Vibrant spaces

Implementing the concept of vibrant places into a public building by redesigning a vacant office building

Architectural engineering studio
- Second life -

P5 presentation
22-June-2023

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Building technology mentor   Engbert van der Zaag
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Vibrant spaces

Vibrant spaces
Introduction:

Fascination

Al Aazm Palace– Damascus, Syria

<u>Vibrant spaces</u>
Introduction:

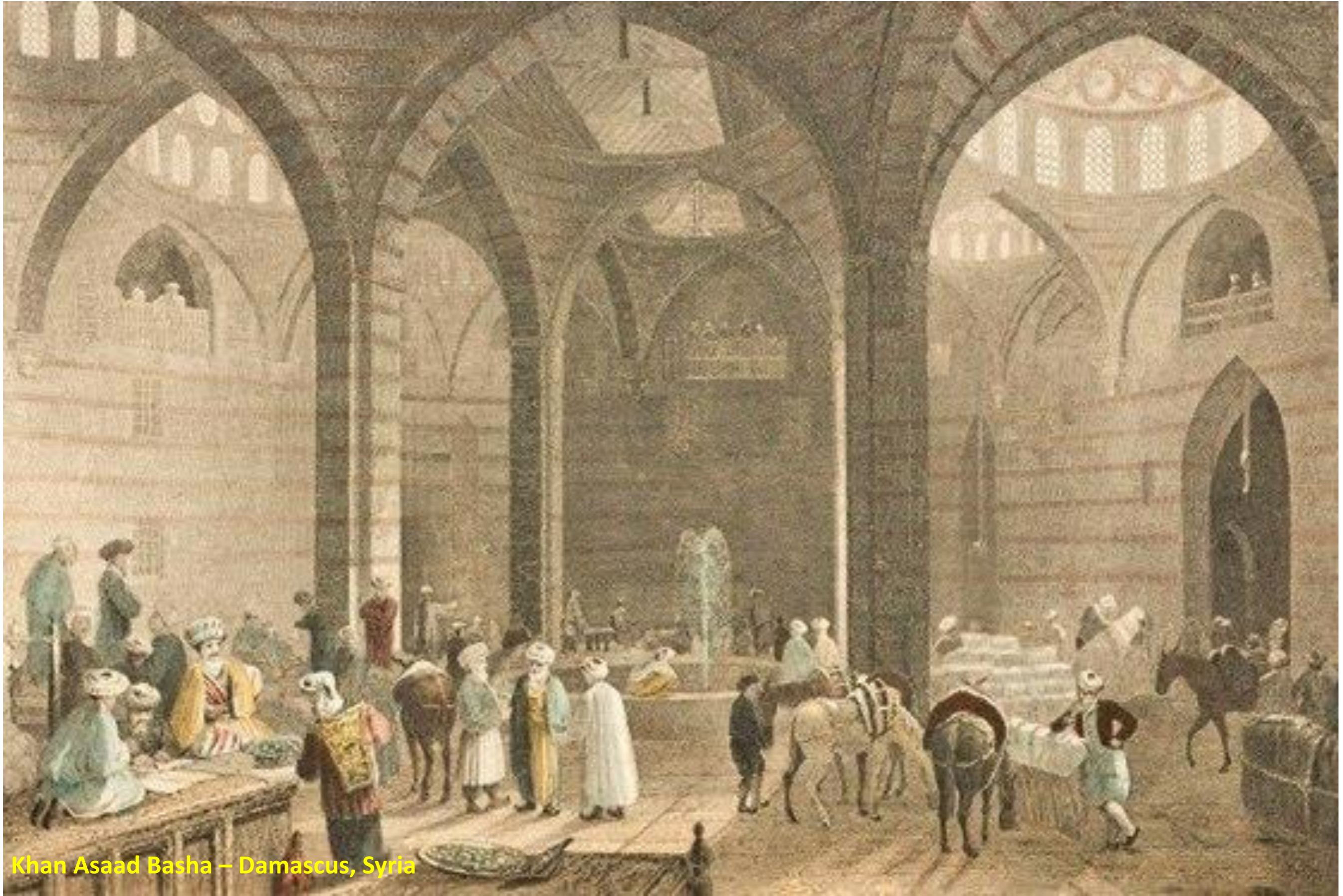**Fascination**

Khan Asaad Basha – Damascus, Syria

Vibrant spaces
Introduction:

Fascination

Khan Asaad Basha – Damascus, Syria

Vibrant spaces
Introduction:

Fascination:
Qualities: Public, Natural elements, Flexible, Aesthetic.

Cultural places are one type of these public domains that has existed since ancient times. Within these buildings and their public and open areas, the highest meanings of coexistence and social encounters among the public are manifested.

Café - Restaurant

Exhibition of local handicrafts

Public/Private events hall

Khan Asaad Basha – Damascus, Syria

Vibrant spaces
Introduction:

Design studio: Second Life

Second Life the **Architecture** of **Tomorrow**

NO Demolition but **Renovation** of the **largest building** in the Netherlands

"If ~~circularity~~ is the **Answer.. ..**what is the **Design Question**?"
"If **Transformation** is the **Answer.. ..**what is the **Design Question**?"

Transformation in balance with the

Usage value
Future value
Architectural value

Vibrant spaces
Introduction:

Preliminary interests

Cultural center

Public urban solutions

Permanent sustainable cultural spaces

Program

Architectural Engineering

Technology

Context

Climate adaptation & Enrichment of existing building

Integration of greenery, Sheltering living and nonliving species

Covered Green roof

New Urban Environment

Europe, The Netherlands

The Hague
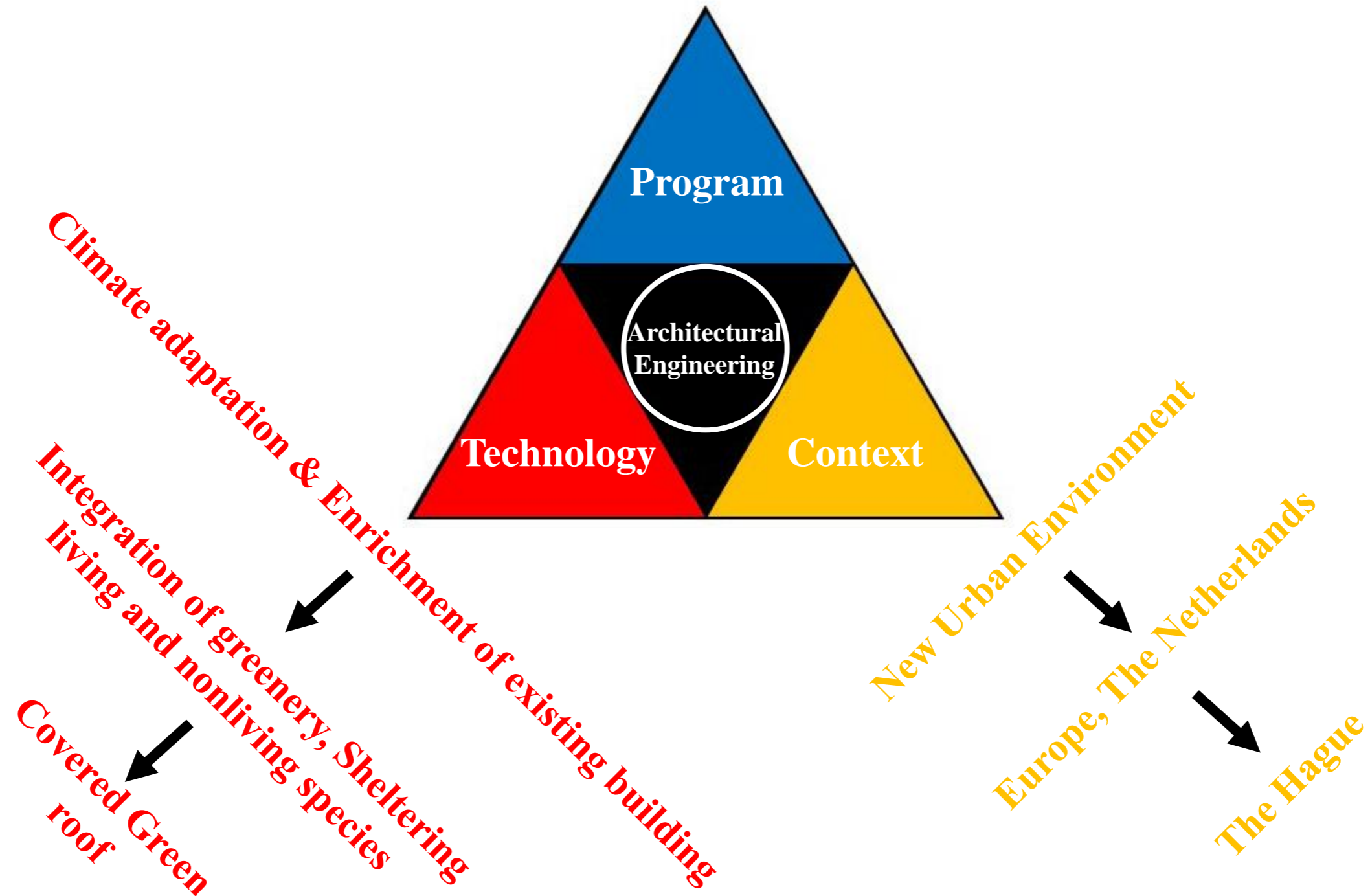
Vibrant spaces
Introduction:

Project choice

Old photo of the location before 1994

Vibrant spaces
Introduction:

Project choice

Proposal photo of the location after 1999

Vibrant spaces
Introduction:

Design studio: Second Life

Vibrant spaces
Introduction:

Project choice

Photo of the site situation in 2020

Vibrant spaces
Introduction:

Project choice

Proposal photo of the location after 2023

Vibrant spaces
Introduction:

Overall design question:

How can an existing vacant building be redesigned to create vibrant spaces within in a new urban area in the Hague?

Vibrant spaces
Introduction:

Objective
Sustainability: Nature

The primary intent is to create an architectural domain as public cultural areas, these places can provide a healthy and vibrant environment for all segments of society, allowing everyone to participate in various social activities.

Depot roof – Rotterdam, The Netherlands.

Hangzhou Square – Hangzhou, China.

Public Square – Foum el-Oued, Morocco.

Cultural Square – Manama, Bahrain.

Vibrant spaces
Introduction:

Objective
Social: Encounter

The concept of the **vibrant places** and its vital impact on the social interaction is central in this project.

Louvre – Abu Dhabi, UAE
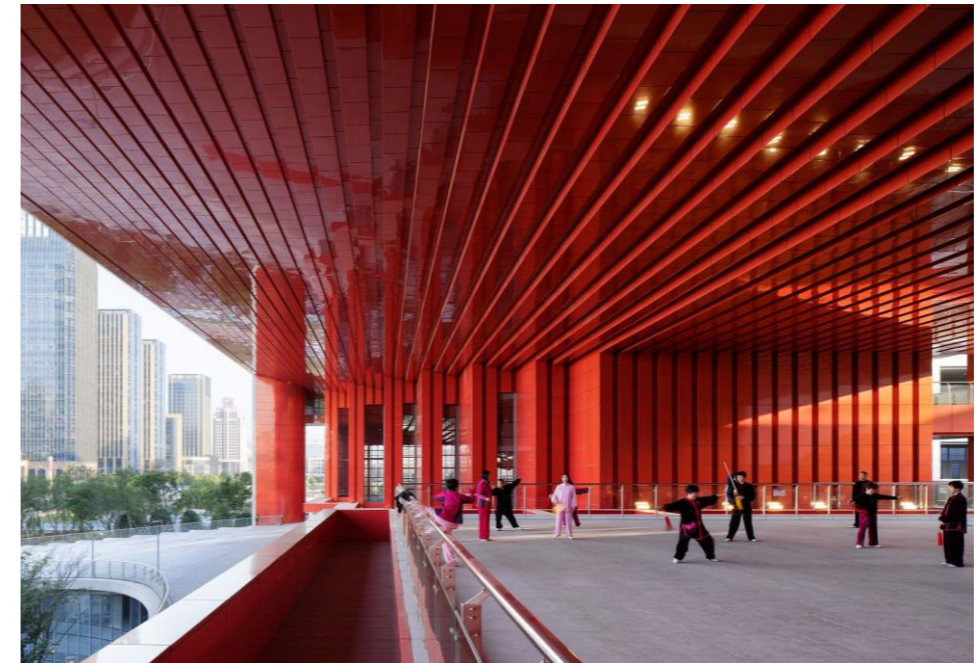
Yiwu Cultural Centre – Jinhua, China.

Wendelstrand – Mölnlycke, Sweden.

Santa Clara square – Silicon valley, USA.

Vibrant spaces
Architectural translation:

Final project's images

Vibrant spaces
Architectural translation:

Final project's images

Thematic question:

What aspects can be utilized in the redesign of buildings to achieve vibrant - more specifically- sustainable and social spaces?

Methodology:

Case study approach was adopted to analyse existing architectural precedents.

Vibrant spaces
Research:

Defining the criteria

- Reduce contribution to global **climate change**.
- Protect and restore **water resources**.
- Enhance individual **human health**.
- Promote sustainable and regenerative **materials cycles**.
- Enhance **community quality of life**.
- Protect and enhance the **biodiversity** and **ecosystem services**.

- Net **zero Carbon**.
- Health and **social impact**.
- **Biodiversity**.
- Whole **life performance**.
- **Circularity** and resilience.
- Disclosures and reporting.

Criteria

Social aspects

Human Health
Bio-Diversity
Public spaces
Accessibility
Visibility

Sustainable aspects

Energy
Water
Nature
Materials
Climate

Vibrant spaces
Research:

The chosen cases

- ### Project 1: Crossrail Place - London

A complex built in the North Dock of the West India in London's Canary Wharf. Designed by Foster + Partners and Arup in 2015.
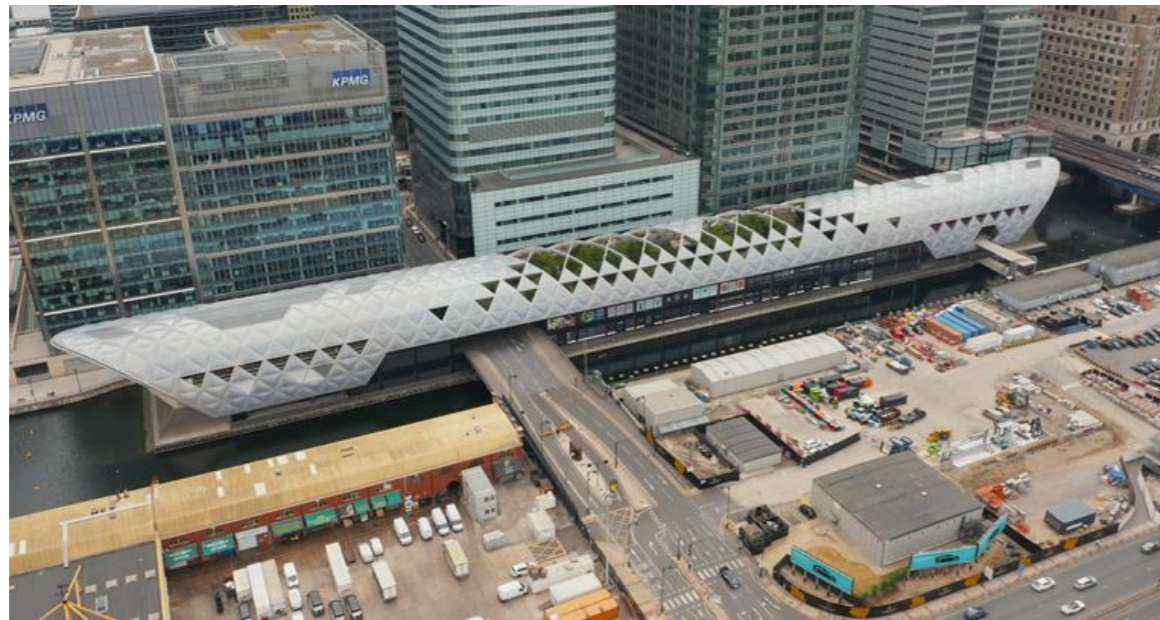
- ### Project 2: 20 Fenchurch street - London

A commercial skyscraper in London. Designed by architect Rafael Viñoly in 2014, its sky garden was opened in 2015.

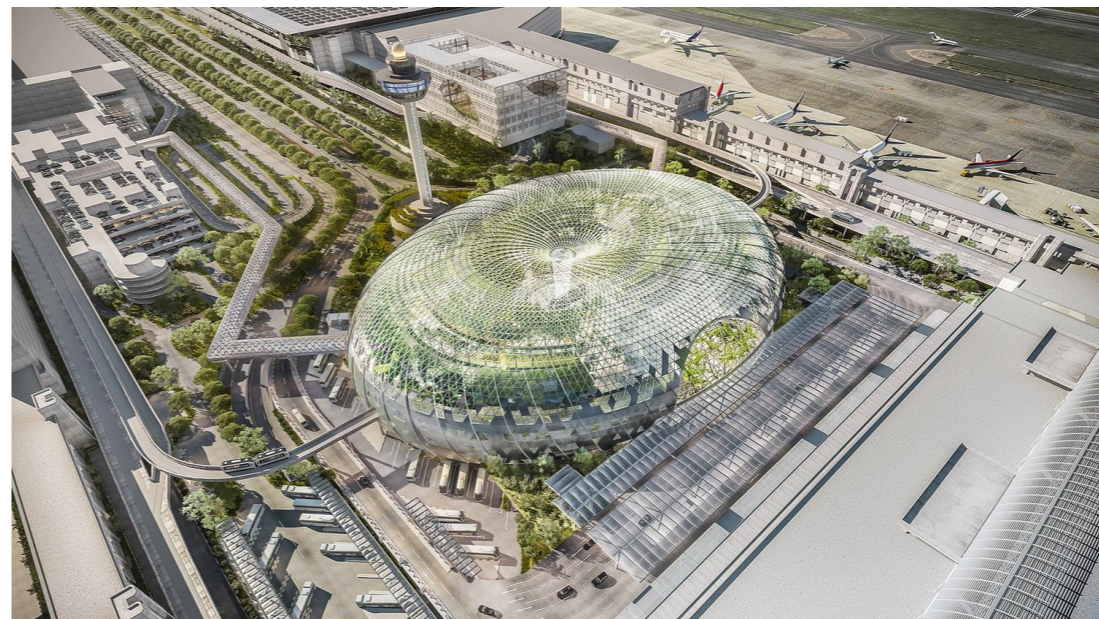## Vibrant spaces
Research:

The chosen cases

- **Project 3: Salesforce Transit Centre - San Francisco**

A station in San Francisco. It serves as the primary bus terminal and potentially as a future rail terminal. Designed by Pelli Clarke in 2018.
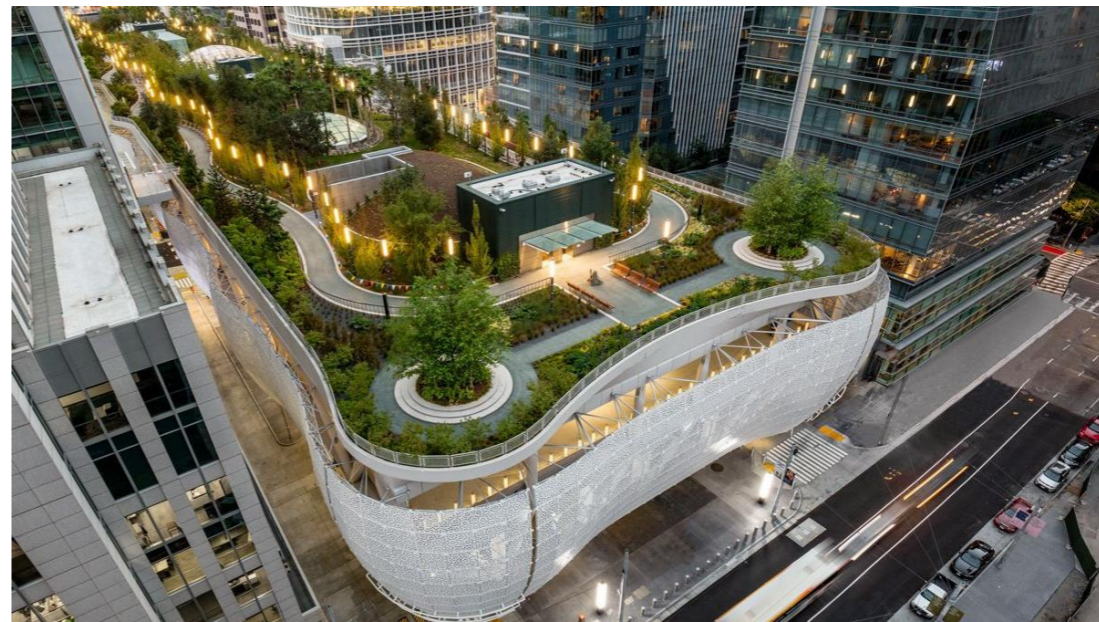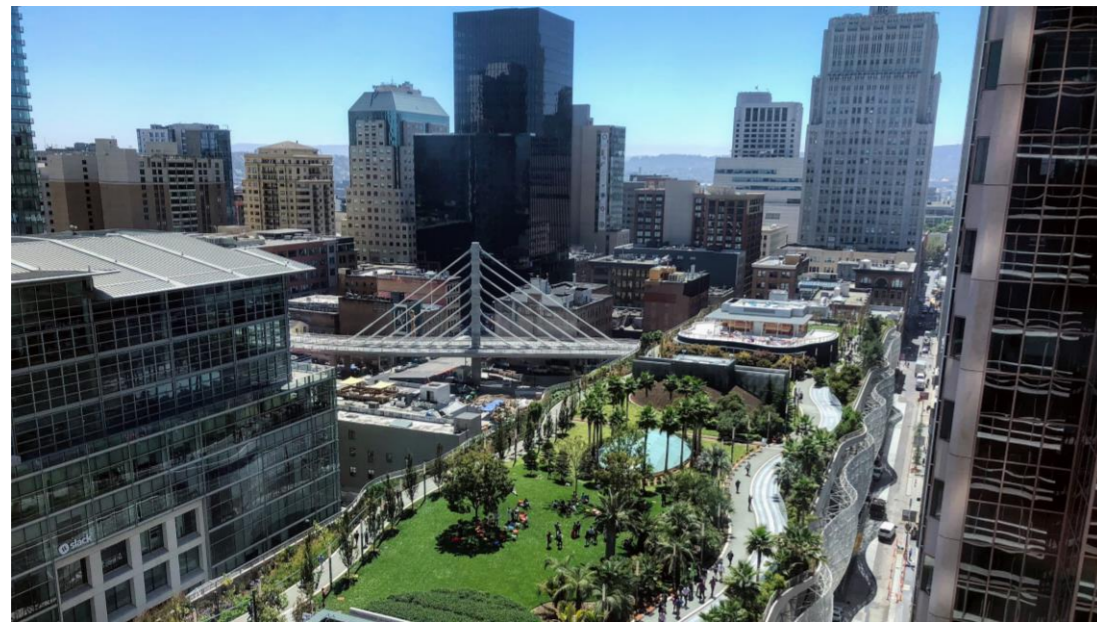
- **Project 4: Jewel Changi Airport - Singapore**

An entertainment and retail complex surrounded by and linked to the terminals of Changi Airport, Singapore. Designed by Moshe Safdie in 2019.

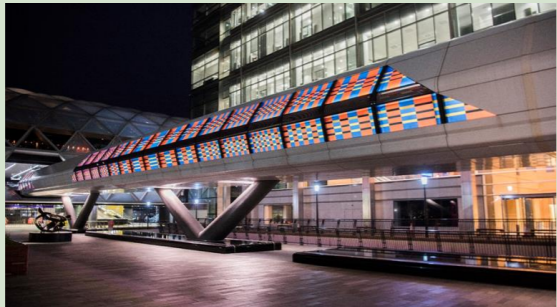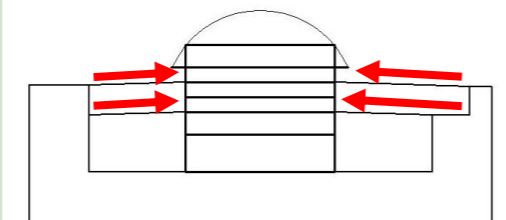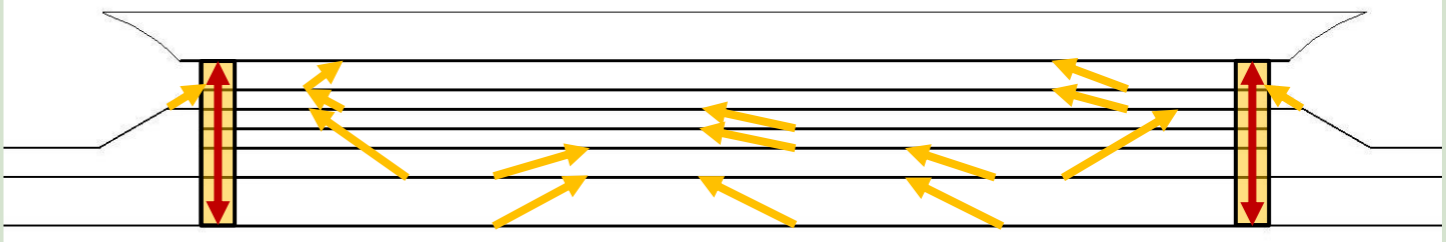|	Social aspects				
	Human Health	Bio-diversity	Public spaces	Architecture	
				Accessibility	Visibility
Case 1 Crossrail Place London	The canopy structure helps create a favourable micro-climate that shelters both plants and people.	Places for Human, Flora and Fauna.	**Open And Covered places contain:** • Shops • Cafes • Amenities sit.	people can use the new park and shops **all the time** through: • **Escalators** • **Lifts** • **Staircases.**	**See Diagram**
Case 2 20 Fenchurch street London	• North and South elevations feature glazing to maximize views. • Vertical façade on East and West provide sun shading.	Providing a much-needed plant and insect ecosystem, an important habitat for nesting birds, and valuable green infrastructure.	**Covered place contains:** combines public and private spaces, offering stunning views of London and a new landmark for the capital. • Restaurants • Cafes	**Partially open through:** • **Escalators** • **Lifts** • **Staircases.**	**See Diagram**
Case 3 Salesforce Park San Francisco	A central "light column" draws natural daylight down from the roof to all building's levels.	Places for Human, Flora.	**Open And Covered places contain:** • walking trails • picnic areas • Benches • fountains • children's areas • performance and art venues. • a 1,000-person amphitheatre.	**The park is fully accessible via:** • **Escalator** • **Elevator** • **Sky bridges** Almost 12 entry for this park.	**See Diagram**
Case 4 Jewel Changi Changi	The aim to create a place where the people of Singapore interact with the people of the world through an indoor landscape and the 40-meter-tall waterfall.	Places for Human, Flora.	**Covered place contains:** • Airport facilities • Indoor gardens • Leisure spaces • Retail offerings • Restaurants • Cafes • Hotel	**Fully accessible via:** • **Escalator** • **Elevator** • **Sky bridges** Each axe is reinforced by gateway gardens that offer visual connections.	**See Diagram**
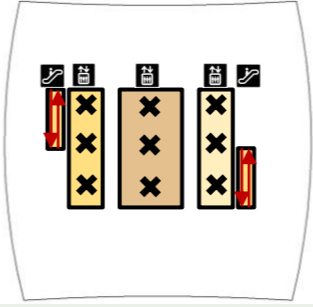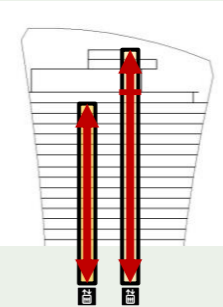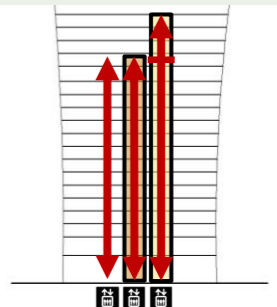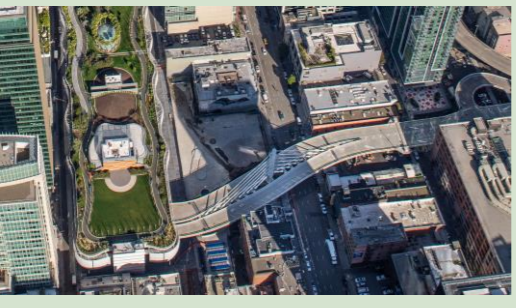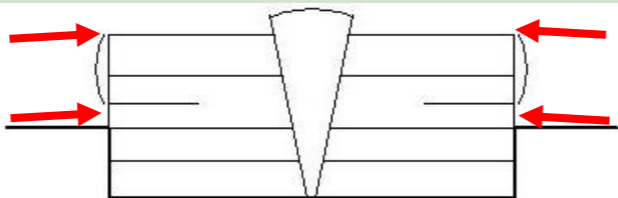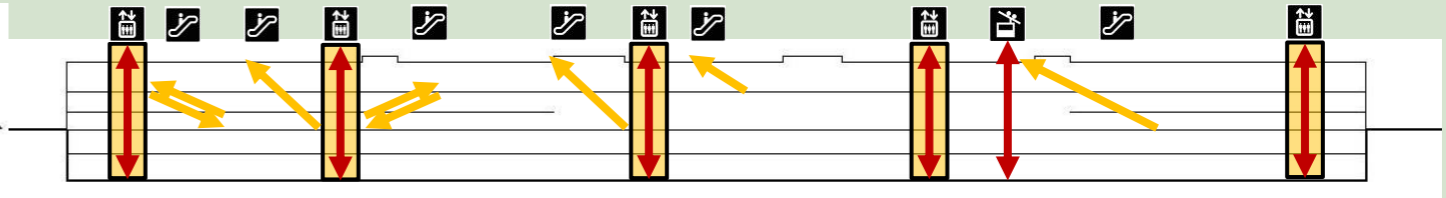
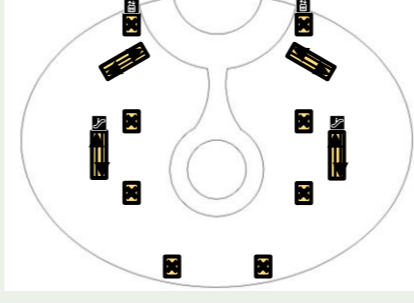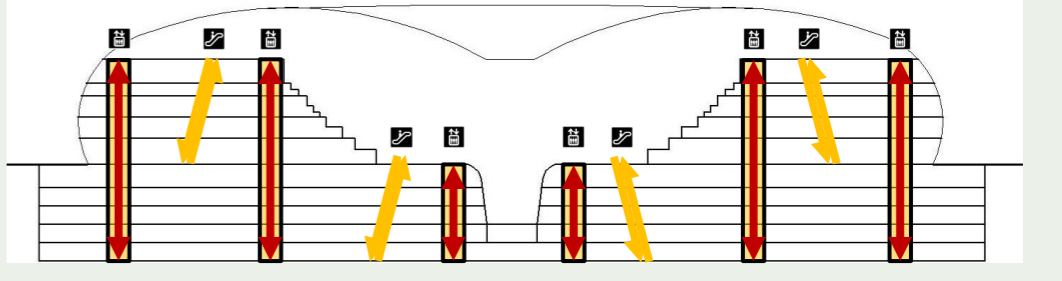|	**Sustainable aspects**				
	Energy	Water	Nature	Materials	Climate
Case 1 Crossrail Place **London**	• Collecting light for Greenery • minimise energy consumption.	• Collecting rain for natural irrigation • grey-water recycling.	The chosen species are indigenous to countries visited during the 19th century.	• Timber beams • Steel nodes • ETFE air cushions • Aluminium flashing.	• Naturally ventilated • Passive cooling measures.
Case 2 20 Fenchurch street **London**	• A fuel cell tri-generation system produces simultaneous electricity • Roof mounted solar PV.		UK's **largest green wall.**	• Certified Sustainable Sourced concrete • structural steelwork. • FSC certified timber. • Recycling construction waste.	• Natural and renewable resources to reduce harmful emissions. • Noise and air quality monitoring.
Case 3 Salesforce Park **San Francisco**	abundant use of natural daylight, reducing overall energy usage.	• Water and rainwater management. • The green roof build-up system consists of a root barrier and water drainage. • Treats all water from the neighbouring.	anchored by a lush 5.4-acre public park, a central gathering place with native trees and plants. The park will present a wide variety of Bay Area ecologies, from oak trees to a wetland marsh.	• Metal panels that reflect lightness and buoyancy. • Angled steel columns. • Application of recycled materials to cut down on construction waste.	• Filters and processes the exhaust from the railways. • Geothermal • Natural ventilation • Radiant systems • Daylighting/shading solutions, • Thermal mass coupling.
Case 4 Jewel Changi **Changi**		collects significant rainwater to be re-used in around the building.	200 different species of trees and flora.	• Steel members. • Custom-shaped solid steel nodes. • Glass panels. • Timber. • Insulated opaque panels.	• The waterfall aids in the cooling of the landscape environment.

Vibrant spaces
Research:

The social aspects

Table 7. A table shows the applications implemented within the studied cases in relation to the accessibility aspect.

Accessibility	Accessibility is a crucial factor that determines the success and efficiency of public spaces in engaging the public and enhancing their quality of life. In all four cases, providing convenient access to public spaces within the building is paramount. This can be accomplished by designing corridors that lead to the public spaces, as depicted in all four cases. Alternatively, separate bridges can be constructed to provide access to the public spaces without the need to enter the building, as seen in cases 1 and 3. Finally, specific paths within the building, such as those demonstrated in cases 2 and 4, can be created to facilitate access to the public spaces.
Case 1	
Case 2	
Case 3	
Case 4	

Vibrant spaces
Research:

The sustainable aspects

Table 11. A table shows the applications implemented within the studied cases in relation to the nature aspect

| Nature	From the images of the cases, it's clear that all of them followed the theory that "greener means more pleasant and clever." To emphasize this, most of the projects incorporated various forms of greenery in their public spaces. Some of them were based on specific historical moments, such as cases 1 and 3, which collected and planted local types of plants not necessarily related to their culture, but rather to their ancestors who lived in different regions during a certain period of time. Others were based on the meaning and identity of the project, like case 2, which has the highest and largest green space in that area, or case 4, which showcases a wide range of different local plants and trees to highlight not only the project's identity but also the place to the public.
Case 1	
Case 2	
Case 3	
Case 4	

Vibrant spaces
Research:

The Conclusion & Requirements

In conclusion, this paper aims to be a guide for designing green and vibrant spaces within public buildings and also to determine whether more contemporary and creative ways to design these in-between and vital areas can be obtained, by finding relationships linking the aspects referred to within the research to each other in a way to achieve architectural public spaces that are visible, easily accessible, naturally lit and energy efficient in terms of collecting and storing the energy, and finally capable of containing and protecting the living and non-living species within it. There are wide-ranging issues associated with the vitality and openness of the building that needs to be examined, although the strategies discussed show ways to provide dynamic and in-between spaces that are in line with the new sustainability requirements and climatic conditions of our life. I suggest that future research could focus on developing new strategies for integrating sustainable and social aspects into public buildings. Moreover, other research is needed to understand the specific challenges associated with designing public spaces in different types of buildings.

The range of aspects identified and examined in this research can be used as a toolbox to provide a critical evaluation of public buildings and as part of the methodology for designing new social and sustainable projects. The paper follows regulations, standards, and recommendations as formulated for instance by organizations such as LEED and BREEAM. To give an answer to the research question: What aspects can be utilized in the redesign of buildings to achieve vibrant -more specifically- sustainable and social public spaces? Therefore, the factors that play a role in this regard were investigated in two categories. The first category concerns the social aspects: Human Health, Bio-Diversity, Public spaces, Accessibility, and Visibility. While the second category concerns the sustainable aspects: Energy, Water, Nature, Materials, and Climate. These were the basic aspects with which 4 case studies were examined to create vibrant areas within public buildings
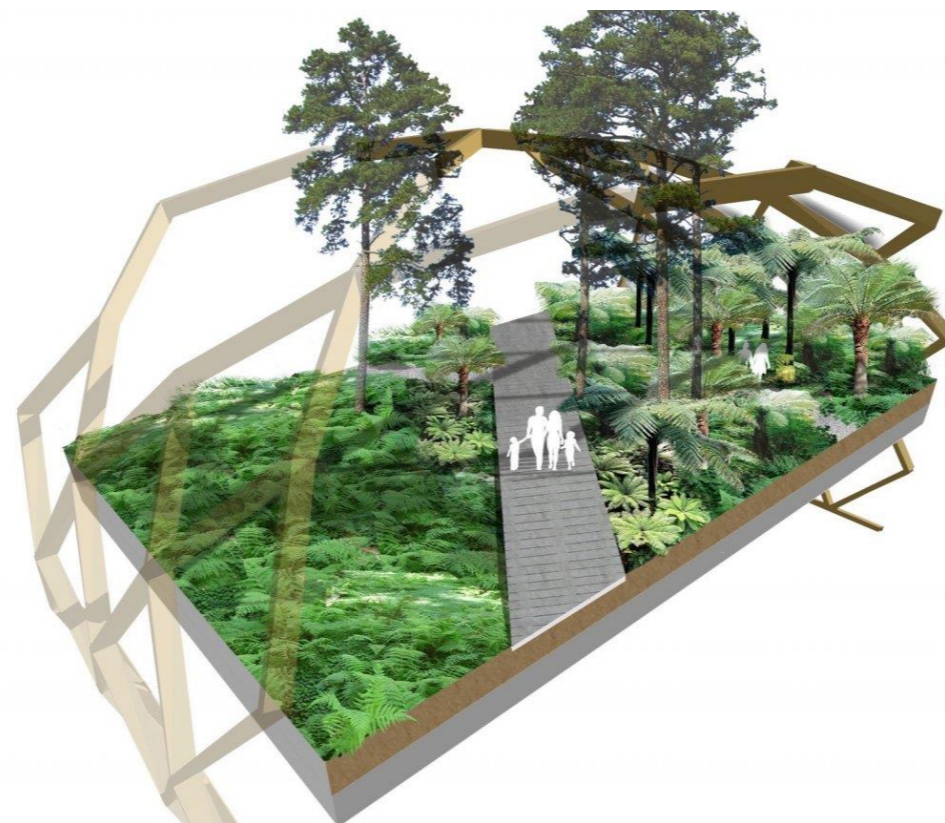
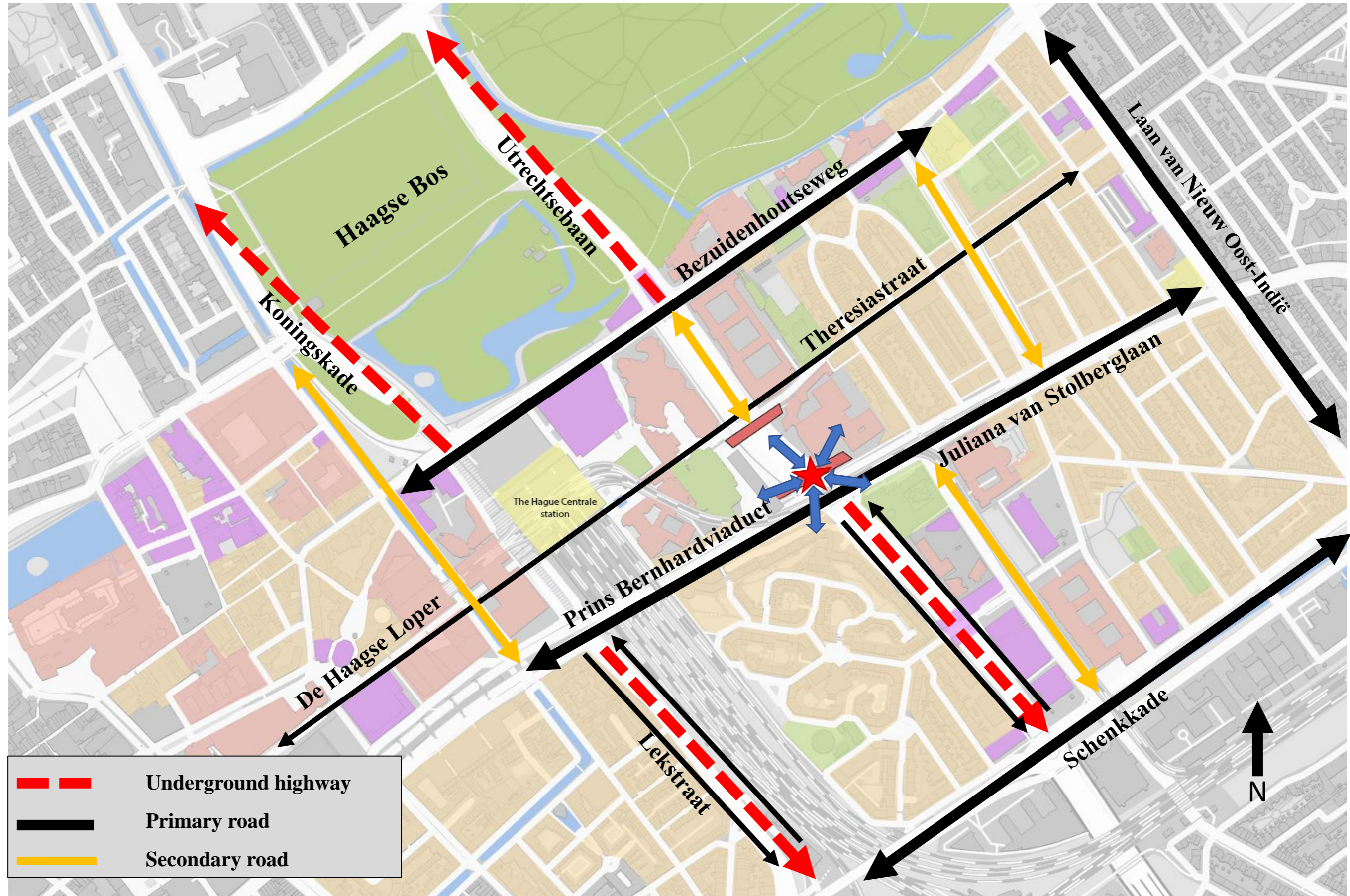**Vibrant spaces**
Architectural translation:

Project choice
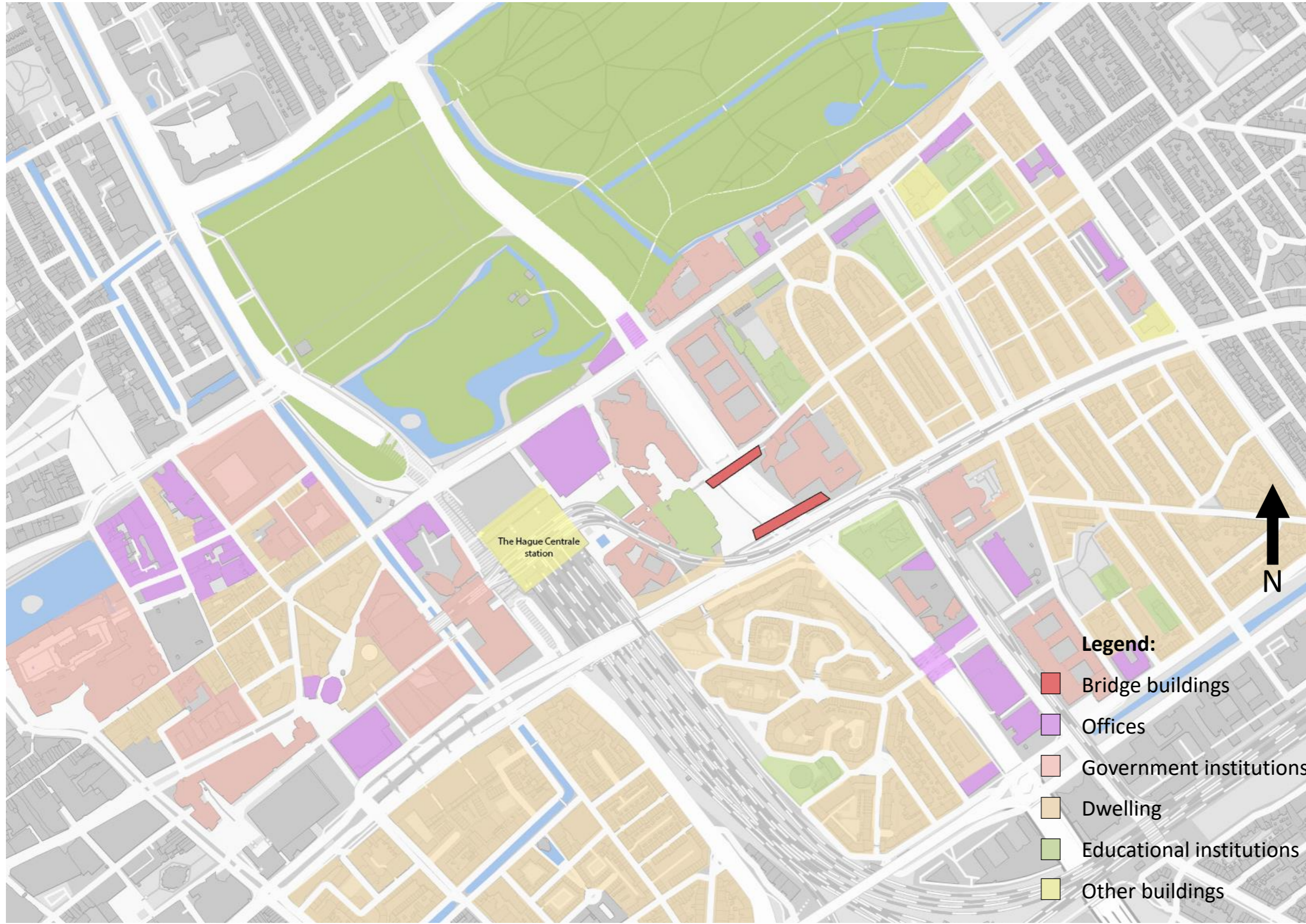
Vibrant spaces
Architectural translation:

Context: Surroundings buildings

Vibrant spaces
Architectural translation:

Context: Routes

Haagse Bos

Utrechtsebaan

Koningskade

Bezuidenhoutseweg

Theresiastraat

Laan van Nieuw Oost-Indië

Juliana van Stolberglaan

The Hague Centrale station

De Haagse Loper

Prins Bernhardviaduct

Schenkkade

Lekstraat

N

Underground highway

Primary road

Secondary road

Vibrant spaces
Architectural translation:

Context: Functions & Users

The Hague Centrale station

N

Legend:

- Bridge buildings
- Offices
- Government institutions
- Dwelling
- Educational institutions
- Other buildings

CITIZENS

AGE: all ages

VISITING PURPOSE: leisure / dwellings

FUNCTIONS: dwelling, sitting area's, shops, cafés and restaurants

THE ELDERLY

AGE: 67+

VISITING PURPOSE: leisure

FUNCTIONS: sitting area's, sanitary facilities, shops

TRAVELERS

AGE: all ages

VISITING PURPOSE: leisure

FUNCTIONS: park, public space, bar, restaurant and sights

PARK VISITORS

AGE: all ages

VISITING PURPOSE: leisure

FUNCTIONS: sitting area's, sanitary facilities, shops

STUDENTS

AGE: 12 - 18 / 18+

VISITING PURPOSE: education

FUNCTIONS: lecture halls, class rooms, flex workspaces and private workspaces

TEACHERS

AGE: 23 - 67

VISITING PURPOSE: education

FUNCTIONS: lecture halls, classrooms and meeting / conference rooms

BUSINESS PEOPLE

AGE: 23 - 67

VISITING PURPOSE: work

FUNCTIONS: private workspaces and flex workspaces

GOVERNMENT OFFICIALS

AGE: 23 - 67

VISITING PURPOSE: work

FUNCTIONS: conference/ meeting rooms, private workspaces and flex workspaces

Vibrant spaces
Architectural translation:

Context: Green spaces
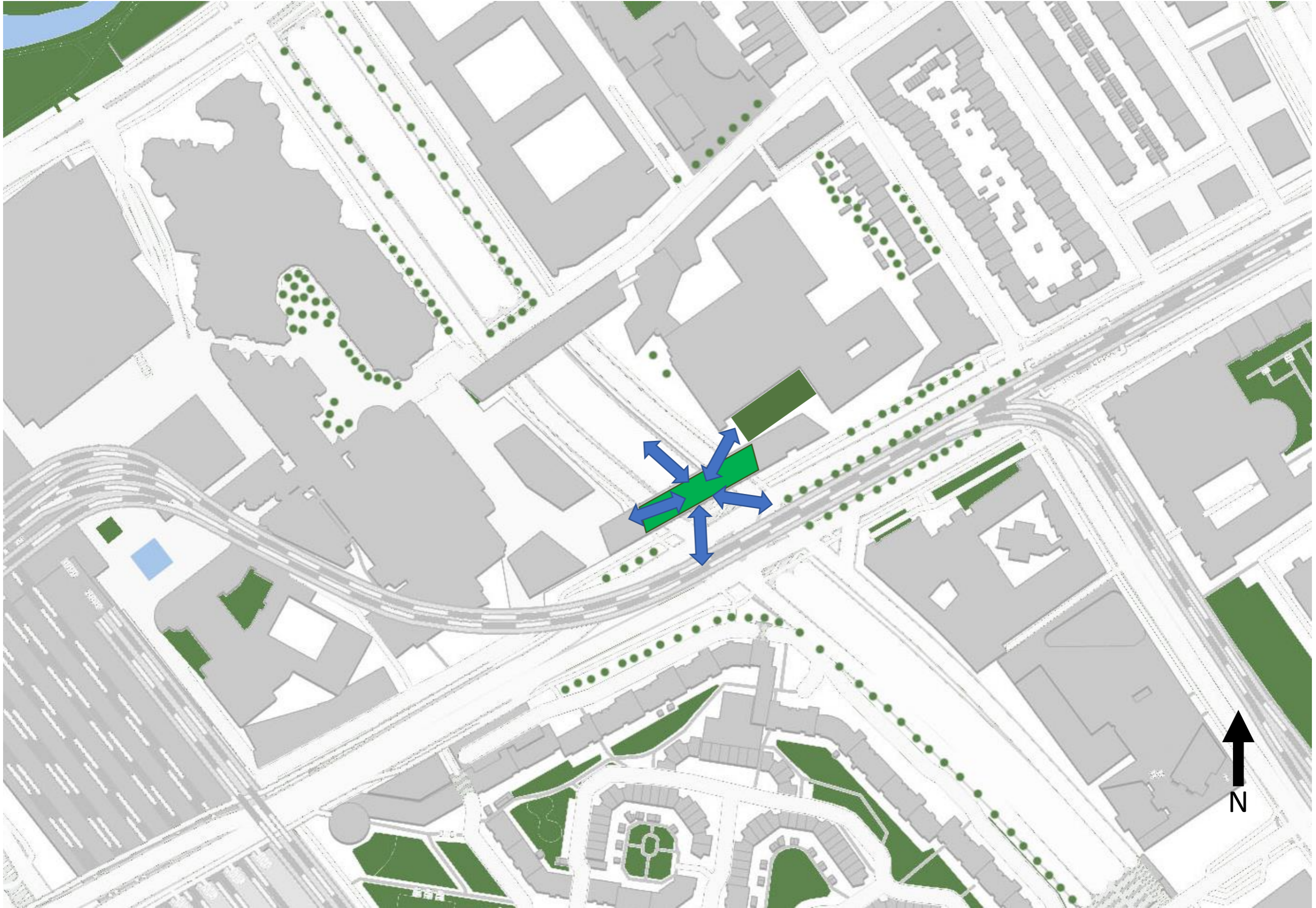
Vibrant spaces
Architectural translation:

Design strategy

- **Unlock the buildings:**   Open the building's plinth and give the priority for pedestrians and cyclists around it.

- **Make it public:**   Introduce diverse types of public functions in the building.

- **Introduce vibrant space:**   Connect the building to urban cultural spaces.

City: Create a cultural hub centrally placed in the city of the Hague.

Context: Improve the pedestrian paths and the public domain.

Building: Promoting different public functions within a public building as a show case for others.

Social: Create a multi-functional spaces which provides vibrant places to its users and passers-by.

Sustainable: Sustain the building with natural built materials and energy.

Vibrant spaces
Architectural translation:

Existing situation:

The Bruggebouw has **5 floors**, each one is almost **2000** m^2.

In addition, there is a block of **4 floors** located on the top right side of the building, which is **2000** m^2.

The whole built area is **12500** m^2.
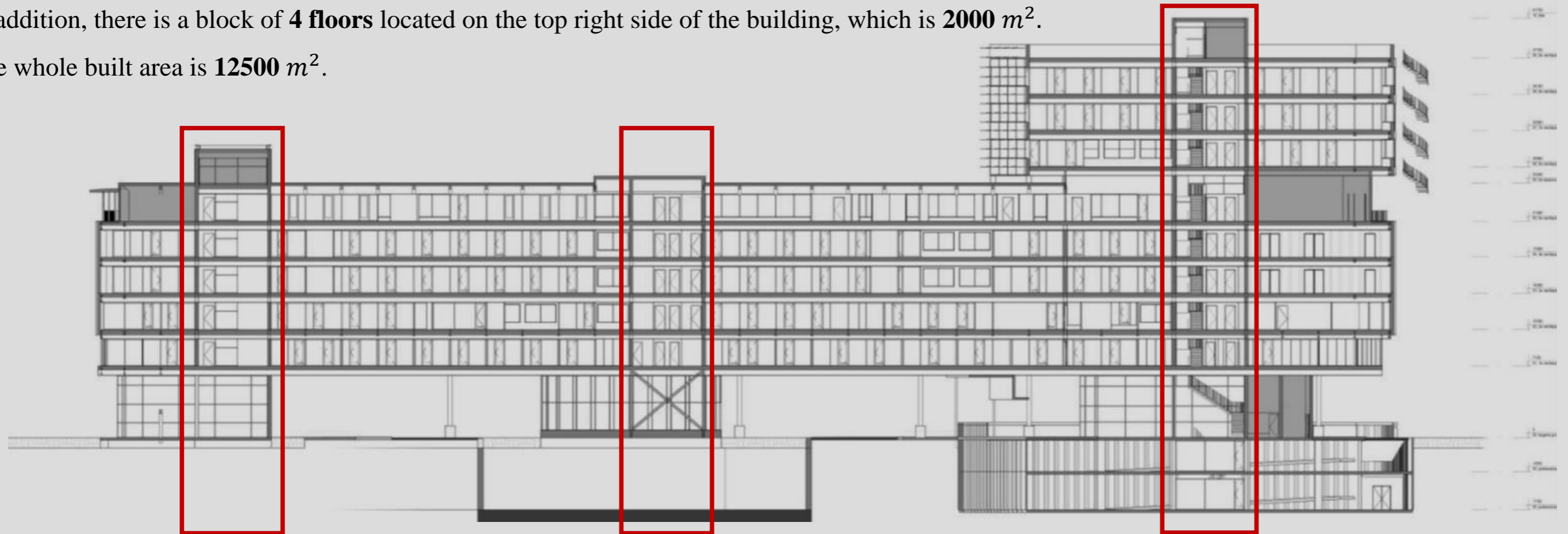
South-East Section
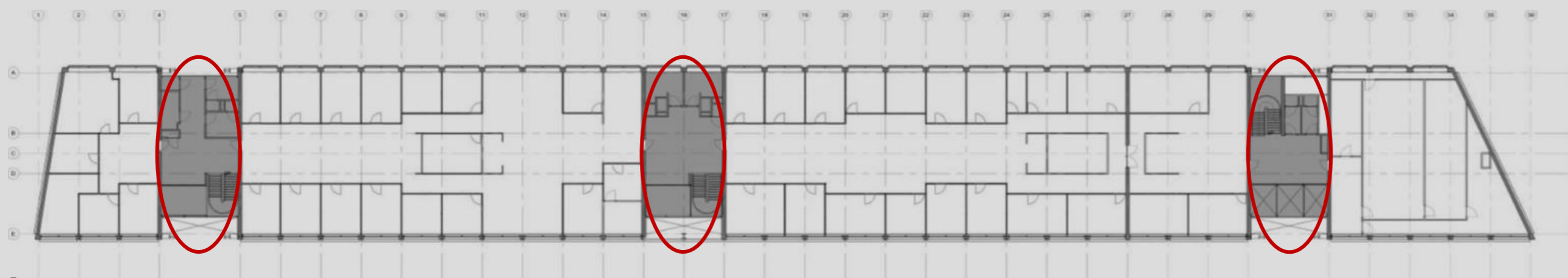
Floor plan

Core 1   Core 2   Core 3
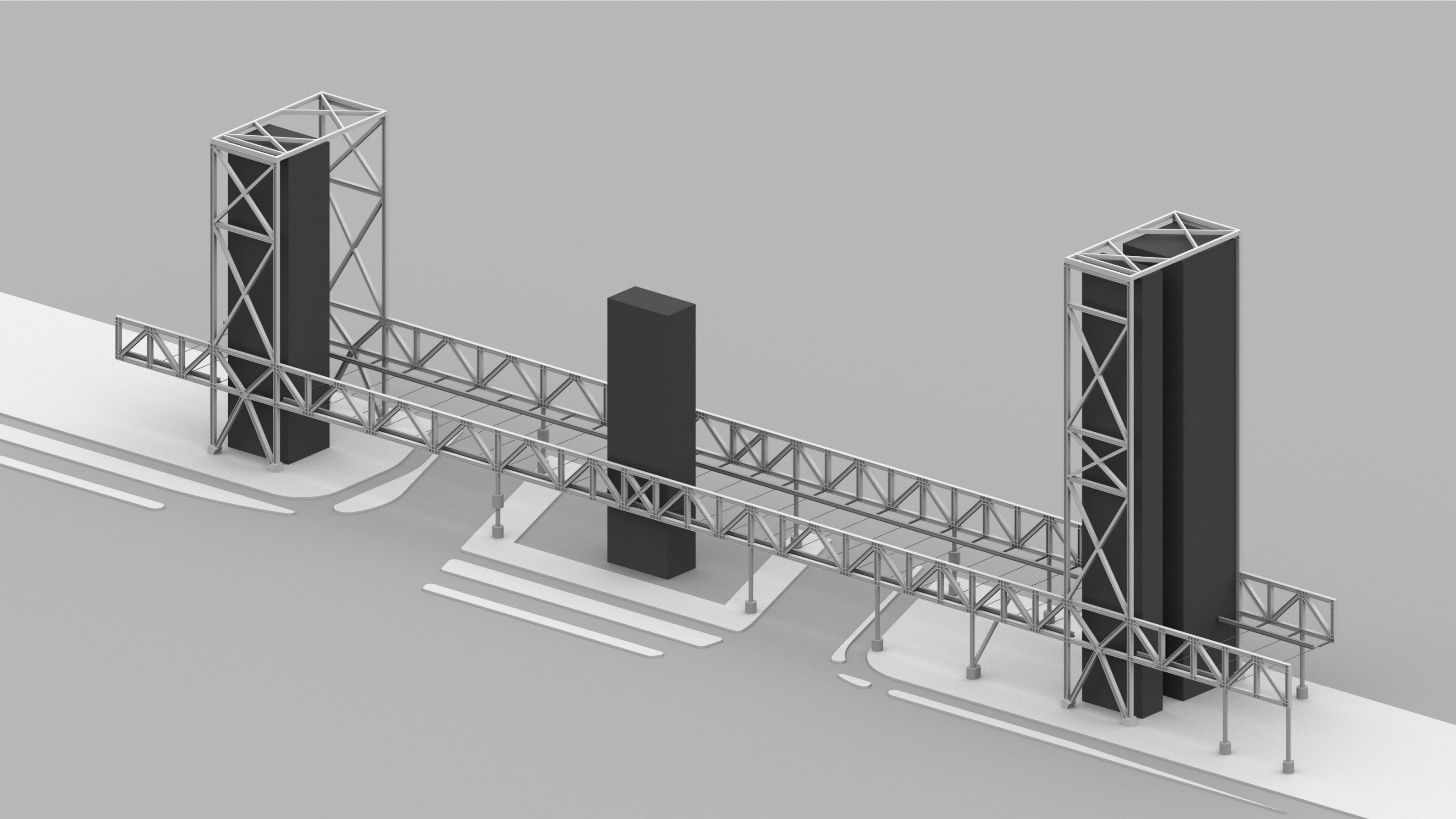
Vibrant spaces
Architectural translation:

Existing structure situation:
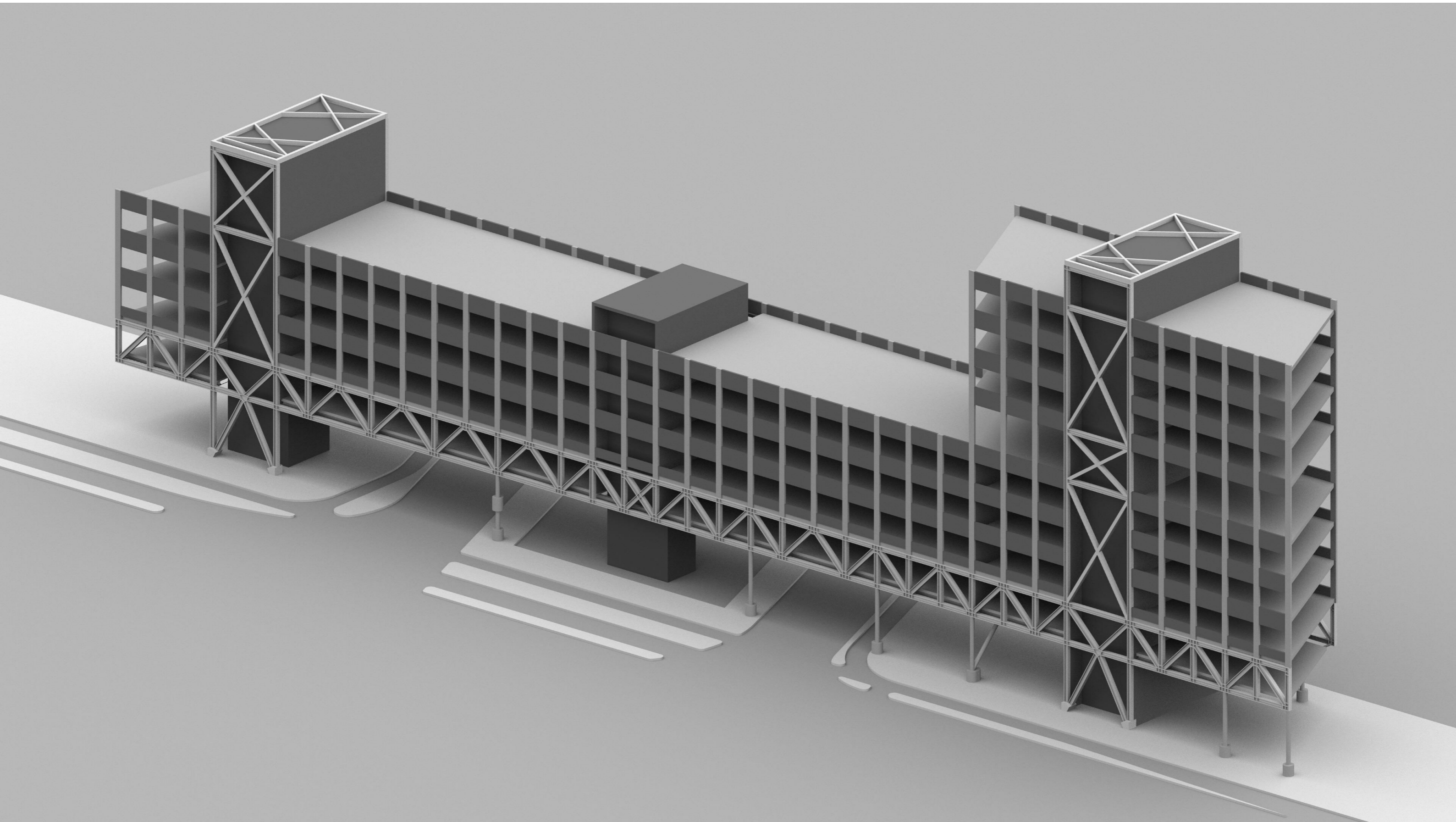
Vibrant spaces
Architectural translation:

Stability and main structure scheme

Vibrant spaces
Architectural translation:

Structure scheme
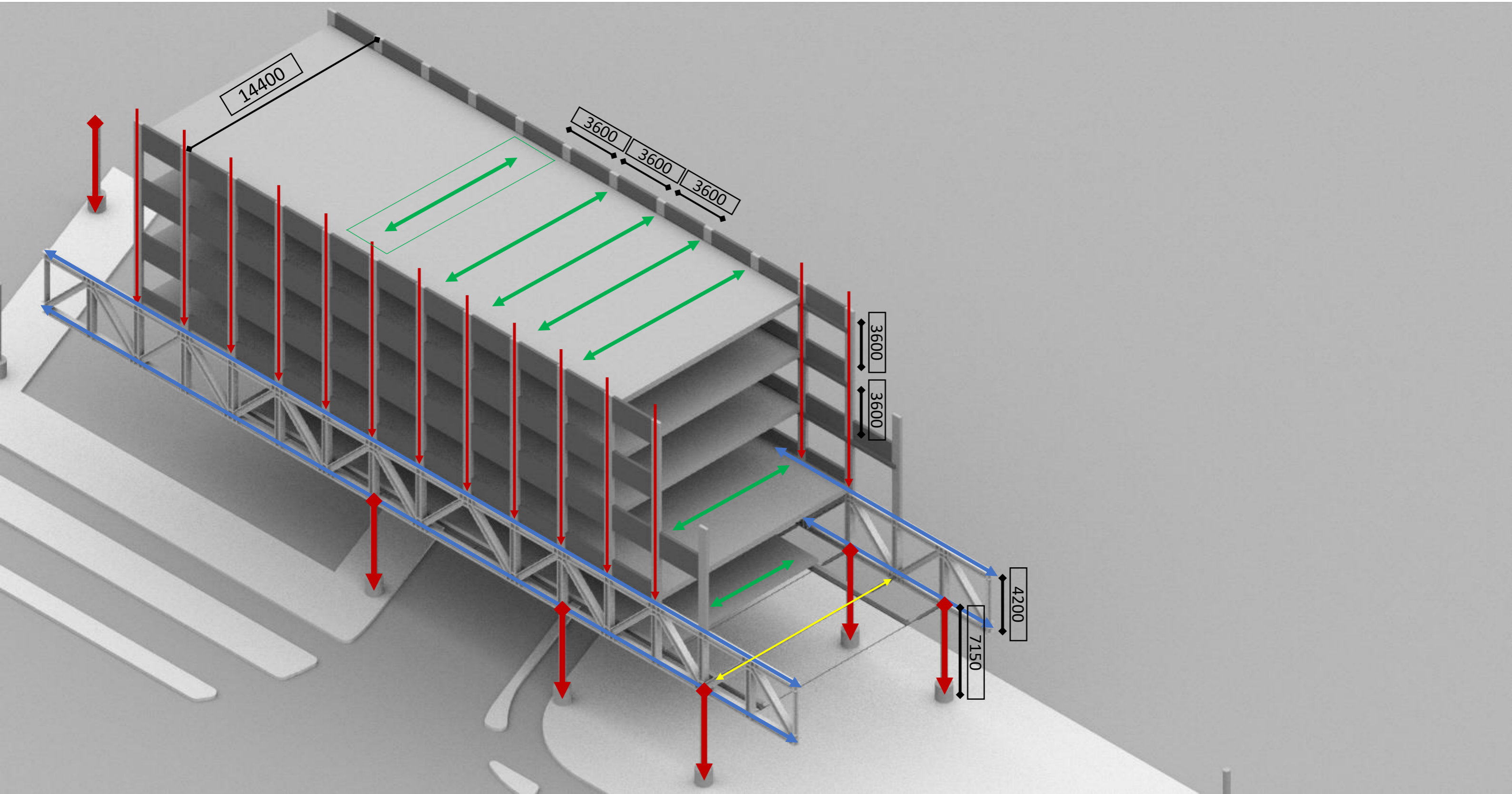
Vibrant spaces
Architectural translation:

New Program:

Within **12500** m^2 area:

1. Shops **2000** m^2
2. Offices **2000** m^2
3. Flex Studios **2000** m^2
4. Show spaces **2000** m^2
5. Meeting rooms **1000** m^2
6. Roof garden **1000** m^2
7. Restaurant/café **500** m^2
8. Hotel **1000** m^2
9. Services **500** m^2
10. Circulation **500** m^2

Vibrant spaces
Architectural translation:

New floor plans

5th floor - Roof garden

4th and 3rd floors - Exhibition space

2nd floor - Market space

Floors 1/200

Vibrant spaces
Architectural translation:

User's movements scheme

Legend:
- Park visitors
- Officers / Students
- Local citizens

Users movements schema - 1/250
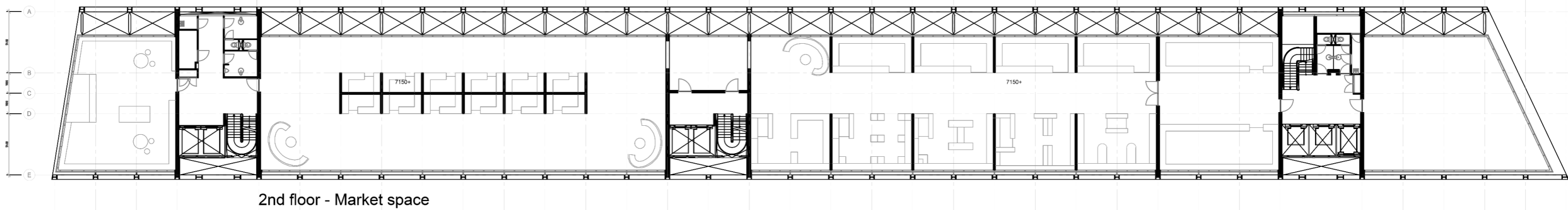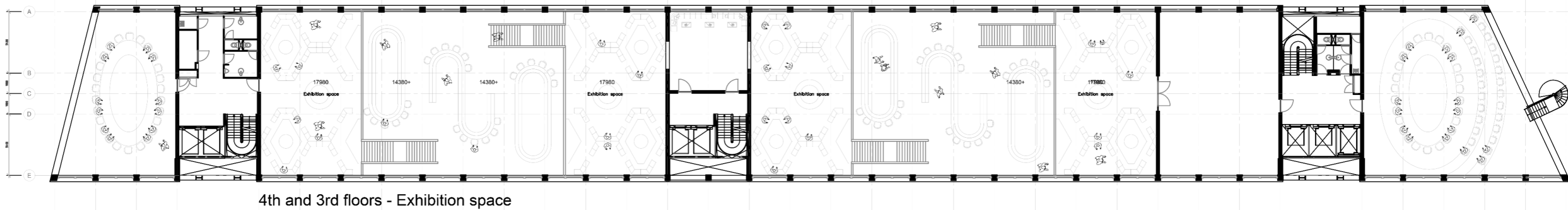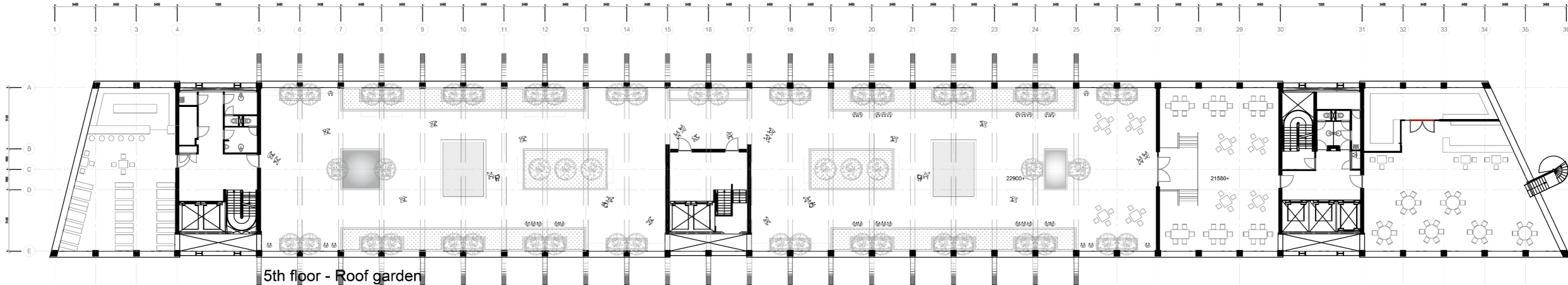
Vibrant spaces
Architectural translation:

Methods of improvements

Option 1: Adding columns on the ground floor
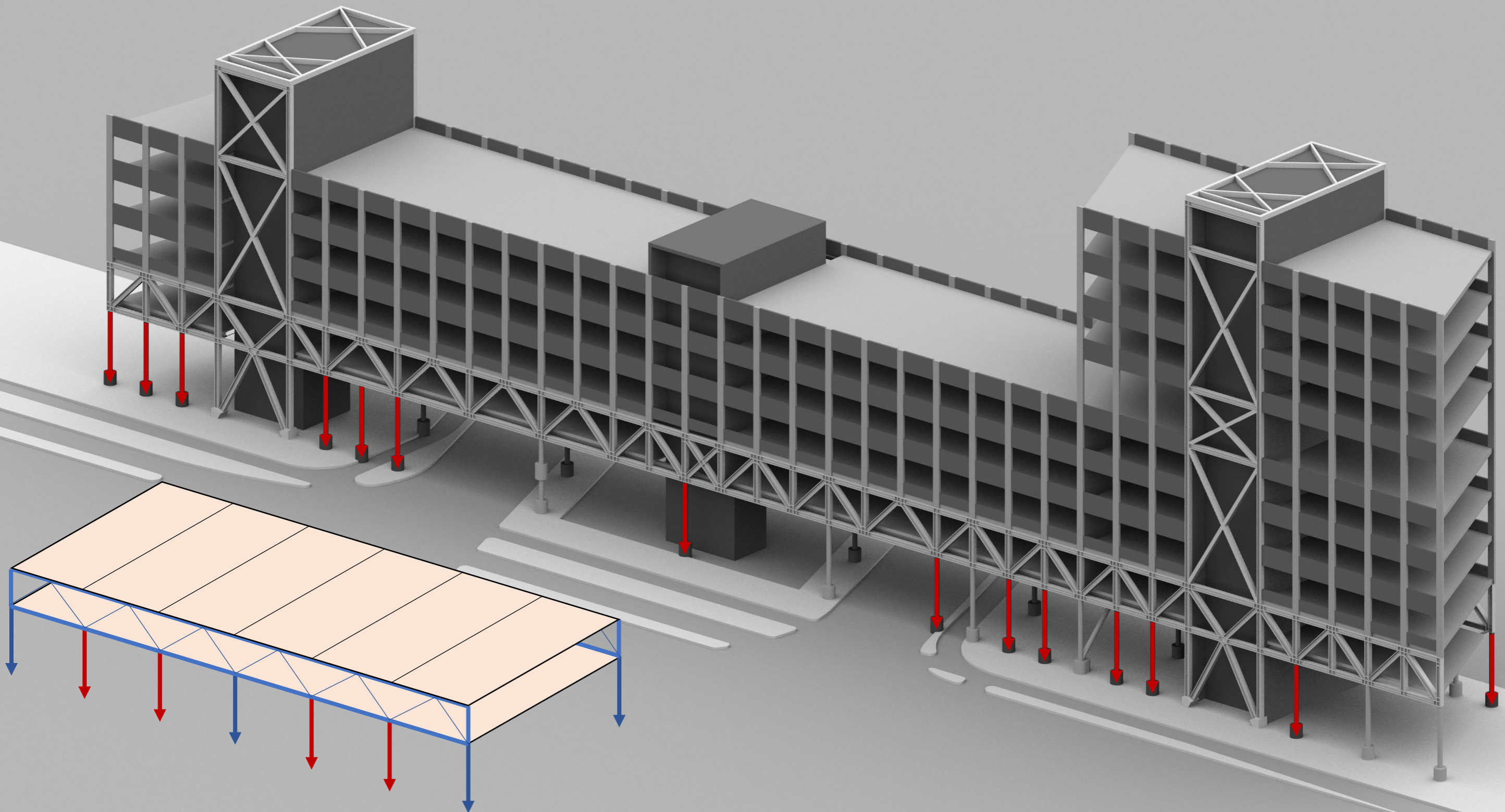
Vibrant spaces
Architectural translation:

Methods of improvements

Option 2: Creating openings -vida- supported by extra columns.
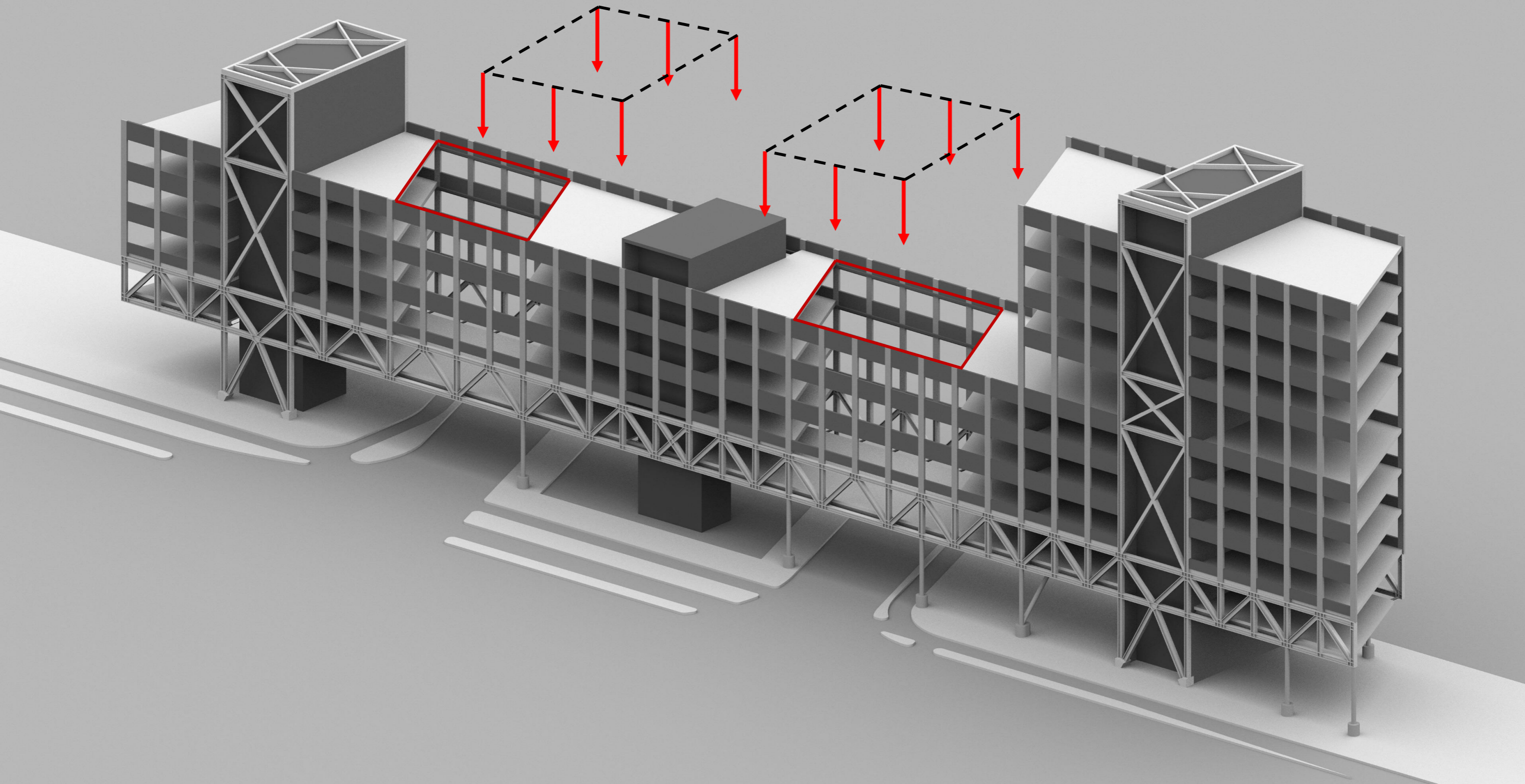
Vibrant spaces
Architectural translation:

Methods of improvements

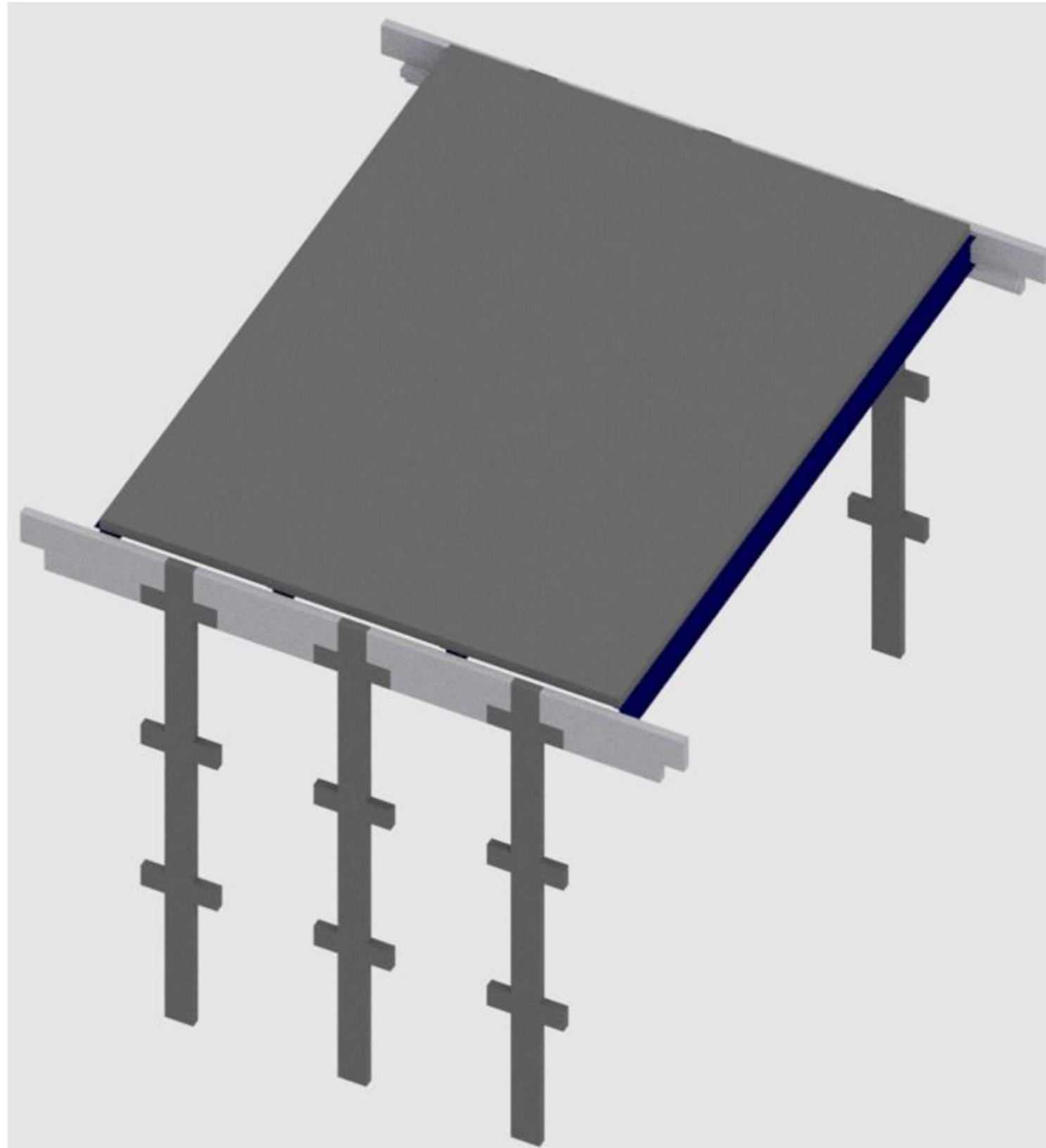**Option 3:** Adding beams and columns to support the park floor.
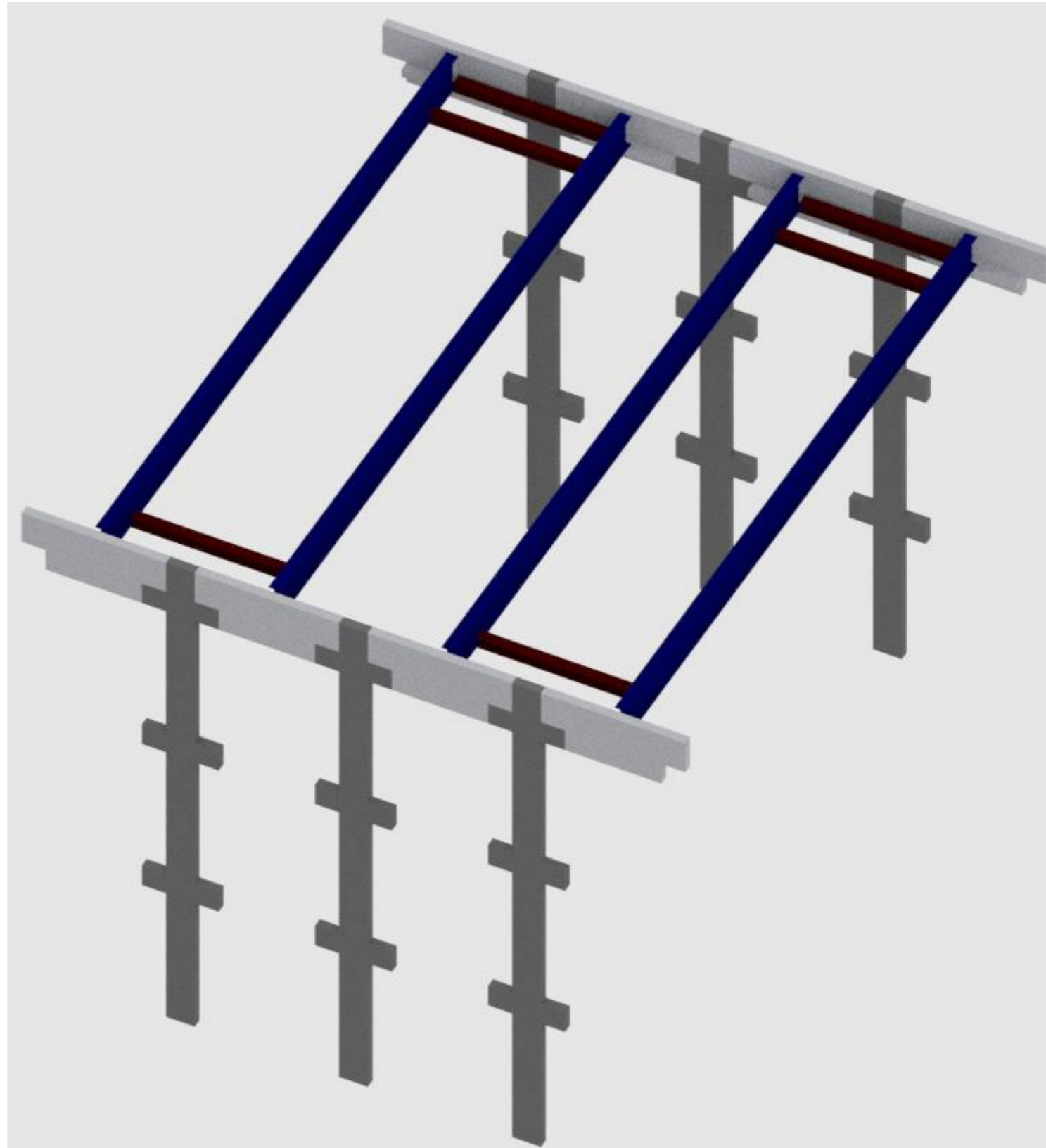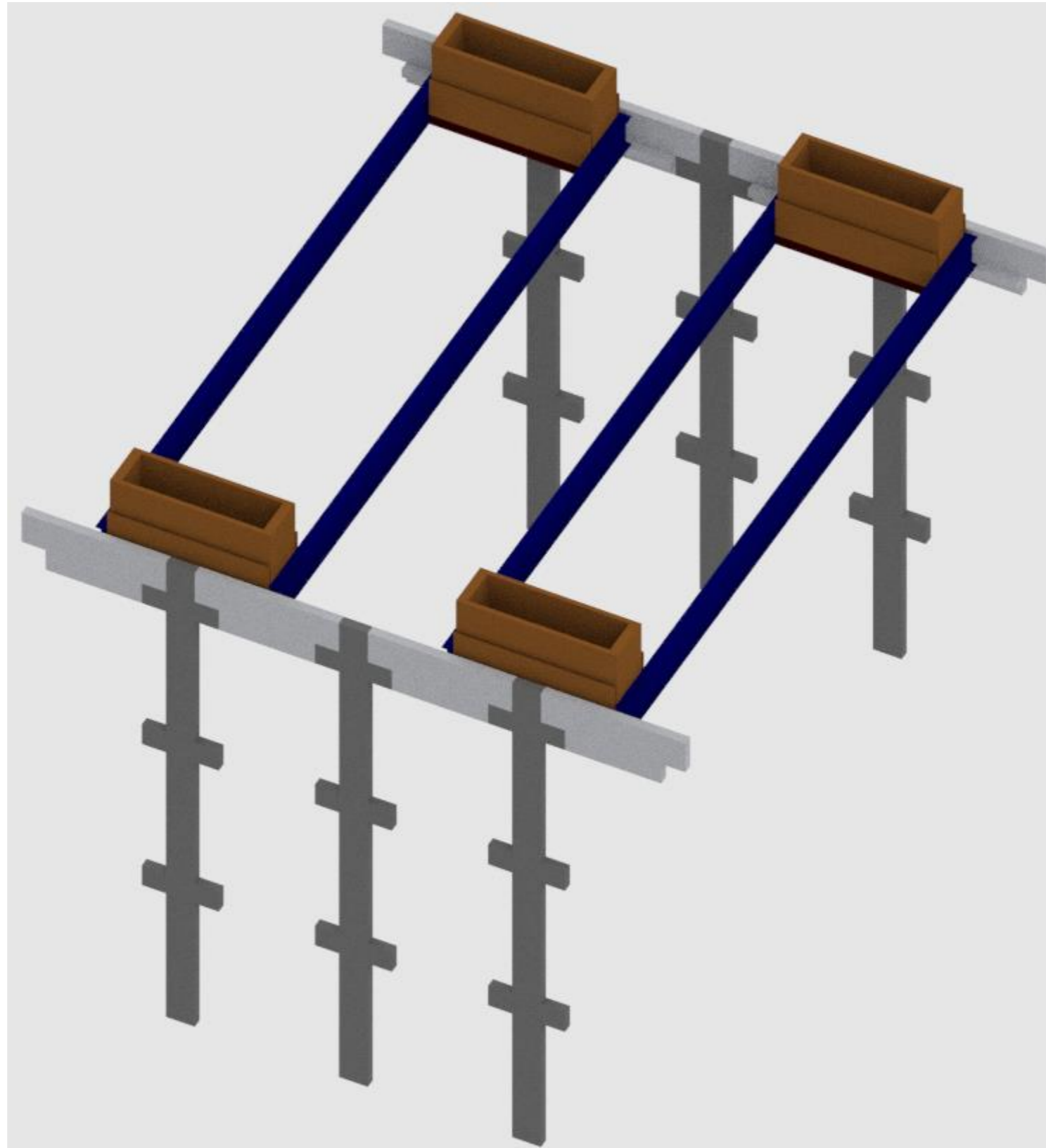
Vibrant spaces
Architectural translation:

First phase of improvements

Green garden floor

Vibrant spaces
Architectural translation:

First phase of improvements

Green garden floor

<u>Vibrant spaces</u>
Architectural translation:

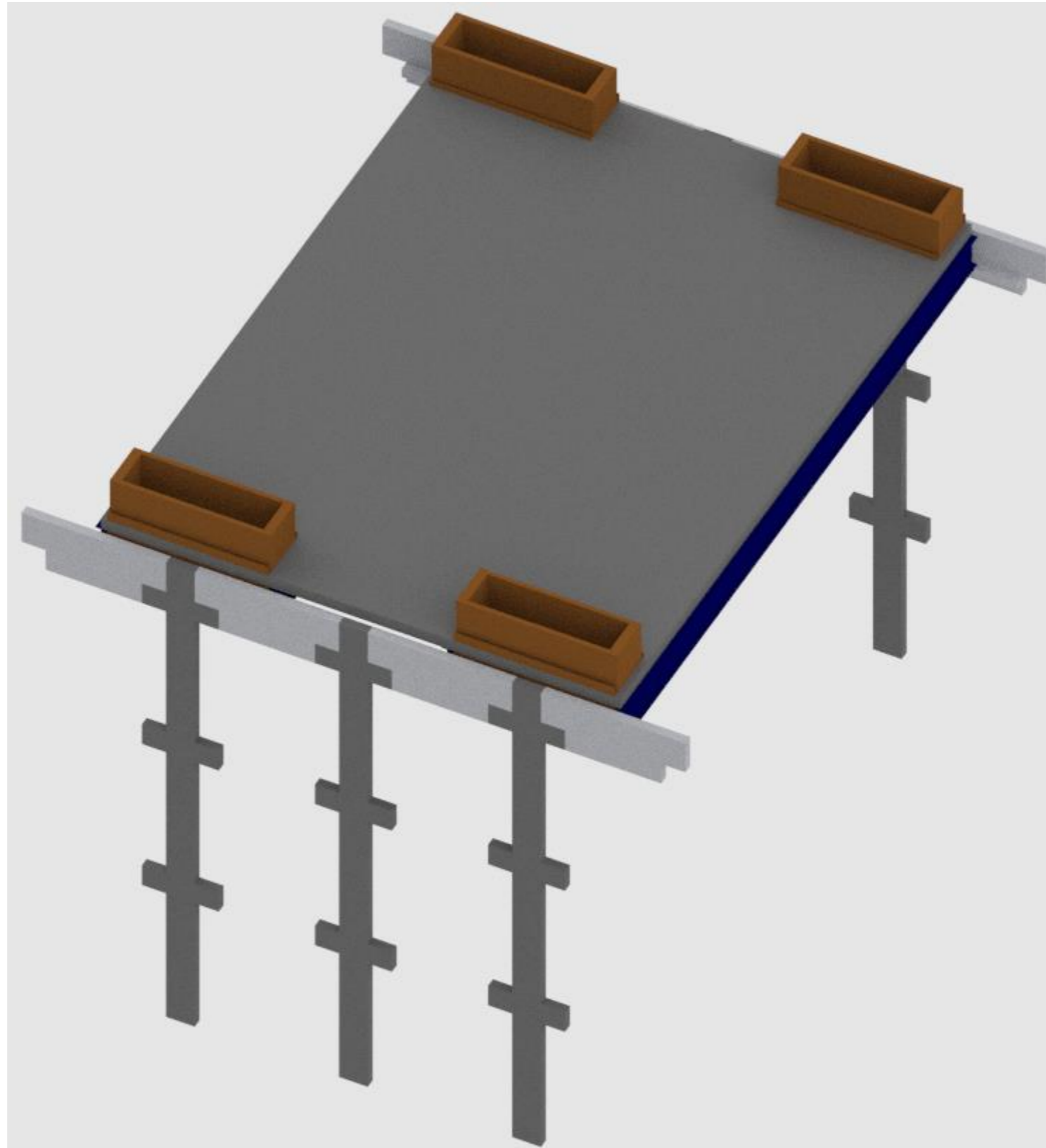**First phase of improvements**

Green garden floor

Vibrant spaces
Architectural translation:

First phase of improvements

Green garden floor

Vibrant spaces
Architectural translation:

First phase of improvements

Green garden floor

Vibrant spaces
Architectural translation:

First phase of improvements
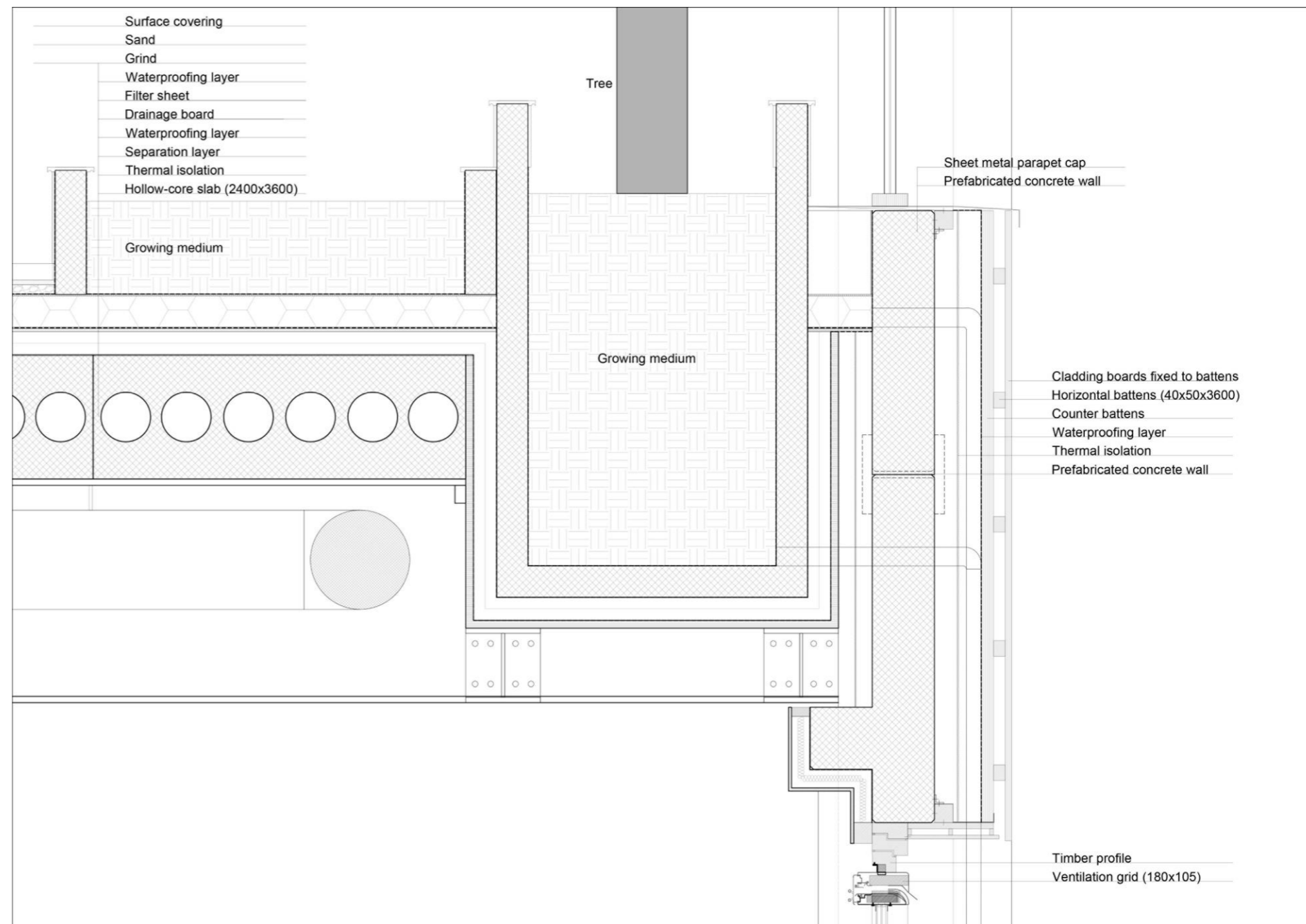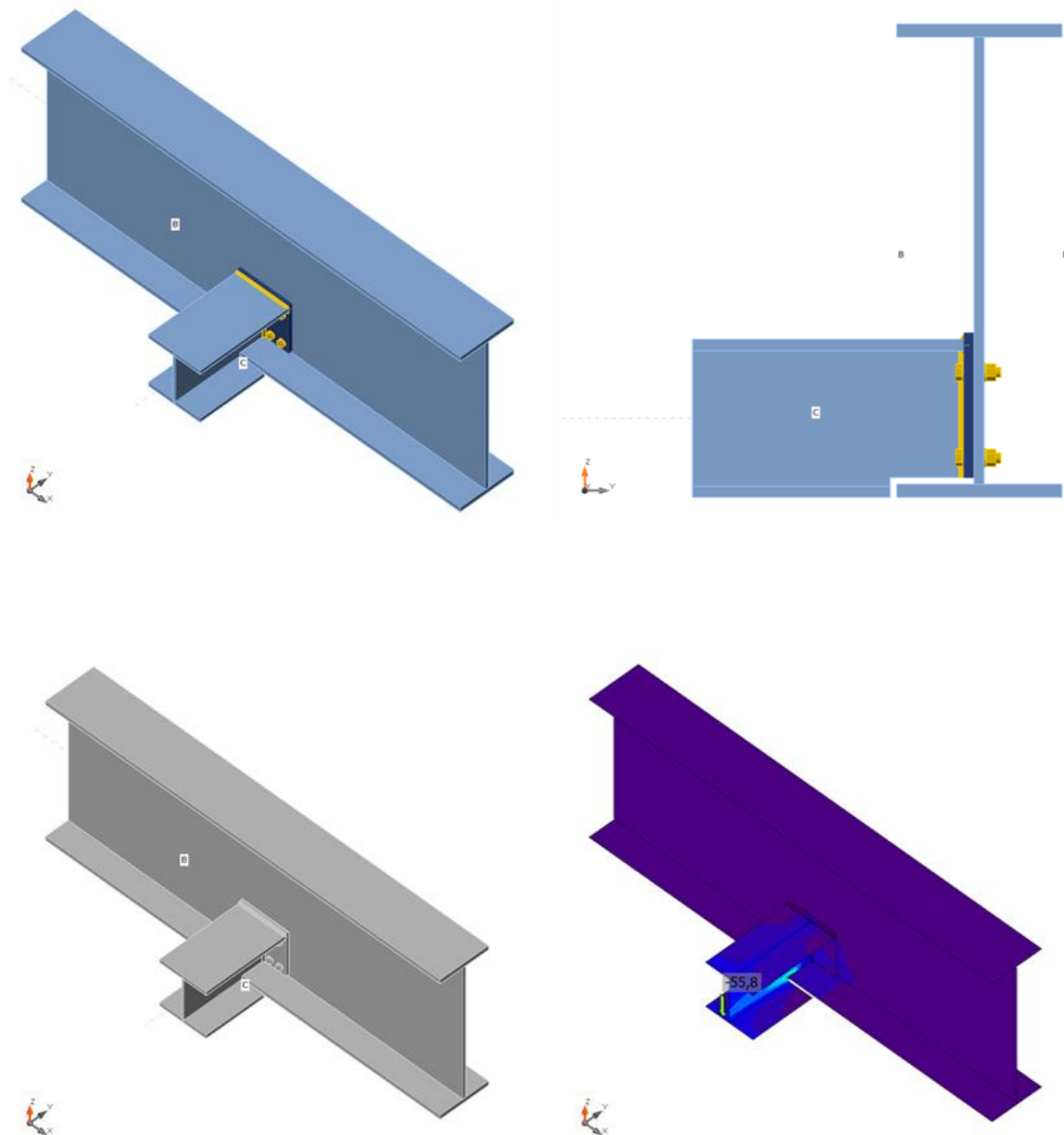
Green garden floor

Vibrant spaces
Architectural translation:

Second phase of improvements

Green pot details

Details of the I steel beams under the greenery bot of the garden.

Surface covering
Sand
Grind
Waterproofing layer
Filter sheet
Drainage board
Waterproofing layer
Separation layer
Thermal isolation
Hollow-core slab (2400x3600)

Growing medium

Tree

Sheet metal parapet cap
Prefabricated concrete wall

Growing medium

Cladding boards fixed to battens
Horizontal battens (40x50x3600)
Counter battens
Waterproofing layer
Thermal isolation
Prefabricated concrete wall

Timber profile
Ventilation grid (180x105)

Detail of the greenery bot on the garden roof.

Vibrant spaces
Architectural translation:

Third phase of improvements

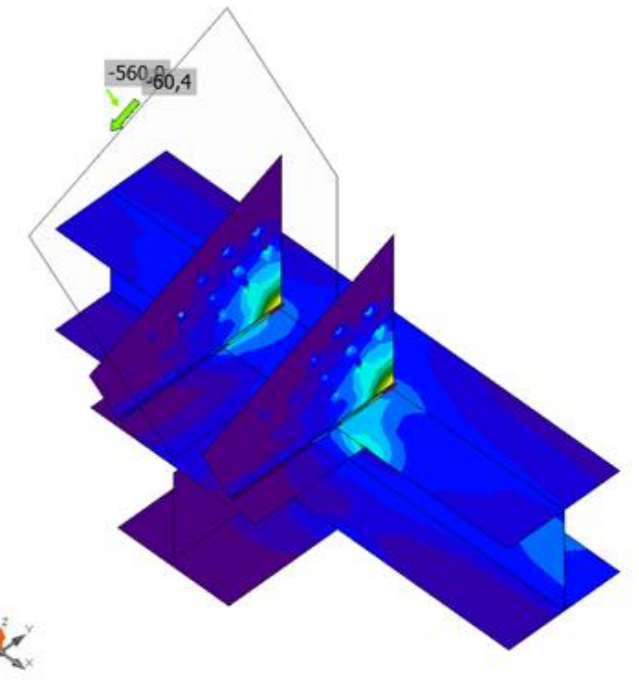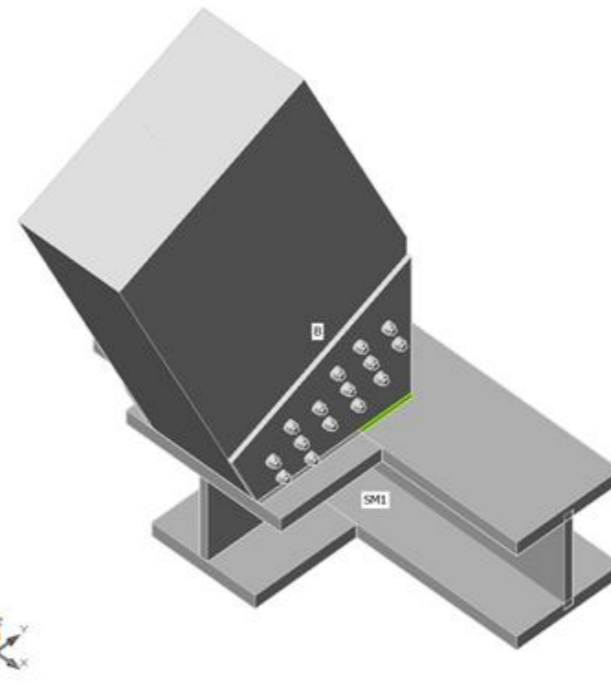## Timber frame details

Surface covering
Filter sheet
High efficiency screed
Under floor heating system
High efficiency screed
Waterproofing layer
Thermal isolation
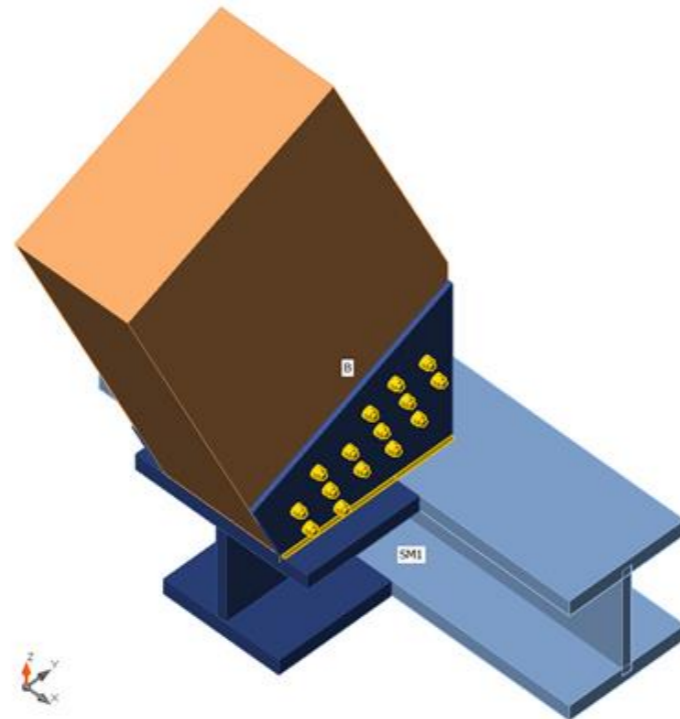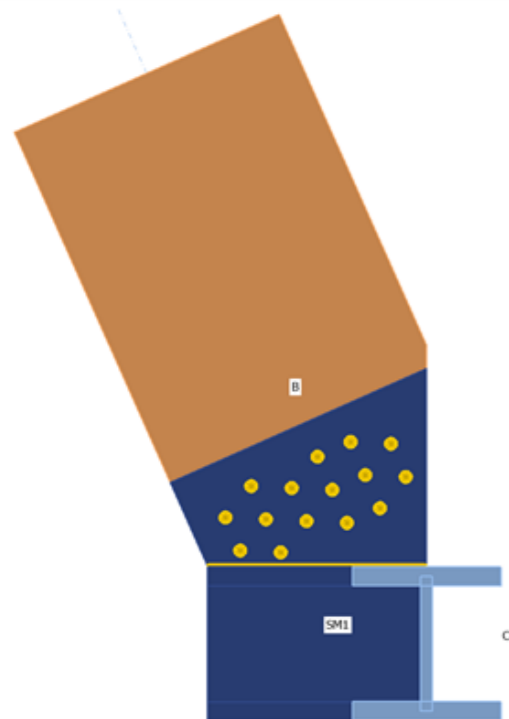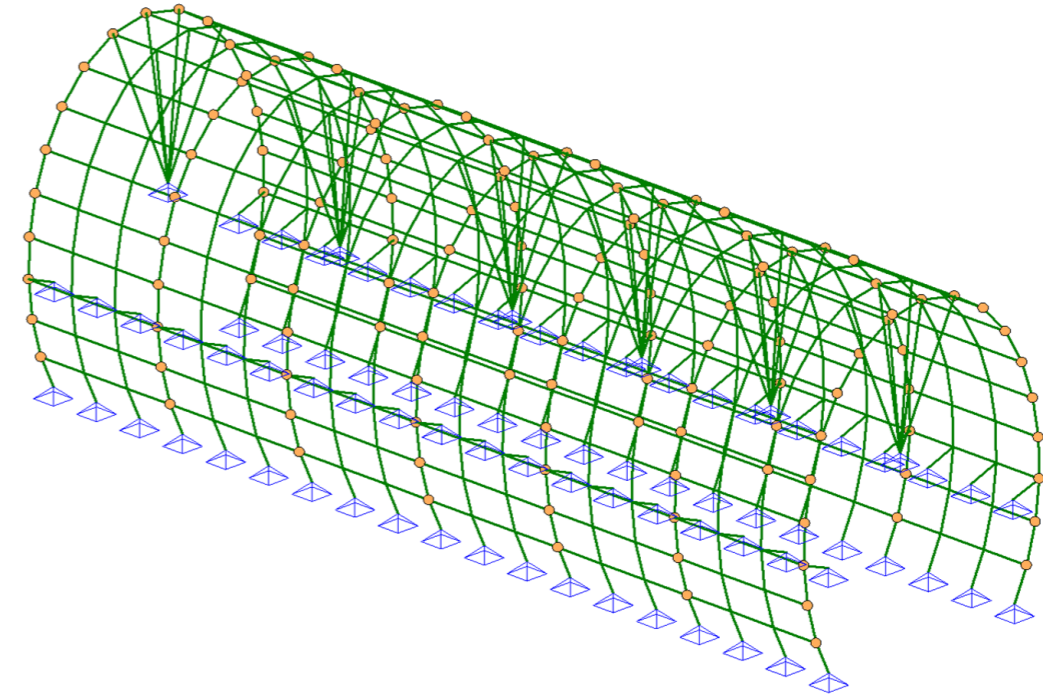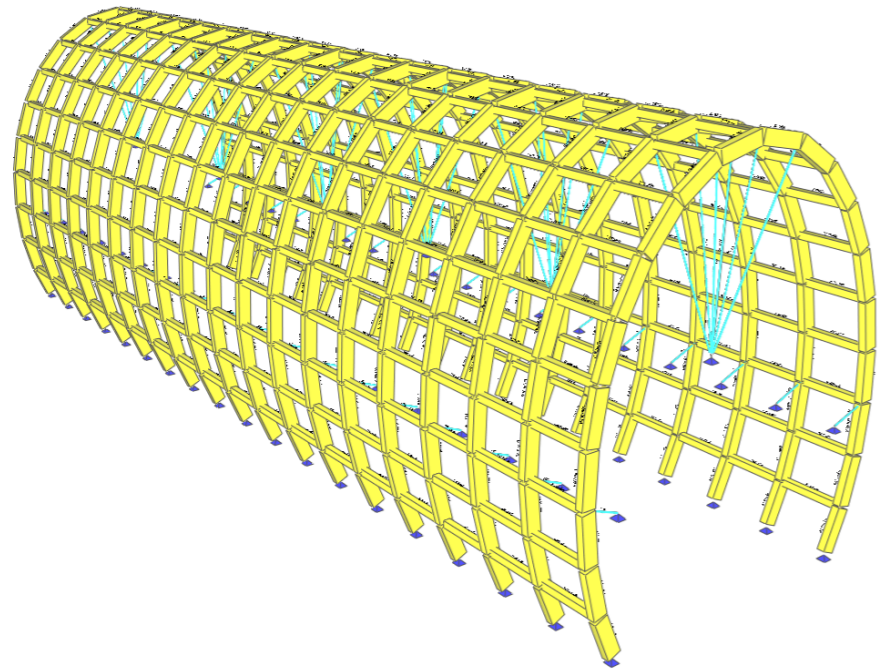Prefabricated concrete floor

3D Image of the connection
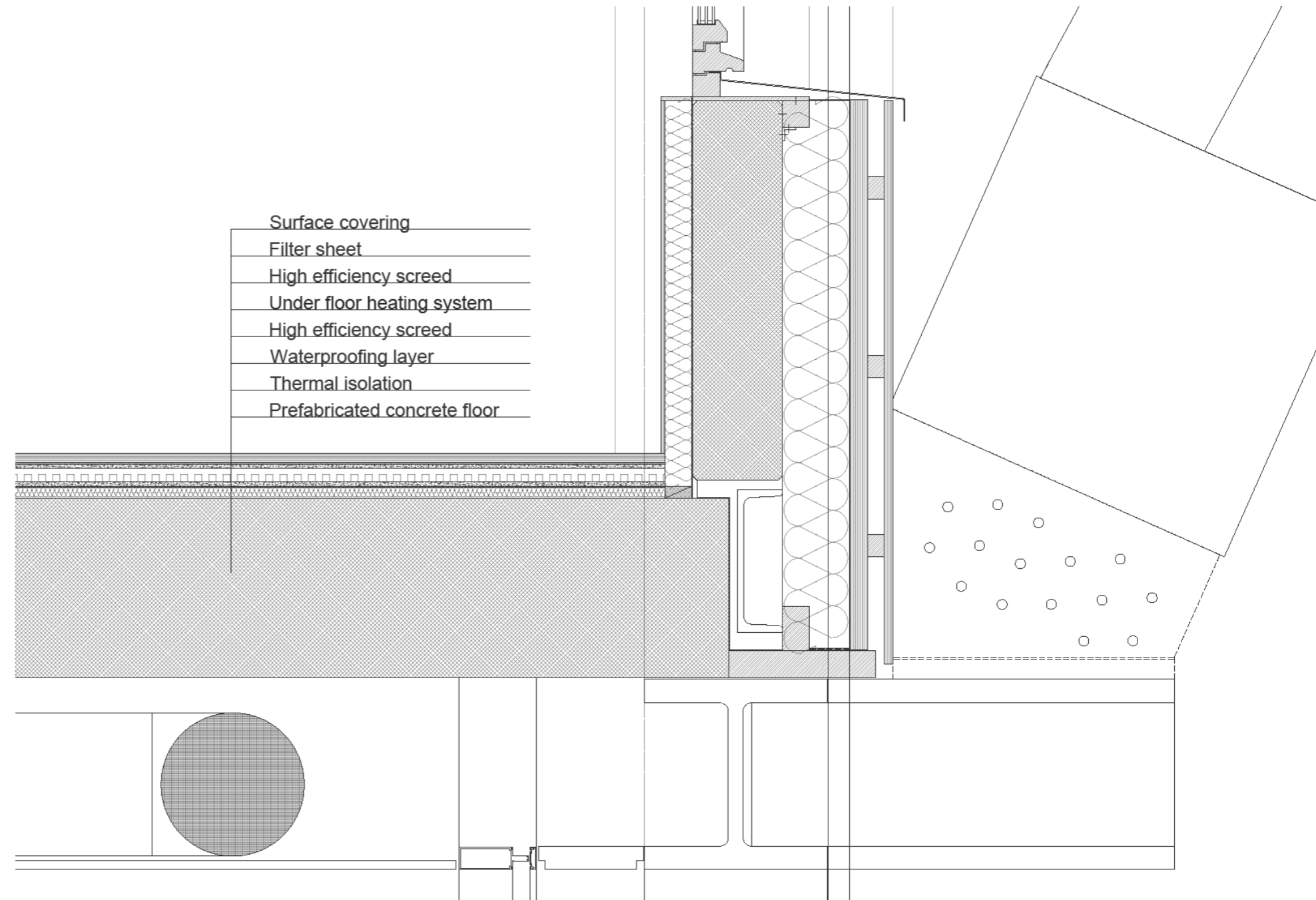
Detail of the timber frame connection to the building structure.

Vibrant spaces
Architectural translation:

Third phase of improvements
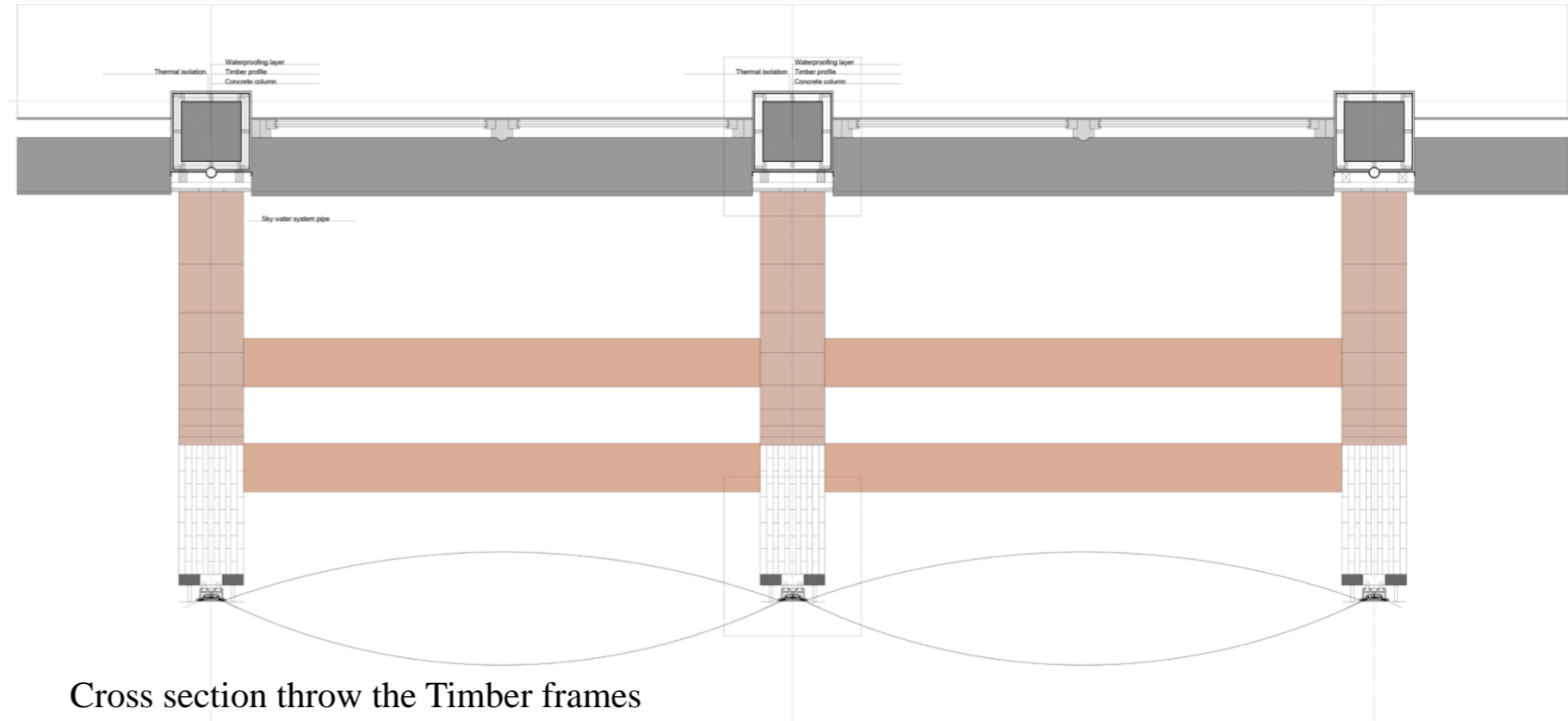
Timber frame details
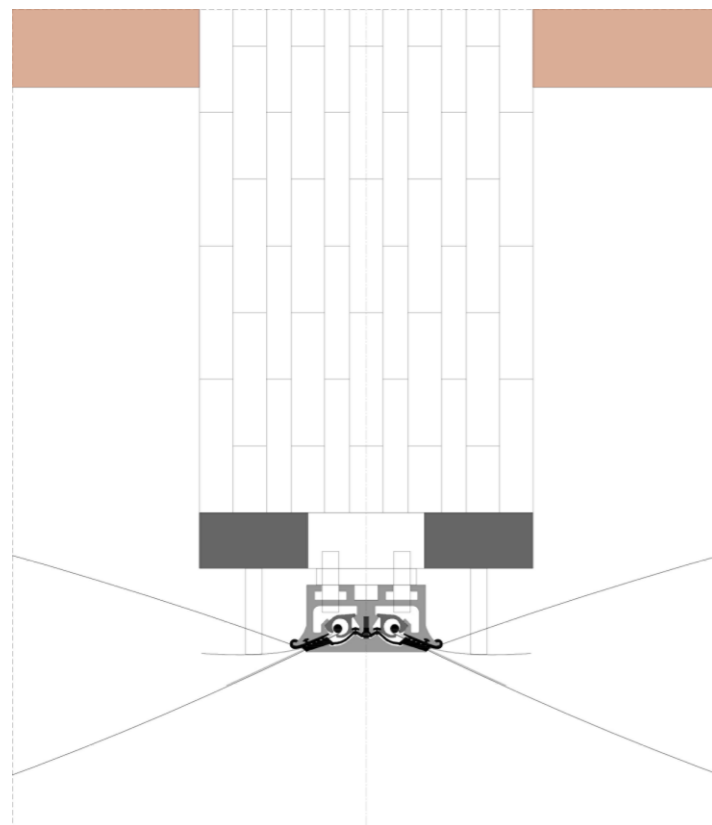
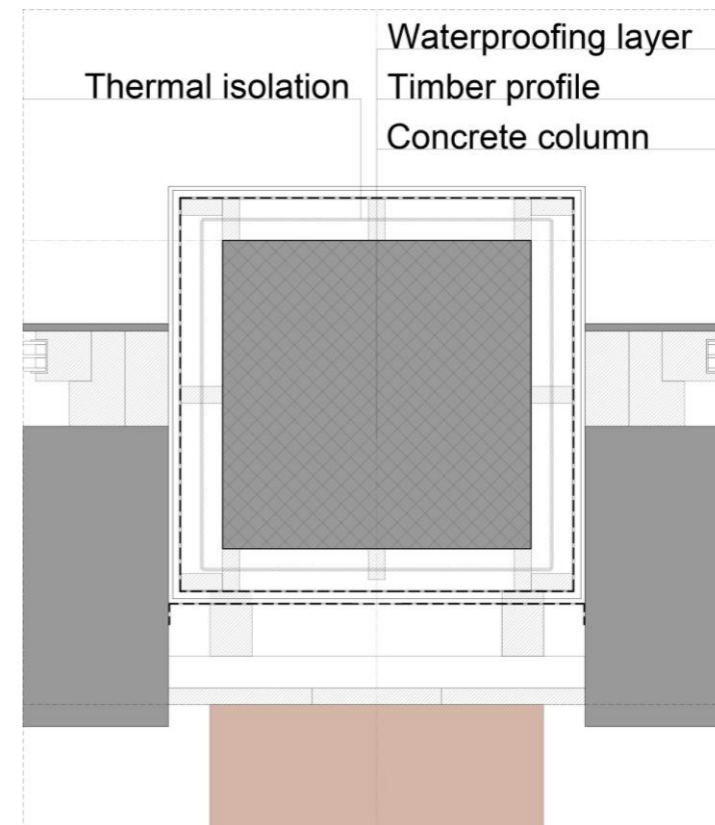# Vibrant spaces
Architectural translation:

ETFE cushions details

3D Image of the ETFE cushions

Cross section throw the Timber frames
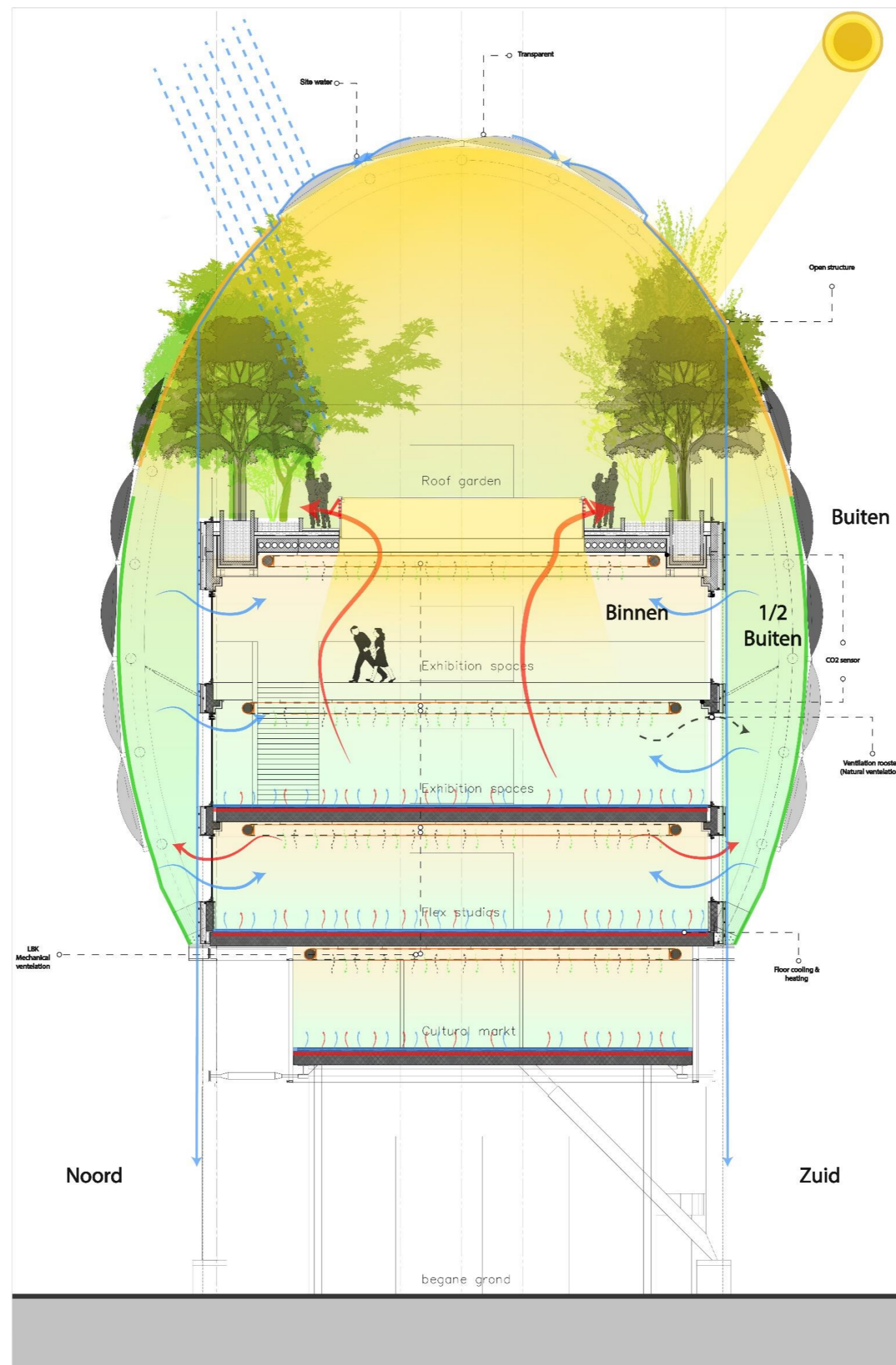

ETFE cushions detail

Thermal isolation

Waterproofing layer
Timber profile
Concrete column

Column detail

Vibrant spaces
Architectural translation:

Climate scheme

Site water

Transparent

Open structure

Roof garden

Buiten

Binnen

1/2 Buiten

CO2 sensor

Exhibition spaces

Ventilation rooster
(Natural ventilation)

Exhibition spaces

Flex studios

LBK
Mechanical
ventilation

Floor cooling &
heating

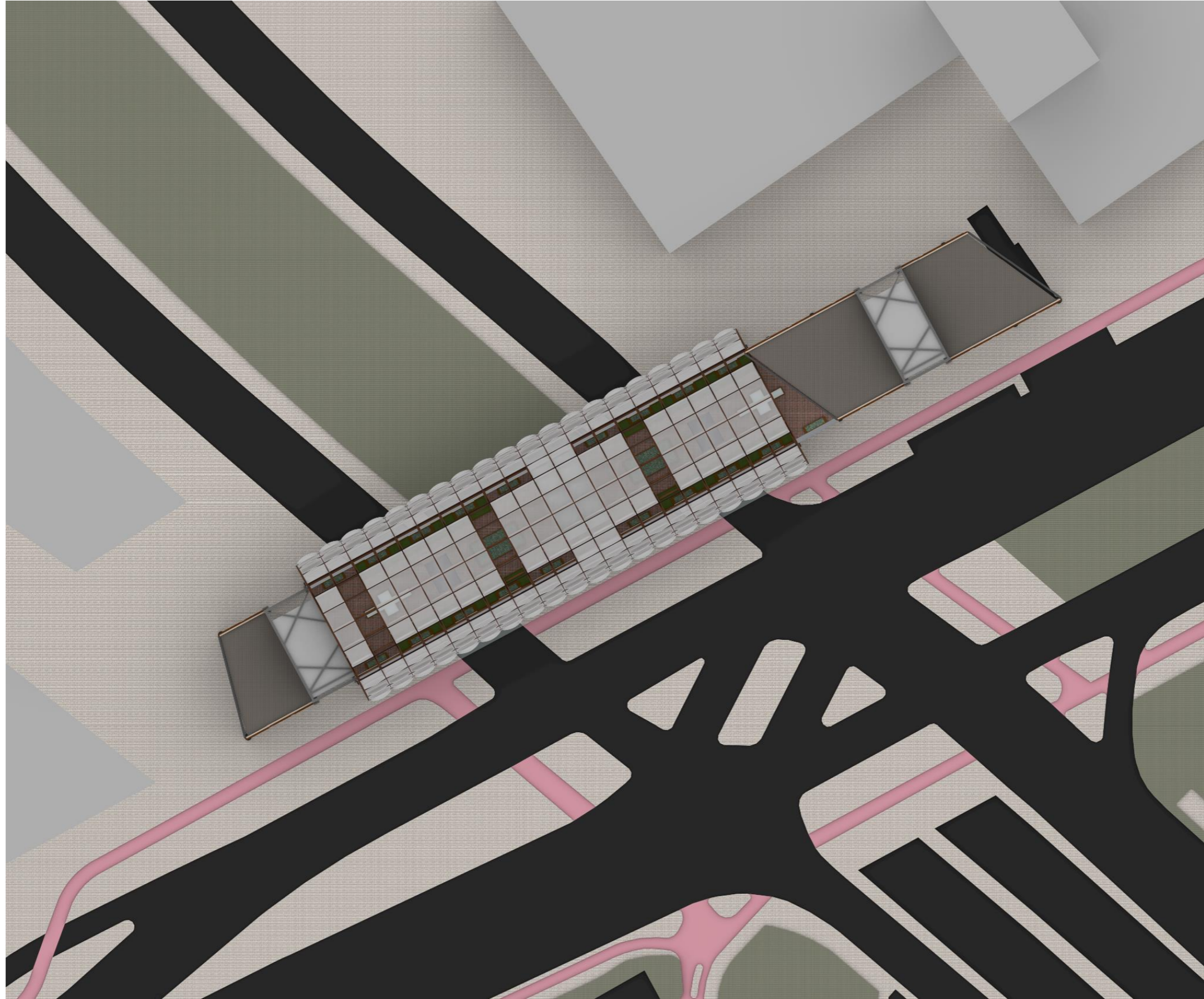Cultural markt

Noord

Zuid

begane grond

Vibrant spaces
Architectural translation:
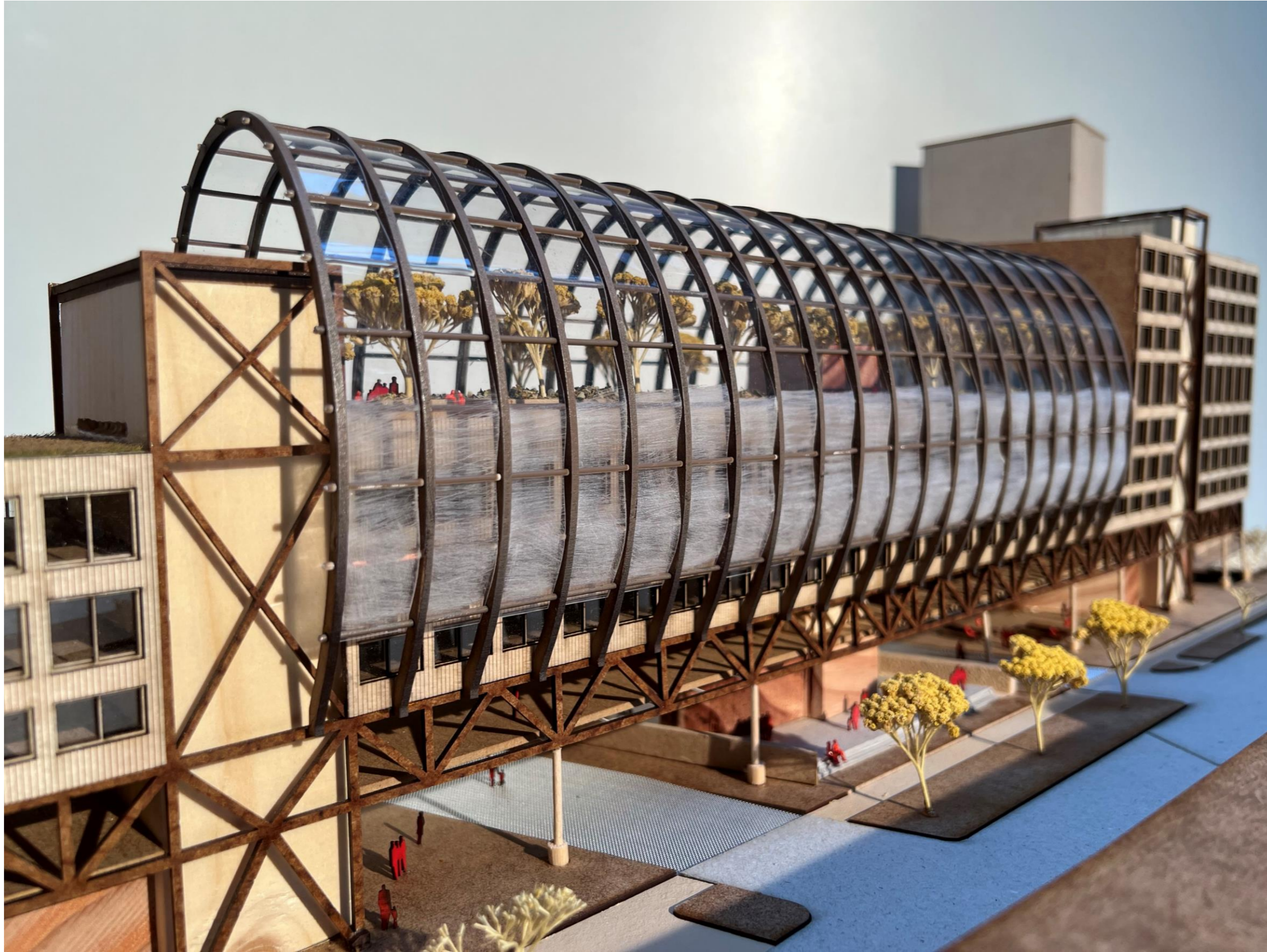
New situation drawing

Vibrant spaces
Architectural translation:

Final model's images

Vibrant spaces
Architectural translation:

Final model's images

Vibrant spaces
Architectural translation:

Final model's images

Vibrant spaces
Architectural translation:

Final project's images

Vibrant spaces
Architectural translation:

Final project's images

Vibrant spaces
Architectural translation:

Final project's images

Vibrant spaces
Architectural translation:

Final project's images

Vibrant spaces
Architectural translation:

Final project's images