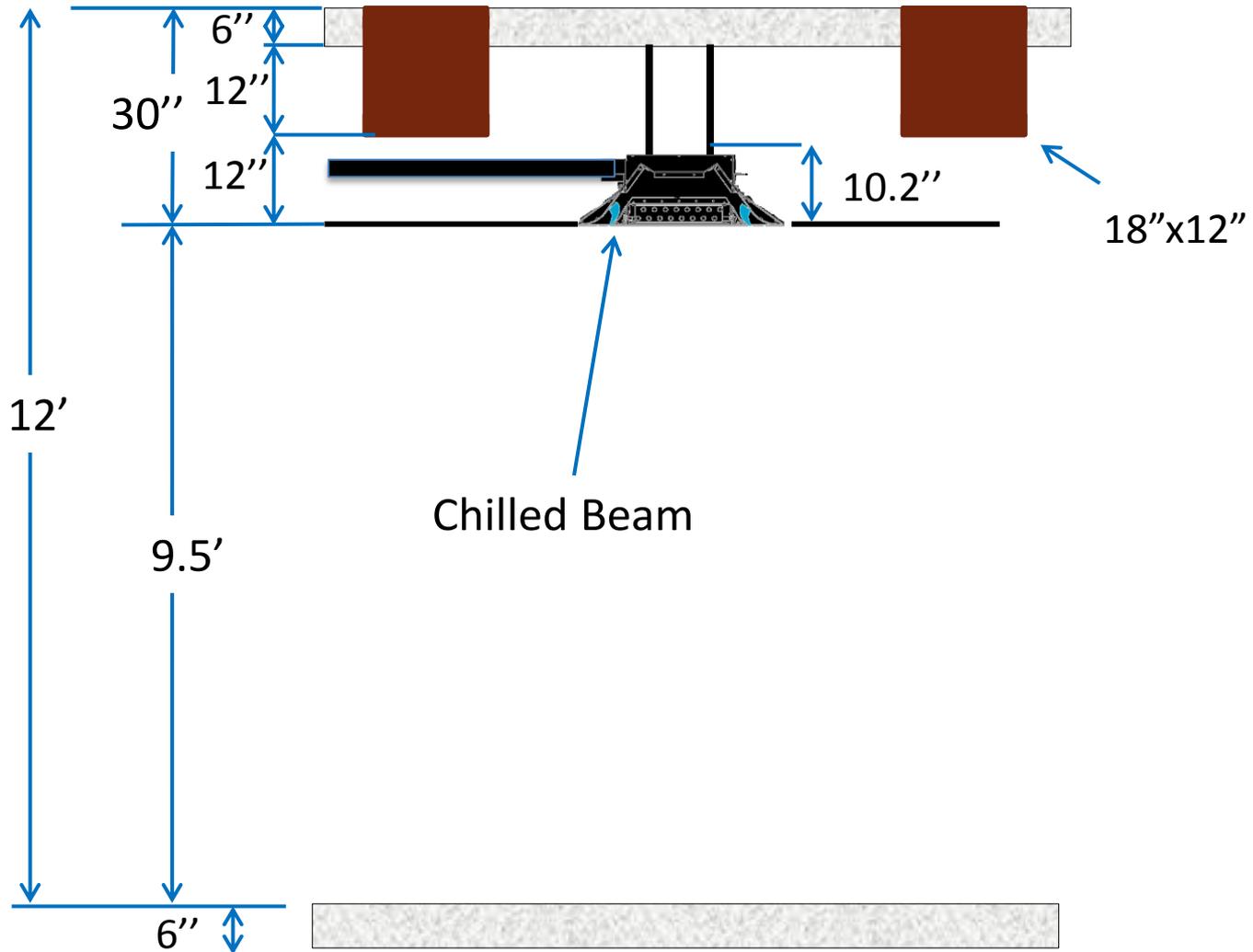


The Staircase

Floor to Ceiling – Concrete

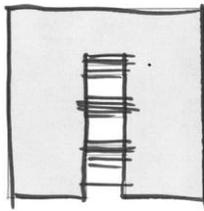


A
E
M
C

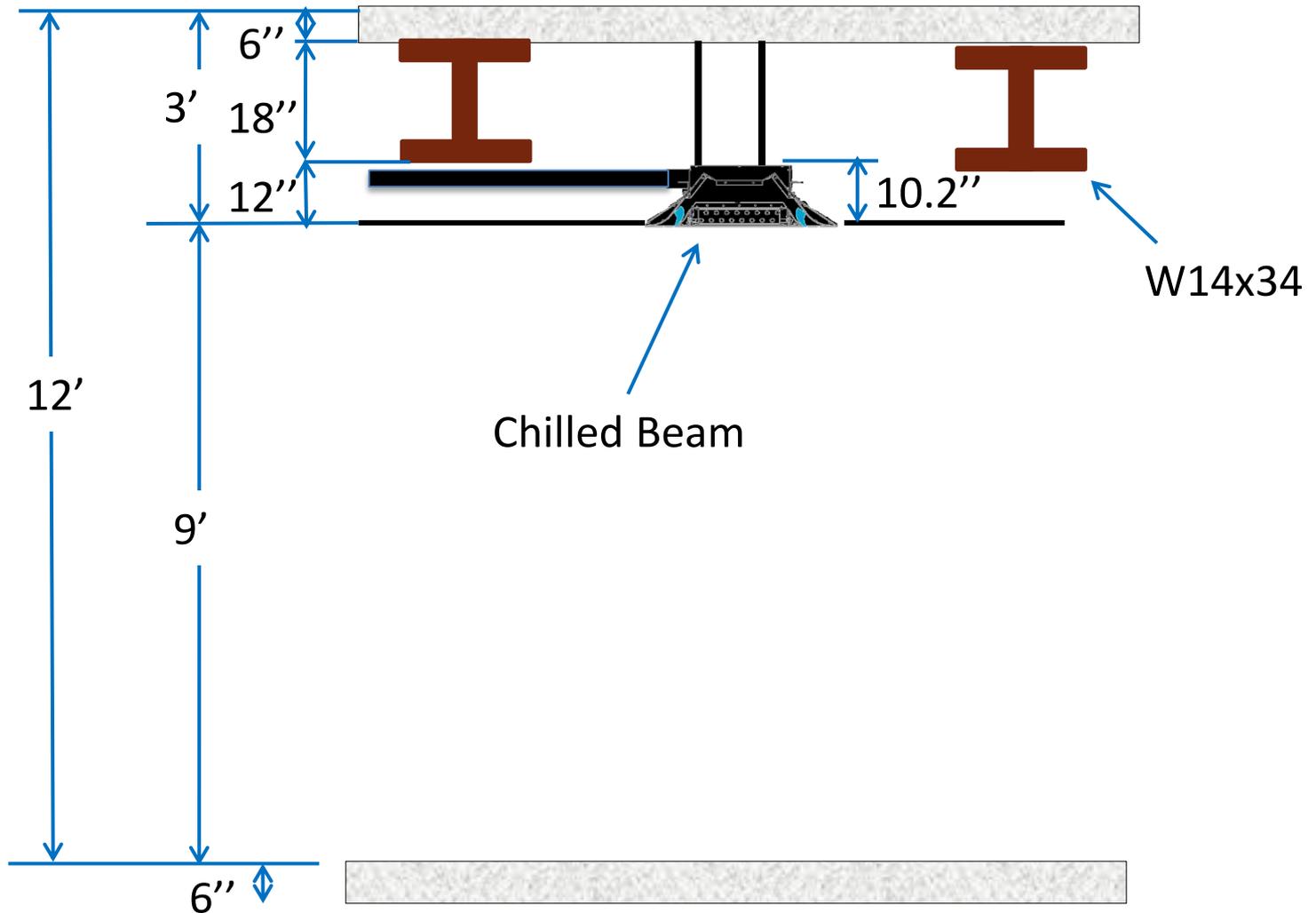


The Staircase

Floor to Ceiling – Steel

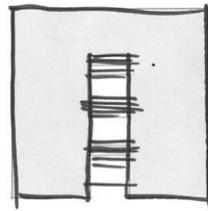


A
E
M
C



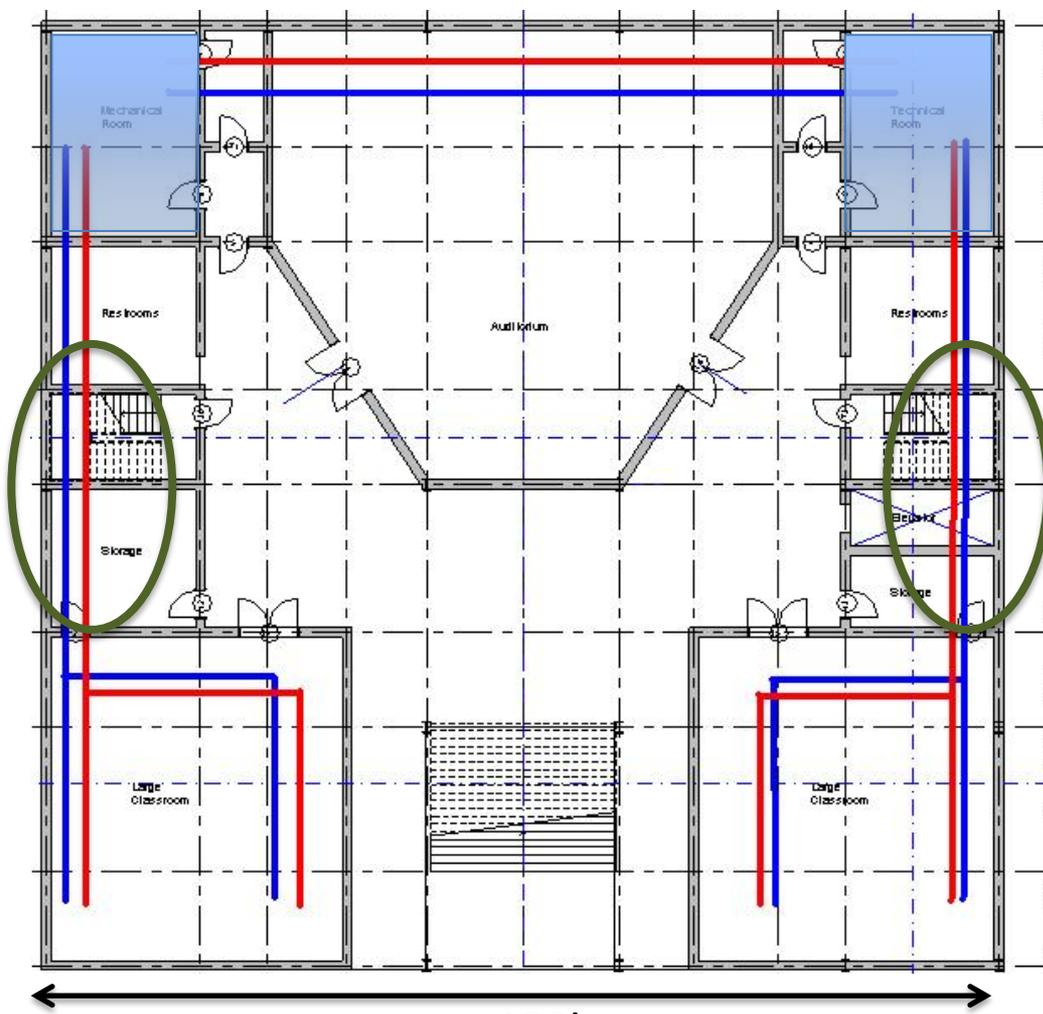
The Staircase

Water Distribution – 1st Floor



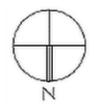
A
E
M
C

Stairwell



100'

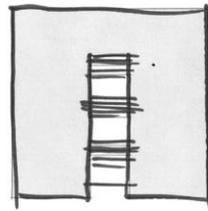
— Hot
— Cold



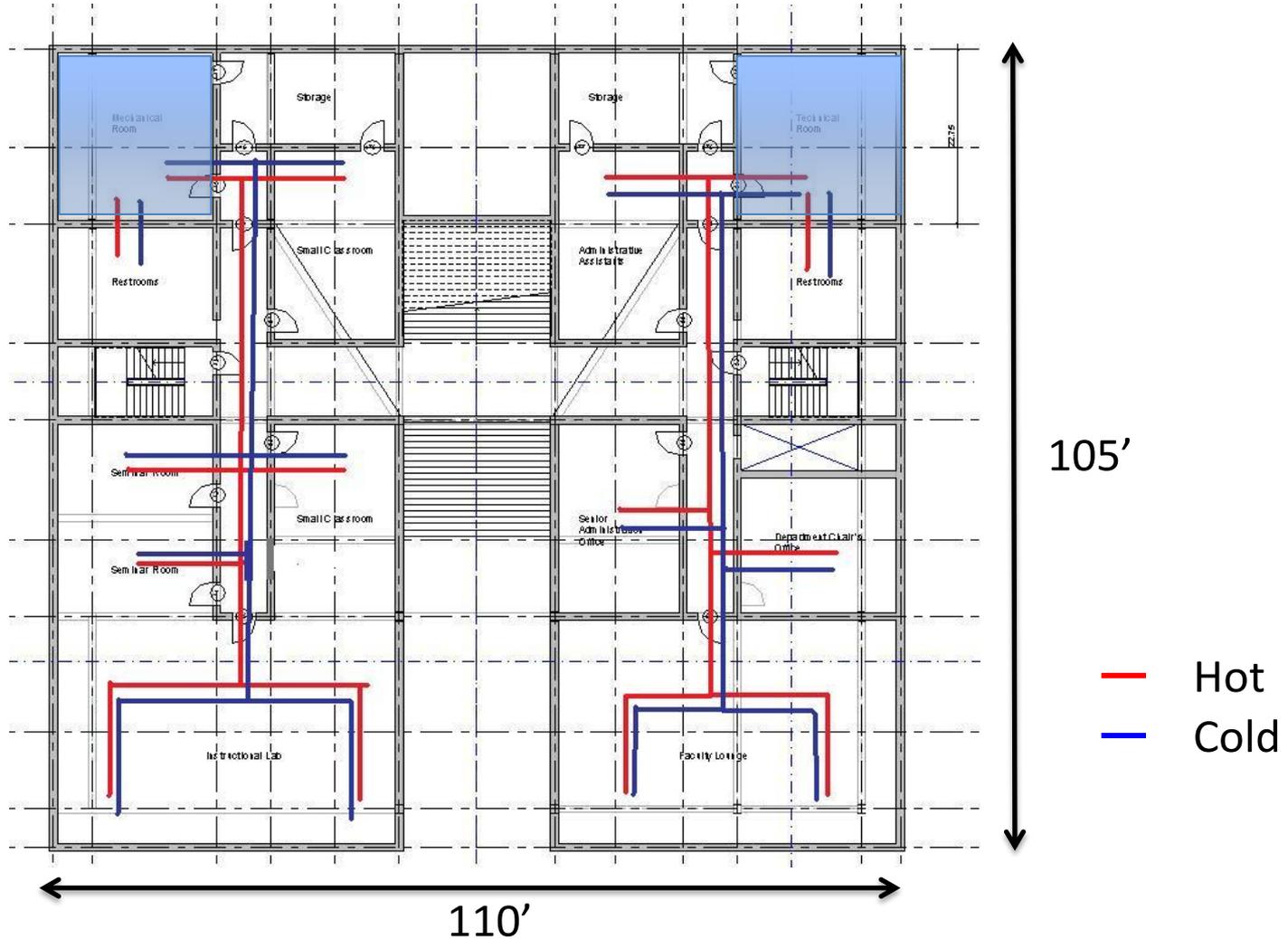
100'

The Staircase

Water Distribution – 2nd Floor

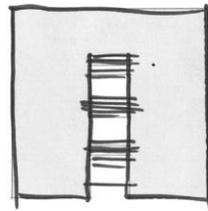


A
E
M
C

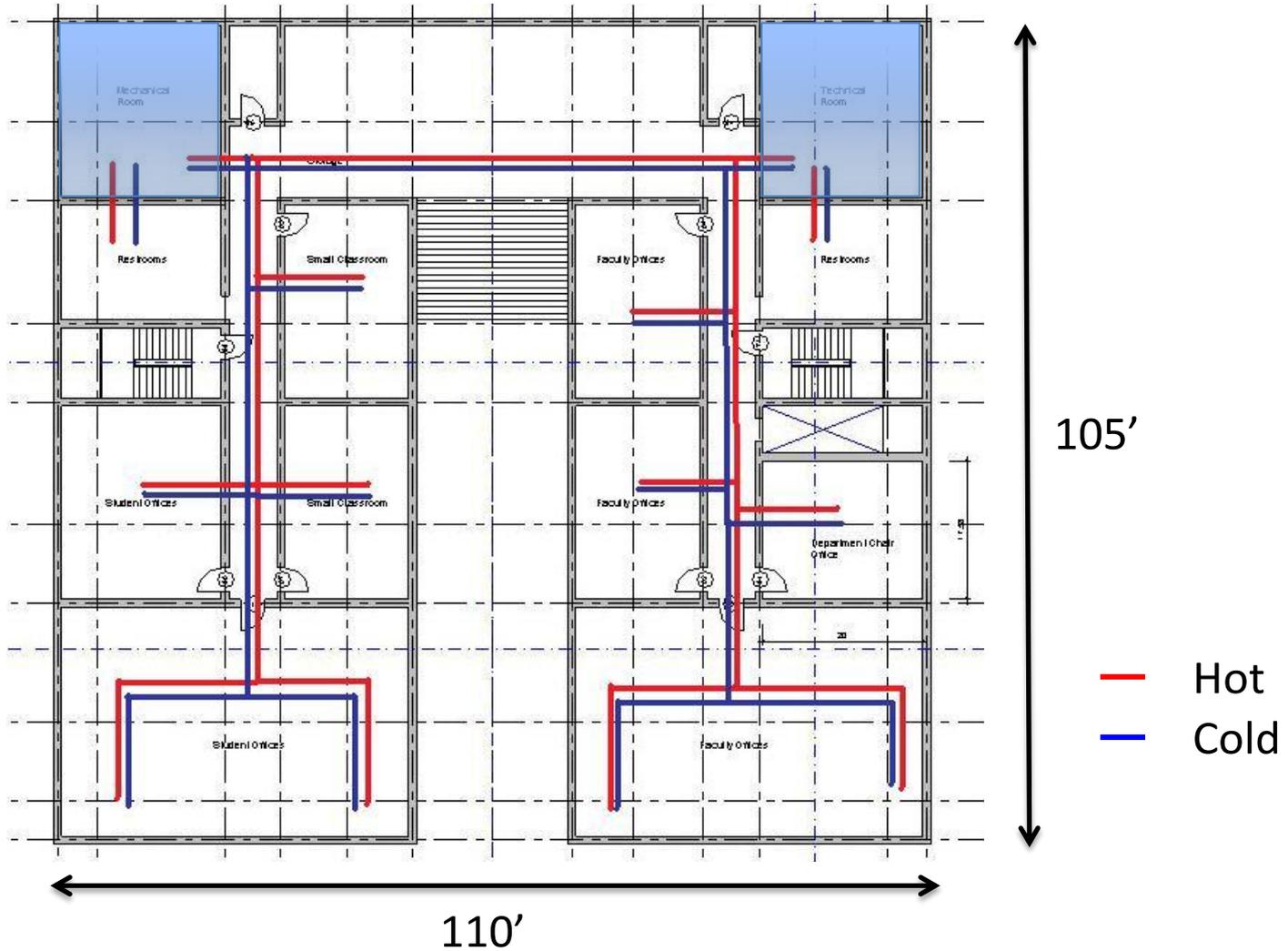


The Staircase

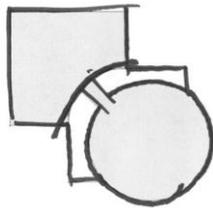
Water Distribution – 3rd Floor



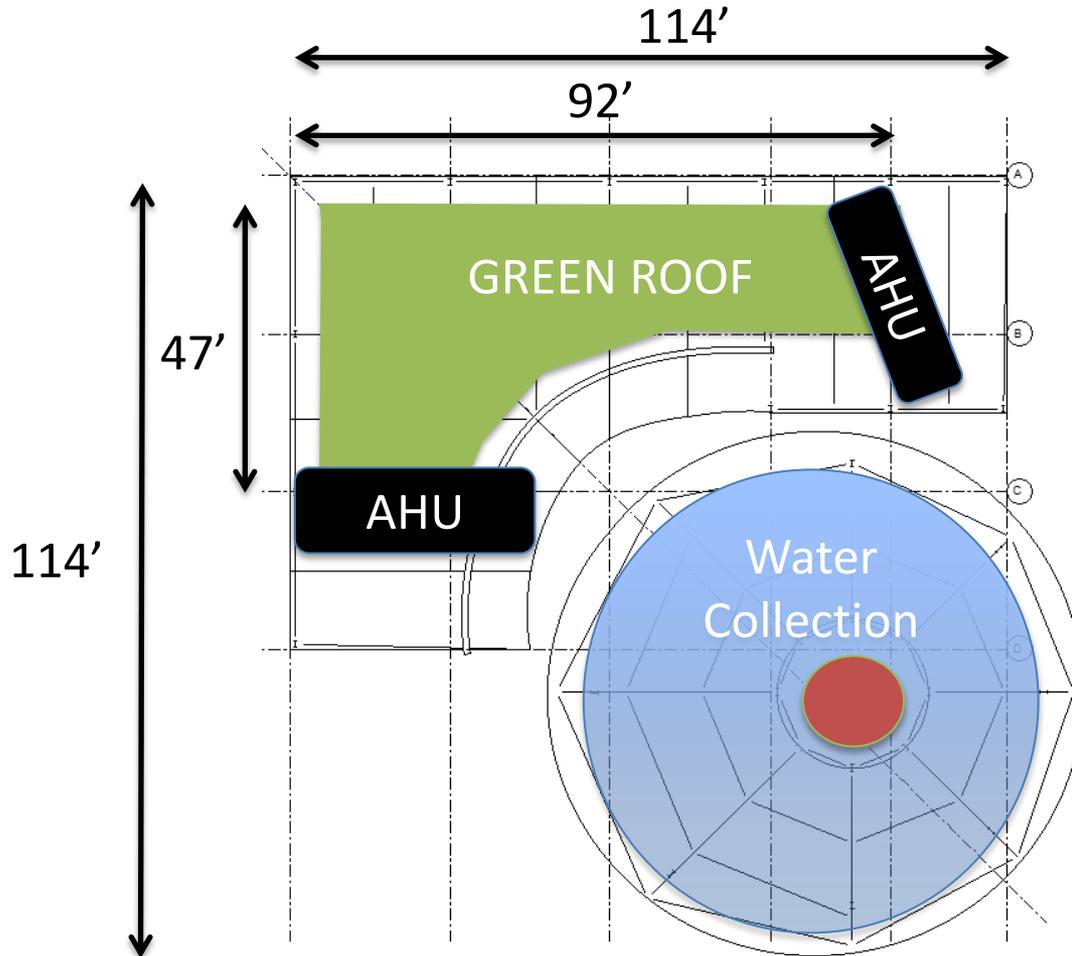
A
E
M
C



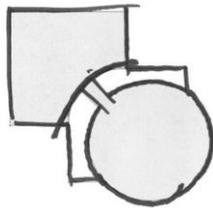
Contrast Roof



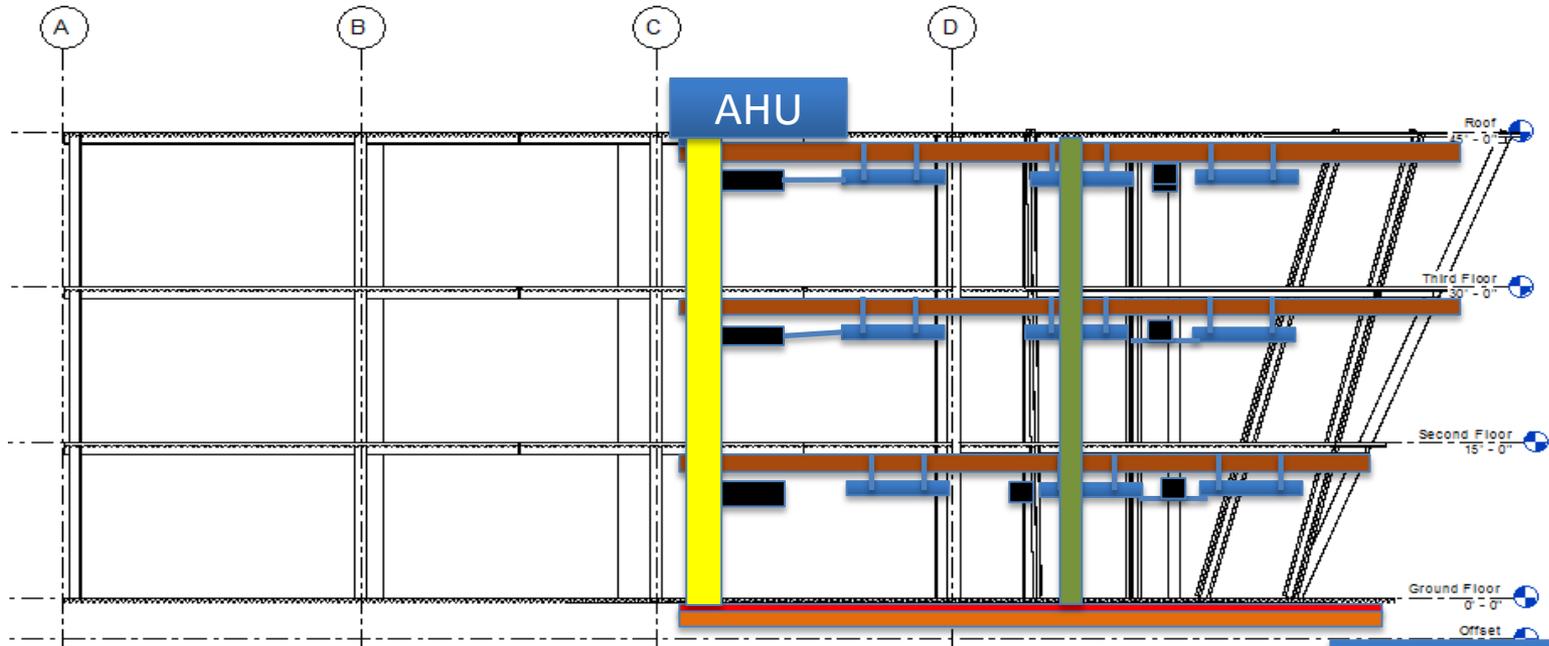
A
E
M
C



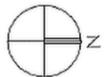
Contrast Elevation



A
E
M
C

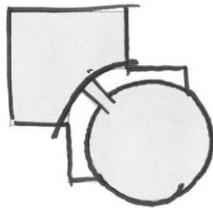


Water Basin

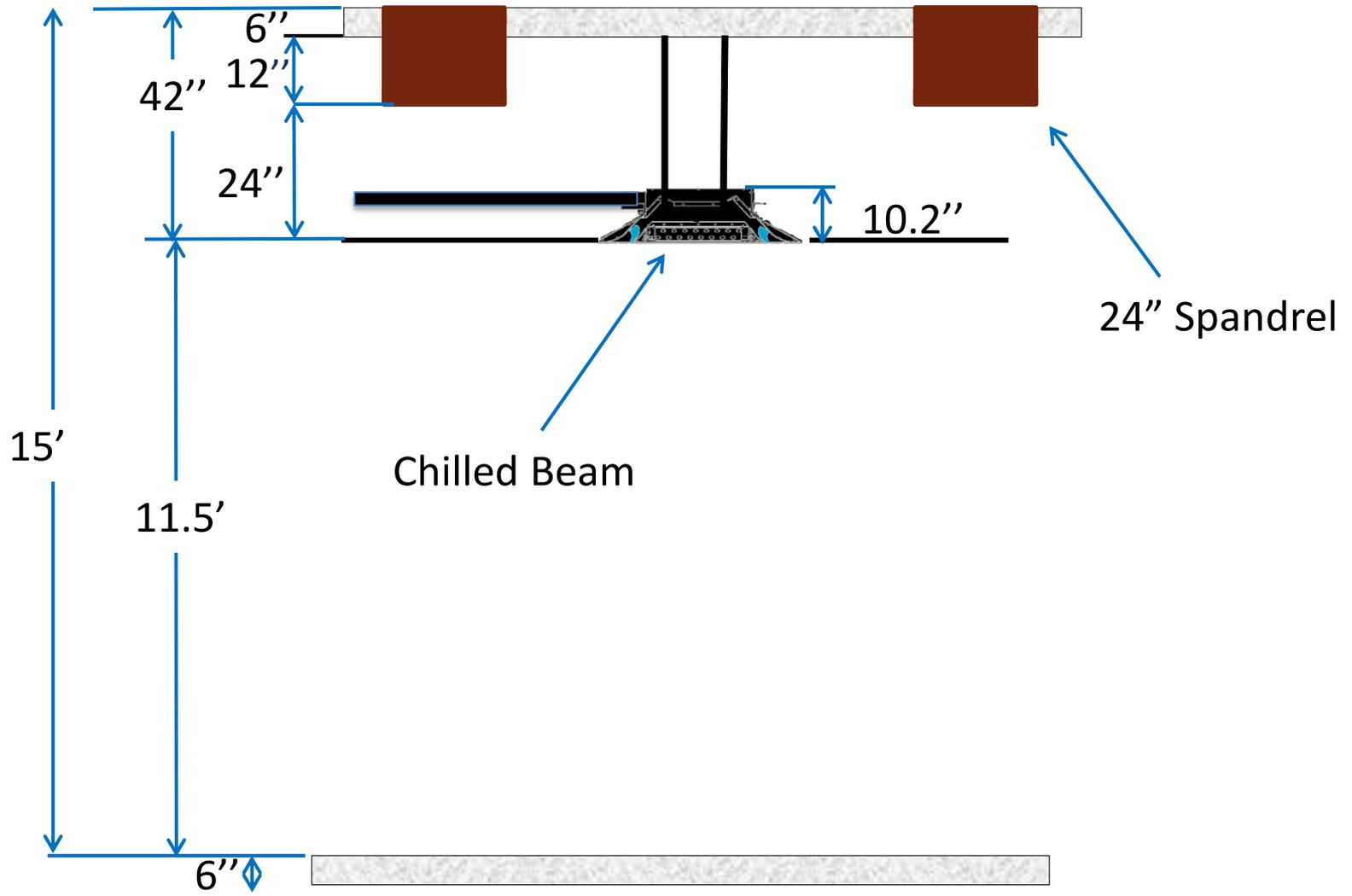


Contrast

Floor to Ceiling – Concrete

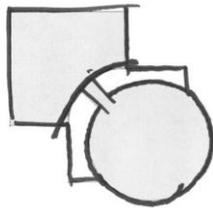


A
E
M
C

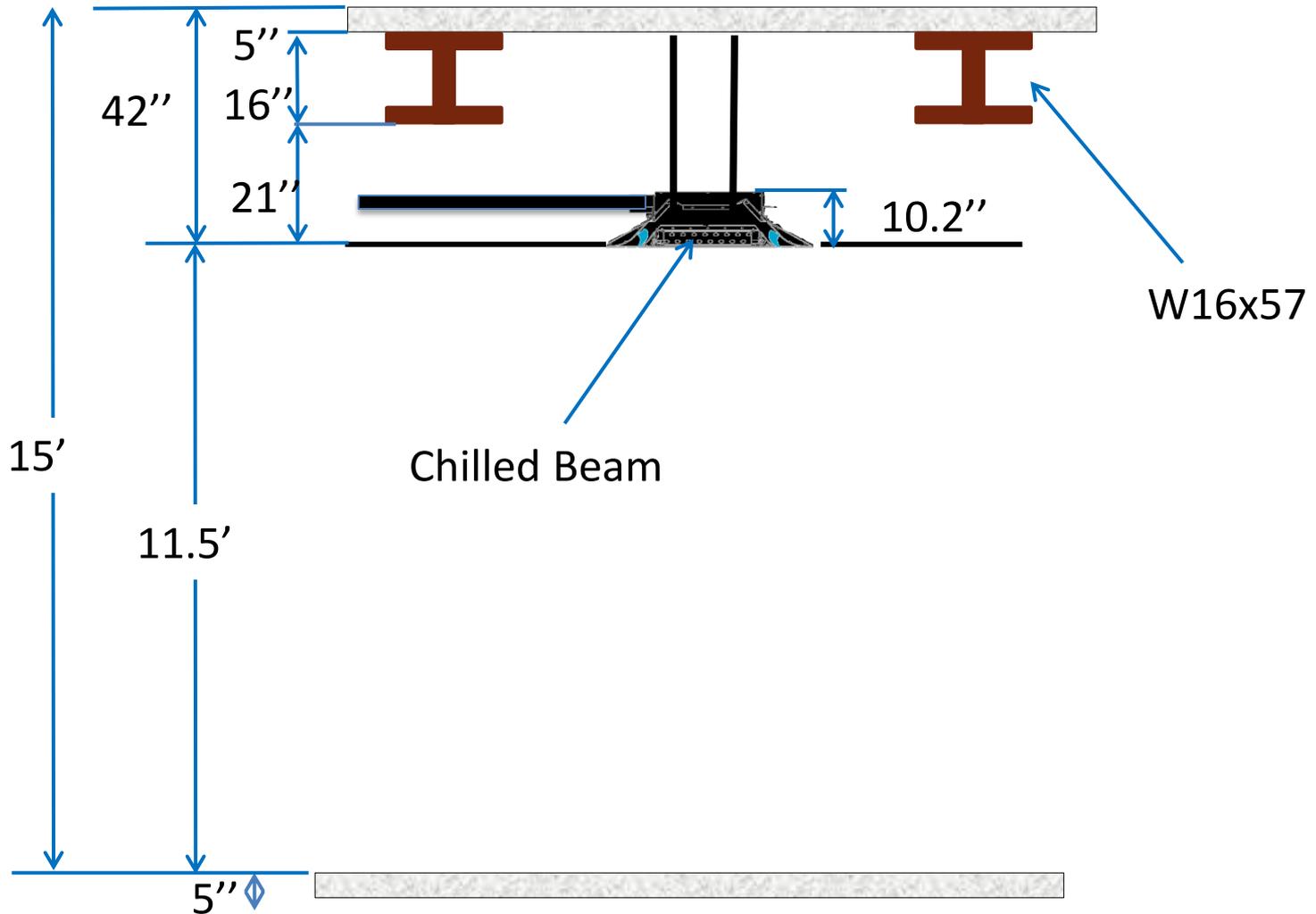


Contrast

Floor to Ceiling – Steel

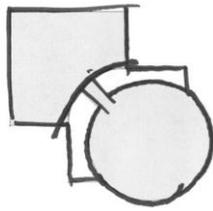


A
E
M
C

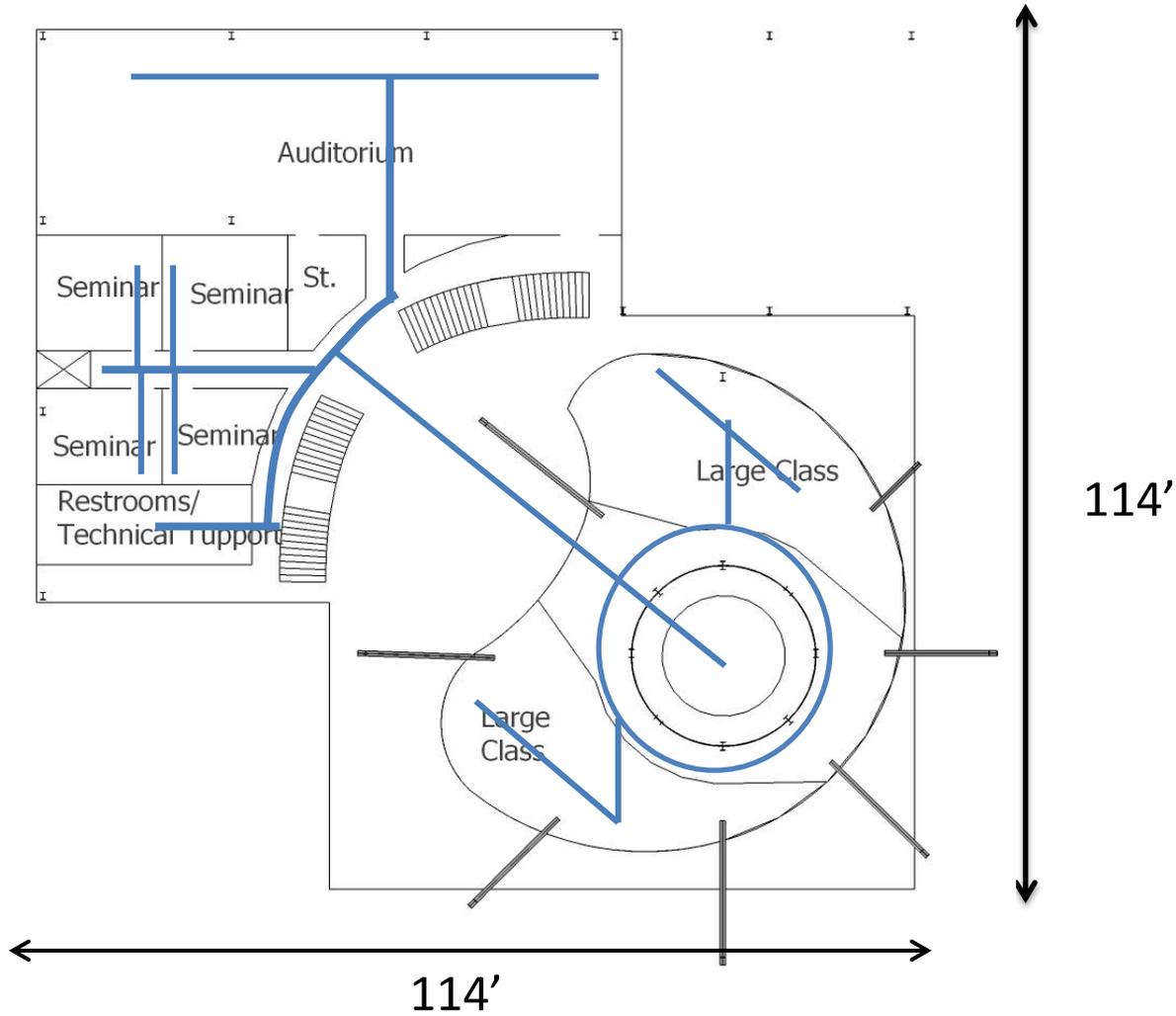


Contrast

Water Distribution – 1st Floor



A
E
M
C

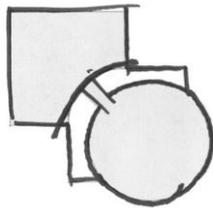


— Hot and Cold

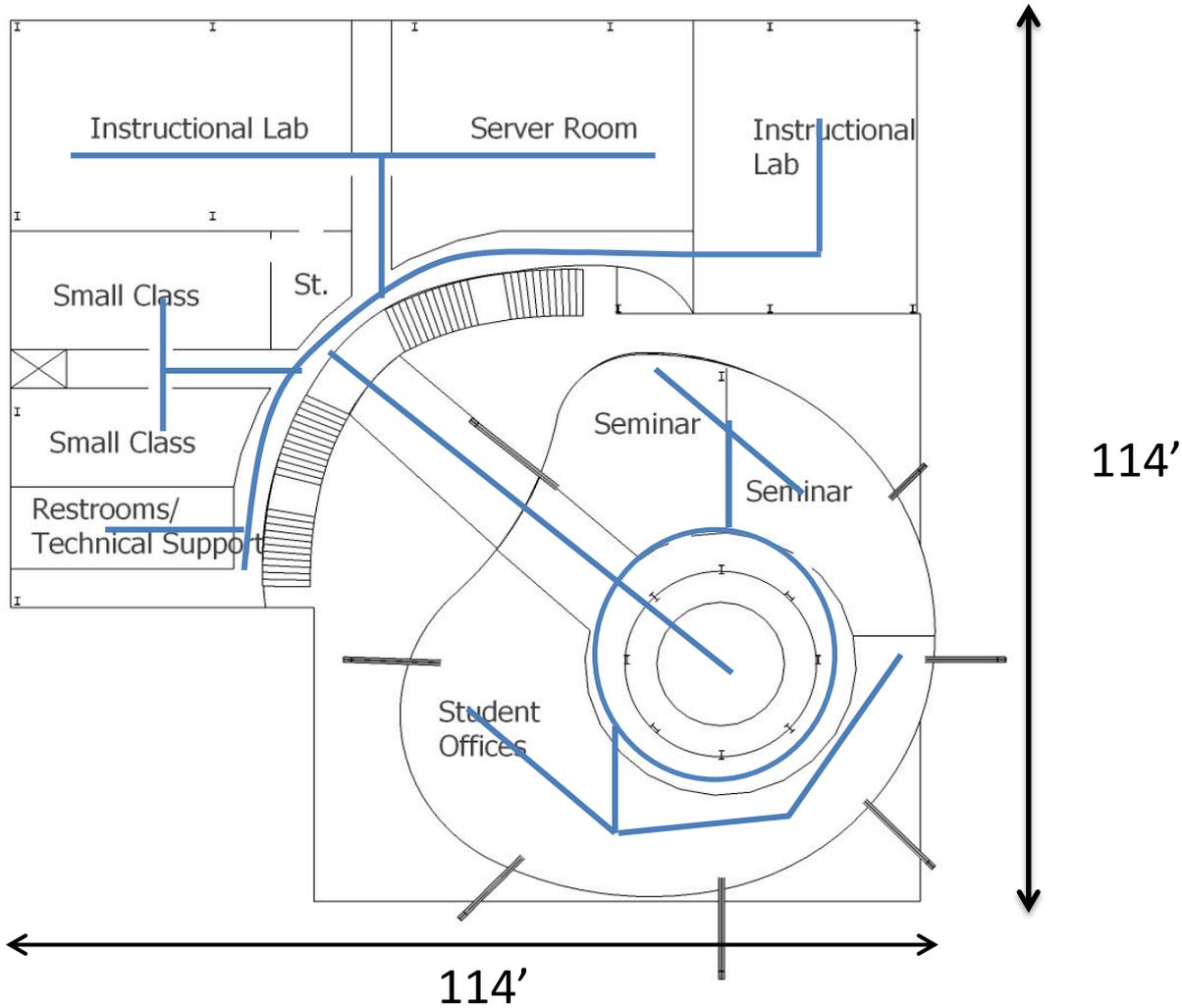


Contrast

Water Distribution – 2nd Floor



A
E
M
C

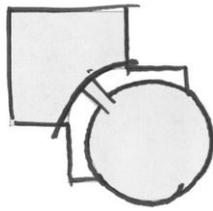


— Hot and
Cold

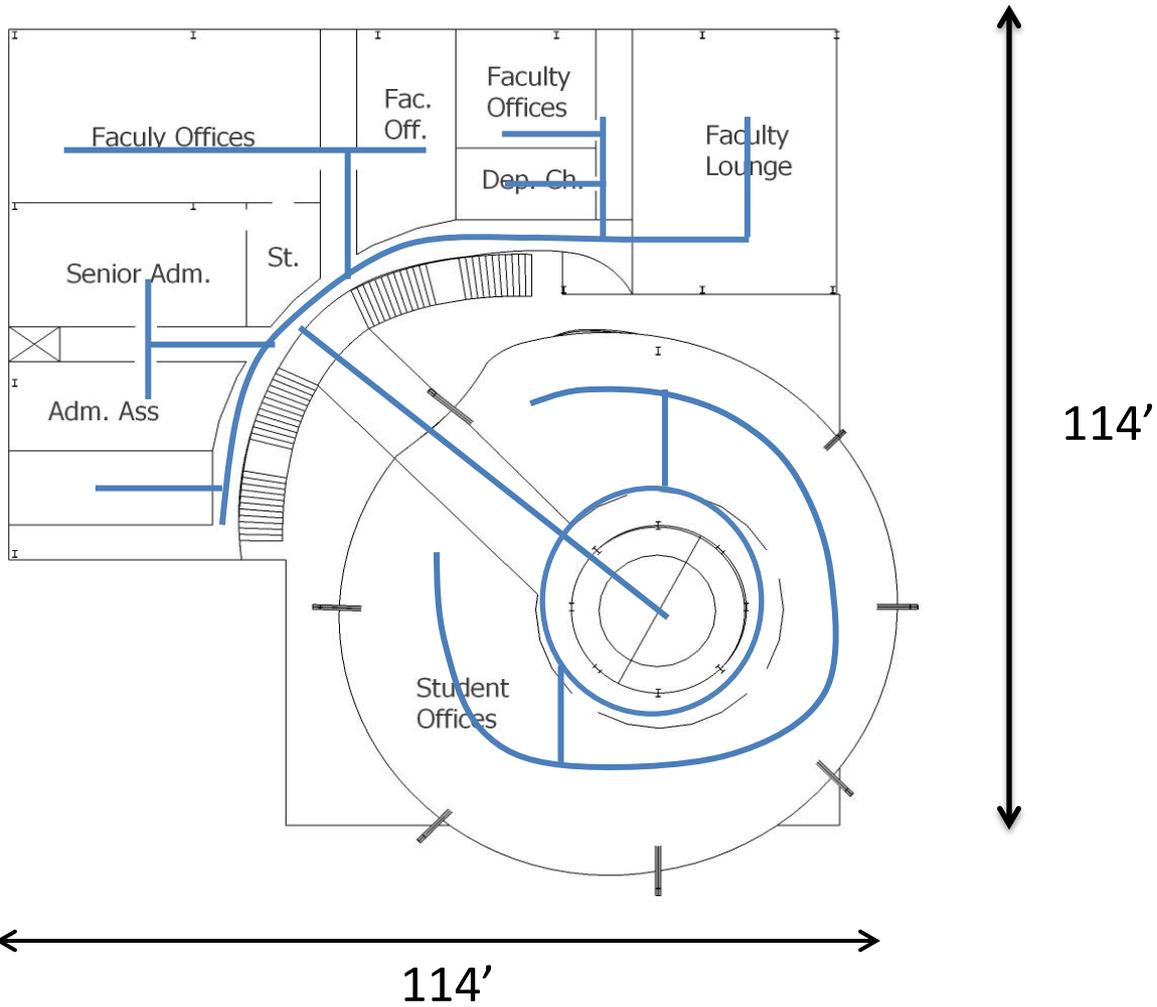


Contrast

Water Distribution – 3rd Floor



A
E
M
C



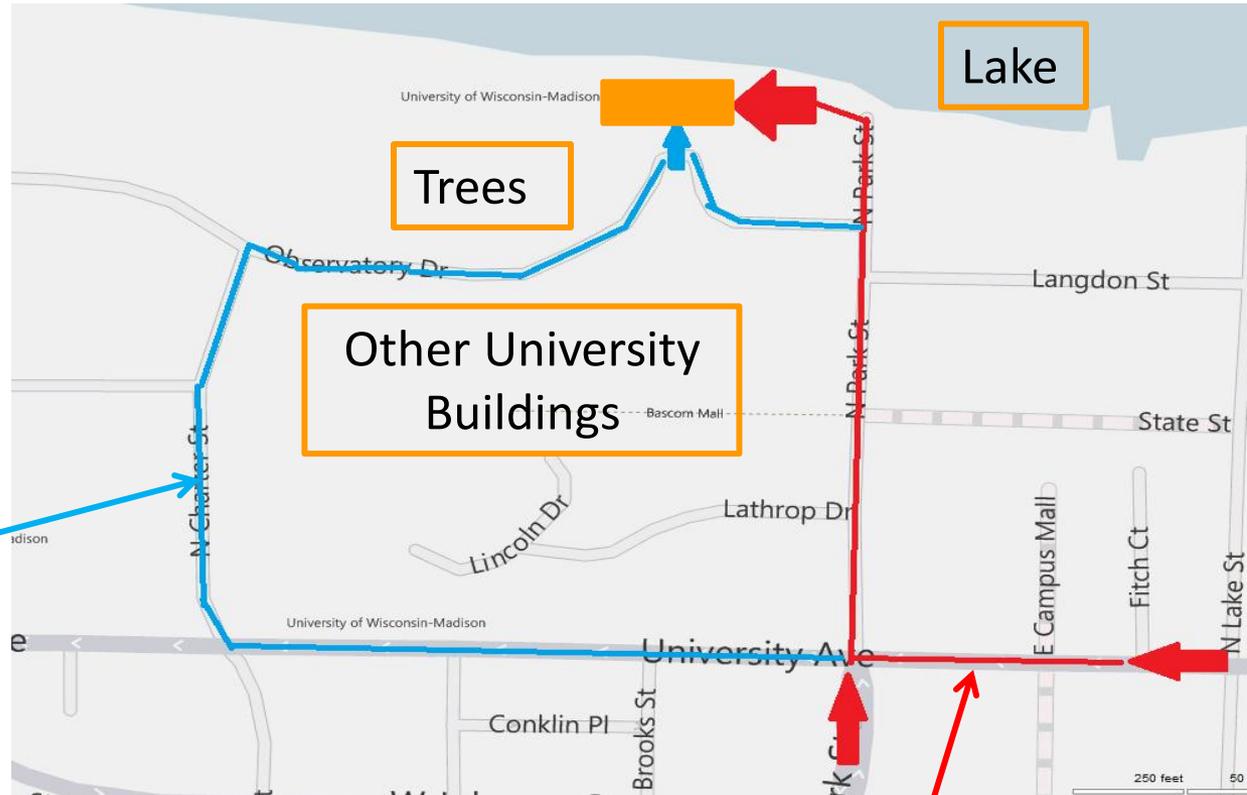
— Hot and Cold

Site Access

- Tight Site
- Difficult Access

Secondary Delivery Path

45' Max Transportable Member

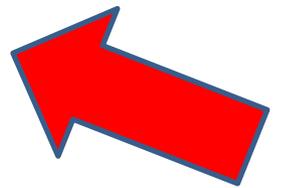


Primary Delivery Path

Site Access

Delivery Path

A
E
M
C



Excavation Equipment

A
E
M
C



- EXCAVATOR (1X)
- DOZER (1X)
- DUMP TRUCK (2X)
- PILING RIG (1X)



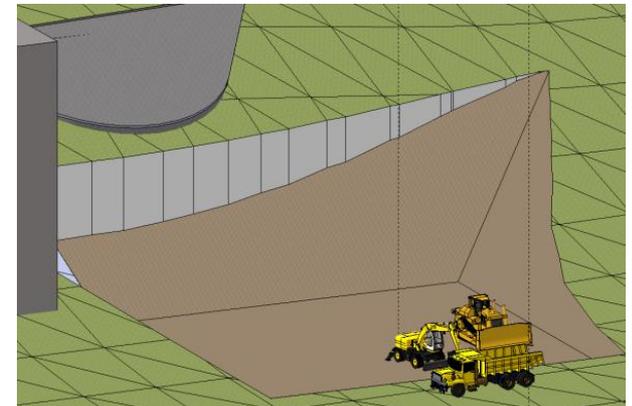
Excavation

A
E
M
C



Temporary Retaining Wall

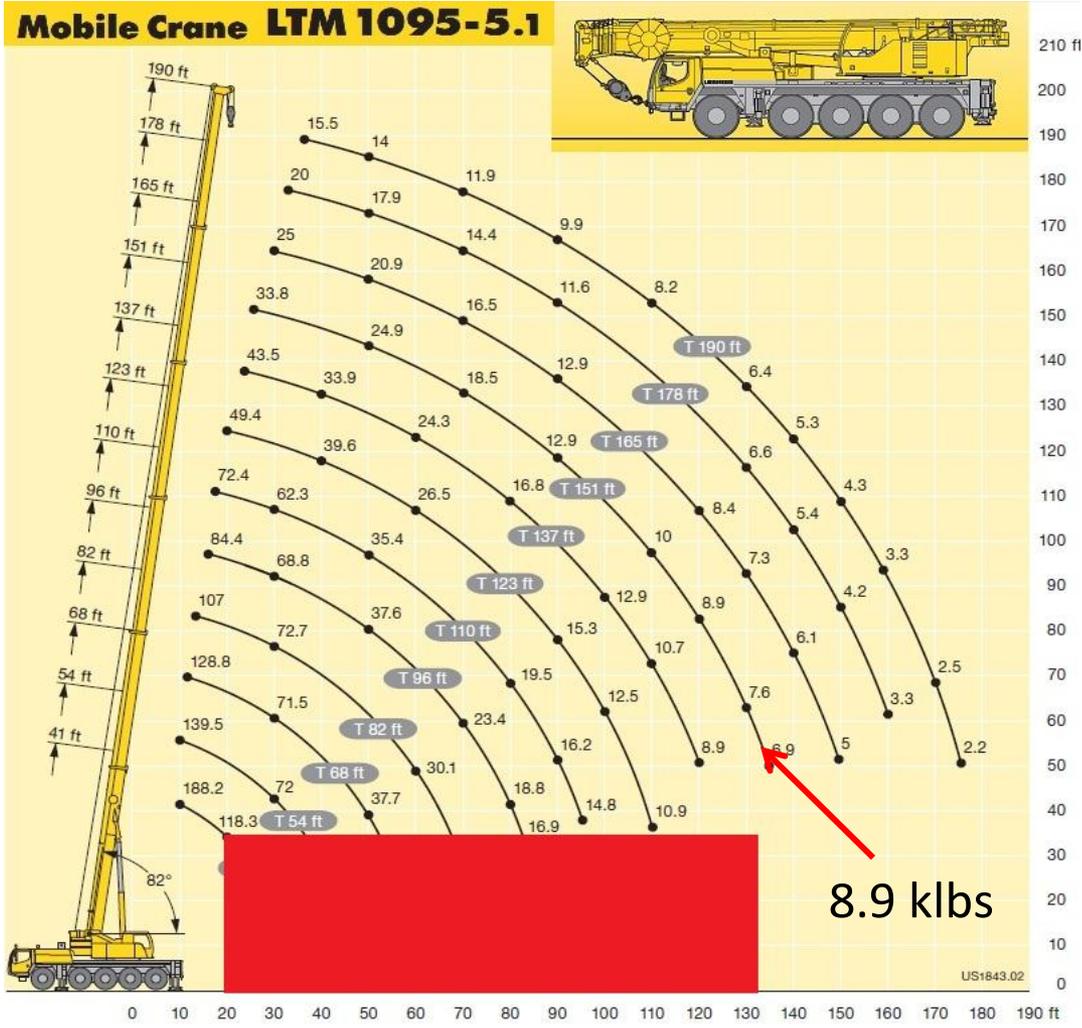
Excavation Cut



Steel Equipment

Mobile Crane

A
E
M
C



45' Long Crane

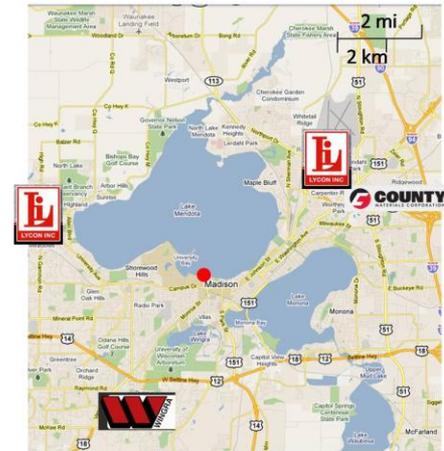
Heaviest Lift is 8 klbs

Concrete Equipment

A
E
M
C



- CONCRETE MIXER (4x)
- CONCRETE PUMP (1x)



	Time : 23 min Distance: 5 mile
	<i>Time: 55 min</i> <i>Distance: 35 mile</i>
	Time: 21 min Distance: 8 mile

Time calculated with: <http://www.viamichelin.com/>

Schedule

Steel, Concrete & Combination

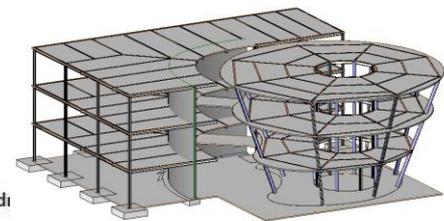
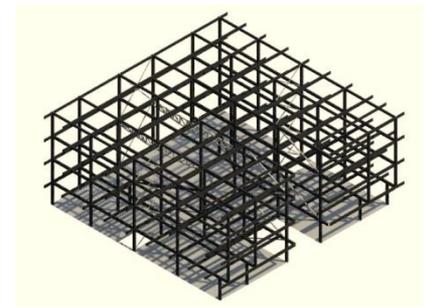
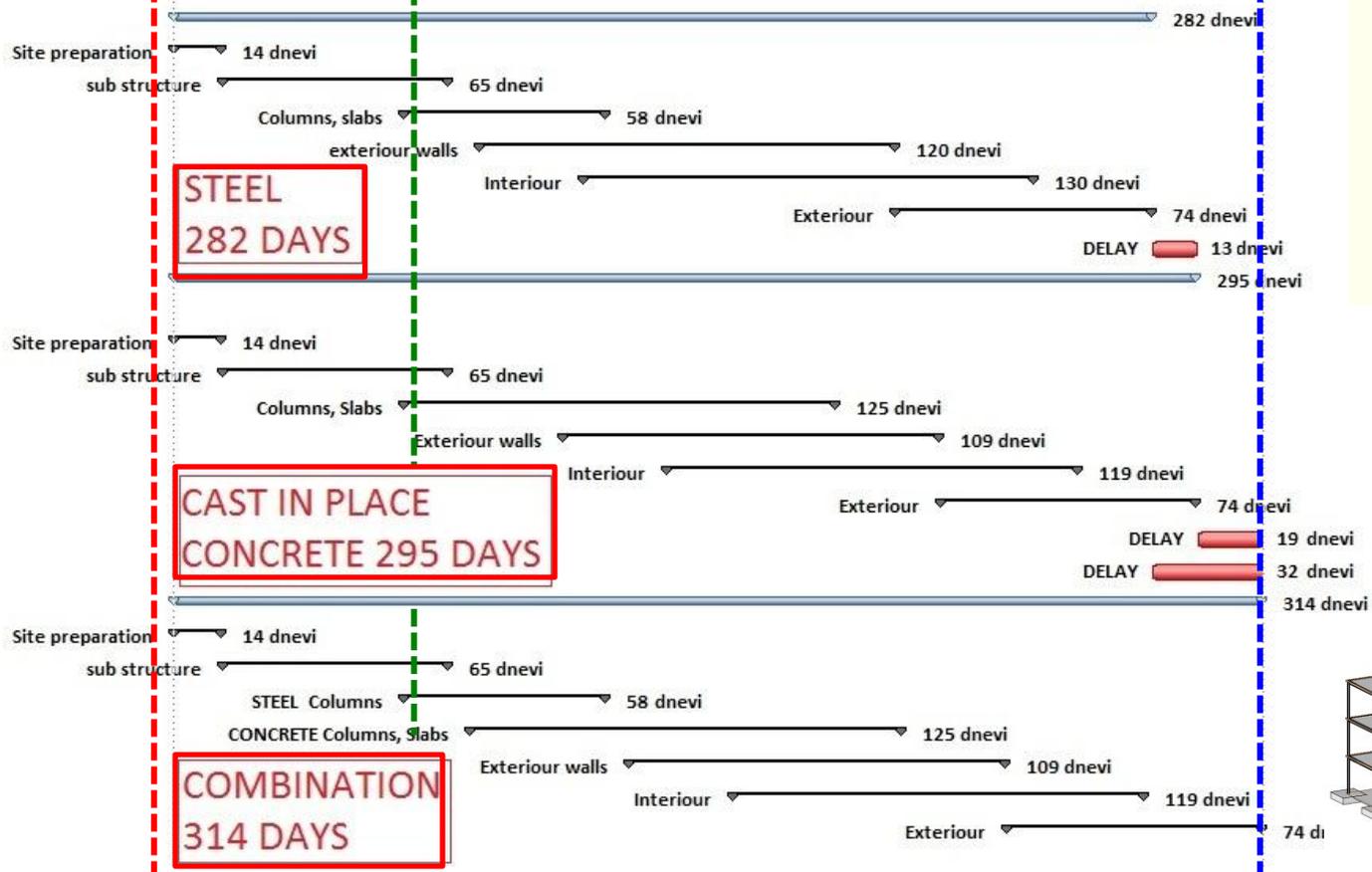
A
E
M
C

unij | julij | avgust | september | oktober | november | december | januar | februar | marec | april | maj | junij | julij

Start August 1st

Finish Foundation October 19th

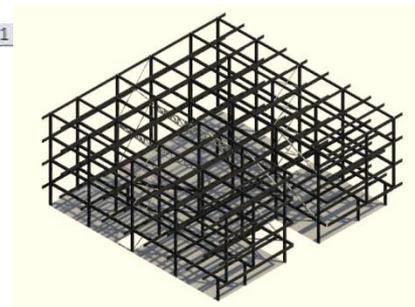
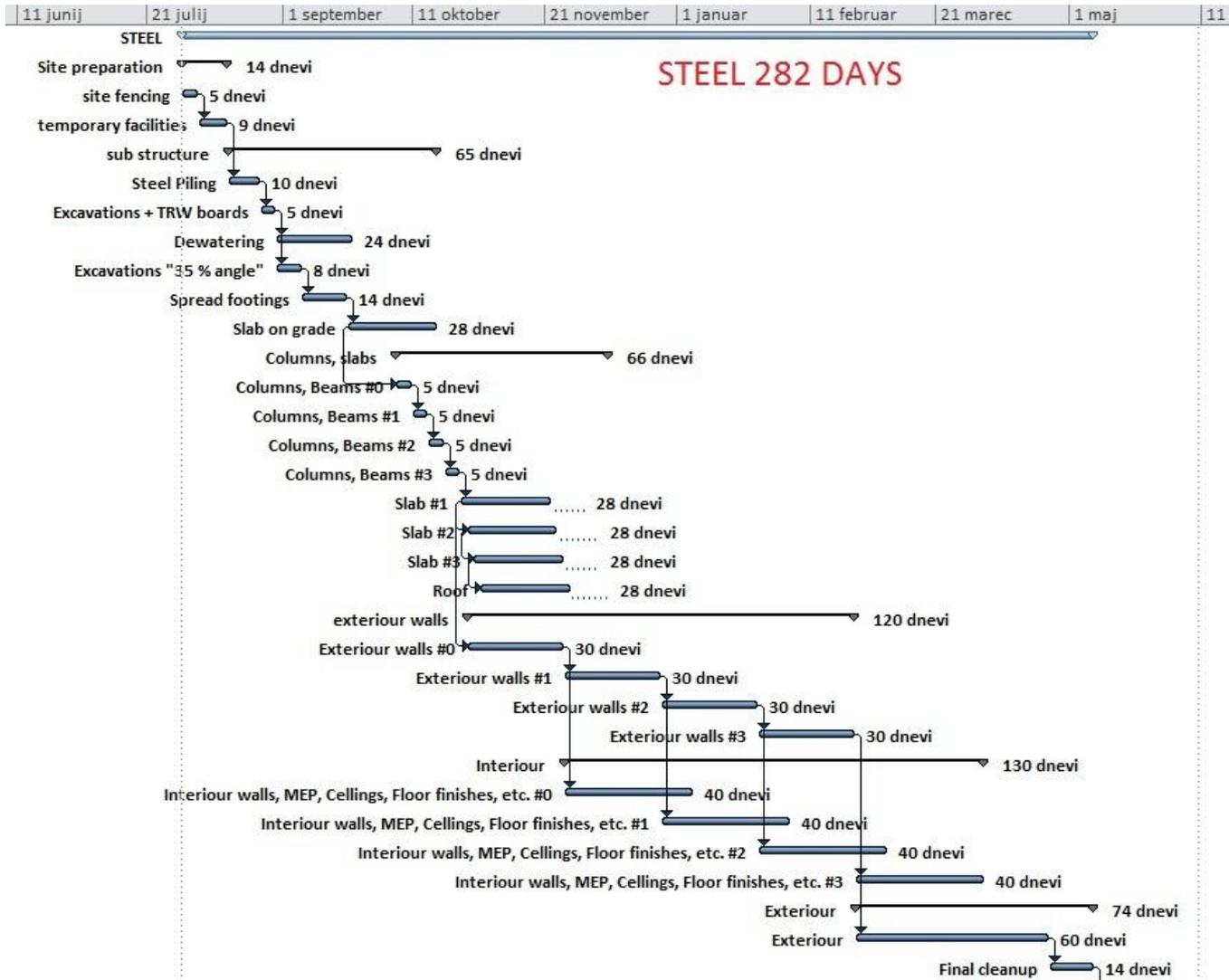
Enclose Building June 1st



Schedule

Steel

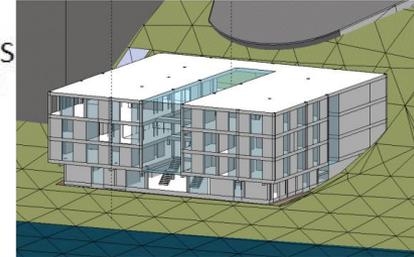
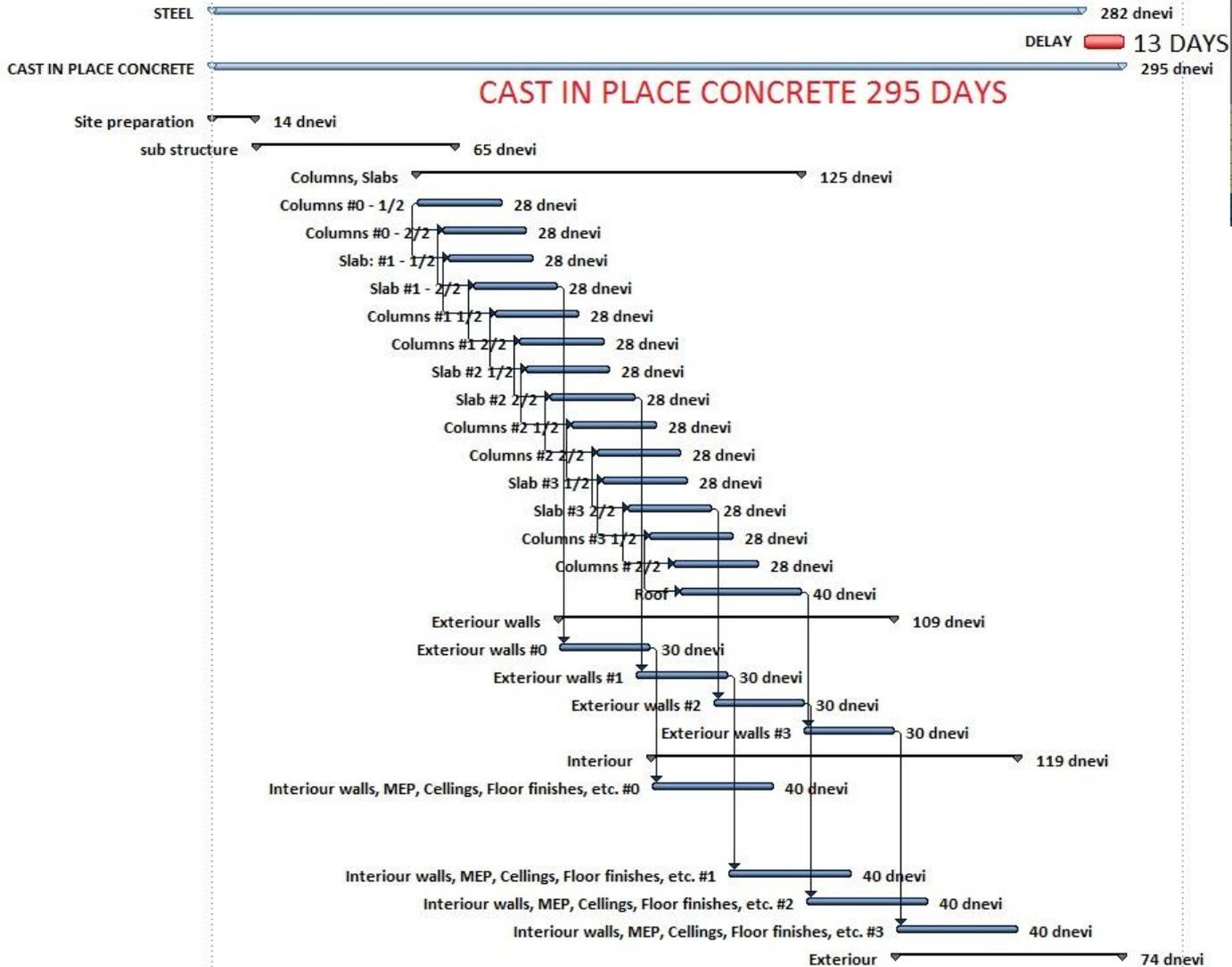
A
E
M
C



Schedule

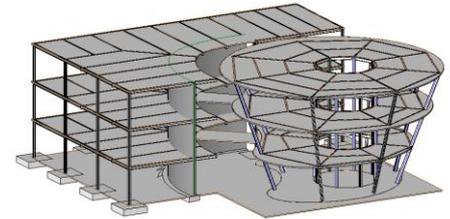
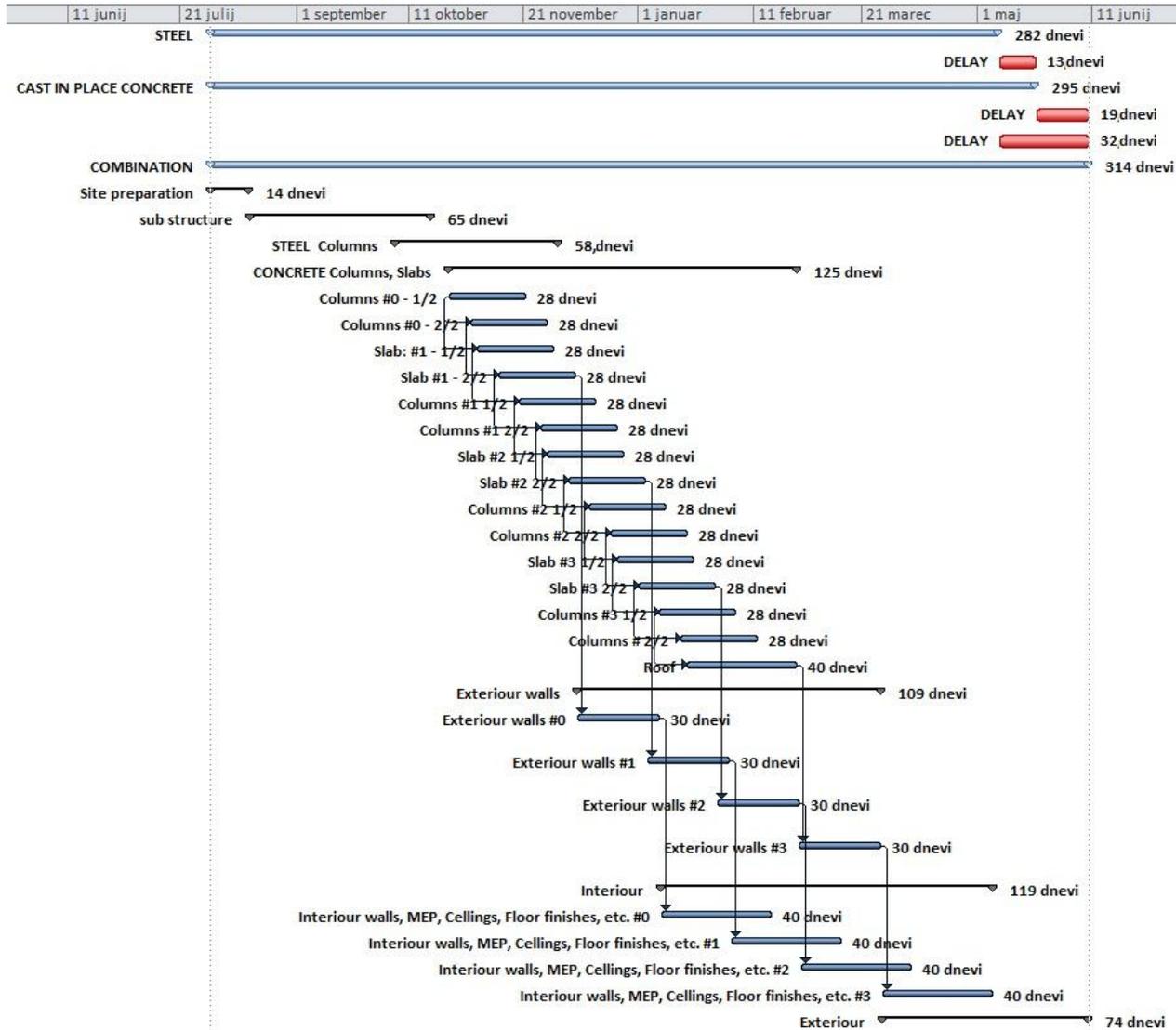
Concrete

A
E
M
C



Schedule Concrete

A
E
M
C



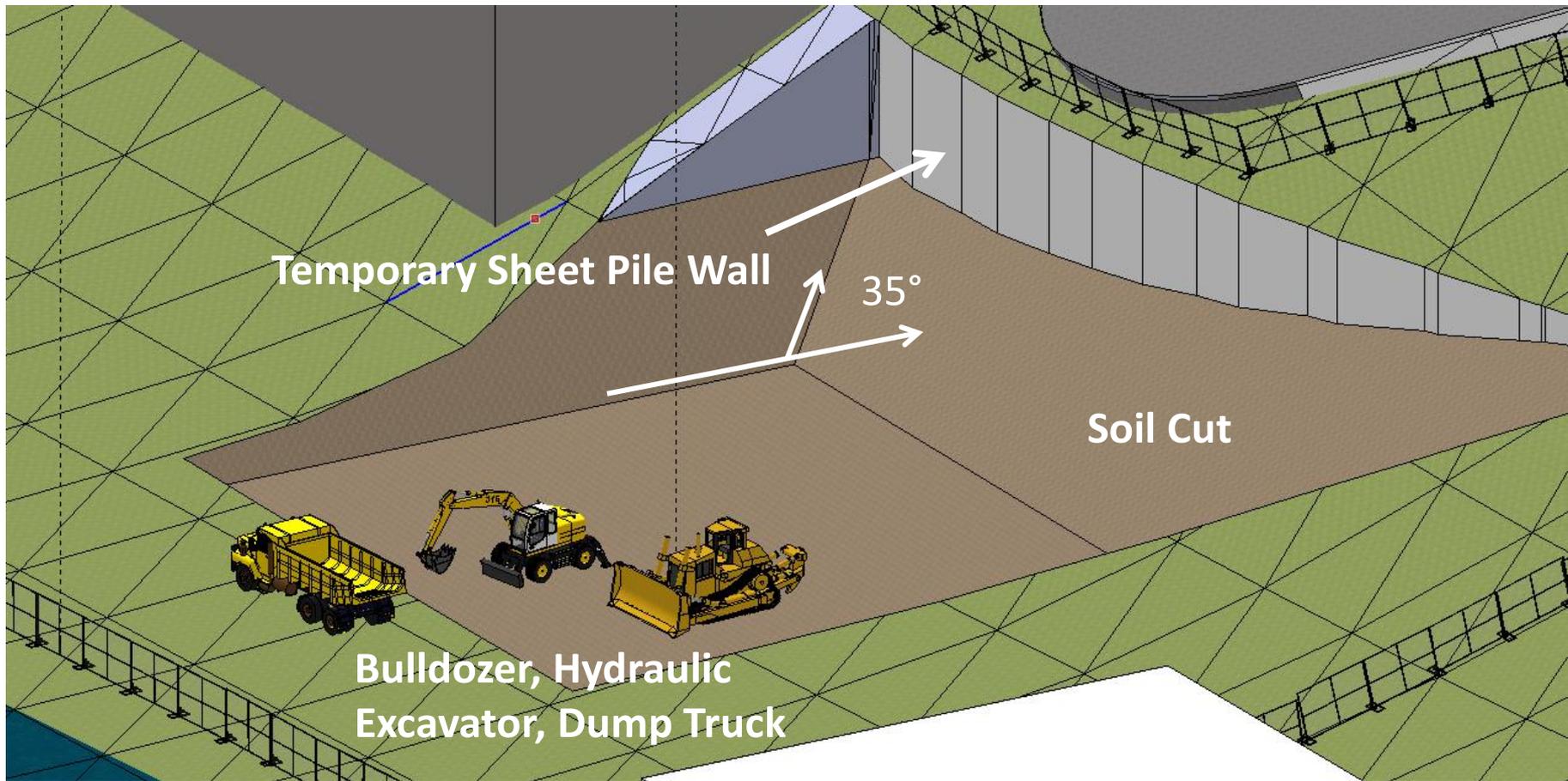
Site Layout

A
E
M
C



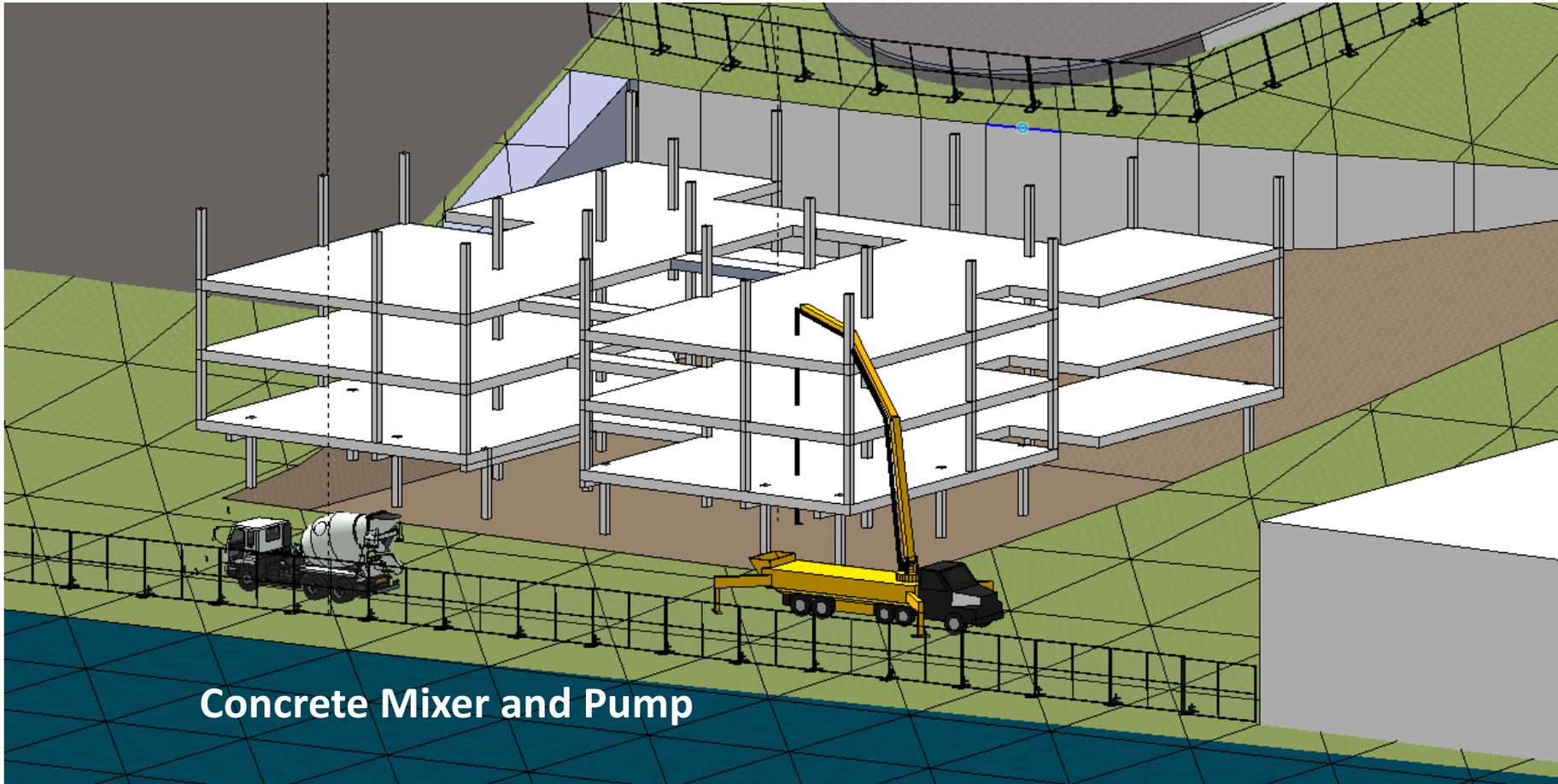
Excavation

A
E
M
C



Concrete Erection

A
E
M
C

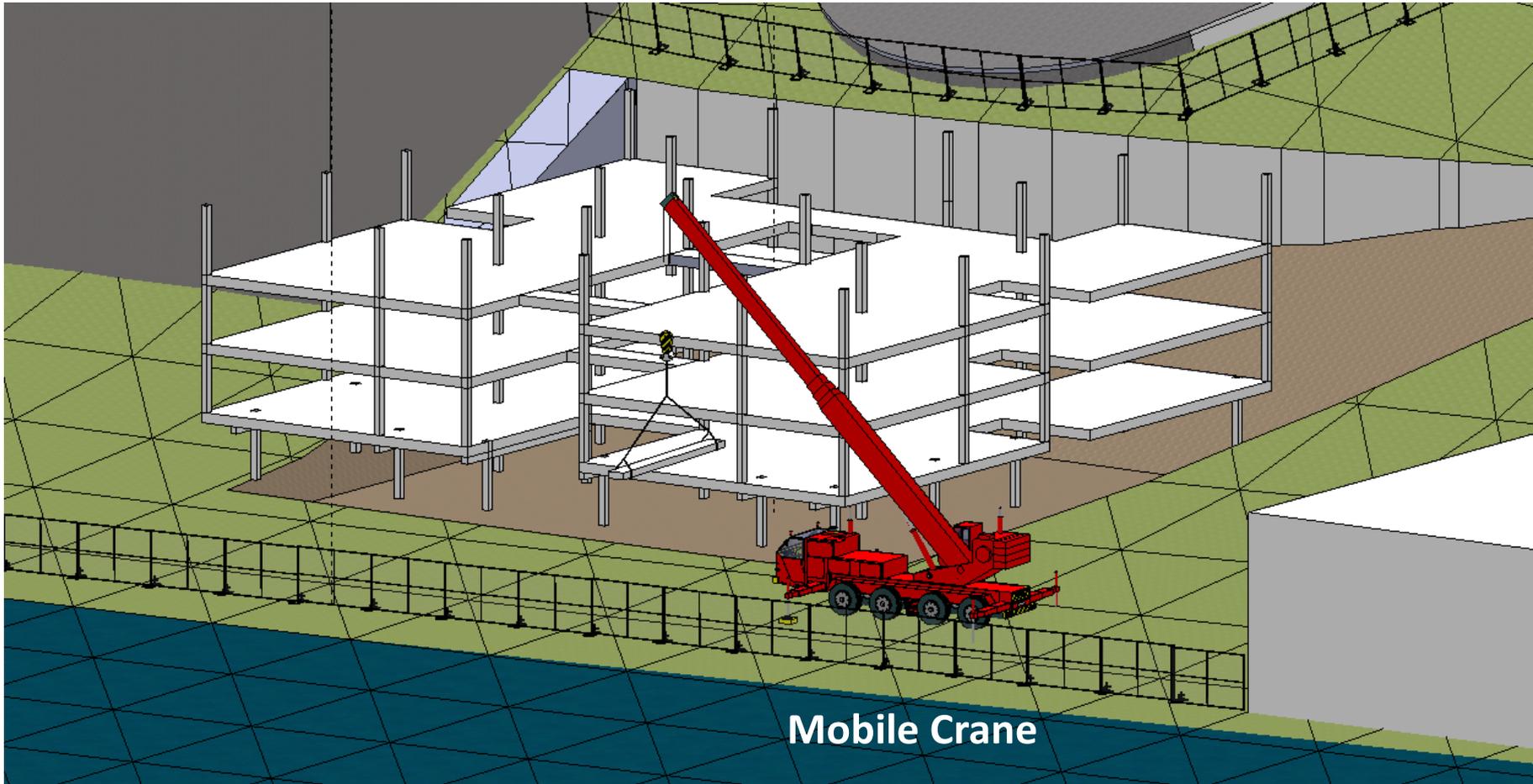


Concrete Mixer and Pump



Steel Erection

A
E
M
C

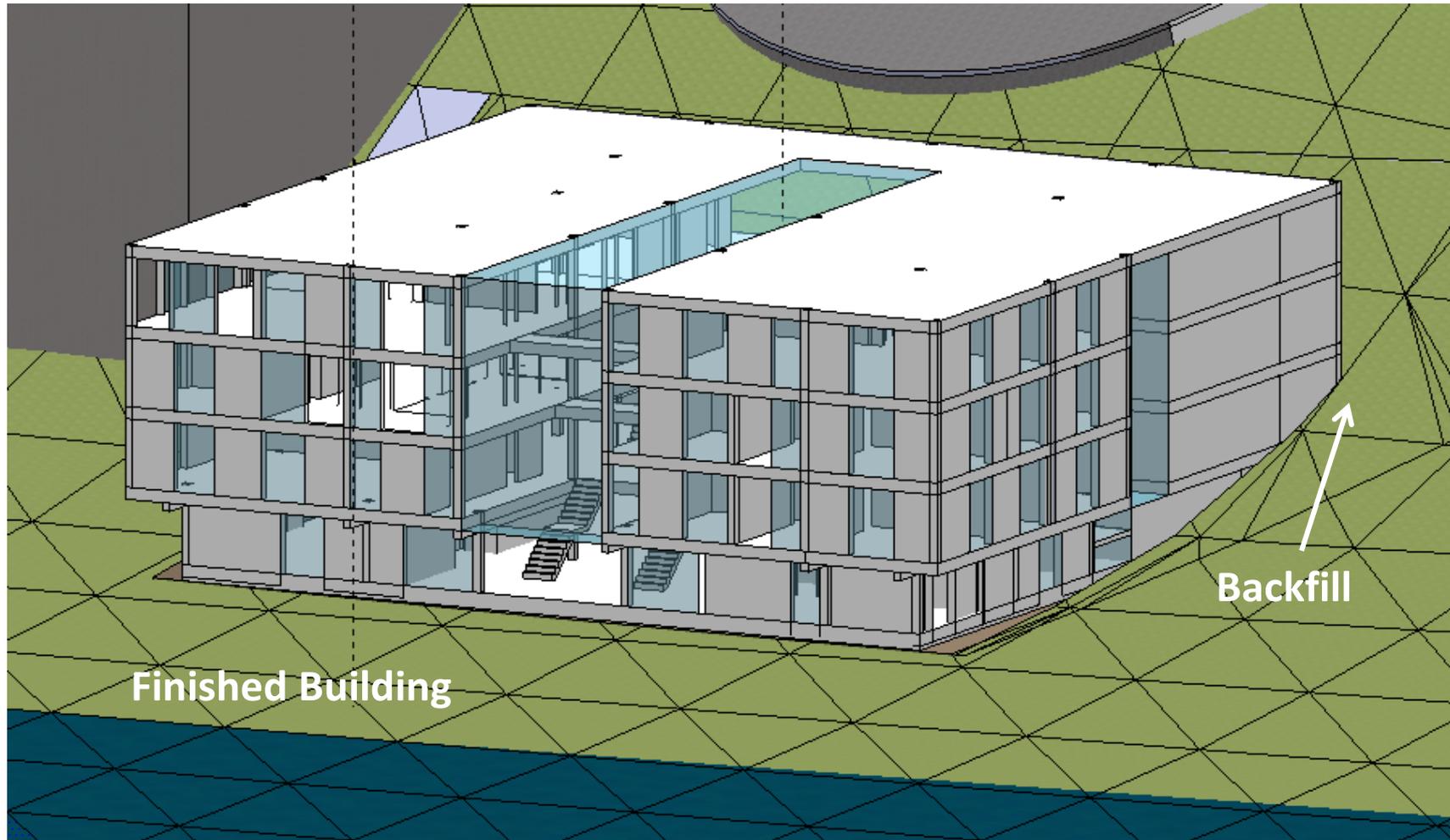


Mobile Crane



Building Shell and Backfill

A
E
M
C



LEED Certification



A
E
M
C

Category	Points
Sustainable Sites	21
Water Efficiency	4
Energy and Atmosphere	19
Materials and Resources	5
Indoor Environmental Quality	14
Innovation and Design Process	1
TOTAL	64



LEED GOLD



Sustainable Site

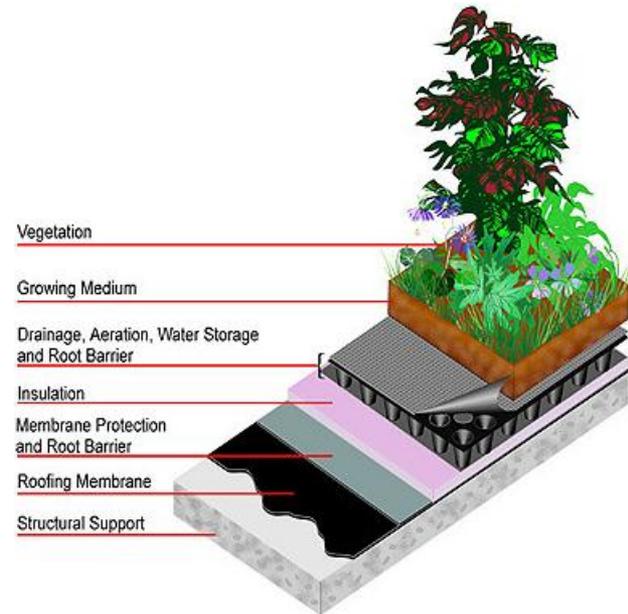
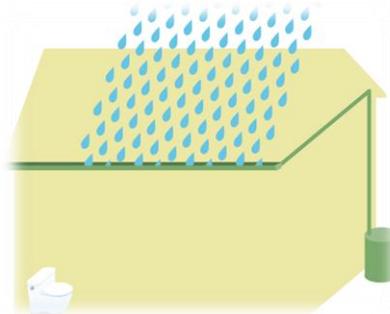


A
E
M
C

Water Efficiency



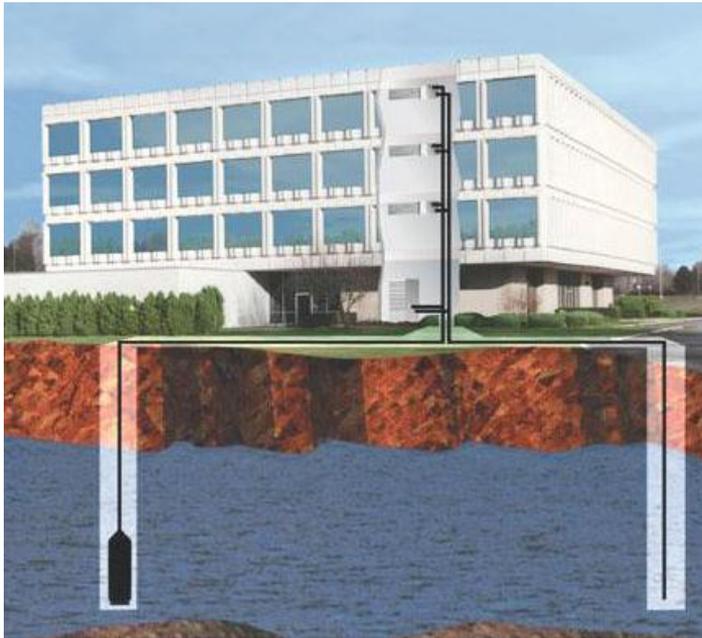
A
E
M
C



Energy And Atmosphere



A
E
M
C



Ground Source Heat Pump



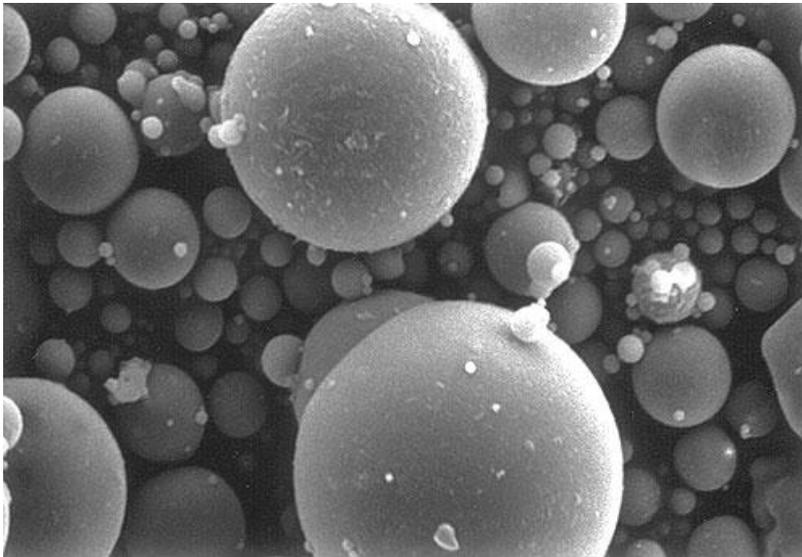
Materials and Resources



A
E
M
C



Local Aggregate



Fly Ash

Indoor Environmental Quality



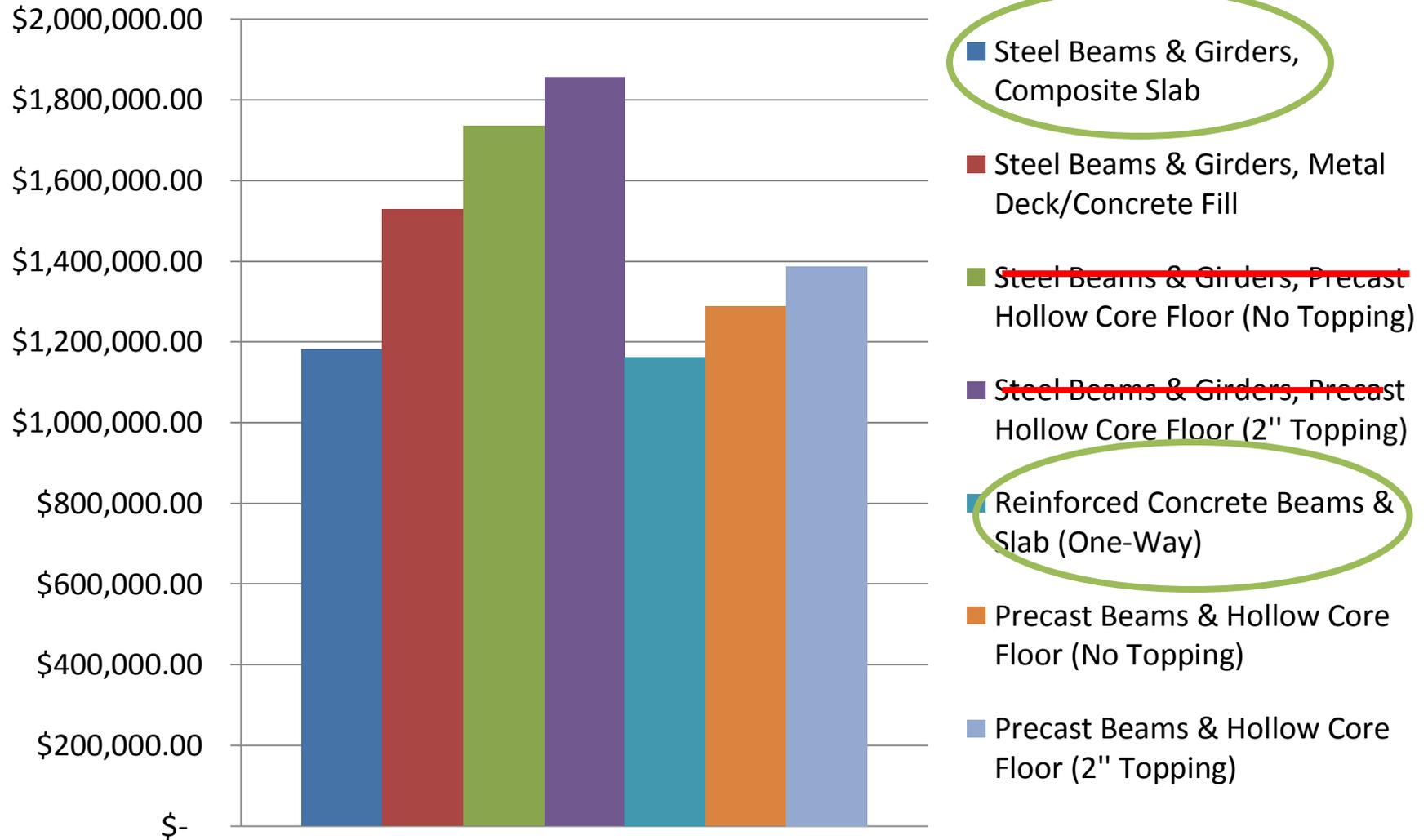
A
E
M
C



Economics in Design

Make Design Decisions Transparent

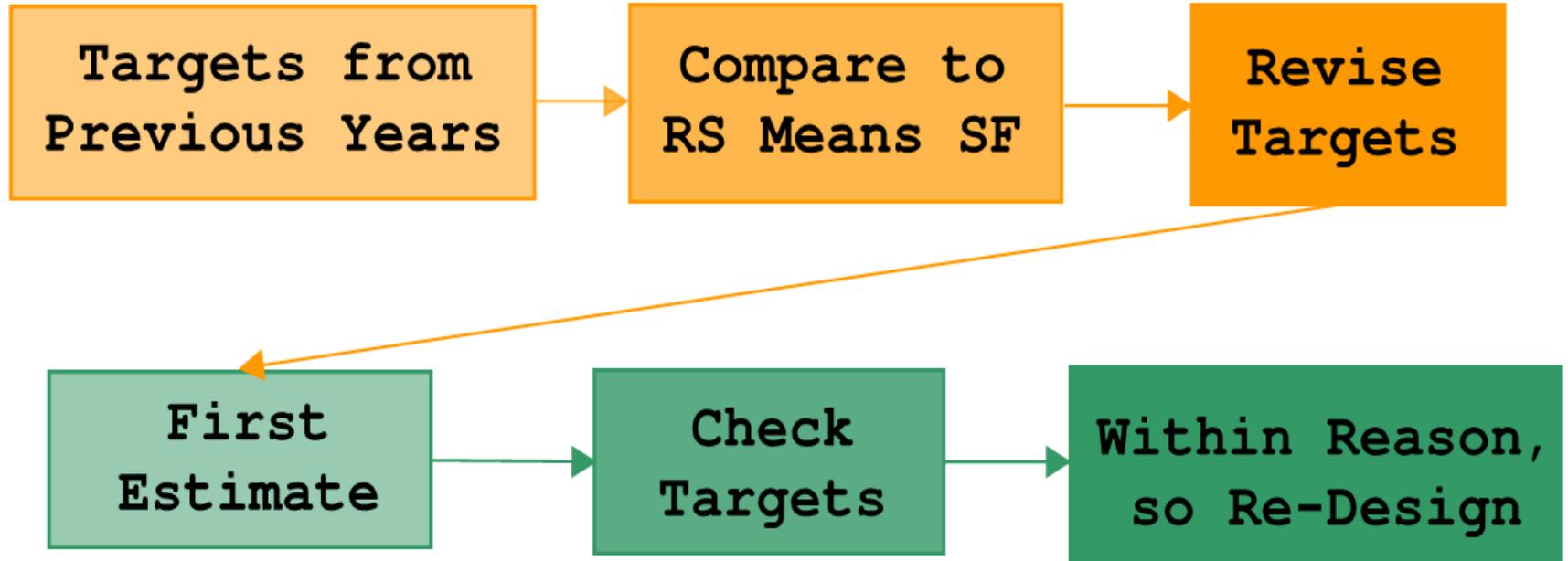
A
E
M
C



Target Value Design

Establishing our Targets

A
E
M
C

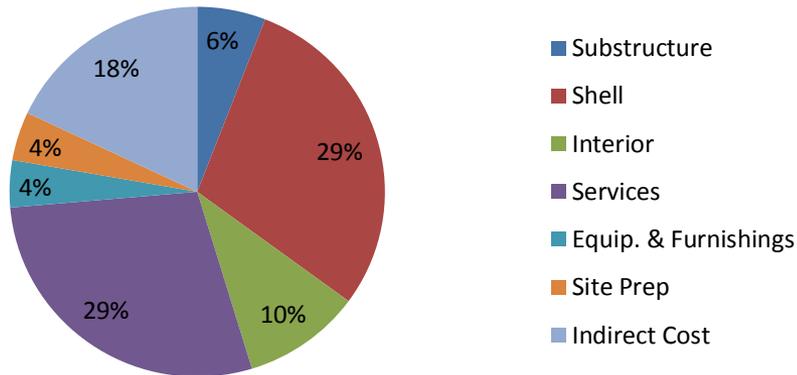


Target Value Design

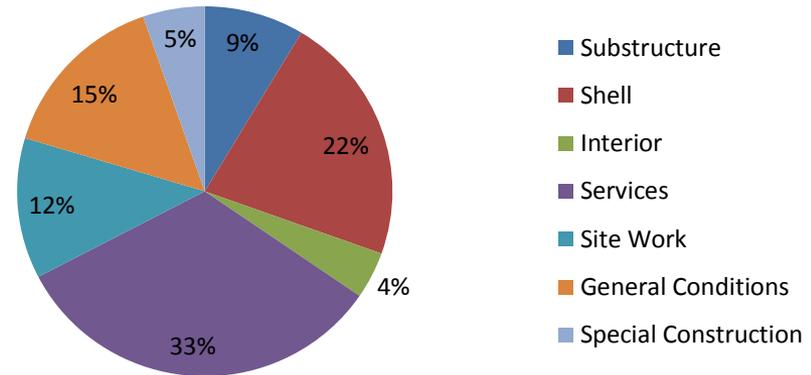
Establishing our Targets

A
E
M
C

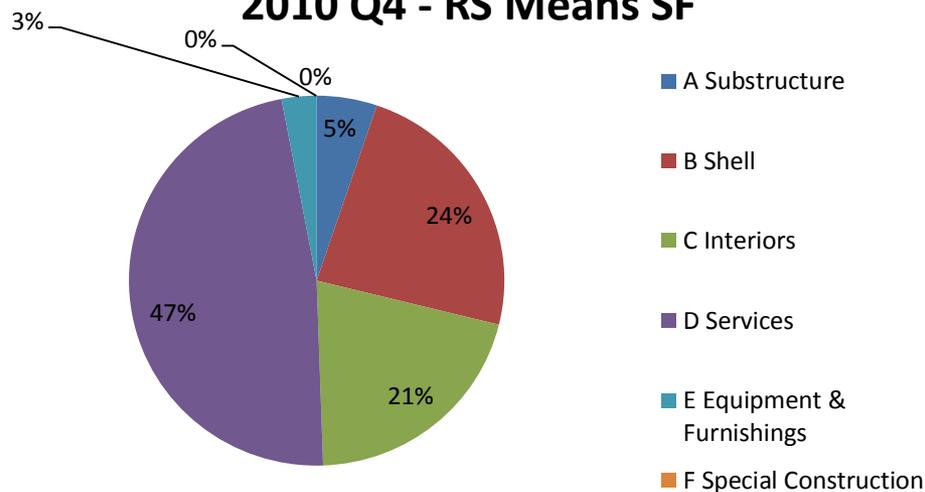
Atlantic-2009 Final



Atlantic-2010 Final



2010 Q4 - RS Means SF

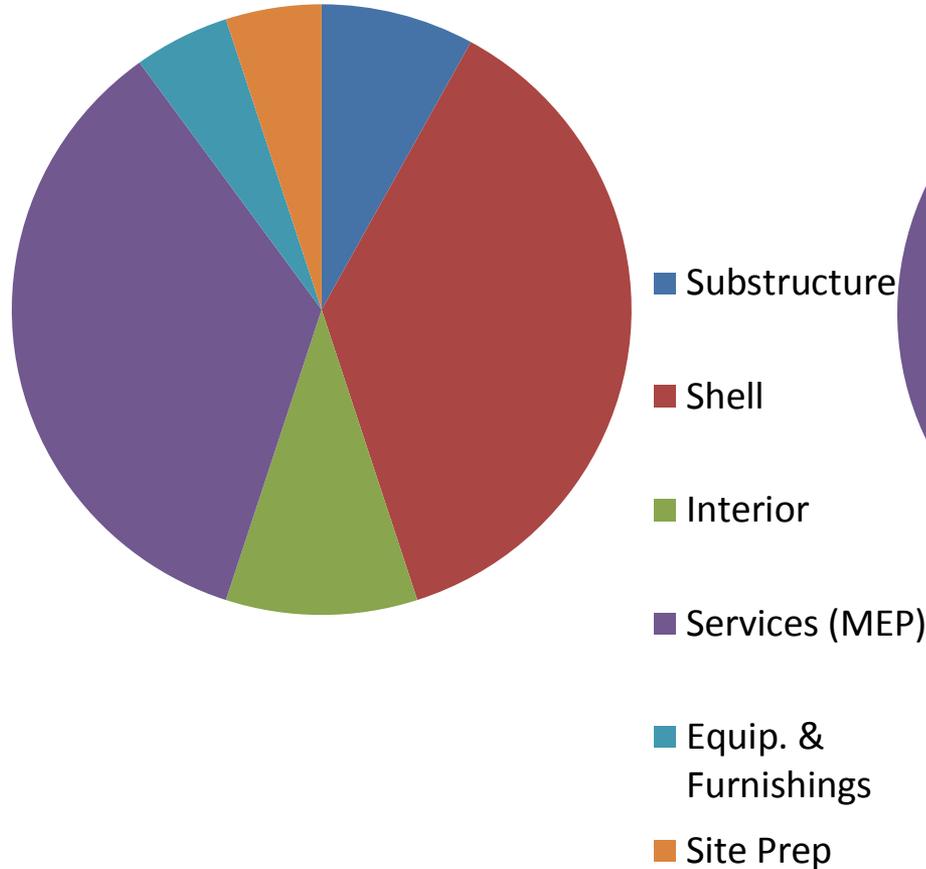


Target Value Design

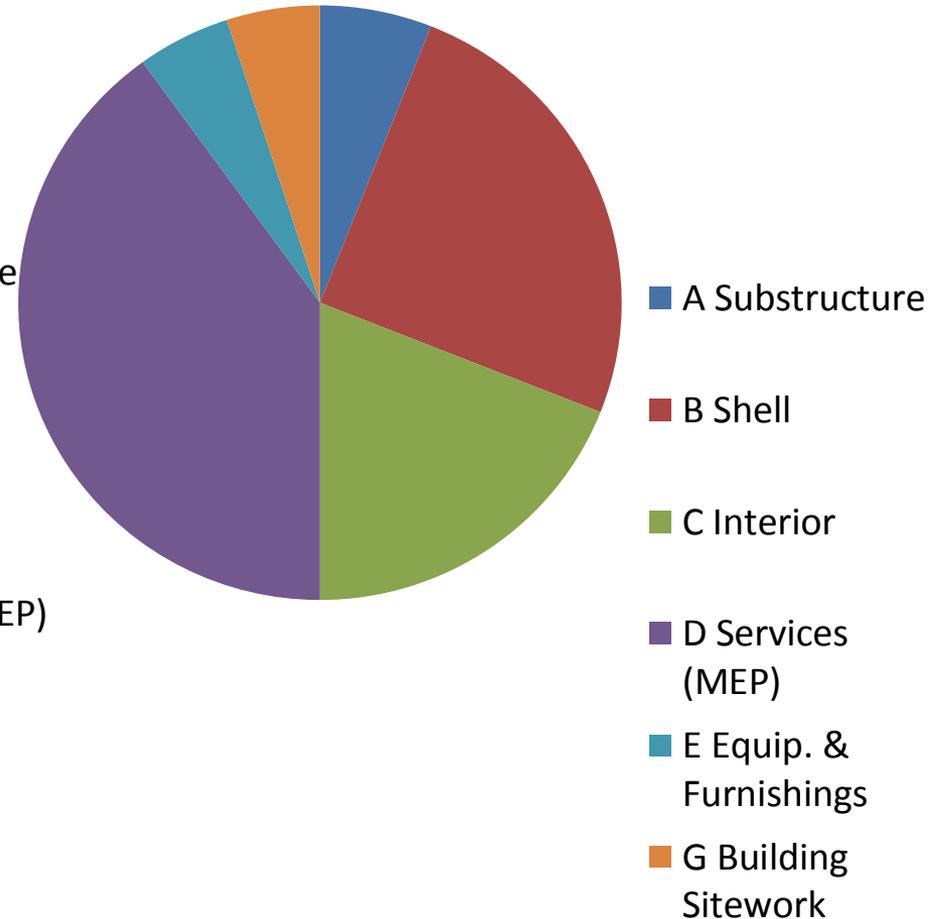
Targets Change

A
E
M
C

Target Values - 02/02/11



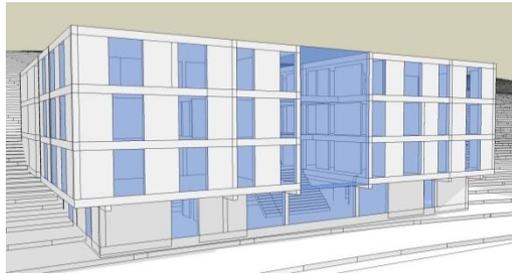
Target Values - 02/15/2011



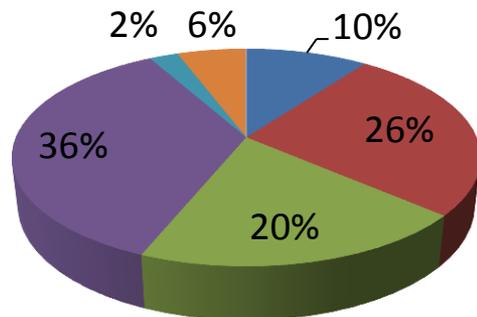
Estimates

Breakdown of Costs

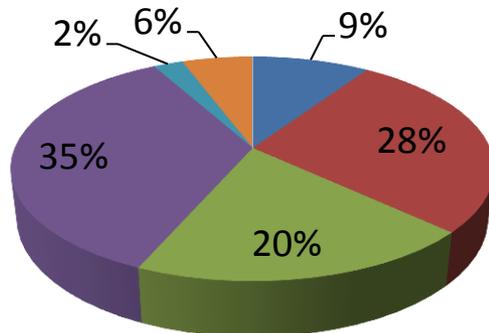
A
E
M
C



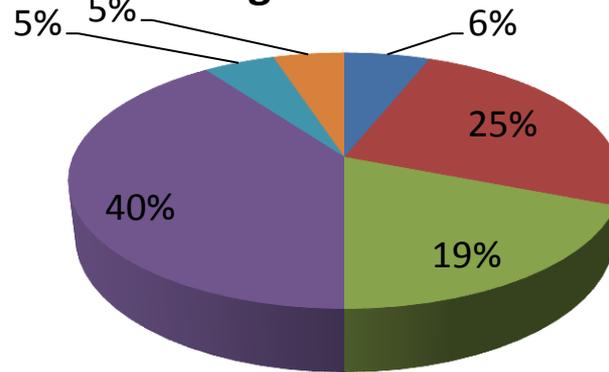
Concrete



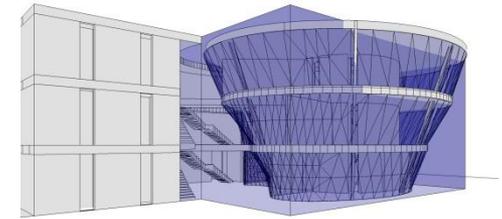
Steel



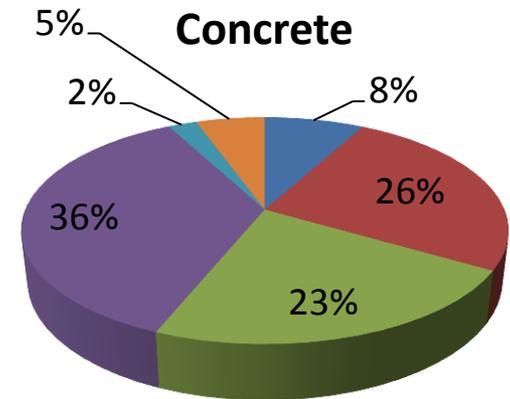
Target Values



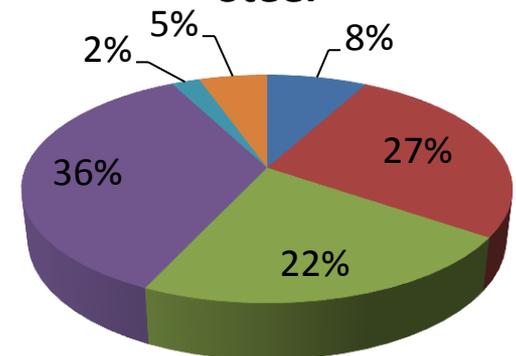
- A Substructure
- B Shell
- C Interior
- D Services
- E Equip. & Furnishings
- G Building Sitework



Concrete

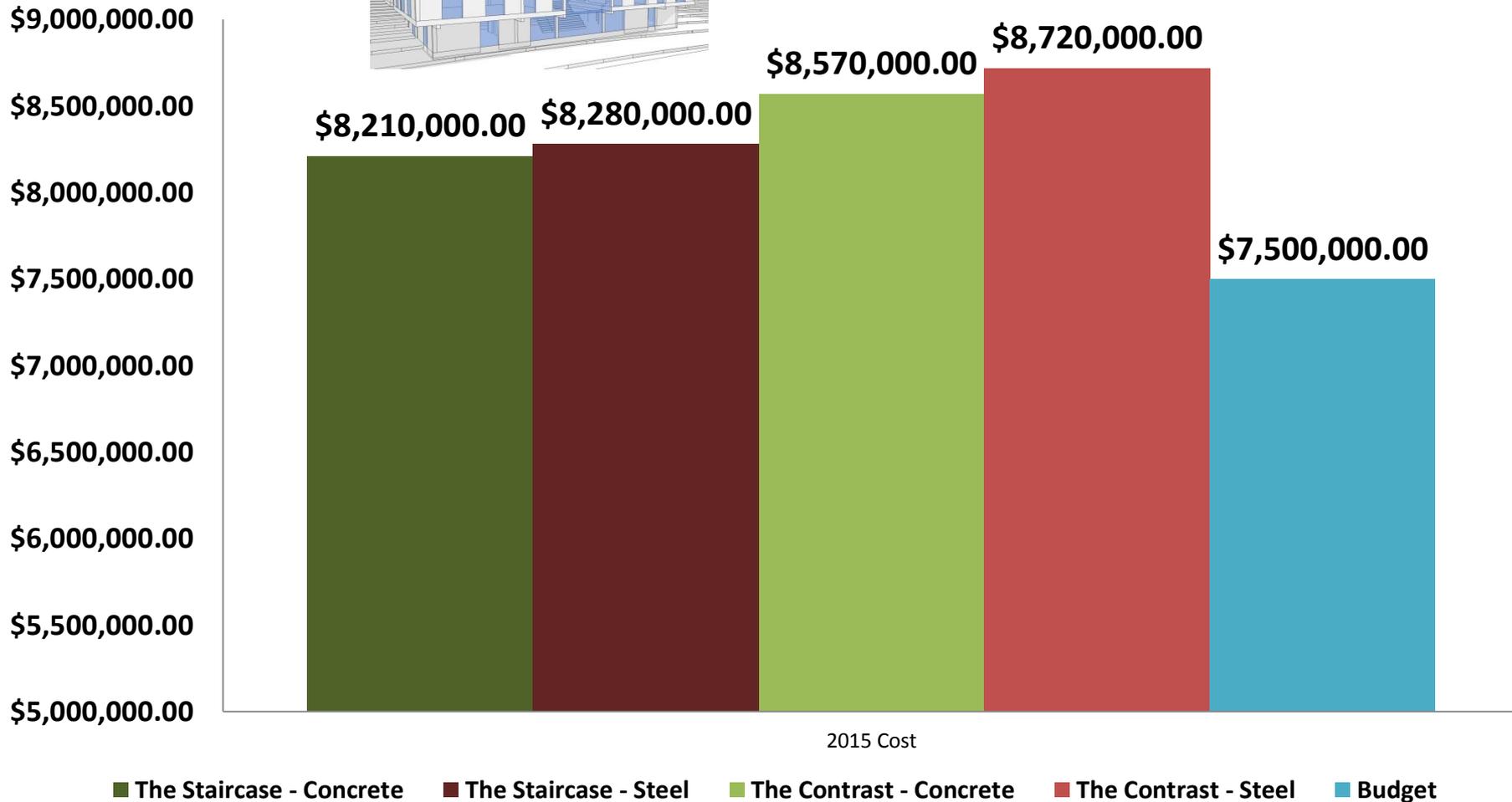
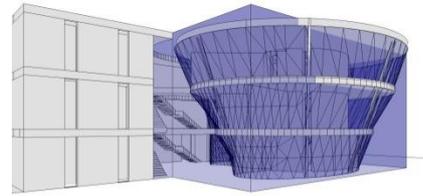
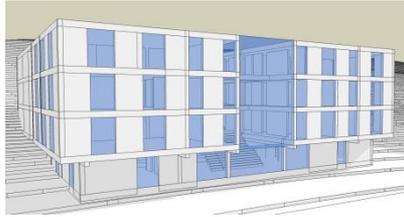


Steel



Estimates

A
E
M
C



Integrated Project Delivery

How do we integrate our knowledge?

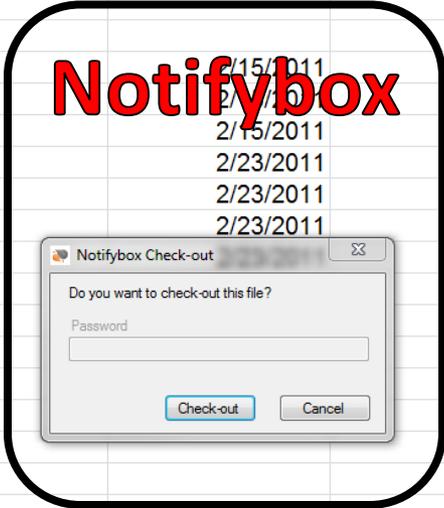
A
E
M
C



Integrated Project Delivery

Daily Updated Commitment List

	A	B	C	D	E	F
	Need ID #	Needs	From Who	For Whom	Meeting Request	Needed By:
1						
2						
3	1	Local Materials Research	KIM			1/28
4	2	size and position of the building	Maria			1/27
5	3	Floor Plan with Dimensions	Maria			2/4
6	4	Updated structural SketchUp Model	Colin			2/9
7	5	max length of members (colums etc	SE, MEP			
8	6	weigth of members	SE, MEP			
9	7	foundation depth	SE	CM		
10	8	Rough Lateral Design	SE's	CM	2/15/2011	1/17
11	9	Rough Foundation Design	SE's	CM	2/15/2011	1/17
12	10	Rough Column Design	SE's	CM	2/15/2011	1/17
13	11	Dewatering Cost	CM		2/23/2011	3/4
14	12	Excavation Cost	CM		2/23/2011	3/4
15	13	Basement Insulation	MEP		2/23/2011	3/4
16	14	Basement Waterproofing	CM			3/4
17	15	Flood Control	CM			3/4
18	16	groundwater pumping requirement	CM	MEP		3/3
19	17	Floor plans	A	MEP		3/2
20	18	Beams dimensions	SE	MEP		3/1
21	19	Floor to floor dimensions	A	MEP		3/1
22	20	Beam positions	SE	MEP		3/2
23	21	Material quantity/types in the cost est	CM	MEP		3/2
24	22	Revised C1 Structural Quantities	SE's	CM		3/3
25	23	First C2 Strucutral Quantities	SE's	CM		3/4
26	24	A MODEL C2	A	SE		3/4
27	25	C1 Revit Model	A	CM		3/6
28	26					
29	27					
30	28					
31	29					
32	30					
33						



Integrated Project Delivery

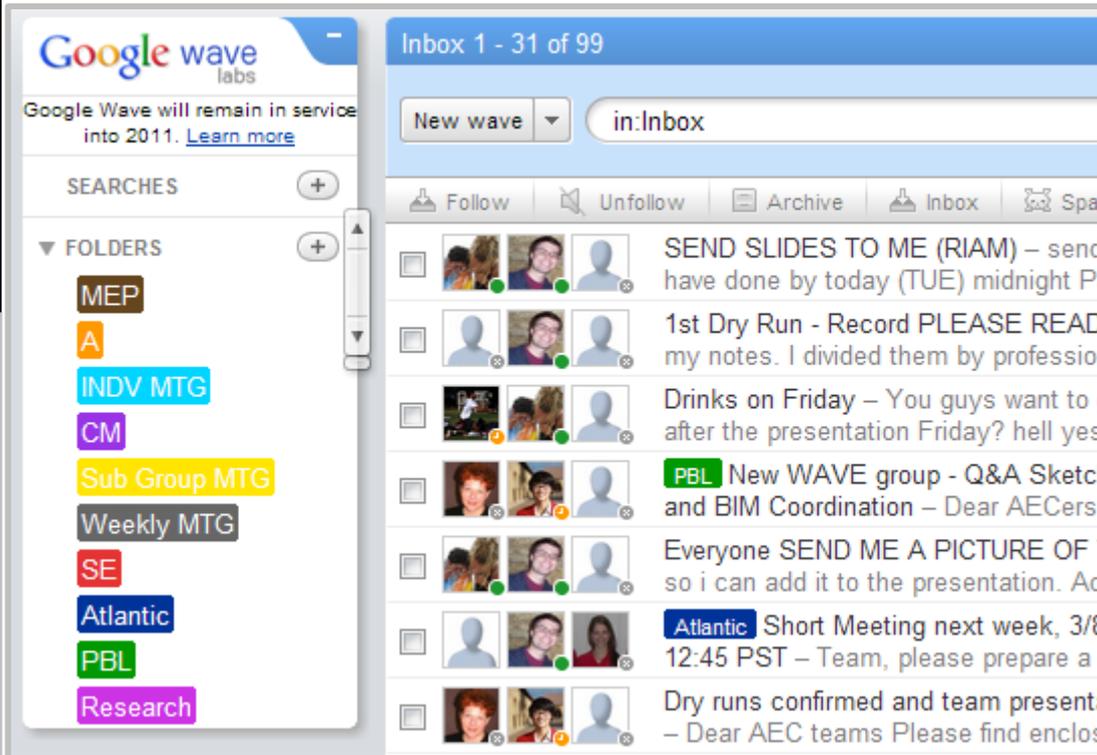
Make work Transparent

Green = Completed
Red = Not Completed

A
E
M
C

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1															
2															
3															
6	By Whom	<u>2/25/2011</u>	<u>2/26/2011</u>	<u>2/27/2011</u>	<u>2/28/2011</u>	<u>3/1/2011</u>	<u>3/2/2011</u>	<u>3/3/2011</u>	<u>3/4/2011</u>	<u>3/5/2011</u>	<u>3/6/2011</u>	<u>3/7/2011</u>			
	RIAM														
33	TRAVIS	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green			
34	TRAVIS														
35	RIAM	Green	Green	Green	Green	Green	Red	Red	Red	Red	Red	Red	Red	Red	Red
36	COLIN	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
37	RIAM	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green			
38	RIAM														
39	RIAM			Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	TRAVIS														
40	RIAM, TRAVIS												Green	Green	Green
41	RIAM, TRAVIS												Green	Red	Red
42	RIAM												Green	Green	Green
43	TRAVIS												Green	Green	Green
44	RIAM												Green	Green	Green
45	RIAM												Green	Green	Green
46	RIAM												Green	Green	Green

Communication



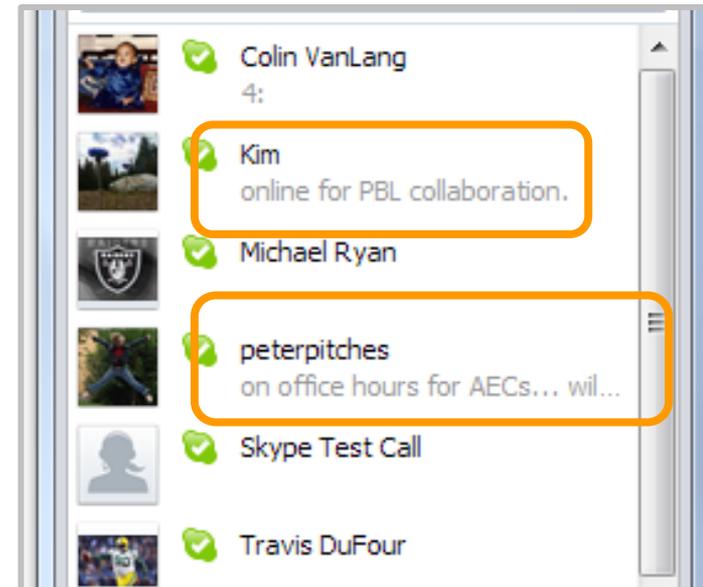
Over 100 Waves



Skype Office Hours

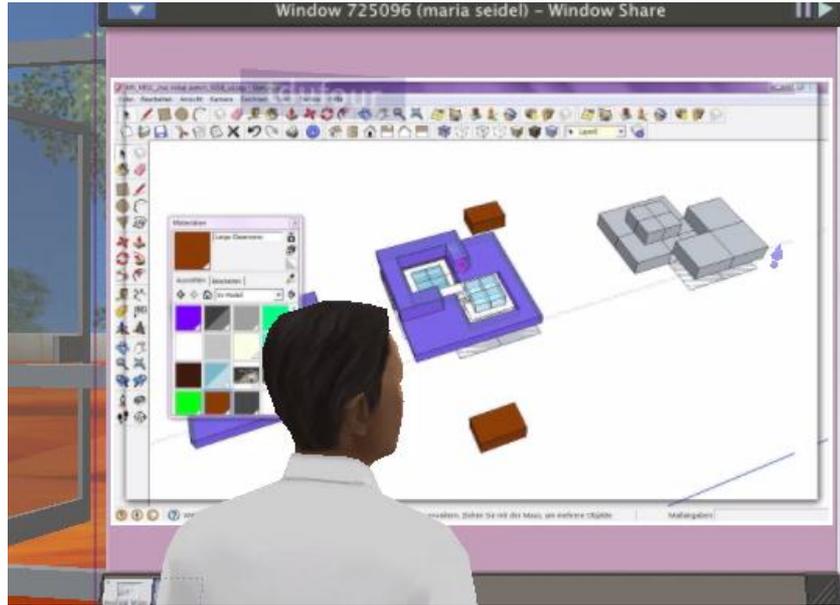
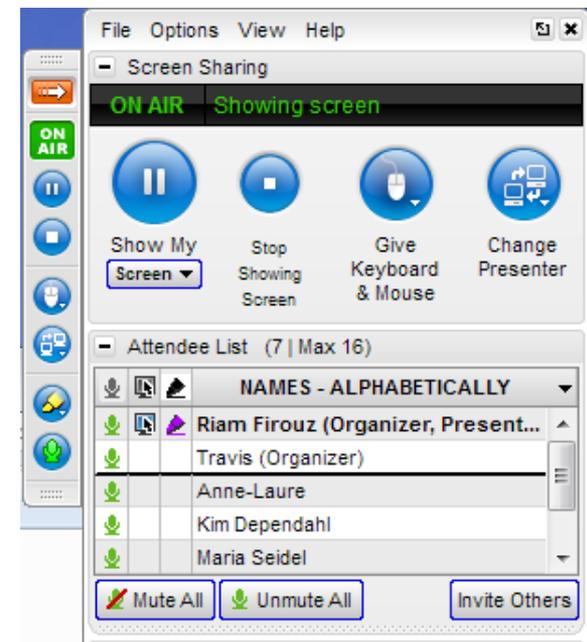
No Email Policy

Meeting Minutes Taken in Real Time in **Wave**



Communication

GoToMeeting®

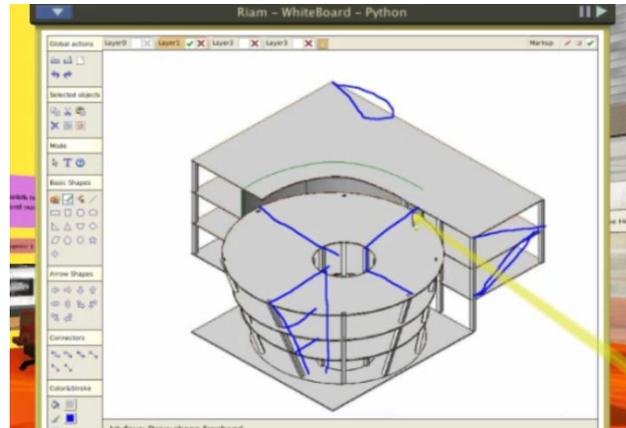


Real Time Presence of Teammates

Screen Sharing

Teleplace

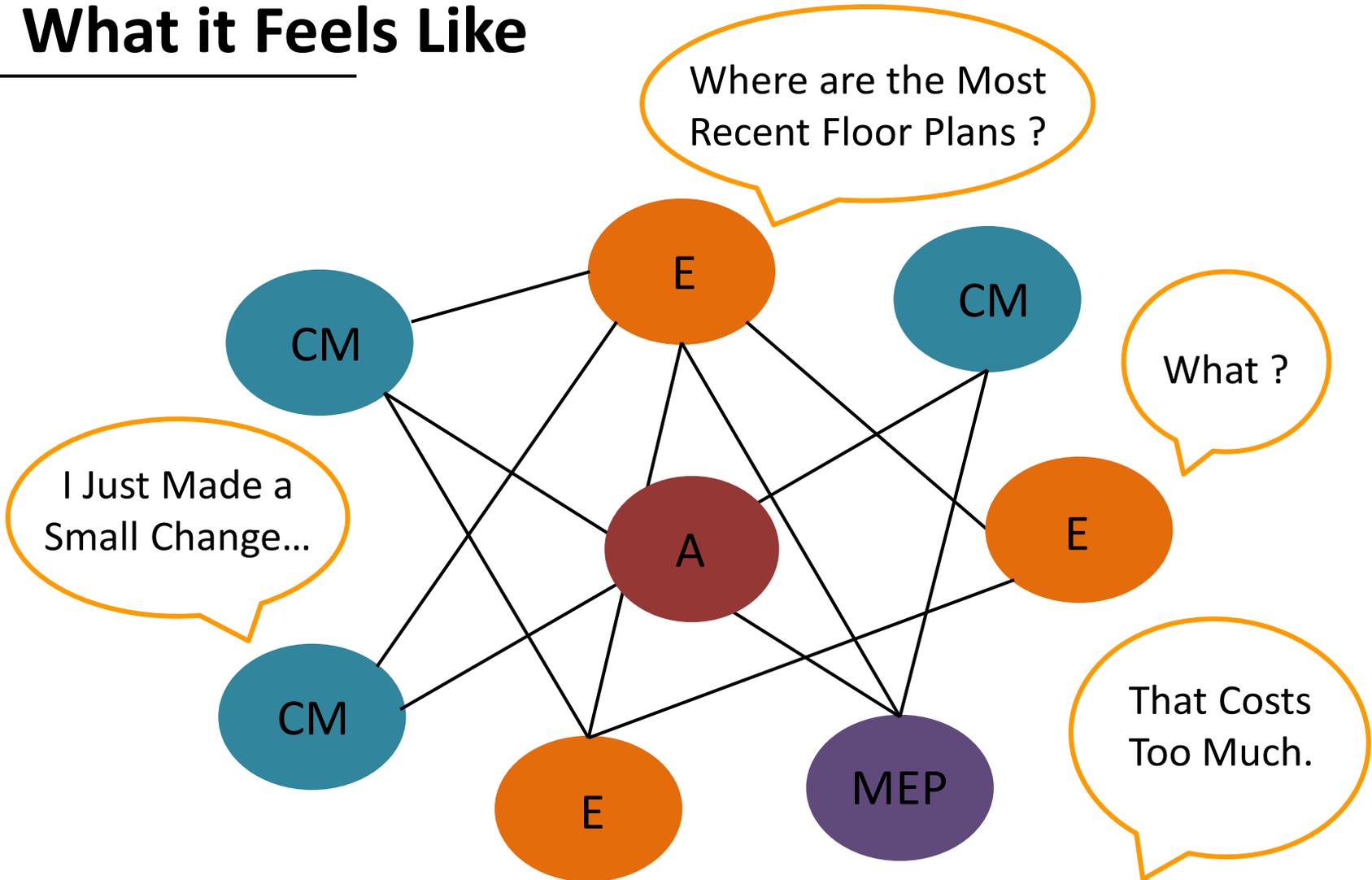
Sketching In the Virtual World



Collaboration

What it Feels Like

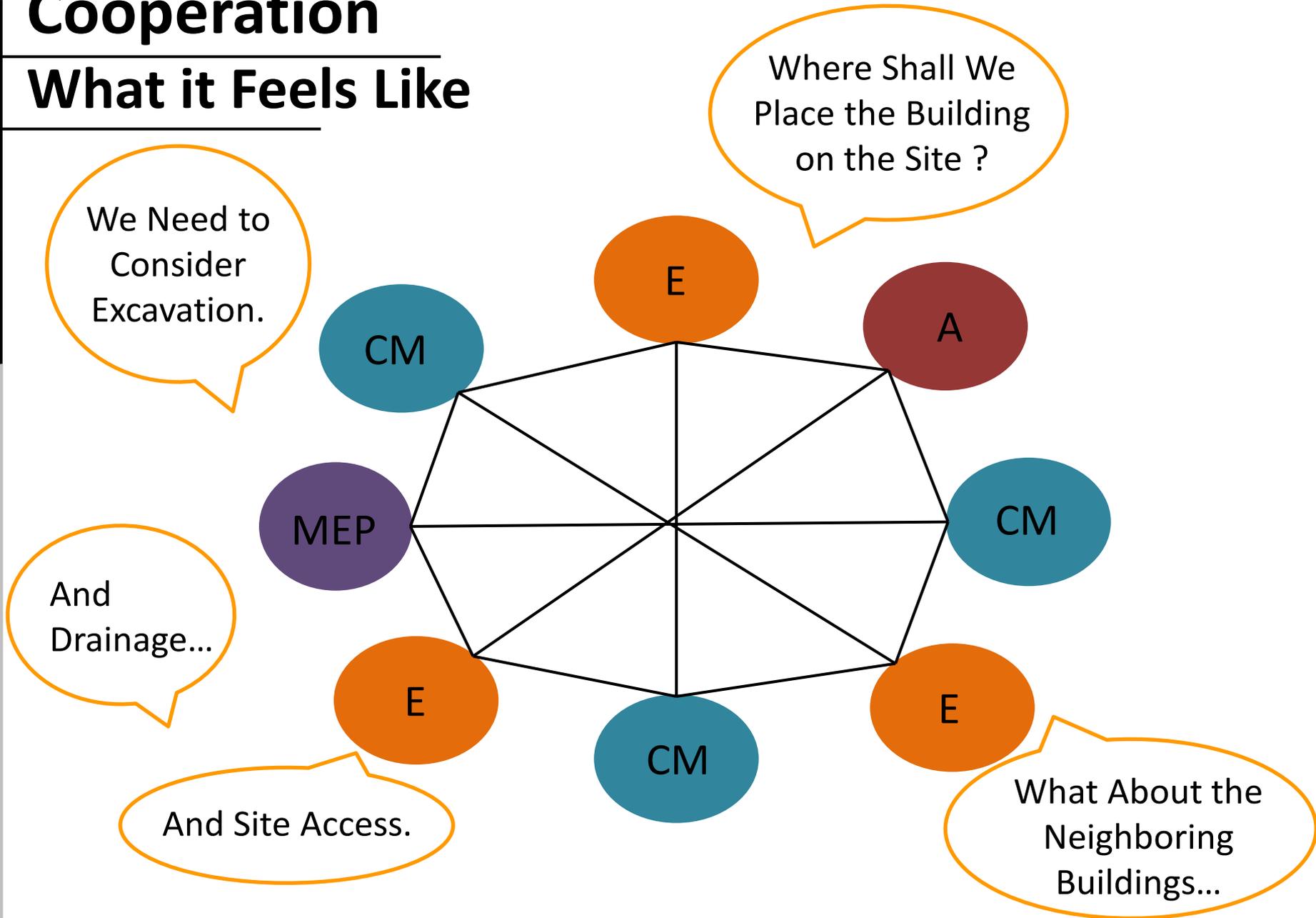
A
E
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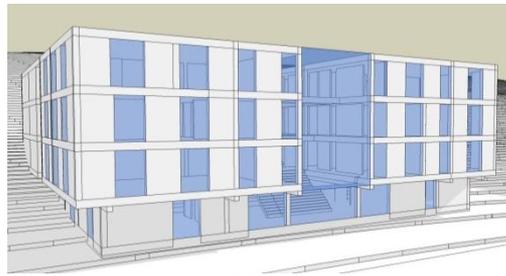
Cooperation

What it Feels Like

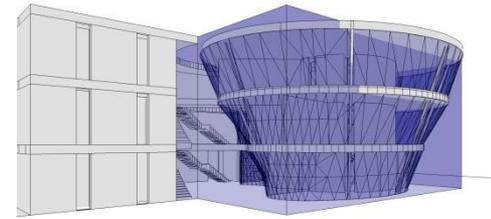
A
E
M
C



Decision Matrix



The Staircase



Contrast

Scale: -2 to 2 with 0 Neutral

Metrics	The Staircase		Contrast		Weight
	Steel	RC	Steel	Mixed	
Symmetry	2	2	0	0	1
Feel	1	1	2	2	1
Iconicity	0	0	2	2	1
Aesthetics	0	0	2	2	1
Simplicity of Structure	0	-1	2	1	1
Innovation	0	0	1	1	1
Sustainability	1	2	1	2	1
Going Native	0	2	0	1	1
Schedule	2	1	1	0	1
Cost	1	2	-2	-1	2
Site	0	1	0	1	1
Constructability	2	1	-1	-1	1
Owner Preference	0	0	2	2	3

TOTAL	10	13	12	15
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Team Atlantic Presents

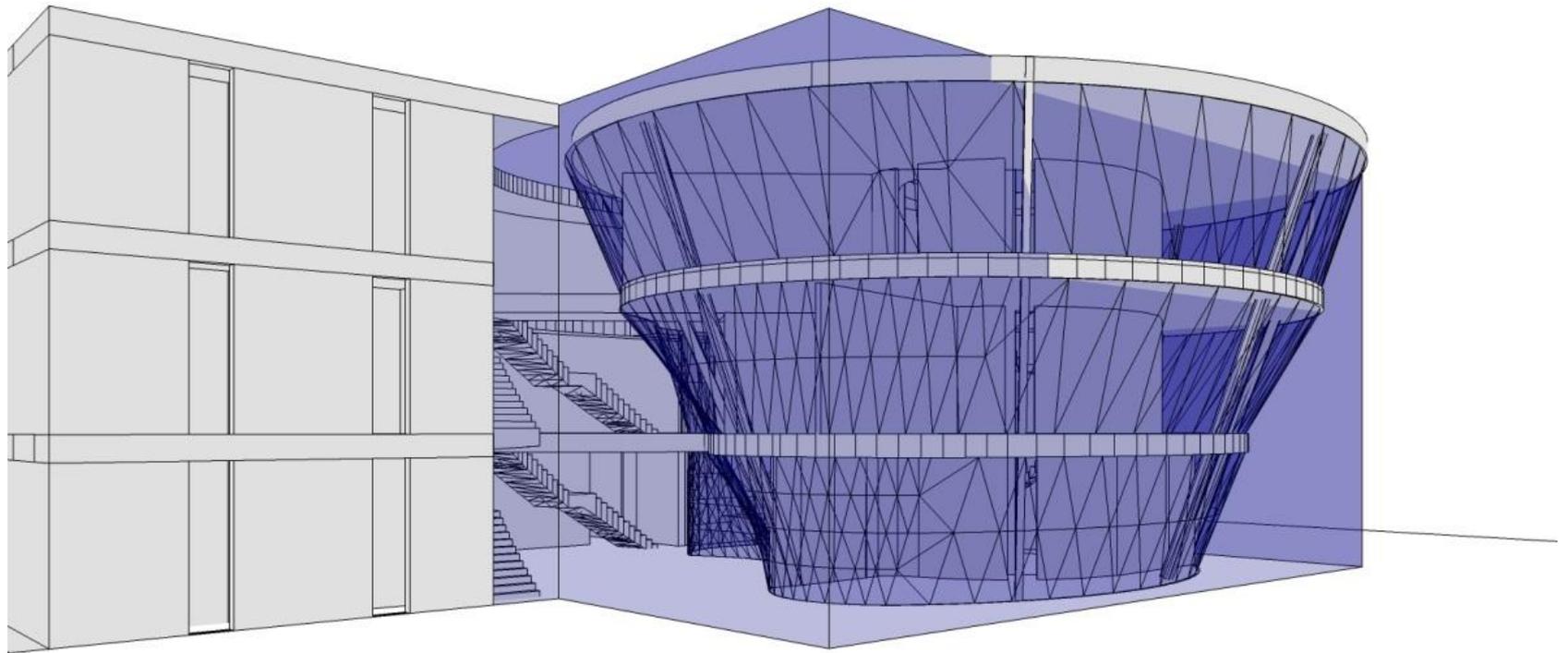
Contrast

A

E

M

C



What Worked

How to Improve

A

E

M

C

Worked:

- Skype Office Hours
- Skype Communication
- Meeting Minutes in Real Time in Wave
- NotifyBox (for Dropbox)

To Improve:

- Updating IPD Task List
- Task Transparency
- Meeting Set Deadlines
- Organizing and Responding to Waves
- Weekly Meeting Efficiency

A

E

M

C

Josh Odelson

Glenn Katz

All the Mentors

Renate

Martin Dembski

Tine Logonder

David Bendet

Thank You!

Willem Kymmell

Lauren Scammell

Eric Borchers

Ivo Zagar

Prof. Miranda

Marko Balant

Prof. Borja

Michael Pearson

Prof. Krawinkler

Prof. Nelson