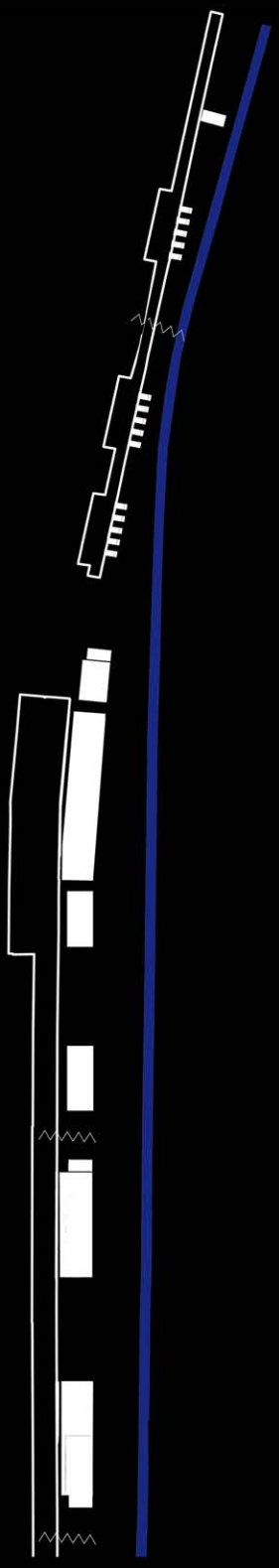


PEST LOWER EMBANKMENT(Belgrád rkp.) REVITALIZATION

Department of urban planning and design

supervisor :Dr. Szabó Árpád
student : rand sukkar

PEST LOWER EMBANKMENT(Belgrád rkp.) REVITALIZATION

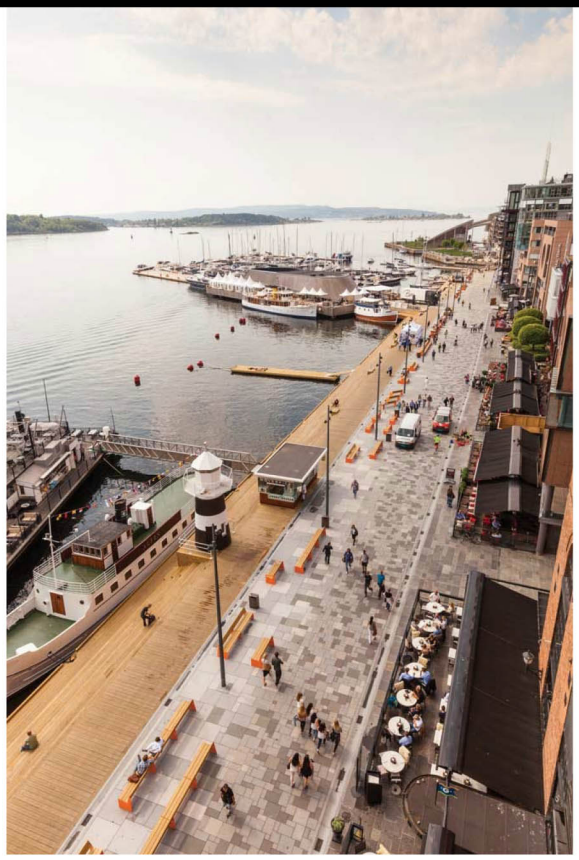
Background

This project focuses on the transformation of the historic Pest Lower Embankment in Budapest, a significant yet underutilized urban space. The revitalization aims to enhance the area's aesthetic appeal, functionality, and environmental sustainability, thereby reconnecting the city with its vibrant waterfront. the project seeks to create a dynamic public realm , while addressing contemporary urban challenges. This revitalization will not only rejuvenate the embankment but also contribute to the broader urban regeneration goals of the city.

The importance of projects like river embankment revitalization lies in their multifaceted benefits, enhancing urban aesthetics and sustainability while promoting economic and social well-being. These projects transform underutilized areas into vibrant, attractive public improving environmental quality and resilience. By boosting local economies through increased tourism and property values, they foster economic growth and investment. most importantly for such public projects , they create accessible, multifunctional spaces that encourage social interaction and community activities, significantly enhancing the quality of life for residents and fostering a stronger sense of community.

Similar projects :

Aker Brygge



Designed by : LINK Landskap
Location
OsloNorway

Client
Norwegian Property (NPRO)

Status
Completed

Gross Area
10.000 m²

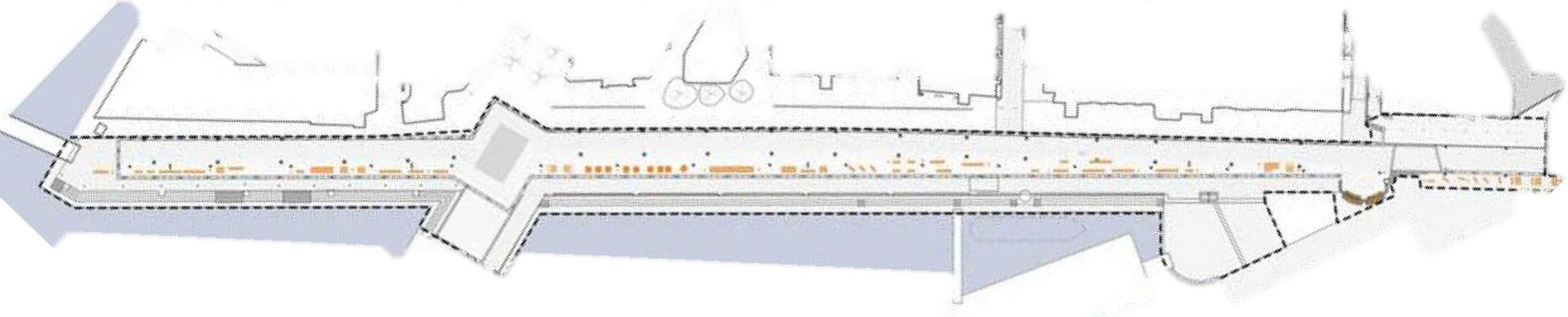
LINK Landskap has revitalized Oslo's largest and most dynamic harbour promenade, **with several publicly accessible residences, which facilitate social interaction by the water**.

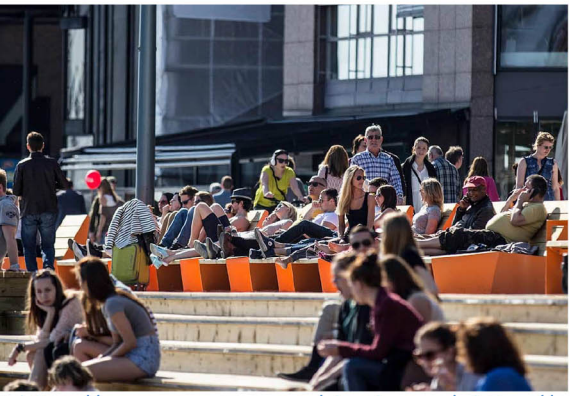
he outdoor areas are of great importance to Aker Brygge as a district. The renovation facilitates social interaction to a greater extent than before. The aim was to create public zones for rest and recreation without having to visit restaurants or bars. The promenade promotes city life in general and contributes to even more people visiting the district.

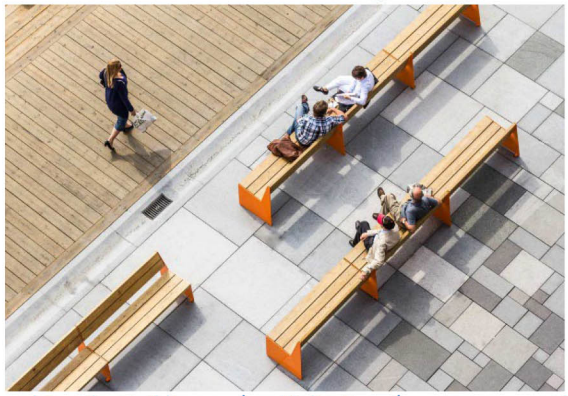
The overall revitalization project for Aker Brygge won the City Award 2016.

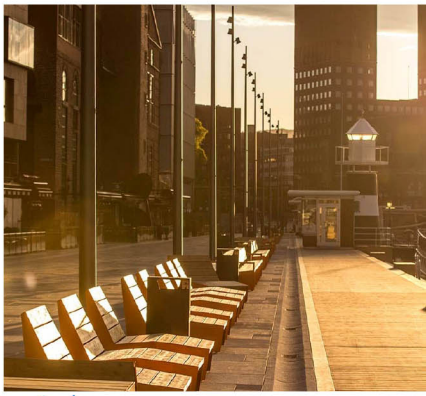
Bjørvika covers a total of 820 000 m2. 40% of this will be turned into parks, commons (known as “allmenning” in Norwegian) and a 3 kilometer long waterfront promenade.

Some of the commons are organized for high activity, culture, art, shopping and restaurants. Others are meant for recreation, sports, quiet contemplation and experiencing closeness to nature and the fjord.







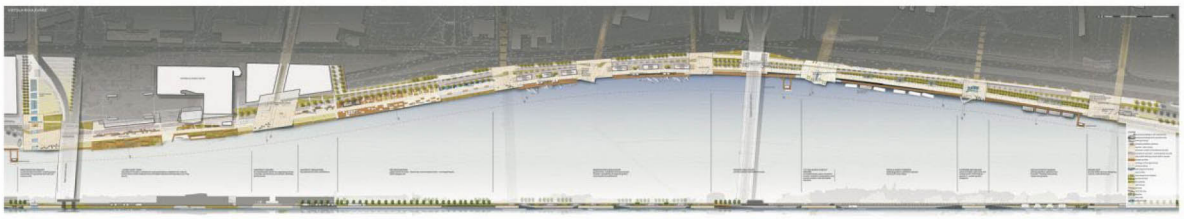


f. https://www.spacegroup.no/aker-brygge/ , https://www.bjorvikautvikling.no/portfolio-item/commonspace_bjorvika/ , tps://landezine-award.com/aker-brygge-the-city-floor/ , https://www.designboom.com/architecture/link-arkitektur-stranden-aterfront-promenade-aker-brygge-oslo-05-13-2014/

Vistula Boulevards

designed by RS Architektura Krajobrazu , Scale: 8,7 hectares
Location: Poland / Warsaw / Type: Waterfronts / Built: 2017 /

Vistula Boulevard is situated on one of the most attractive parts of the central Warsaw stretching between historical and new urban areas. The proximity of those touristic places created opportunities for the high-quality outdoor mixed-use and leisure destination that would not only return the river back to the city but also link disjointed uses and functions. When addressing the site of the disconnected Vistula river, RS Landscape Architects concentrated on few major design aspects: to create unique and 'accessible to all' public space, form an urban continuity by improved communication, allow the site to be floodable and to offer recreational and social functions bringing community and visitors together all year round. The design process included the program of local community engagement.



The linearity is defined by bike lane set along the riverside and vertical elements (trees, pavilions, pergolas) establishing a clear circulation strategy and use of the site. The unique character of the site was an important matter during the design process in creating major community destination, a true meeting place where locals and visitors interact, relax and are entertained. The boulevard offers different functions and can be divided into the three areas. The area opposite the Old Town, celebrates historic setting and responds to the classical layout which includes walkway with docking deck, green zone and relaxation hub with floating cafes. Another strip located near commercial development offers catering services from the sequence of 'floating' pavilions that are designed to deal with occasional flooding. The last strip evolved to accommodate recreation and educational type of functions and become the main destination of the boulevard and its heart. It consists of the park with podiums, beach with pavilions, amenity lawns, educational zone and expo pavilions.

. https://landezine.com/vistula-boulevards-by-rs-architektura-krajobrazu/ , https://landscape.coac.net/en/node/177

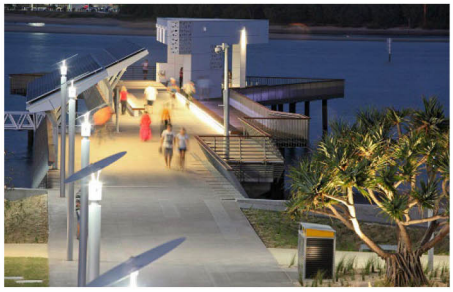
Southport Broadwater Parklands

designed by AECOM / Location: Australia / Gold Coast / Type: Parks / Playgrounds / Waterfronts / Built: 2010

AECOM Design + Planning (Studio: Brisbane): Incorporating exemplary landscape, contemporary built forms and integrated environmental design, Broadwater Parklands has been transformed into an iconic gateway for the Gold Coast and a popular destination, where events, history and water combine to create an active green waterfront. The redevelopment of the parklands has rejuvenated this magnificently located public land, previously dominated by a large asphalt car park, into a contemporary world class foreshore park.

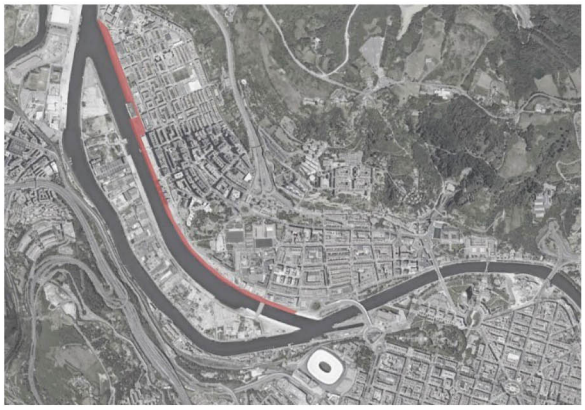
Some of the main features of the Parkland include: event lawns, bathing boxes, barbeque shelters and play equipment, a central community pavilion, extensive walking and cycling network, a new Anzac Park, a new 100m+ pier and the incredibly popular 'Rockpools' (boutique children's waterplay space).



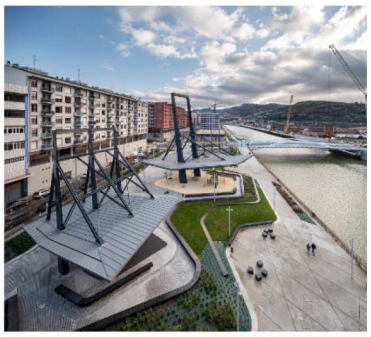
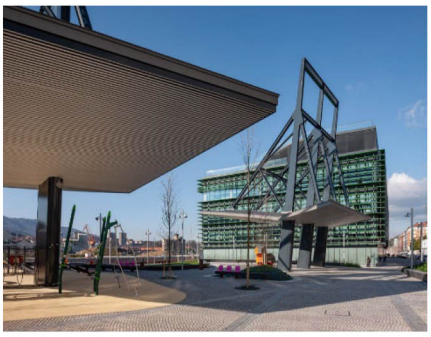
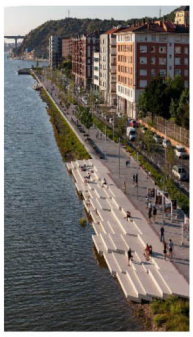
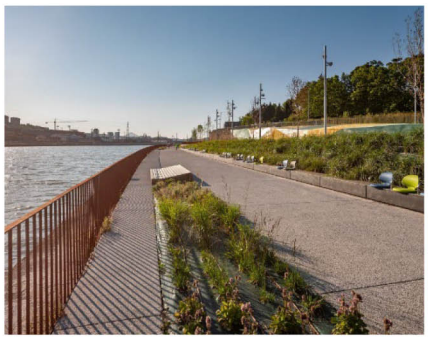


Zorrozaurre Waterfront

by G&C arquitectos + JDVDP architects

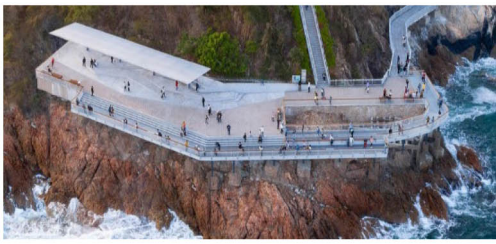


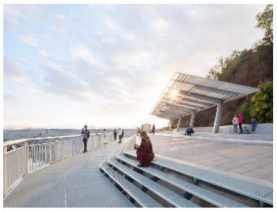
Public Projects / Public Projects / Spain / Built in 2020 / The Zorrotzaurre project is the latest large operation towards urban regeneration launched in Bilbao. It represents a complete and sustainable plan to recover what is now a degraded area, in order to transform it into a new district; well connected to the city centre, with convenient housing developments, zones for non-polluting companies, numerous social and cultural facilities, and extensive areas for public relaxation. The project´s Master Plan was designed by architect Zaha Hadid, and it contemplated the complete opening of the Channel of Deusto, and the consequent transformation of the Zorrotzaurre peninsula into an island. This means that Zorrotzaurre is today a key element in the transformation of Bilbao. The radical opening of the historic Channel is meant to establish for the future island its complete integration in the everyday life of the metropolitan Bilbao.

Ref. https://landezine-award.com/zorrozaurre-waterfront/
Ref. https://landezine.com/southport-broadwater-parklands-by-aecom-design-and-planning/

Yantian 19.5km Waterfront Boardwalk / eLandscript Studio





Architects: eLandscript Studio

Area: 200000 m² , Year: 2020 , City: Shenzhen ,China

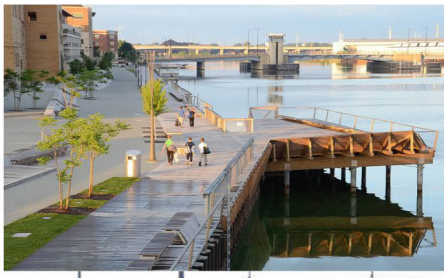
leisure path, with tourist and sports elements, also extends to Seafood Street, which is a promenade along with local commercial blocks. It provides open spaces with higher inclusiveness and flexibility. By taking the chance of reconstruction, the Waterfront Boardwalk links up the fragmented urban fabric with the natural tourist spots, redefining the relationship between the living and natural landscape.

The CityDeck / StossLU

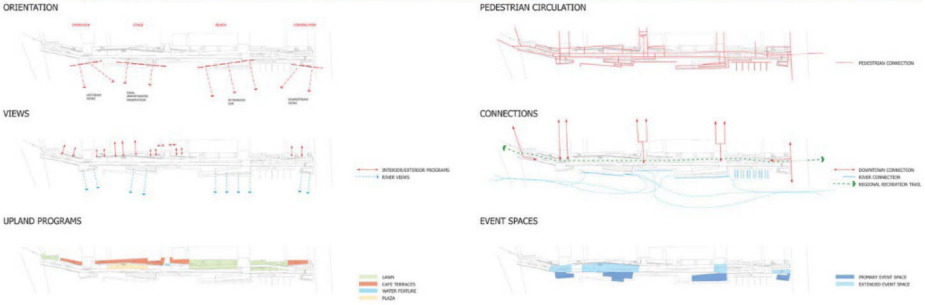
Architects: StossLU

GREEN BAY, UNITED STATES , Year: 2010

The CityDeck by StossLU is a two-acre long strip of riverfront land developed primarily to increase access to the Fox River and to foster civic and social presence on its edge. The first stage of this multiphase project sought to directly engage community members and city officials in the re-activation of the site. The main goal of the project was to infuse a programmatic dependency between the new public park and the under occupied surrounding city blocks. Flexible paved areas specifically sited near street entrances serve as zones for larger spontaneous gatherings or planned events at a civic scale. The diverse quality of spaces created by these elements bring a degree a flexibility to the project leaving its ultimate use up to its users.

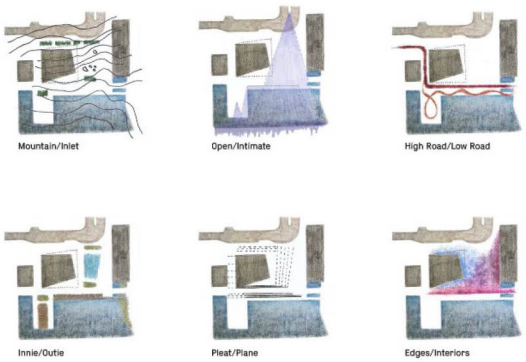


The seemingly simplistic formal and material logic laid out in the project breeds a spectrum of complex relationships between the park-goer the city and the river.



Ref. https://www.archdaily.com/958428/yantian-1km-waterfront-boardwalk-elandscript-studio , https://landezine-award.com/yantian-19-5km-waterfront-boardwalk/

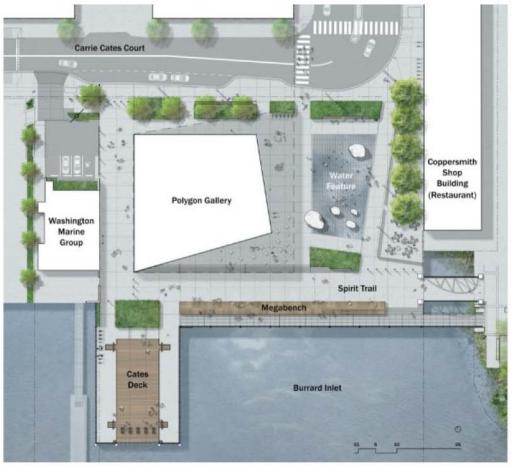
Foot of Lonsdale



Designed by Hapa Collaborative /

Location: Canada / Vancouver / Type: Squares and Plazas / Water features / Waterfronts / Built: 2018

By understanding the scale and flexible program for the site, we were able to make a place which feels good when empty but is open enough for a crowd. The design was sensitive to the magnitude of its dazzling neighbours, the Polygon and the waterfront, by focusing on two over-scaled and elegantly detailed elements: The Megabench and the water feature.



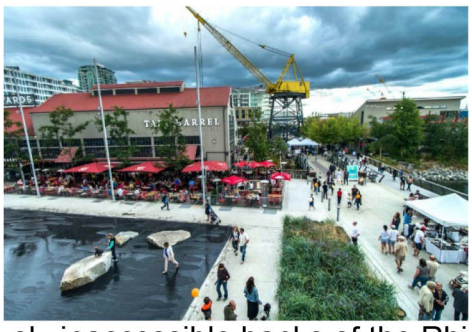
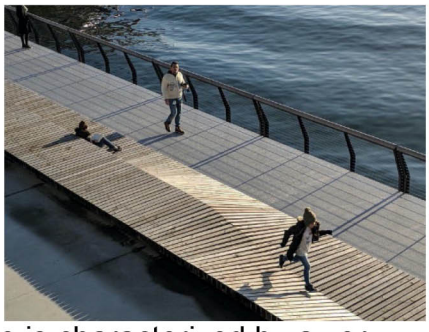
The Megabench is a three-meter-wide and 50-meter-long deck. Its undulating form mimics an ocean wave as well as the wooden bike ramps built throughout the forests of North Vancouver's mountains. The bench bridges a grade change of eighteen inches, from the plaza down to a metal grate walkway hovering over the water. This dip means that the view from the plaza is not interrupted by guardrails and gives the bench and walkway a feeling of closeness to the water and separation from the bustle of the plaza.

Rhine Boulevard

designed by Planorama Landschaftsarchitektur /

Location: Cologne / Germany / Type: Riverbanks / Built: 2016 /

Planorama Landschaftsarchitektur: Through the competition Rheinboulevard Cologne´, the city of Cologne saw the opportunity to improve the district of Deutz on the east side of the river. With the hope that its improvements would help connect the right side of the Rhine bank with the city center, which had previously been divided.

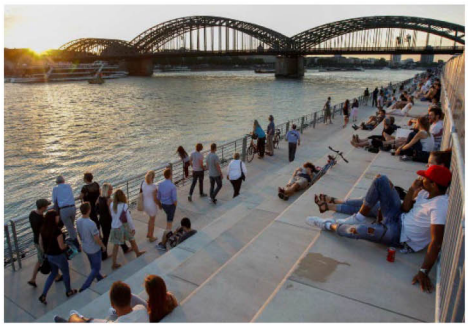
The new development on the previously inaccessible banks of the Rhine is characterized by a very high and complex watercourse architecture, constructed to extensive flood protection requirements.

Ref. https://www.archdaily.com/158661/the-citydeck-stosslu , https://www10.aeccafe.com/blogs/arch-showcase/2011/10/15/the-citydeck-in-green-bay-wisconsin-by-stoss-landscape-urbanism/ , https://architizer.com/projects/the-citydeck/

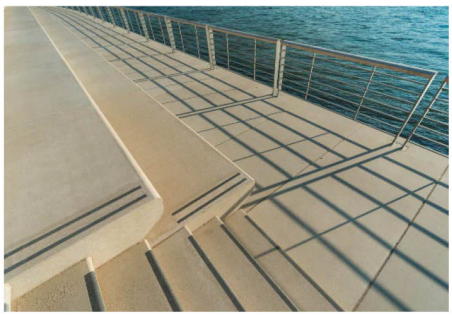
Ref. https://landezine.com/foot-of-lonsdale/

Furthermore, archaeological finds from the construction site helped illustrate the city's 2000 years of history and parts have been integrated into the design.

For the mediation of the project, several procedures for citizen participation and joint planning workshops were carried out. In July 2015, was the opening ceremony for the Rhine Bank steps, since then it has become a destination for Cologne's citizens. As the project was organized within the framework ´Regionale 2010´program, it received funding from the urban development program, in the category of supporting urban renewal.



The recovery of areas by water as recreation spaces and the creation of atmospheric places on the water is still a major challenge for many cities in Europe. With the planning and realization of the Rhine Boulevard, we believe that through means of landscape architecture alone we have created a place that has changed the relationship between the city and river in Cologne, as well as making important contribution to discussions over city´s and their river banks. The city district Deutz, previously considered the less appealing side of the river, now offers generous access to the water and a place from which to enjoy the impressive panorama of Cologne's old town opposite Cologne´s cathedral. Attraction to the right side of the Rhine river has now been strengthened, and a public space has been created by the water, which has also served creating greater attraction to Cologne as a whole.



The construction work on the water was also a major structural engineering challenge with regard to statics and the construction process.

Ref. https://landezine.com/rhine-boulevard-by-planorama/

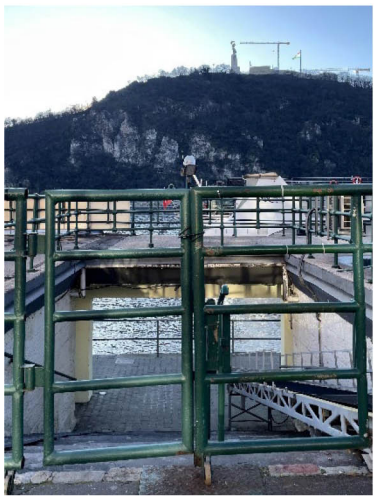
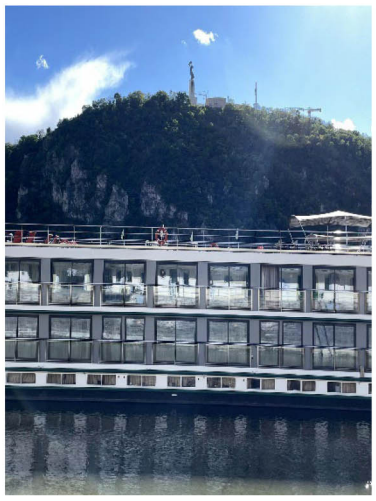
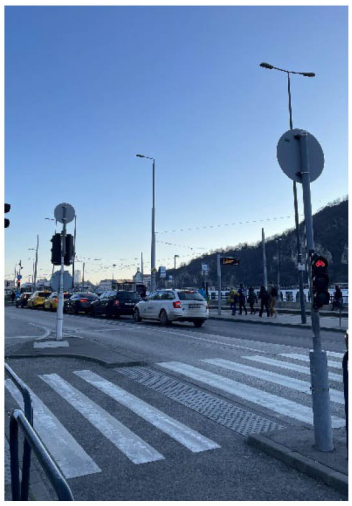
Project problem

The revitalization of the Pest Lower Embankment (Belgrád rkp.) is a crucial , and addresses several pressing issues while offering substantial benefits to the city of Budapest.

For multiple reasons:

Urban Connectivity and Accessibility:

The current state of the embankment is underutilized and disconnected from the rest of the city. Revitalization will improve pedestrian and cyclist access, creating seamless connections between the waterfront and the urban core.


Cultural and Historical Preservation:

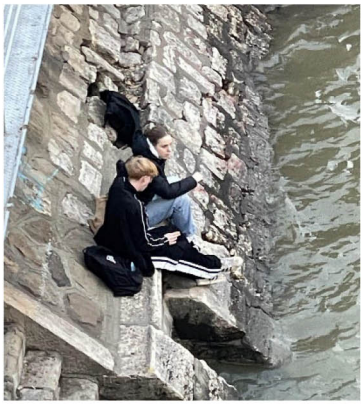
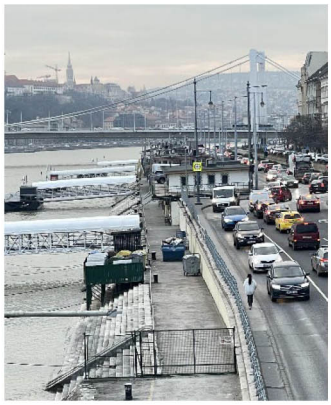
The embankment holds historical significance and cultural heritage. Revitalization efforts will preserve and highlight these aspects, making them more accessible and enjoyable for residents and tourists.



Social and Recreational Benefits:

Creating vibrant public spaces encourages social interaction and community activities. The project will provide recreational areas, promoting healthier lifestyles and enhancing

the quality of life for residents. Return the public space to public benefit all citizen and city users,in a viable built environment and spaces .

Flood Management and Resilience:

The embankment plays a critical role in flood defense. Modernizing its infrastructure will improve flood management capabilities, making the area more resilient to climate change impacts.


BUILDINGS SCALE challenges ,The existing structures along the Pest Lower Embankment (Belgrád rkp.) are underutilized and lack environmental sustainability. The revitalization project addresses this by :

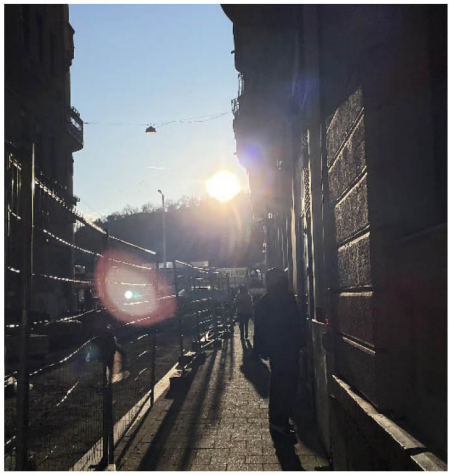
Making them viable and efficiently utilized through a series of innovative, sustainable strategies.

-solar studies will inform the placement of shading structures, ensuring optimal thermal comfort and reducing heat gain.

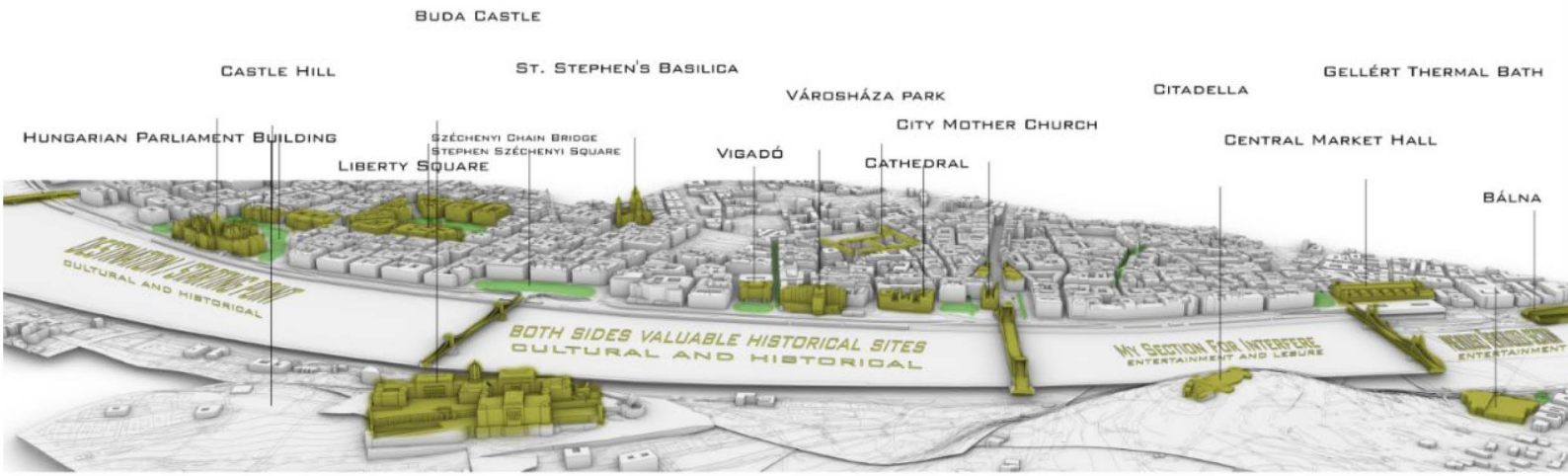
-Atrium-like ventilation will be integrated to enhance natural ventilation, promoting airflow and minimizing the need for artificial cooling.

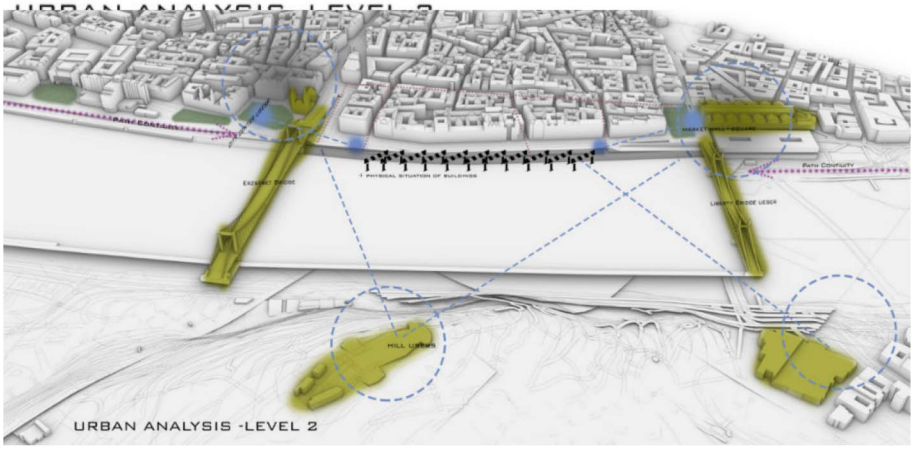
-the **development of spaces** with layered materials for thermal isolation and waterproofing will ensure energy efficiency and durability against flood and frost .

These interventions will not only improve the environmental performance of the buildings but also create more comfortable, functional, and aesthetically pleasing spaces, thereby revitalizing the embankment into a vibrant urban area.



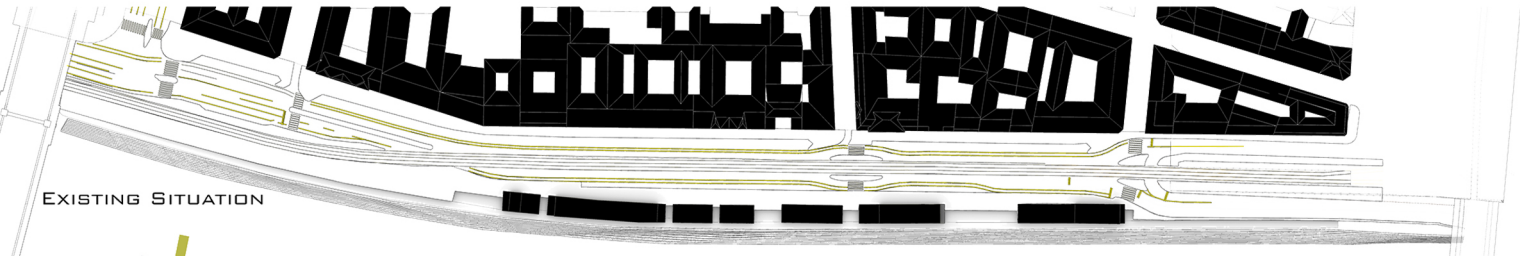
The design process :



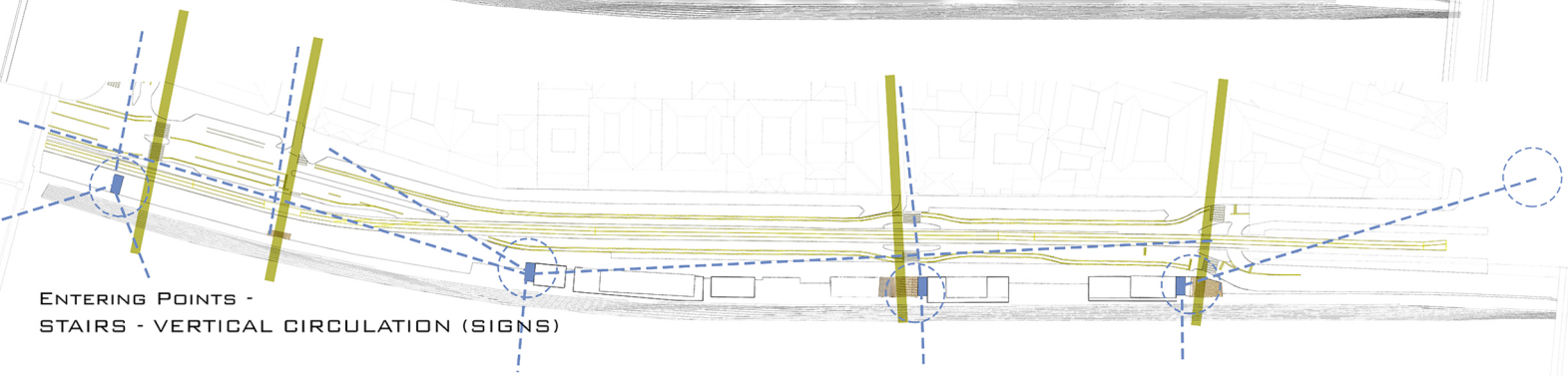


Urban design intervention

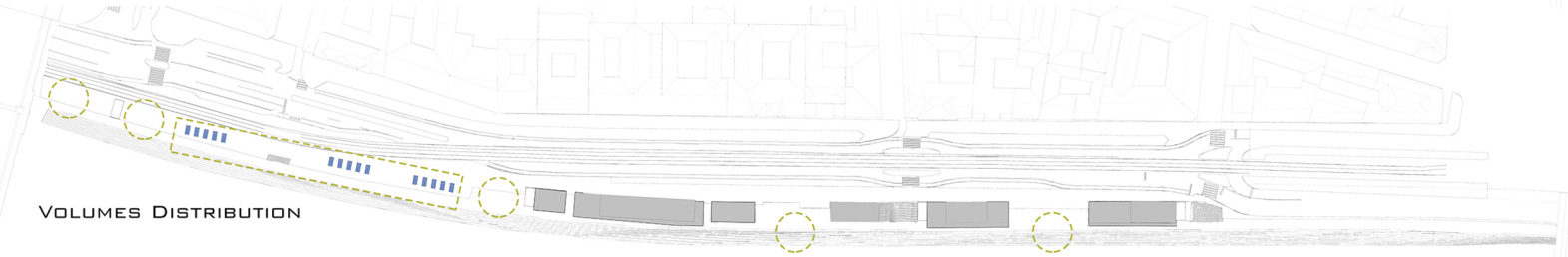
ENHANCED TRAFFIC SOLUTION FROM COMPETITION'S WINNING PROPOSAL



EXISTING SITUATION

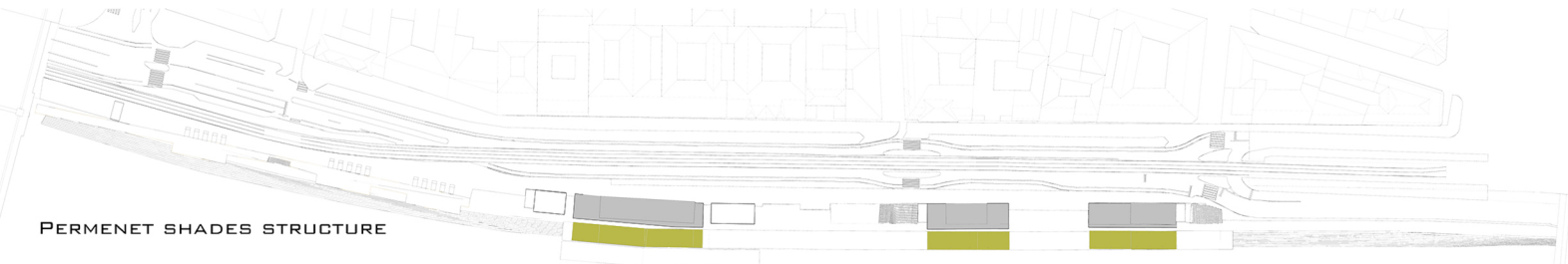


ENTERING POINTS -
STAIRS - VERTICAL CIRCULATION (SIGNS)

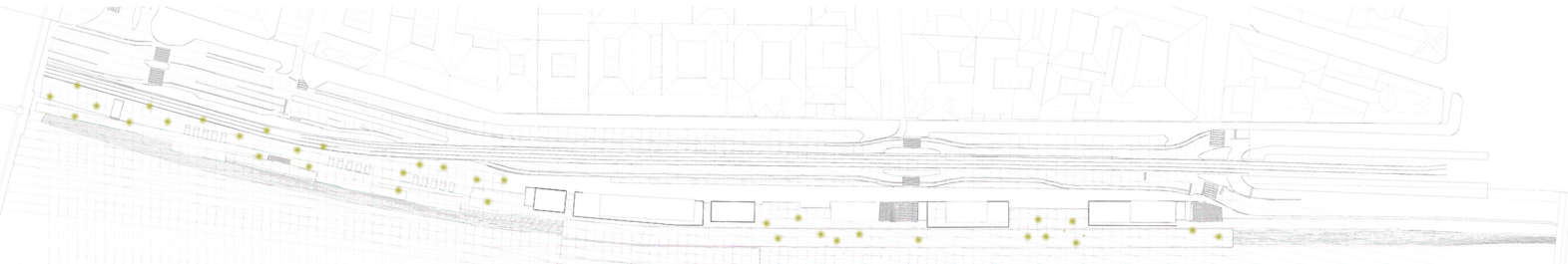


VOLUMES DISTRIBUTION

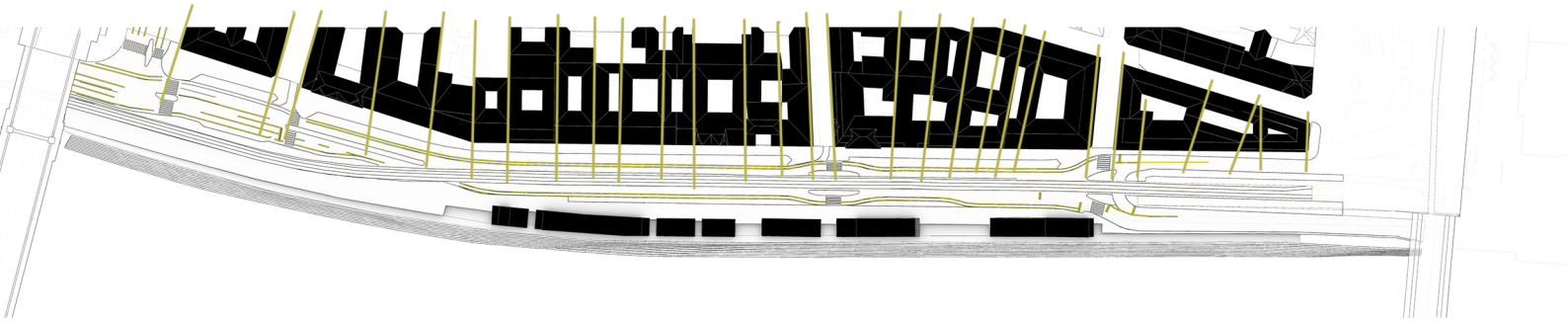
PATH EXTENTION

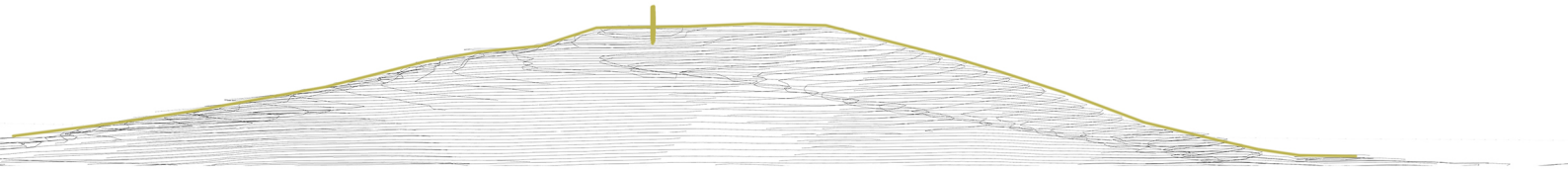


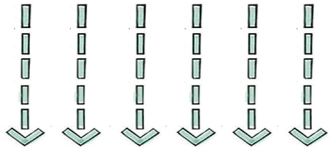
PERMENET SHADES STRUCTURE

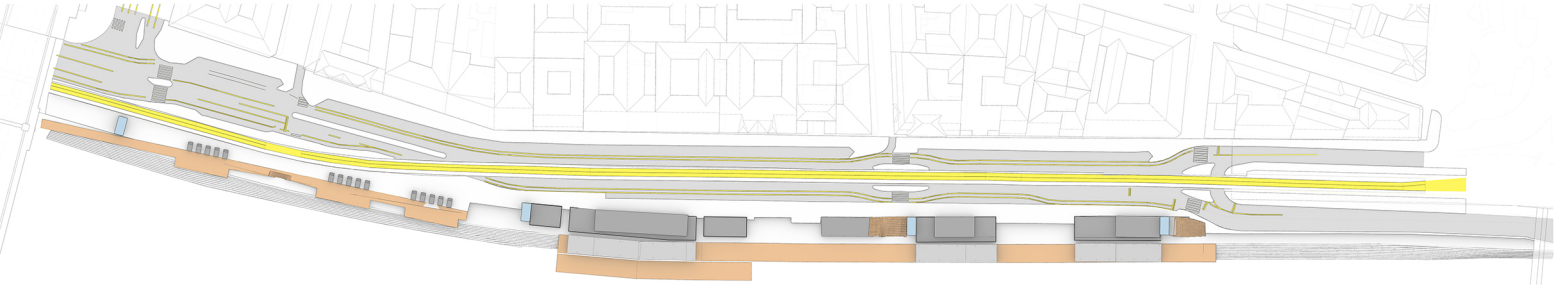


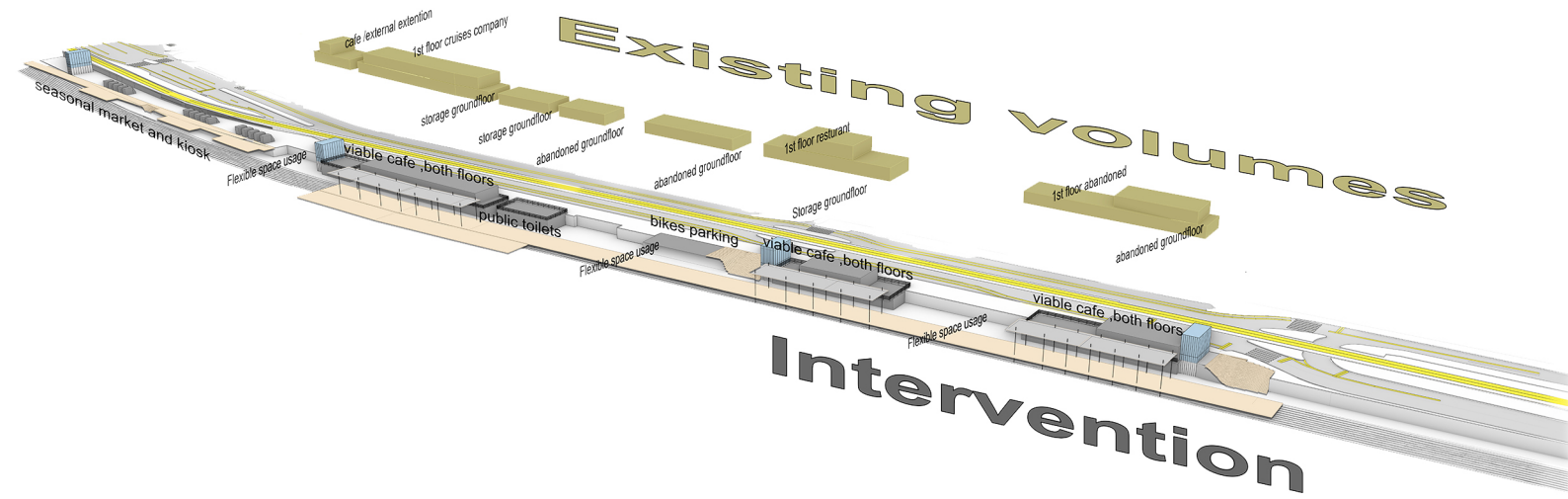
TEMPORARLY SHADES STRUCTURE







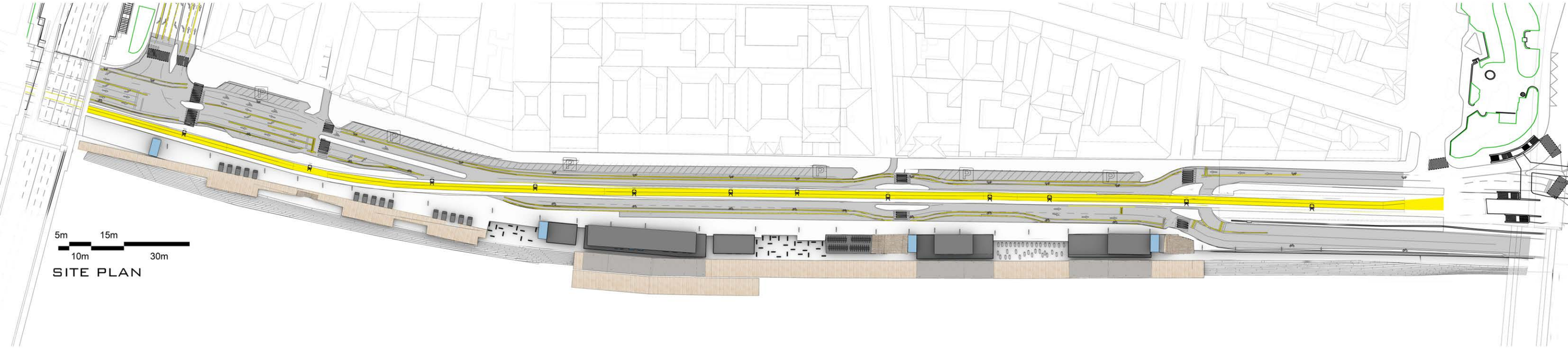



Existing volumes
cafe /external extention
1st floor cruises company
storage groundfloor
storage groundfloor
abandoned groundfloor
abandoned groundfloor
1st floor resturant
Storage groundfloor
1st floor abandoned
abandoned groundfloor
Seasonal market and kiosk
Flexible space usage
viable cafe ,both floors
public toilets
bikes parking
Flexible space usage
viable cafe ,both floors
Flexible space usage
viable cafe ,both floors
Intervention

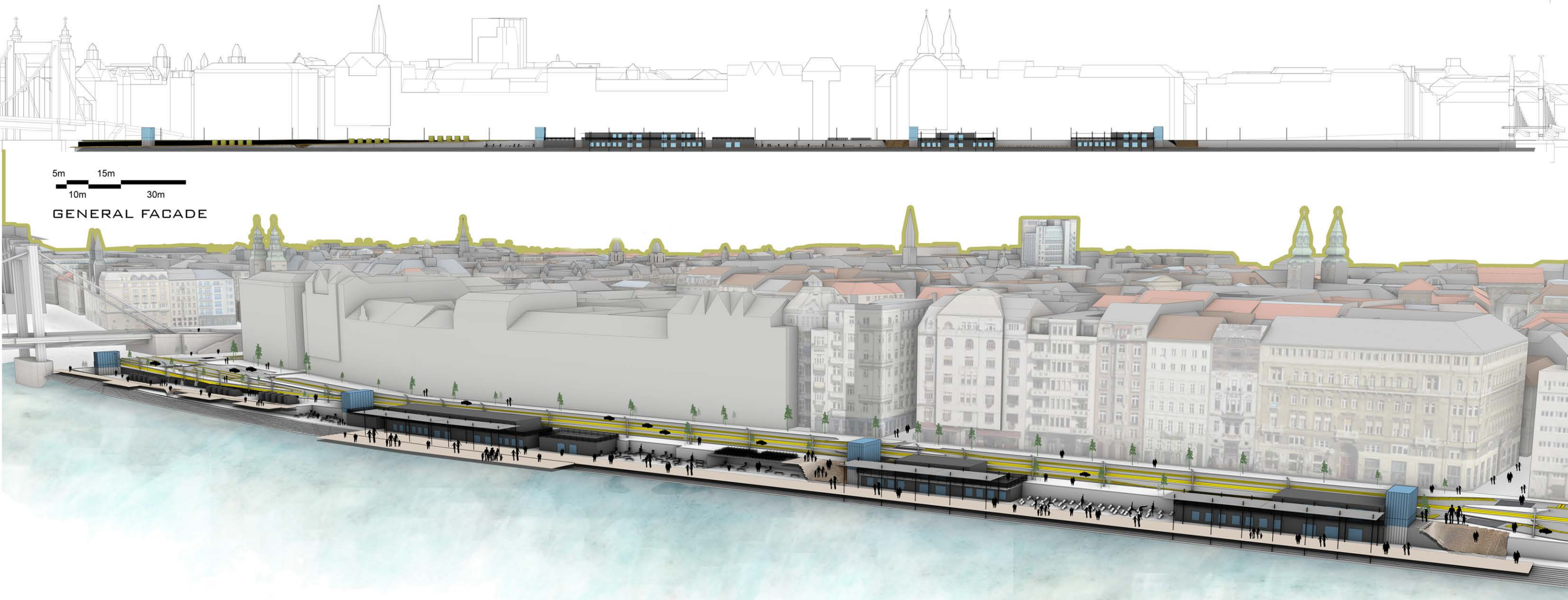
DIPLOMA

PEST LOWER EMBANKMENT(Belgrád rkp.) REVITALIZATION

2024



SITE PLAN



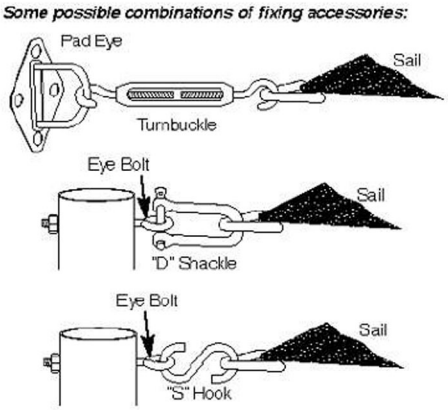
GENERAL FACADE

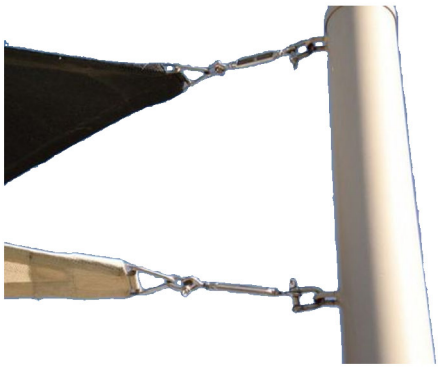
BUDAPESTI MŰSZAKI ÉS GAZDASÁTUDOMÁNYI EGYETEM
ÉPÍTÉSZMÉRNÖKI KAR / URBANISZTIKA TANSZÉK
urb.bme.hu

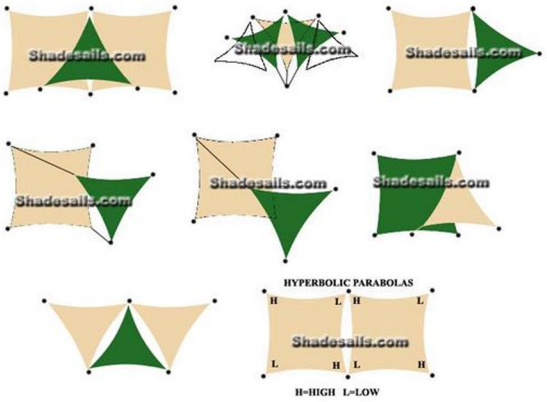
urb/bme

MŰEGYETEM 1782

FOR THE LAST STEP RELATED TO TEMPORARLY STRUCTURES AND FLEXIBLE SPACE :



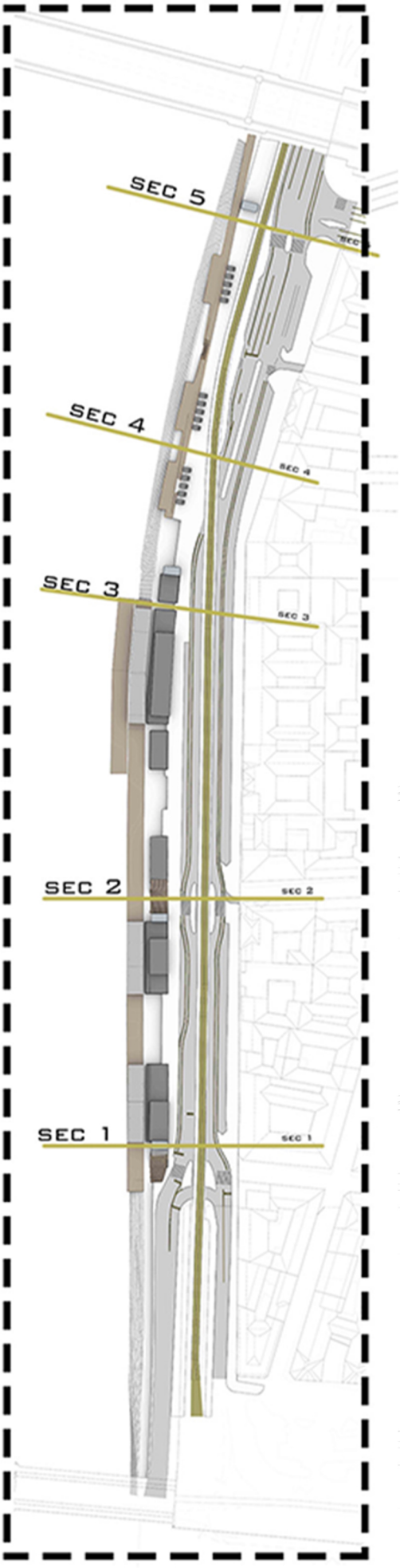


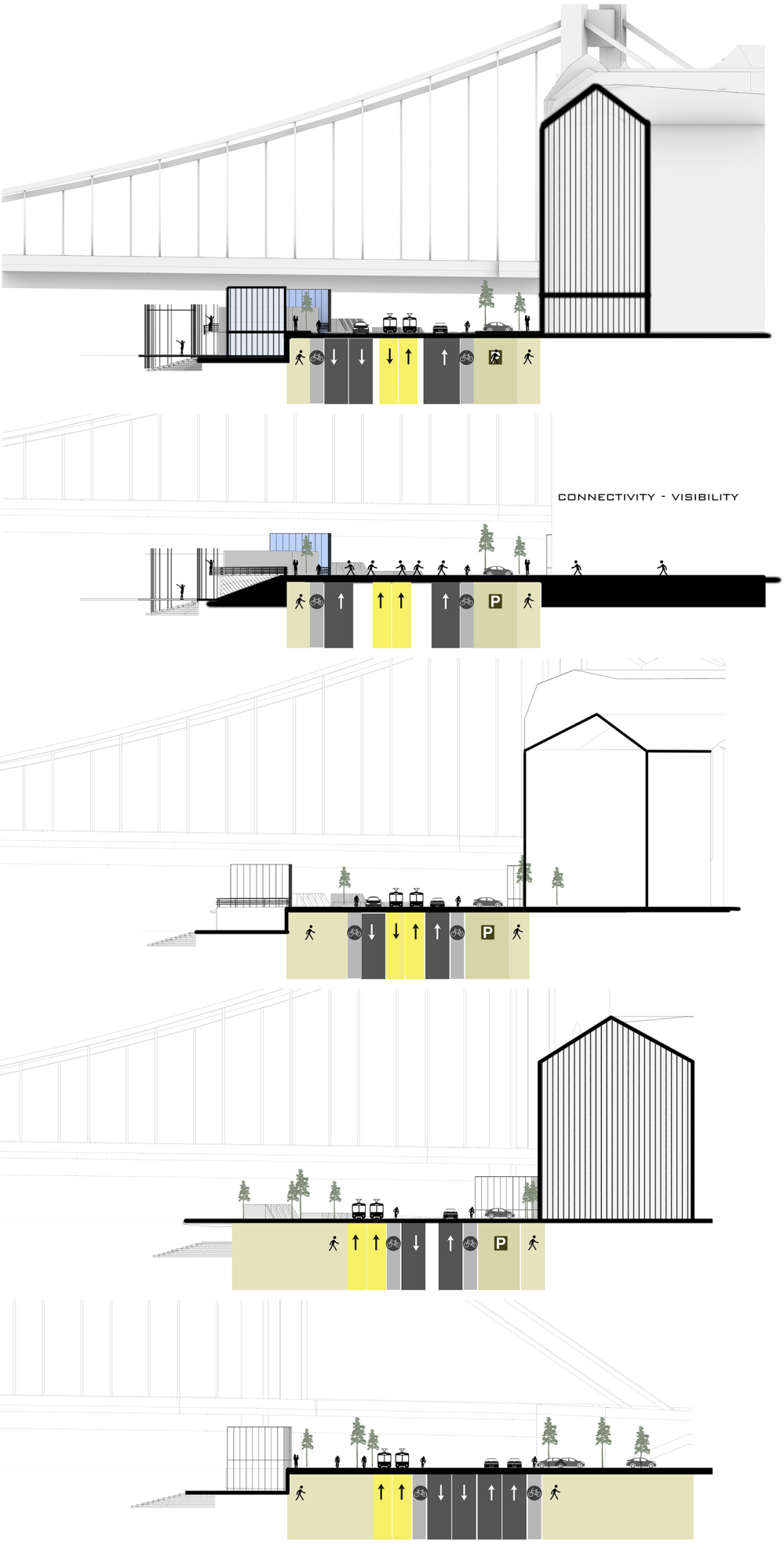


COLUNM HEIGHT

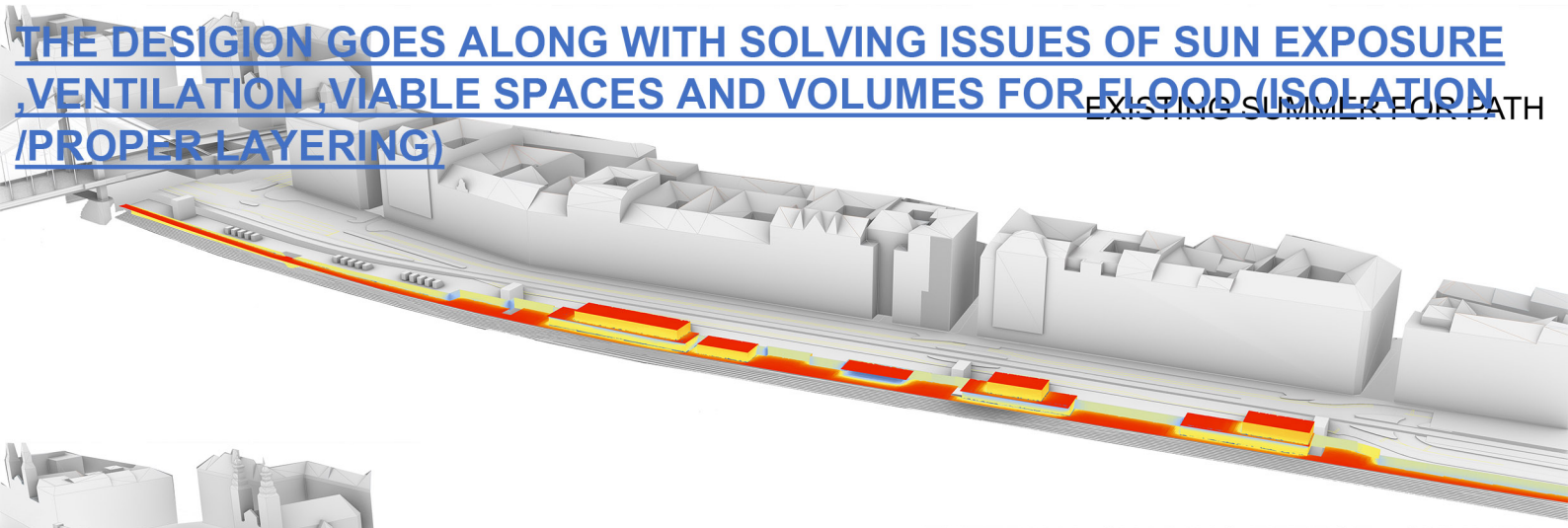
BETWEEN COLUMNS

REF. EGYETEM SQUARE/ BUDAPEST

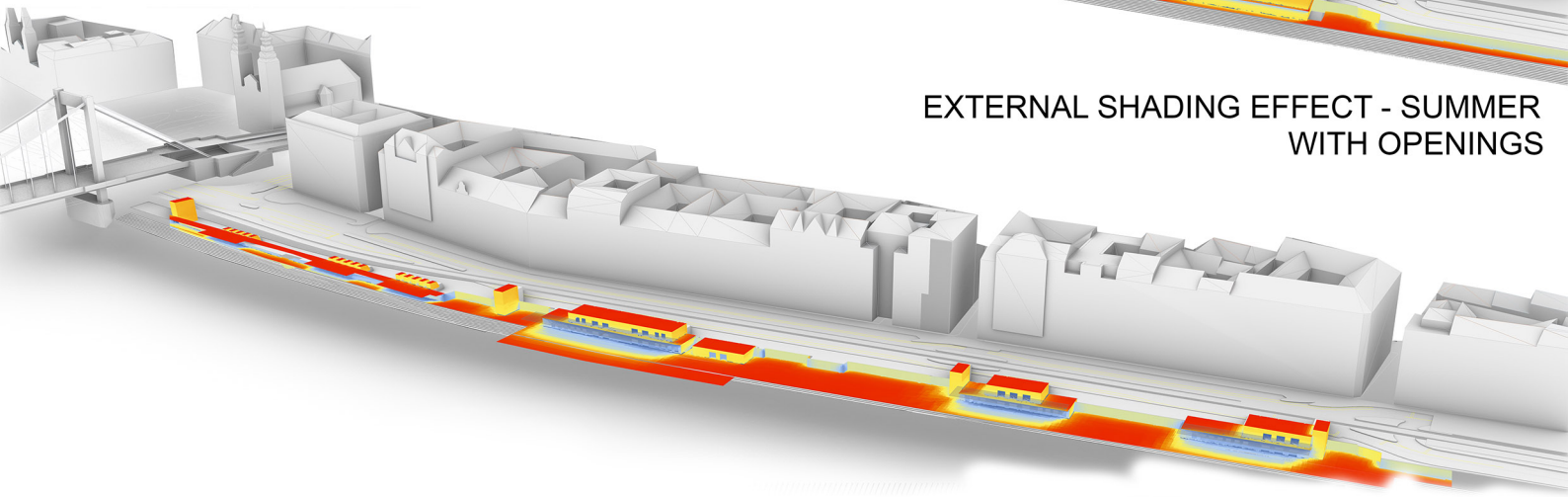

SEC 5
SEC 4
SEC 3
SEC 2
SEC 1


CONNECTIVITY - VISIBILITY

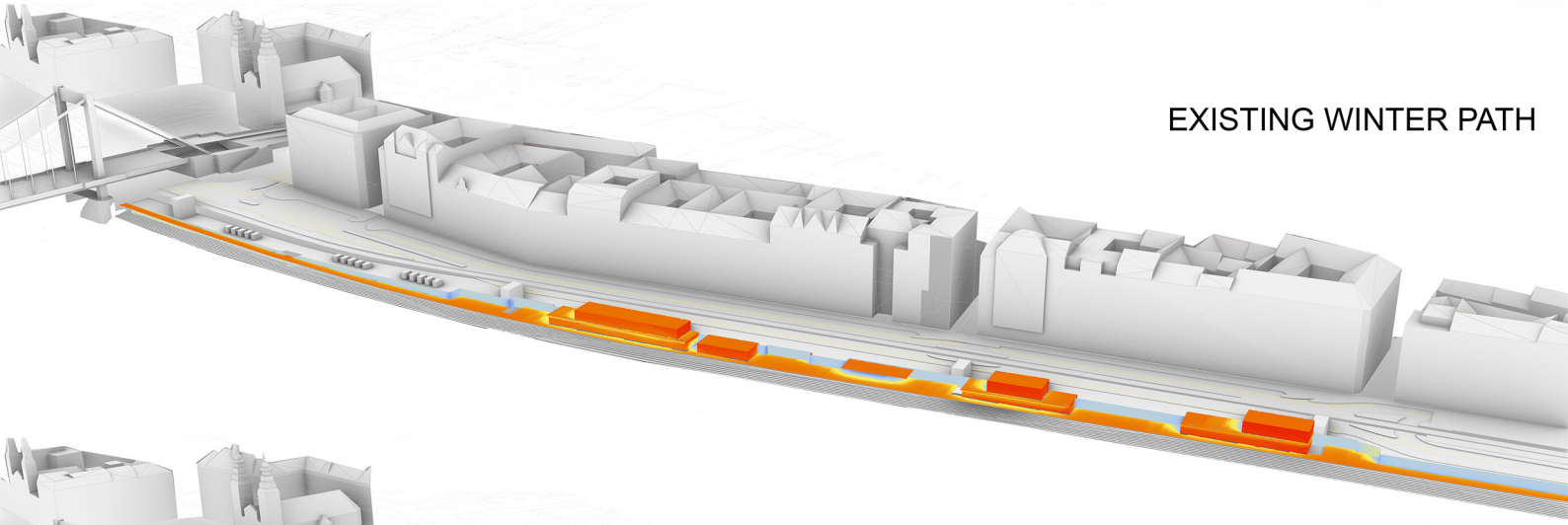
THE DESIGION GOES ALONG WITH SOLVING ISSUES OF SUN EXPOSURE ,VENTILATION ,VIABLE SPACES AND VOLUMES FOR FLOOD (ISOLATION /PROPER LAYERING)



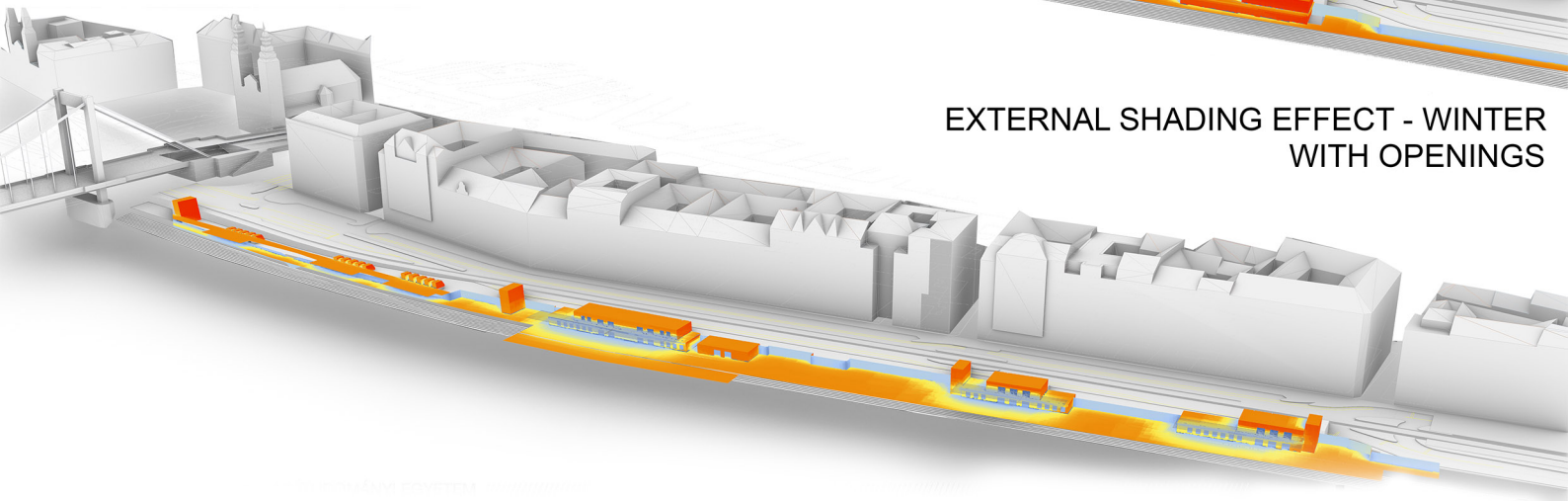
EXISTING SUMMER FOR PATH



EXTERNAL SHADING EFFECT - SUMMER
WITH OPENINGS

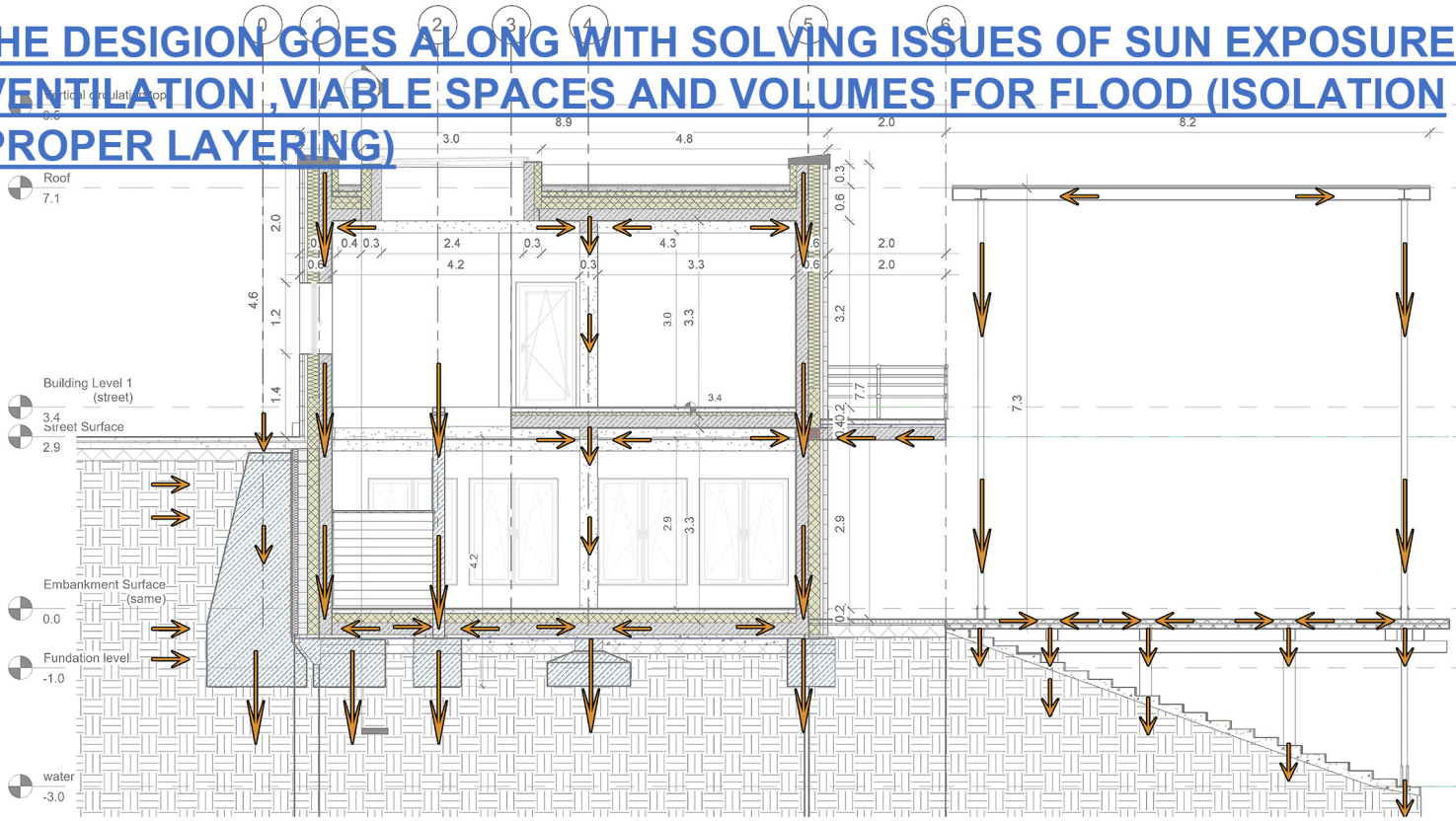


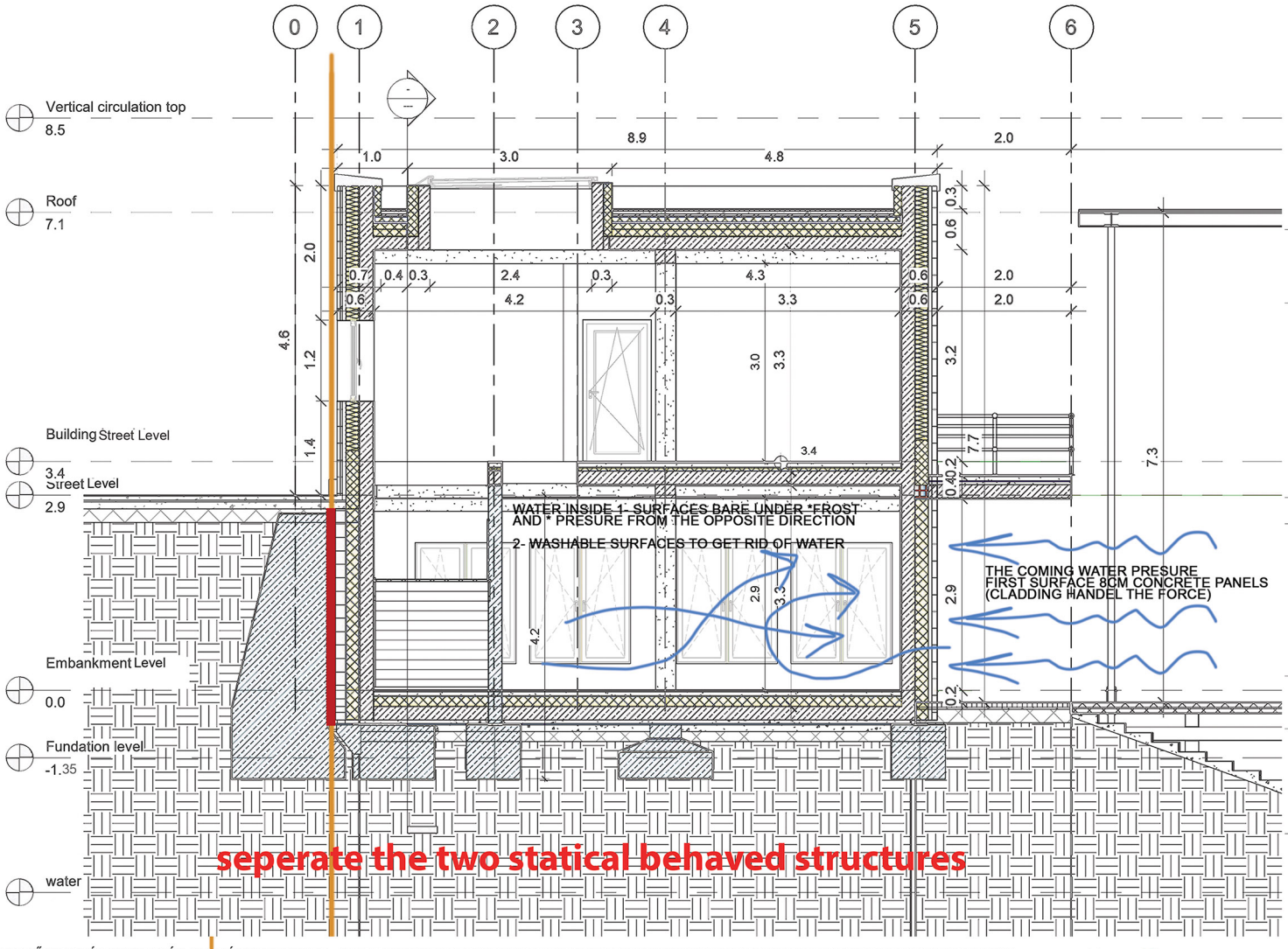
EXISTING WINTER PATH



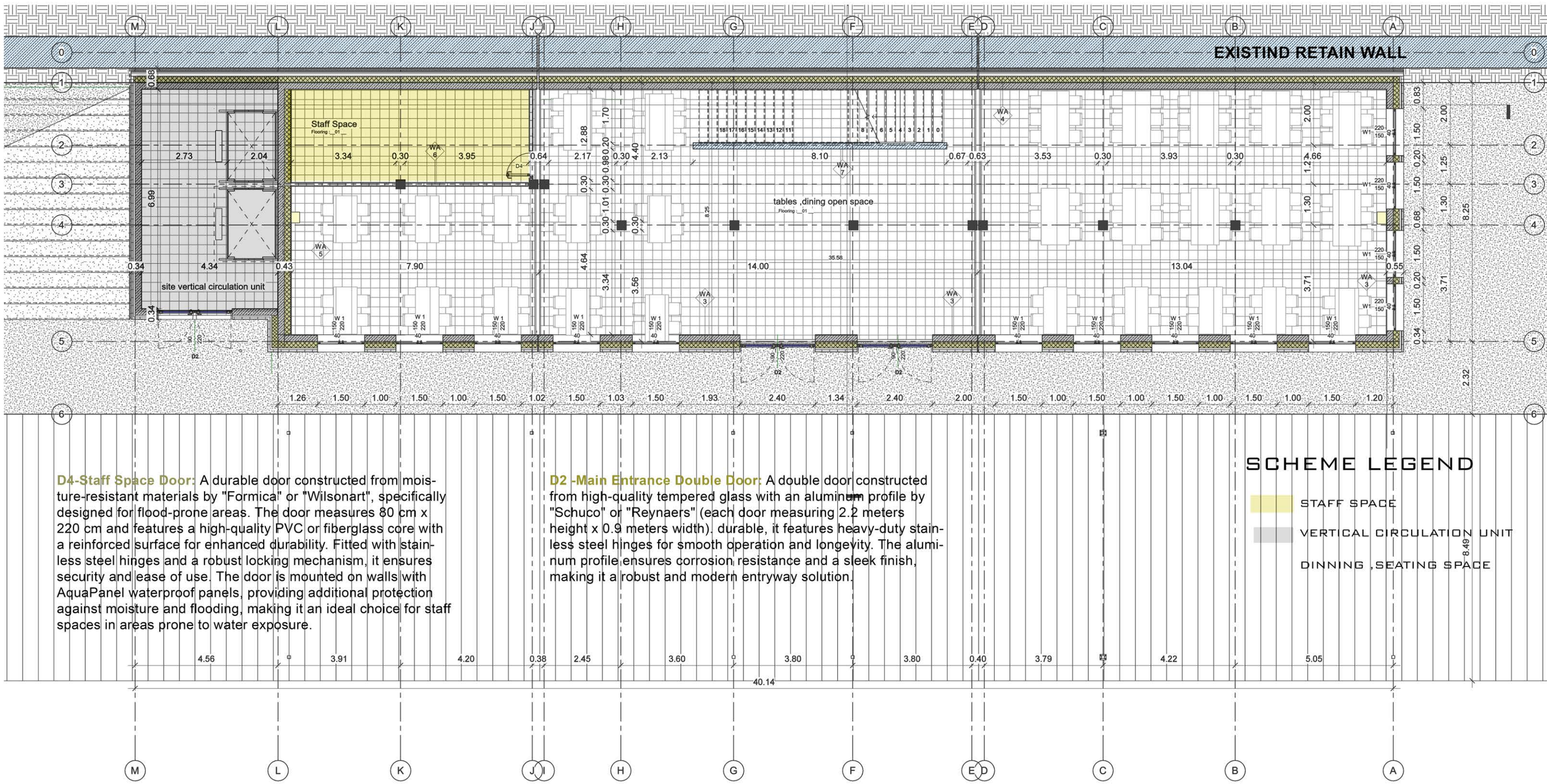
EXTERNAL SHADING EFFECT - WINTER
WITH OPENINGS

THE DESIGION GOES ALONG WITH SOLVING ISSUES OF SUN EXPOSURE ,VENTILATION ,VIABLE SPACES AND VOLUMES FOR FLOOD (ISOLATION /PROPER LAYERING)





GROUND FLOOR PLAN



D4-Staff Space Door: A durable door constructed from moisture-resistant materials by "Formica" or "Wilsonart", specifically designed for flood-prone areas. The door measures 80 cm x 220 cm and features a high-quality PVC or fiberglass core with a reinforced surface for enhanced durability. Fitted with stainless steel hinges and a robust locking mechanism, it ensures security and ease of use. The door is mounted on walls with AquaPanel waterproof panels, providing additional protection against moisture and flooding, making it an ideal choice for staff spaces in areas prone to water exposure.

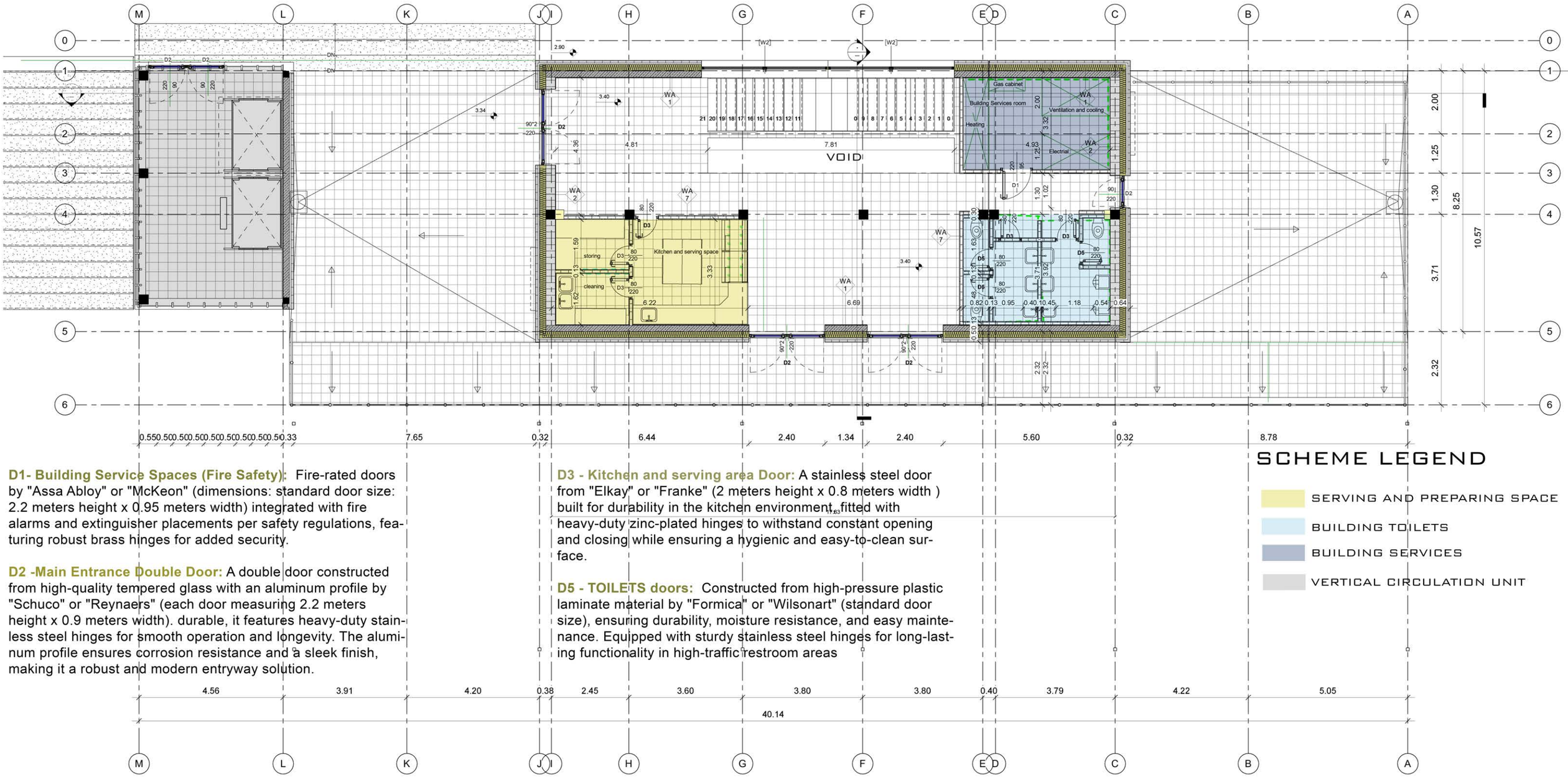
D2 -Main Entrance Double Door: A double door constructed from high-quality tempered glass with an aluminum profile by "Schuco" or "Reynaers" (each door measuring 2.2 meters height x 0.9 meters width). durable, it features heavy-duty stainless steel hinges for smooth operation and longevity. The aluminum profile ensures corrosion resistance and a sleek finish, making it a robust and modern entryway solution.

SCHEME LEGEND

- STAFF SPACE
- VERTICAL CIRCULATION UNIT
- DINNING ,SEATING SPACE

Ceramic Tile for Flooring: Durable and easy-to-clean ceramic tiles from "Porcelanosa" or "Marazzi." These tiles provide a washable, stain-resistant, and water-resistant surface, for high-traffic areas and water exposed .

FIRST FLOOR PLAN



D1- Building Service Spaces (Fire Safety): Fire-rated doors by "Assa Abloy" or "McKeon" (dimensions: standard door size: 2.2 meters height x 0.95 meters width) integrated with fire alarms and extinguisher placements per safety regulations, featuring robust brass hinges for added security.

D2 -Main Entrance Double Door: A double door constructed from high-quality tempered glass with an aluminum profile by "Schuco" or "Reynaers" (each door measuring 2.2 meters height x 0.9 meters width). durable, it features heavy-duty stainless steel hinges for smooth operation and longevity. The aluminum profile ensures corrosion resistance and a sleek finish, making it a robust and modern entryway solution.

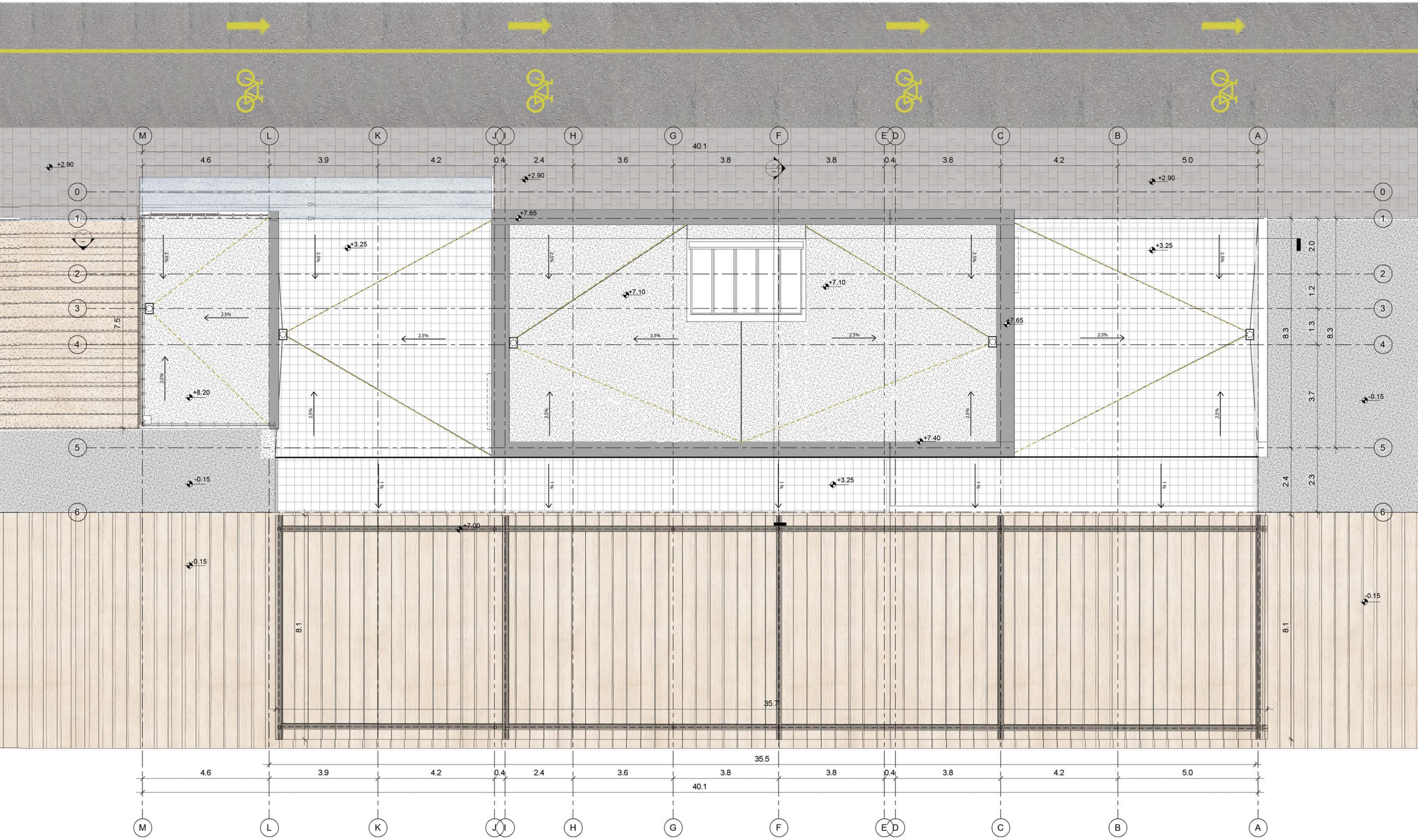
D3 - Kitchen and serving area Door: A stainless steel door from "Elkay" or "Franke" (2 meters height x 0.8 meters width) built for durability in the kitchen environment, fitted with heavy-duty zinc-plated hinges to withstand constant opening and closing while ensuring a hygienic and easy-to-clean surface.

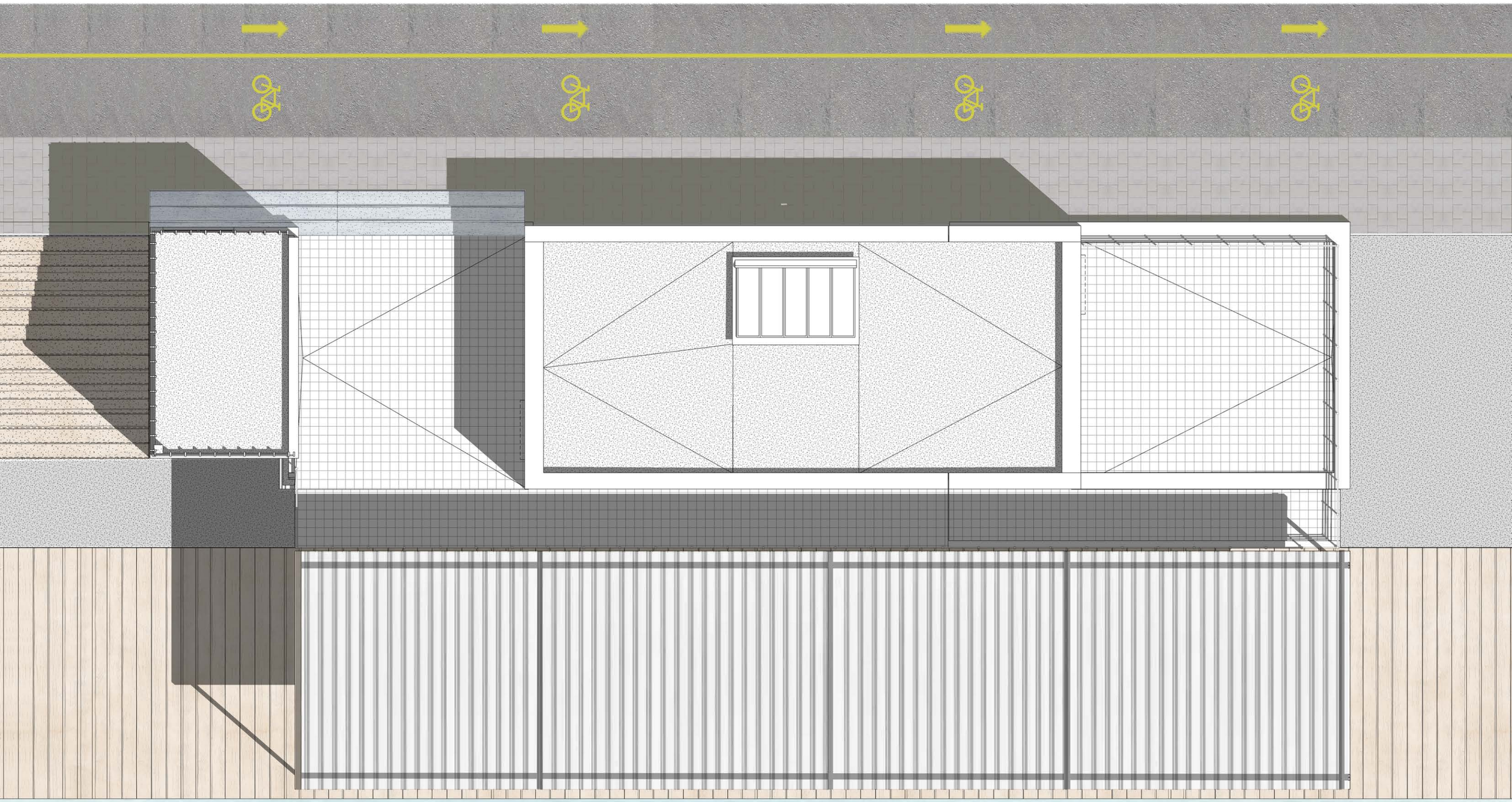
D5 - TOILETS doors: Constructed from high-pressure plastic laminate material by "Formica" or "Wilsonart" (standard door size), ensuring durability, moisture resistance, and easy maintenance. Equipped with sturdy stainless steel hinges for long-lasting functionality in high-traffic restroom areas

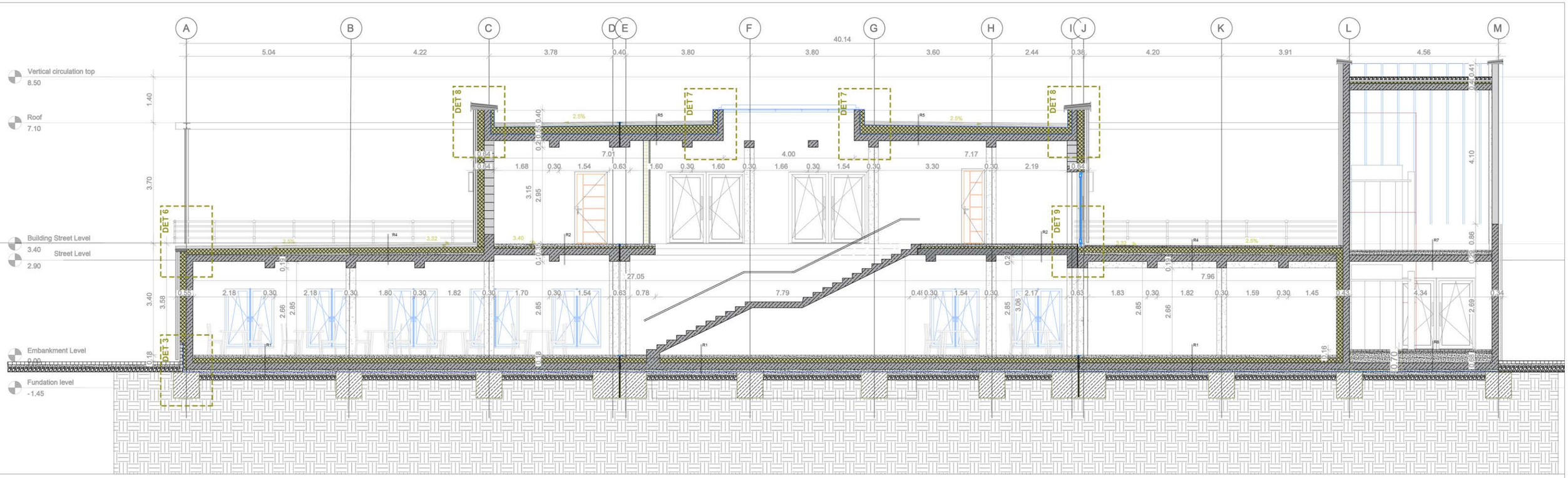
SCHEME LEGEND

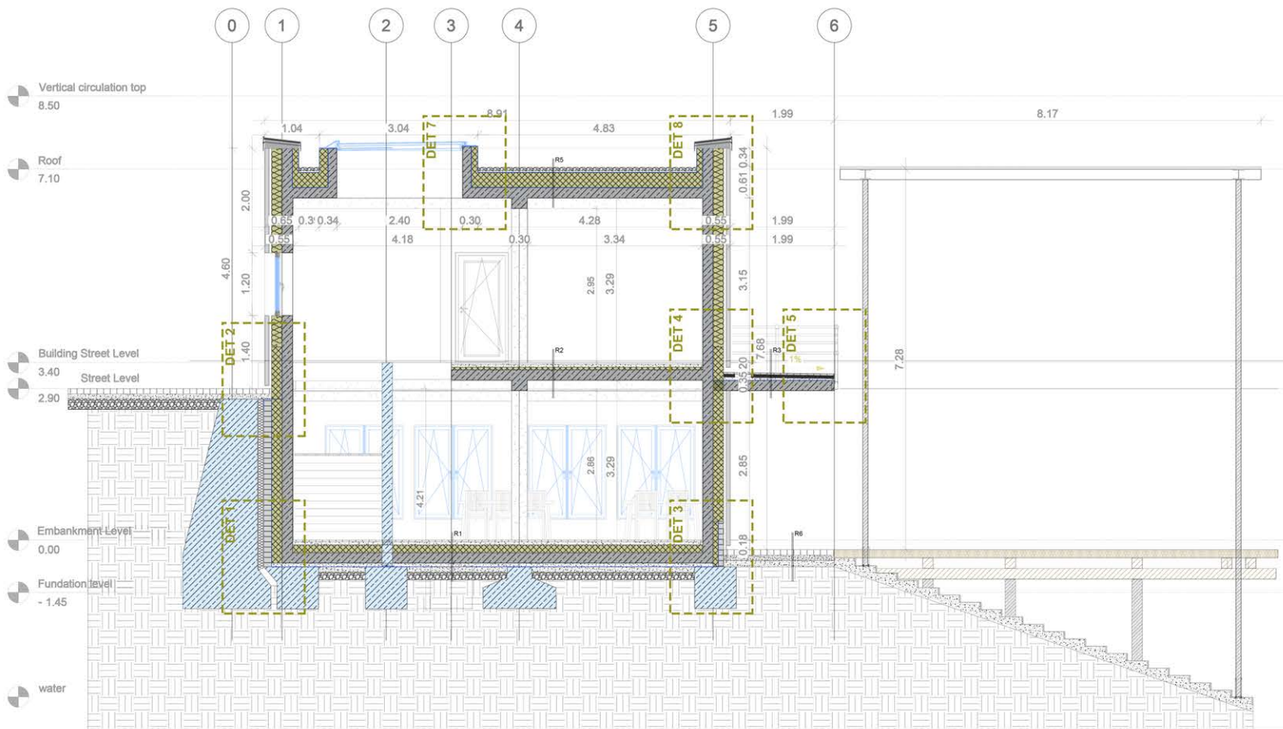
- SERVING AND PREPARING SPACE
- BUILDING TOILETS
- BUILDING SERVICES
- VERTICAL CIRCULATION UNIT

Ceramic Tile for Flooring: Durable and easy-to-clean ceramic tiles from "Porcelanosa" or "Marazzi." These tiles provide a washable, stain-resistant, and water-resistant surface, for high-traffic areas and water exposed .


M L K J I H G F E D C B A
4.6 3.9 4.2 0.4 2.4 3.6 3.8 3.8 0.4 3.8 4.2 5.0
40.1
+2.90
+7.65
+3.25
+7.10
+8.20
+7.40
+7.00
-0.15
2.5%
1 %
7.5
8.3
1.2
1.3
2.0
3.7
2.4
2.3
8.1
35.7
35.5







Slabs layer order

Ground floor slab -R1
3cm ceramic tiles
6cm cement screed
1layer PE foil
15cm XPS
20cm RC slab
5cm protection layer concrete screed
2 layers water proofing
10cm concrete screed
15 cm gravel
soil

Interior midle slab - R2
3cm ceramic tile
6cm cement screed
1layer PE foil
5cm XPS
20cm RC slab

Cantilever Terrace slab – R3
3cm ceramic tile
6cm cement screed
Liquid waterproofing
4cm concrete (for inclination)
20RC slab

Terrace slab (heated) - R4
3 cm non-slipping ceramic tiles
3 cm flexible adhesive
1 layer dimpled sheet with permanent filtration geotextile
(drainage system) eg. Dörken: Delta-Teraxx
1 lyr / 1,5 mm PVC waterproofing, in 8 cm overlapping 3 cm hot air welding
18cm / PIR foam – thermal isolation
Inclination concrete layer
1 lyr 3 mm / self-adhesive modified bituminous sheet vapour barrier
20cm /RC Slab

Last roof / no traffic - R5
7cm stone - pebbles
1layer synthetic filter layer
1layer PVC waterproofing
1layer polyester separation
28cm EPS foam (with inclination)
1Layer waterproofing (bituminous sheet)
20cm RC slab

Sidewalk – R6
6 cm granite stone paving
10 cm Ø 8-15 mm stone chipping and drainage layer
-20 cm Open-graded base reserver soil

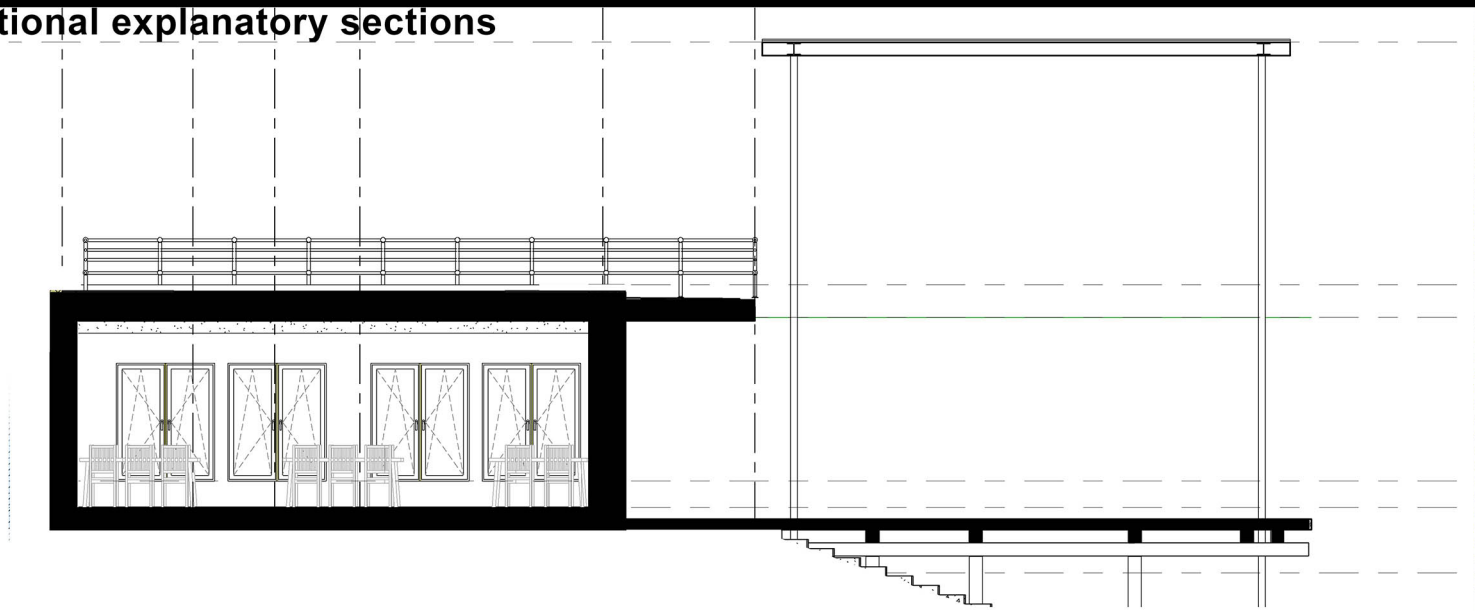
Vertical circulation middle slab -R7
3cm ceramic tile
6cm cement screed
20cm RC slab

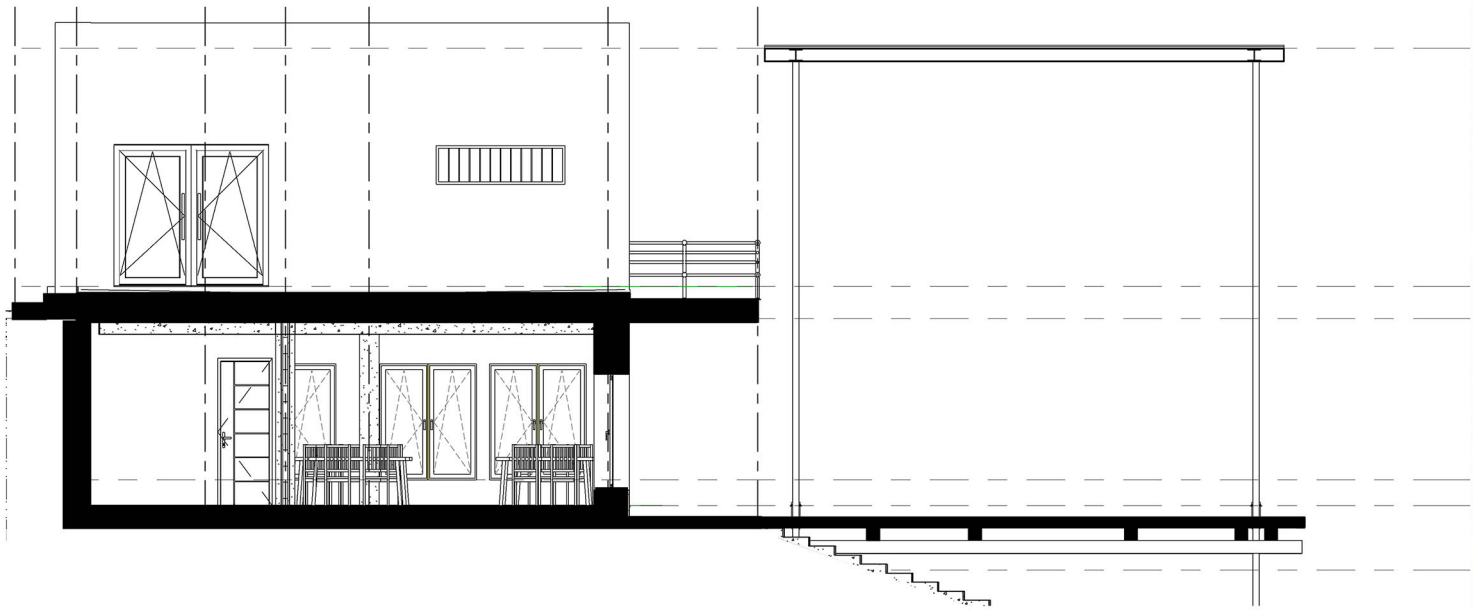
Ground floor slab for vertical circulation – R8
3cm ceramic tiles
6cm cement screed
30 cm gravel (large stone) – to fill the lift pit height.
20cm RC slab
5cm protection layer concrete screed
2 layers waterproofing
10cm concrete screed
15 cm gravel
Soil

BUDAPESTI MŰSZAKI ÉS GAZDASÁTUDOMÁNYI EGYETEM
ÉPÍTÉSZMÉRNÖKI KAR / URBANISZTIKA TANSZÉK
urb.bme.hu

urb/bme
MŰEGYETEM 1782

Additional explanatory sections





WALLS layer order

Exterior wall first floor – WA1
8cm concrete panel cladding
5cm air gap
20cm mineral wool thermal isolation
20cm RC wall

Exterior concrete blocks wall first floor – WA2
8cm concrete panel cladding
5cm air gap
20cm mineral wool thermal isolation
plaster
30cm concrete blocks wall

Exterior wall ground floor – WA3
8cm concrete panel cladding
5cm air gap
20cm XPS thermal isolation
20cm RC wall

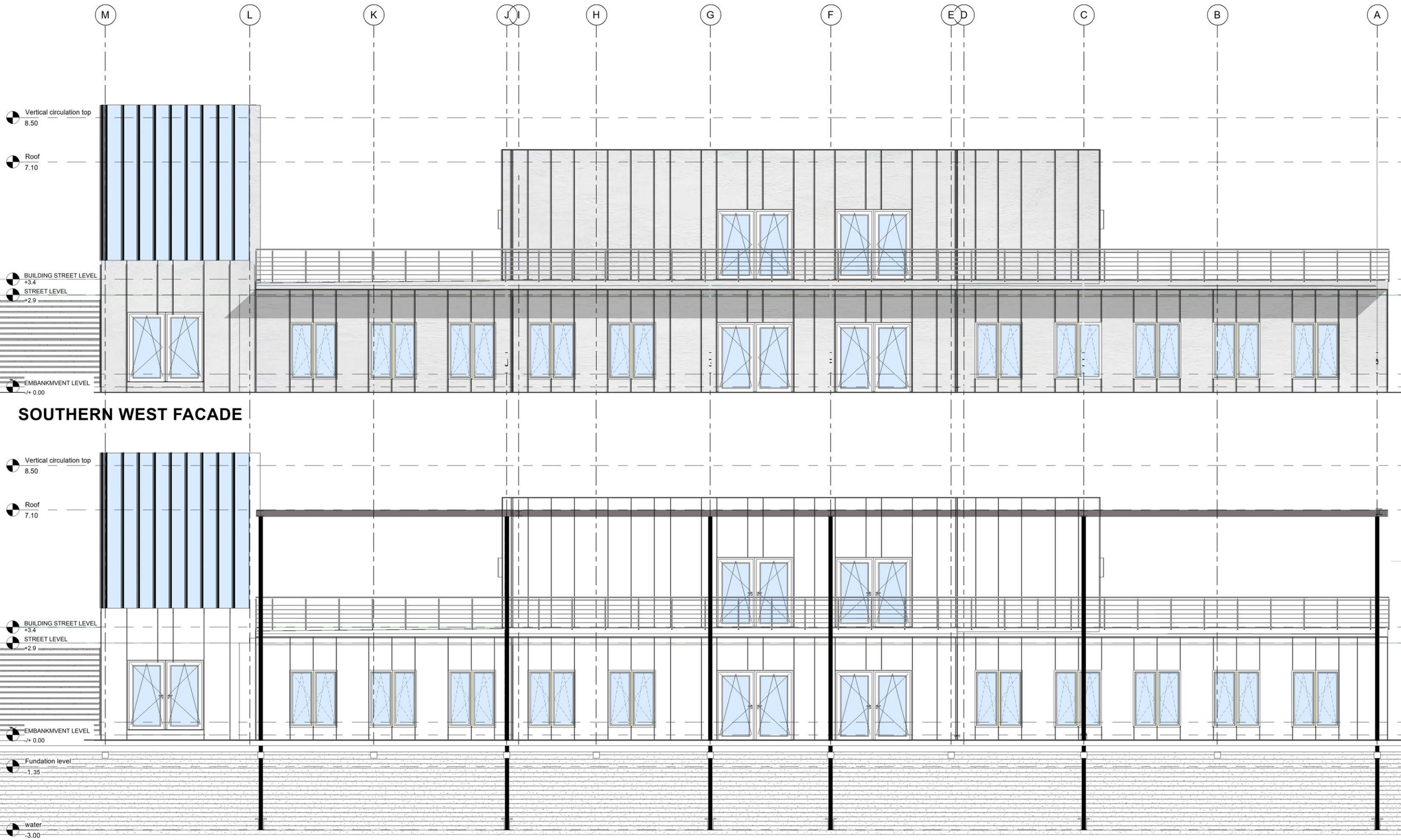
Wall next to retain wall -WA4
Plastic paint
20cm RC wall
20cm XPS thermal isolation
2lyr water proofing
15cm concrete block wall
15cm gap filled with isolation (not for thermal isolation reason)
The retain wall

Interior partition wall (building/vertical circulation) (heated /unheated) – WA5
Plastic paint
20cm RC wall
20cm XPS
Vapor barrier foil
1.25 aqua panel board

Interior partition - WA6
AQUAPANELS partitions
1.25cm AQUA panel boards
7.5 cm gap with metal structural studs in 60 cm distance
1.25cm AQUA panel boards
Structure partitions (toilets)
finishing (coating, spackle paste, painting)
15cm concrete blocks
finishing (coating ,spackle paste ,painting)

Stair loadbearing wall – WA7
Plastic paint
20 cm RC wall
Plastic paint

Vertical circulation wall -WA9
8cm concrete panel cladding
5cm air gap (fixing halfen elements)
20cm RC wall



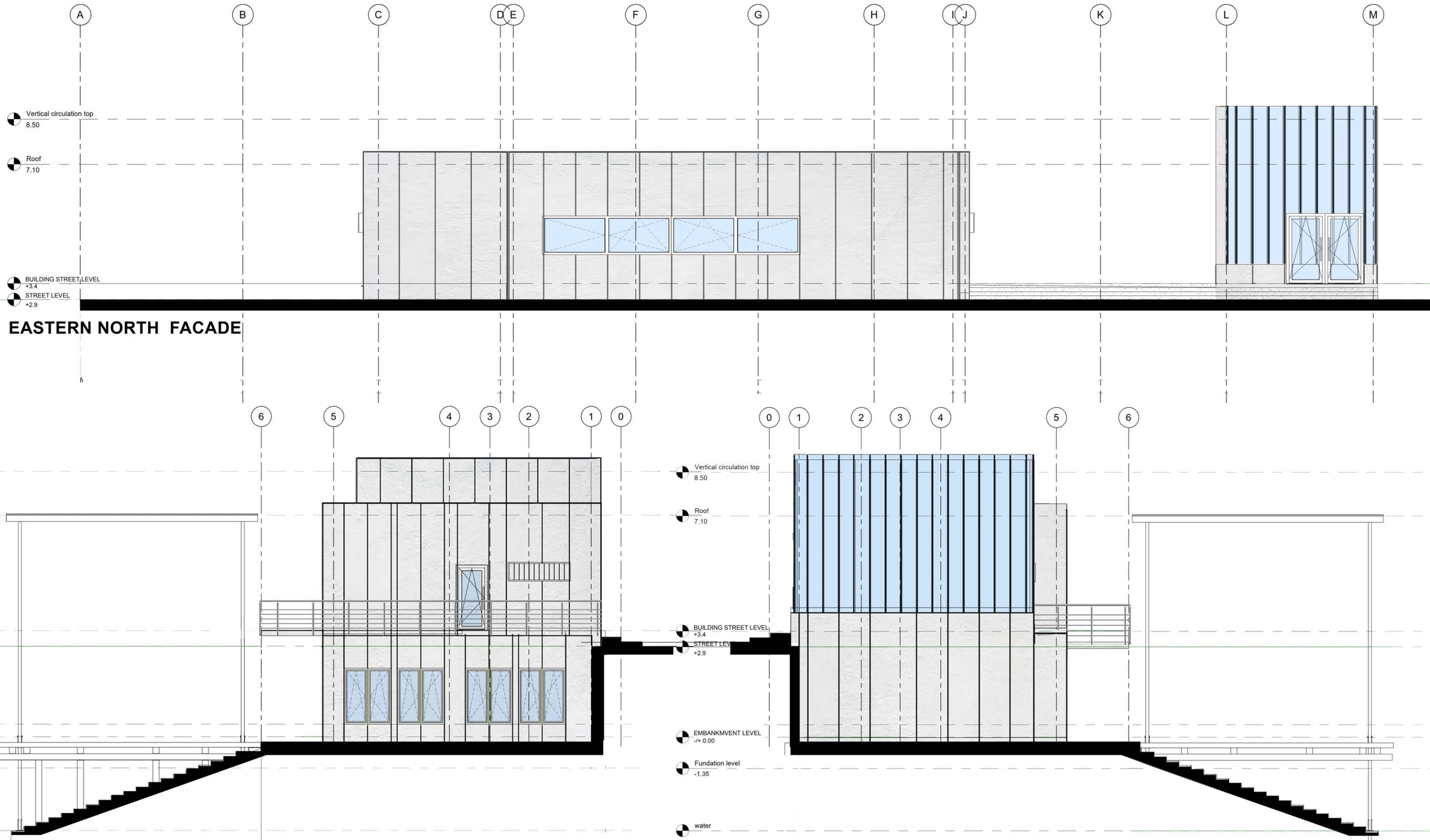
SOUTHERN WEST FACADE

SOUTHERN WEST FACADE/WITH THE CANOPY

BUDAPESTI MŰSZAKI ÉS GAZDASÁTUDOMÁNYI EGYETEM
ÉPÍTÉSZMÉRNÖKI KAR / URBANISZTIKA TANSZÉK
urb.bme.hu

urb/bme

MŰEGYETEM 1782



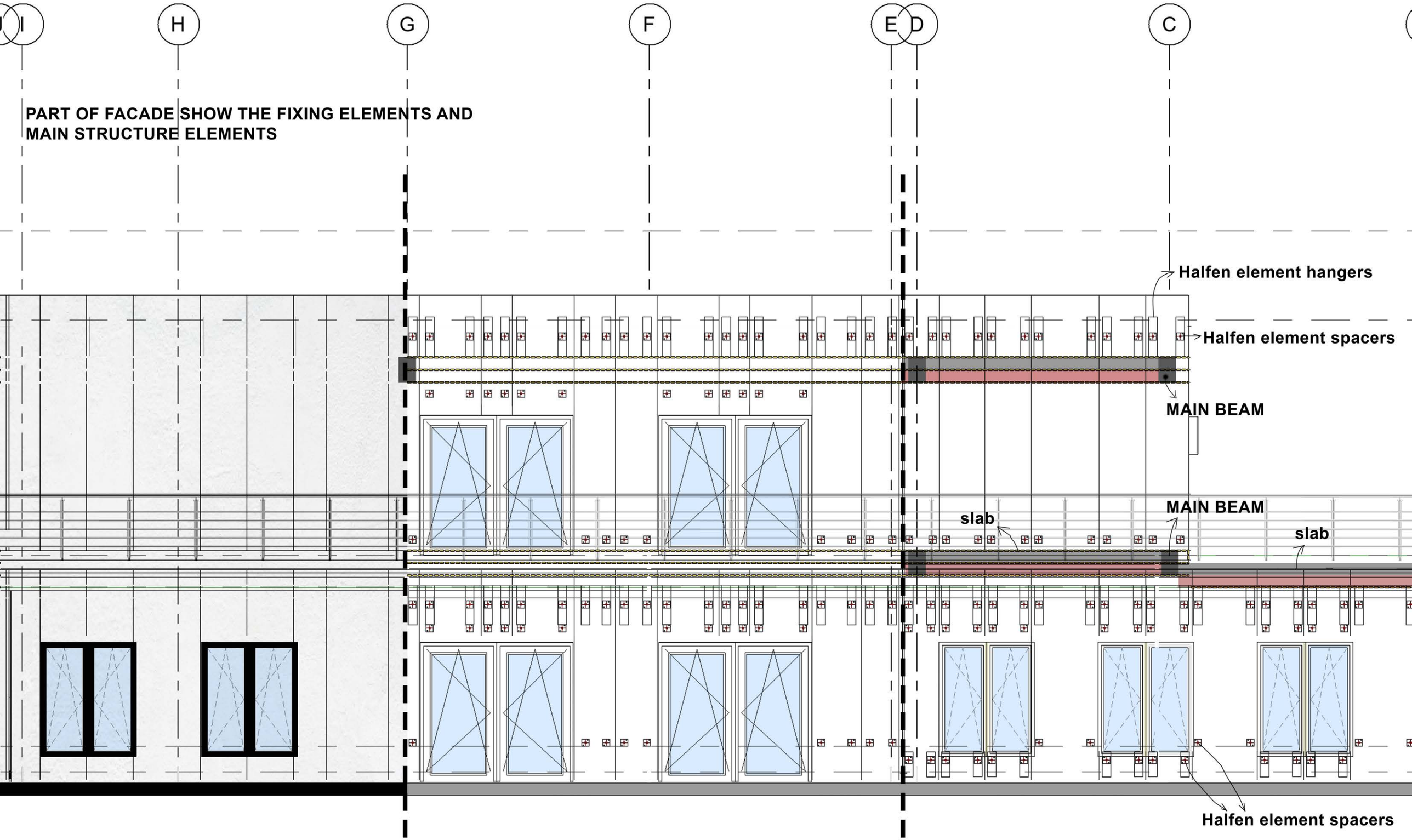
EASTERN NORTH FACADE

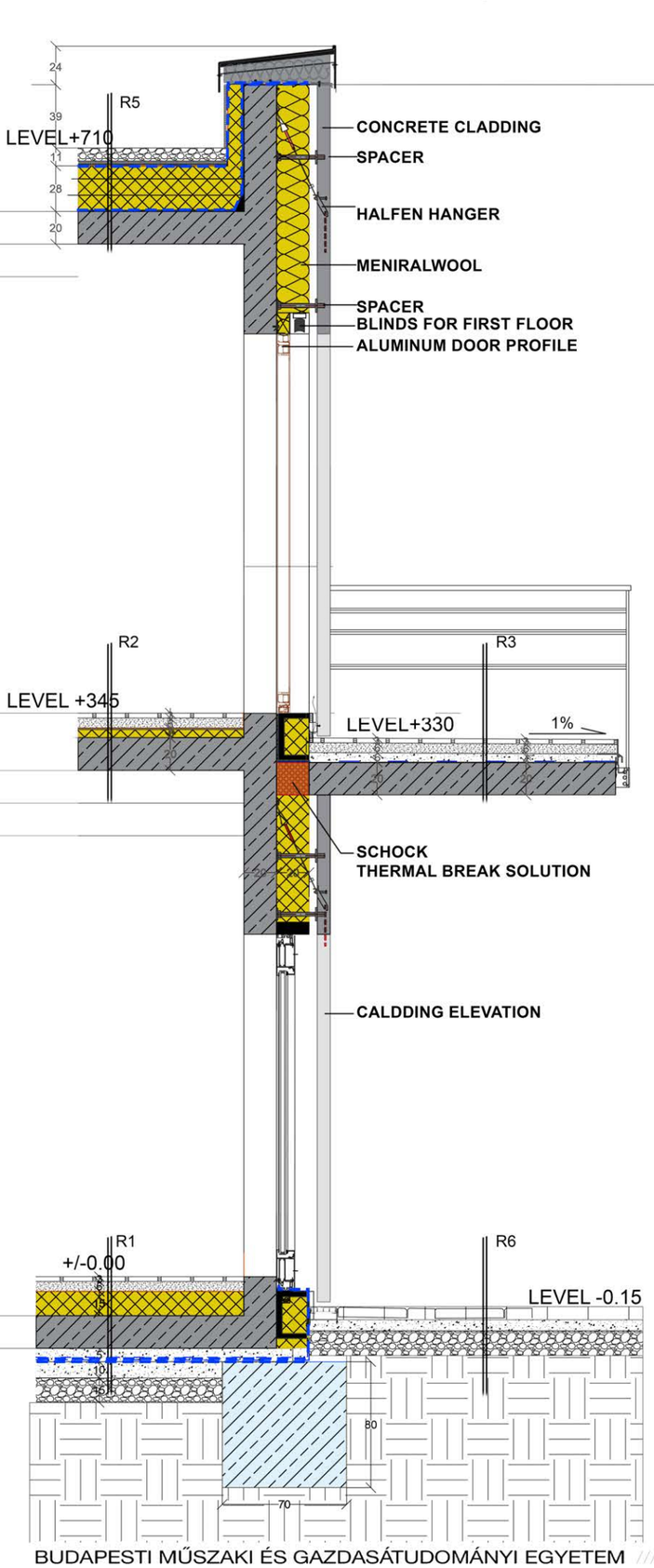
WESTERN SOUTH FACADE

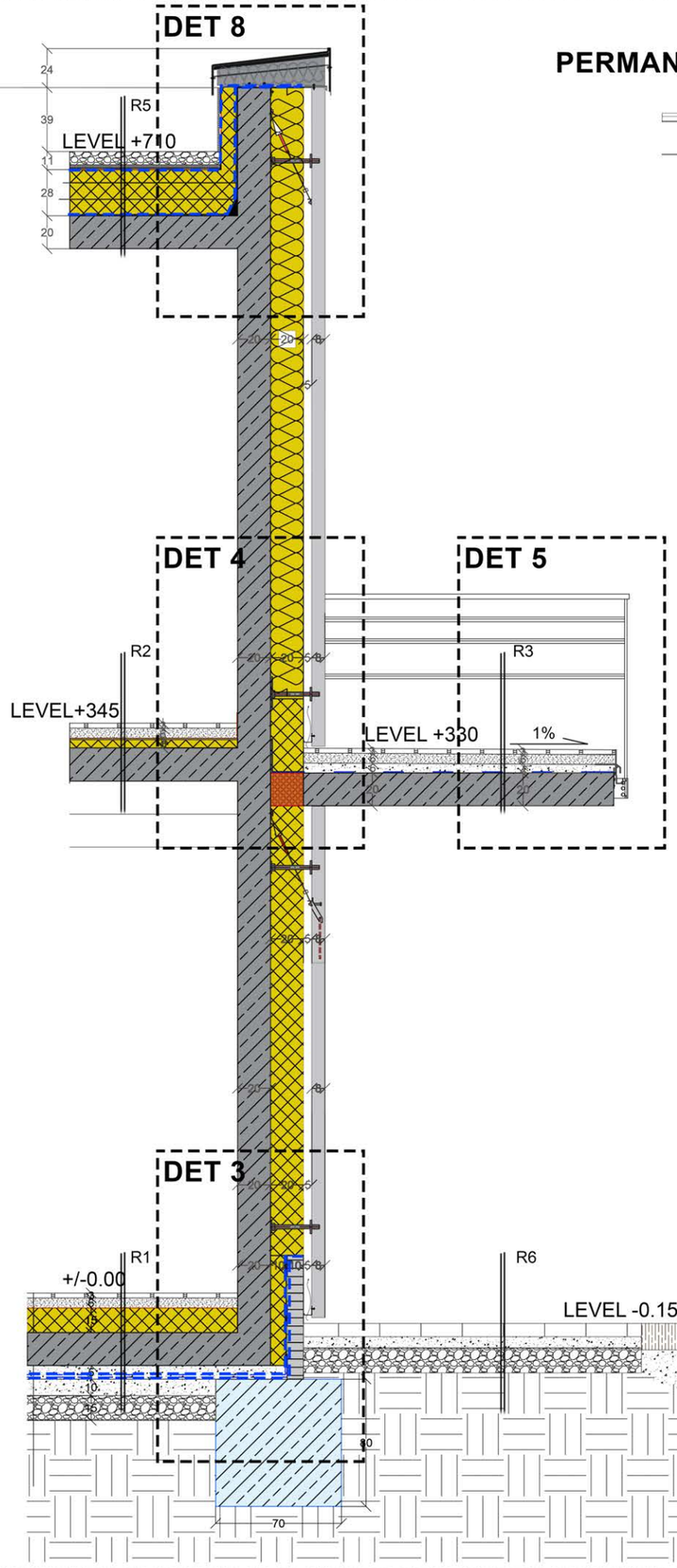
NORTHERN WEST FACADE

I H G F E D C

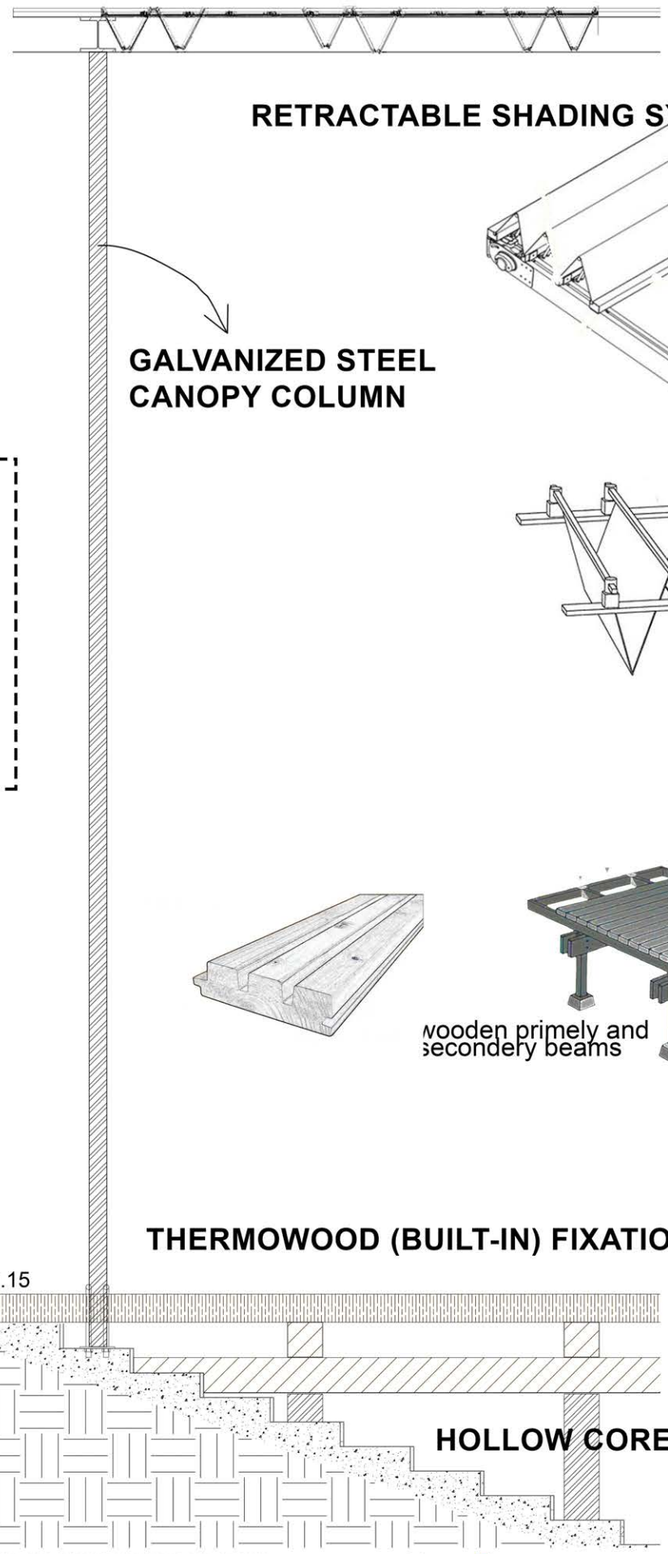
PART OF FACADE SHOW THE FIXING ELEMENTS AND MAIN STRUCTURE ELEMENTS



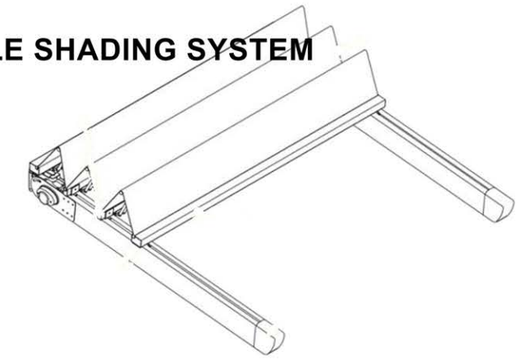


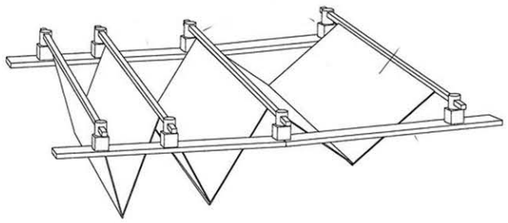


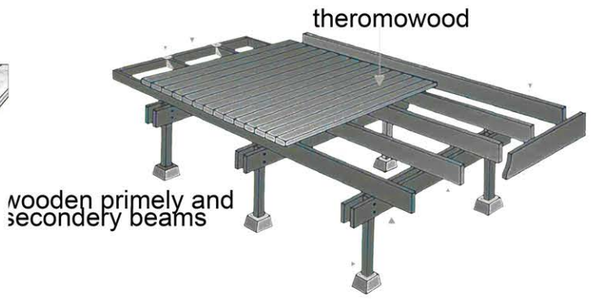
PERMANENT CANOPY STRUCTURE



RETRACTABLE SHADING SYSTEM







THERMOWOOD (BUILT-IN) FIXATION

WOODEN BEAMS

HOLLOW CORE STEEL SUPPORTS

DIPLOMA 2024

PEST LOWER EMBANKMENT(BELGRÁD RKP.) REVITALIZATION

DEPARTMENT OF URBAN PLANNING AND DESIGN

BUDAPESTI MŰSZAKI ÉS GAZDASÁTUDOMÁNYI EGYETEM
ÉPÍTÉSZMÉRNÖKI KAR / URBANISZTIKA TANSZÉK
urb.bme.hu

urb/bme

CONCUSION

The revitalization of the Pest Lower Embankment (Belgrád rkp.) represents achievement in urban design, integrating architectural innovation with public utility. By adding simple urban elements such as shades, new stairs, kiosks, temporary structures, and path extensions, to transforme the embankment into a lively "third place" for leisure and social interaction, giving the riverfront back to the city's users.

The preservation and enhancement of existing structures to ensure that the revitalized area is not only aesthetically but also functional and sustainable.

These interventions is to create a viable and livable urban space that meets construction standards and promotes environmental sustainability. The project's outcomes reflect a blend of preserving and integration for site have significant weight in the city image while fostering contemporary urban life, ultimately enhancing the quality of life for the community .