Express *2012*

MEET THE TEAM

COURTNEY WONG
Stanford
Structural Engineer

CURTIS WONG
Stanford
Structural Engineer

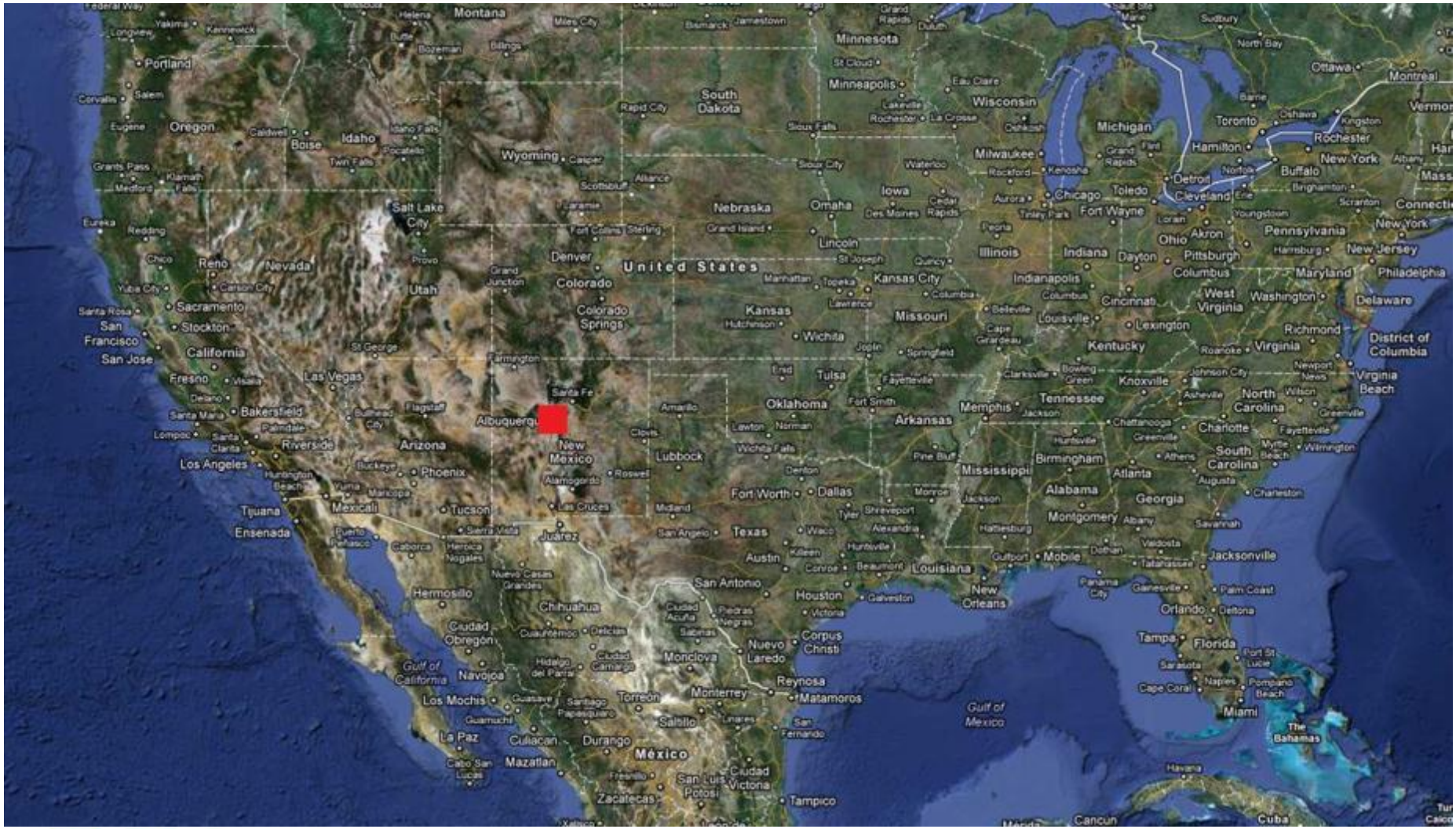
DIANA LOUIE
Stanford
Construction Manager

SARA SUNDELIN
Stanford
Construction Manager

JOHN DODINI
Stanford
Apprentice

KAROLINA OSTROWSKA
Warsaw Univ. of Tech
Architect

SITE LOCATION

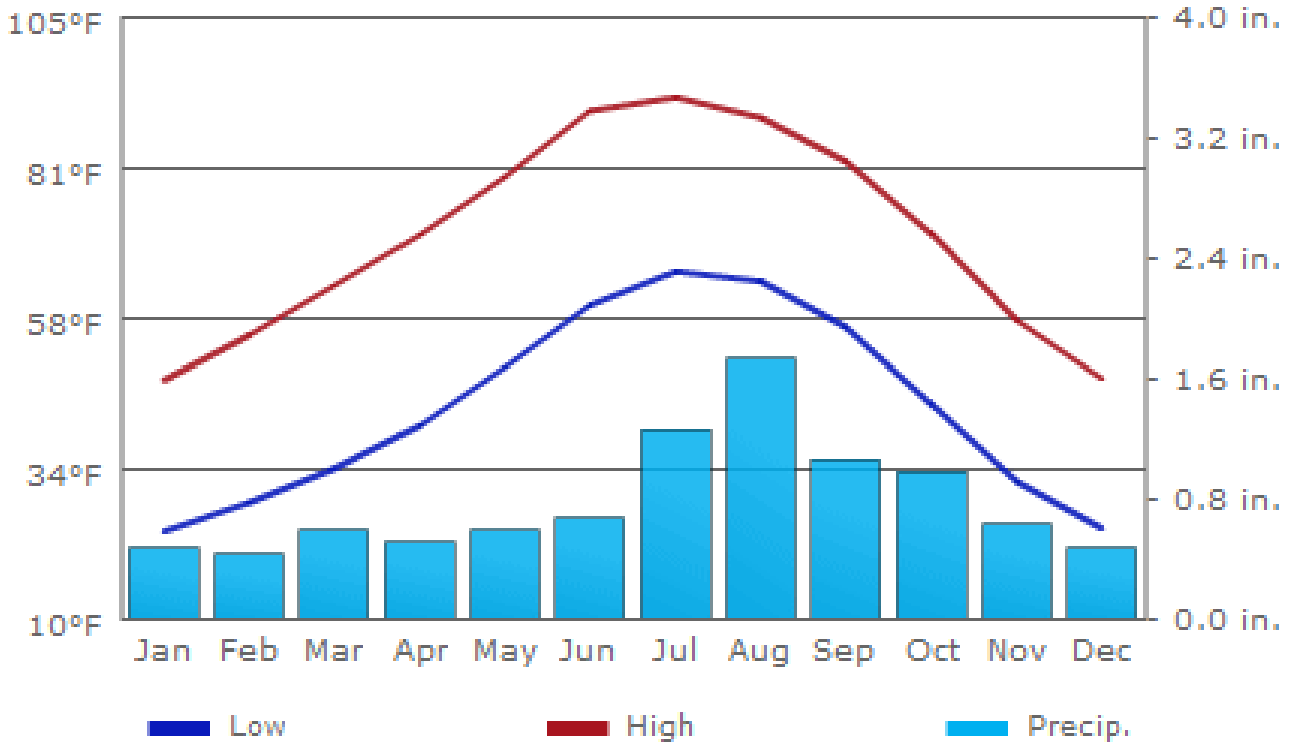


Albuquerque, NM, 35°06'39"N 106°36'36"W

SITE LOCATION

Albuquerque, NM, 35°06'39"N 106°36'36"W

SITE CLIMATE CONDITIONS

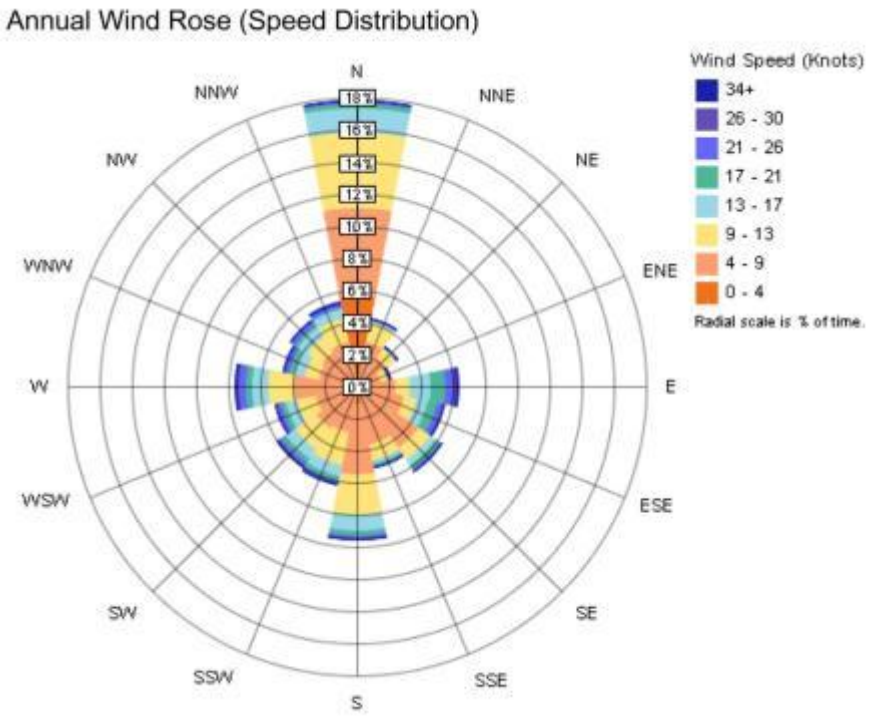


Temperature & Precipitation

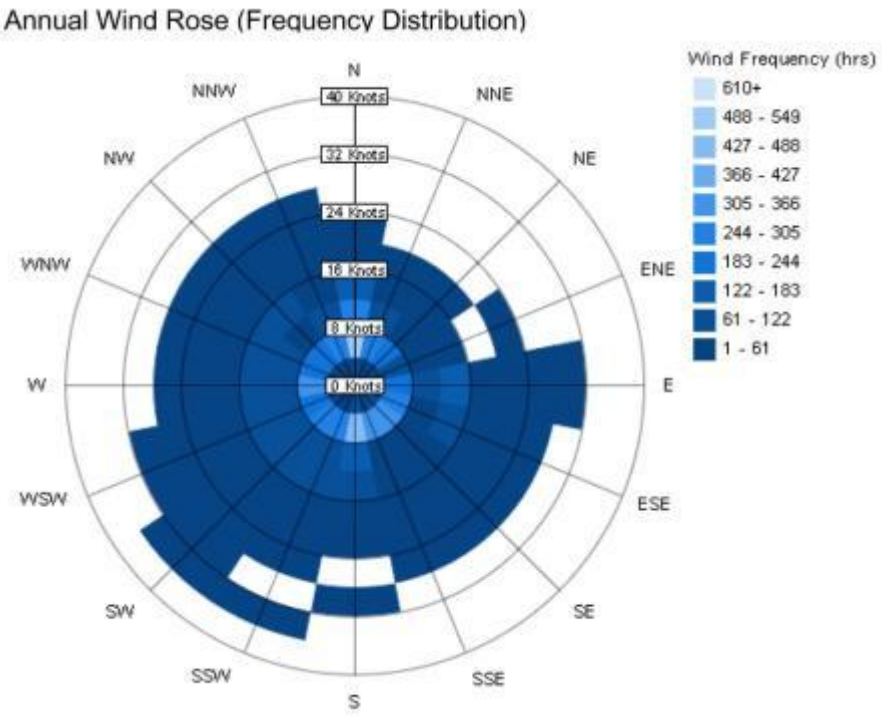
SITE CLIMATE CONDITIONS

- Annual average high temperature: **70.4 ºF**
- Annual average low temperature: **43.2 ºF**
- Annual average preciptitation: **9.4 inches**
- Annual average sunshine: **3418 hours**

Annual Wind Rose (Speed)

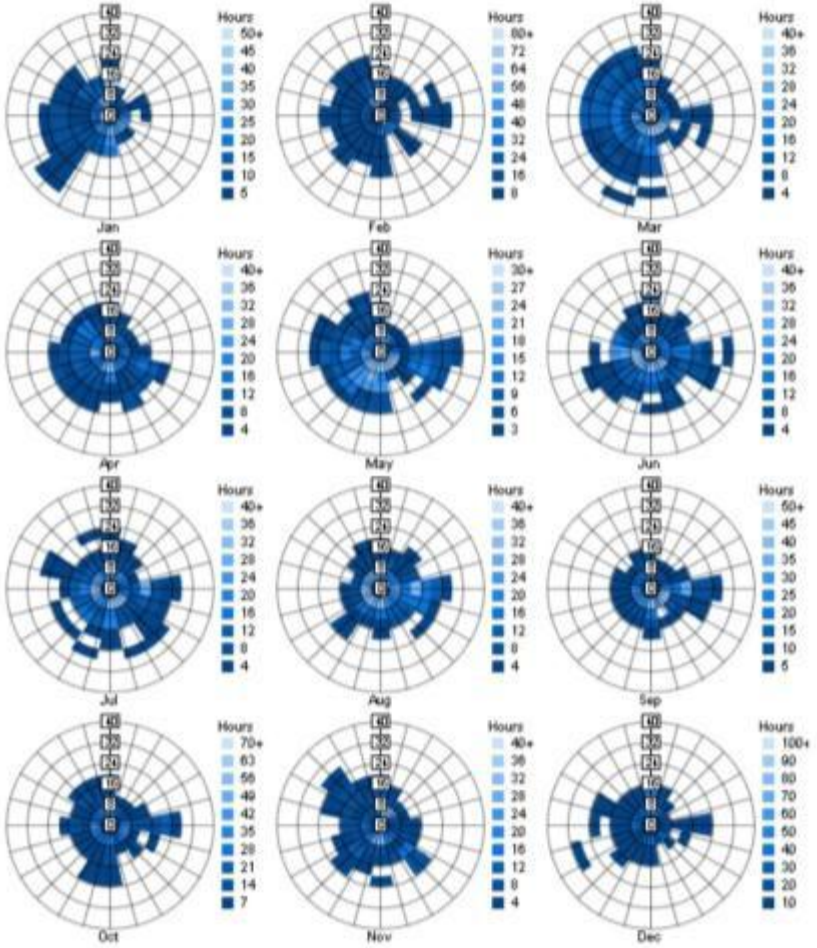


Annual Wind Rose (Frequency)

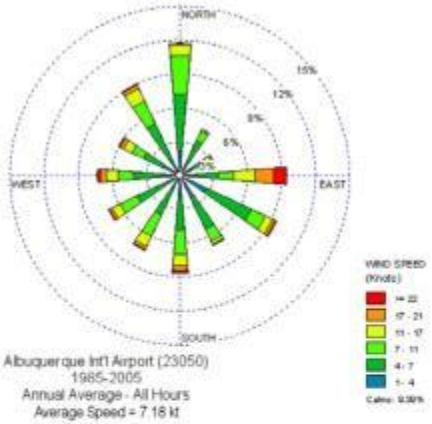


SITE CLIMATE CONDITIONS

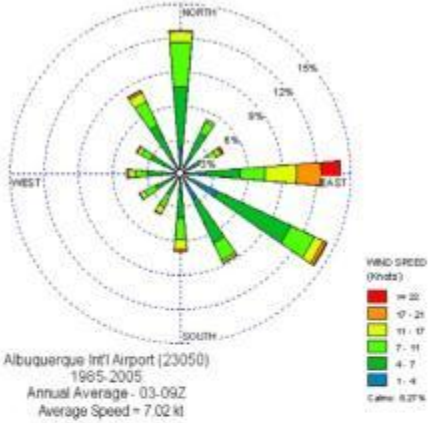
Monthly Wind Roses (Frequency Distribution)



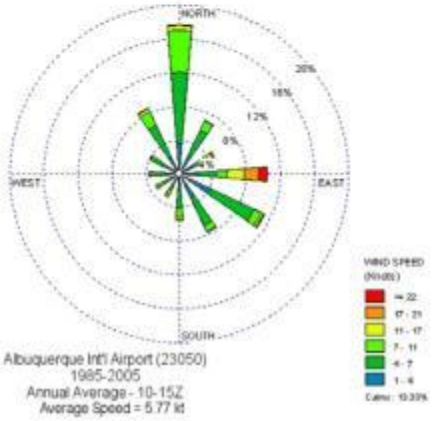
Frequency distrubution throughout day



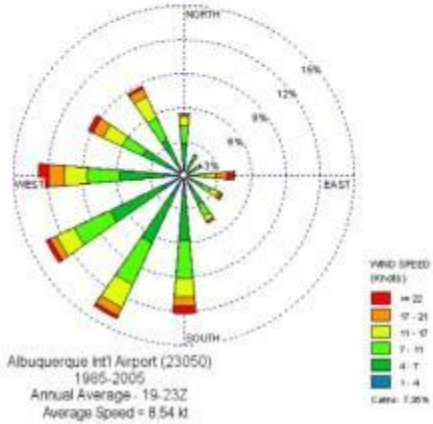
Albuquerque Int'l Airport (23050)
1985-2005
Annual Average - All Hours
Average Speed = 7.18 kt



Albuquerque Int'l Airport (23050)
1985-2005
Annual Average - 03-09Z
Average Speed = 7.02 kt



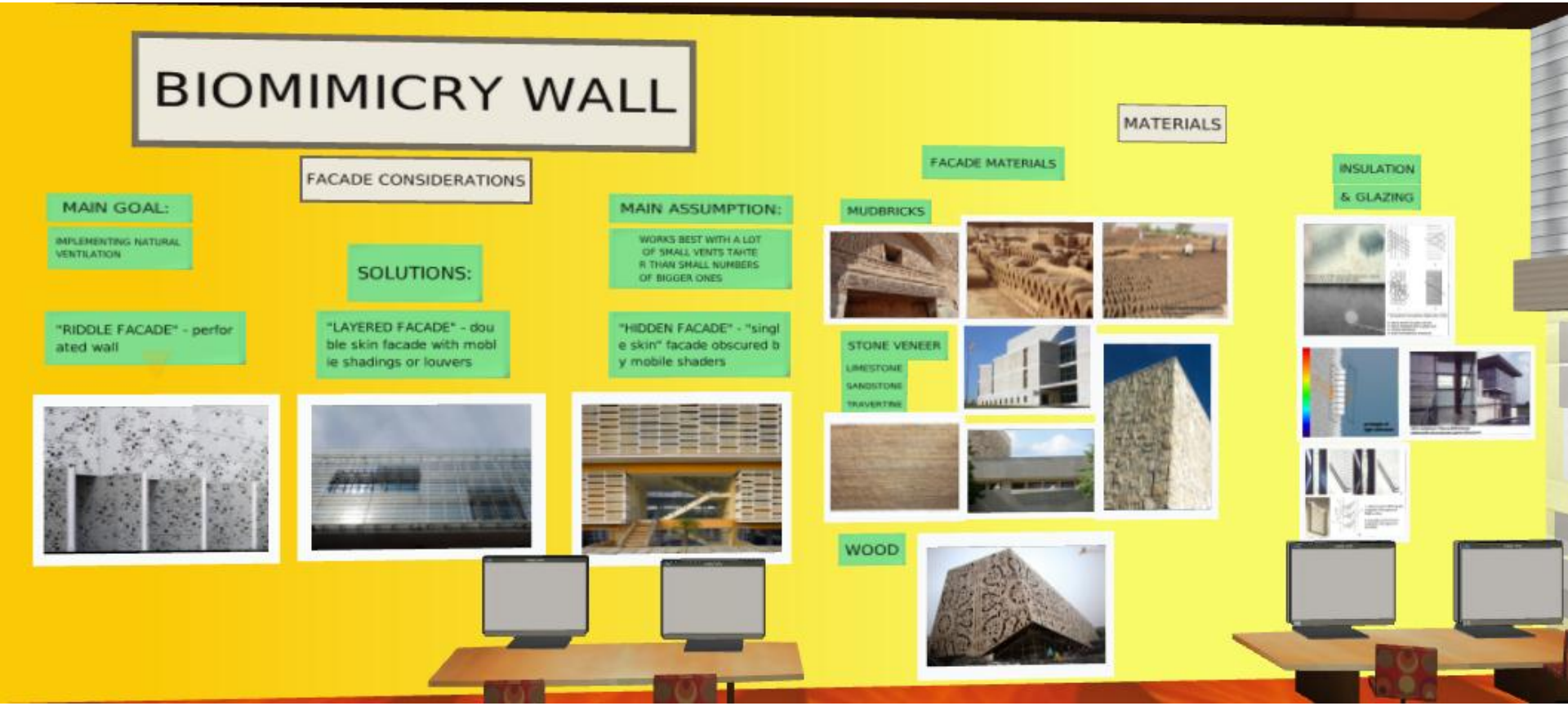
Albuquerque Int'l Airport (23050)
1985-2005
Annual Average - 10-15Z
Average Speed = 5.77 kt



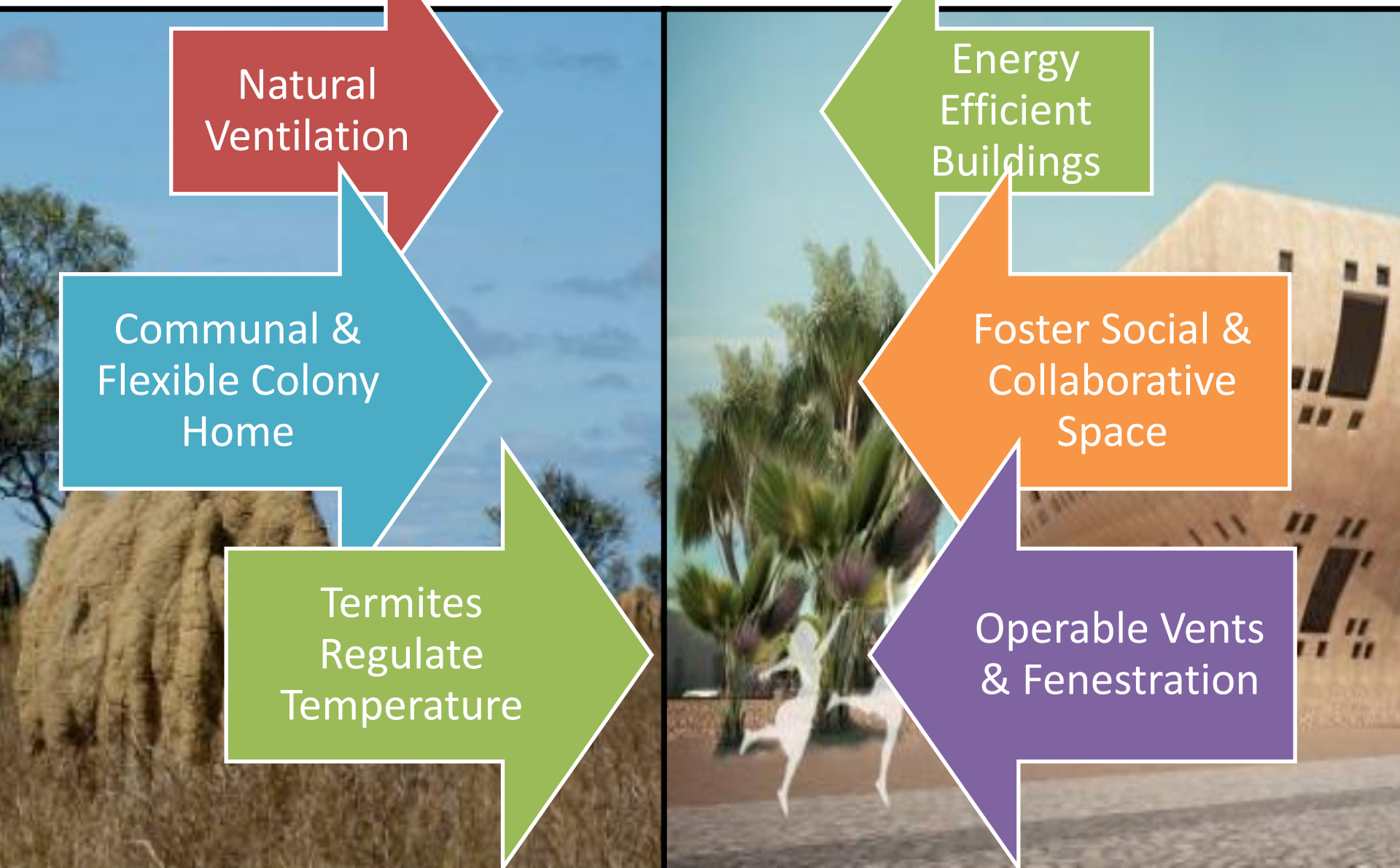
Albuquerque Int'l Airport (23050)
1985-2005
Annual Average - 19-23Z
Average Speed = 8.54 kt

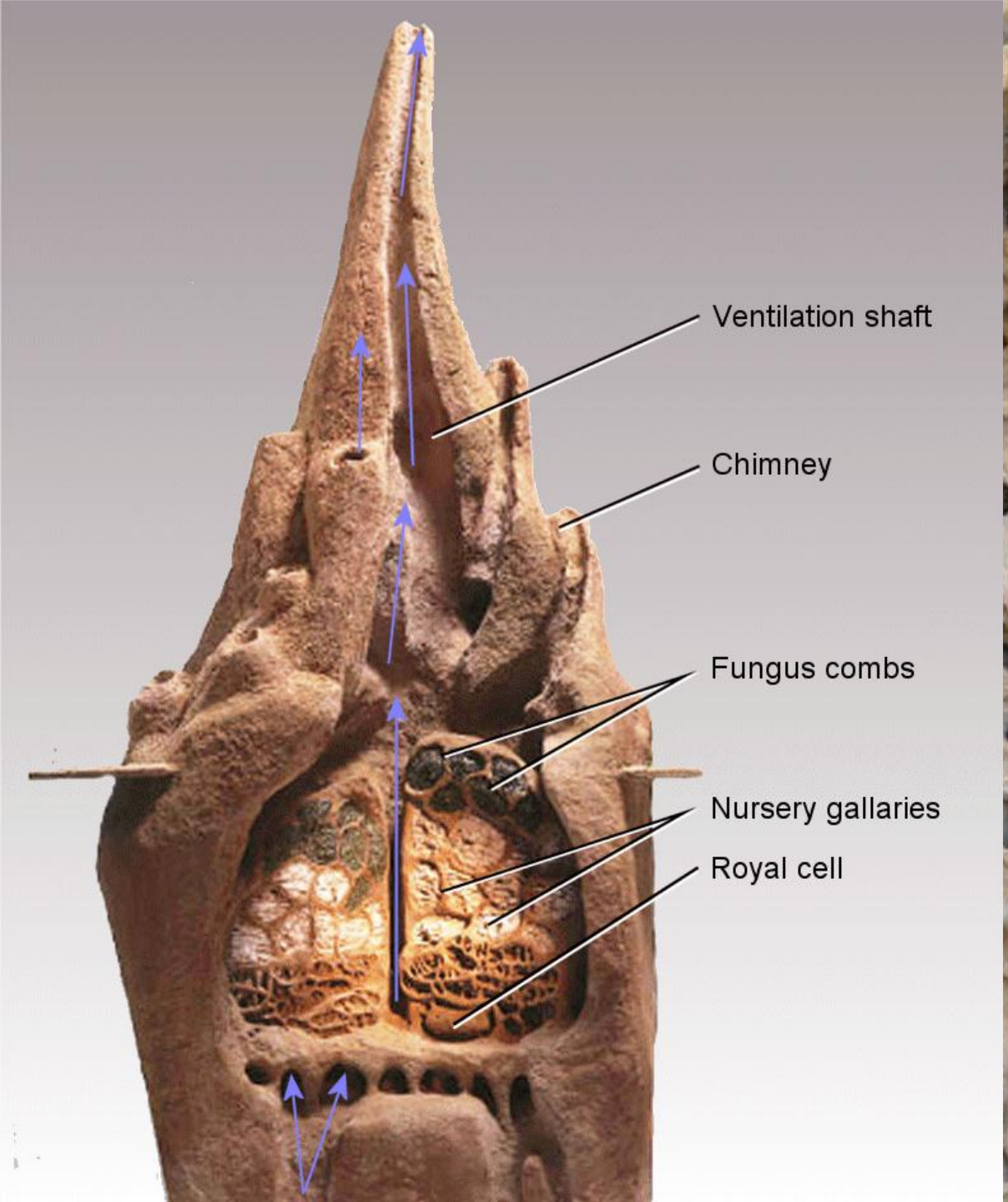
Wind

BIOMIMICRY TEAM INSPIRATIONS



TERMITE MOUND FEATURES




Ventilation shaft
Chimney
Fungus combs
Nursery gallaries
Royal cell

SITE LOCATION

Albuquerque, NM, 35°06'39"N 106°36'36"W

SURROUNDINGS

NEARBY BUILDINGS

SURROUNDINGS

NEARBY BUILDINGS

SURROUNDINGS

GREENERY

SURROUNDINGS

COMMUNICATION

DECISION MATRIX – WINTER QUARTER

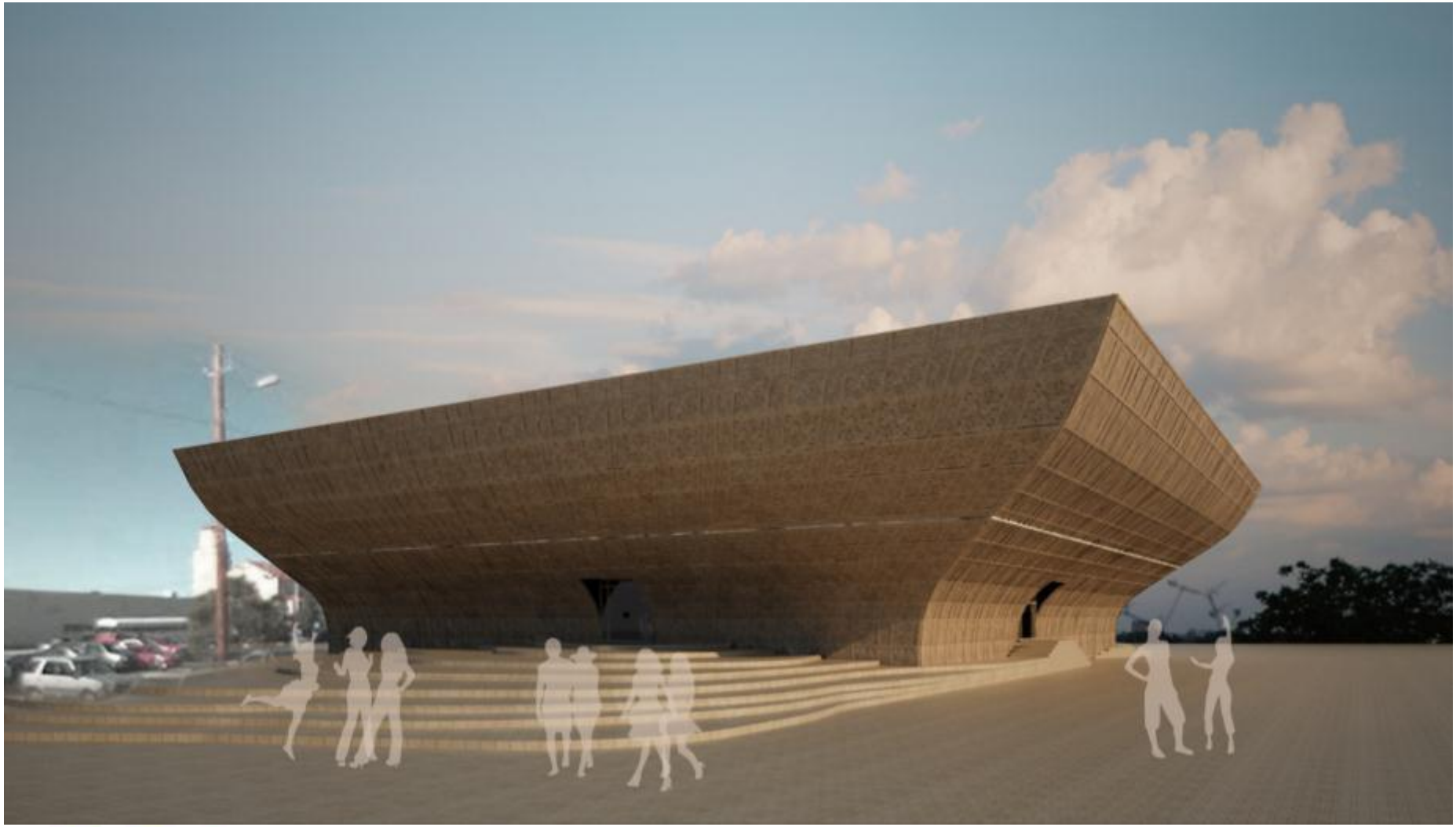
	Parameters	TERMITE ENTERPRISE		INVERTED MOUND	
		Cellular beams	Post-tensioned	Regular steel	Bubble deck
Arch.	Design (interior) space	3	3	3	3
	Overall Aesthetics / Impression	3	3	2	2
	Effective Organization	2	2	3	3
Construction	Relation to Site	1	1	2	2
	Prefabrication	3	1	2	3
	Achievement of Milestones	3	1	2	3
	Constructability	2	1	3	3
	Local Materials Available	1	3	2	1
	Estimate Cost Compliance	1	1	2	3
Structural	MEP Installation / Compatibility	3	2	1	2
	Structural Cost	2	1	2	3
	Structural Aesthetics	3	1	2	1
General	Natural Ventilation	3	3	2	2
	Energy Efficiency	2	2	3	3
	Sustainability	2	3	2	3
	Biomimicry	3	2	2	3
	Overall Preference	3	1	1	2
	Team Score	94	75	85	102
	Combined Owner Score	96	88	81	82
	Total Overall Score	**95**	**84**	**82**	**89**

DECISION MATRIX

TERMITE ENTERPRISE CONCEPT

DECISION MATRIX

INVERTED MOUND CONCEPT

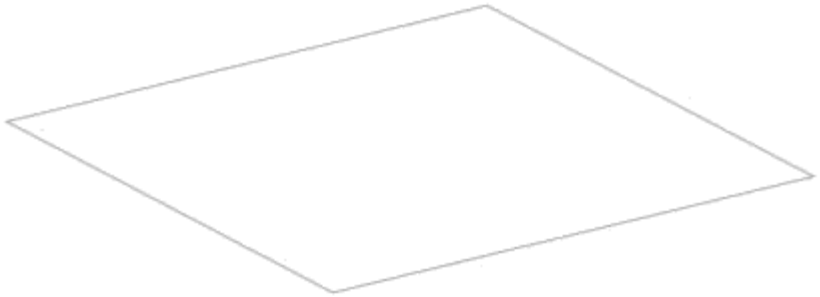


REVISED DECISION MATRIX

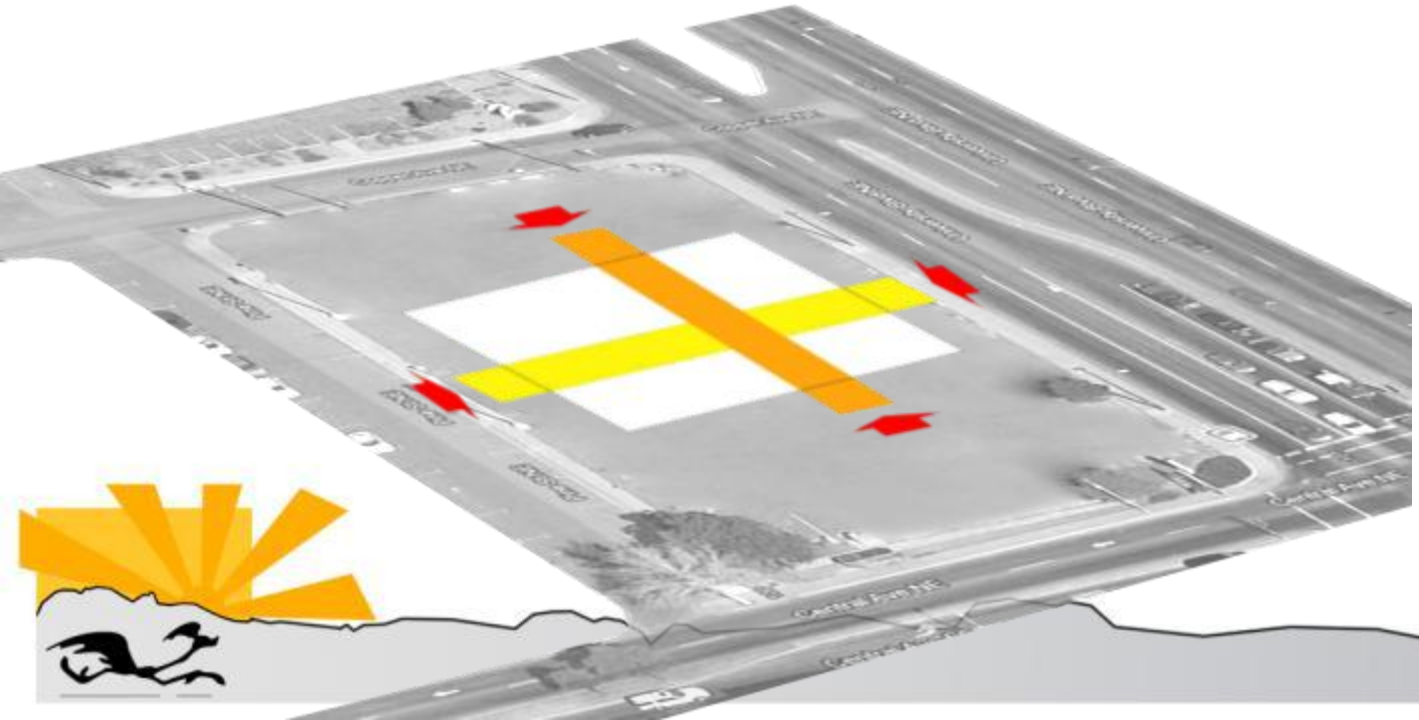
FINAL DECISION MATRIX
CONCEPTS COMPARISON

	TERMITE ENTERPRISE	INVERTED MOUND
Functional efficiency	+ providing different level of privacy to different floors + found space for additional functionality - small cafe - not all the suggested affinities are met - auditorium close to faculty offices - inefficient communication - about 40% of total area - complicated communication on the top floor - zigzagging corridors, wasted space	+ providing different level of privacy and security to different floors + found space for additional functionality - small cafe + about 10% savings in gross total SqFt - total building area is less than 27 000 SqFt + very efficient relation between circulation and assignable square footage - communication takes less than 30% of gross total SqFt + clear organization of floor plans + compactness transfers into cost efficiency
Egress	- insufficient egress possibilities from auditorium - all egress paths lead to the middle of the building	+ clear and easy egress from every zone + egress paths shorter than in Termite Enterprise
Flexibility	+ possibility of opening and manipulating student offices and classrooms - inflexible top floor	+ possibility of opening and manipulating most of the rooms: student offices, large/small classrooms, auditorium, seminar rooms
Biomimicry	+ North-South orientation refering to termite mound - flat-looking form - extensive - low efficiency of natural ventilation	+ more organic shape + thanks to smooth shape wind from different directions is way easier to catch + self-shading form - self-protecting from sun at its' peak + more sustainable thanks to good functional organization
Overall impression	- chaotic, complicated design - engages too many ideas	+ more well balanced look + simpler, more friendly design
Rework needed	- need of redesigning the entire auditorium area, which would change the whole impression of the building - need of decreasing communication area - need of redesigning the facade	- need of redesigning the facade
Structural compatibility	+ stacking of large rooms - more efficient location of large spans - complicated floor plans - complicated facade	+ simple floor plans + stacking of rooms - complicaded facade
MEP compatibility	- some parts of the building unavailable for natural ventilation - building shape not supporting natural ventilation - because of building's expanse air stack effect is impossible - building's expanse requires complicated MEP design - long distances between rooms implicate need of more wires, pipes, ducts	+ availability of stack effect + building shape more supporting natural ventilation + compact form allows easier and cheaper heating as well as cooling + compact form implicates less complicated MEP design + shorter distances between rooms that need to be connected to certain MEP services

PHASE I - FEBRUARY



PHASE I - FEBRUARY



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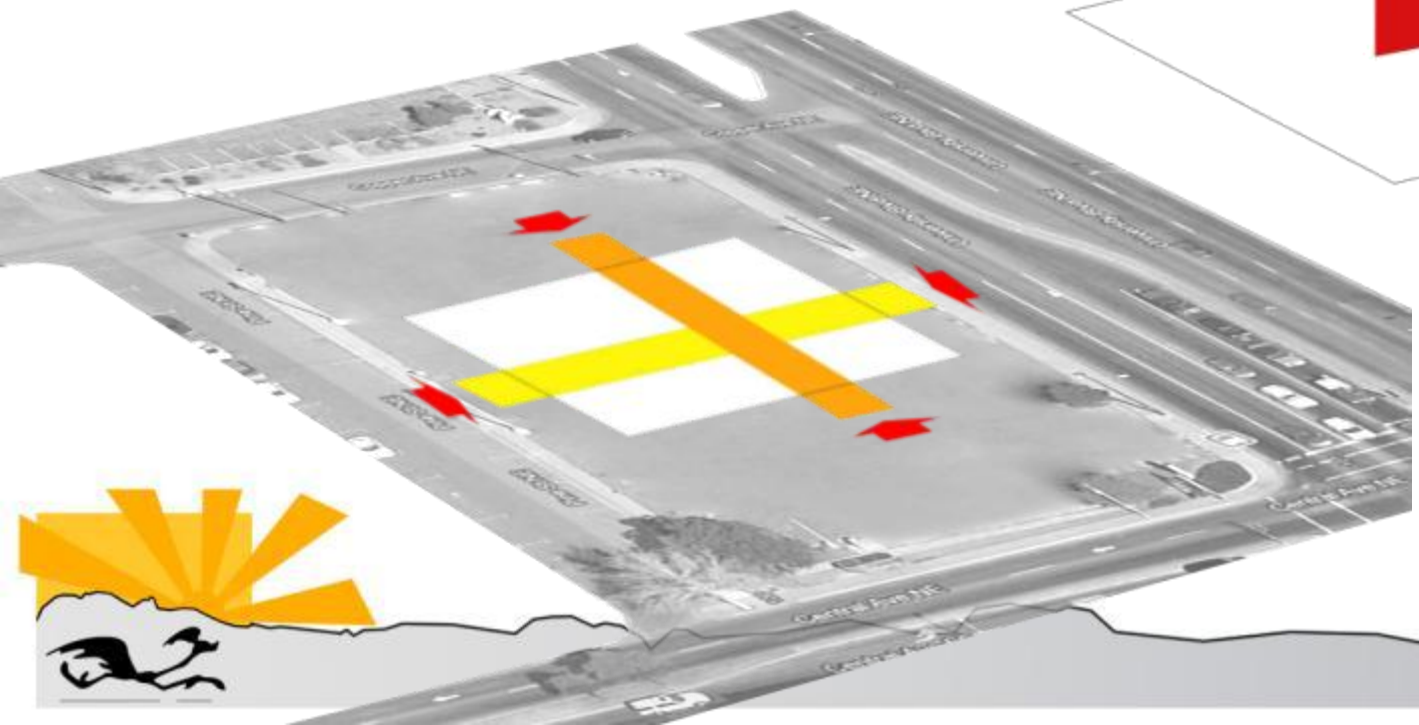

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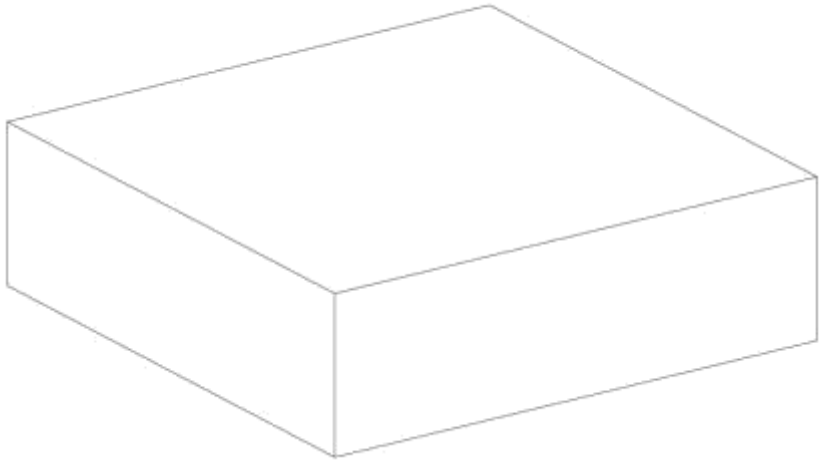

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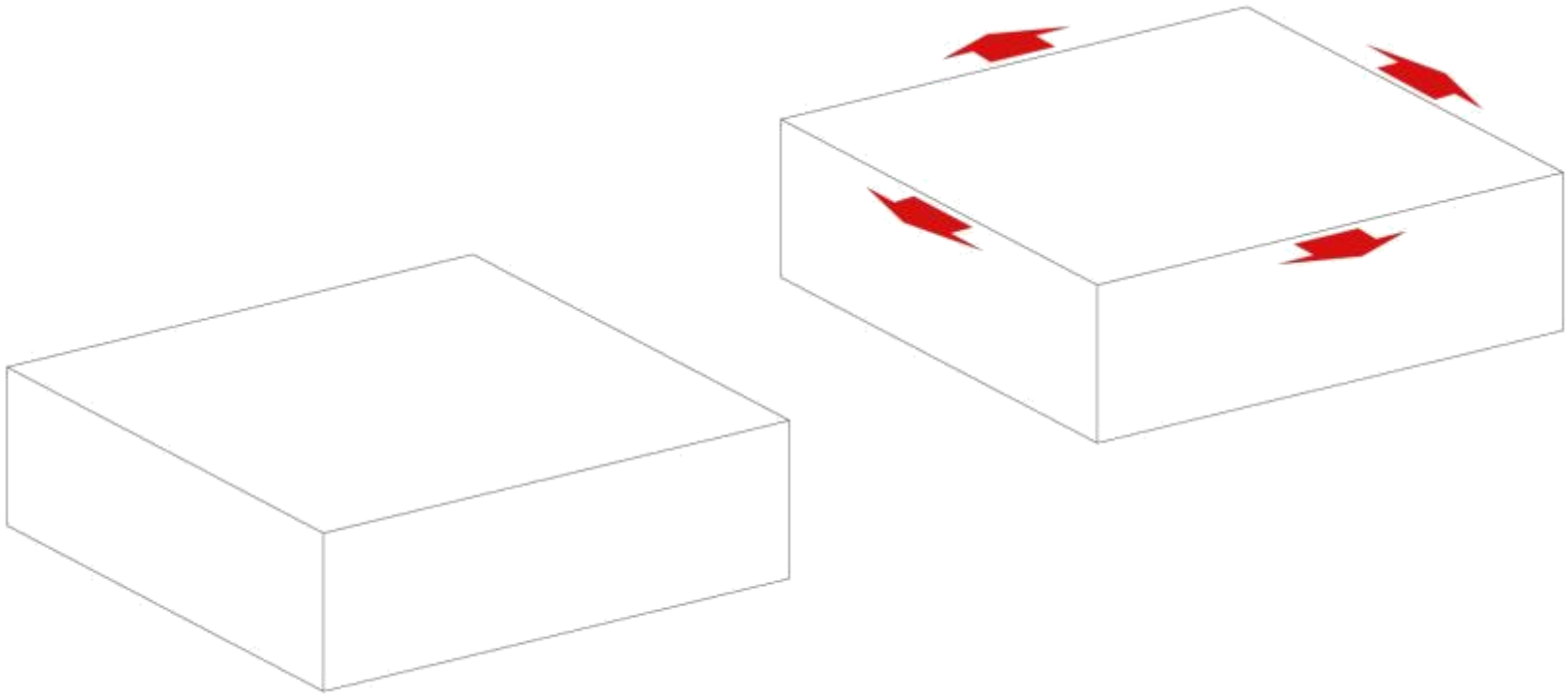

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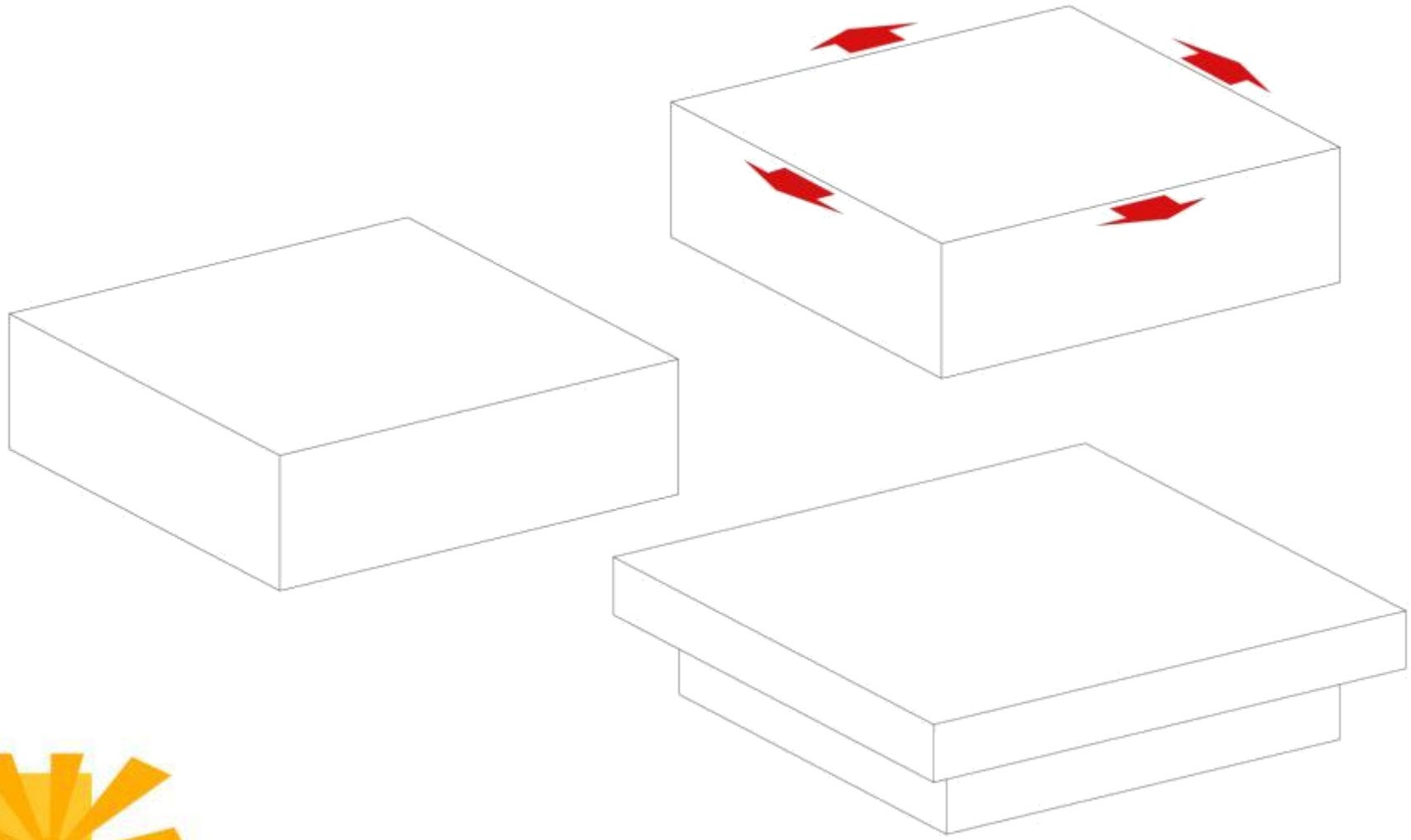

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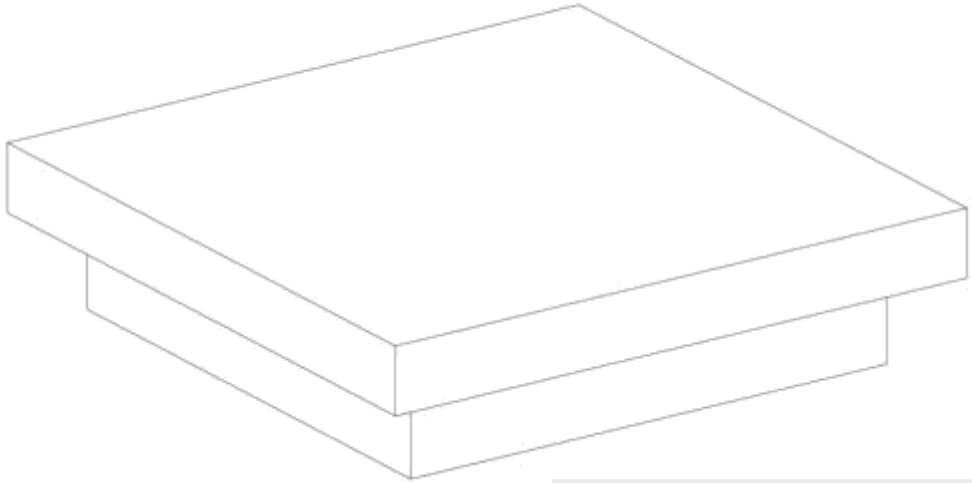
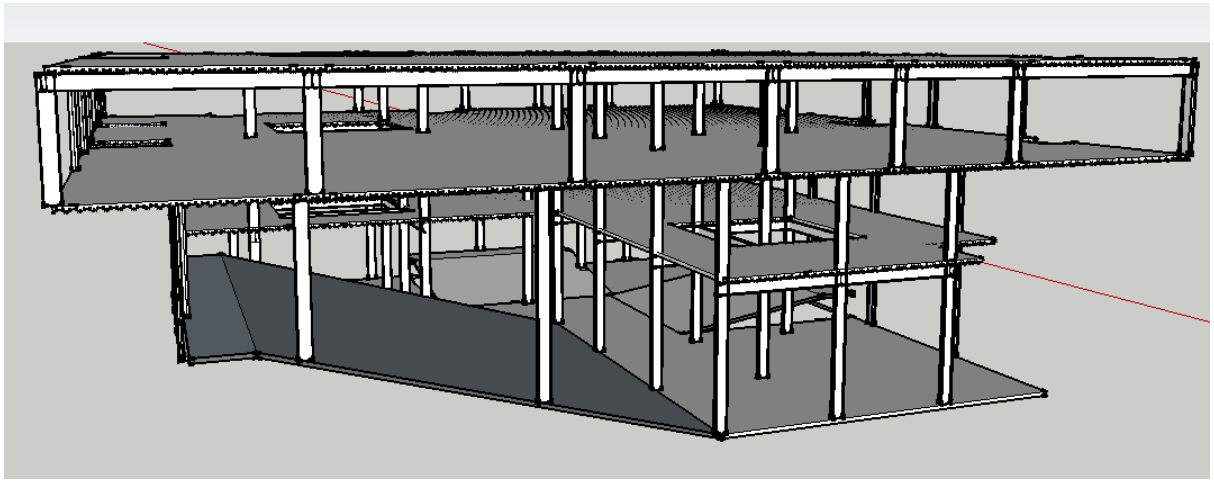
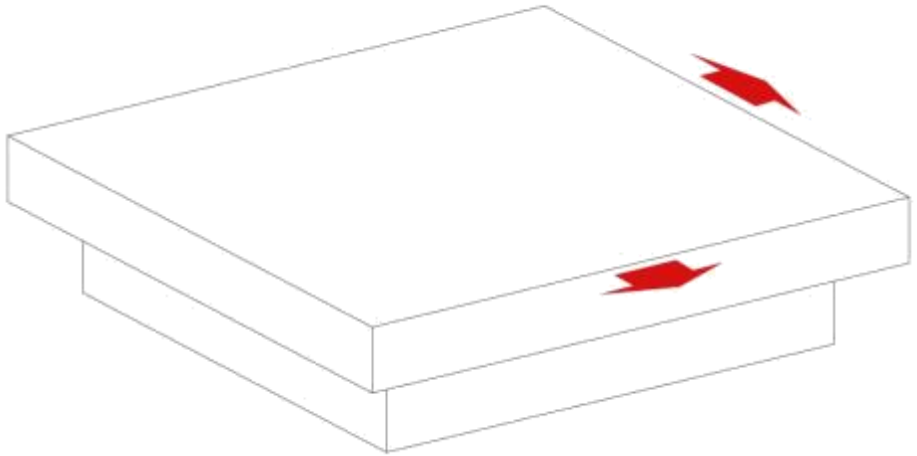


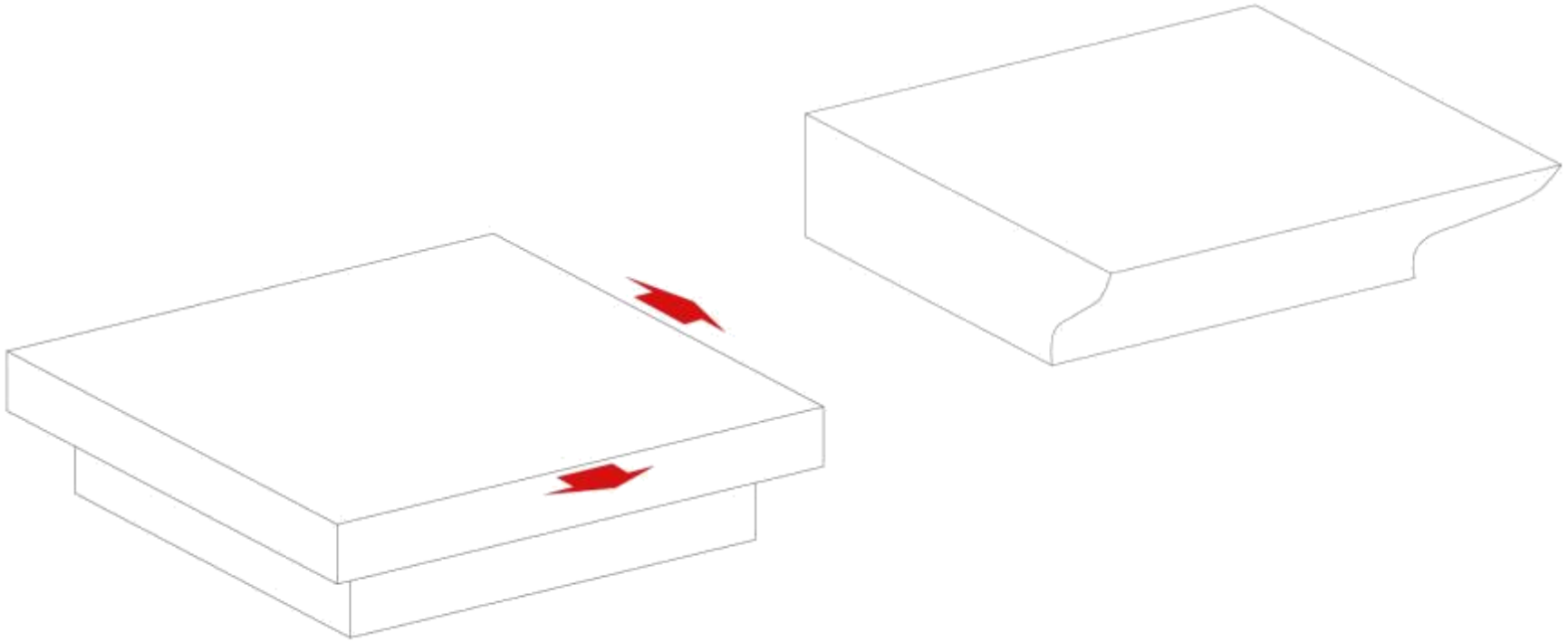


PHASE I - FEBRUARY

PHASE II - MARCH



PHASE II - MARCH



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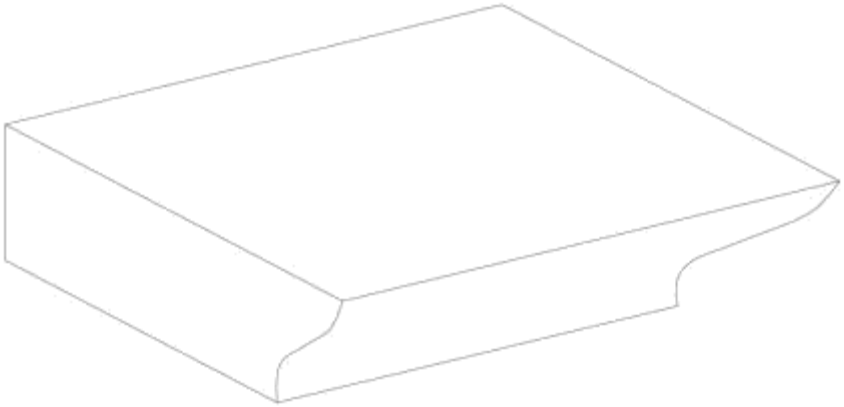
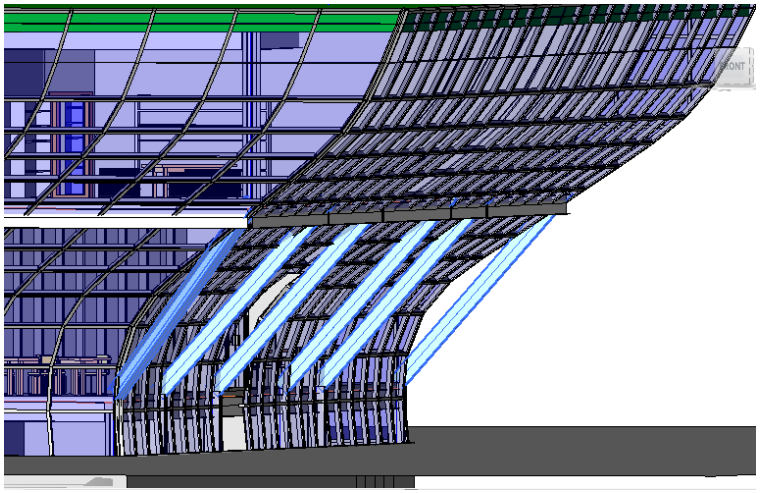
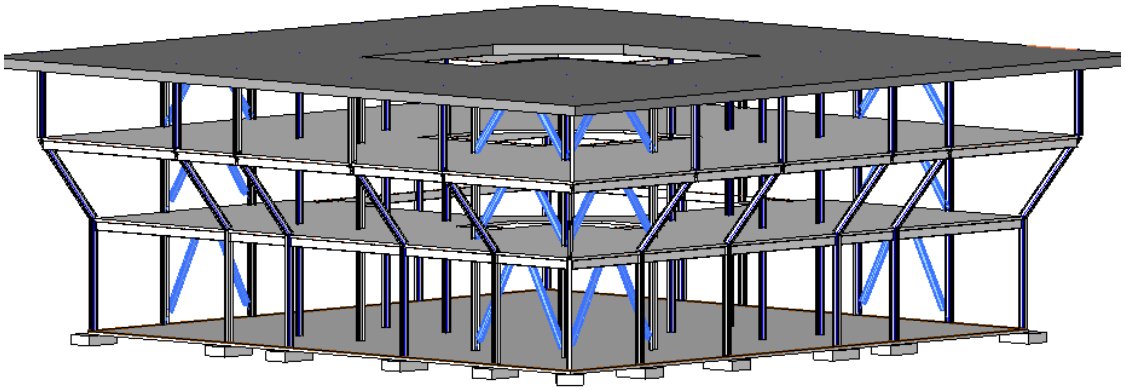


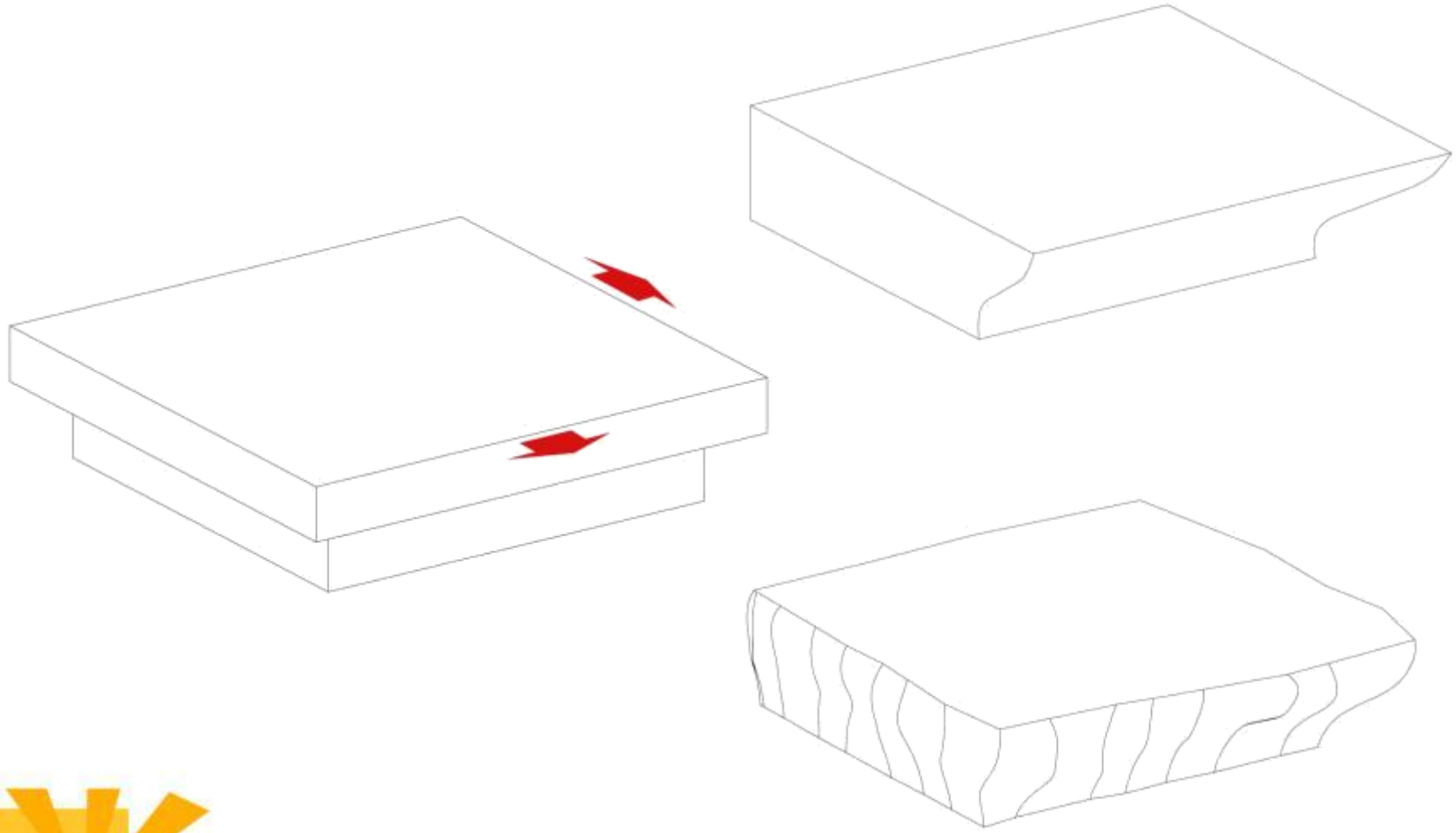




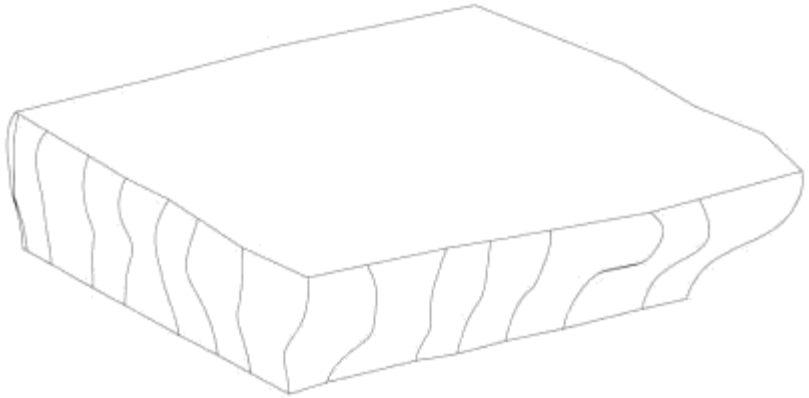
PHASE II - MARCH

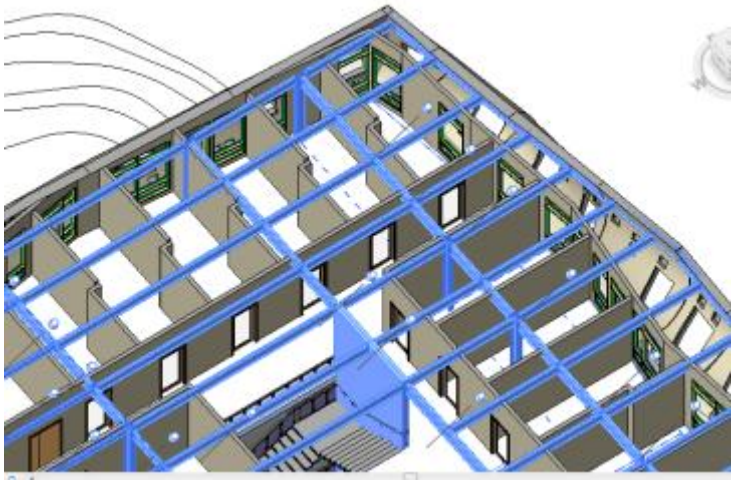
VERSION FROM WINTER PRESENTATION

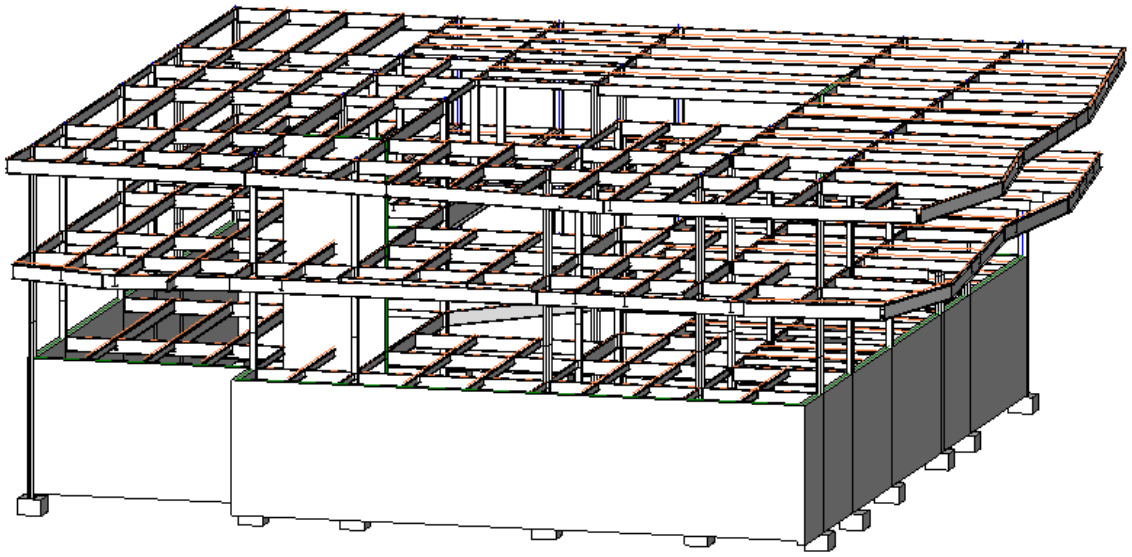
PHASE III - APRIL



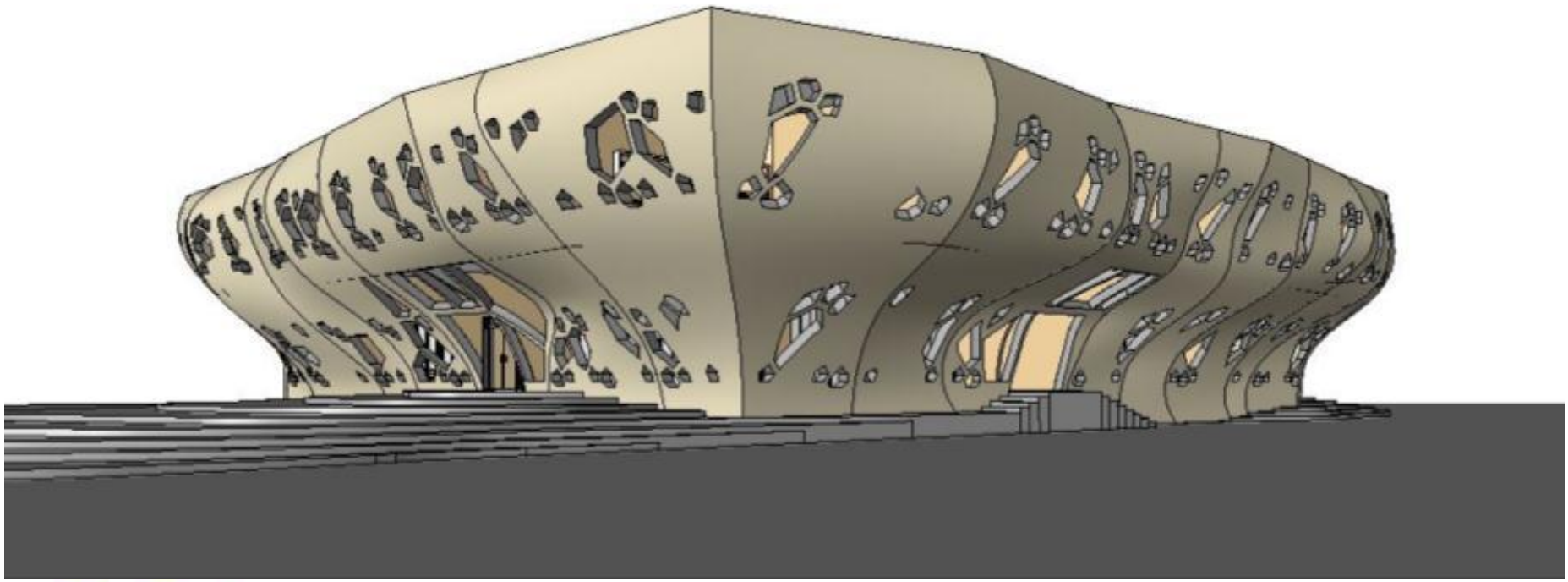
PHASE III - APRIL







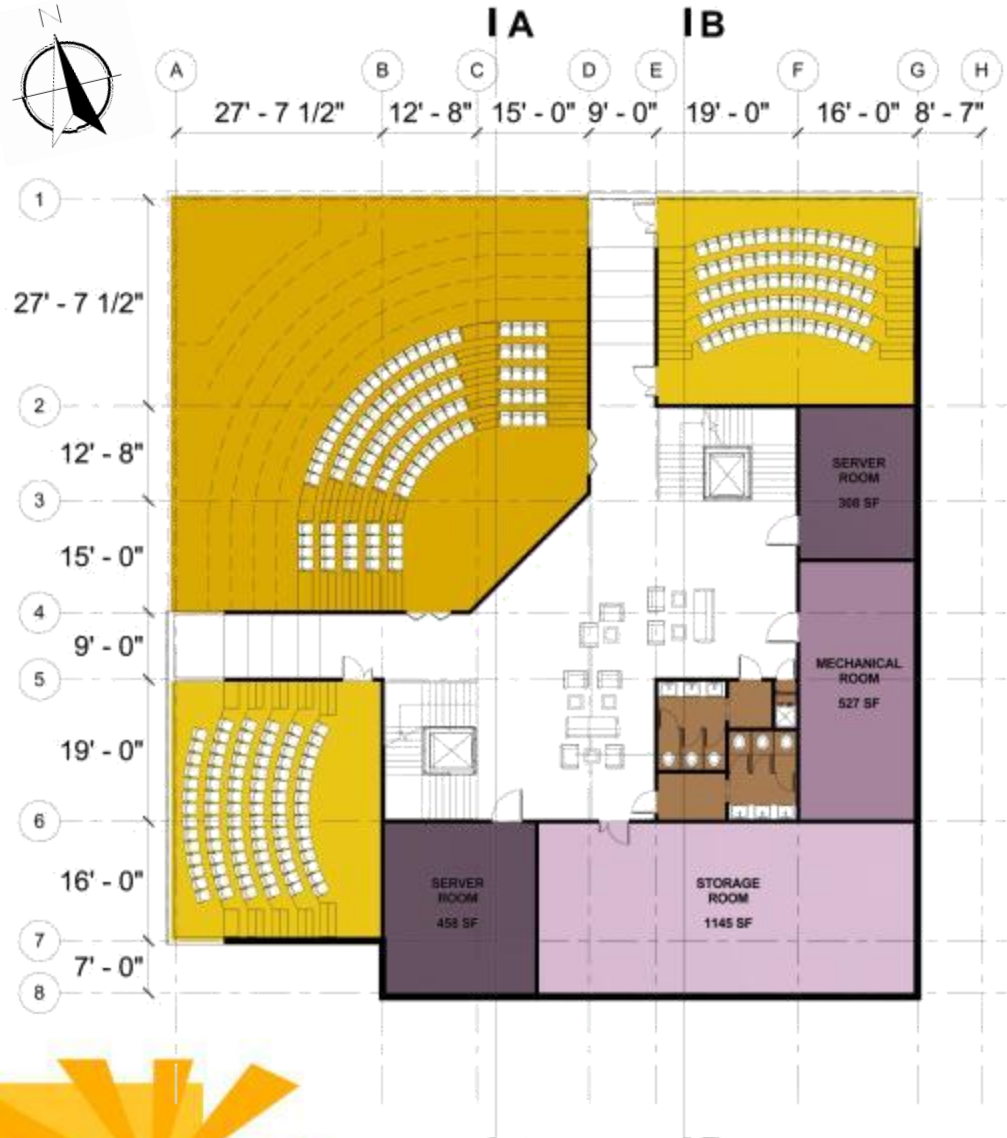
PHASE III - APRIL



PHASE III - APRIL

FUNCTIONS ALLOCATION

FLOOR PLAN & SPACE ALLOCATION



EDUCATION

Auditorium	3.000
Large classrooms	1.928

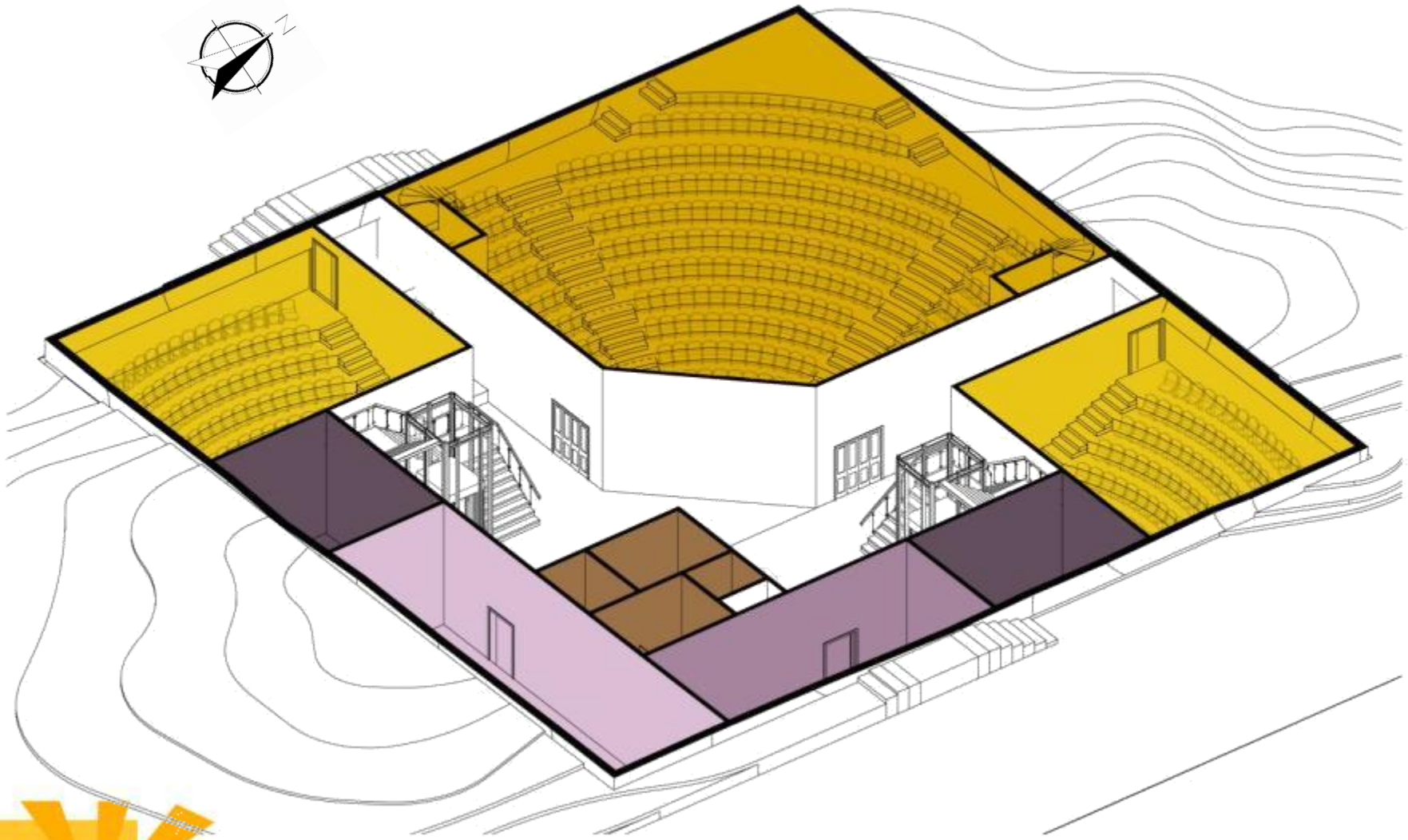
TECHNICAL & STORAGE

COMMUNICATION & LOUNGES

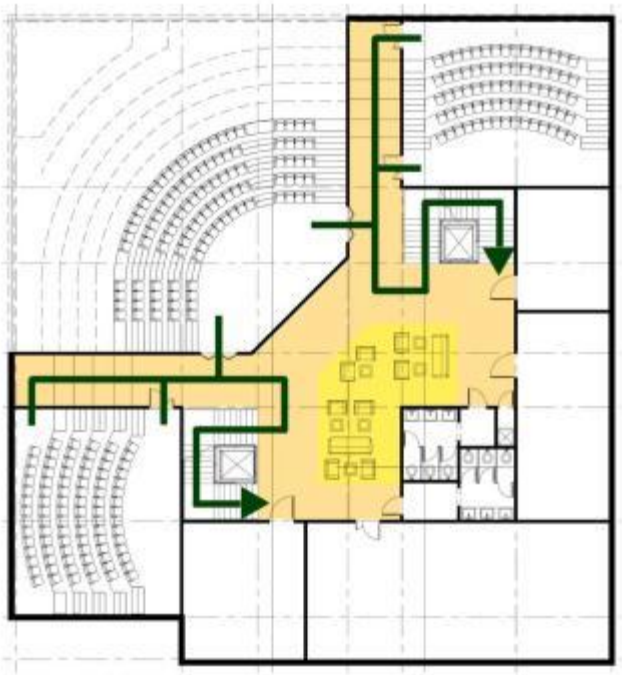
Server rooms	766
Mechanical room	527
Storage room	1.145
	2 484

RESTROOMS

UNDERGROUND



UNDERGROUND - EGRESS



CORRIDORS

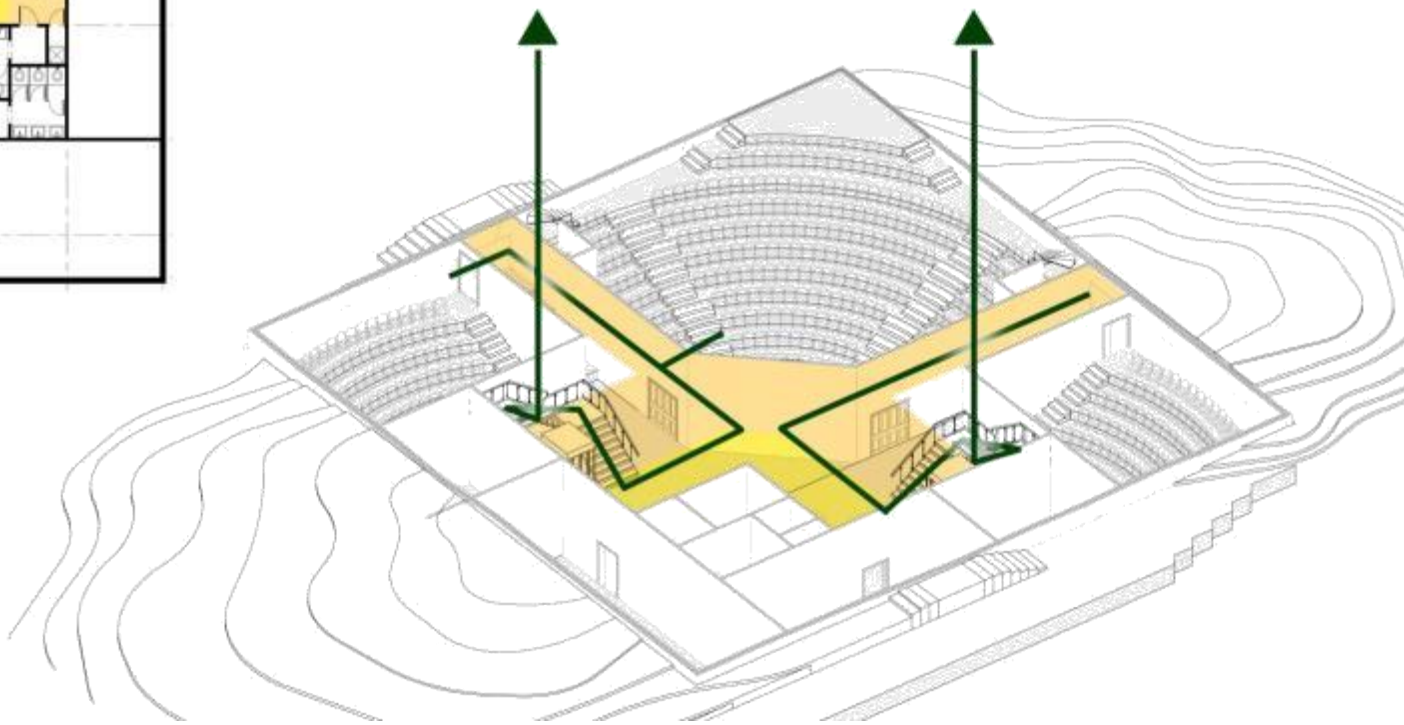
LEISURE AREAS / LOUNGES

ATRIUM

BOTTOM FLOOR EGRESS

GROUNDFLOOR EGRESS

TOP FLOOR EGRESS



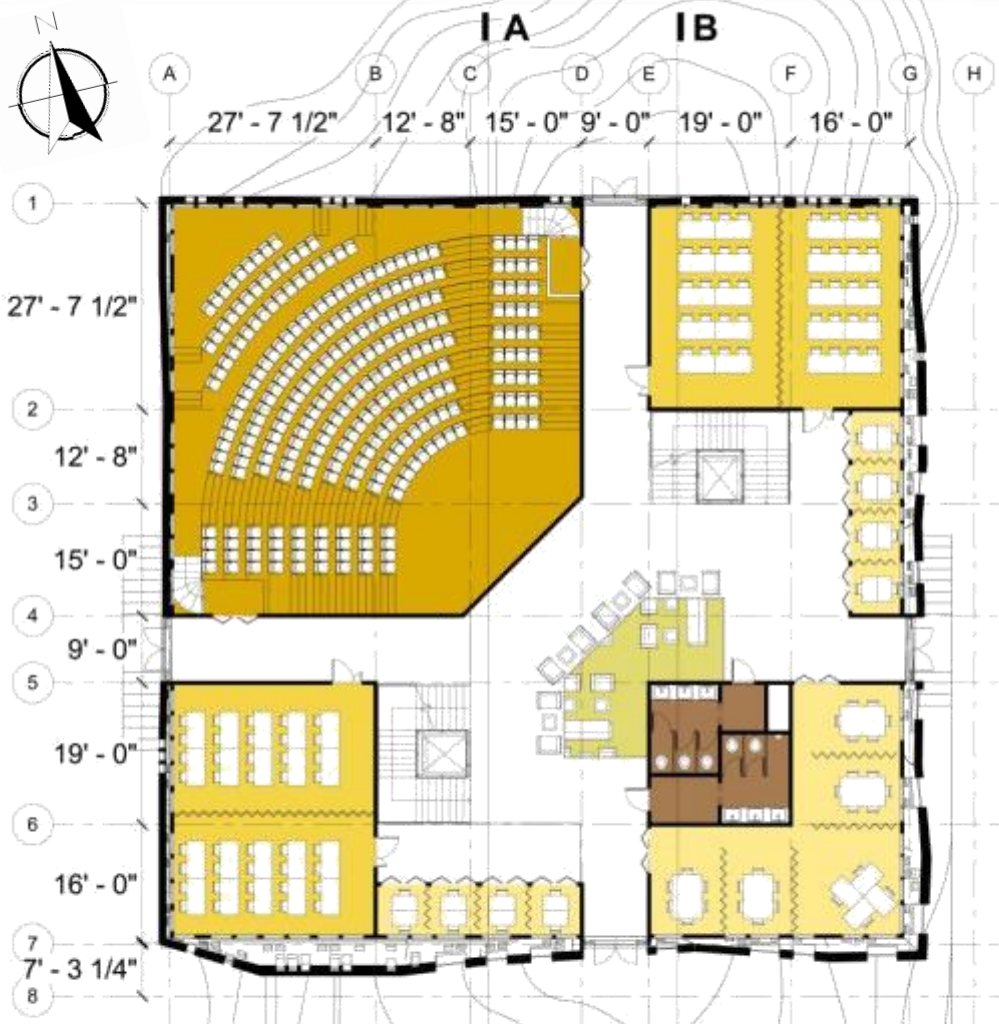
UNDERGROUND – INTERIOR VIEW

UNDERGROUND – INTERIOR VIEW

FUNCTIONS ALLOCATION

GROUND FLOOR – SITE VIEW

GROUNDFLOOR – FLOOR PLAN



EDUCATION

Auditorium	3.000
Large classrooms	1.928
Small classrooms	1.936
Student offices	1.241

TECHNICAL & STORAGE

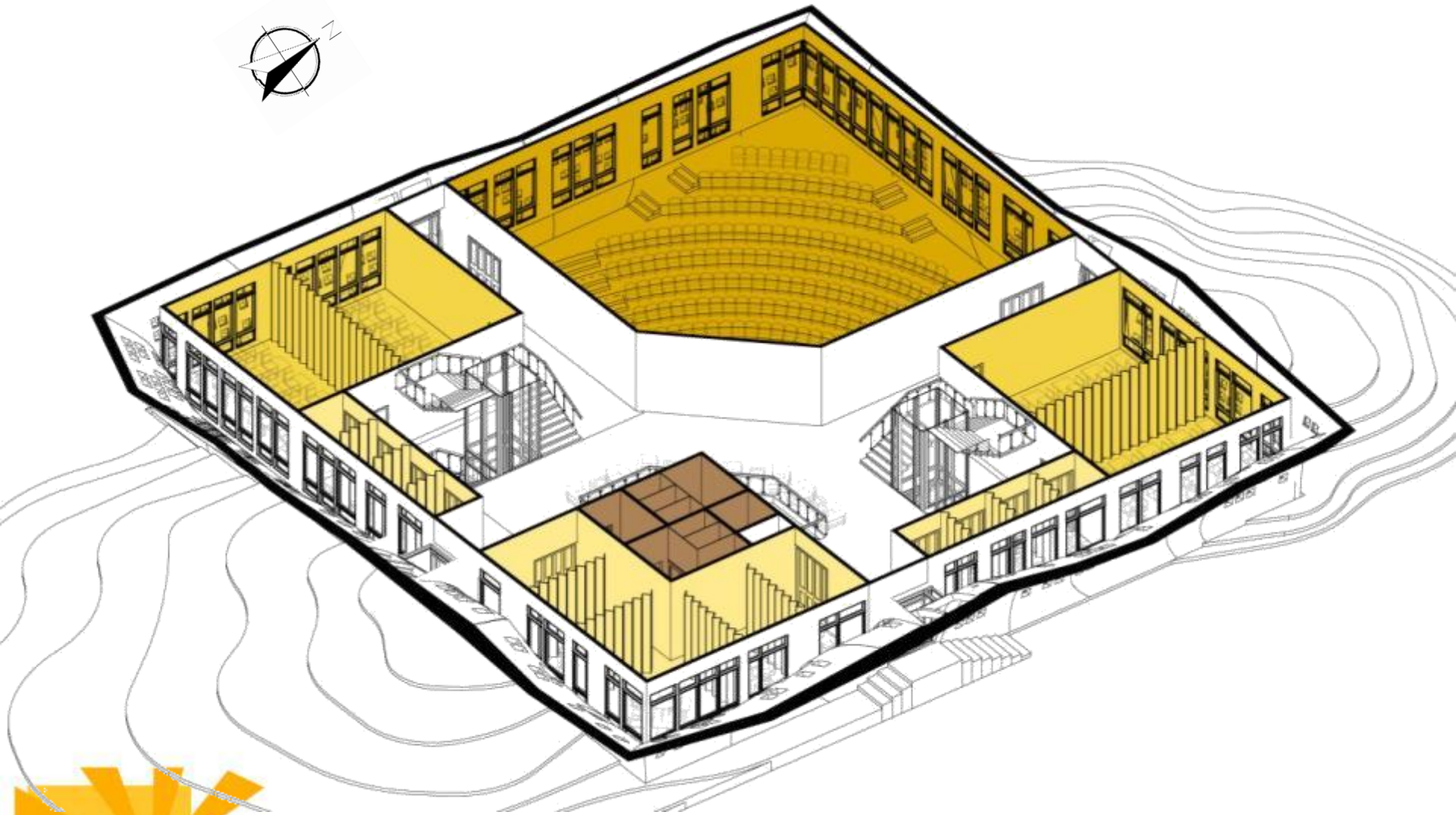
Server rooms	766
Mechanical room	527
Storage room	1.145
	2 484

COMMUNICATION & LOUNGES

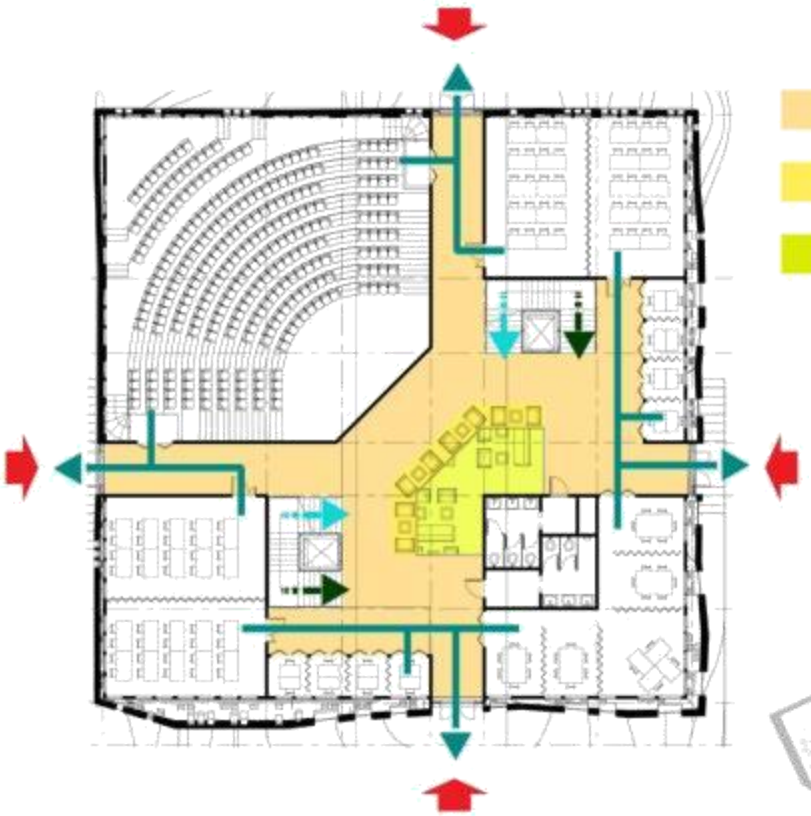
	2.873

RESTROOMS

GROUNDFLOOR – 3D VIEW



GROUNDFLOOR – EGRESS



CORRIDORS

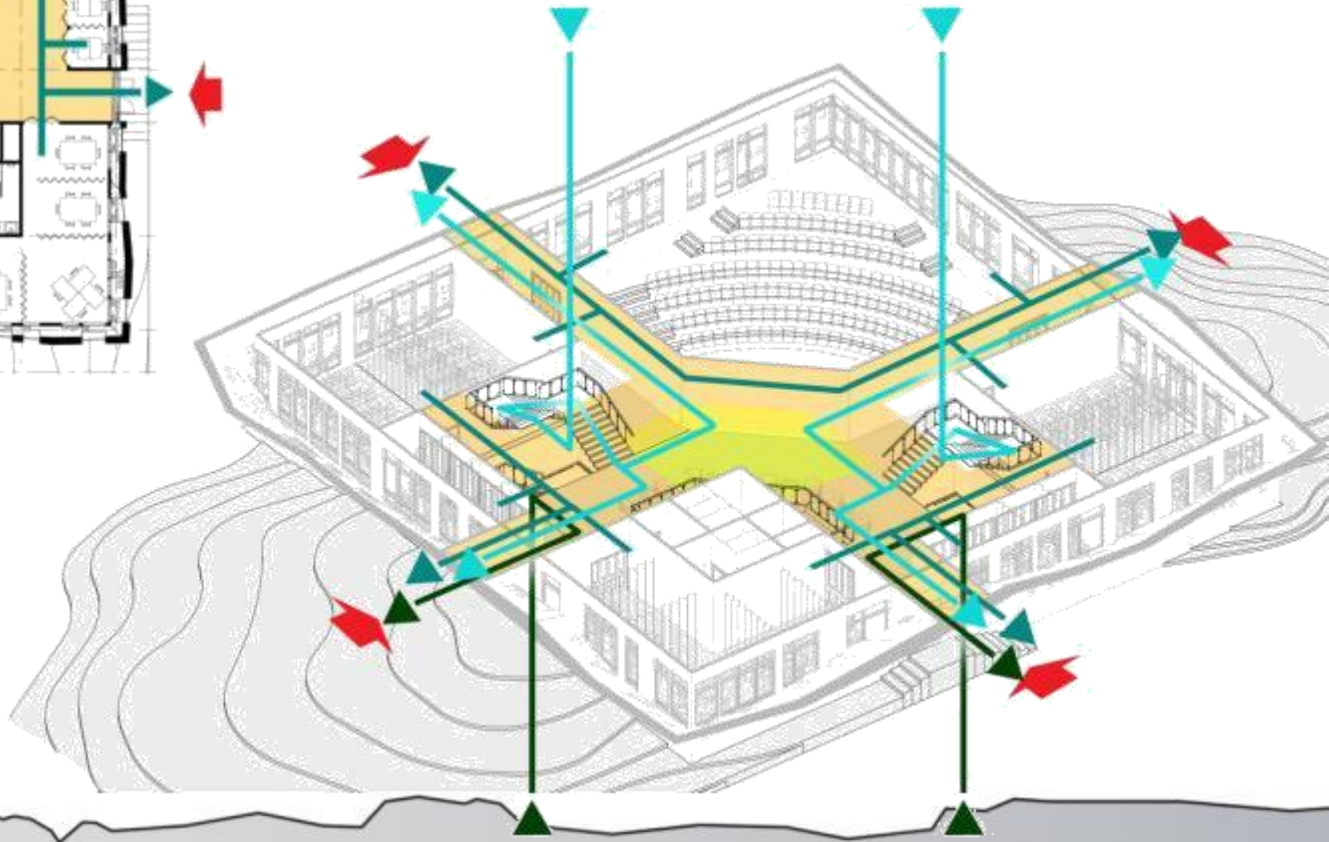
LEISURE AREAS / LOUNGES

ATRIUM

BOTTOM FLOOR EGRESS

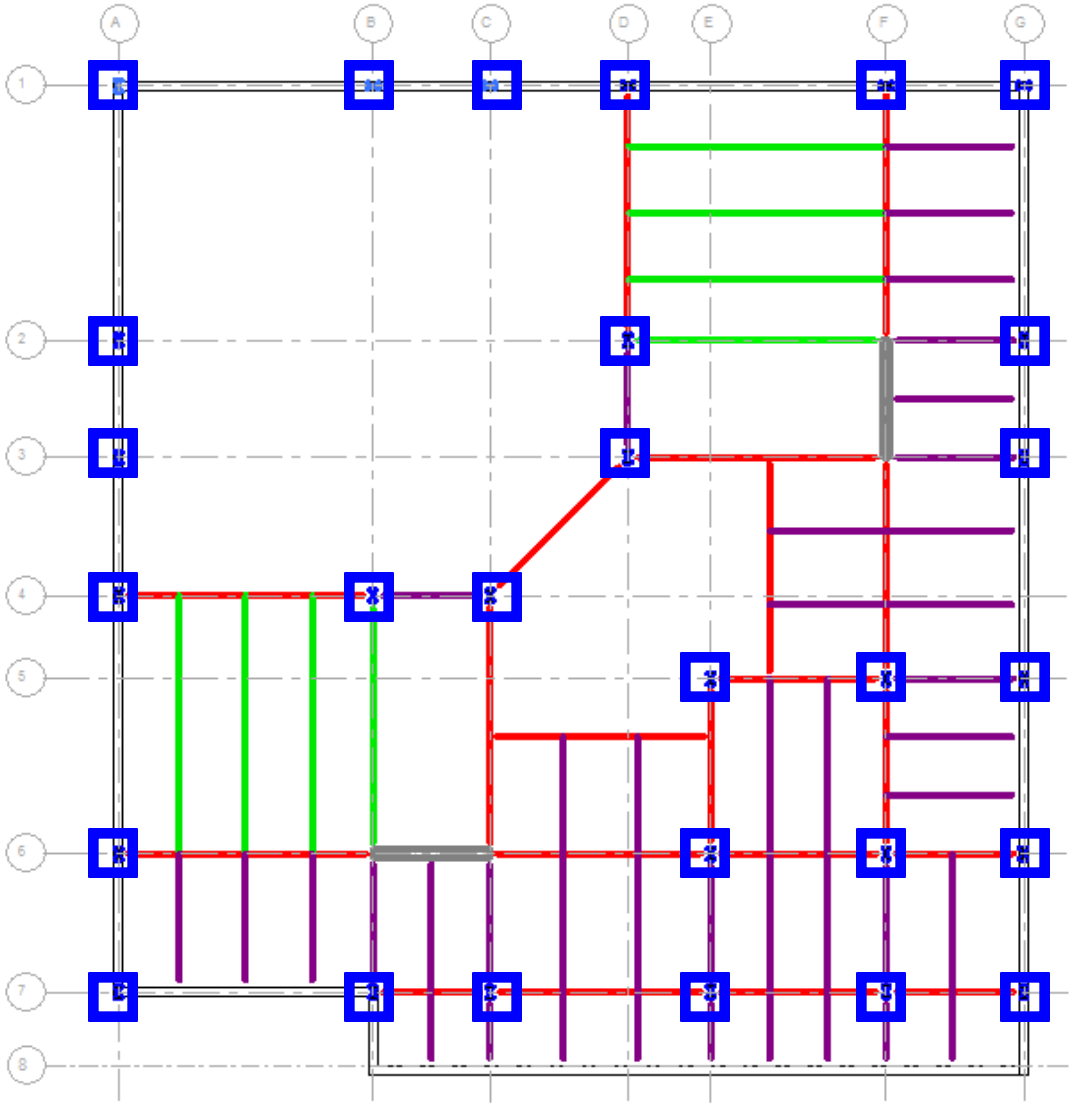
GROUNDFLOOR EGRESS

TOP FLOOR EGRESS



GROUNDFLOOR – INTERIOR VIEW

GROUND FLOOR - GRAVITY SYSTEM



Beams:

- W10x15
- W16x26
- W21x44

Columns:

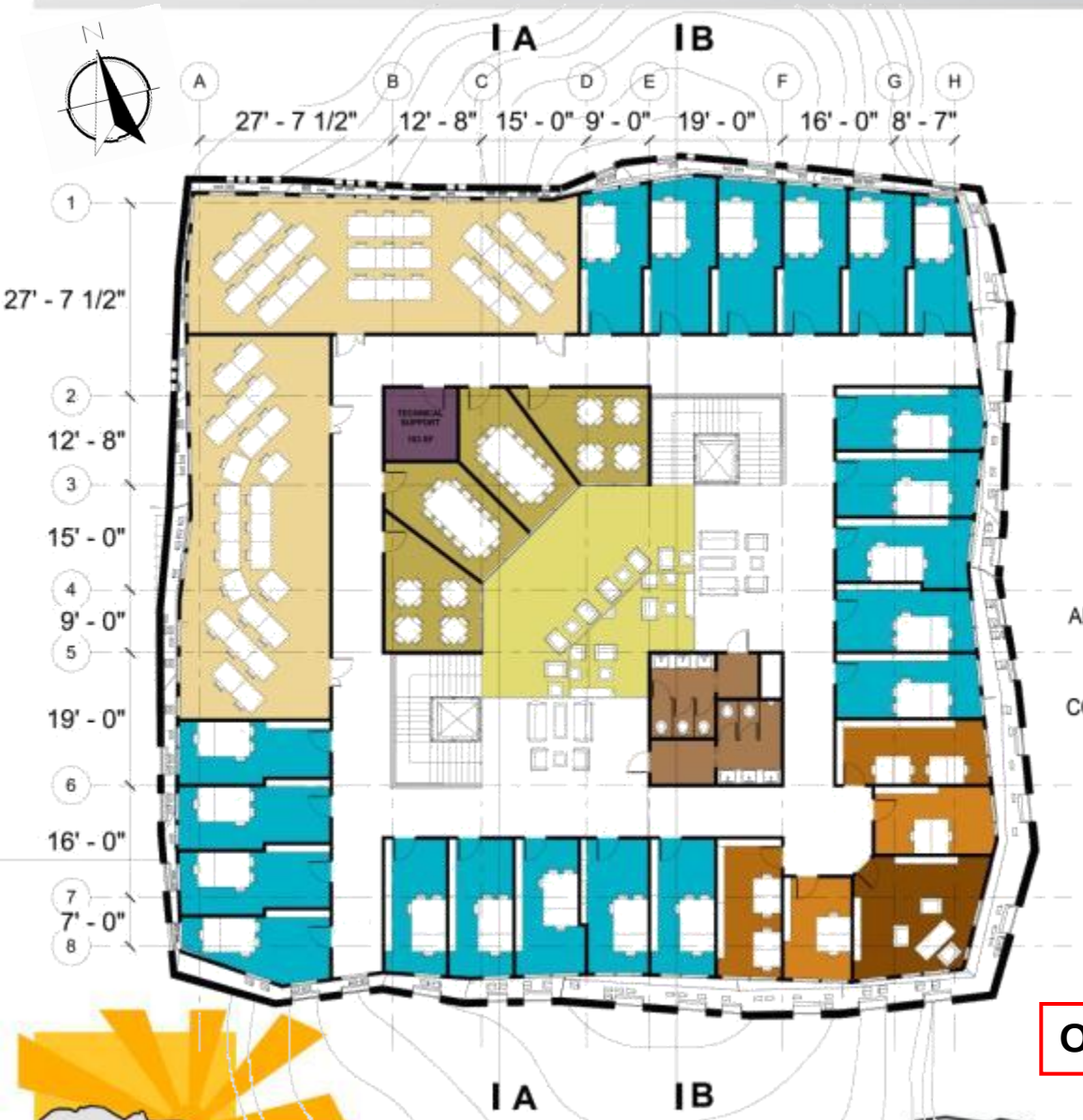
- W14x53

FUNCTIONS ALLOCATION

ENTRANCES


Copper Ave NE
Copper Ave NE
Copper Ave NE
Pine St NE
Pine St NE
Pine St NE
University Blvd NE
University Blvd NE
University Blvd NE
Redondo N Dr
Redondo S Dr
Central Ave NE
Central Ave NE
N

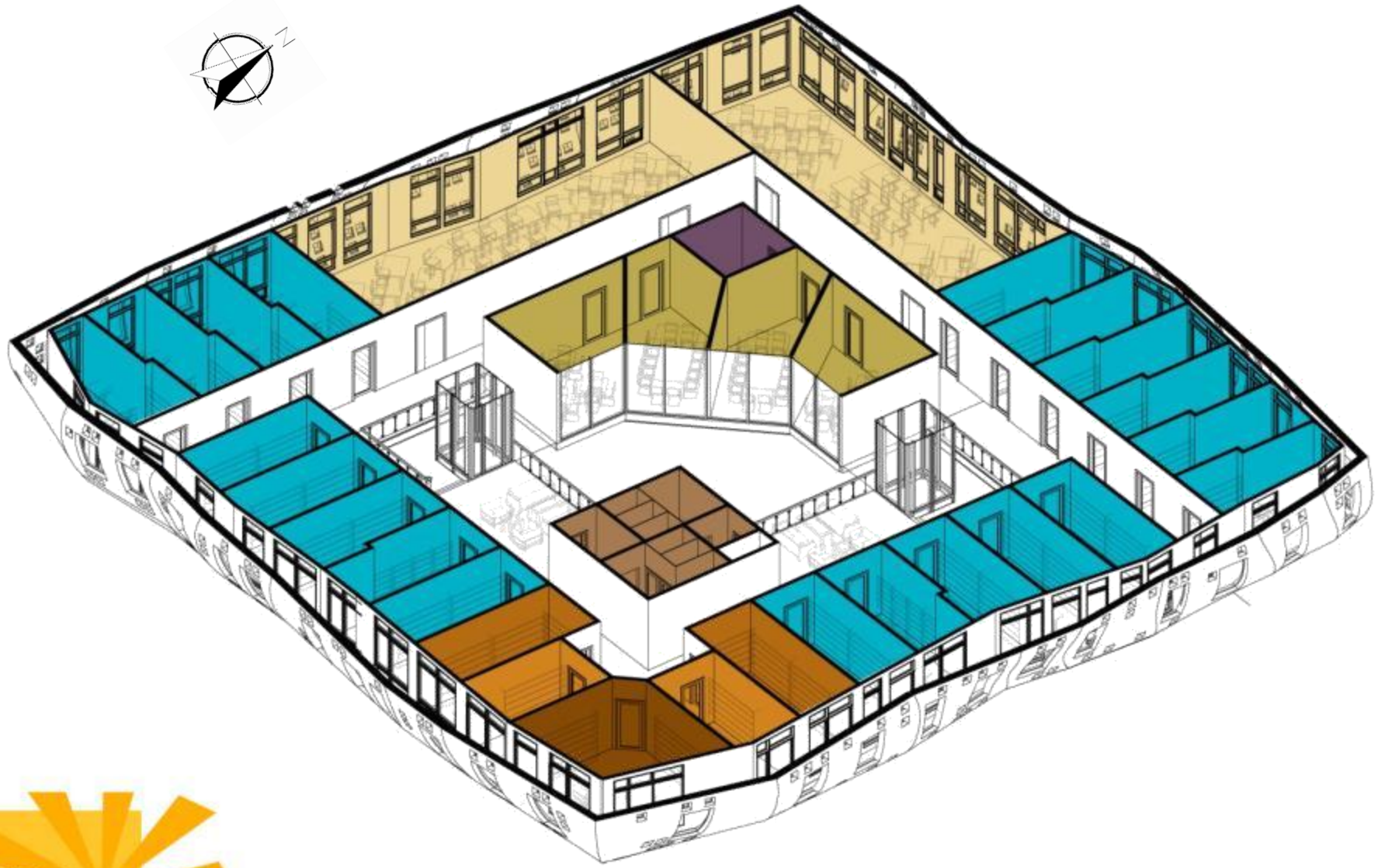
TOP FLOOR – FLOOR PLAN



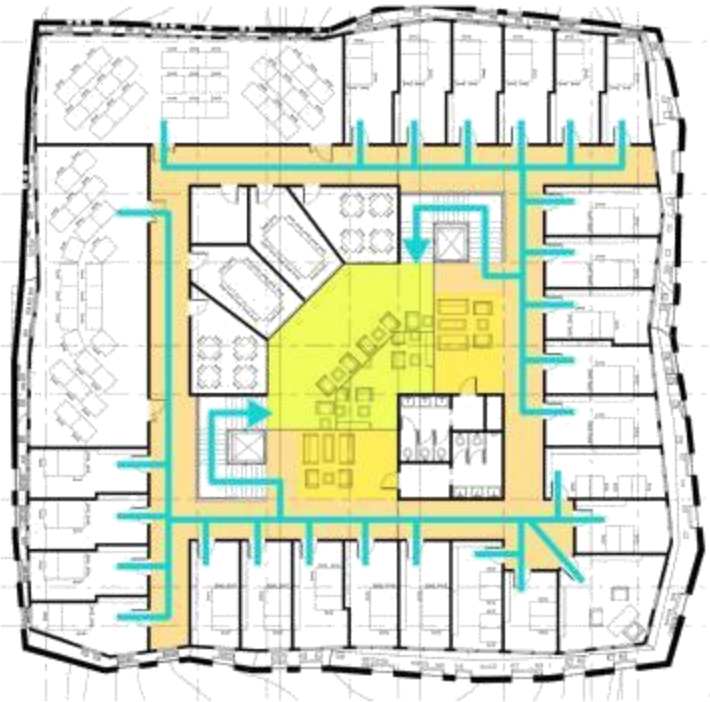
EDUCATION	Auditorium	3.000
	Large classrooms	1.928
	Small classrooms	1.936
	Student offices	1.241
	Instructional labs	2.012
	Seminar rooms	810
FACULTY	Faculty offices	3.560
ADMINISTRATION	Dean's office	312
	Senior admin. off.	368
	Admin. assistant	284
TECHNICAL & STORAGE	Server rooms	766
	Mechanical room	527
	Storage room	1.145
	Technical support	105
COMMUNICATION & LOUNGES		2 484
		2.873
		2.871
RESTROOMS		990

OVERALL **27,212 SqFt**

TOP FLOOR – FLOOR PLAN



TOP FLOOR – EGRESS



CORRIDORS

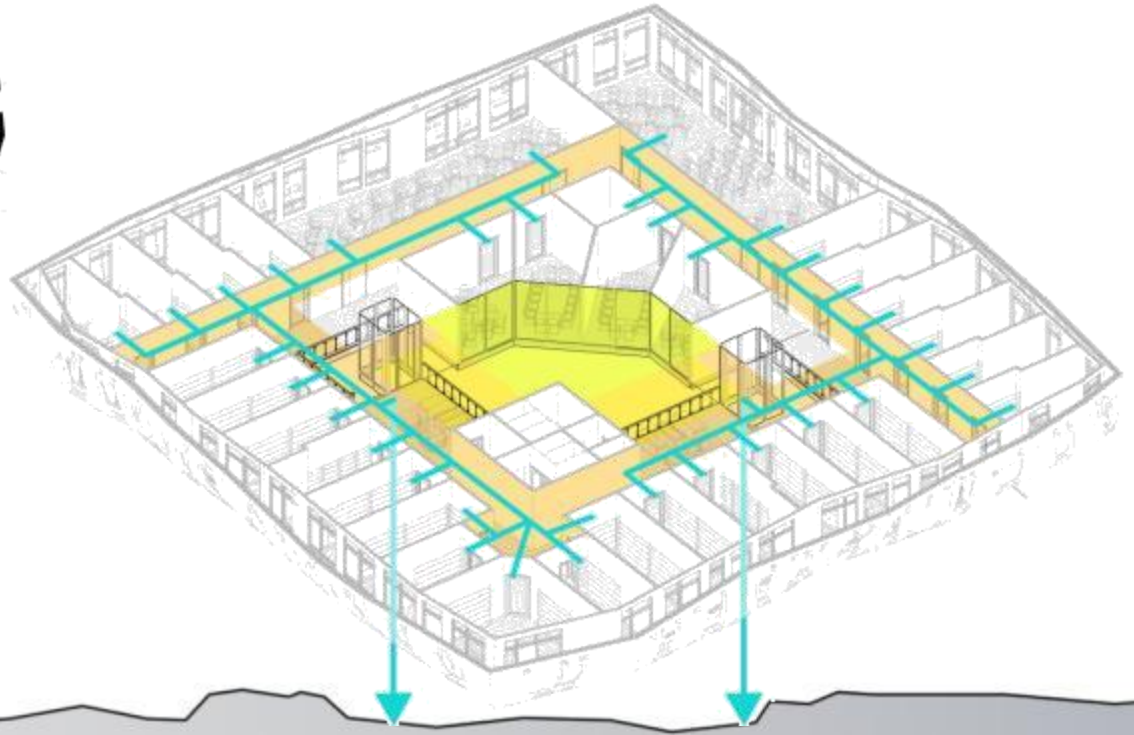
LEISURE AREAS / LOUNGES

ATRIUM

BOTTOM FLOOR EGRESS

GROUNDFLOOR EGRESS

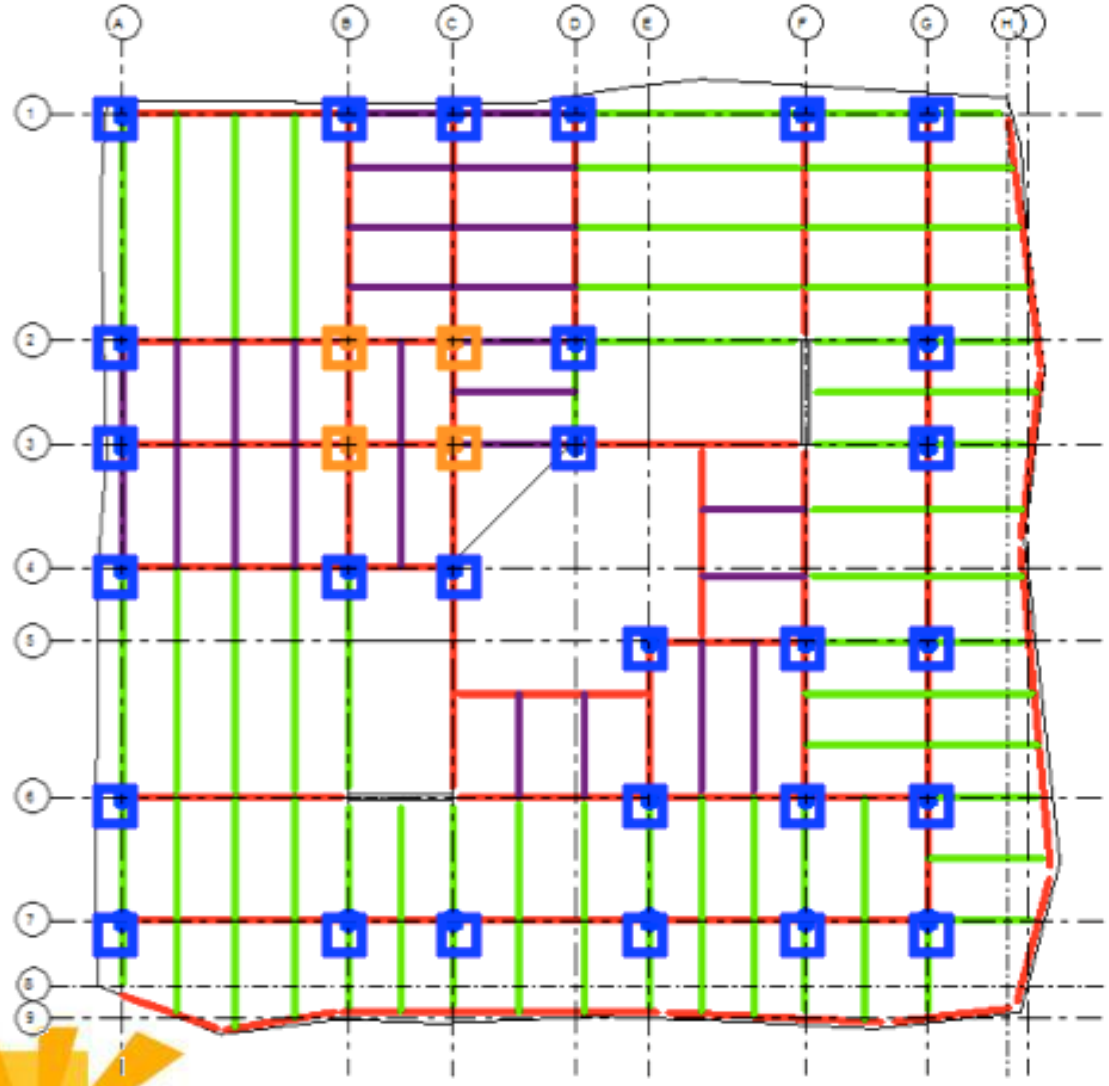
TOP FLOOR EGRESS



TOP FLOOR – ATRIUM VIEW

TOP FLOOR – DEAN'S OFFICE

TOP FLOOR - GRAVITY SYSTEM



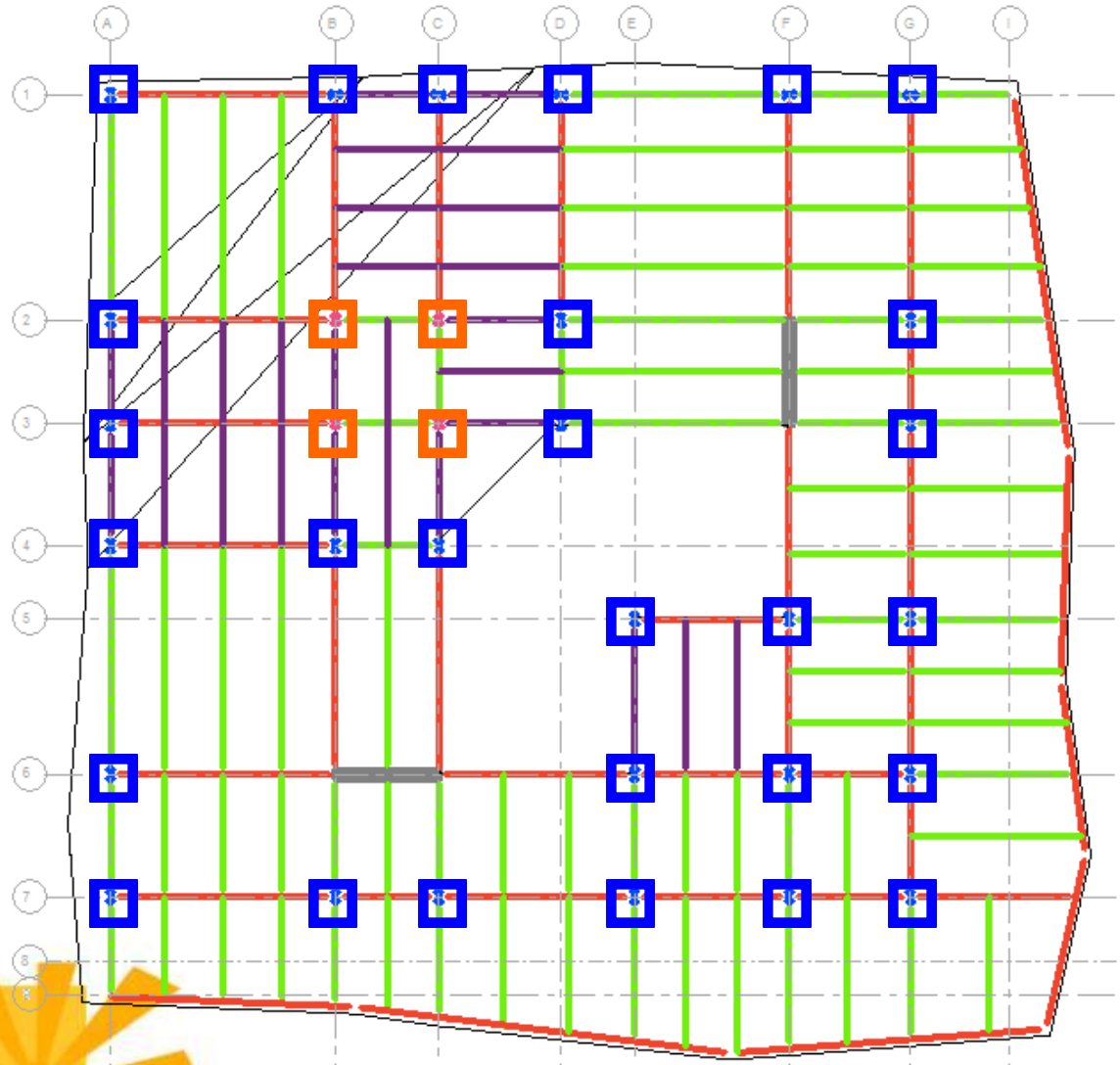
Beams:

- W10x15
- W16x26
- W21x44

Columns:

- W14x53
- W10x49

ROOF - GRAVITY SYSTEM



Beams:

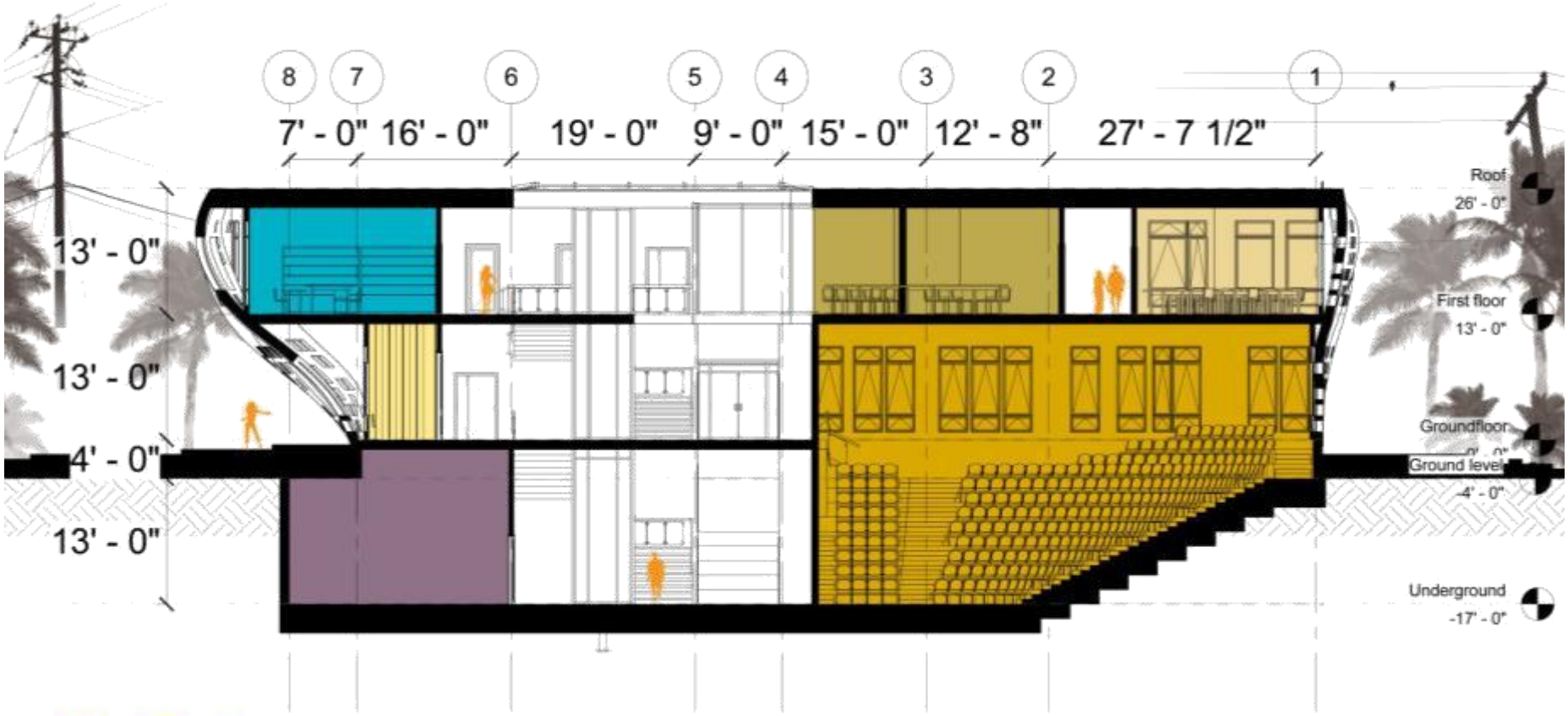
- W10x15
- W16x26
- W21x44

Columns:

- W14x53
- W10x49

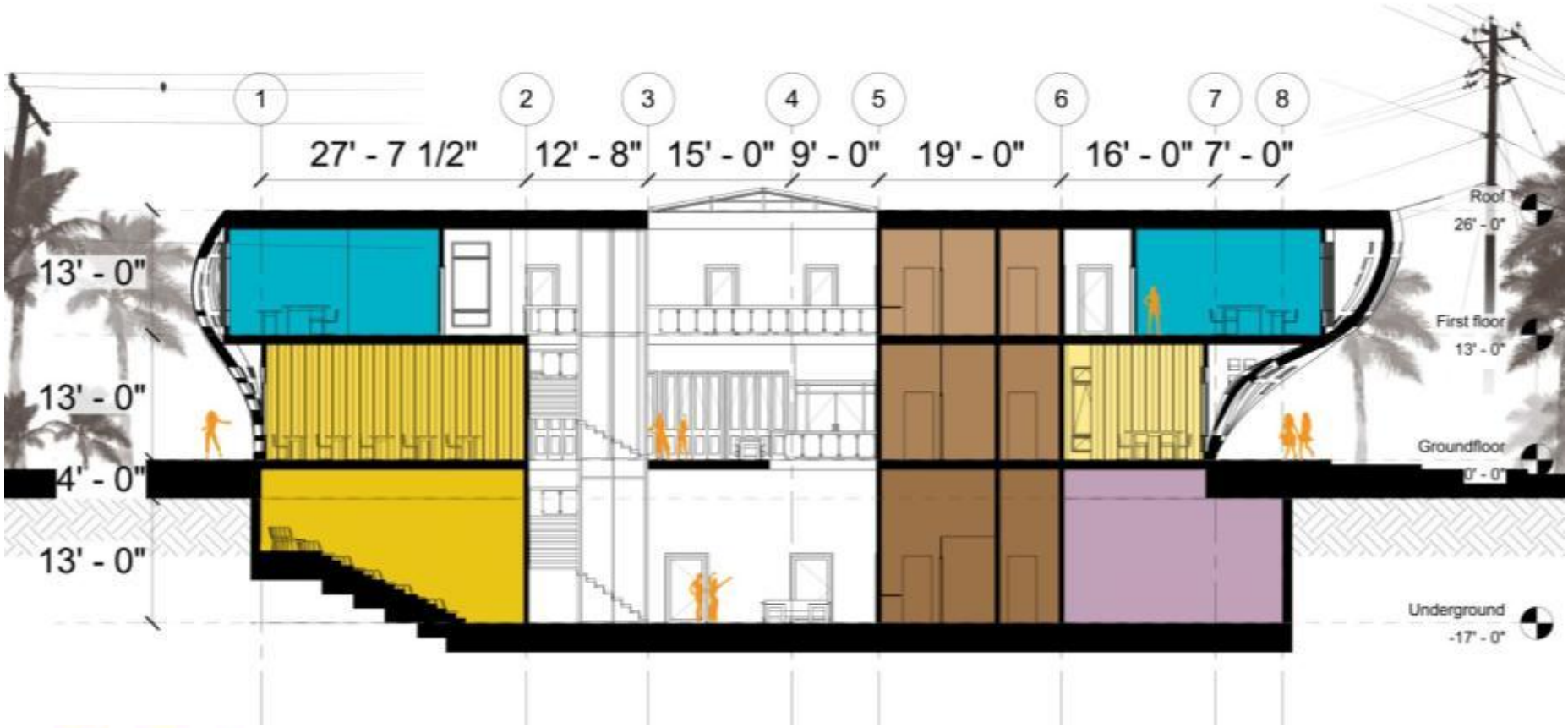
ELEVATION – EAST VIEW

SECTION VIEW A-A



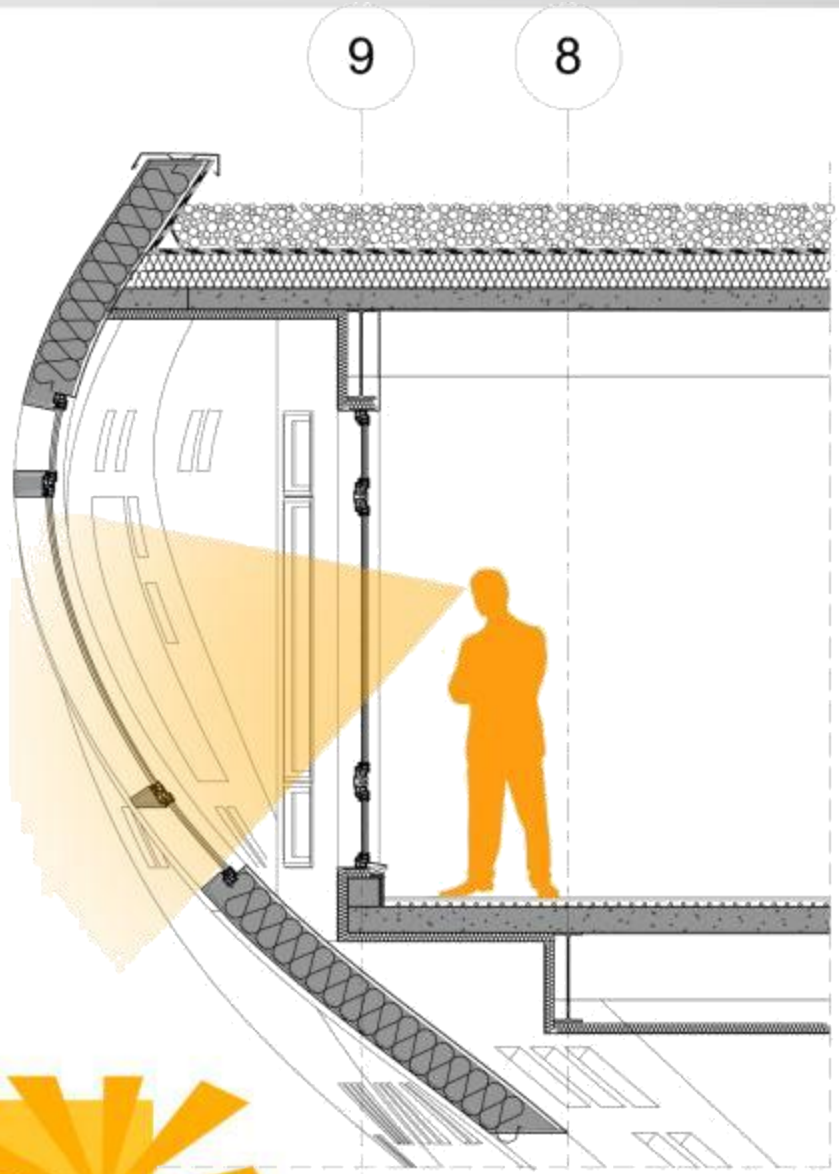
SECTION VIEWS

B - B



ELEVATION – WEST VIEW

FLOOR SANDWICH



11"
8"
5"
16"

“YELLOW” GRAVEL ROOF

DUCTWORK BETWEEN BEAMS

10' - 0"

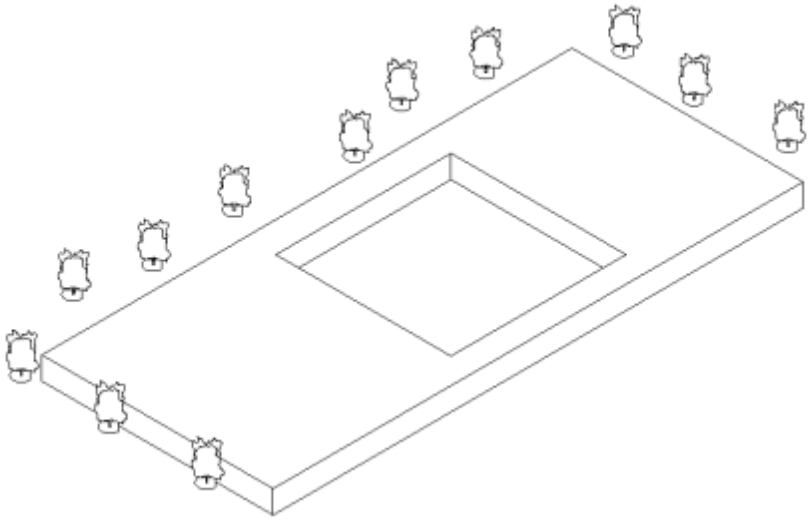
ROOM SPACE

1/2"
6"
2"
16"

FLOOR SLAB

DUCTWORK BETWEEN BEAMS

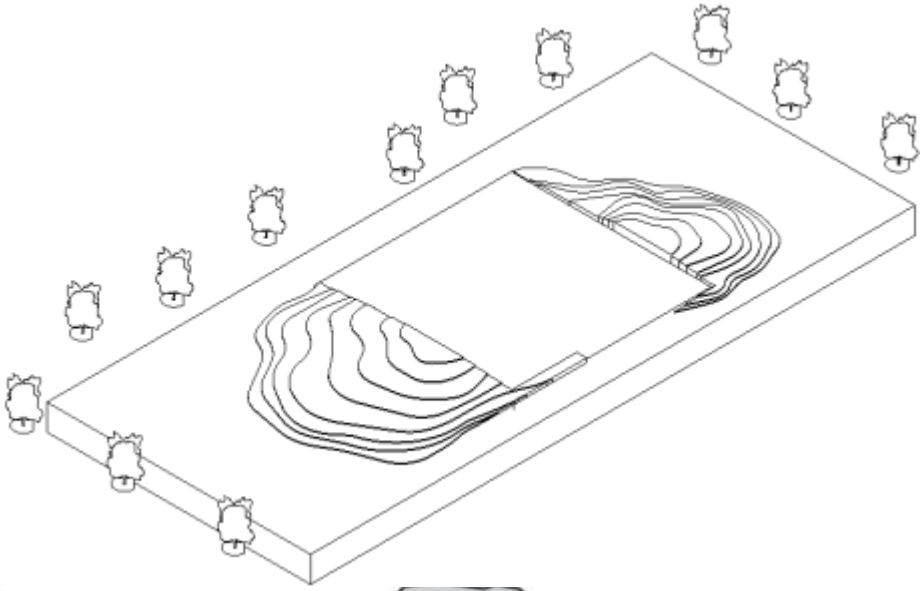
EXCAVATION PROCESS



BASEMENT EXCAVATION

17 FEET DEEP

5800 CY OF SOIL



FOUNDATION DESIGN SOLUTION

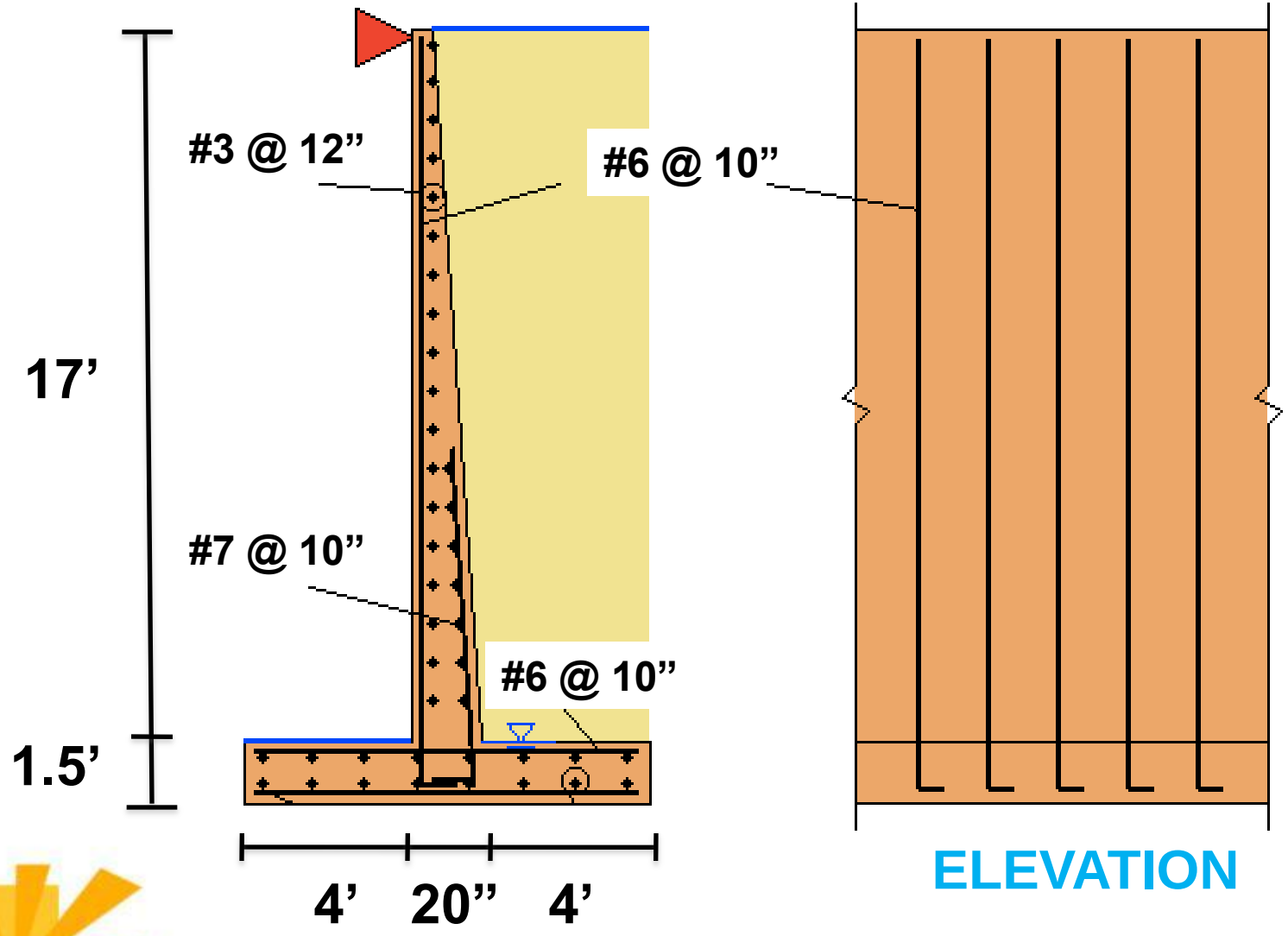
Soil Conditions:

- Bearing Capacity = 4 ksf
- Medium compact sand
- Inorganic silts

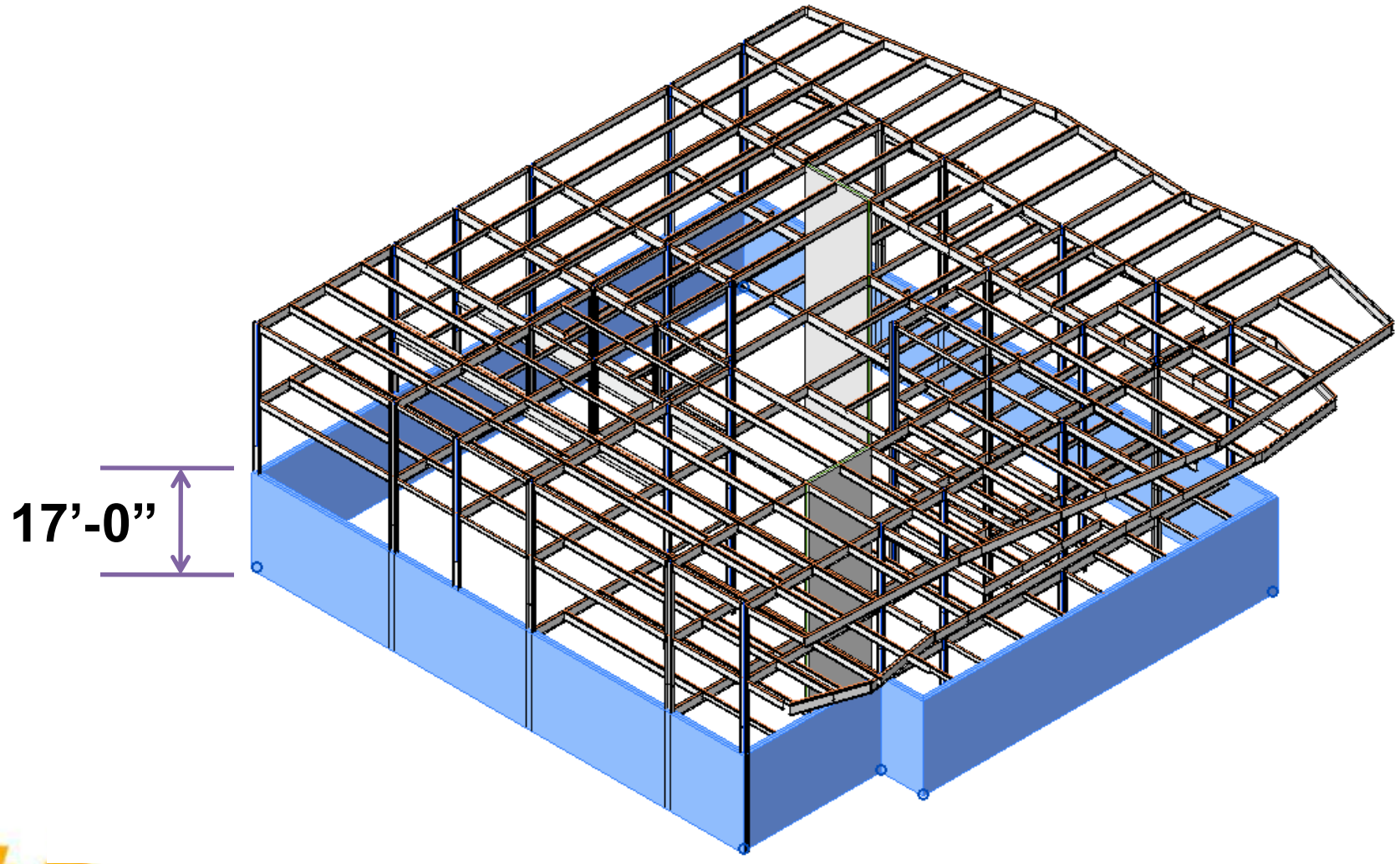
Design Parameters:

- w_{soil} = 125 pcf
- $\phi = 30°$
- f = 0.45

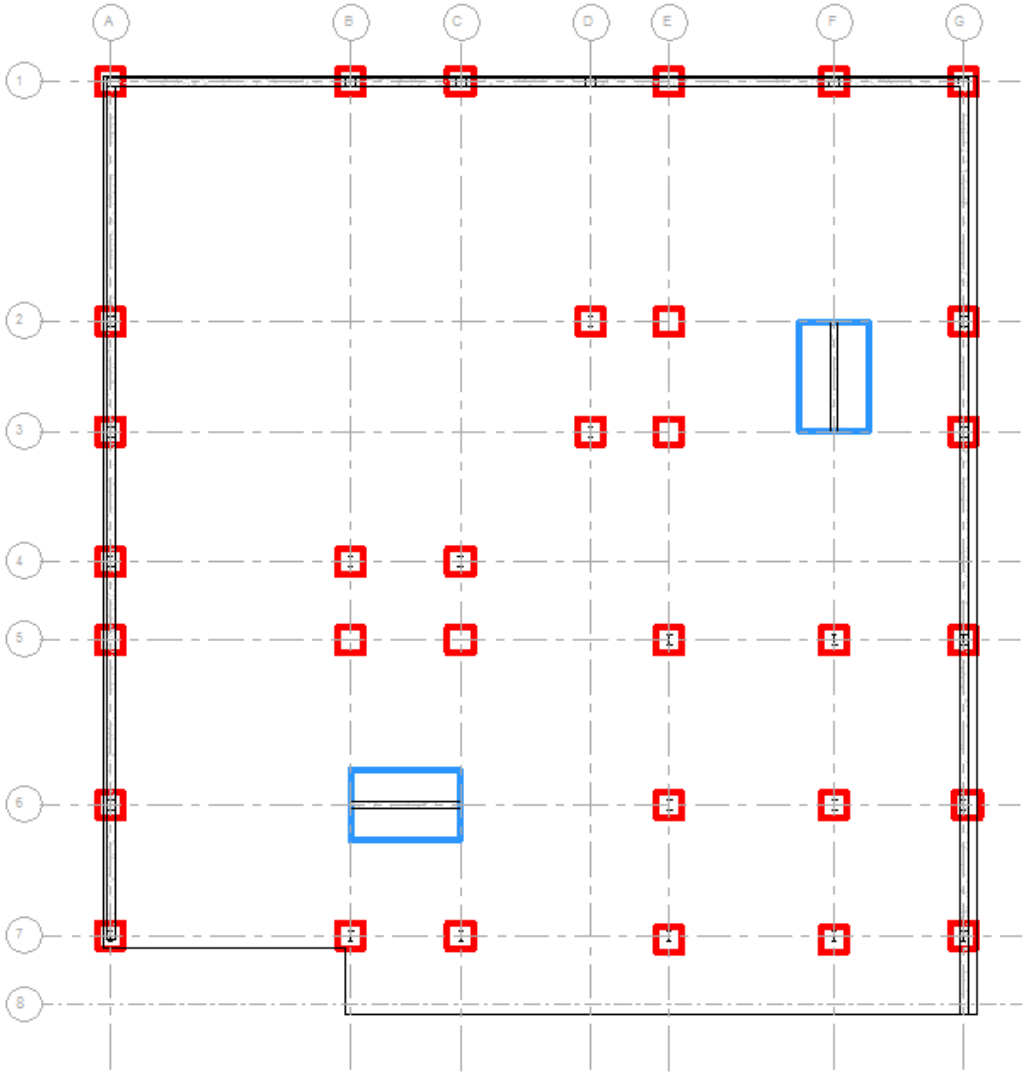
CONCRETE RETAINING WALL



CONCRETE RETAINING WALL – 3D VIEW



SPREAD FOOTINGS



Columns:

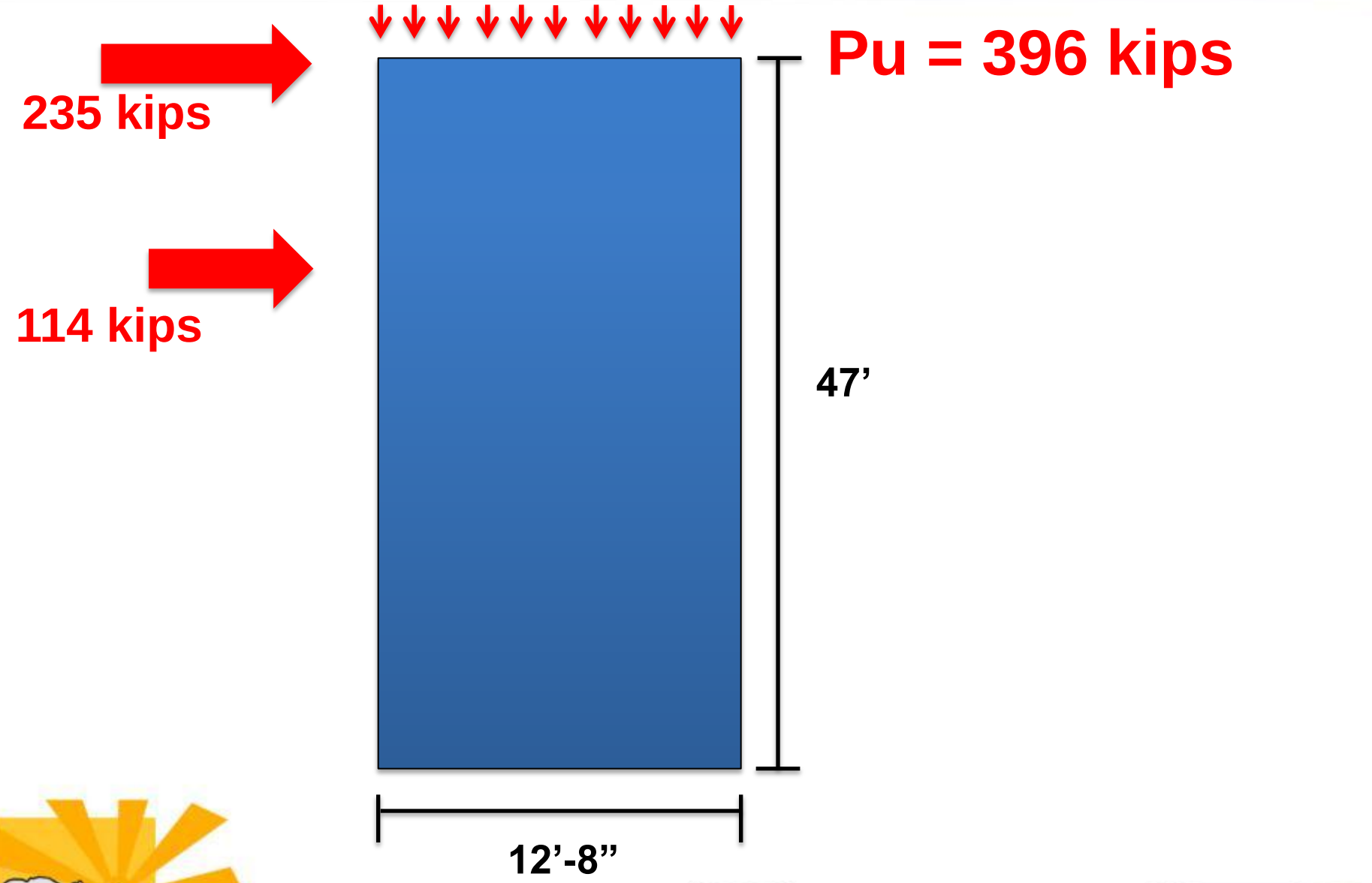
- 3’ x 3’ x 2’

Shear Walls:

- Length = 12’ - 8”
- Width = 8’
- Depth = 15”

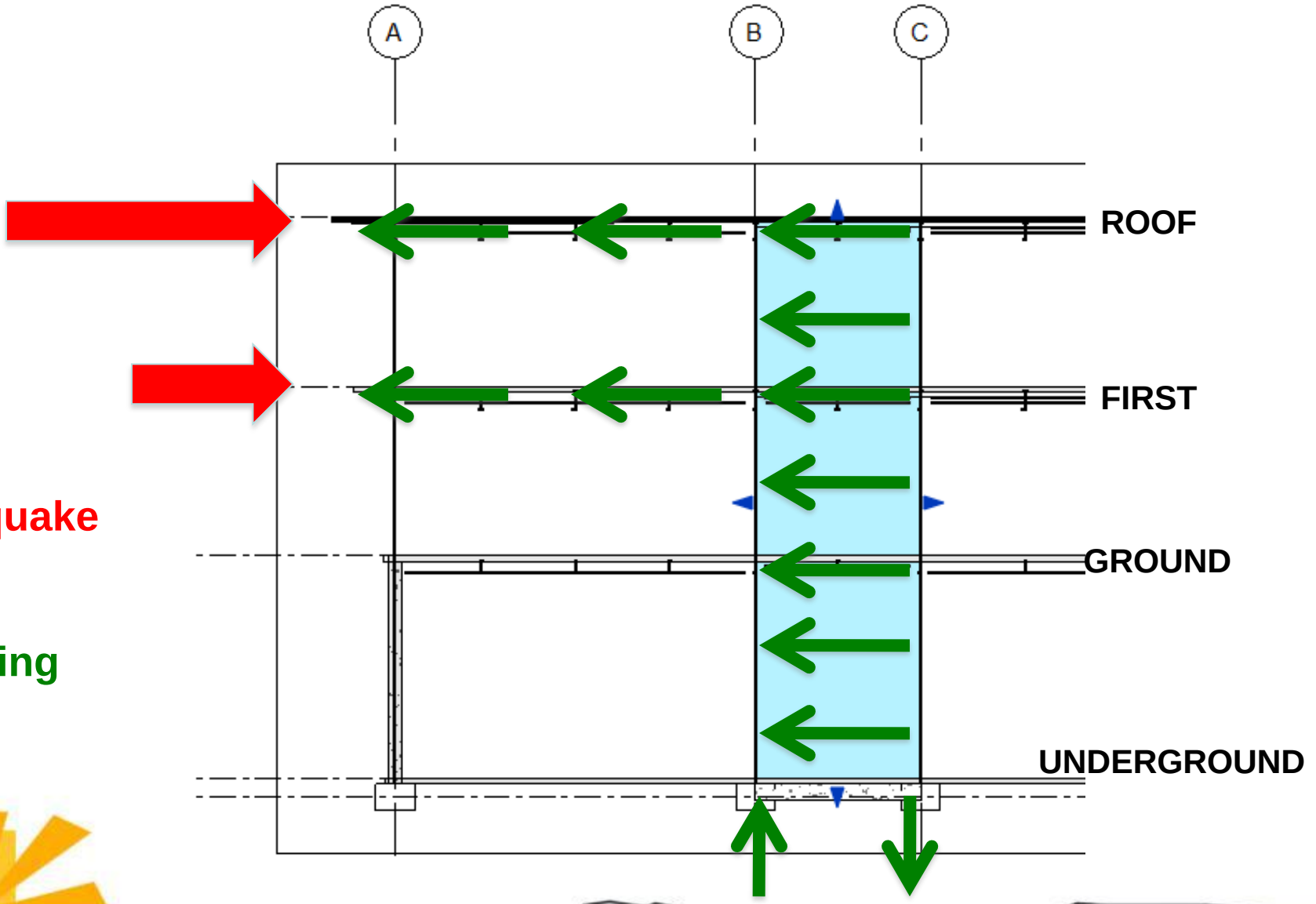
FOUNDATION PLAN

SHEAR WALL DESIGN

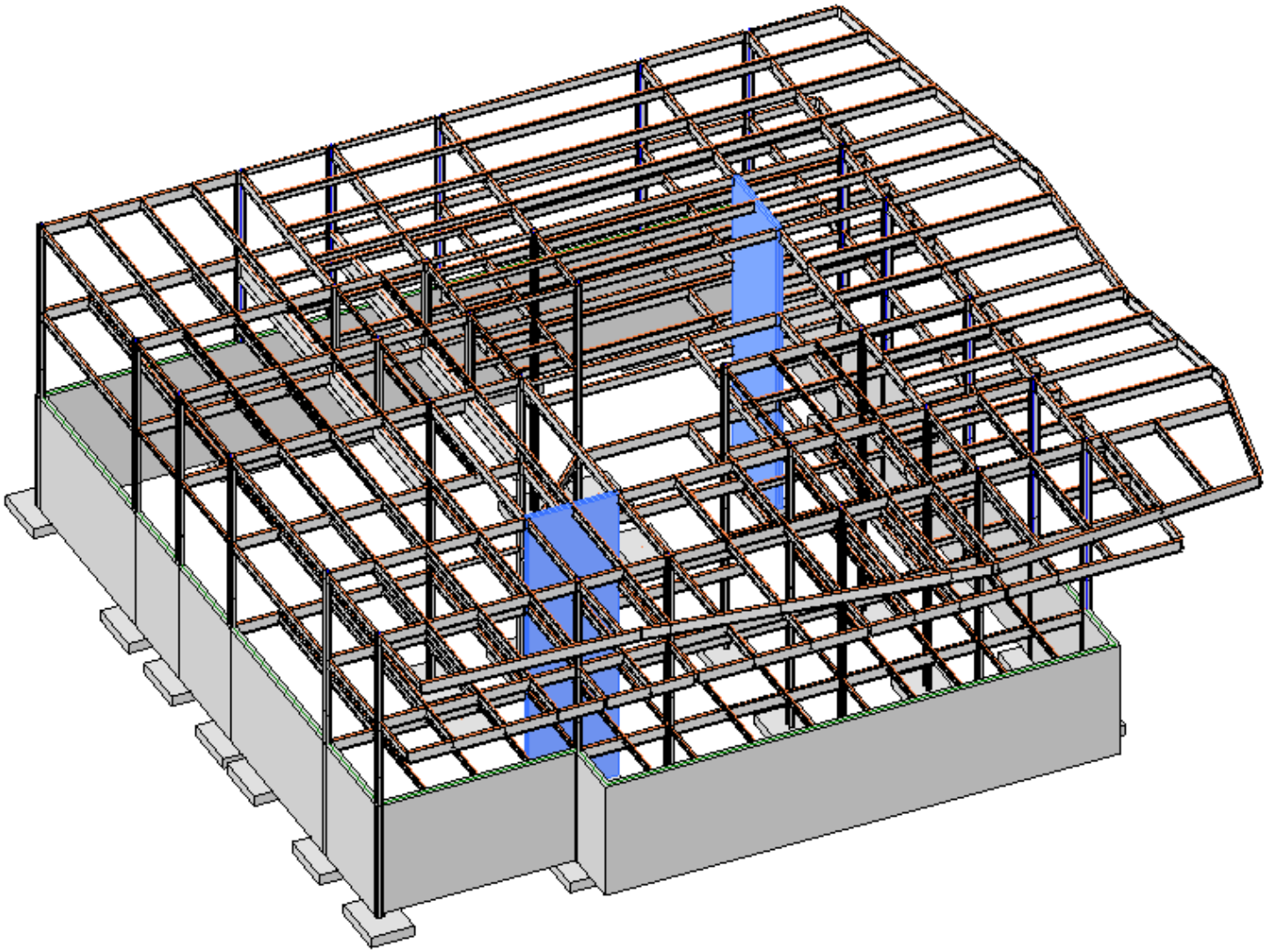


LOAD PATH – 3D

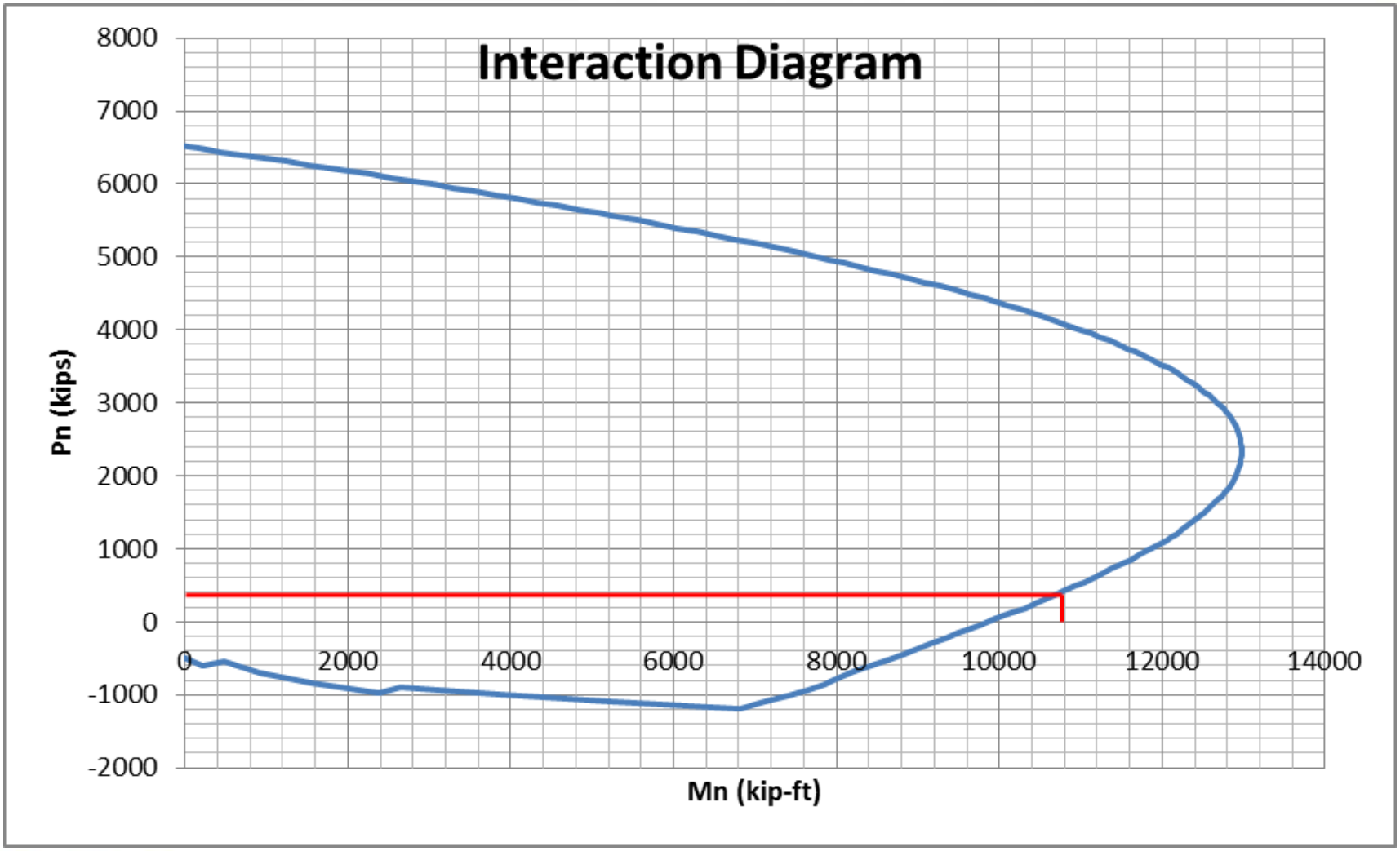
LOAD PATH - ELEVATION



CONCRETE SHEAR WALLS – 3D VIEW

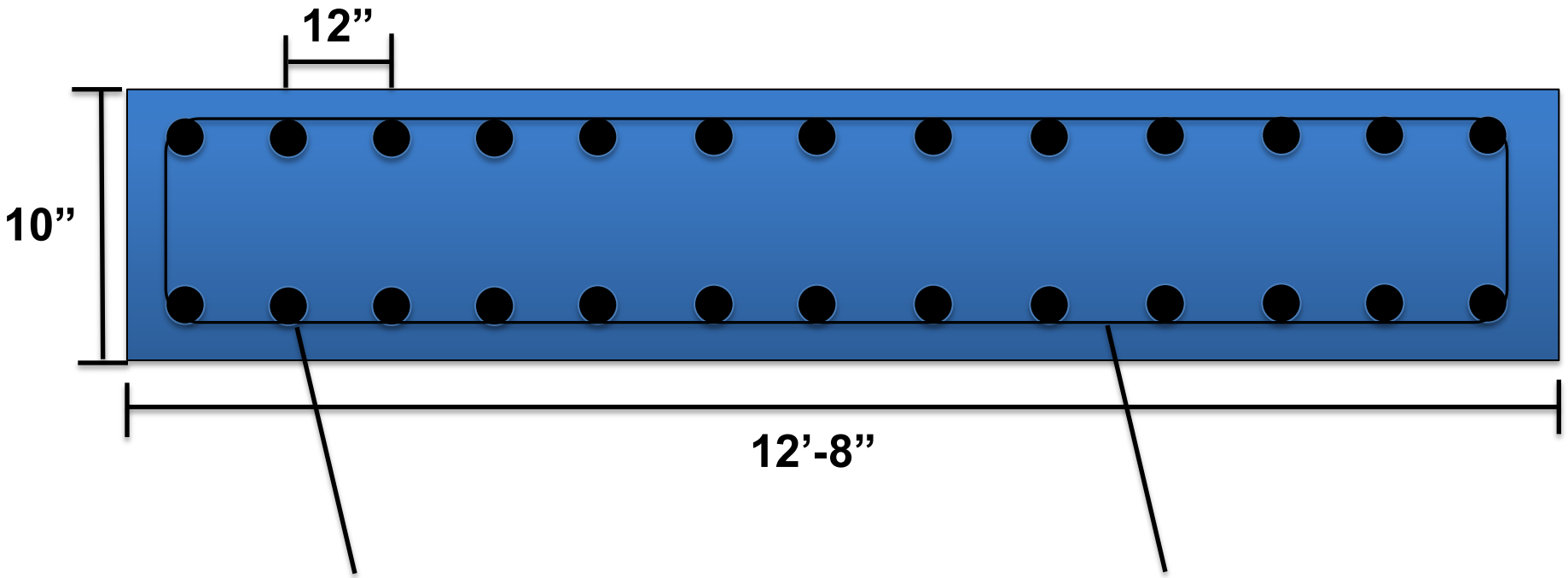


SHEAR WALL CAPACITY



- *Moment Capacity of 10,800 kip-ft*

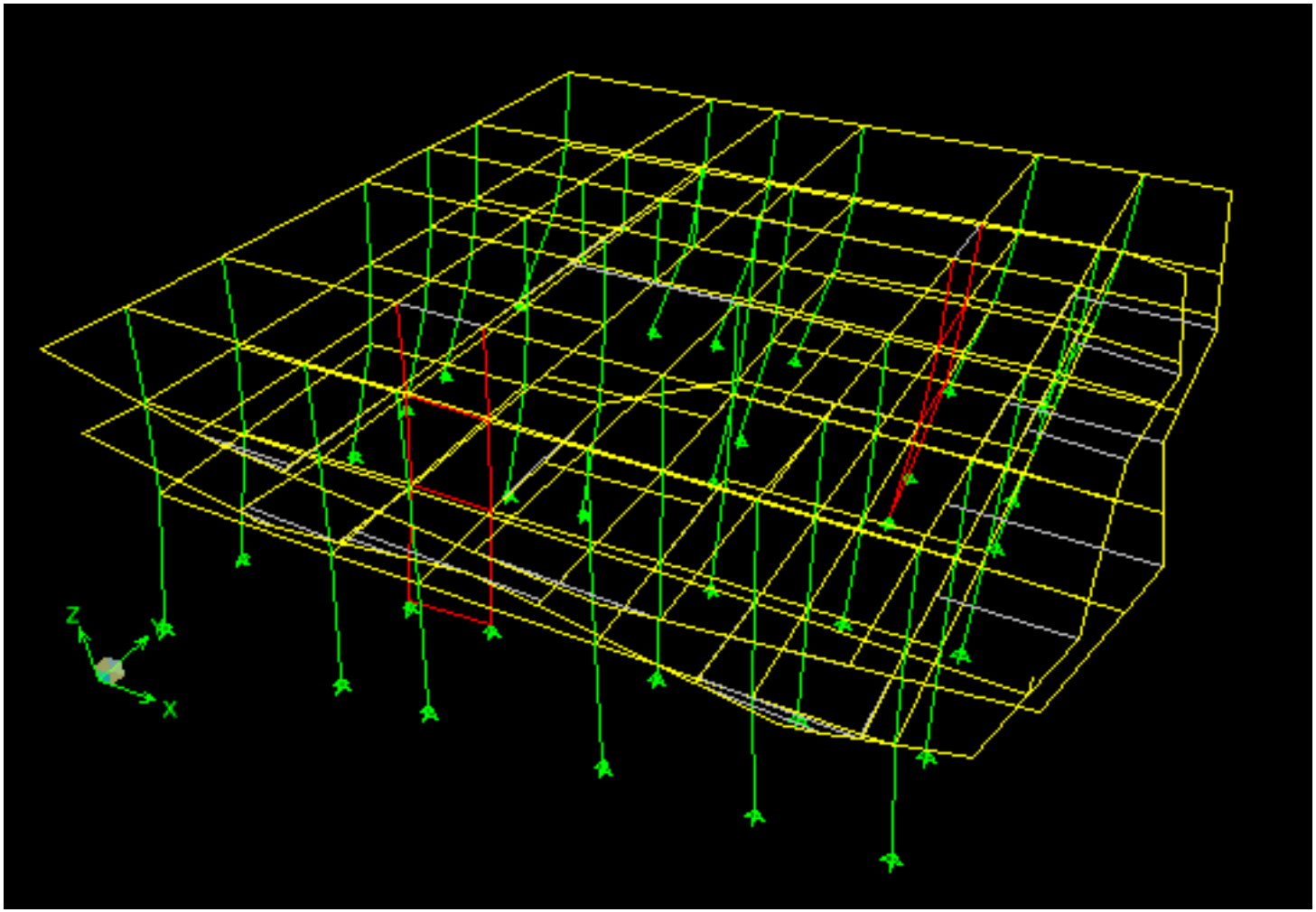
SHEAR WALL – PLAN VIEW



#9 @ 12” O.C.

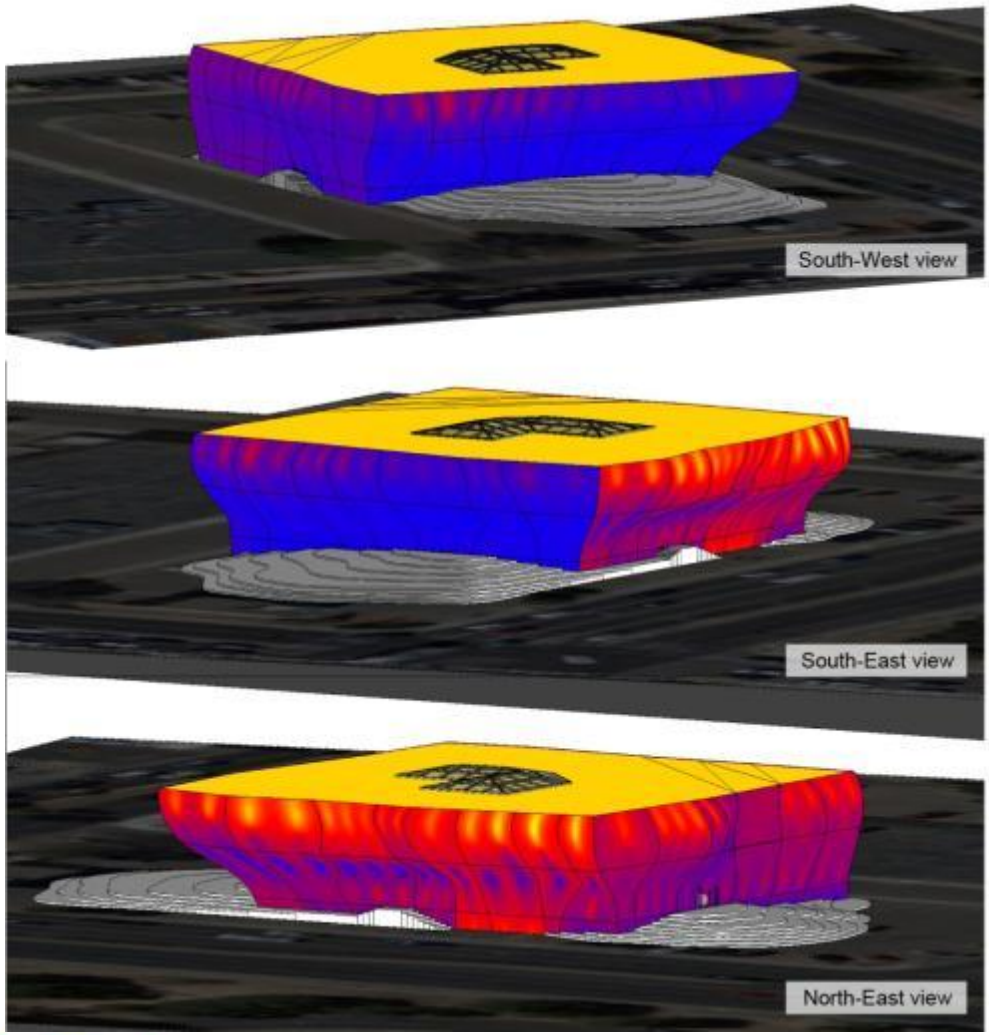
#11 @ 12” O.C.

SHEAR WALL – PLAN VIEW



Max Interstory Drift of 0.019

SUN SHADING - SUMMER

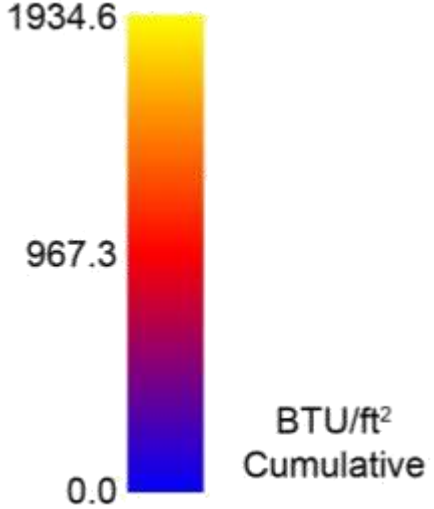


SOLAR RADIATION
ANALYSIS

SUMMER SOLSTICE

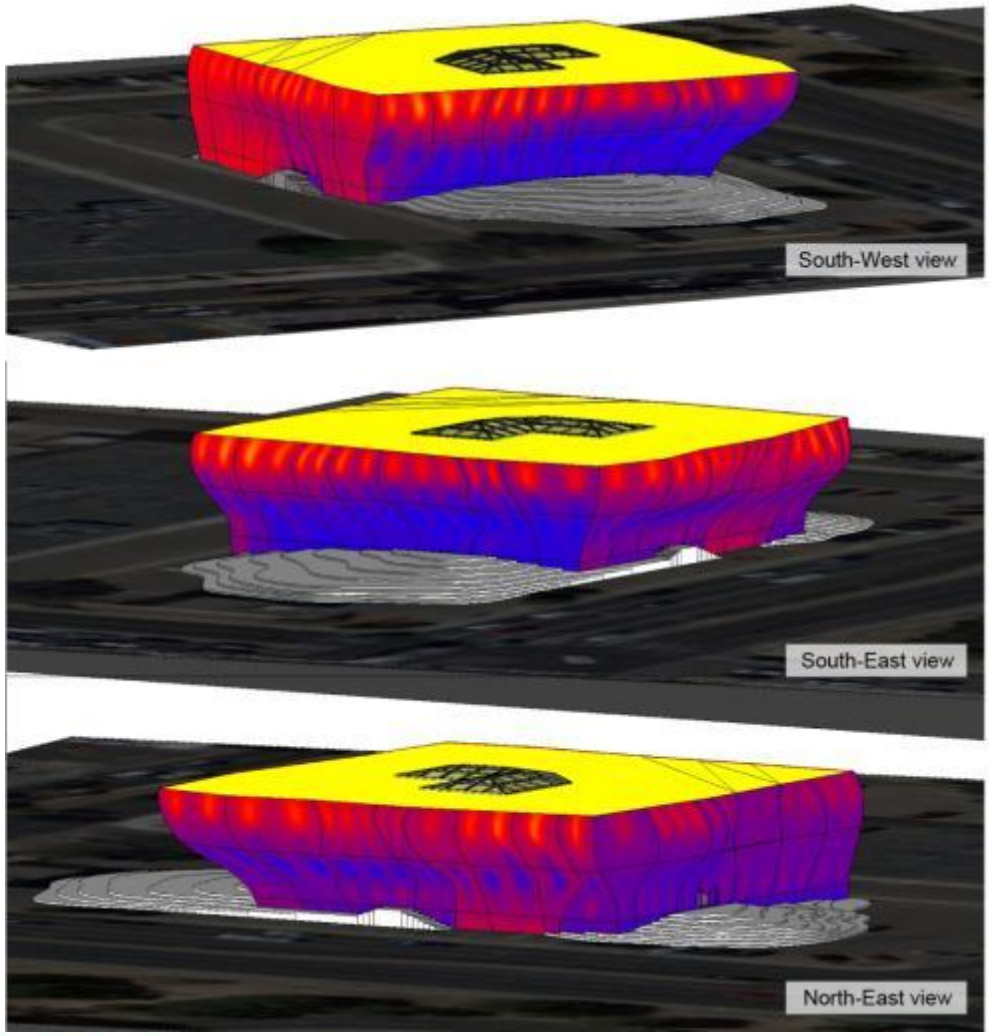
Sun study start date time:
6/22 5:57 AM

Sun study end date time:
6/22 8:19 PM



SUMMER SUN ANGLE

SUN SHADING – SPRING/AUTUMN

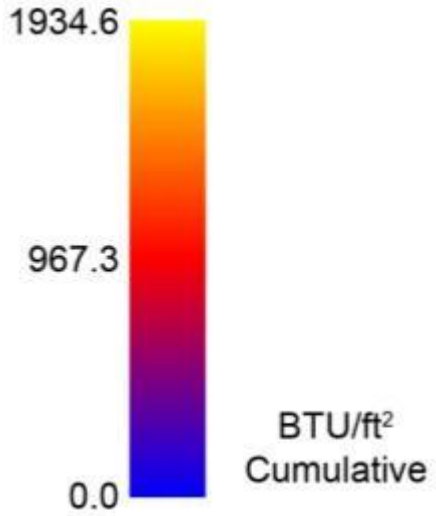


SOLAR RADIATION
ANALYSIS

SPRING/AUTUMN EQUINOX

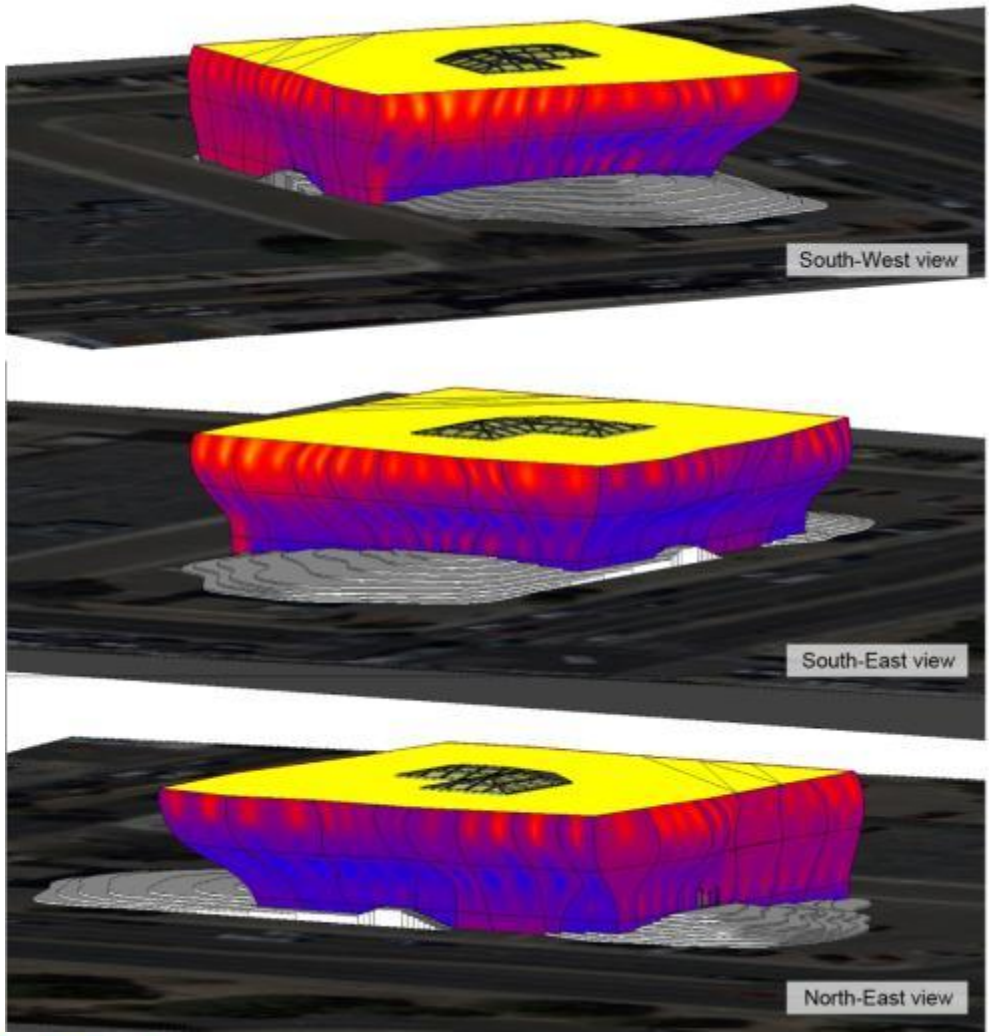
Sun study start date time:
3/21 7:14 AM

Sun study end date time:
3/21 7:12 PM



SPRING/AUTUMN SUN ANGLE

SUN SHADING - WINTER

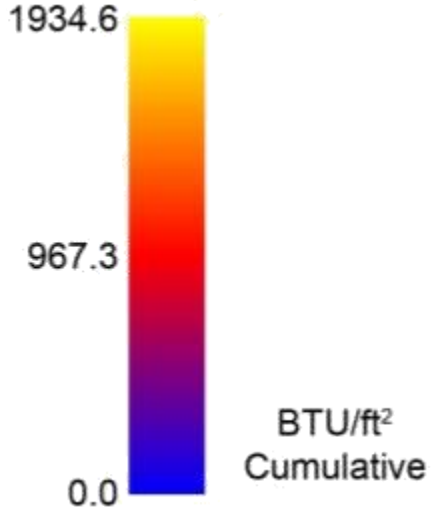


SOLAR RADIATION
ANALYSIS

WINTER SOLSTICE

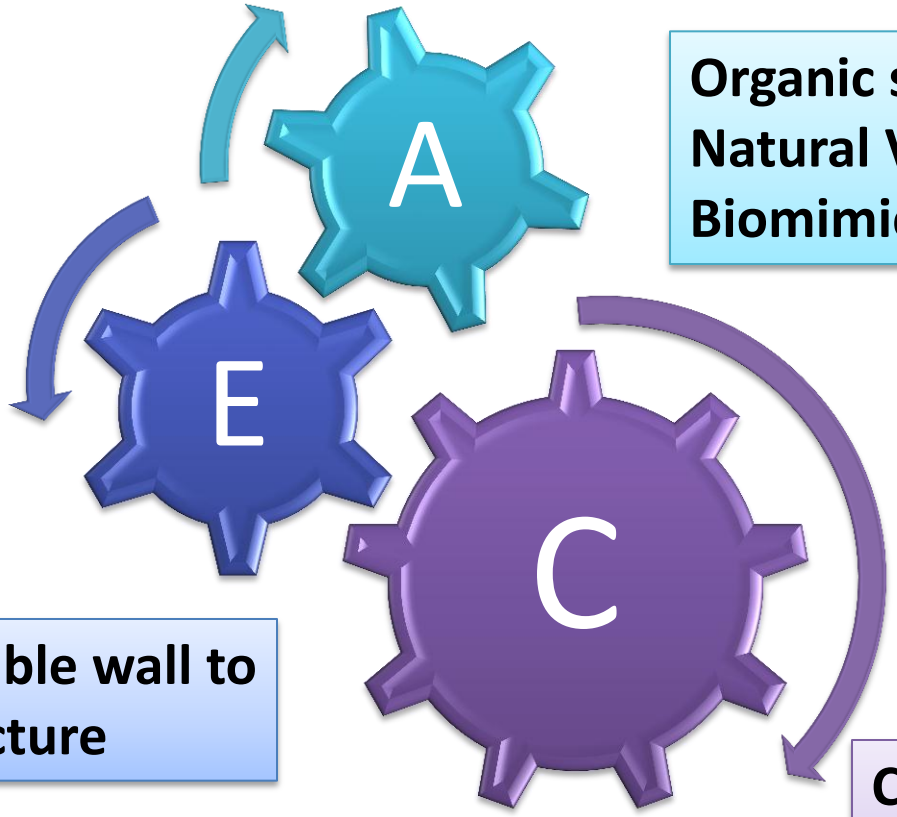
Sun study start date time:
12/22 8:15 AM

Sun study end date time:
12/22 5:53 PM



WINTER SUN ANGLE

EXTERIOR WALL CHALLENGE

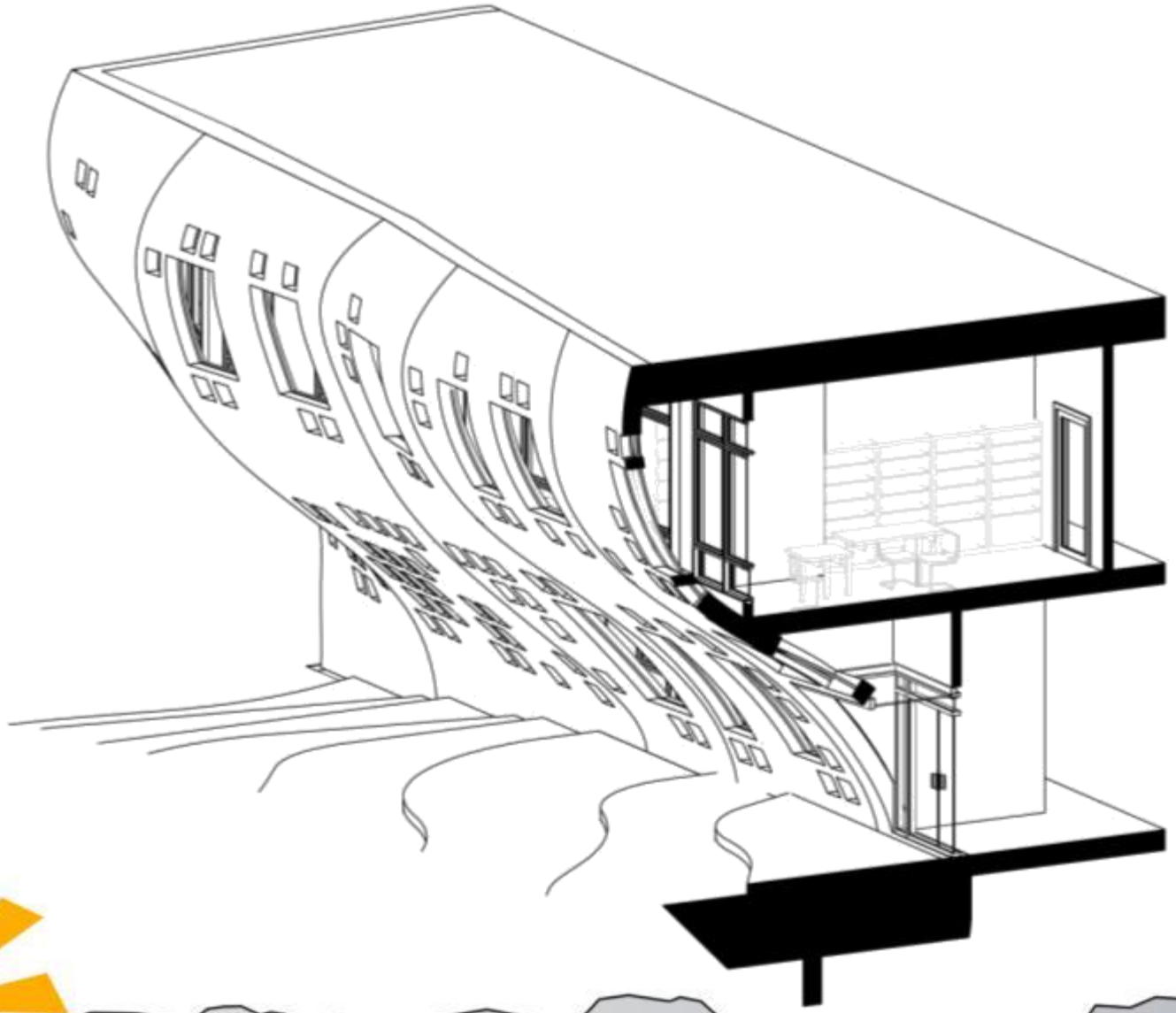


Organic shape
Natural Ventilation
Biomimicry Inspiration

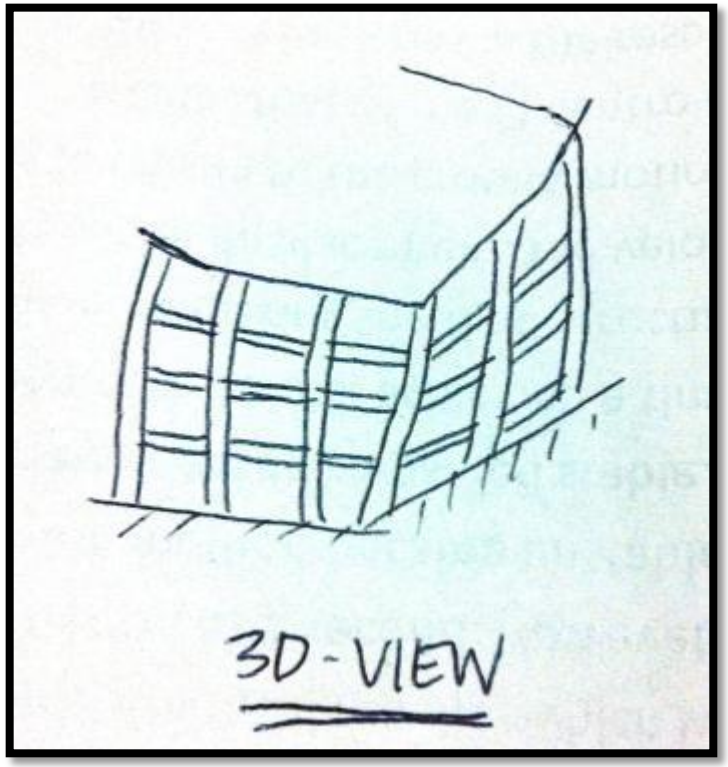
Attach double wall to structure

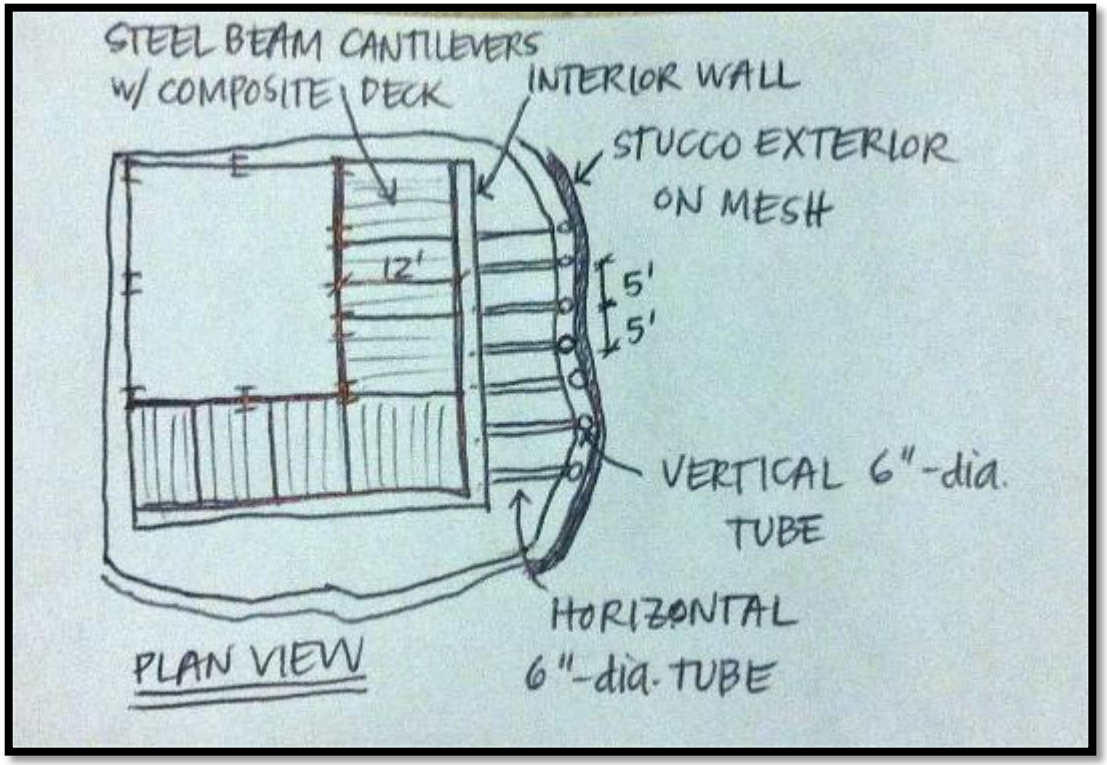
Constructability concerns
Almost double the cost
Unique fabrication

DOUBLE EXTERIOR FAÇADE



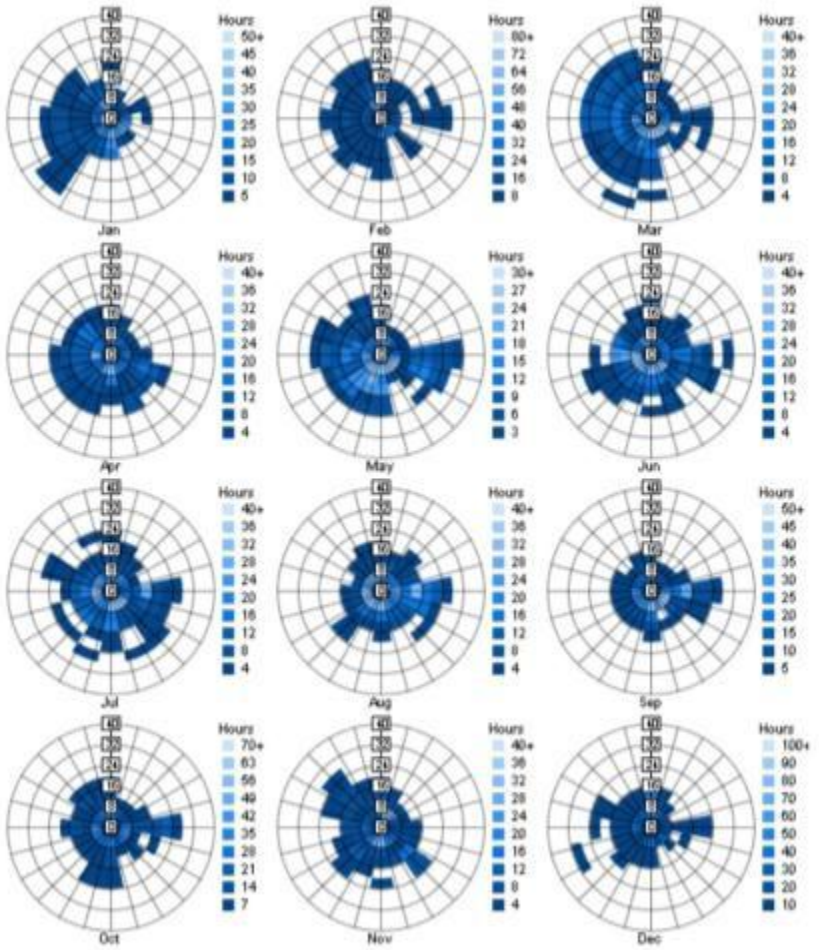
"DOUBLE WALL" SKETCHES



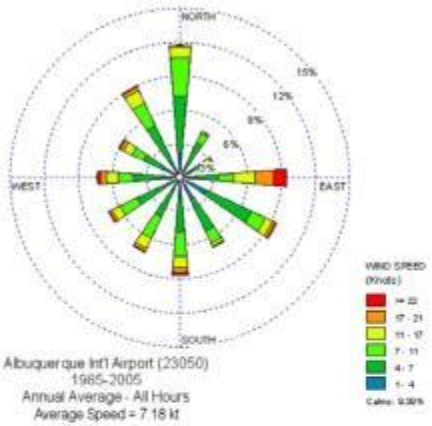


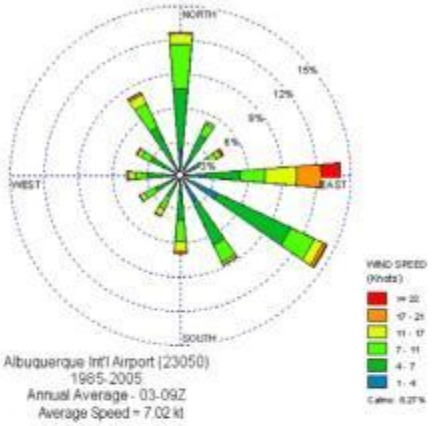
SITE WIND CONDITIONS

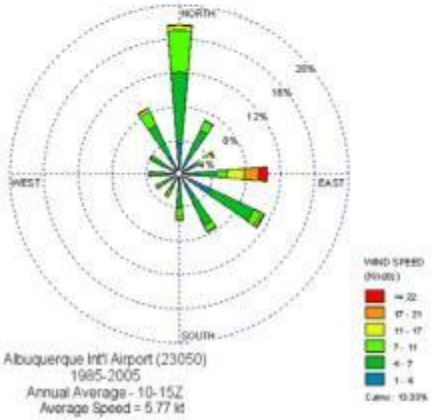
Monthly Wind Roses (Frequency Distribution)

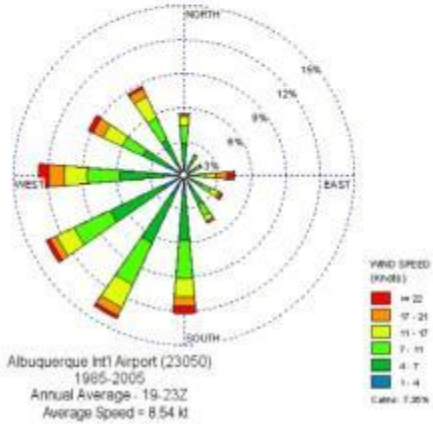


Frequency distrubution throughout day

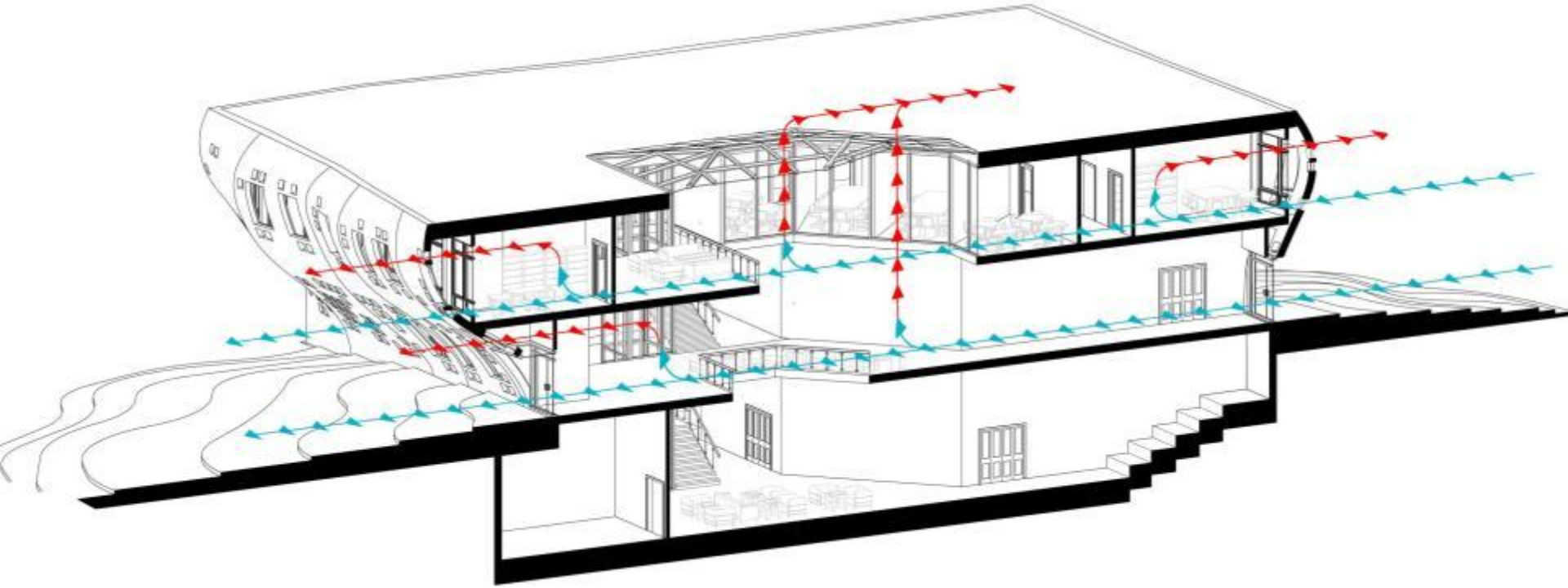






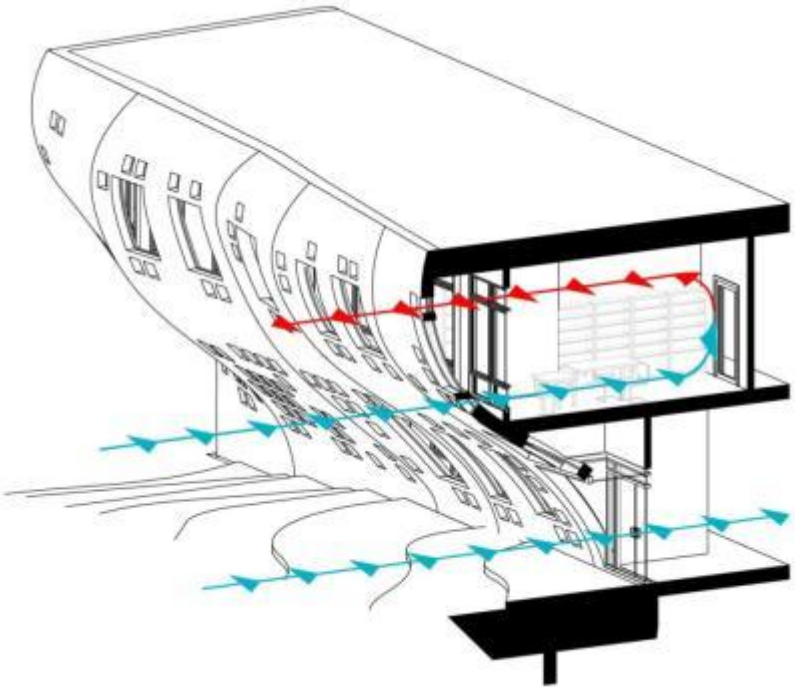


NATURAL VENTILATION – AIR CIRCULATION

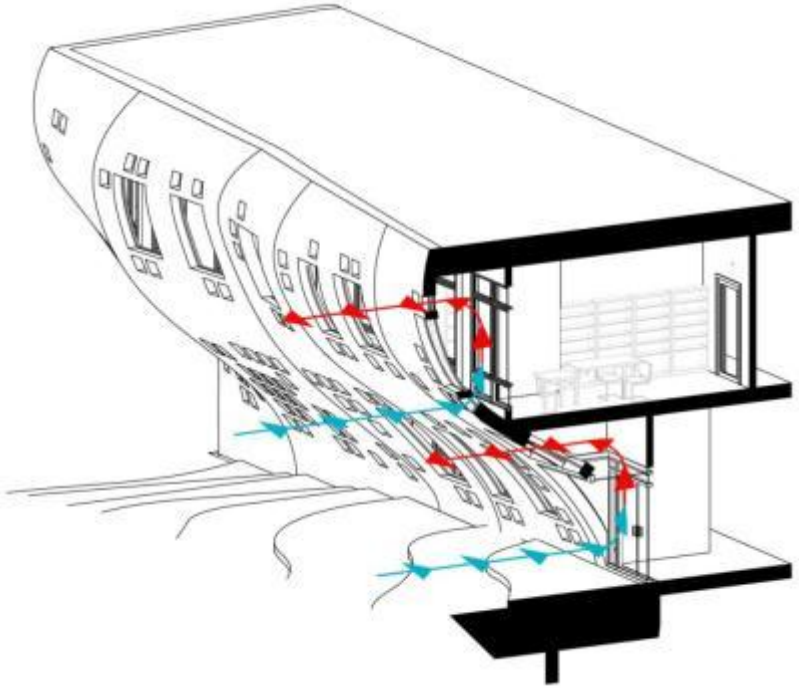


NATURAL VENTILATION – AIR CIRCULATION

SINGLE SIDED VENTILATION



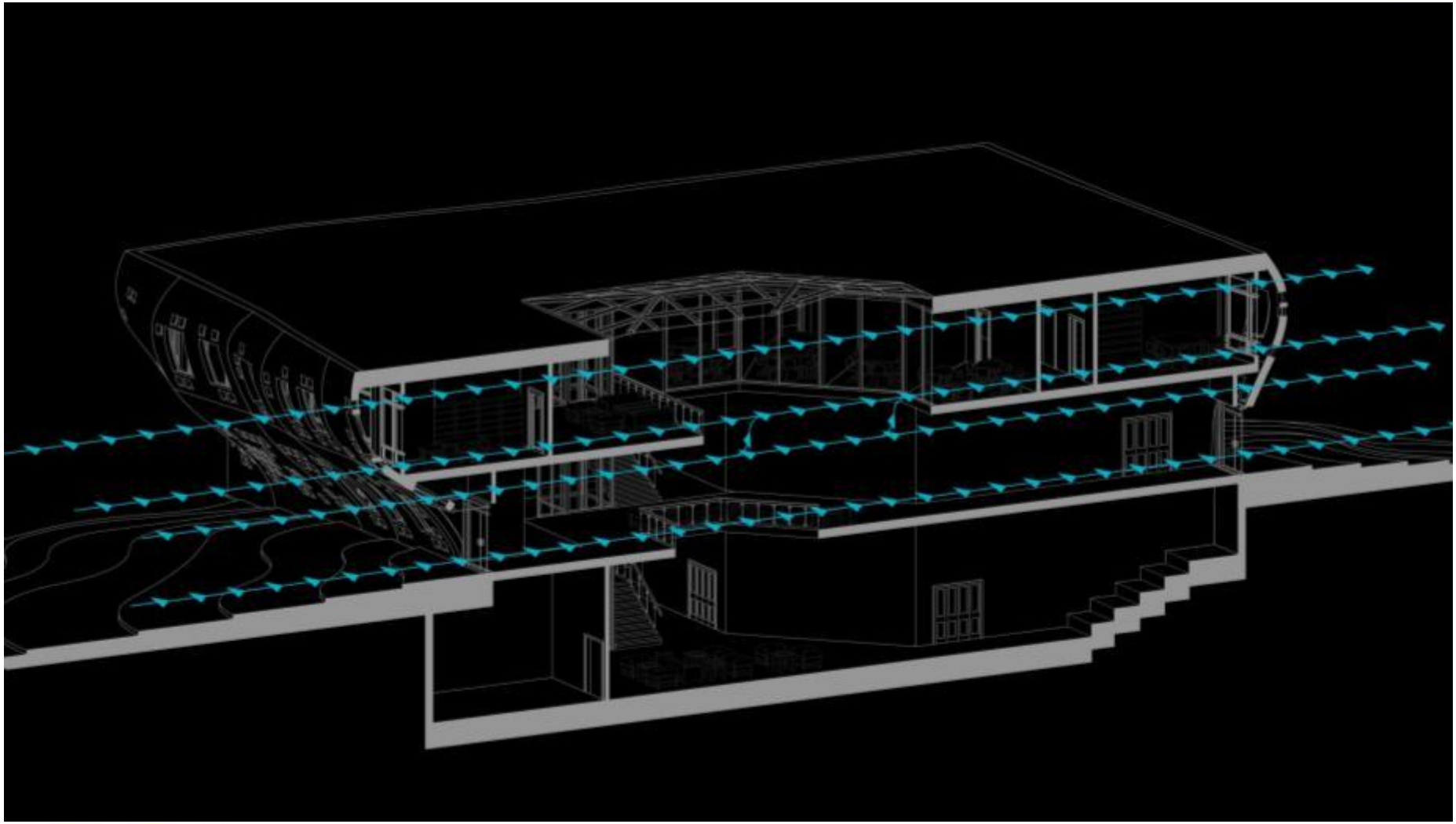
VENTILATED CAVITY



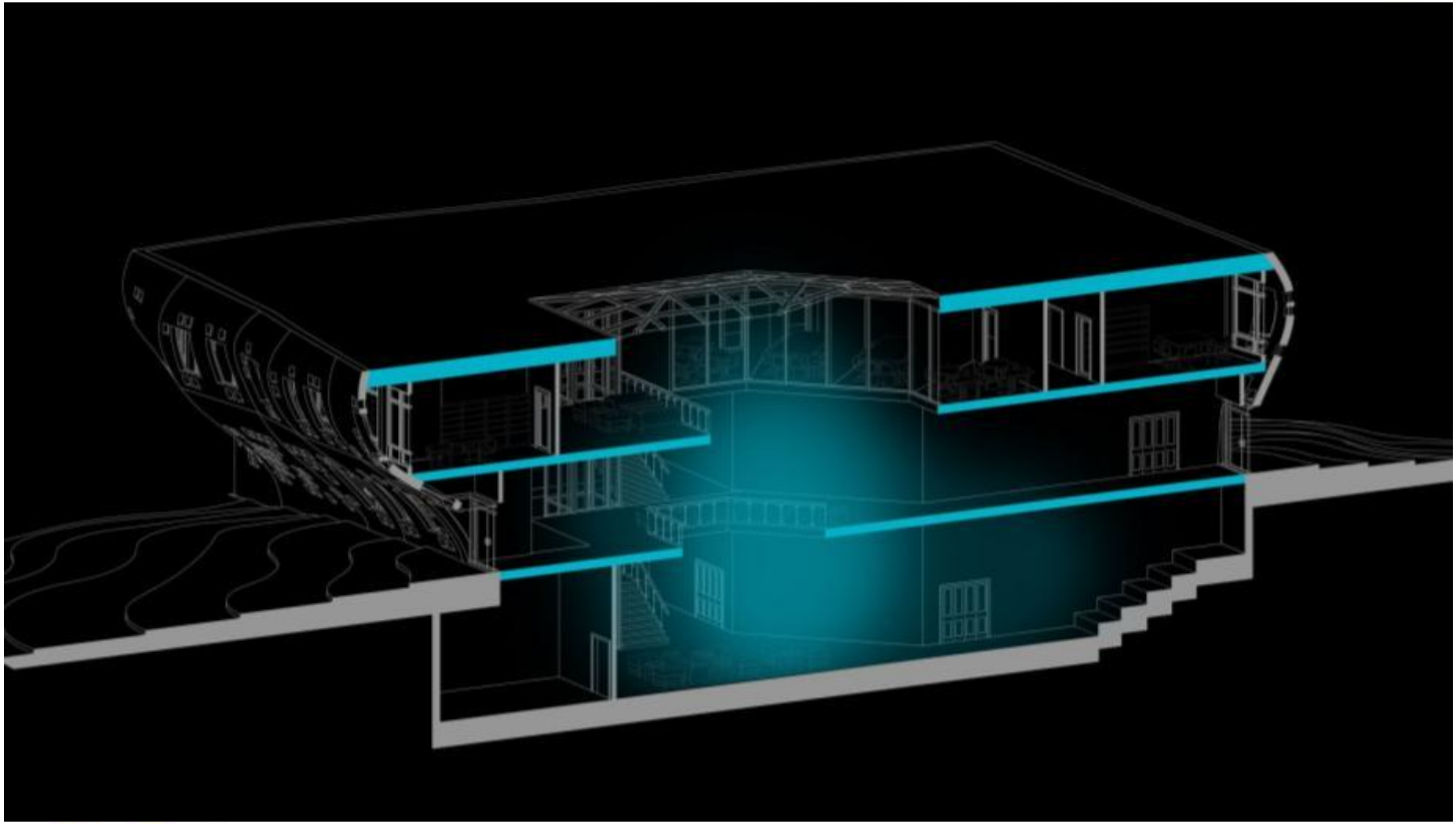
FENESTRATION – SOUTH VIEW

FENESTRATION – NORTH VIEW

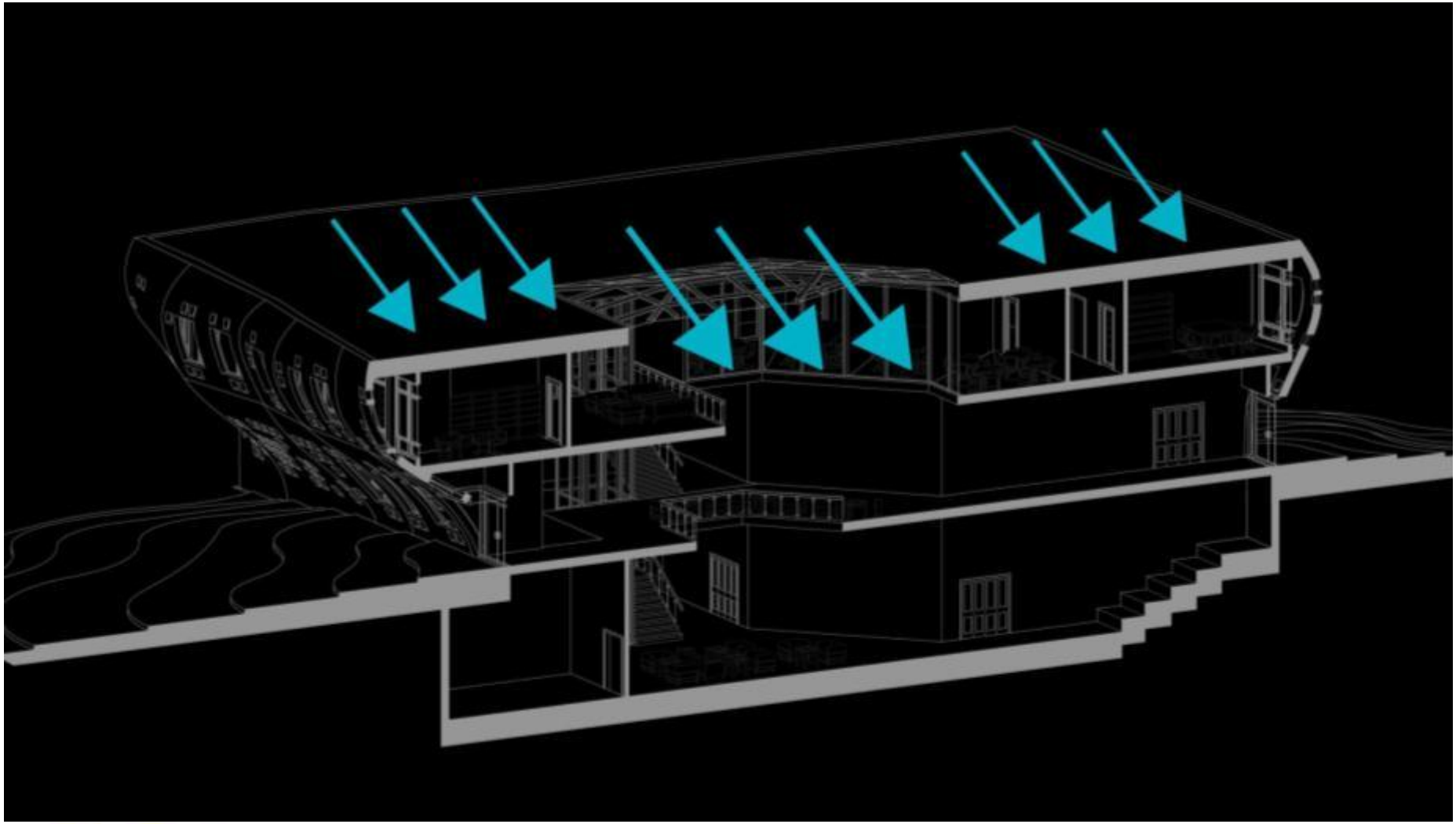
NATURAL VENTILATION – NIGHT COOLING



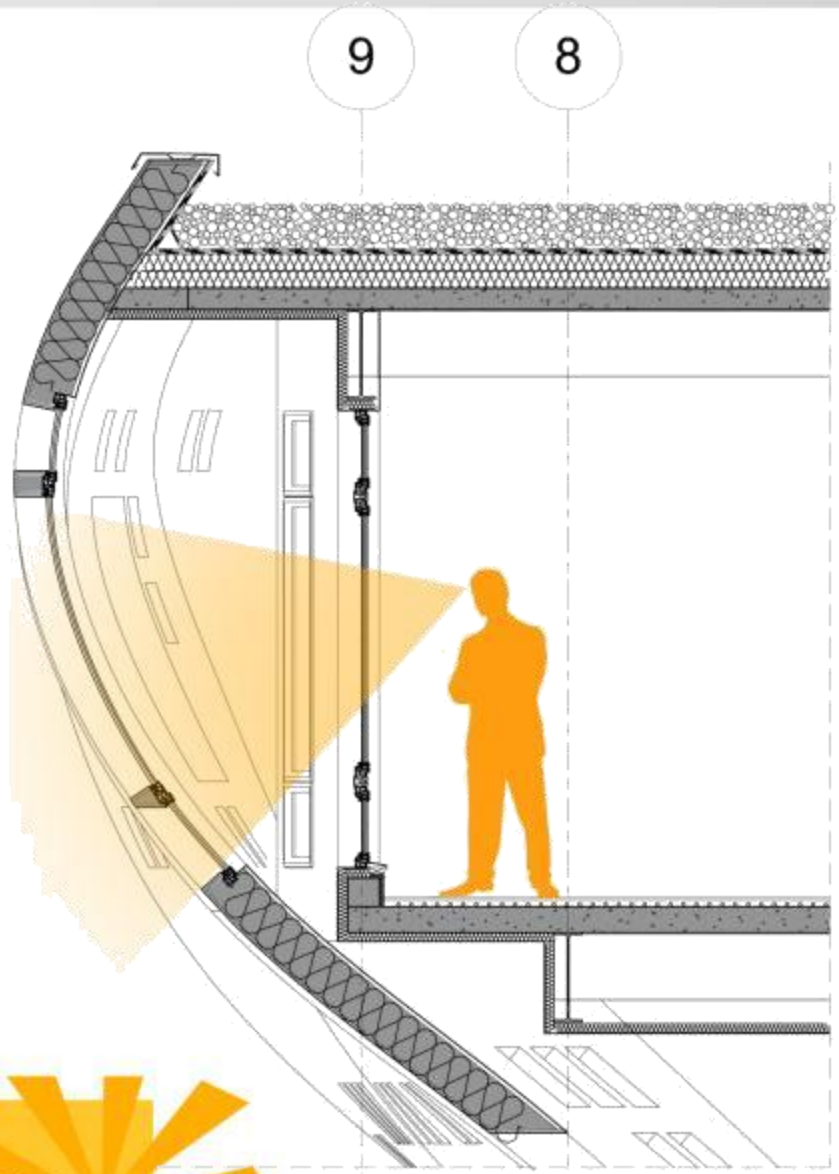
NATURAL VENTILATION – NIGHT COOLING



NATURAL VENTILATION – NIGHT COOLING



FLOOR SANDWICH



11"
8"
5"
16"

“YELLOW” GRAVEL ROOF

DUCTWORK BETWEEN BEAMS

10' - 0"

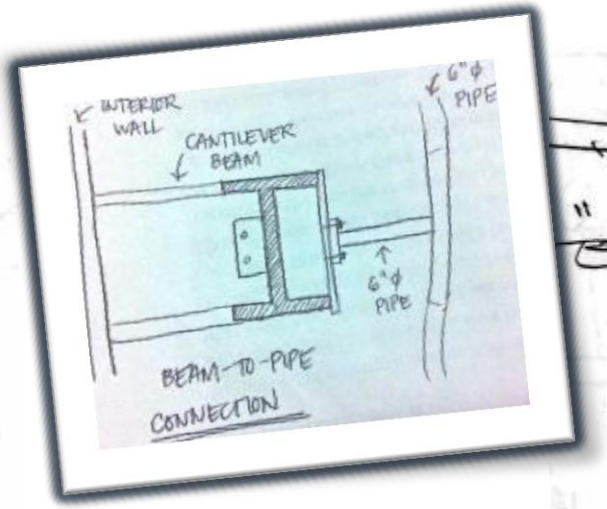
ROOM SPACE

1/2"
6"
2"
16"

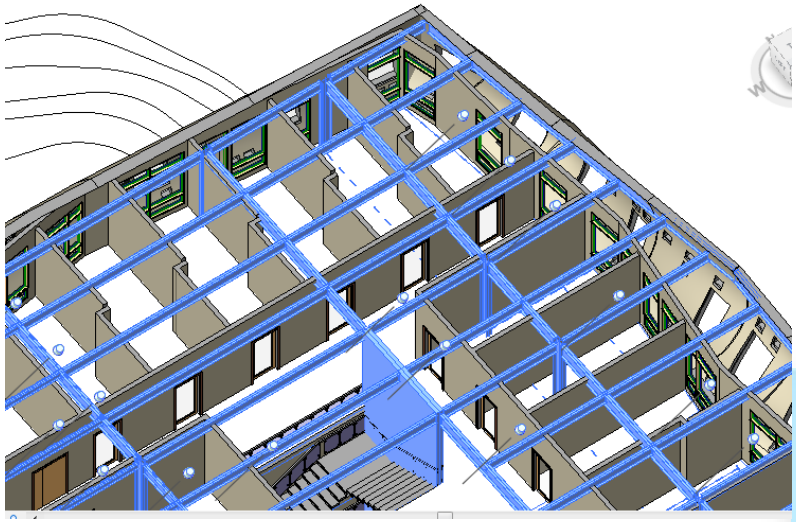
FLOOR SLAB

DUCTWORK BETWEEN BEAMS

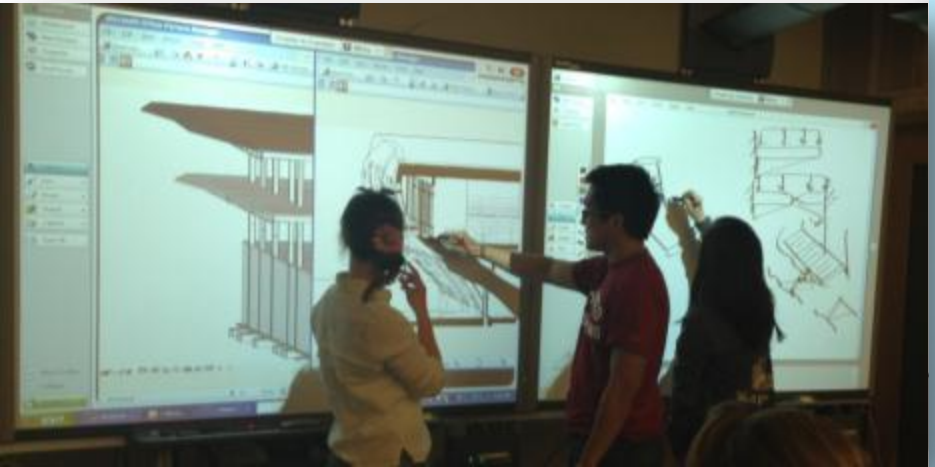
“DOUBLE WALL” PRELIMINARY SKETCHES



EXTERIOR WALL PROBLEM-SOLVING

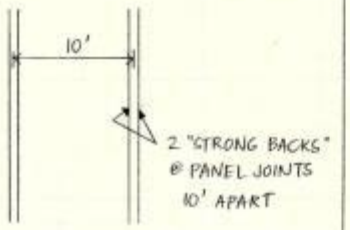


A+E Collaboration



DESIGN OF PANEL "STRONG BACK"

DESIGN OF PANEL "STRONG BACK"



CHECK WALL FOR 25 PSF LATERAL LOAD:

W_u = 1.6 (5')(0.025 KSF) = 0.2 K/LF

L = 13'

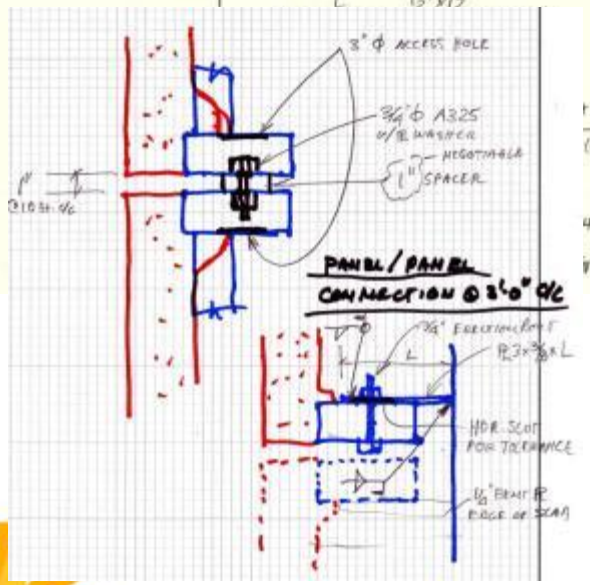
ASSUME SIMPLY-SUPPORTED (CONSERVATIVE)

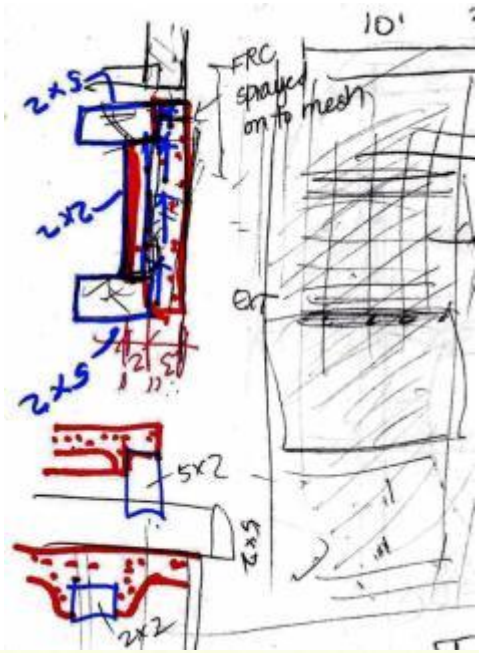
$M_u = \frac{W_u L^2}{8} = \frac{(0.2)(13')^2}{8} = 4.2\ ^K/_{FT}$

$Z_{REQ'D} = \frac{4.2(12)}{0.9(46)} = 1.2\ in^3$

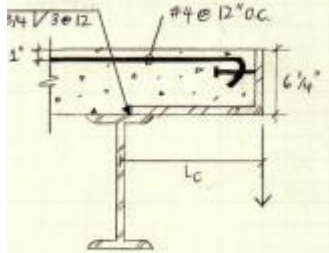
TRY HSS 2½ x 2½ x 3/16

CHECK DEFLECTION LIMIT:





EDGE OF SLAB - BENT PLATE DETAIL



CONSTRUCTION:

NORMAL WT CONC = 120 PCF

CONSTRUCTION LL = 20 PSF

$W_D = 1.2\left(\frac{6.25"}{12}\right)\left(0.12\ \frac{K}{FT^3}\right) = 0.075\ KSF$

$W_L = 1.6\ (0.02\ KSF) = 0.032\ KSF$

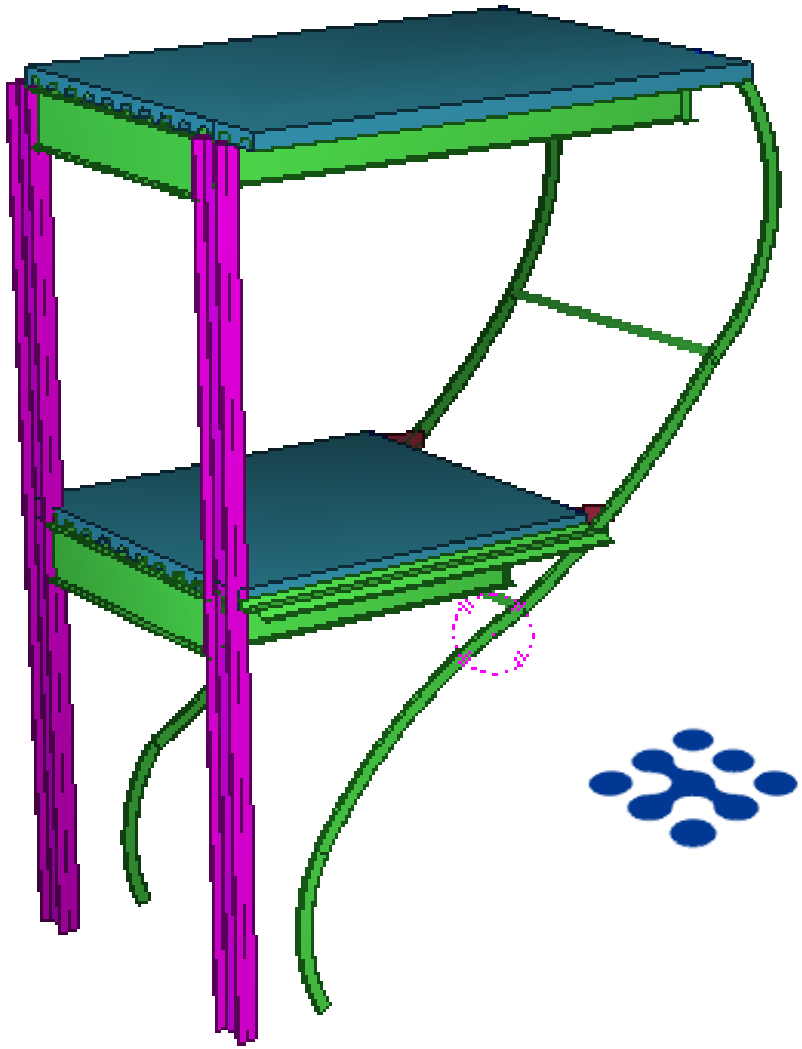
$W_u = W_D + W_L = 0.107\ KSF$

$M_u = \frac{0.107\ (L_C)^2 \times 12}{2}$

$\phi M_n = (0.9)\ \frac{12(0.25)^2}{4}\ (36) = 6\ ^{IN\text{-}K}/_{FT}$

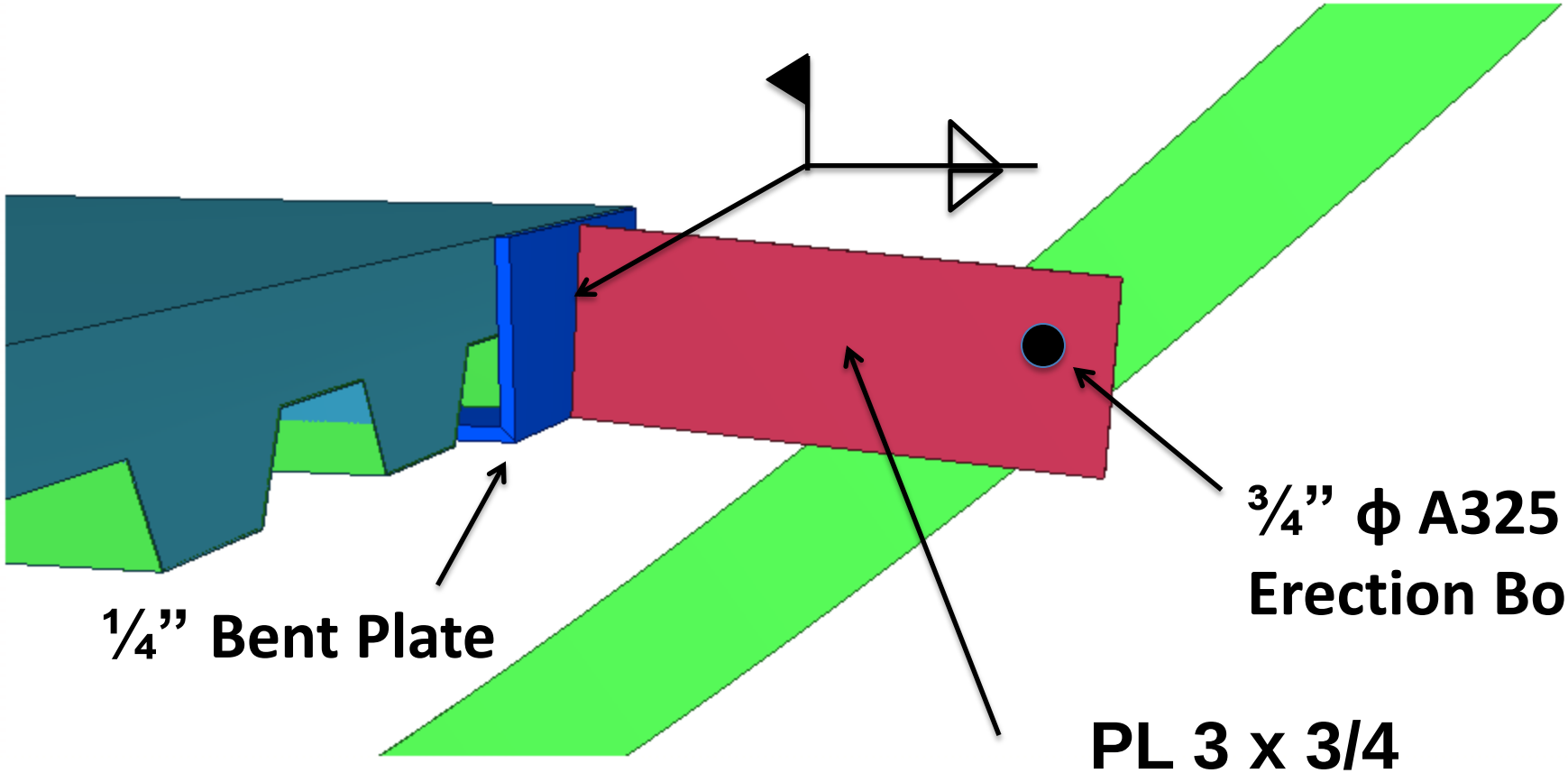
$L_C = \sqrt{\frac{2(6)}{0.107(12)}} = 3\ FT$

FAÇADE CONSTRUCTION

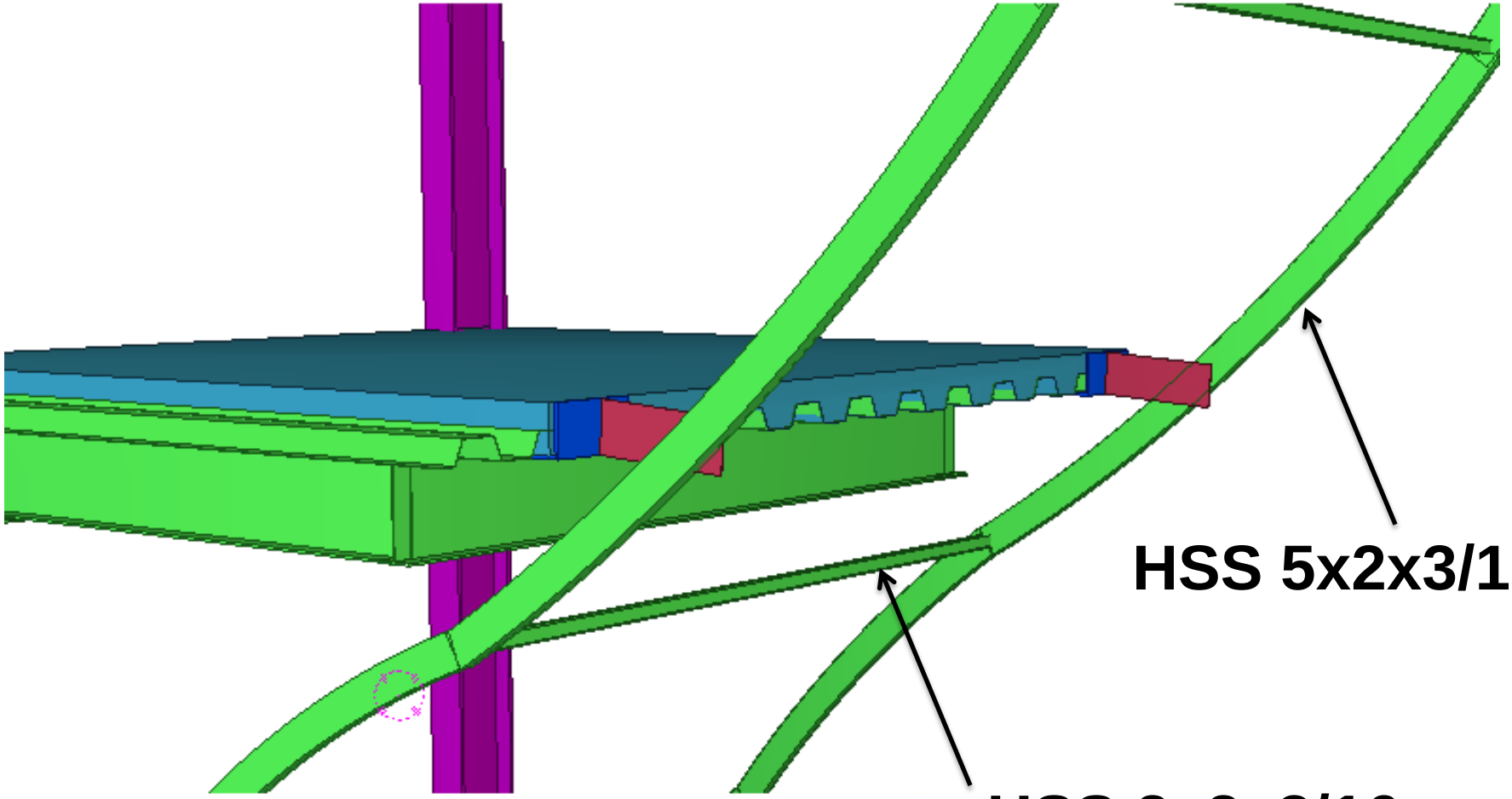


TEKLA

FAÇADE CONSTRUCTION



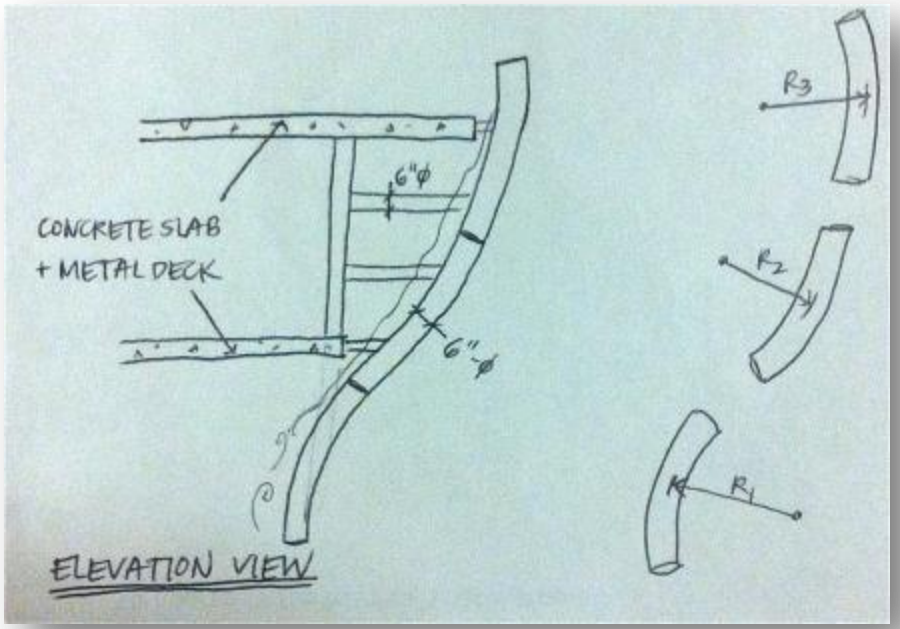
FAÇADE CONSTRUCTION



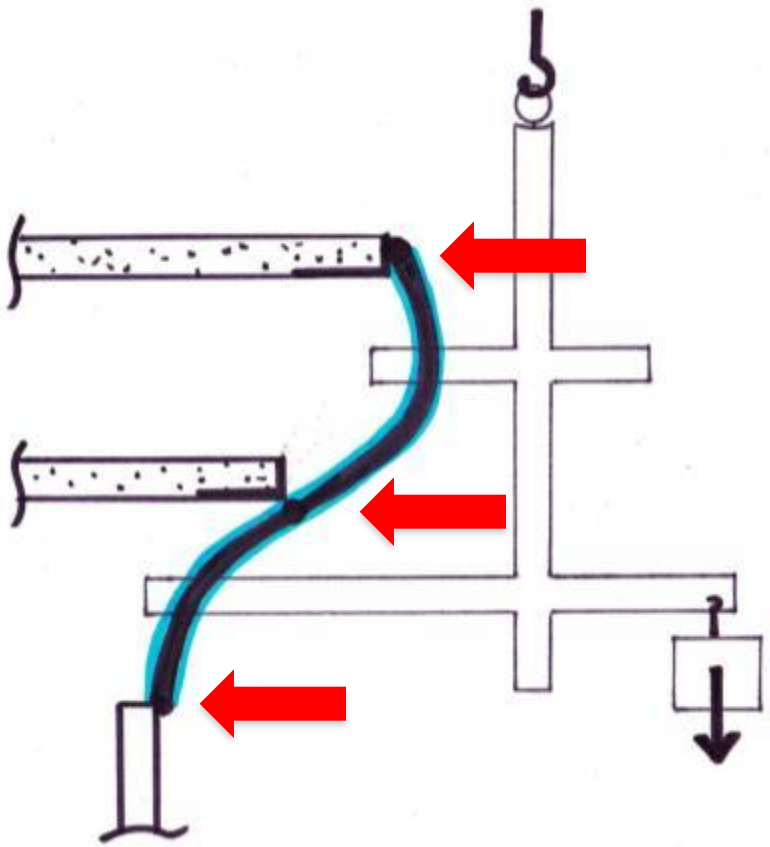
REPETITION, REPETITION, REPETITION...

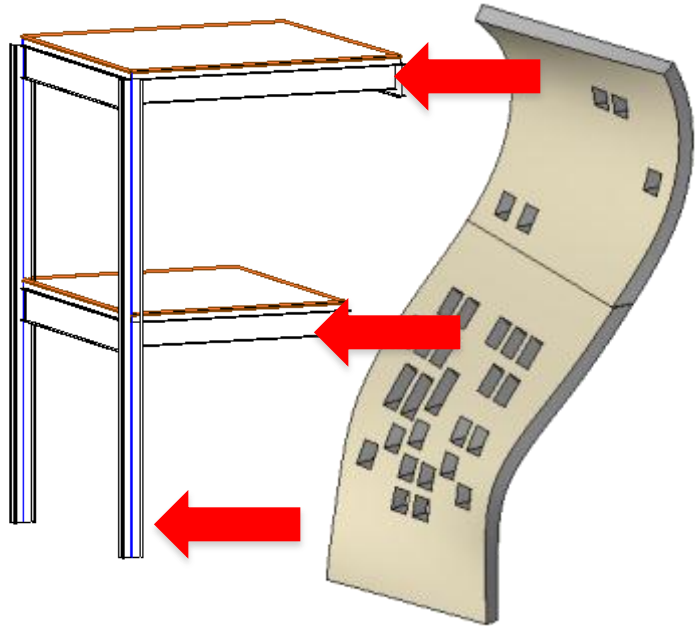
"How can we make something ***atypical*** … ***typical***?"

- ***DR. GREG P. LUTH***



HOISTING MECHANISM





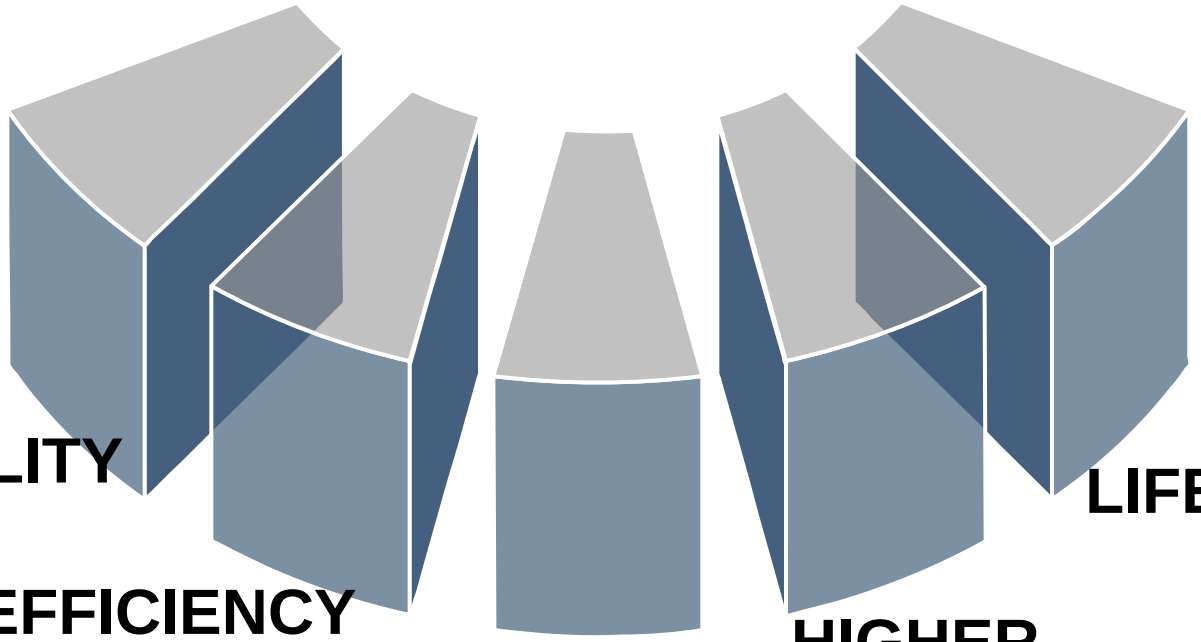
- *RIGGING SYSTEM WITH COUNTERWEIGHTS*

6 LABORERS

3 DAYS

BUILDING SQUARE FOOTAGE

27,000 SF vs. 30,000 SF



SUSTAINABILITY

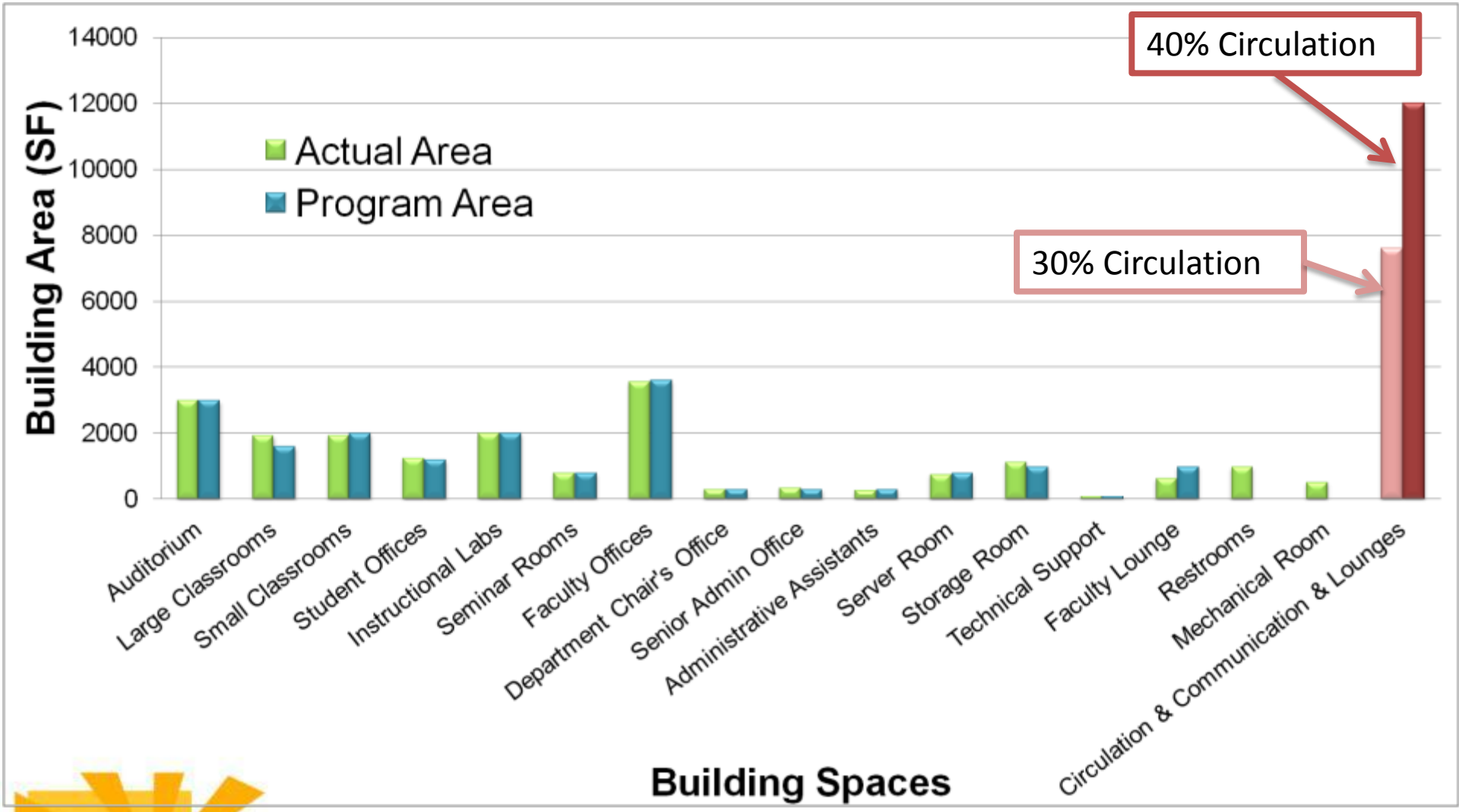
EFFICIENCY

COST

HIGHER QUALITY

LIFE CYCLE

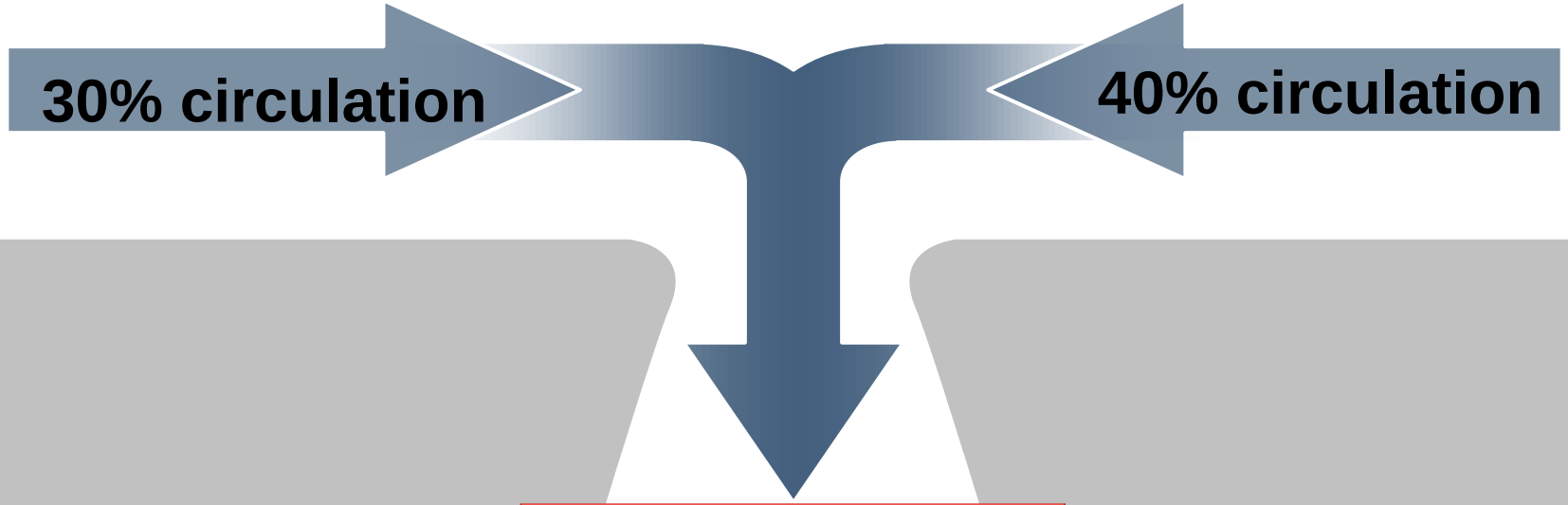
BUILDING SQUARE FOOTAGE



EFFICIENCY OF CIRCULATION

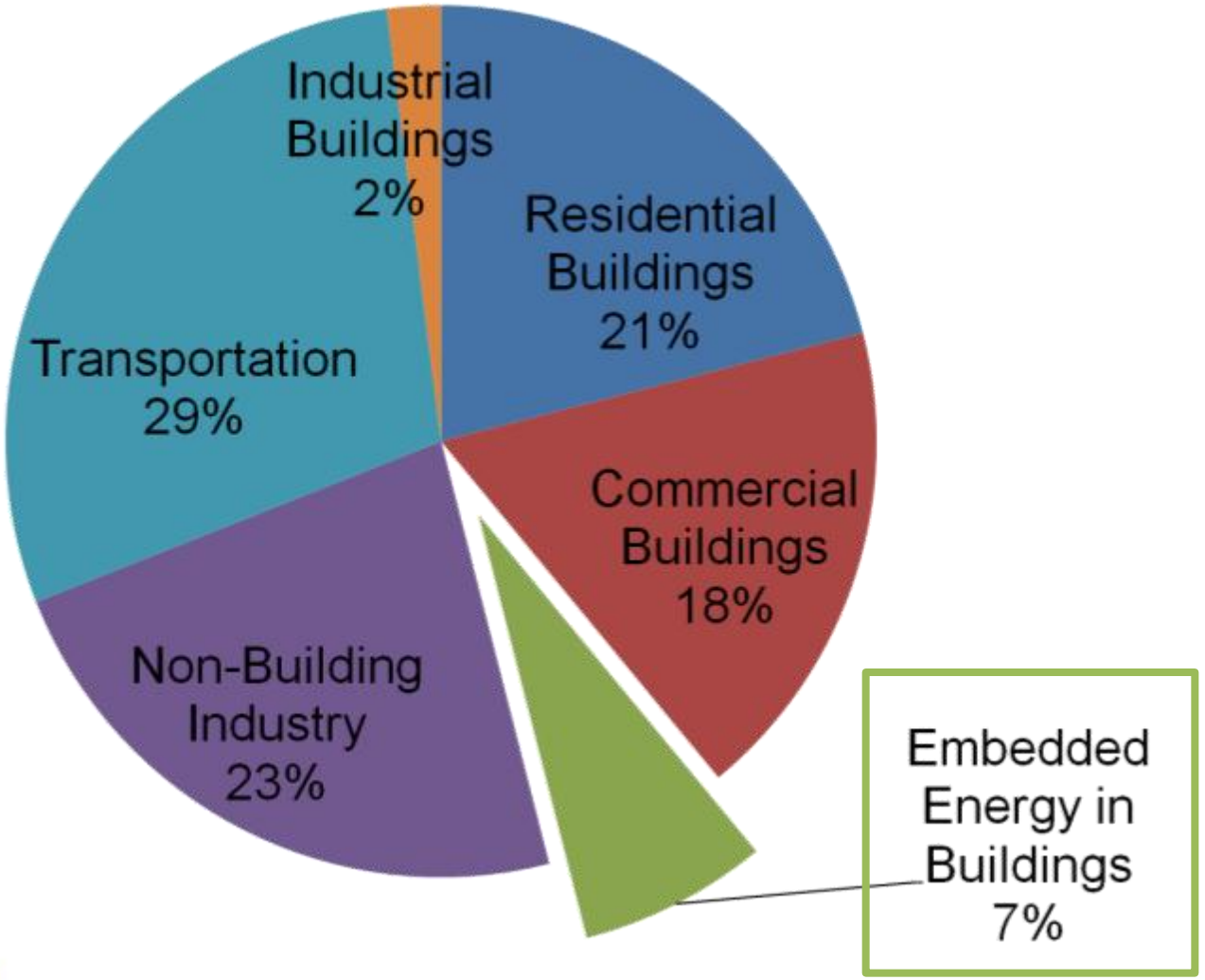
No waste of space
Less energy for heating and cooling
Reduce carbon footprint
Creative & compact

Less efficient use of space
Carbon footprint greater
High life cycle cost



27,000 SF is more efficient

HALF OF U.S. CARBON EMISSIONS ARE FROM BUILDING SECTOR



Source: Professor Gilbert Masters, Stanford

OWNER CONCERNS

Category	Description	Owner's Value (Hoss)	Owner's Value (Sinan)	Owners' Average
A. Substructure	Building Location on Site	7	10	8.5
B. Shell	Exterior Enclosure (Façade)	9	9	9
	Roof	8	7	7.5
	Exterior Enclosure (Walls)	7	6	6.5
C. Interiors	Interior Finishes (Partitions, Floors, Doors)	8	9	8.5
D. Services	Energy Efficiency	10	10	10
	Indoor Air Quality	9	8	8.5
	Elevators	6	4	5
	Lighting	8	8	8
	Communications and Electrical Services	7	7	7
E. Equipment and Furnishings	Auditorium Furnishing	9	6	7.5
	Classroom Furnishing	9	6	7.5
F. Specialty Construction	Special or Distinguishing Features	10	7	8.5
G. Building Sitework	Landscaping	7	8	7.5
H. Conditions	Contingency	7	8	7.5

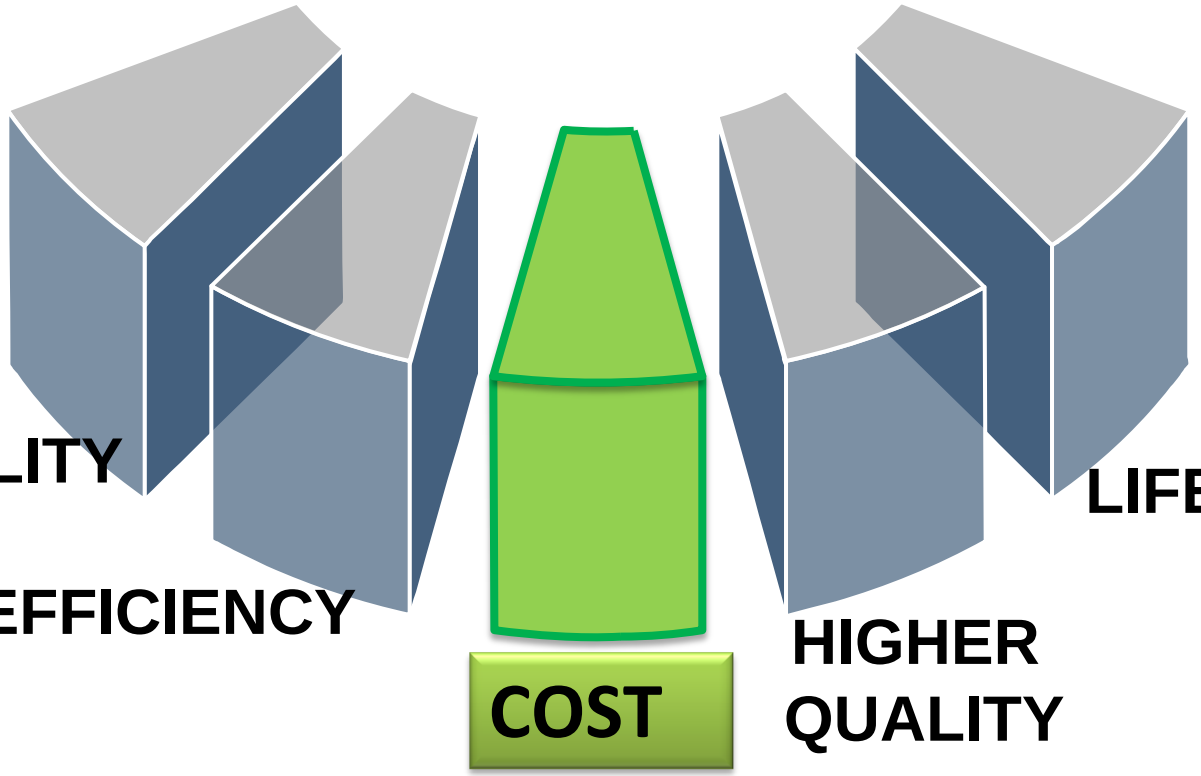
LEED GOLD 60 POINTS

LEED 2009 for New Construction

Chapter	Possible Points	Received Points
Sustainable Sites	26	18
Water Efficiency	10	2
Energy and Atmosphere	35	24
Materials and Resources	14	8
Indoor Environmental Quality	15	7
Innovation and Design Process	6	1
Regional Priority Credits	4	0
Total	**110**	**60**

DIRECT COST SAVINGS

27,000 SF vs. 30,000 SF



THE FIXED TARGET

Return on Investment = 0.8%
Inflation = 4%

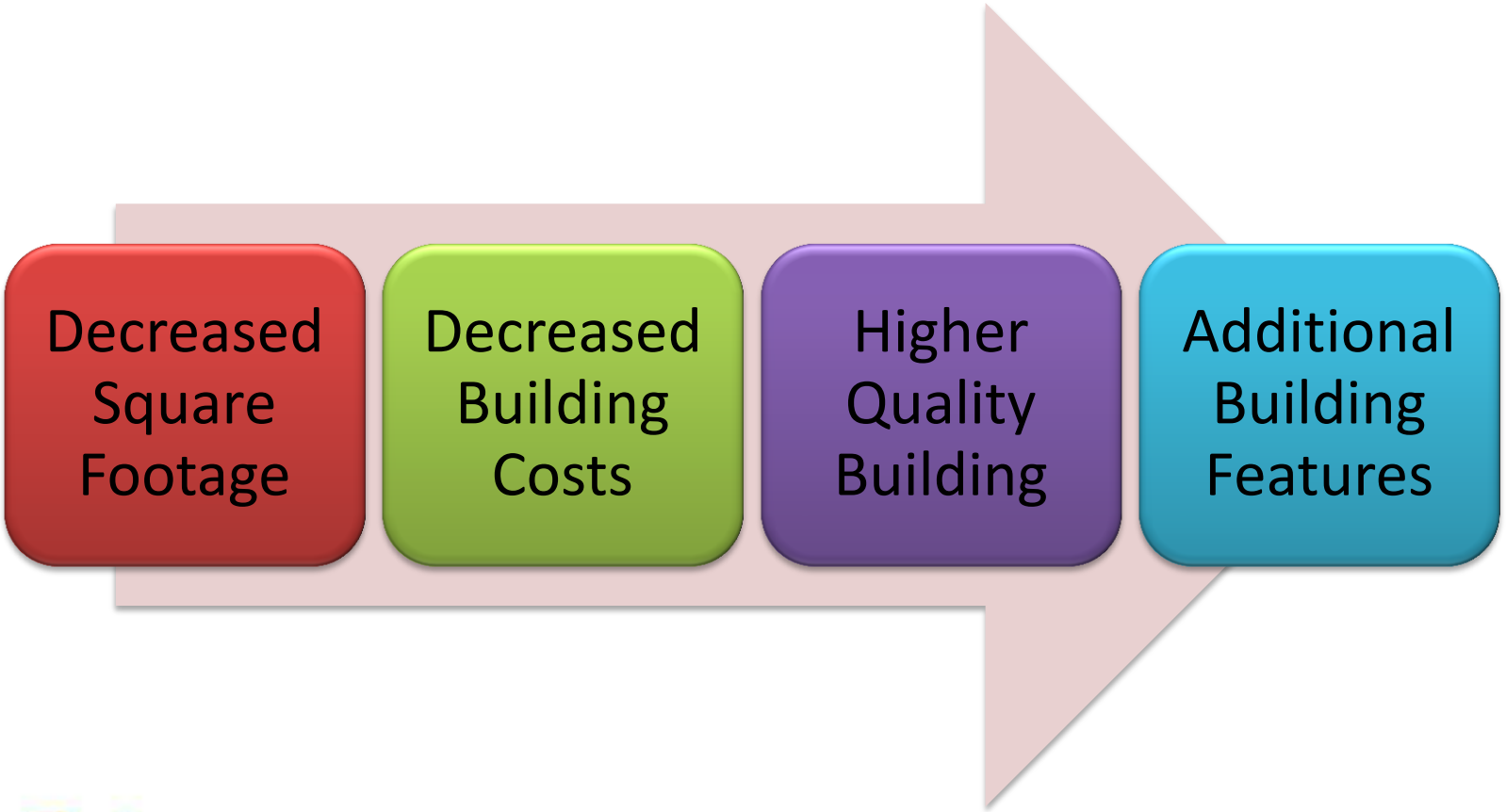
Grant (in 2012 Dollars): **$8,500,000**

Start of Construction on August 3, 2015: **$7,293,000**

TARGET VALUE: **$7.2 MILLION**

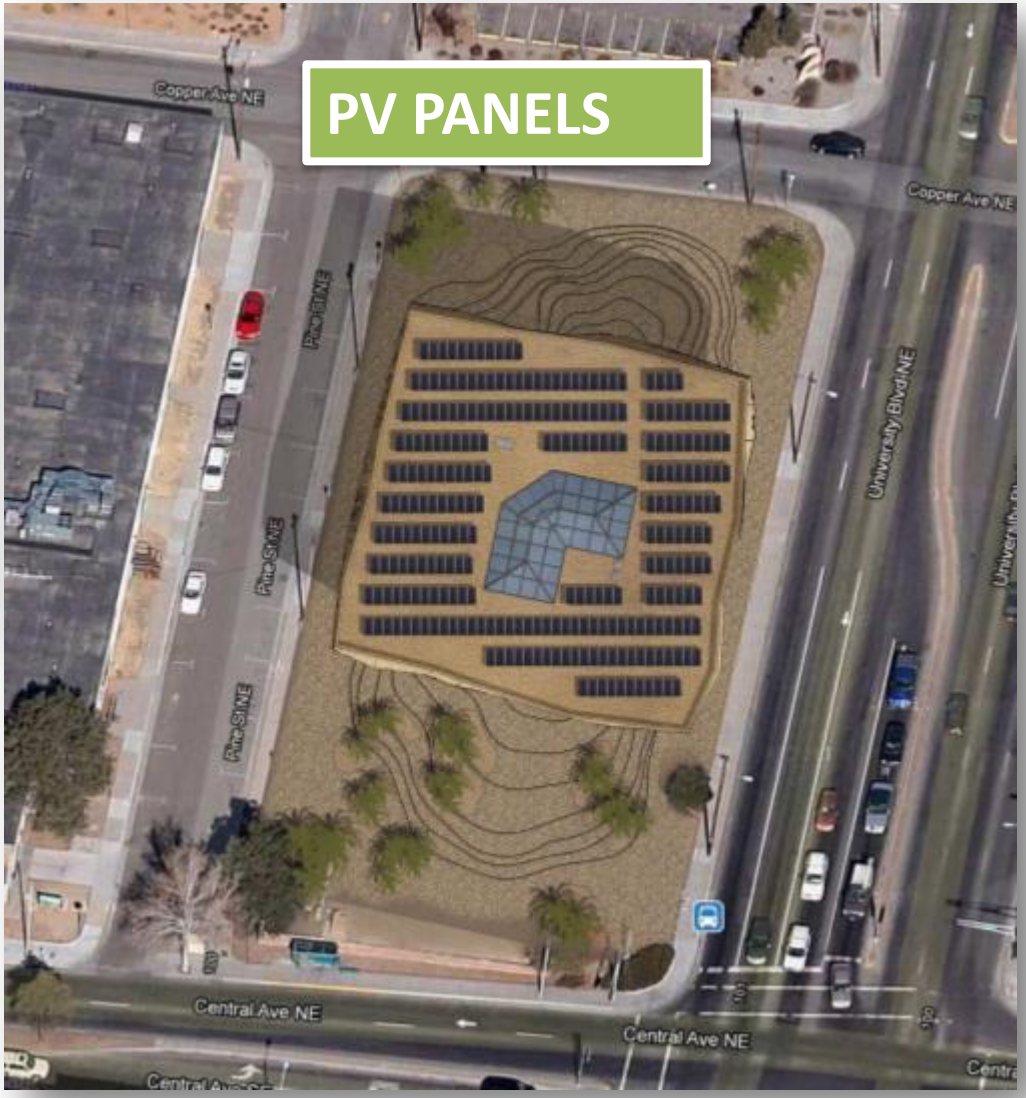
HIGHER QUALITY BUILDING

27,000 SF vs. 30,000 SF

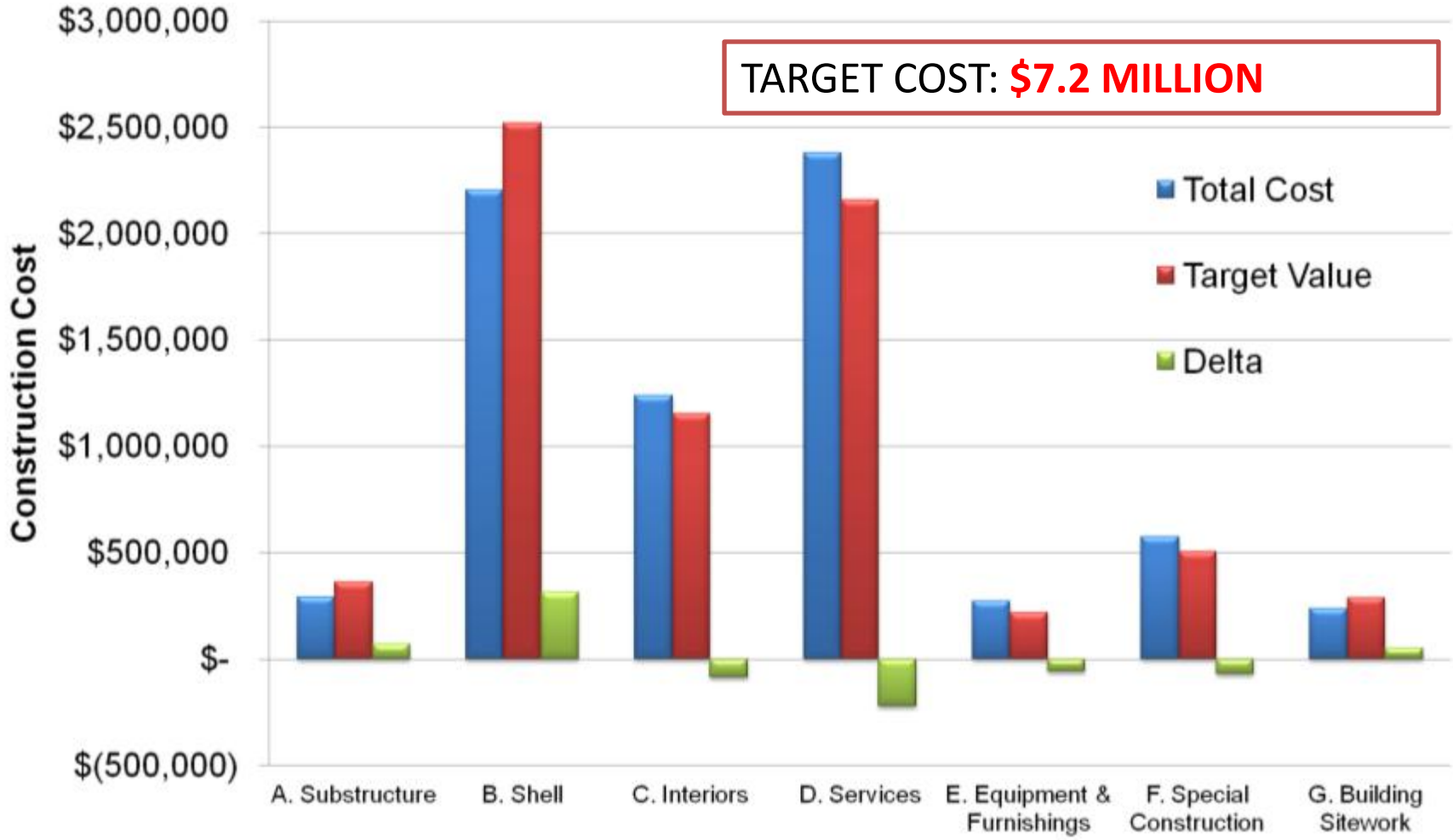


ADDITIONAL BUILDING FEATURES

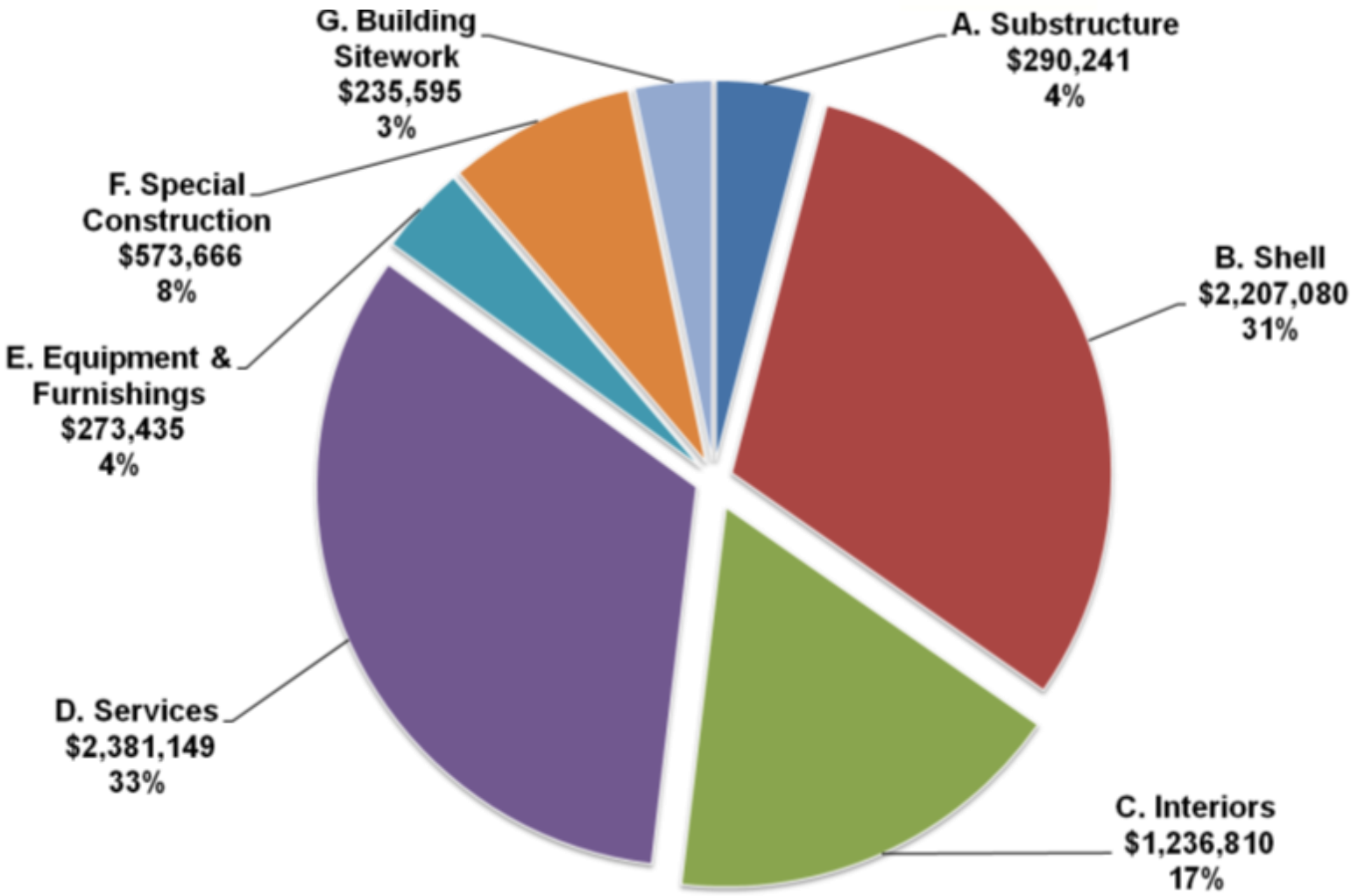
HIGHER QUALITY FINISHES



COST ESTIMATE

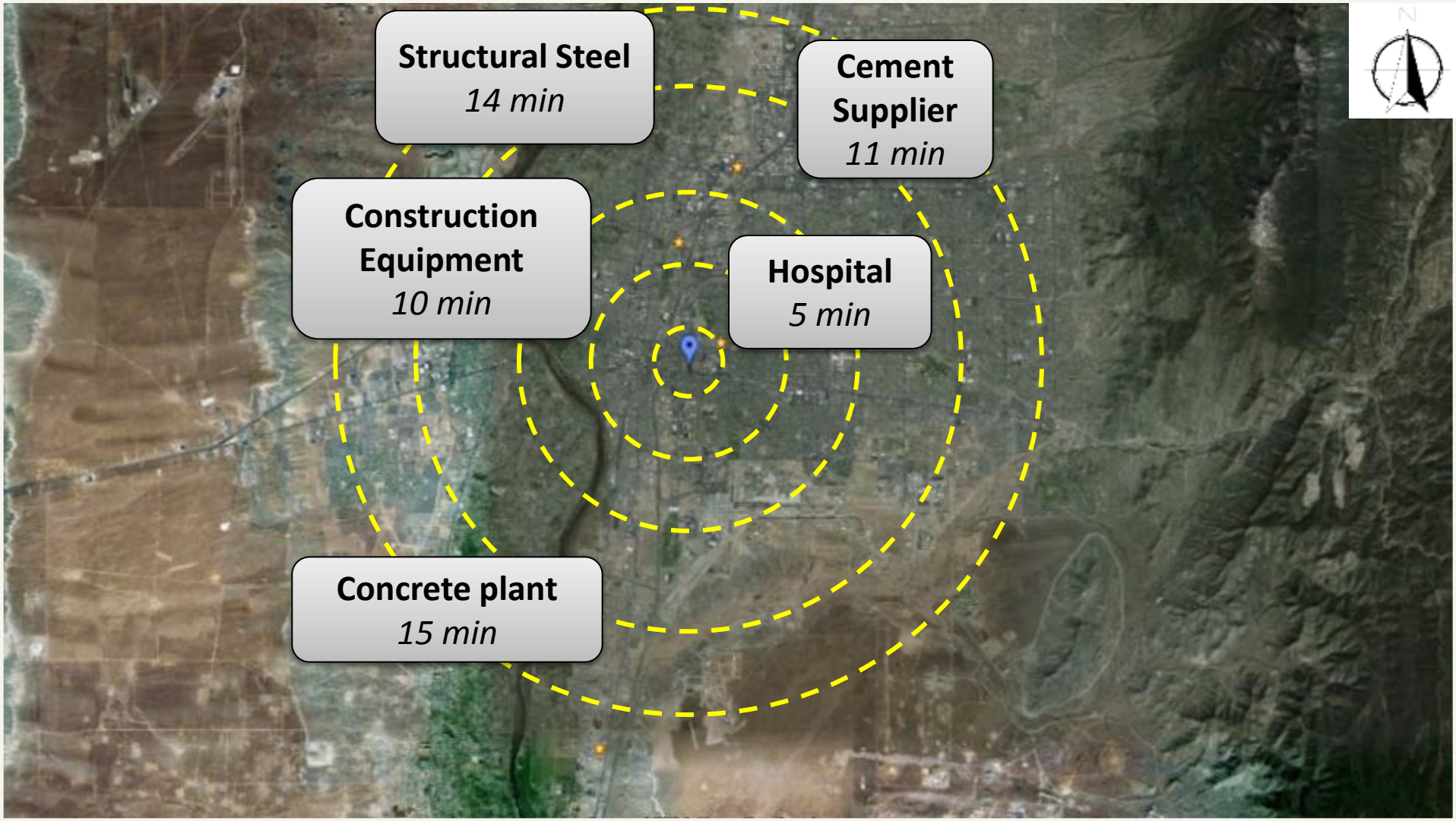


ESTIMATE RESULTS



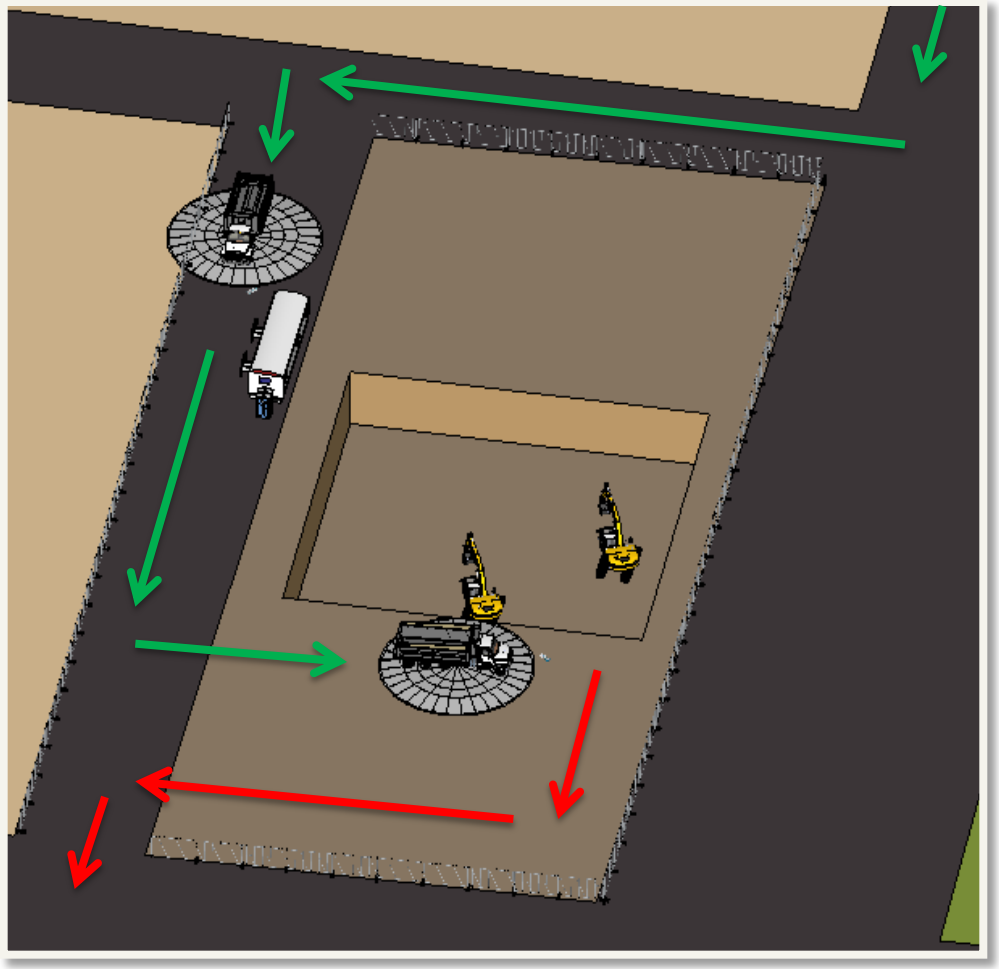
TARGET VALUE: **$7.2 MILLION**

COMPANIES NEARBY



SITE ACCESS

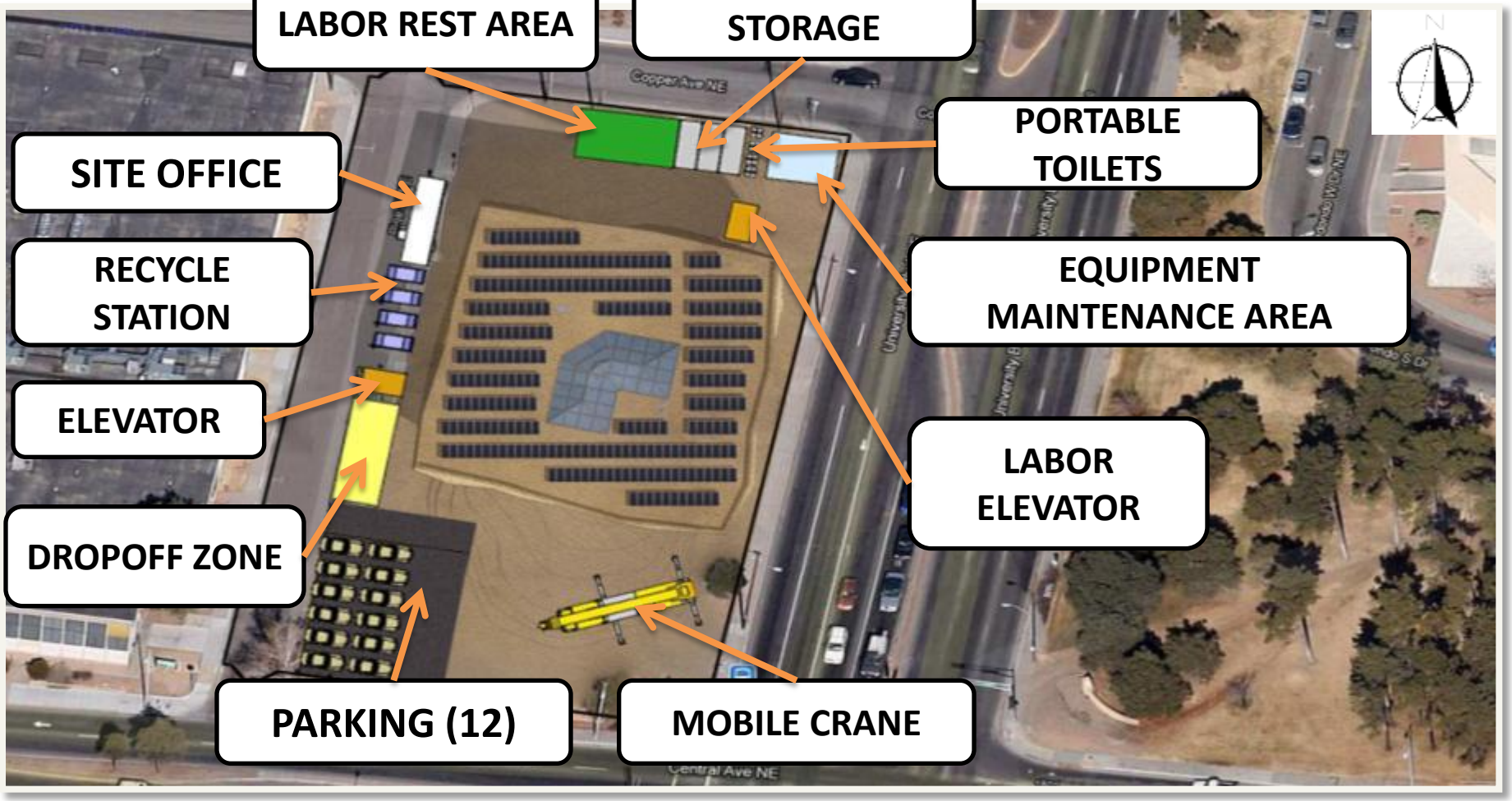
SITE PLAN - EXCAVATION



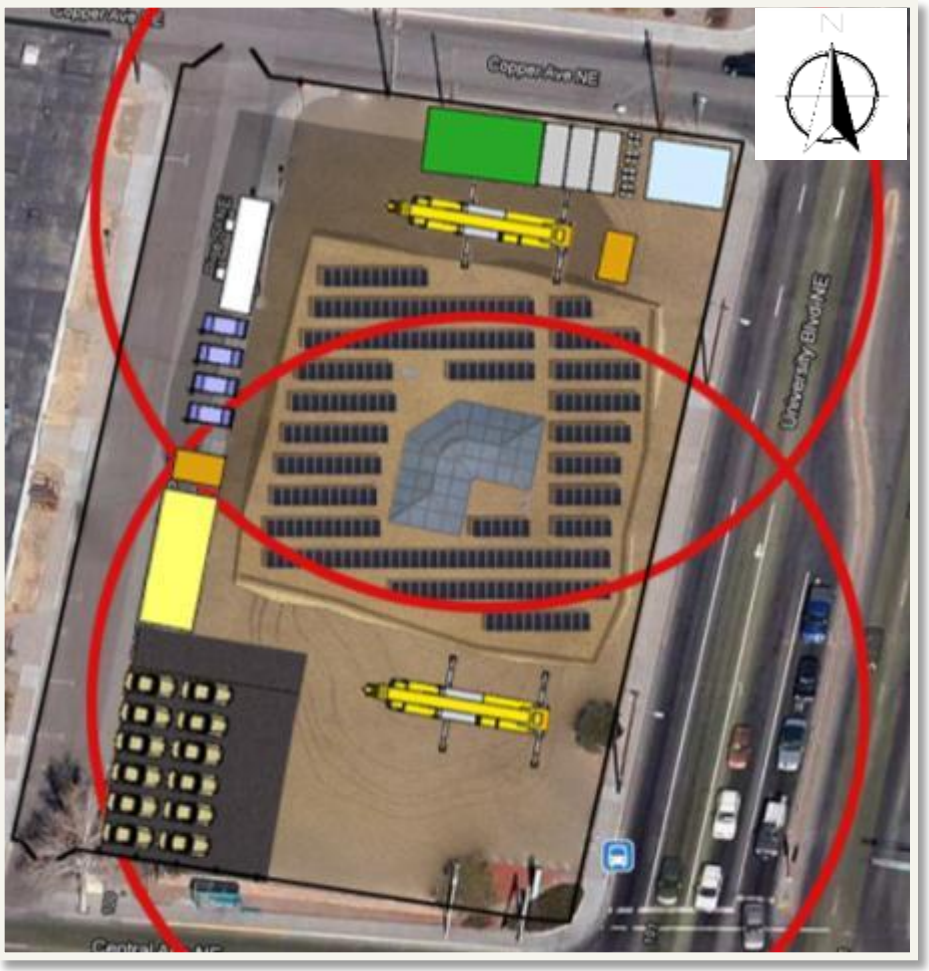
2 Excavators

Crawler 56,800 Lbs.
(Ec240Blc)
Max digging 33’ – 8”

SITE PLAN


LABOR REST AREA
EQUIPMENT STORAGE
PORTABLE TOILETS
SITE OFFICE
RECYCLE STATION
EQUIPMENT MAINTENANCE AREA
ELEVATOR
LABOR ELEVATOR
DROPOFF ZONE
PARKING (12)
MOBILE CRANE
Copper Ave NE
Central Ave NE
N

SITE PLAN – CRANE CAPACITY



1 Mobile Crane

Grove TM9120
120 ton
Boom 130’
Jib 58’
Reach 105’

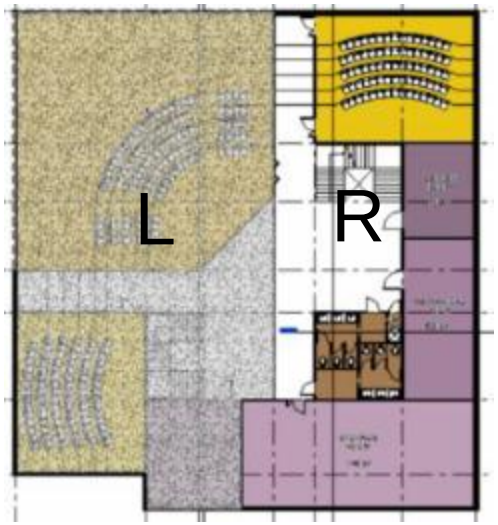
EQUIPMENT

1 Fork Lift

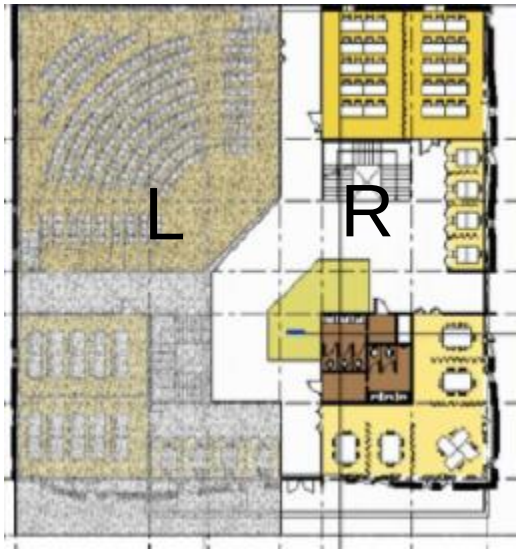
2 Construction Elevators

2 Excavator Trucks

CONSTRUCTION ZONES



Underground Floor

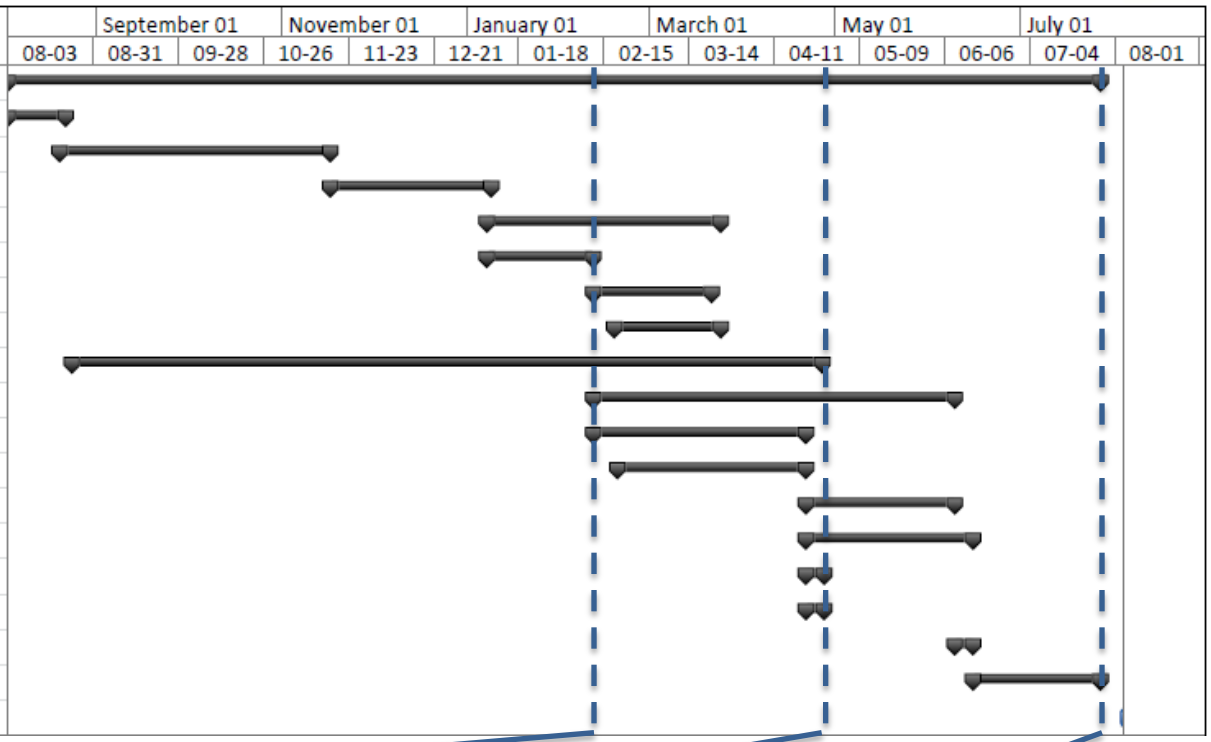


Ground Floor

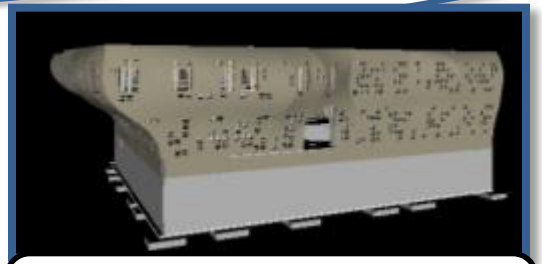
Top Floor

SCHEDULE

ID	Task Name	Duration
1	**Construction time**	**257,5 days**
2	**Sitework**	**15 days**
9	**Substructure**	**63 days**
39	**Superstructure**	**39 days**
72	**Shell**	**55 days**
73	**Exterior walls - interior part**	**25 days**
76	**Exterior walls - exterior part**	**27 days**
81	**Gravel Roof**	**25 days**
83	**Services**	**177 days**
88	**Interior**	**85 days**
89	**Firstfloor**	**50 days**
108	**Groundfloor**	**44 days**
127	**Undergroundfloor**	**35 days**
146	**Equipment and Furnishing**	**39 days**
147	**Firstfloor**	**4 days**
150	**Groundfloor**	**4 days**
153	**Undergroundfloor**	**4 days**
156	**Building Sitework**	**30 days**
159	Final move in date	1 day



Enclosed Building
02/02/2016

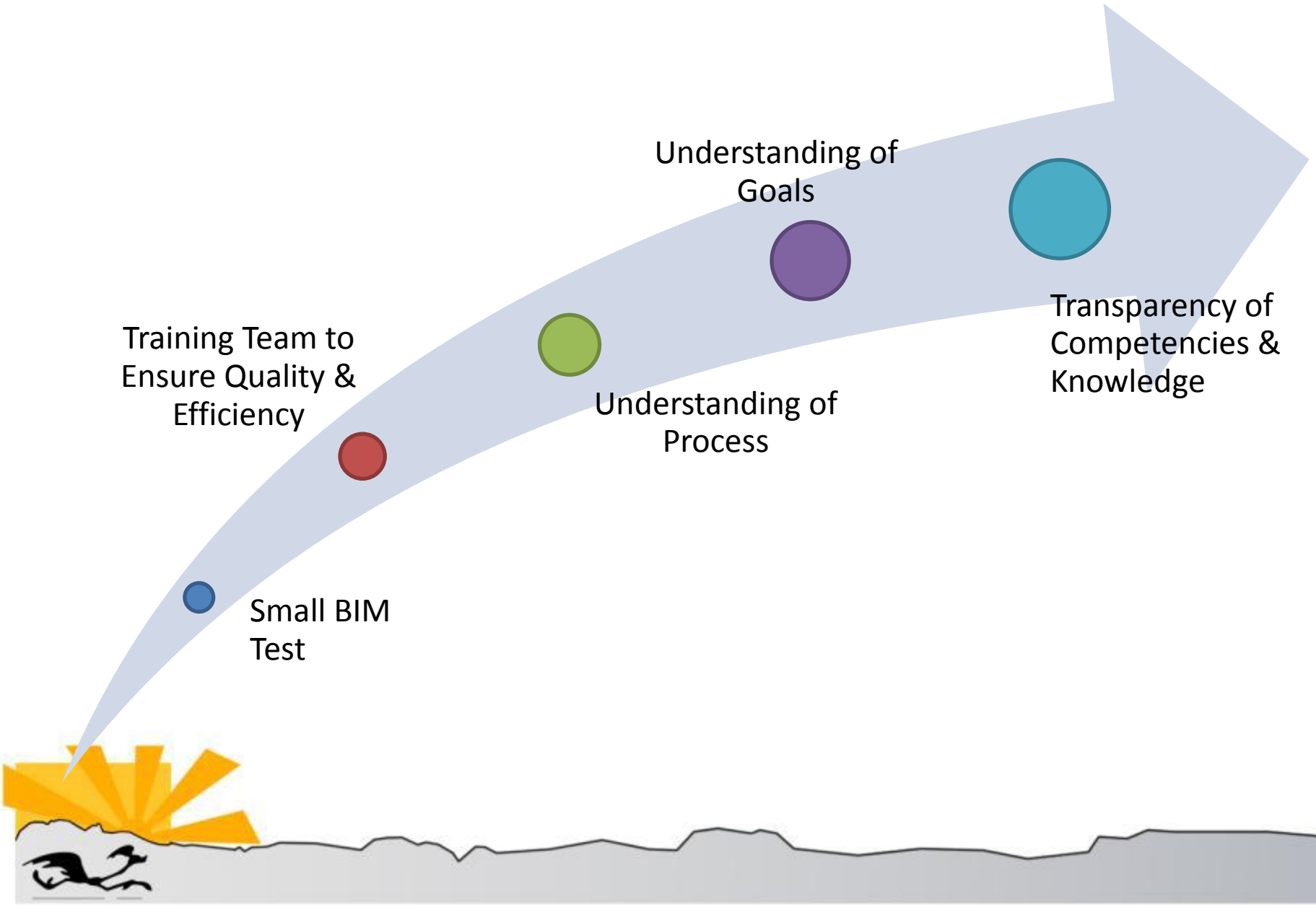


Lab Access
04/28/2016

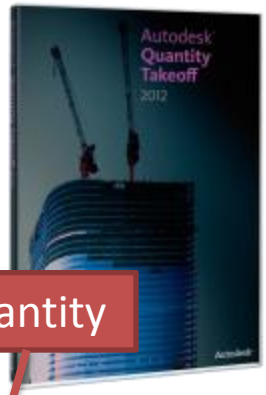
Finish Building
07/27/2016

4D MODEL

BIM COORDINATION PROCESS - TRAINING



MODEL-BASED COST ESTIMATE

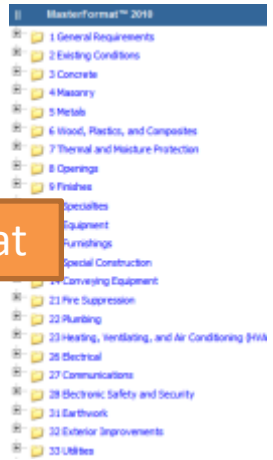


Quantity

CostWorks®
RSMeans

Uniformat

Masterformat

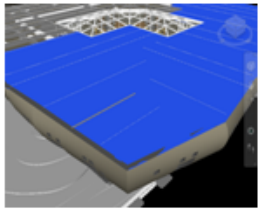
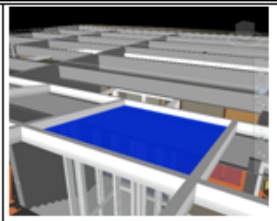


G. Building Sitework														
G10. Site Preparation														
G1030. SITE EARTHWORK														
G1030210. COMMON EARTH BACKFILL														
Backfill for landscaping to form tiers/layers; Haul unused soil 20 miles away														
Quantity	**LineNumber**	**Description**	**Crew**	**Daily Output**	**Labor Hours**	**Unit**	**Material**	**Labor**	**Equipment**	**Total**	**Ext. Mat.**	**Ext. Labor**	**Ext. Equip.**	**Ext. Total**
180	312323145420	Backfill, structural, common earth, 300 H.P. dozer, 300' haul, from existing stockpile, excludes compaction	B10M	1350	0.009	L.C.Y.	$ -	$ 0.41	$ 1.41	$ 1.82	$ -	$ 73.80	$ 253.80	$ 327.60
8	312323240100	Compaction, structural, 10 tons, steel wheel tandem roller	B10F	8	1.5	Hr.	$ -	$ 68.48	$ 31.66	$ 100.14	$ -	$ 547.84	$ 253.28	$ 801.12
5700	312323201078	Cycle hauling(wait, load,travel, unload or dump & return) time per cycle, excavated or borrow, loose cubic yards, 15 min load/wait/unload, 12 C.Y. truck, cycle 20 miles, 40 MPH, excludes loading equipment	B34B	120	0.067	L.C.Y.	$ -	$ 2.51	$ 5.41	$ 7.92	$ -	$ 14,307.00	$ 30,837.00	$ 45,144.00
Total											**$ -**	**$ 14,928.64**	**$ 31,344.08**	**$ 46,272.72**

BIM COORDINATION PROCESS

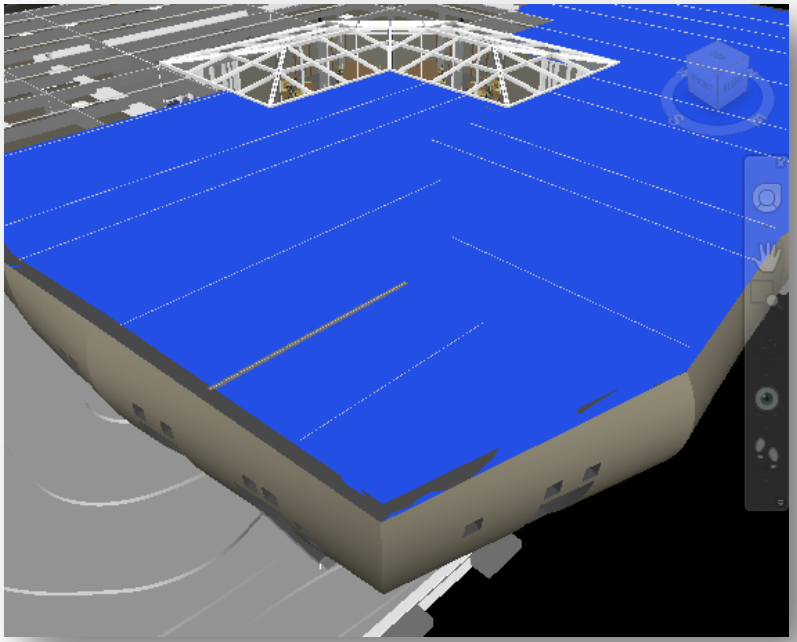
CODING	QUANTITY	DISCIPLINE	RESPONSIBLE	NOTES
B2010_3L_interior	3	Architecture	Karolina	Interior facade top level
B2010_3R_interior	3	Architecture	Karolina	Interior facade top level
B2020_3L_groups_windows	14	Architecture	Karolina	Exterior facade windows
B2020_3R_groups_windows	15	Architecture	Karolina	Exterior facade windows
B2020_3L_interior_windows	42	Architecture	Karolina	Interior large windows
B2020_3L_interior_vents	84	Architecture	Karolina	Interior vents
B2020_3R_interior_windows	36	Architecture	Karolina	Interior large windows
B2020_3R_interior_vents	72	Architecture	Karolina	Interior vents
B3010_3L_roof	1	Architecture	Karolina	"Yellow" roof
B3010_3R_roof	1	Architecture	Karolina	"Yellow" roof
B3010_3L_skylight	1	Architecture	Karolina	
B1010_1L_column	12	Structural	Curtis	W14x53
B1010_2L_column	4	Structural	Curtis	W10x49
B1010_1R_column	17	Structural	Curtis	W14x53
B1010_1L_fillerbeam	14	Structural	Curtis	5 W16x26, 9 W10x15
B1010_1R_fillerbeam	42	Structural	Curtis	5 W16x26, 35 W10x15
B1010_2L_fillerbeam	45	Structural	Curtis	23 W16x26, 22 W10x15
B1010_2R_fillerbeam	52	Structural	Curtis	49 W16x26, 3 W10x15
B1010_3L_fillerbeam	51	Structural	Curtis	27 W16x26, 24 W10x15
B1010_3R_fillerbeam	50	Structural	Curtis	47 W16x26, 3 W10x15

CLASH DETECTION PROCESS

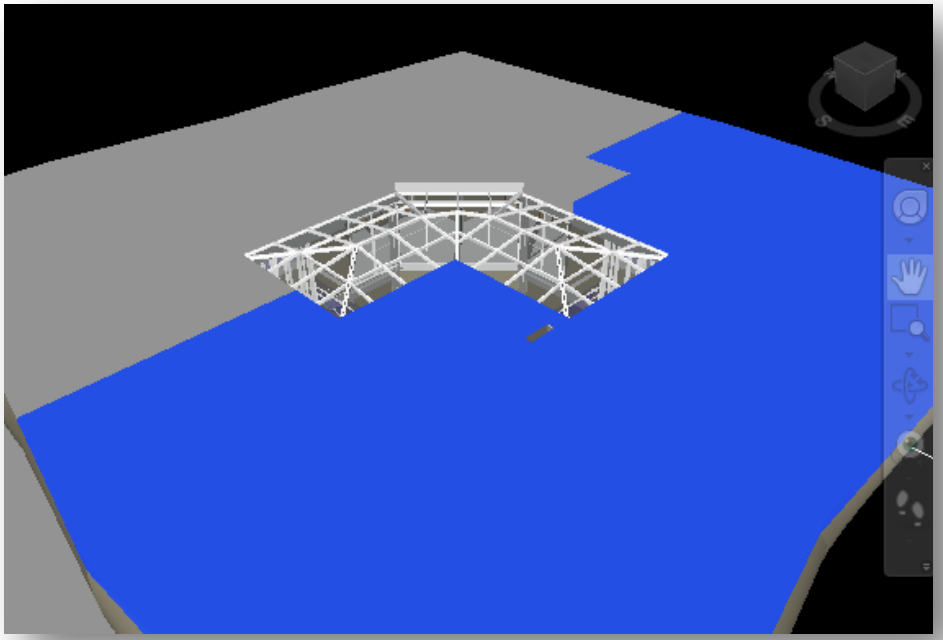
Clash Number	Clash Date	Item 1	Item 2	Image	Responsible Person	Fixed By	Fixed On	Remarks
1	4/23/2012	Roof Slab	Beams and Girders		Karolina / Curtis / Courtney	4/24/2012	4/25/2012	Lowered beams and girders throughout building
2	4/23/2012	Roof Slab	Skylight		Karolina	4/24/2012	4/24/2012	Okay - not an actual clash (model detailing issues)
3	4/23/2012	Floor Slab	Columns		Karolina	4/24/2012	4/24/2012	Okay - not an actual clash (model detailing issues)
4	4/23/2012	Double wall - exterior	W14x53 Column		Karolina / Curtis / Courtney	4/26/2012	4/26/2012	Aligned structural model to "inner" grid; will replace with pipes

MEMBER COLOR CODING

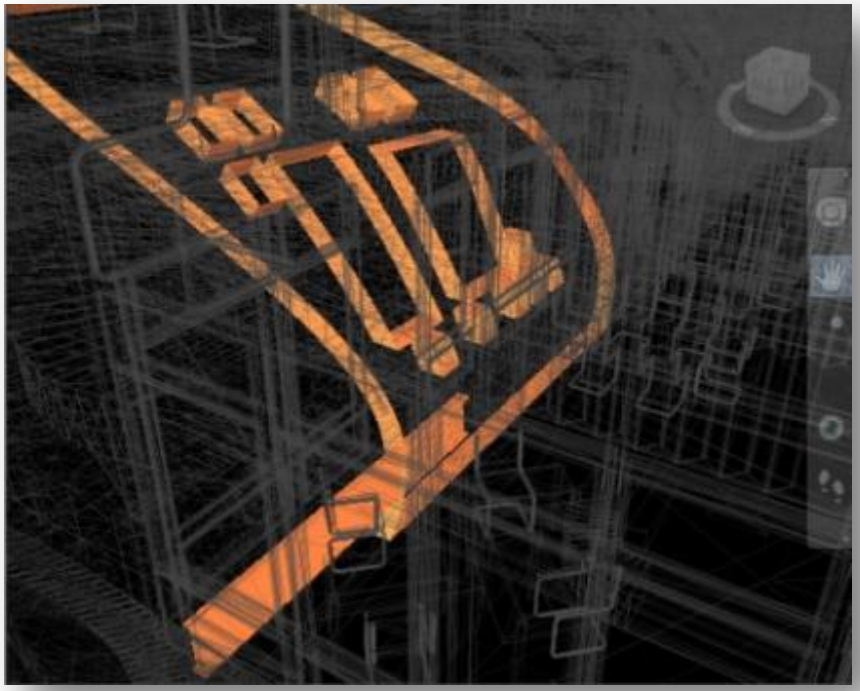
EARLY CLASH DETECTION



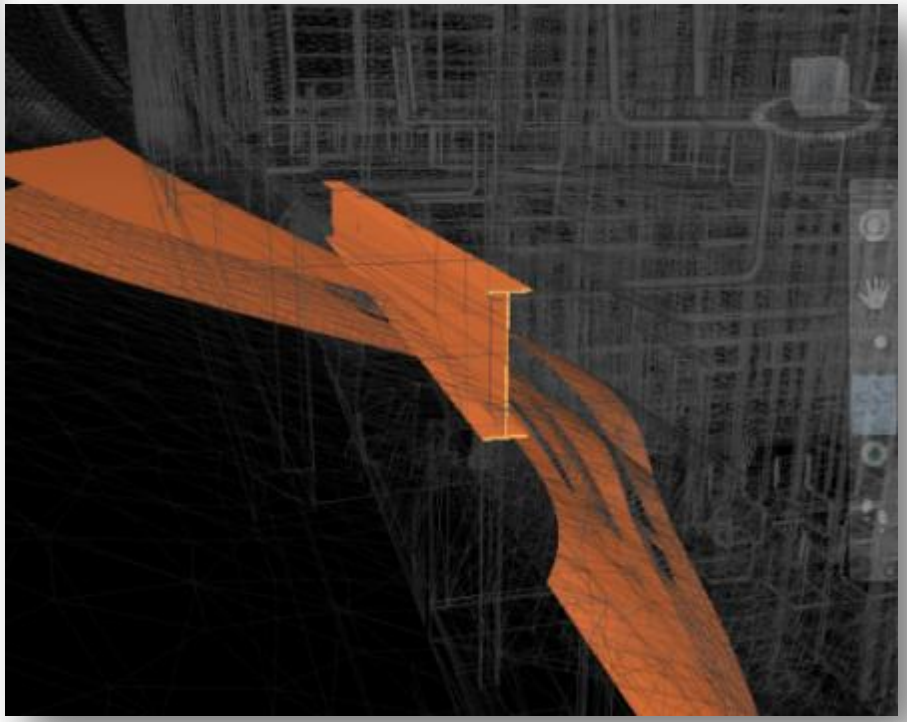
2000+ CLASHES!



CLASH DETECTION

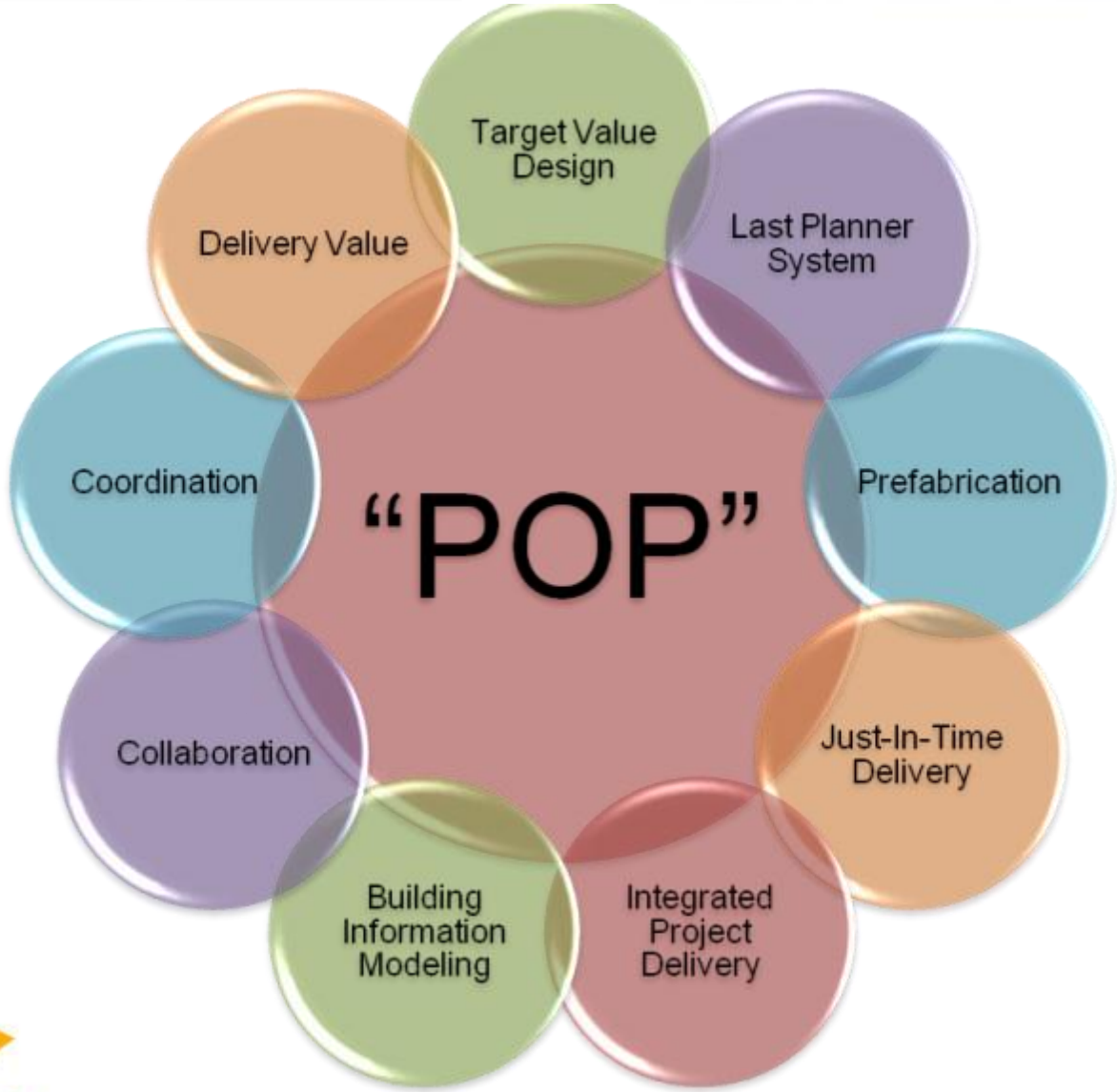


Exterior double wall & beams



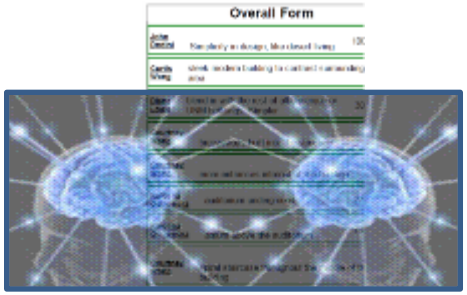
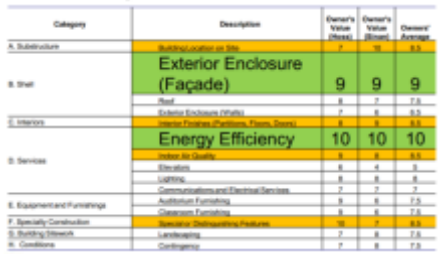
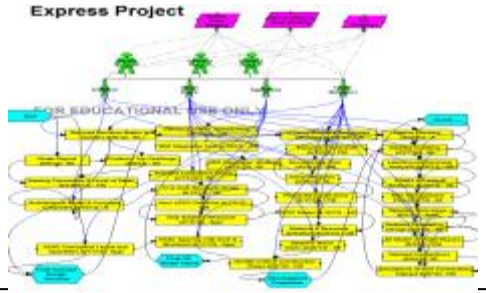
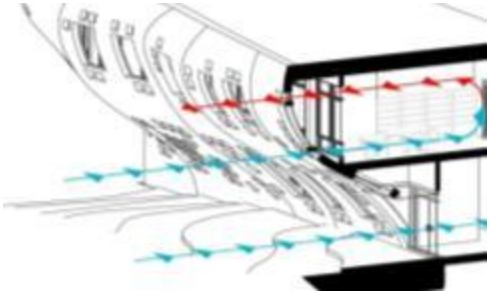
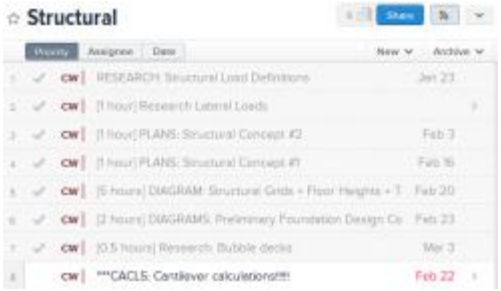
New exterior wall support system

PRODUCT, ORGANIZATION, PROCESS

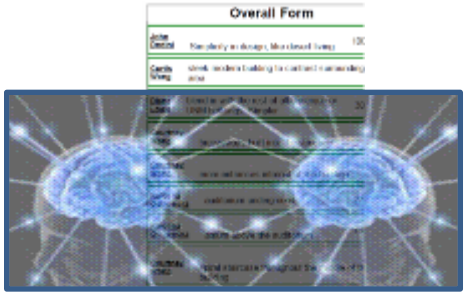
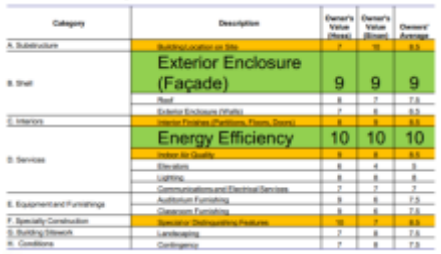
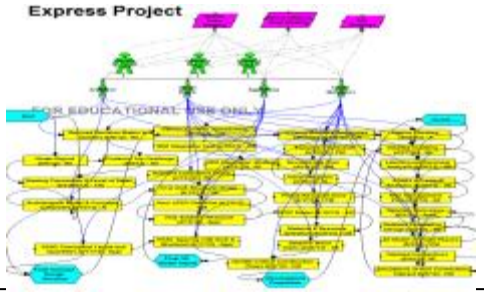
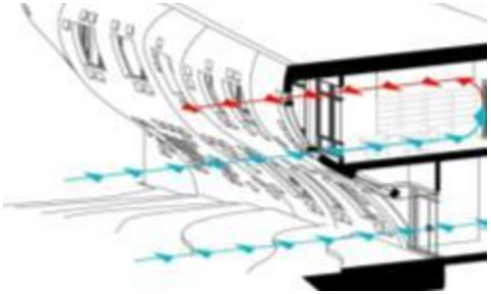
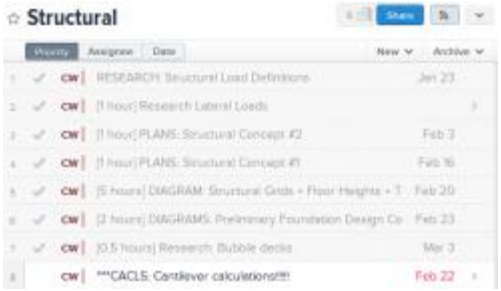


“POP”! It’s what we’ve been doing all along!

WHAT IS "POP"?

	Product	Organization	Process
Function			
Form			
Behavior			

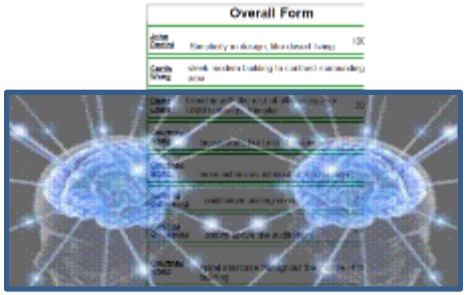
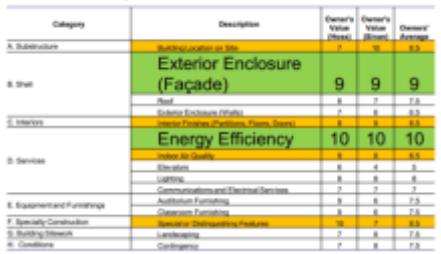
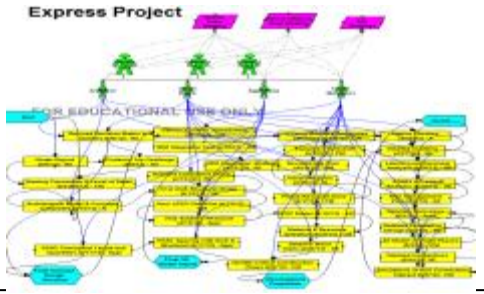
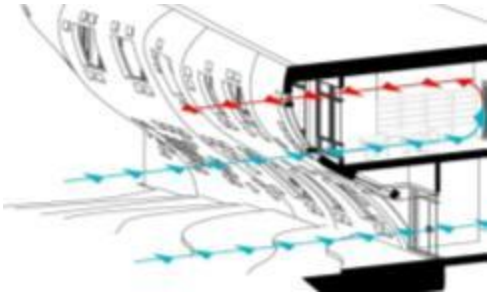
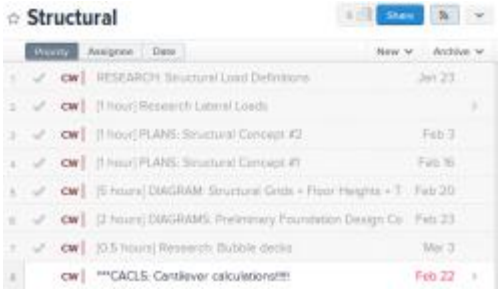
PRODUCT - FUNCTION

	Product	Organization	Process
Function			
Form			
Behavior			

IMPROVED PERFORMANCE - EFFICIENCY

IMPROVED PERFORMANCE - EFFICIENCY

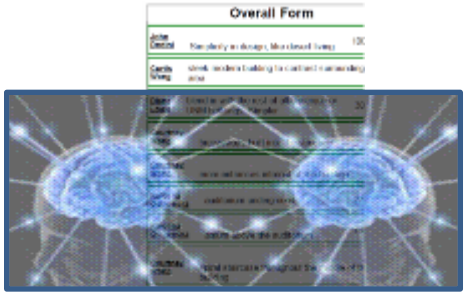
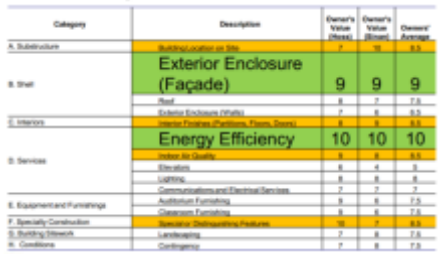
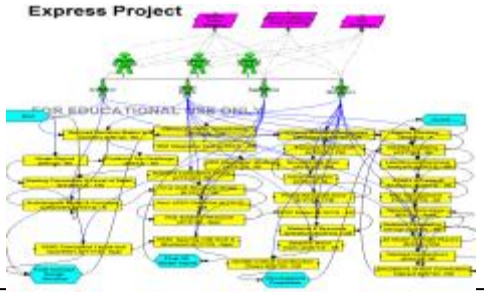
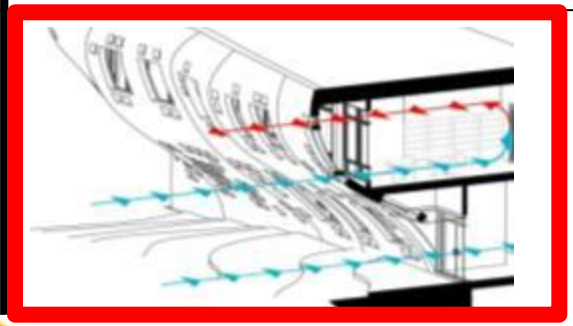
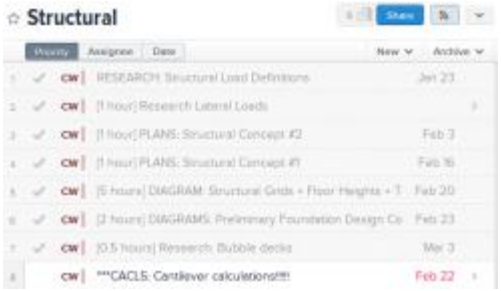
PRODUCT - FORM

	Product	Organization	Process
Function			
Form			
Behavior			

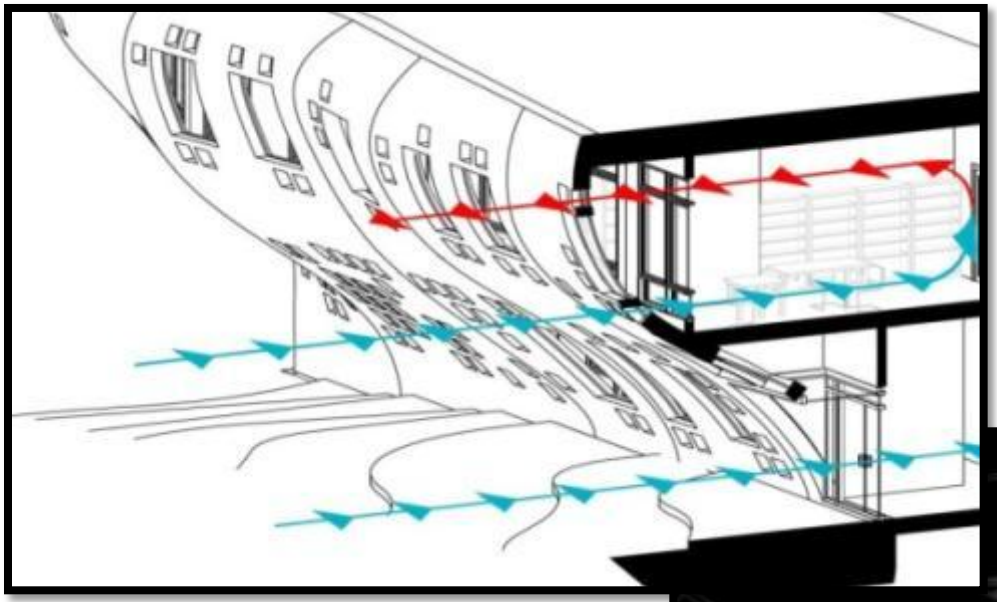
BIOMIMICRY – ORGANIC SHAPE

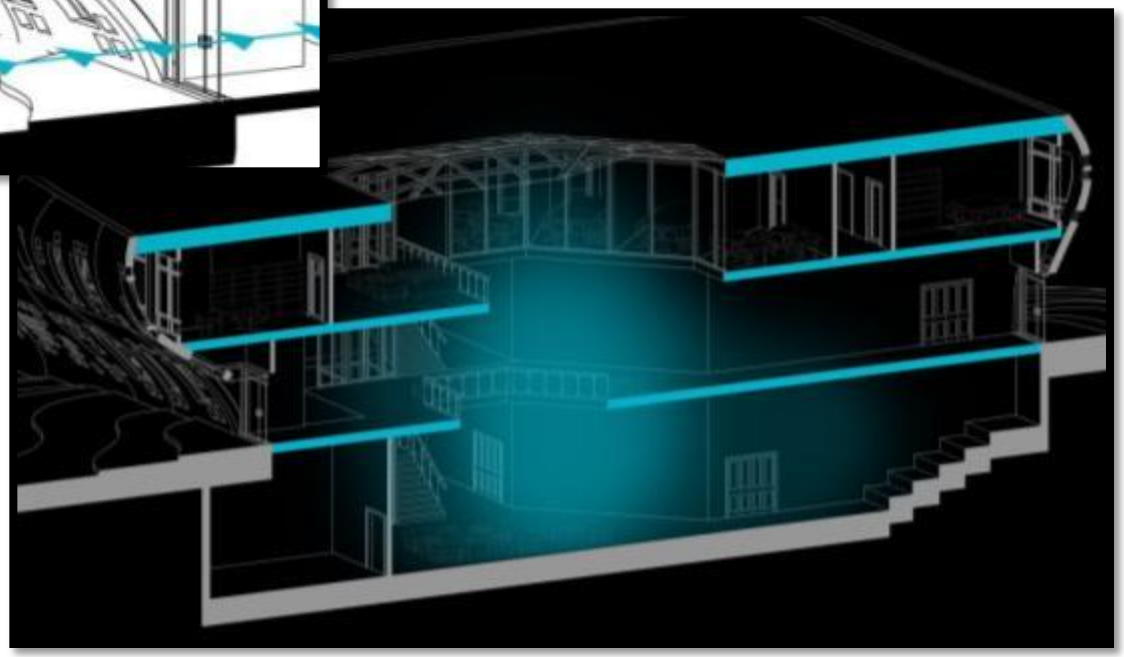
BIOMIMICRY – ORGANIC SHAPE

PRODUCT - BEHAVIOR

	Product	Organization	Process
Function			
Form			
Behavior			

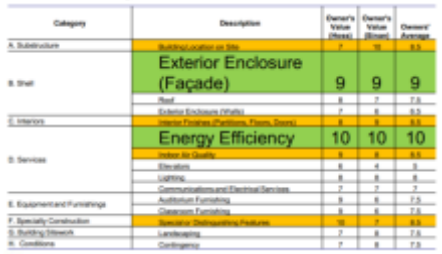
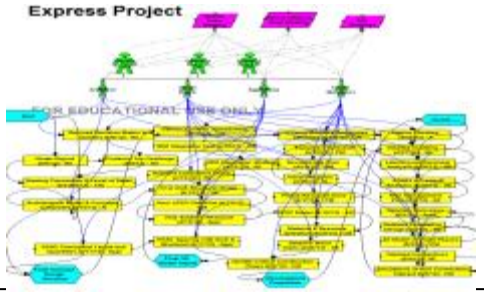
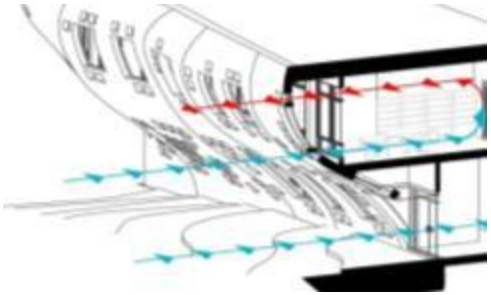
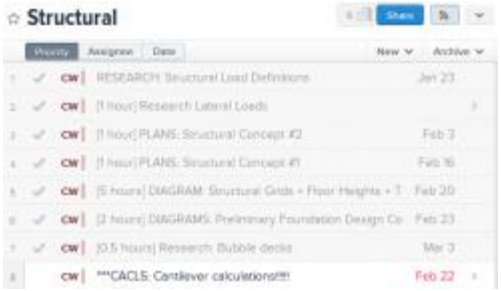
BUILDING PERFORMANCE VS. TARGETS





BUILDING PERFORMANCE VS. TARGETS

ORGANIZATION - FUNCTION

	Product	Organization	Process
Function			
Form			
Behavior			

OUR VISION & GOALS - BRAINMERGE

Idea List

The brighter (orange) the ideas are, the more popular they are !

#1 CourtneyWong	incorporating the outside/desert "feel" on the interior design - including furniture, walls, architectural finishes	100
#2 SaraSundelin	natural ventilation	61
#3 DianaLouie	native species/plants	57

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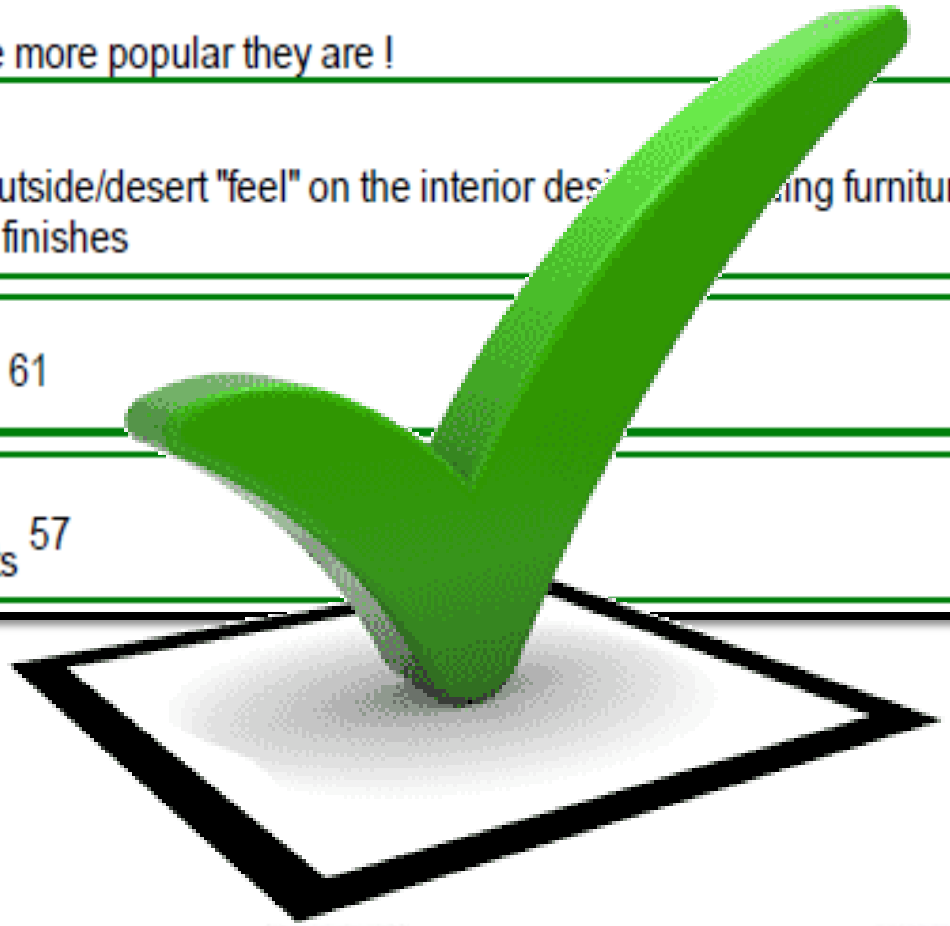
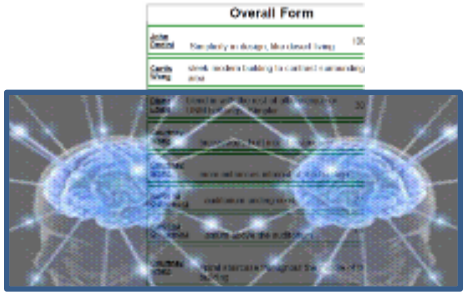
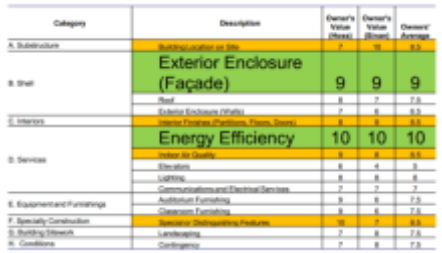
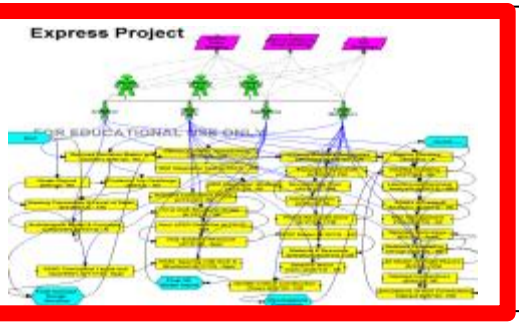
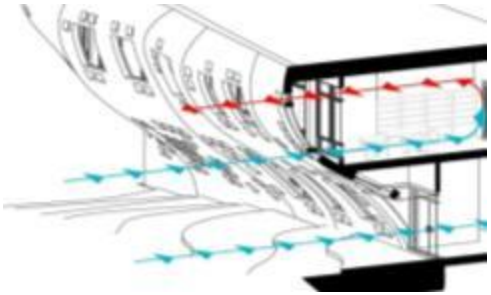
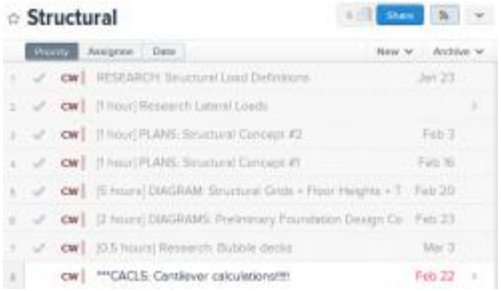
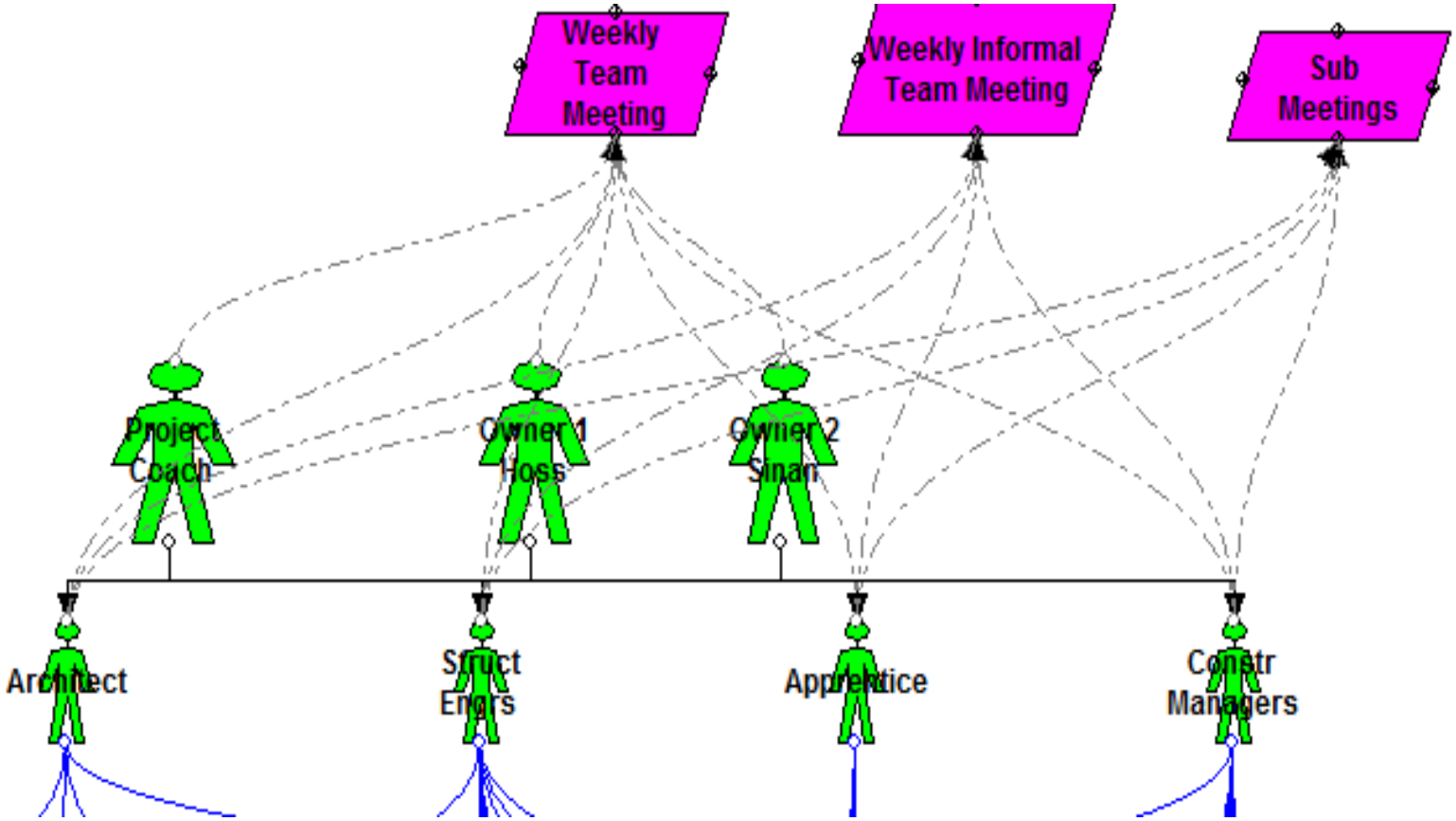


ORGANIZATION - FORM

	Product	Organization	Process
Function			
Form			
Behavior			

HOW TO ACHIEVE OUR GOALS:
FLAT HIERARCHY & "SWIFT" TEAM



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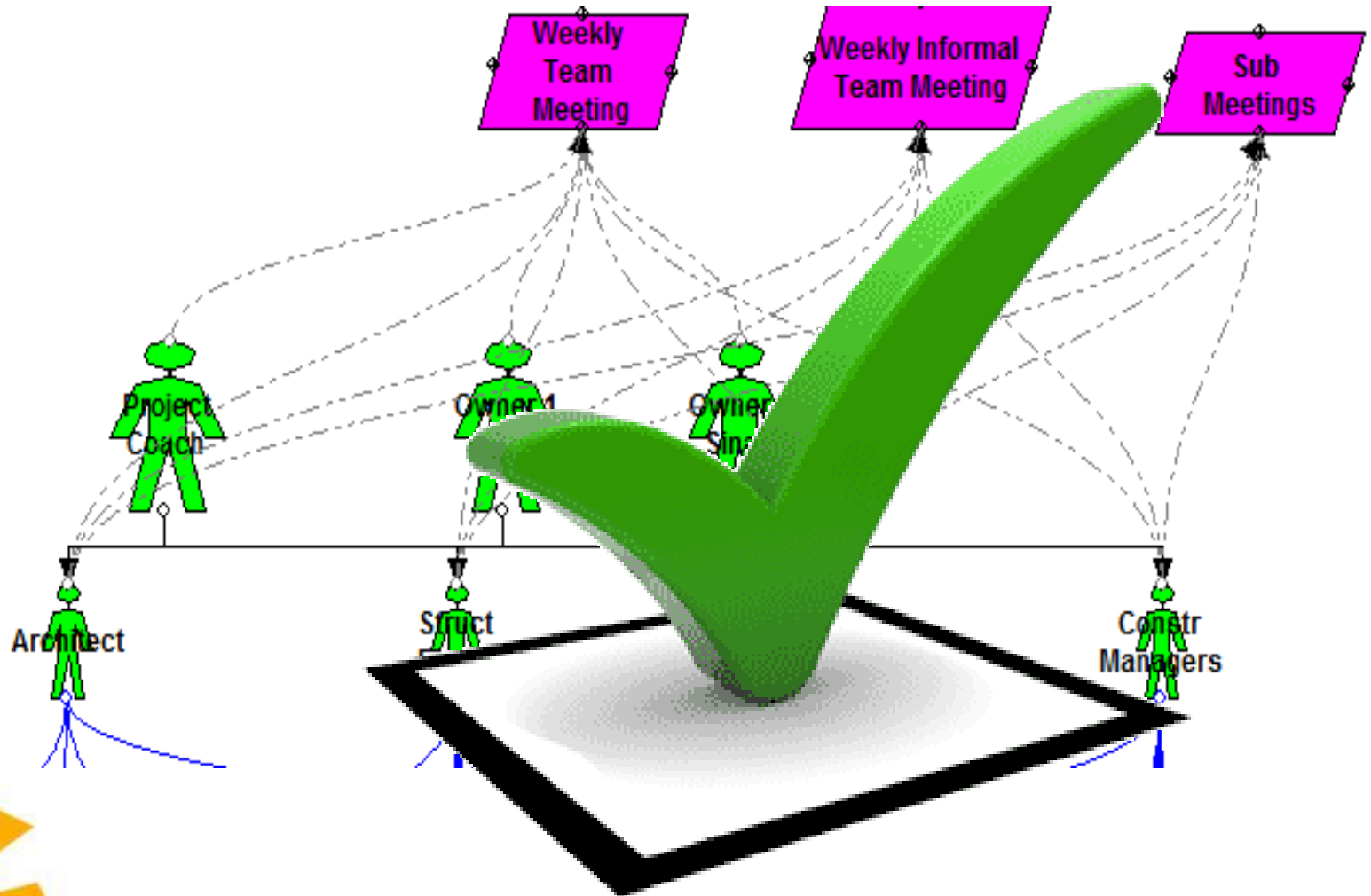
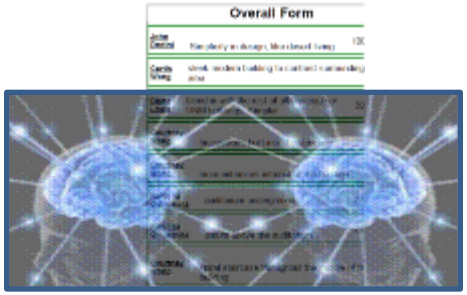
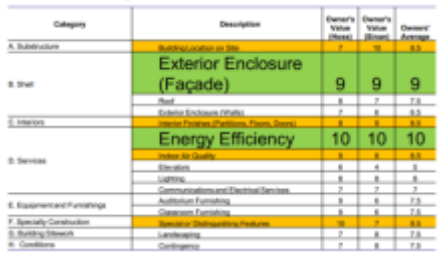
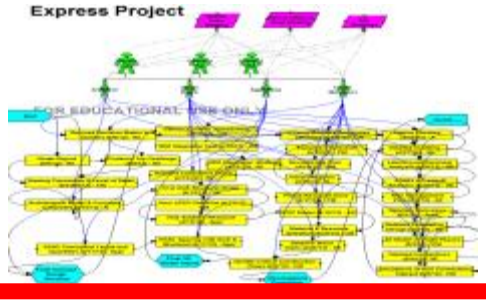
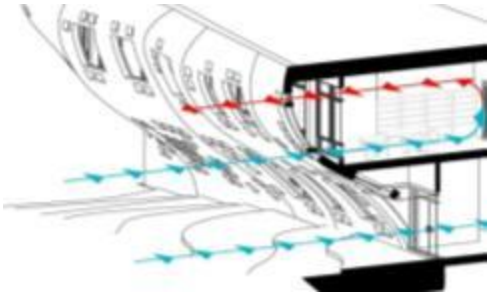
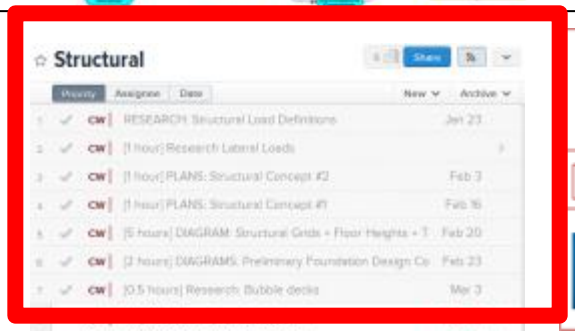
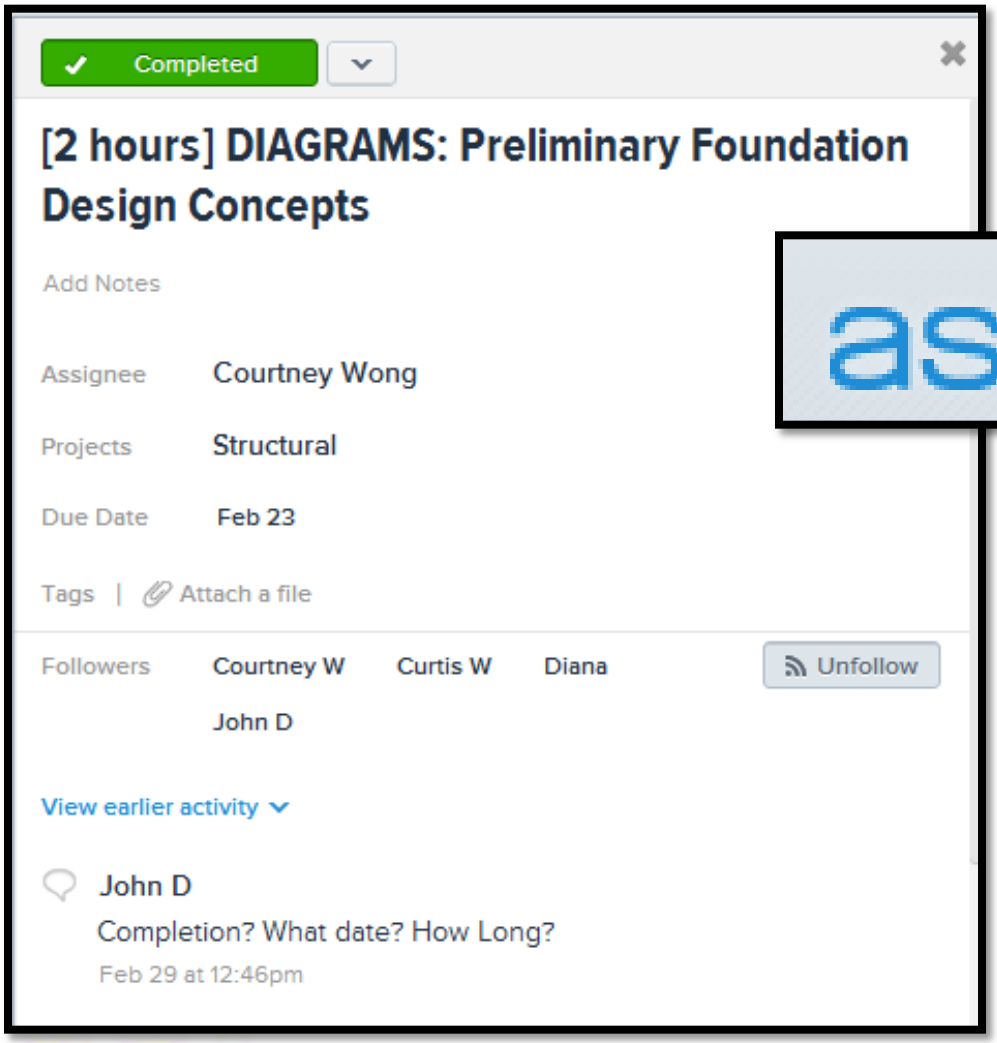


ORGANIZATION - BEHAVIOR

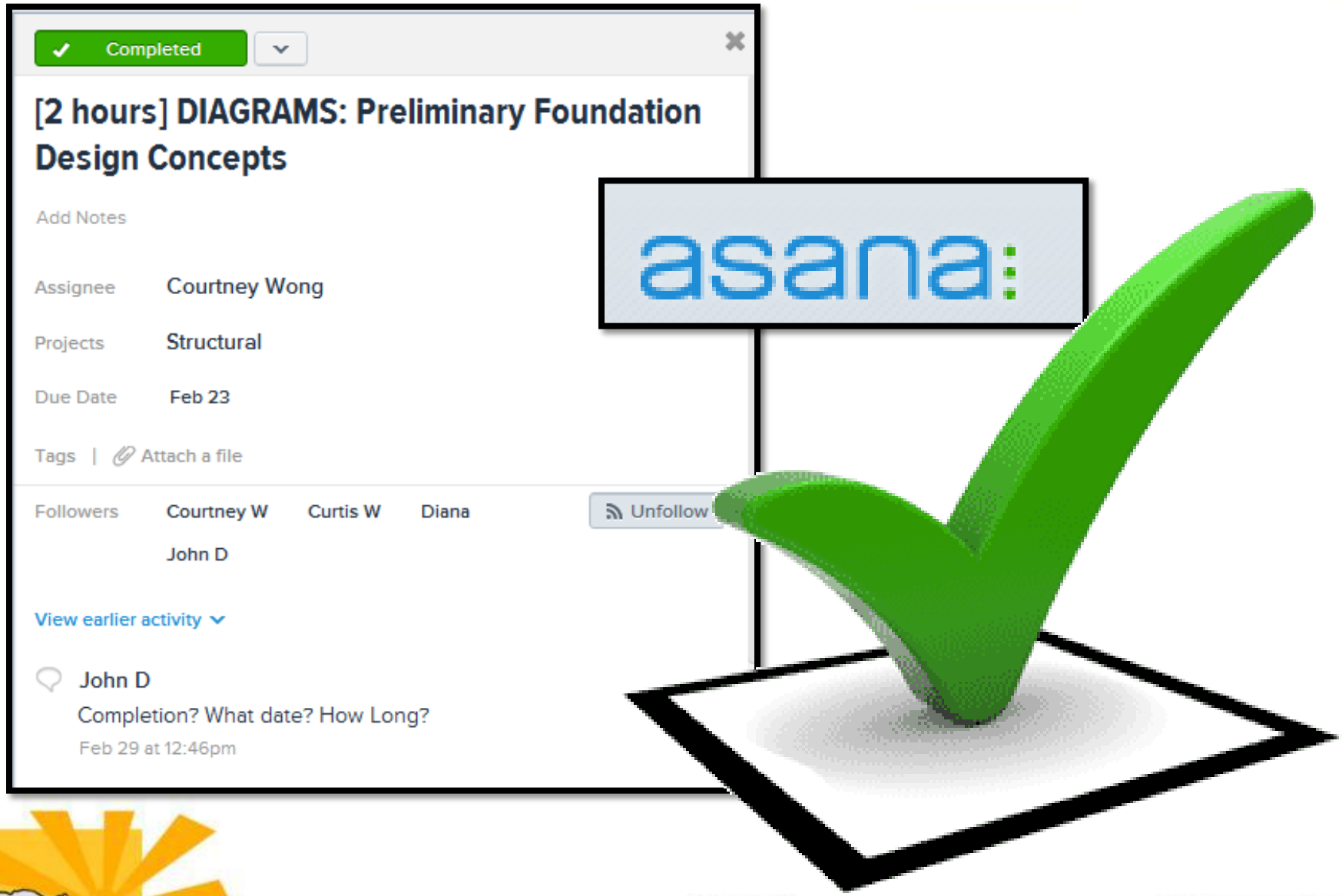
	Product	Organization	Process
Function			
Form			
Behavior			

MEASURING PERFORMANCE

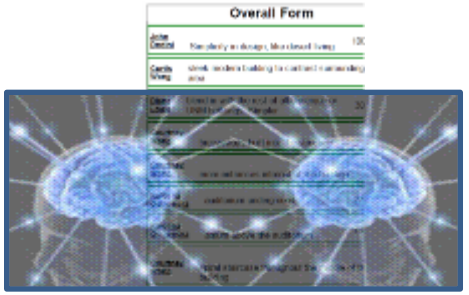
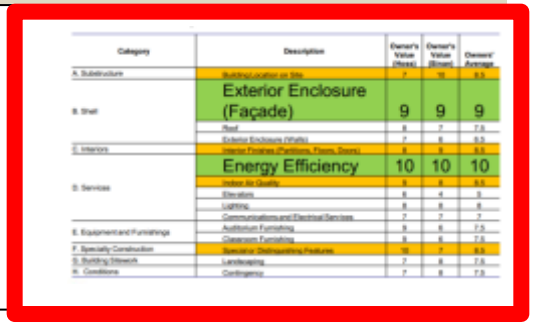
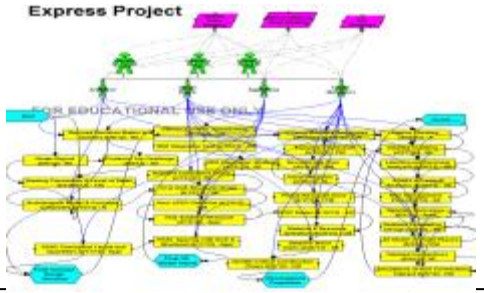
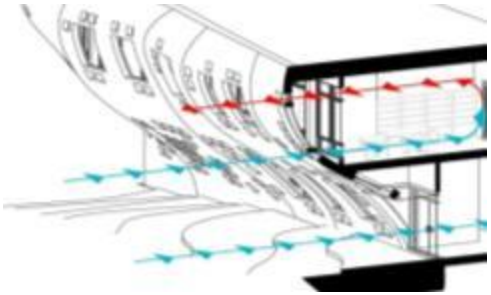
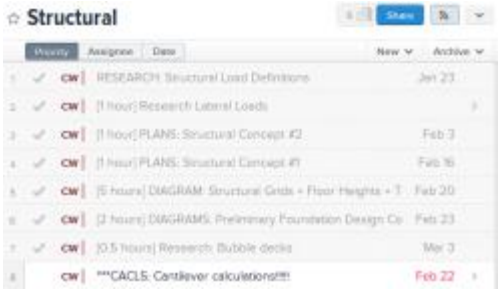


asana:

MEASURING PERFORMANCE



PROCESS - FUNCTION

	Product	Organization	Process
Function			
Form			
Behavior			

WORK TOGETHER TO DELIVER VALUE

SINAN sinanmihelcic@gmail.com

to me

yes, this is a big GO from me!

Hoss Nasseri hossnasseri@gmail.com Apr 10

to me, Karolina, fruchter, sara.sundelin86, Curtis, Courtney, SINAN, John

More discussion can he done tomorrow night but as far as I am concerned this is a "go" unless Sinan has an objection. Please advise Sinan :)

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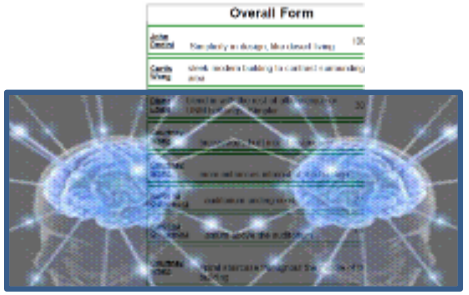
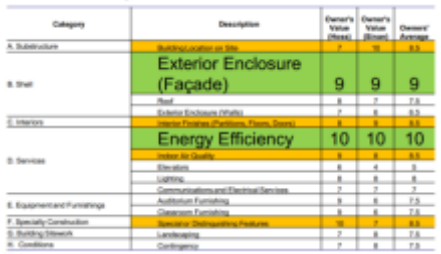
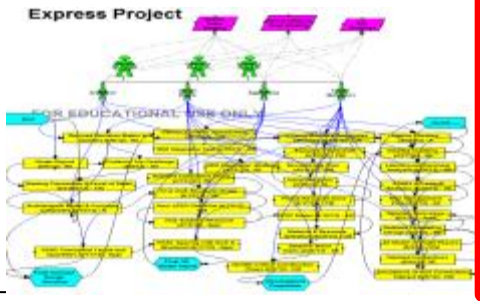
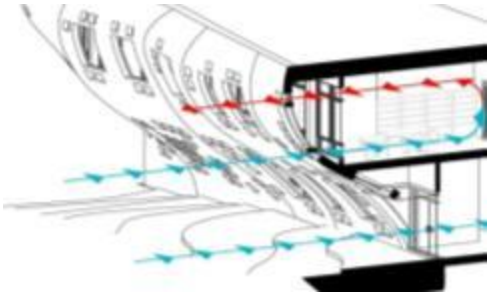
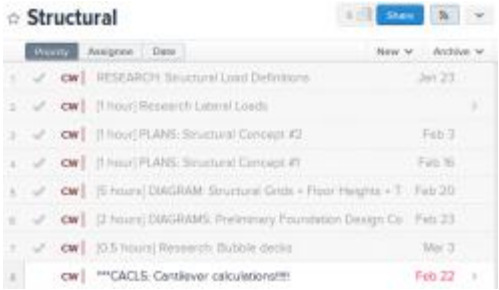
PROCESS - FORM

	Product	Organization	Process
Function			
Form			
Behavior			

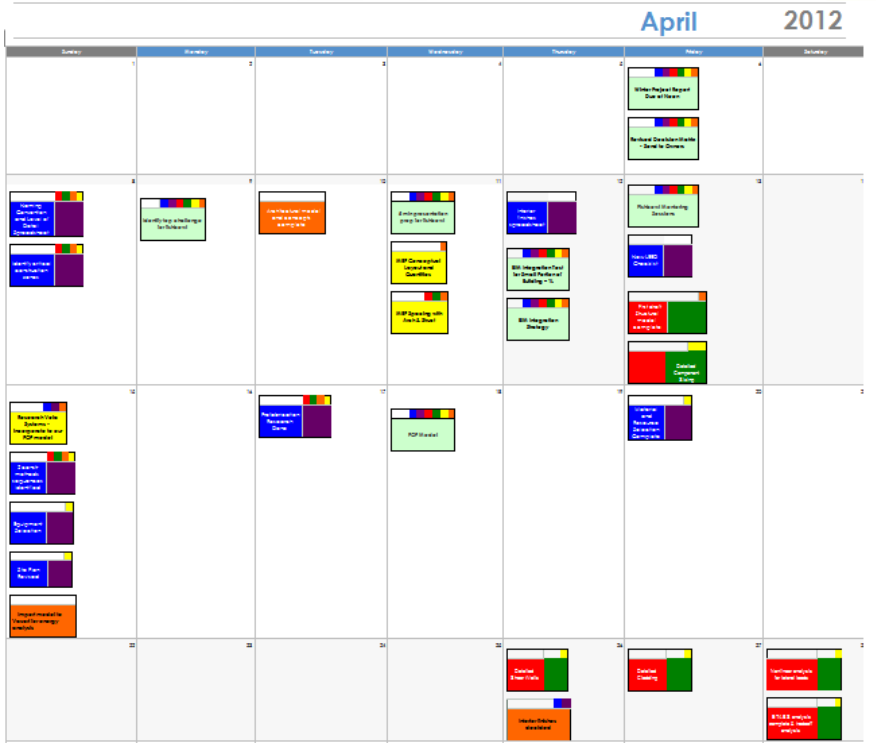
LAST PLANNER SYSTEM

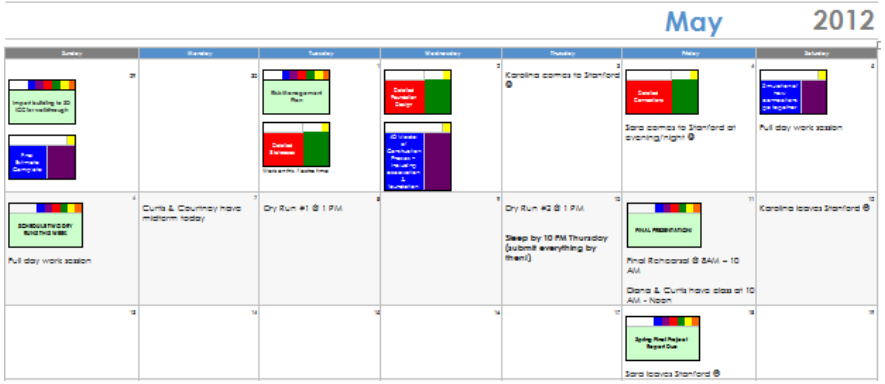
Curtis
Diana
Courtney
Sara
John
Karolina
All

8

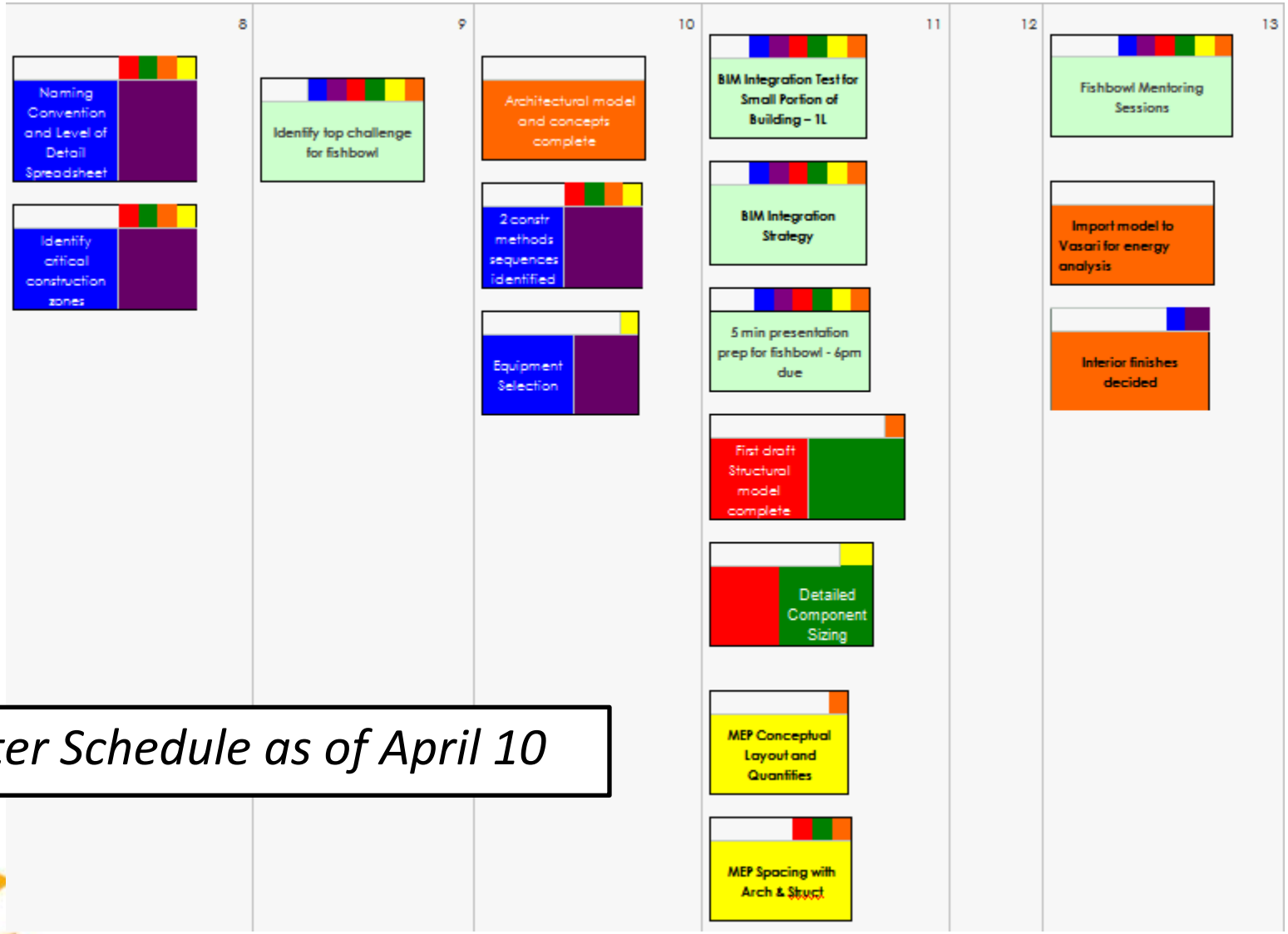
Naming Convention and Level of Detail Spreadsheet

Identify critical construction zones



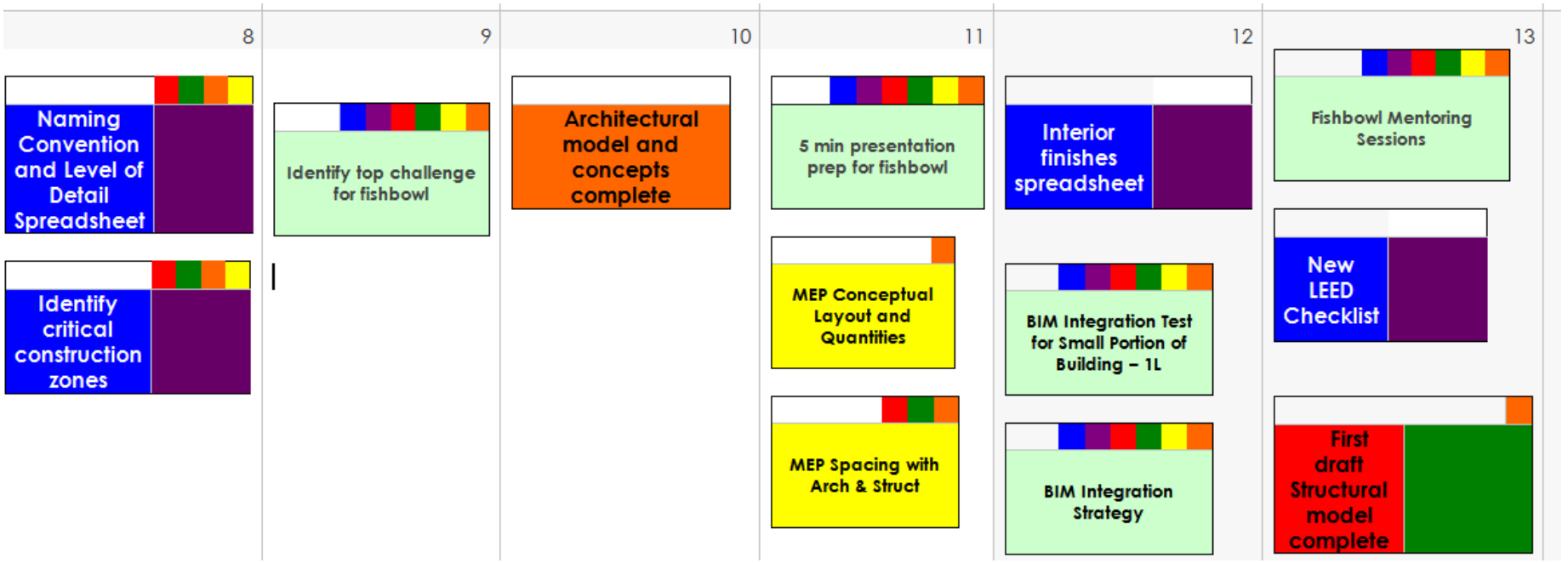


PULL PLANNING SESSIONS



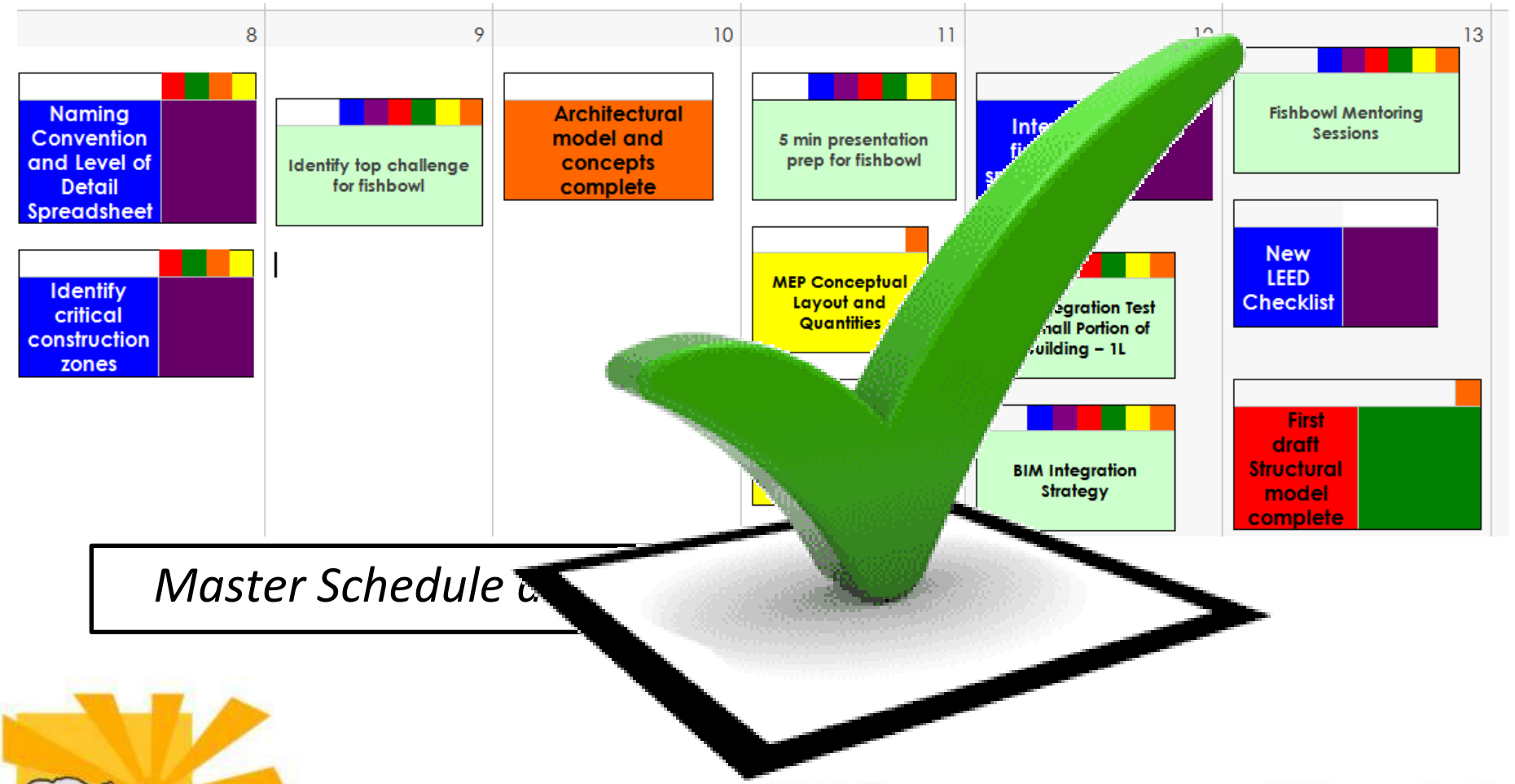
Master Schedule as of April 10

PULL PLANNING SESSIONS



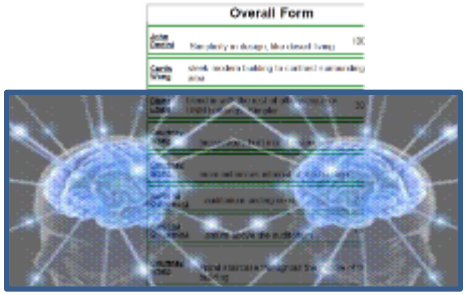
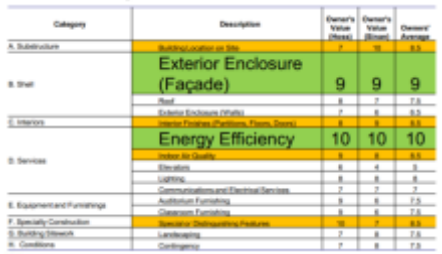
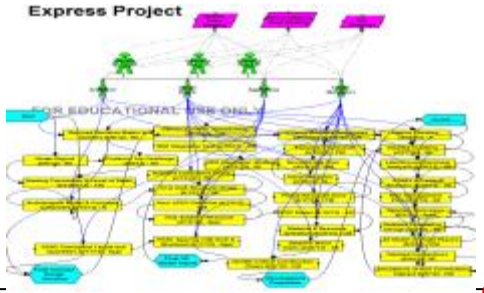
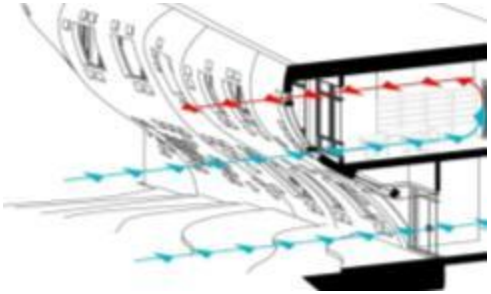
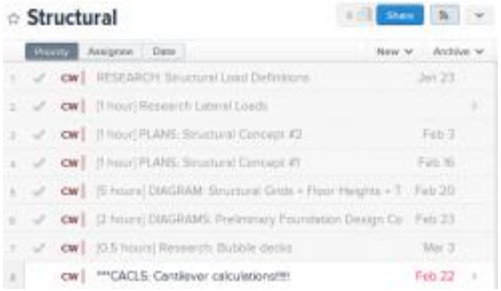
Master Schedule as of April 25

PULL PLANNING SESSIONS

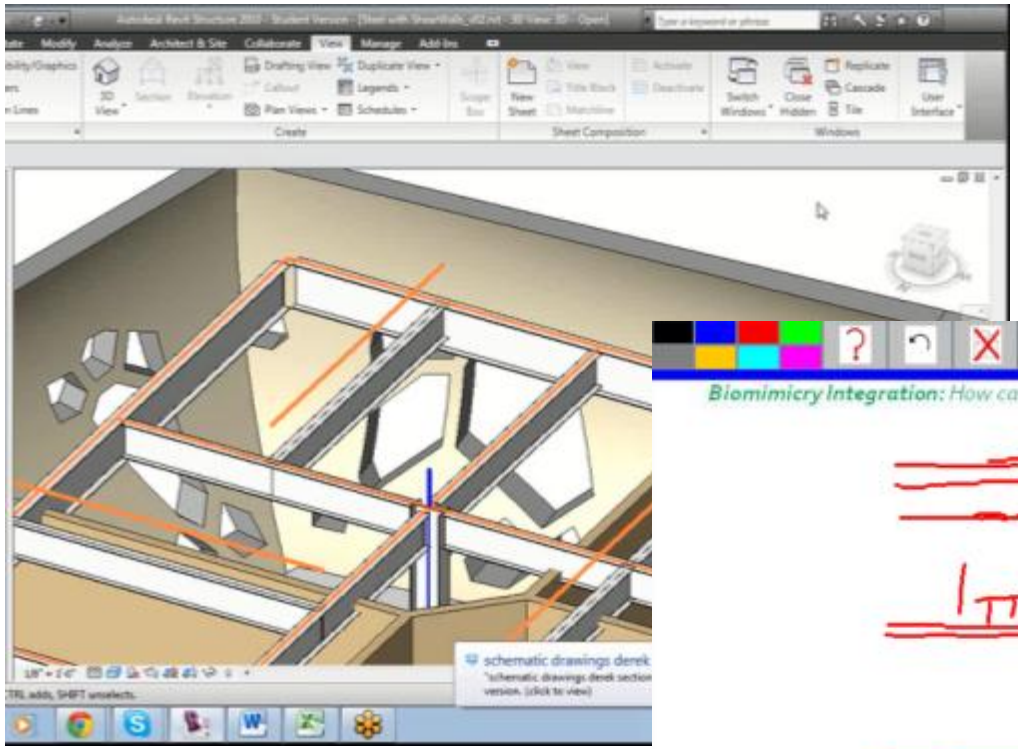


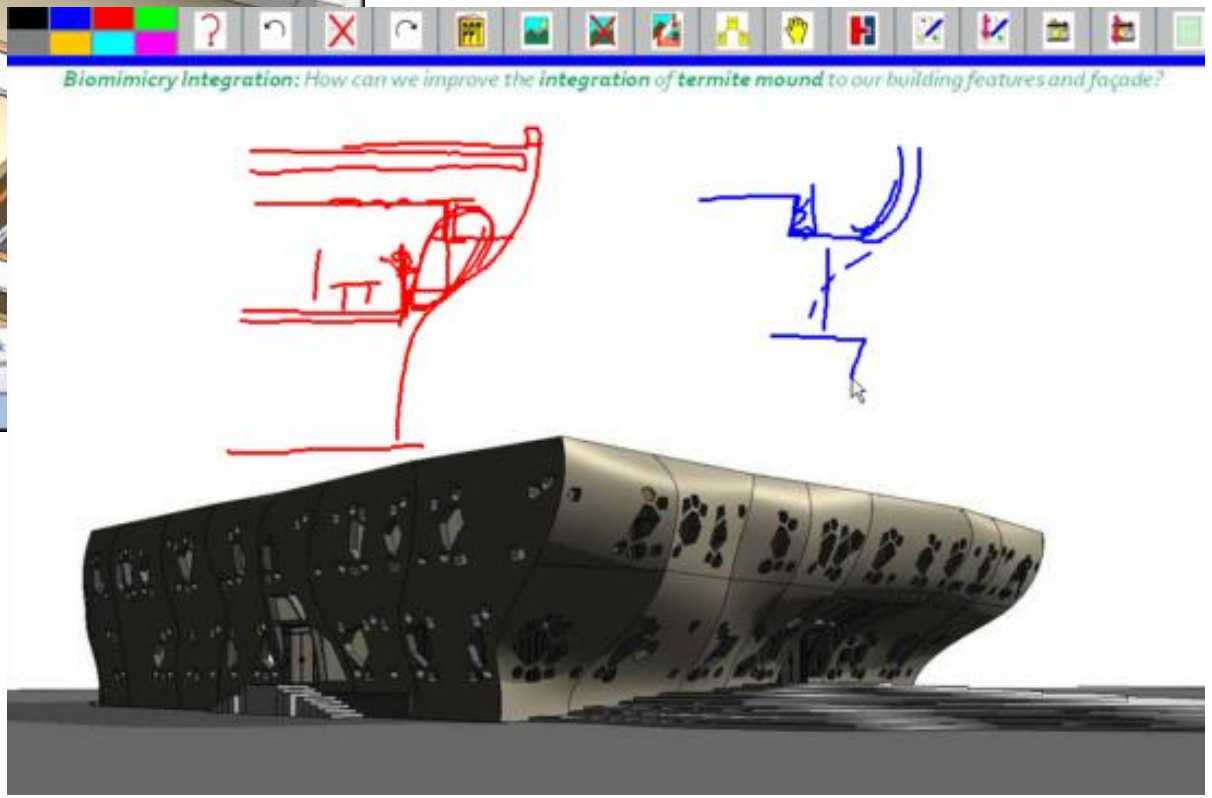
Master Schedule

PROCESS - BEHAVIOR

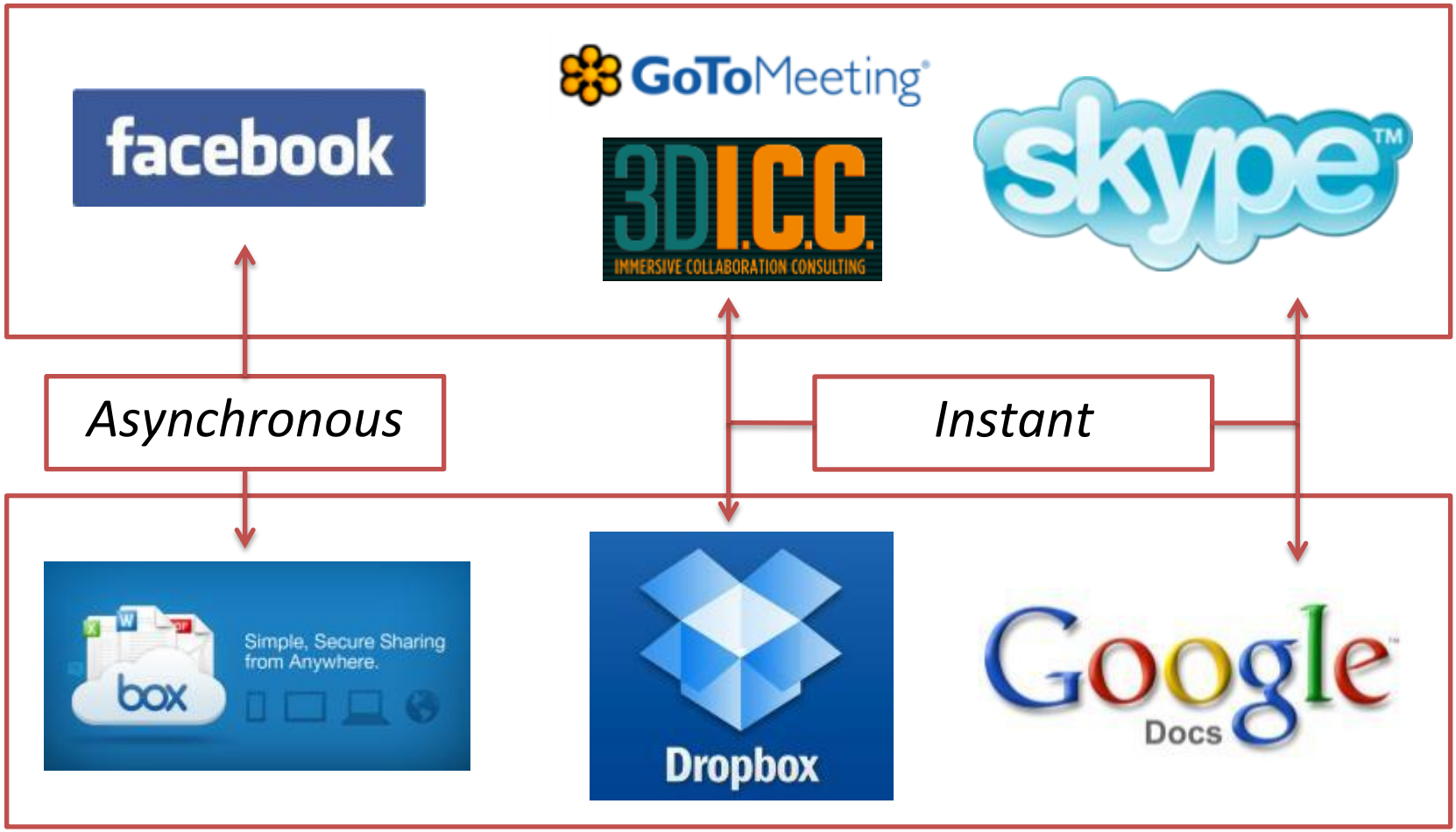
	Product	Organization	Process
Function			
Form			
Behavior			

IMPROVING PERFORMANCE VIA COMMUNICATION

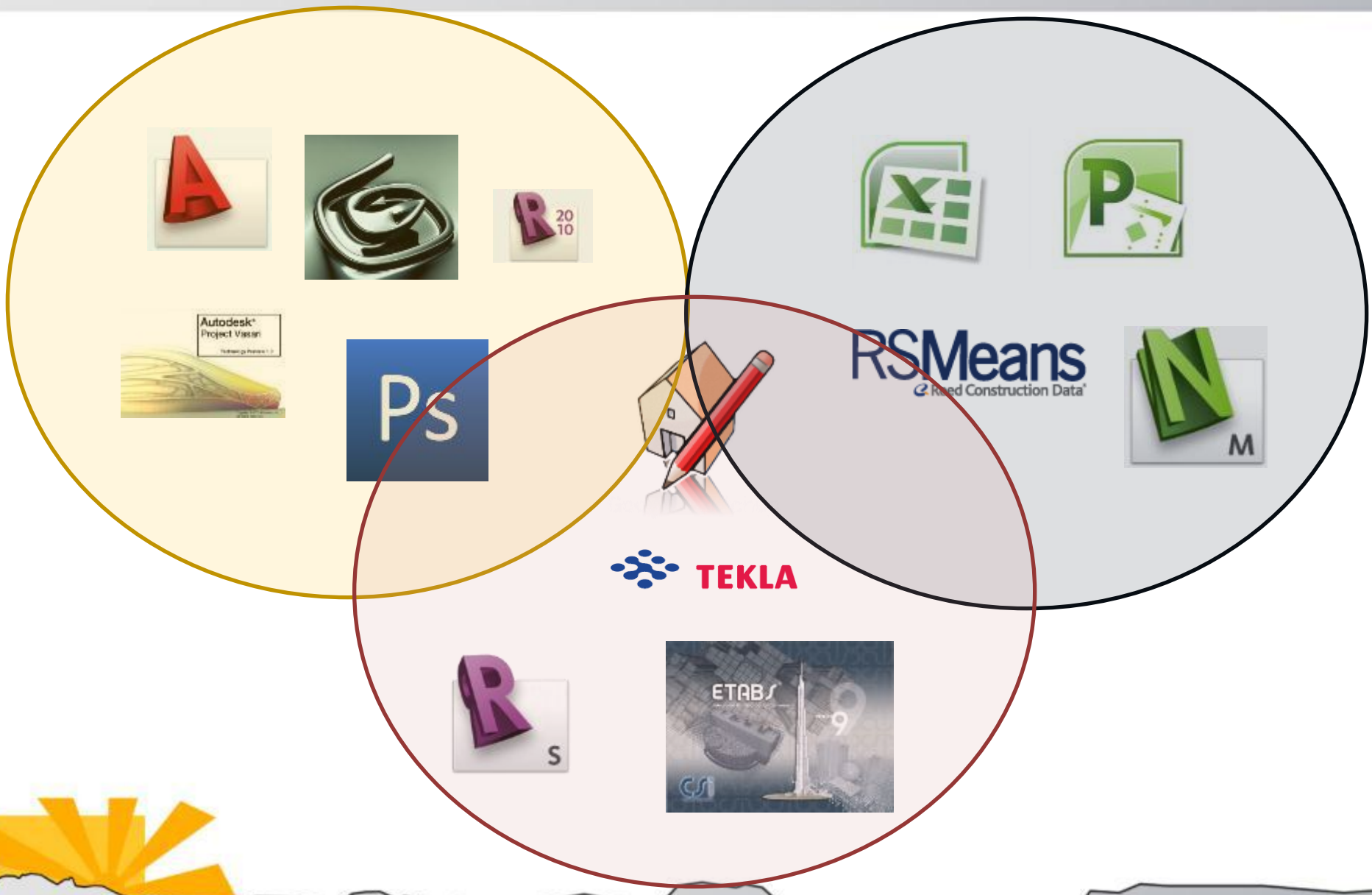




COMMUNICATION - TOOLS

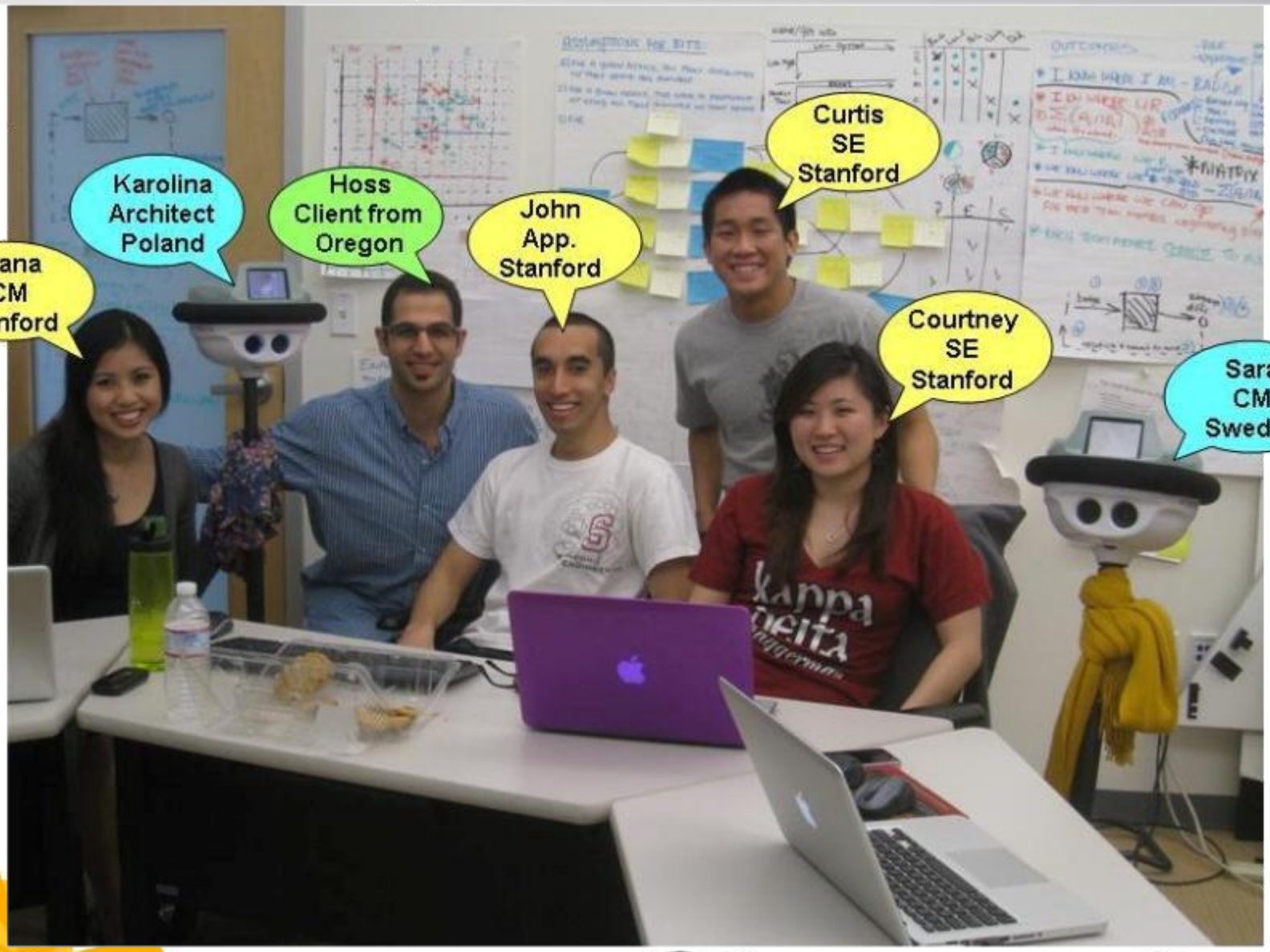


COMMUNICATION - SOFTWARE



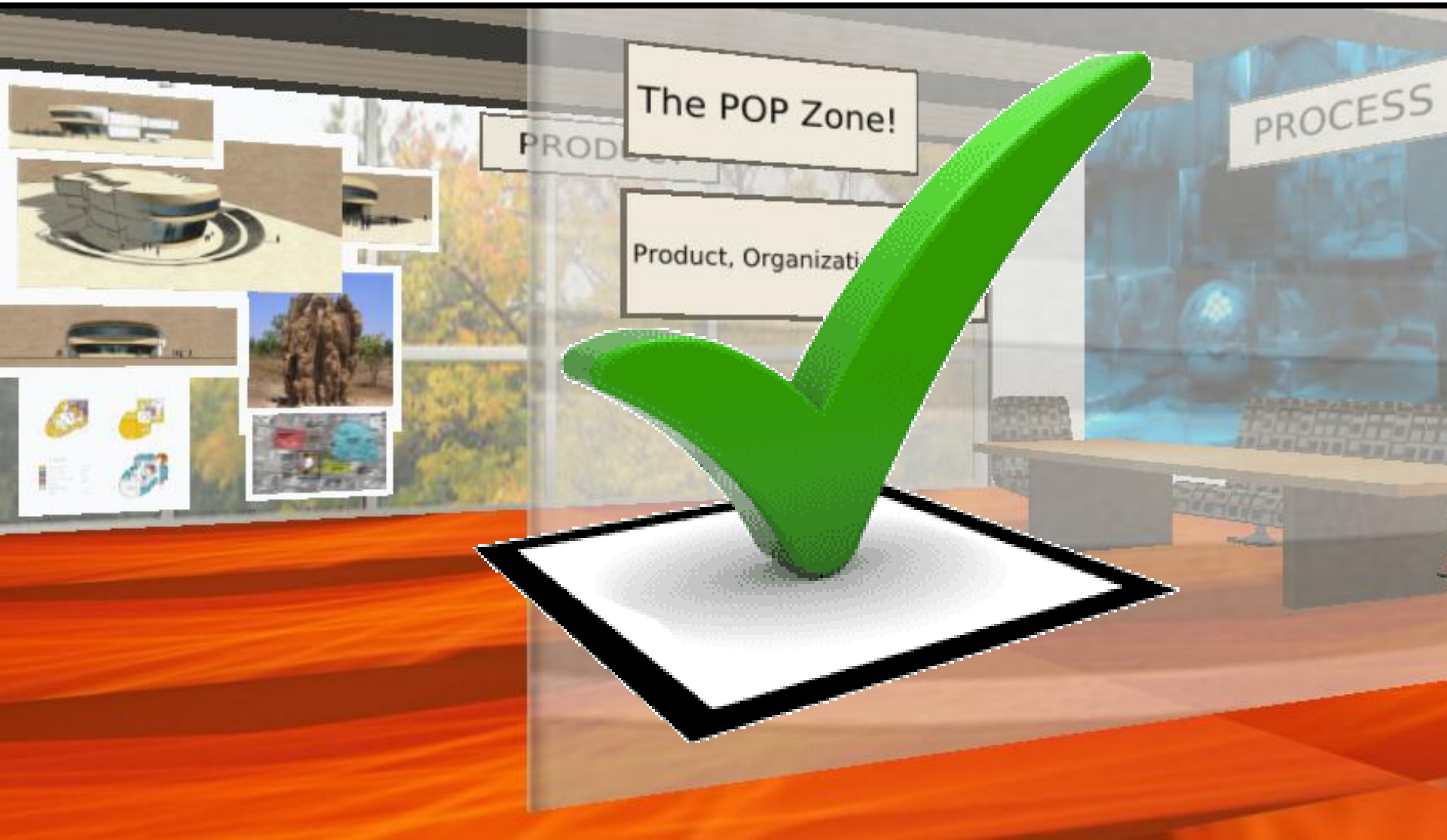
VIRTUAL LOUNGING & HANGING OUT

TEAM MEETING USING ROBOTS

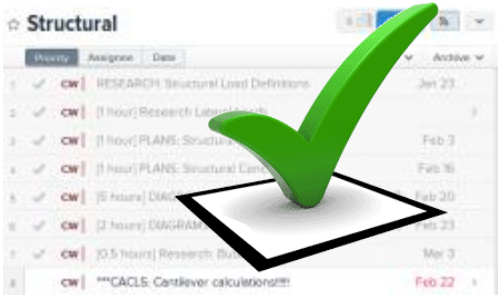


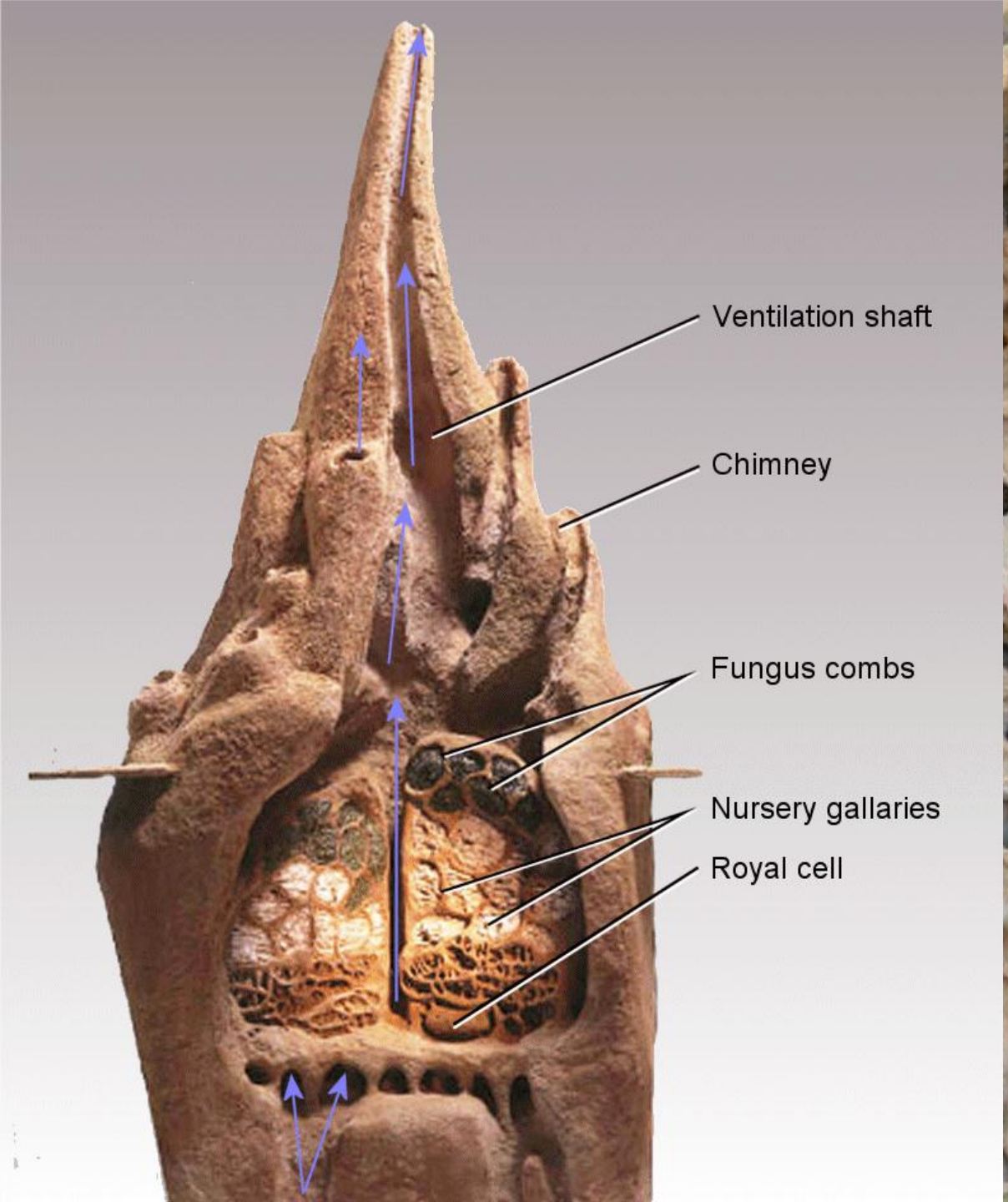
TEAM COLLABORATION

VIRTUAL COLLOCATION

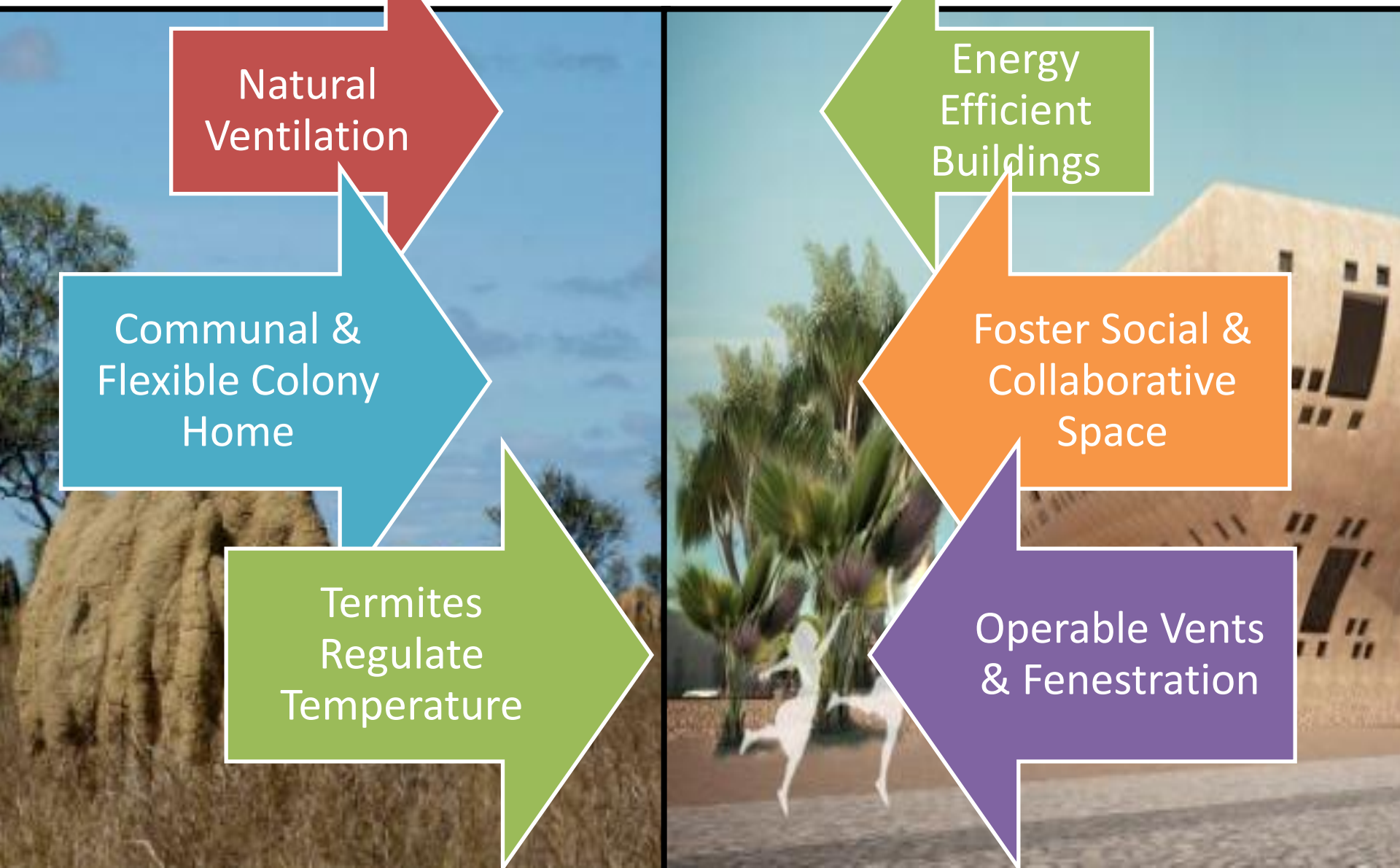


WHAT IS "POP"?

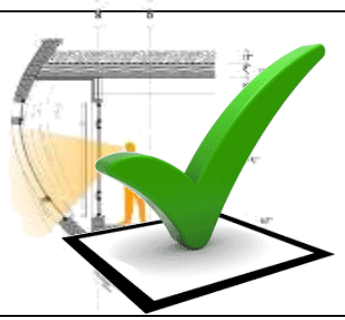
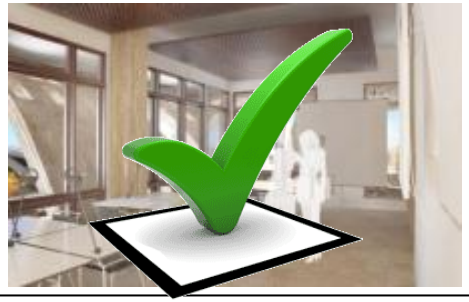
	Product	Organization	Process
Function			
Form			
Behavior			


Ventilation shaft
Chimney
Fungus combs
Nursery gallaries
Royal cell

TERMITE MOUND FEATURES



BIOMIMICRY – TERMITE MOUND

Natural Ventilation			
Communal & Flexible Home			
Termites Regulate Temperature			

THANK YOU!


Eye on the prize!
There comes a time when you have to stop making changes.
Remember the big picture!
You have less time than you think.
We are always pushing the boundaries of what we can do.
Every individual decision should benefit the team.