TEAM EXPIRESS



FINAL PRESENTATION

May 9, 2014

ARIEL | CHRIS | DORIAN | MANDY | TIANAO | SANJA | YIHAI

TEAM EXPAT

RESS

TEAM EXPAT

RESS


SE a


SE


SE


CM
CM


MEP


SE


A

Palo Alto CA
Stanford

Atlanta GA
Georgia Tech

Copenhagen DK
DTU

Weimar D
Bauhaus

Ljubljana SLO
ULJ FA


A


MEP


SE


CM

Anja Ethan Anirudh Niklas

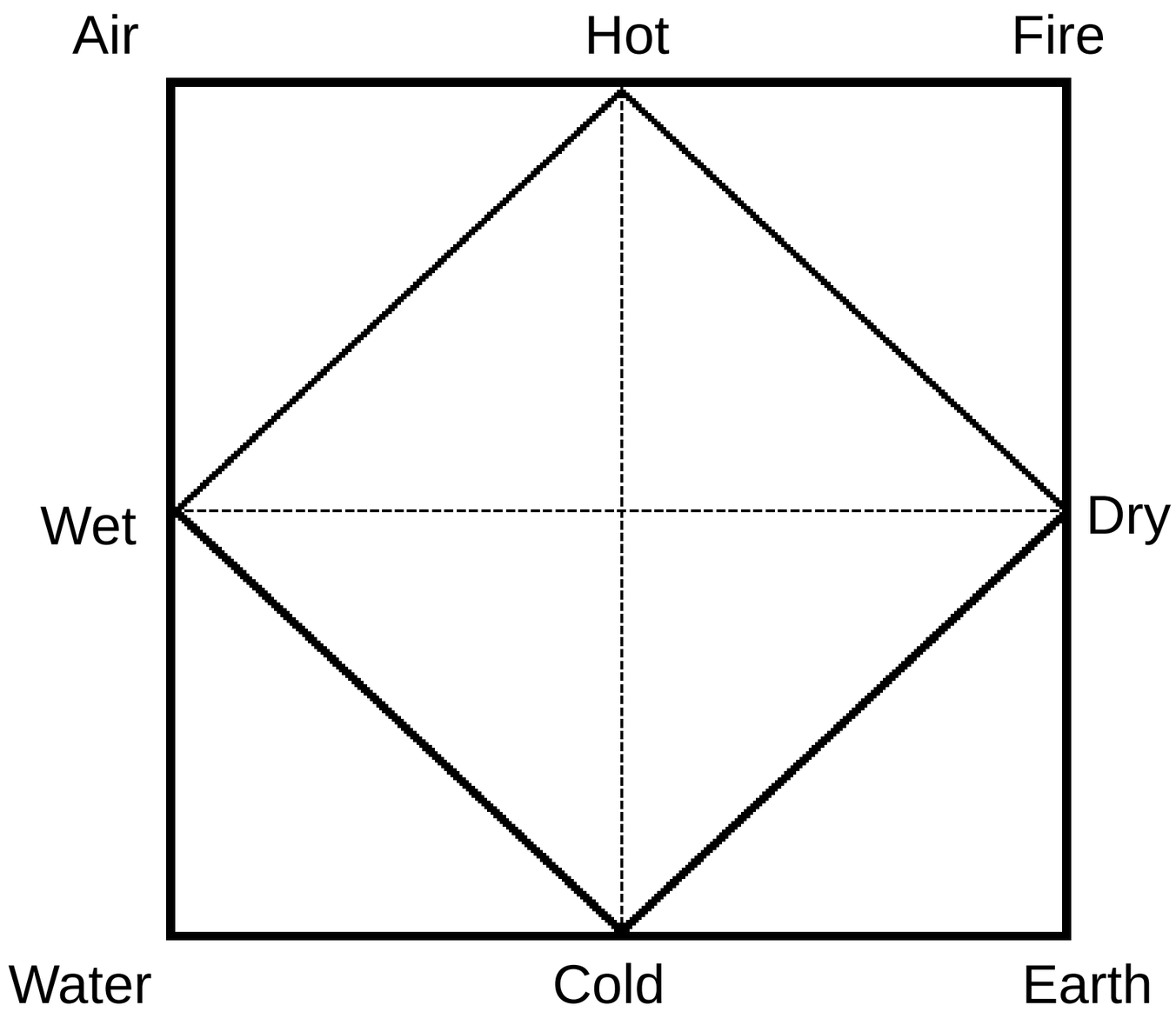


Sophrosyne

σωφροσυνη

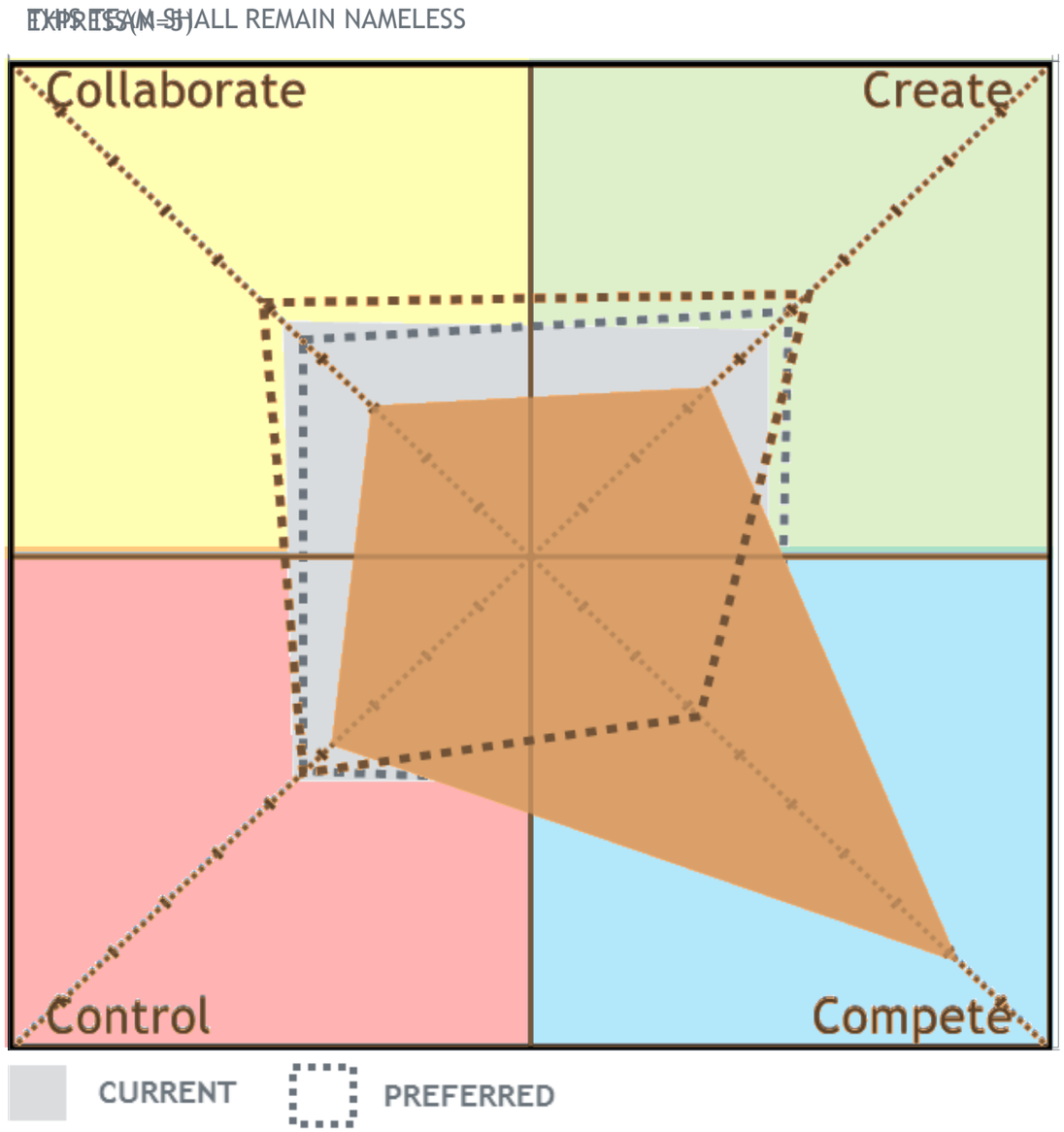
Noun. Greek philosophy of healthiness from balance

Greek Balance of Aethers



Team Dynamics

Collaborate



Create

Control

Compete

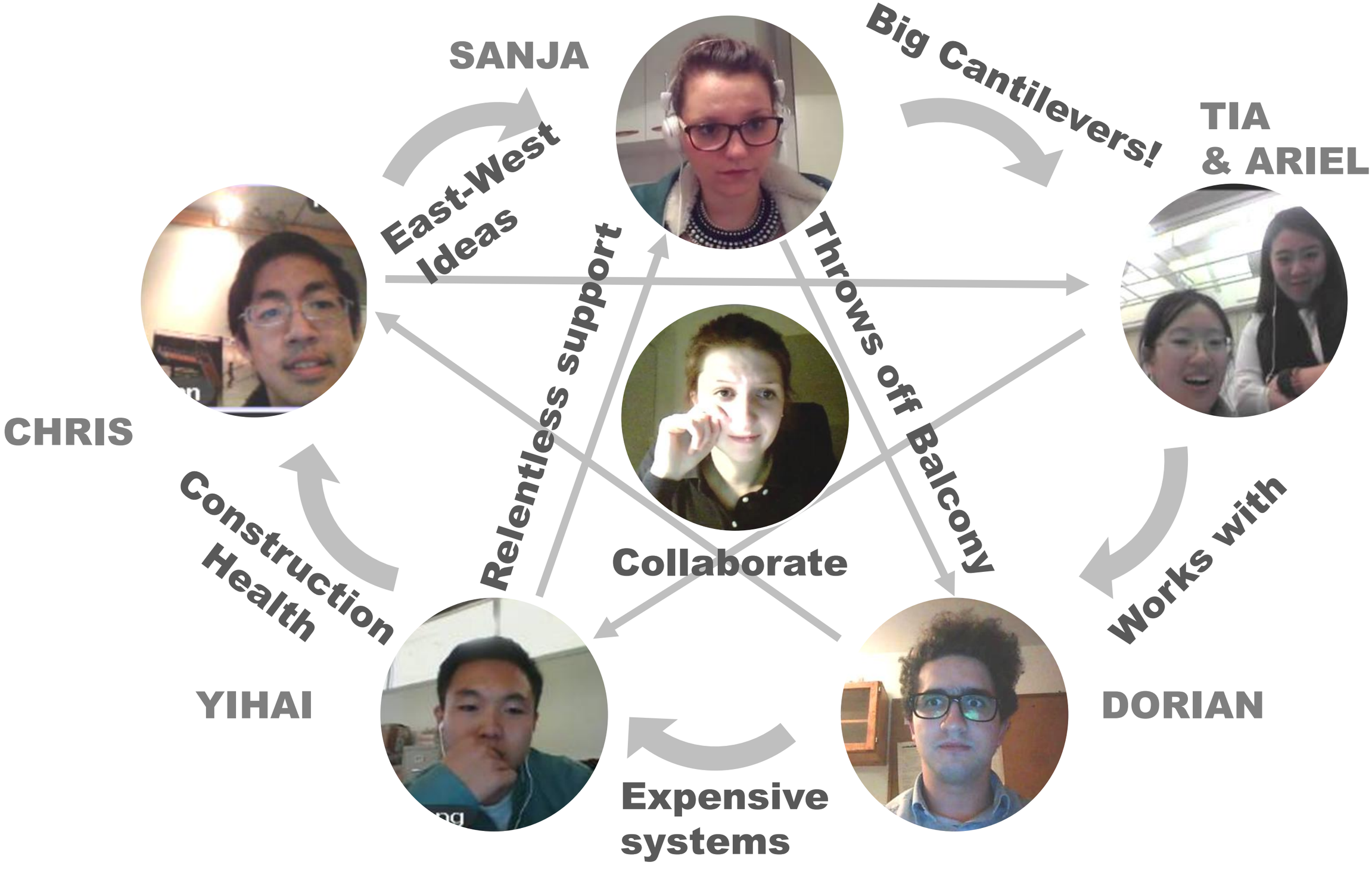
Balance

ravnotežje 平衡

Gleichgewicht

A SE MEP CM

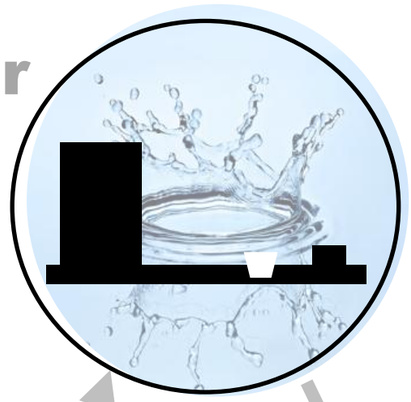
Team Balance



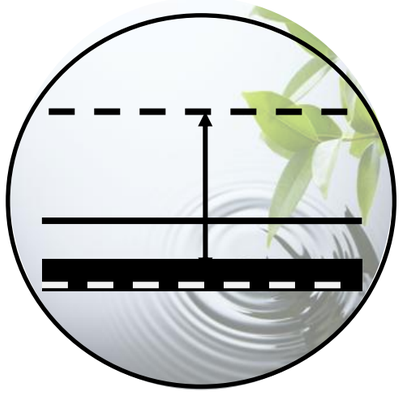
The Challenge of Balance



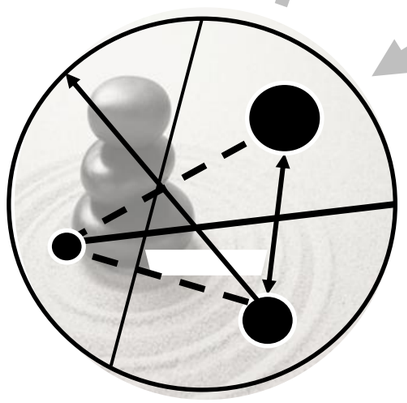
金 Metal



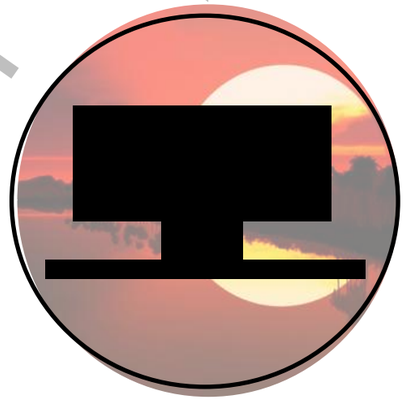
水 Water



木 Wood



土 Earth

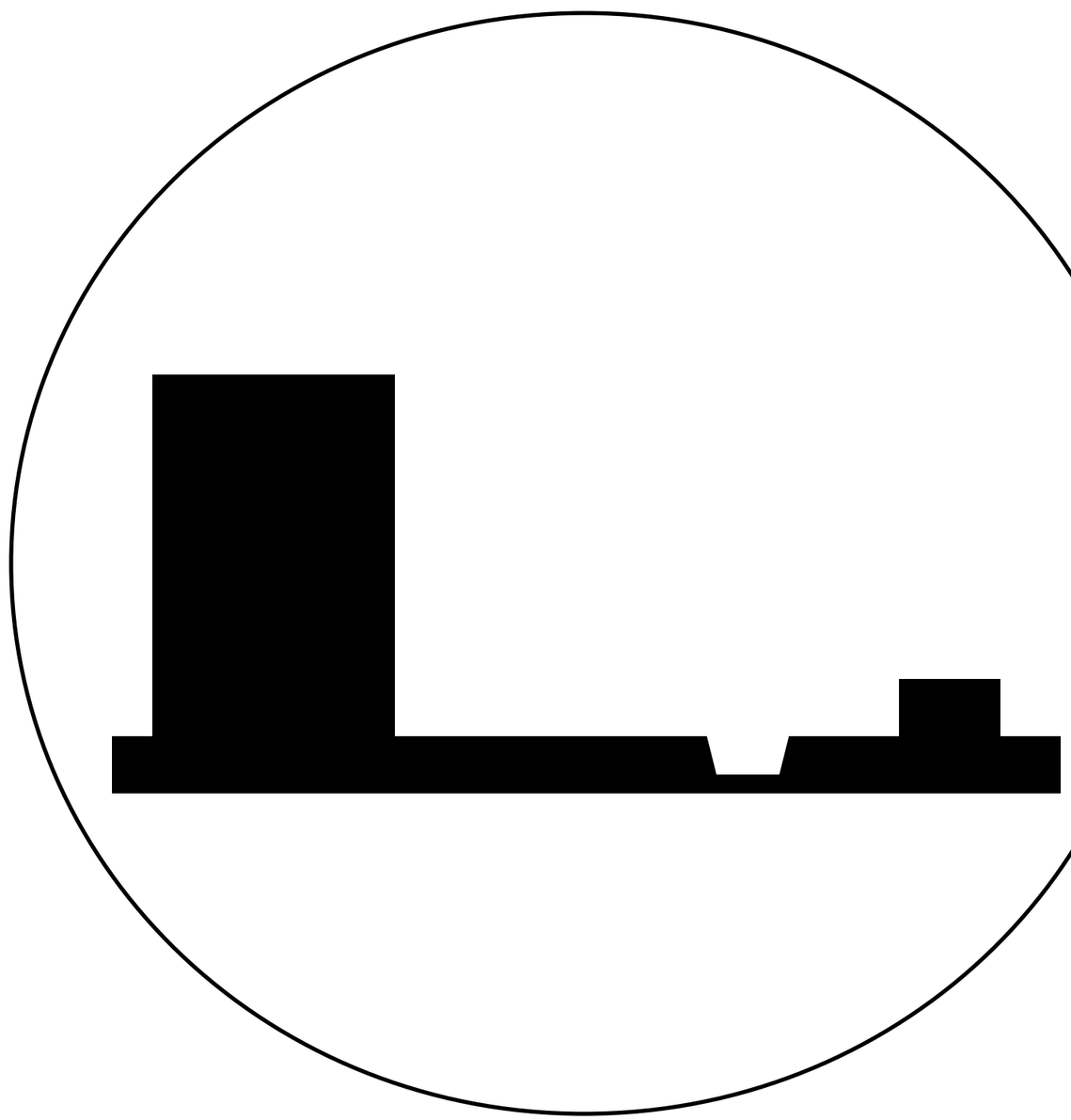


火 Fire

Balance of Local Site







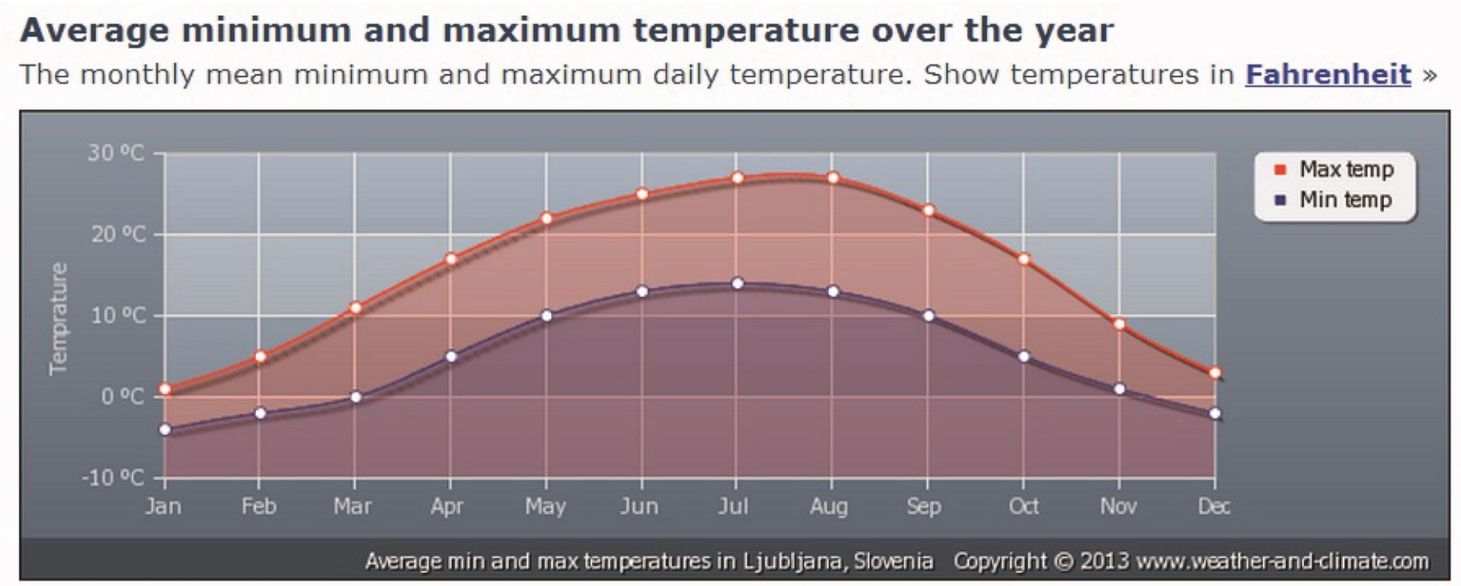




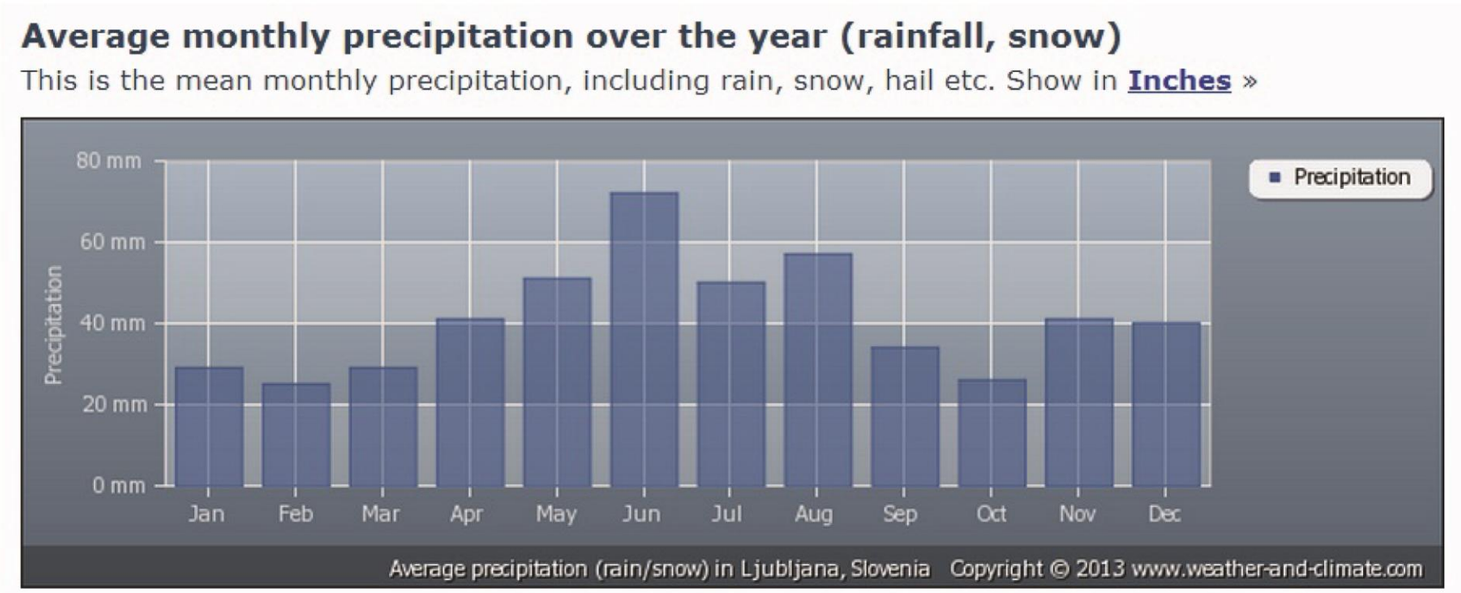
Site Challenges – Weather Conditions

big difference in maximum and minimum temperature

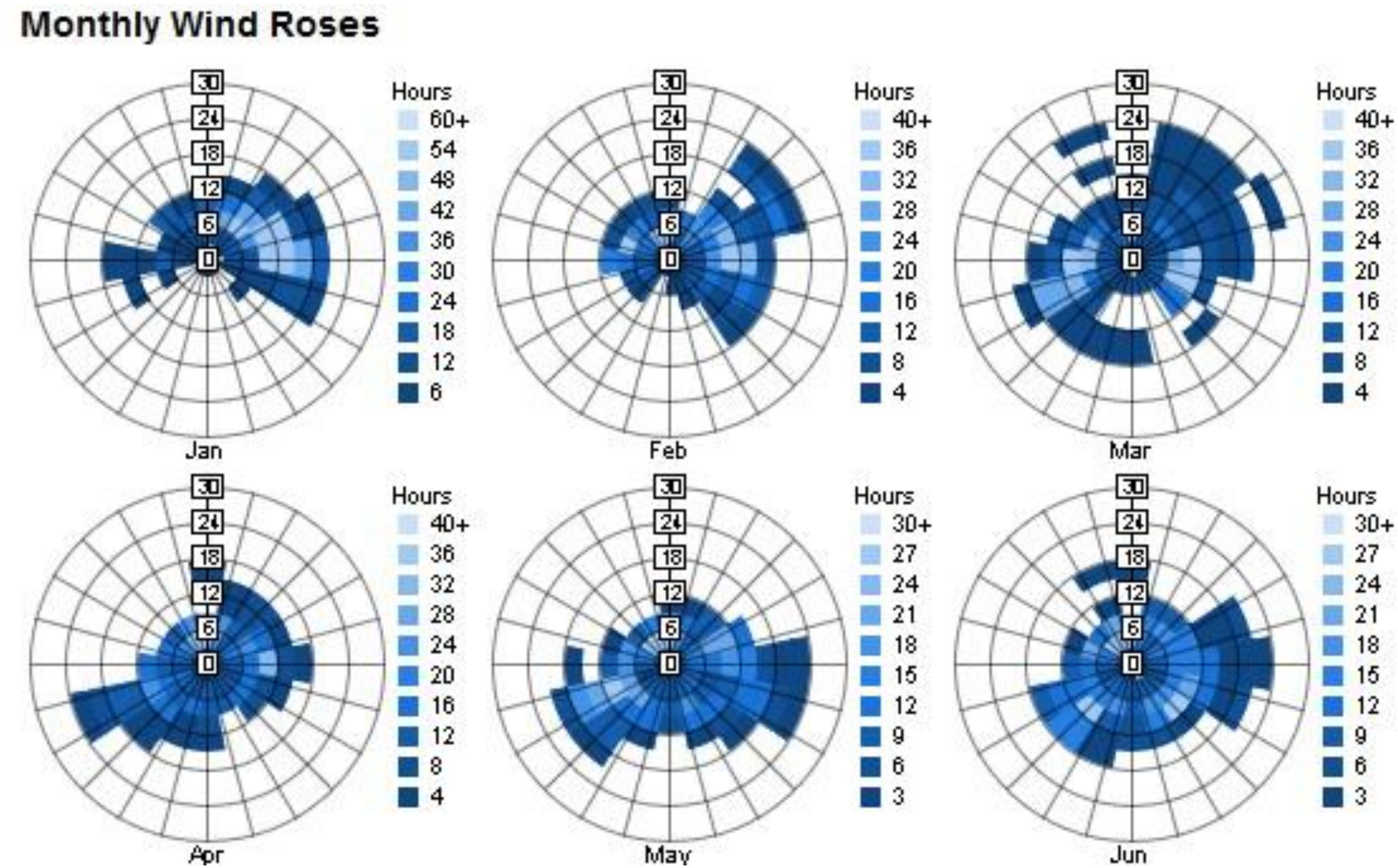
Average maximum 25 celsius
Average minimum -4 celsius



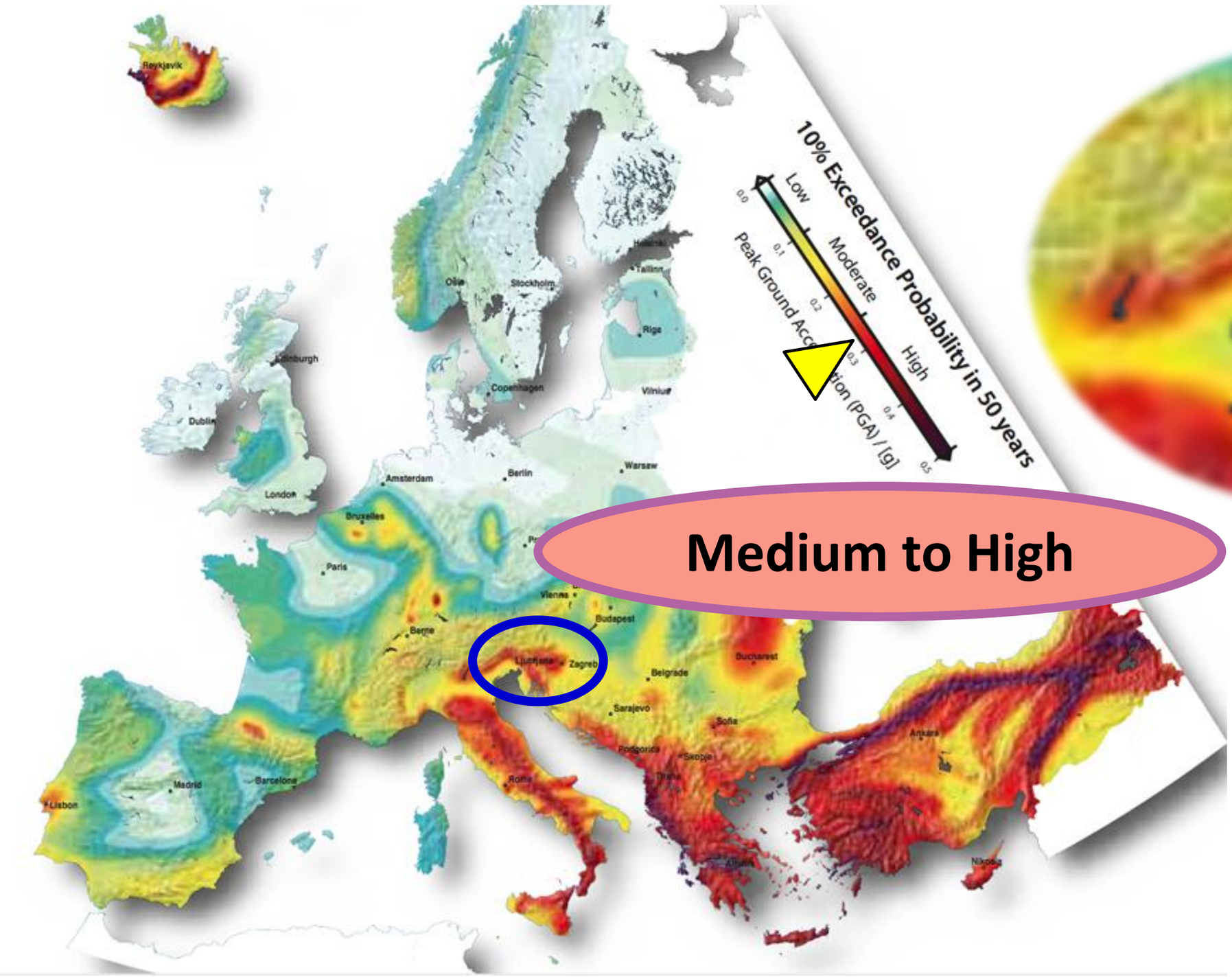
Rainy, rains about 1/3 of the year



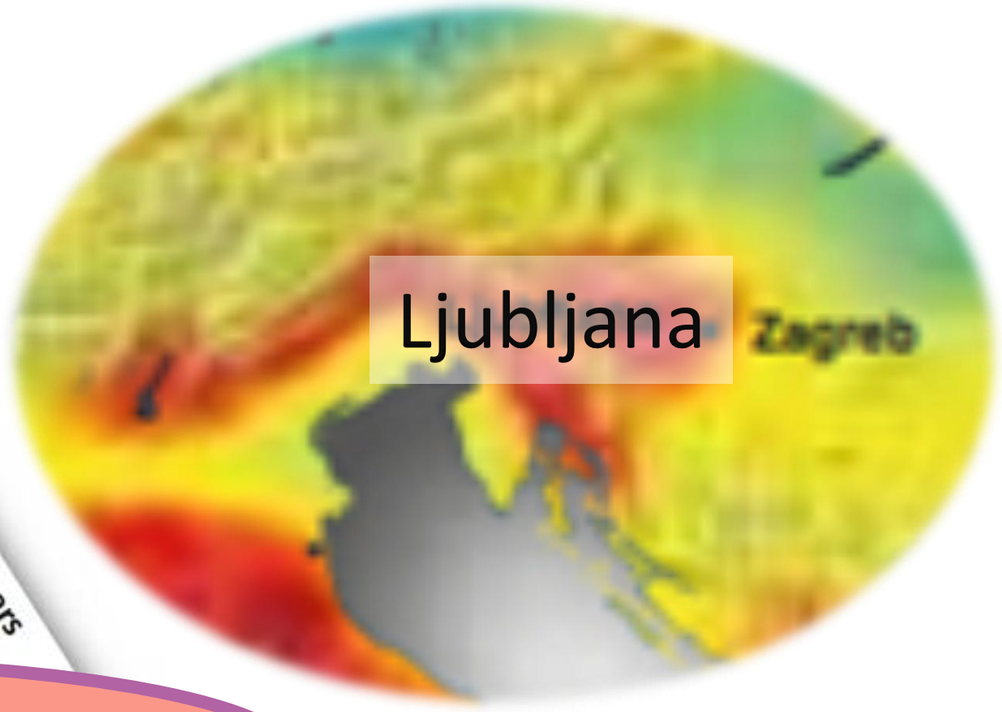
Site Challenges - Wind Calculation



Site Challenges - Earthquake

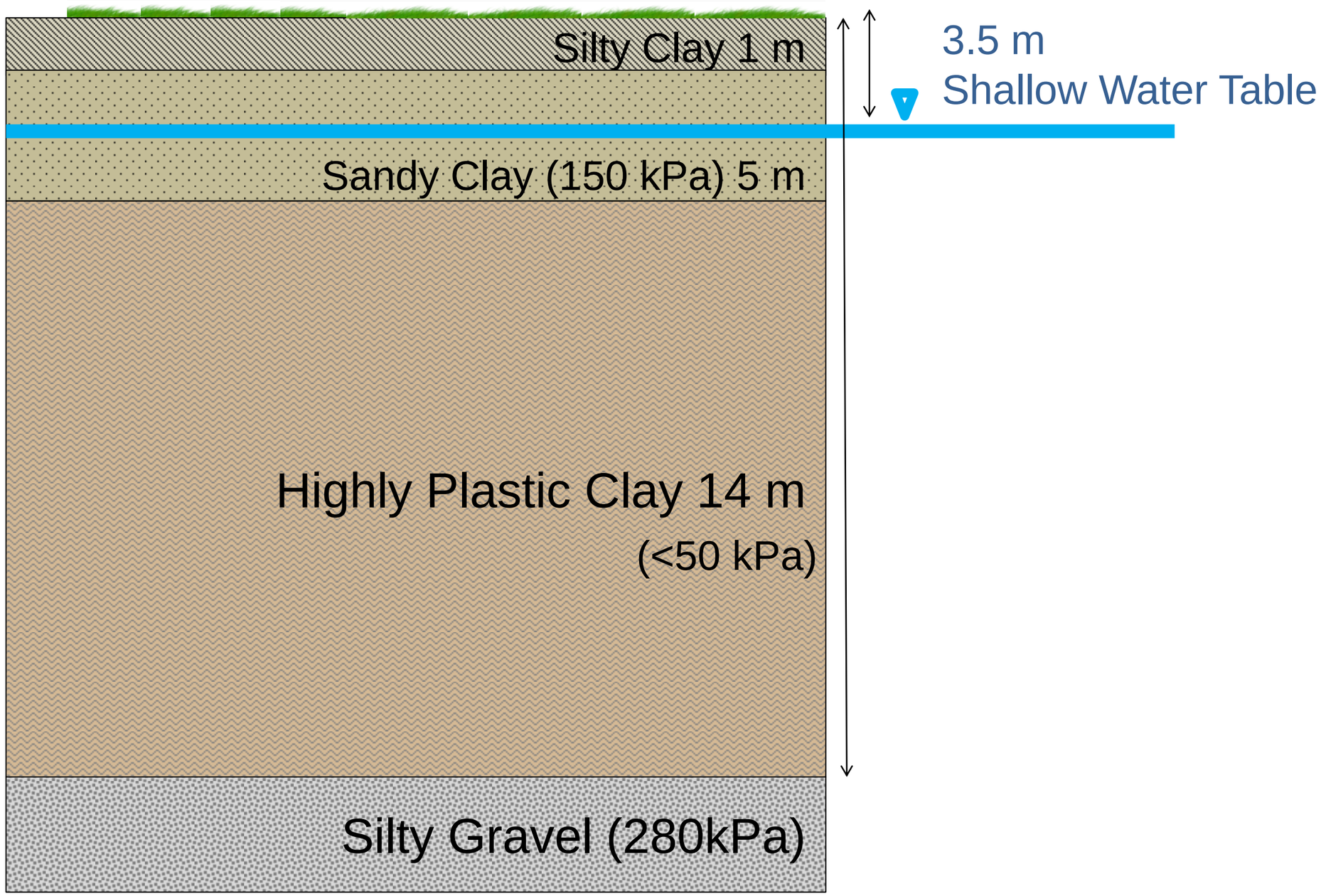


Medium to High

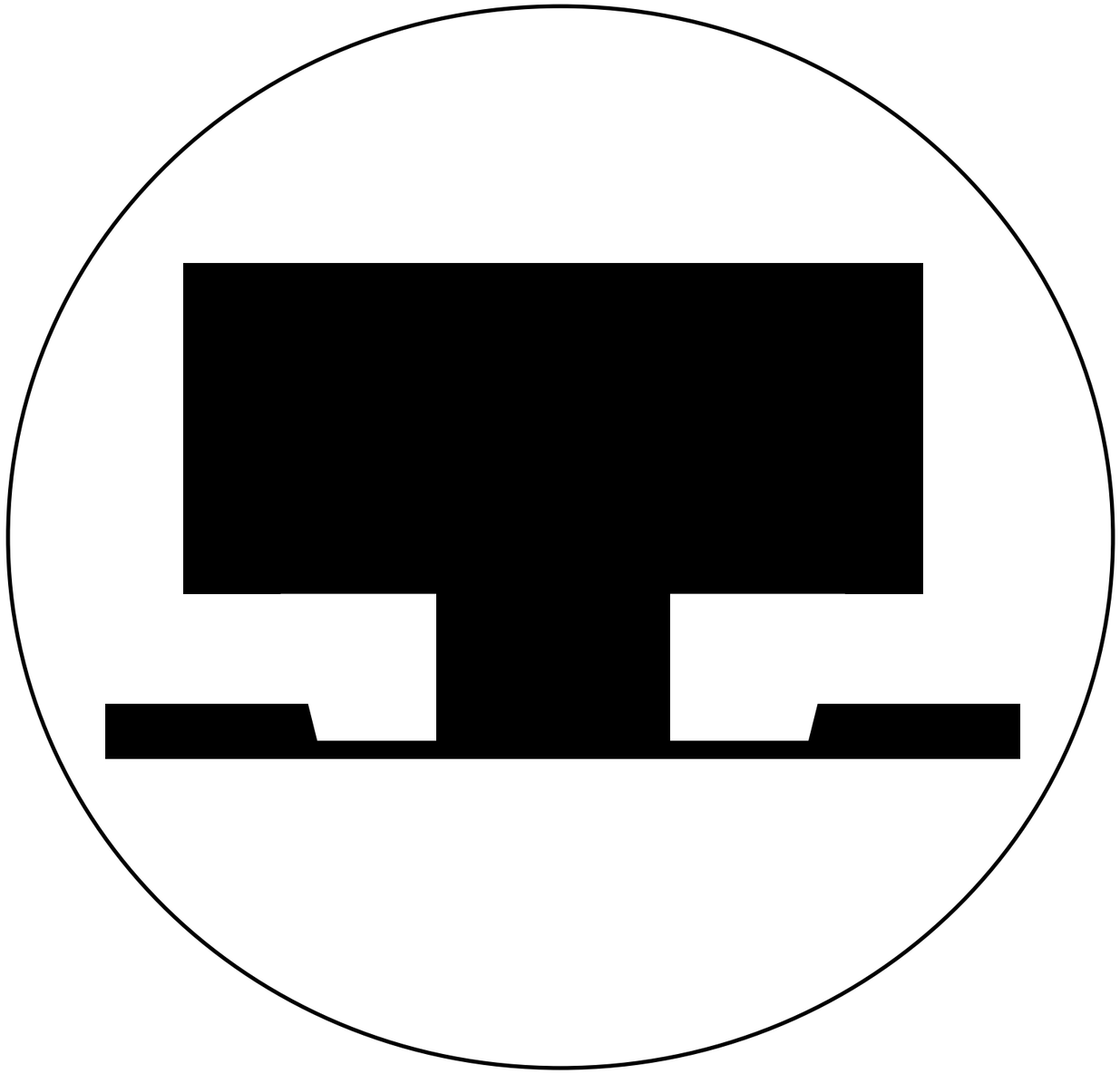


Design Ground Acceleration
0.635 g

Site Challenges - Soil Profile



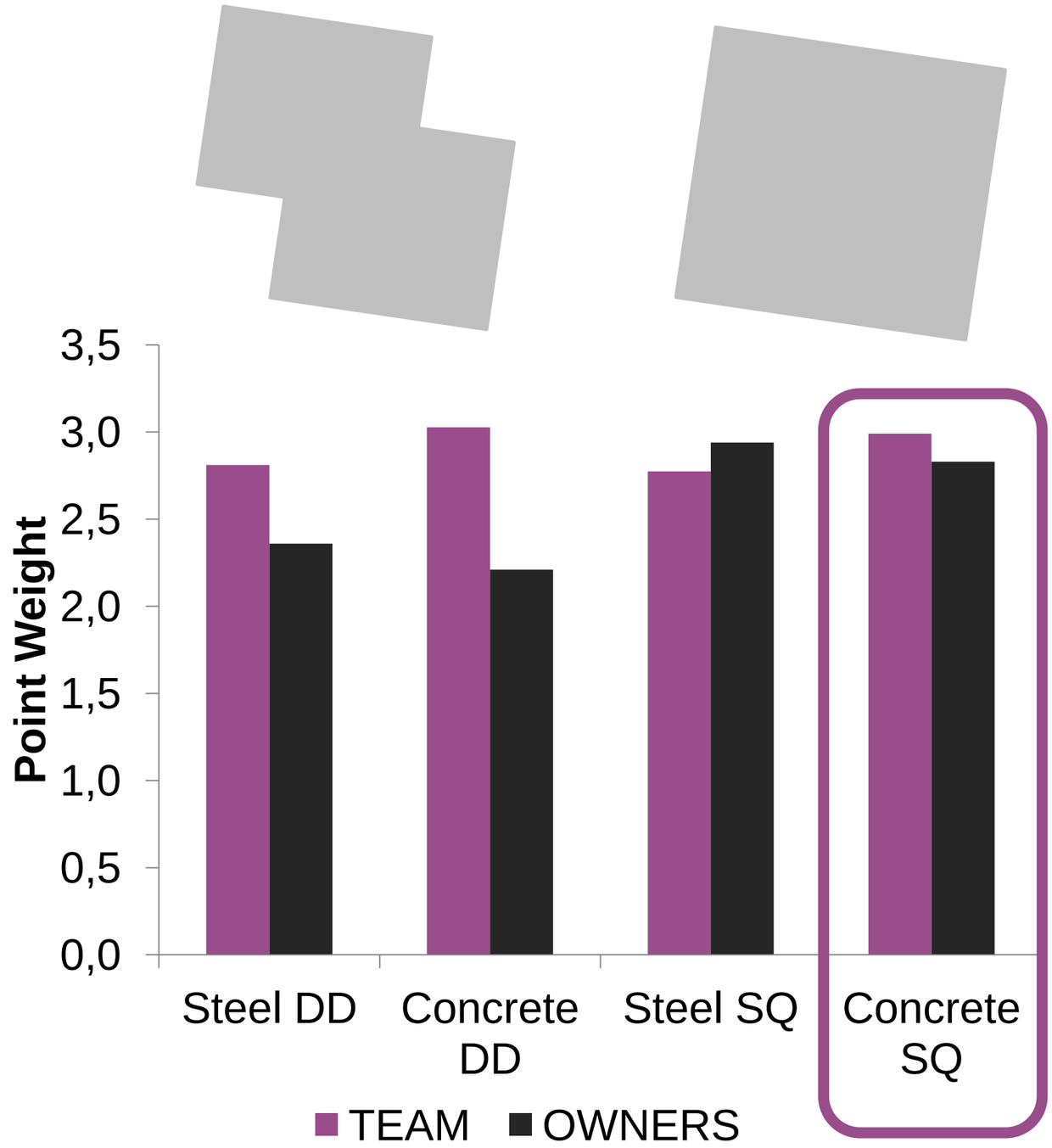
Balance of Stability



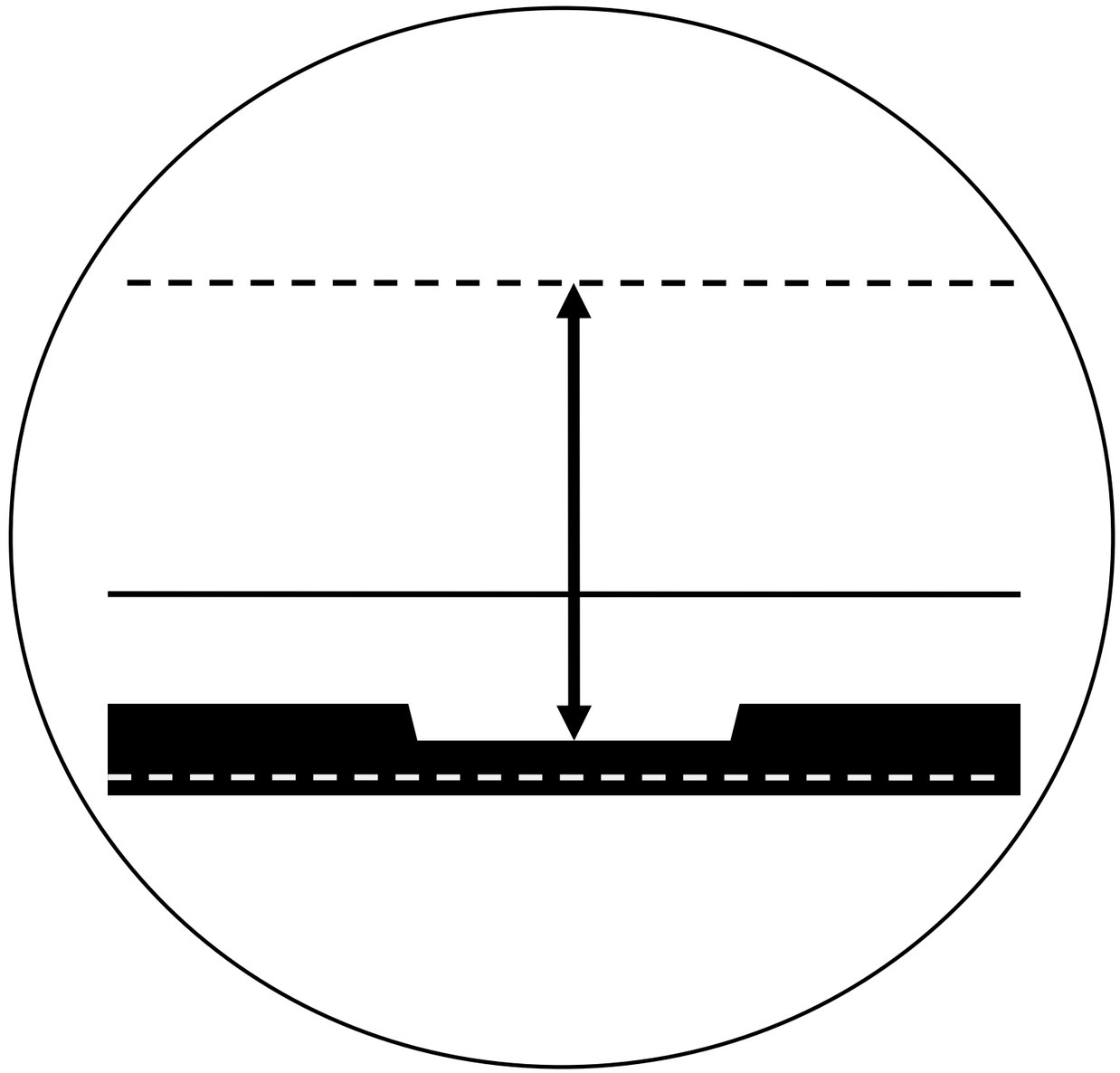
Decision Matrix -Winner

Category

- Connectivity
- Challenge Integration
- Cost
- Aesthetic Value
- Structural Design
- Constructability
- Adaptability
- Sustainibility
- Health

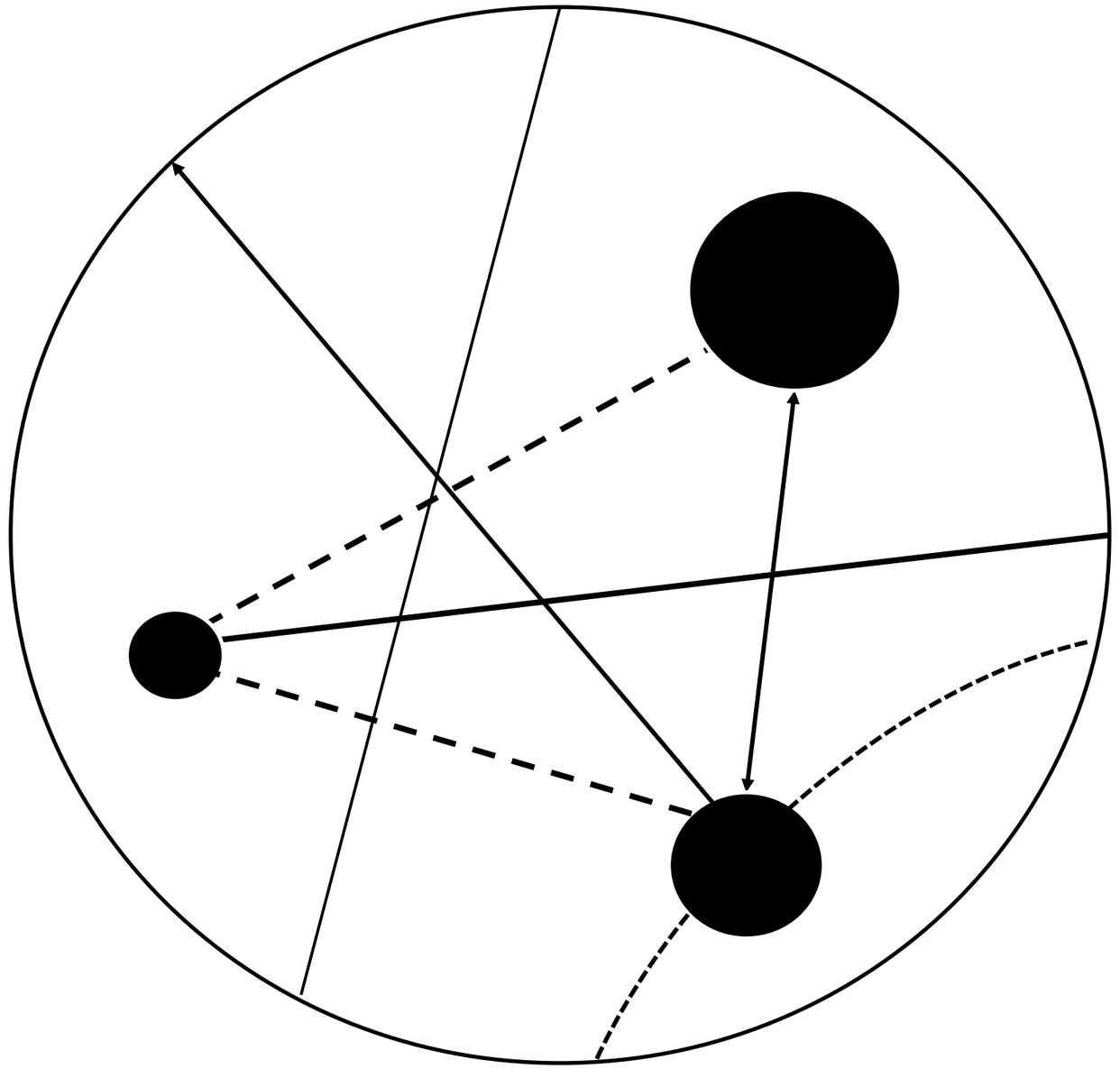


Balance of Height and Depth



Site Challenges

Balance of Connection

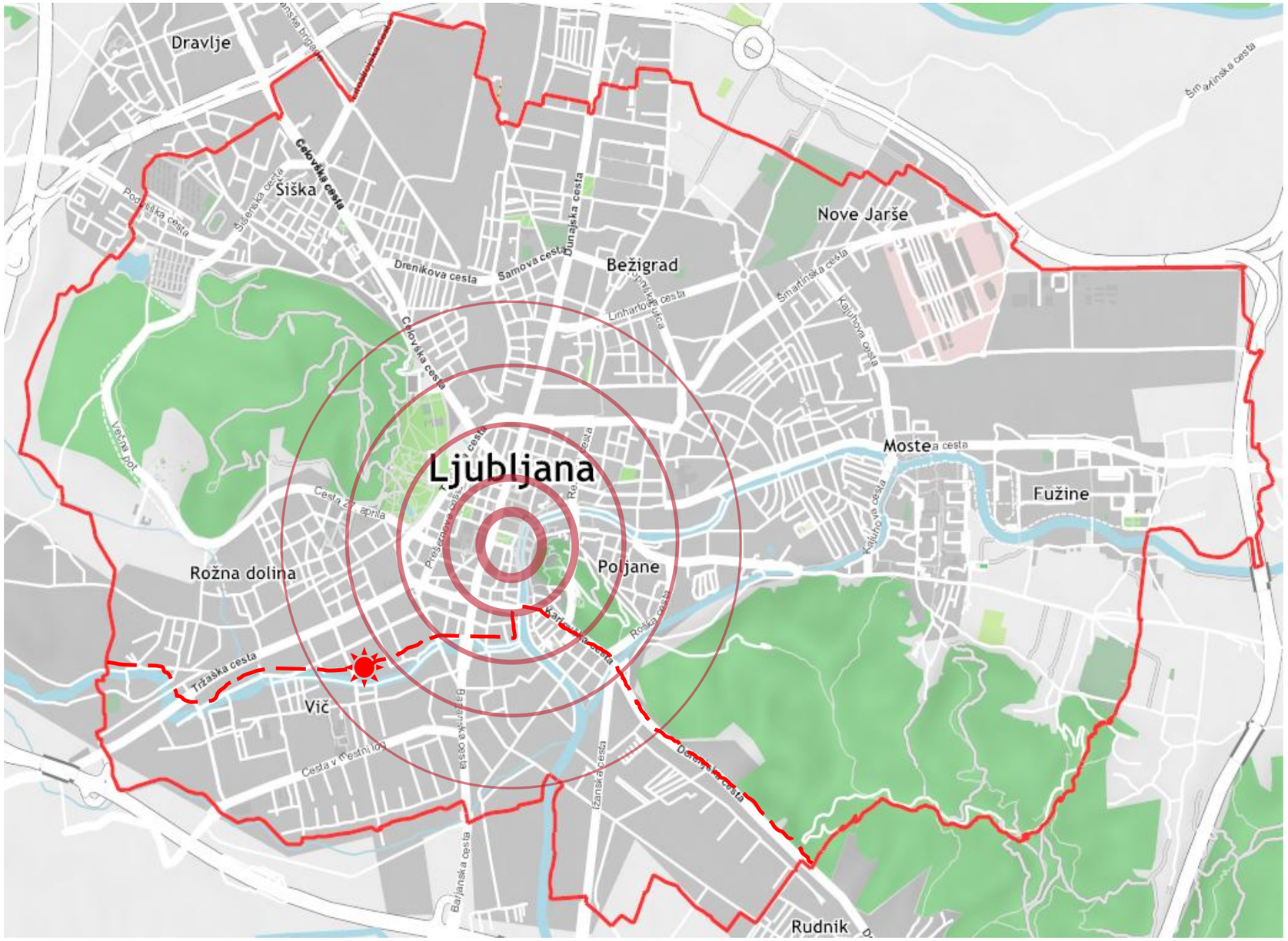


Connection with Ljubljana City & Green Ring









Ljubljana Path of Remembrance

Urban Analysis

1. City Block Size

Small — **Large**

2. Structural Age

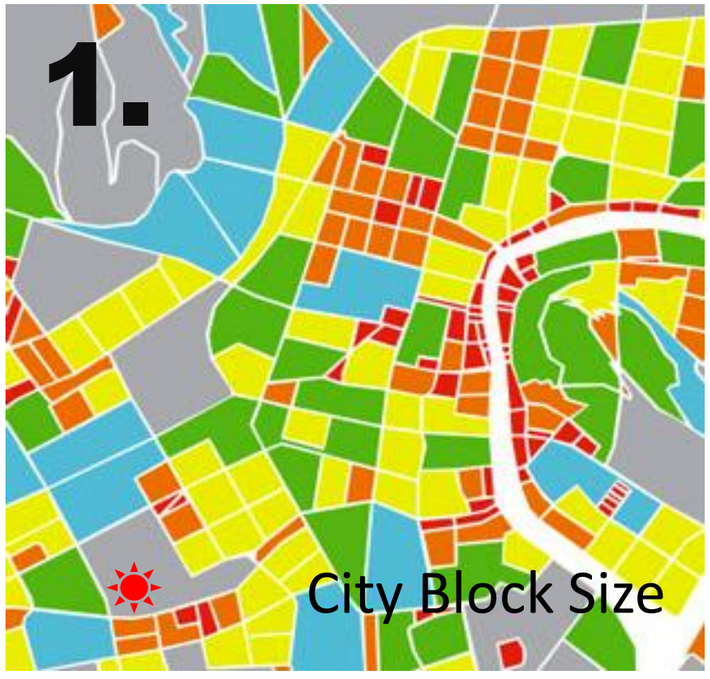
1888 — **2013**

3. Real Estate Price

$$$** — **$

4. City Noise

High — **Low**









Balance of Social Expectation



Rok



Petra





Sara



Drago

Local Student Insights



I'm always hungry when we are in a lecture and I wish that the faculty could be closer to the city center where all the restaurants and happenings are.

- Rok

"Jaz sem vedno lačen ko smo na predavanju in želim si da je fakulteta bližje centru mesta, kjer so vse restavracije in dogotki"



Health is important to me, and I'm always looking for ways to live well according to this.

- Petra

“Zdravje je pomembno zame, in vedno iščem načine, da tudi živim u skladu z tem.”

Local Student Insights



Lack of space, light and too much noise impact on my learning and productivity!

- Drago

"Pomanjkanje prostora , svetlobe in preveč hrupa vpliva na moje učenje in produktivnost!"



Sometimes the school feels too cramped and it affects my state of mind.

- Sara

"Včasih se v soli počutim preveč utesnjeno in to vpliva na moje stanje duha."

The Nature of Balance



金 Metal



水 Water



木 Wood



土 Earth



火 Fire

Health Concept Design Goals

Impact Health



Healthy Environment

- Air Ventilation
- Personalized Ventilation
- Noise
- Hygiene
- Material Health

Injury Prevention

- Traffic Calming
- Walkability
- Lighting
- Traffic Circles
- Visibility

Health Culture

- Community Garden
- Healthy food options
- Proximity and recommendation
- Smoking Area Restriction

Health Concept Design Goals

Influence Heath



Health Suggestions

- Healthy Food Options
- Recreational Activities
- Real- time Transit Information

Recreational Connections

- Workout Park
- Walkability
- Bike path
- Sloped Plazas

Health Culture

- Community Garden
- Healthy food options
- Proximity and recommendation
- Smoking Area Restriction

Health Concept Design Goals

Reflect Health



Environment

- Air quality monitoring
- Personalized Ventilation
- Emotional Reflection
- Temperature Sensing

Emotion

- Happiness meter
- Social Network Link
- Virtual Space
- Positive-Negative Space

Awareness

- Collaborative Space
- Healthy food options
- Interactive Virtual Wall
- Graffiti Wall

Health Concept Design Goals

Maintain Health



Recreational Space

- Bike Connection
- Noise
- Hygiene options
- Sloped Plazas
- Workout Park

Meditative Space

- Quietness
- Walkability
- Seclusion
- Connection with Nature

Social Channels

- Interactive Social Wall
- Social Networks
- Graffiti Wall
- Community Garden
- Collaborative Space

Health Concept Design Goals

Generate Health



Connectivity

- Real-time information
- Social Networks
- Transit Flow
- Bike Path
- Walkability

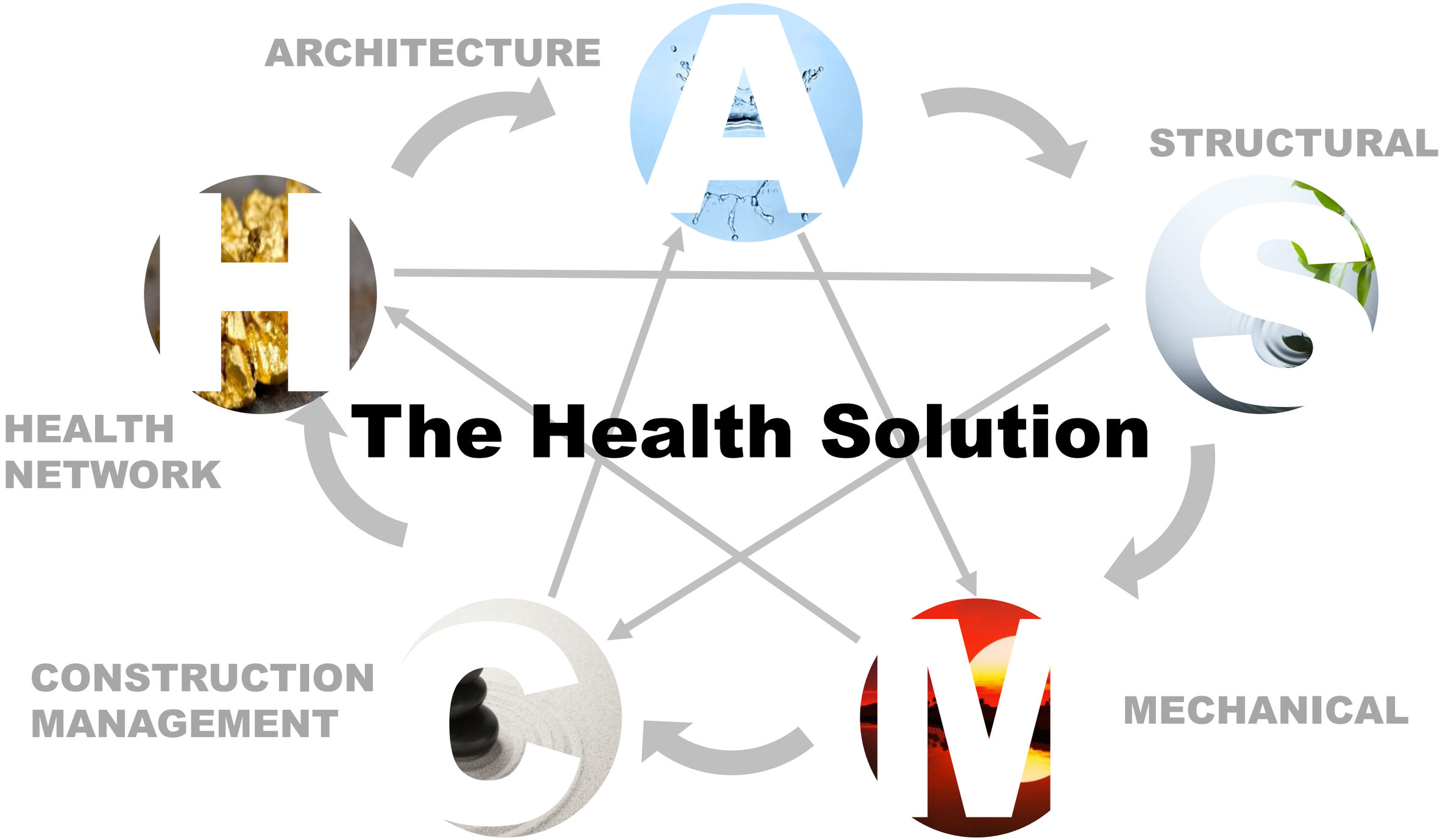
Cohesion

- Emotional Reflection
- Virtual Link
- Connection with community

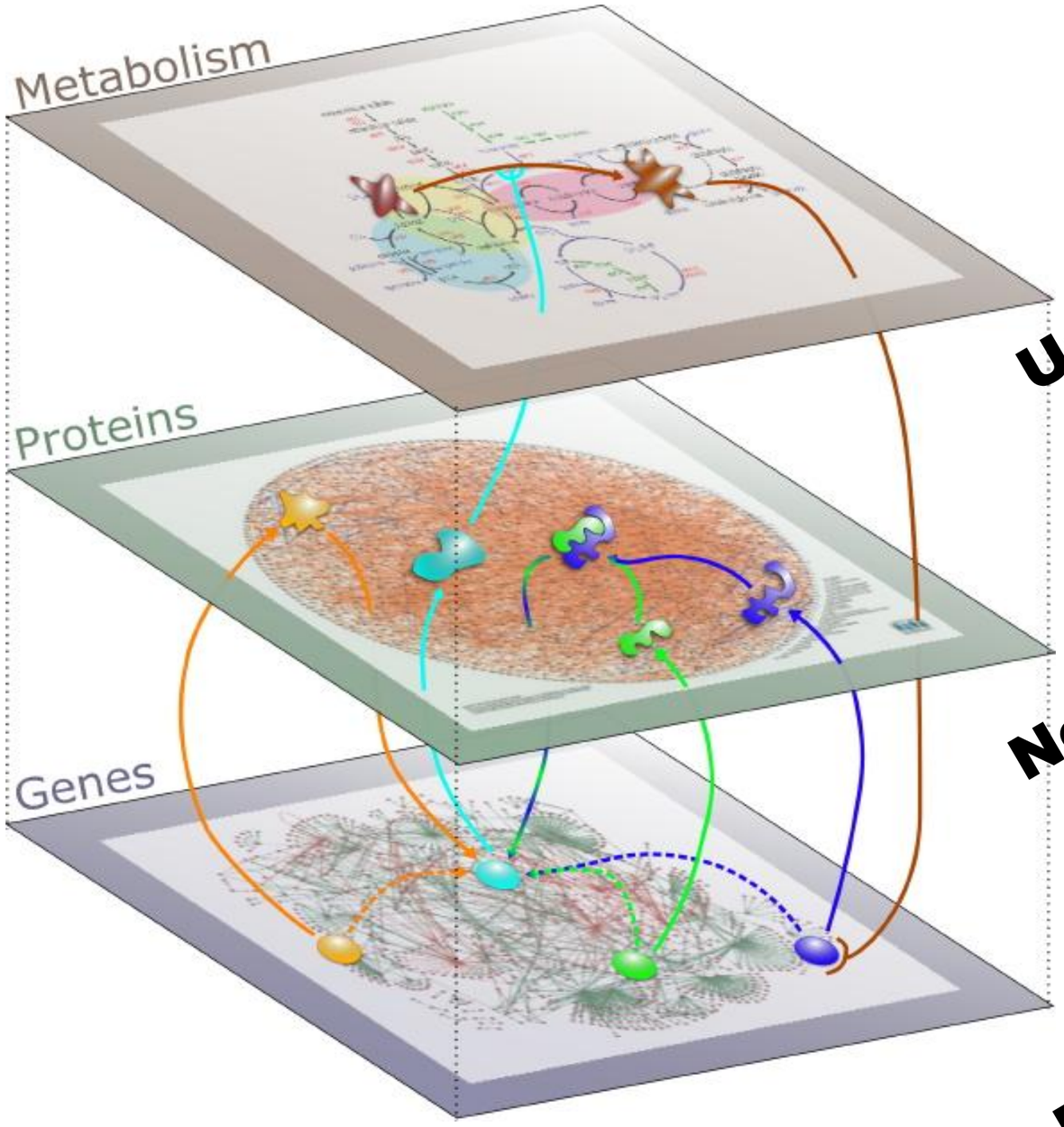
Visibility

- Community Garden
- Healthy food options
- Proximity and recommendation
- Smoking Area Restriction

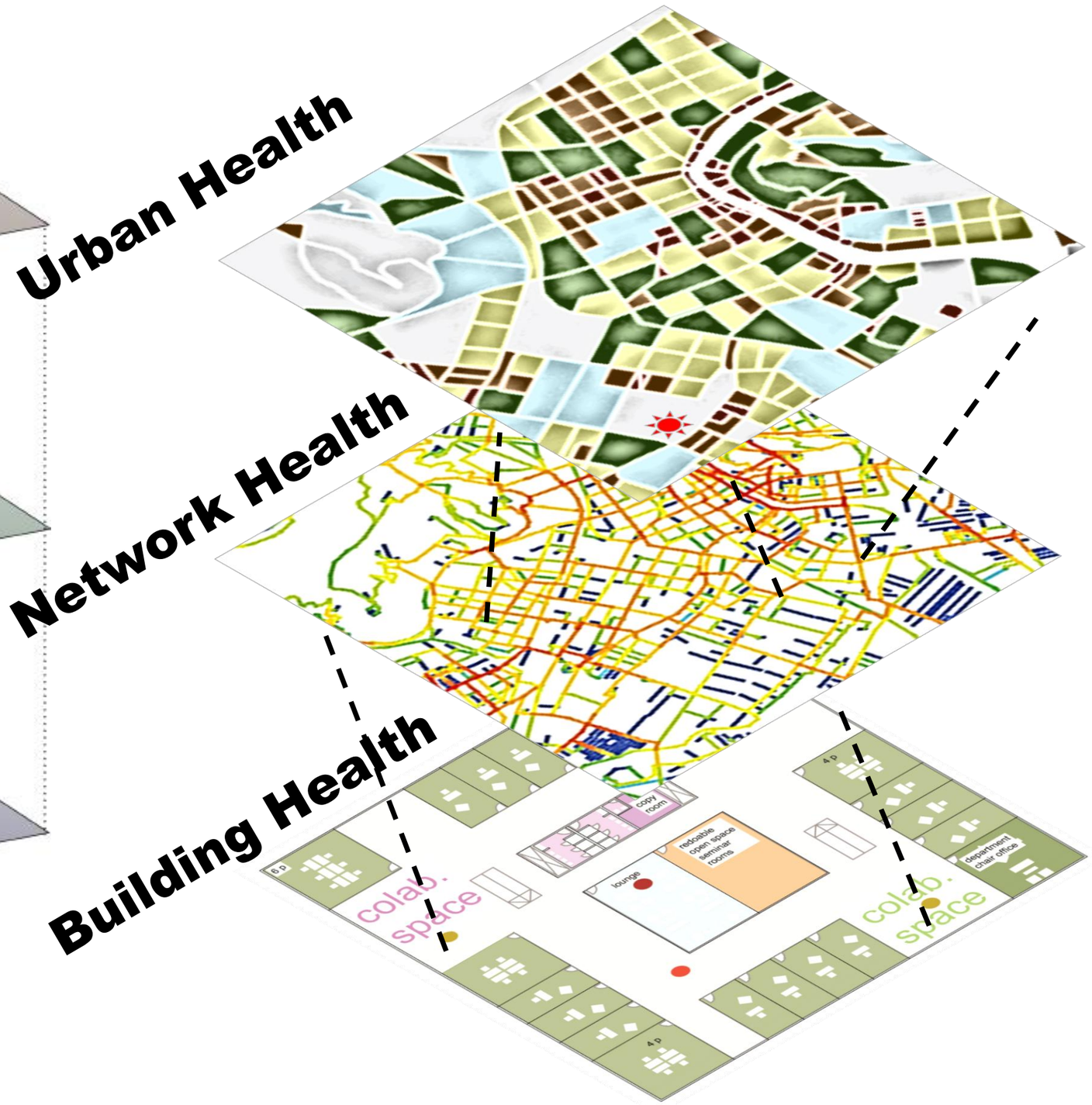
The Health Solution



Scales of Health Systems

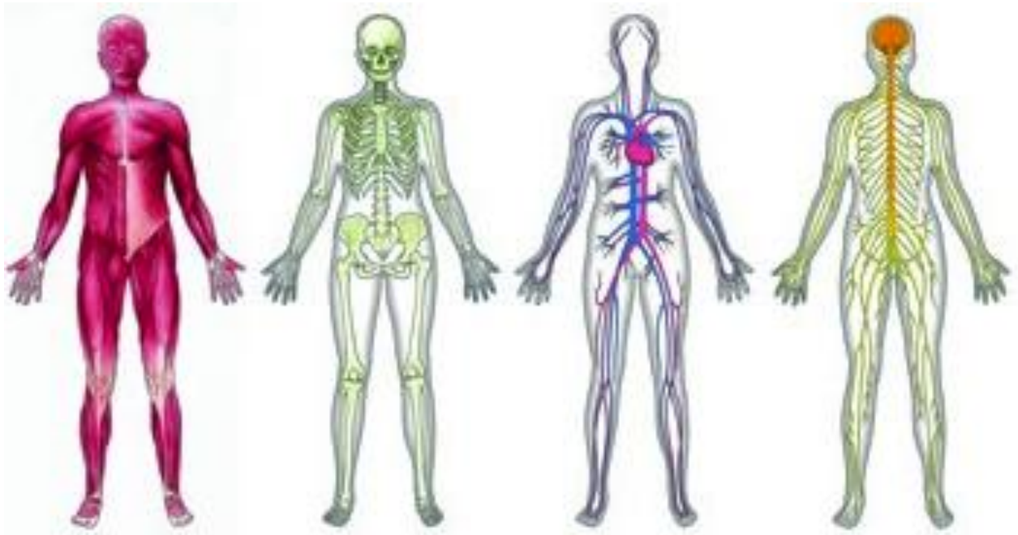


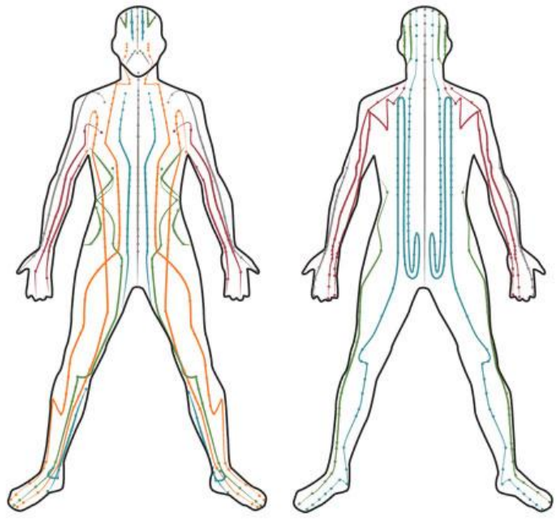
Biological Health System



Networks of Health

Health of Body Networks



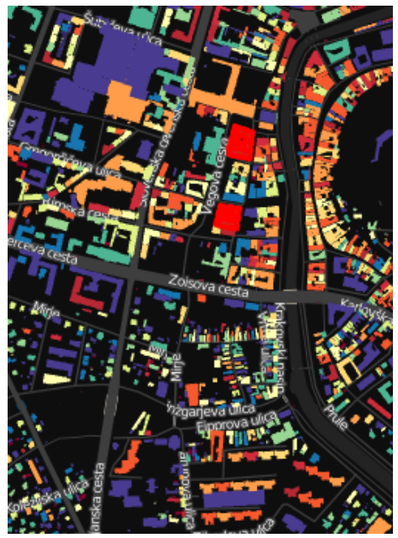


Health of Urban Networks



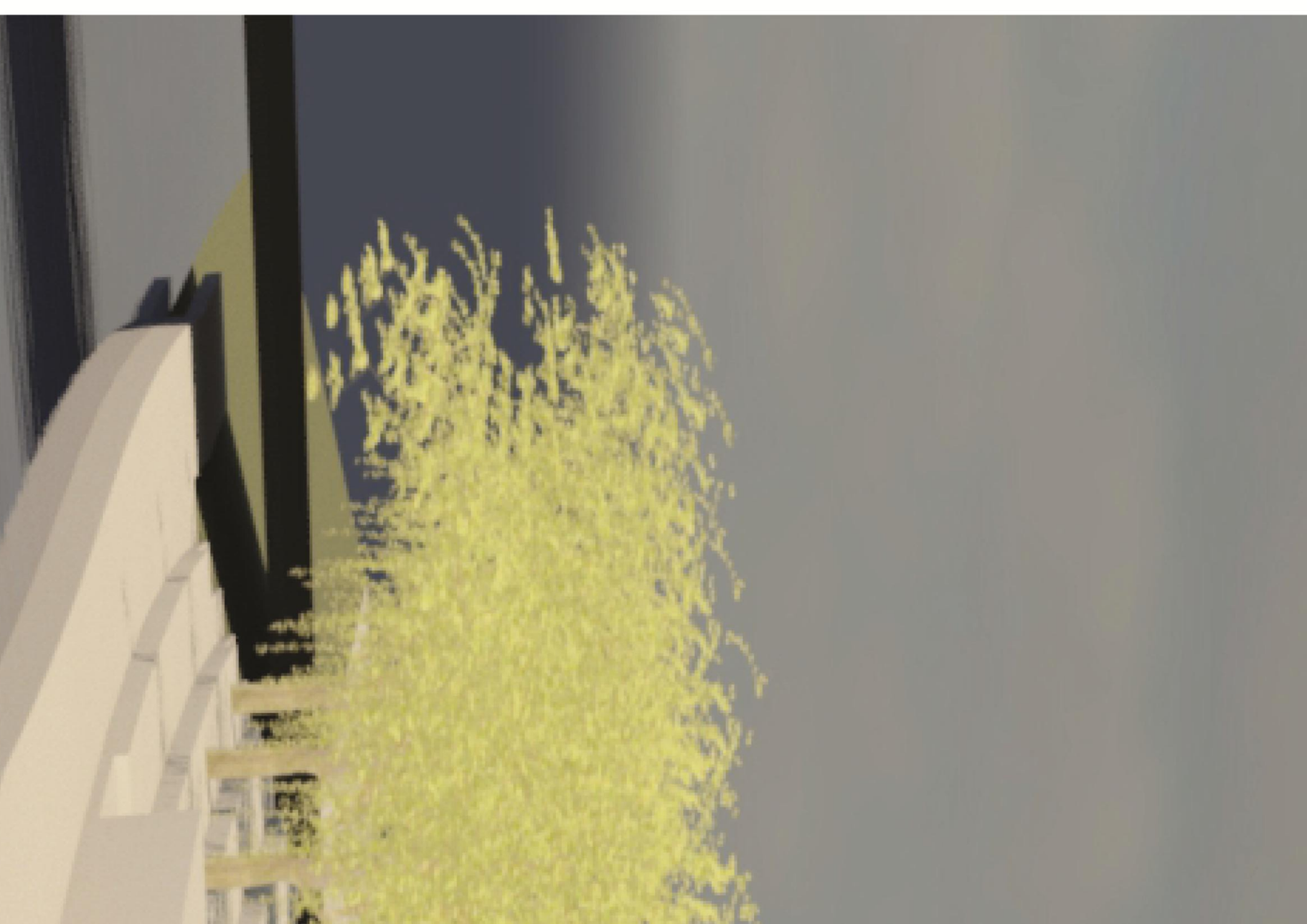


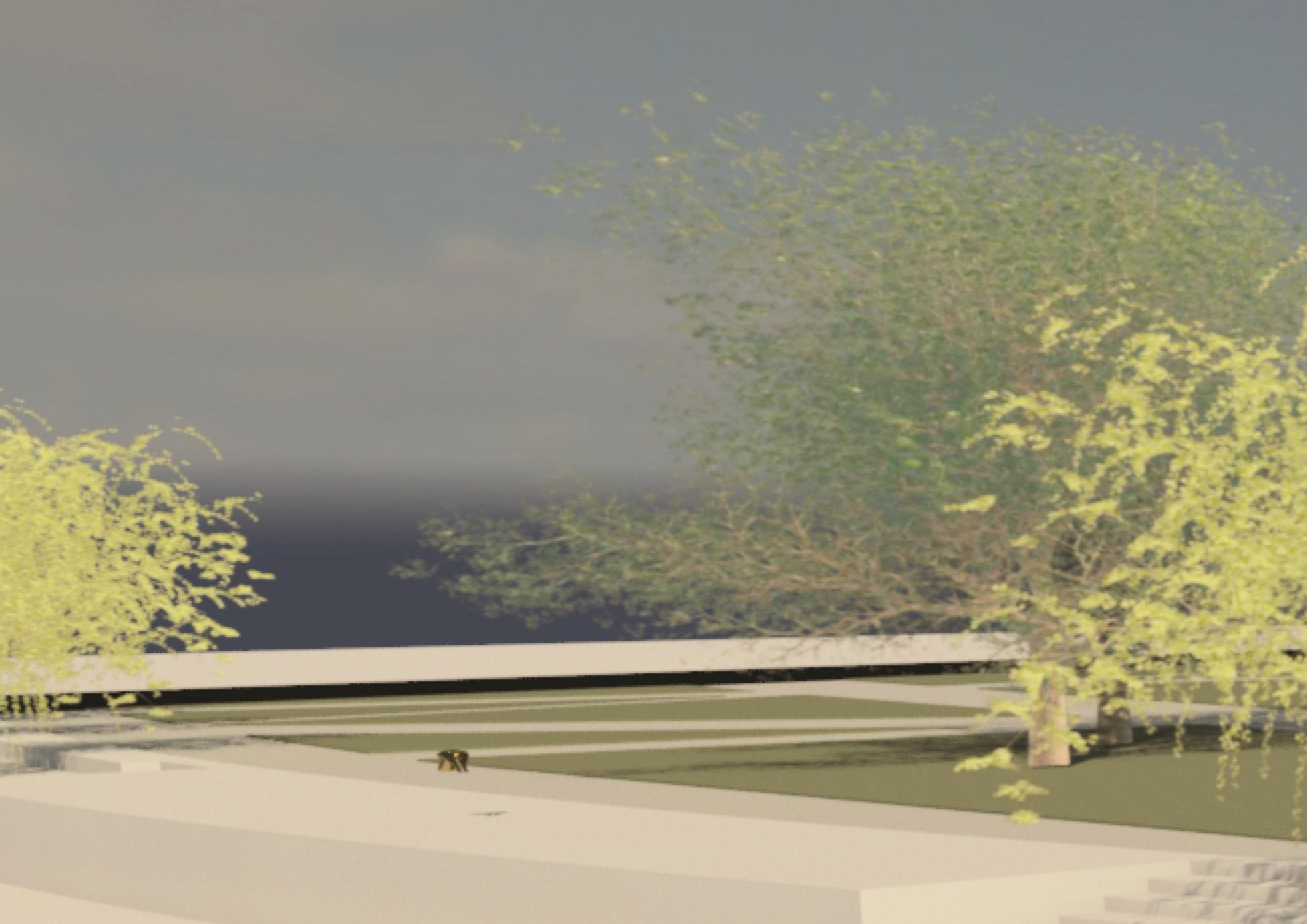


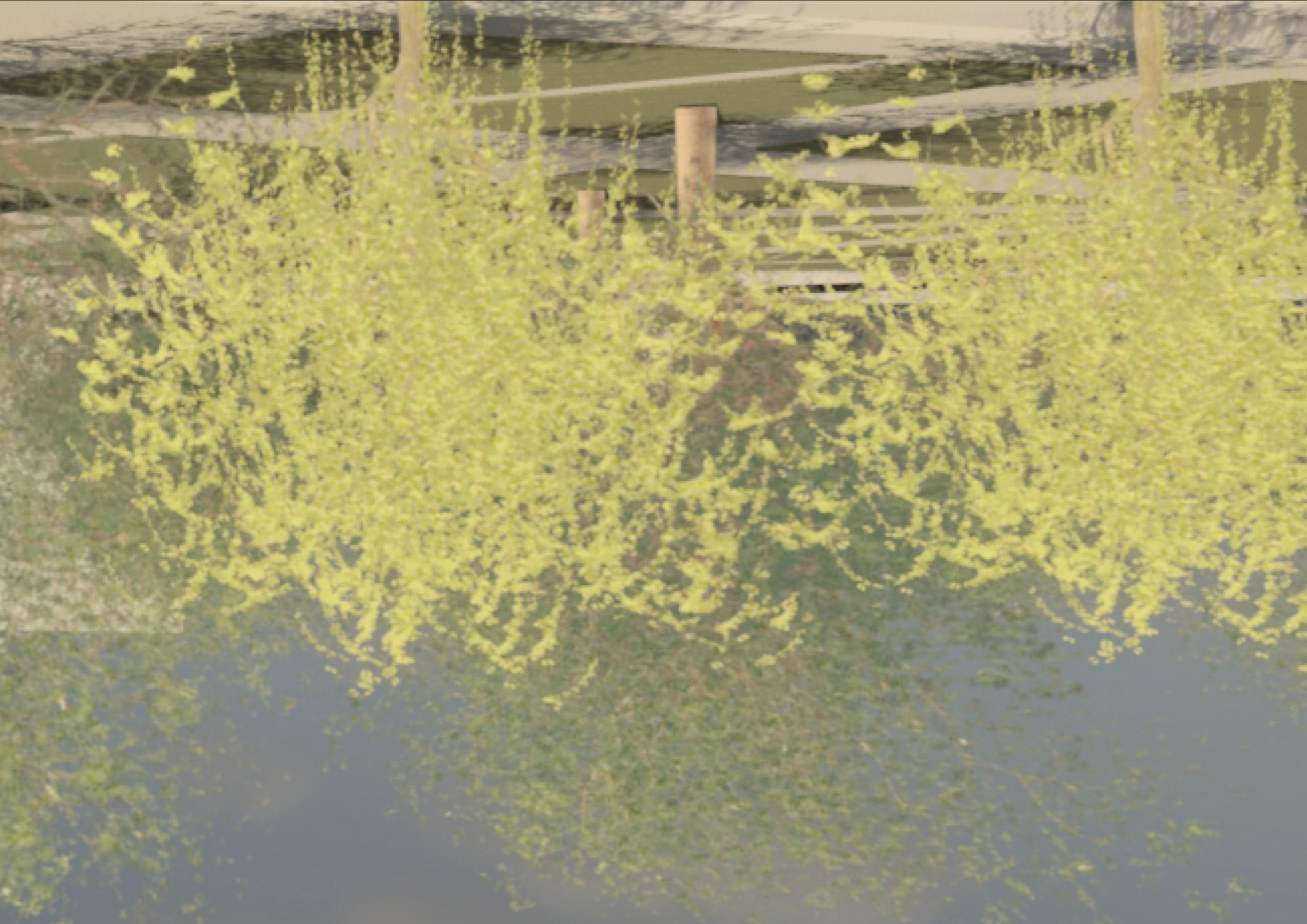


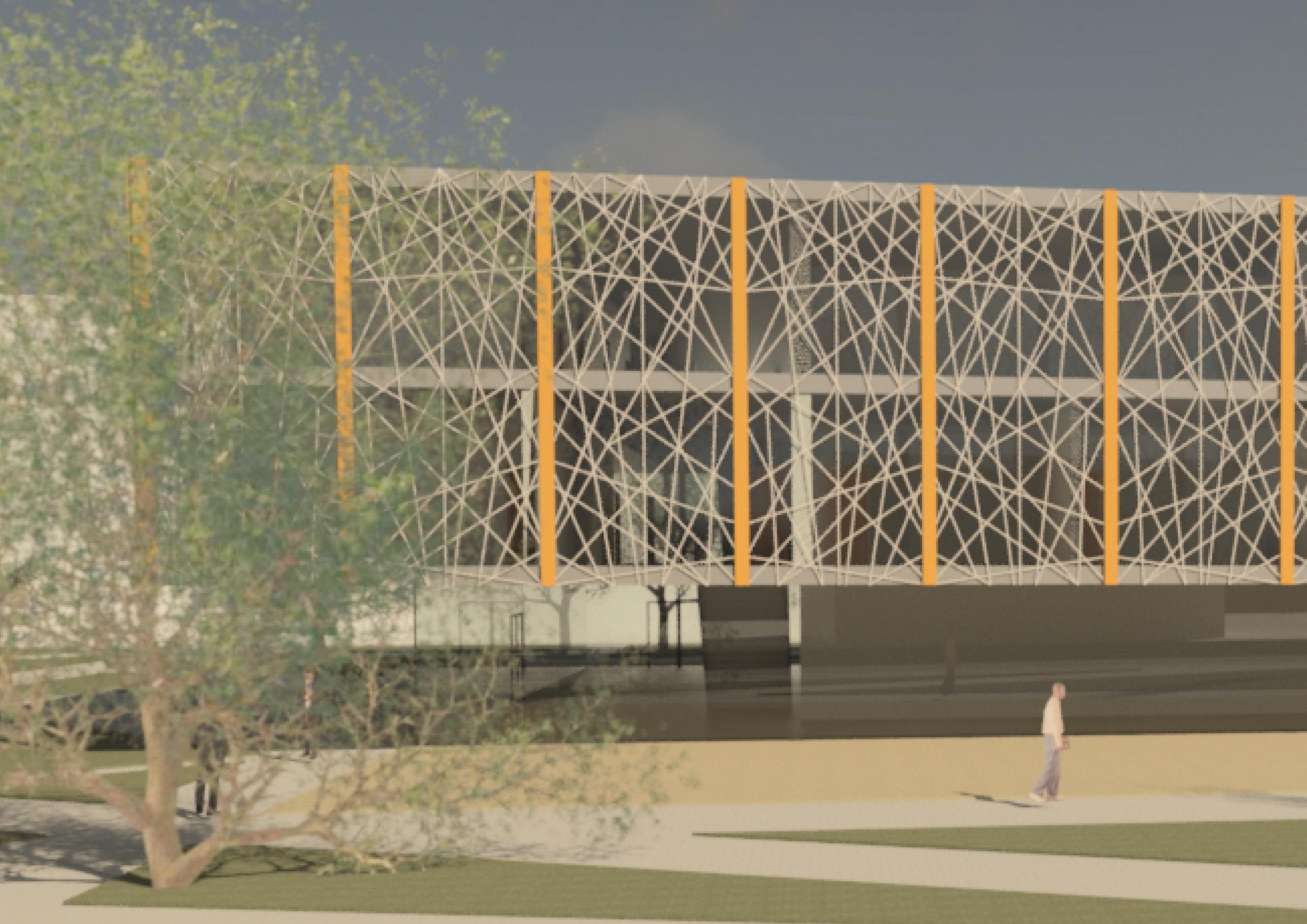


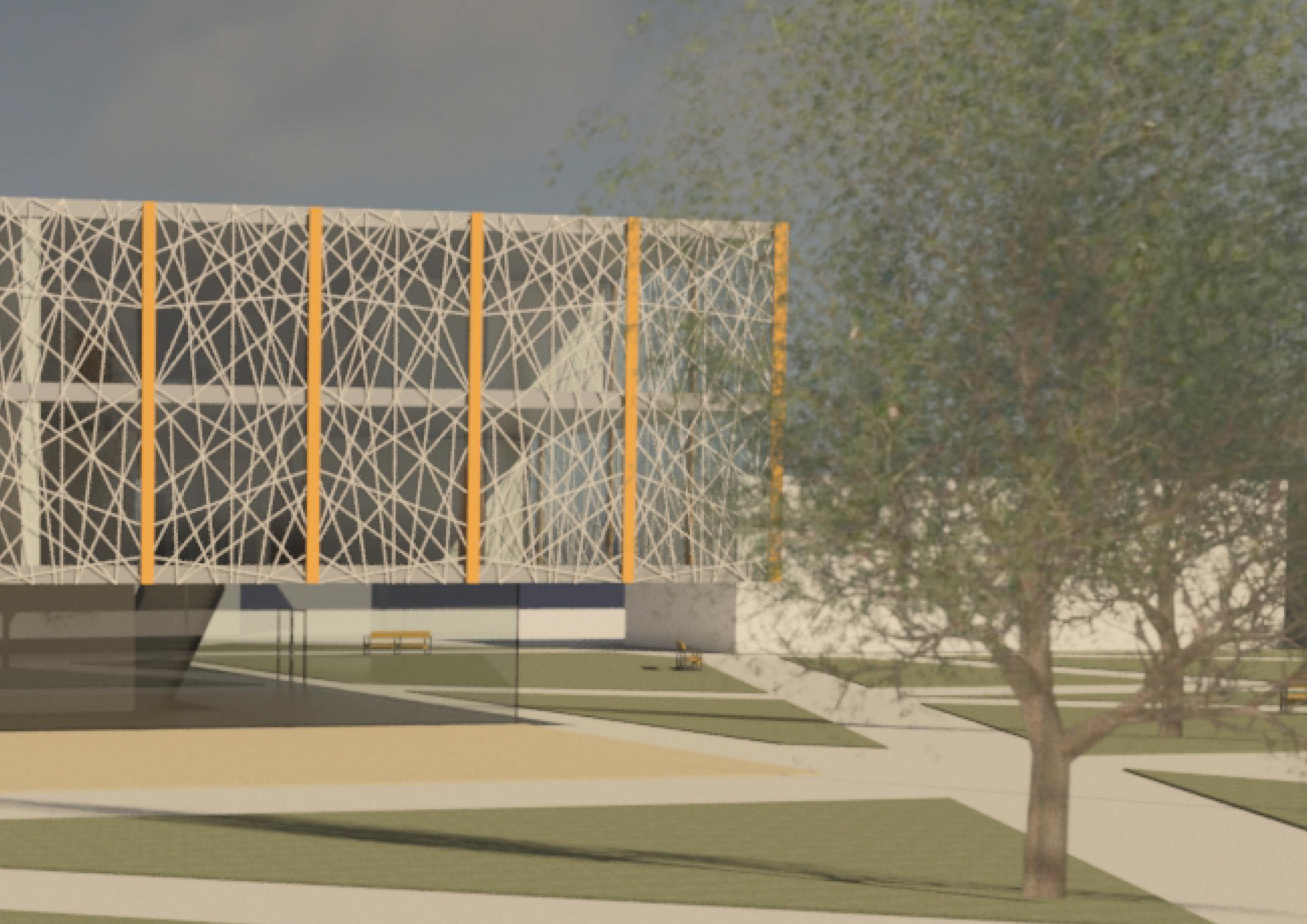
Network







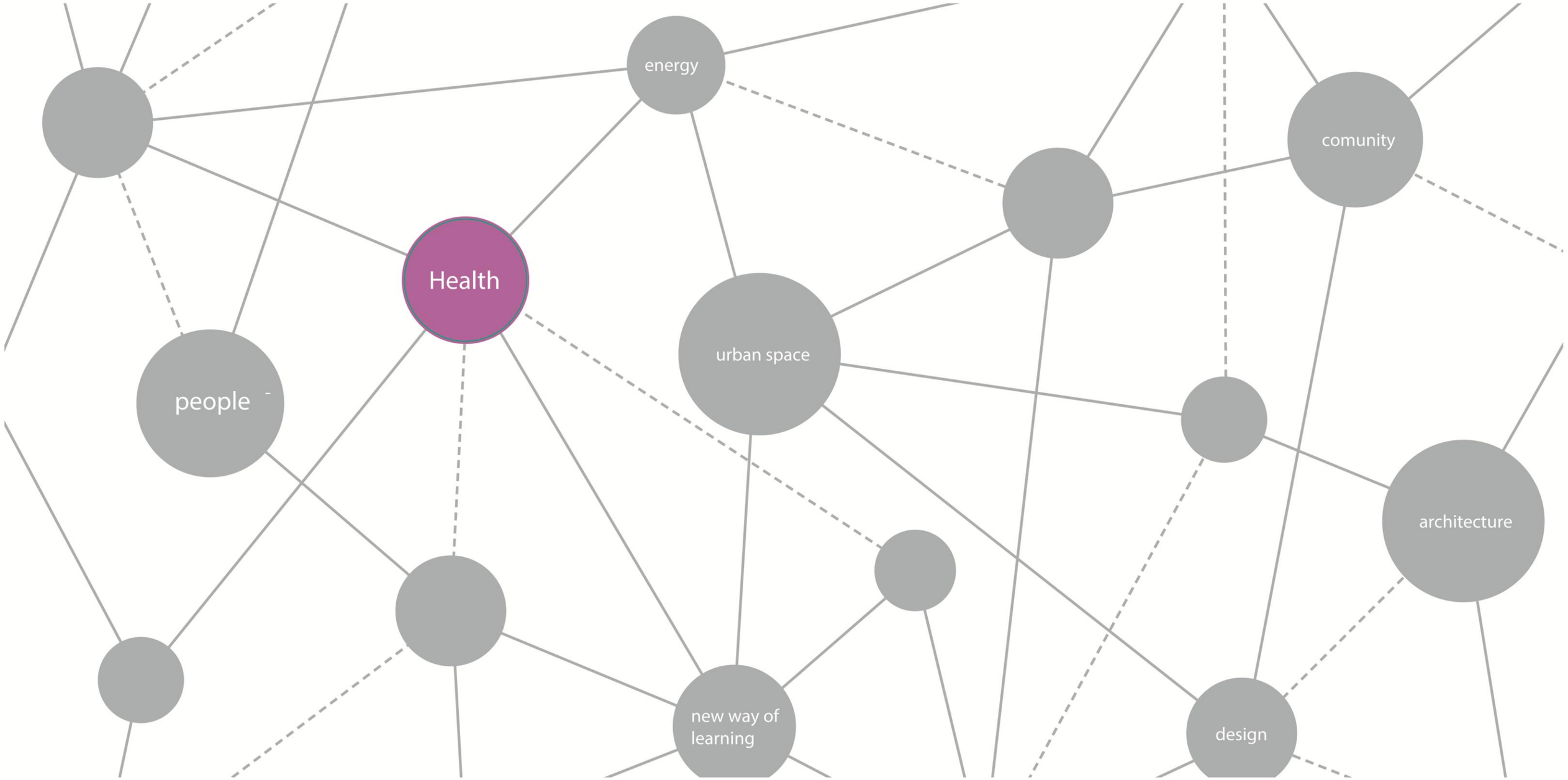




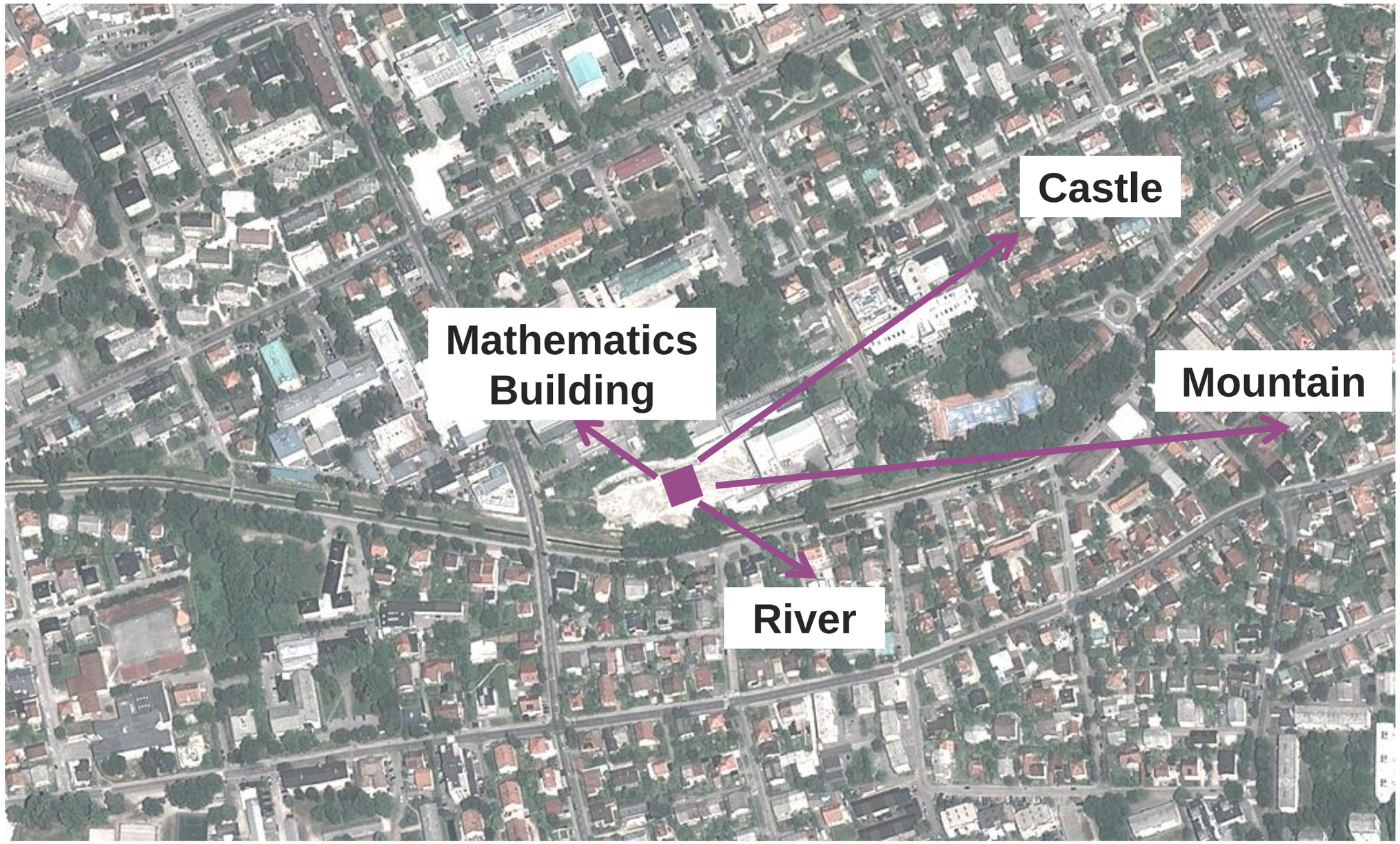


Network

Network

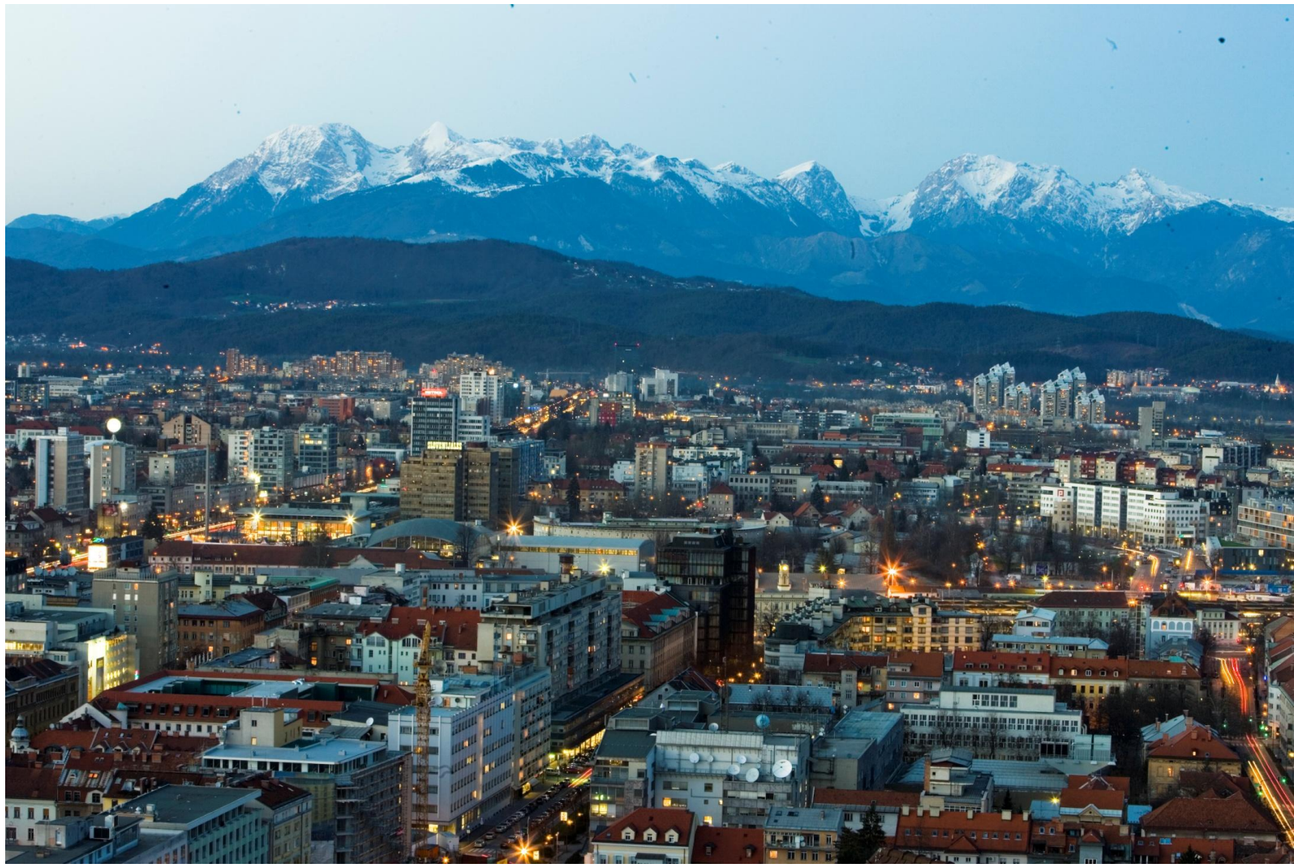


Views



View Towards Mathematic Building And Mountains



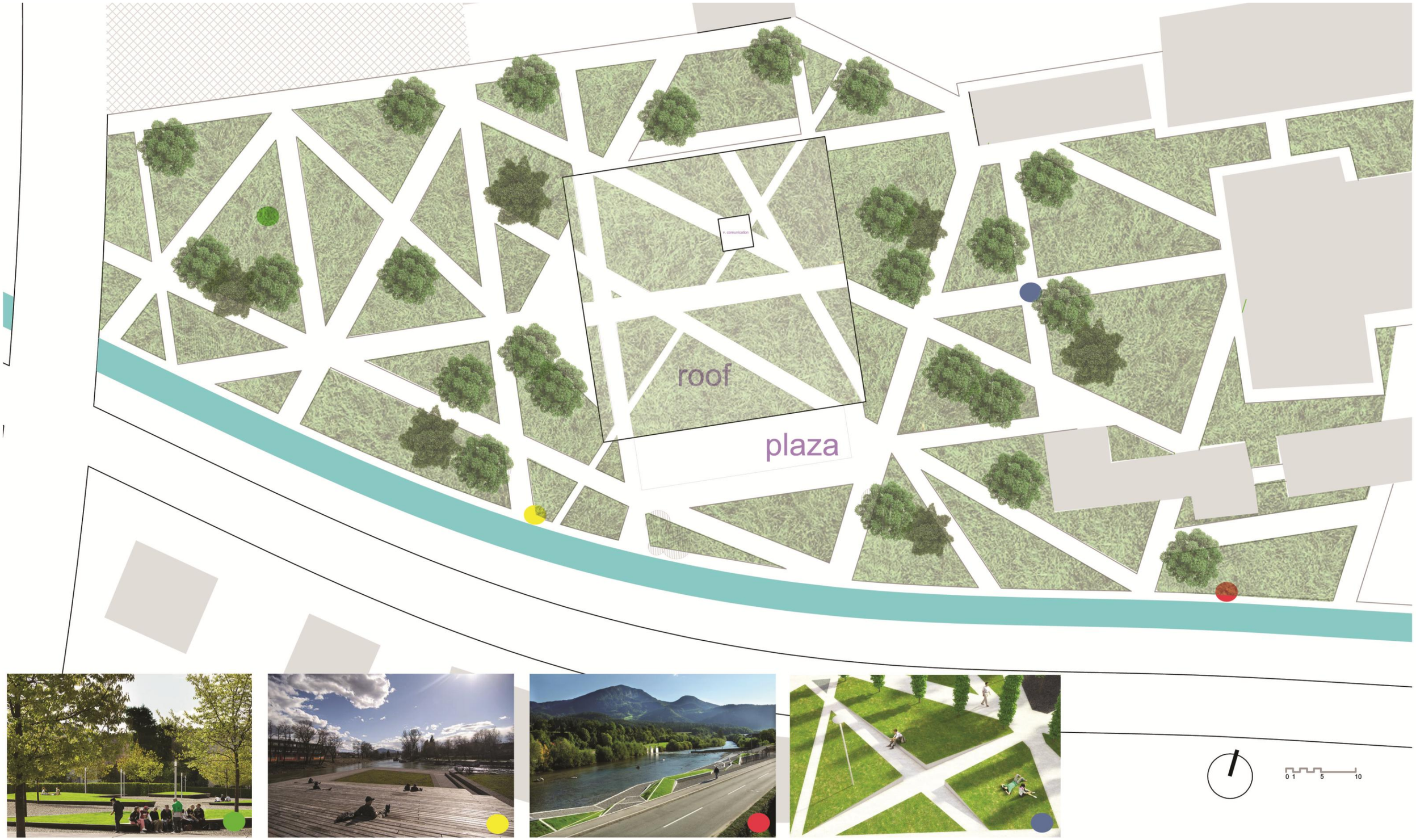


View Towards The Castle and River



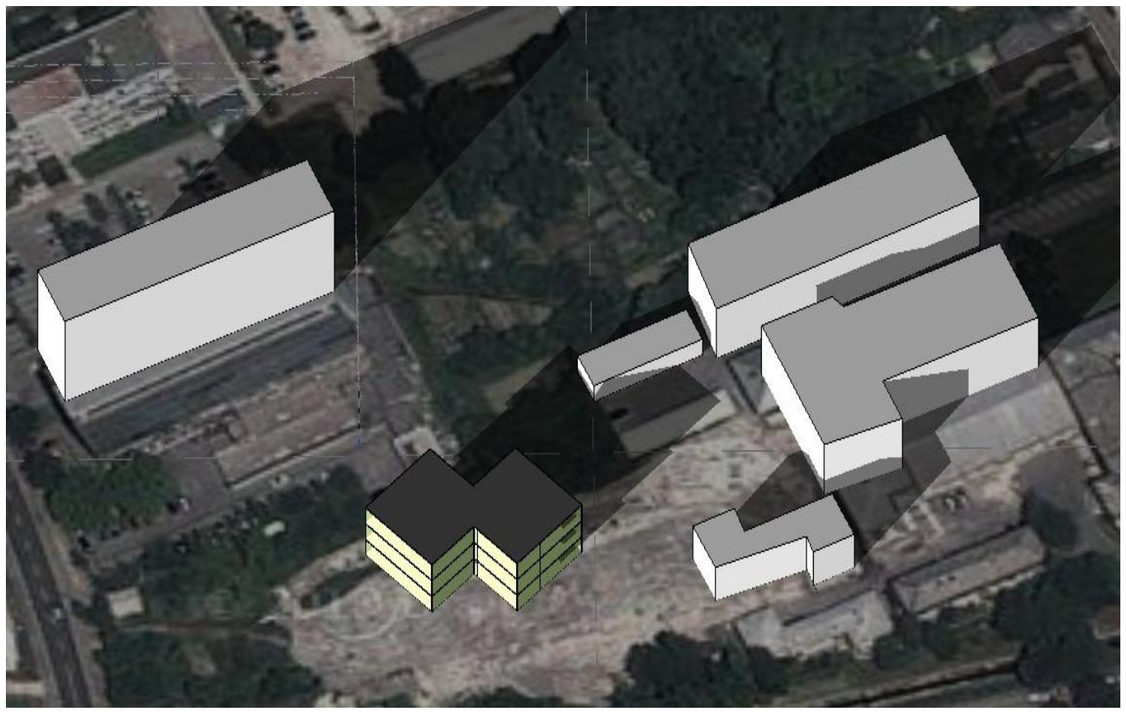


Urban Space

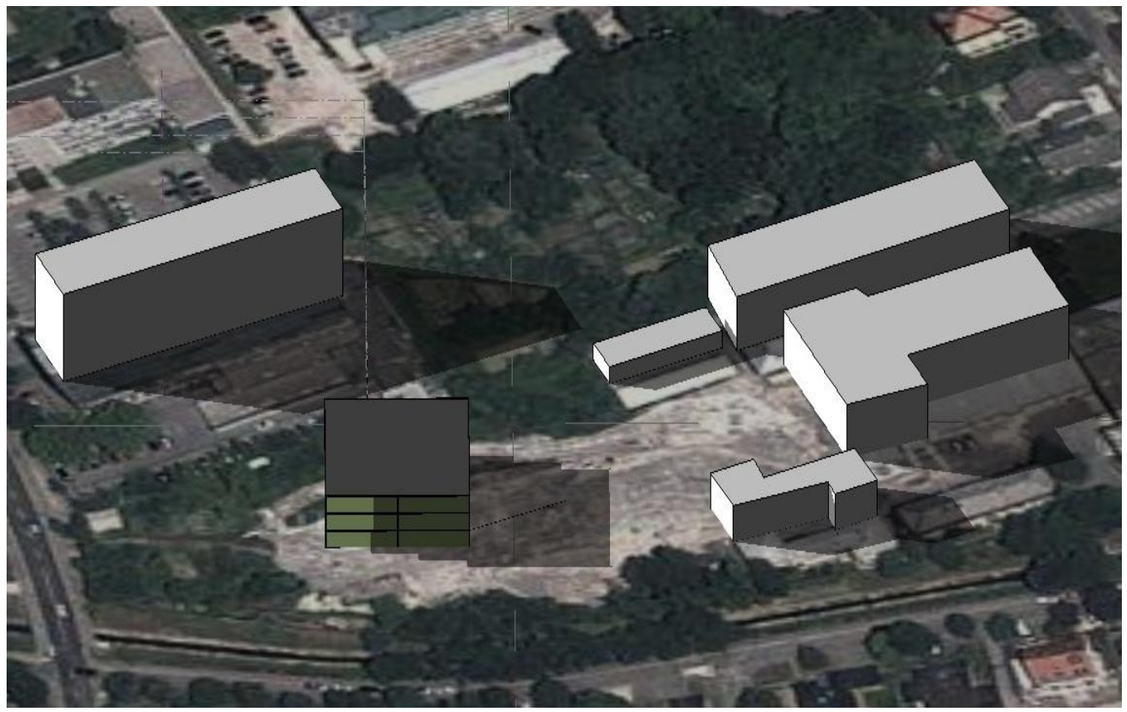


Building Shape

Double diamond



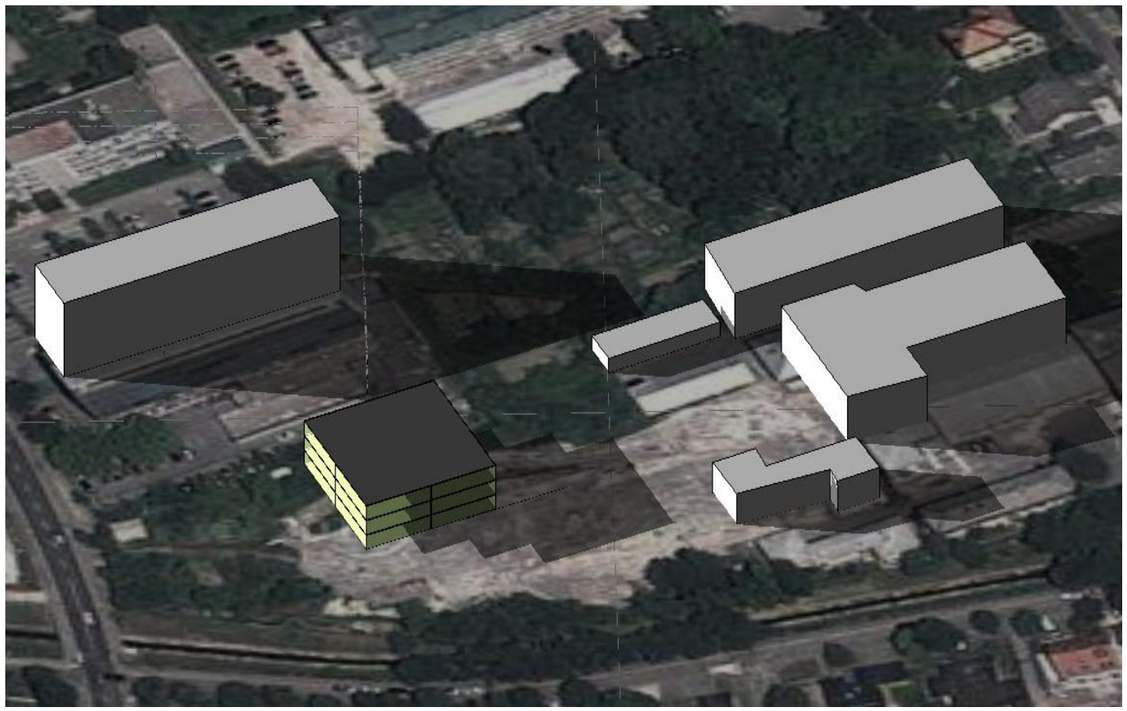
Square



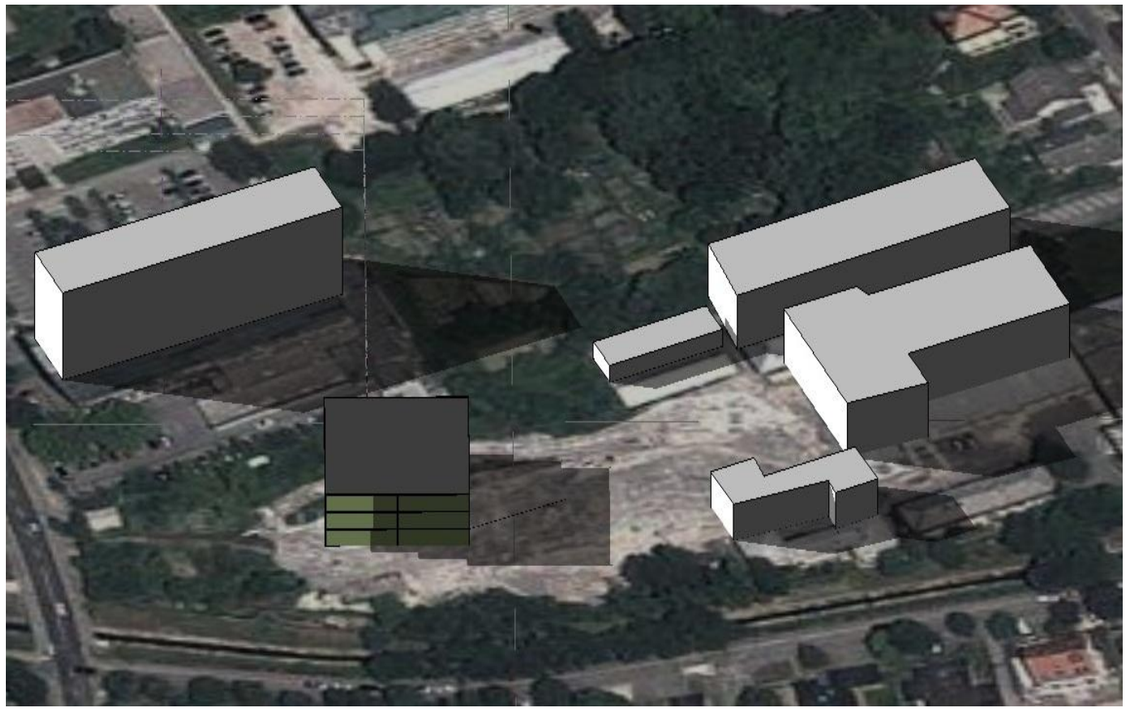
Autodesk Vasari

Building Orientation

Square tilted 22 degree East



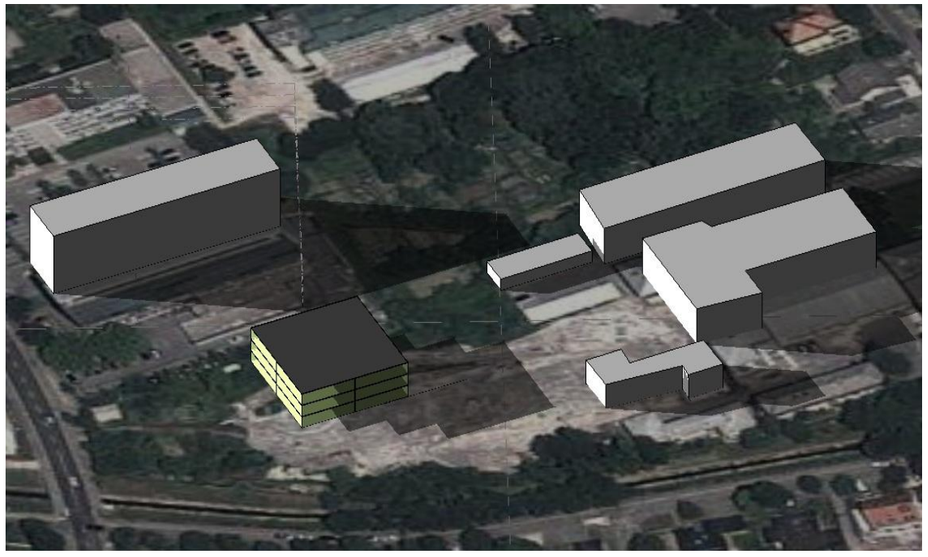
Square

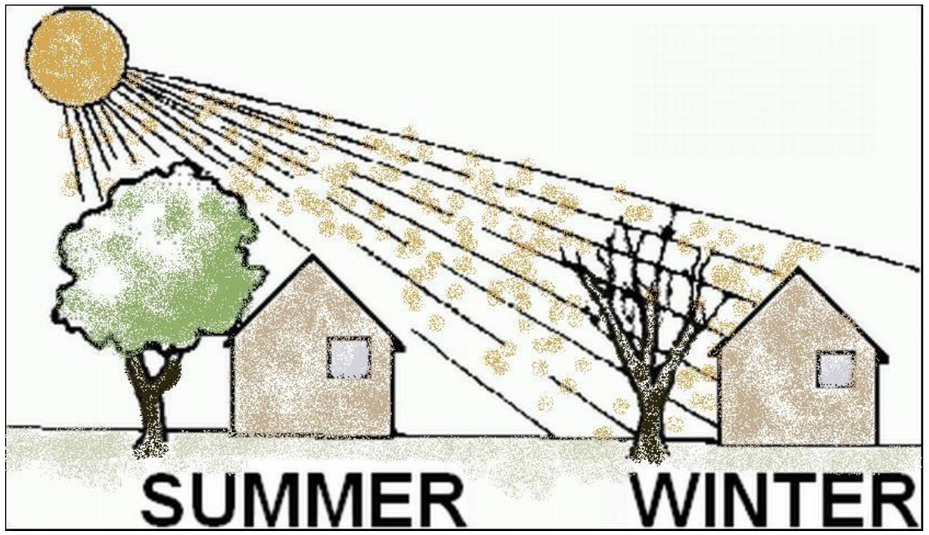


Autodesk Vasari

Tree Shade Coverage

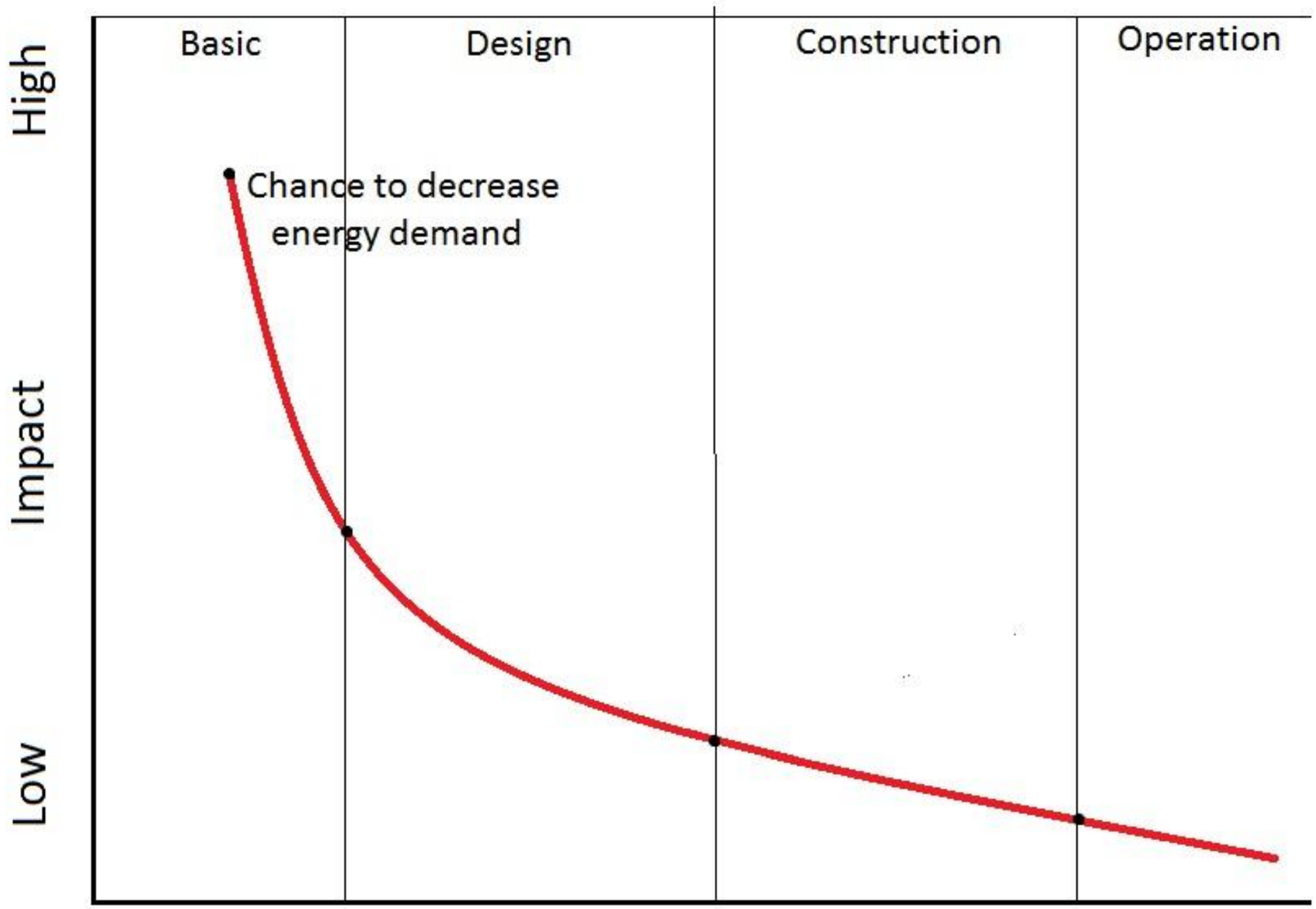
Square tilted 22° East





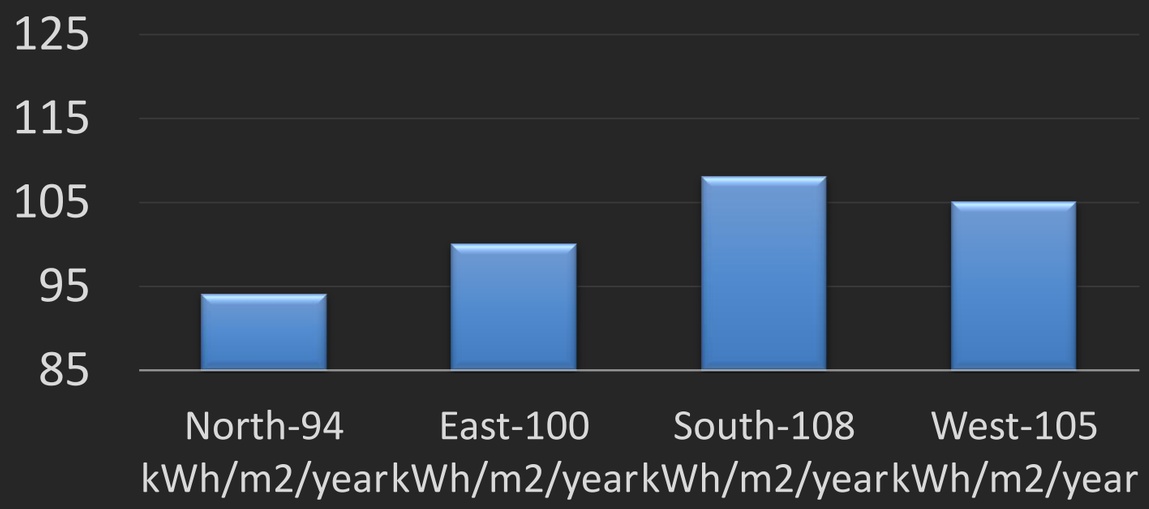


IPD-Impact on energy design

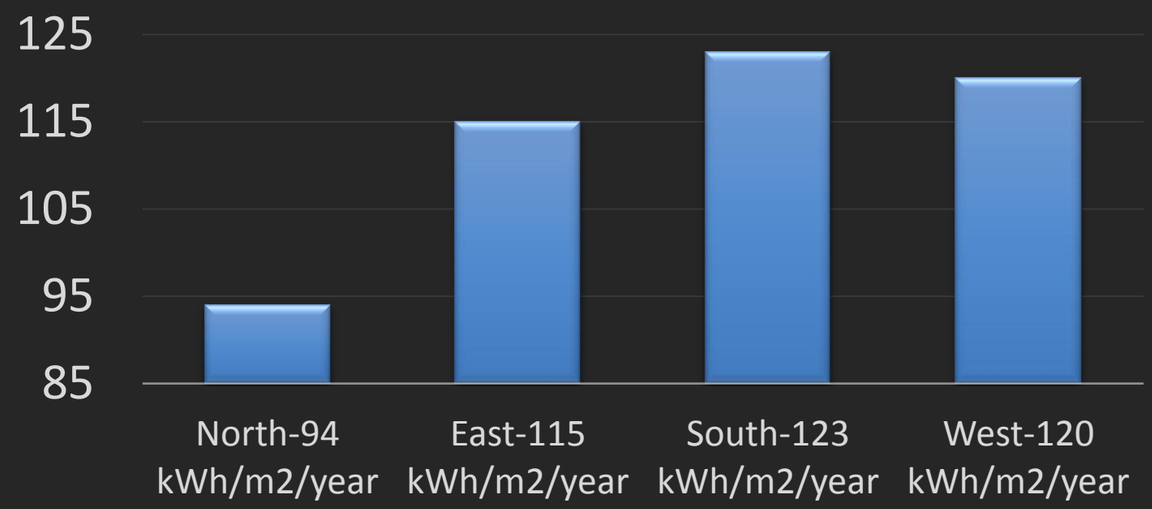


Integrated Energy Design

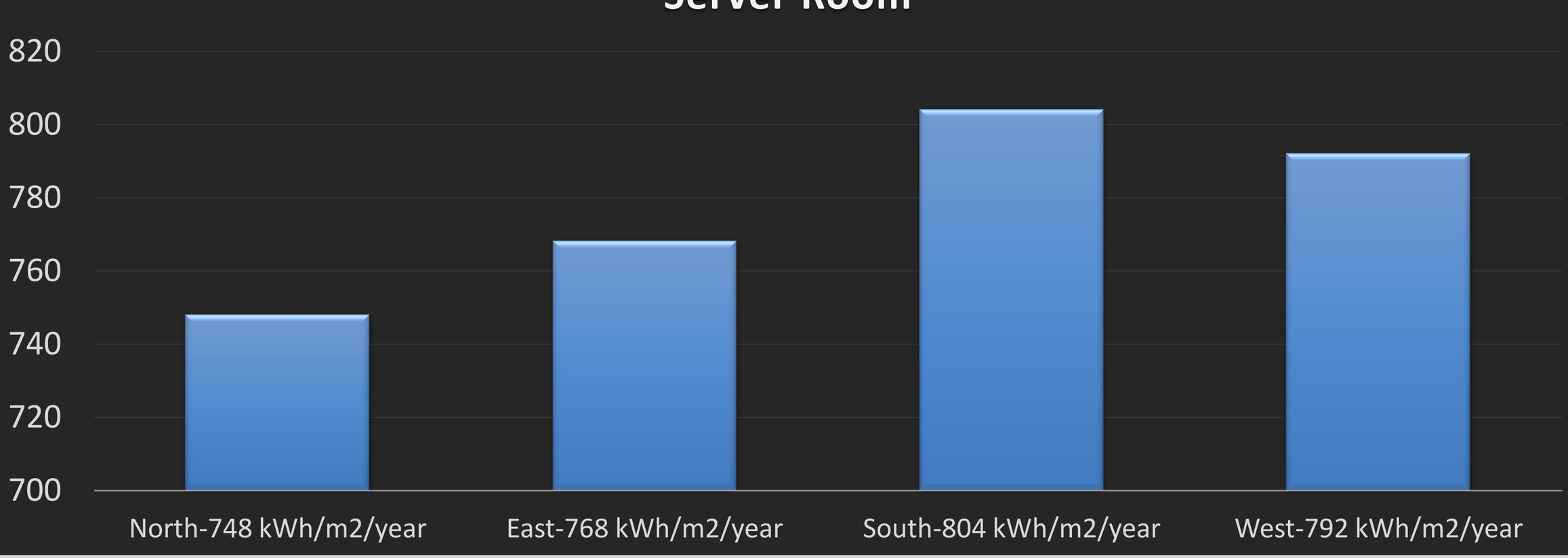
Small classroom



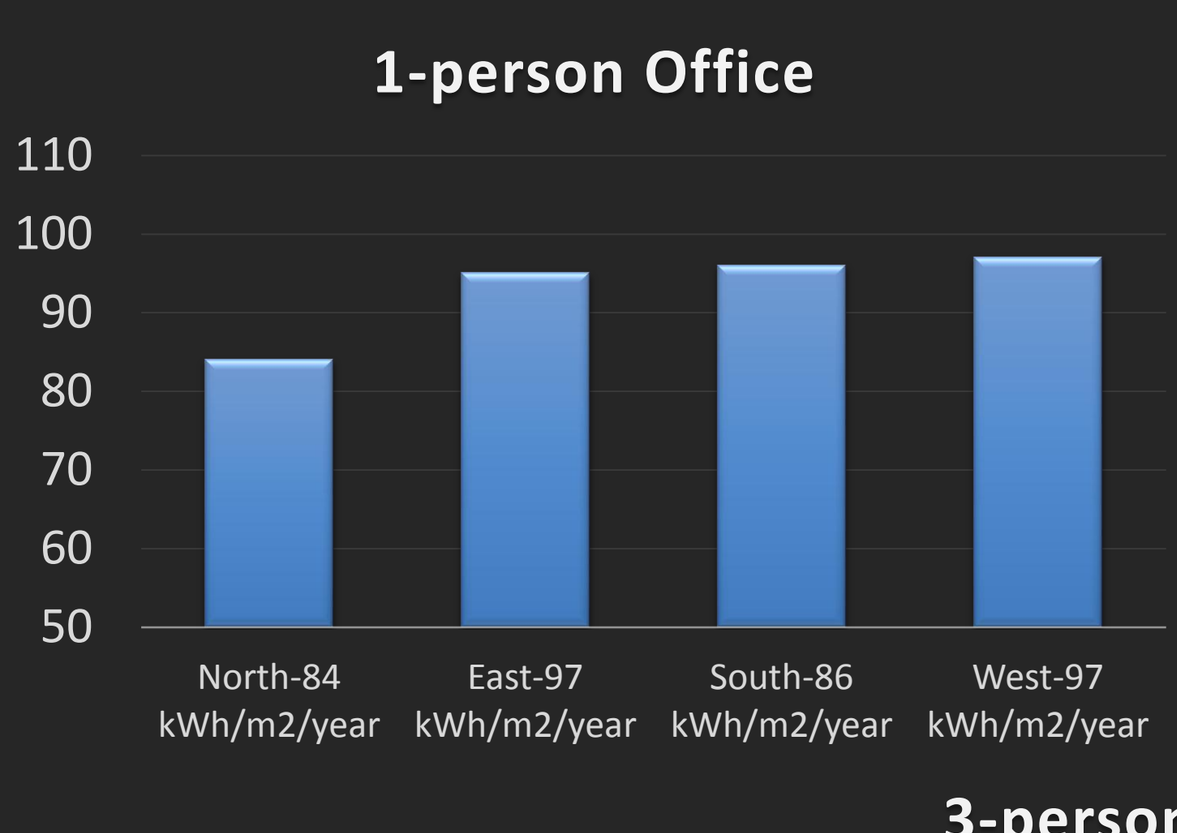
Lab

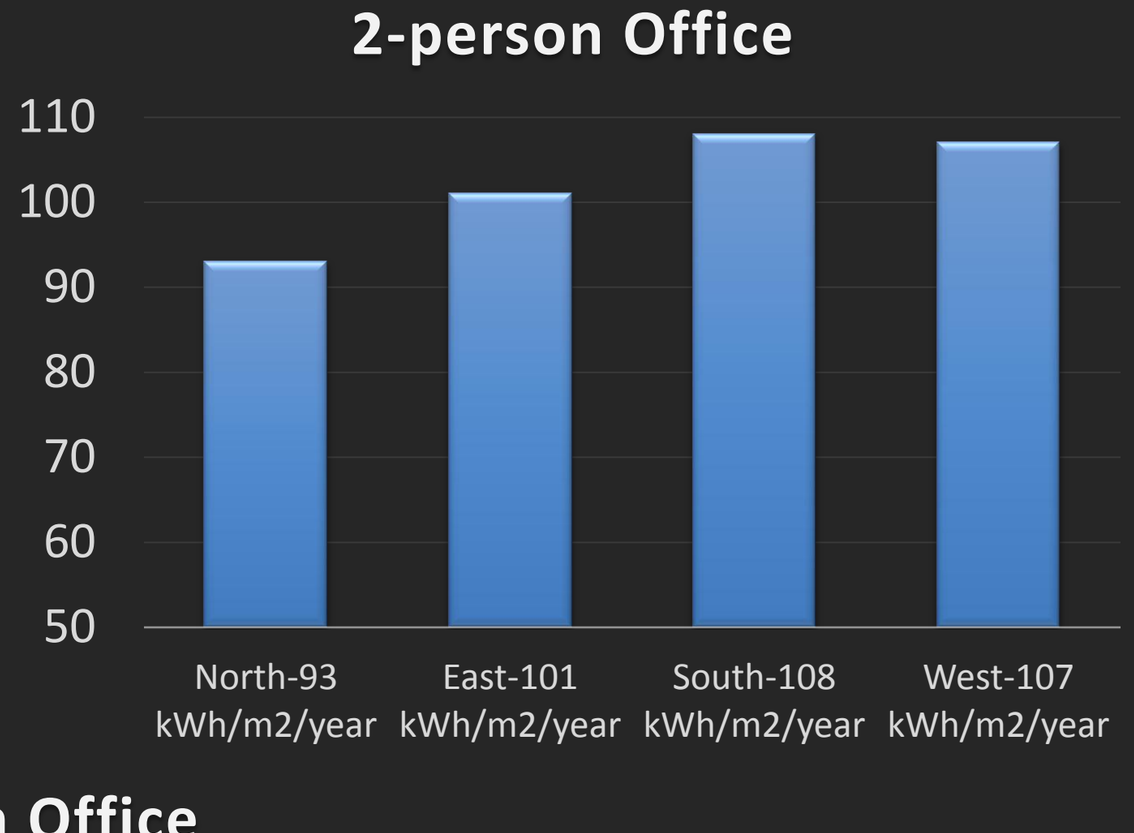


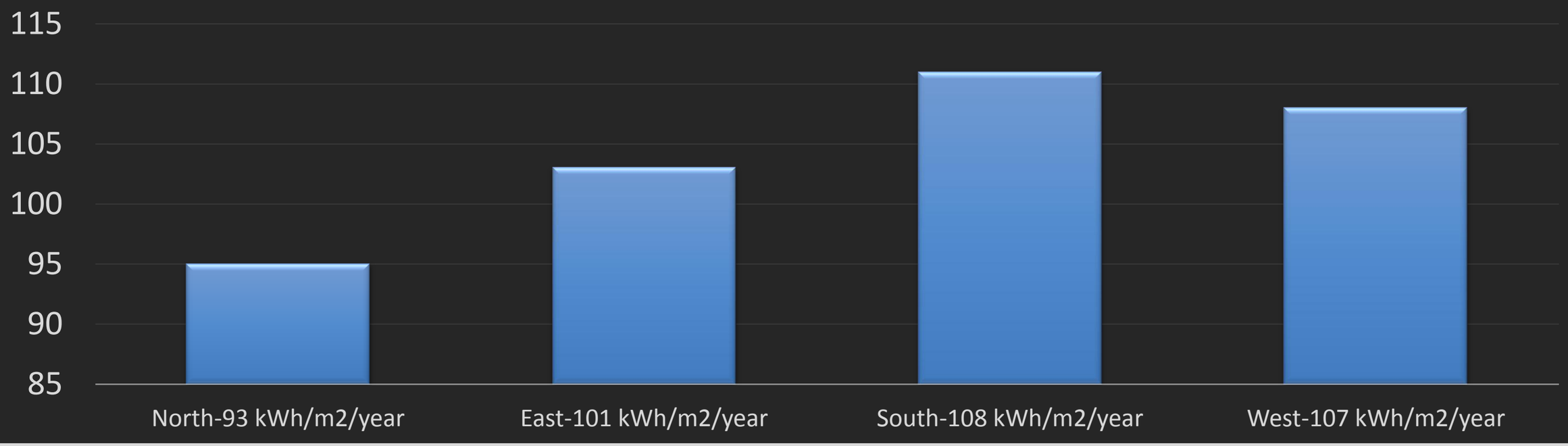
Server Room



Integrated Energy Design







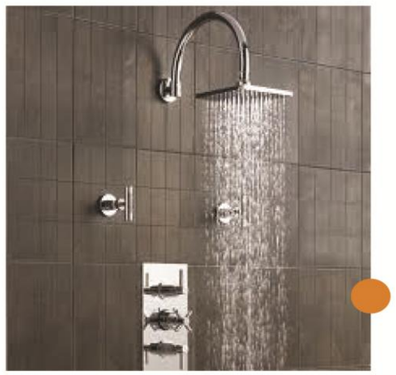
A SE MEP CM

Floor Plan - Basement

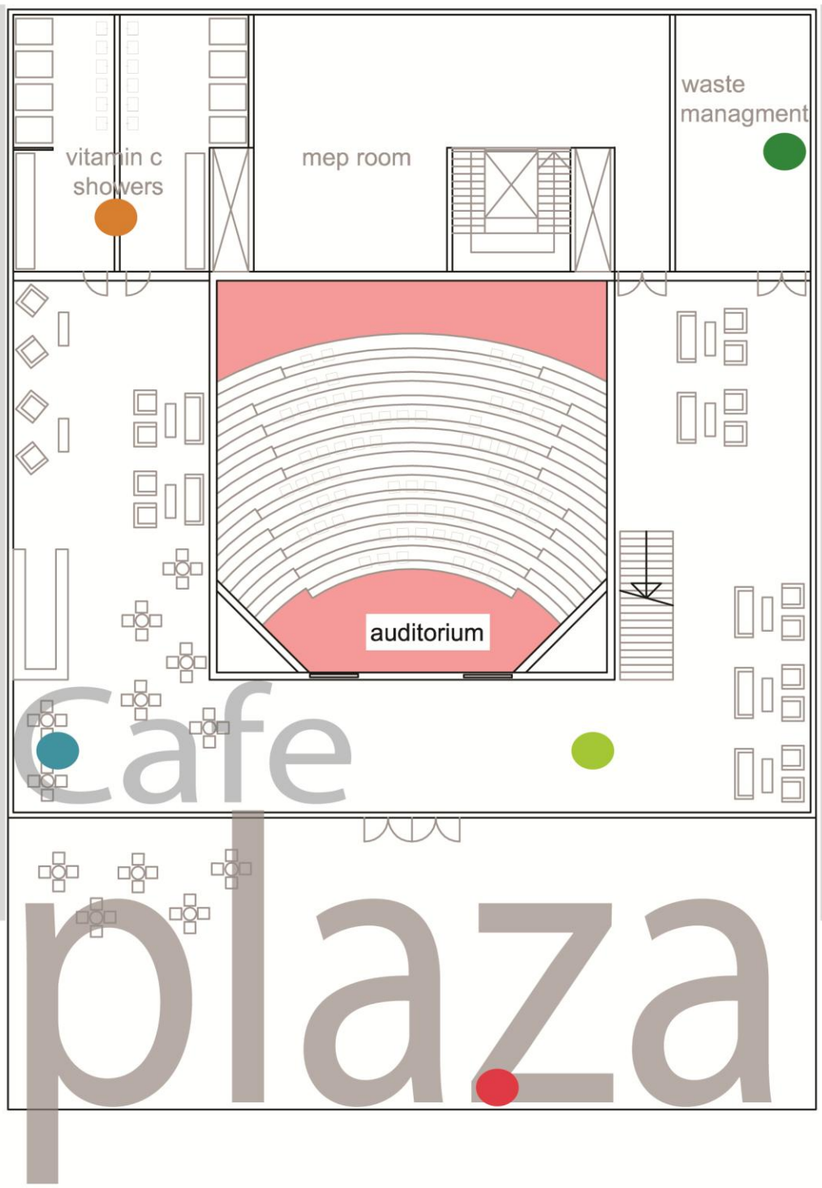




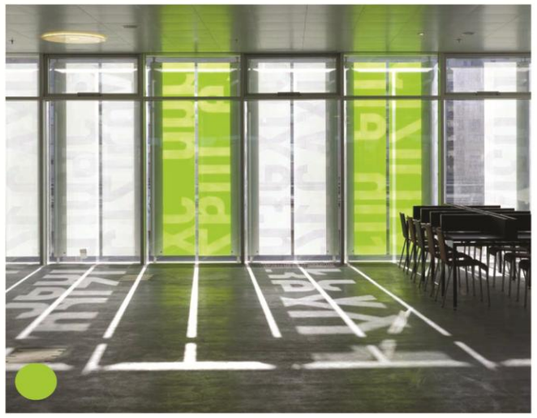








REUSE
REDUCE
RECYCLE

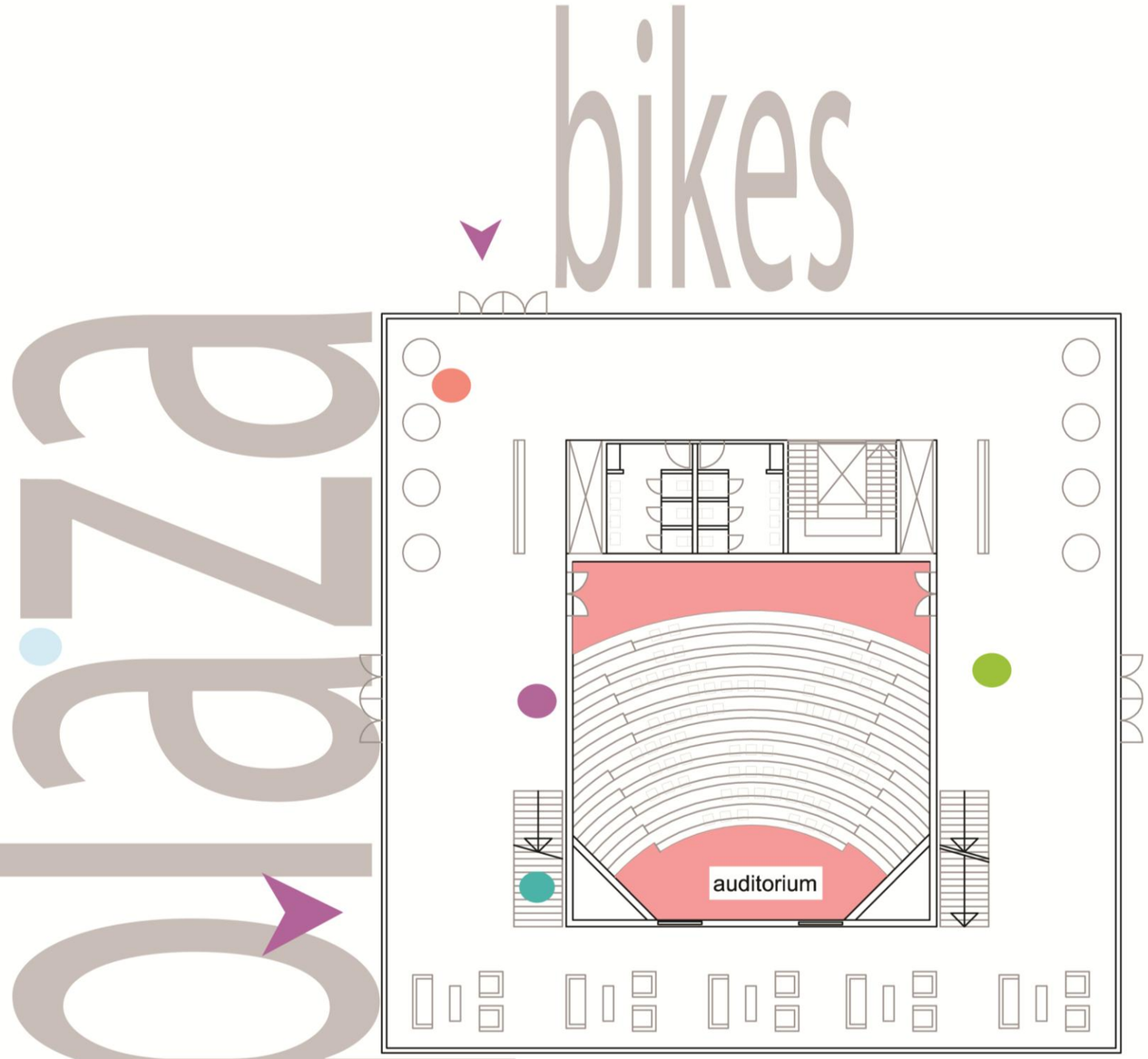




Floor Plan – Ground Floor









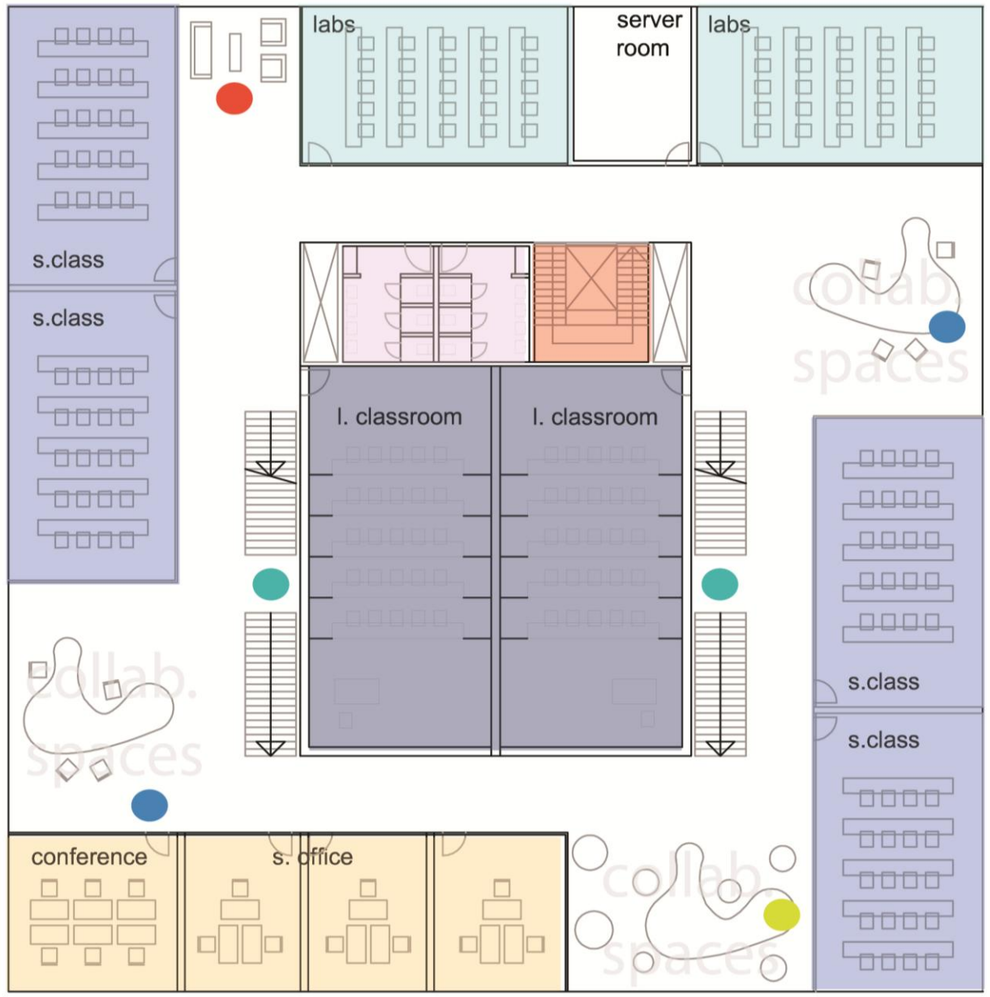




PRC

Floor Plan – First Floor











restrooms

vertical circulation (elevator, stairs)

mep

small classroom

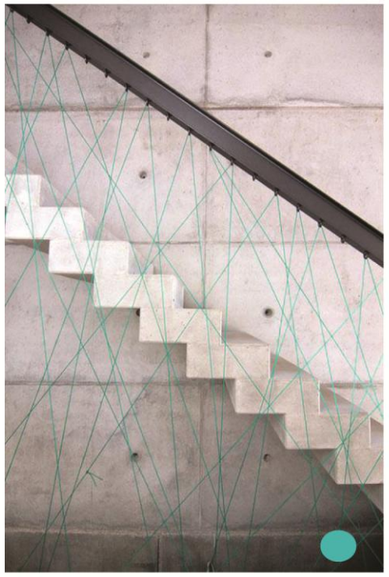
labs

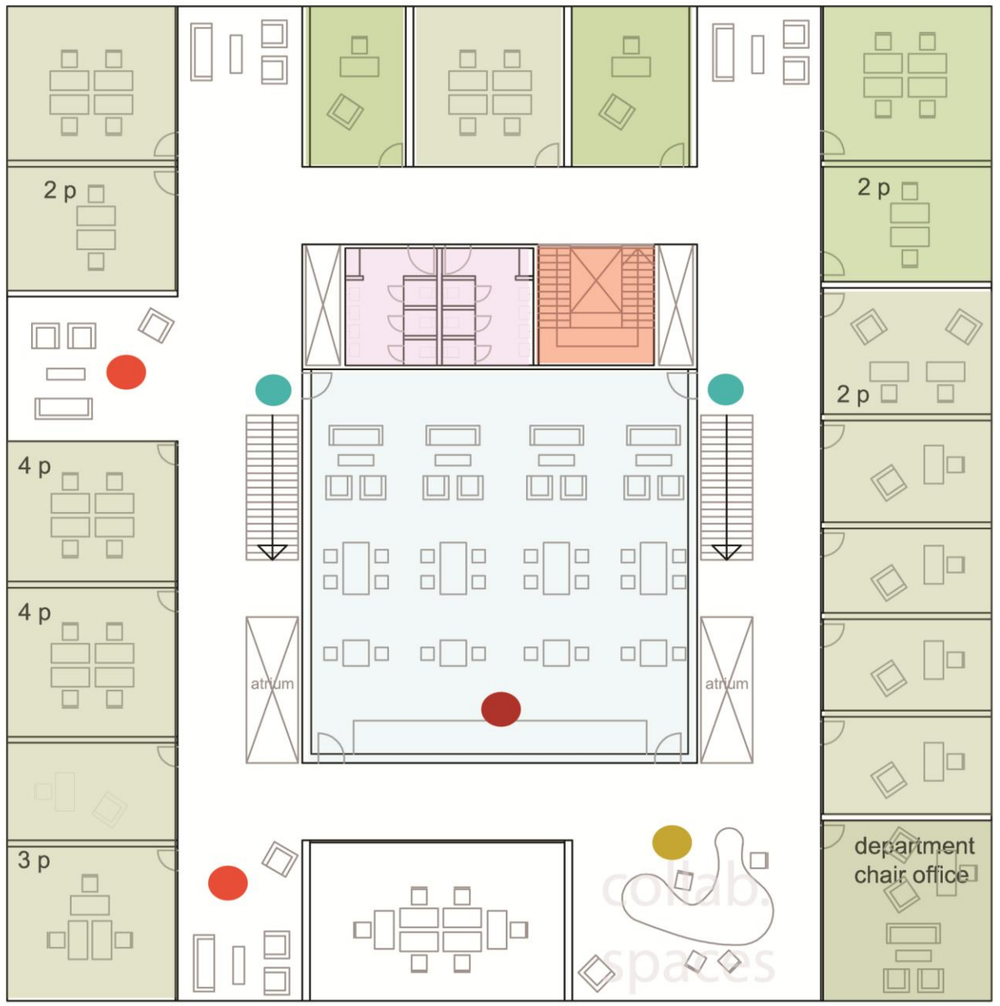
large classroom

student offices

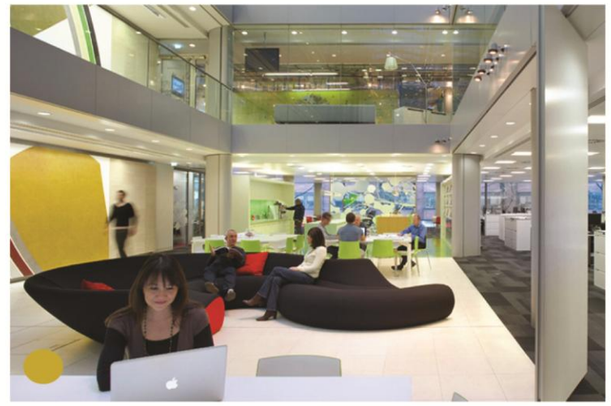
0 5 10

Floor Plan – Second Floor







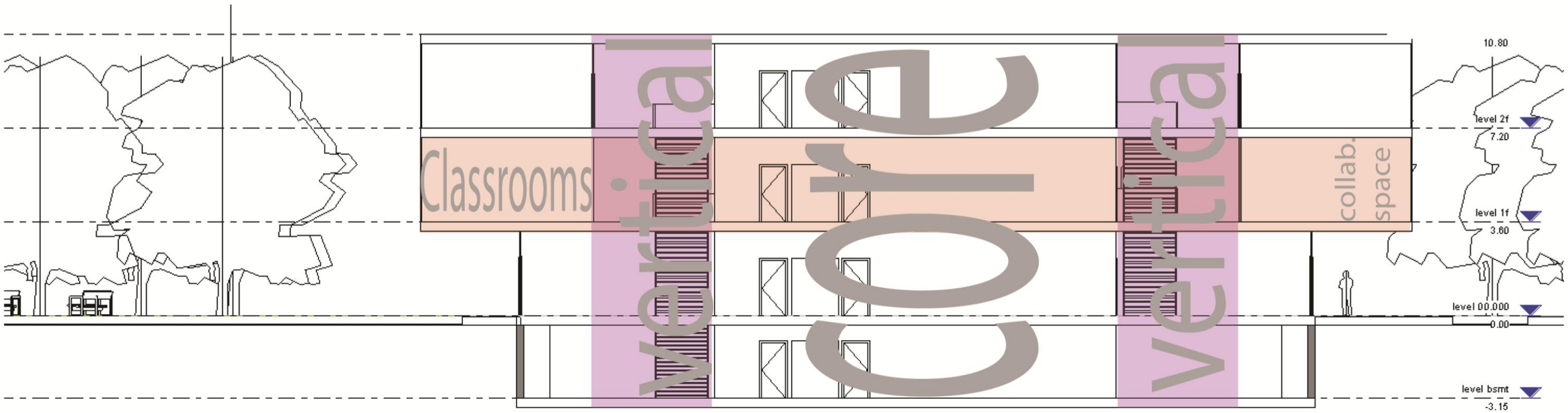


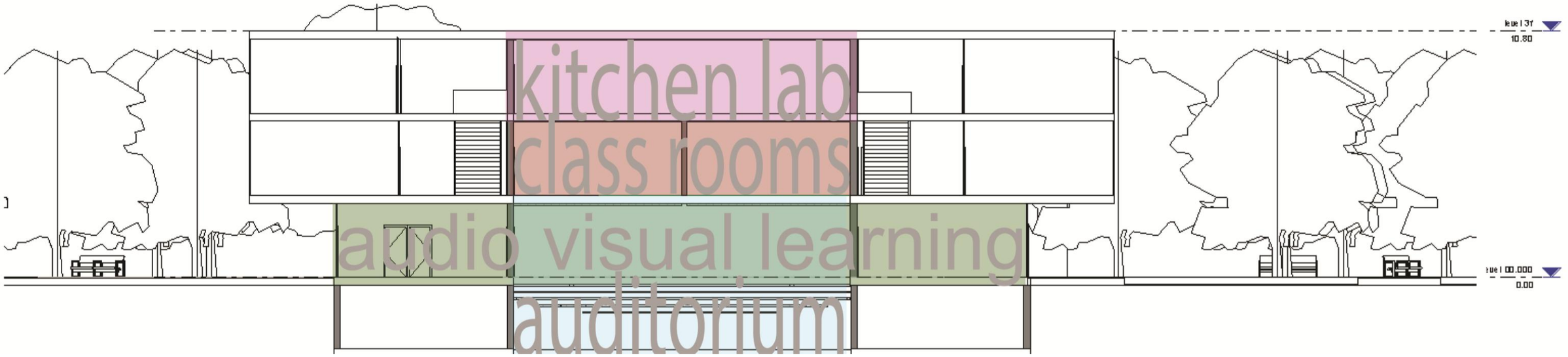


restrooms
vertical circulation (elevator, stairs)
mep
storage
office
department chair
senior administration
administrators

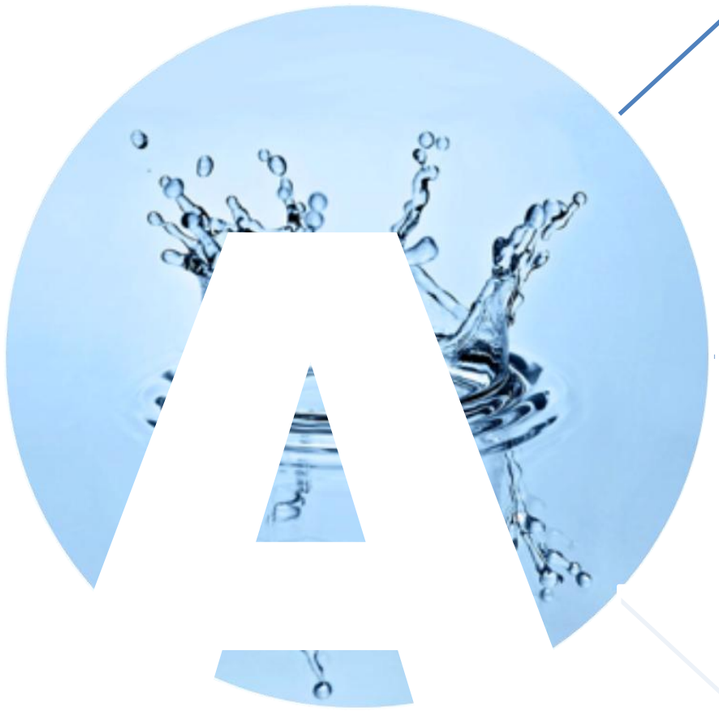
0 1 5 10

Section


Classrooms
vertical
core
vertical
collab.
space
10.80
level 2f
7.20
level 1f
3.60
level 00.000
0.00
level bsmt
-3.15


kitchen lab
class rooms
audio visual learning
auditorium
level 3f
10.80
level 00.000
0.00

Architectural Health Concept



Collab Space

- Choice of own workspace
- Flow in the space
- Flexibility

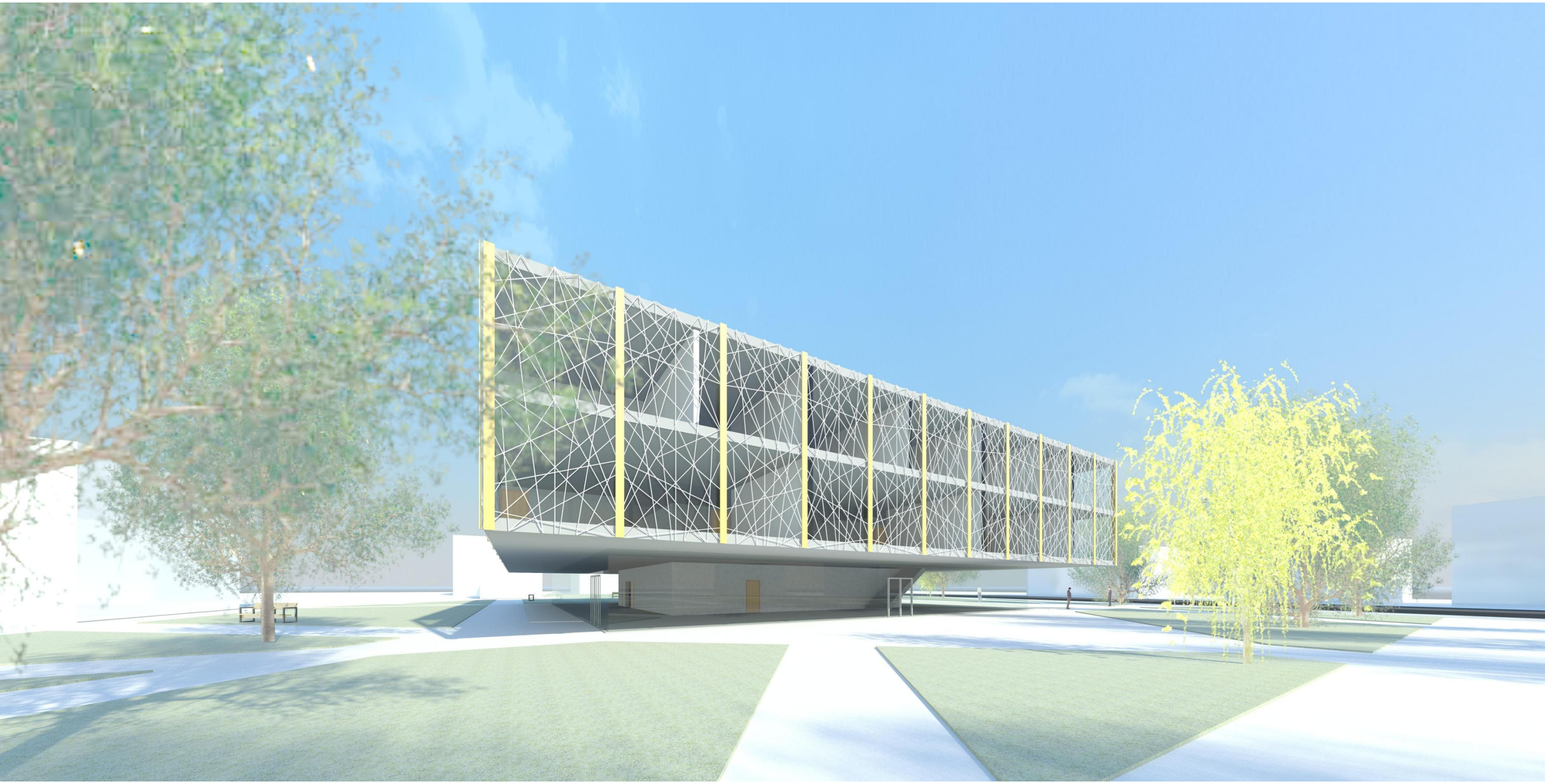
Outdoor Health Design

- Division by private, semi-private and private-public
- Harvesting Garden
- River spine/heart of building

Audio-visual Space

- Landmark
- School is going everywhere
- New ways of learning

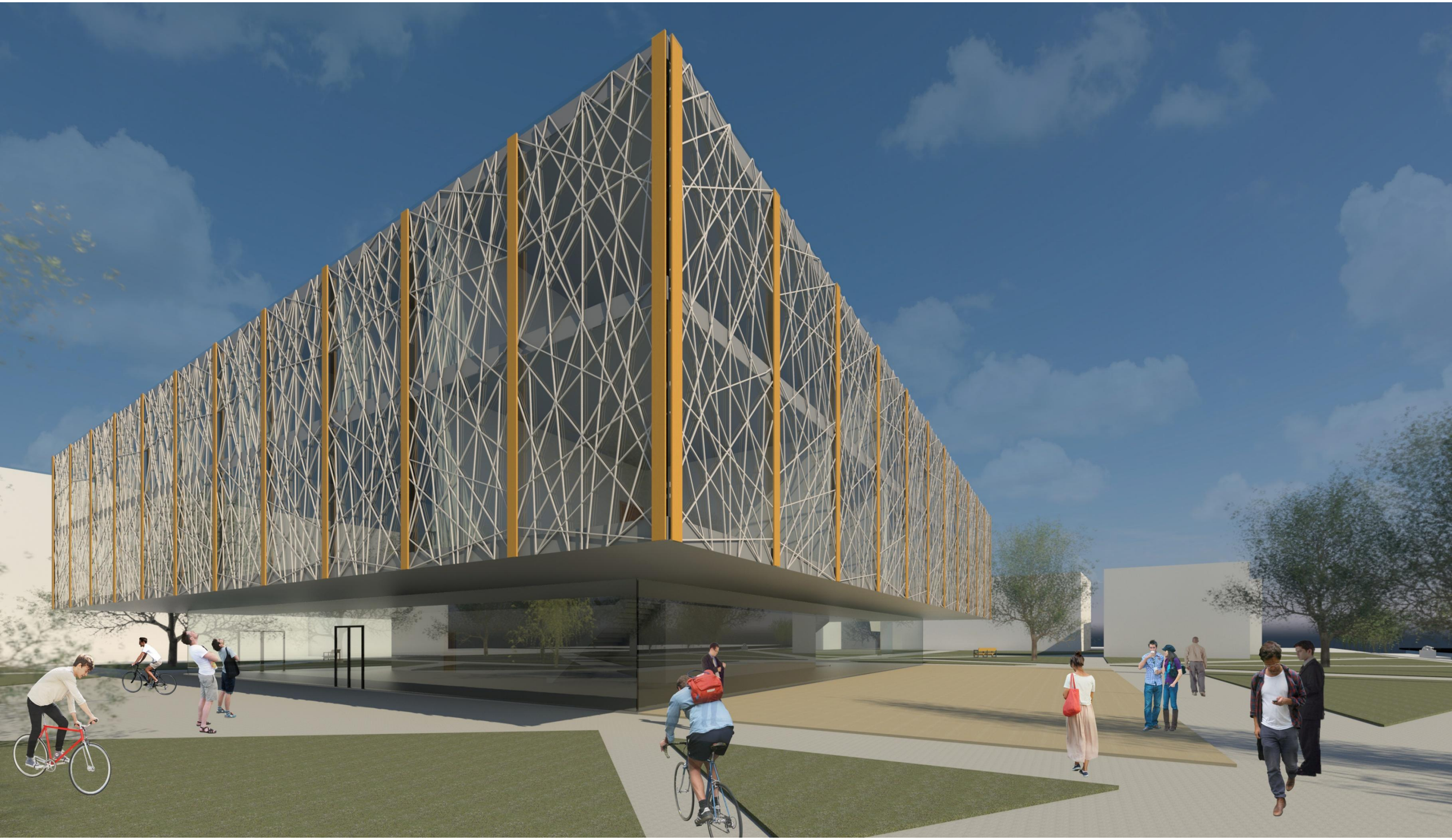
North East View



West View Towards Main Entrance

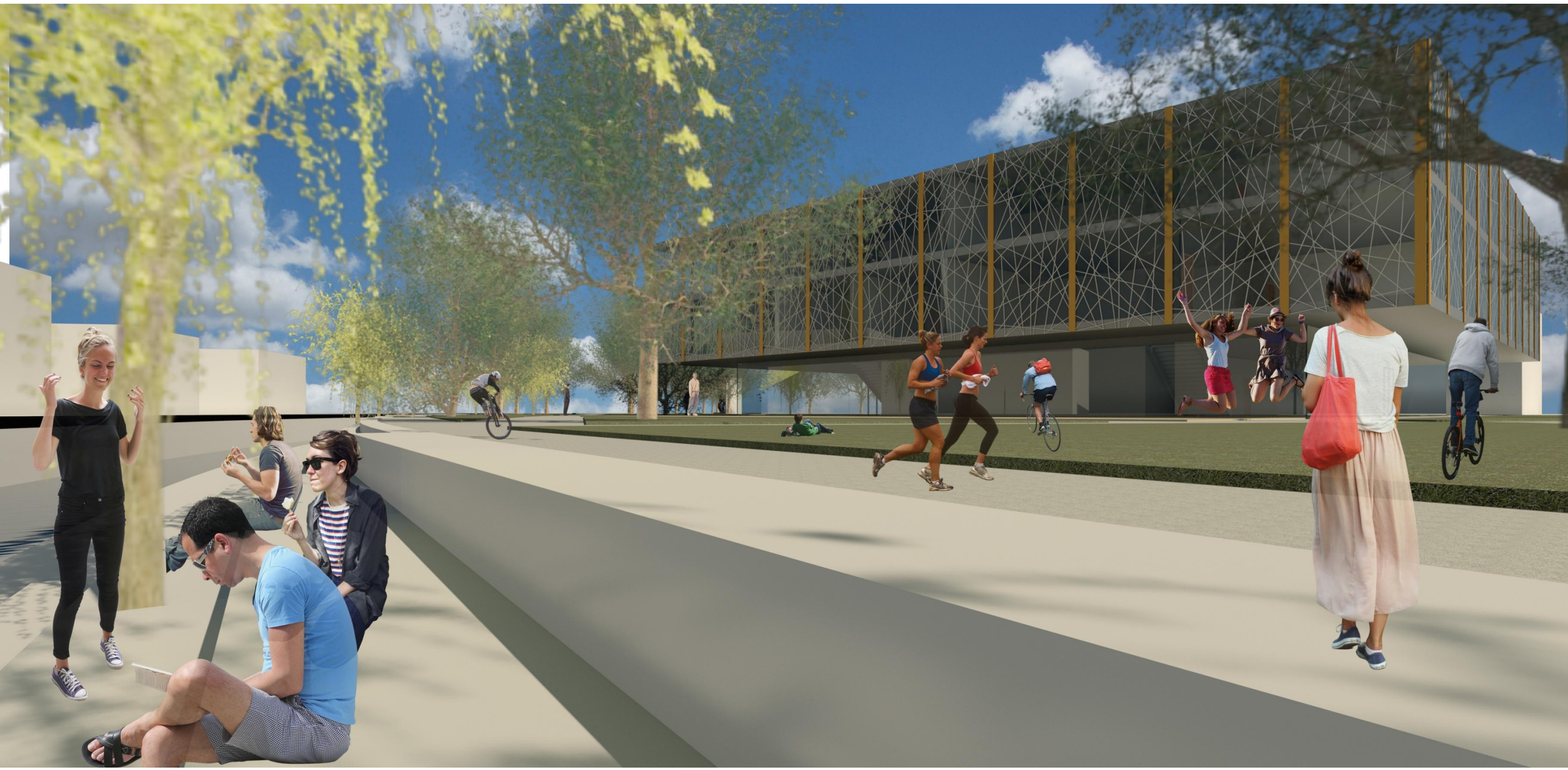


South West View



A SE MEP CM

View From The Steps Next To The River

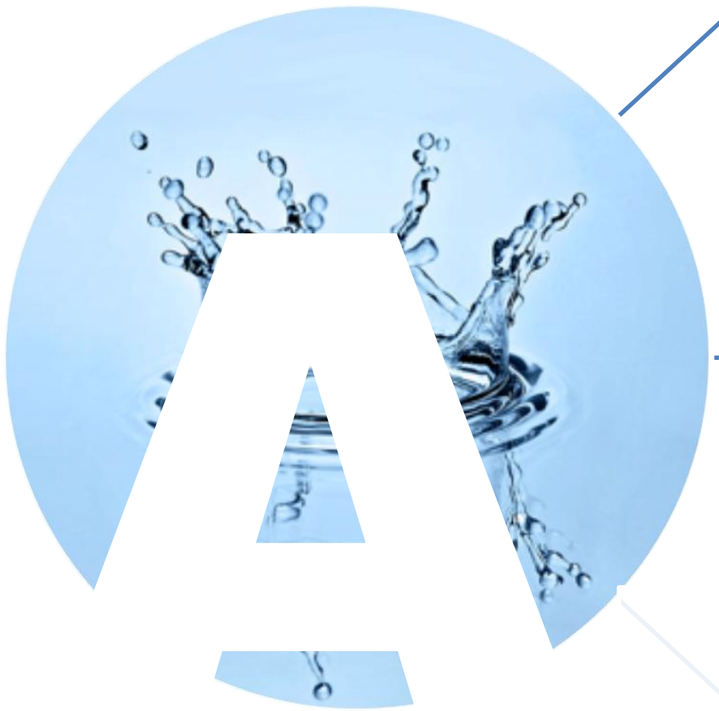


A SE MEP CM

West View From The Park



Architectural Health Concept



Collab Space

- Choice of own workspace
- Flow in the space
- Flexibility

Outdoor Health Design

- Division by
  - private,
  - semi-private and
  - private-public
- Harvesting Garden
- River spine/heart of building

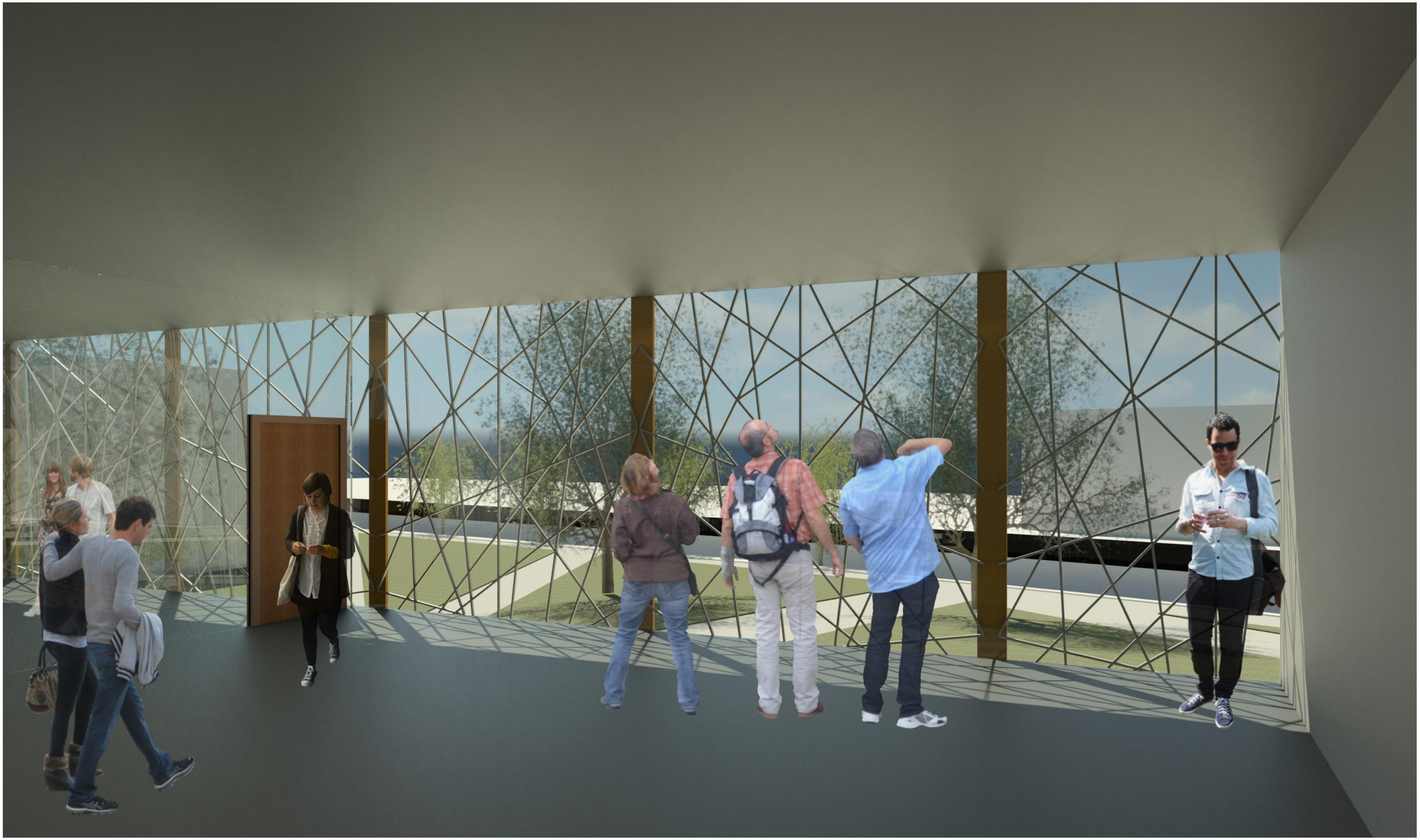
Audio-visual Space

- Landmark
- School is going everywhere
- New ways of learning

Corridor View



View From the Office to the River



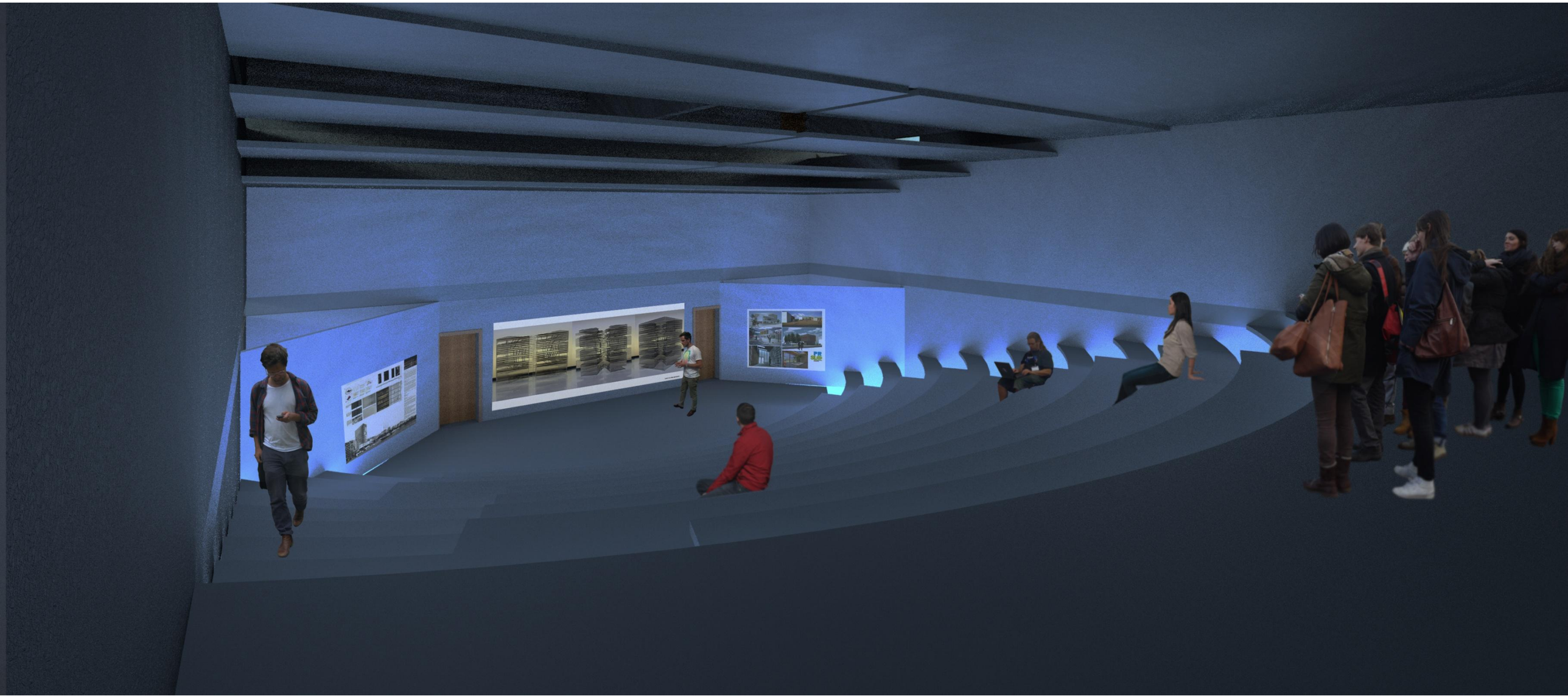
Offices



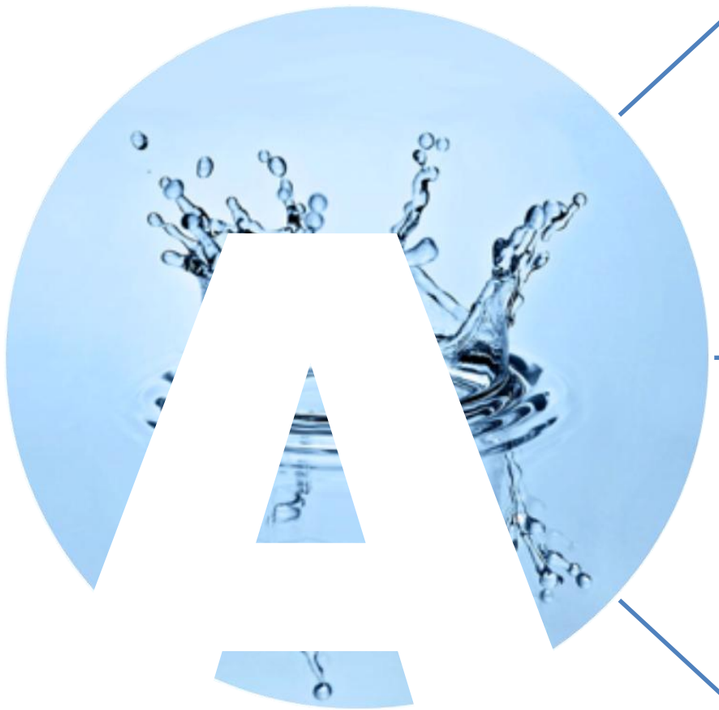
View Towards Collaborative Space



Auditorium



Architectural Health Concept



Collab Space

- Choice of own workspace
- Flow in the space
- Flexibility

Outdoor Health Design

- Division by
  - private,
  - semi-private and
  - private-public
- Harvesting Garden
- River spine/heart of building

Audio-visual Space

- Landmark
- School is going everywhere
- New ways of learning

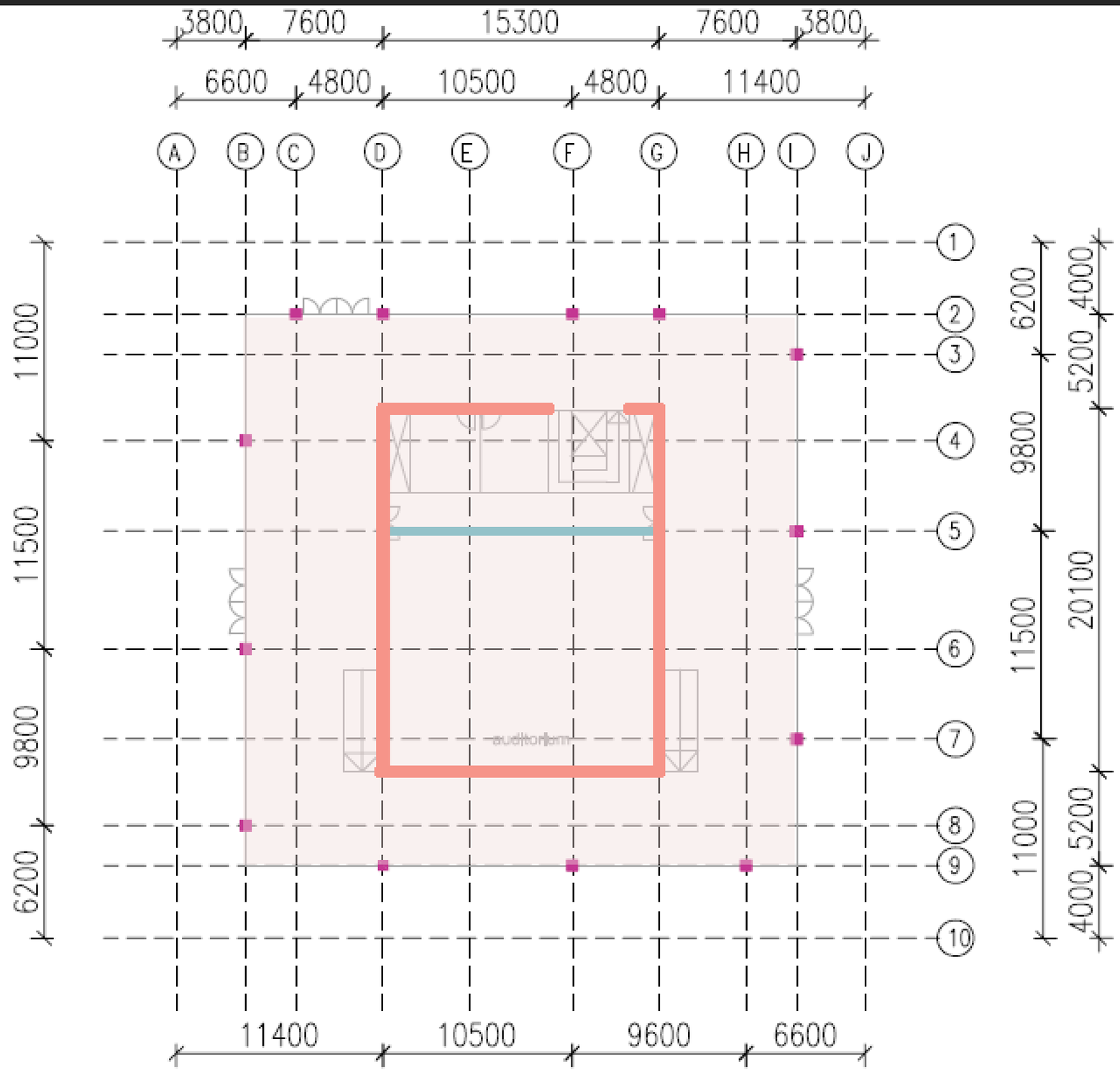
Legend



	Slab	200
	Beams (core)	350X300
	Beams (cantilever)	300x200
	Perimeter PT Beams(Int./Ext)	1220/610x60
	Int. Column	350X350
	Ext. Column	250 X250
	Shear wall	300
	Cantilever	
	Footprint:	

Unit (mm)

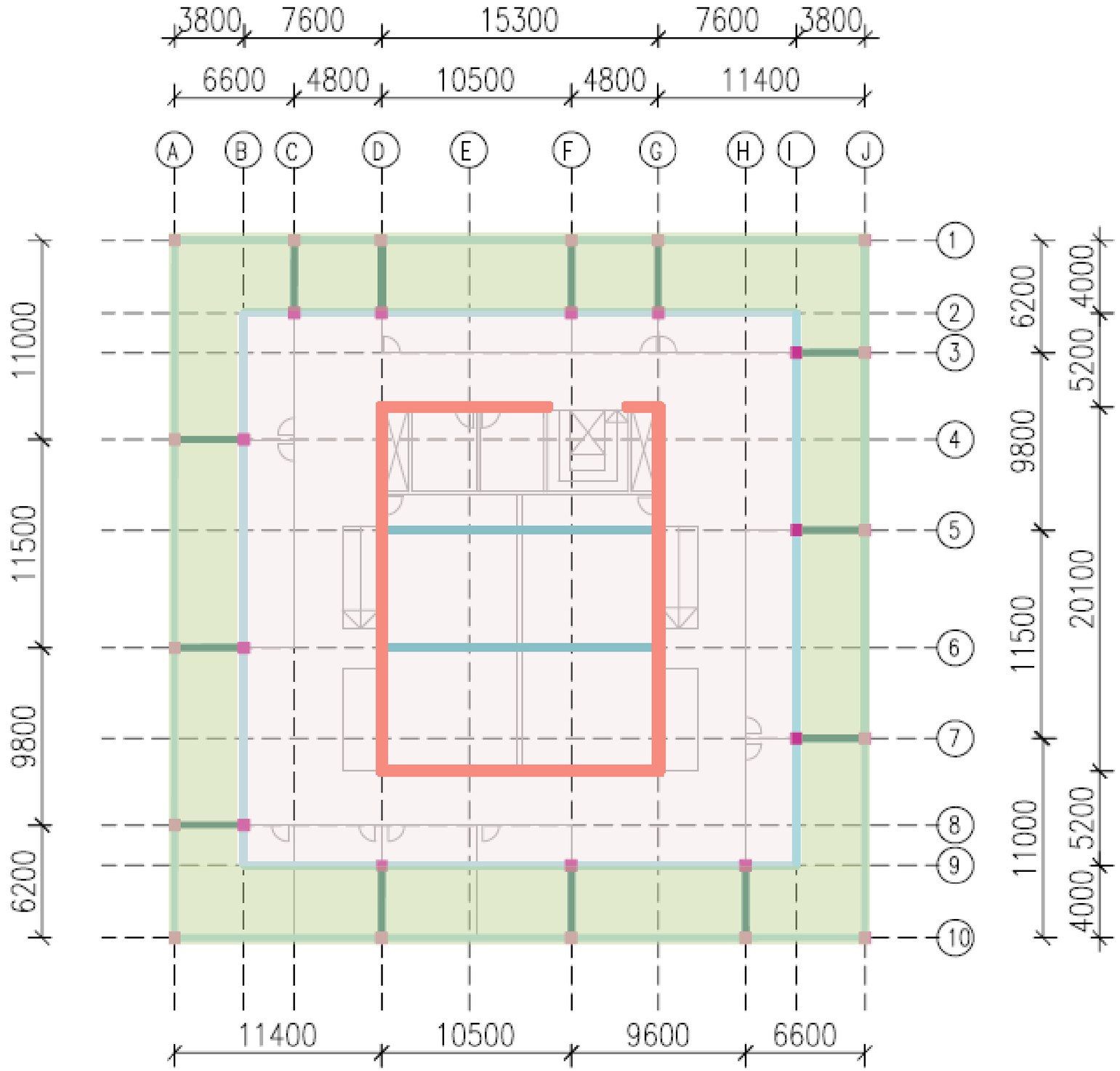
Structural Grid Ground Floor



[mm]

A SE MEP CM

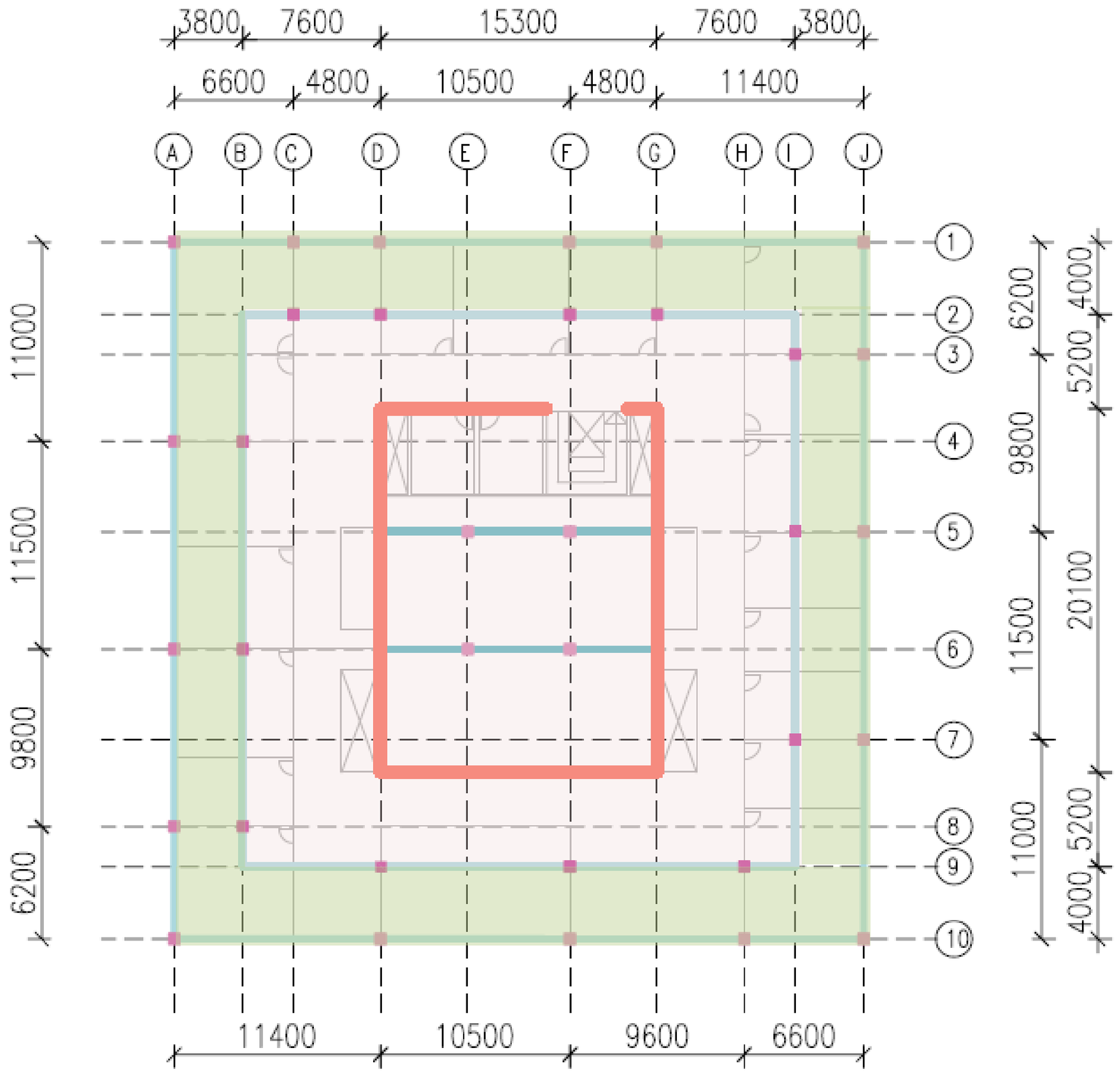
Structural Grid 1st Floor



[mm]

A SE MEP CM

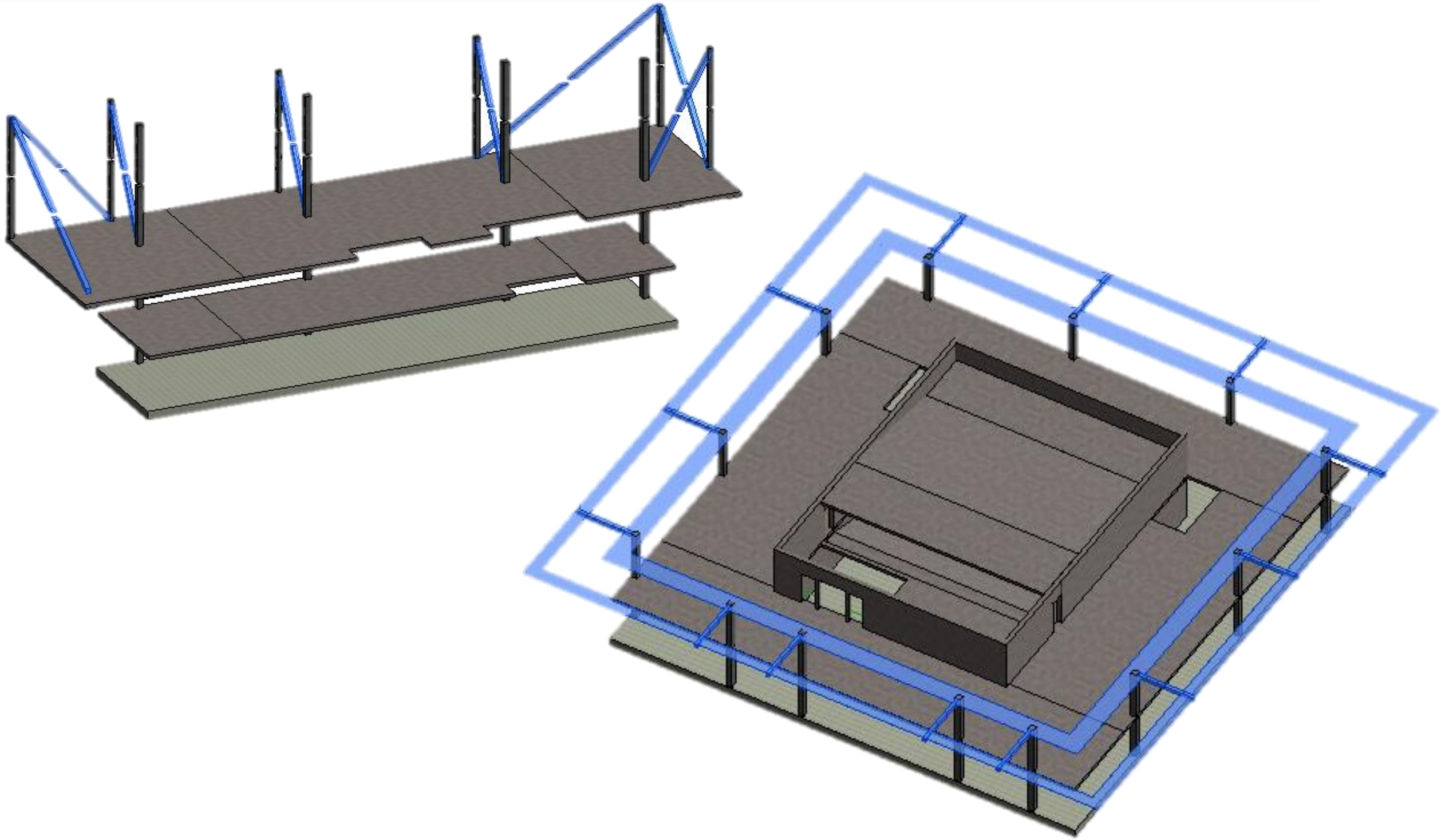
Structural Grid 2nd Floor



[mm]

A SE MEP CM

3D Framing and Bracing



Structural Health Concept



Healthy Durable Materials

- CO_2 – absorbing cement
- Mix design that increase the lifetime

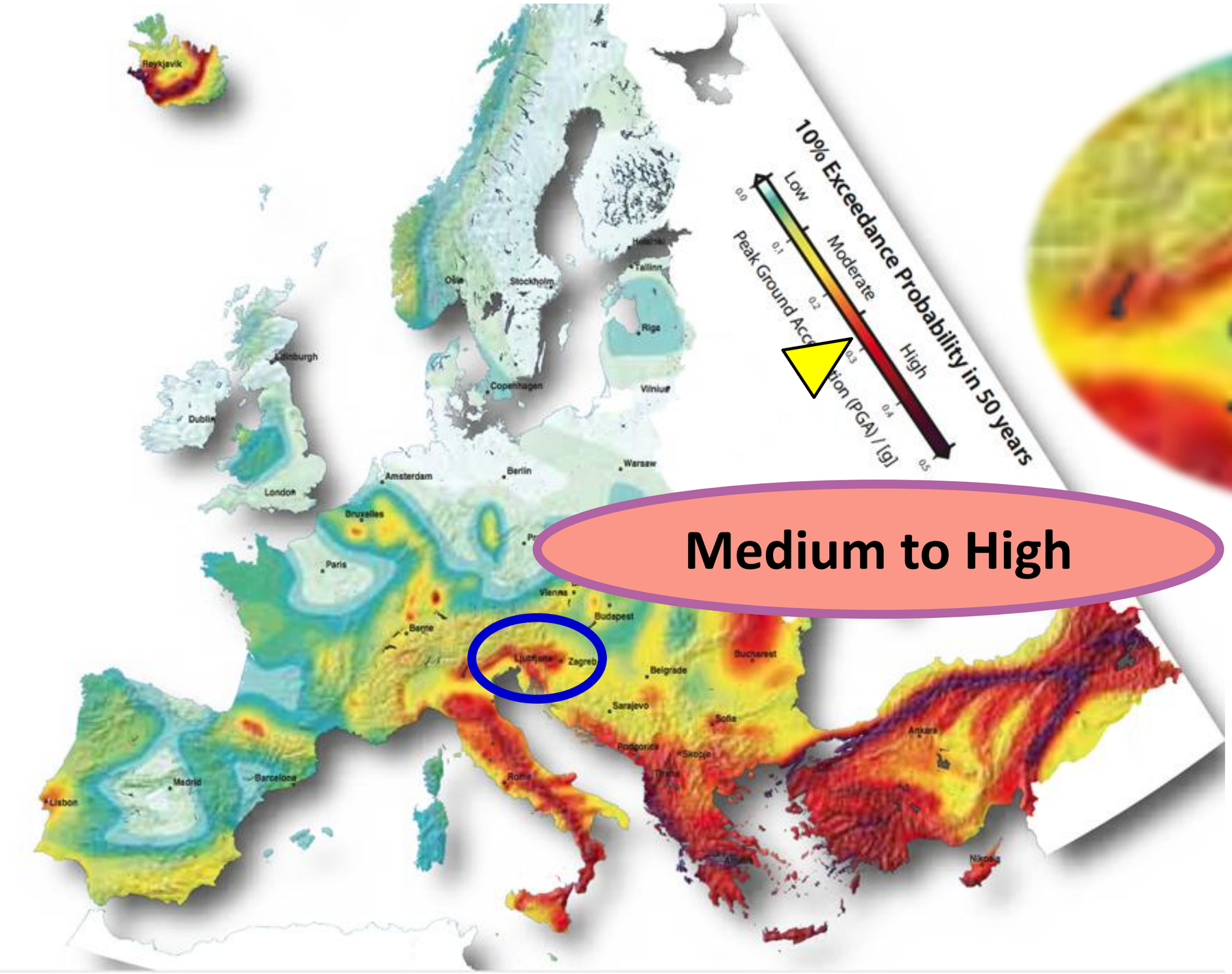
Structural Health Monitor

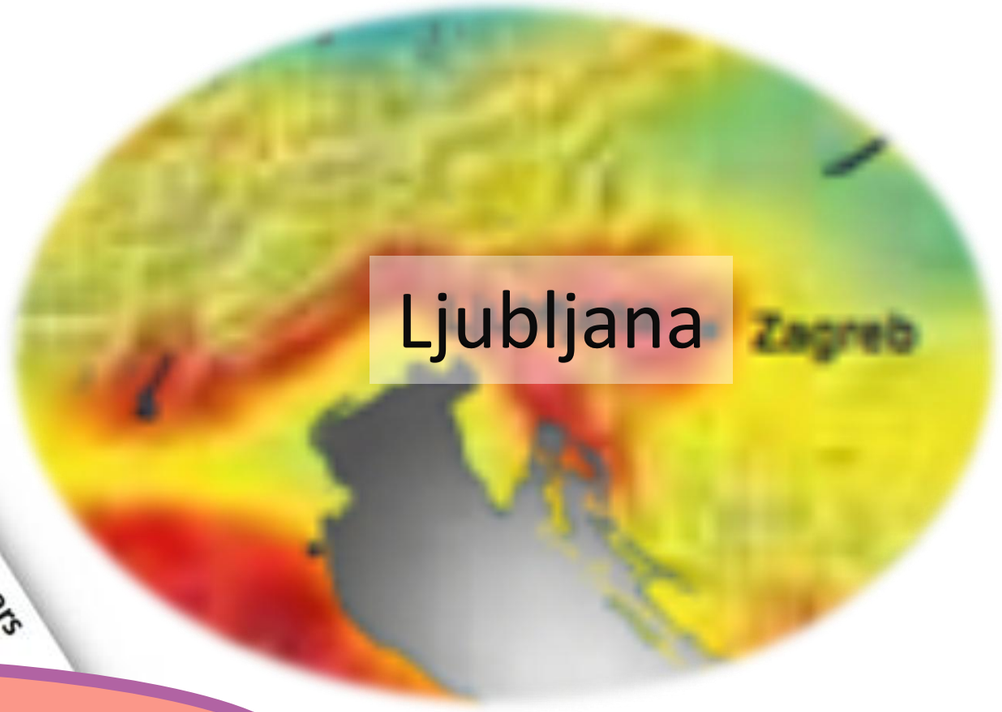
- damage detection
- smartphone-based sensors

Local Sourcing

- Lower CO2 emissions from transport
- Utilization of local industry

Constraint Earthquake

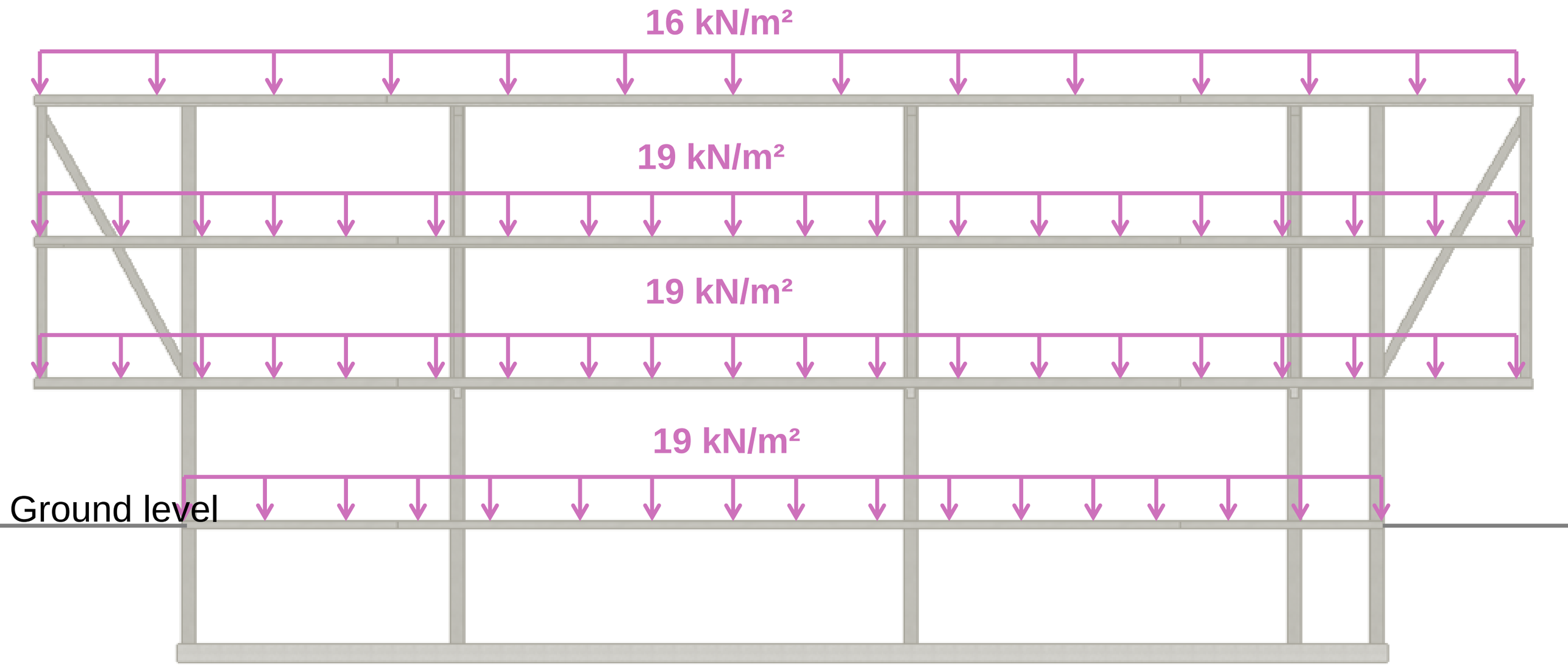




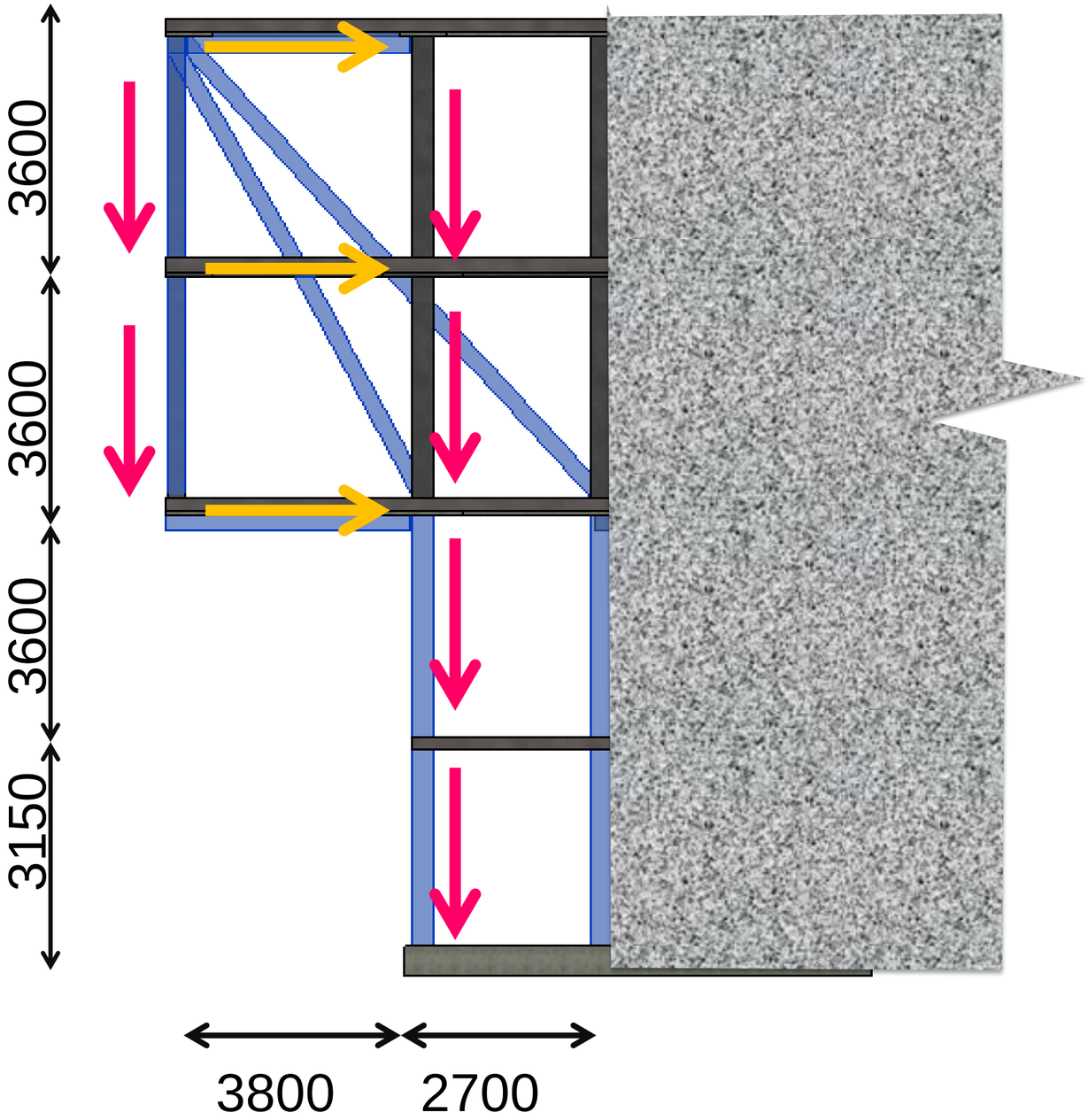
Medium to High

Design Ground Acceleration 0.635 g

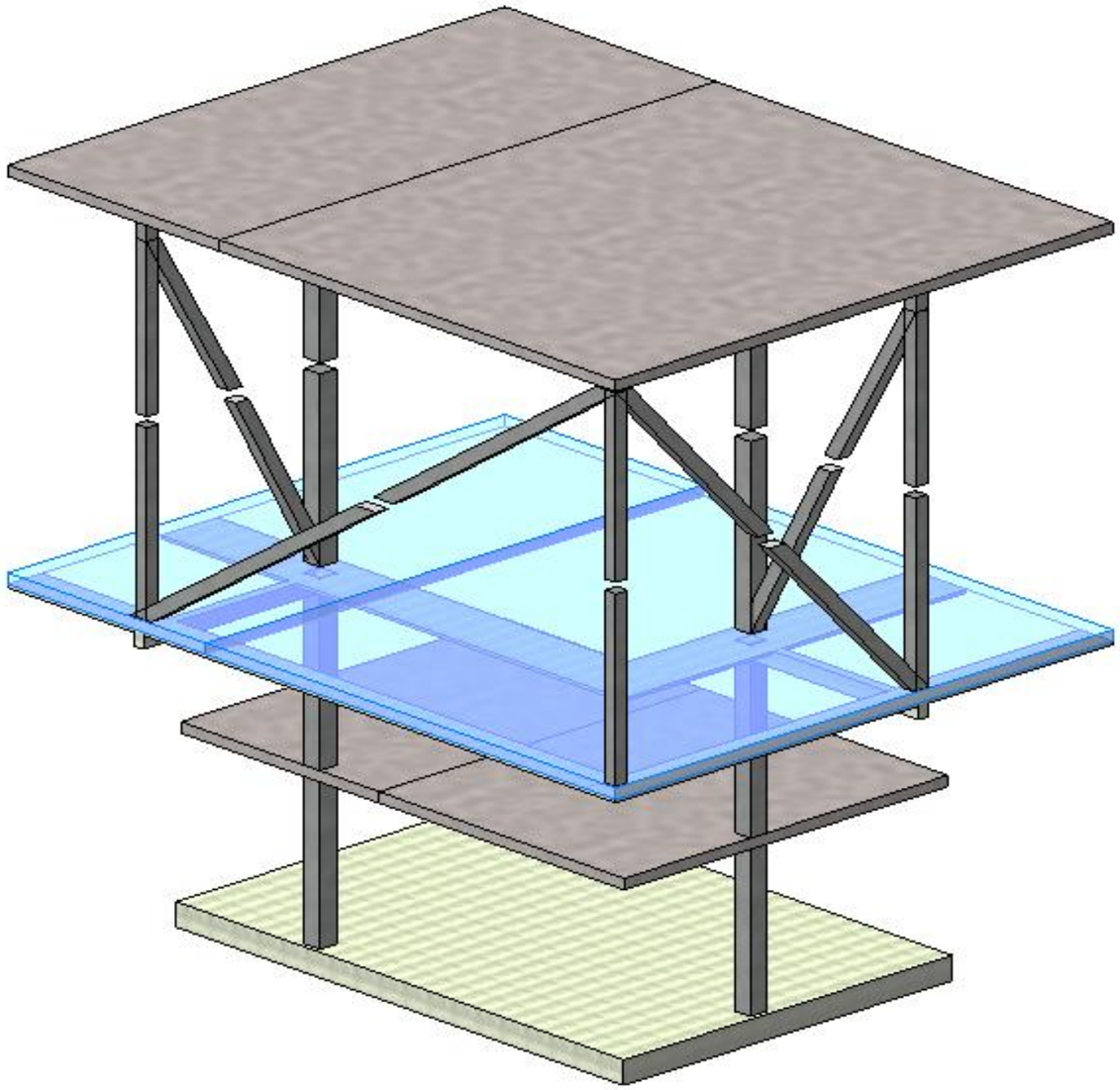
Gravity Load



Load Path - Gravity



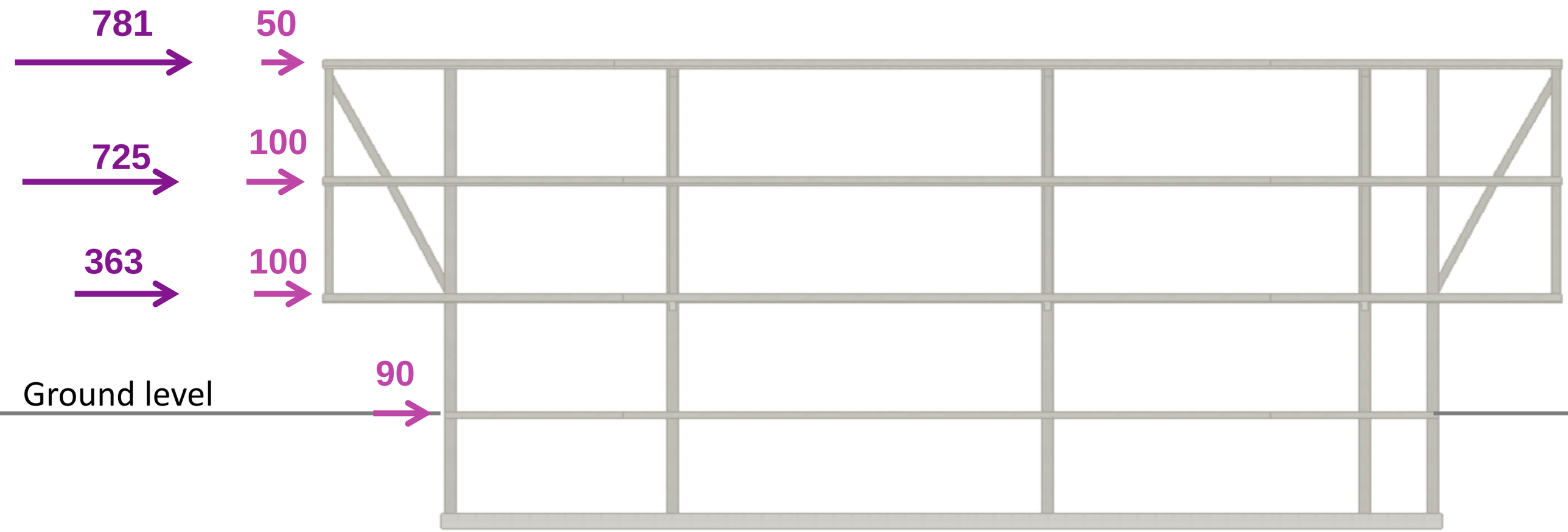
[mm]



west - north cantilever

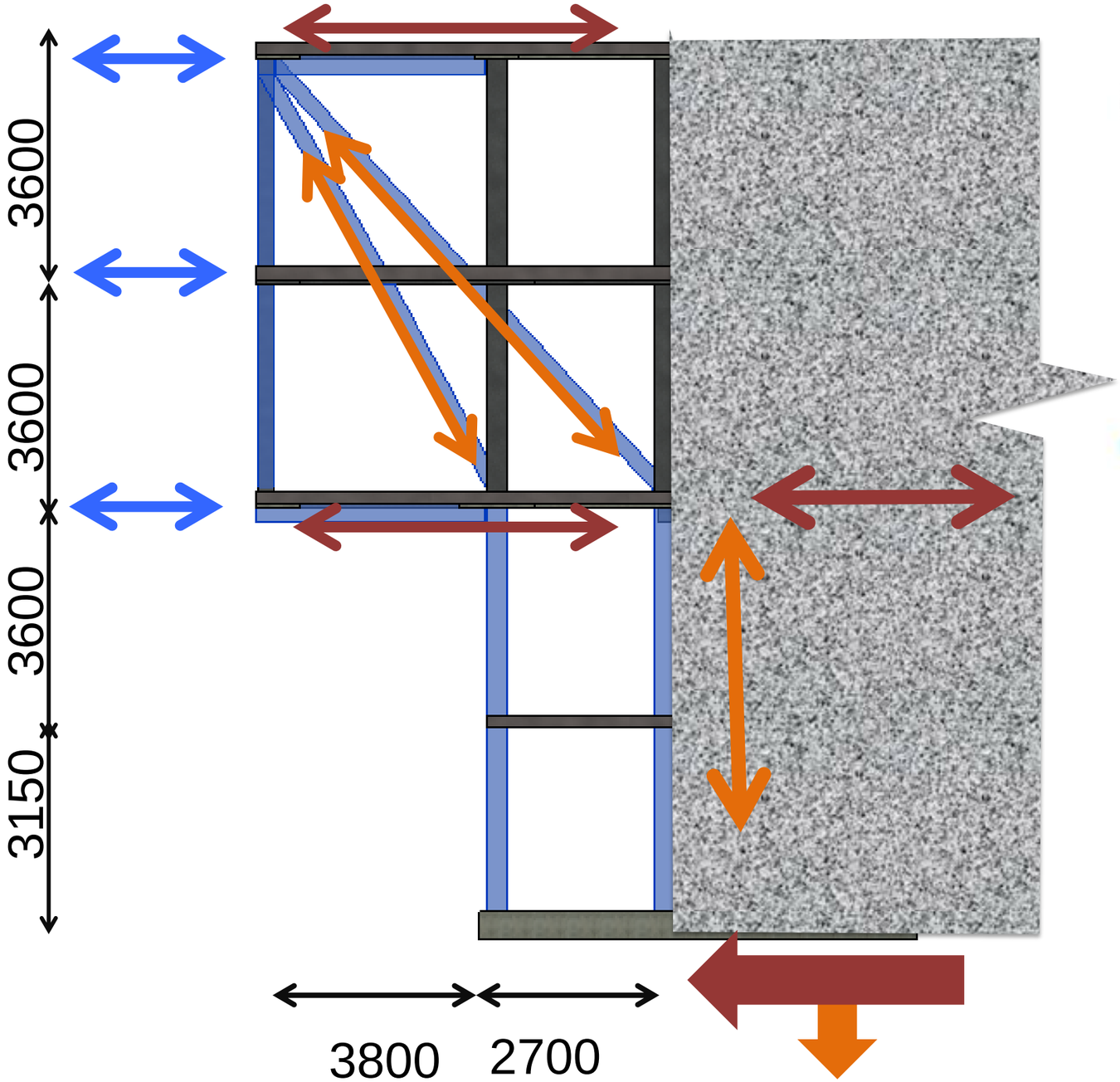
Lateral Load

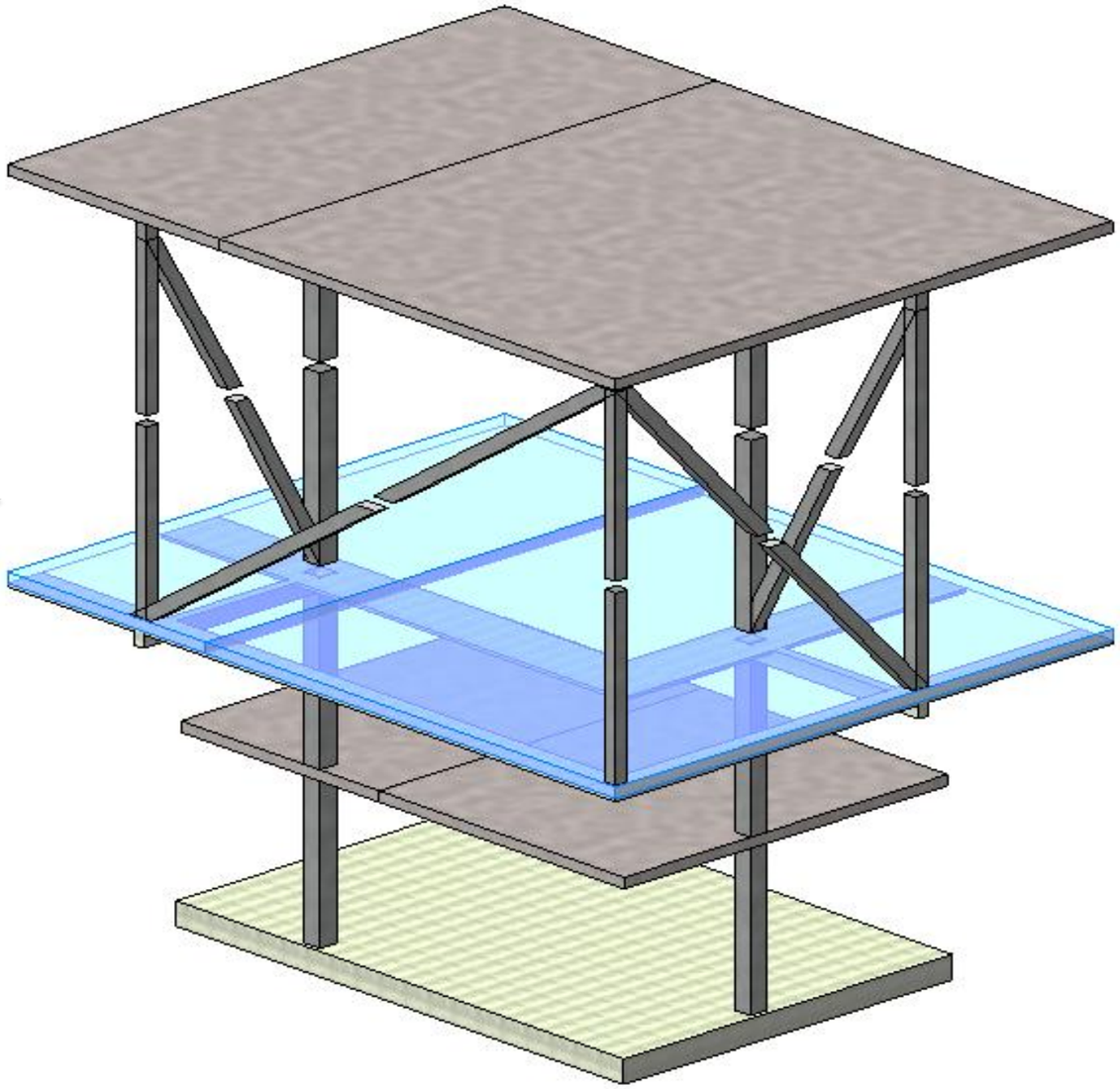
Earthquake **Wind**



[kN]

Load Path - Lateral





west - north cantilever

[mm]

Structural Health Concept



Healthy Durable Materials

- CO_2 – absorbing cement
- Mix design that increase the lifetime

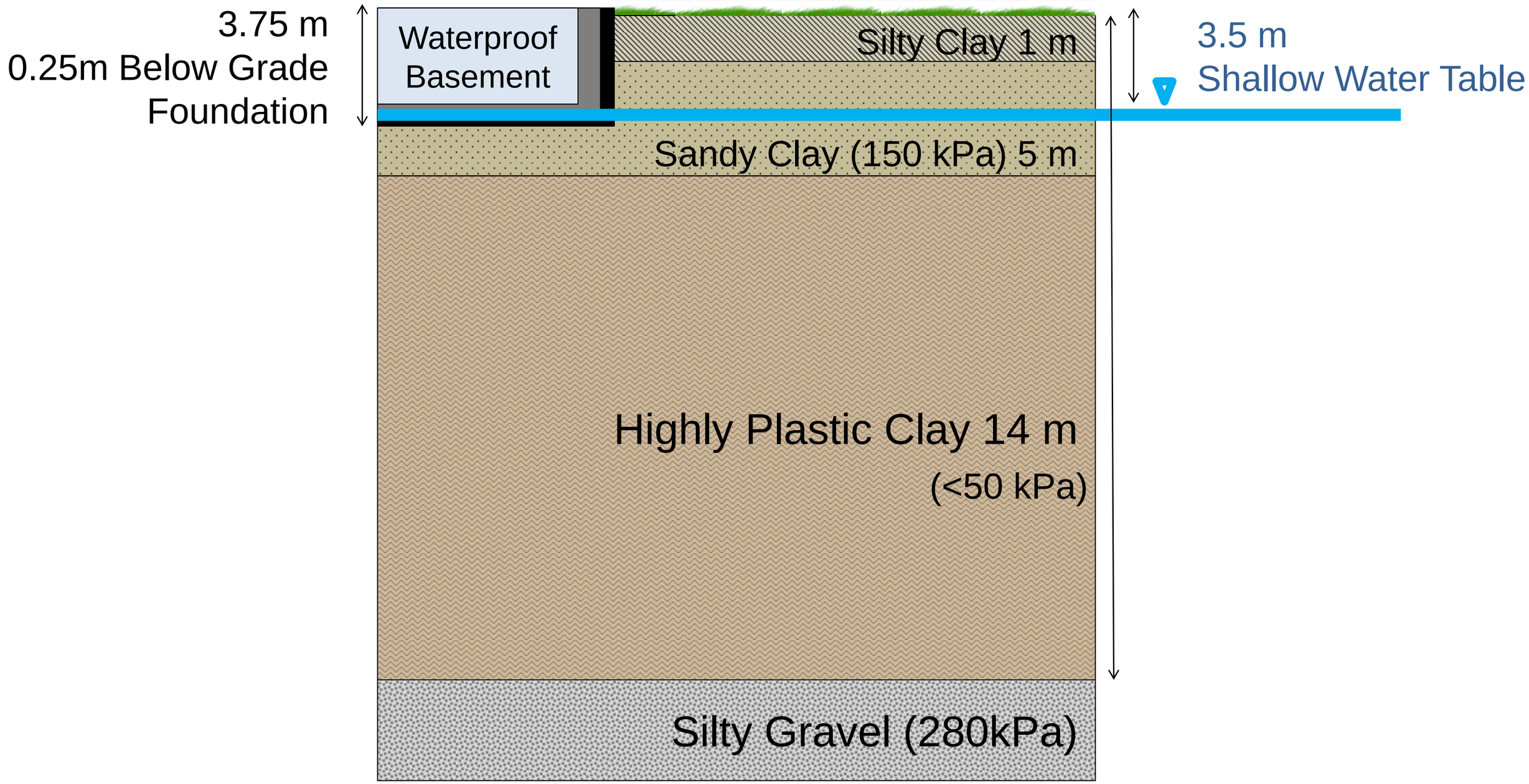
Structural Health Monitor

- damage detection
- smartphone-based sensors

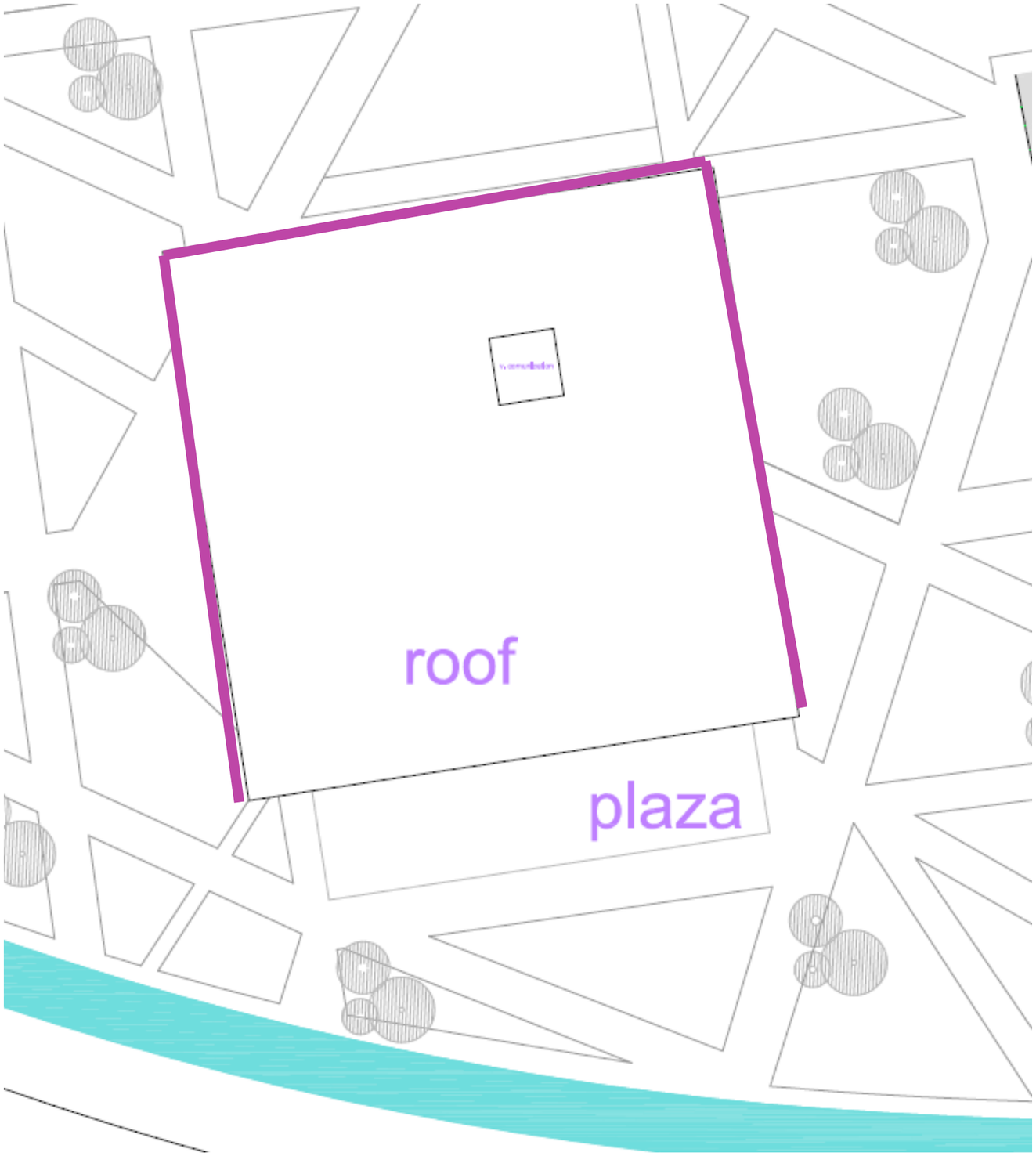
Local Sourcing

- Lower CO2 emissions from transport
- Utilization of local industry

Soil Profile – High Water Table

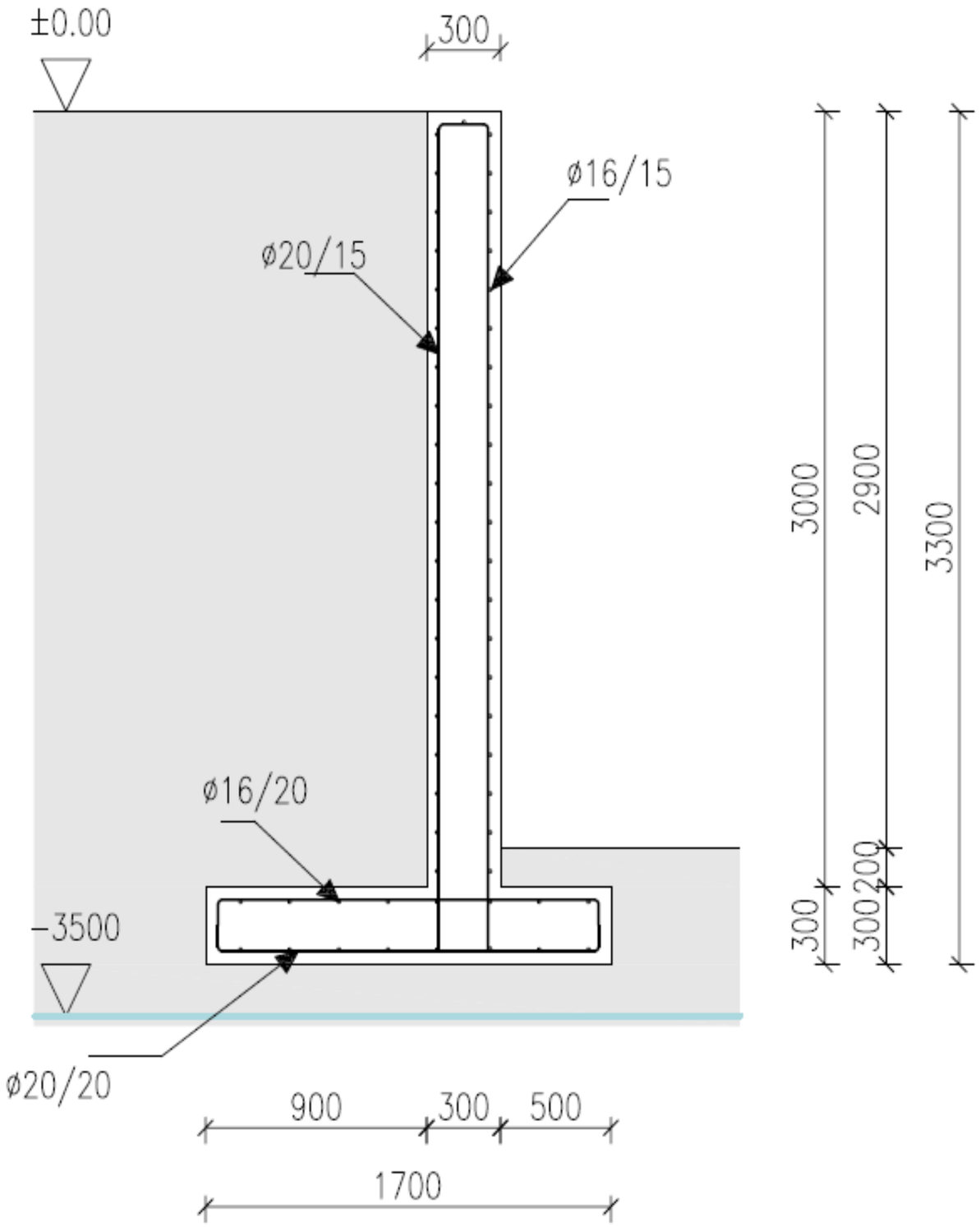


Retaining Wall



Plan view

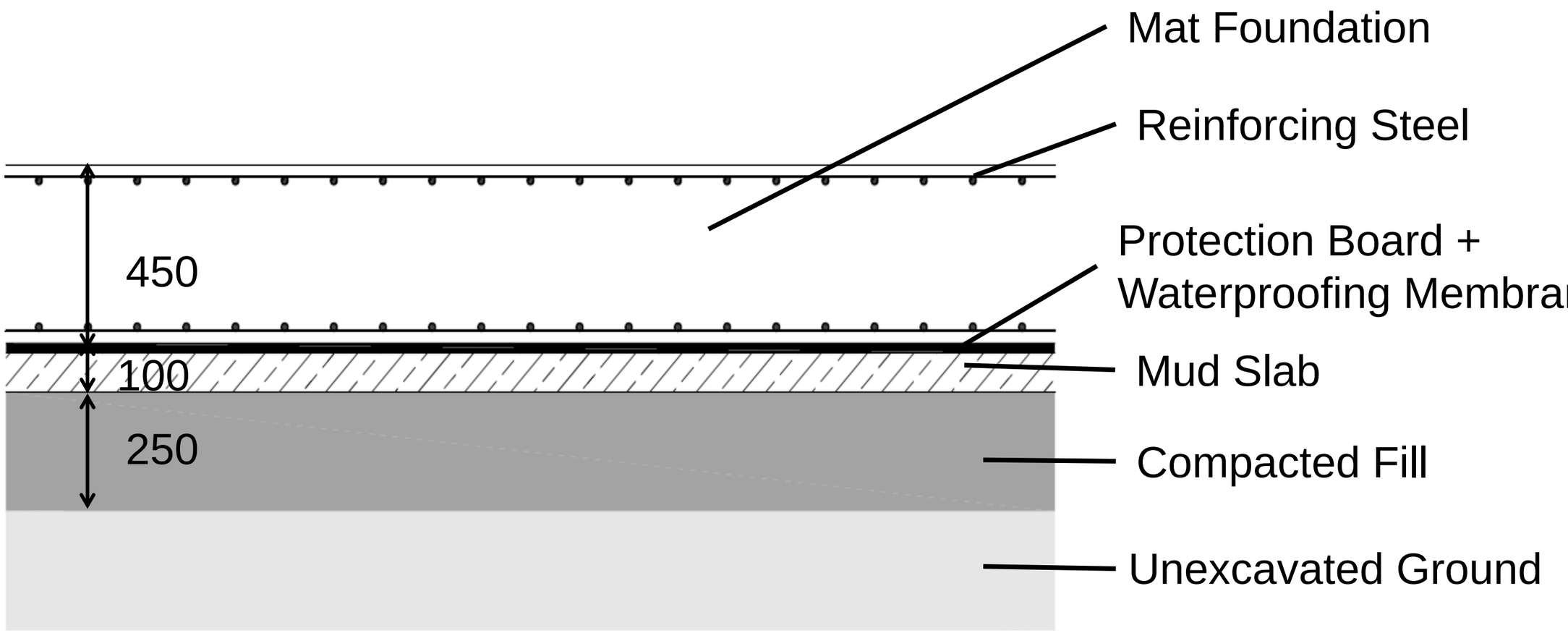
Retaining Wall



- External Stability (Geometry)
  - Sliding
  - Overturning
  - Resultant Force Location
- Internal Stability (Reinforcement)
  - Tensile Strength
  - Punching Shear
  - Temperature Reinforcement

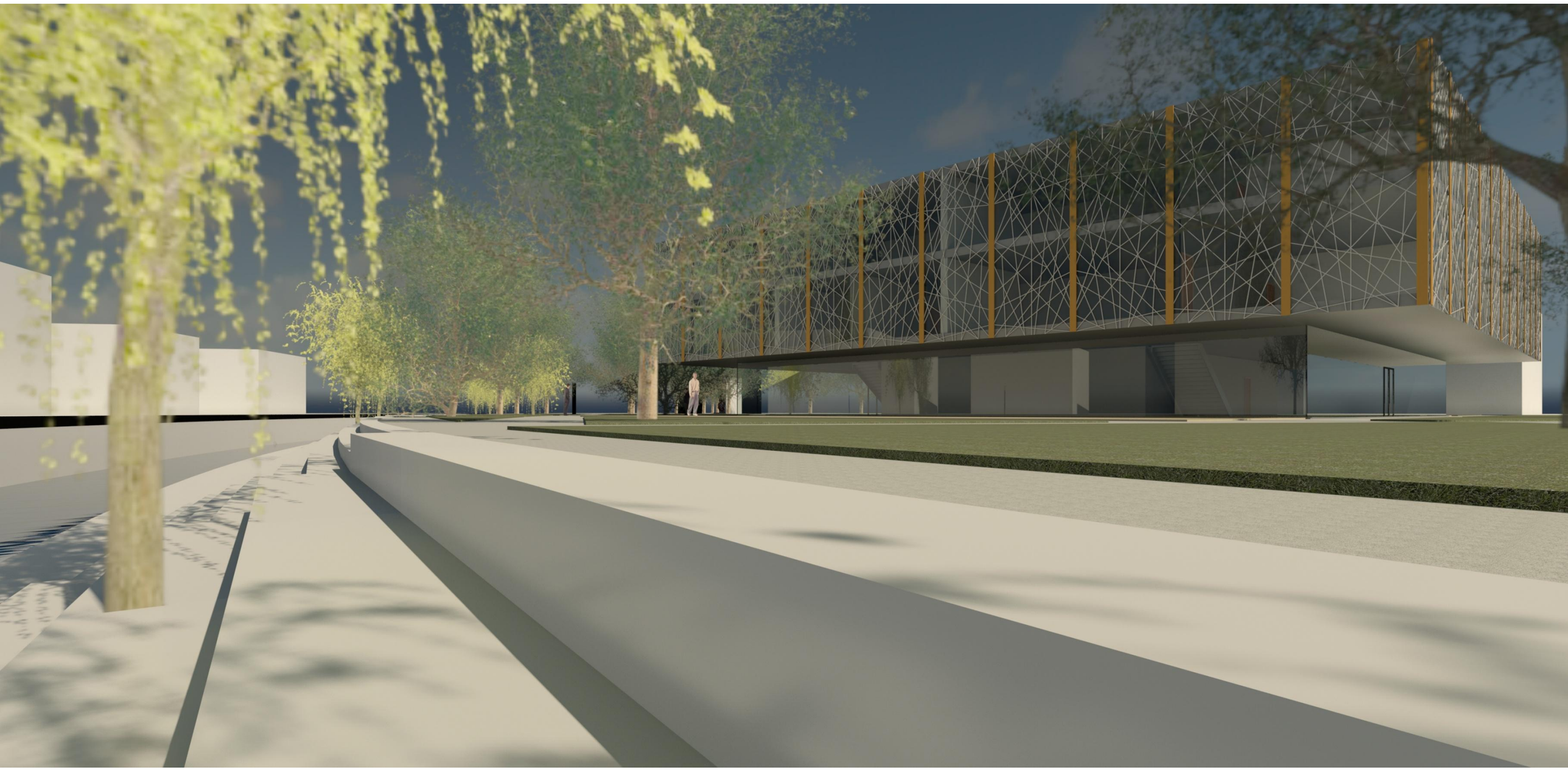
[mm]

Mat Plan - Detail



[mm]

View From The Steps Next To The River



A SE MEP CM

Structural Health Concept



Healthy Durable Materials

- natural lime-cement
- non-toxic pigment concrete

Structural Health Monitor

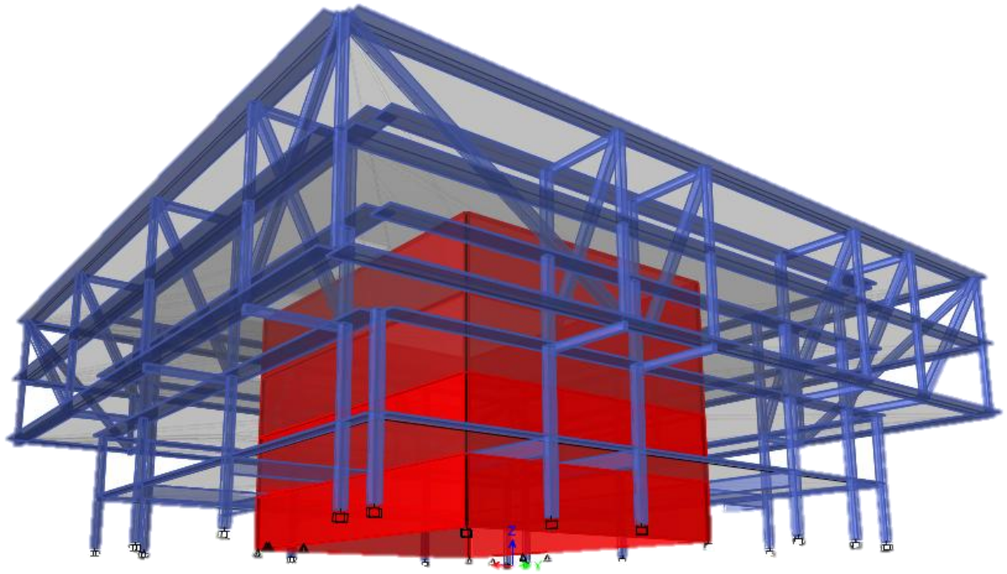
- damage detection
- smartphone-based sensors

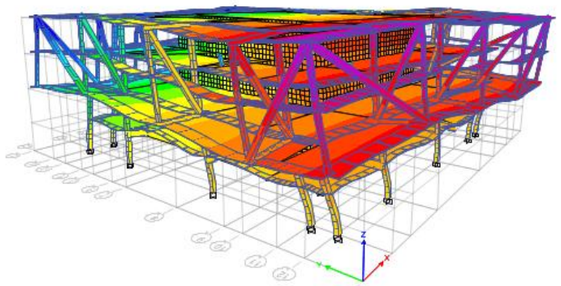
Local Sourcing

- Lower CO2 emissions from transport
- Utilization of local industry

ETABS – 3D Model

ETABS® 2013



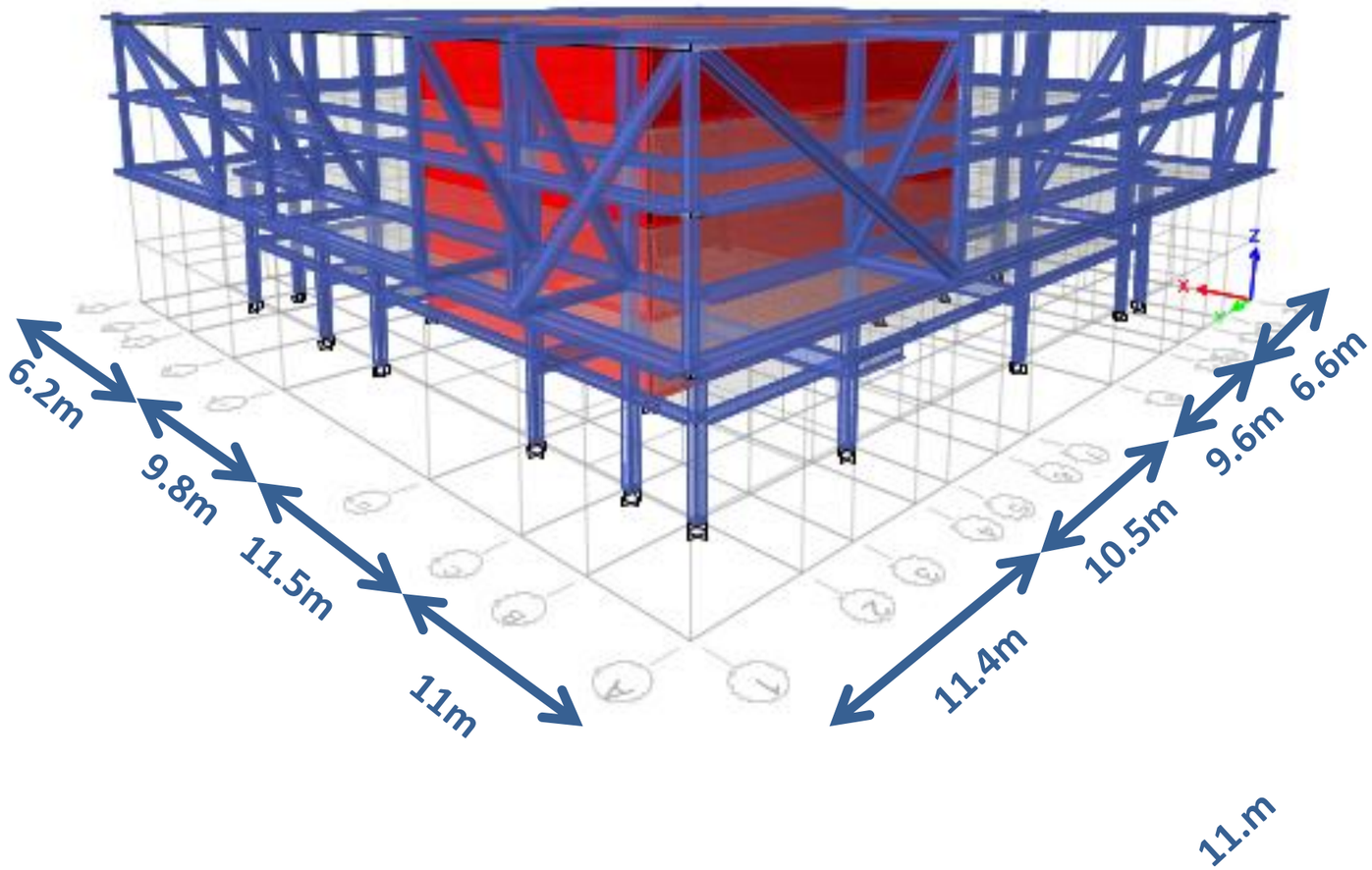




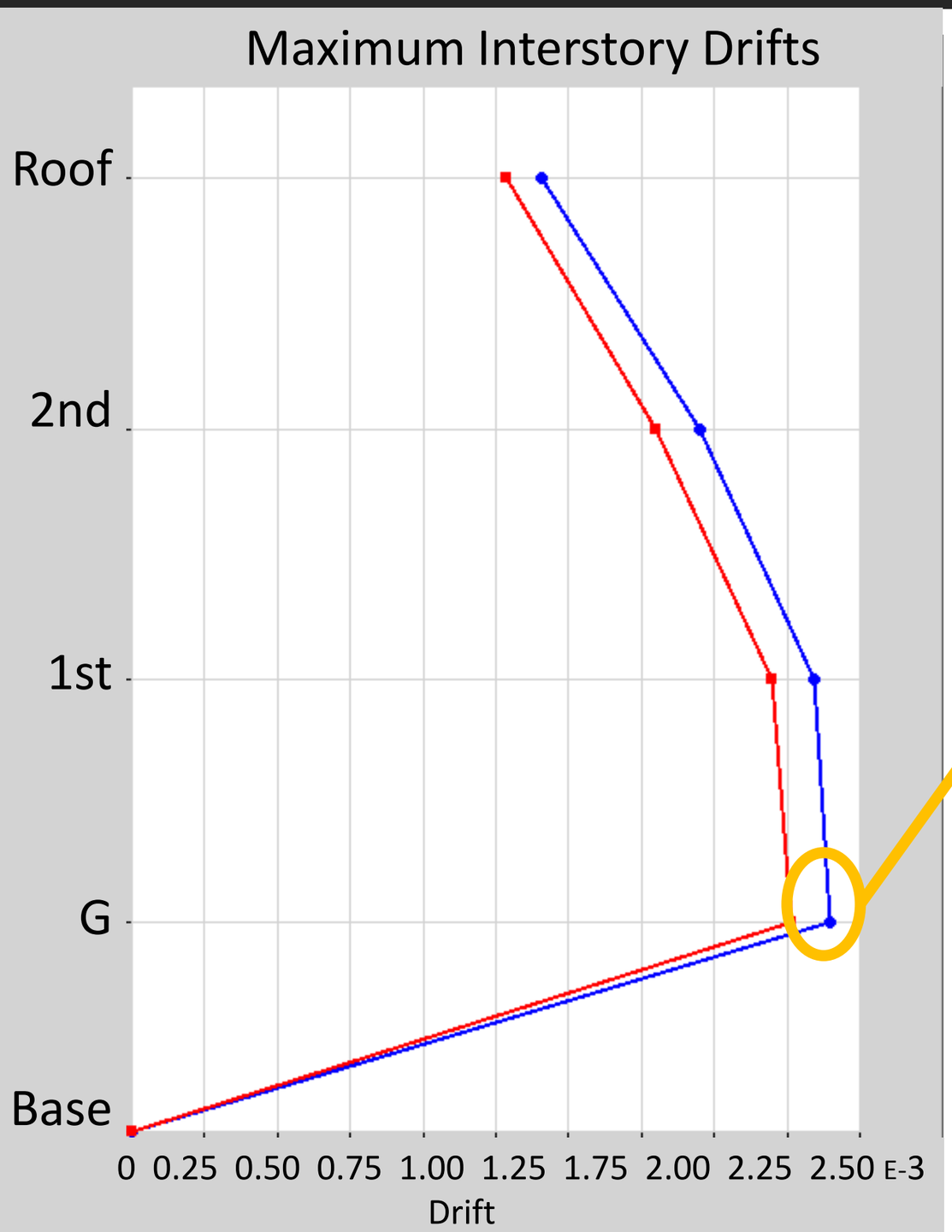
Max displacement

X-direction 32mm

Y-direction 27mm



Interstory Drift Ratio



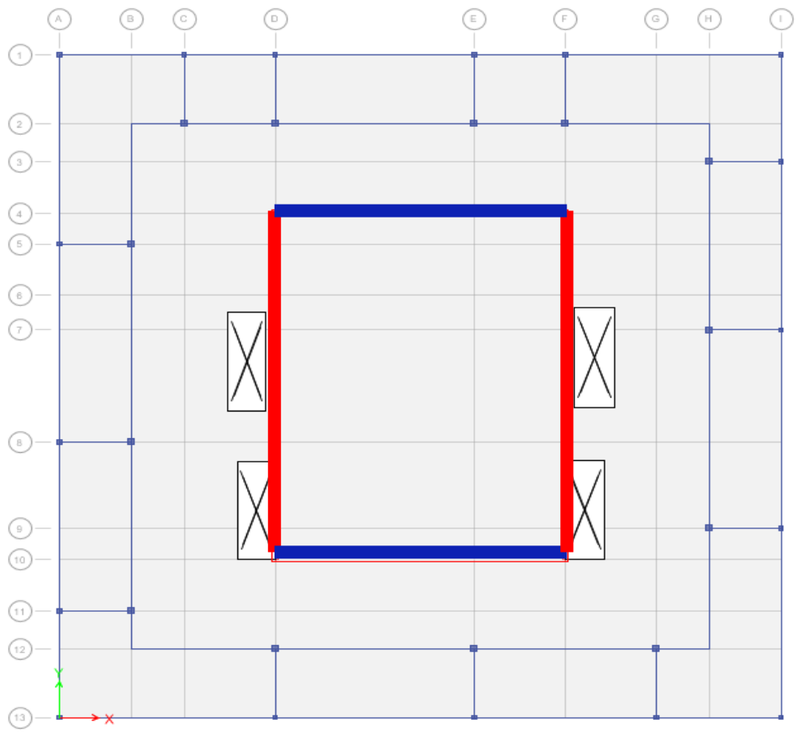
Per se Eurocode 8 Section 4.4.3.2

$d_r v$ **= 0.0075h,**

(v = importance factor = 0.4 for Risk Category III)

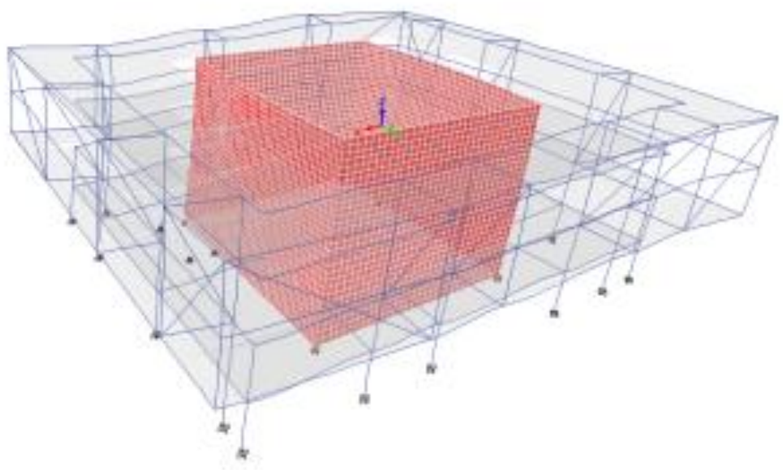
Interstory Drift Ratio $\leq 1.875\%$

Max = 0.24% at Ground Level <1.875% OK!

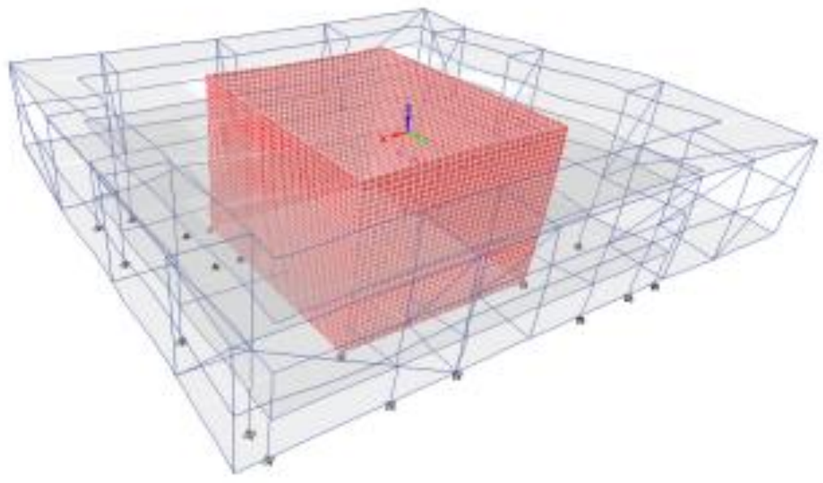


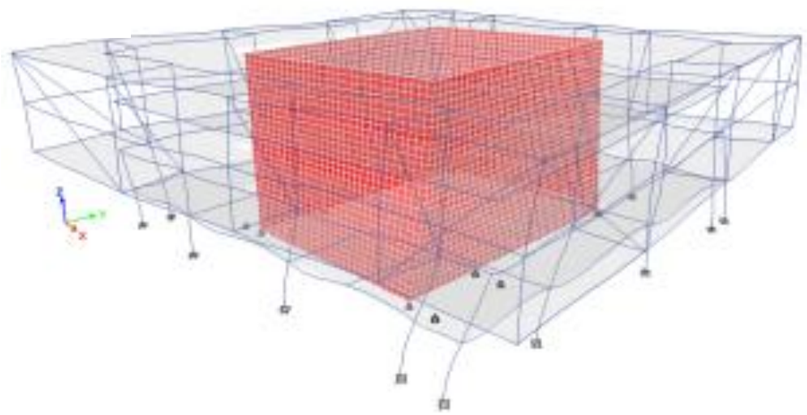
3D Animation

Mode 1 T= 0.284s



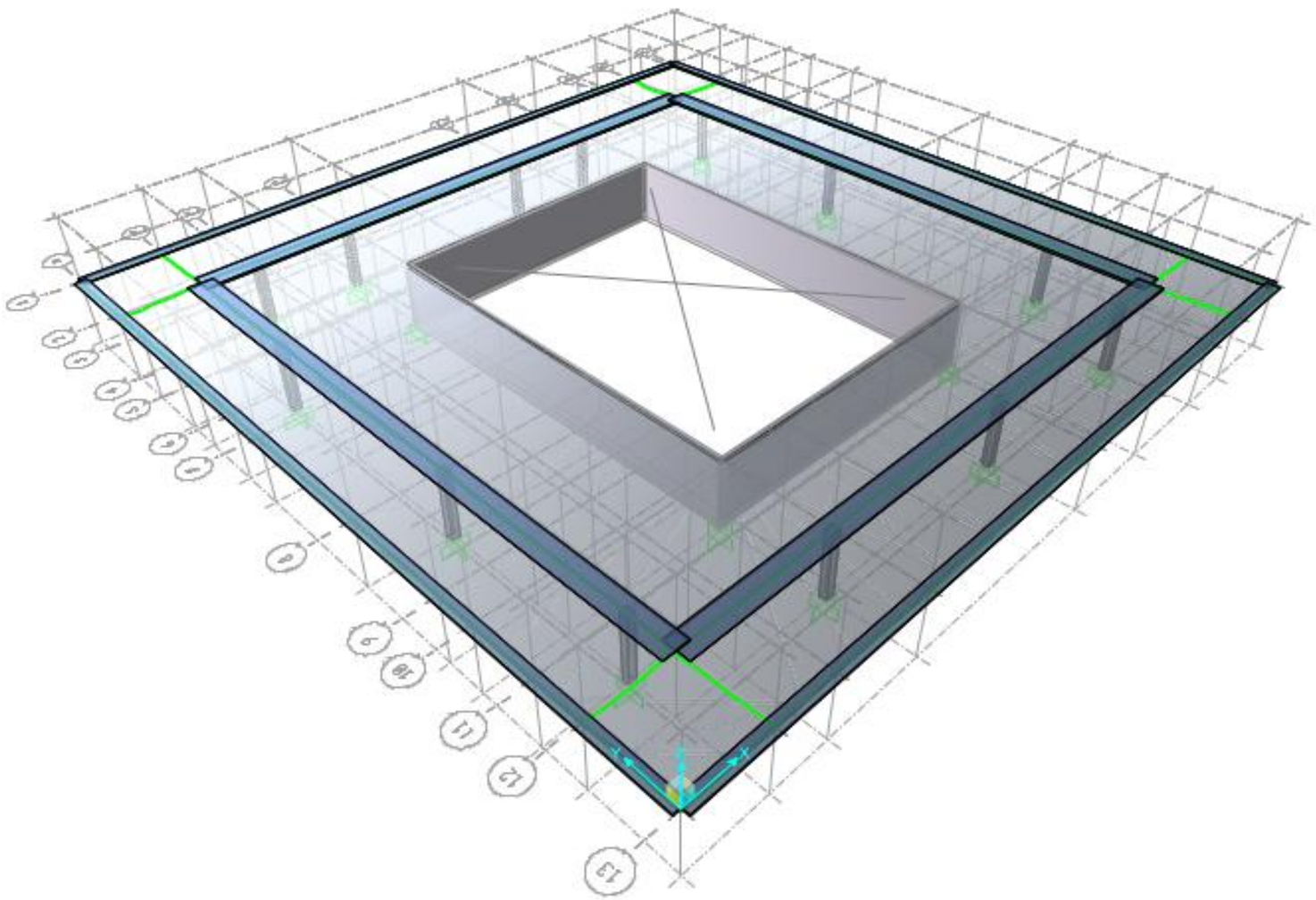
Mode 2 T= 0.232s



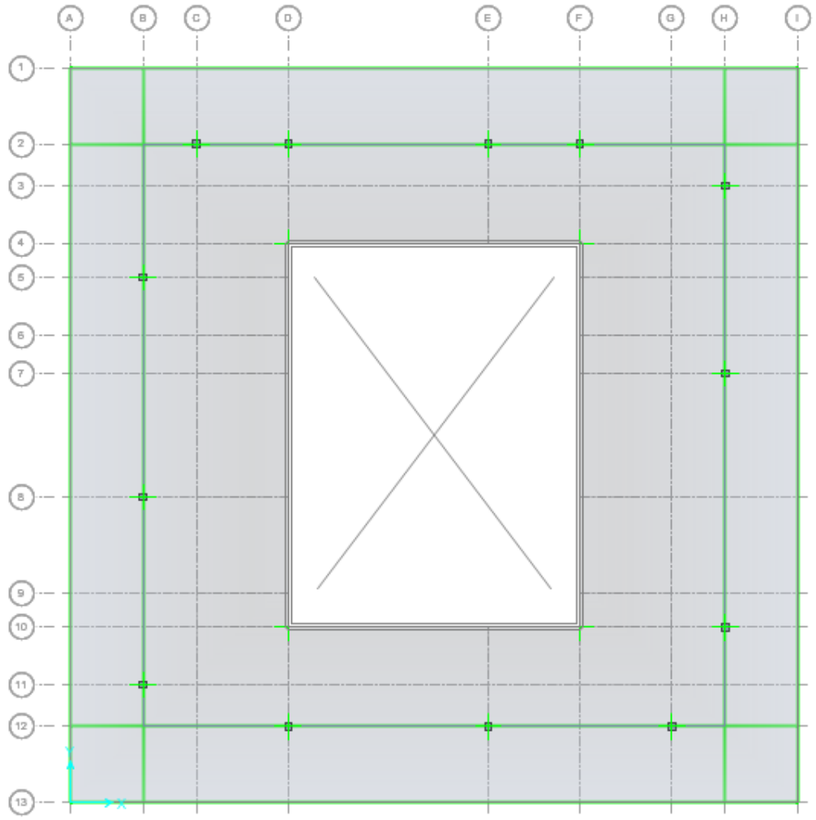


Mode 3 T= 0.305s

Post-Tension Beam Design - SAFE



SAFE® 2014

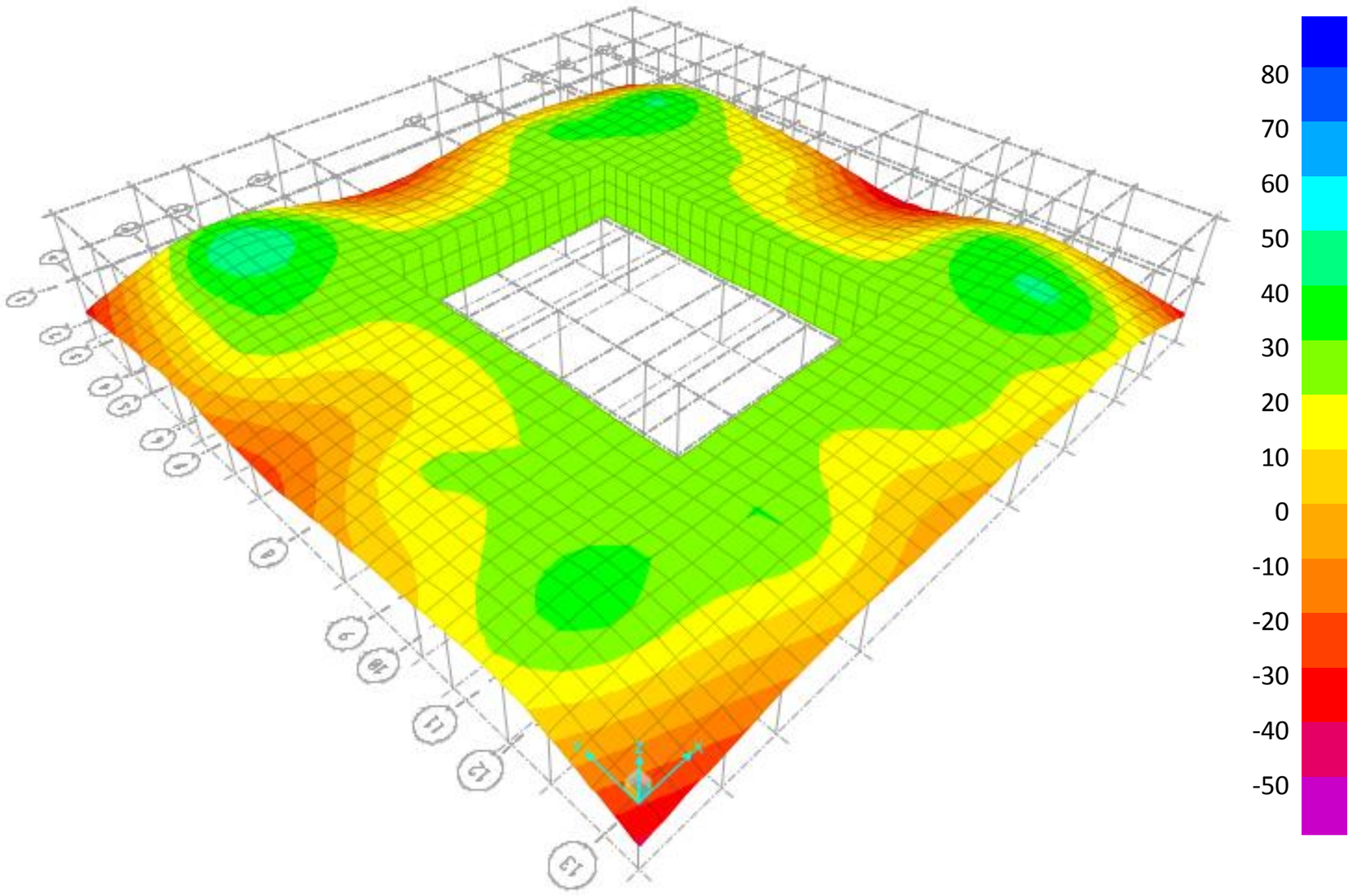


Ground Level Cantilever
200mm Flat Slab
60mm thick Perimeter Beams

Banded Tendons
in Column Strip
Max Span: 11.5m

SAFE - Deflection

Deflection Under Load Combination



Per Se Eurocode 2
Section 7.4.1:

Δ ≤ l/250

Max Deflection: -31.7mm

Structural Health Concept



Healthy Durable Materials

- natural lime-cement
- non-toxic pigment concrete

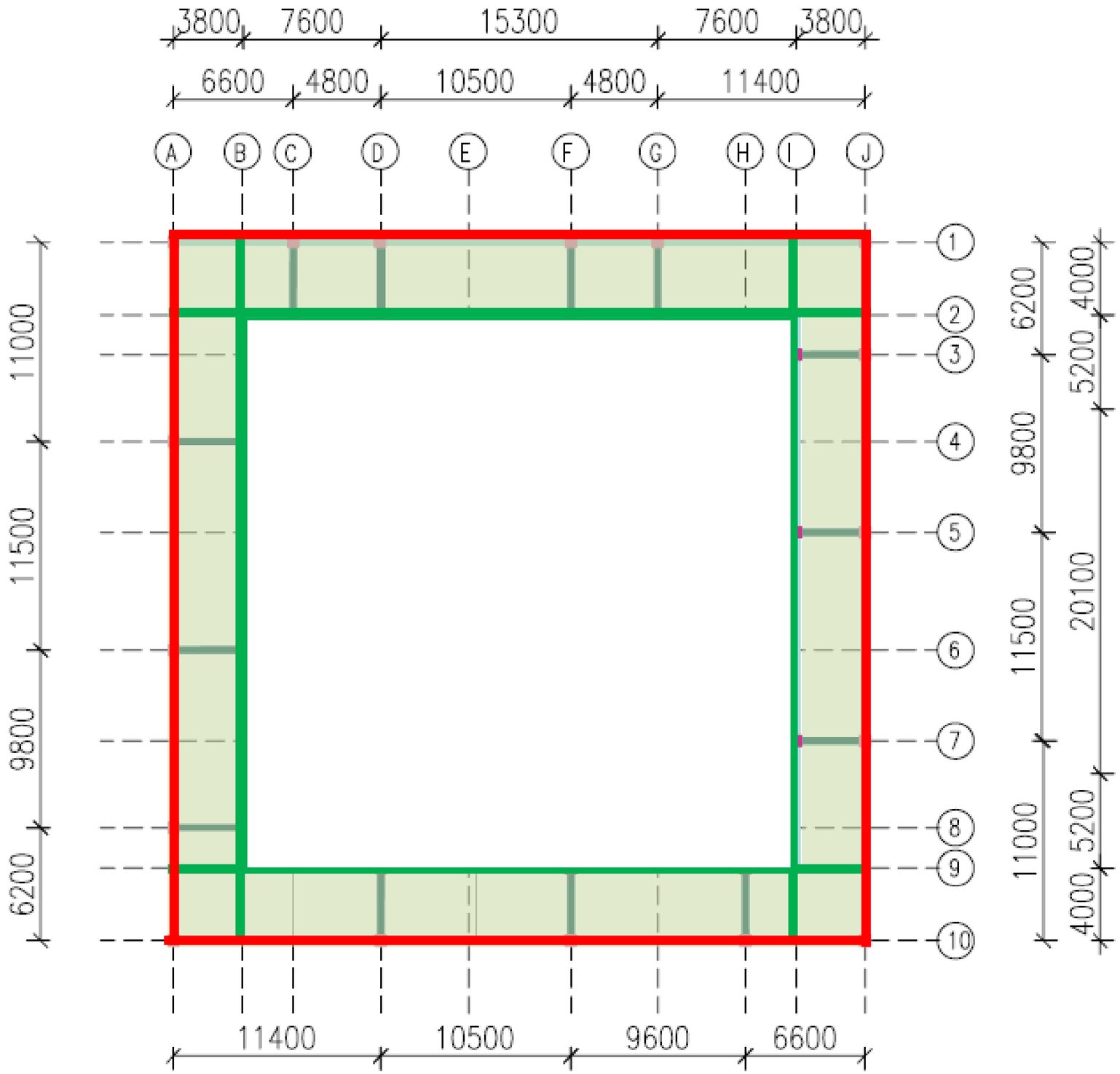
Structural Health Monitor

- damage detection
- smartphone-based sensors

Local Sourcing

- Lower CO2 emissions from transport
- Utilization of local industry

Structural Grid 1st Floor



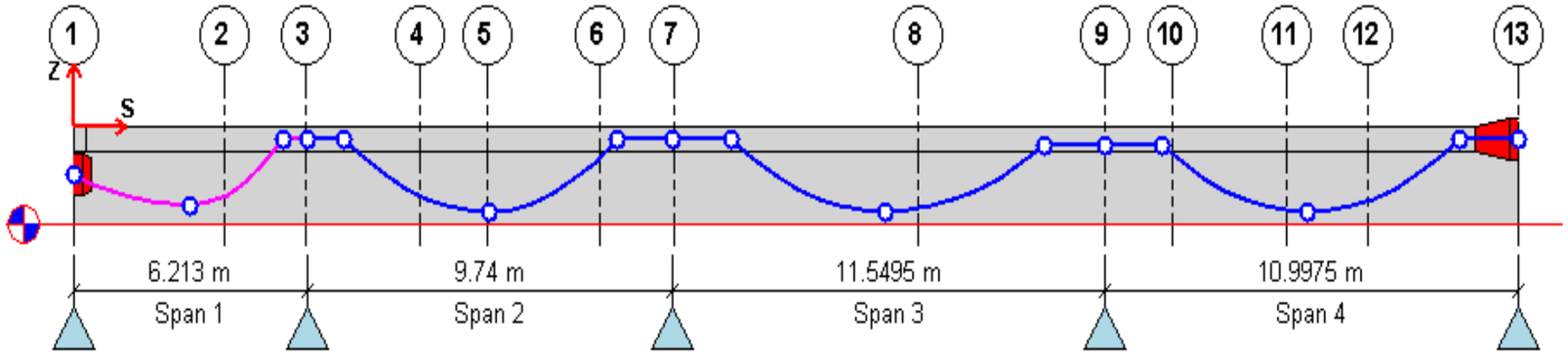
- Exterior PT Tendons

- Exterior PT Tendons

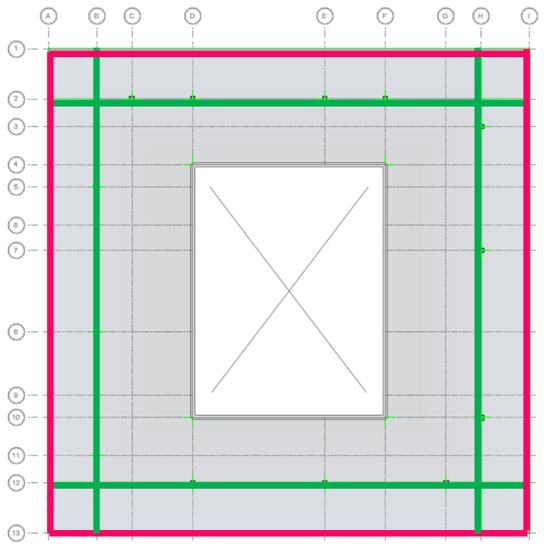
[mm]

Post-tensioned Tendon

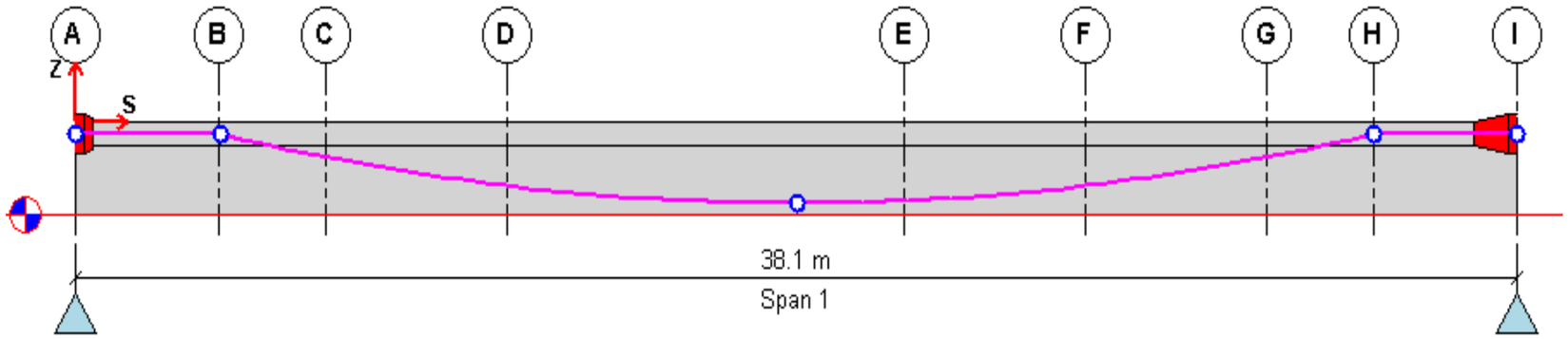
Interior



260 mm



Exterior



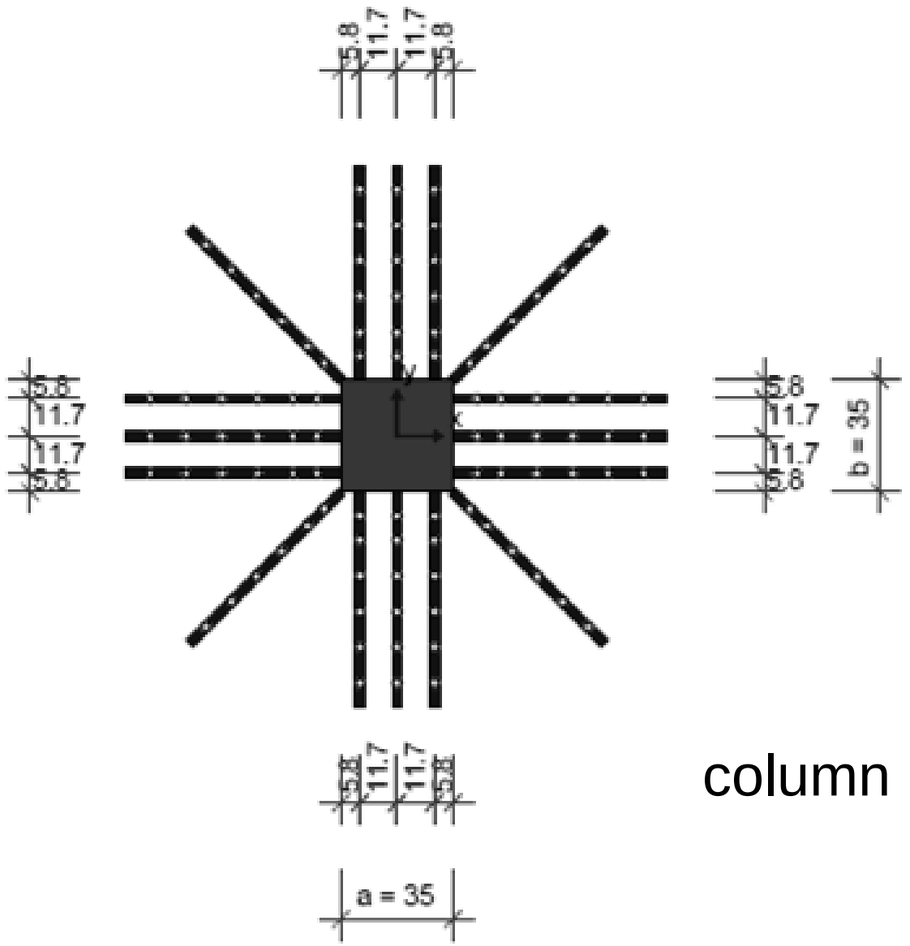
260 mm

Concrete Reinforcement Details

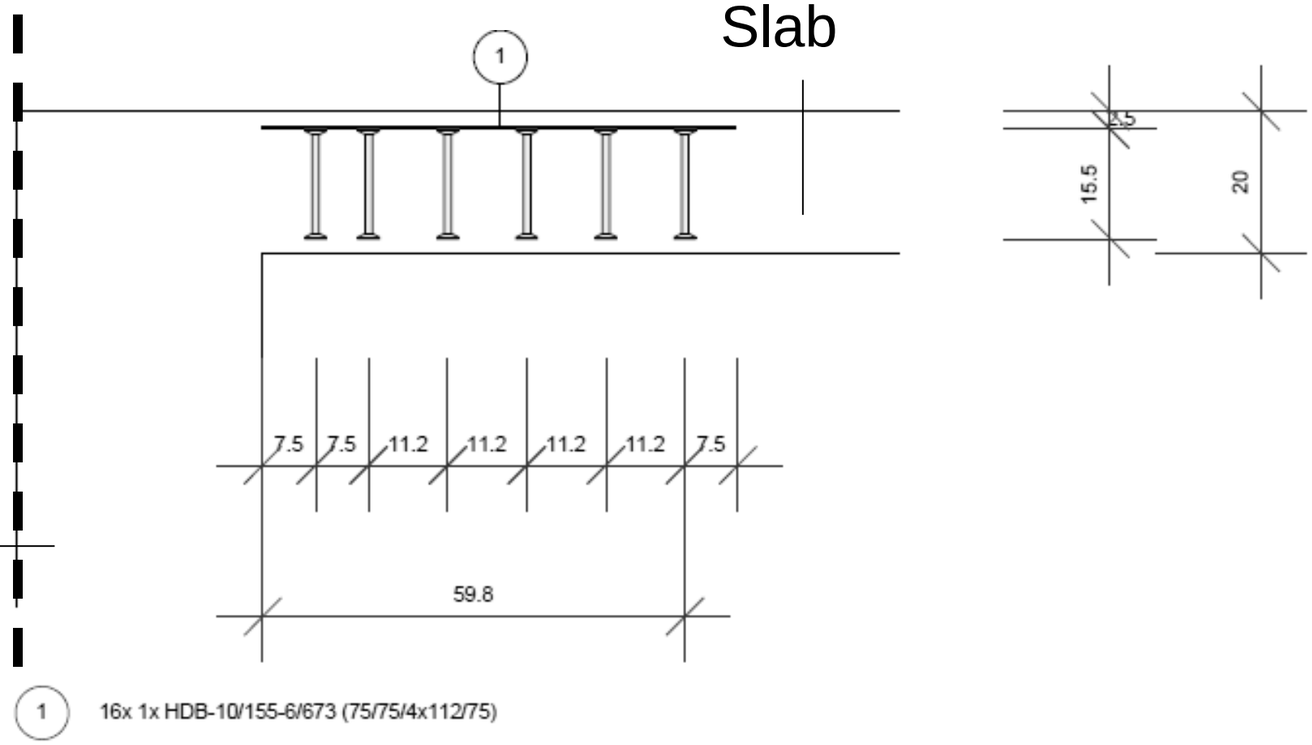
HDB Shear Rail

F = 740 kN

with reinforcement ratio 1.1 % (16.5cm²/m)



Plan view

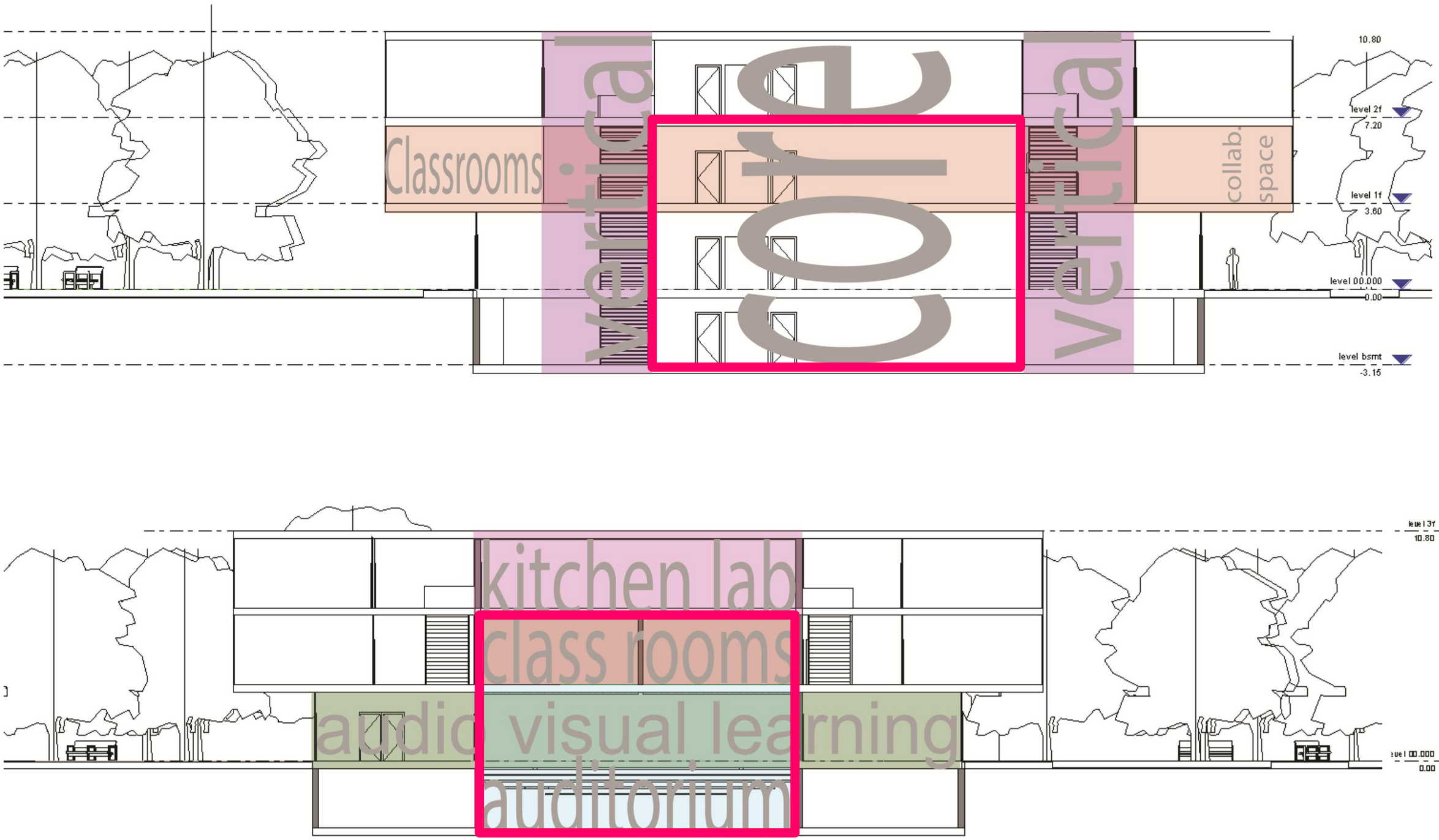


Section view

[cm]

A SE MEP CM

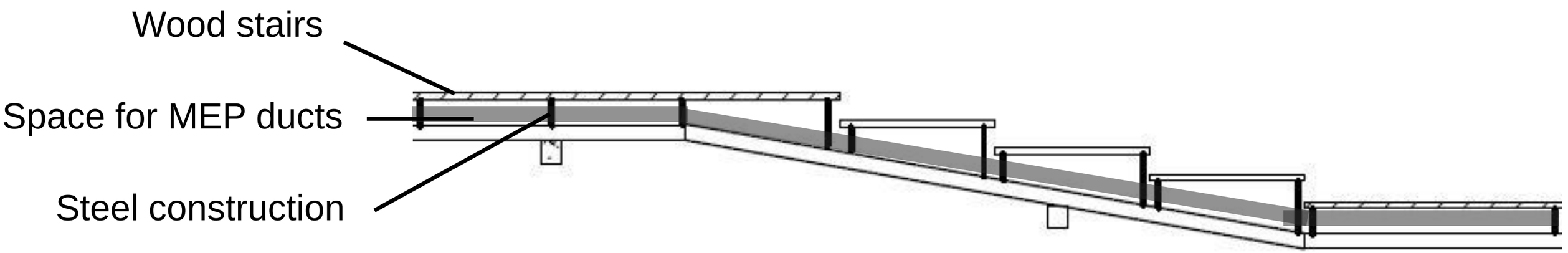
Section View



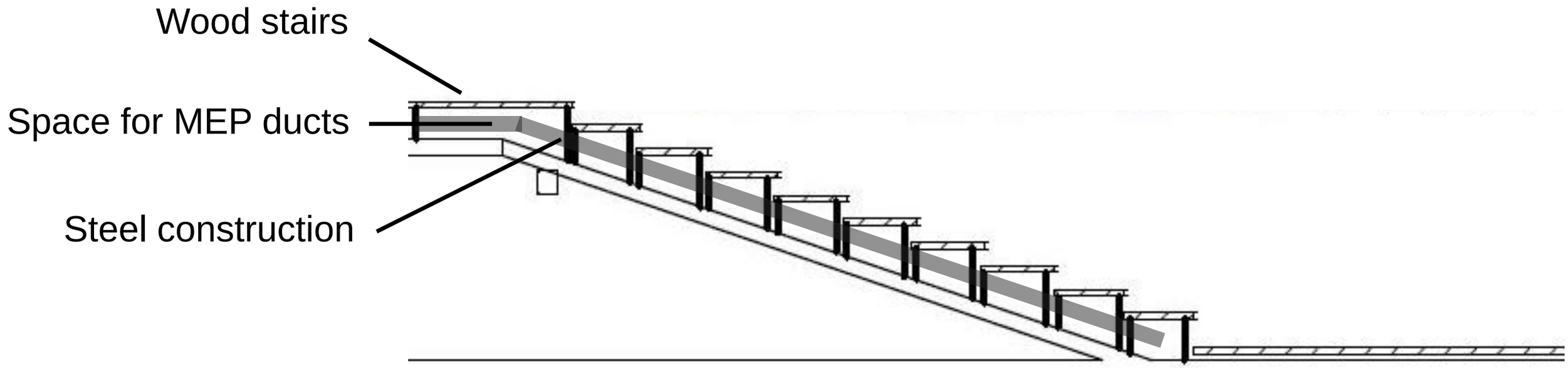
Sloped Slab

1st floor sloped classroom

Enclosed by shear walls



Ground floor Auditorium



Structural Health Concept



Healthy Durable Materials

- natural lime-cement
- non-toxic pigment concrete

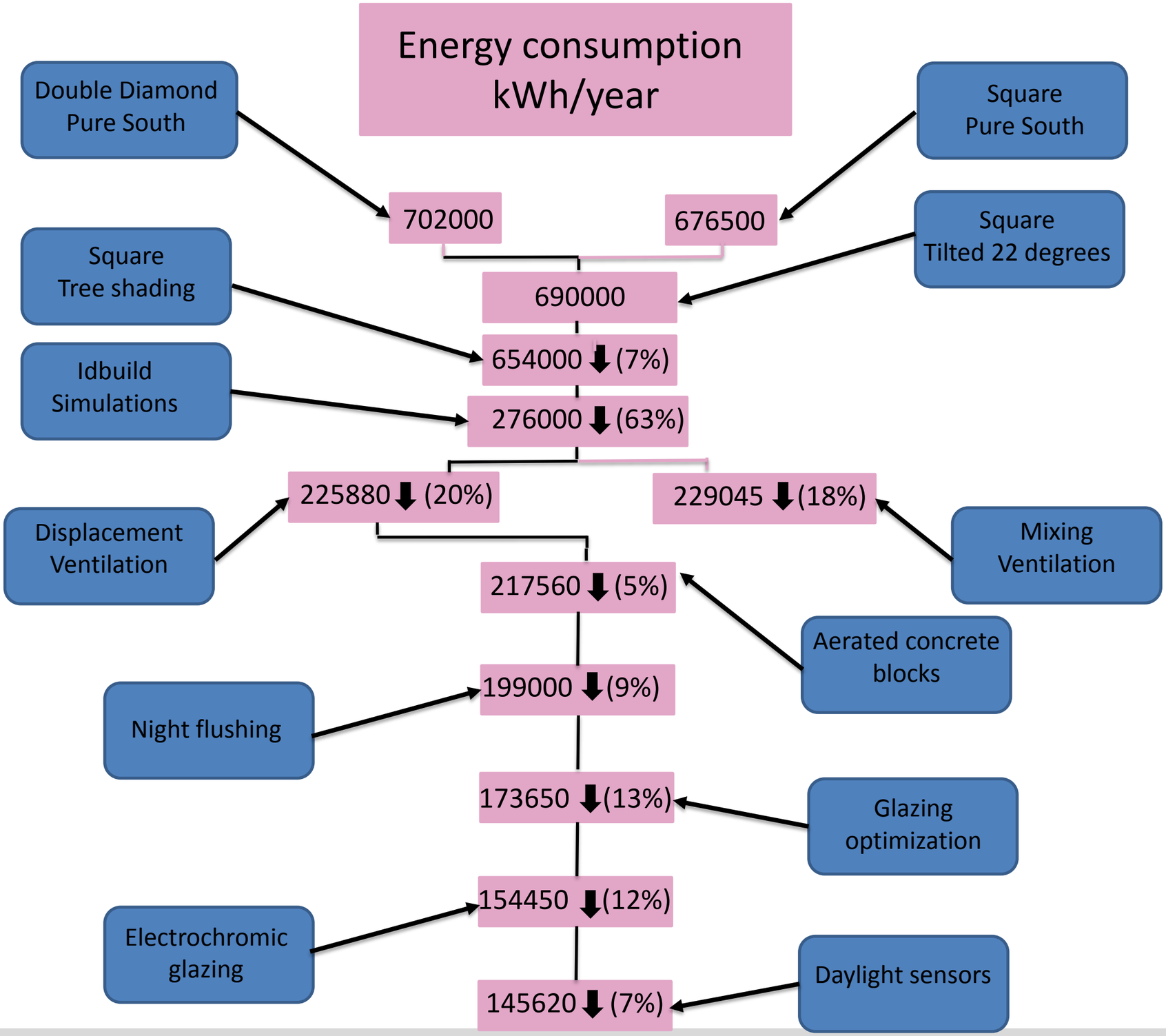
Structural Health Monitor

- damage detection
- smartphone-based sensors

Local Sourcing

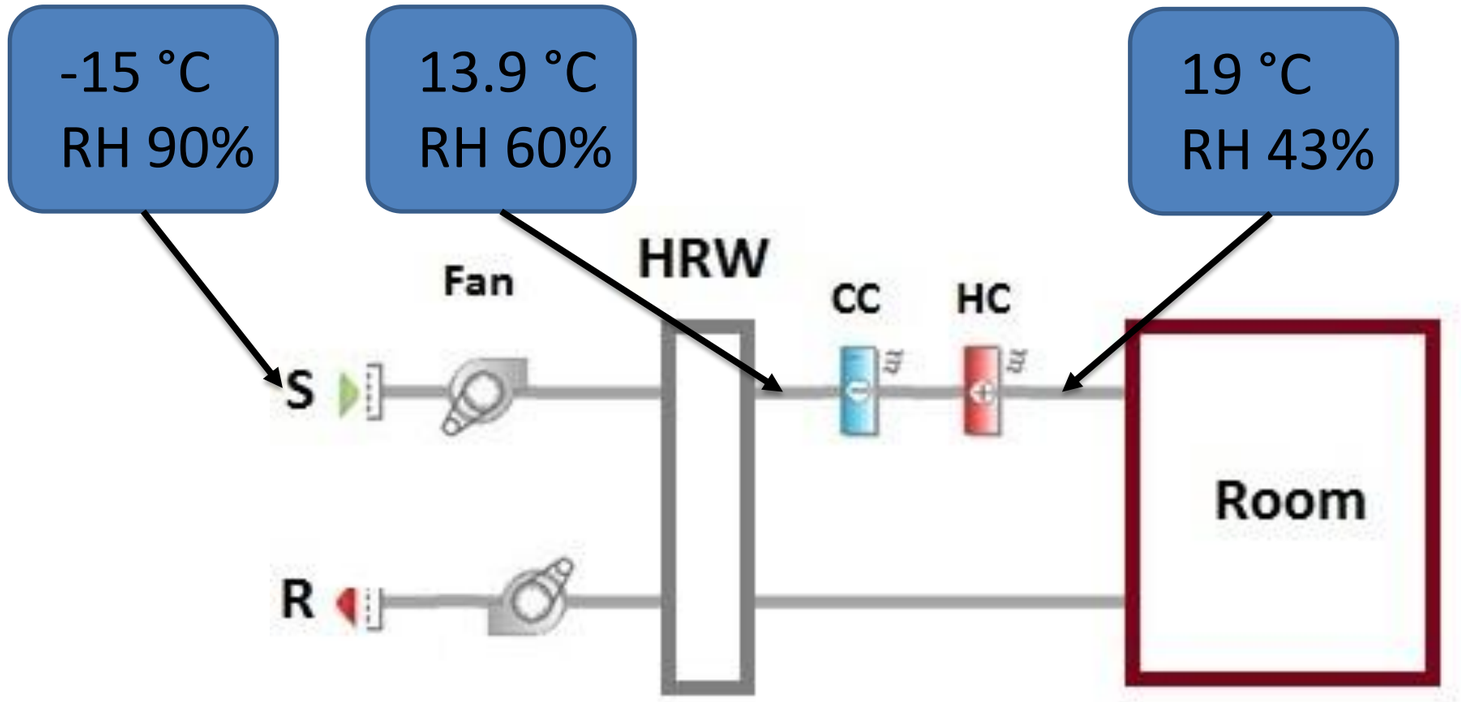
- Lower CO2 emissions from transport
- Utilization of local industry

Energy Optimization

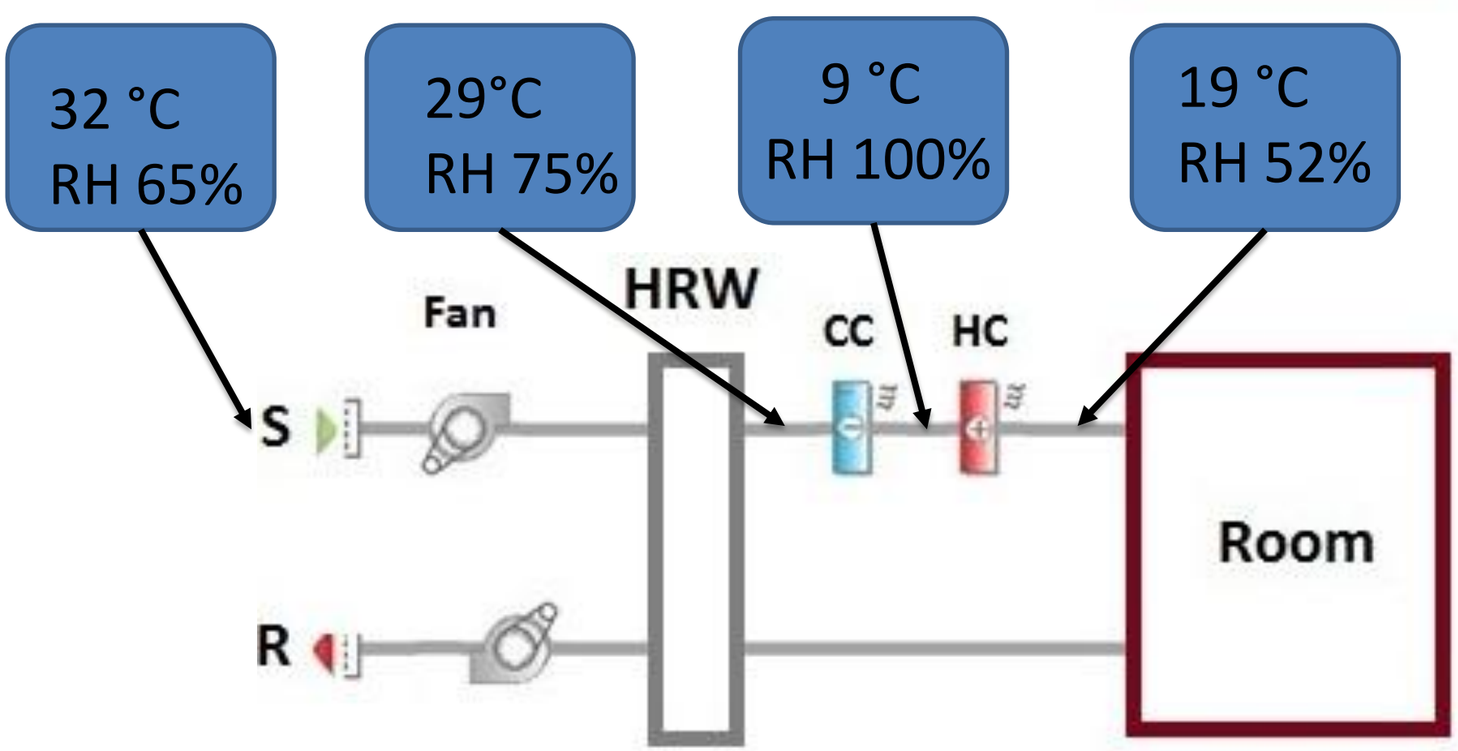


Air Handling Unit Diagram

Winter cycle



Summer cycle

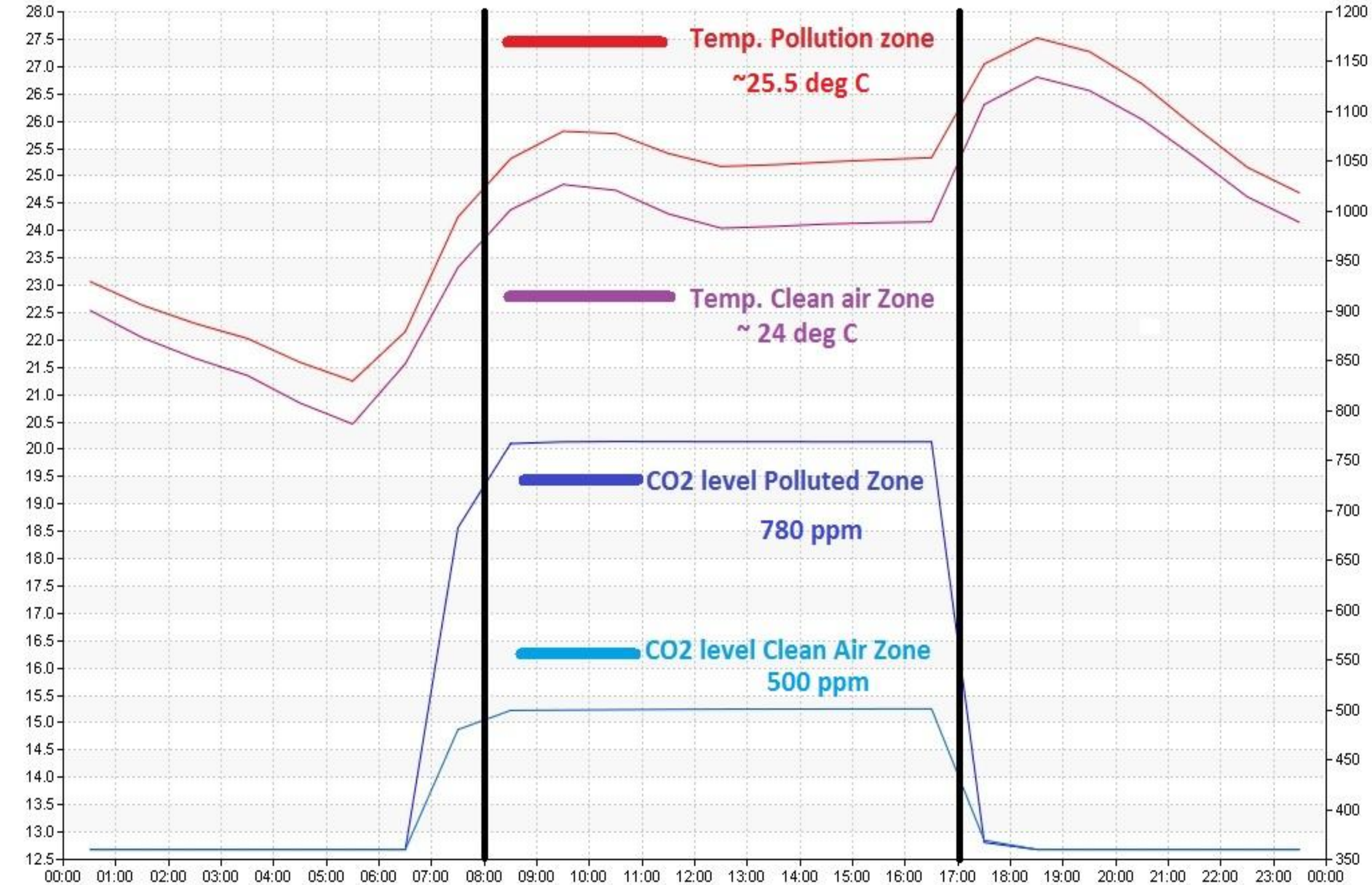


Average max. temp.
June: 25 °C
July: 28 °C
August: 27 °C

Displacement Ventilation – Small Classroom



27 July 20XX



A SE MEP CM

Mixing Ventilation - Lap



MEP Health Concept



Displace-ment Ventil.

- No mixing of pollutants.
- Creates clean air zone.

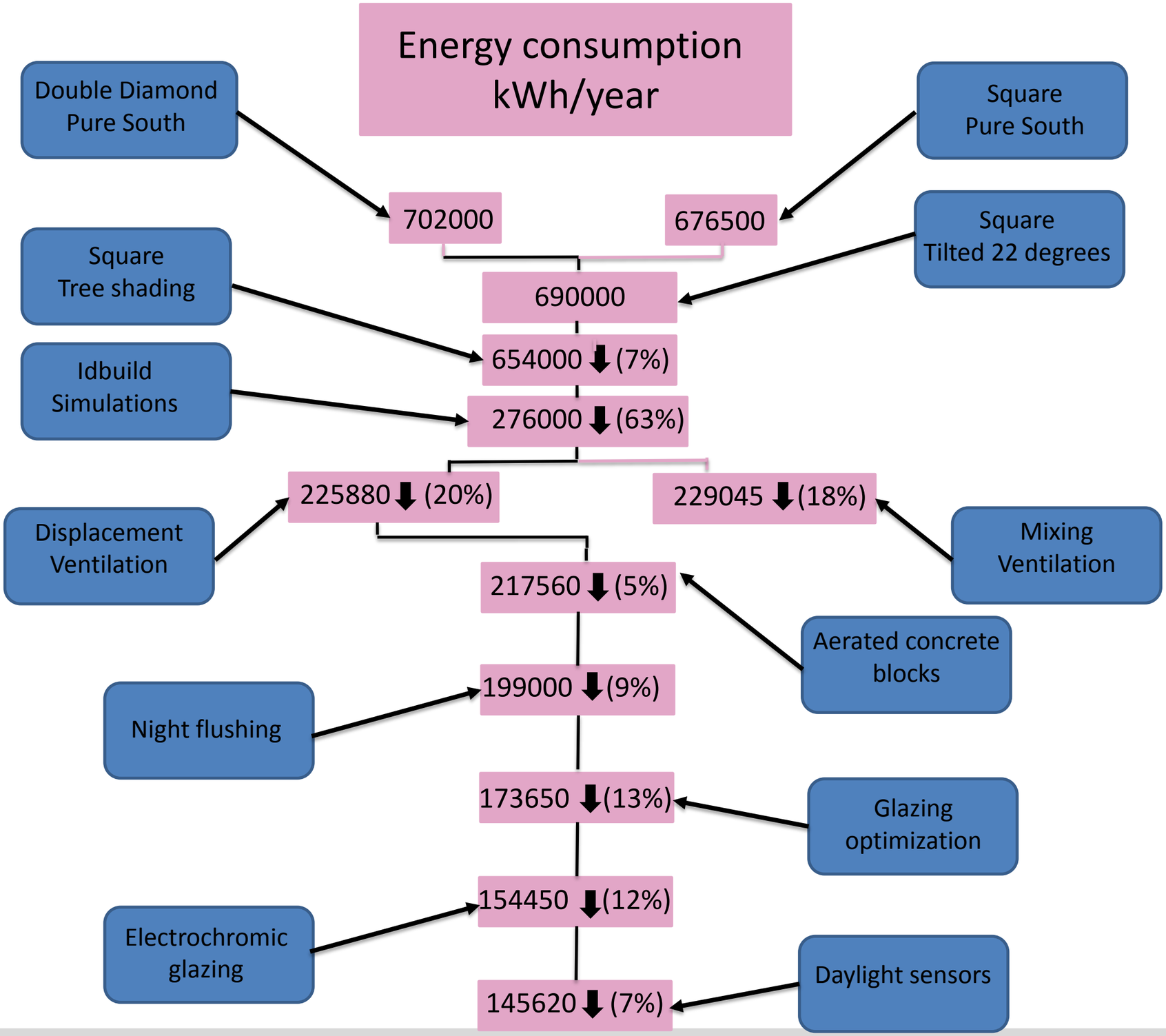
Improved Acoustic Ambience

- Eliminates mech. background noise.
- Better student performance

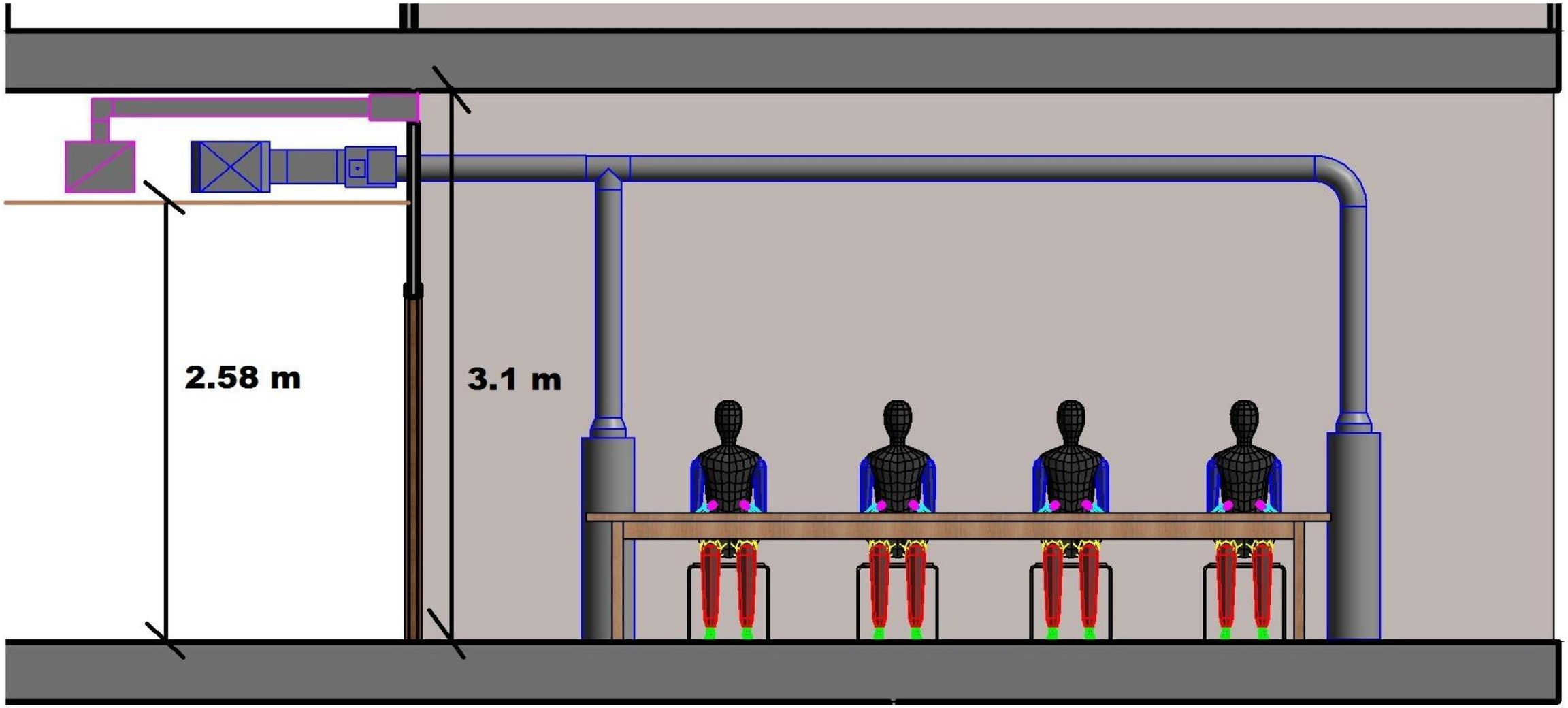
Low-polluting Materials

- Low-VOC emitting paint
- Bioline wood ceiling tiles

Energy Optimization



Sandwich Floor



Low-polluting materials

Aerated Concrete
Block
with recycled material
as fly ash and rebar



Eco-cement floor



Clay Earth Plaster
VOC free



Low-polluting materials

Wood made ceiling tile



Parador wood floor



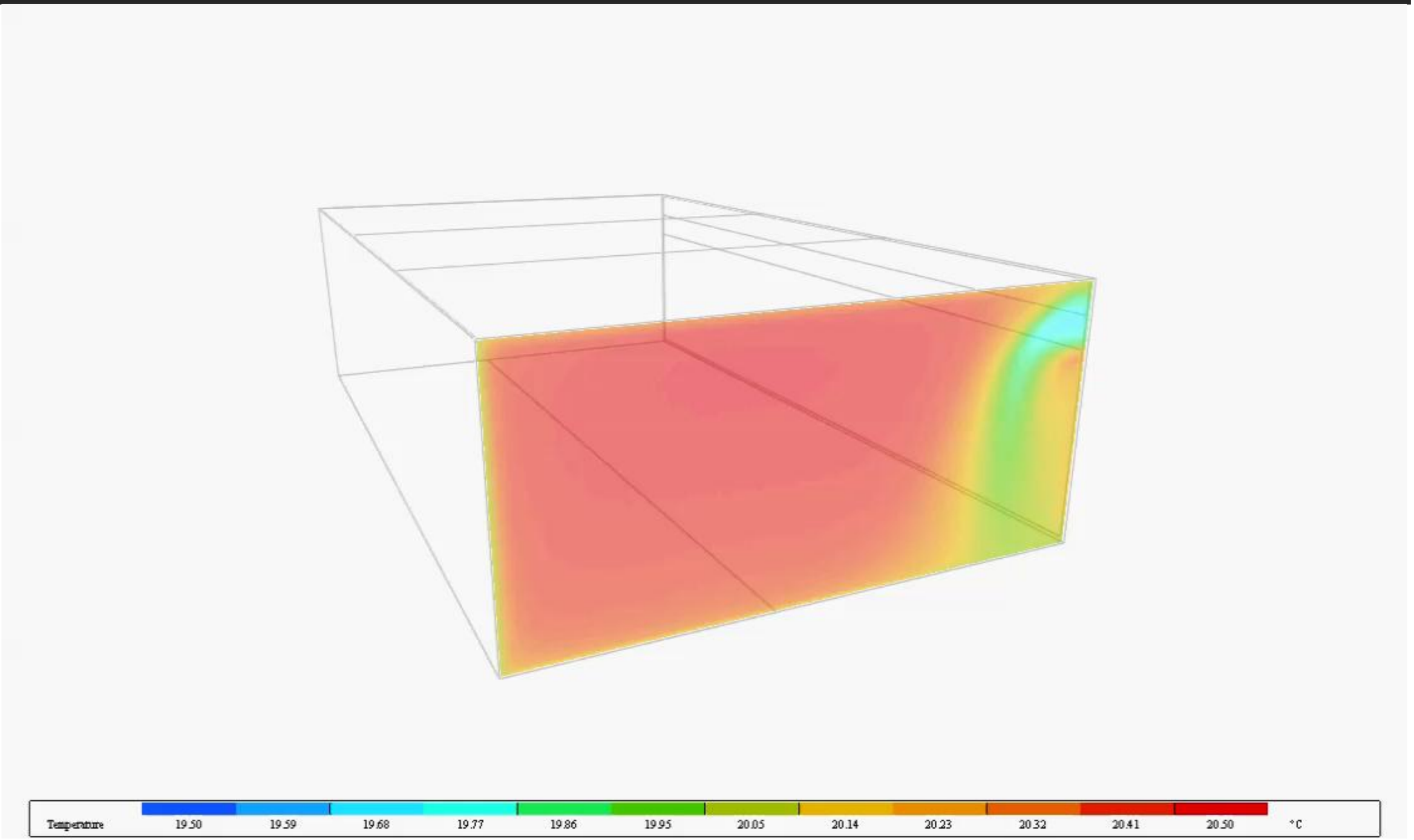
Low-VOC Furniture



LEED v4

FSC

Single-Sided Natural Ventilation



MEP Health Concept



Displace-ment Ventil.

- No mixing of pollutants.
- Creates clean air zone.

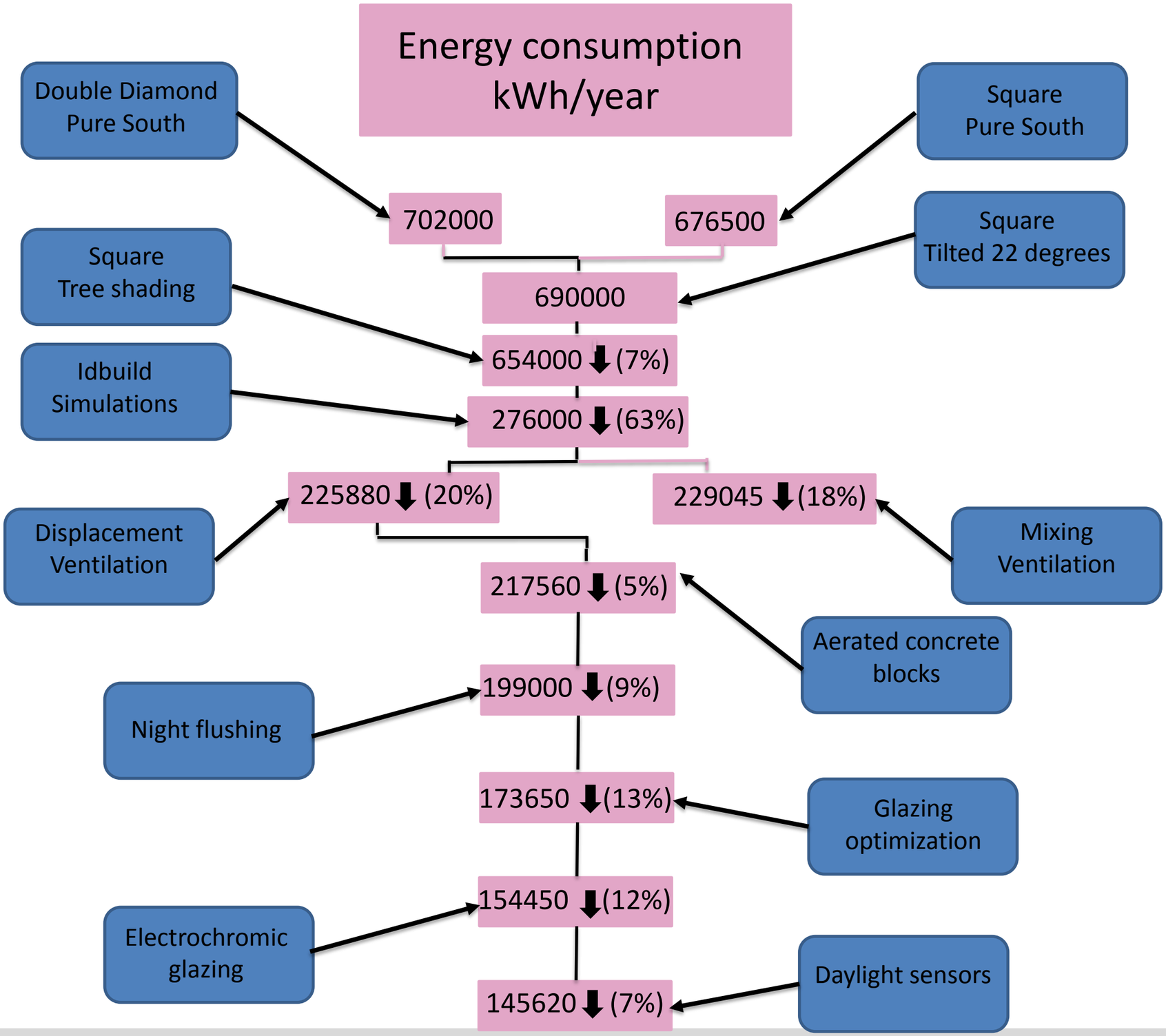
Improved Acoustic Ambience

- Eliminates mech. background noise.
- Better student performance

Low-polluting Materials

- Low-VOC emitting paint
- Bioline wood ceiling tiles

Energy Optimization



Optimized glazing

Triple unit, 52 mm Argon fill
Ug = 0.5 W/m^{2}K
Insulated frame U_W: 0.68 W/m^{2}K
EN 673





FSC

Optimized shading

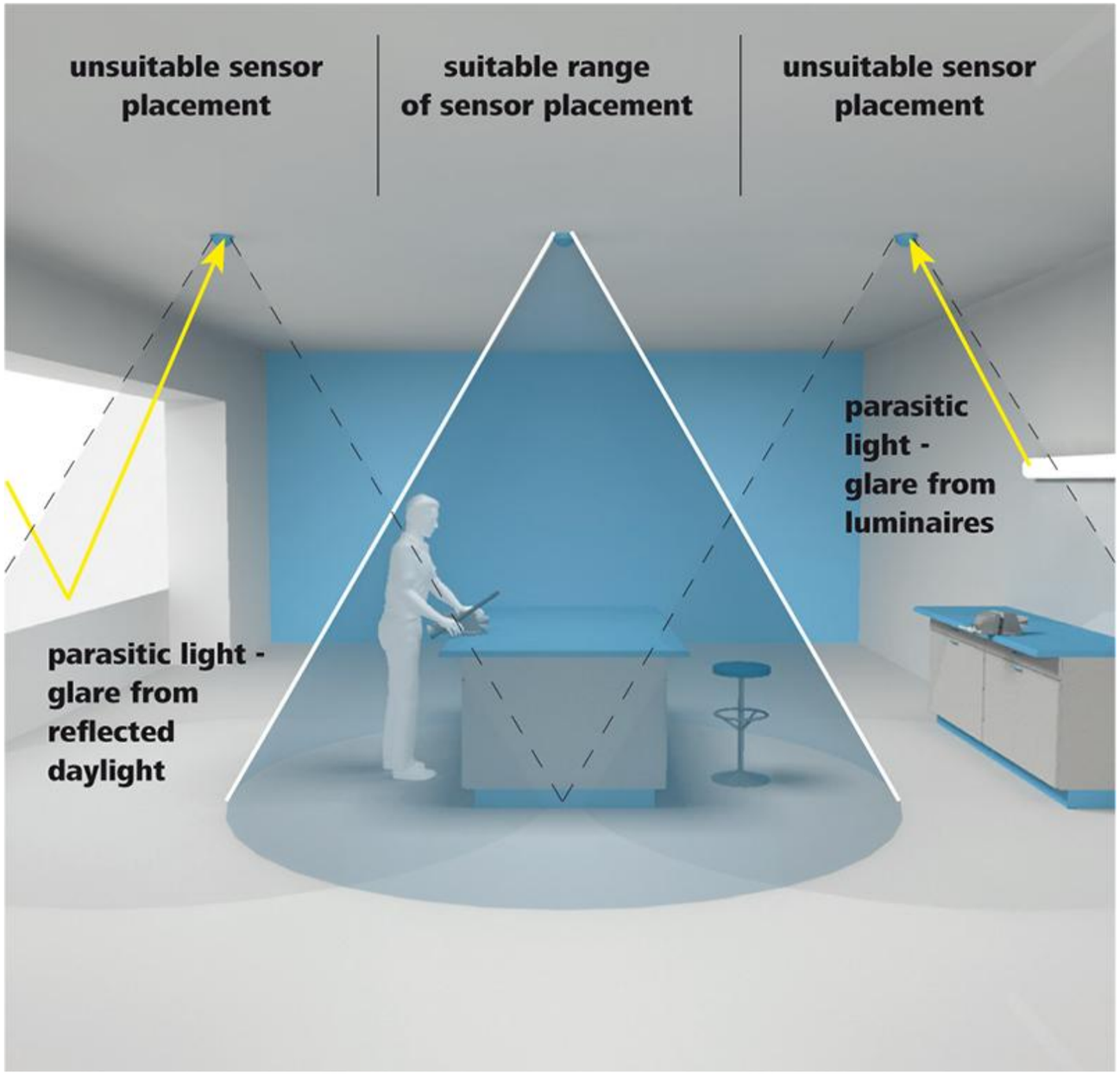
Solar Heat Gain Coefficient-0.55



Solar Heat Gain Coefficient-0.15



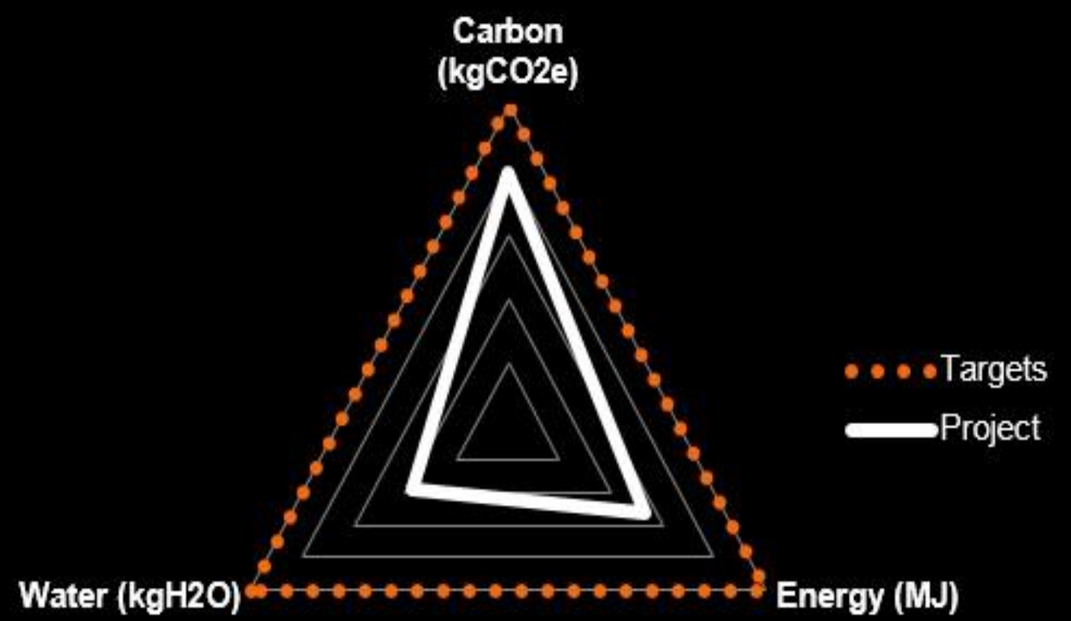
Daylight Sensors



Sustainable Target Value

Performance Relative to Life Cycle Impact Targets

Impact	Target	Project	%
Carbon (kgCO2e)	4,664,724	3,689,929	79%
Energy (MJ)	163,196,824	86,047,863	53%
Water (kgH2O)	1,466,958,904	549,521,514	37%
Ozone (kgCFC11	-	1.28E-01	-



MEP Health Concept



Displace-ment Ventil.

- No mixing of pollutants.
- Creates clean air zone.

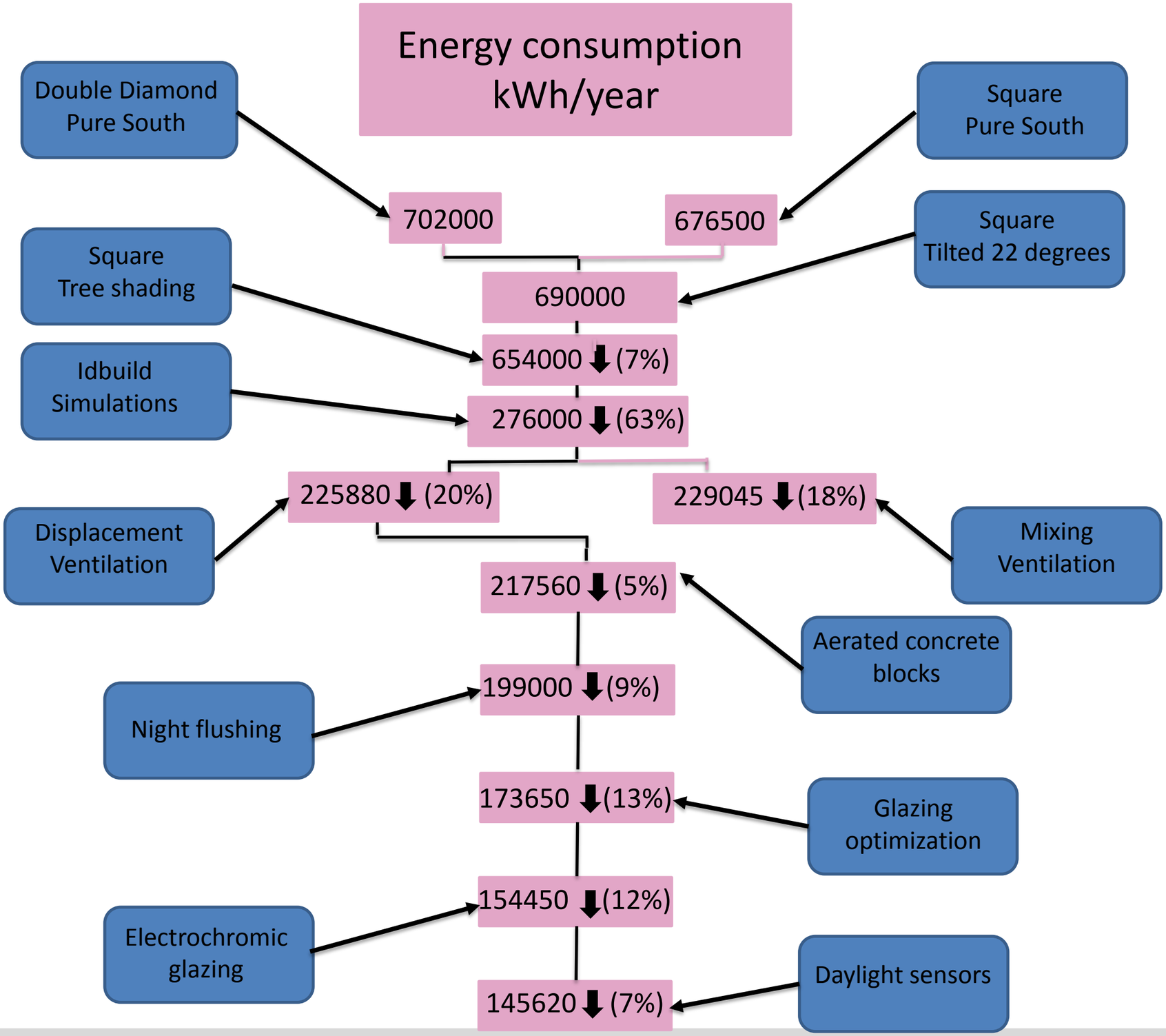
Improved Acoustic Ambience

- Eliminates mech. background noise.
- Better student performance

Low-polluting Materials

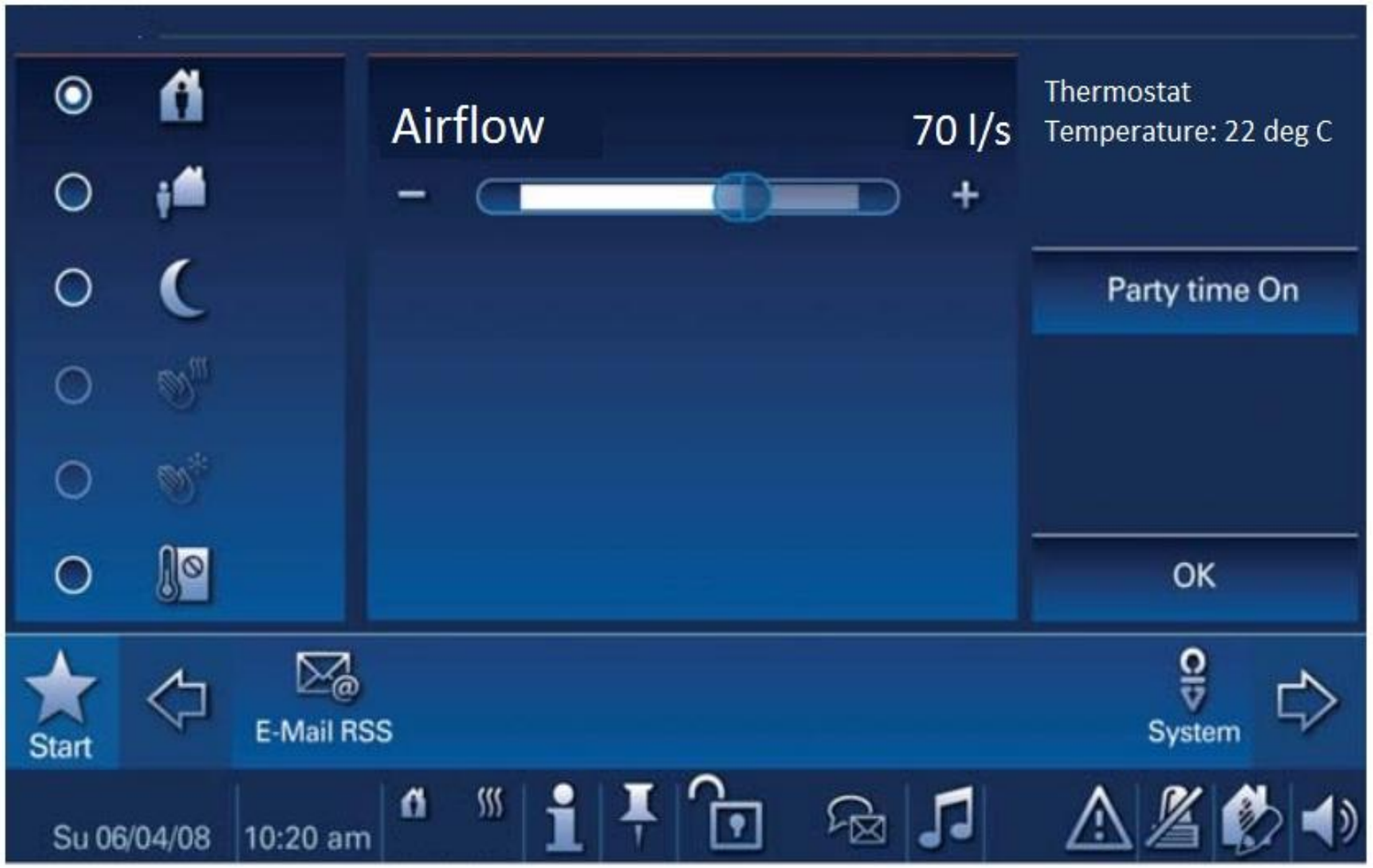
- Low-VOC emitting paint
- Bioline wood ceiling tiles

Energy Optimization



Intelligent Building Control

Busch Comfort Touch Panel



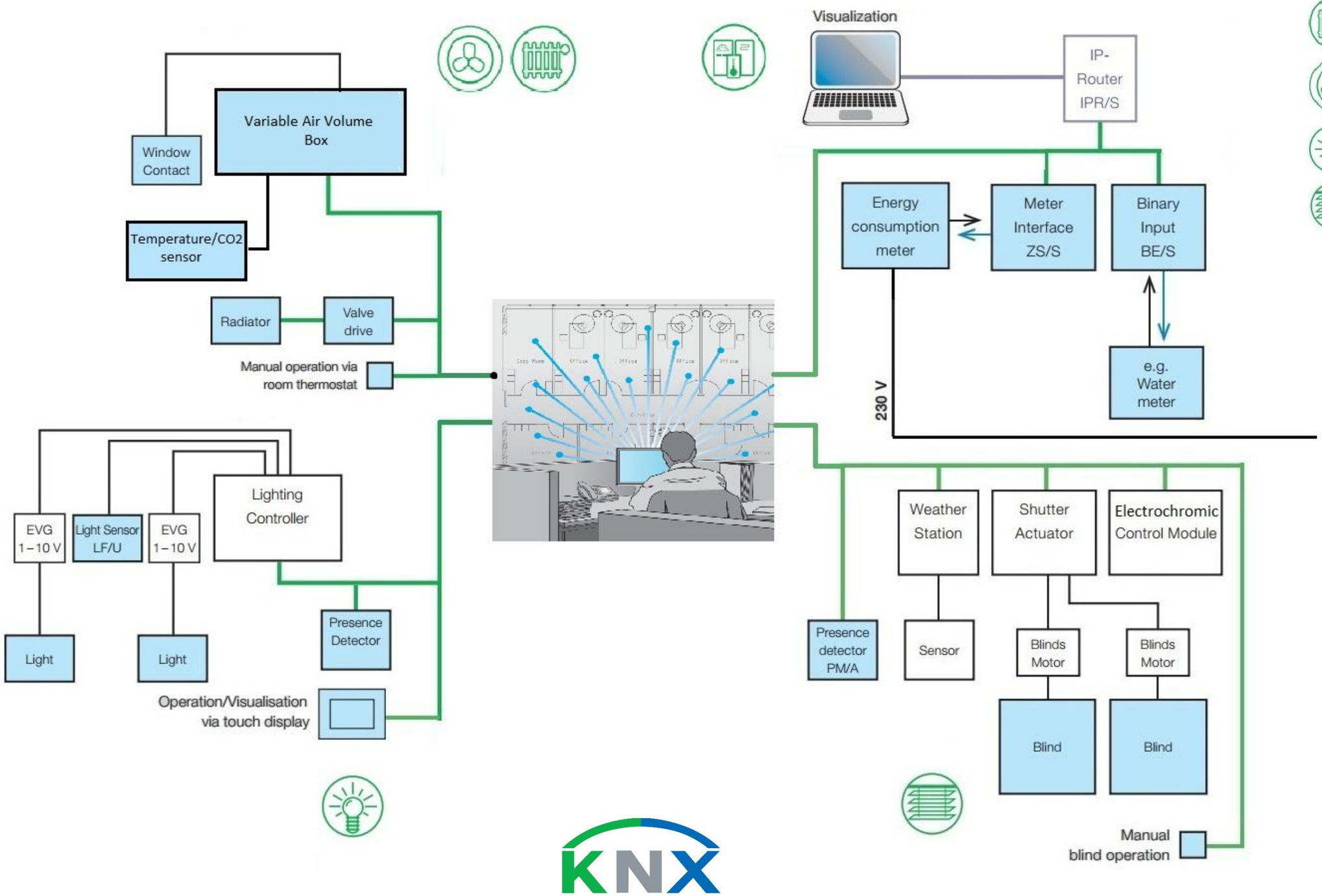
KNX

Intelligent Building Control

Busch Comfort Touch
Application



BMS-Intelligent Building Control



14-25%

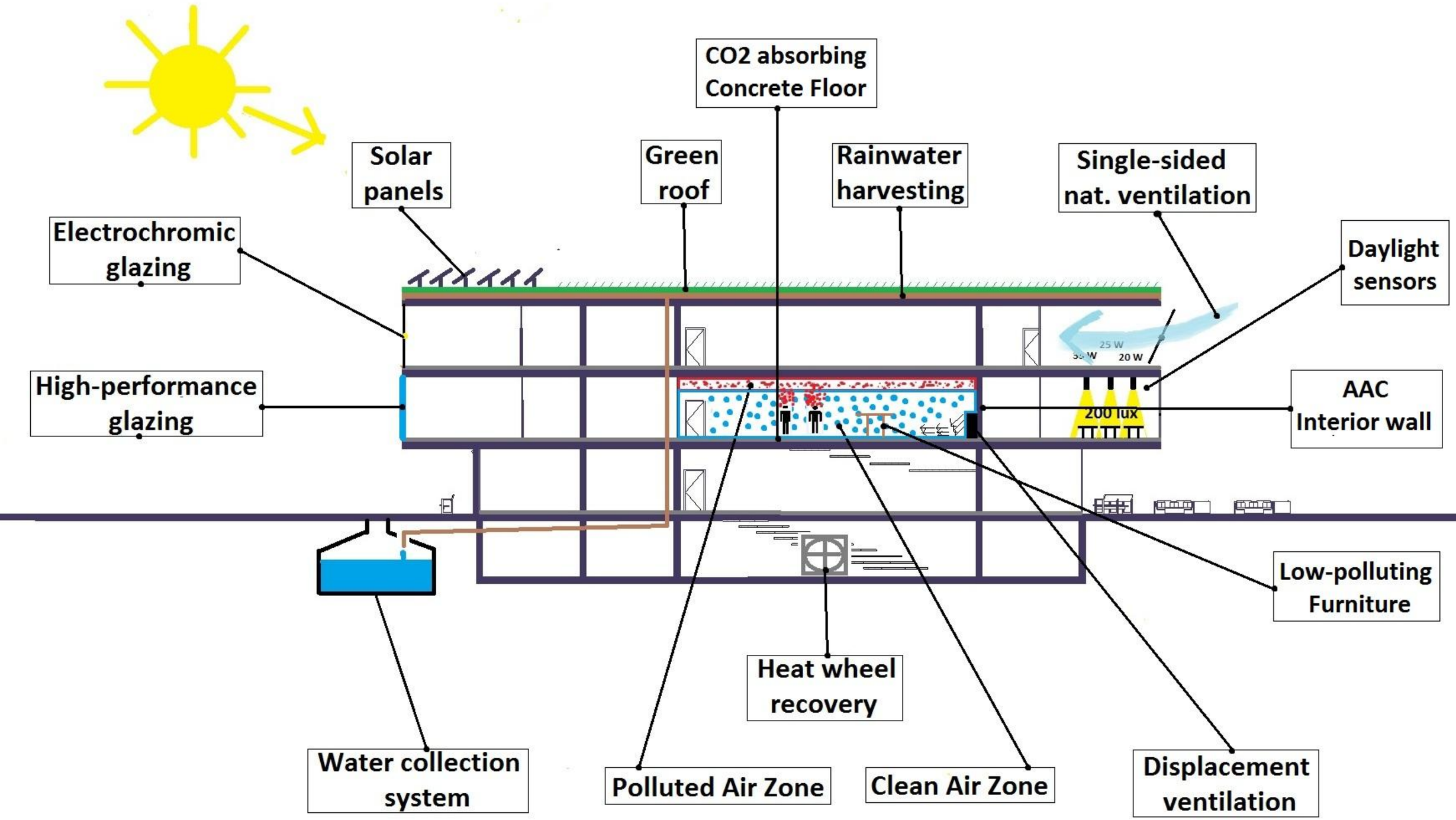
20-45%

20-58%

11-20%

KNX

Energy and Indoor Climate Concept



MEP Health Concept



Displace-ment Ventil.

- No mixing of pollutants.
- Creates clean air zone.

Improved Acoustic Ambience

- Eliminates mech. background noise.
- Better student performance

Low-polluting Materials

- Low-VOC emitting paint
- Bioline wood ceiling tiles

Construction Health Concept



Green Construction

- Runoff, dust, noise control
- Zero waste
- Community friendly

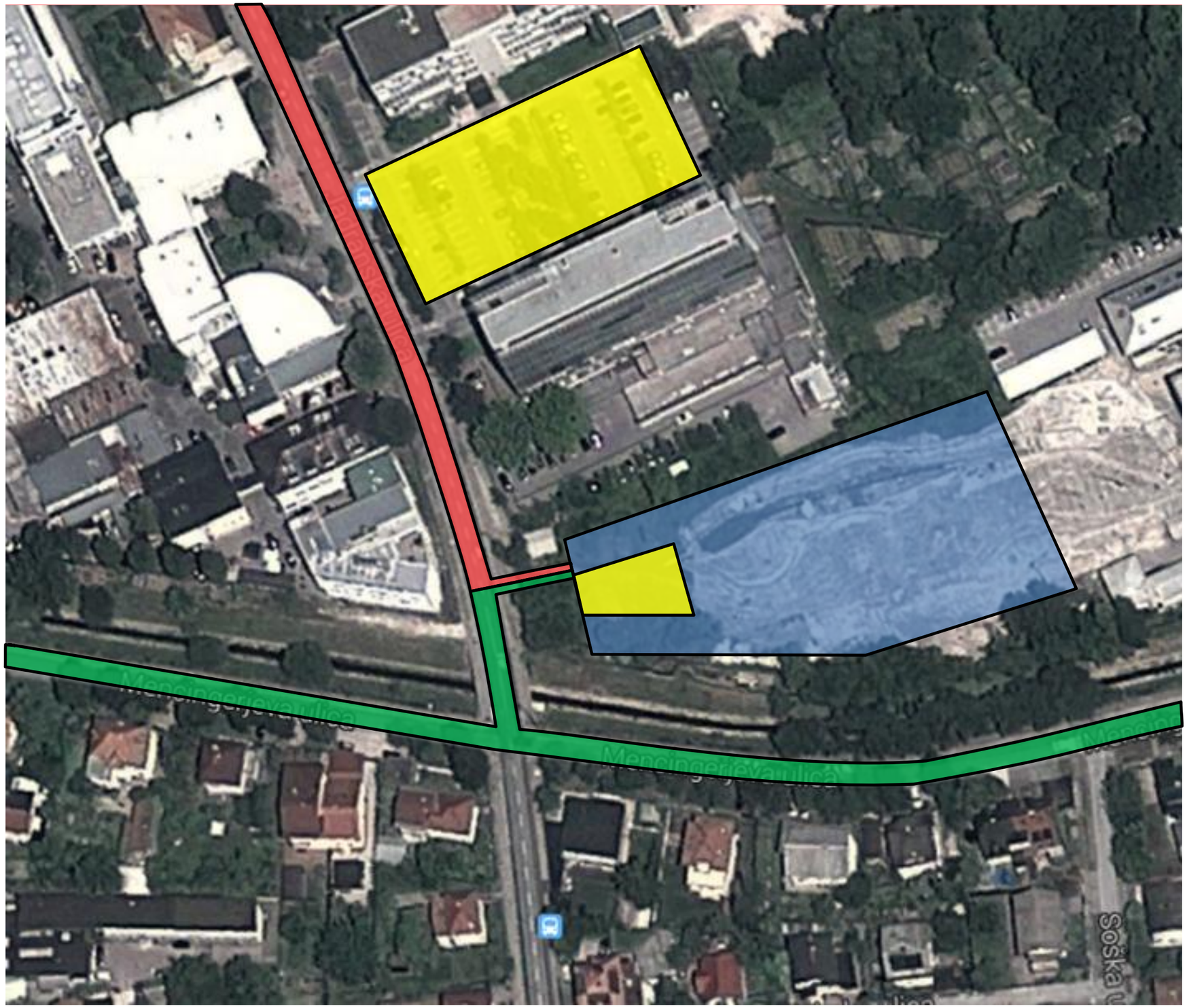
Construction Quality

- Prefabrication
- Modularization
- Just-in-time-delivery

Construction Safety

- Design for safety
- Job hazard analysis

Logistics – Site Access



Logistics – Site Access



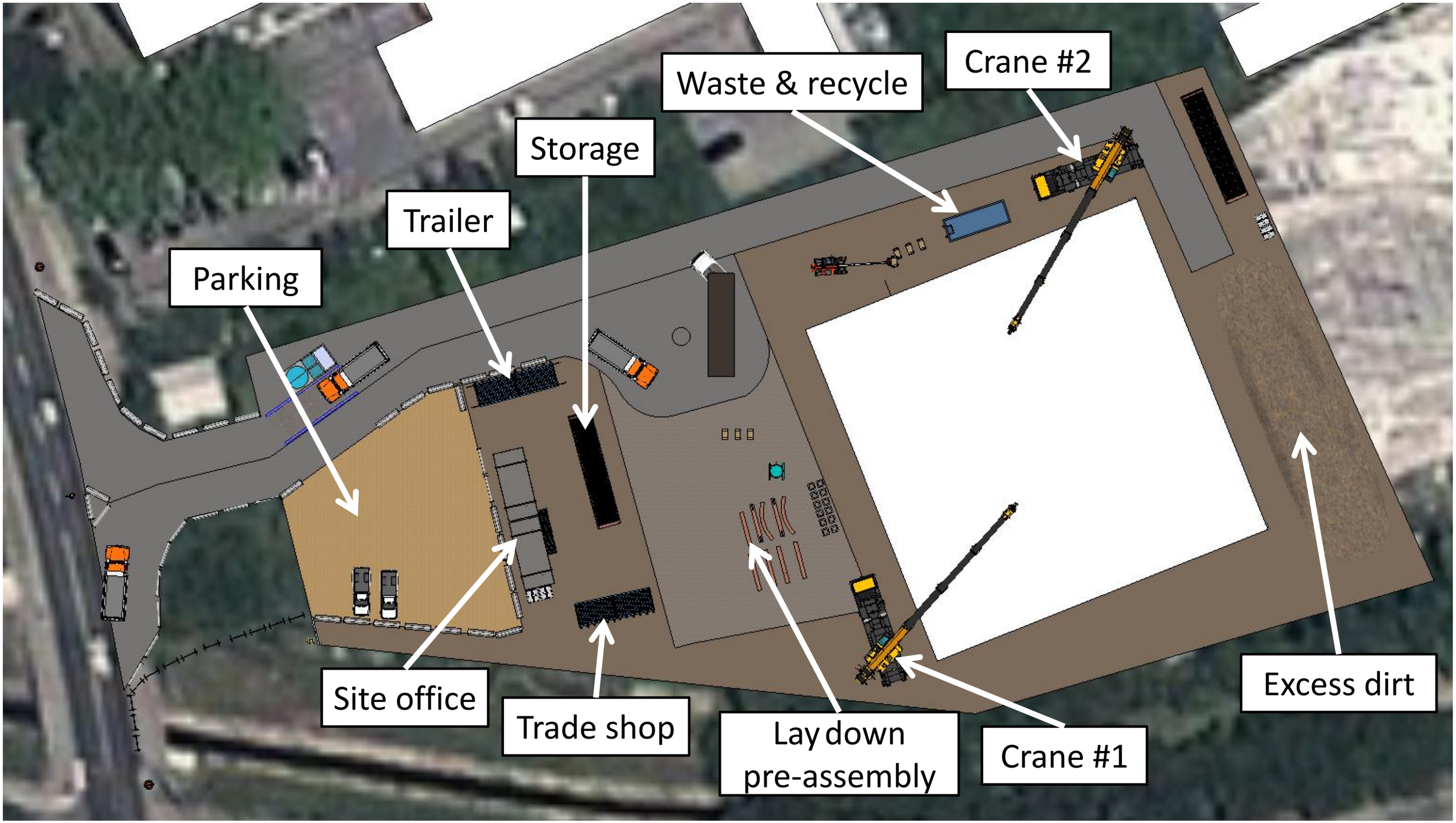
Site

Faculties

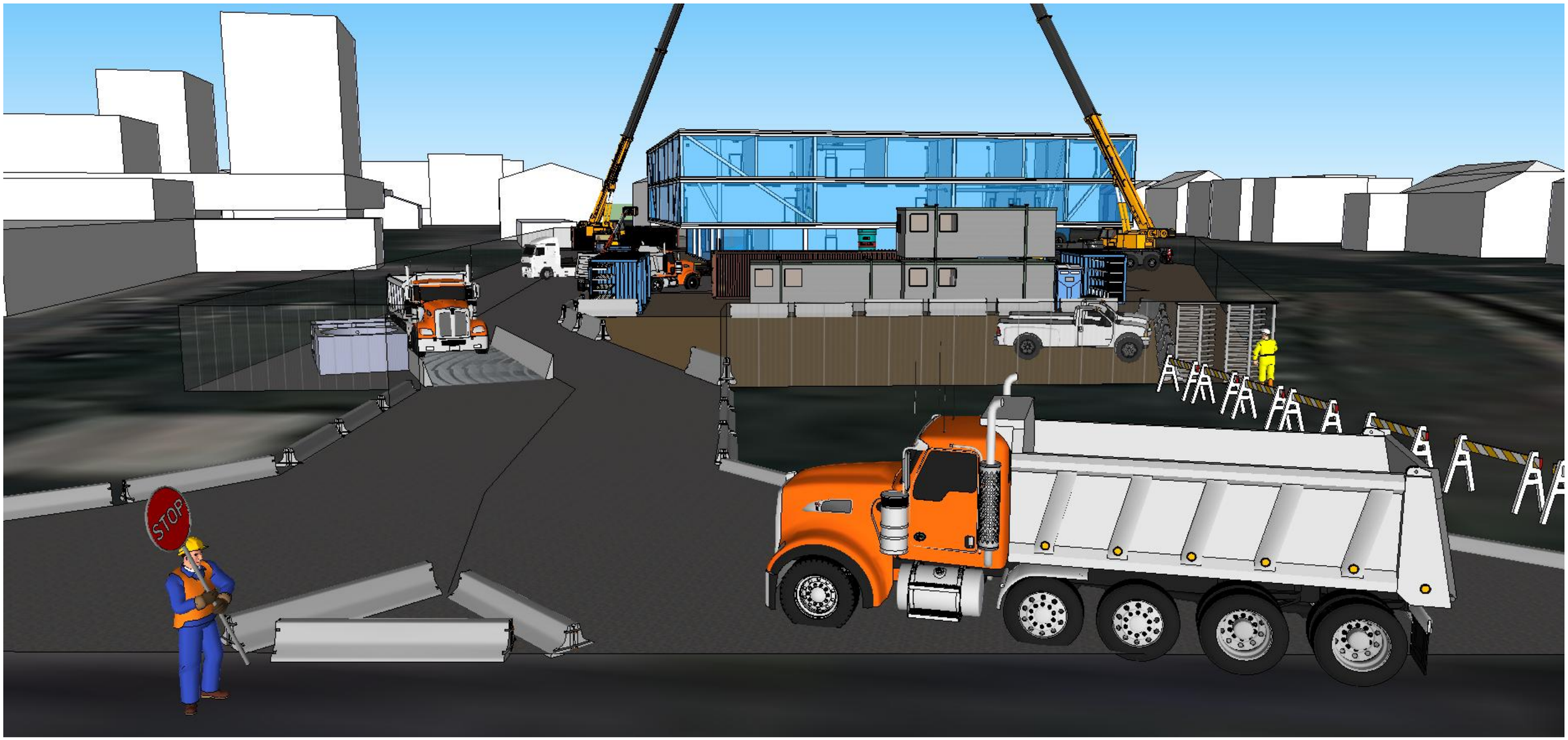
Residential area

River

Logistics – Site Layout



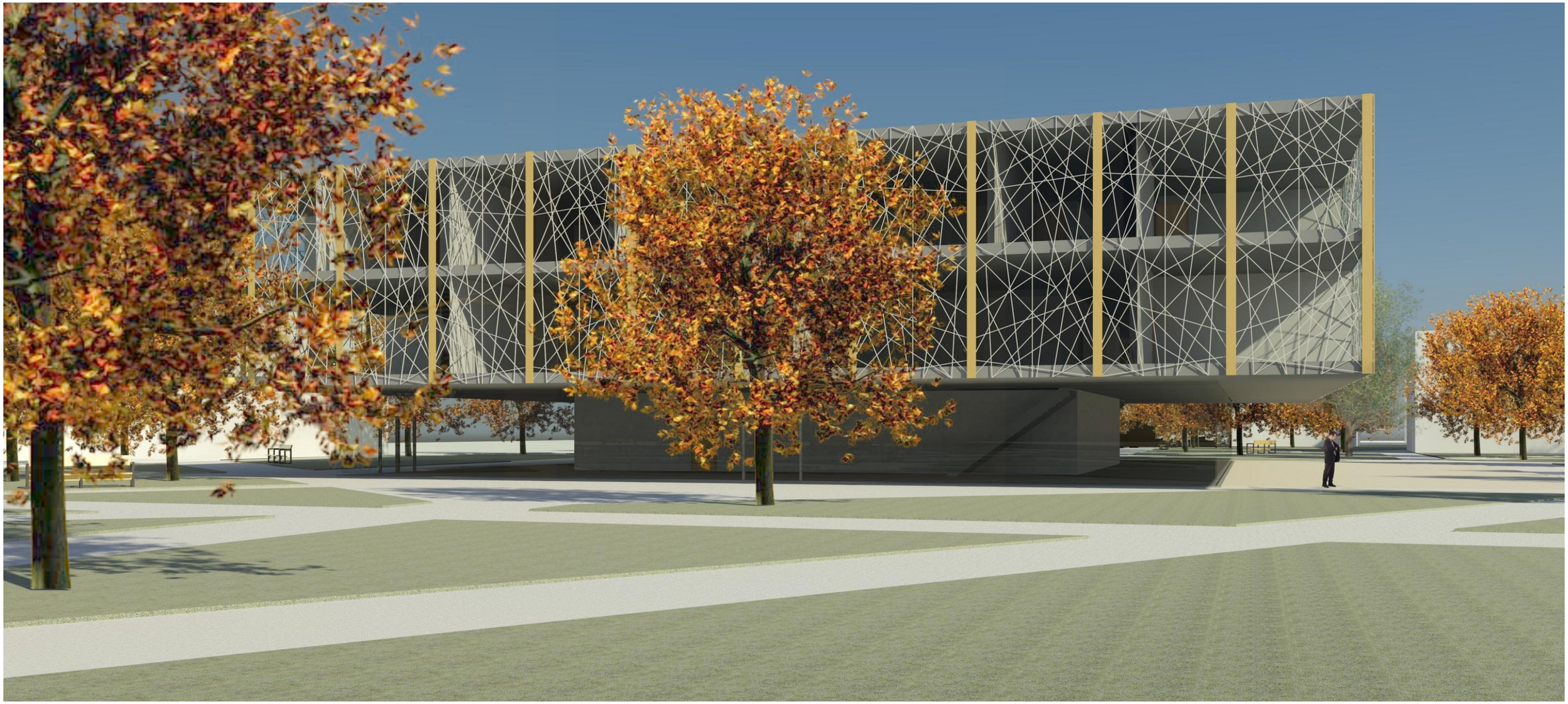
Site Preview



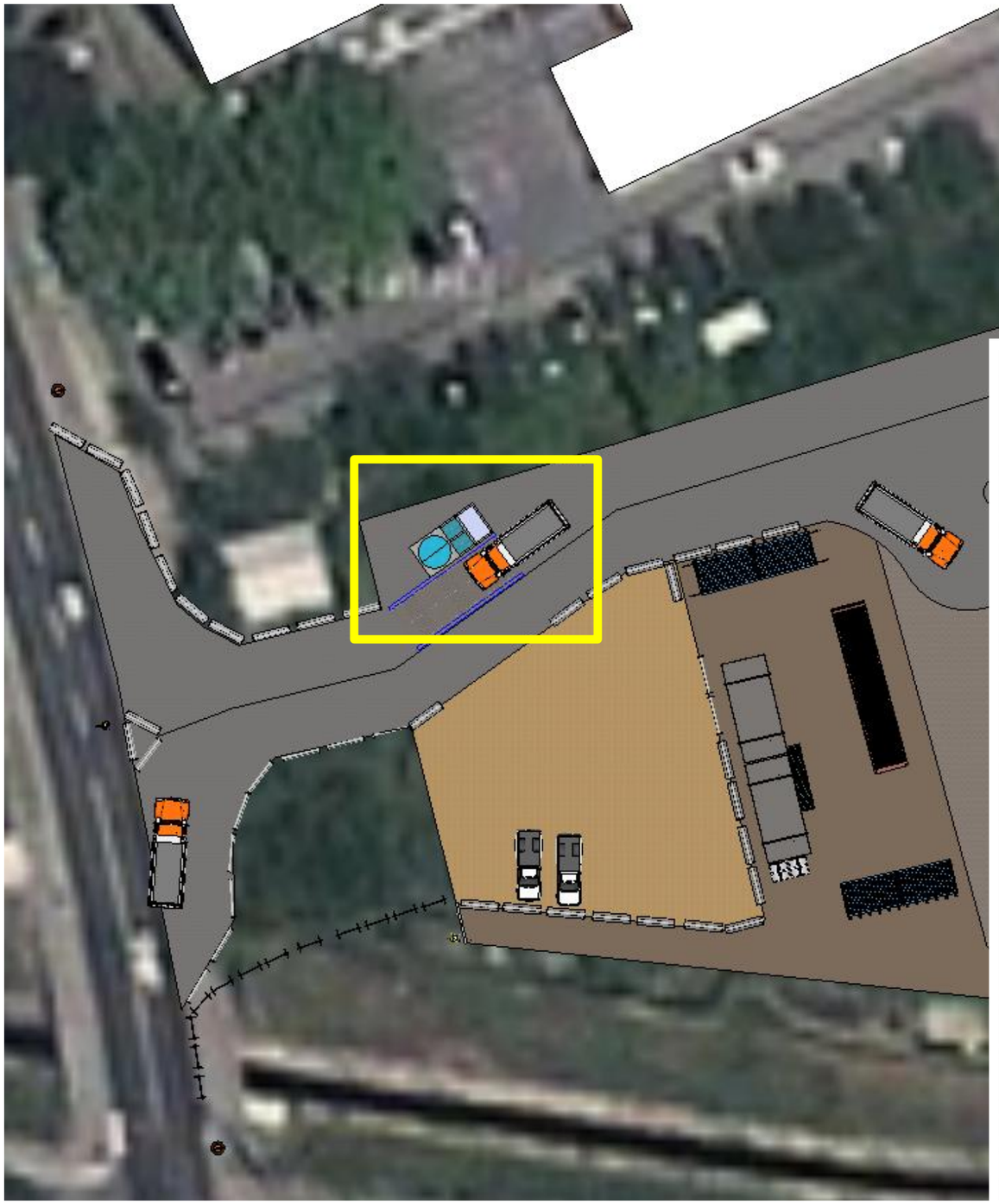
Site Preview

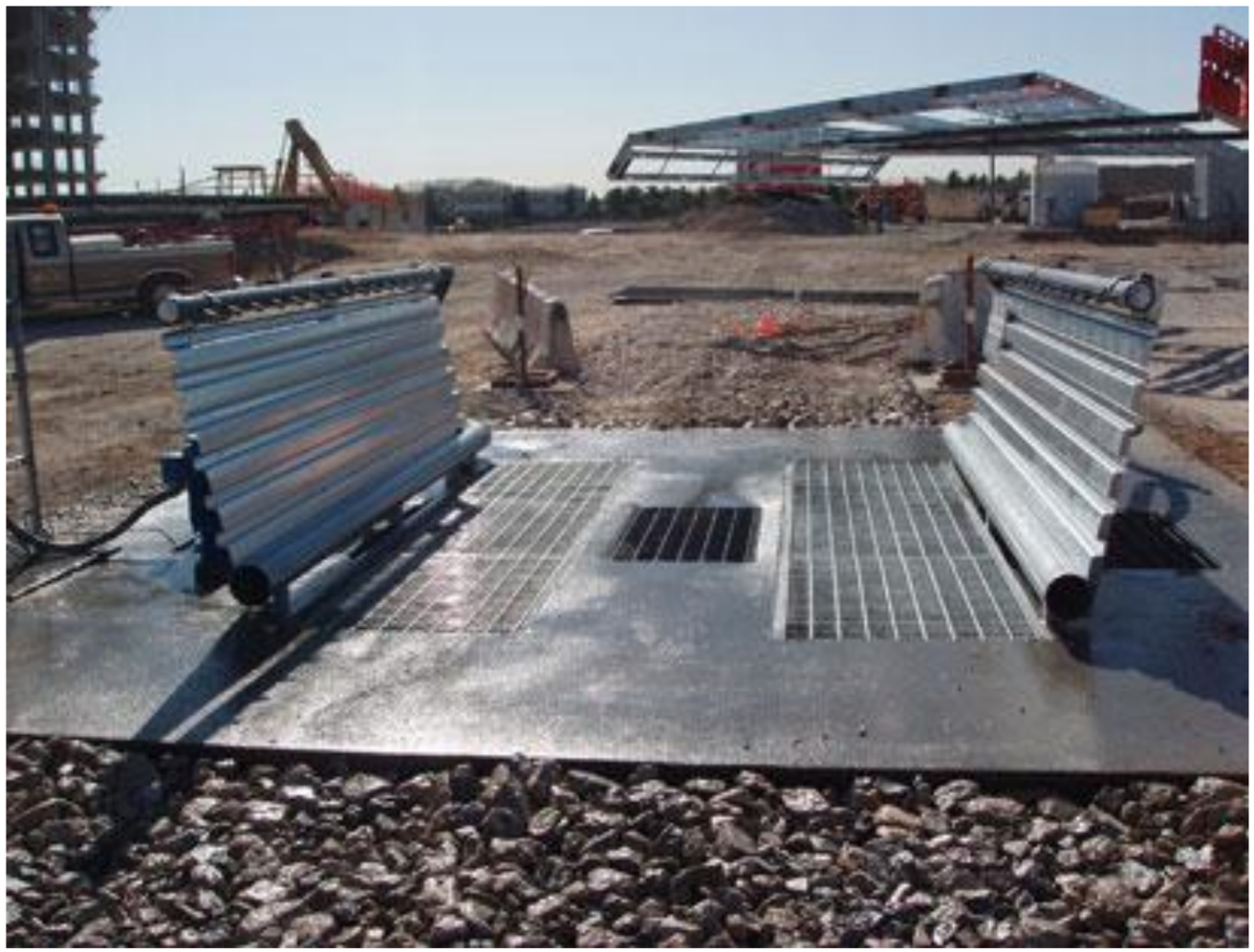


View



Tire Washing Station





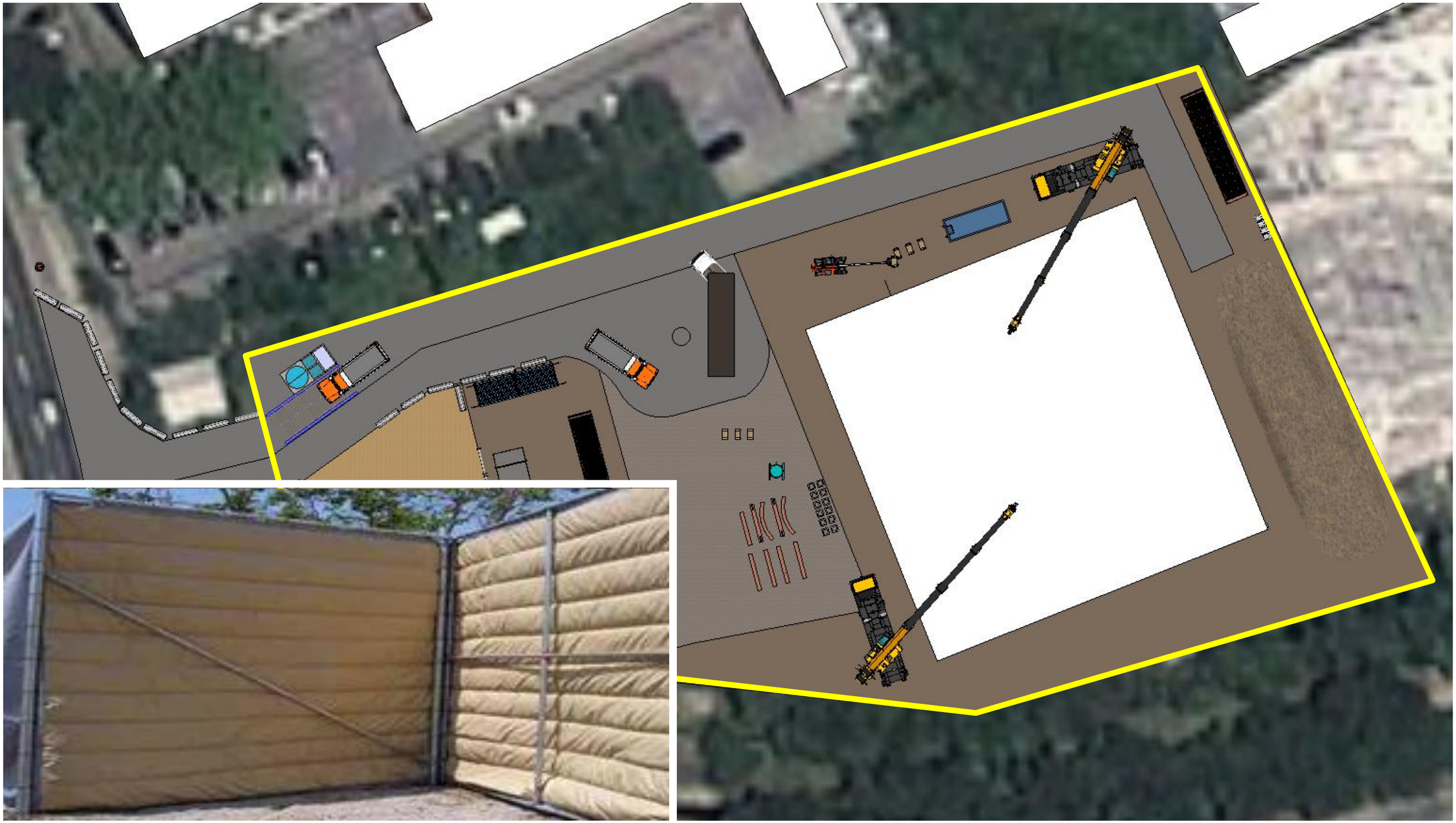
Sediment Barrier



Bare Soil Cover



Noise Barrier Fence



Construction Health Concept



Green Construction

- Runoff, dust, noise control
- Zero waste
- Community friendly

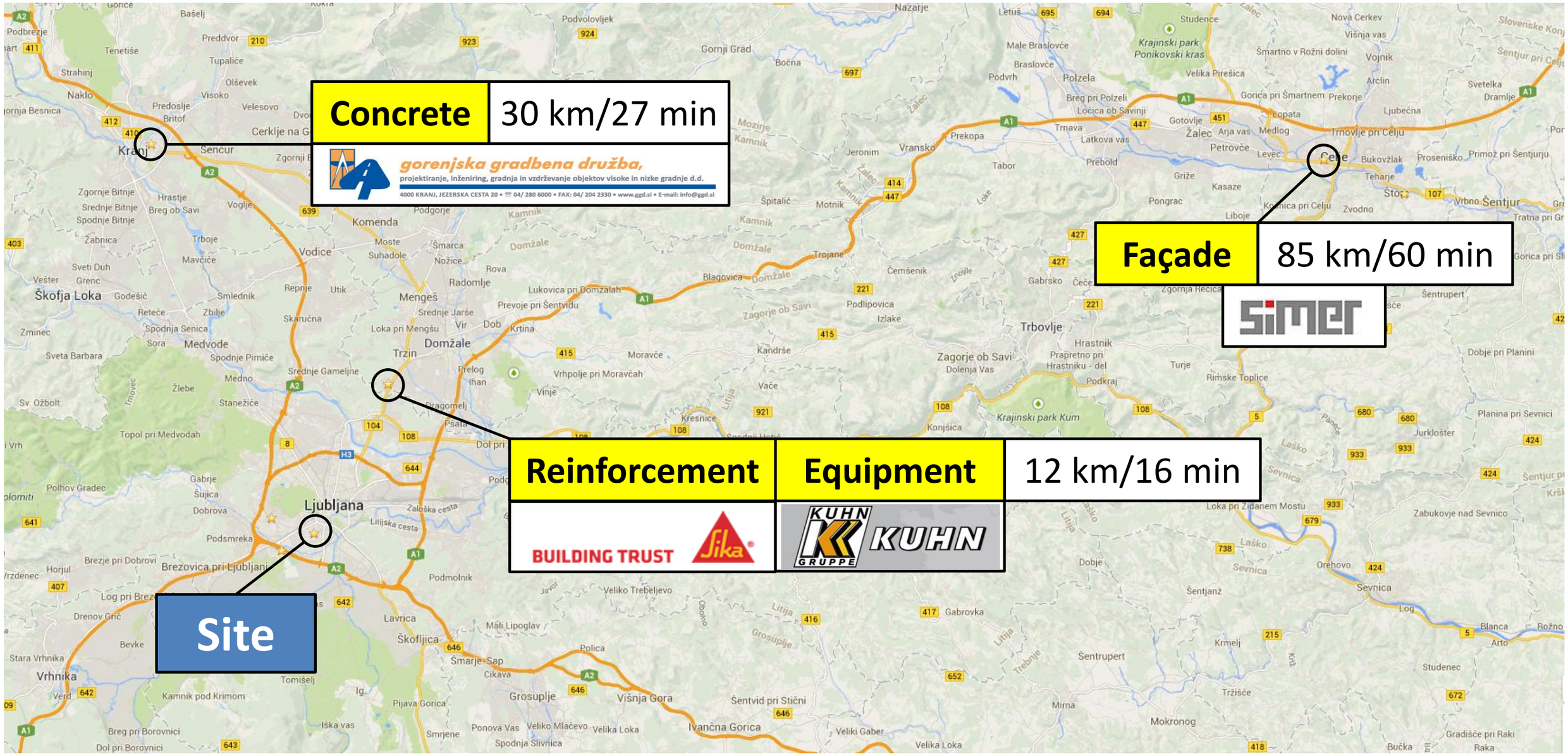
Construction Quality

- Prefabrication
- Modularization
- Just-in-time-delivery

Construction Safety

- Design for safety
- Job hazard analysis

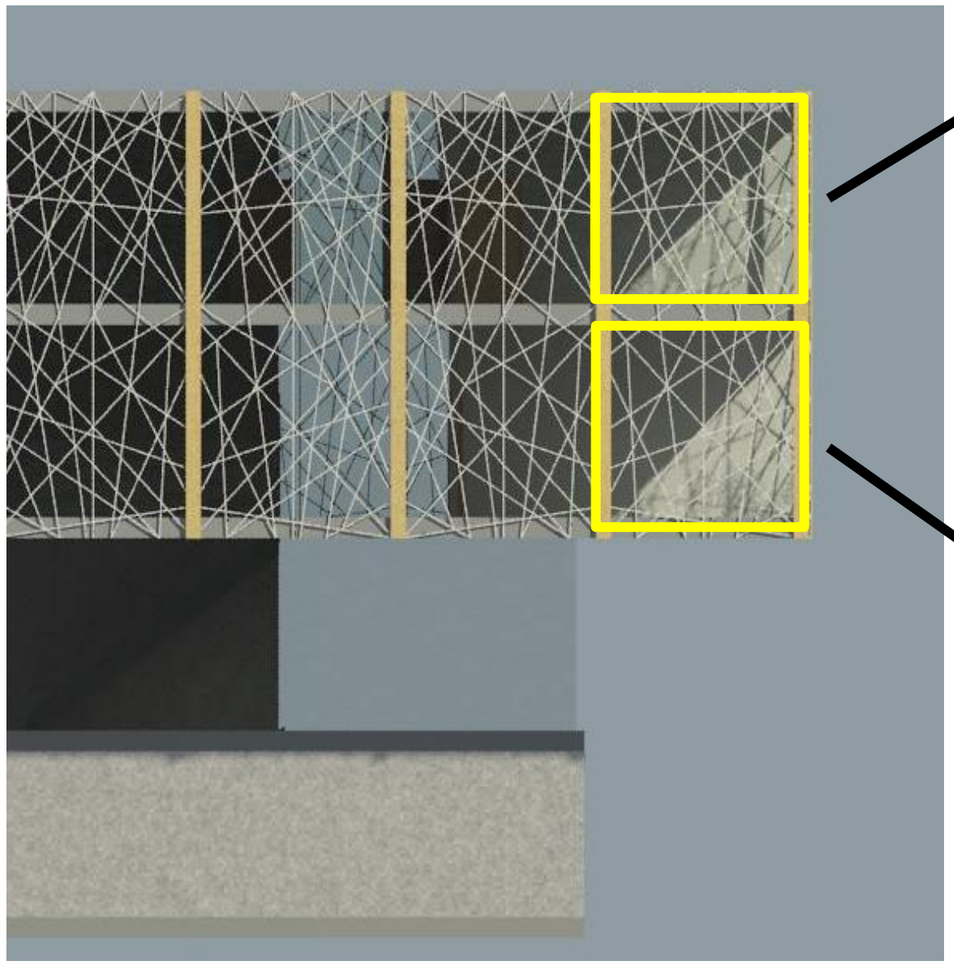
Local Suppliers

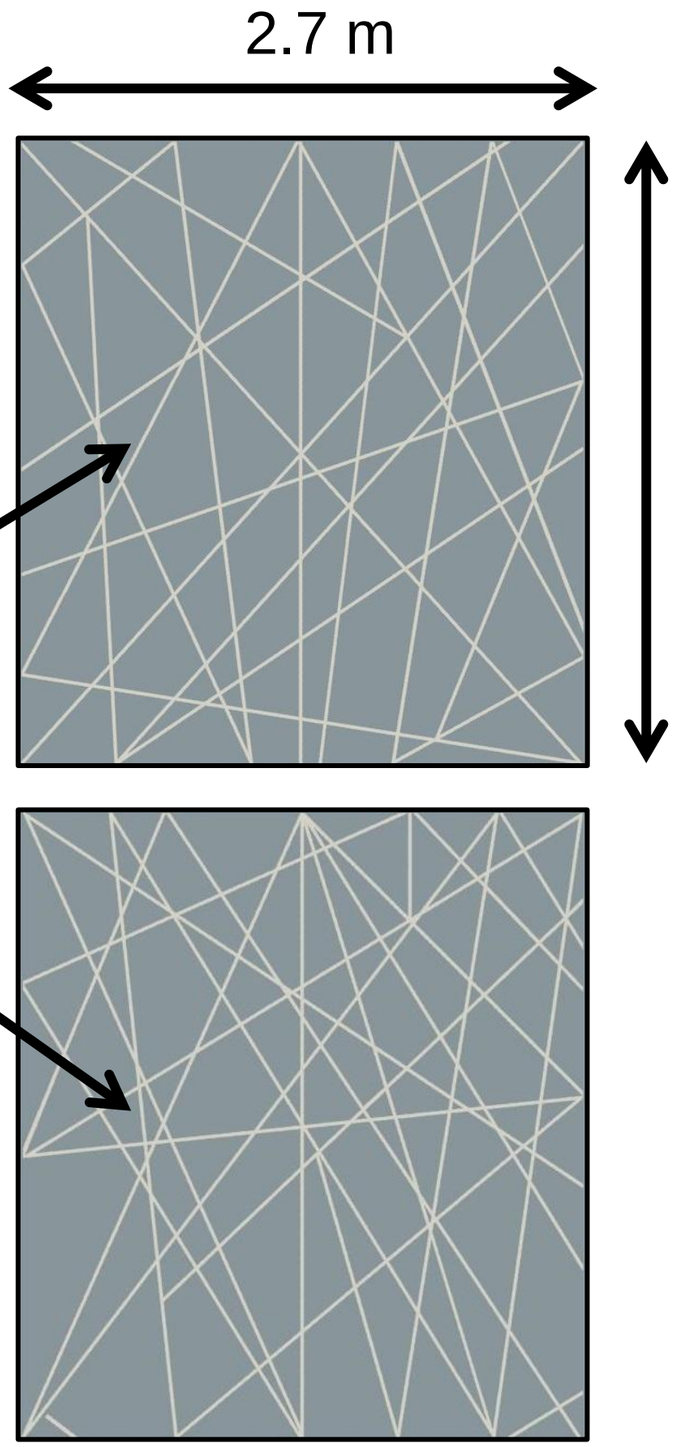


A SE MEP CM

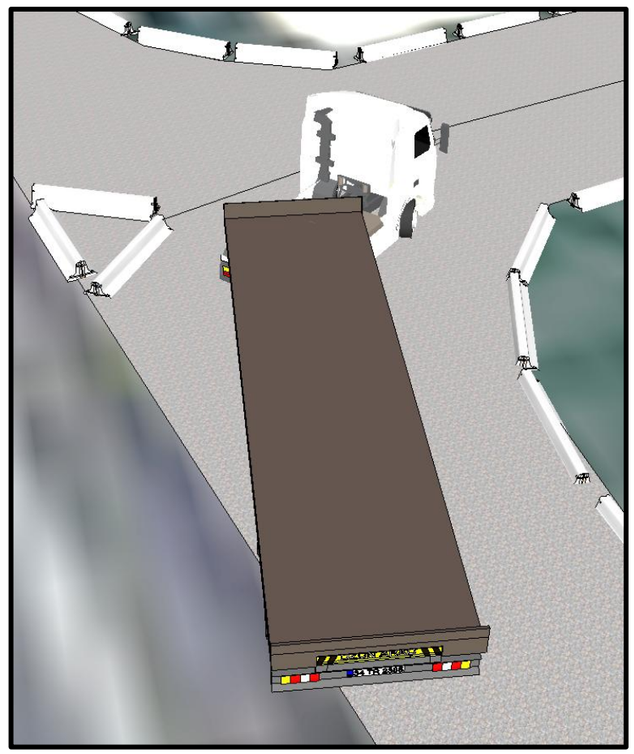
Constructability – Façade Panels











Constructability – Crane Coordination

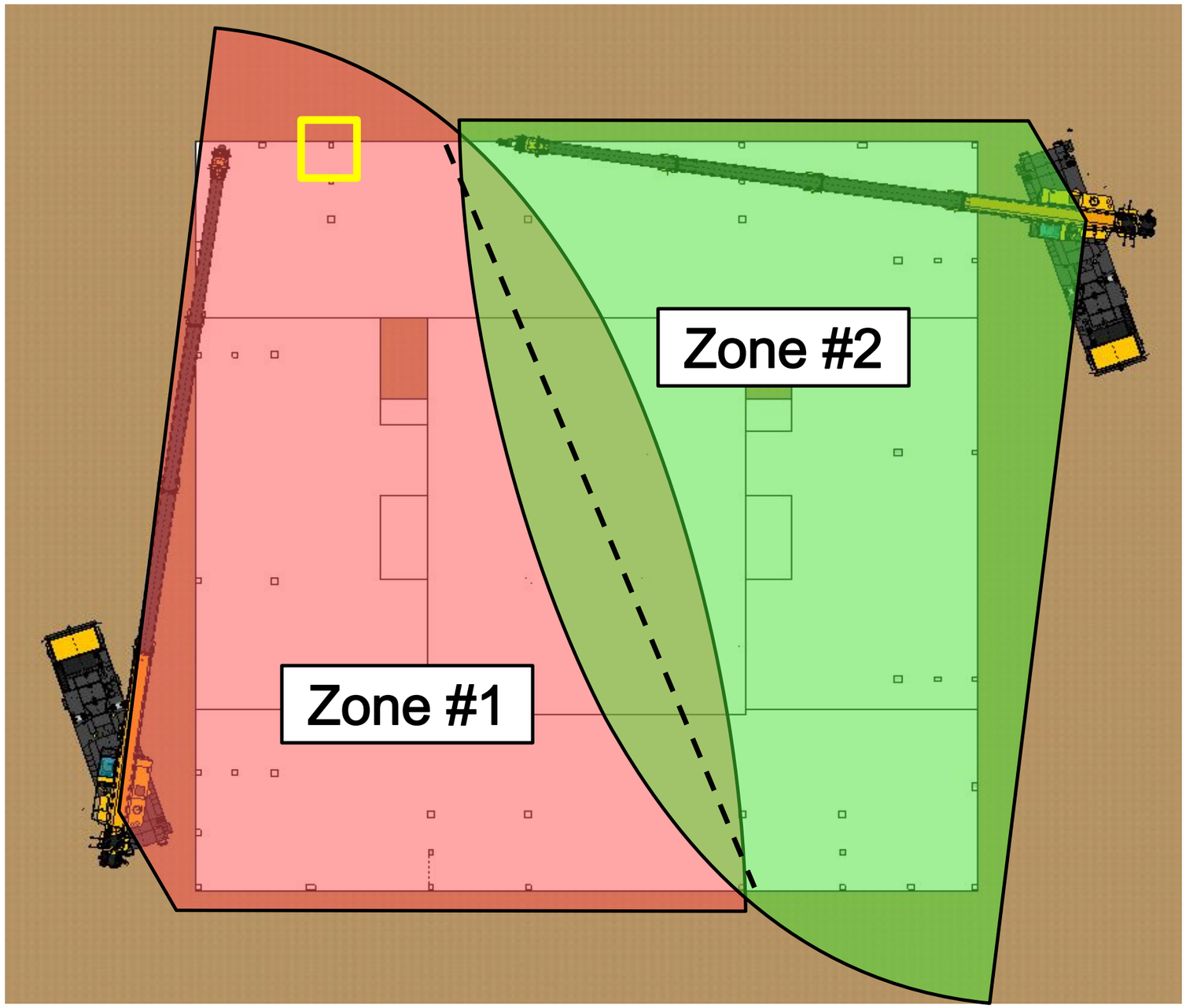
Liebherr LTM 1100

- 11.5t at 52m

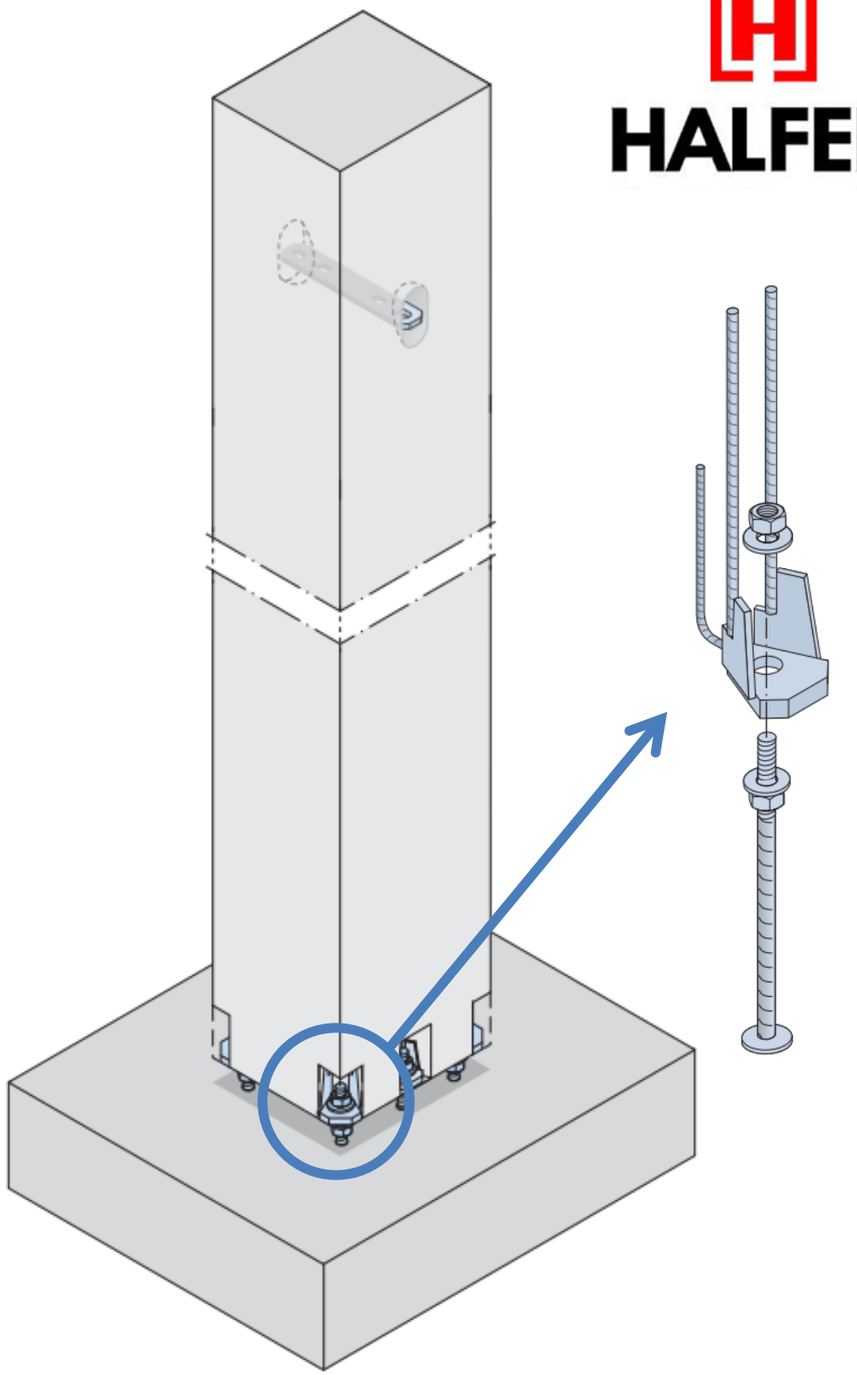
Critical column lifting:

- 35 m
- 1.2 ton



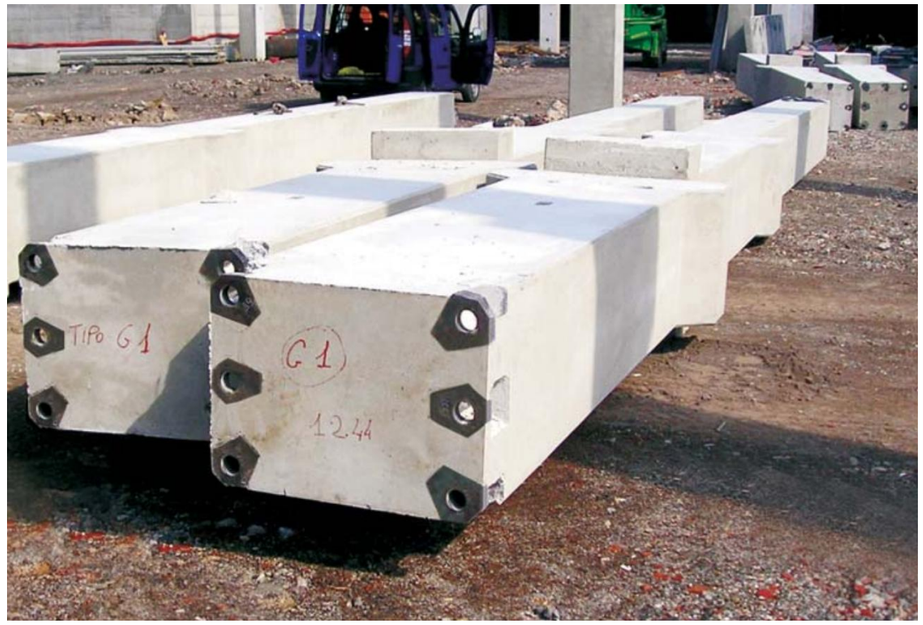


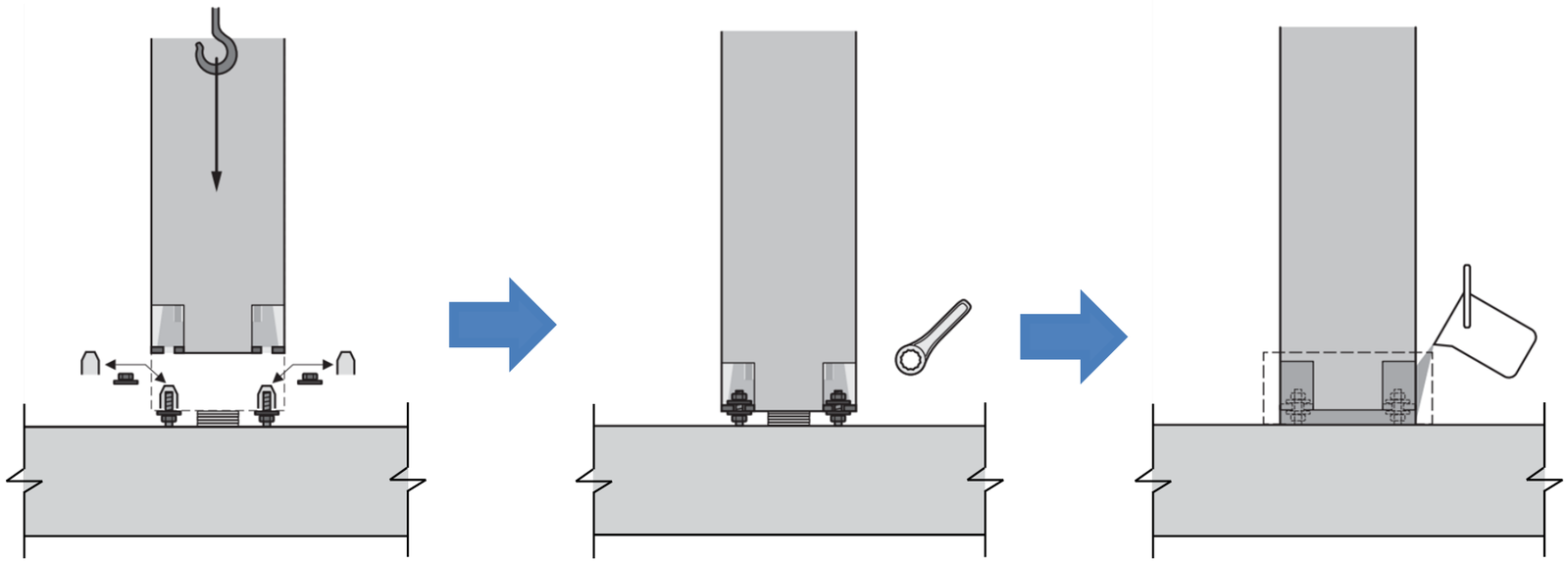
Constructability –Column Installation



HALFEN







Construction Health Concept



Green Construction

- Runoff, dust, noise control
- Zero waste
- Community friendly

Construction Quality

- Prefabrication
- Modularization
- Just-in-time-delivery

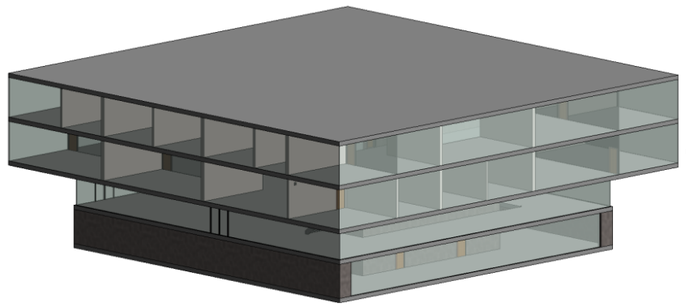
Construction Safety

- Design for safety
- Job hazard analysis

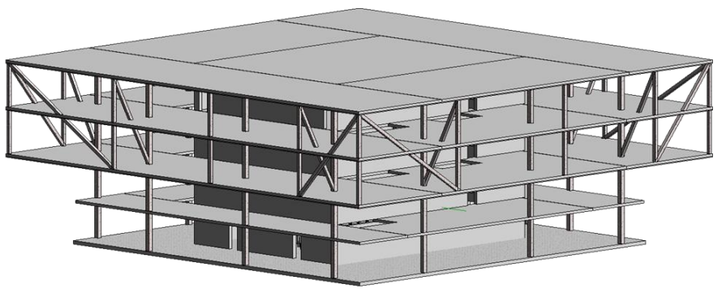
BIM Coordination

Modeling

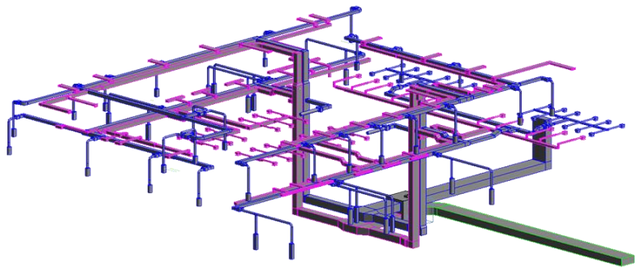
AUTODESK® REVIT® 2014



ARCH model



SE model



MEP model

Analysis

360 GLUE

3D ICC

Clash detection

AUTODESK NAVISWORKS

4D simulation

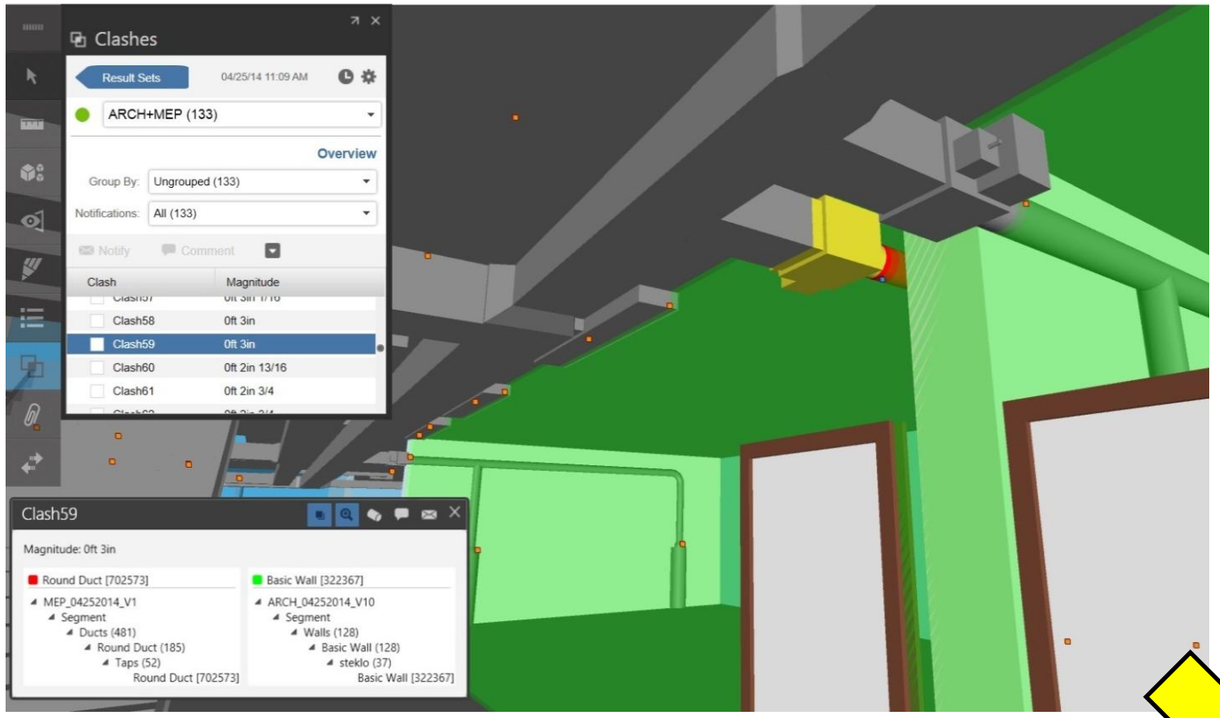
ETABS® 2013

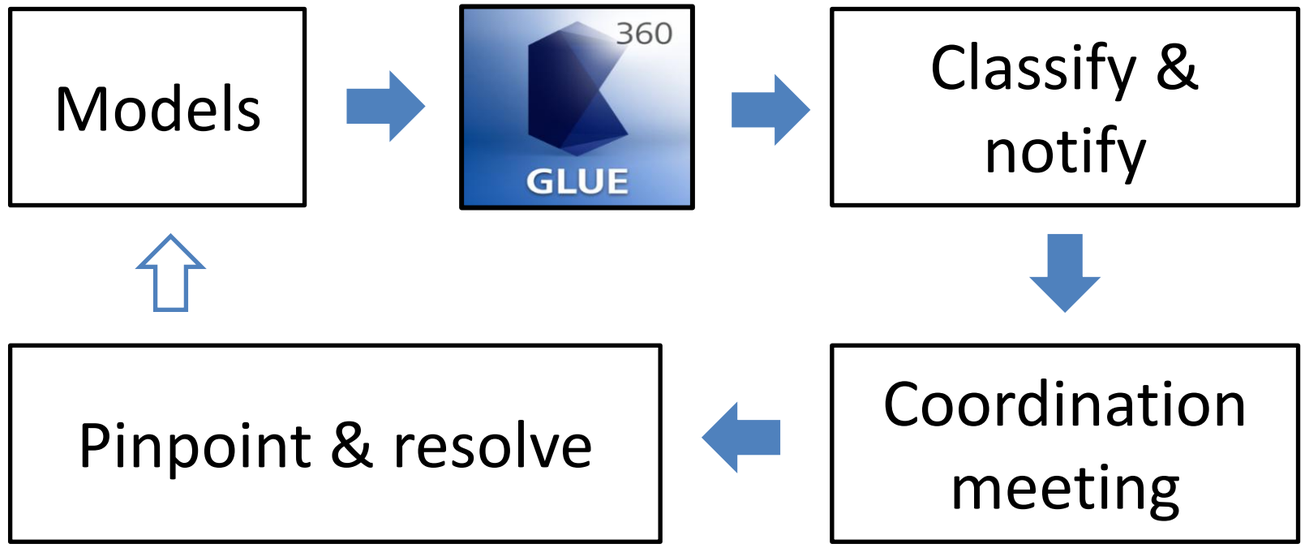
SE analysis

Autodesk Vasari

Energy simulation

Clash Detection & Coordination

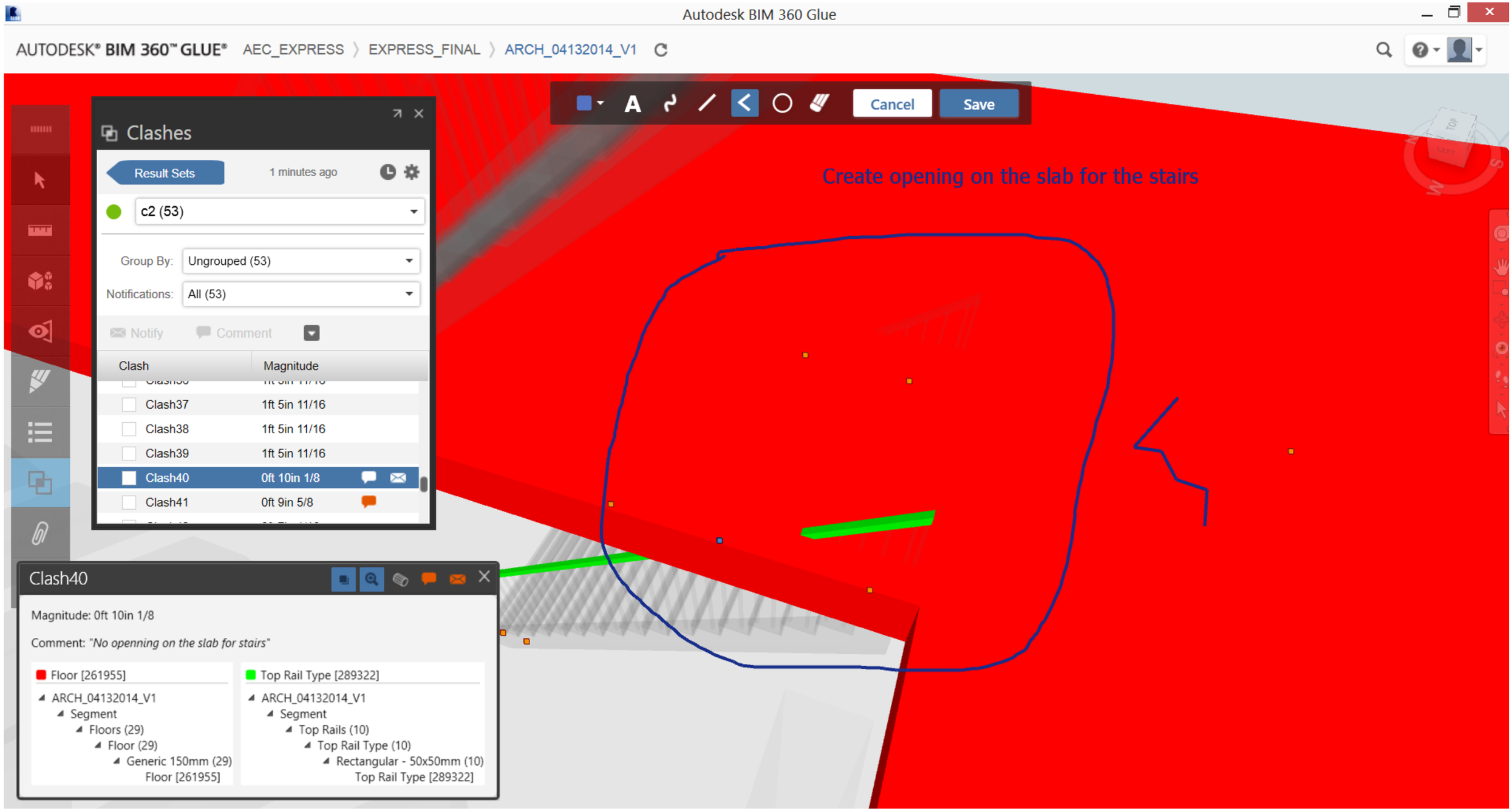




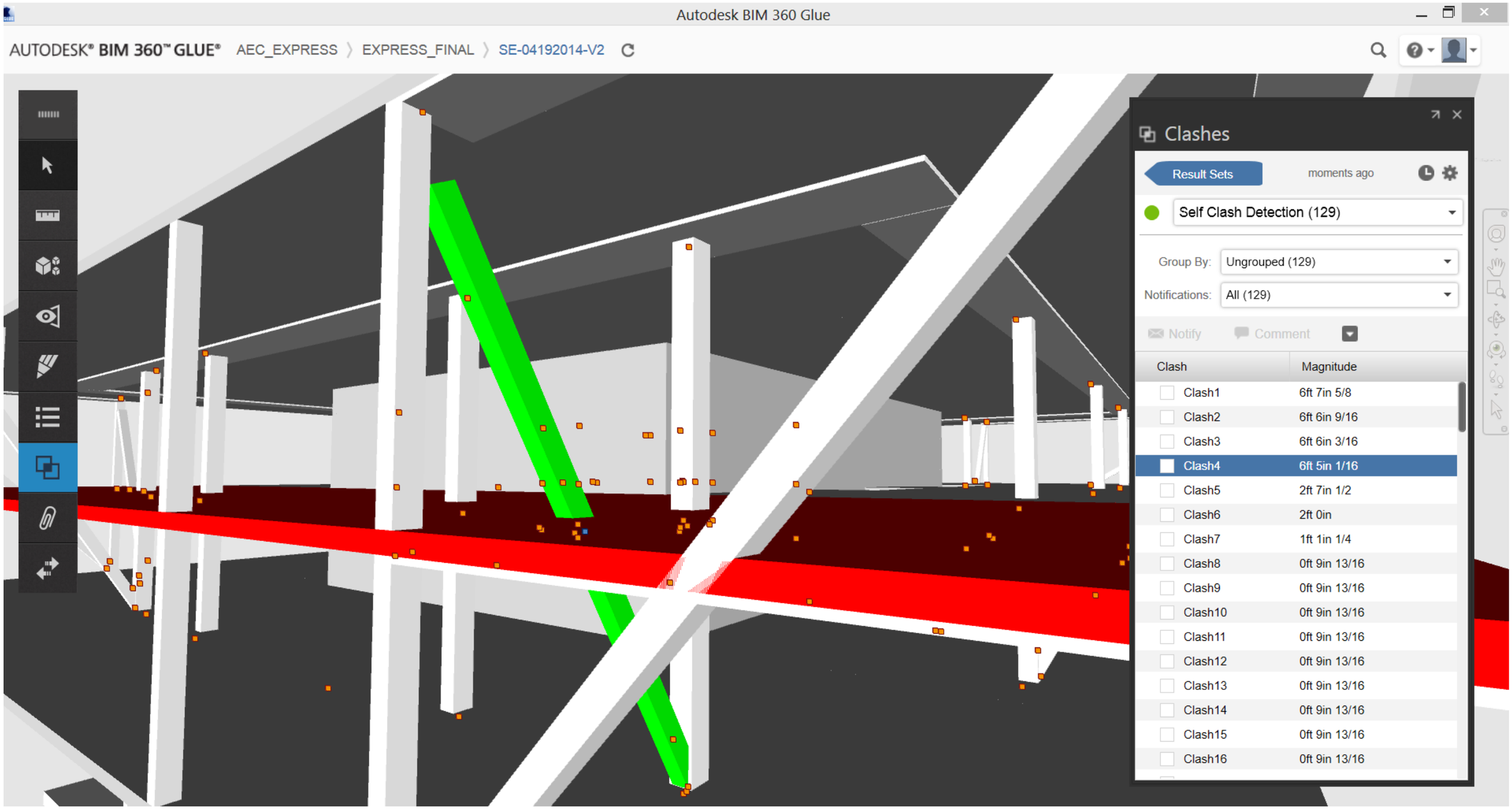
	Before	After
Arch/SE	1660	553
Arch/MEP	553	No major
SE/MEP	357	No major



Clash Detection



Clash Detection



Construction Health Concept



Green Construction

- Runoff, dust, noise control
- Zero waste
- Community friendly

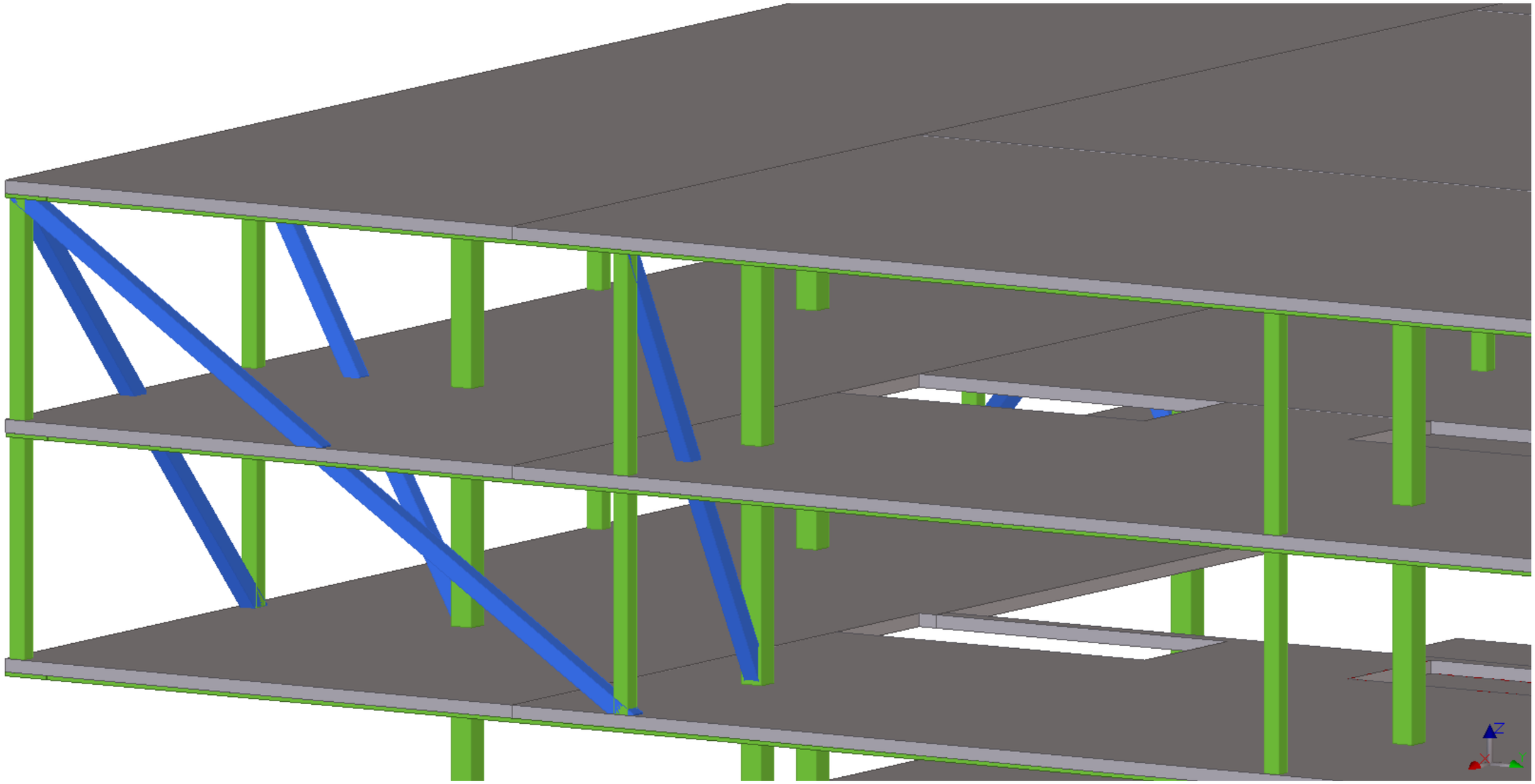
Construction Quality

- Prefabrication
- Modularization
- Just-in-time-delivery

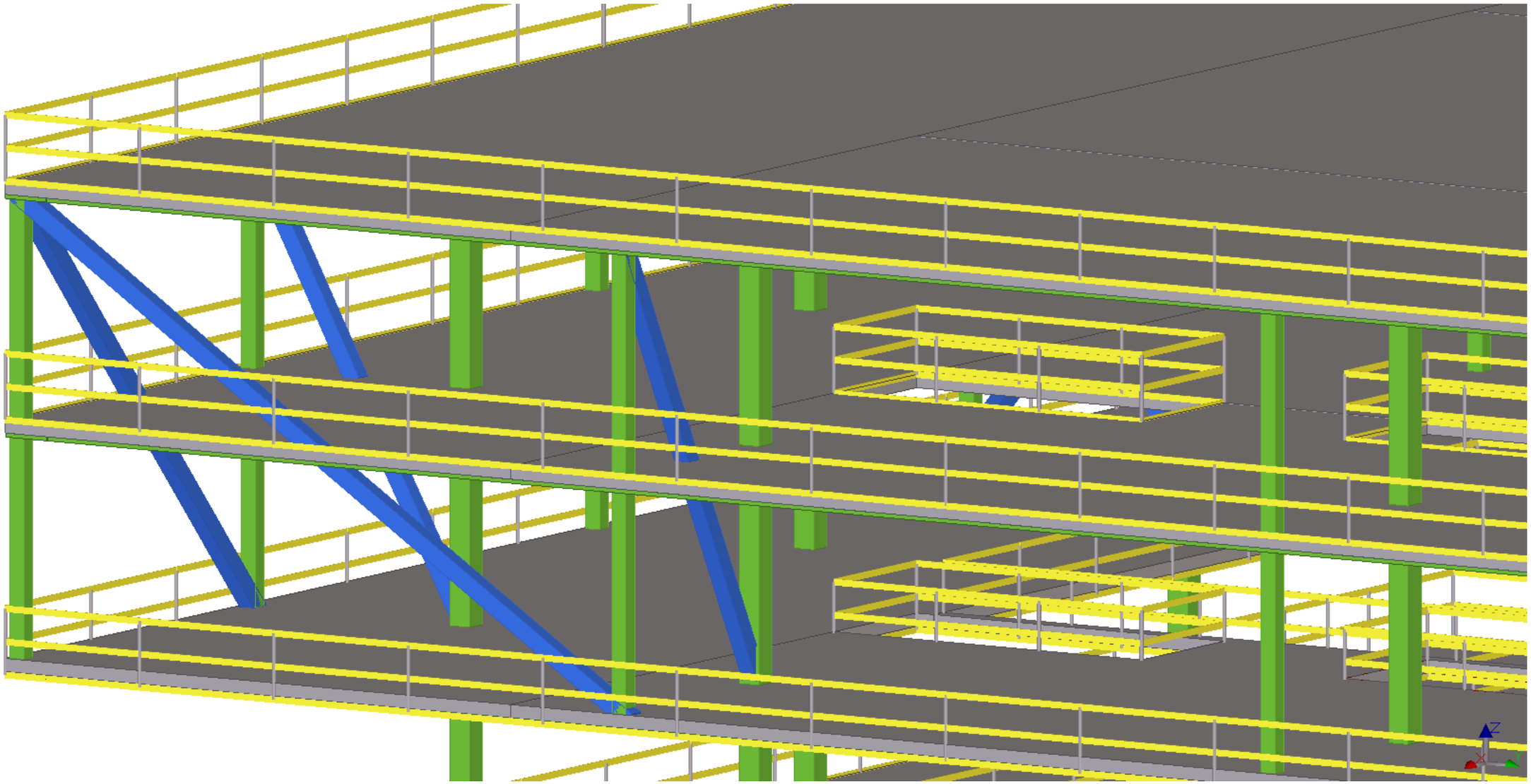
Construction Safety

- Design for safety
- Job hazard analysis

Construction Safety – Fall Protection

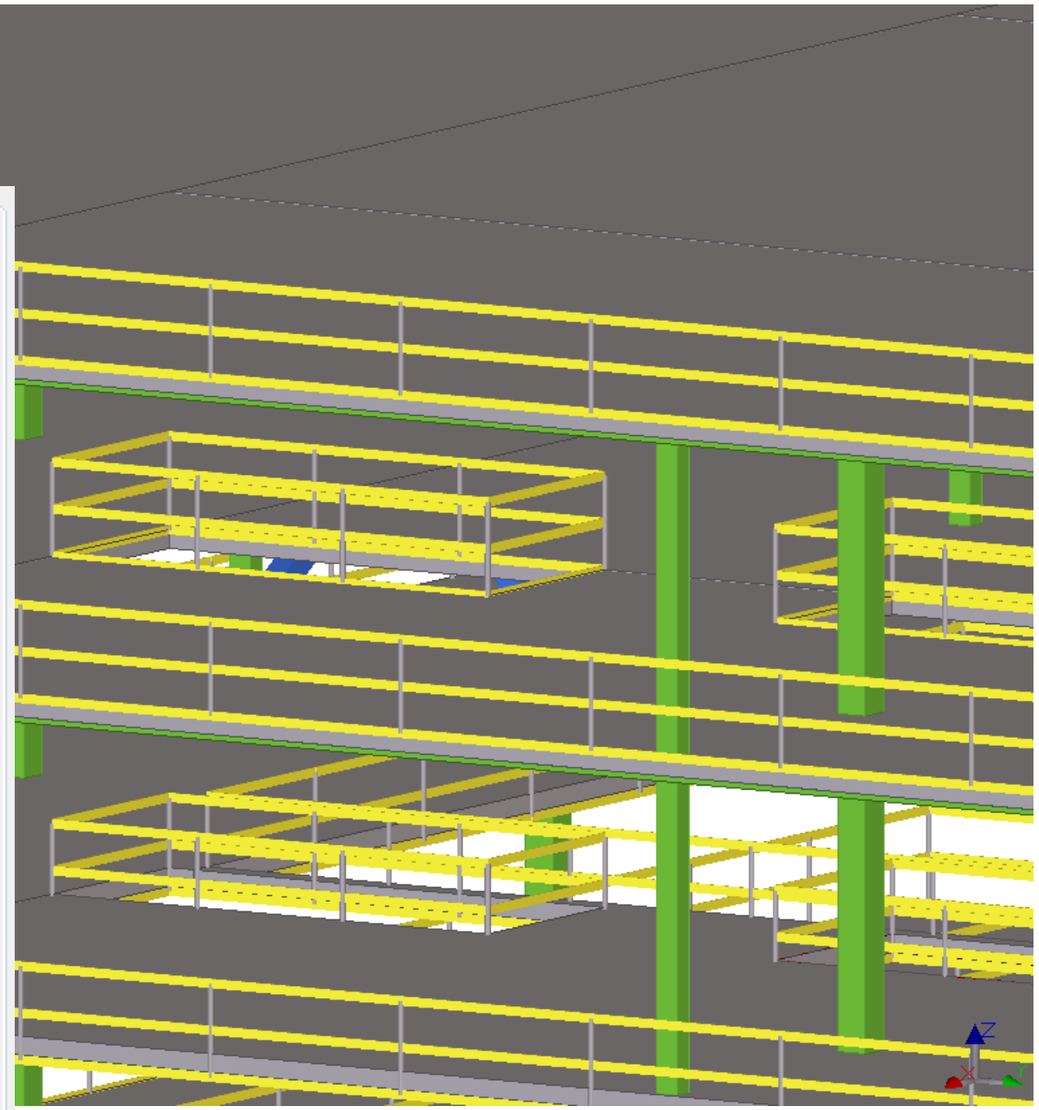


Construction Safety – Fall Protection



- Automatically identify edges and openings
- Apply safety equipment (guardrails, covers) on BIM model
- Safety equipment quantity takeoff

Construction Safety – Fall Protection



Report

ADVANCED BILL OF MATERIAL

PROJECT NAME: PROJ:NAME Date: 05/01/2014
JOB NUMBER: PROJ:# Time: 16:47:56

Page: 1

Qty	ABM Mark	Profile	Grade	Length	Weight(kg)
535		PIPE51STD	8.8	1000	0
6		PL20X100	A992	1290	20
6		PL20X100	A992	1300	20
15		PL20X100	A992	1430	22
36		PL20X100	A992	1820	29
12		PL20X100	A992	1910	30
45		PL20X100	A992	1920	30
36		PL20X100	A992	1930	30
12		PL20X100	A992	2070	33
42		PL20X100	A992	2120	33
48		PL20X100	A992	2130	33
60		PL20X100	A992	2210	35
27		PL20X100	A992	2220	35
42		PL20X100	A992	2250	35
30		PL20X100	A992	2270	36
24		PL20X100	A992	2280	36
24		PL20X100	A992	2300	36
78		PL20X100	A992	2350	37
78		PL20X100	A992	2360	37
156		PL20X100	A992	2370	37
576		PL20X100	A992	2380	37

Total weight for 1888 members: 48198

END OF REPORT

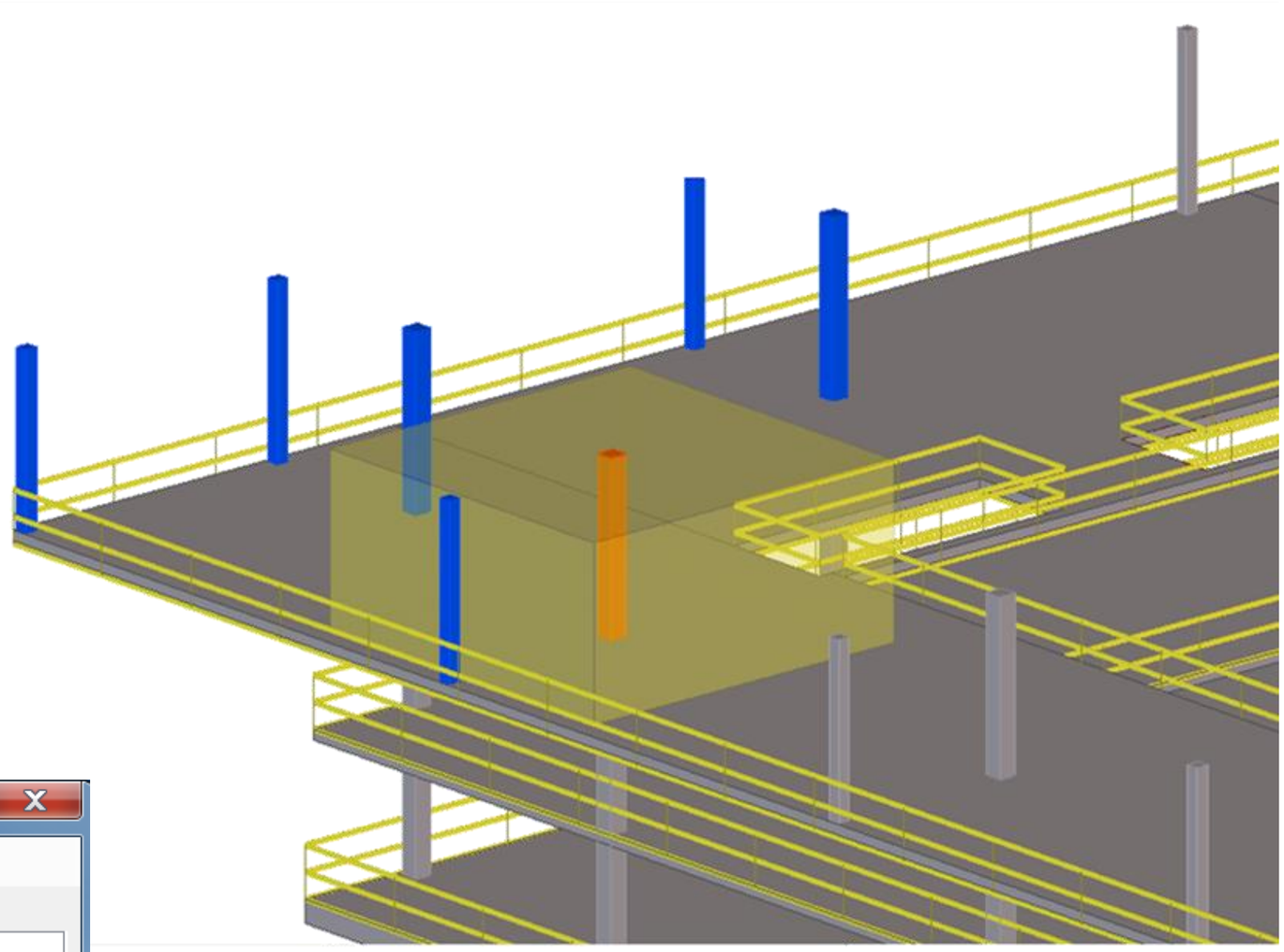
Construction Safety – Job Hazard Analysis

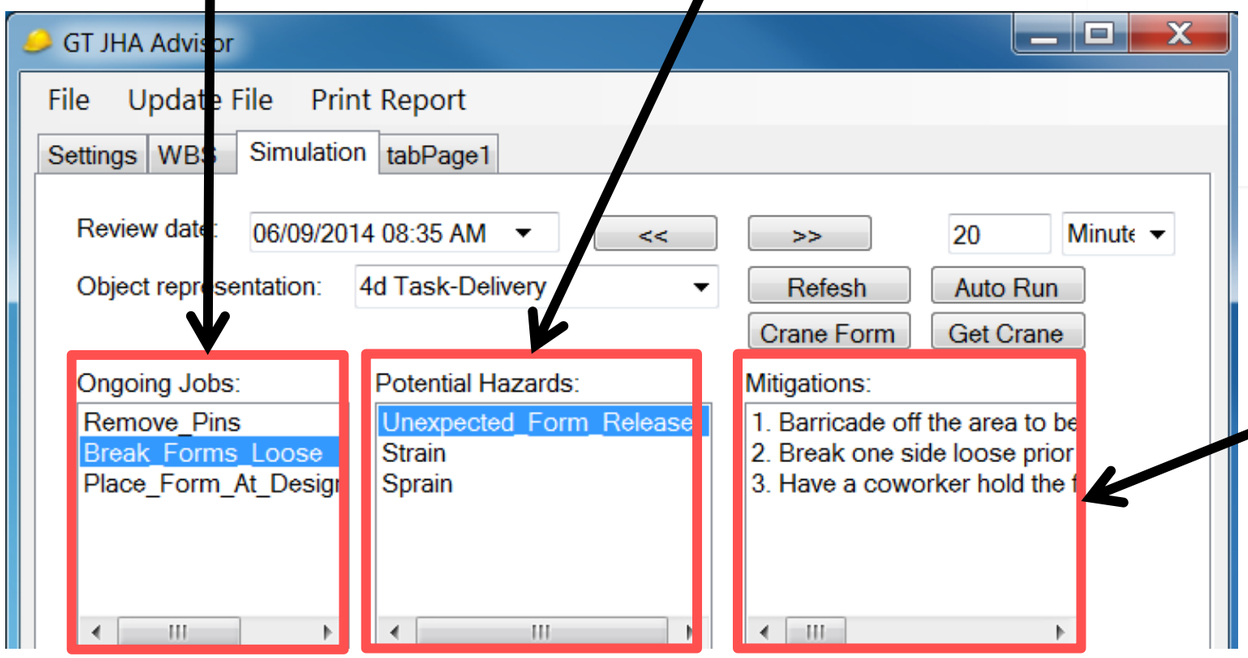
On-going jobs:

1. Remove pins
2. Break forms loose
3. Place form at design place

Potential hazards:

1. Unexpected form release
2. Strain
3. Sprain

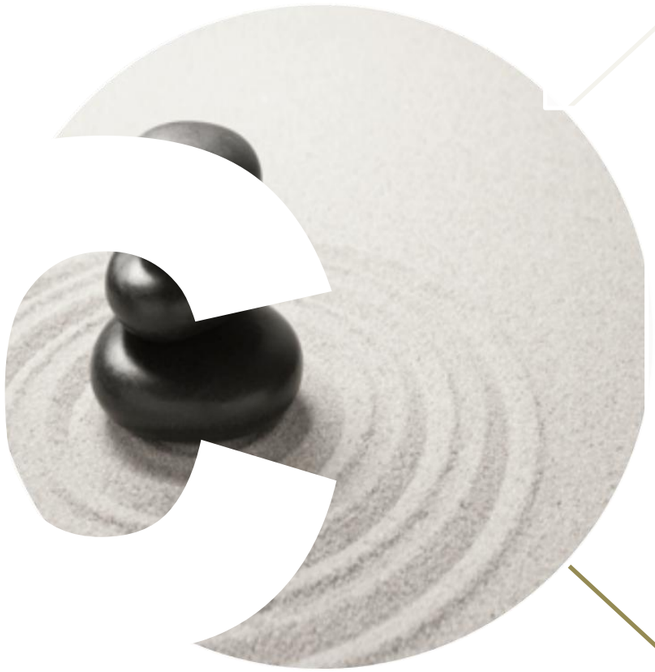




Hazard mitigation suggestions:

1. Barricade off the area to be stripped
2. Break one side loose prior to removing all pins
3. Have a coworker hold the form from falling

Construction Health Concept



Green Construction

- Runoff, dust, noise control
- Zero waste
- Community friendly

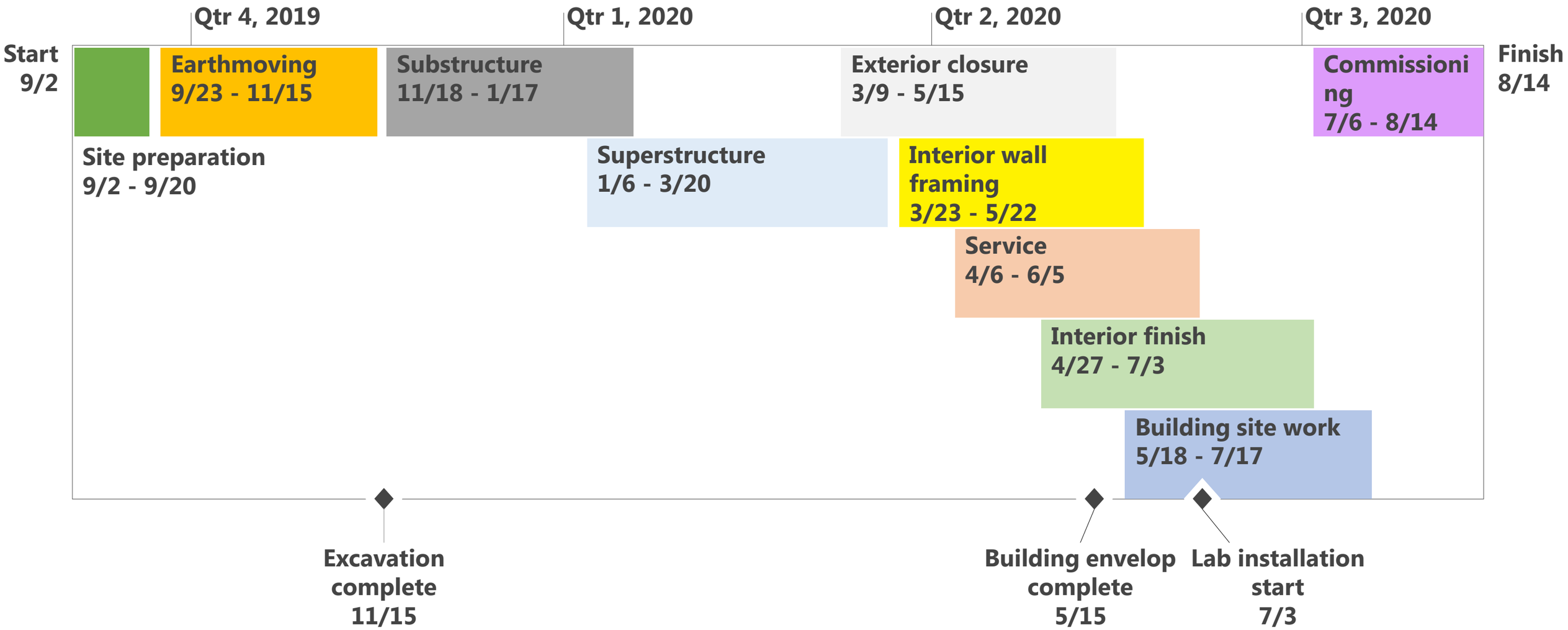
Construction Quality

- Prefabrication
- Modularization
- Just-in-time-delivery

Construction Safety

- Design for safety
- Job hazard analysis

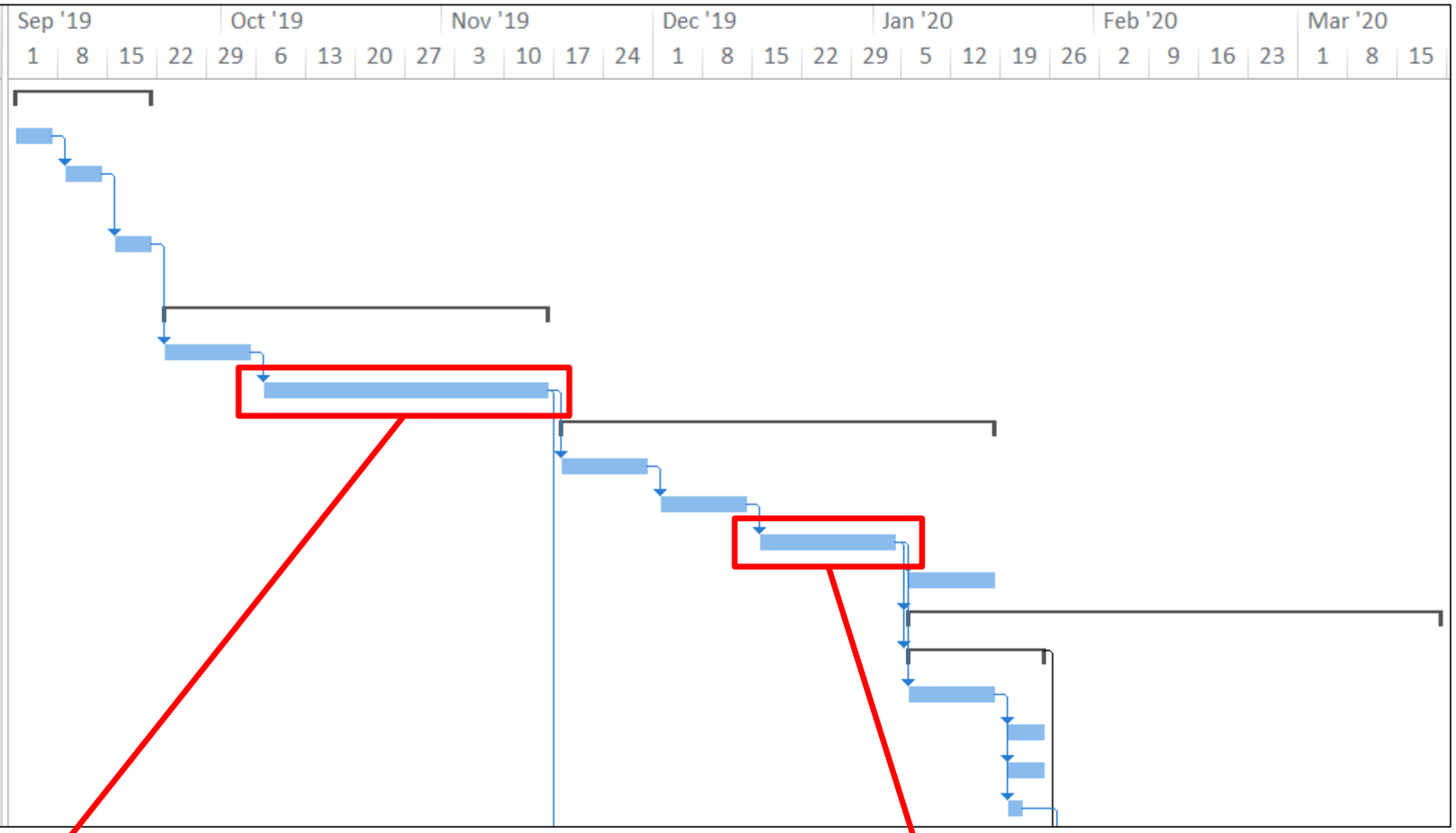
Timeline & Milestones

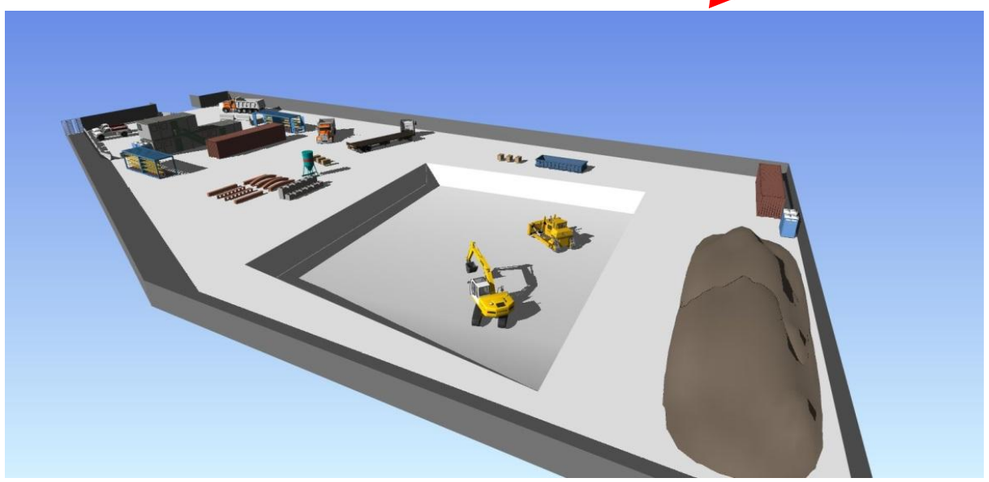


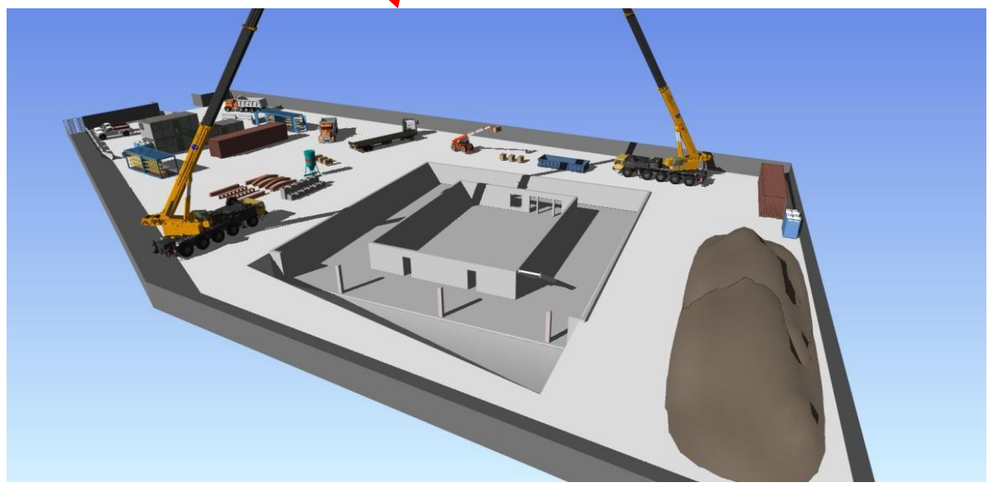
Construction Schedule

GANTT CHART

	Task Name	Durati
1	**Site preparation**	**15 days**
2	Transplant Trees	5 days
3	Install temporary & permanent utilities	5 days
4	Prepare site - lay down yard and temporary fencing	5 days
5	**Earthmoving**	**40 days**
6	Shoring and dewatering	10 days
7	Excavation	30 days
8	**Substructure**	**45 days**
9	Mat foundation	10 days
10	Retaining wall	10 days
11	Basement	15 days
12	Water proofing	10 days
13	**Superstructure**	**55 days**
14	**1st floor**	**15 days**
15	Cast-in-place slab	10 days
16	Pre-cast wall install.	5 days
17	Pre-cast column install.	5 days
18	Pre-cast stairs install.	2 days



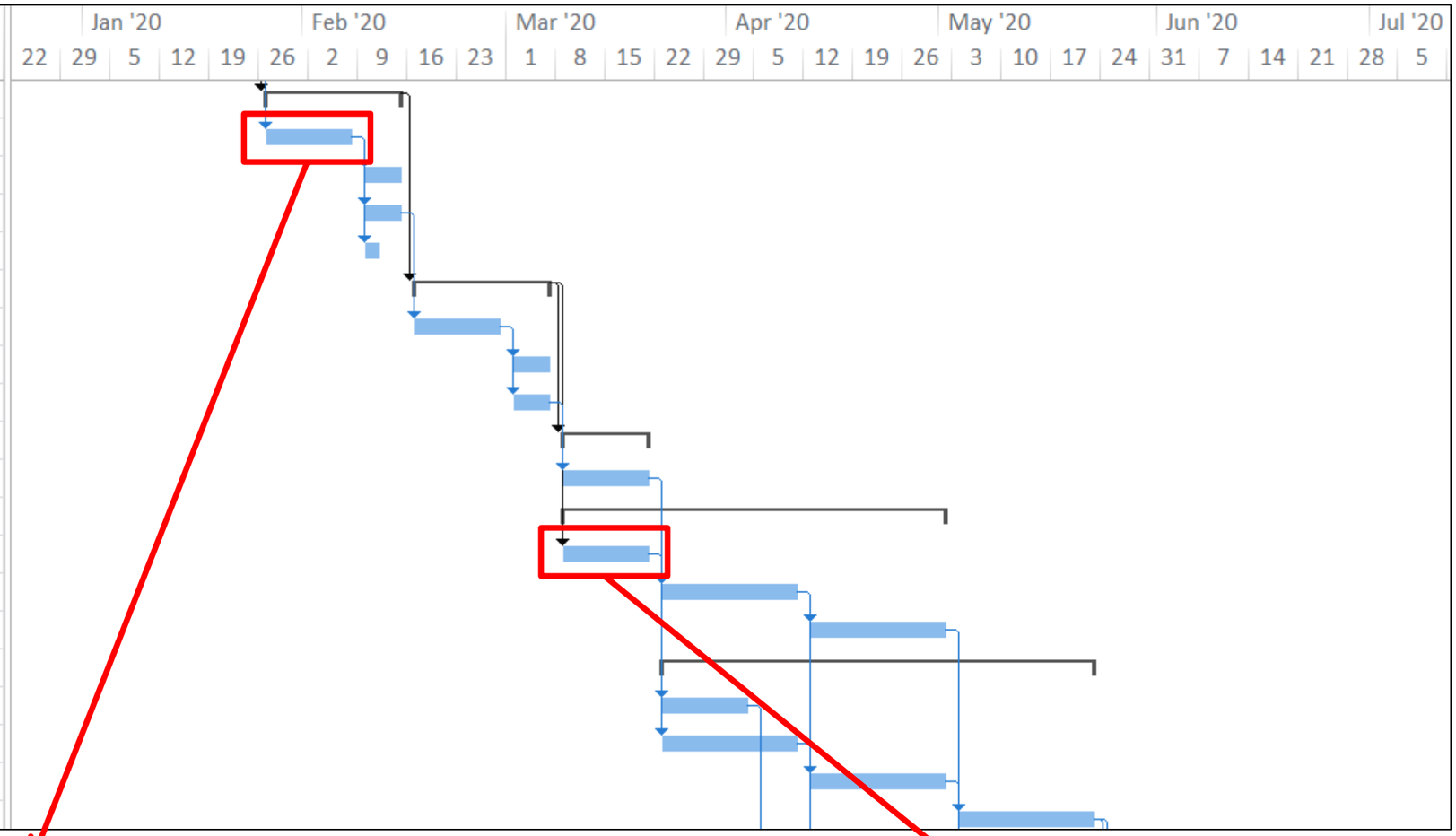


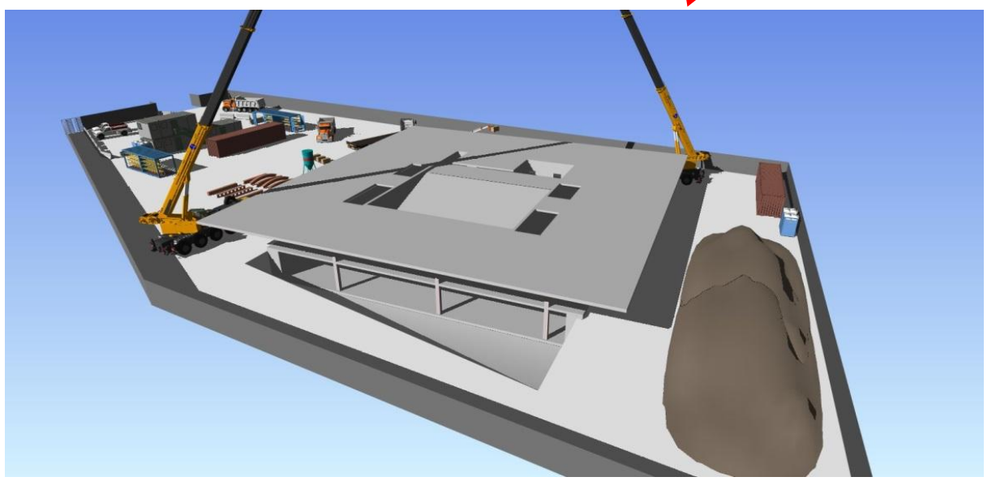


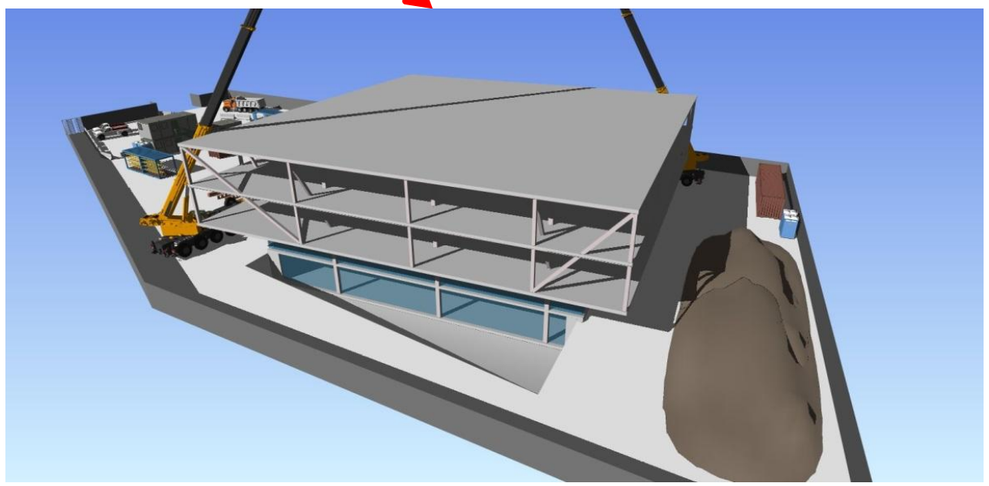
Construction Schedule

GANTT CHART

	Task Name	Durati
19	**2nd floor**	**15 days**
20	Cast-in-place slab	10 days
21	Pre-cast wall install.	5 days
22	Pre-cast column install.	5 days
23	Pre-cast stairs install.	2 days
24	**3rd floor**	**15 days**
25	Cast-in-place slab	10 days
26	Pre-cast wall install.	5 days
27	Pre-cast column install.	5 days
28	**Roof**	**10 days**
29	Cast-in-place slab	10 days
30	**Exterior closure**	**40 days**
31	1st floor	10 days
32	2nd floor	15 days
33	3rd floor	15 days
34	**Interior wall framing**	**45 days**
35	Basement	10 days
36	1st floor	15 days
37	2nd floor	15 days
38	3rd floor	15 days



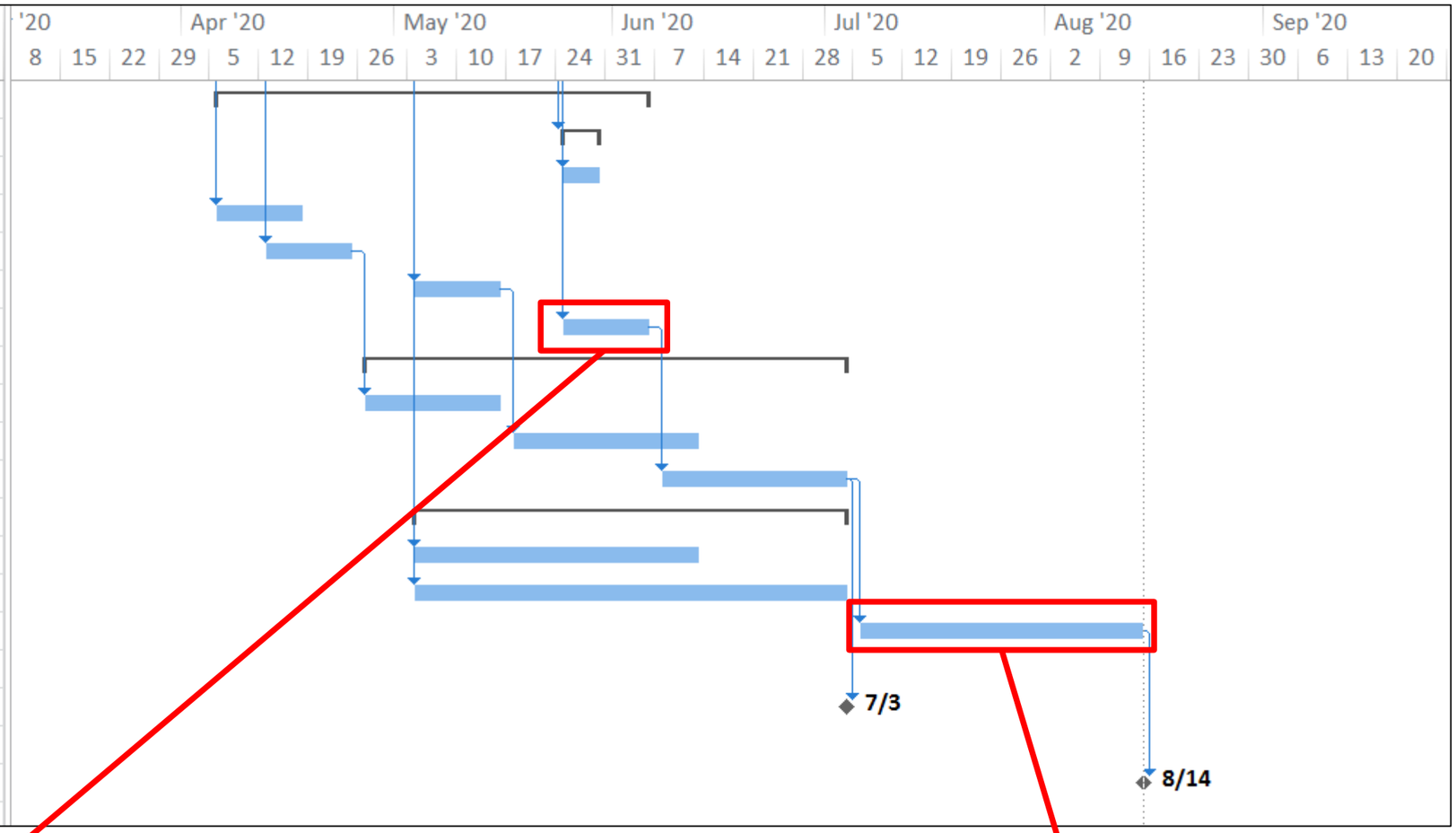


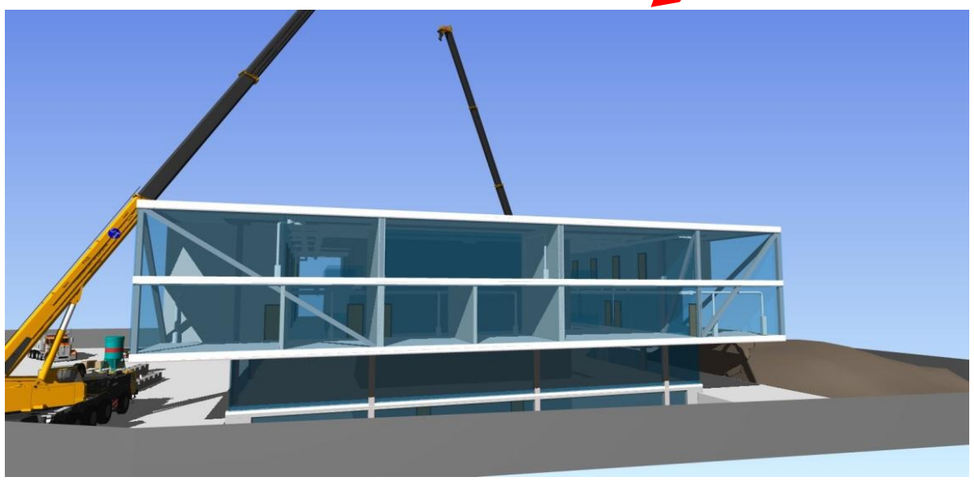


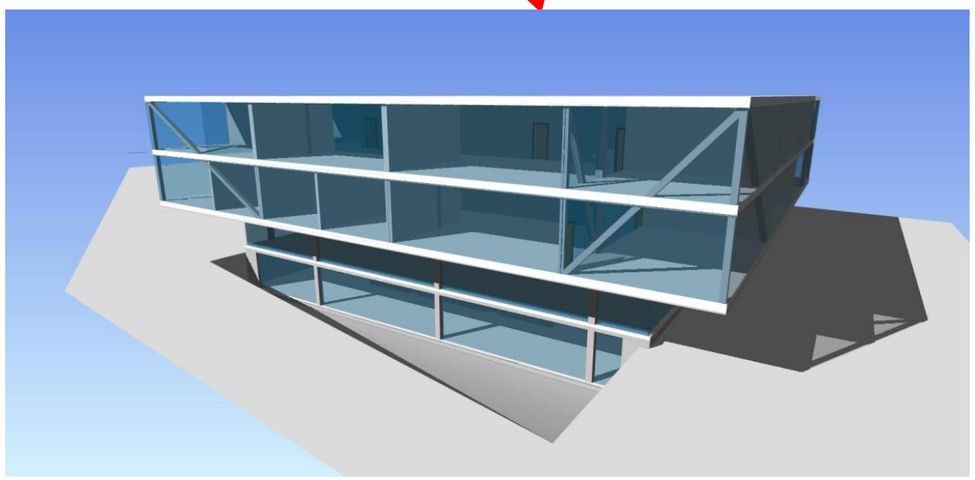
Construction Schedule

GANTT CHART

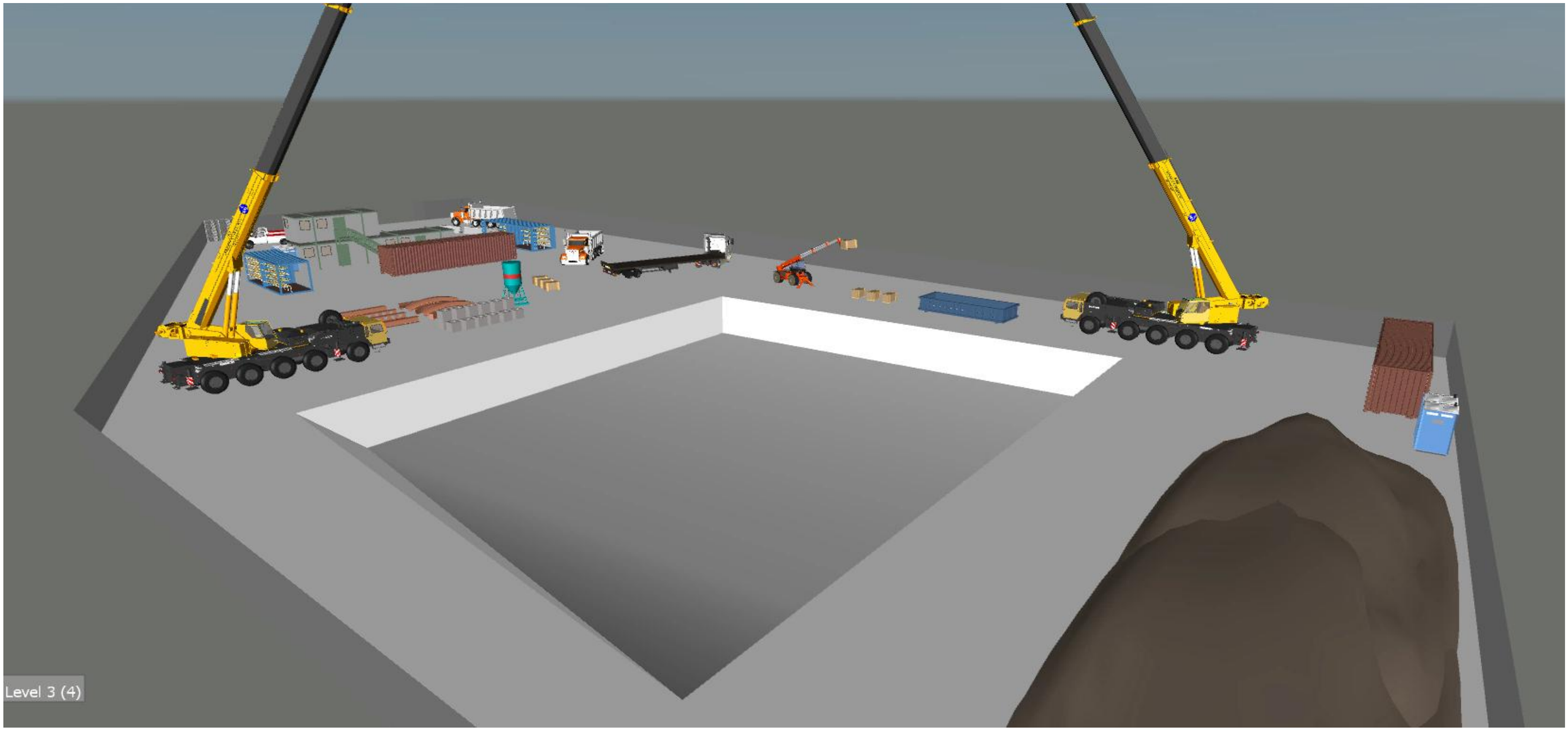
	Task Name	Durati
39	**Service**	**45 days**
40	**Conveying**	**5 days**
41	Elevator	5 days
42	MEP overhead basement	10 days
43	MEP overhead 1st floor	10 days
44	MEP overhead 2nd floor	10 days
45	MEP overhead 3rd floor	10 days
46	**Interior finish**	**50 days**
47	1st floor	15 days
48	2nd floor	20 days
49	3rd floor	20 days
50	**Buidling sitework**	**45 days**
51	Plaza construction	30 days
52	Landscaping	45 days
53	Commissioning	30 days
54	Excavation complete	0 days
55	Lab installation start	0 days
56	Building envelop complete	0 days
57	Building complete	0 days



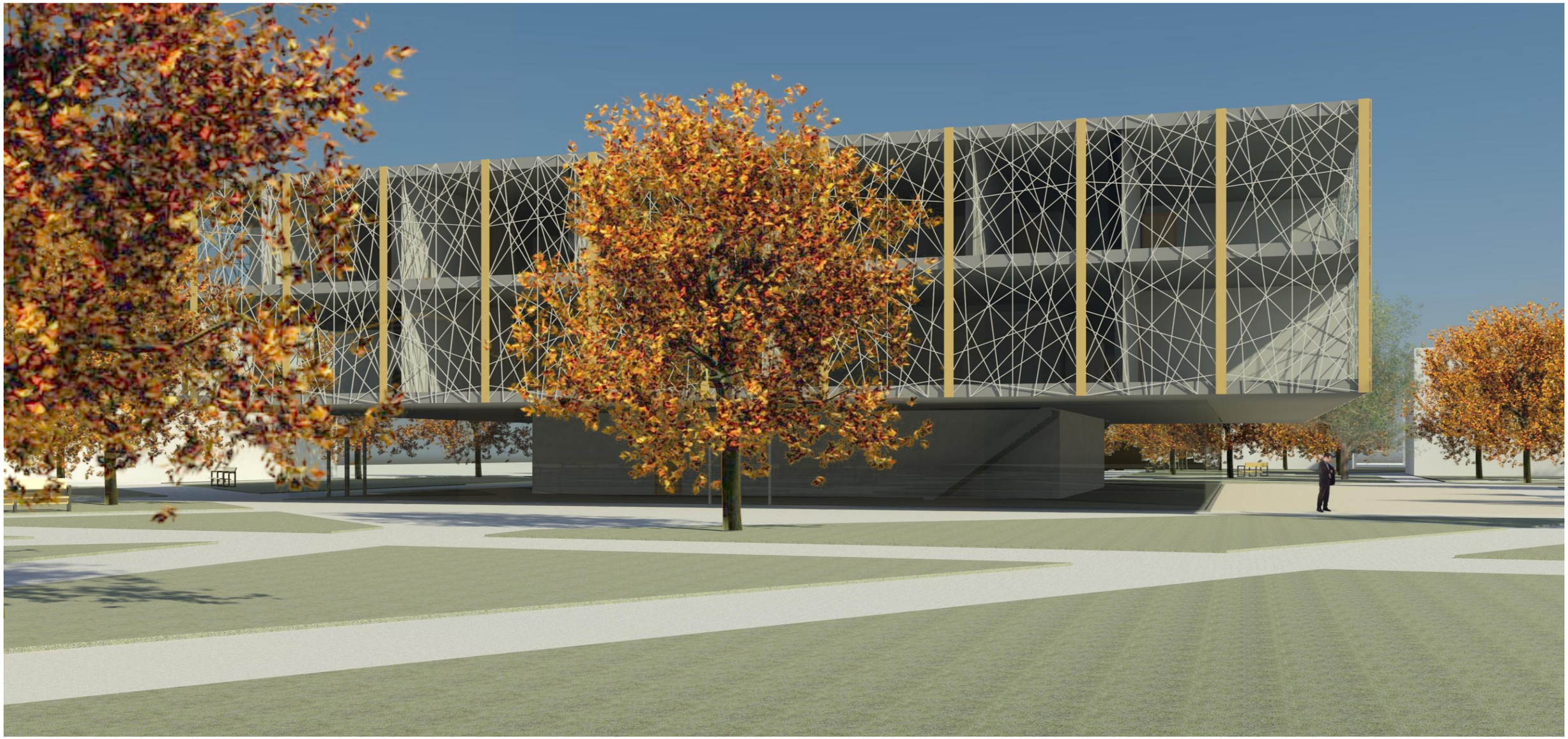




4D Simulation



View



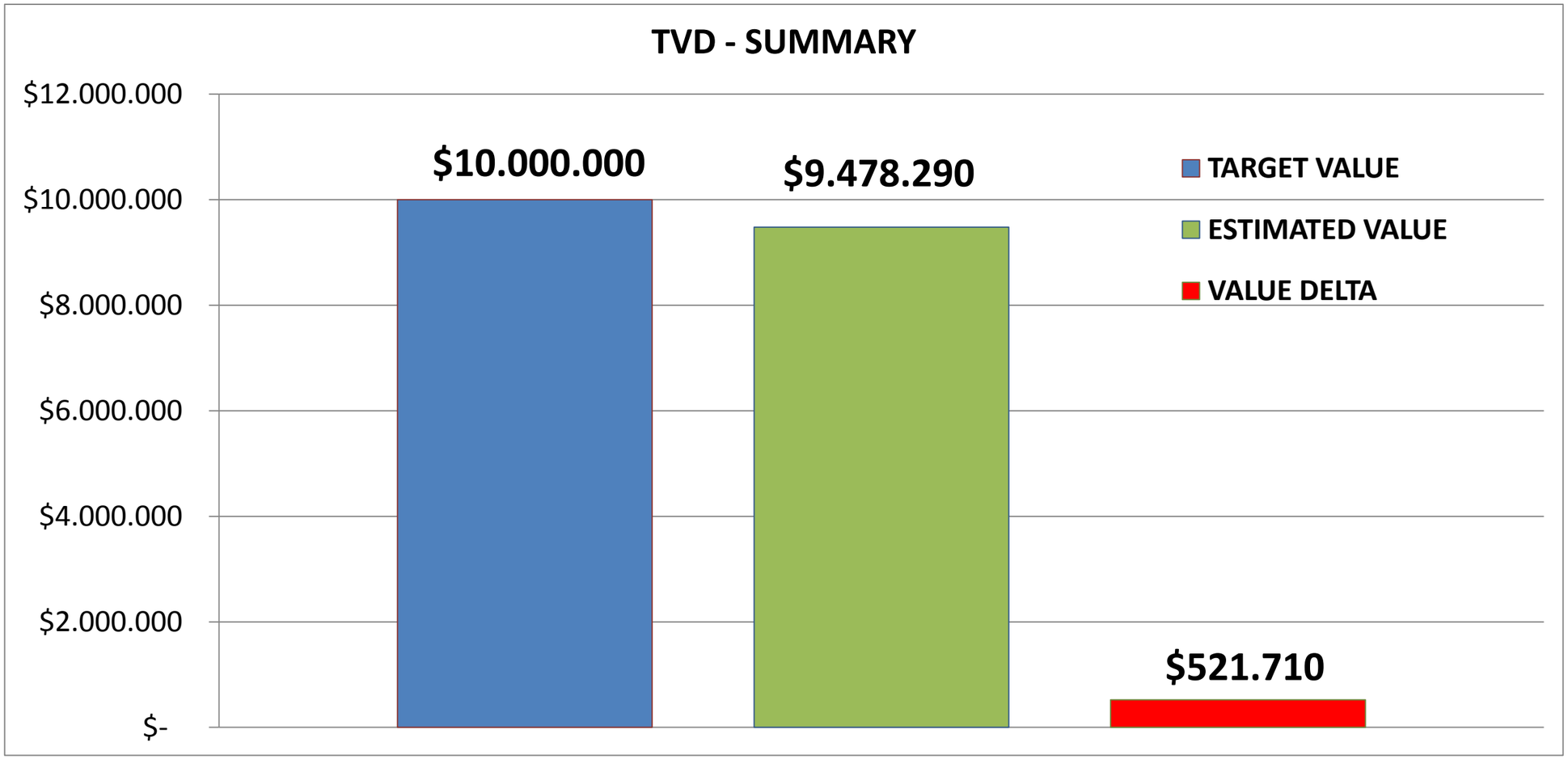
TVD – Budget & Target

Budget: $ 10,500,000

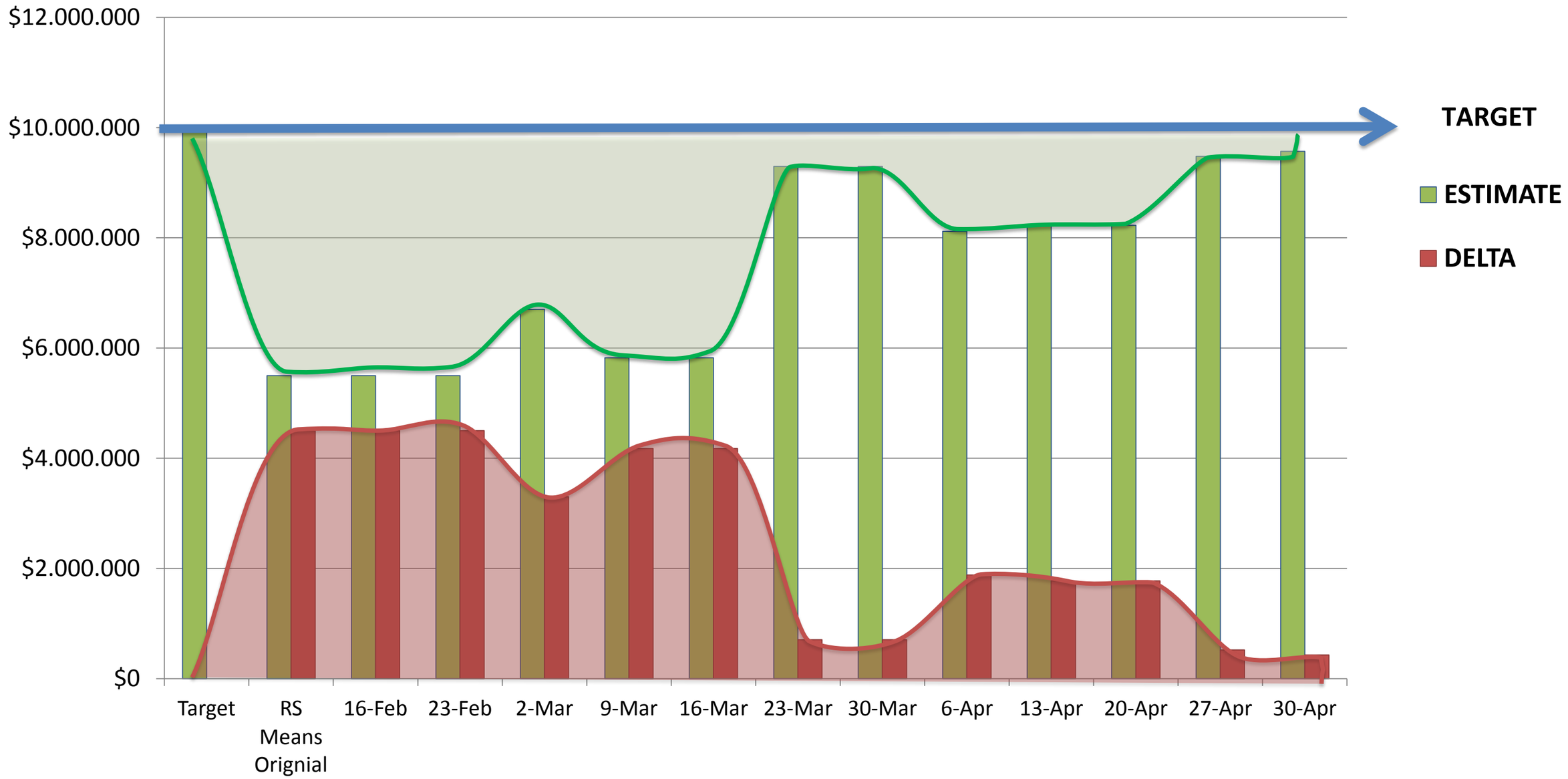
Expected inflation: 2% (Slovenia)

Expected investment return: 1.44% (US Treasury Notes)

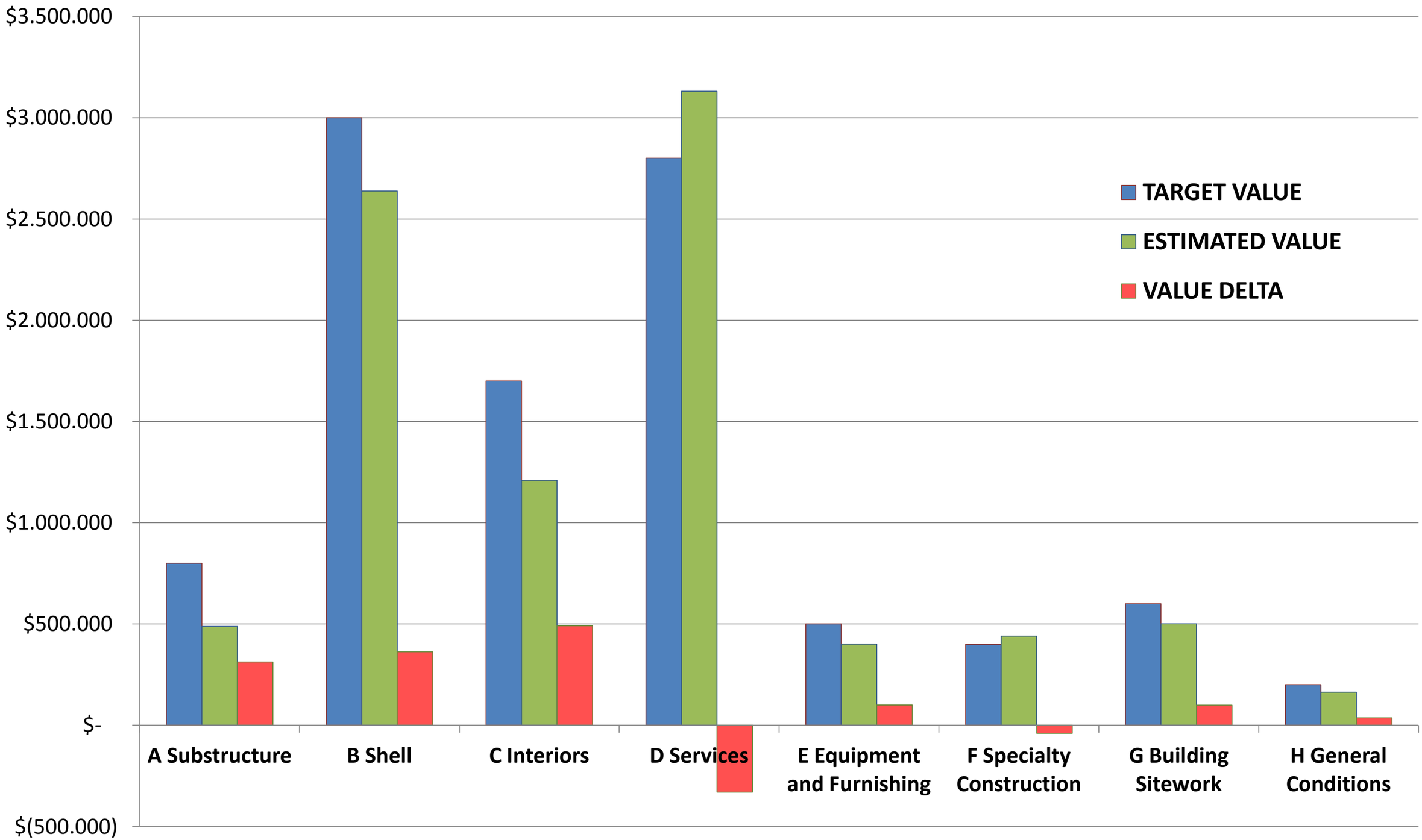
Actual budget in 2019: $10,209,274



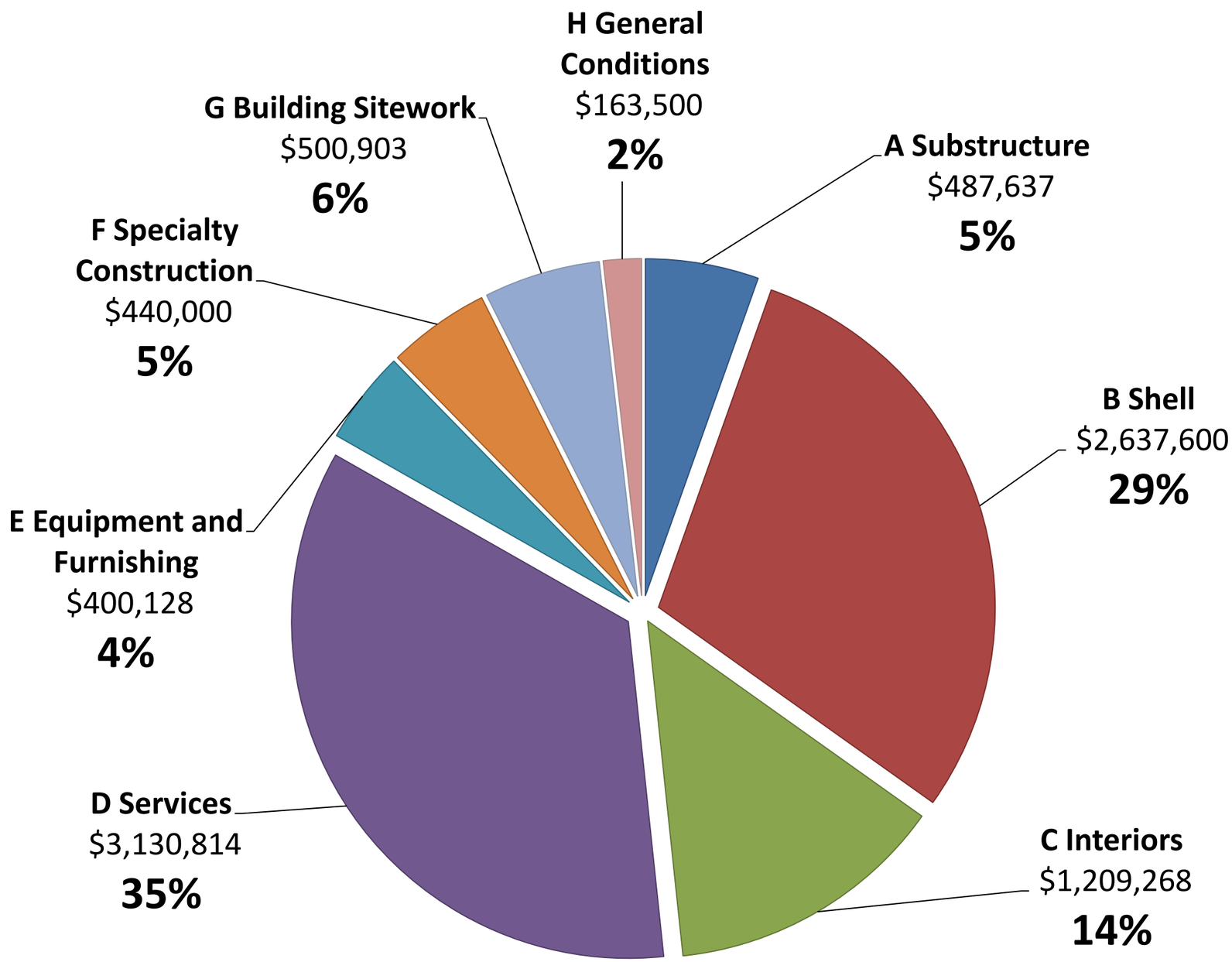
TVD – Tracking Target Over Time



TVD – Target by Cluster



TVD – Estimate Summary



Construction Health Concept



Green Construction

- Runoff, dust, noise control
- Zero waste
- Community friendly

Construction Quality

- Prefabrication
- Modularization
- Just-in-time-delivery

Construction Safety

- Design for safety
- Job hazard analysis

ARCHITECTURE





STRUCTURAL



HEALTH NETWORK

CONSTRUCTION MANAGEMENT





MECHANICAL

A SE MEP CM

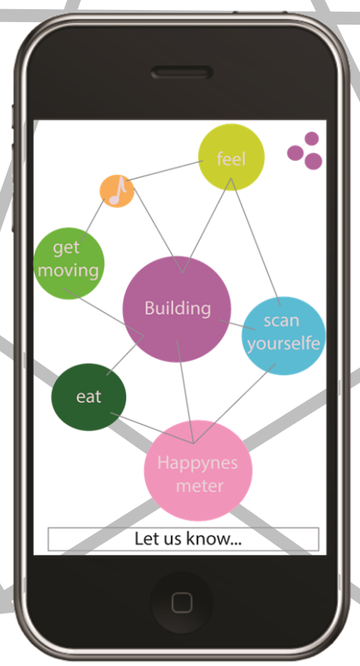
ARCHITECTURE

STRUCTURAL

HEALTH
NETWORK

Hygeia APP

Hygeia - greek - word Health



CONSTRUCTION
MANAGEMENT

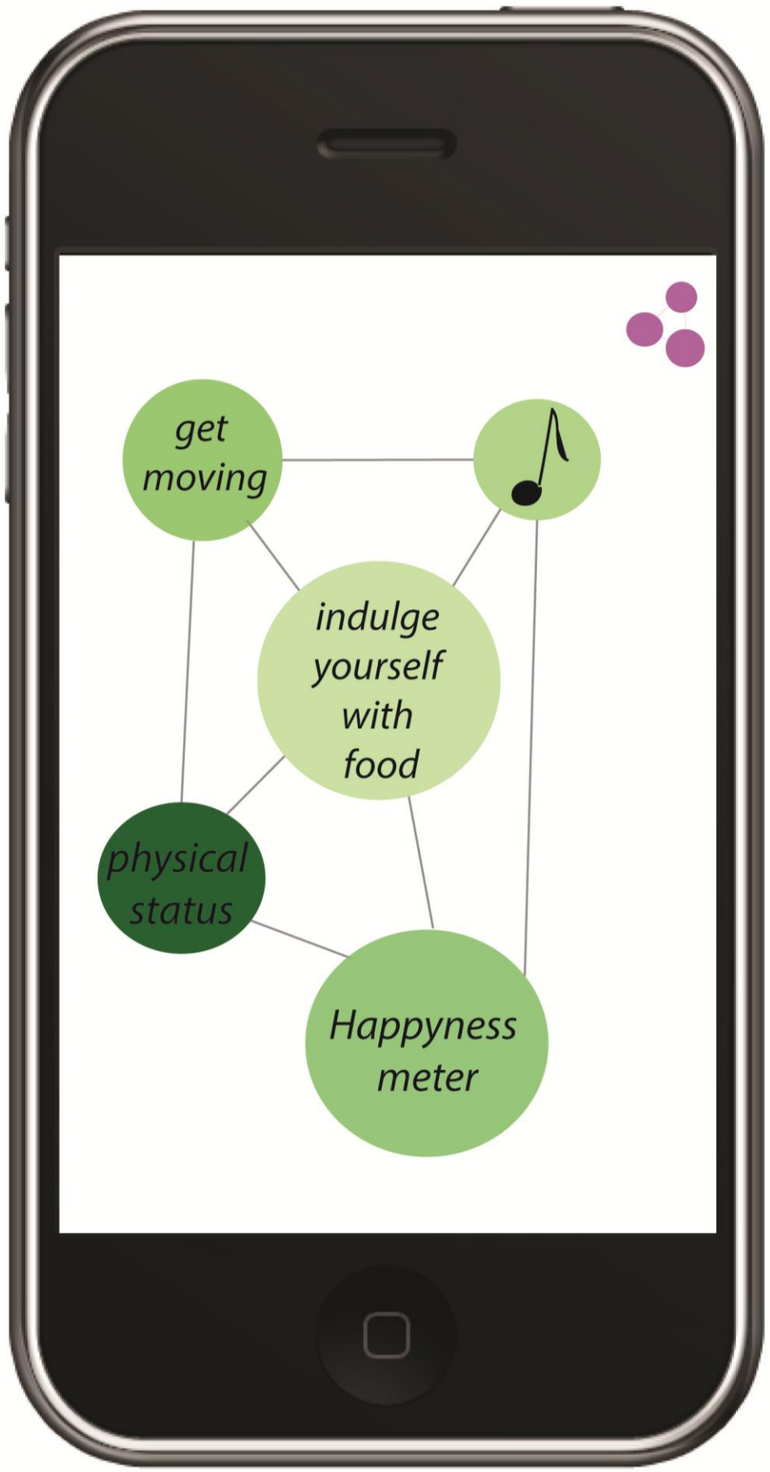
MECHANICAL

HYGEIA

Urban design	Architecture building	Interior	Furniture
network bike route walkability herb garden meditative garden harvesting garden wather harvesting energy stations	materials visual comunication/section air building water RIVER is the heart of building	flooring wall finishing sound colour	ergonomic furniture fabrics/ texture relaxing

HYGEIA

health



- indulge yourselfe - *Make your own breakfast!*

- get moving - *Meditate in our garden!*

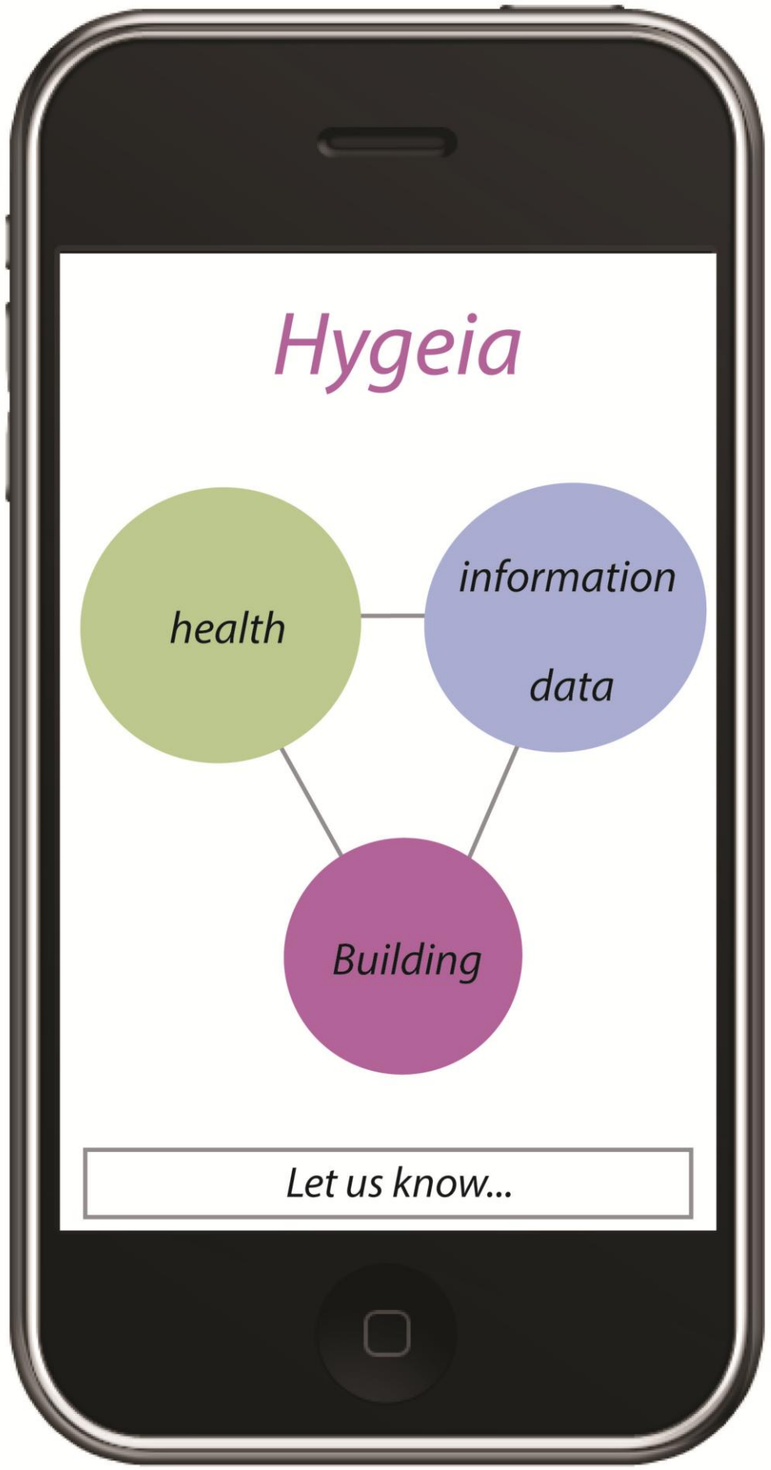
- physical status - *How does your body feels?*

- happyness meter - *Balance your life!*

HYGEIA

Hygeia APP

Hygeia - greek - word Health



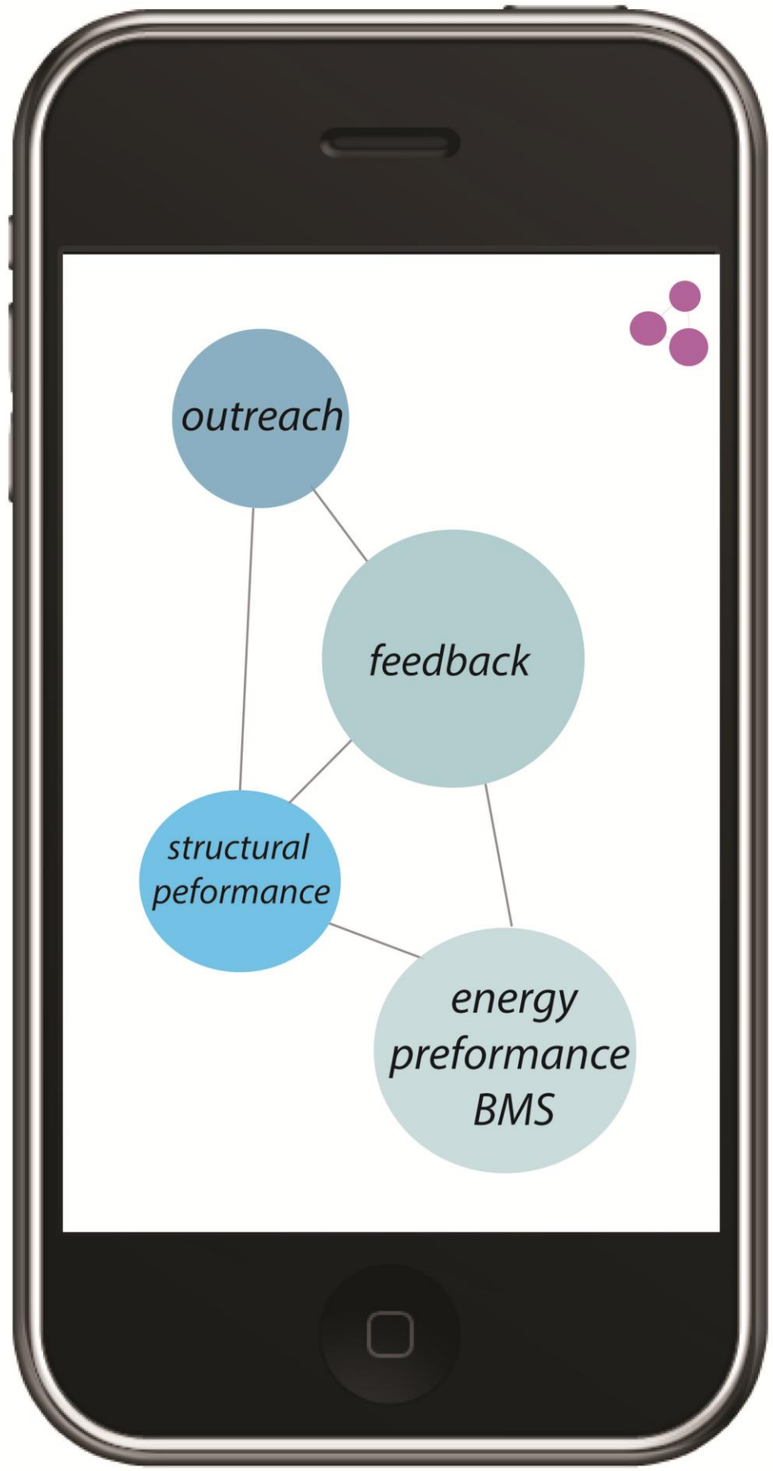
HYGEIA

- outreach - *Our building is going anywhere*

- feedback - *Give us your feedback! How do you feel?*

- structural preformance - *Interact with the building!*

- energy preformance - *Are you hot?*



Building Quality

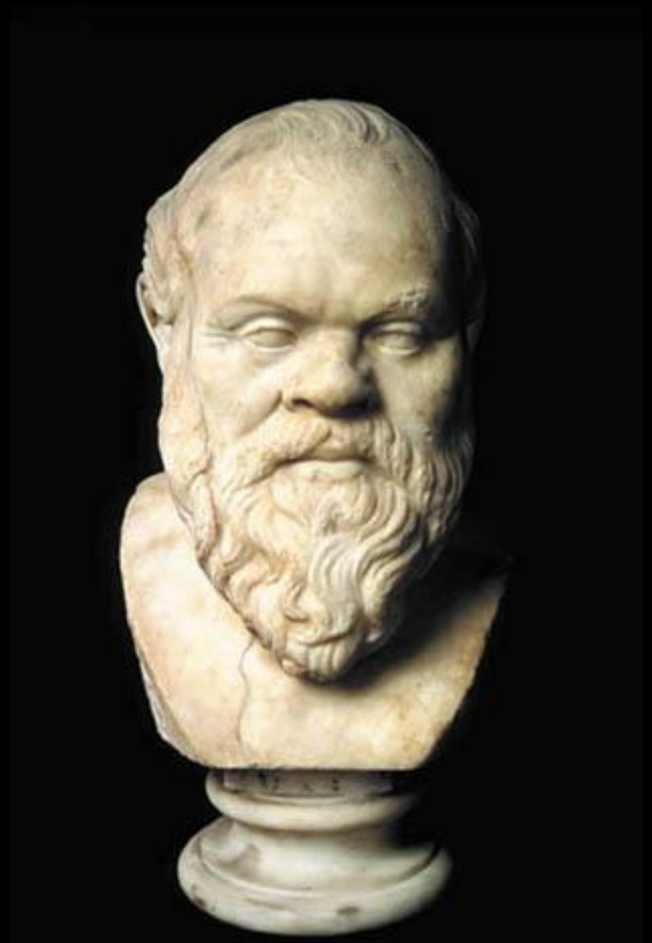
Building Health Facts

Serving Size 400 people	
Amount Per Serving	
1 Building	
	% Daily Value
Total Material	
Structural	
Recycled Content	23%
Structural Health Monitor	100%
MEP	
Indoor Air Quality	86%
Personal Ventilation	20%
Daylight Penetration	49%
Miscellaneous	
Social Connectivity	62%
Energy Efficiency	73%
Average Happiness	87%

LEED Gold
Total 64 points

Area	Points
Location and transportation	14
Sustainable sites	9
Water Efficiency	7
Energy and Atmosphere	12
Materials and resources	2
Indoor environmental quality	15
Innovation	5



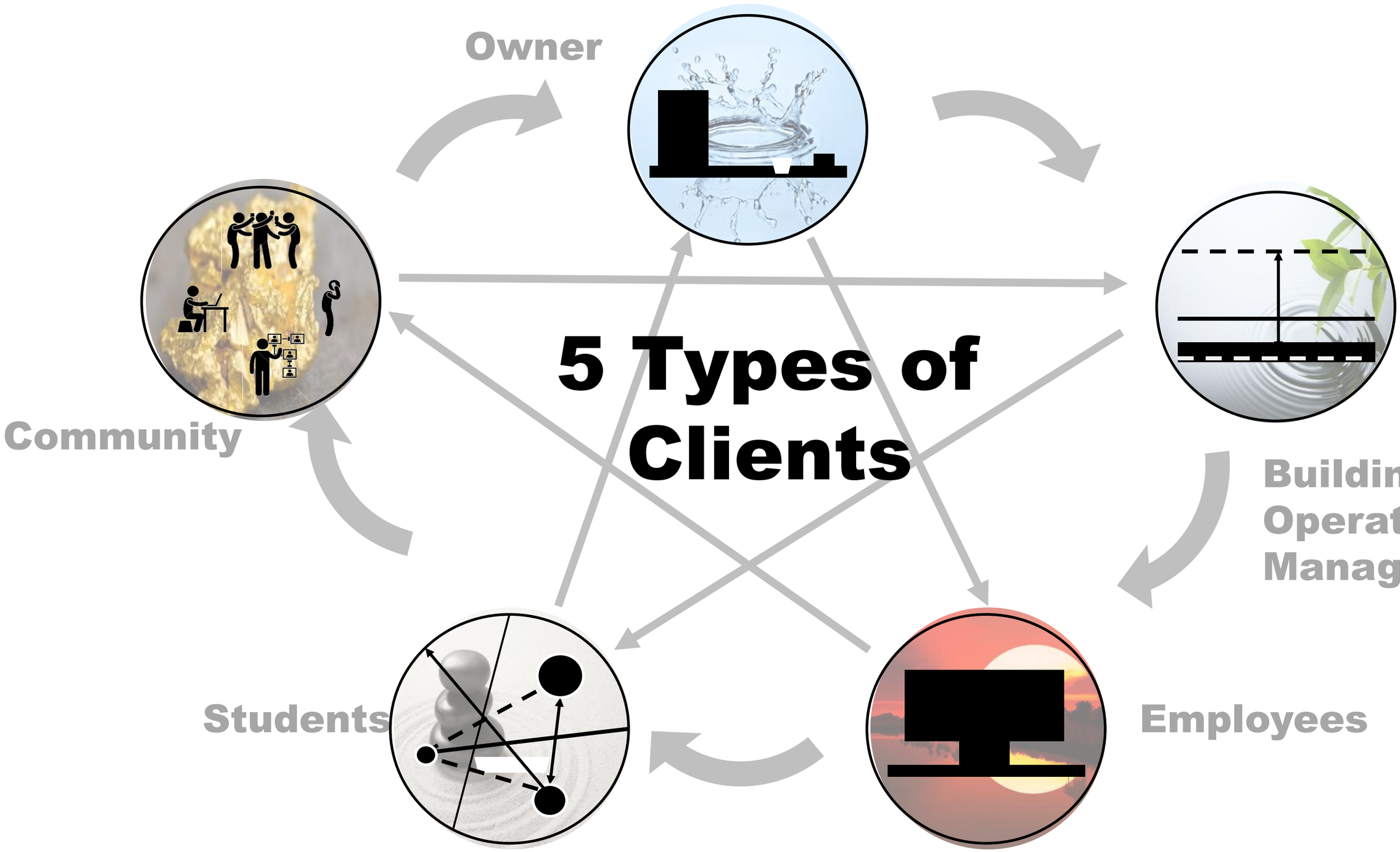


Sophrosyne
σωφροσύνη

The quest for value is more than just the attainment of wealth or material goods; there are other more valuable virtue of one's possessions.

- Socrates

Total Value for Client



Total Value for Client

PROFIT

•10-30% Energy Savings from Building Management System

•Cost savings from increased construction safety

HEALTH REPUTATION

•Brand Value of Faculty

•# of Social Network shares

•Health social cultural

HEALTH KNOWLEDGE

•Linked Social Networks

•Structural Health Update

•Real-time healthy suggestions

Team Process – Coordination

Meeting agenda

Team Express Meeting Agenda

Date: Feb. 2, 2014
1:00 pm - 3:00 pm PST
GoToMeeting ID:674-389-413

Facilitator: SS
Recorder: AB

#	Agenda Item	Duration	Actual Duration	Leader
1	Greeting and check in	5 min	5	SS
2	Summary from last week	10 min	8	-
3	Floor Sandwich	10 min	20	CC
4	Foundation Options	10min	10	MB

#	Sub-group Meetings	Date	Time (PST)
1	SE	04.02.2014	01:00 pm PST
2	A, SE	04.02.2014	10:30 pm PST
3	SE, MEP	05.02.2014	9:00 am PST

Task list

ID #	Activity	Deliverable	By Whom	For Whom	INITIAL Etimated Finish Time	Actual Finish Time	Reason for Delay	Completed
1	Floor plan V1.0	Architectural model	ARCH/MEP	ENG/CM	10:30 am PST, 1/28/2014	12:00 am PST, 1/28/2014		Yes
2	Floor height for the first floor	Data/drawings	ARCH/MEP	MB	10:30 am PST, 1/28/2014	8:00 am PST, 1/29/2014	Changes	Yes
3	Orientation	Architectural model	MEP	ARCH	11:00 am CET, 2/03/2014	11:00 am CET, 2/02/2014		Yes
4	Floor plans	Architectural model	ARCH	STRUCTURE/MEP	1:30 pm, PST, 2/04/2014	11:40 am, PST, 2/04/2014		Yes

File Sharing

box — **Model sharing**

Google Drive — **File sharing**

To owners/mentors

A SE MEP CM

Team Process – Communication & Collaboration

Instant idea sharing



Sanja Štimac

i wanna have a green roof... can we do that? preety please!
http://www.elephantjournal.com/2008/10/greenest-museum-in-the-world-the-california-academy-of-sciences/



Yihai Fang I am on board. 🙂 However I see a possible increase on roof load for our structural guys.



Dorian Curcanu if you don't forget about my solar panels and Air Handling Units 😬. Be careful that AHU make a lot of noise 😬

Brainstorm & vote

Voting Room Title: DPR

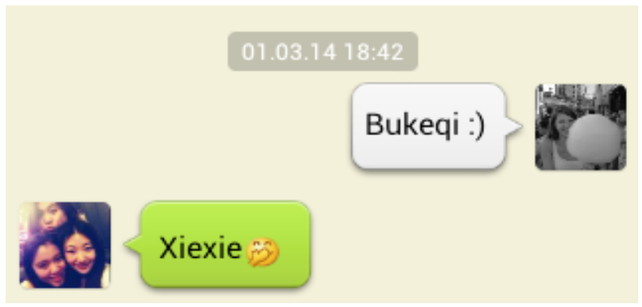
The brighter (orange) the ideas are, the more popular they are !
7 people contributed their ideas.
7 people voted.
Voting Finished!

Sort by Country | Sort by Ranking

Dorian Curcanu	A system connected to the Building Management System that allows the users to control via tablet, smartphone or PC the indoor climate parameters of the room. This system is also possible to present different energy savings strategies to the user, also the expected energy savings for every strategy.	100	Denmark
Dorian Curcanu	Building Management System-a system that controls via a 'computer brain' the MEP systems of the building (heating, ventilation, lighting, fire)	83	Denmark
Dorian Curcanu	Brain wave therapy by corridor speakers: https://www.youtube.com /watch?v=I7cqifnlNKI	64	Denmark
Yihai Fang	Environmental friendly construction (minimize waste, noise, disturbance to the neighborhood) (directly save construction cost, keep a health relationship with the neighborhood)	56	(please select a country)



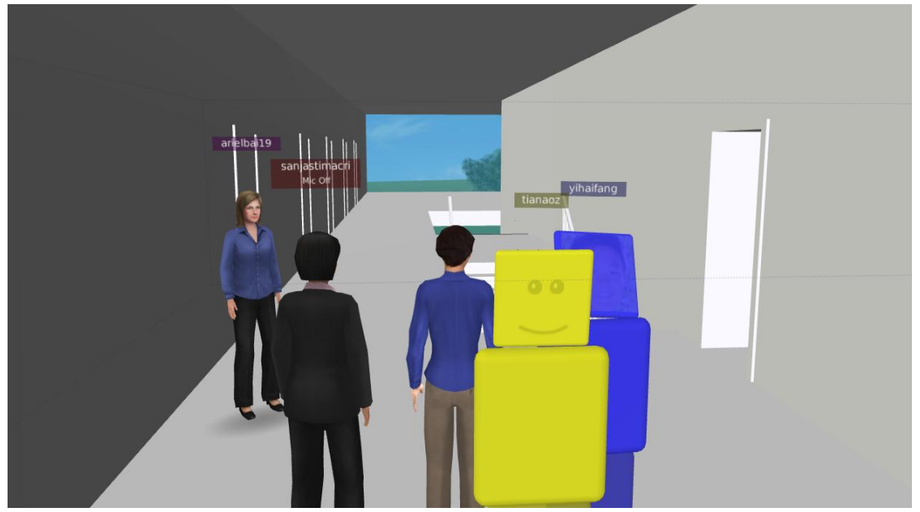
Speak outside thebox



Weekly meeting



Model walk through



A SE MEP CM

John Nelson

Eduardo Miranda

Adhamina Rodriguez

Ronnie Piil Haagensen

David Bendet

Nick Arenson

Prashant Sharma

Kyle Adams

Humberto E. Cavallin

Ramon Iglesias

Donata Trost

Jure Česnik

Ramprasath Palanisamy

Maria Frank

Willem Kymmell

Sijie Zhang

Frank Scheiber

Klemen Kropar

Mike Miller

Greg Luth

Charles Bovet

Forest Olaf Peterson

Wafaa Sabil

Thank You

Renate Fruchter

EXPRESS