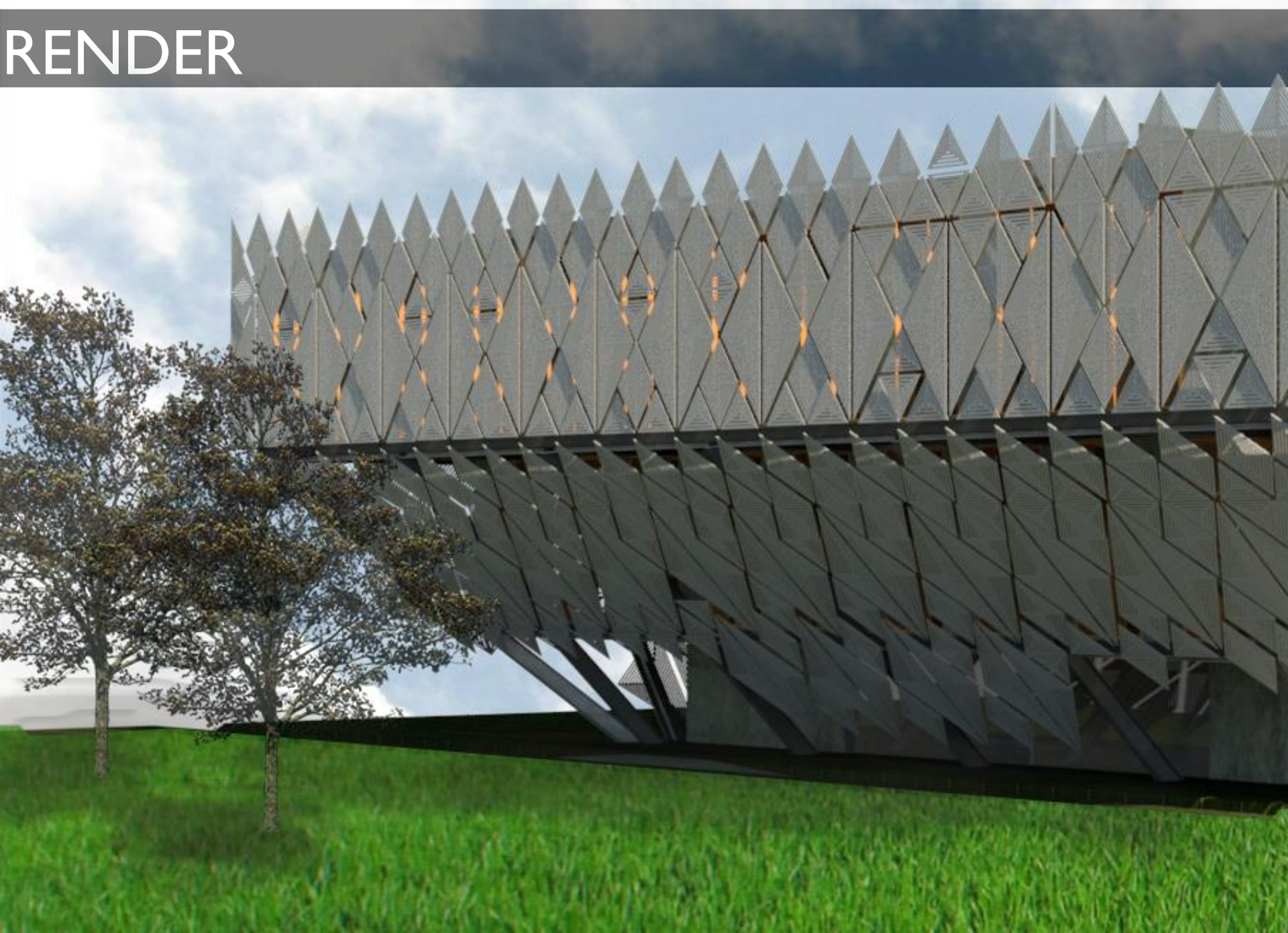
DAVID - JOHANNA - LEYLA - MIKKI - NICK - SARA

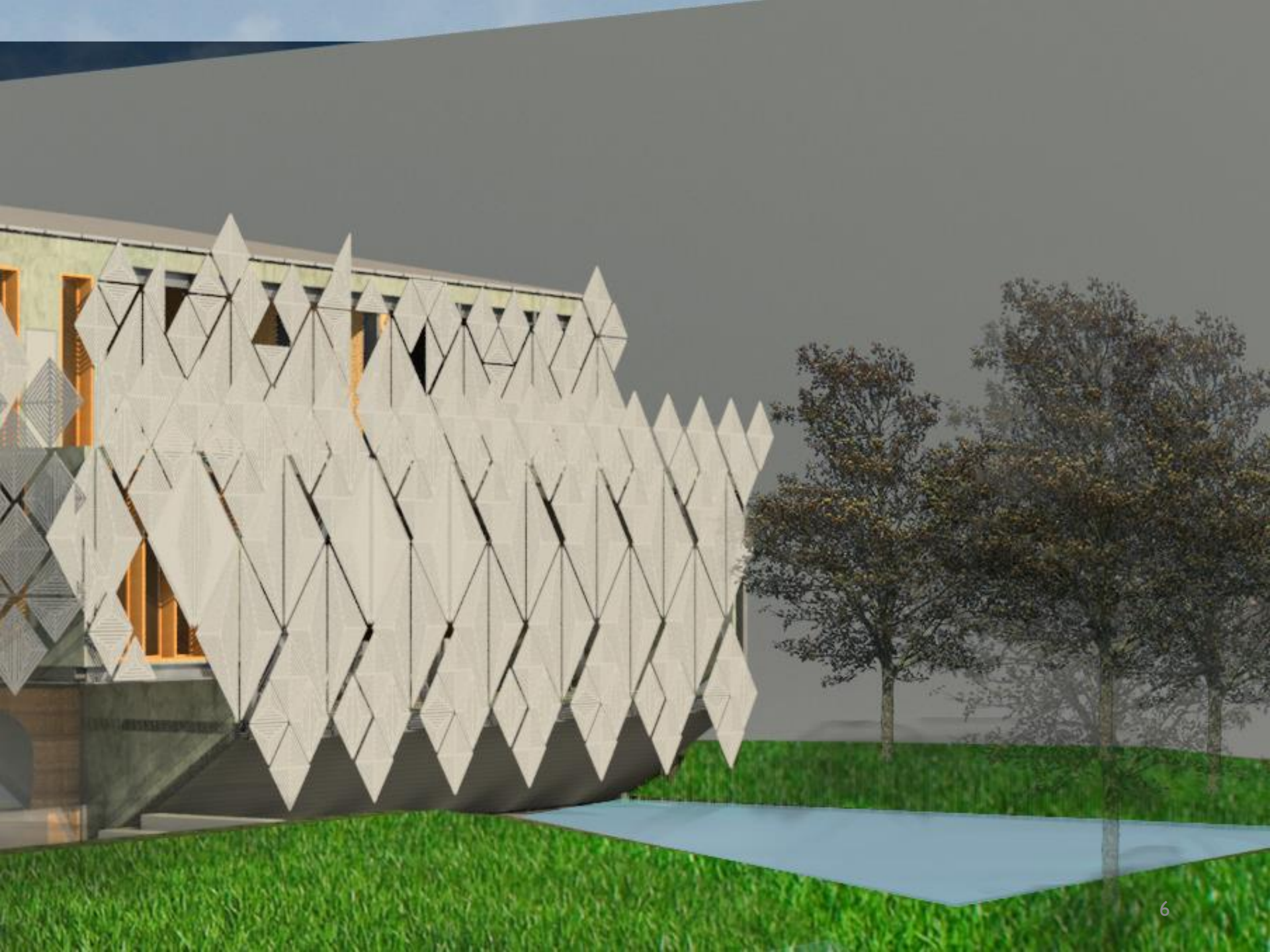
PRE

DAVID - JOHANNA - LEYLA - MIKKI - NICK - SARA

DAVID - JOHANNA - LEYLA - MIKKI - NICK - SARA

RENDER





EXPRESS

SPRING PRESENTATION

MAY 6, 2016

DAVID - JOHANNA - LEYLA - MIKKI - NICK - SARA

EXPRESS TEAM

Nick - SE

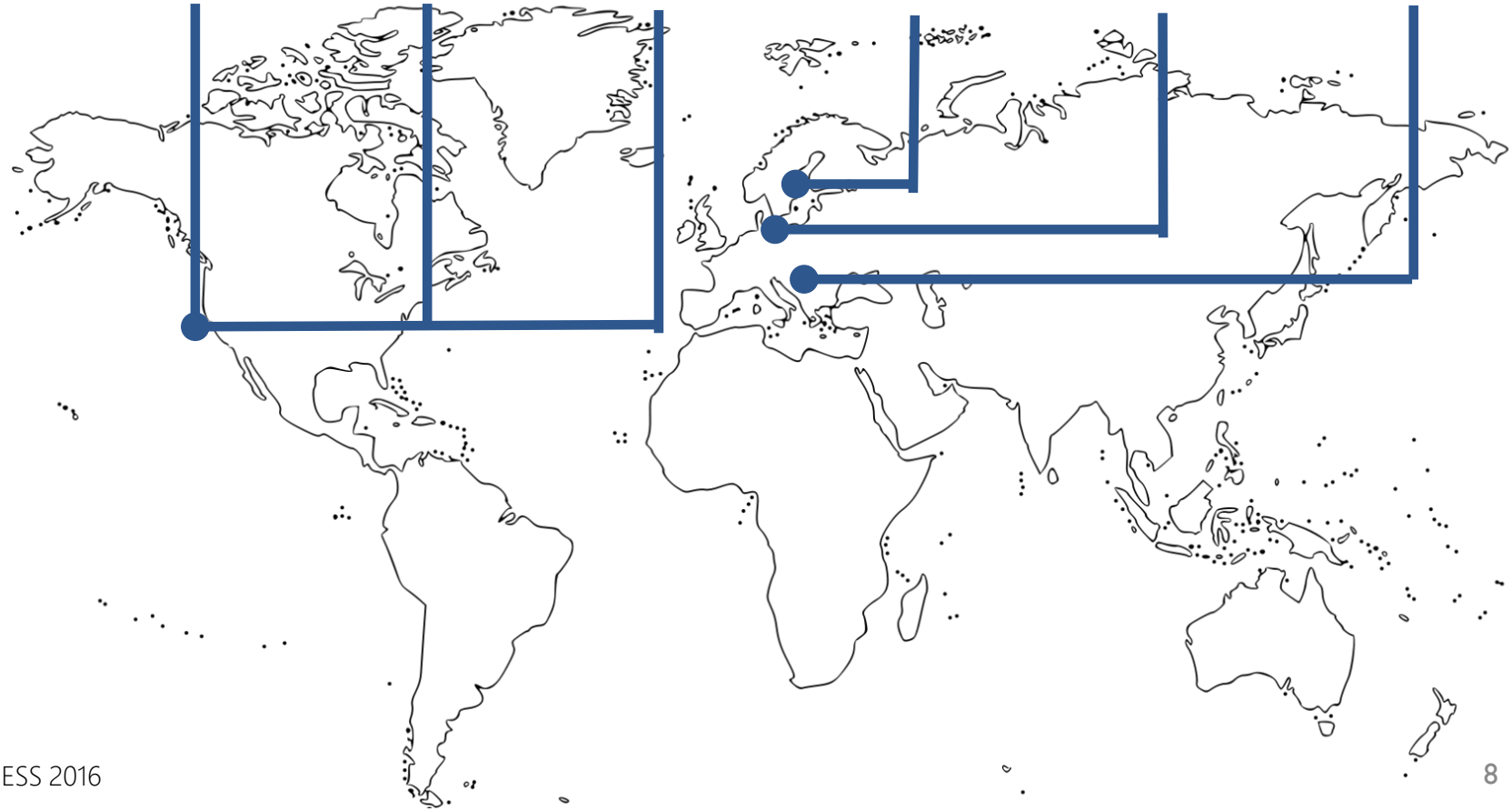
David - SE

Leyla - CM

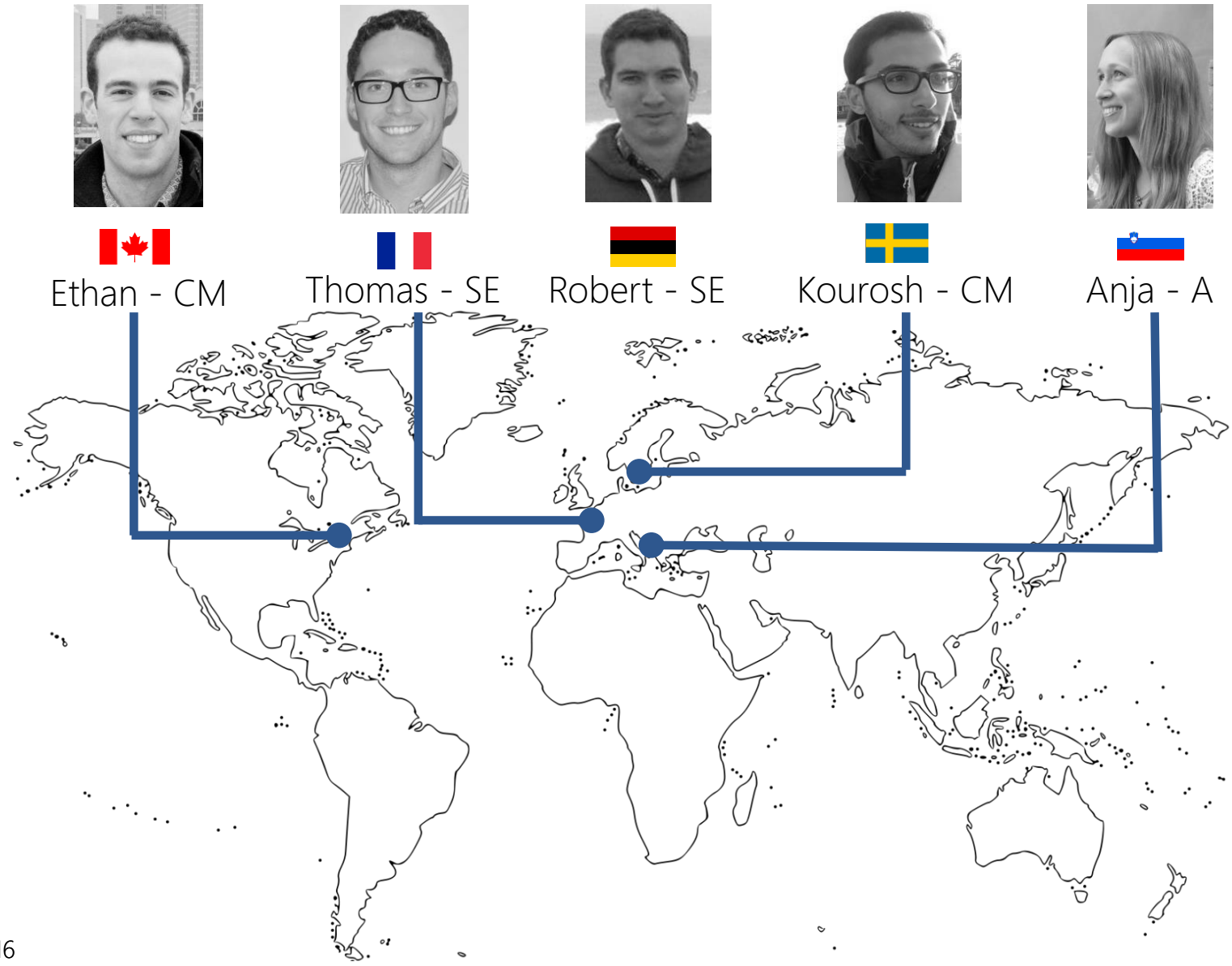
Johanna – CM

Mikki - MEP

Sara - A



OWNERS



PROCESS

CHAMPIONS OF KEY CHALLENGES

- ★ Deploy a strategy
- ★ Define goals
- ★ Coordinate

BIG Idea
Adaptability

Air Quality

BIM coordinator
LEED

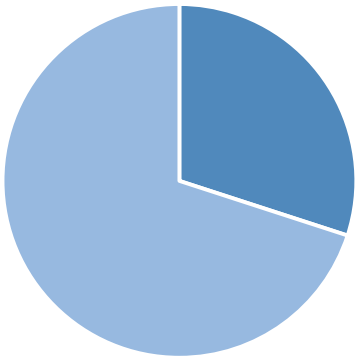
Air Quality

Client Affinity

Virtual Reality
Clash detections

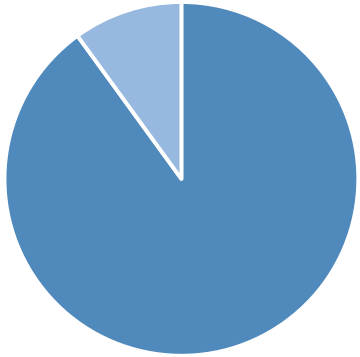
COMMUNICATION TOOLS

Communication



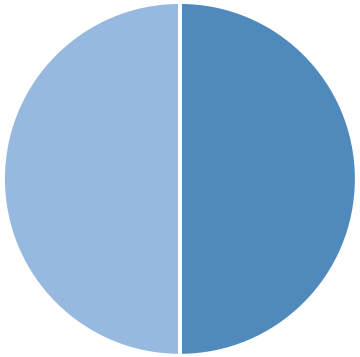
Terf Goto Meeting

Storage



Drive Box

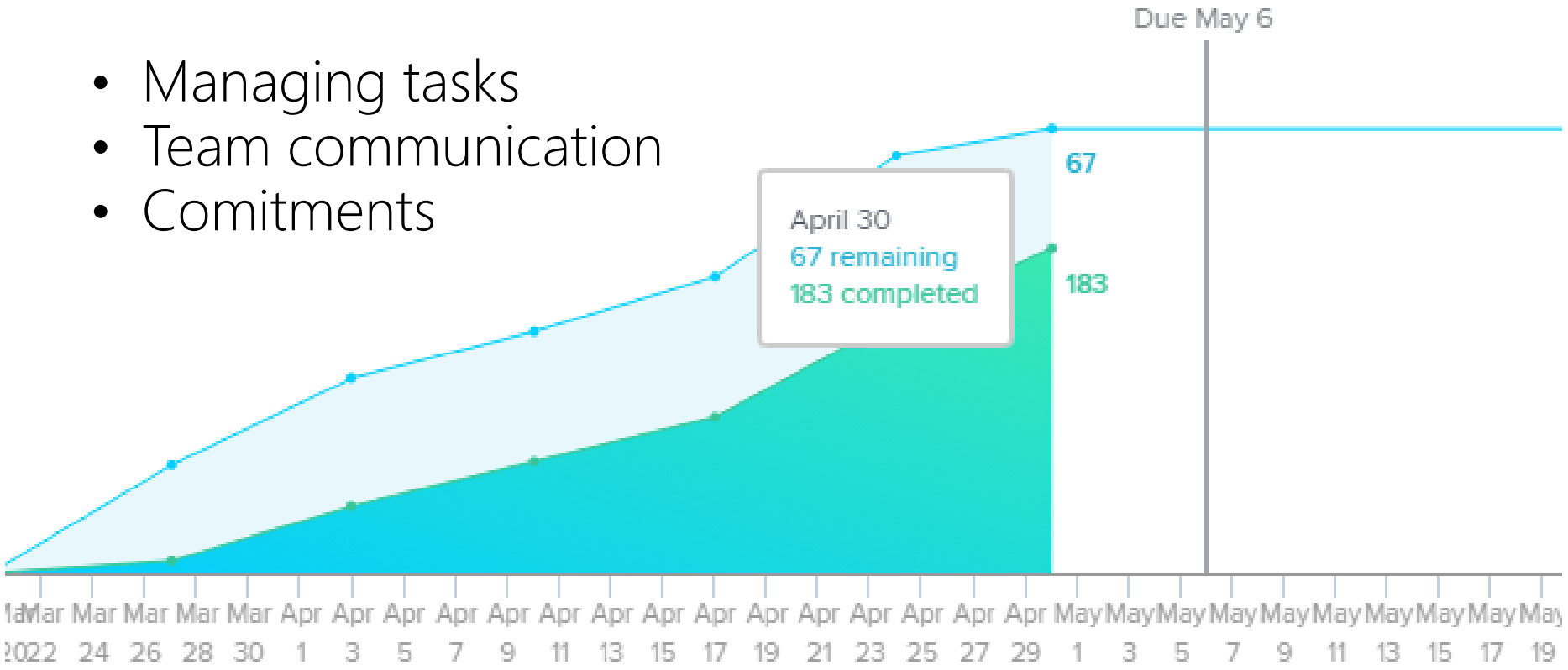
Daily Contact



WhatsApp Facebook

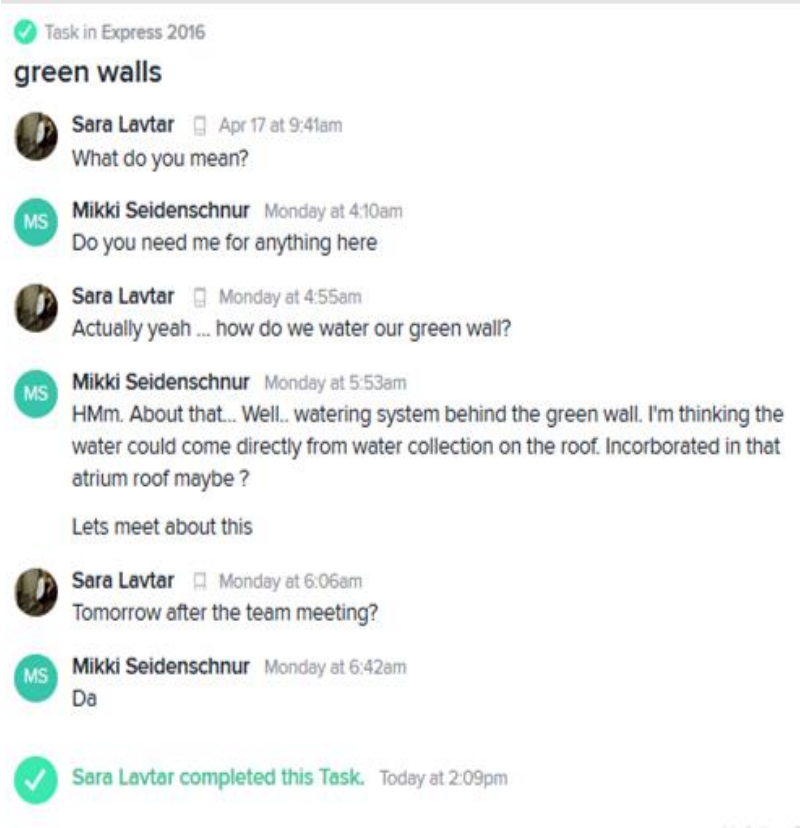
TASK MANAGEMENT TOOL

- Managing tasks
- Team communication
- Comitments

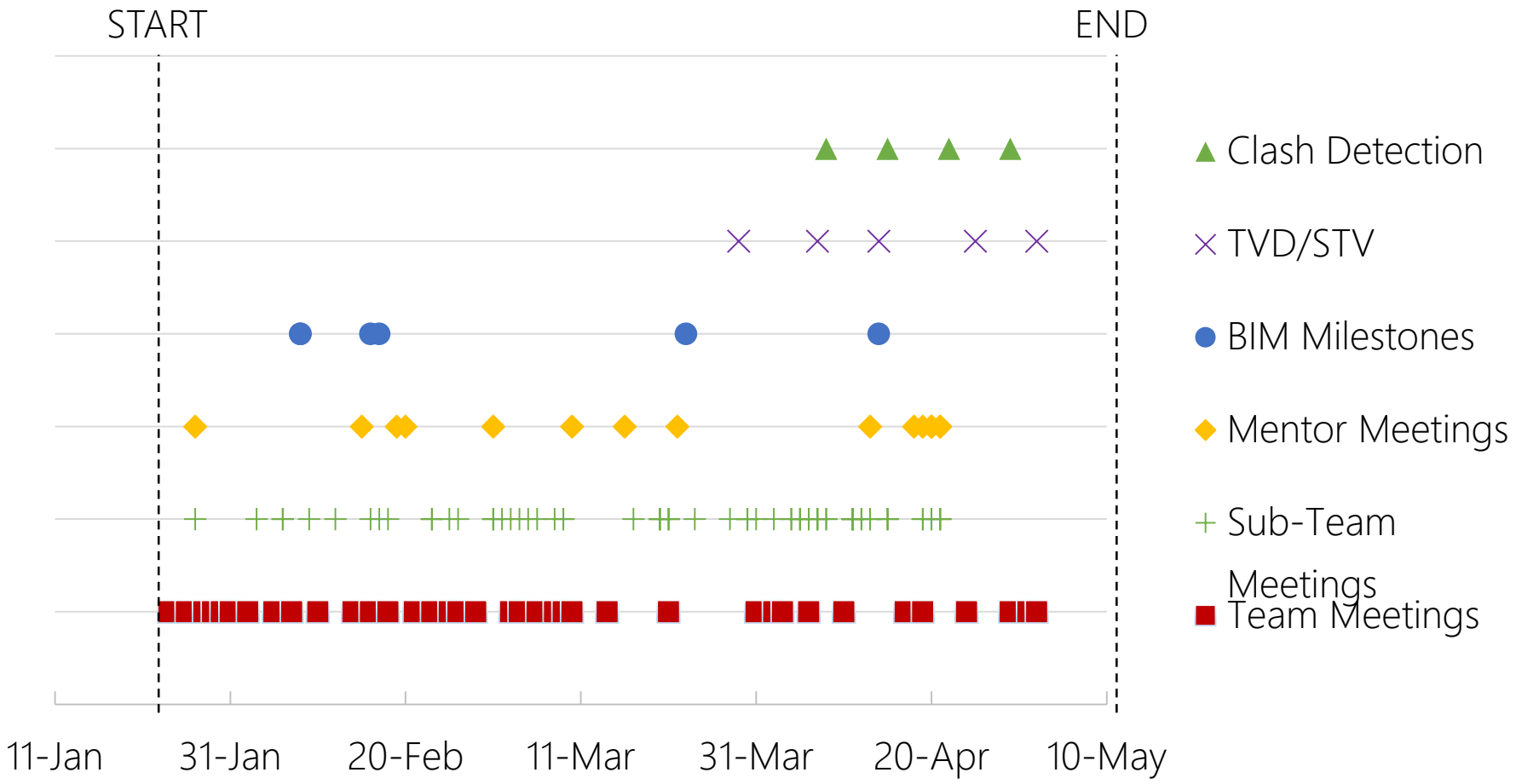


COLLABORATION

asana

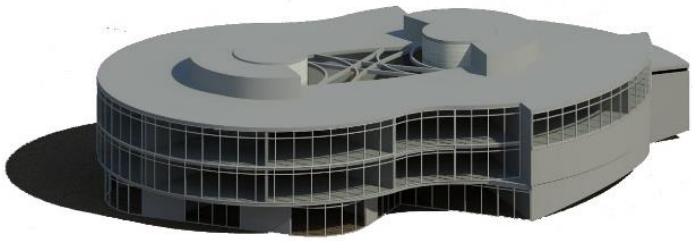


COORDINATION TIMELINE

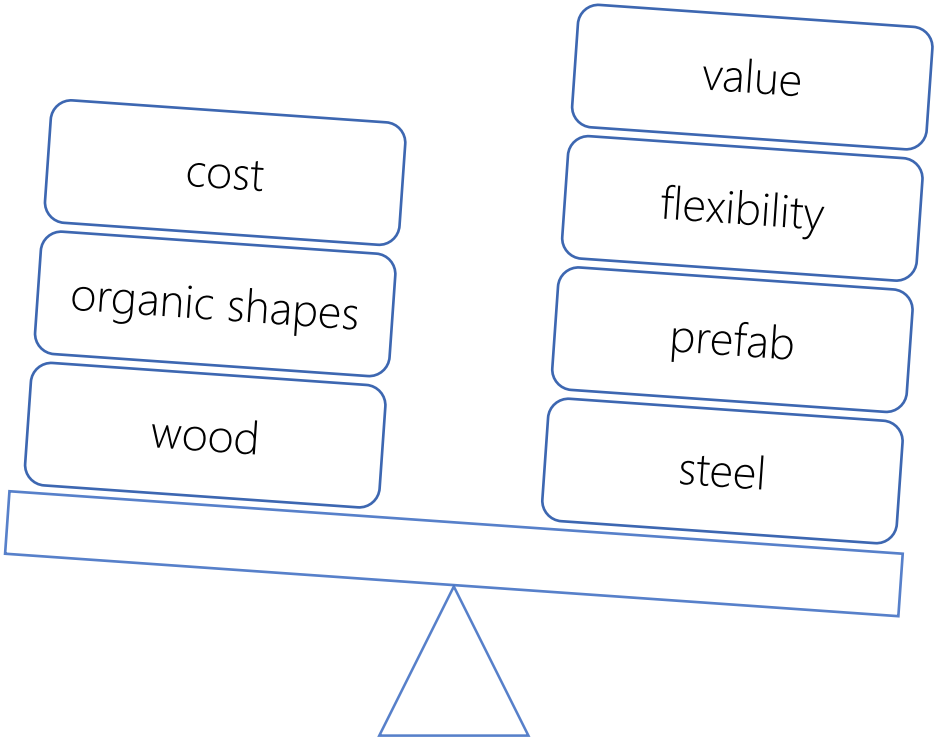


DESIGN COMPARISON

Tree



Kozolec



CHALLENGES

CLIENT AFFINITY STRATEGY

KPI

Communication

Personality Profile

Virtual Reality

Survey Feedback

Weekly Newsletter

TOP 5 KPI

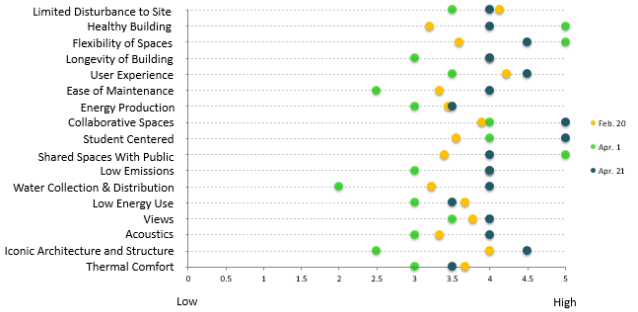
- Limited Disturbance to Site
- Healthy Building
- Flexibility of Spaces
- User Experience
- Longevity of Building

BEYOND METRICS

Communication

>

Metrics



Client

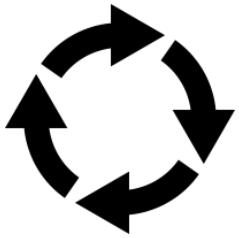
=

Owner + End User

AIR QUALITY STRATEGY

Renew

Adaptable features & renewable **material** choices



Educate

Interactive methods & relevant **data**

Mitigate

Healthy material choices & **Reduction** of unnecessary tasks

AIR QUALITY – RENEW & EDUCATE

Flexibility of spaces

Agricultural Byproduct Partition Walls

Renew

Educate

Interactive Board

Indoor Air Quality sensor

AIR QUALITY - MITIGATE

Green roof and walls

Mitigate

Fly Ash Concrete

Nitrous oxide Capturing Facade

Equipment Plan

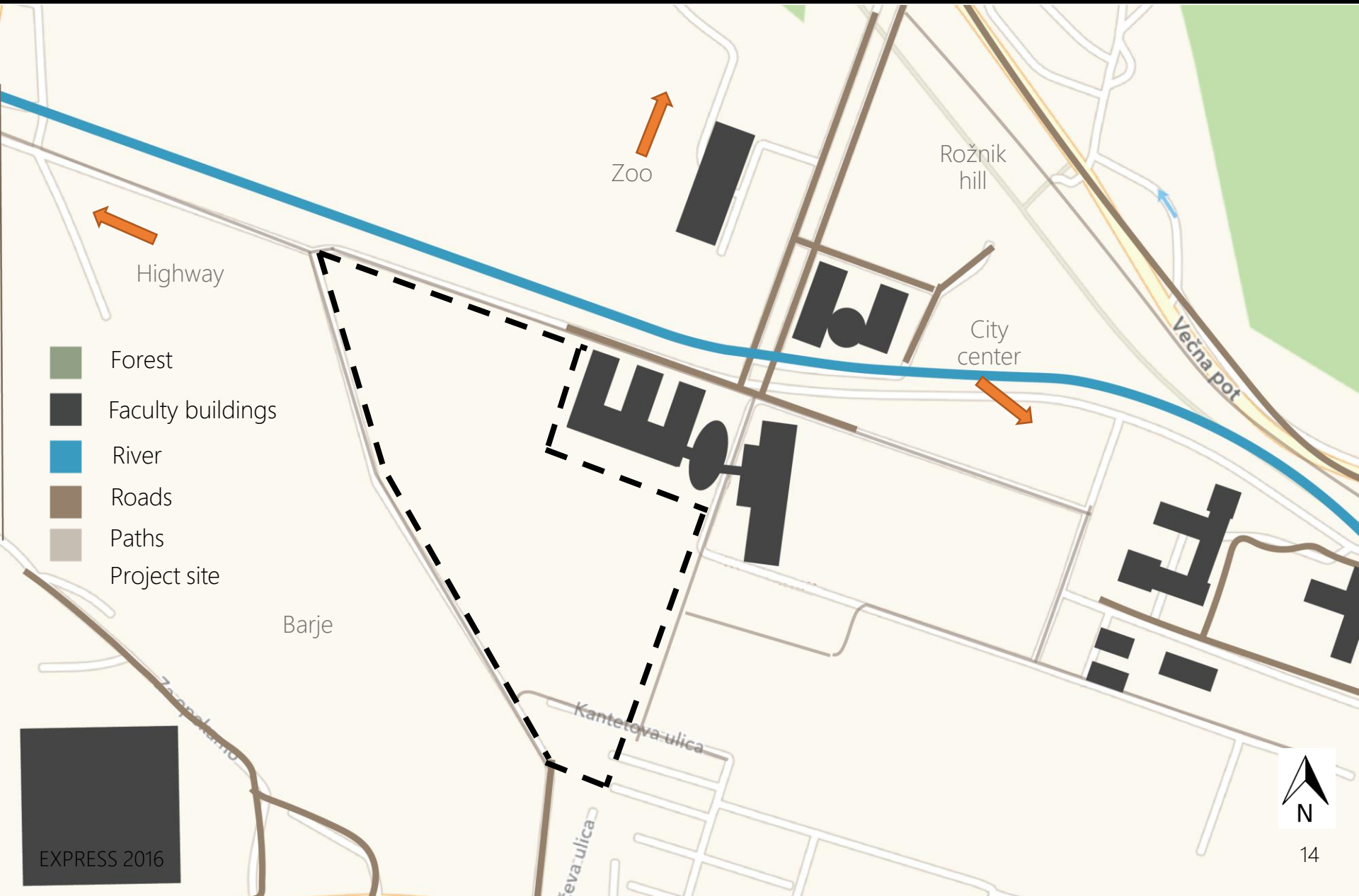
LOCATION

LOCATION


Domžale
Dobeno
Spodnje Pirniče
Srednje Gameljne
Trzin
Medno
Dragomelj
Gunclje
Obvozna cesta
Dunajska cesta
Brinje
Ljubljana
Ljubljana grad
Zaloška cesta
Litijska cesta
Cesta na Brdo
Tržaška cesta
Barjanska cesta
Ižanska cesta
Dolenjska cesta
Celovška cesta
Šmartinska cesta
Podsmreka
Podmolnik
Orle
Črna vas
Lipe
Lanišče
Škofljica
104
644
211
639
E61
E57
108
8
H3
E70
409
A2
645
642
106

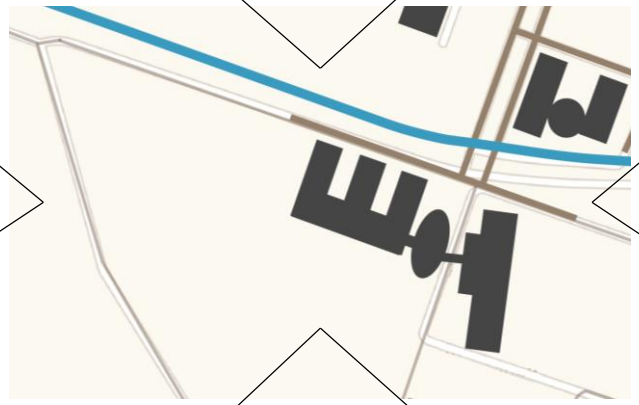

Kanetova ulica
Petrčeva ulica
N

SITE & SURROUNDINGs



EXPRESS 2016

VIEWS



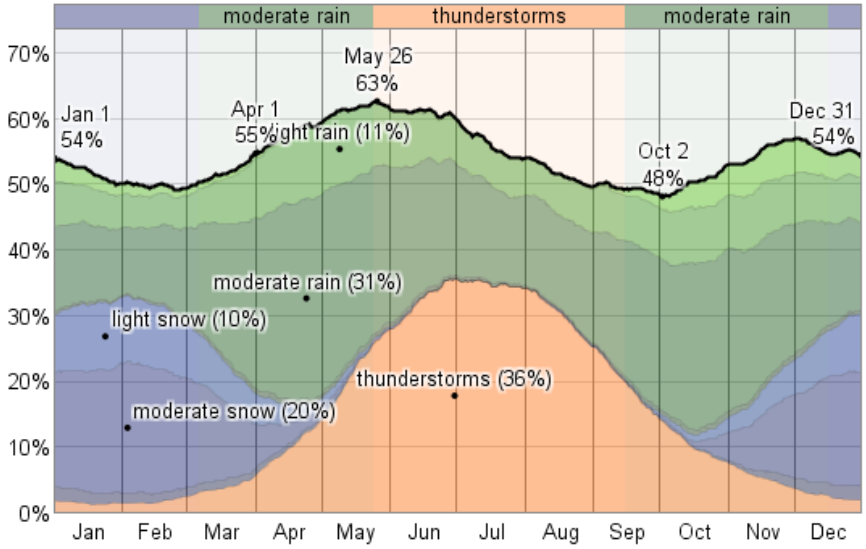
N

WEATHER CONDITIONS

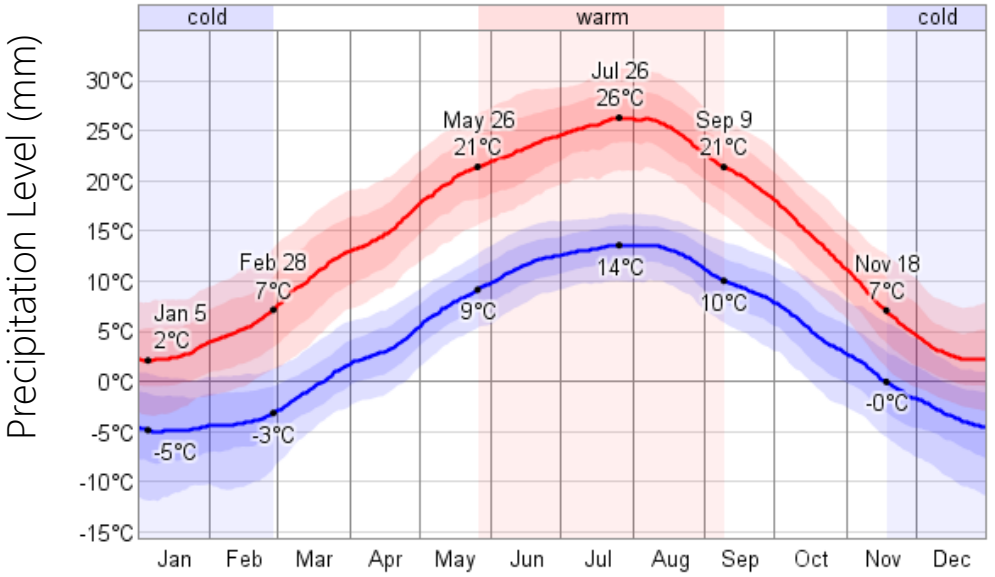
Precipitation is occuring in 63 % of the days in May - June

Temperature Range: 5˚C – 26˚C

Probability of Precipitation



Average Temperature



SITE CHALLENGES

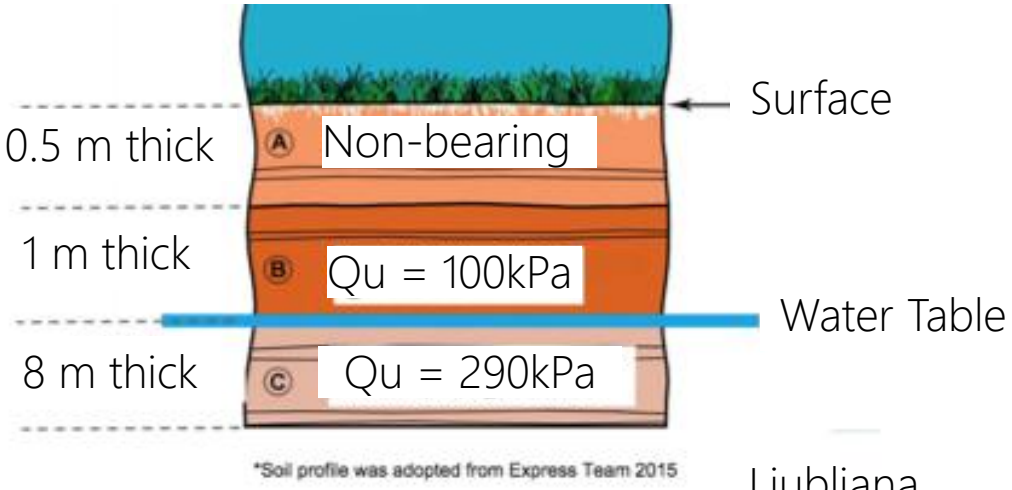
Flood Hazard: Low
100 year flood: 90 cm

Snow Loads: 2 kN/m^2
Max Depth: 50 cm

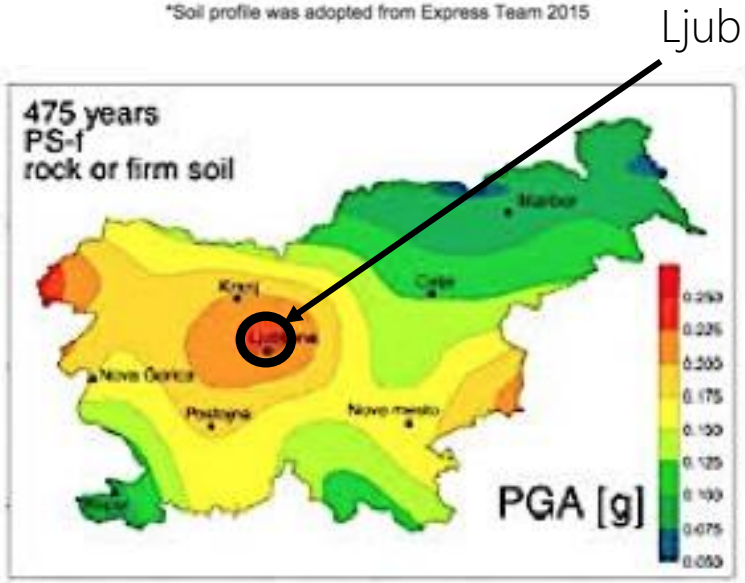
PGA: 0.225g
Max Magnitude: 6.1

Avg. Wind Speed: 2 m/s
Wind Load: 0.67 kN/m^2

Soil Profile



*Soil profile was adopted from Express Team 2015



STRUCTURAL LOADS

Load Type	Gravity			Lateral	
	Live (psf)	Dead (psf)	Snow (psf)	Wind (psf)	Seismic (k)
Roof	20	82	31	14	465
Level 3	100	90	-	14	364
Level 2	100	90	-	14	133
Level 1	100	90	-	-	-
Total Base Shear	-	-	-	-	963

Governing Load Combinations: 1.2(D + F) + 1.0E + f1L + 1.6H + f2S
Source(s): IBC 2012, ASCE 7-10

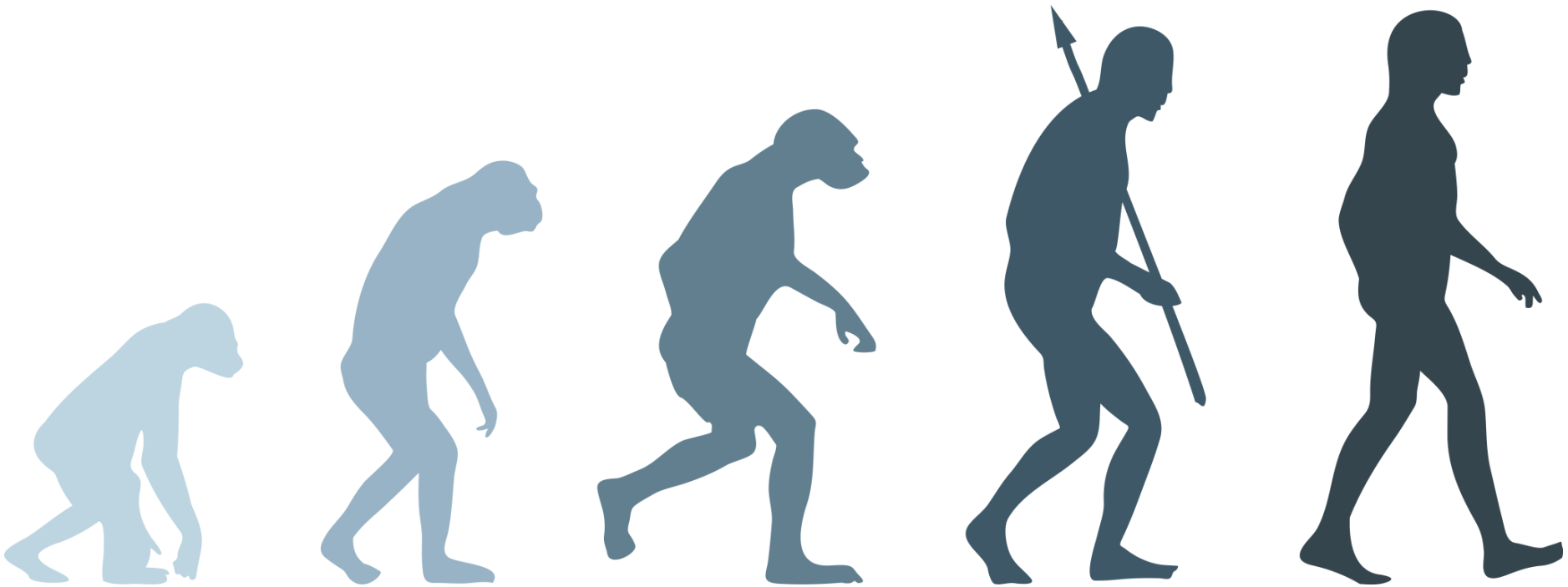
CONCEPT

BIG IDEA

Create a Building

capable of

ADAPTATION and EVOLUTION

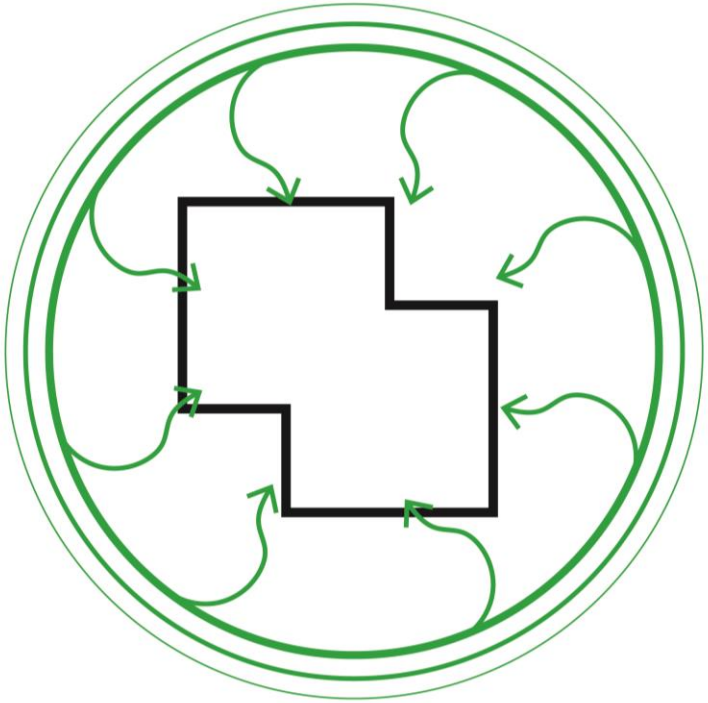


CONCEPT

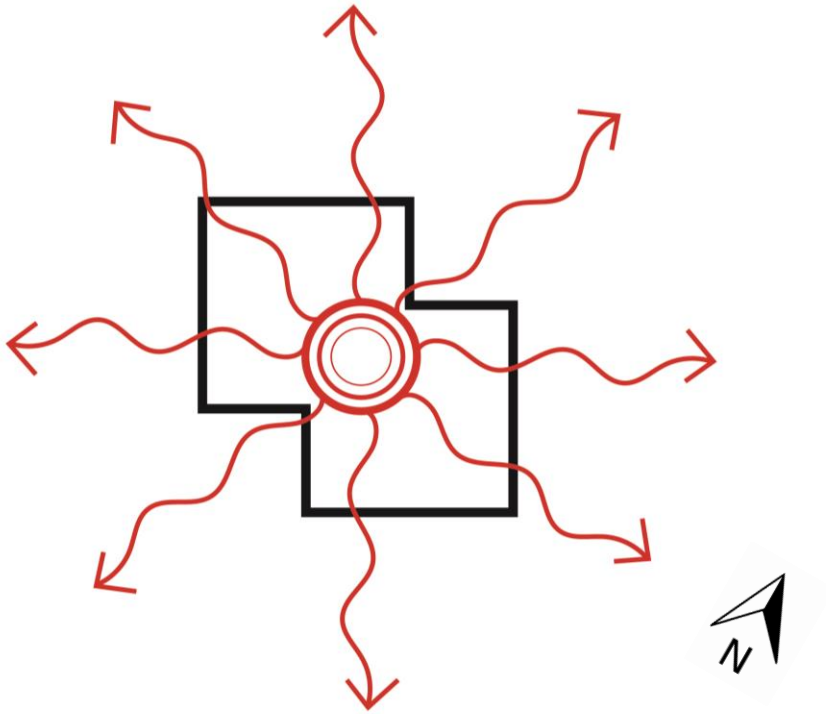
Create a Building

from

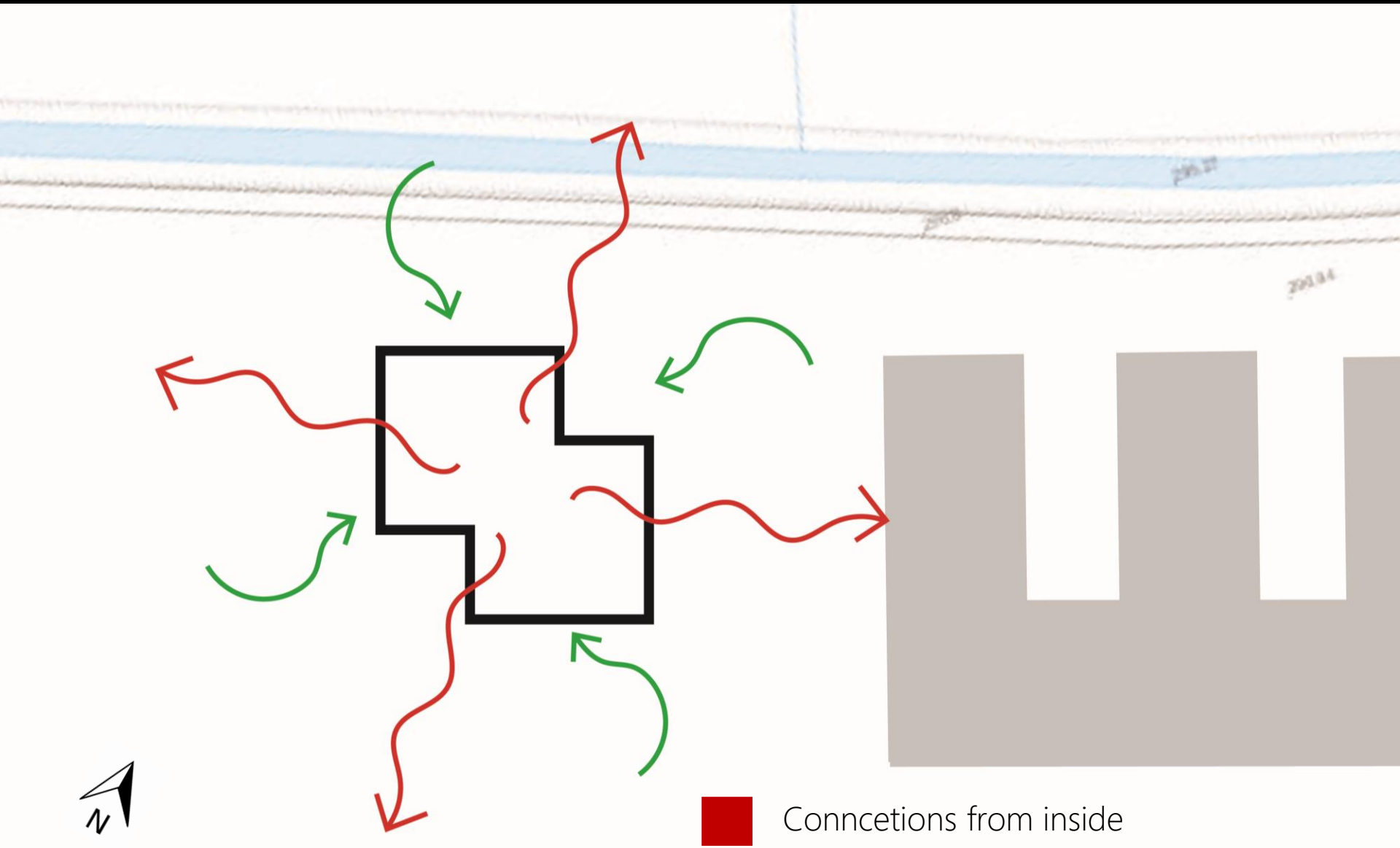
INSIDE → OUT



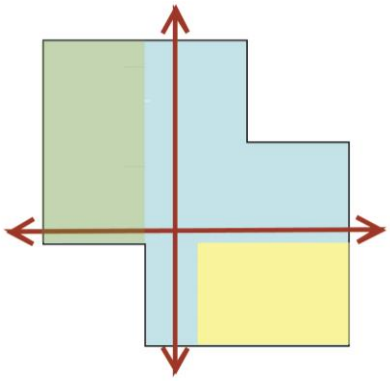
OUTSIDE → IN

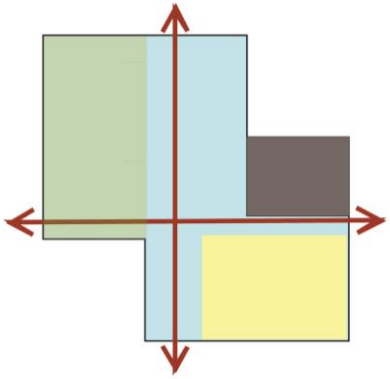


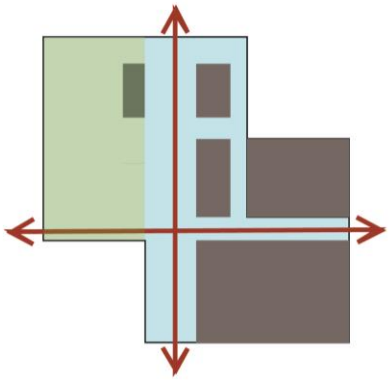
CONNECTION TO SITE



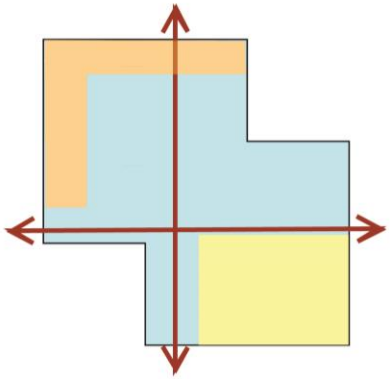
PROGRAM DIVISON

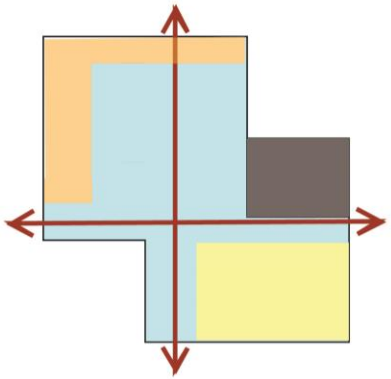


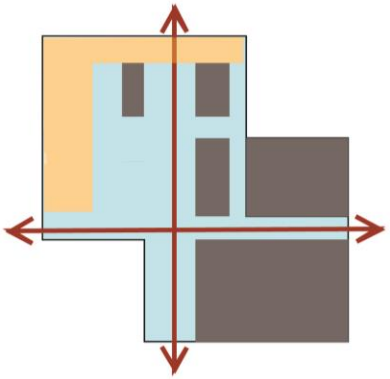




Ground floor







Upper floors

Public/
Collaborative

Classrooms

Autiorium/
Big classrooms

Offices

Restrooms

Fixed program
Servin as
structural core

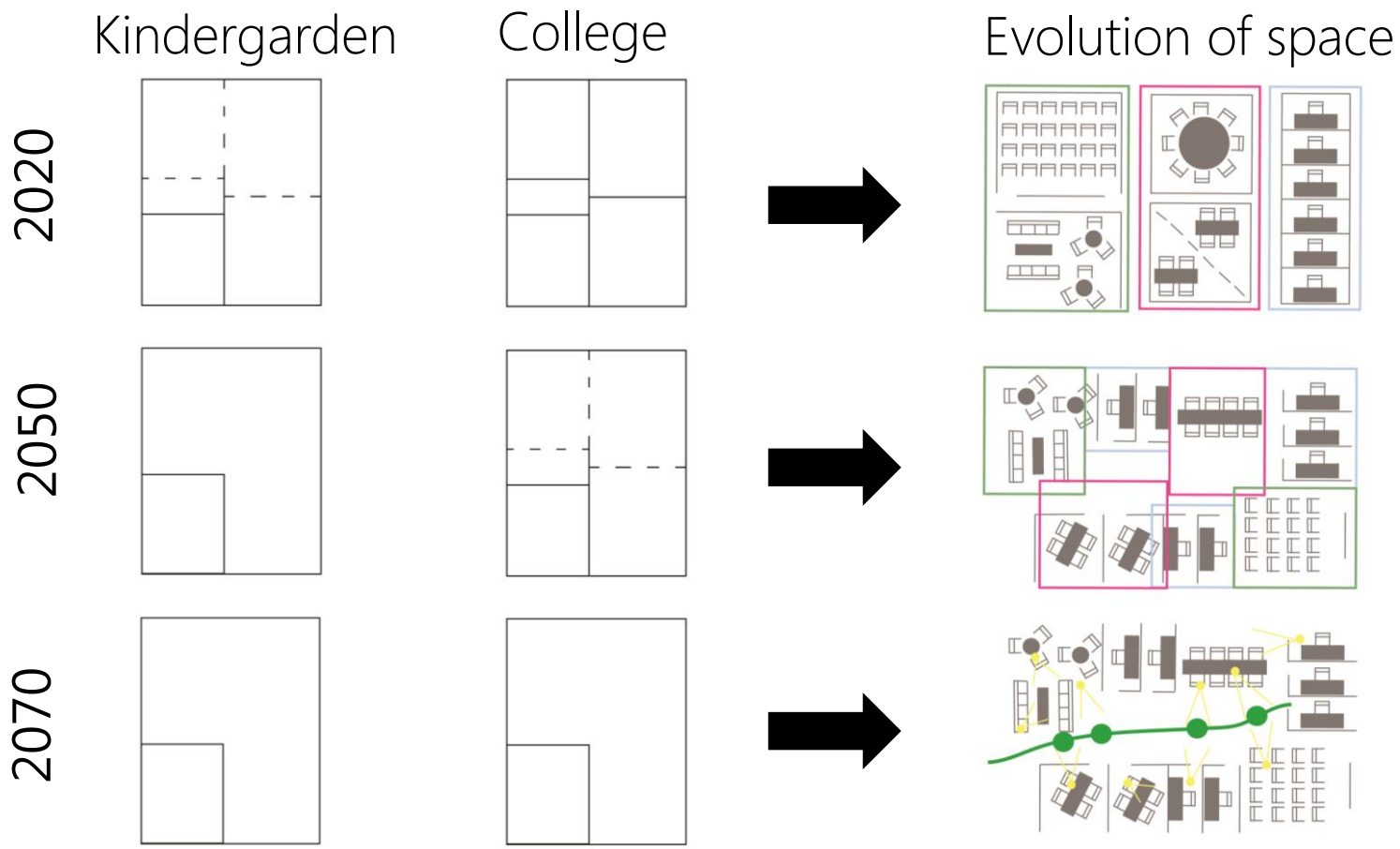
N

ADAPTIBILITY OF SPACE

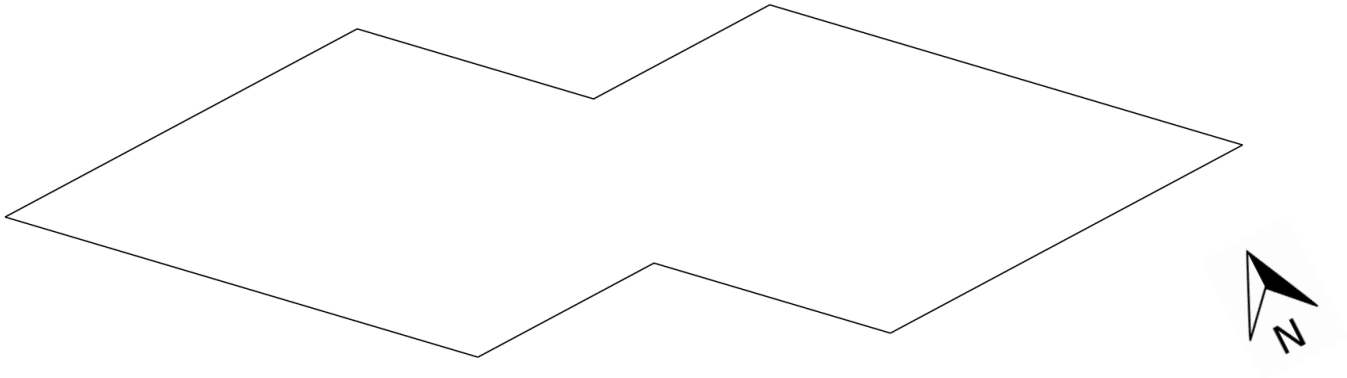
WHY?

evolution of the

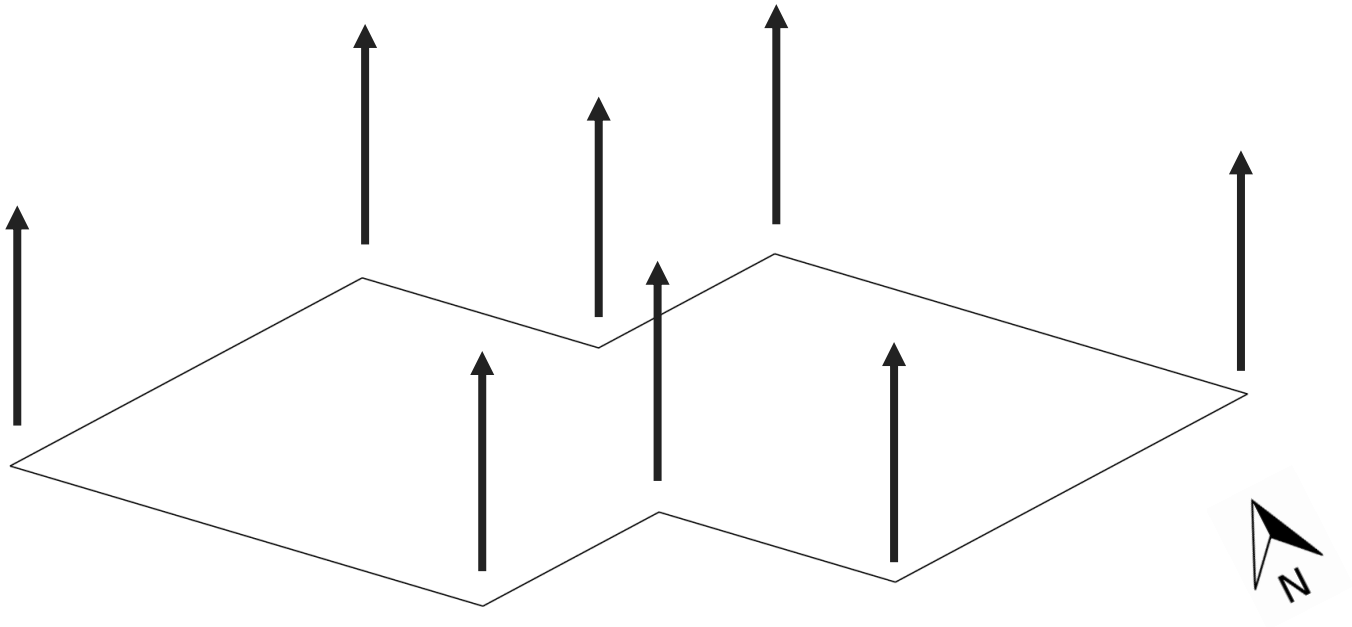
USER



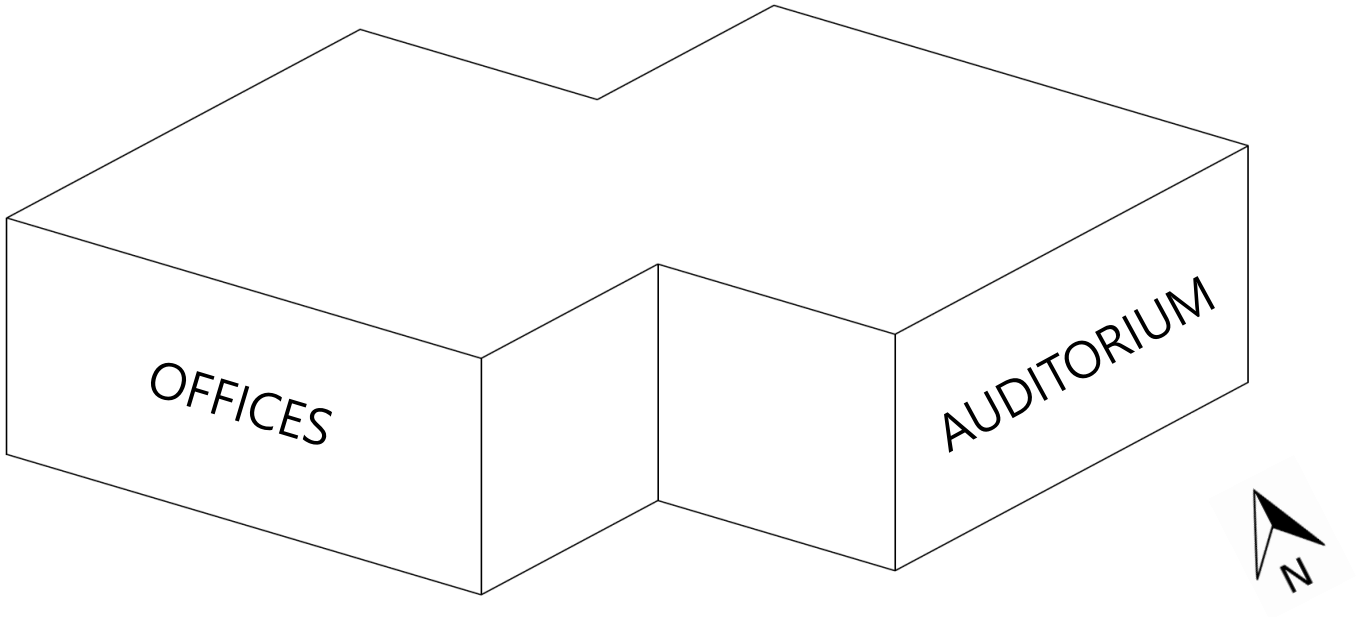
FOOTPRINT



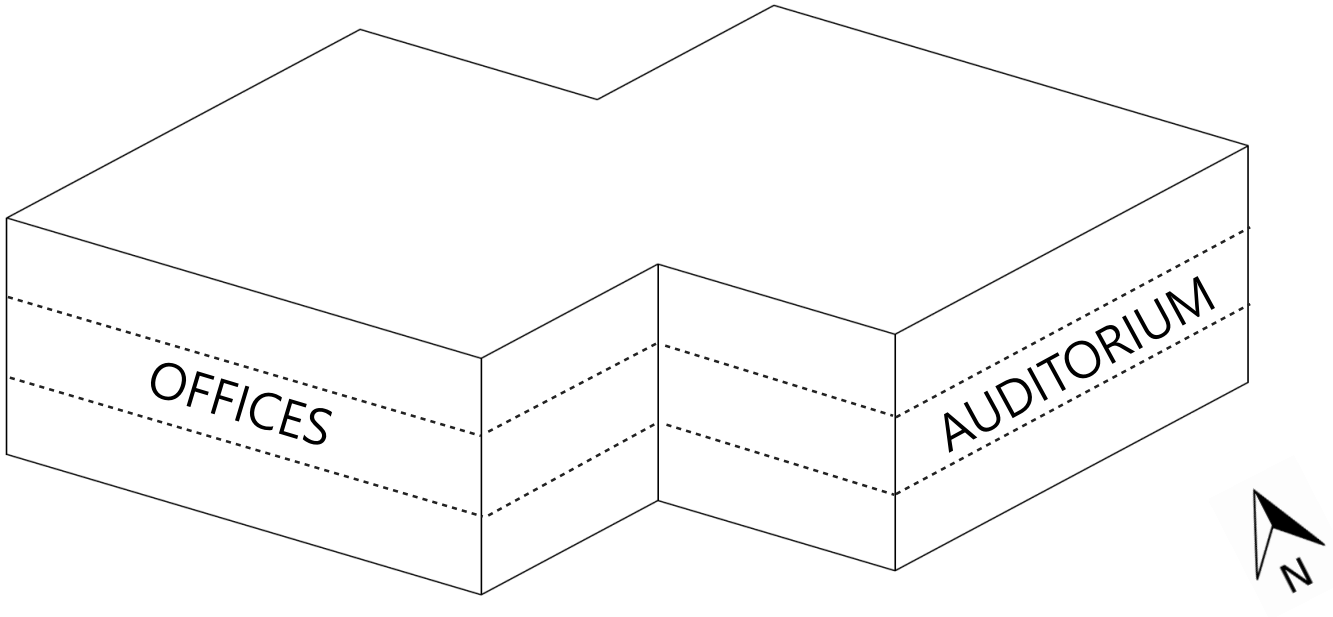
EXTRUDE



PROGRAM



PROGRAM



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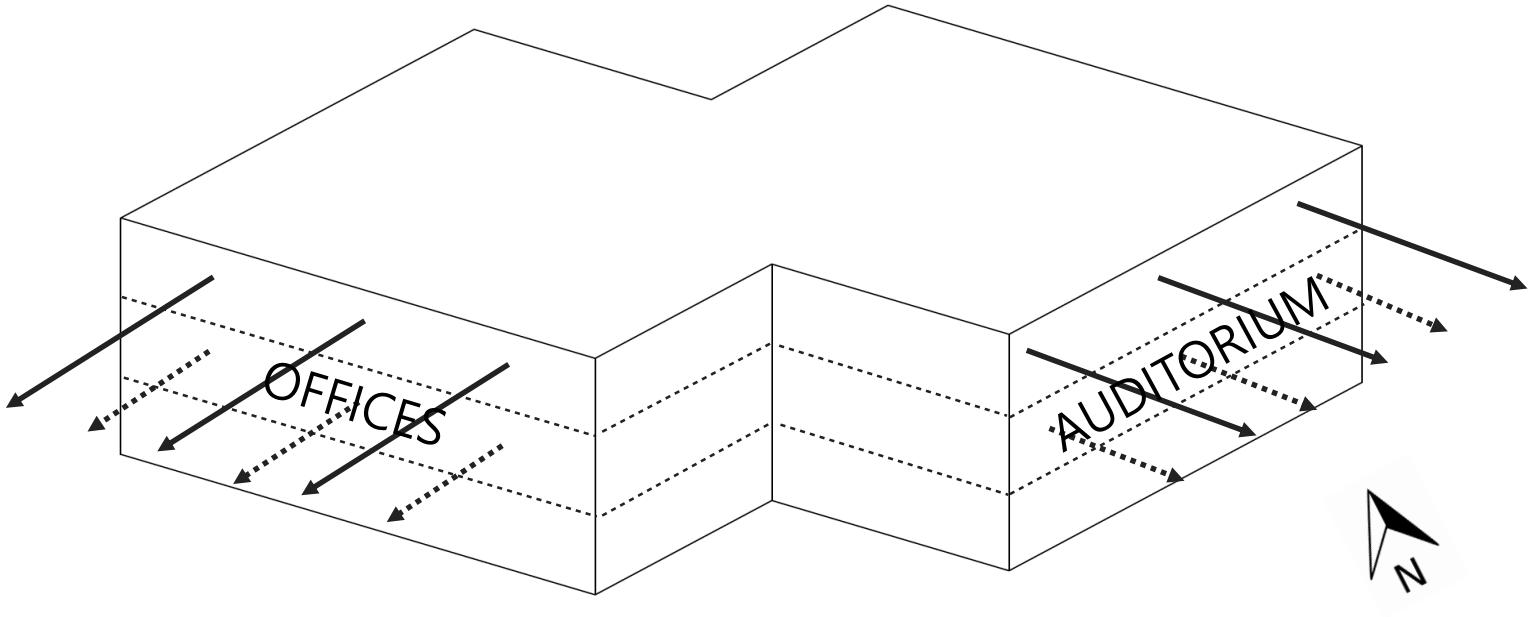

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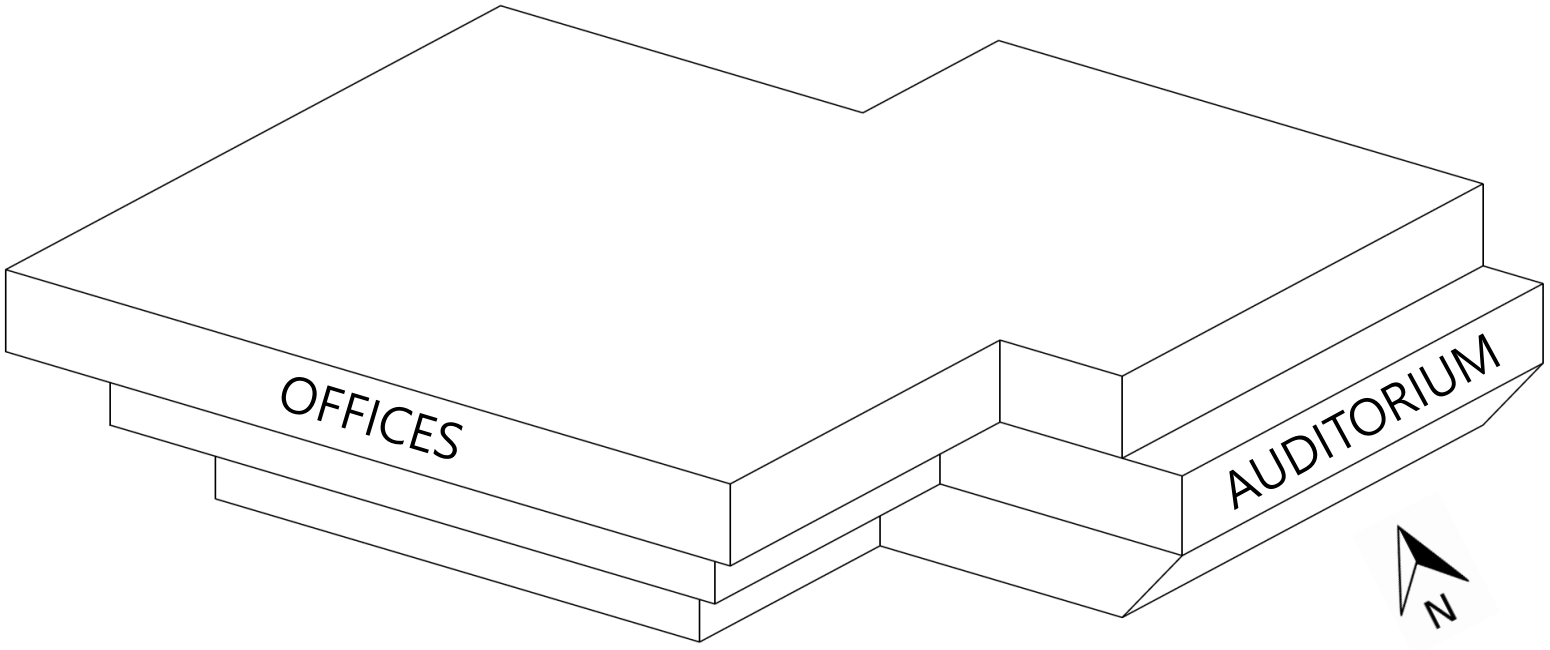
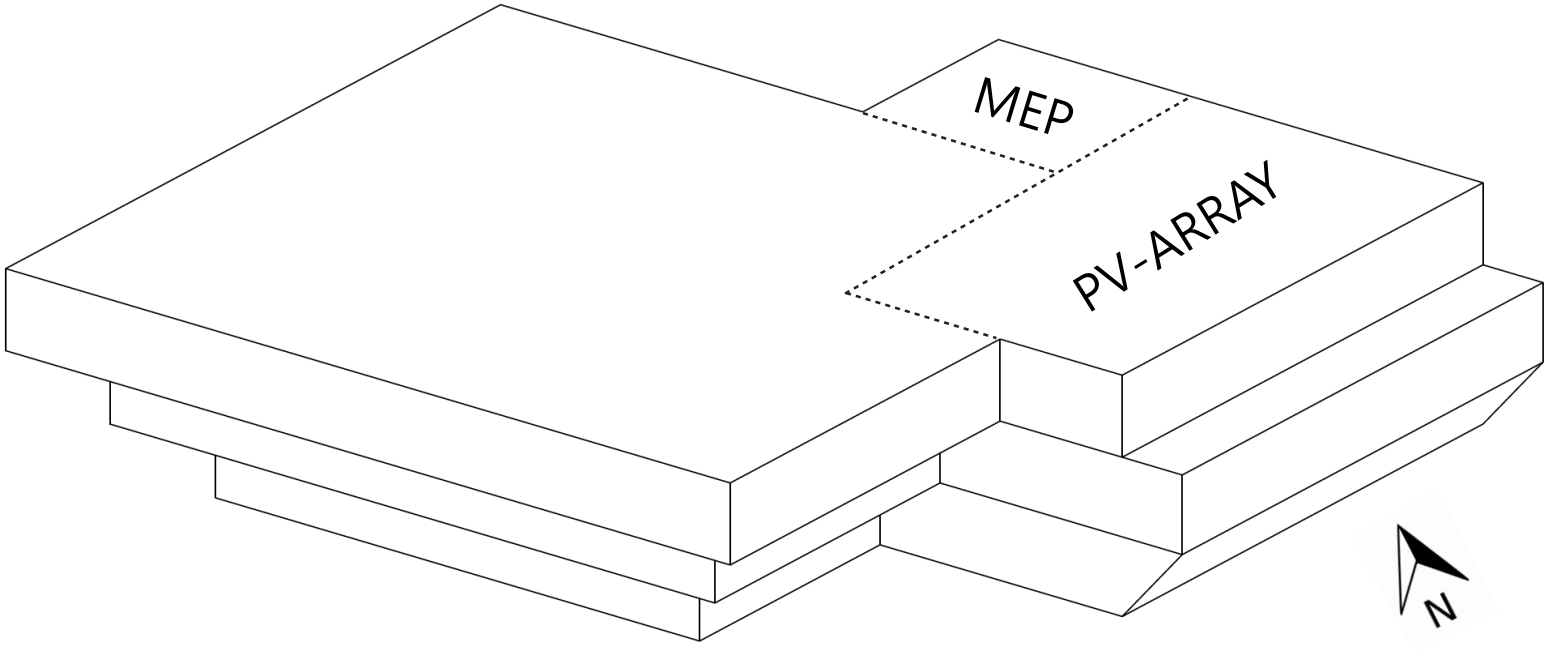


MEP



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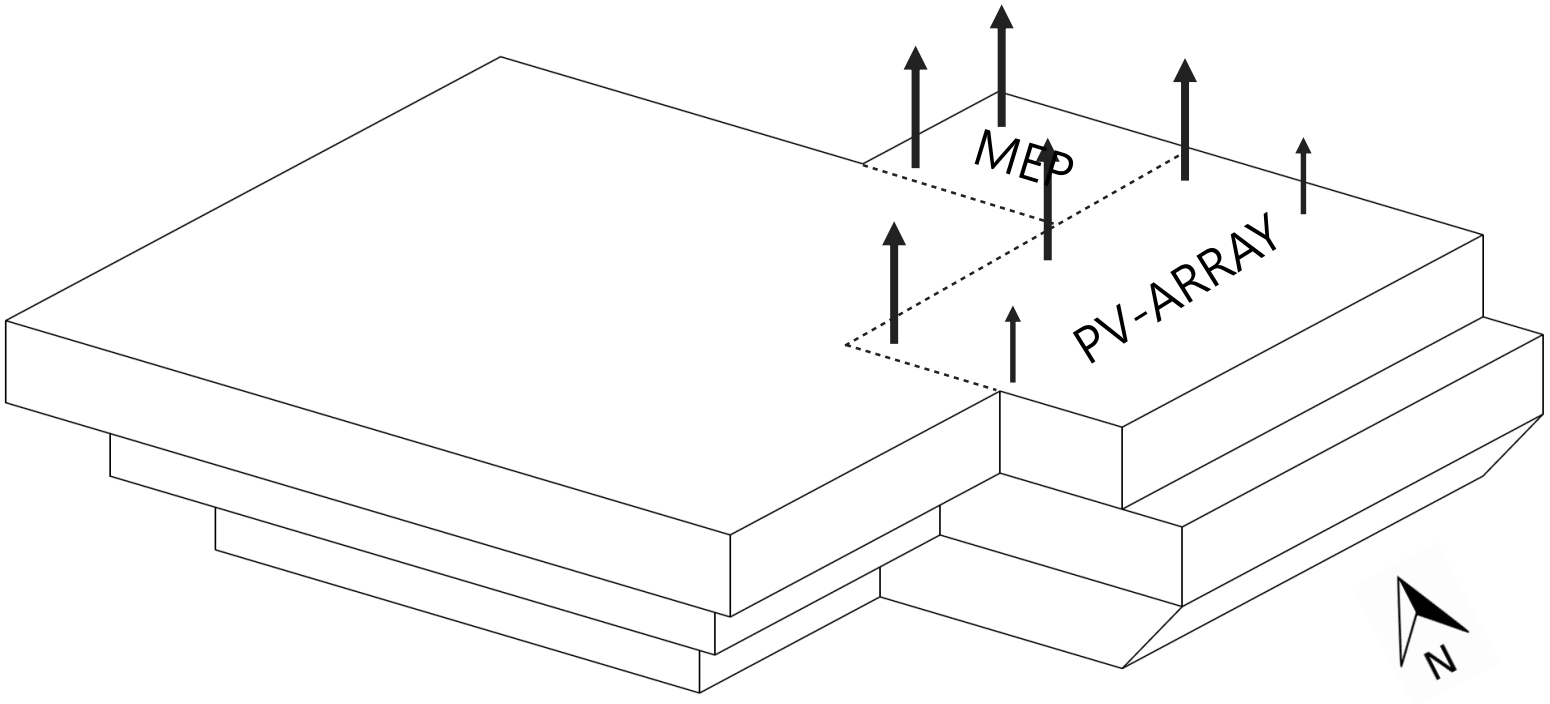
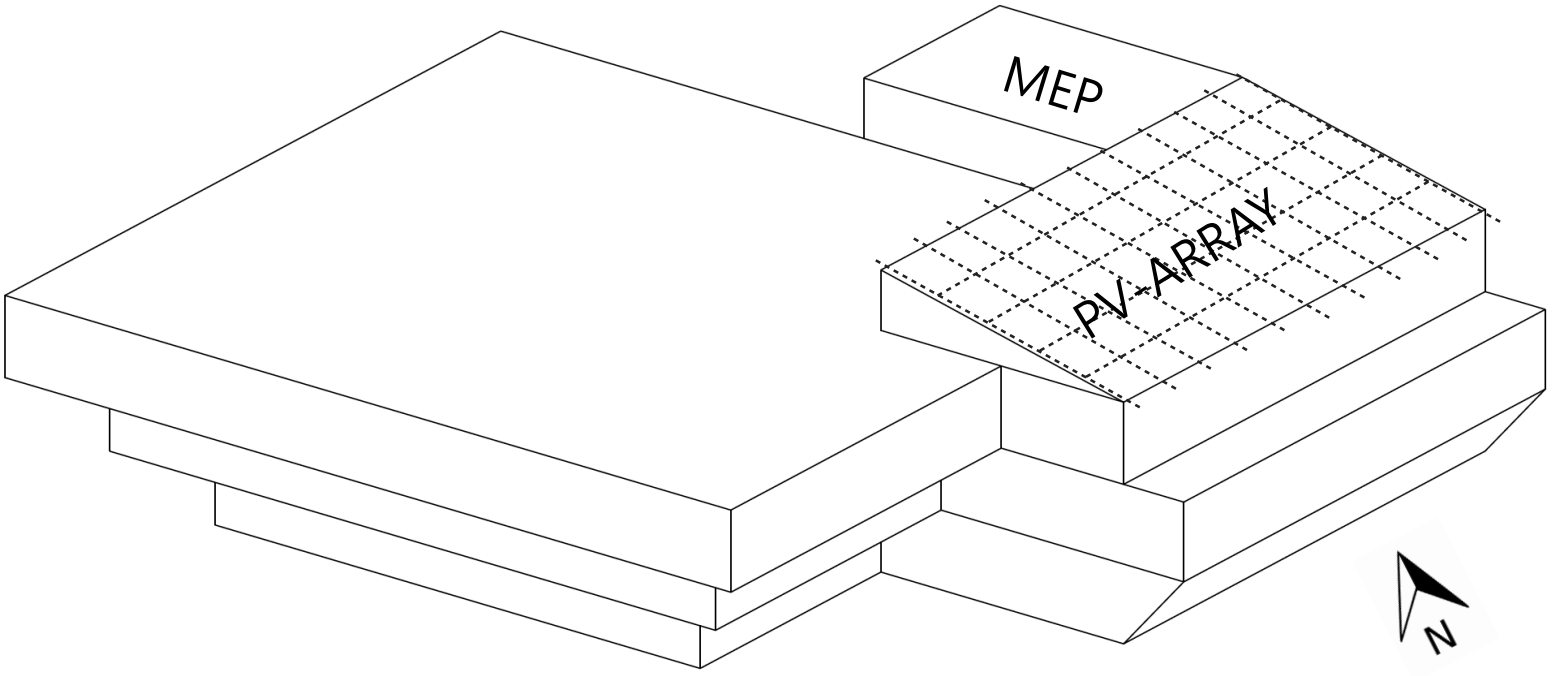
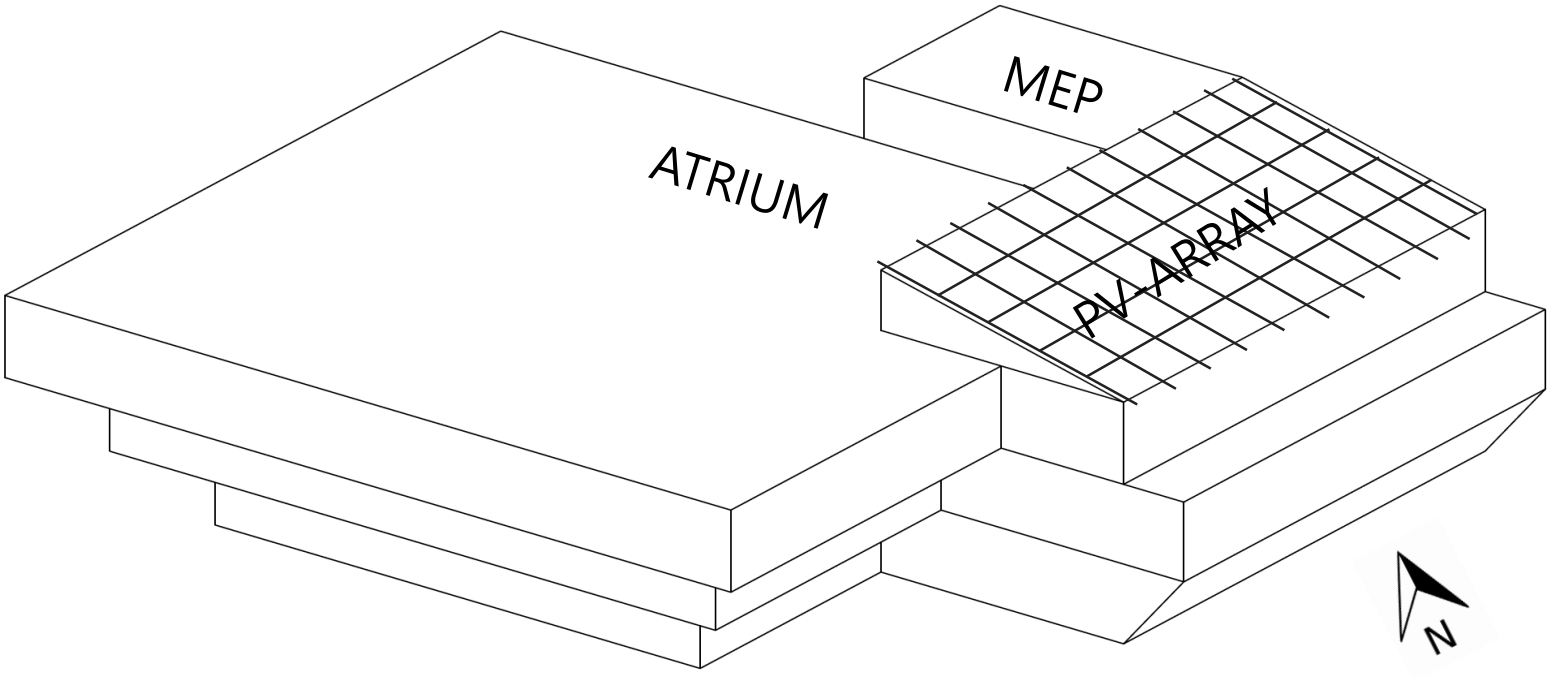


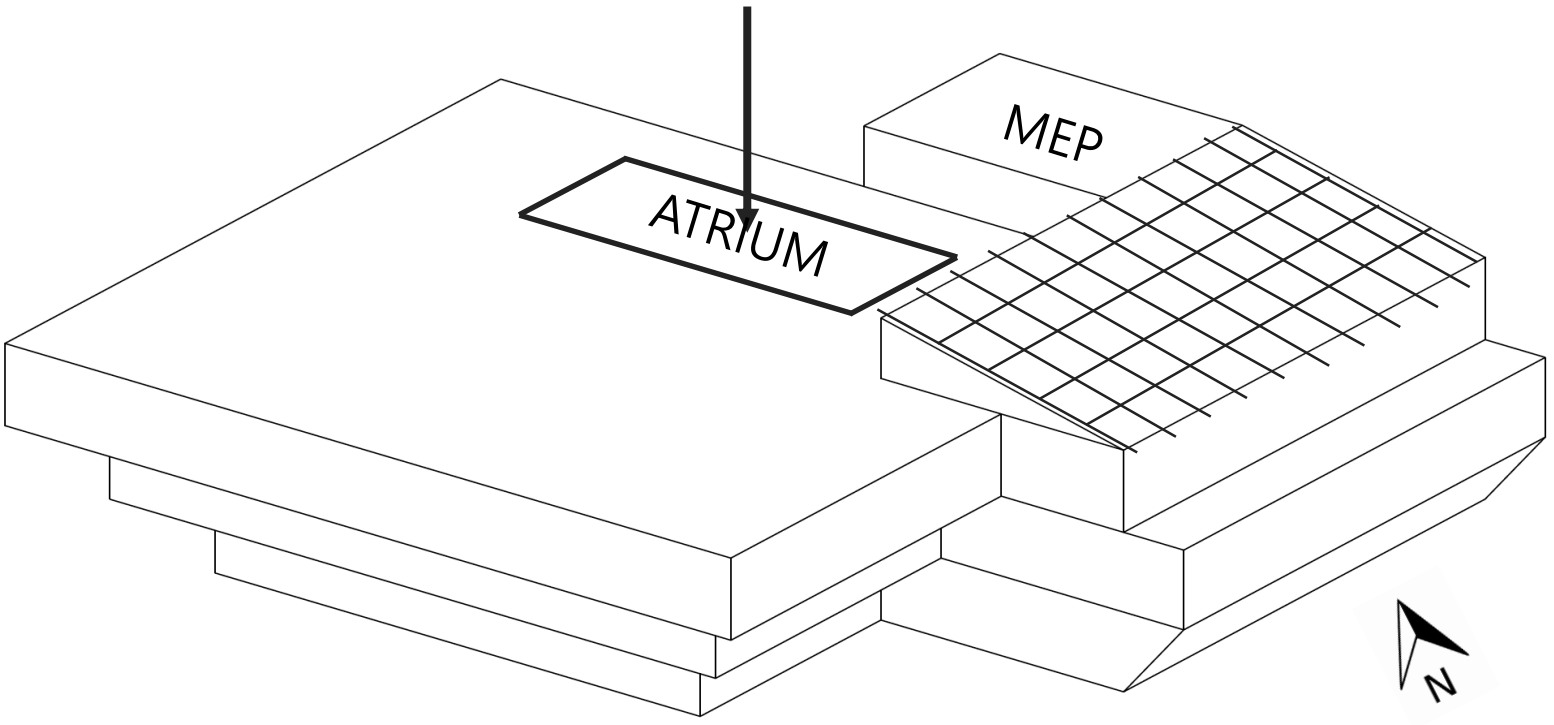
PV-ARRAY



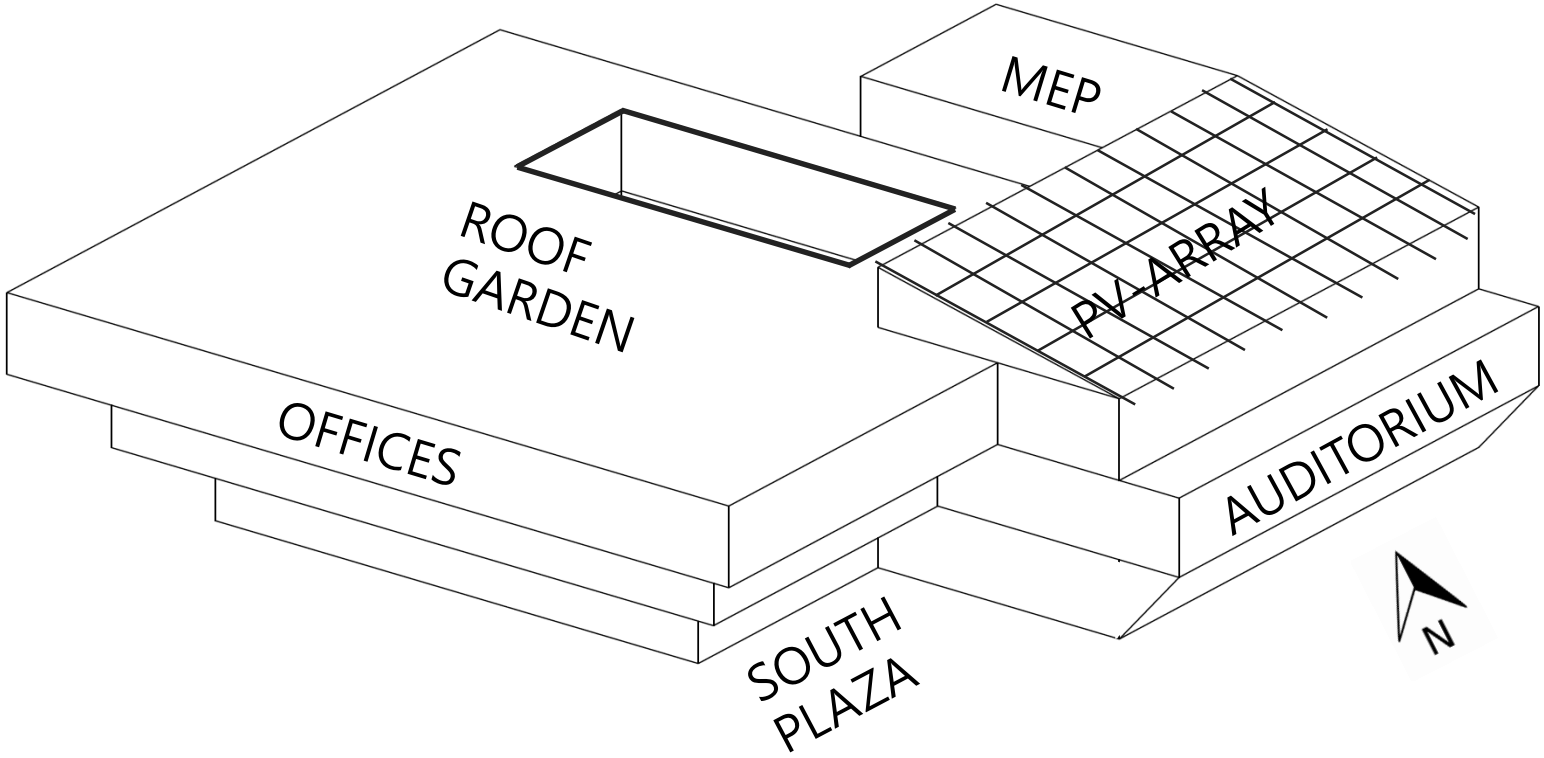
PV-ARRAY



DAYLIGHT

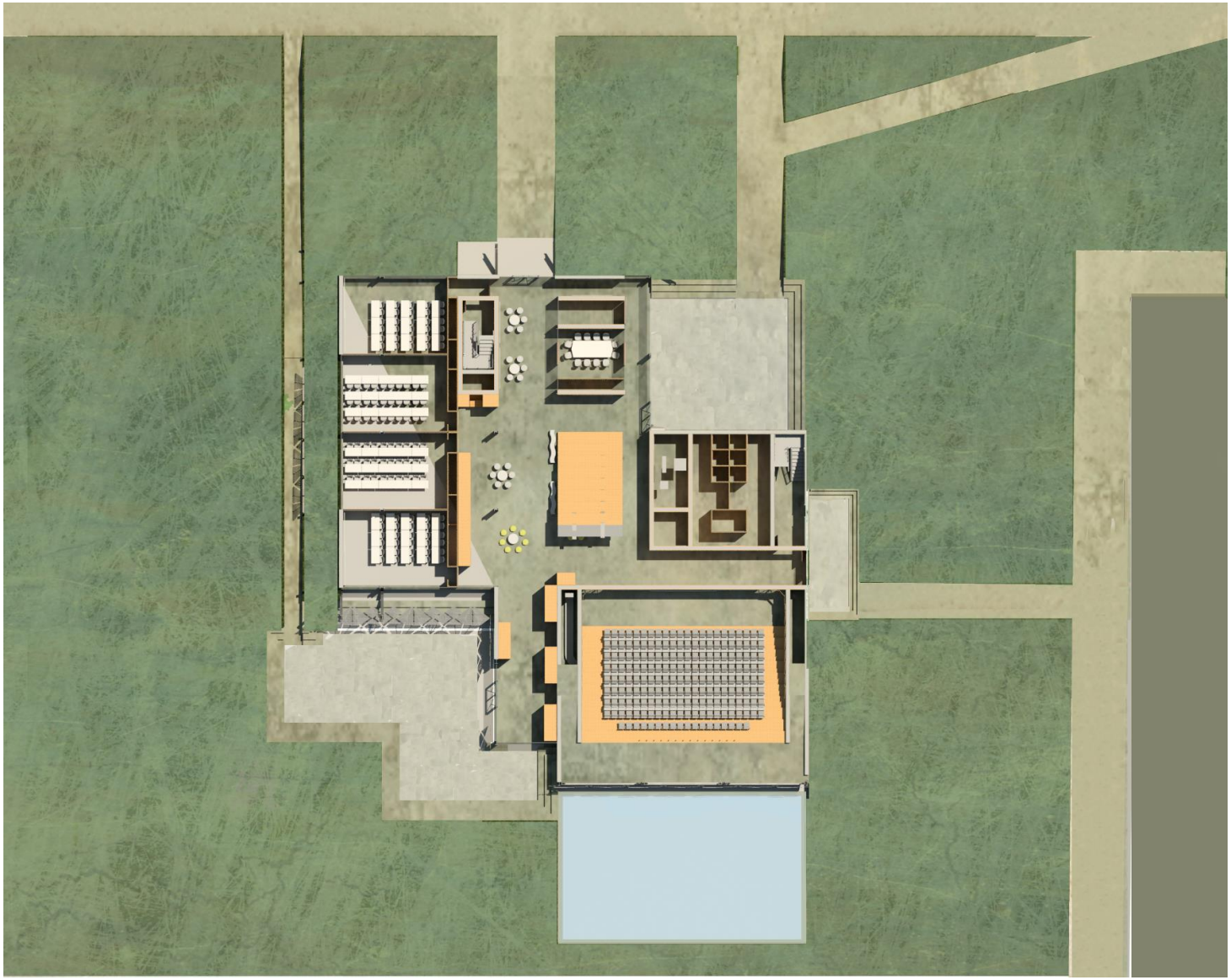


DAYLIGHT



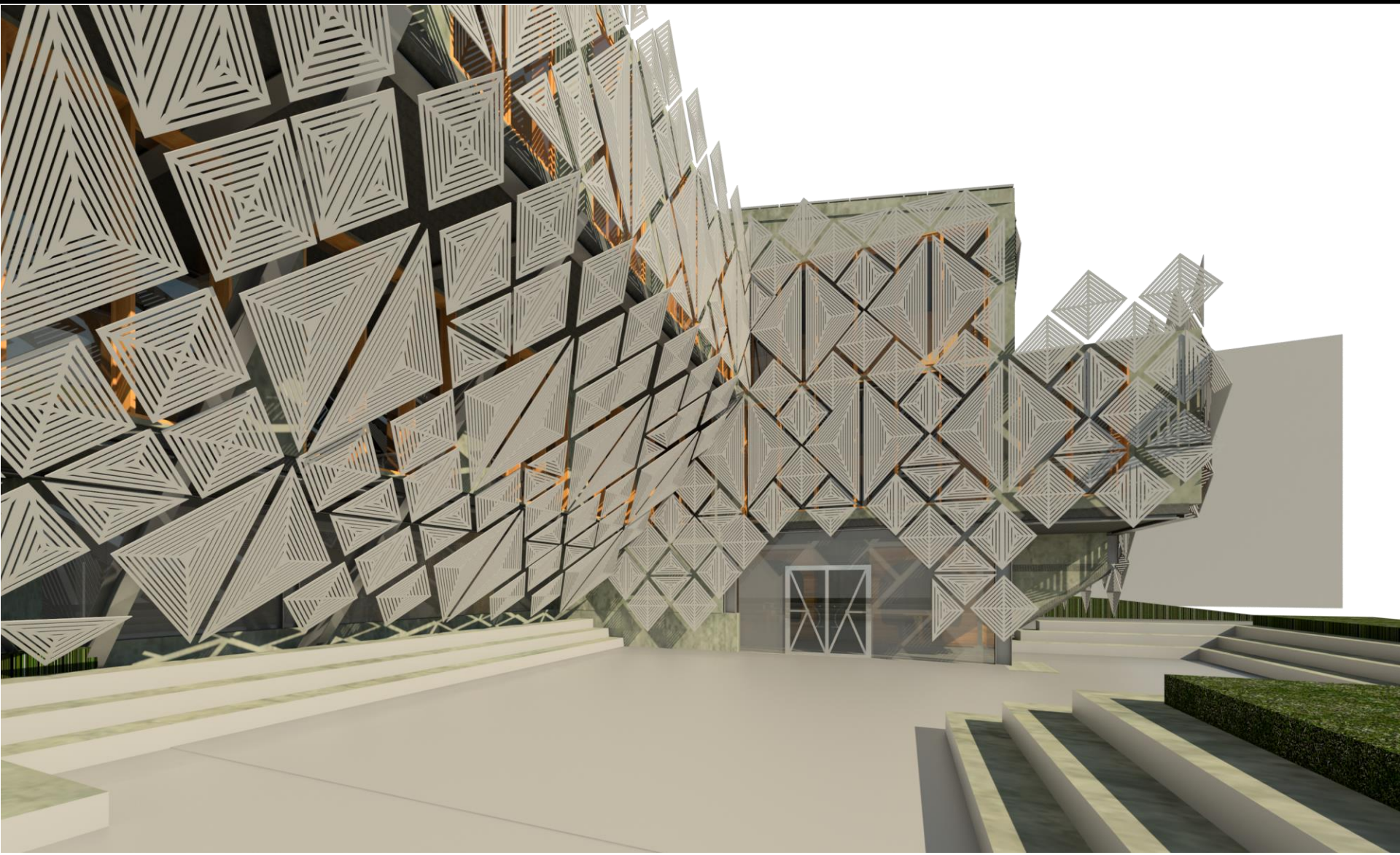
PLANS & SECTIONS

LANDSCAPE

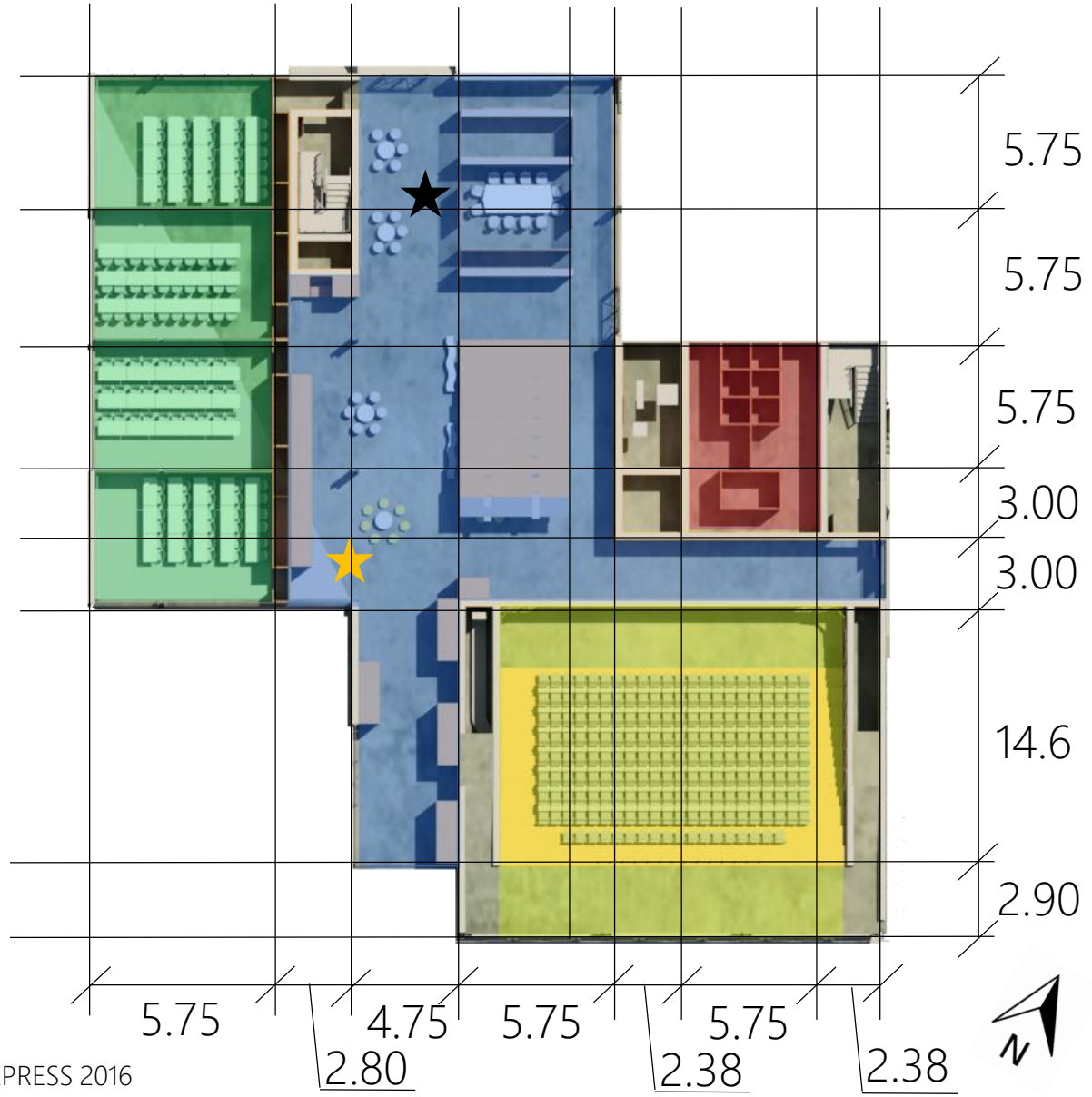


SOUTH WEST VIEW

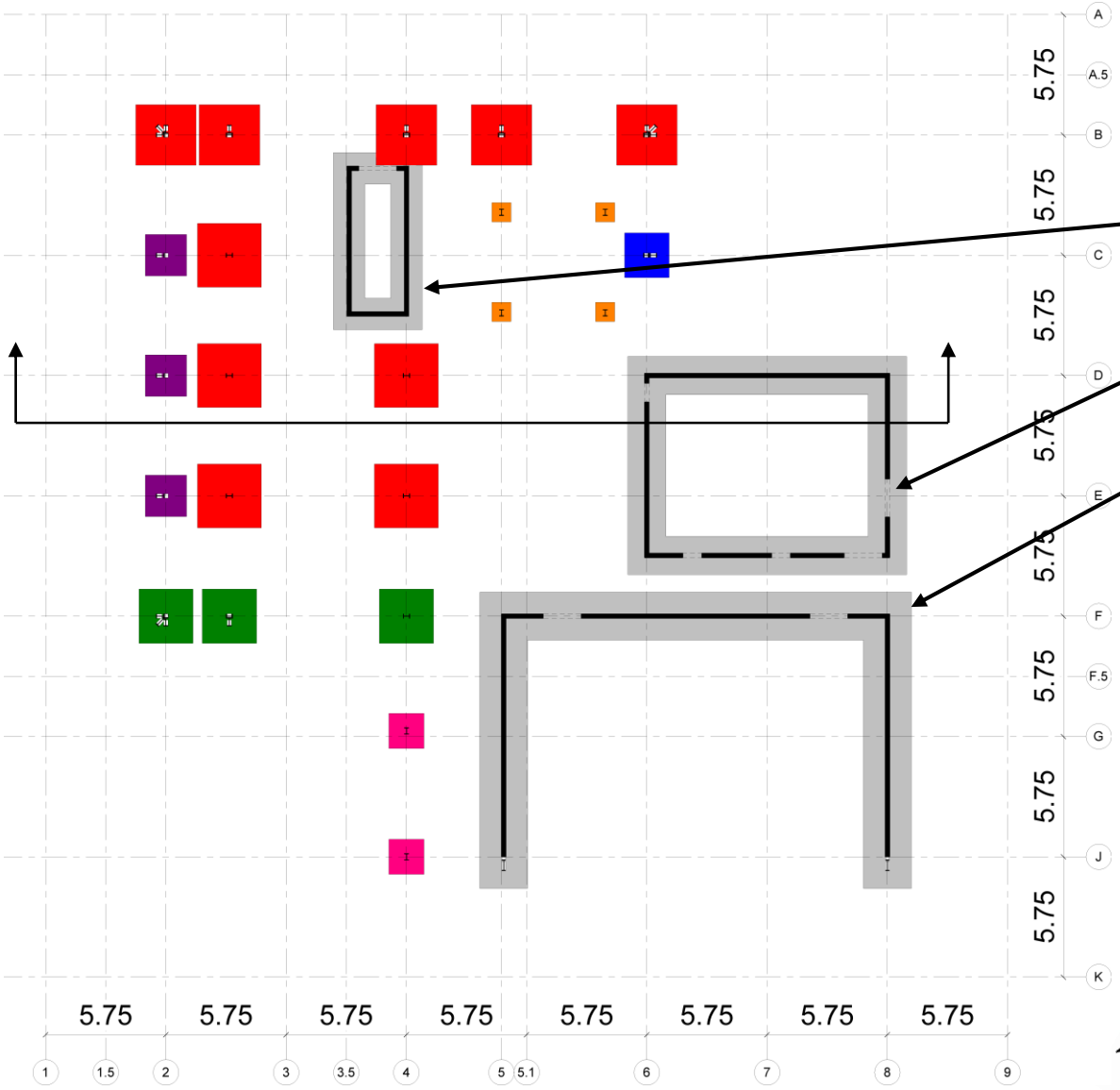
SOUTH PLAZA



A – FLOOR PLAN LEVEL 1



SE - FOUNDATION DESIGN



STRIP FOOTINGS (cm):

150 X 30

180 X 130

230 X 30

SPREAD FOOTINGS (cm):

290 X 290 X 61

260 X 25 X 61

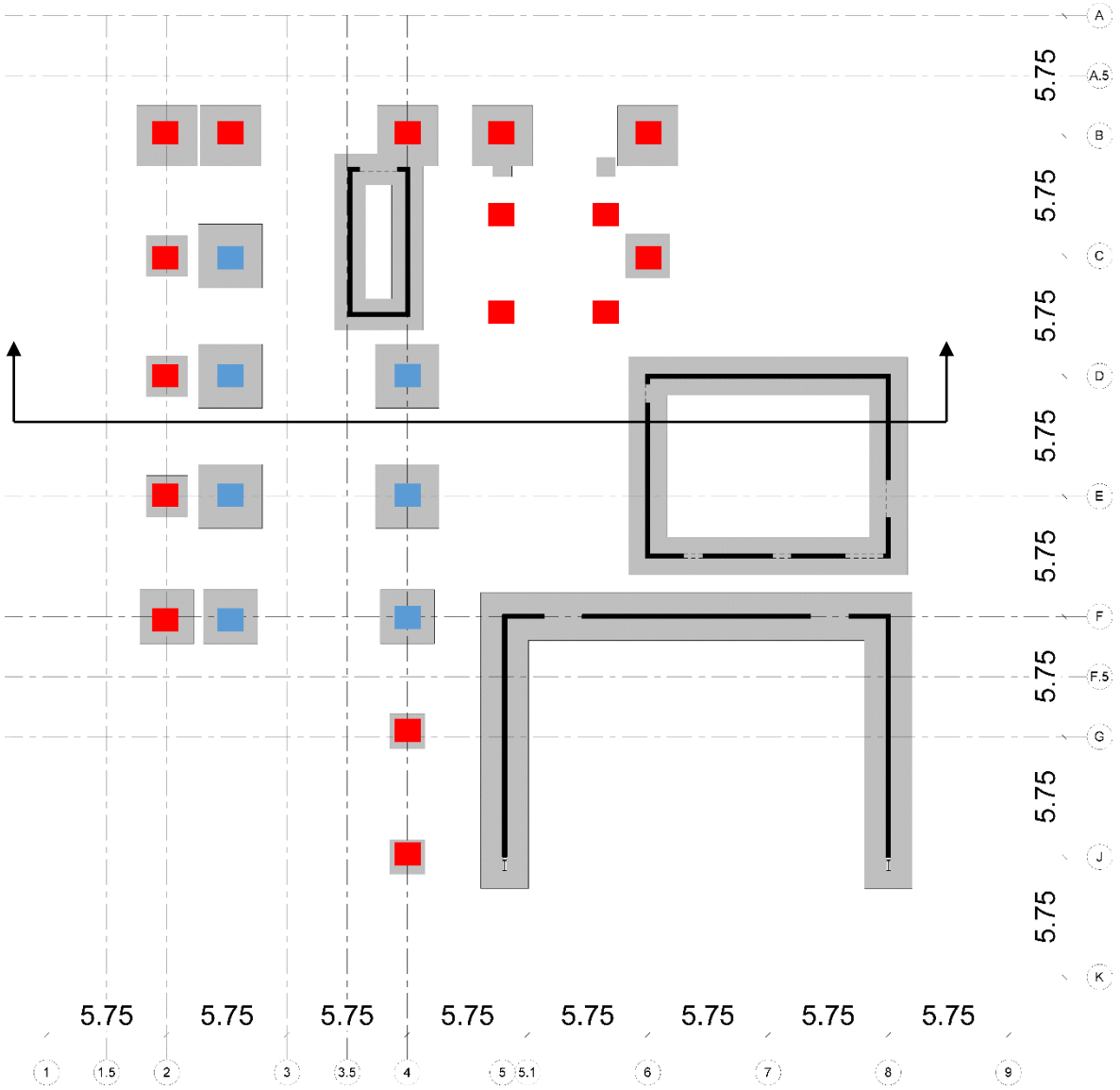
210 X 210 X 61

200 X 200 X 61

170 X 170 X 61

90 X 90 X 61

SE - GROUND LEVEL STRUCTURE

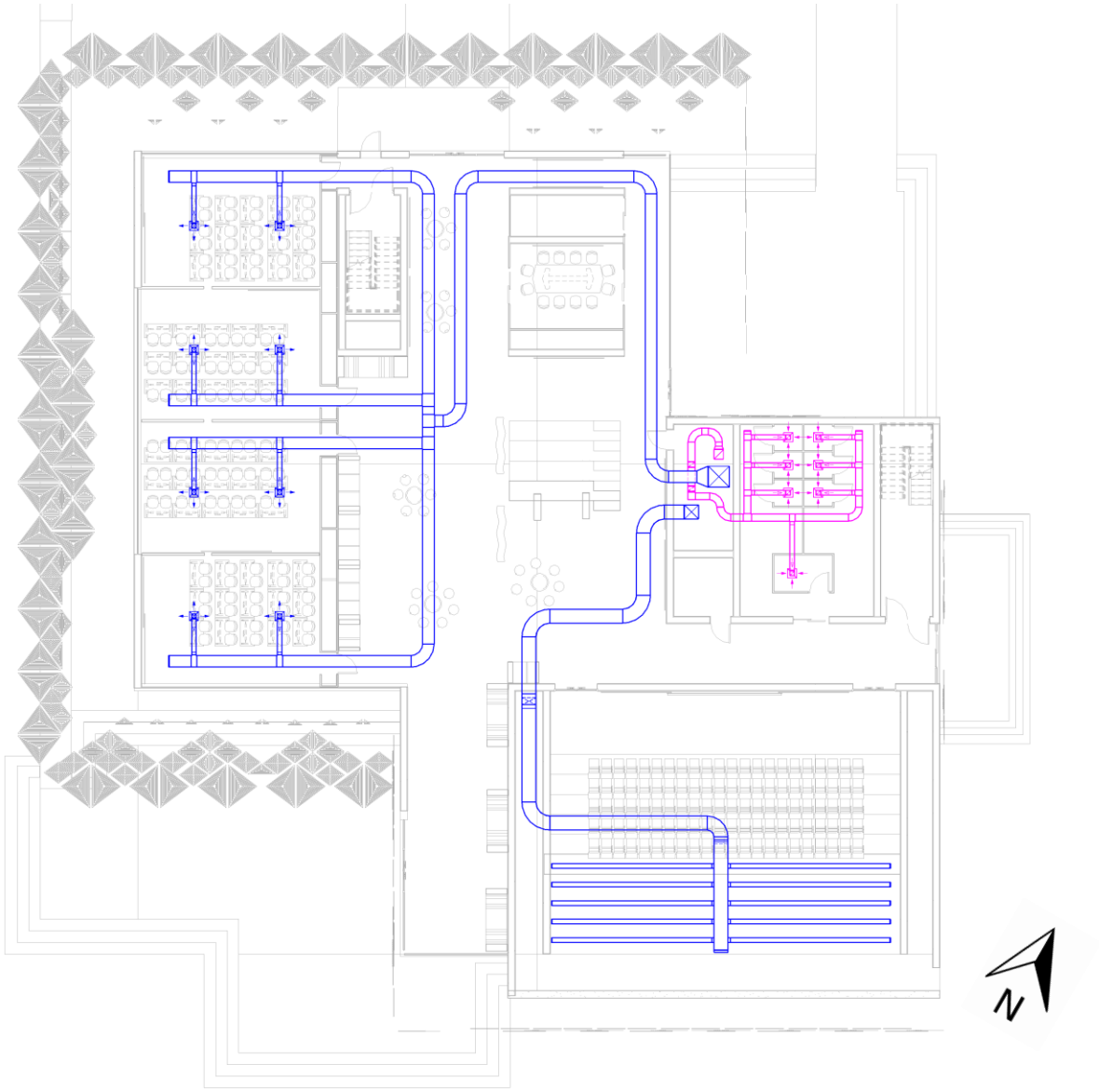


W12X40

W12X50

25.4 cm Concrete Shear Wall

MEP - FLOOR PLAN LEVEL 1



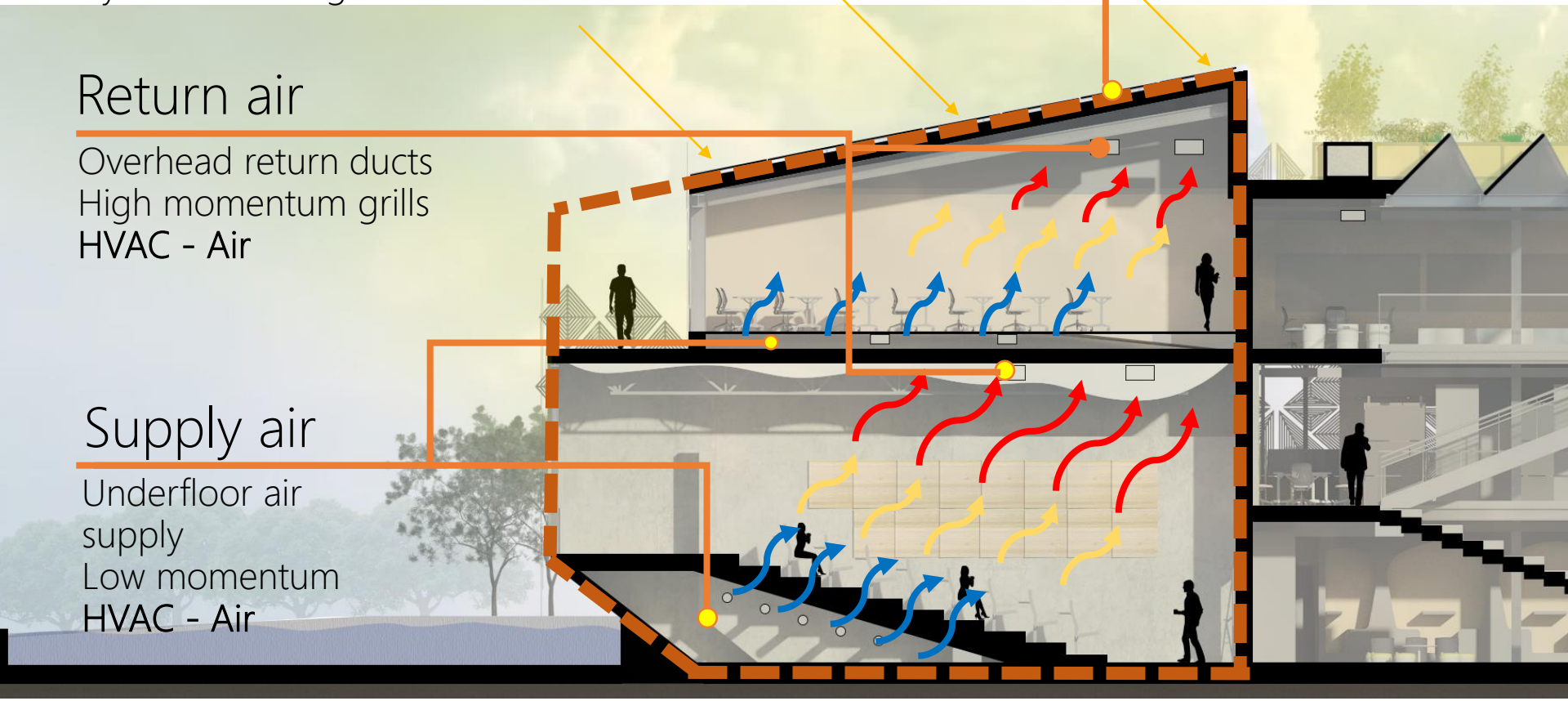
AUDITORIUM & LARGE CLASSROOMS

AHU 2

Capacity: 19800 m^3/h
AHU: DOAS
Electrical cooling coil
Hydronic heating coil

Photovoltaics

270 m^2 of PV-Array
60000 kWh/year



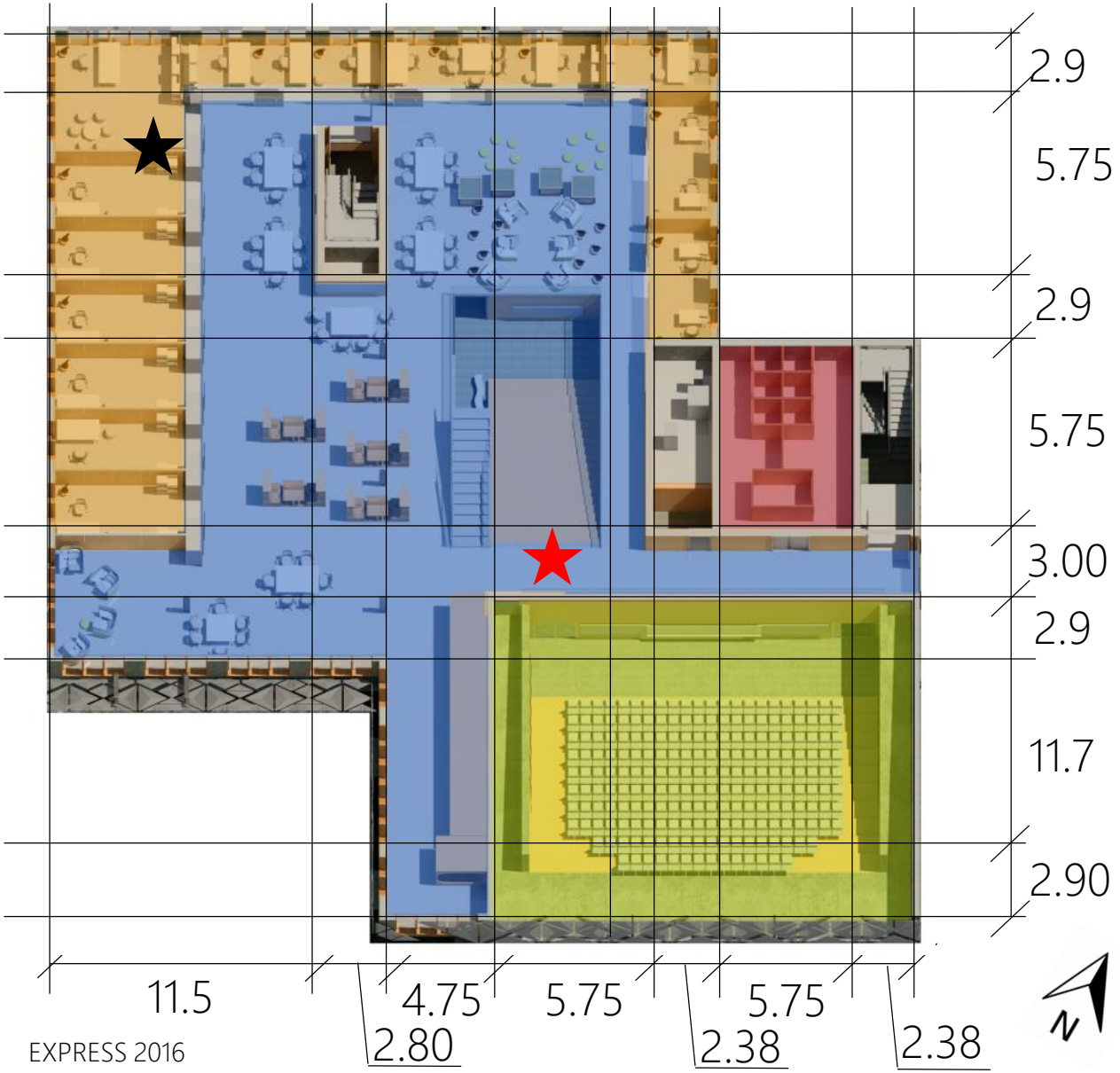
Return air

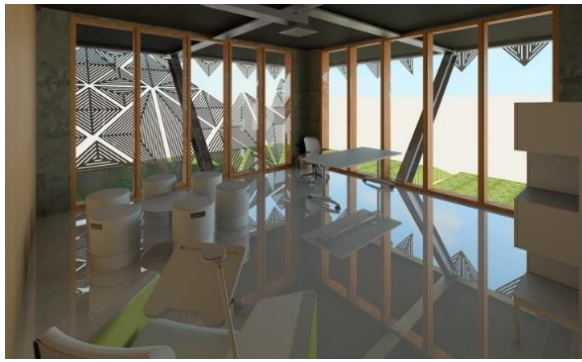
Overhead return ducts
High momentum grills
HVAC - Air

Supply air

Underfloor air supply
Low momentum
HVAC - Air

A - FLOOR PLAN LEVEL 2



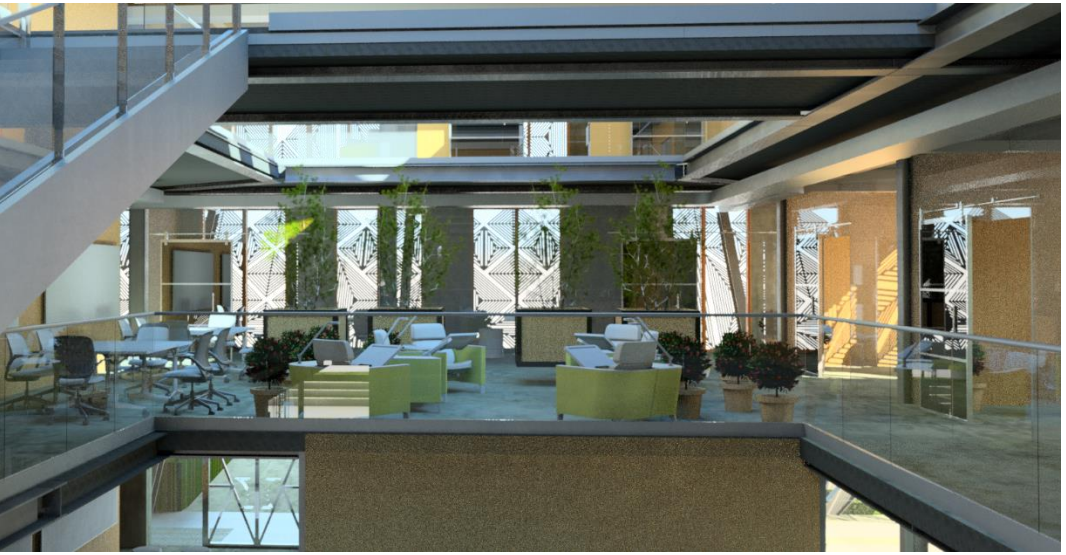


SECTIONS


North to South
Roof 12,50m
Level 3 6,60 m
Level 2 3,30 m


East to West
12,50m Roof
6,60 m Level 3
3,30 m Level 2

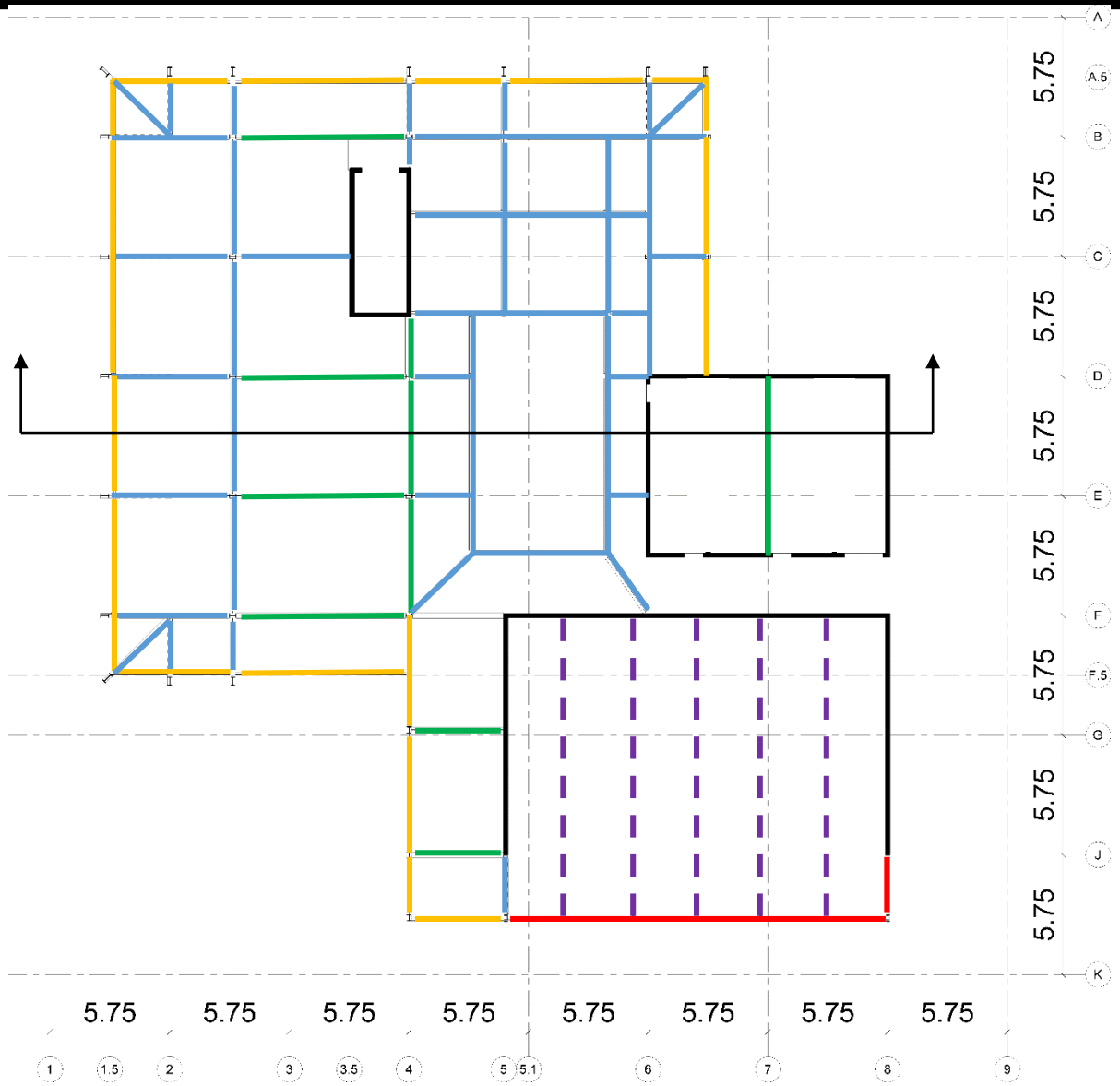
INDOOR VEGETATION



Atrium Greenhouse

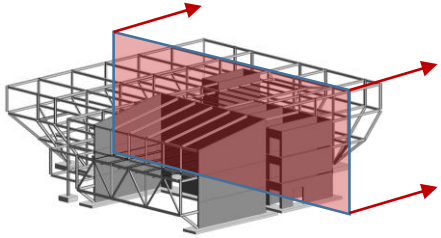
Moss Bio-indicator

SE - LEVEL 2 FRAMING

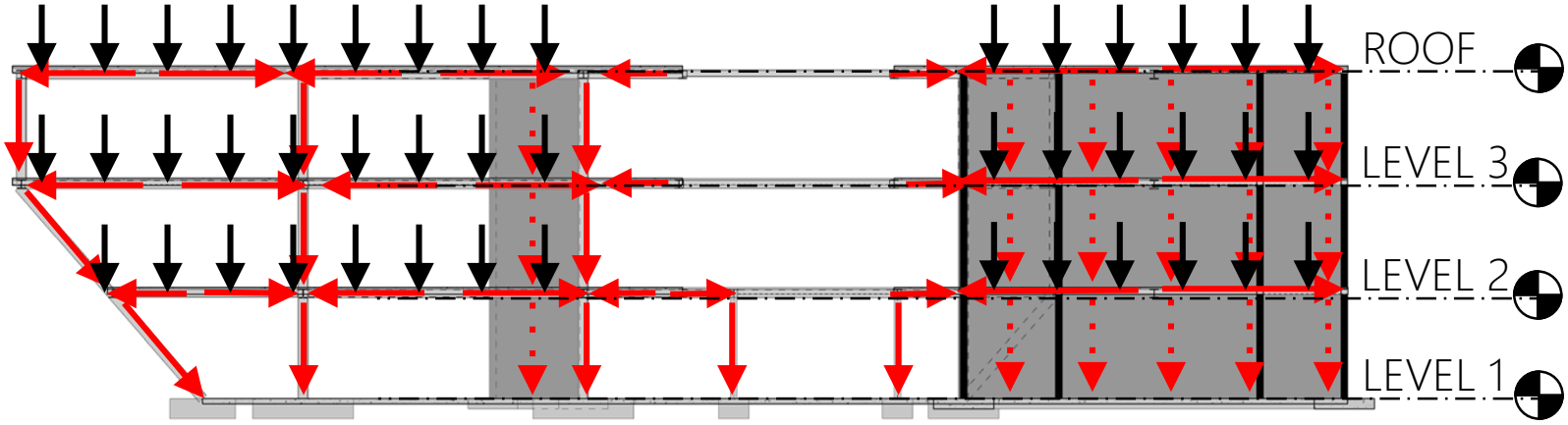


- W10X60
- W10X68
- W10X88
- W12X35
- 36LH15 OWJ
- 25.4 cm Concrete Wall

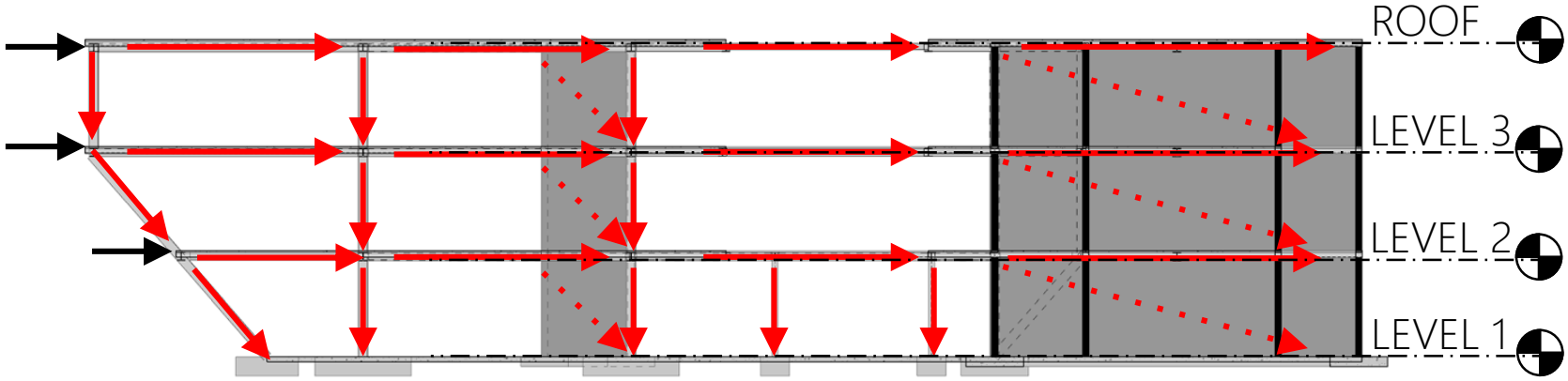
LOAD PATHS



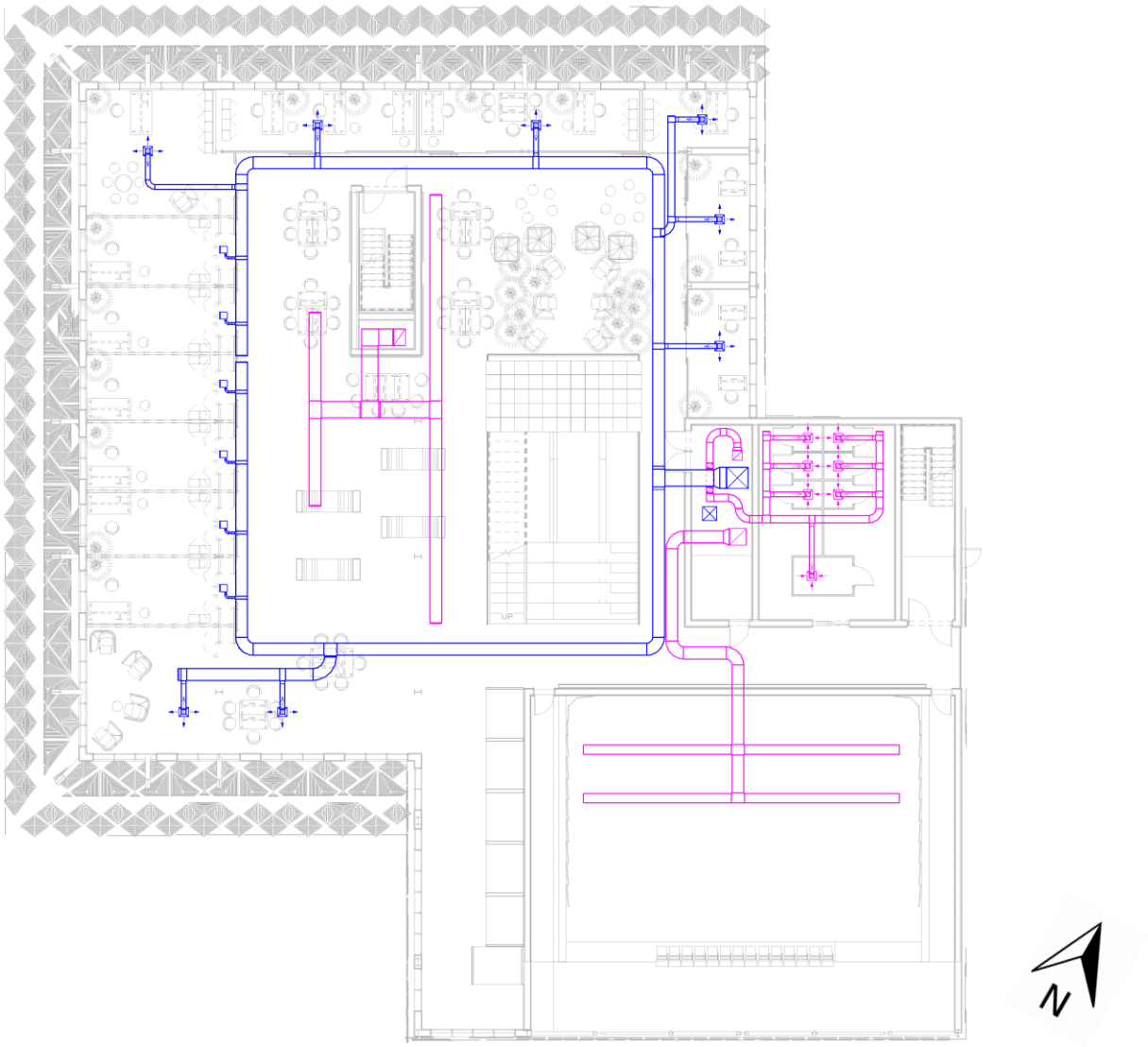
Gravity Load Paths



Lateral Load Paths



MEP – FLOORPLAN LEVEL 2



OFFICES & COLLABORATION SPACES

AHU 1

Capacity
13700 m^3/h
Air Handling Unit
DOAS
Heating/Cooling coil
Electrical Cooling
Hydronic Heating

S. Classrooms & Offices

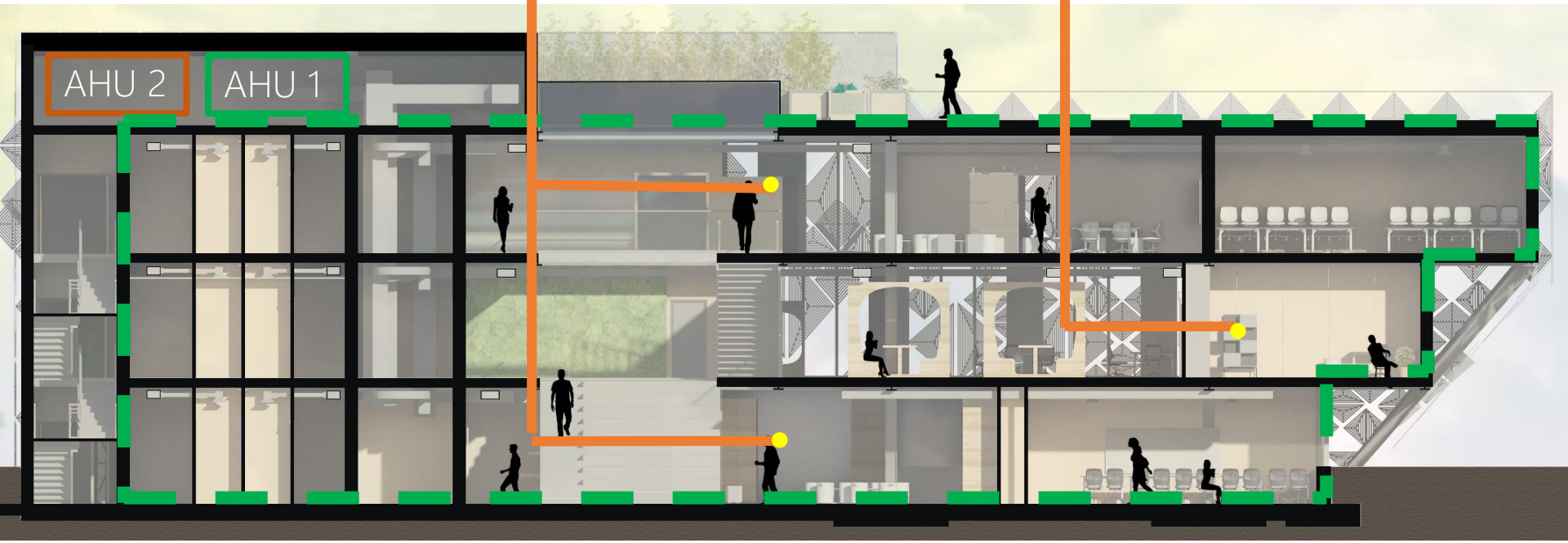
Heating/Cooling:
Radiant floor

Ventilation
Overhead supply
Return in hallway

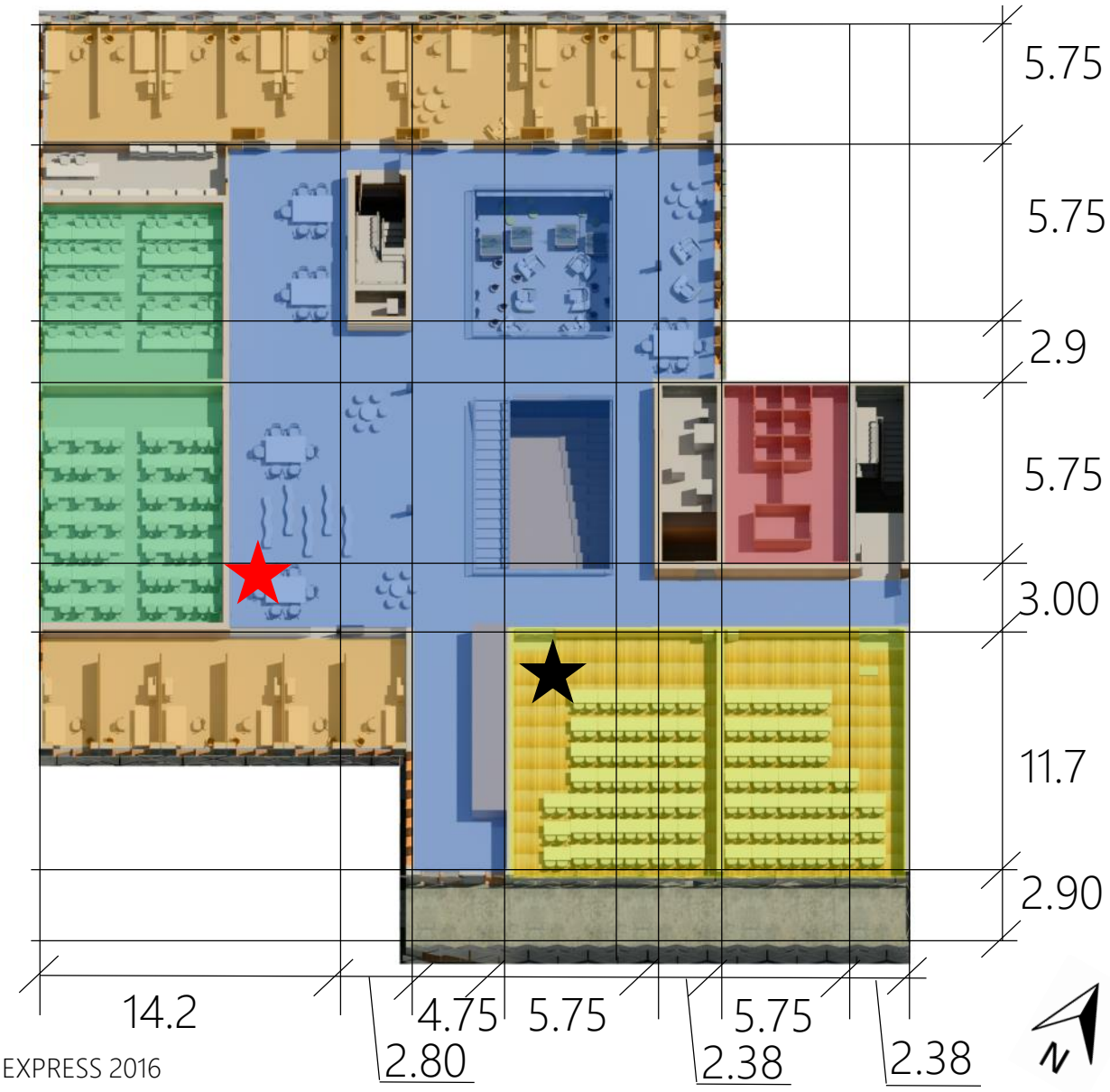
Collaborative Spaces

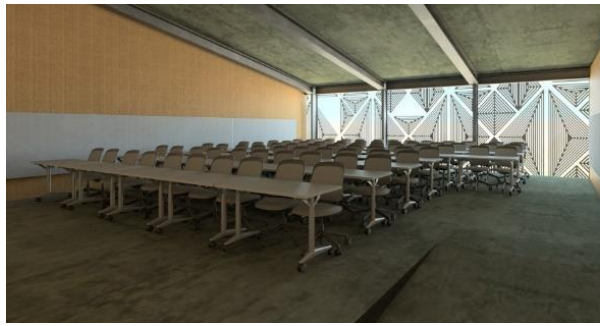
Heating/Cooling
Radiant floor

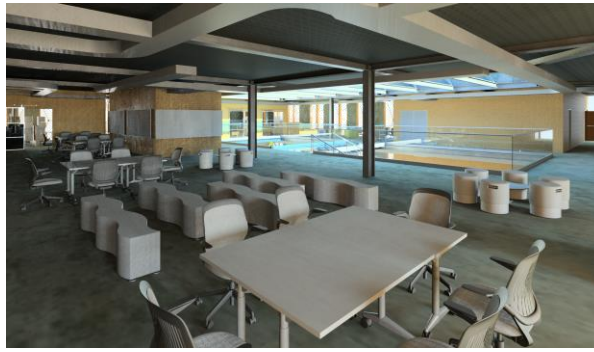
Ventilation
Wall mounted supply
Return in hallways



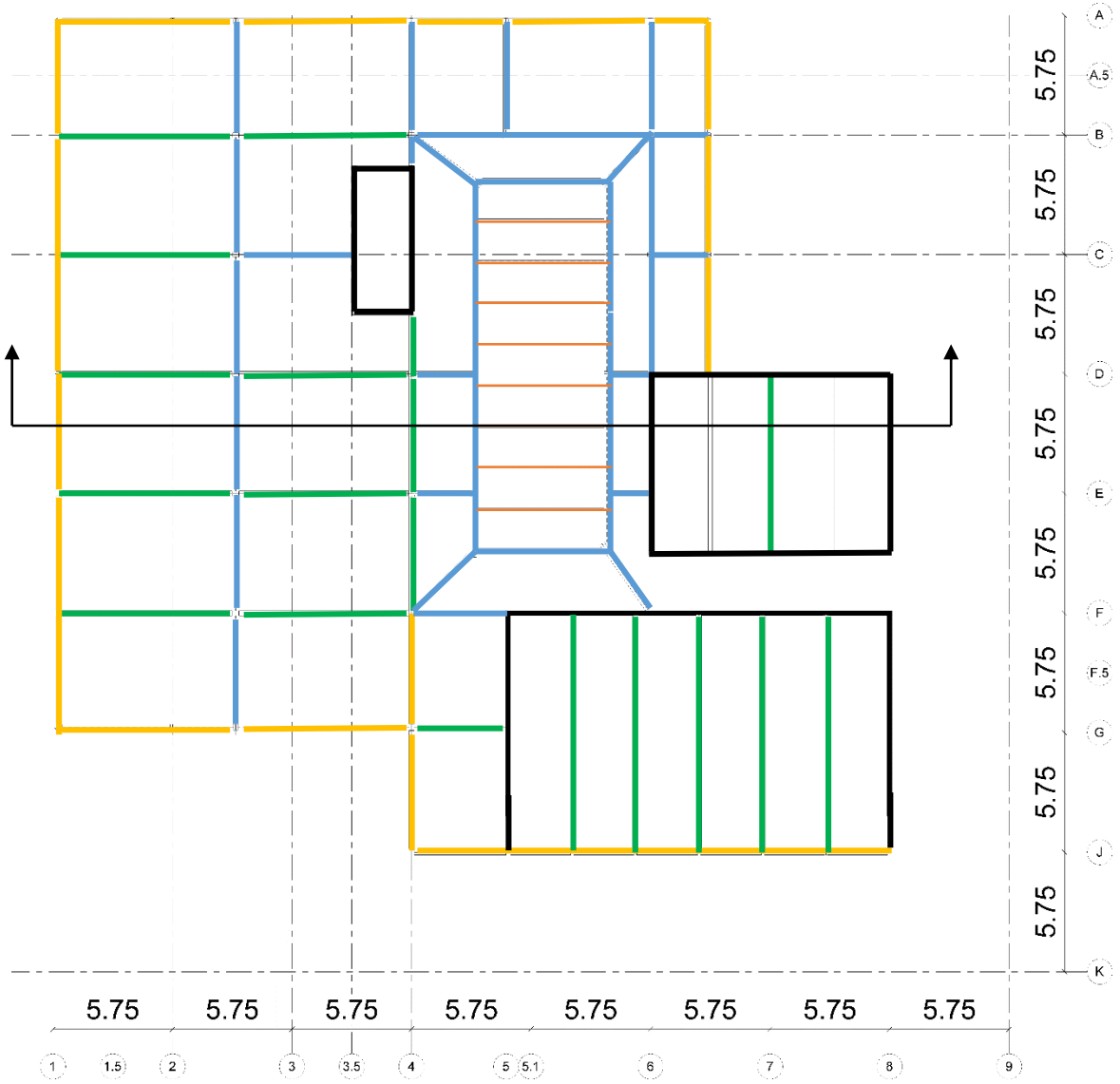
A - FLOOR PLAN LEVEL 3

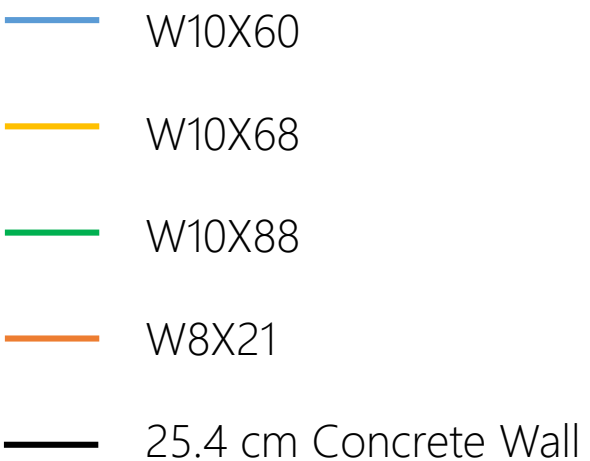




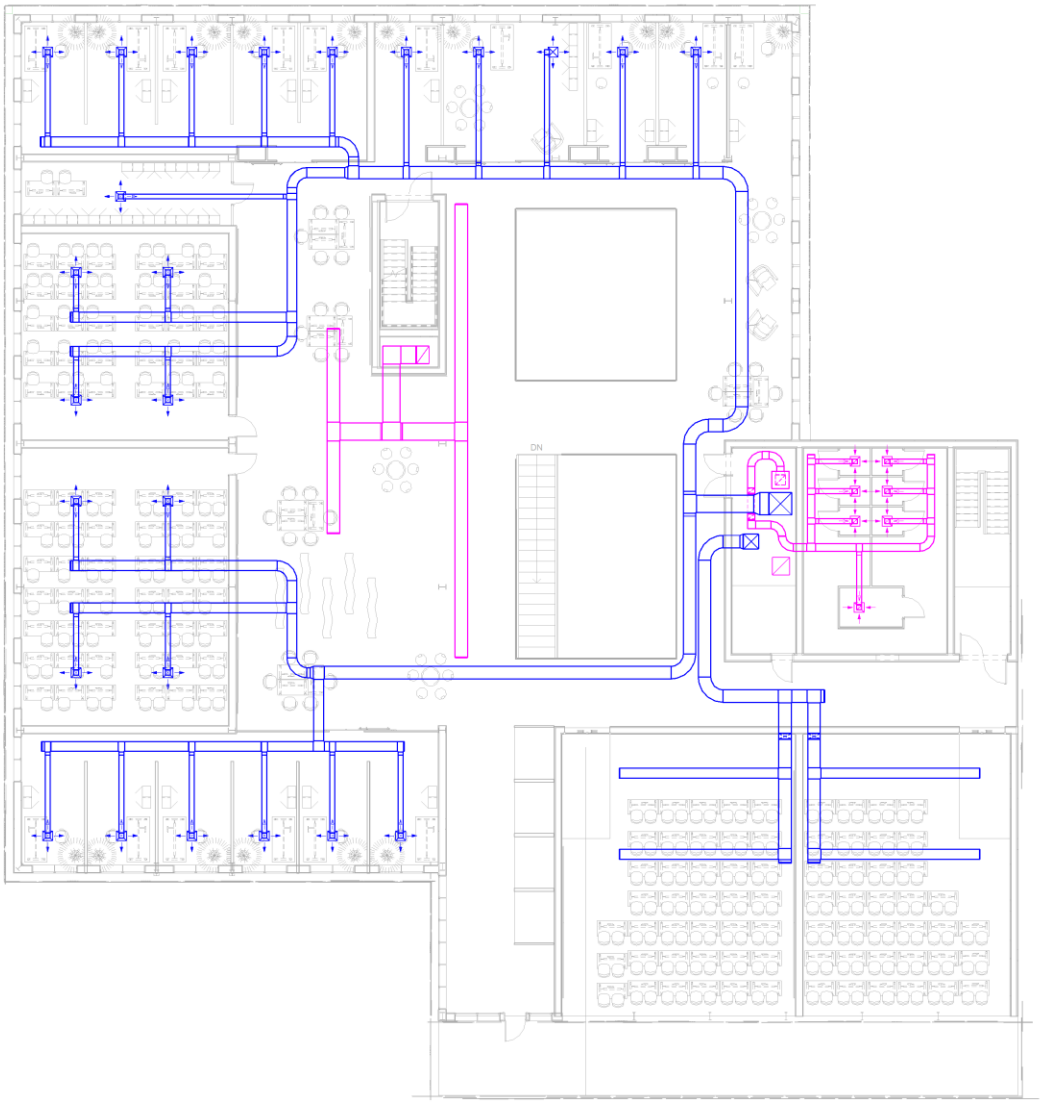


SE – ROOF FRAMING

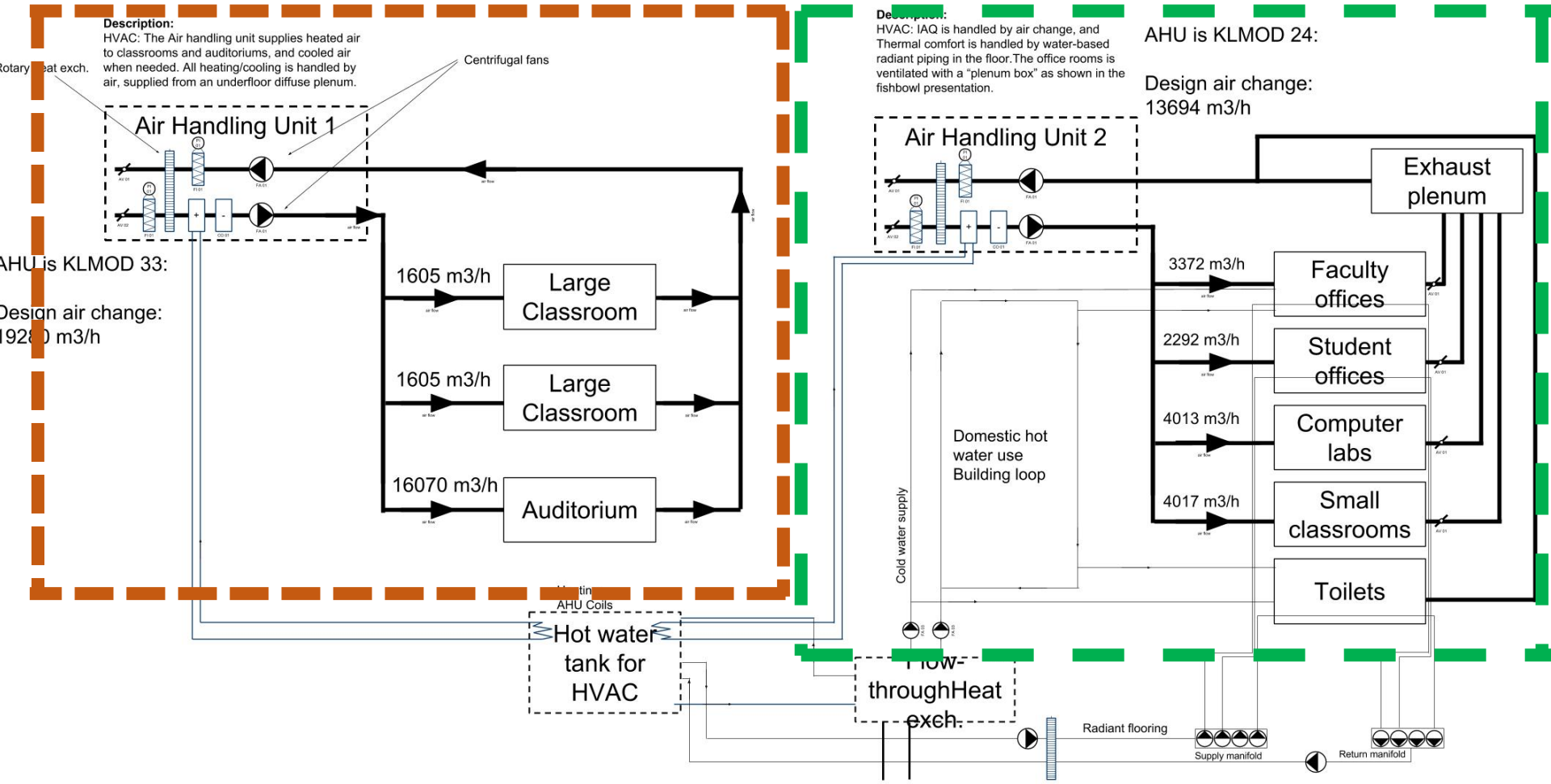




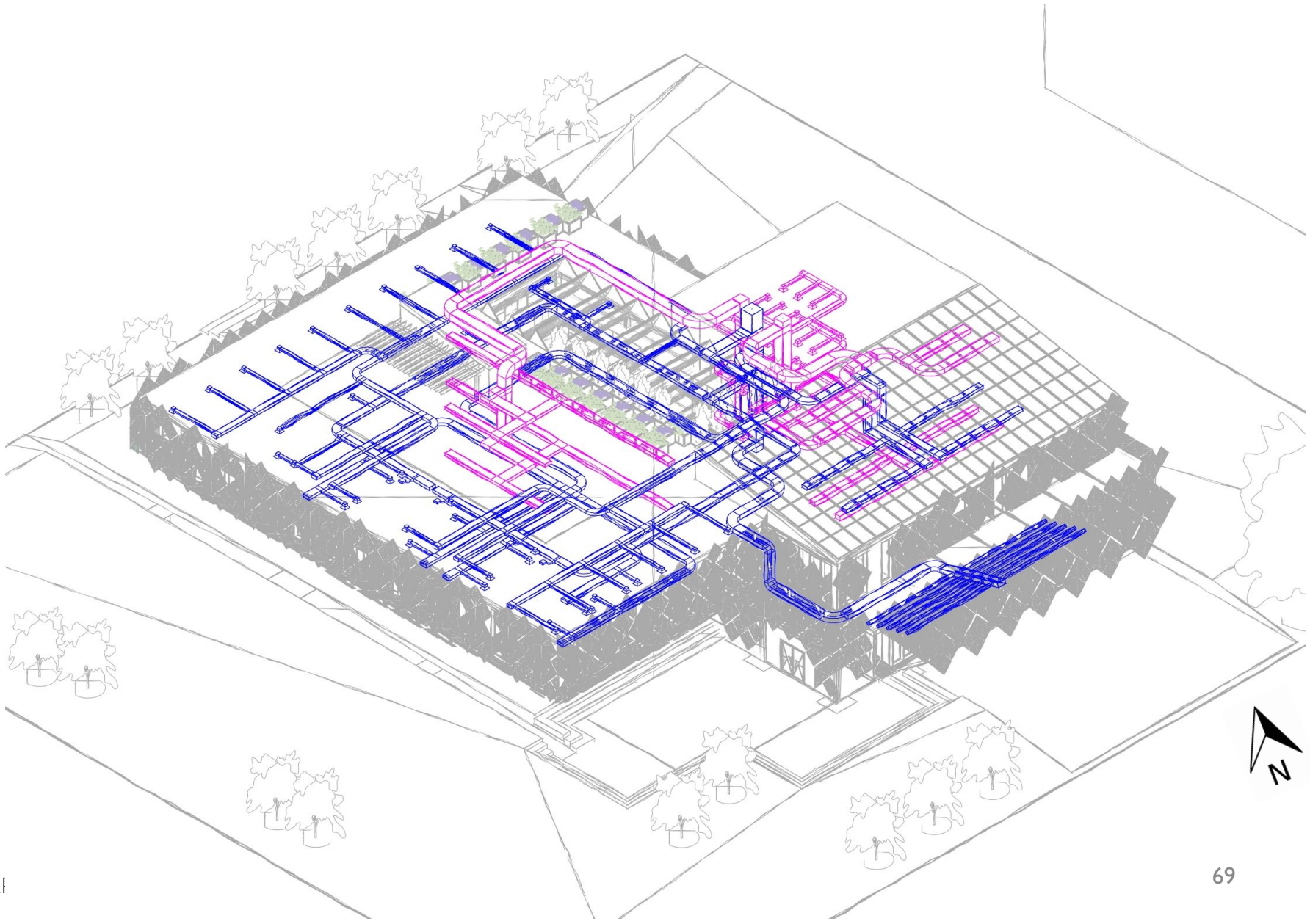
MEP – FLOOR PLAN LEVEL 3



SELF-CLEANING FACADE



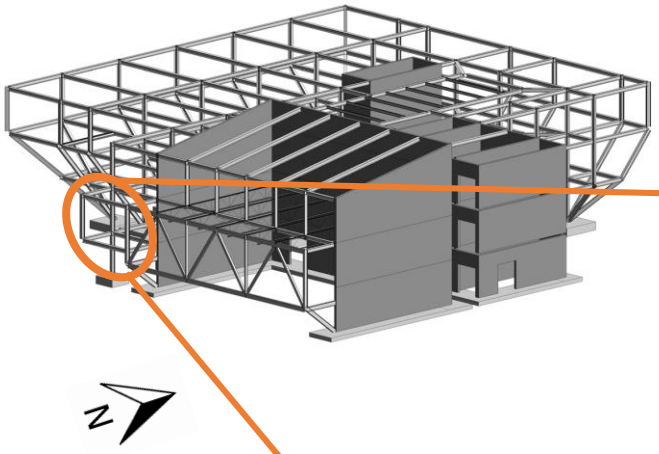
MEP MODEL

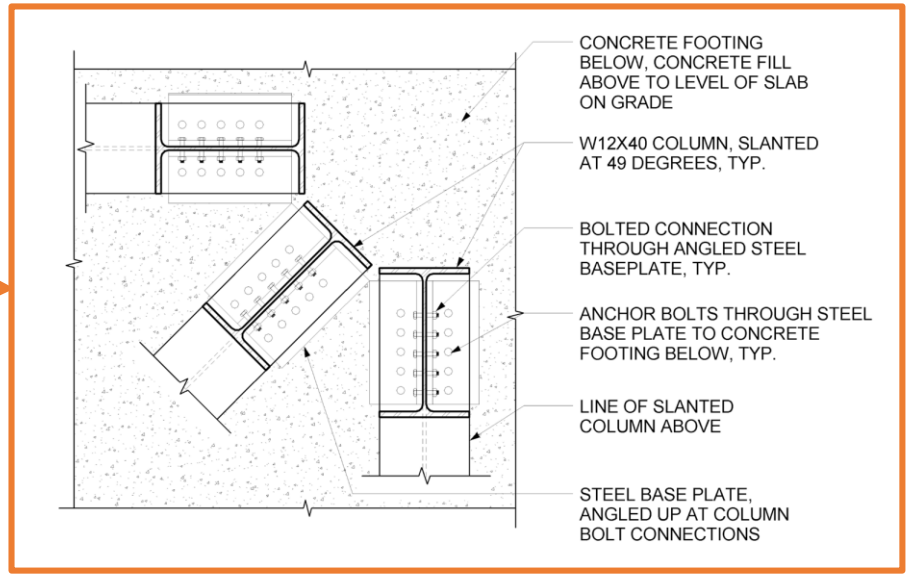


WALK THROUGH

ENABLING STRUCTURAL DETAILS

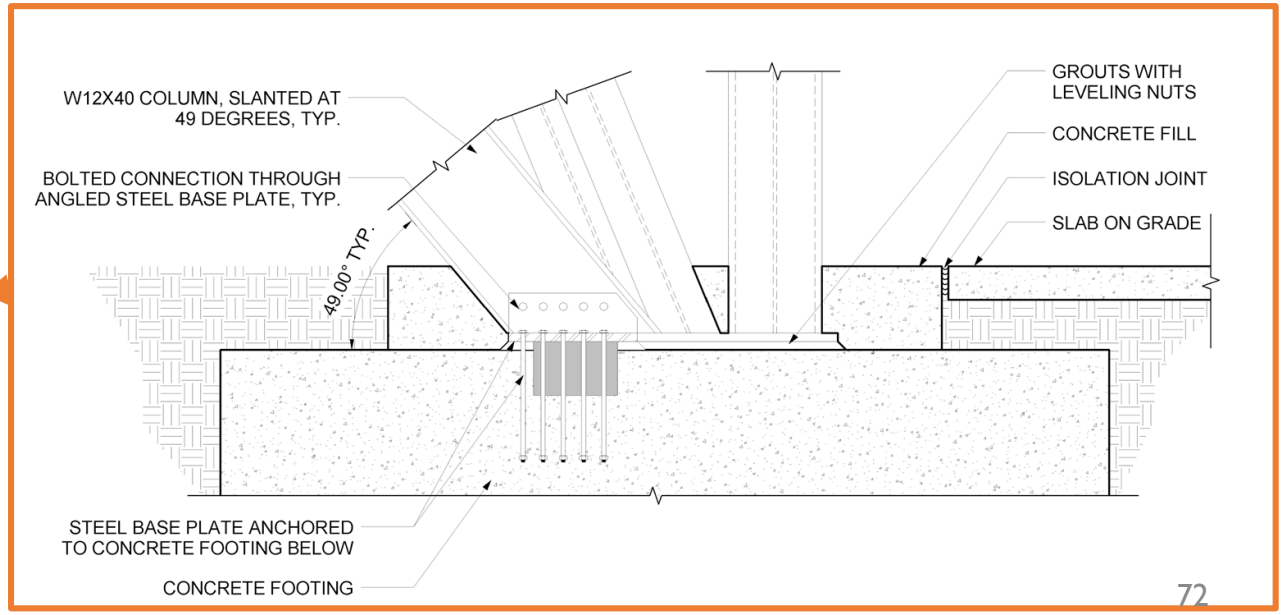
SLANTED COLUMN DETAIL





Key Features:

- Slanted columns
- Triple column intersection at foundation



DEFLECTION CHECK

CHECK #1: LL Only (L/360 Limit)

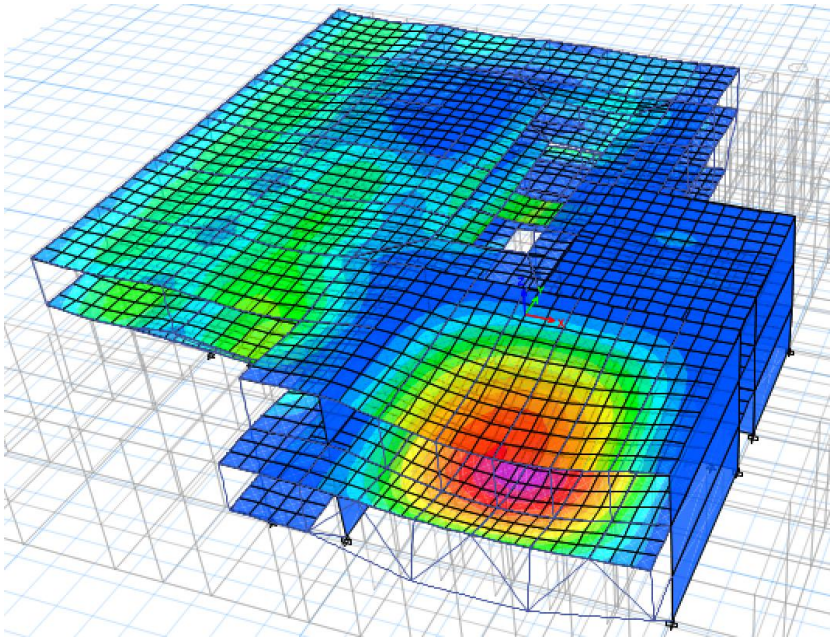
0.8″ < 1.67″ (2.03 cm< 4.24 cm) → OKAY!

CHECK #2: DL + LL (L/240 Limit)

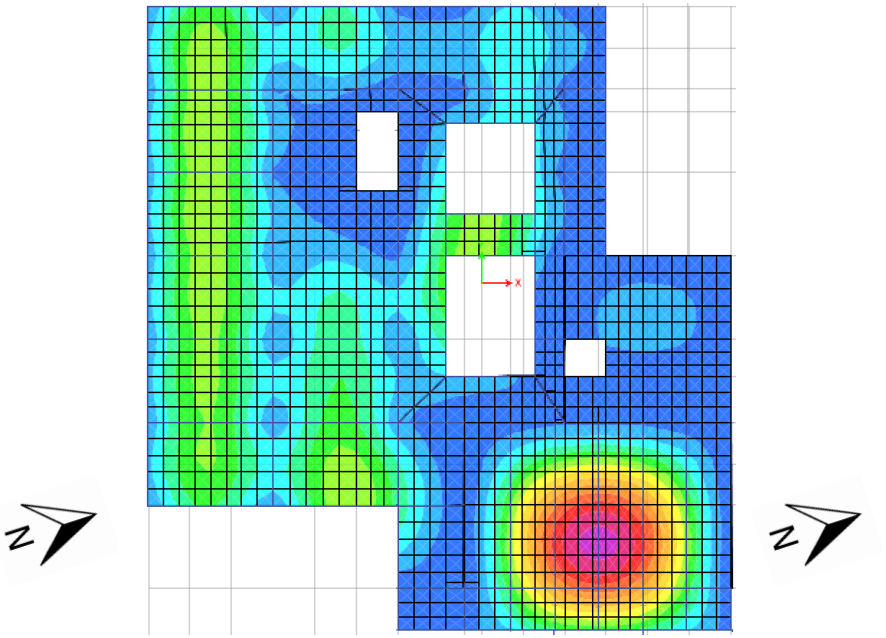
1.89″ < 2.4″ (4.8 cm < 6.1 cm) → OKAY!

*per IBC Code Limits

ISOMETRIC VIEW



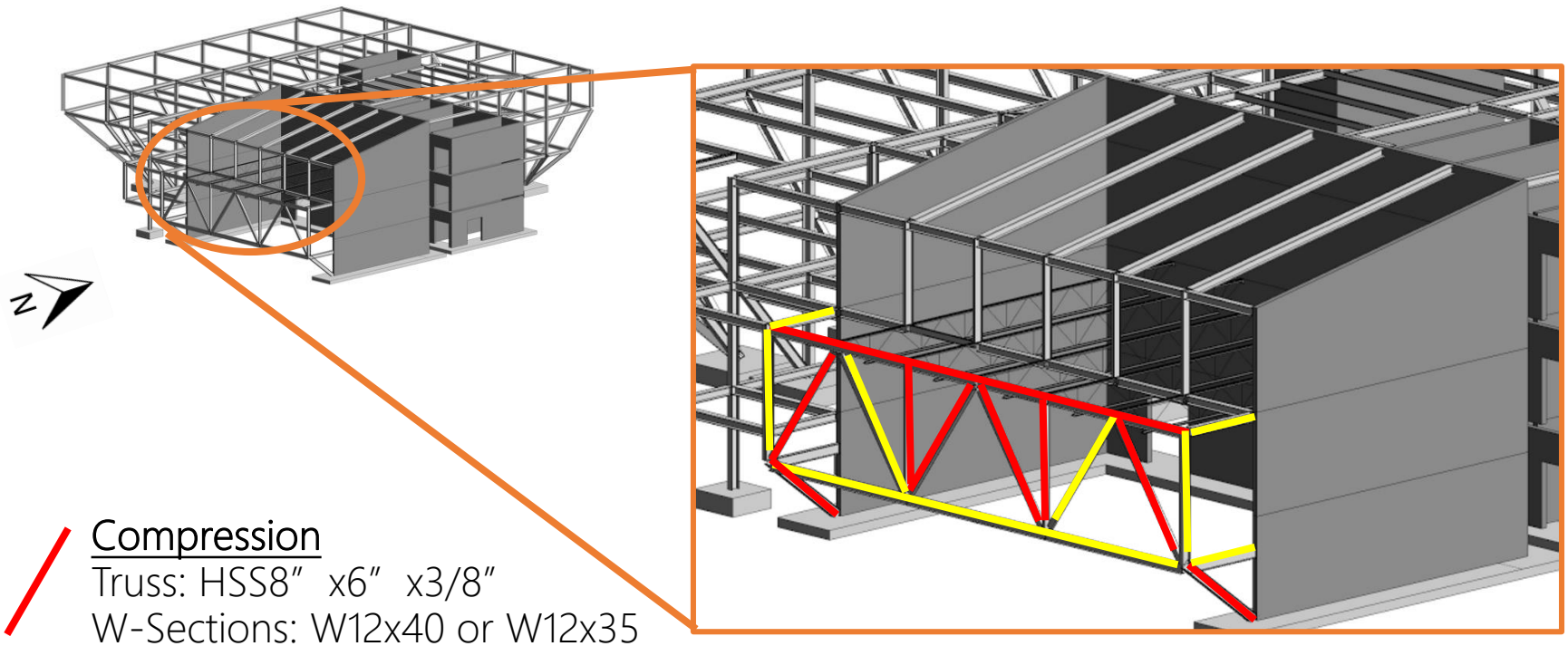
2ND FLOOR PLAN



Deflection Color Gradient (in):

EXPRESS 2016

MEGA TRUSS DETAIL



Compression
Truss: HSS8″ x6″ x3/8″
W-Sections: W12x40 or W12x35

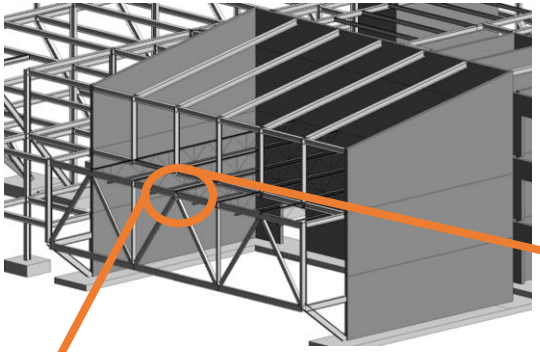
Tension
Truss: HSS8″ x4″ x3/16″
W-Sections: W12x35

*W-sections were used for the top & bottom chord and slanted columns

Key Features:

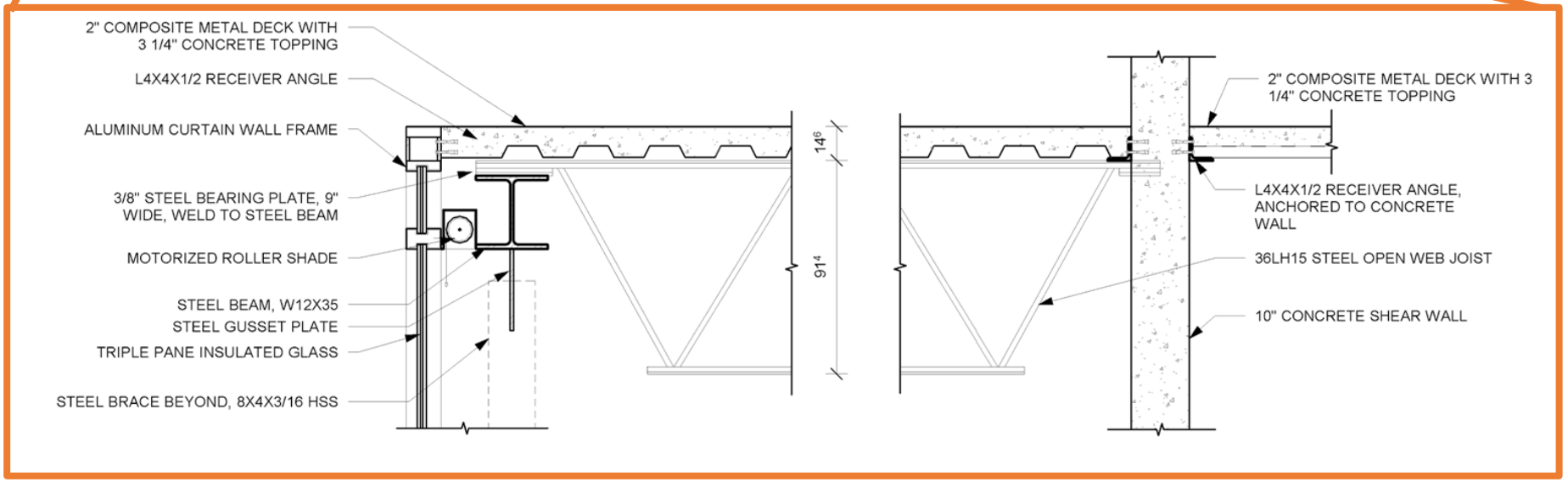
- Mega truss proved to be more efficient than 3 m O.C. slanted columns
- Complements façade tangram pattern

JOIST CONNECTION

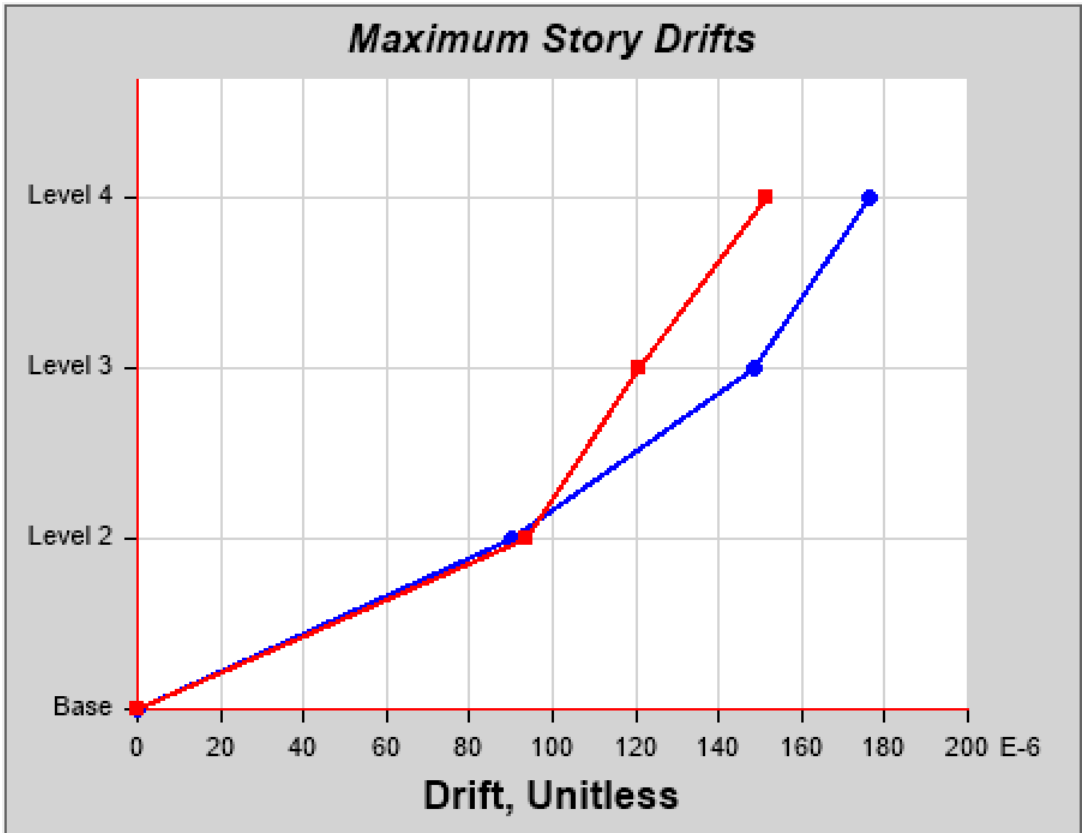


Key Features:

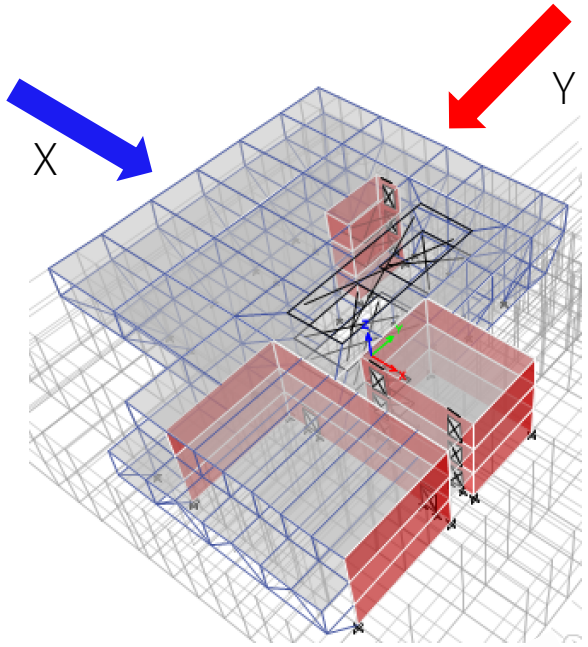
- W-sections are used for the bottom and top chords of the mega truss for constructability
- Connection to shear wall reduces eccentricity of loads



SEISMIC ANALYSIS



0.0176% (MAX IDR) < 1.875% (IBC IDR LIMIT)



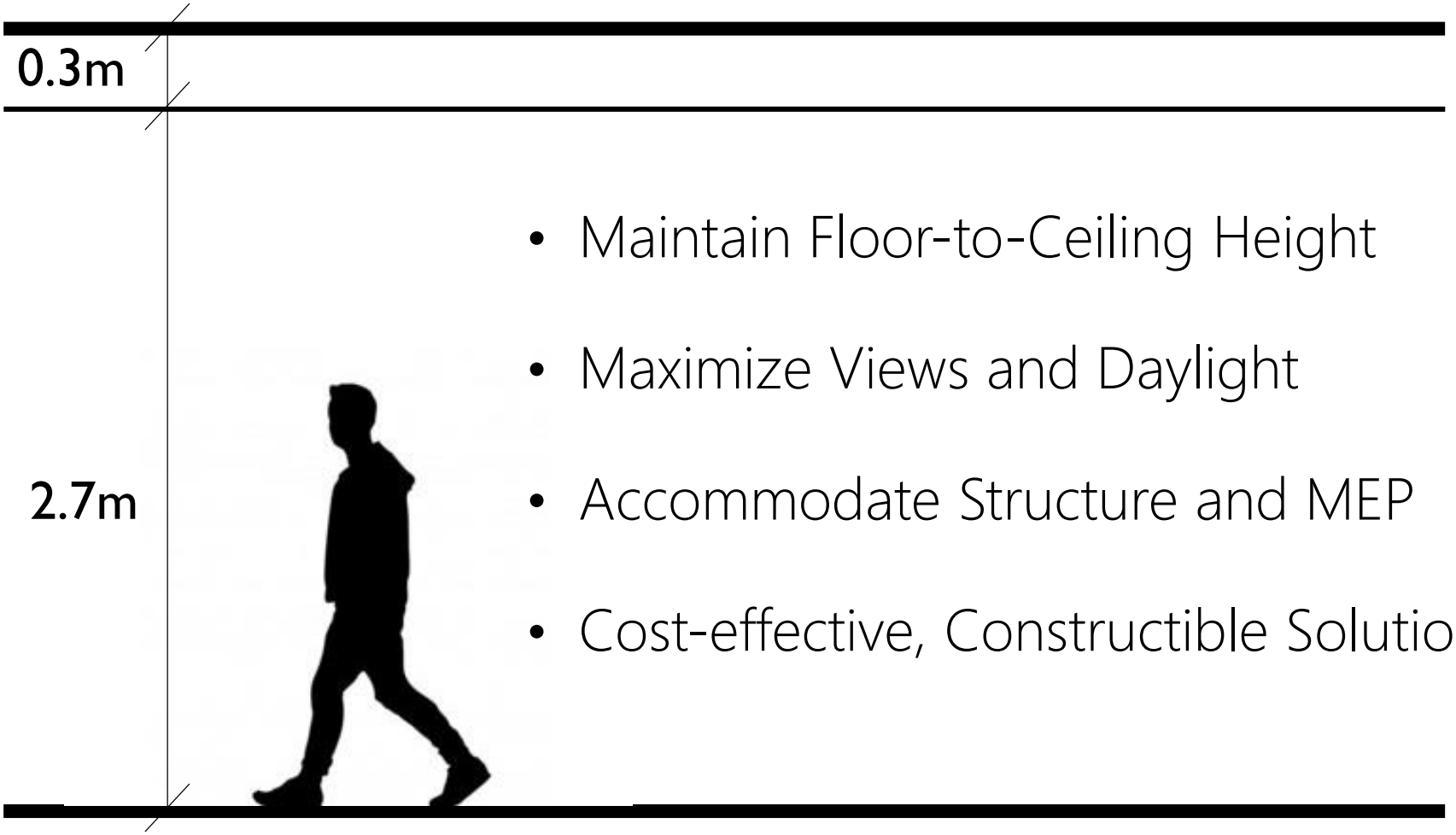
<u>EQ Parameters:</u>

S_{DS} = 0.86g
S_{D1} = 0.35g
Site Class D
R Factor = 5
C_D = 4.5
I_e = 1
T_n= 0.2s

IDR LIMITS SATISFIED AND DAMAGE POTENTIAL MITIGATED!

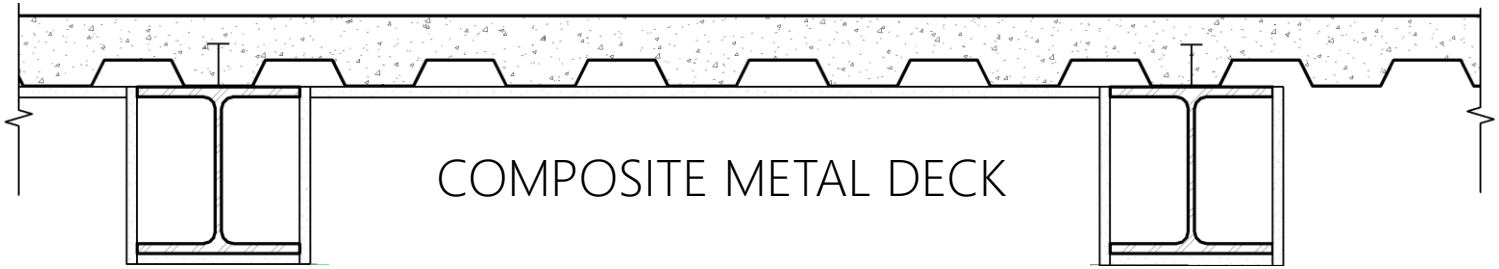
OVERCOMING KEY CHALLENGES

FLOOR ASSEMBLY CHALLENGE

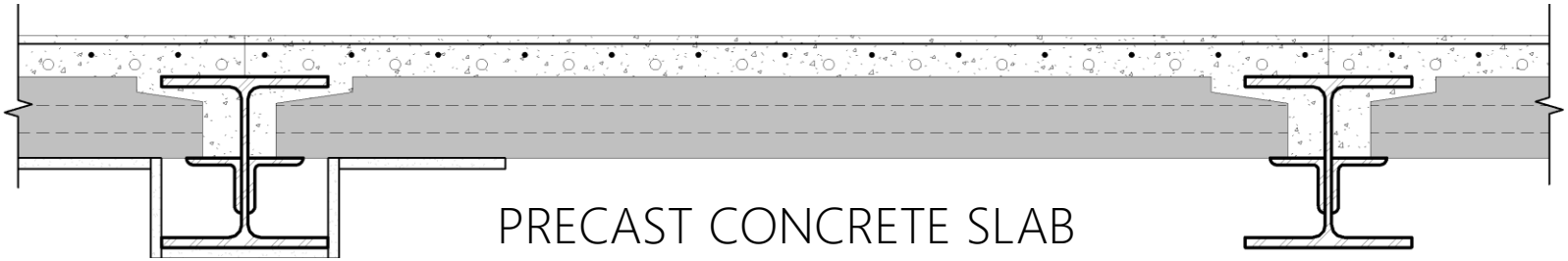


- Maintain Floor-to-Ceiling Height
- Maximize Views and Daylight
- Accommodate Structure and MEP
- Cost-effective, Constructible Solution

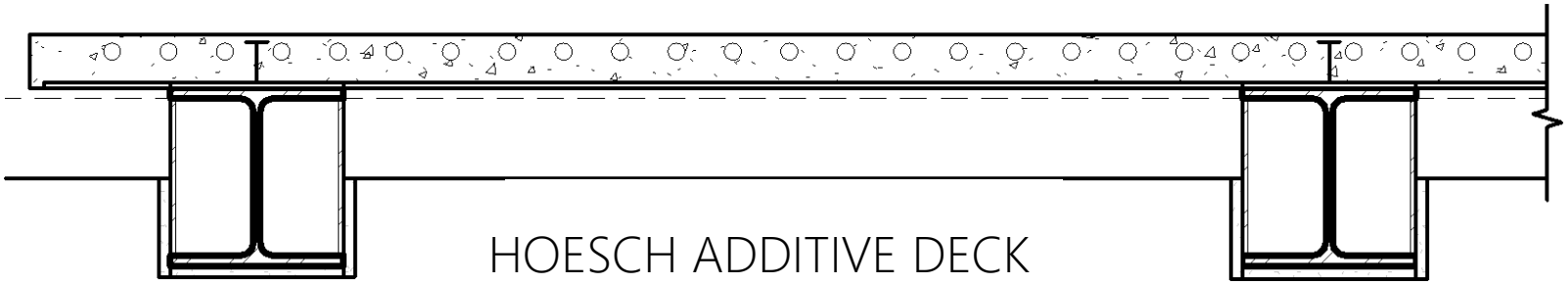
FLOOR ASSEMBLIES



COMPOSITE METAL DECK

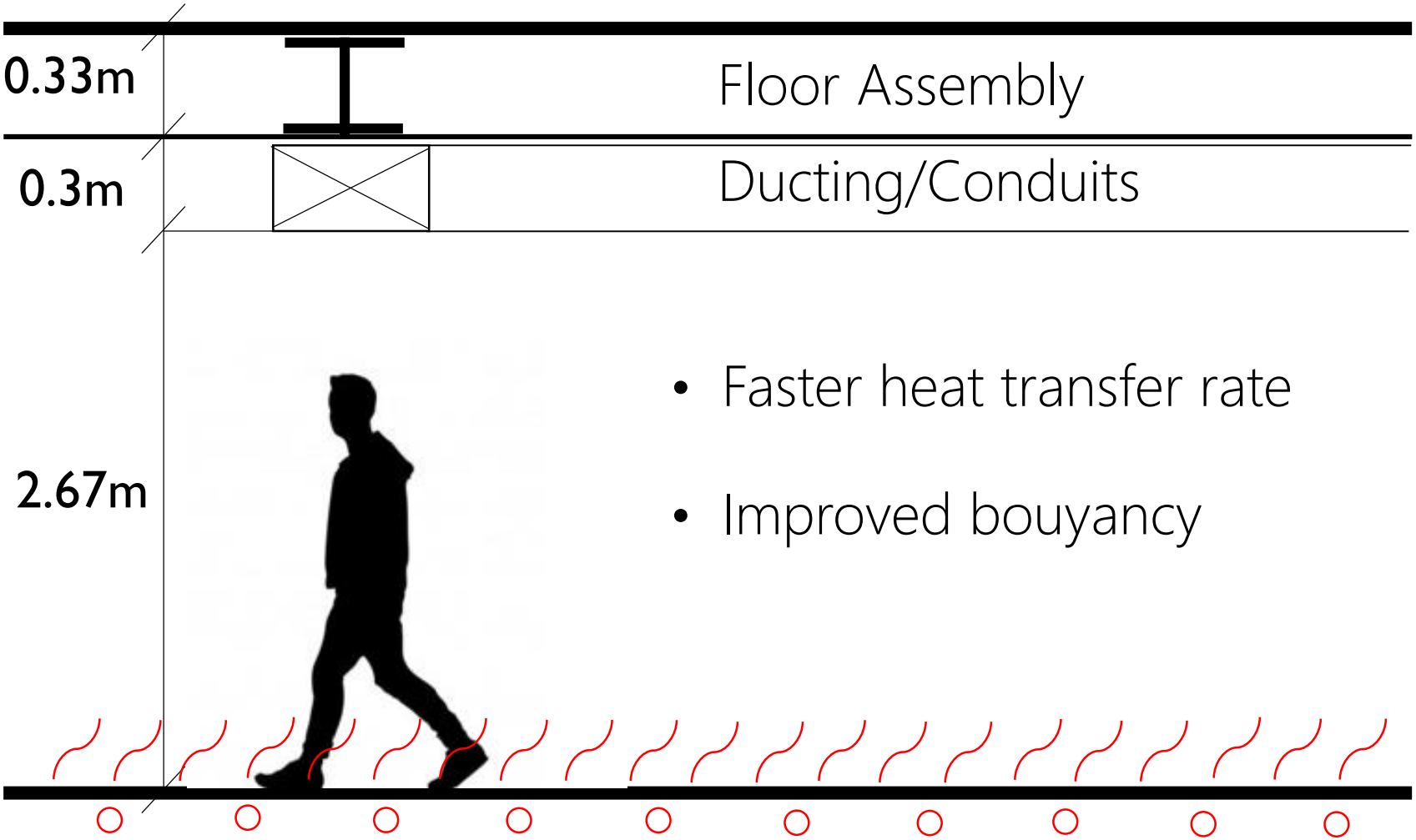


PRECAST CONCRETE SLAB



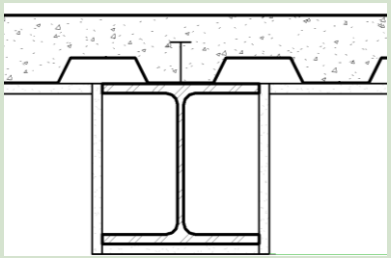
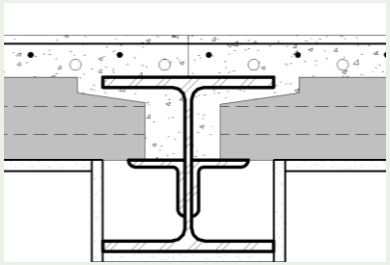
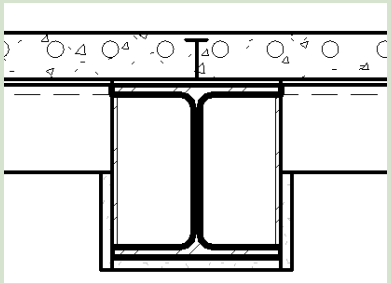
HOESCH ADDITIVE DECK

MEP SYSTEM



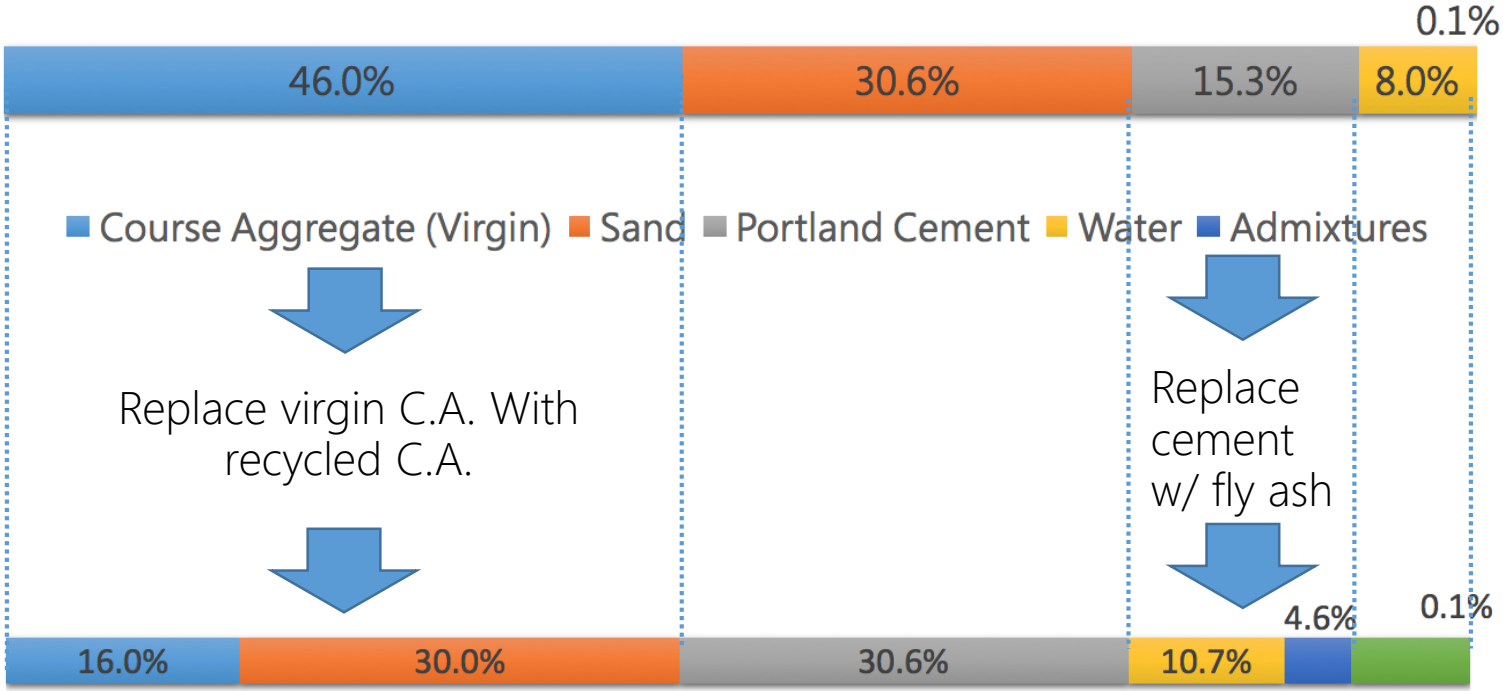
Radiant Flooring

DECISION MATRIX

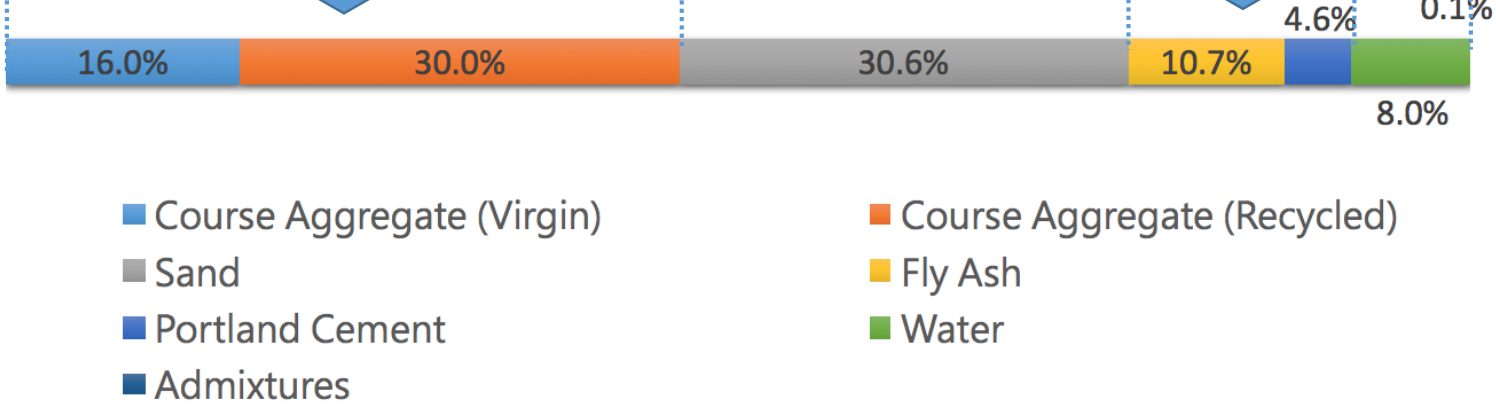
ASSEMBLY	IMAGE	THICKNESS (cm)	COMMENTS
Composite metal deck		38	• Easy to construct • Requires filler beams
Precast concrete slab		35	• Hard to construct • Requires field welding
Hoesch additive deck		33	• Easy to construct • No filler beams or welding

CONCRETE MIX DESIGN

TRADITIONAL CONCRETE MIX



IMPROVED CONCRETE MIX

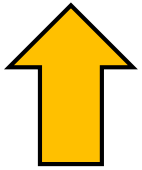


65% EMBODIED REDUCTION IN EMBODIED ENERGY AND CARBON!

STV & TVD IMPACTS

Deck
Cost

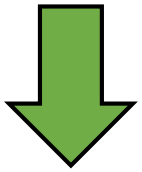
$202,000



	Cost per SF	Total
Precast	$13.20	$307,000
Metal Deck	$21.90	$509,000

Ceiling
Cost

($230,000)

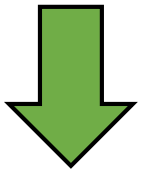


Eliminates

- 20 days
- Support angles

GWP
$kgCO_2e$

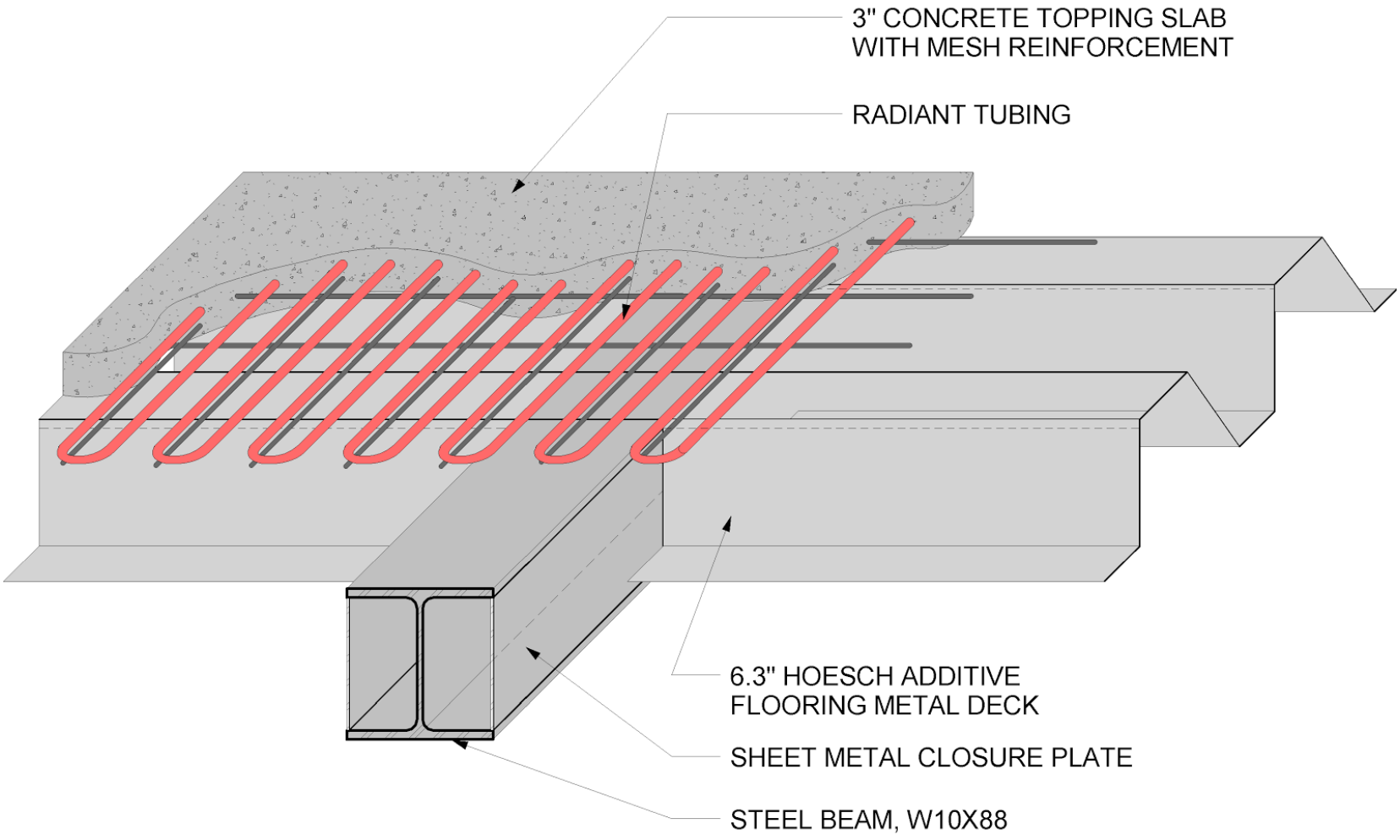
-5%



KPI

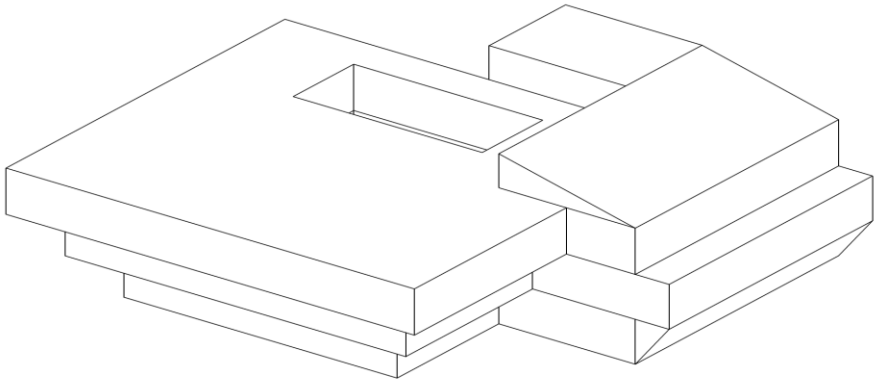
- Thermal Comfort
- Low Emissions
- Limited Disturbance to Site

COMPOSITE DECK



BUILDING ENVELOPE CHALLENGE

Building Form to Fit Envelope

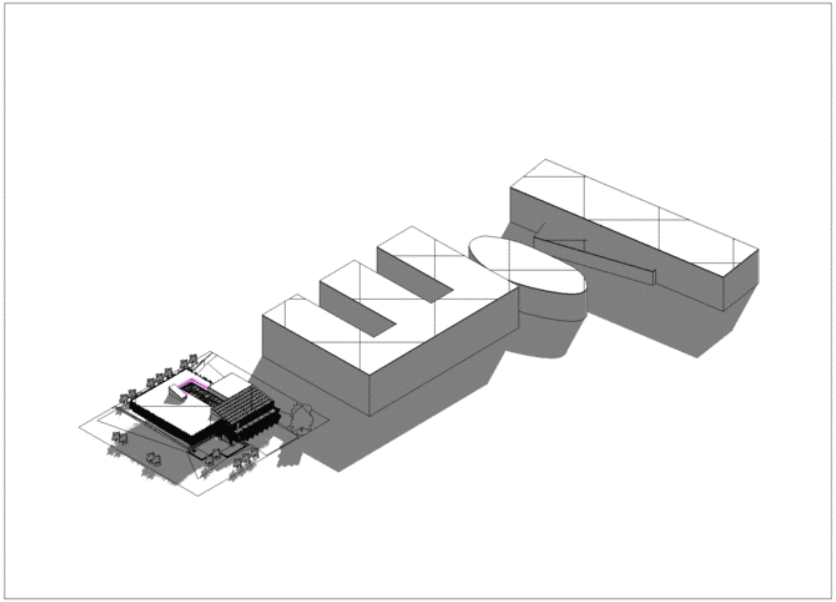


Key Desired Outcomes:

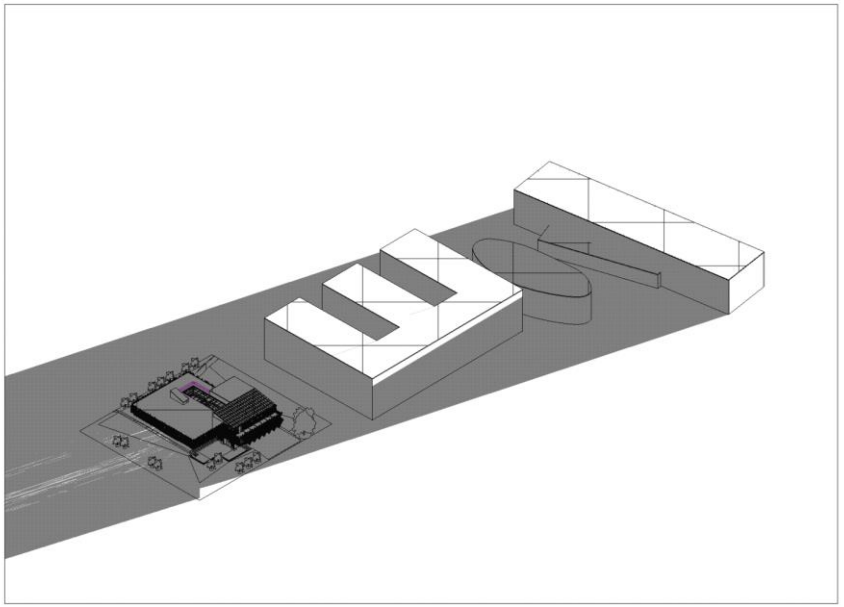
- Adaptable
- Iconic
- Low Energy Usage

SOLAR STUDY

Summer



Winter



SOLAR SHADING

Energy Consumption w/o Shading

109 kWh/m²

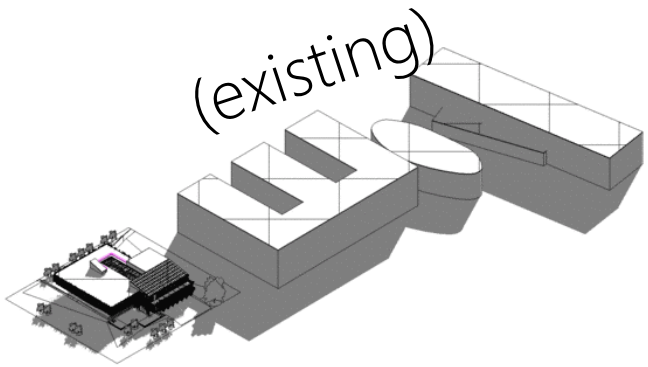
Energy Consumption w/ Shading

89 kWh/m²

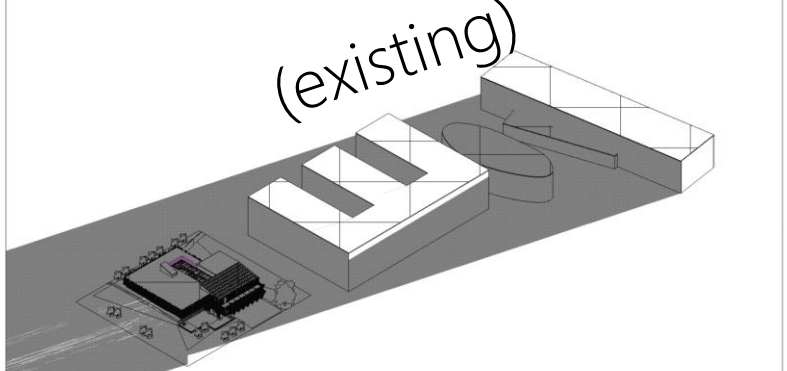
Energy Savings

20 kWh/m²

Summer

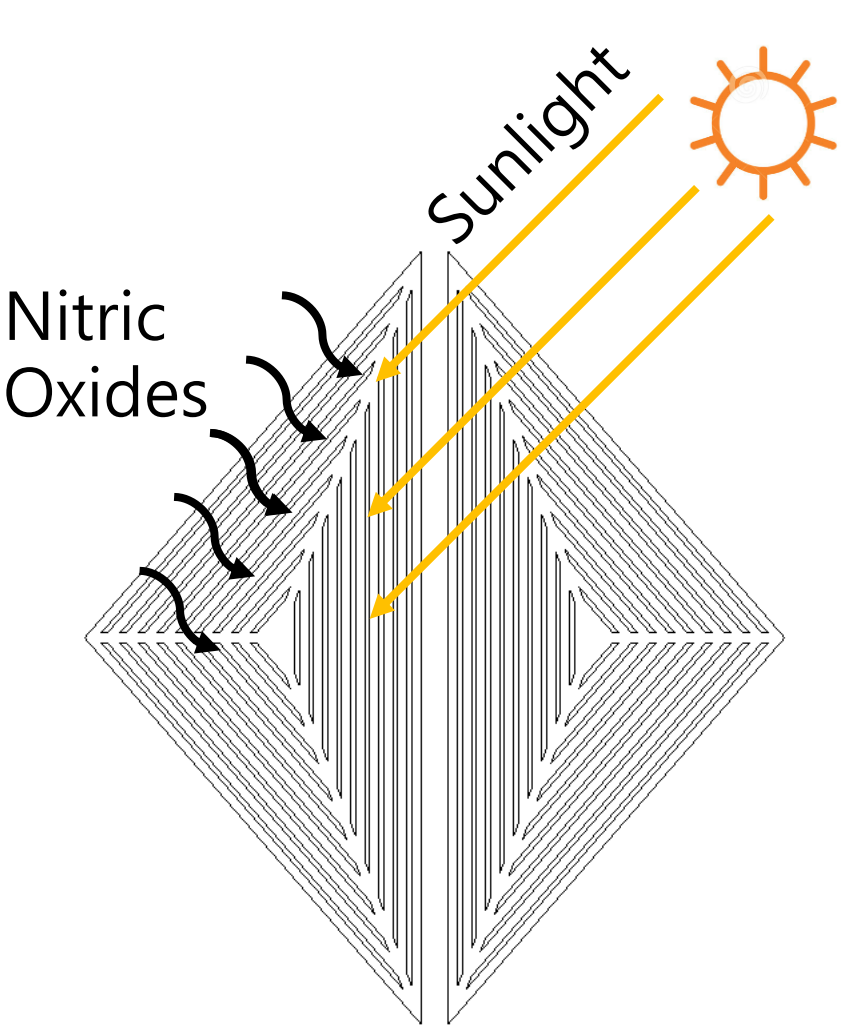


Winter

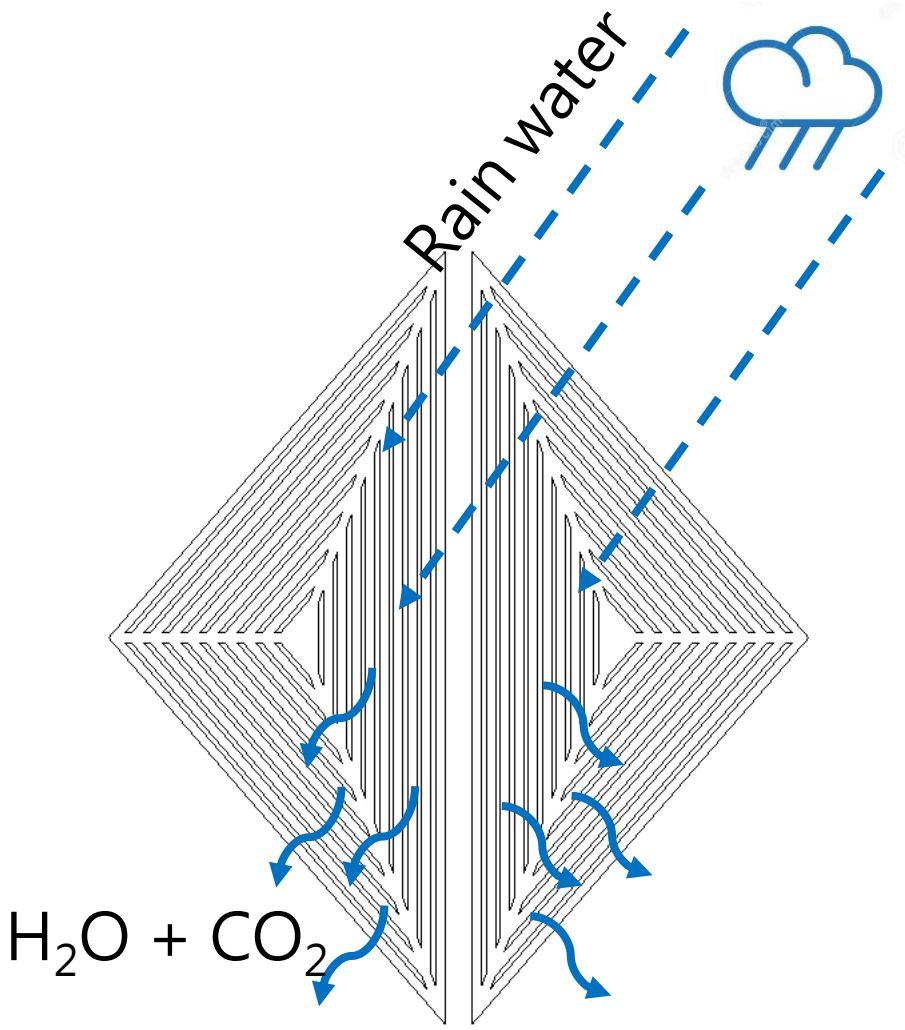


E

SELF-CLEANING FACADE

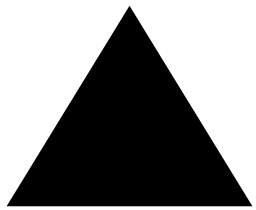


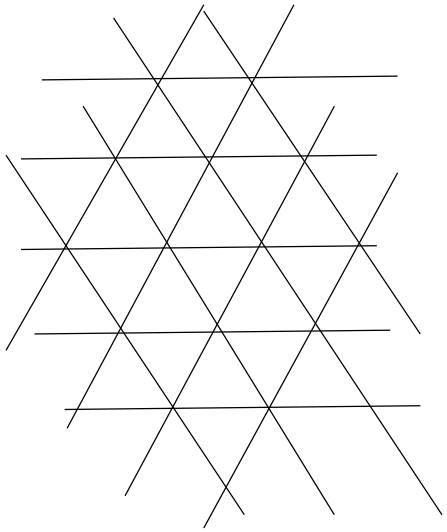
Façade cleans air of NO_x



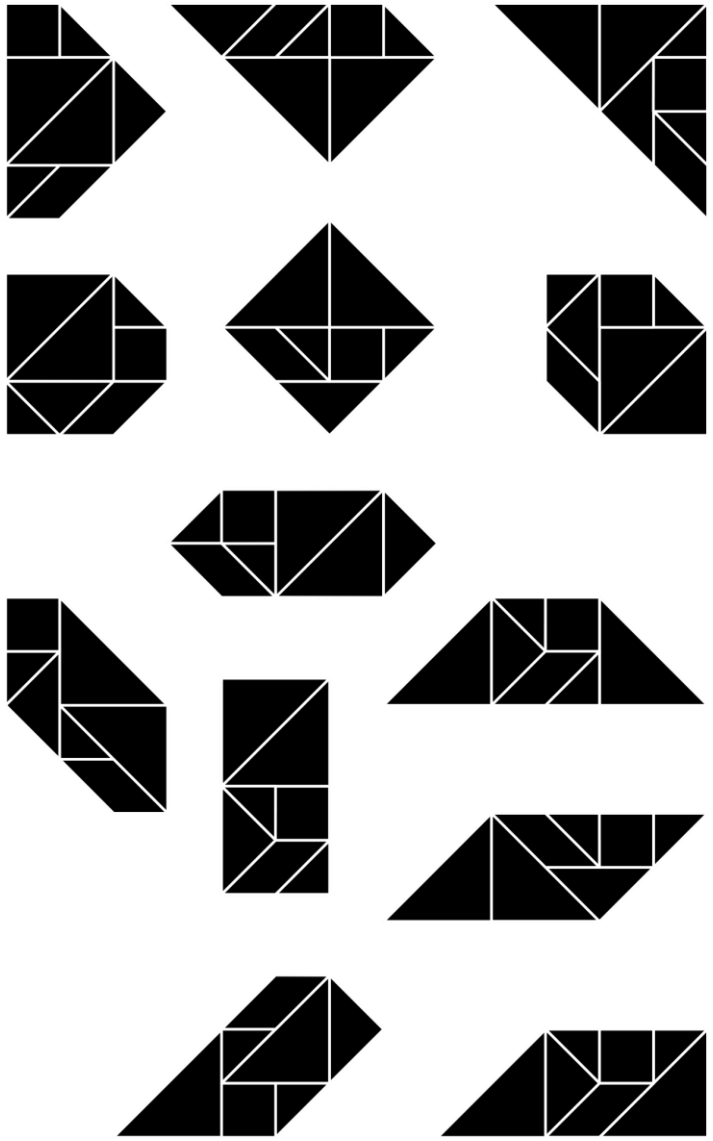
Rain self-cleans façade

FACADE INSPIRATION

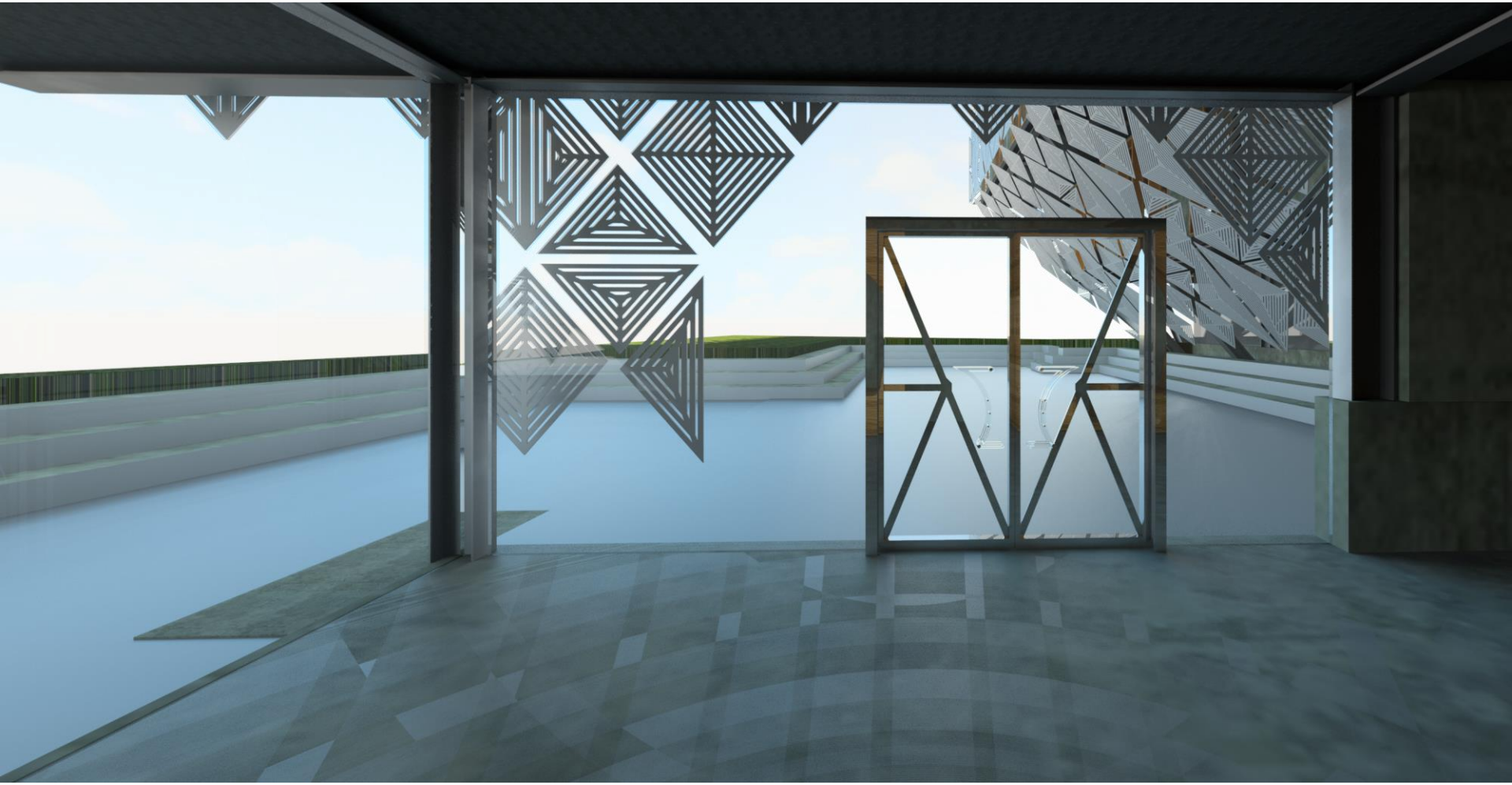




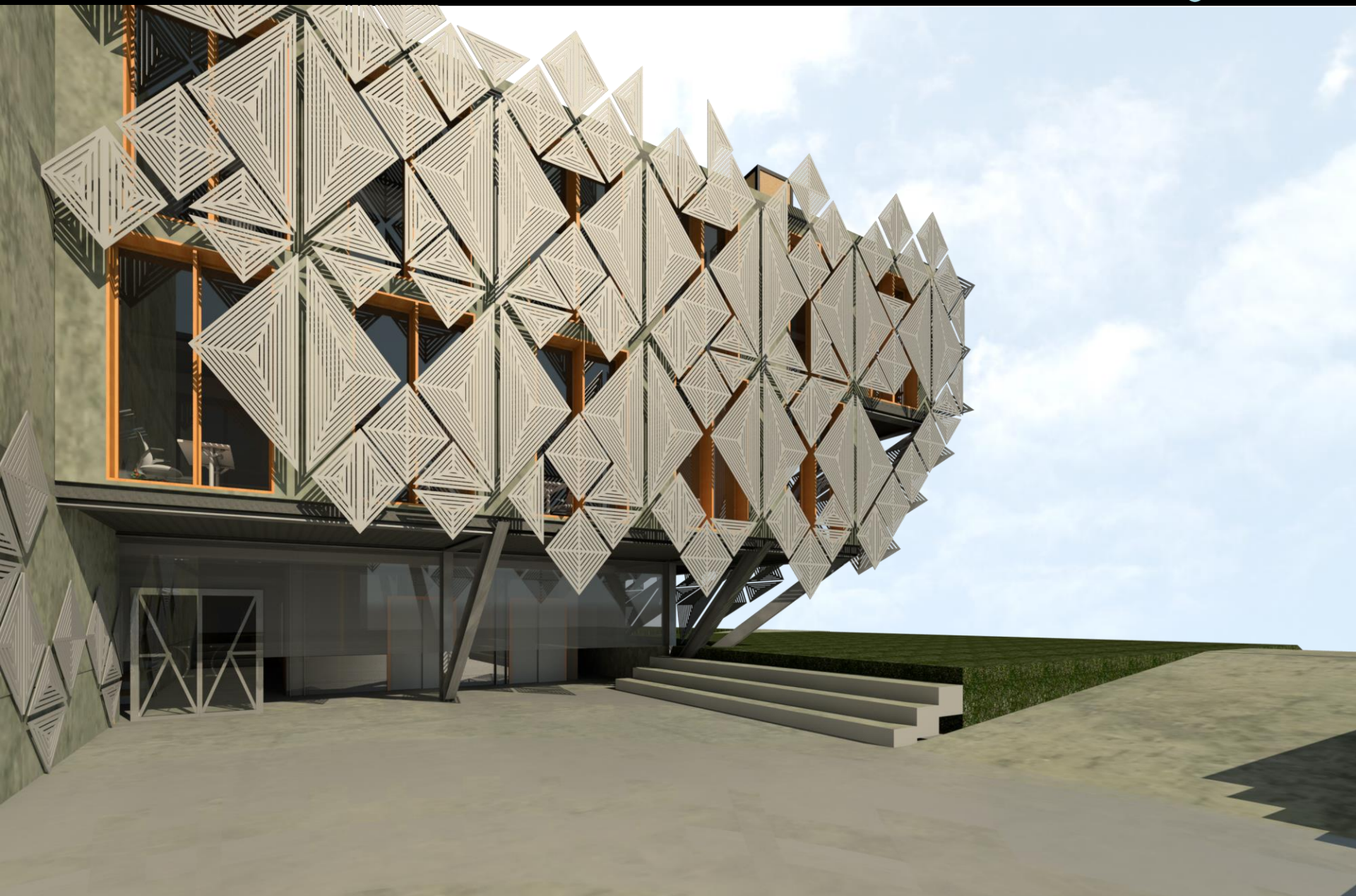
CLIENT



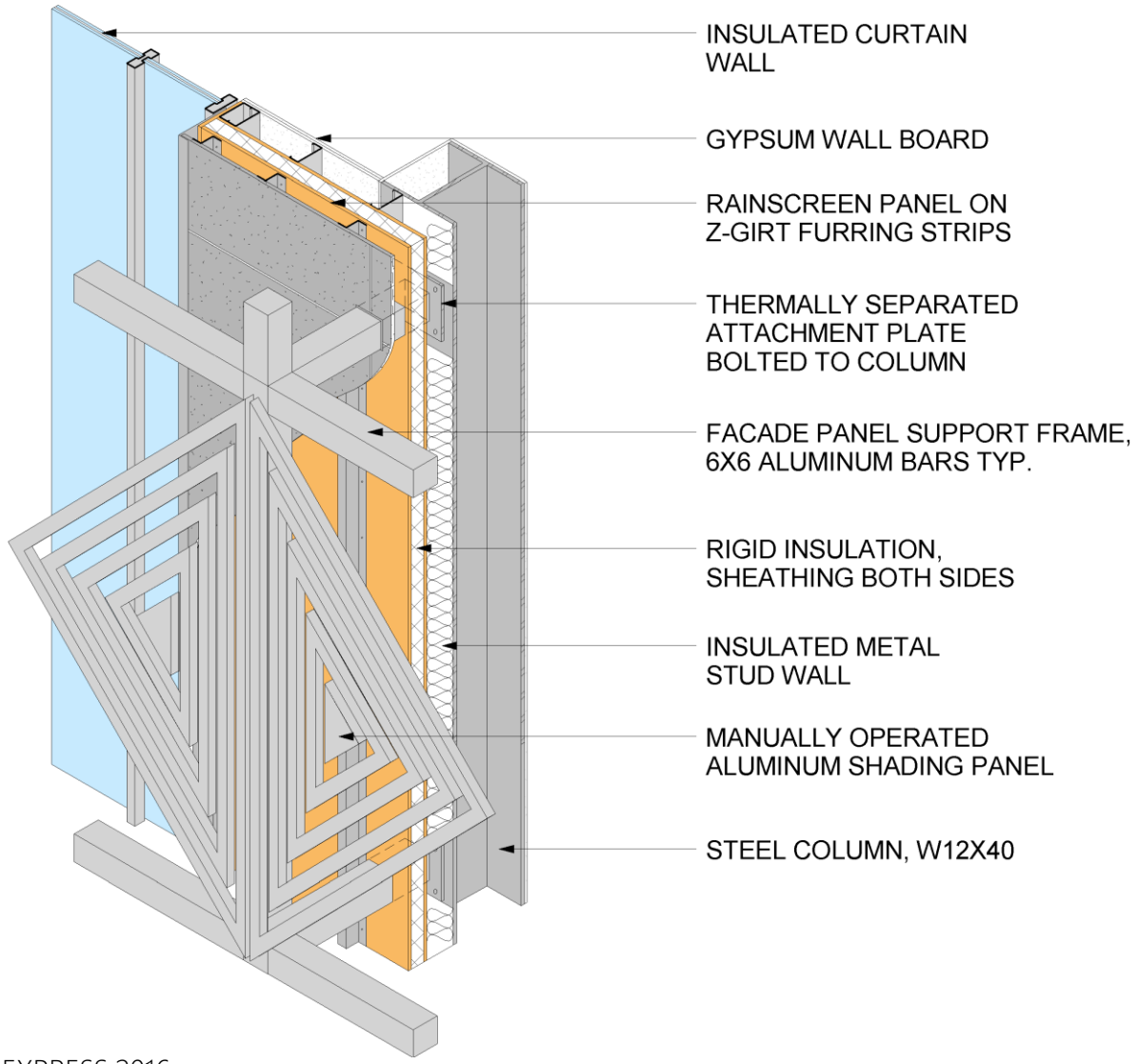
ENVELOPE



ENVELOPE



ADAPTABLE BUILDING PANEL



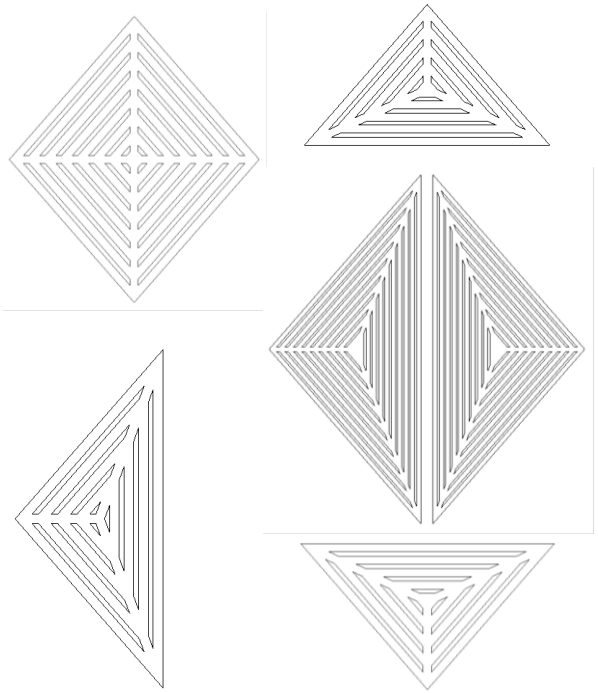
Key Features:

- Adaptable to the user´s desired **comfort level**
- TiO_2 coated panels to **sequester NO_x**
- Triangular shapes inspired by tangrams to **improve façade adaptability**

PRE-FABRICATION

Local vendors

Pre-fabrication



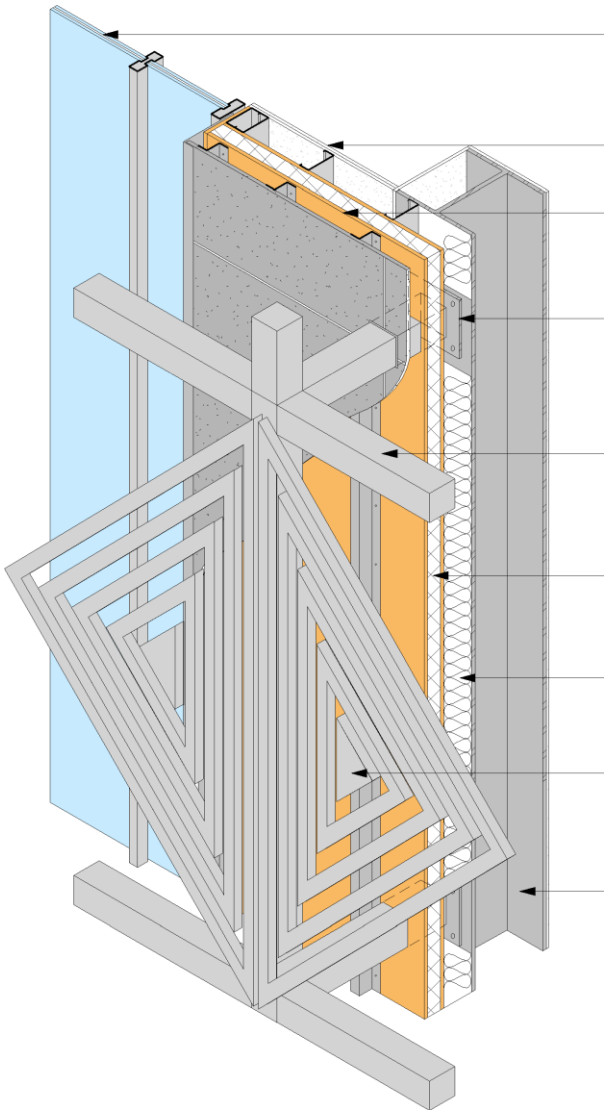
TVD & STV

Total:	$1,504,000
Façade Panels	$743,000
Façade Support	$241,000
Exterior Wall Panels	$225,000
Windows	$195,000
Façade Automation	$100,000

GWP SAVINGS

GWP
$kgCO_2e$

-9%



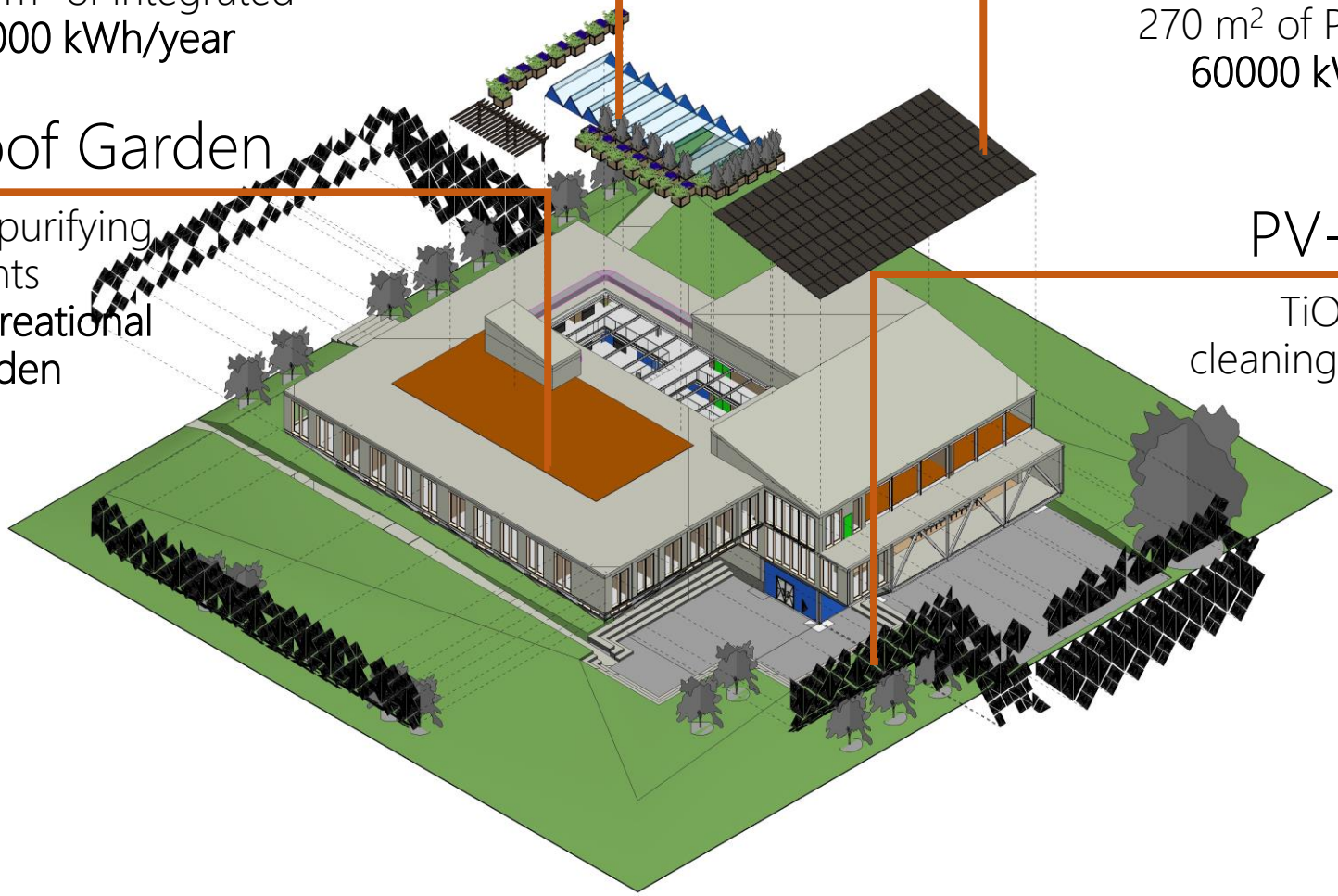
BUILDING ENVELOPE

Atrium Skylight

80 m^2 of integrated
10000 kWh/year

Roof Garden

Air purifying plants
Recreational garden



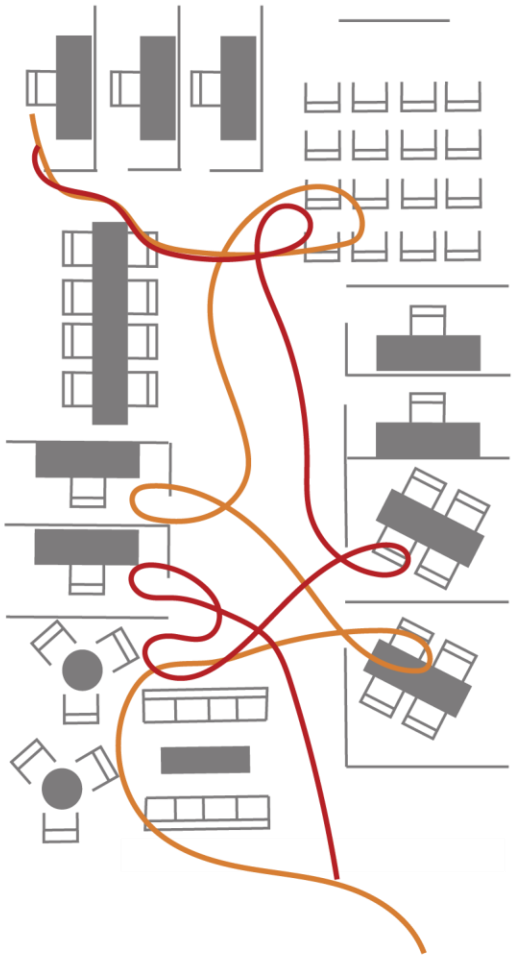
PV-Array

270 m^2 of PV-Array
60000 kWh/year

PV-Array

TiO_2 coated cleaning air from NO_x

INTERIOR CHALLANGE



ADAPTABLE SPACE

Used by the user

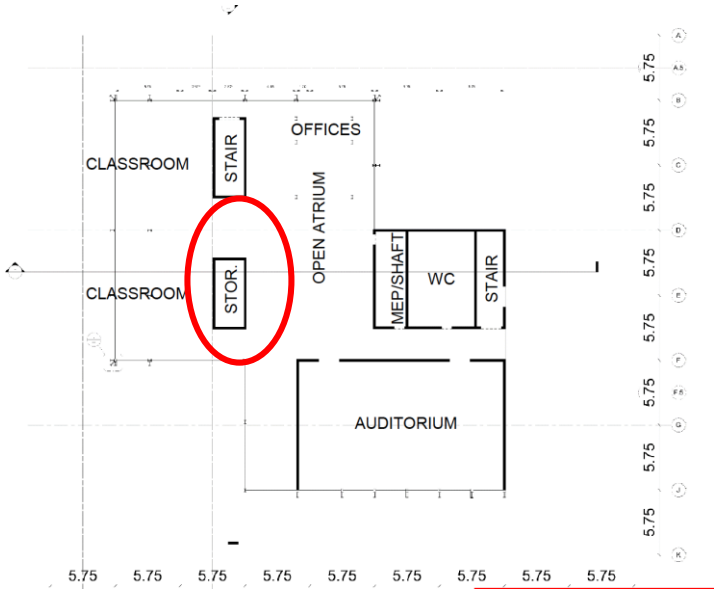
Defined by the user

Reused by the user

Redefined by the user

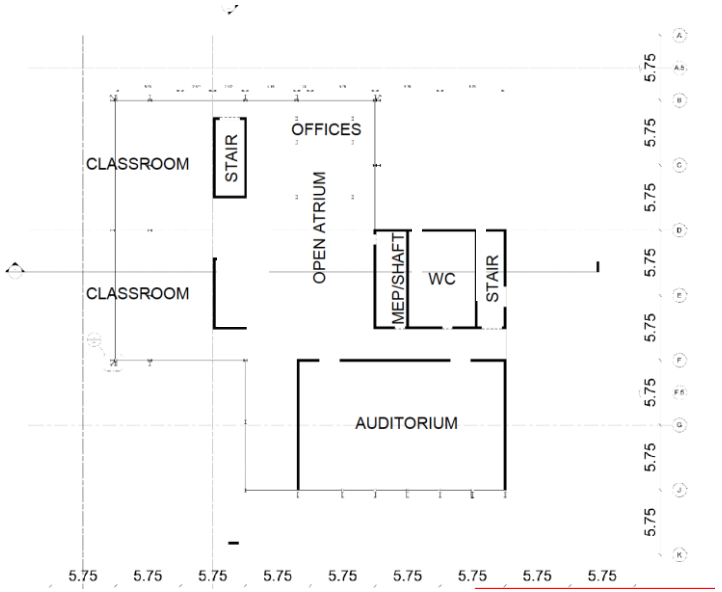
STRUCTURAL CORE WALL REMOVAL

Previous Floor Plan



Structure is inhibiting adaptable spaces

Current Floor Plan



Removal of core used for a storage room

ECO-PARTITIONS

100% REUSED
AGRICULTURAL WASTE

LOCALLY HARVESTED

GWP SAVINGS
-0.618 CO2eq/kg

ENERGY SAVINGS
1.19 MJ/kg
33% Savings

RECYCLABLE
BIODEGRADABLE

NO VOCS
STC 60+

INTERIOR

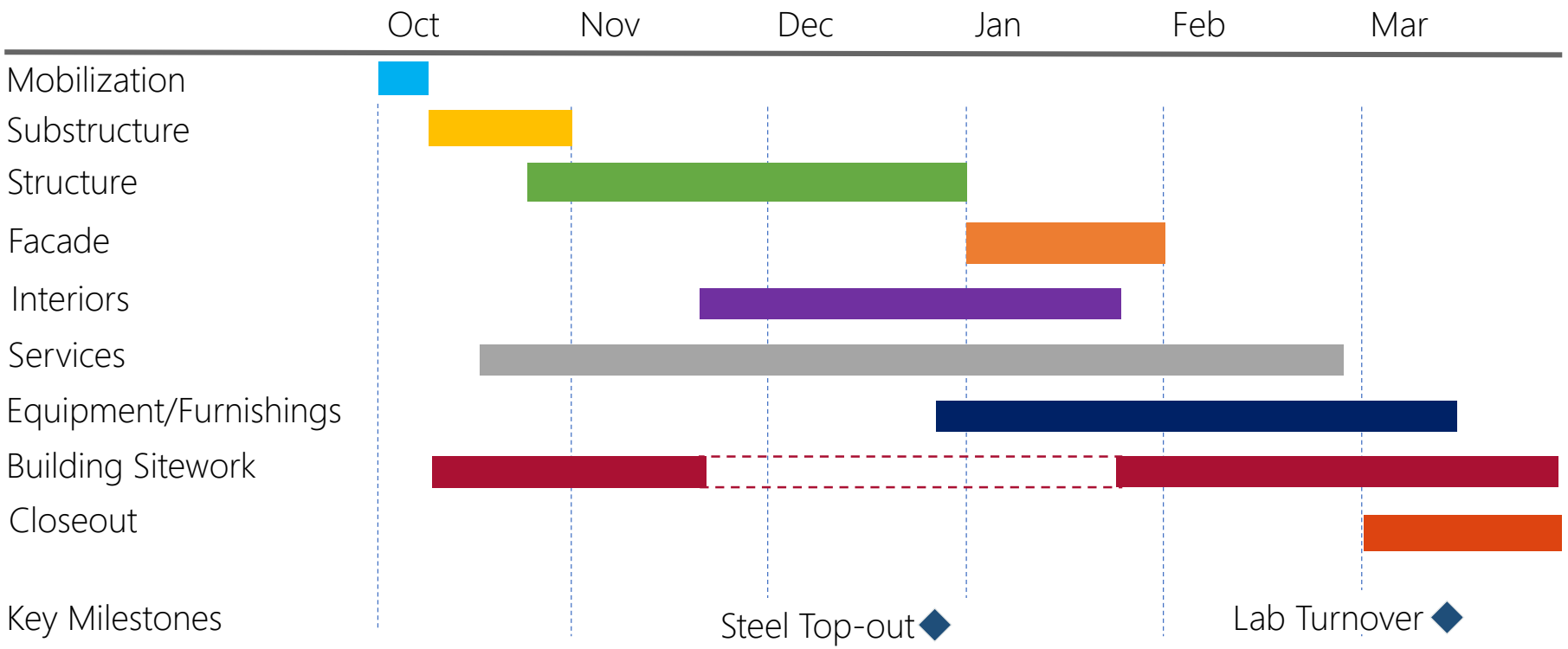
CONSTRUCTION MANAGEMENT

SCHEDULE

Why not deliver the building early to meet the May lab deadline?

Critical Lab Items:

- Stairs/Elevators
- Fire Alarm
- Power
- Finishes
- Furniture



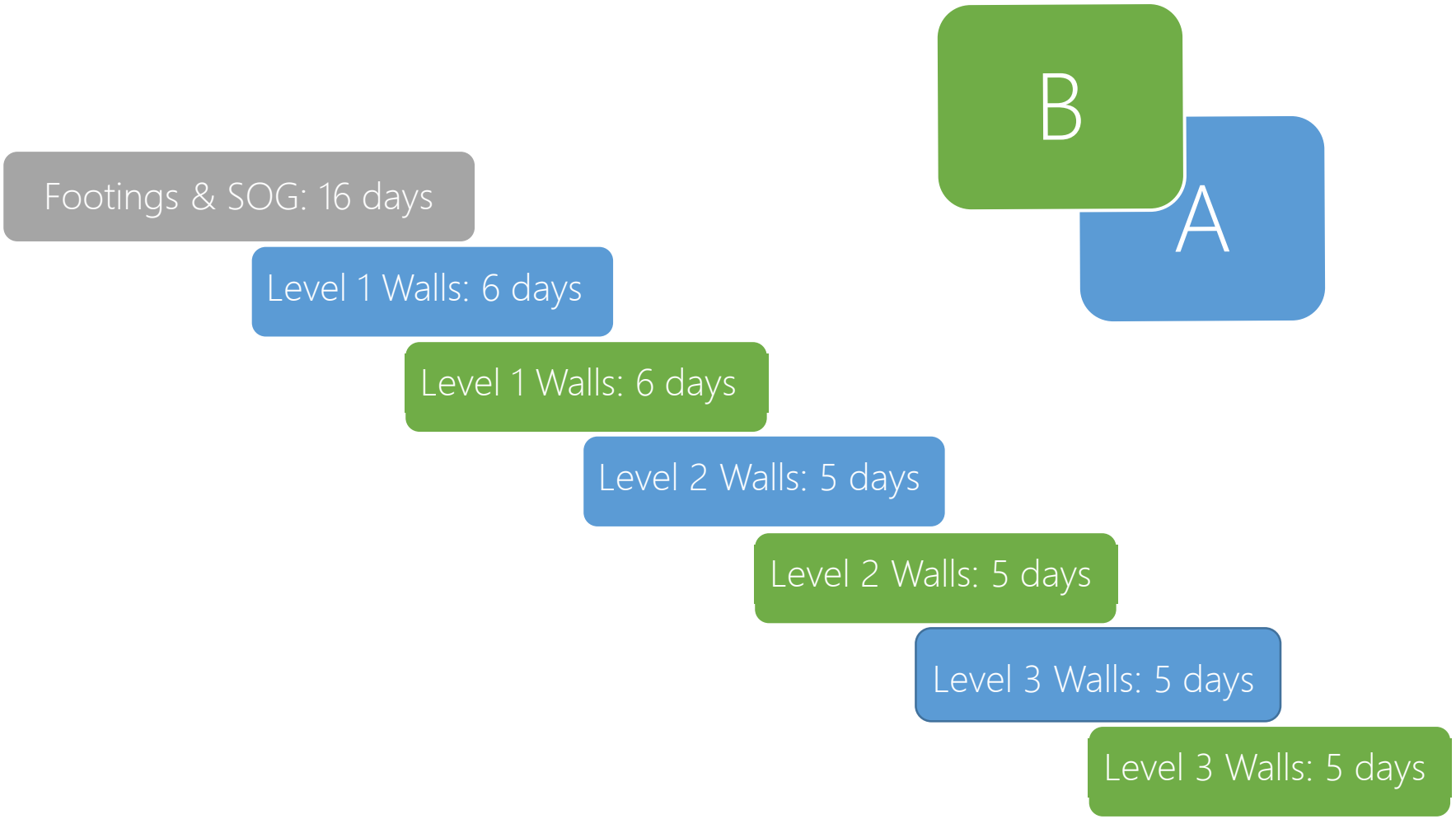
CONSTRUCTION STRATEGY

↑ Optimize Material Selection and Preassembly

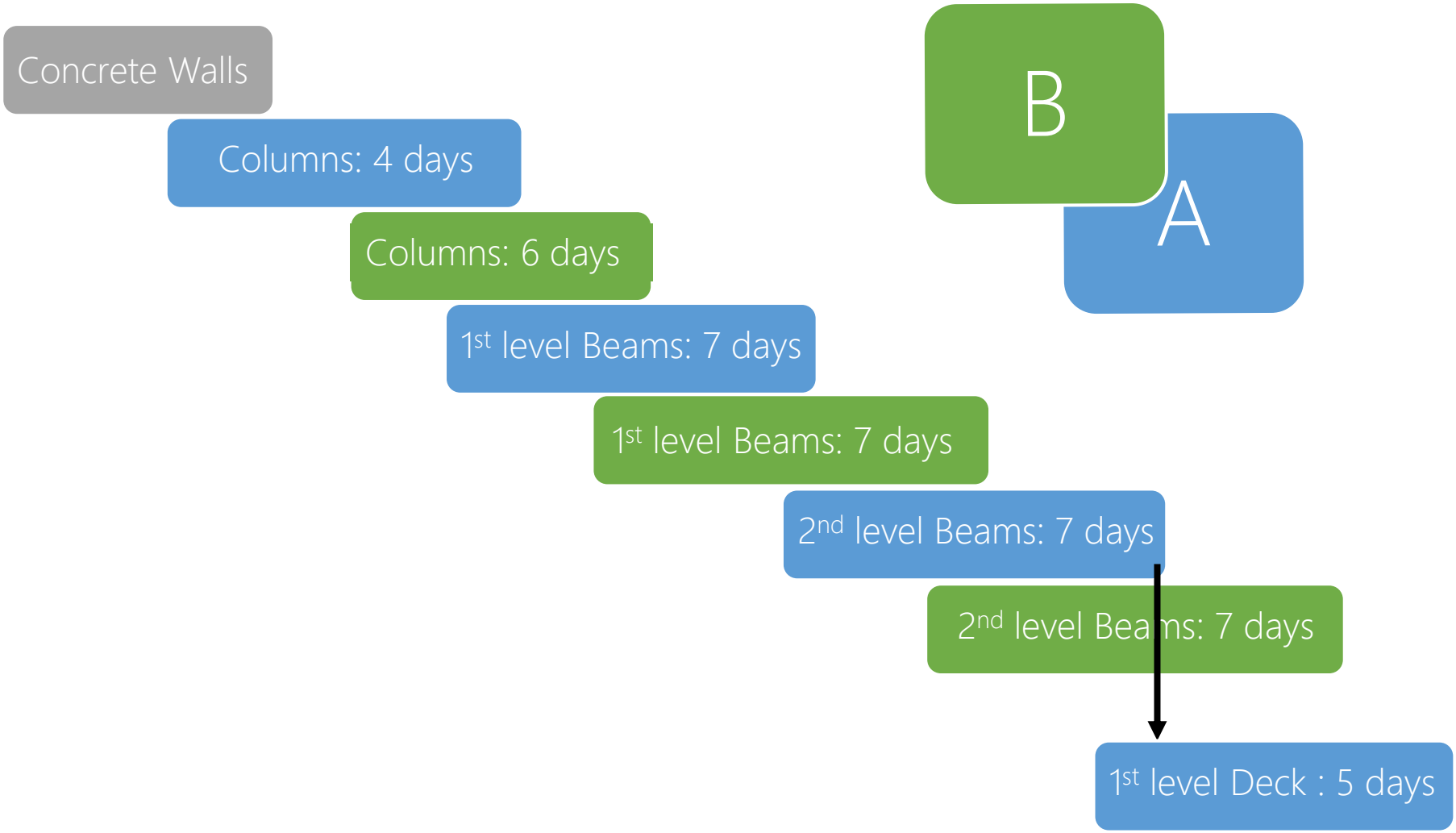
↓ Minimize Sequence and Installation Time

Select	Simplify	Eliminate
Steel	Minimize Structure	No Floor Finishes
Pre-assembled Exterior and Interior Walls	1 Exterior Wall Size	No Ceiling Finishes
Window Units	1 Window Size	
Pre-fabricated Façade Panels	5 Panel Sizes on Regular Grid	

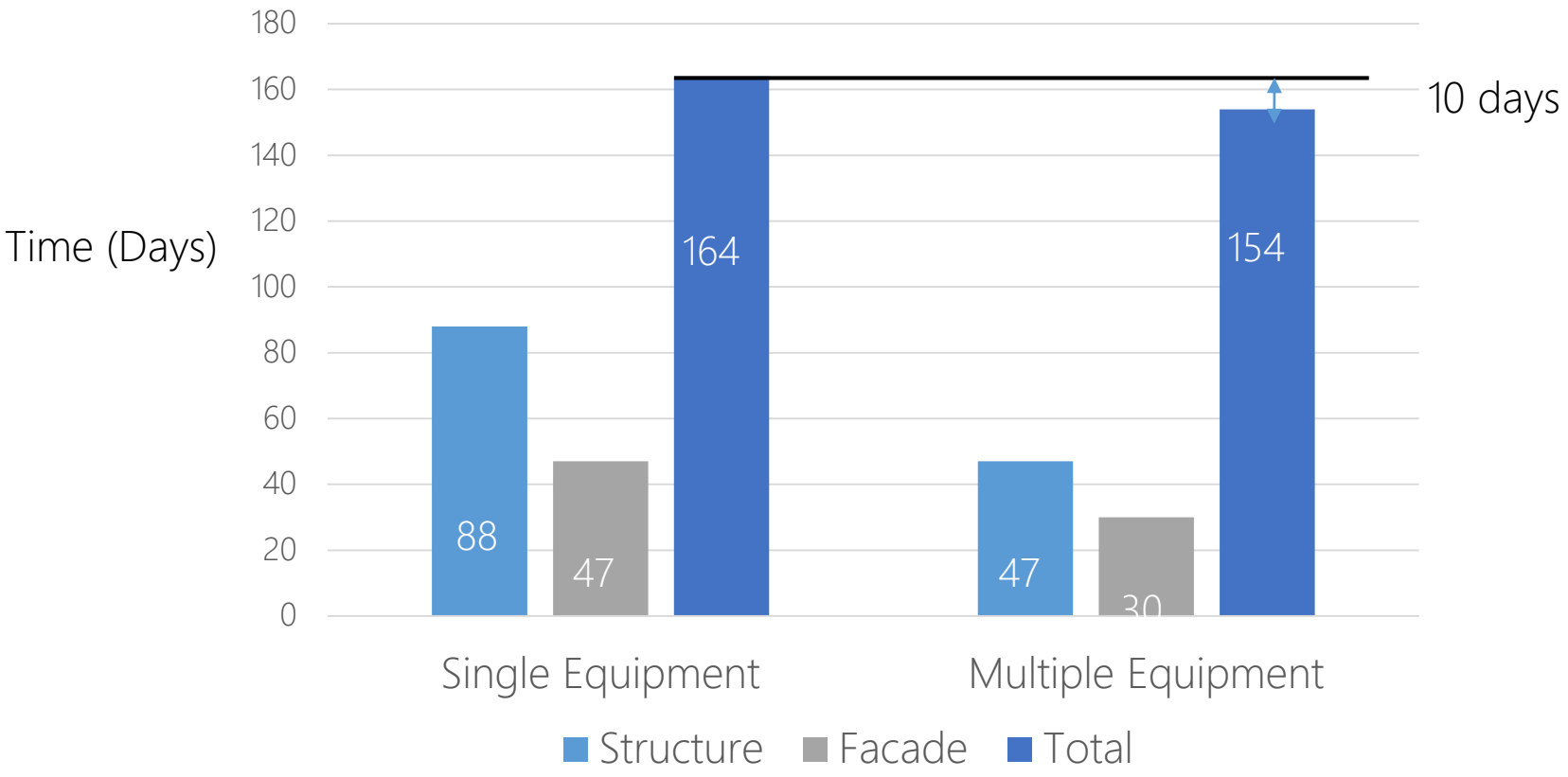
SEQUENCE


B
A
Footings & SOG: 16 days
Level 1 Walls: 6 days
Level 1 Walls: 6 days
Level 2 Walls: 5 days
Level 2 Walls: 5 days
Level 3 Walls: 5 days
Level 3 Walls: 5 days

SEQUENCE


Concrete Walls
Columns: 4 days
Columns: 6 days
1st level Beams: 7 days
1st level Beams: 7 days
2nd level Beams: 7 days
2nd level Beams: 7 days
1st level Deck : 5 days
B
A

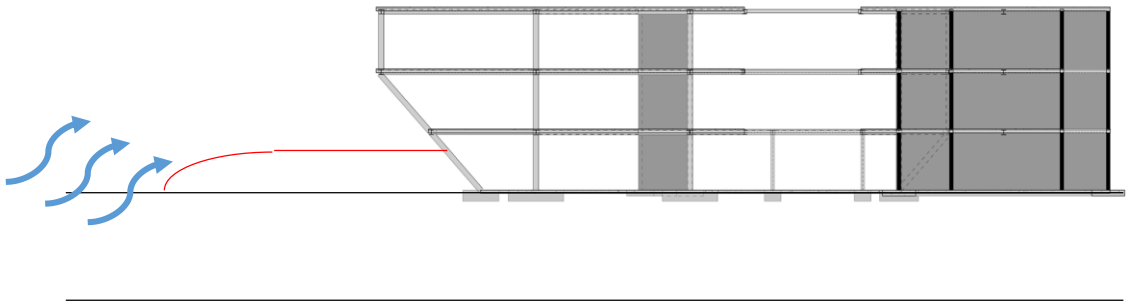
SINGLE VS. MULTIPLE

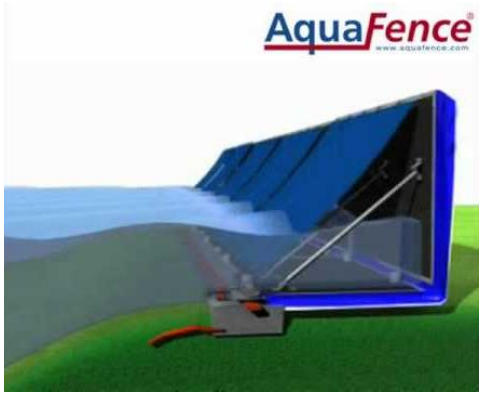


SINGLE VS. MULTIPLE

	Single Equipment	Multiple Equipment	Difference
Lab Turnover	April 30th	March 11th	56 days
Completion	May 14th	March 25th	42 days
General Condition Cost	$485,000	$505,000	$20,000

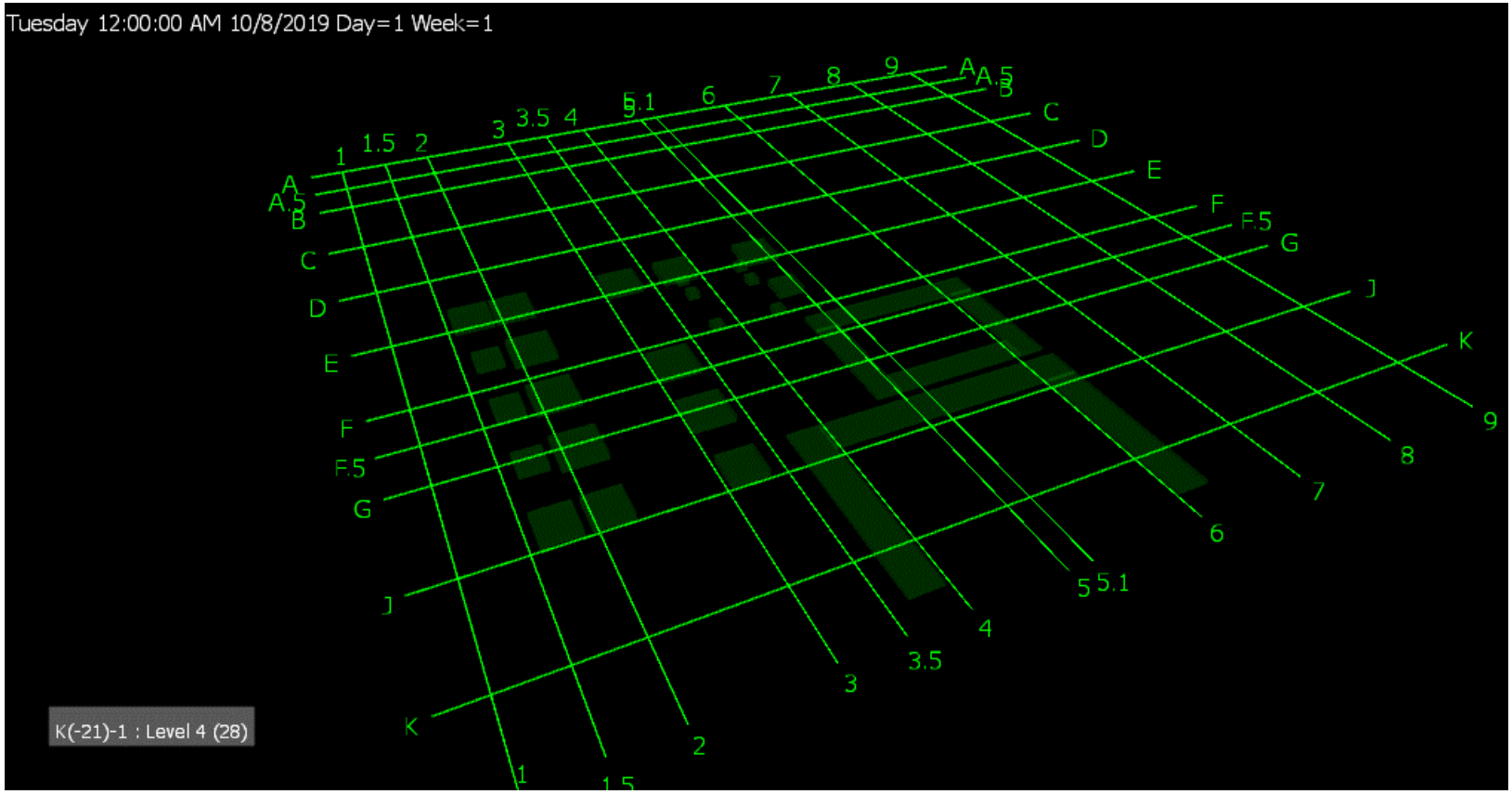
FLOODING



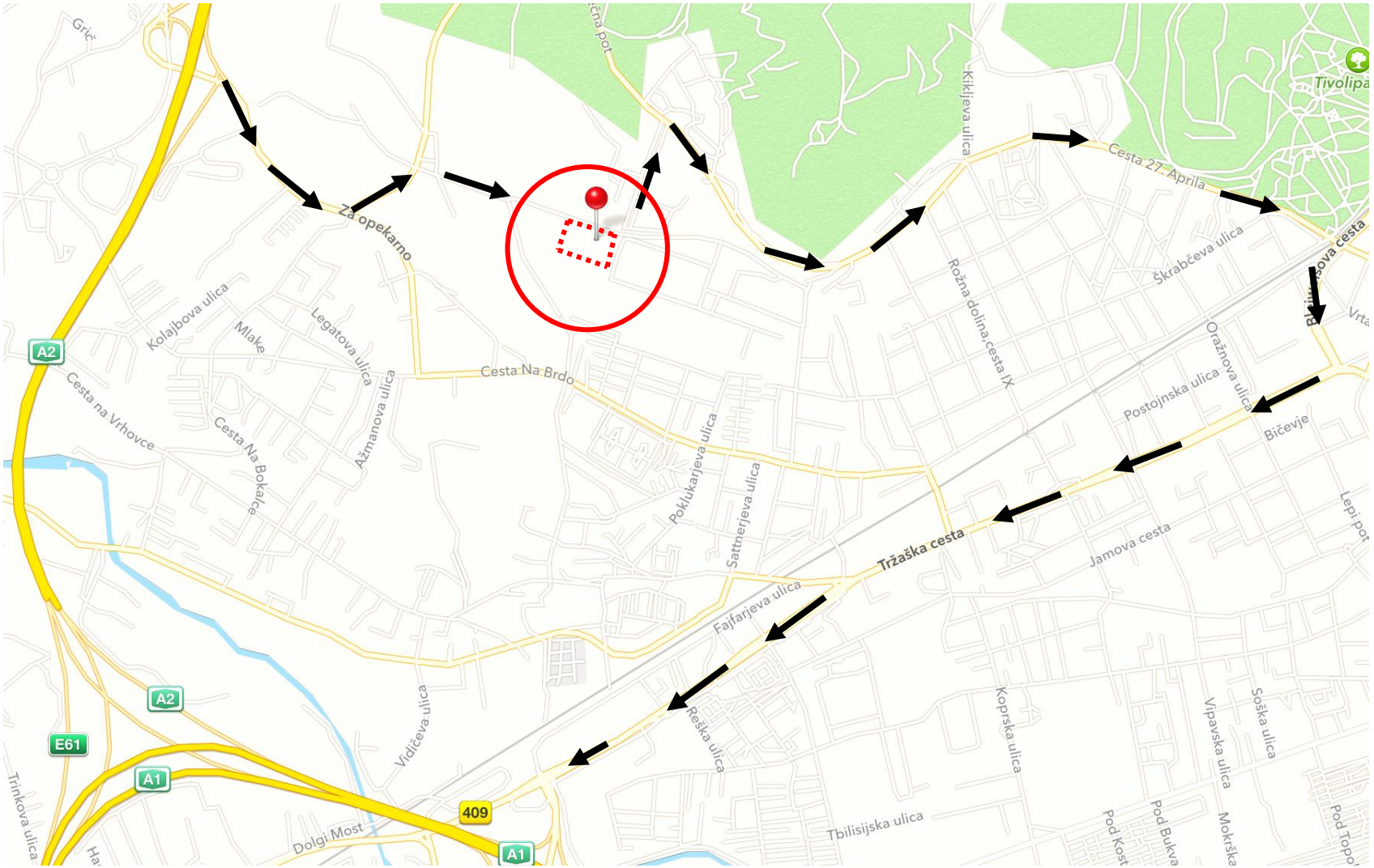


Decision Matrix	Berm	Portable Fence
Positives	• Low maintenance • Increases floor to floor height	• Prevents higher flood • Manufacturer reliability
Negatives	• Supplementation in extreme weather • Disturbs site	• Installation time • Requires storing on site
Cost	$190,000	$193,200

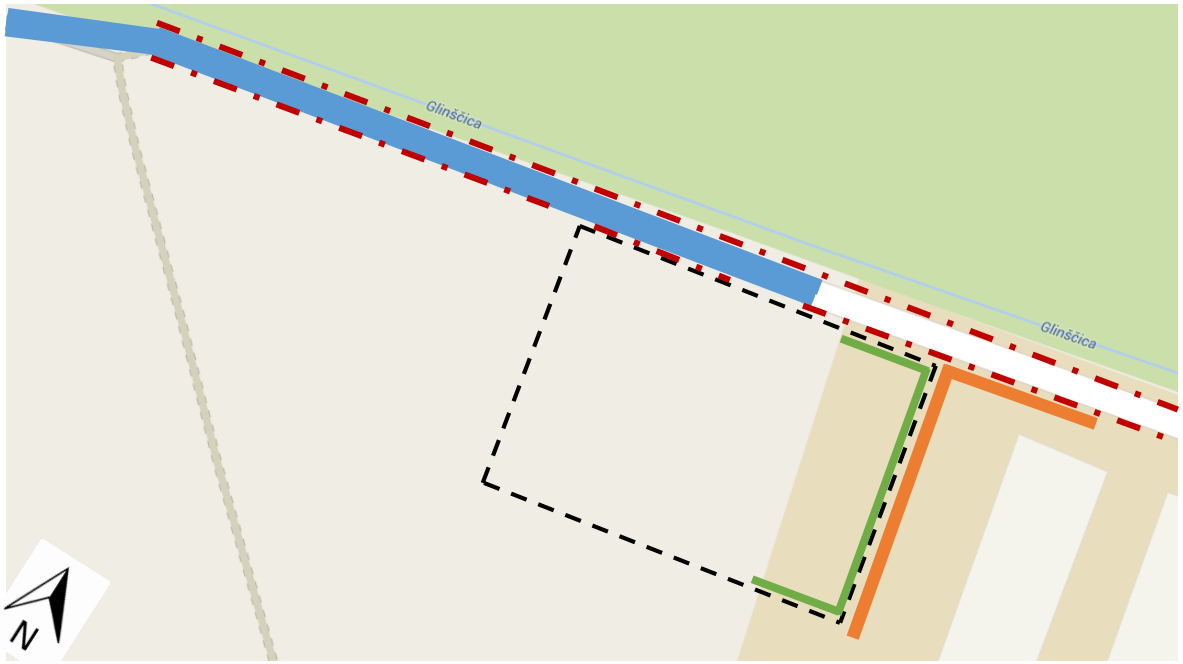
4D MOVIE



OFF-SITE LOGISTICS



COORDINATION WITH PUBLIC



Permable road

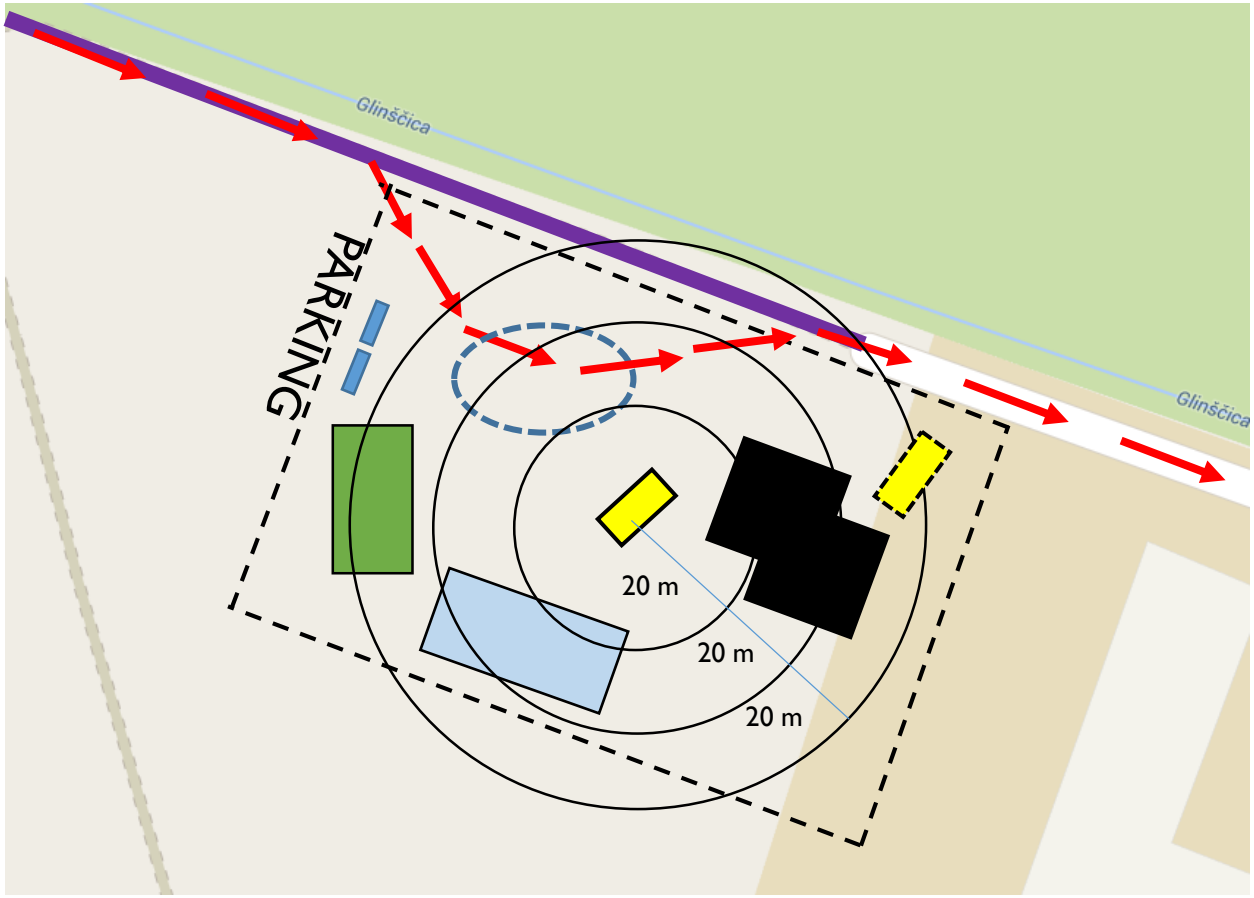
Silt fence

Fence

Construction Sound barrier

Pedestrian protection

ON- SITE LOGISTICS



Fence

Permable road

Traffic flow

Unload area

Trailers

Equipment & Material

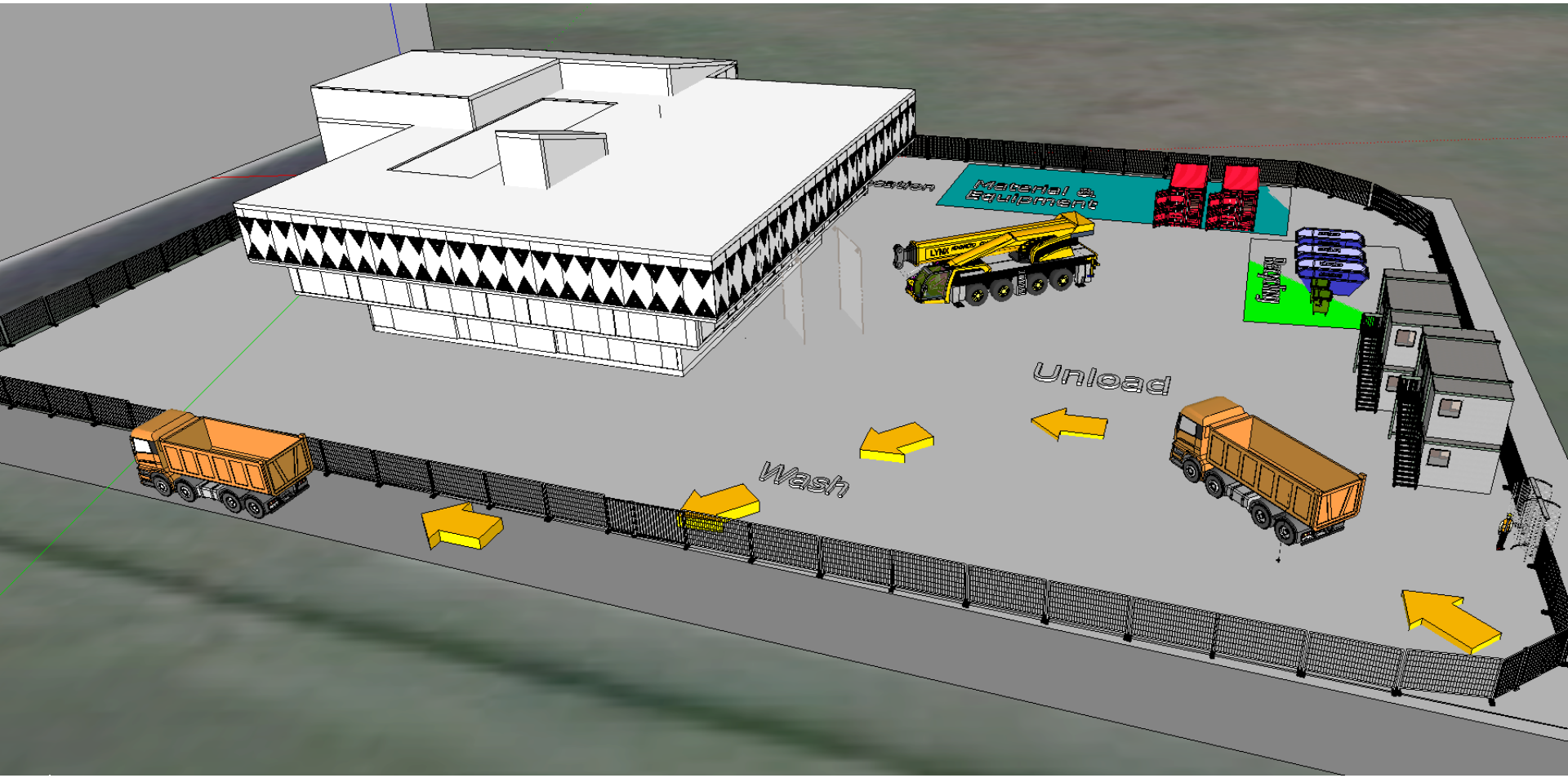
Recycling area

Mobile crane

Potential location 2nd crane

N

ON-SITE LOGISTICS



CLEAN DIESEL CONSTRUCTION DOCUMENTS

Benefits

- Health of project employees
- Limit intake impact to neighboring buildings
- Contributes to LEED rating
- Reduction of cost

Implementation

- Reduction of idling
- Modifying equipment to use clean fuel
- Include performance requirements in contracts
- Educate employees
- Weekly reporting

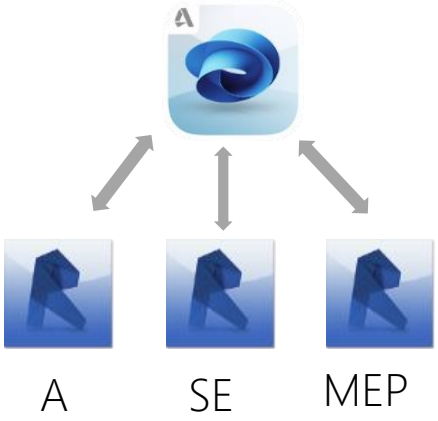
https://www.epa.gov/cleandiesel/clean-diesel-construction-documents

BIM COLLABORATION

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Modeling	Modeling	Modeling	Quality control	Clash detection	Clash resolution	Walkthrough/ Owner sharing

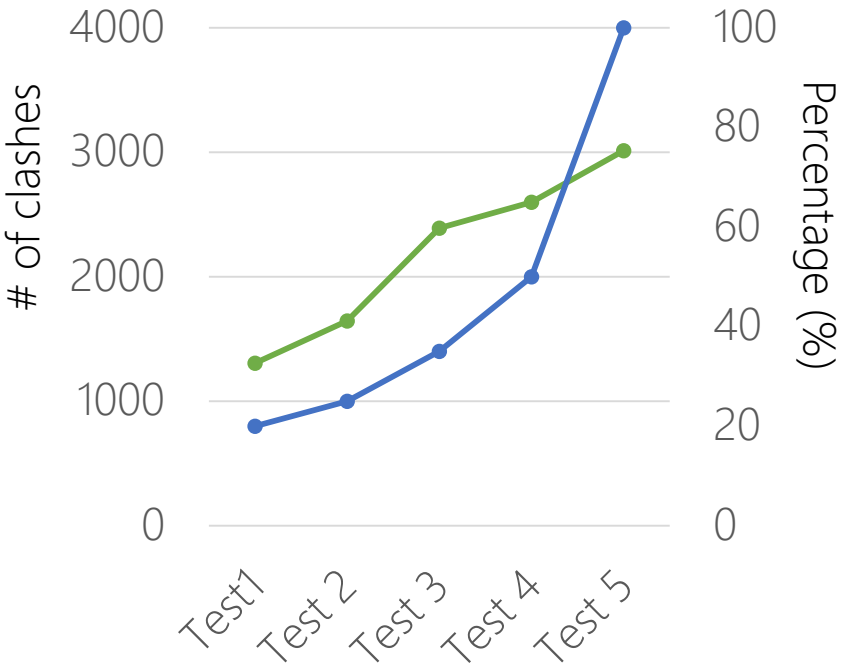
24 hours

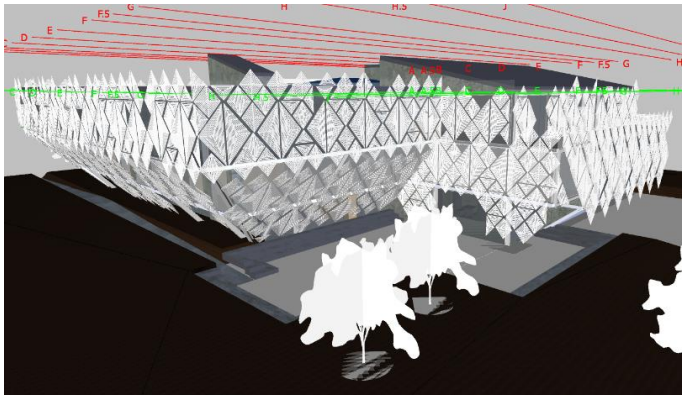
Central model

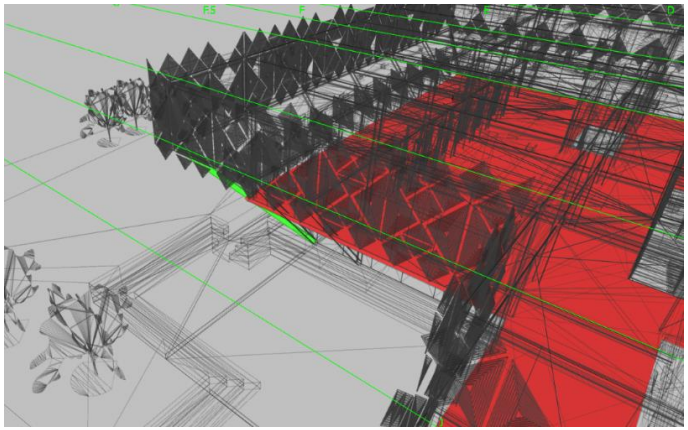


Walk-through

CLASH DETECTIONS



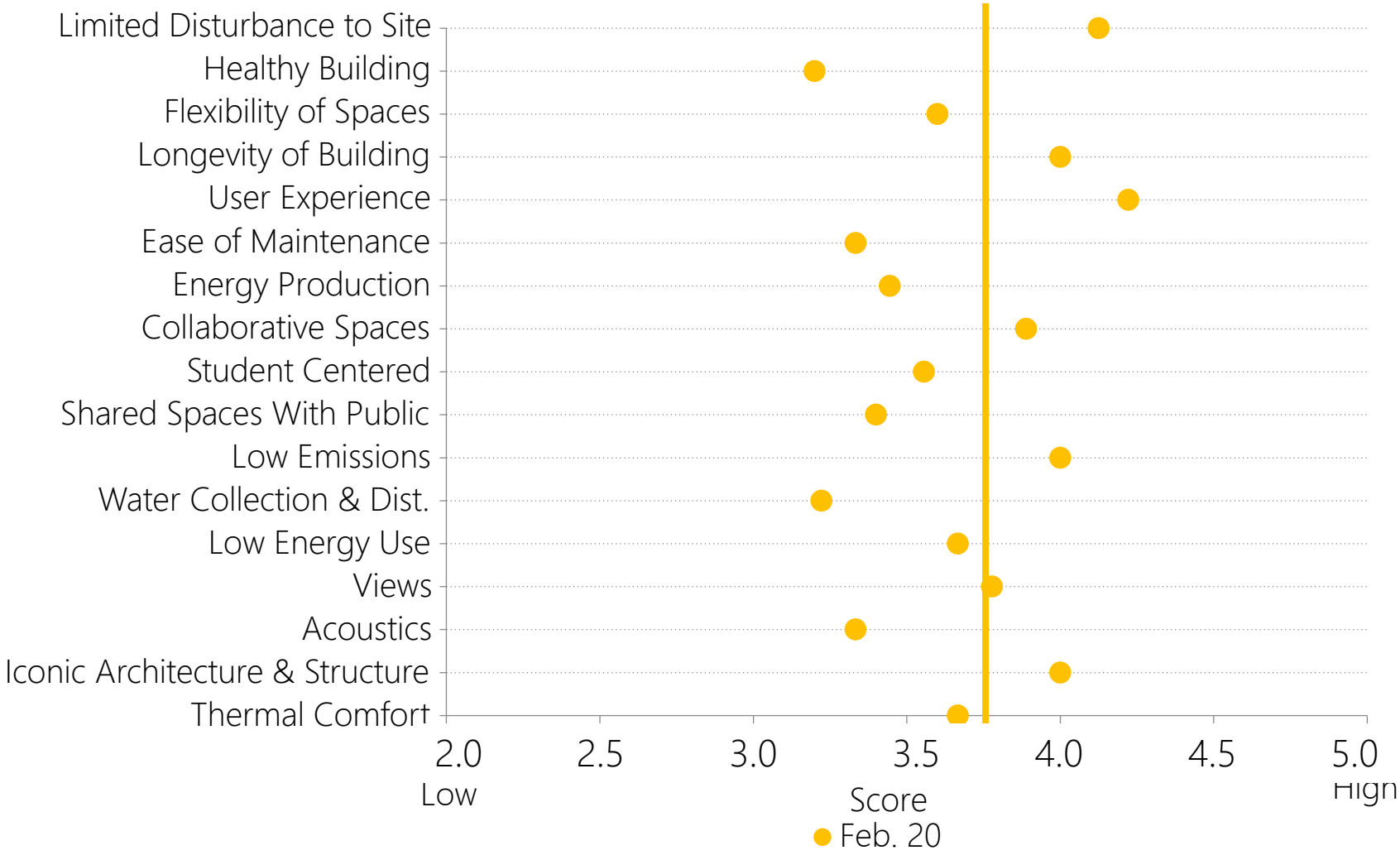




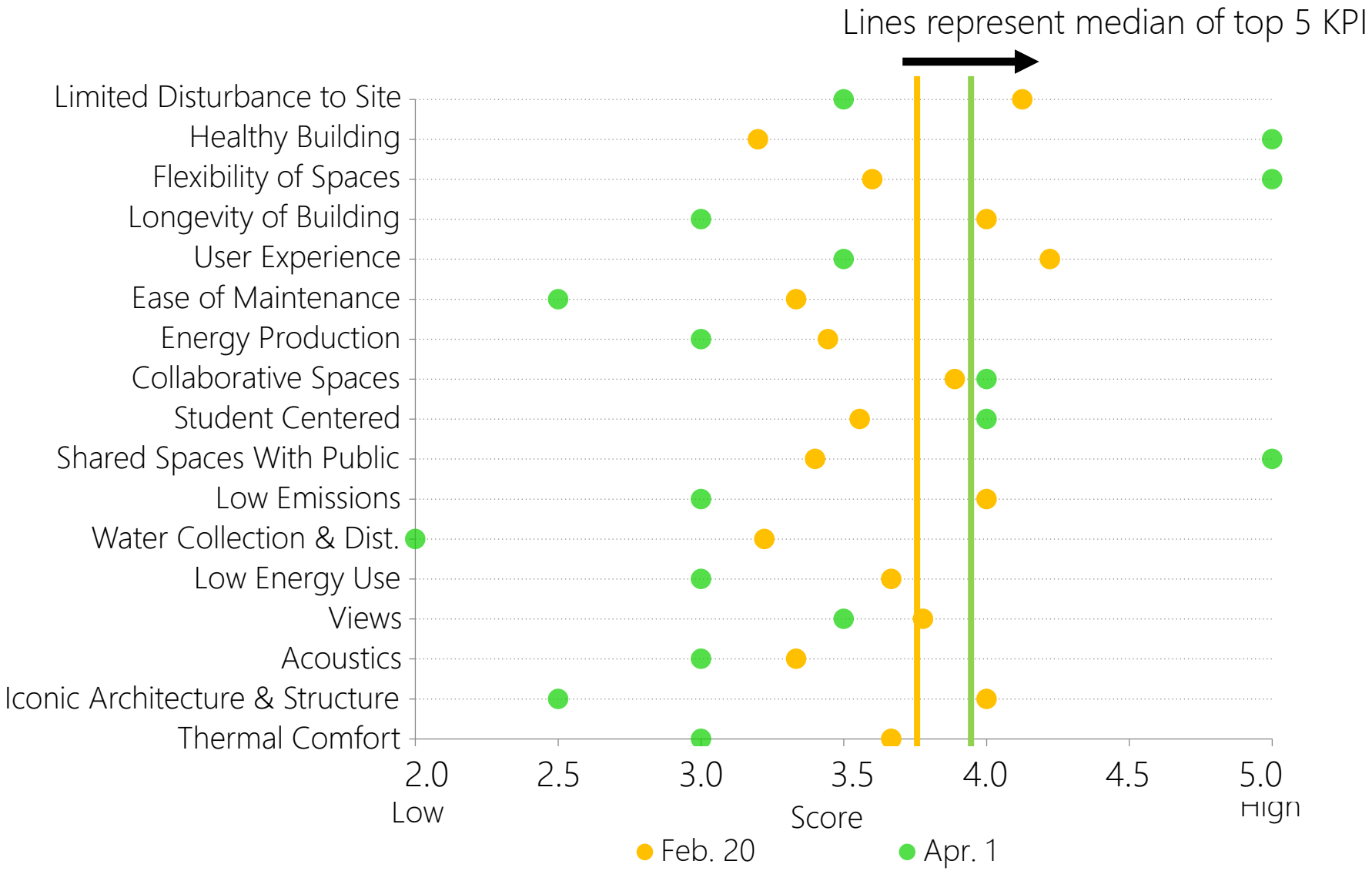
- Clash avoidance through team coordination
- Majority of clashes deemed acceptable

CLIENT AFFINITY

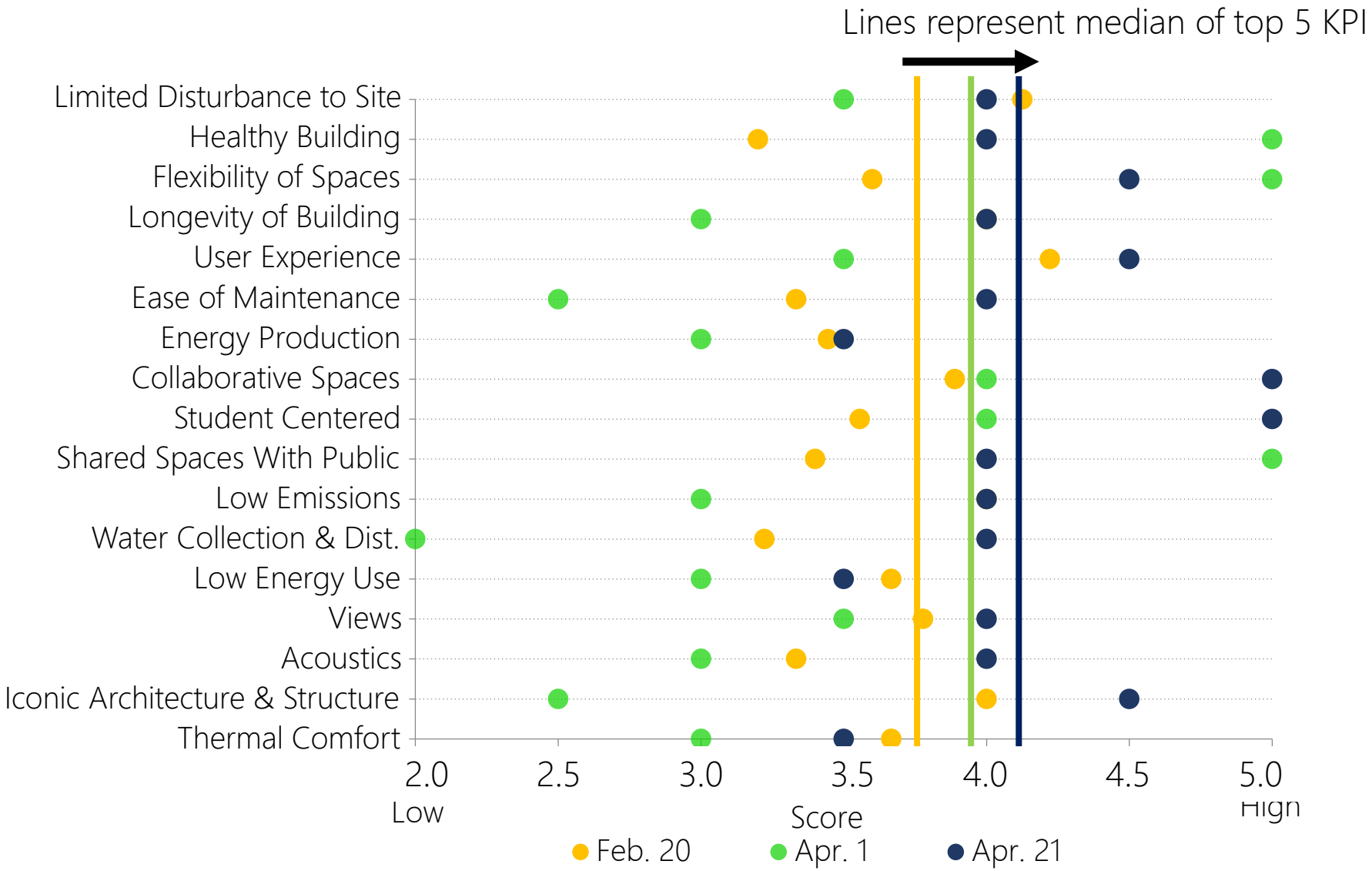
KPI EVOLUTION



KPI EVOLUTION



KPI EVOLUTION



FEEDBACK SURVEY

Please provide any recommendations you have regarding our current design, owner communication, or process.

Good, could engage more with owners on Sunday meeting, i.e. ask questions: do look like that or this?

Do you read the weekly newsletter?

Yes – 4, No - 0

PERSONALITY PROFILE

	Age	Areawork of	Most important in a client & constractor relationship	Favorite sport	Favorite food
Anja	31		Trust, Honesty, Listening		
Robert	25		Transperency, confidence, responsibility		
Thomas	23		Trust, Communication and Transperency		
Ethan	26		Trust, Agreement and understanding of expectations, common goals		
Kourosh	27		Having the goals reminded in each meeting, clear communication, value for client		

DIALOG WITH OWNERS

Thomas Trinelle 21.4.2016 19:43

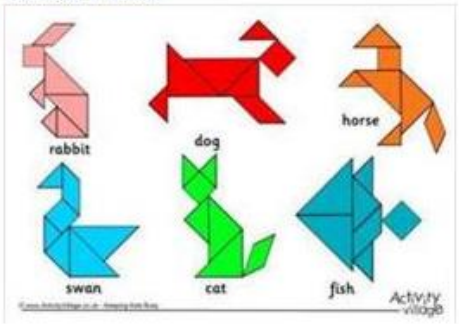
Yo I had a crazy idea

You know that game Tangram? The one I told you about where you move the triangle around and it makes different shapes ?

Why can we do that for the facade? I mean it's so easy to assemble the panels, you could change them over time, change their color size etc

Thomas Trinelle 21.4.2016 19:45

Thomas Trinelle 21.4.2016 19:46



Sara Lavtar 21.4.2016 20:16

Hm, I'm not sure actually 😬 I'll sketch out a bit, but no promises 😬

Thomas Trinelle 21.4.2016 20:23

The last pictures I sent you were the Tangram game.

I'm just saying if the facade is so easy to assemble

It's as easy to change. Like your walls...

Sara Lavtar 21.4.2016 20:28

Oh thats what you ment ... yeah I could follow that idea 😃

Thomas Trinelle 21.4.2016 20:57

Yeah no don't draw ducks or rabbit on the facade hahahah

please no

Sara Lavtar 21.4.2016 21:54

hahaha ok good

i dont know how crazy you are, so ...

Thomas Trinelle 21.4.2016 22:18

Hahaha one idea though is since the panels are laser cut you could drawn letters in them for events or something

NEWSLETTER

Items Needed from Ownership

Items for Review by Ownership

Summary of Our Progress

Item	Impact to Ownership & Justification
2nd Concept Development	Owners noted the need for the team to design as a whole and we responded by developing our second concept in a 2-hour group session. The concept took inspiration from the local Kozolec construction, site orientation from the educational and agriculture surroundings, and program adjacencies from diagramming efforts.

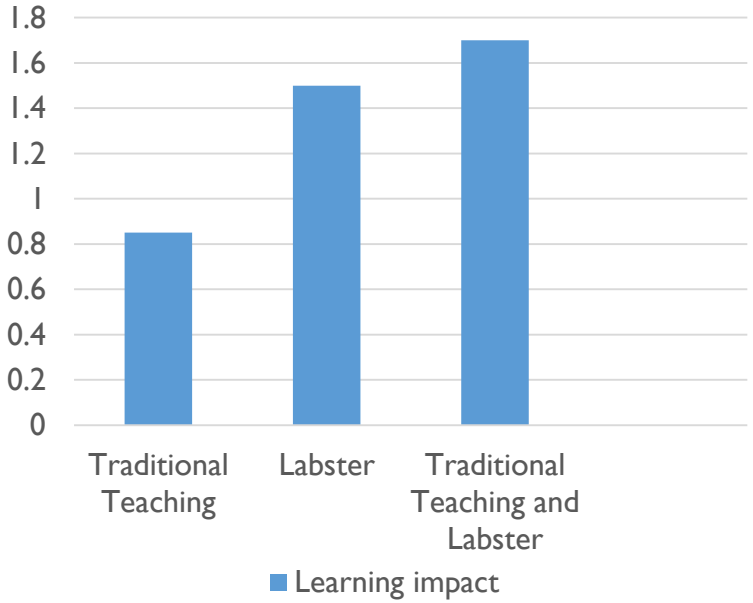
Incorporating Owner Feedback

Comment	Follow Up
KPI indicated low understanding from ownership of energy performance	Nick has reviewed LEED standing and received team feedback. Mikki is developing analyses to share.

INTERACTIVE WALL

VIRTUAL REALITY IN EDUCATION

- Engagement in classroom
- Increased learning impact
- Decreased costs



(Michael Bodekaer, 2015)

IMMERSIVE EXPERIENCE - OWNERS

Oh, this render is amazing"

What kind of material is this?

IAQ Sensors

Problem

- Data on Indoor Air Quality – Hard to obtain
- Standards of ventilation rates are based on static user behavior

Research of building data

- Data sets for the past year can be dynamically accessed

IAQ Sensors

Problem

- Data on Indoor Air Quality – Hard to obtain
- Standards of ventilation rates are based on static user behavior

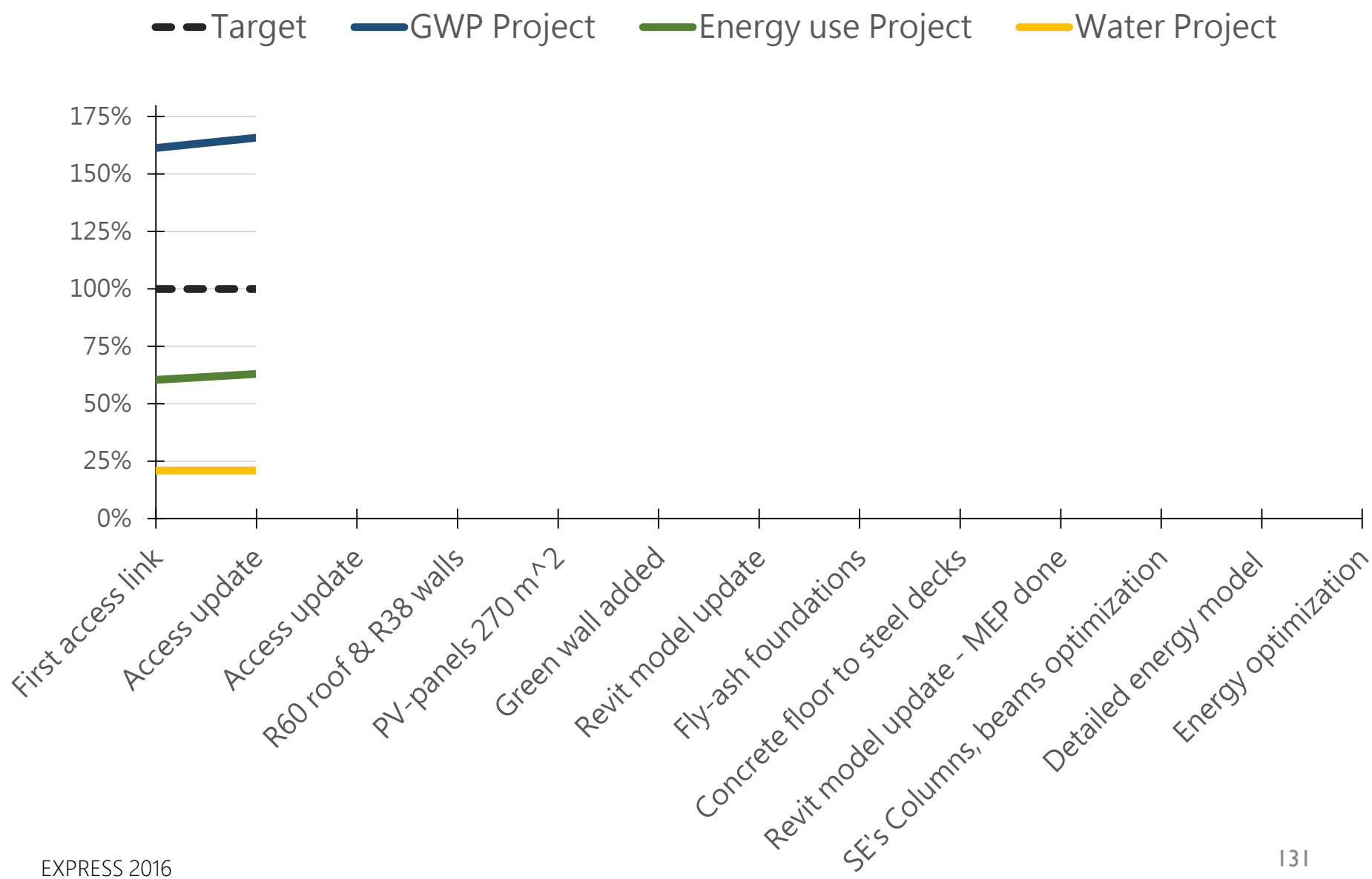
Research of building data

- Data sets for the past year can be dynamically accessed

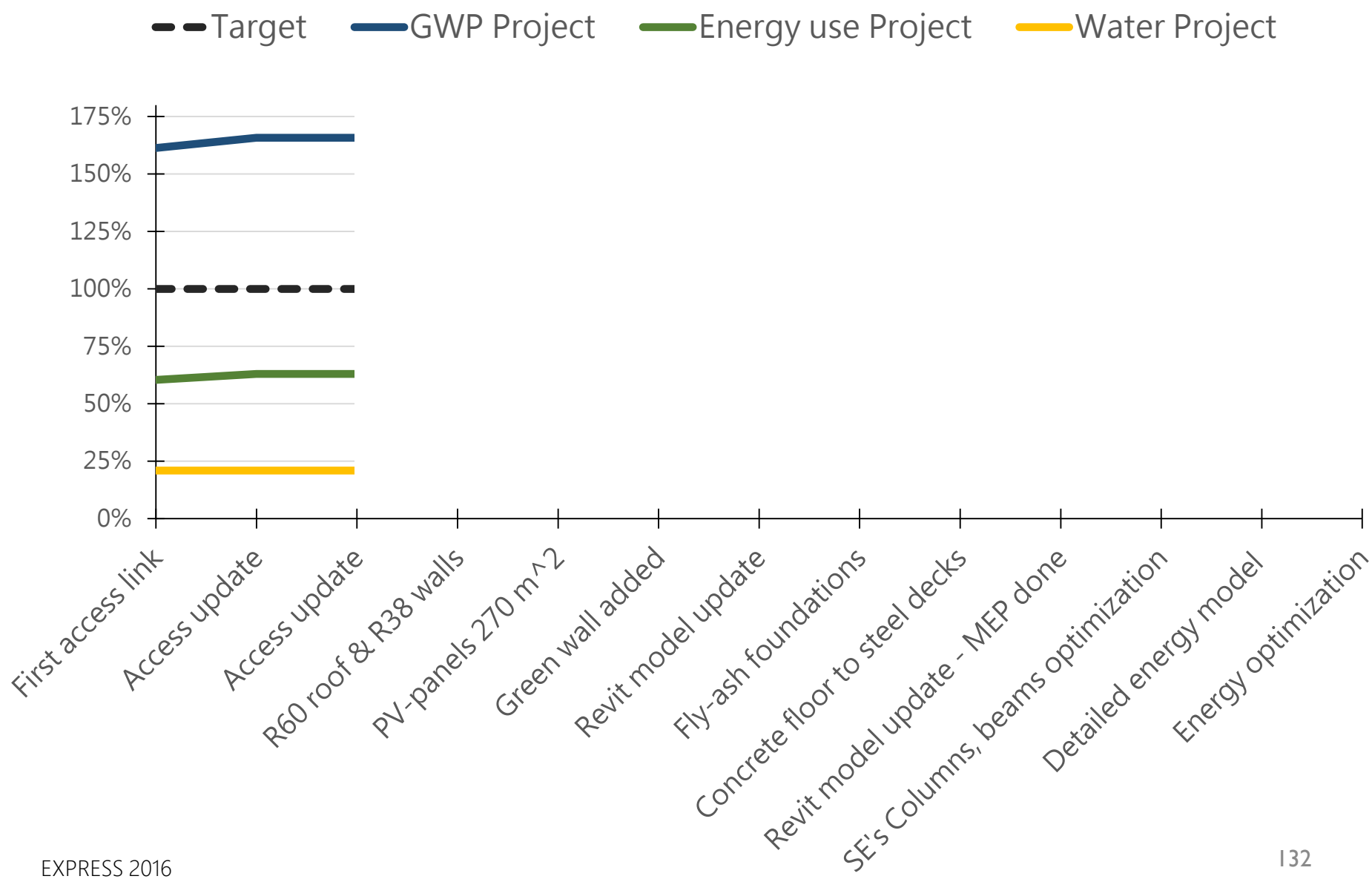
We want to provide better IAQ for the future!

RESULTS

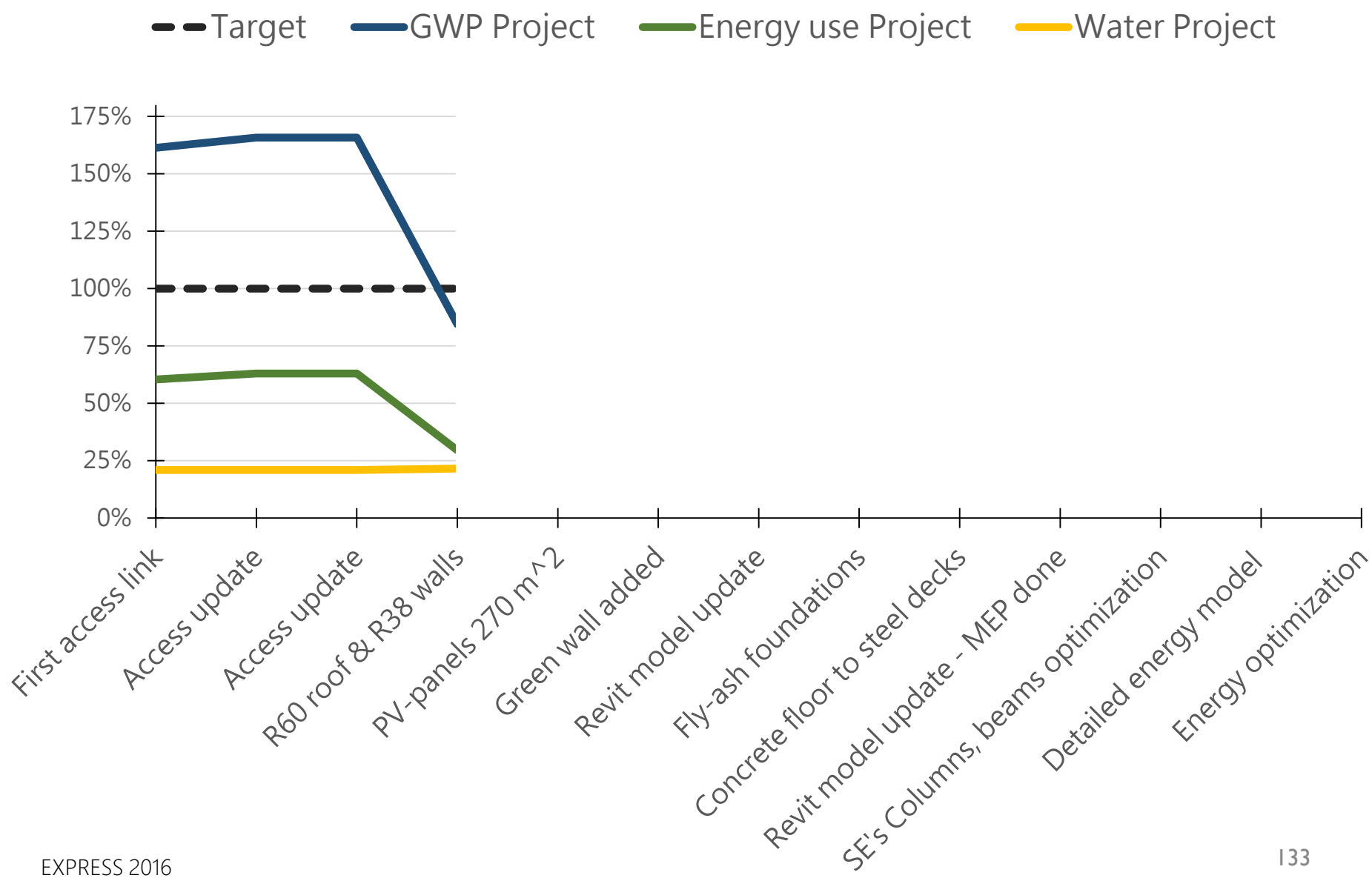
STV – ACCESS LINK



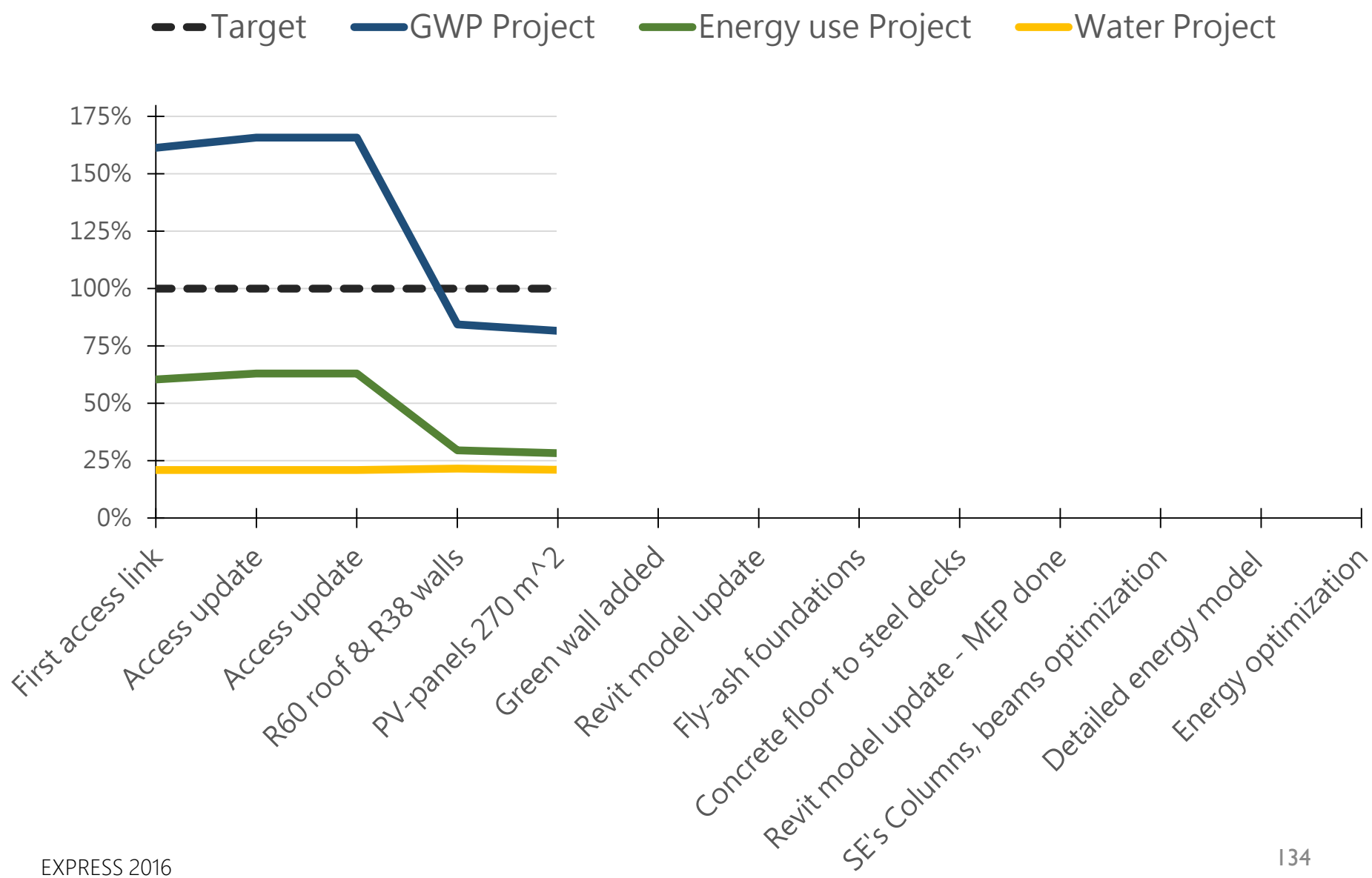
STV – BIM UPDATE



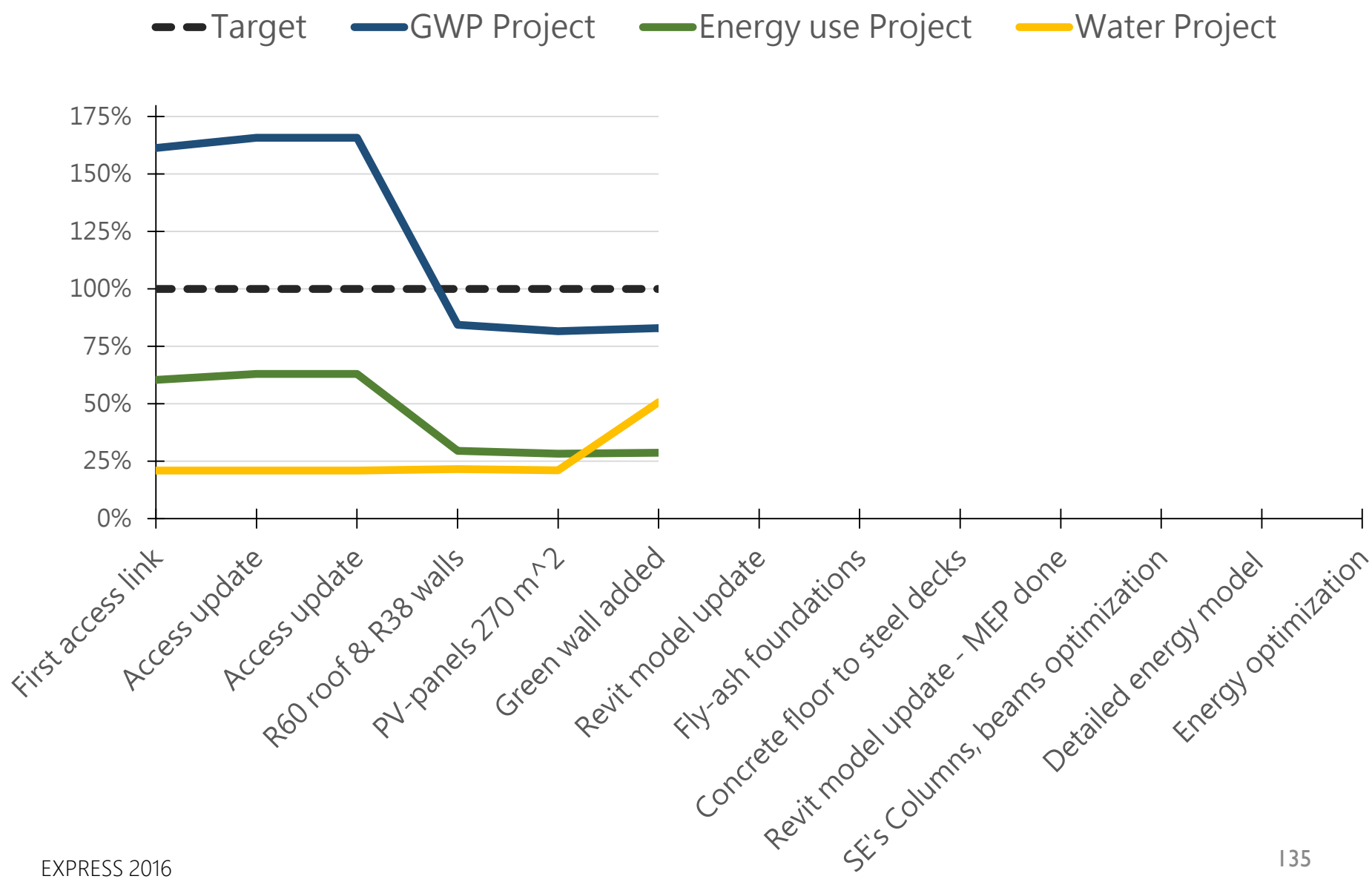
STV – ENVELOPE UPDATE



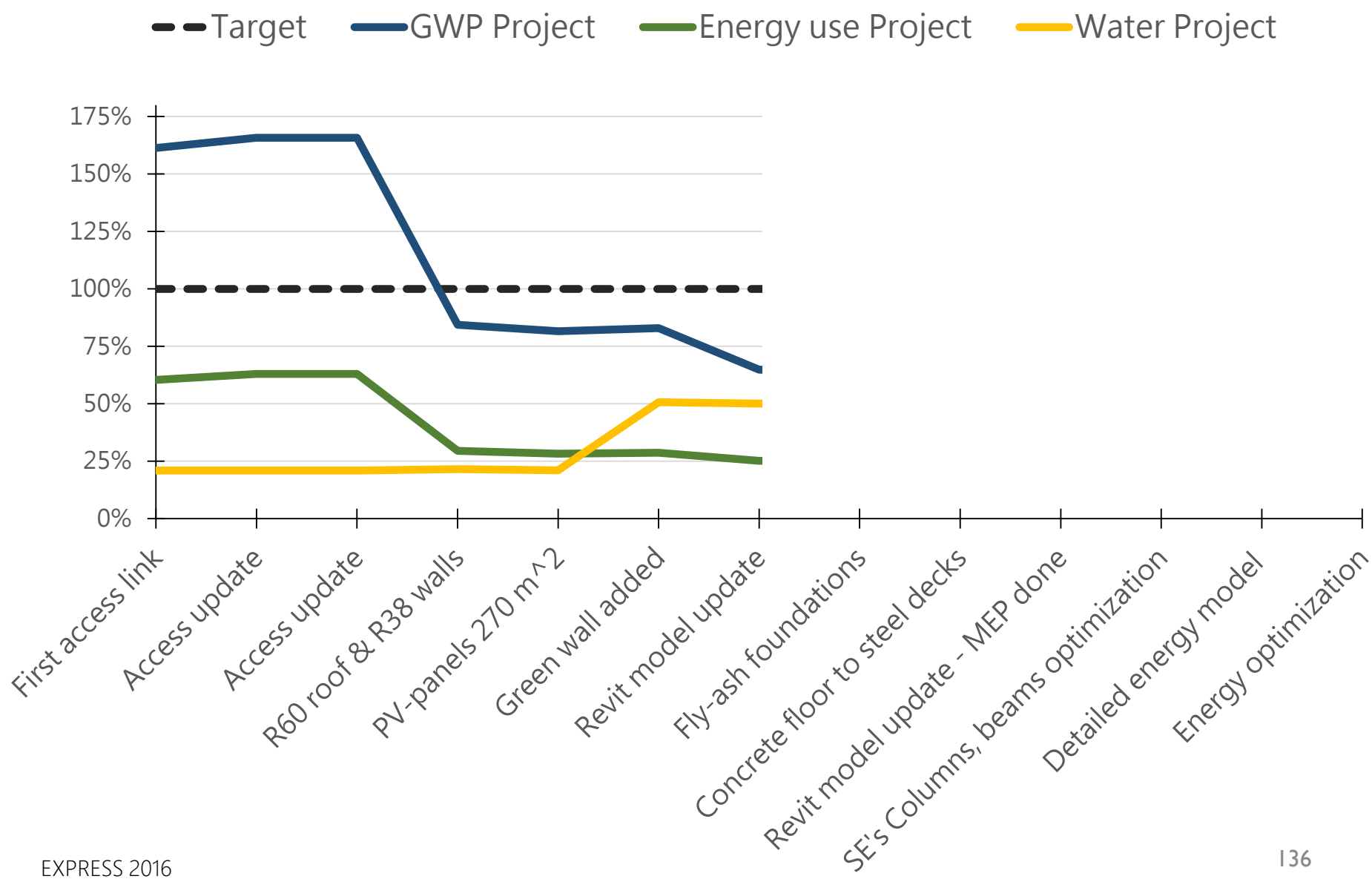
STV – PV PANELS



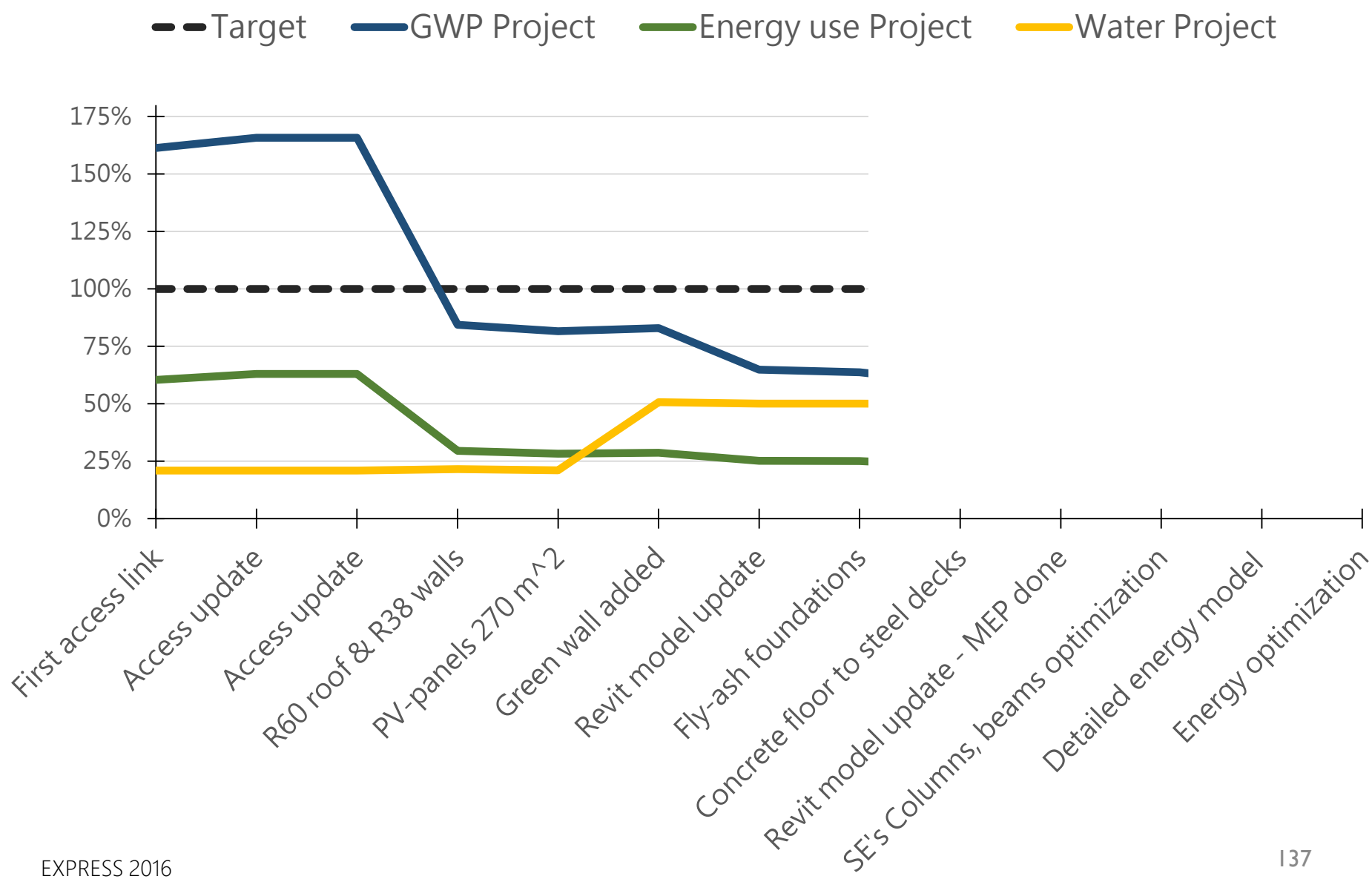
STV – GREEN WALL



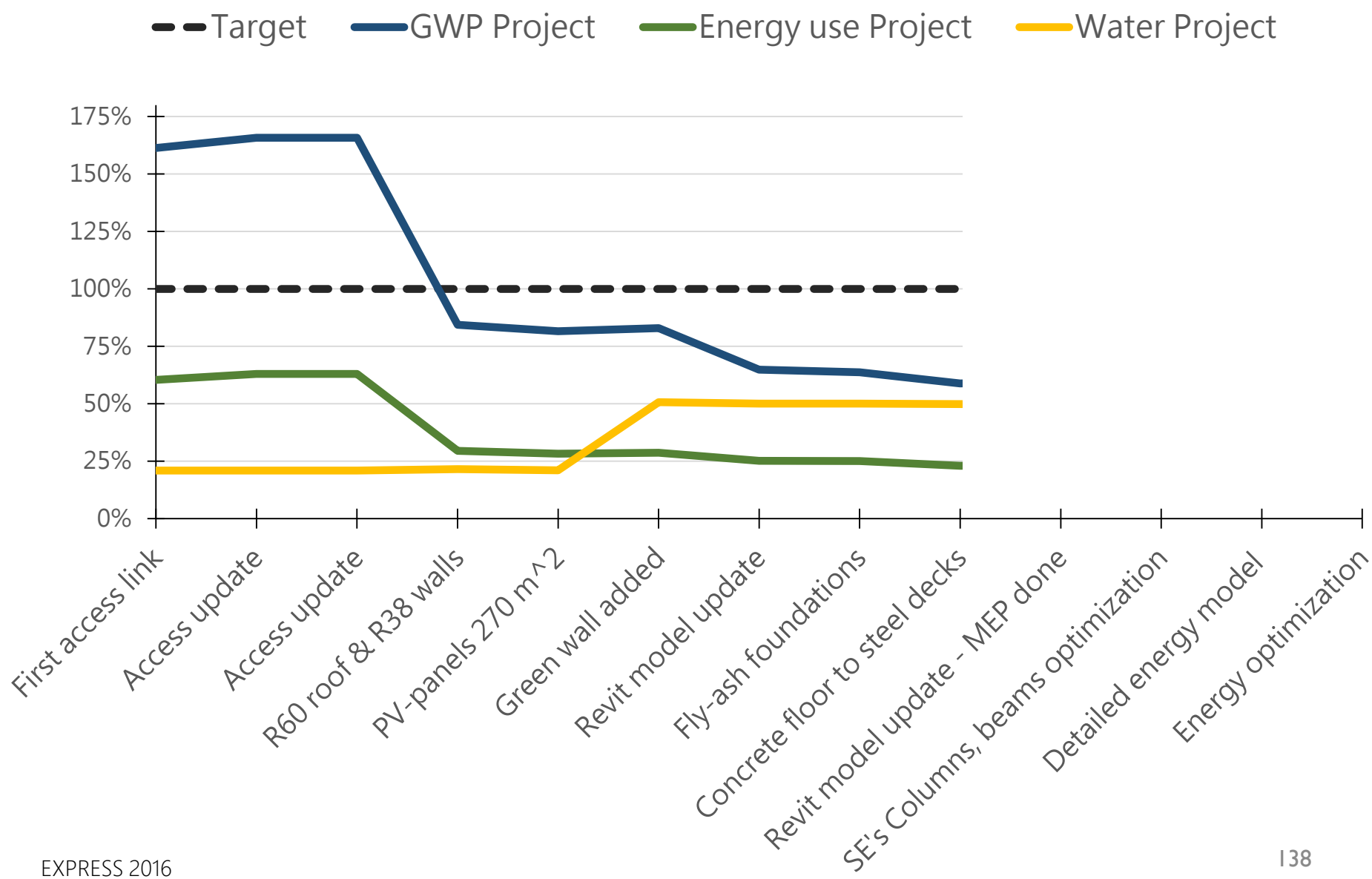
STV – BIM UPDATE



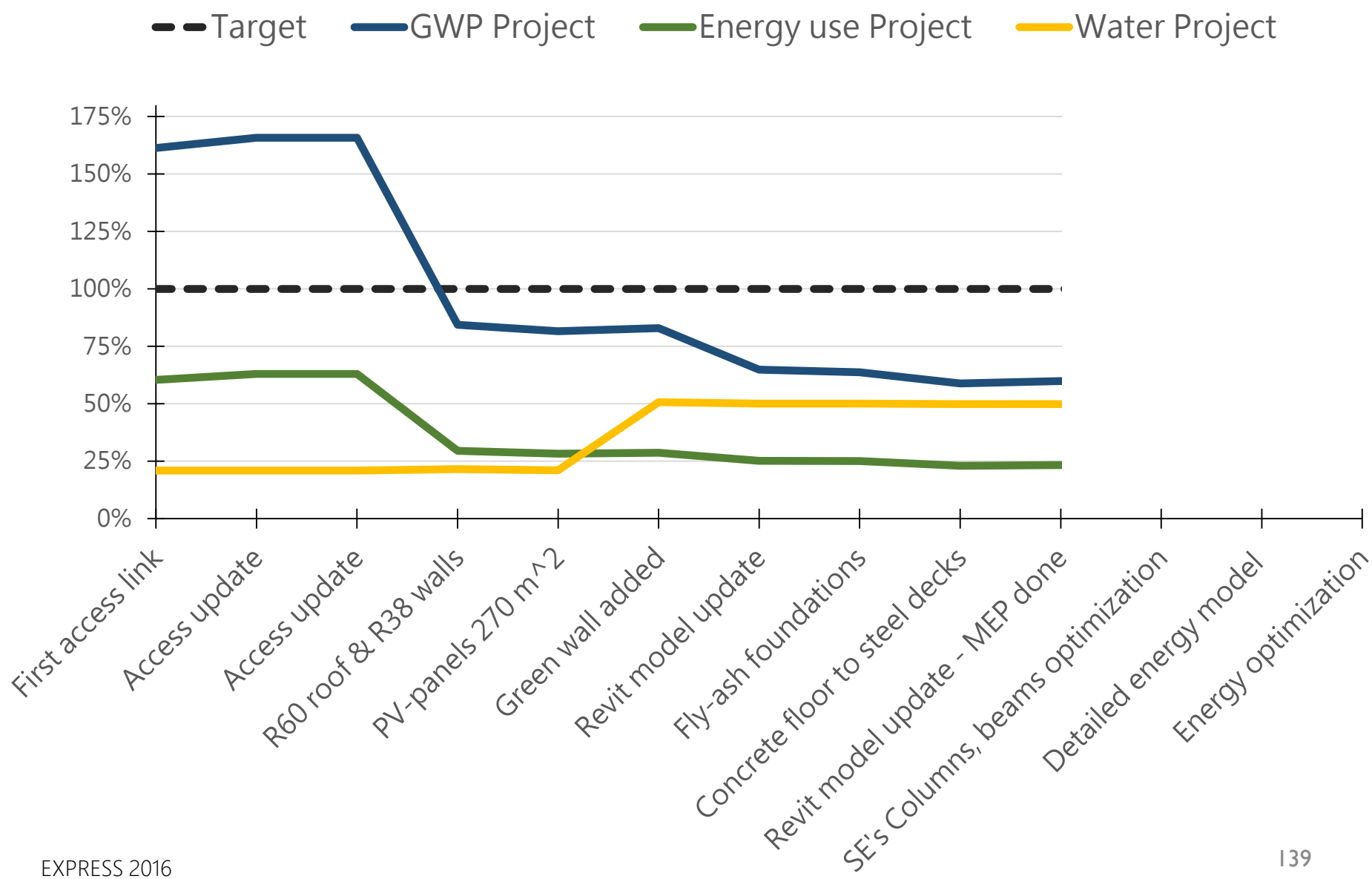
STV – FLY-ASH CEMENT



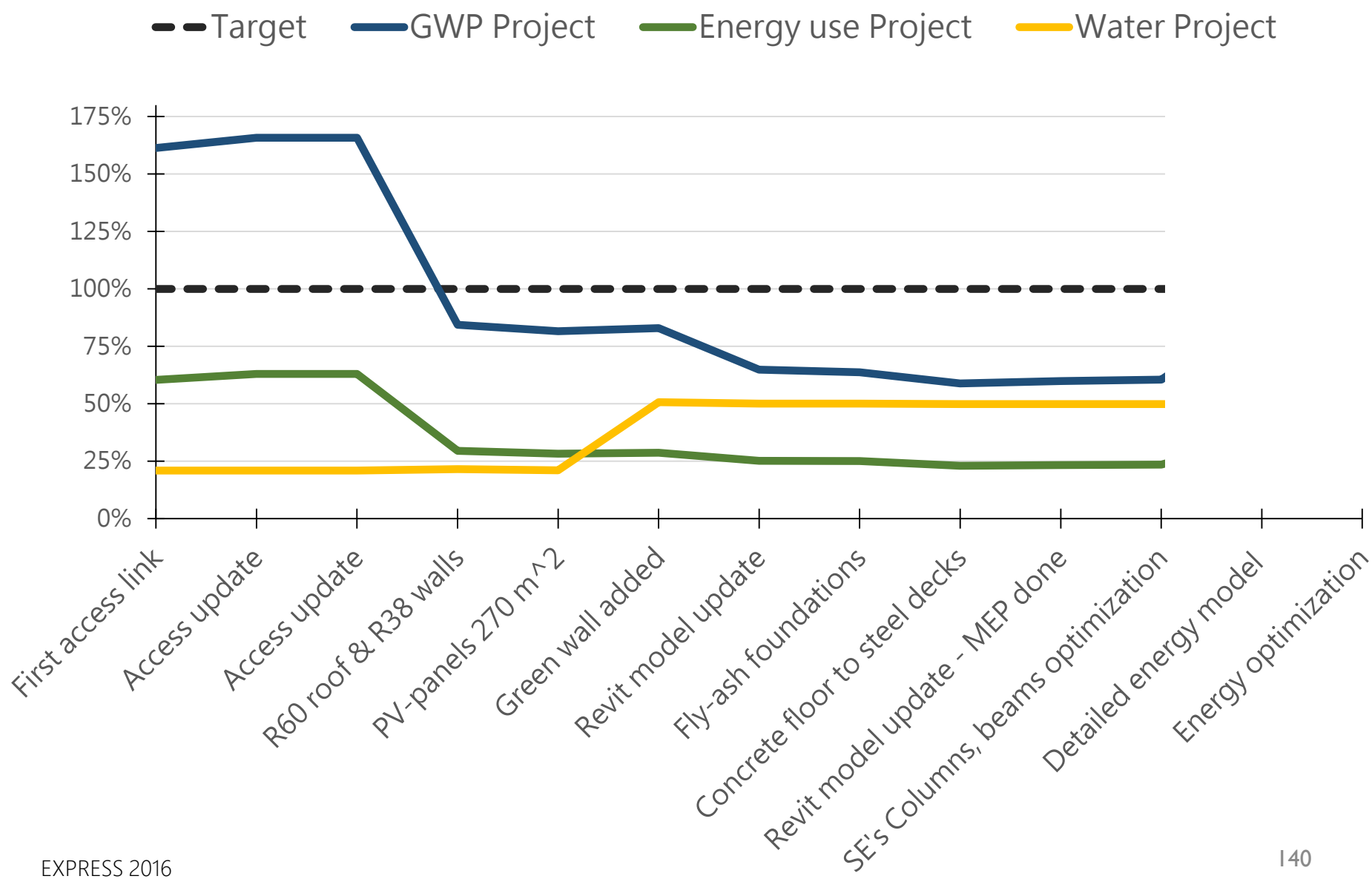
STV – STEEL DECKS



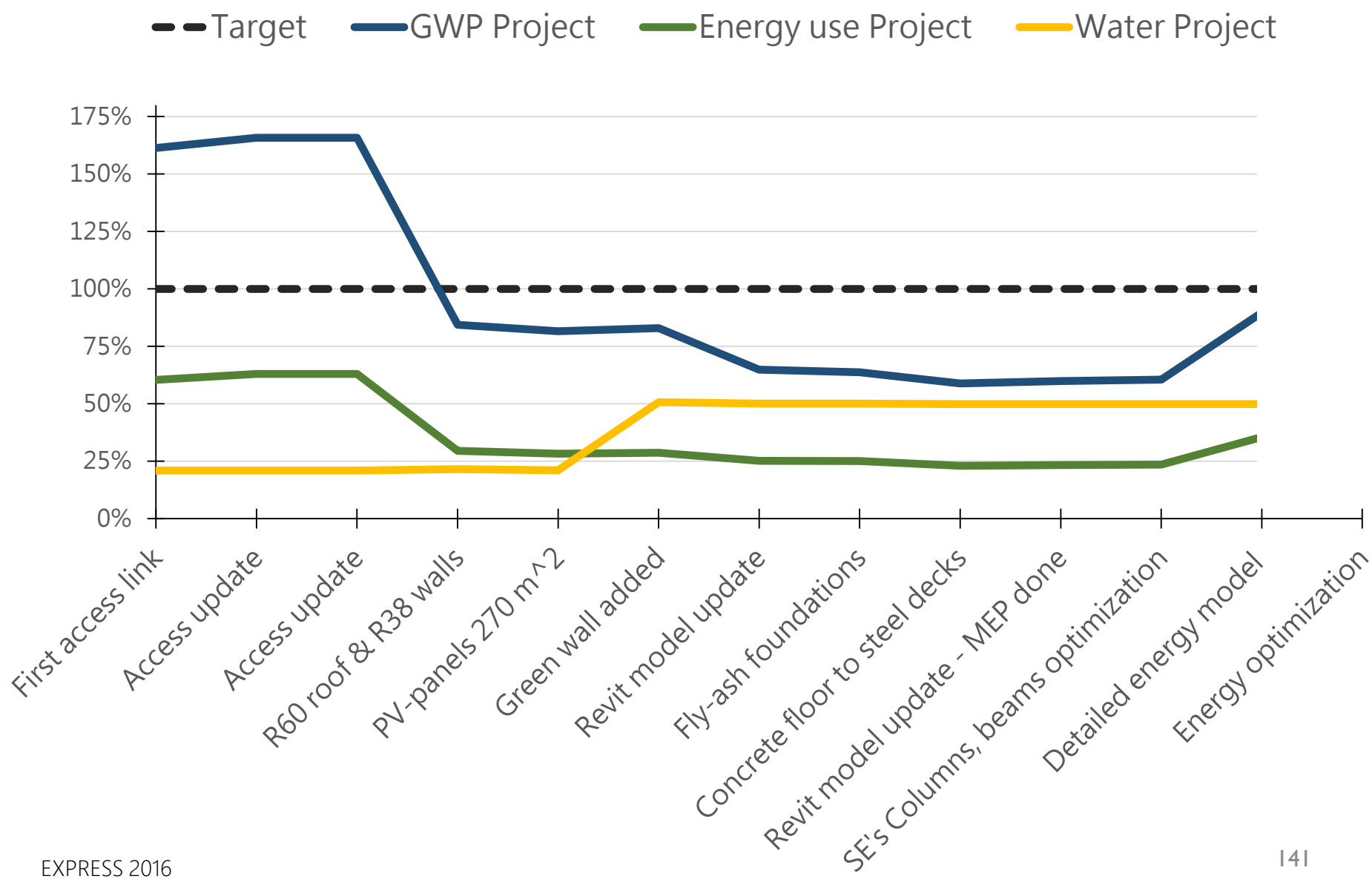
STV – MEP BIM UPDATE



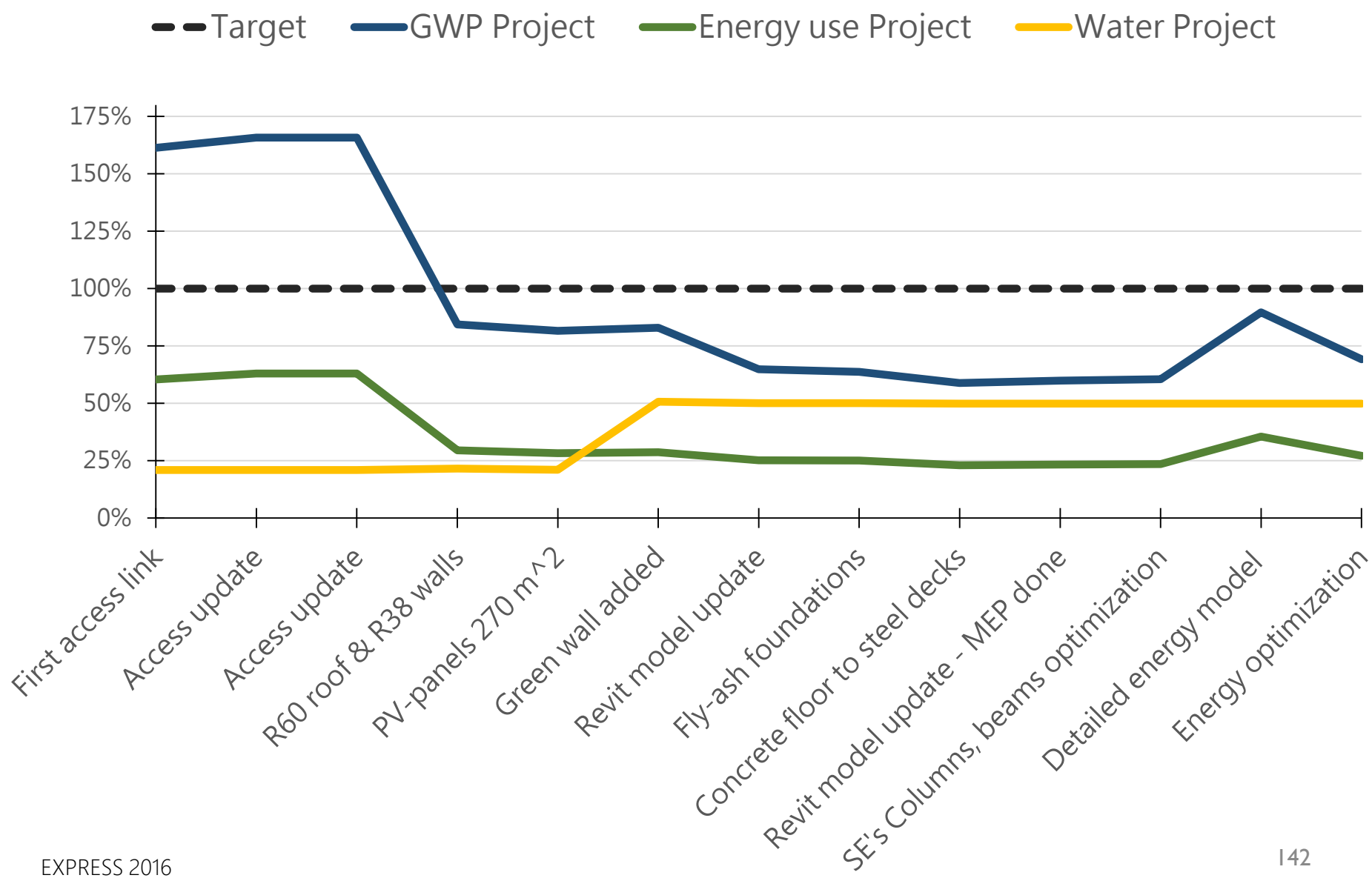
STV – SE OPTIMIZATION



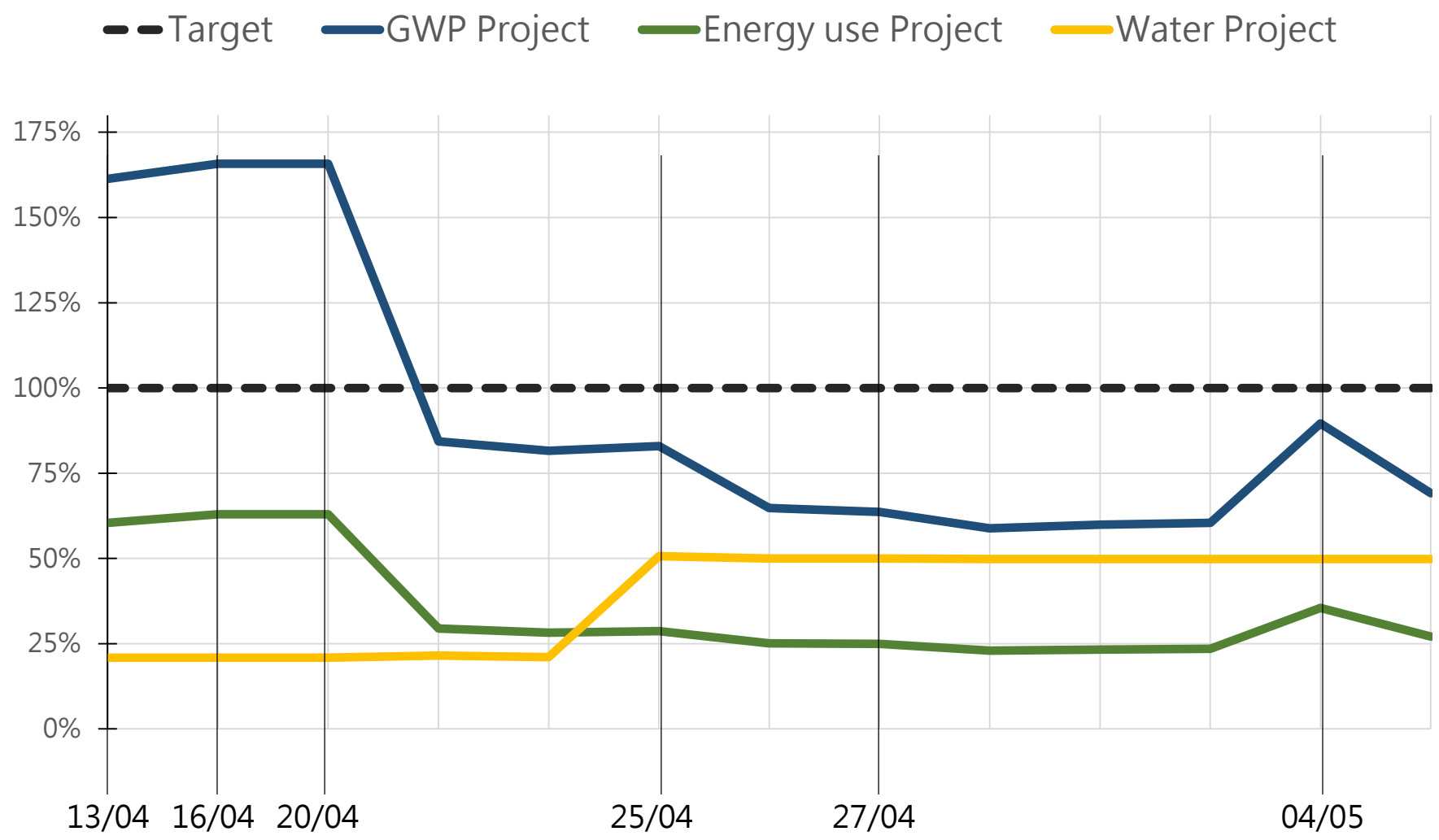
STV – ENERGY UPDATE



STV – ENERGY UPDATE

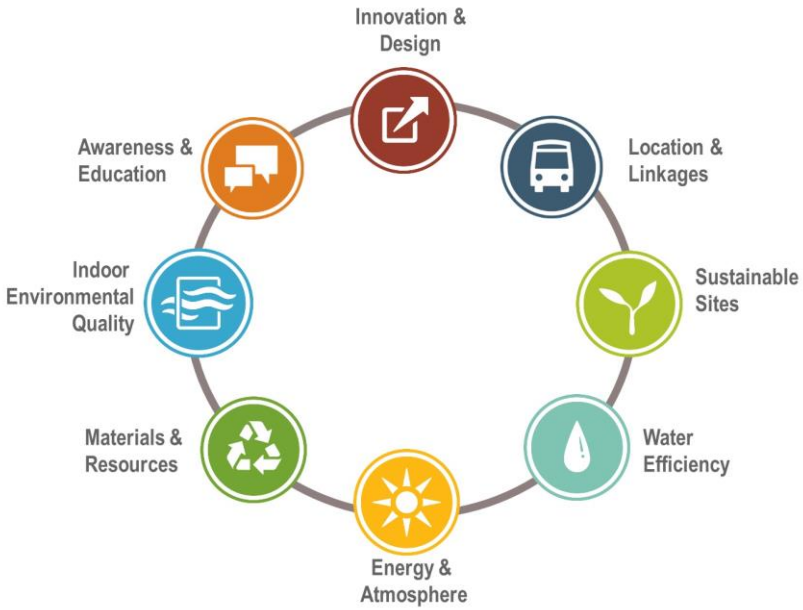


STV EVOLUTION



LEED RATING OUTCOME

CATEGORY	POINTS
Location & Transportation	2 / 16
Sustainable Sites	8 / 10
Water Efficiency	5 / 11
Energy & Atmosphere	18 / 33
Materials & Resources	4 / 15
Indoor Environmental Quality	15 / 16
Innovation & Design	3 / 6
TOTAL	55 / 110



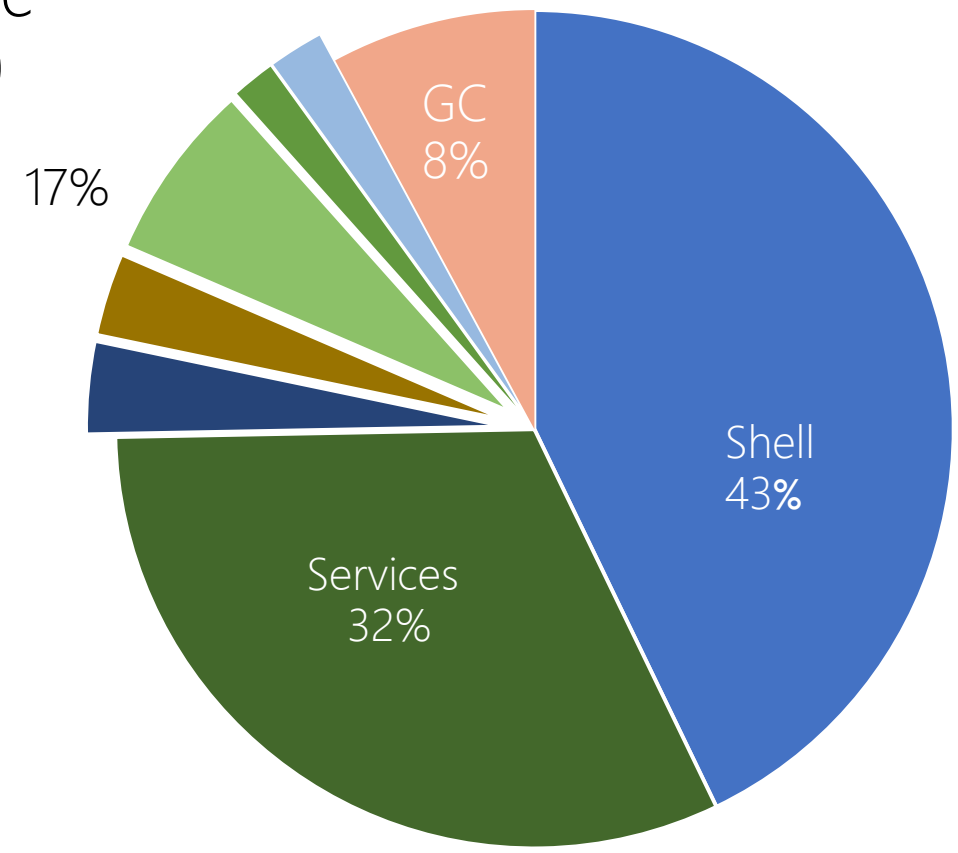
LEED SILVER ACHIEVED!

TVD BUDGET ALIGNMENT

COST DISTRIBUTION

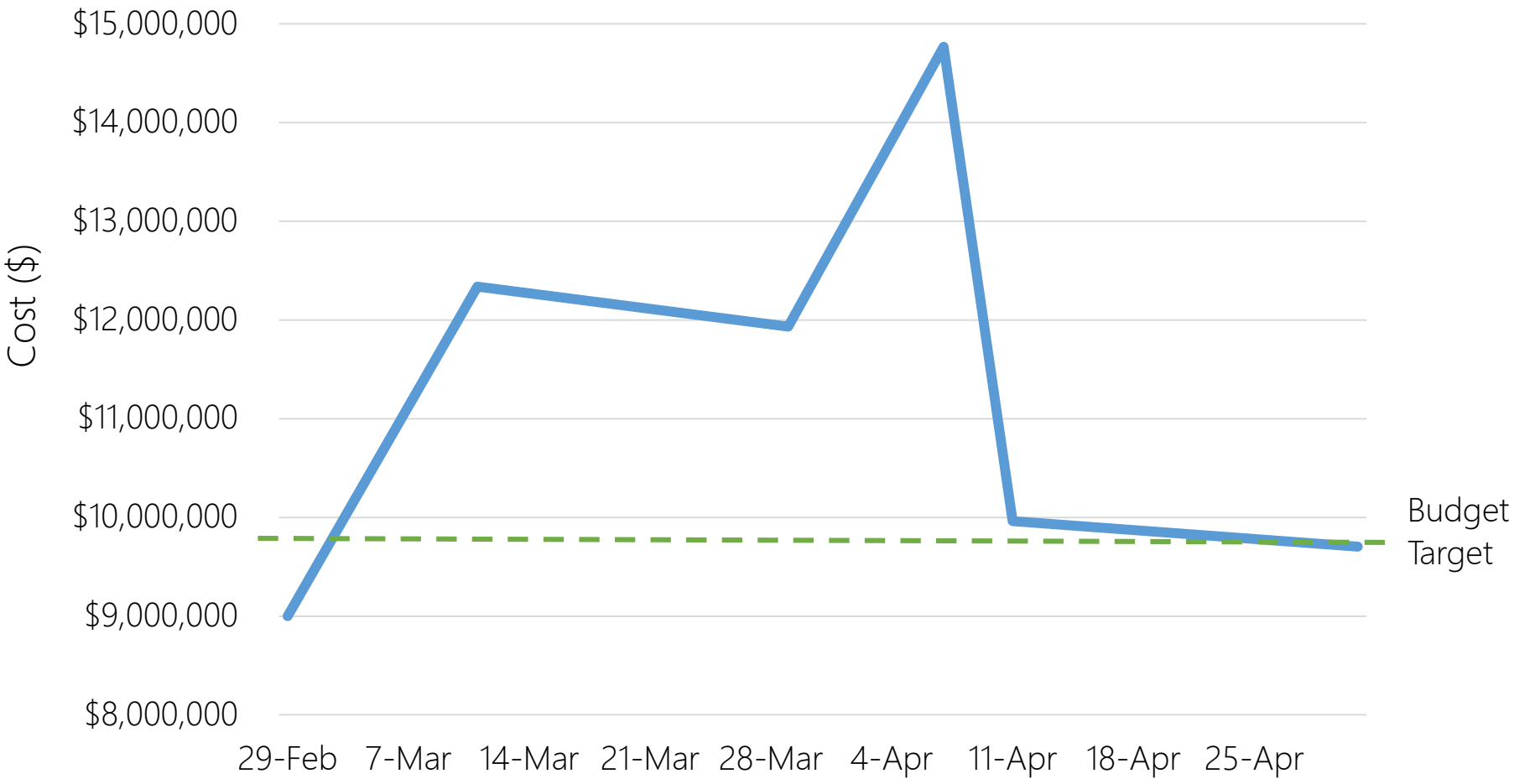
Target value
$9,900,000

Estimated cost
$9,800,000



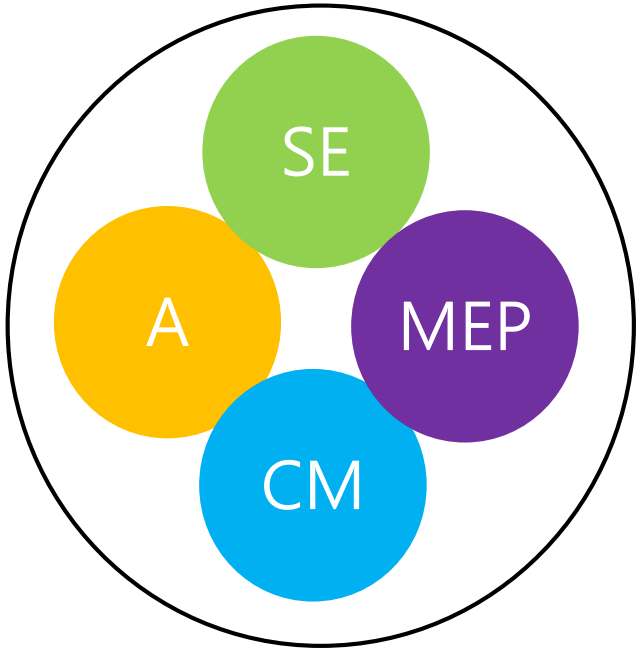
- Shell
- Services
- Equipment & Furnishing
- Speciality Construction
- Building Sitework
- Substructure
- Interiors
- General Conditions

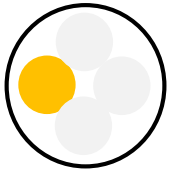
TVD PROGRESSION



CONCLUDING REMARKS

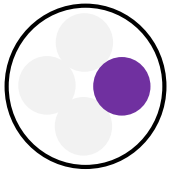
DESIGN SUMMARY



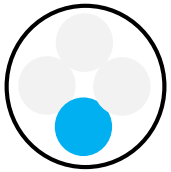


- The game of tangram façade
- Adaptability of space
- Outside-inside-outside

- Systems adaptable to a flexible space
- Minimized exhaust ducting
- Air purifying, self-cleaning façade



- Mega Truss for auditorium
- Additive floor sandwich
- Slanted Columns



- Berm
- Inclusion of VR technologies

CLIENT AFFINITY SUMMARY

Metrics

- Personality profile
- Weekly feedback surveys

Communication

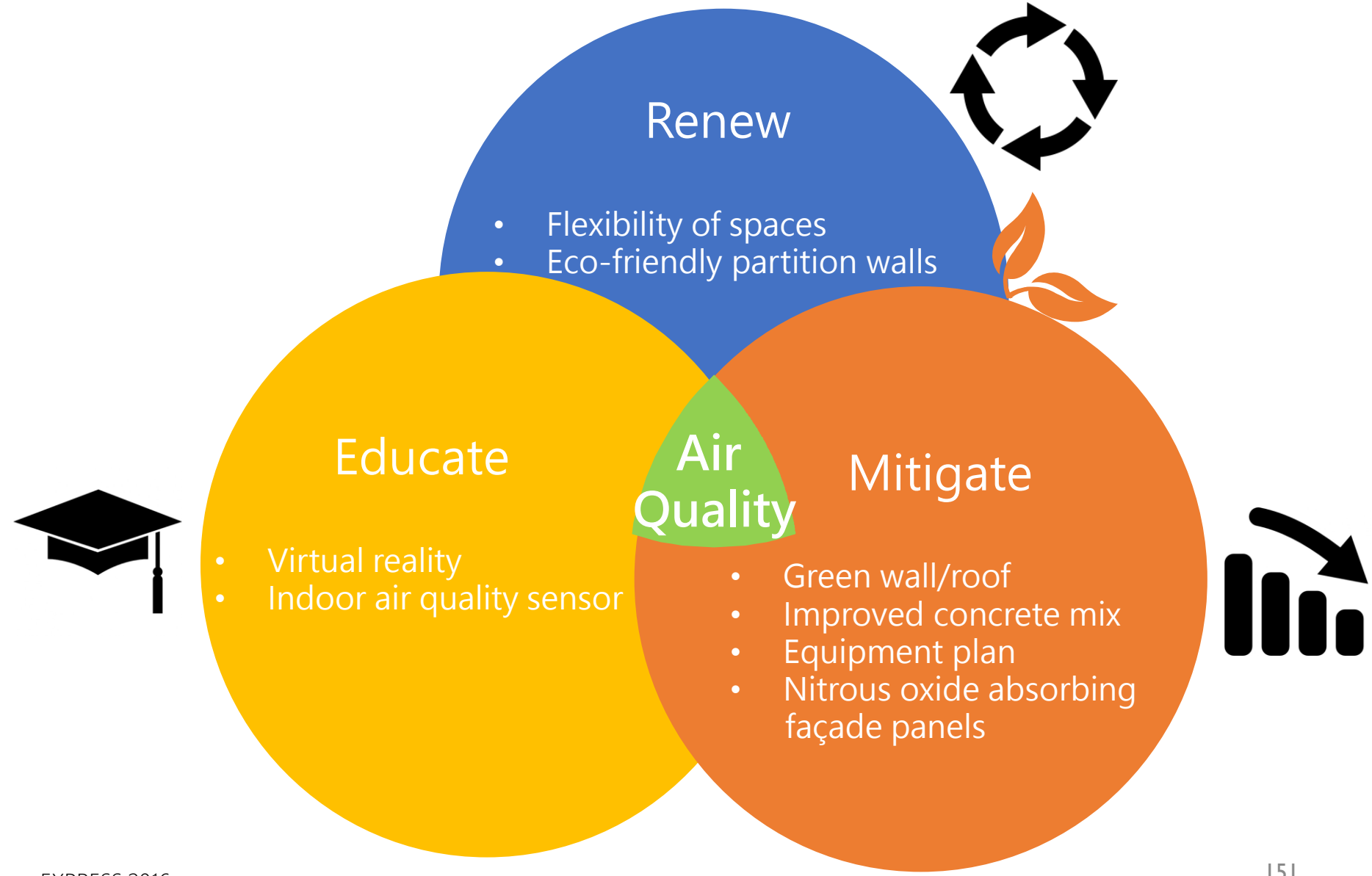
- VR & walkthroughs
- Newsletter

Client Affinity

End User

- Active contribution to building performance
- VR for education

AIR QUALITY SUMMARY



LESSONS LEARNED

Never trust the Revit model!

Nick - SE

Why didn´t you choose the metric?

Sara – A

SE:s can be rough!

Mikki - MEP

MEP doesn´t like the word organic!

Leyla - CM

Virtual Reality is awesome!

Johanna – CM

Naming conventions!

David - SE

EXPRESS 2016

THANK YOU!

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