

the KARAVAN

2023 // 2024 1

Diploma

Multi-function food market and residential building

Budapest University of Technology and Economics // Faculty of Architecture // Department of Urban Planning and Design

BOOKLET of Building Constructions

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content

4 LOCATION ANALYSIS

25 CONCEPT

30 CONSTRUCTION SPECIFICATIONS

38 LAYER ARRANGEMENTS

38 LAYER ARRANGEMENTS

STRUCTURAL ELEMENTS

40

STRUCTURAL MODEL

41

STRUCTURAL FLOORPLANS

42

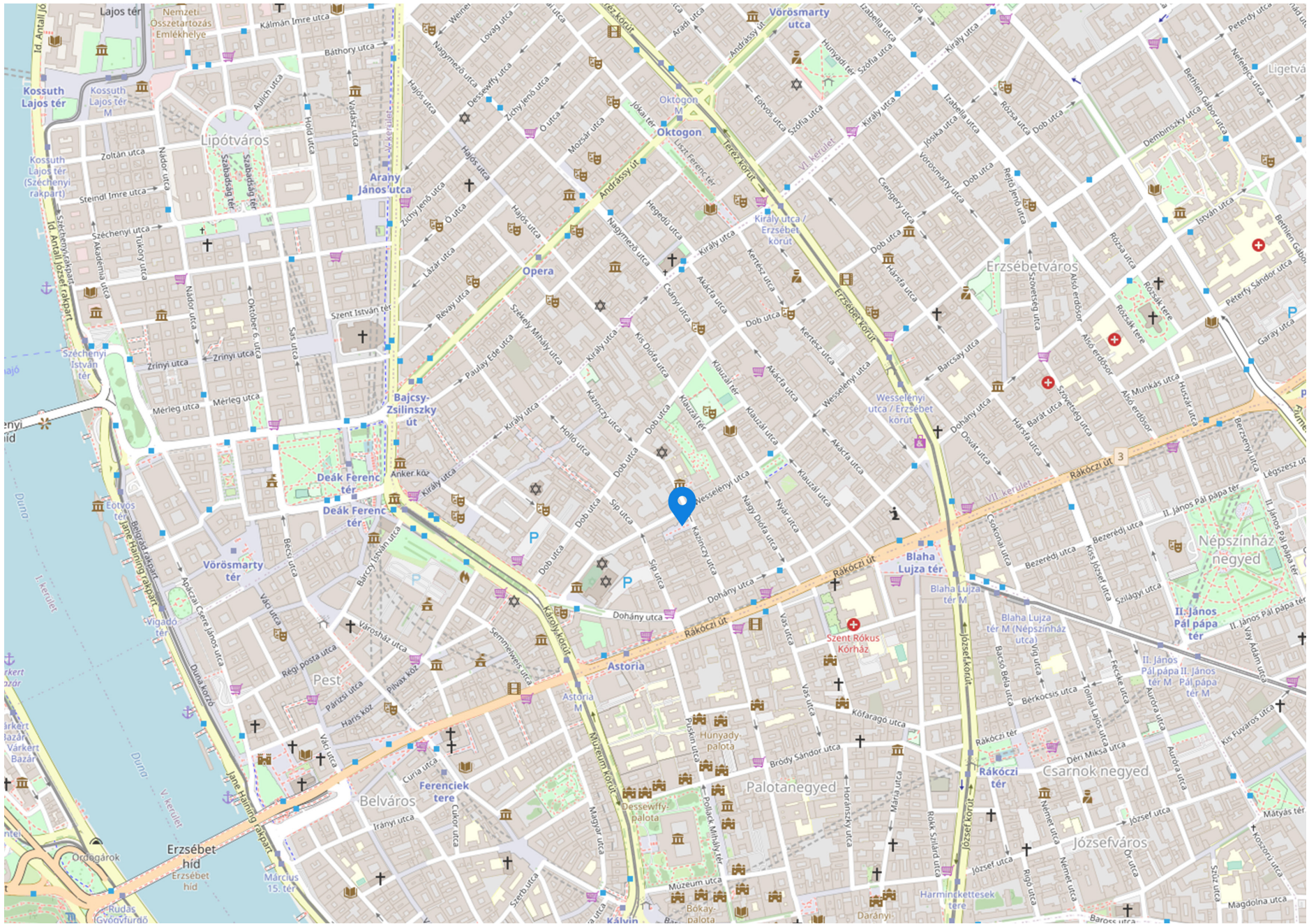
DETAILS IN 1:10

46

SITEPLAN, FLOOR PLANS & SECTIONS

48

addition



DISTRICT 7

The selected site for development is an undeveloped plot situated in Budapest, Hungary, precisely located on Kazinczy Street 18. This area presents a unique opportunity for potential development, and understanding the broader context of the district adds depth to its significance.

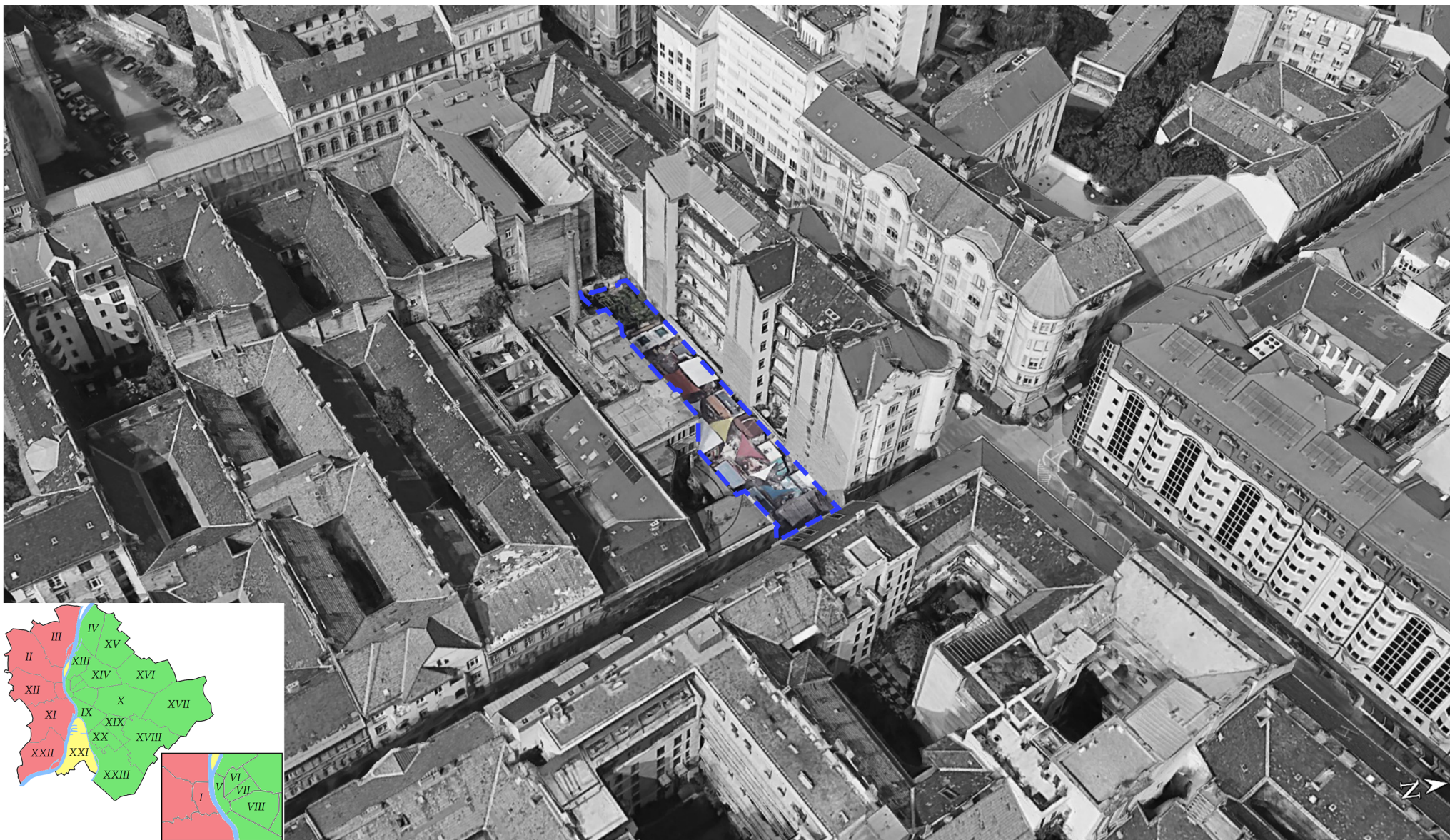
The Jewish Quarter is historically significant, bearing the marks of a rich Jewish heritage. It was once a thriving center for Jewish life, culture, and commerce. The district is adorned with synagogues, including the majestic Great Synagogue, which stands as one of the largest in Europe. Exploring the streets of the Jewish Quarter reveals a tapestry of narrow alleys, eclectic architecture, and a palpable sense of history.

Kazinczy Street 18 is positioned in District 7, which is renowned for its distinctive blend of history, culture, and vibrant urban life. The district encompasses the Jewish Quarter and the Party District, creating a dynamic and multifaceted environment that holds particular importance.

In recent times, District 7 has evolved into the renowned Party District, drawing locals and tourists alike with its lively nightlife and trendy establishments. The comparison of historical landmarks with contemporary bars, clubs, and cafes creates a unique atmosphere that appeals to a diverse range of people. The district comes alive in the evenings, transforming into a hub of social activity.



//PHOTO: TAS TOBIAS



District: VII
 Location: Budapest, Kazinczy u. 18, 1075

Current function: Karavan street food
 Plot size: 589.6m²
 Current structure: Temporary



HISTORIC CONFLICT: The Transformation of the district

The Party District wasn't always a bustling nightlife hub. It has a complex history, with one of its key elements being the transformation of abandoned buildings and factories into the vibrant nightlife spots seen today. This transformation was a response to the city's declining industrial sector and the need for urban renewal in the early 2000s. This led to the birth of the ruin bar culture, turning dilapidated spaces into thriving venues, symbolizing the district's resilience and adaptability.

Despite the evident economic benefits in District 7, a concerning trend of residents leaving the area for residential purposes has emerged, posing a challenge to the district's intended goals. The reasons are disturbances from the vibrant nightlife, insufficient green spaces and inadequate infrastructure.

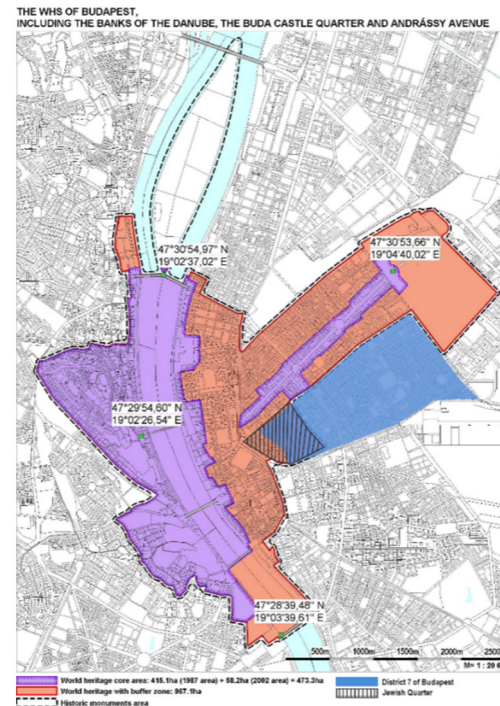
AIM OF THE DISTRICT

Citation: OPEN HERITAGE: Heritage Szimpla Budapest Observatory Case

“In 2015, the district municipality issued a long-term Settlement Development Concept for 2014-2030 and a mid-term Integrated Settlement Development Strategy for 2014-2020 to address all the historic issues such as process of gentrification, “hands-off approach” or “non-planning” strategy, demolition of historical buildings. **They defined vision of the municipality about the district as an area providing high-quality life conditions, urban services, and favorable environmental conditions for various generations, with a touristic offer based on its rich built and intangible heritage. Cooperation, climate consciousness, and solidarity are defined as the main values.**”

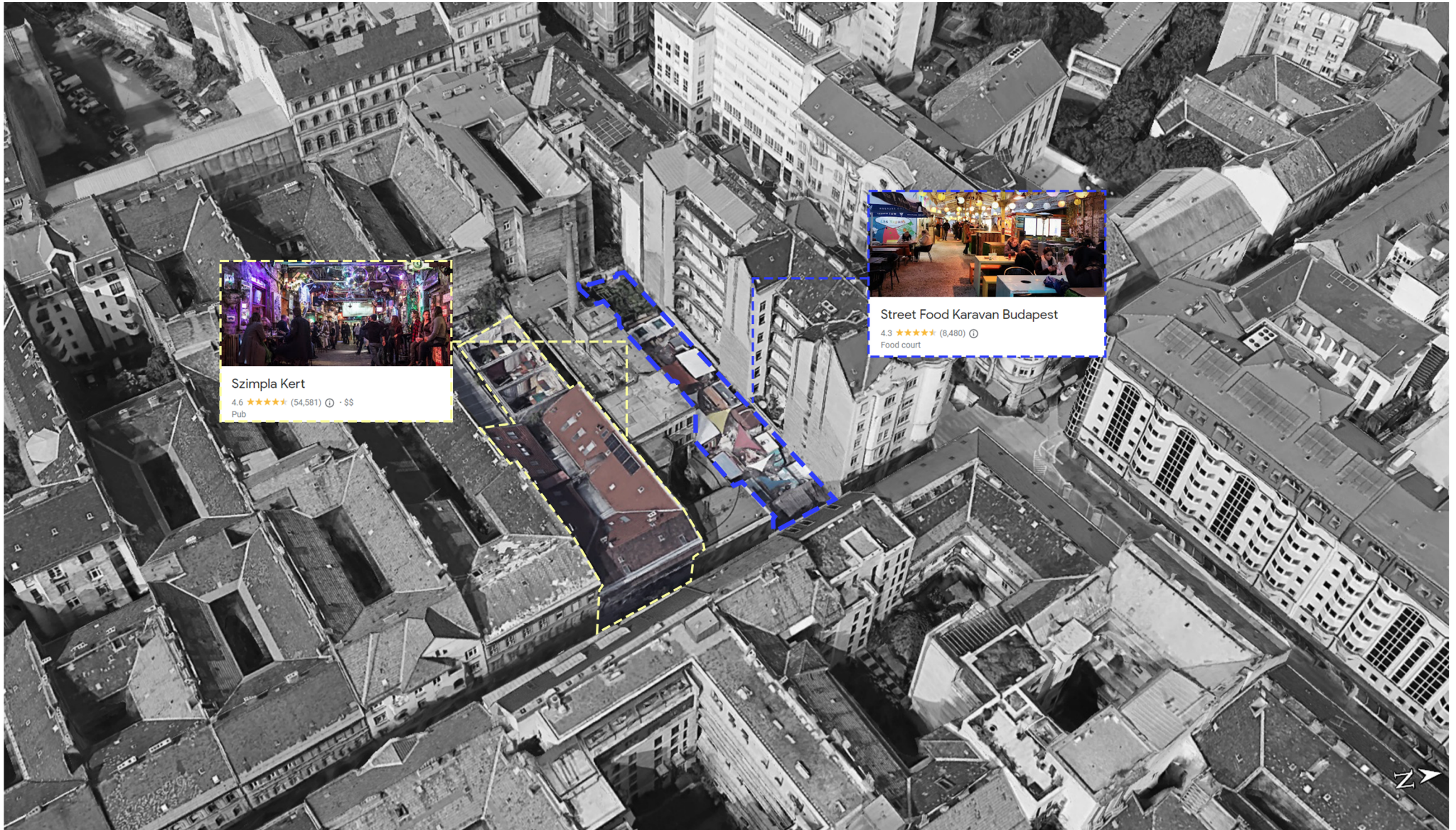


Old and modern building at the intersection of Kazinczy and Wesselenyi Streets.
Photo: Dora Merai



The UNESCO World Heritage Site (purple) and its buffer zone (brown) in Budapest, and its relation to the 7th district (blue) and the Jewish district (striped) within.

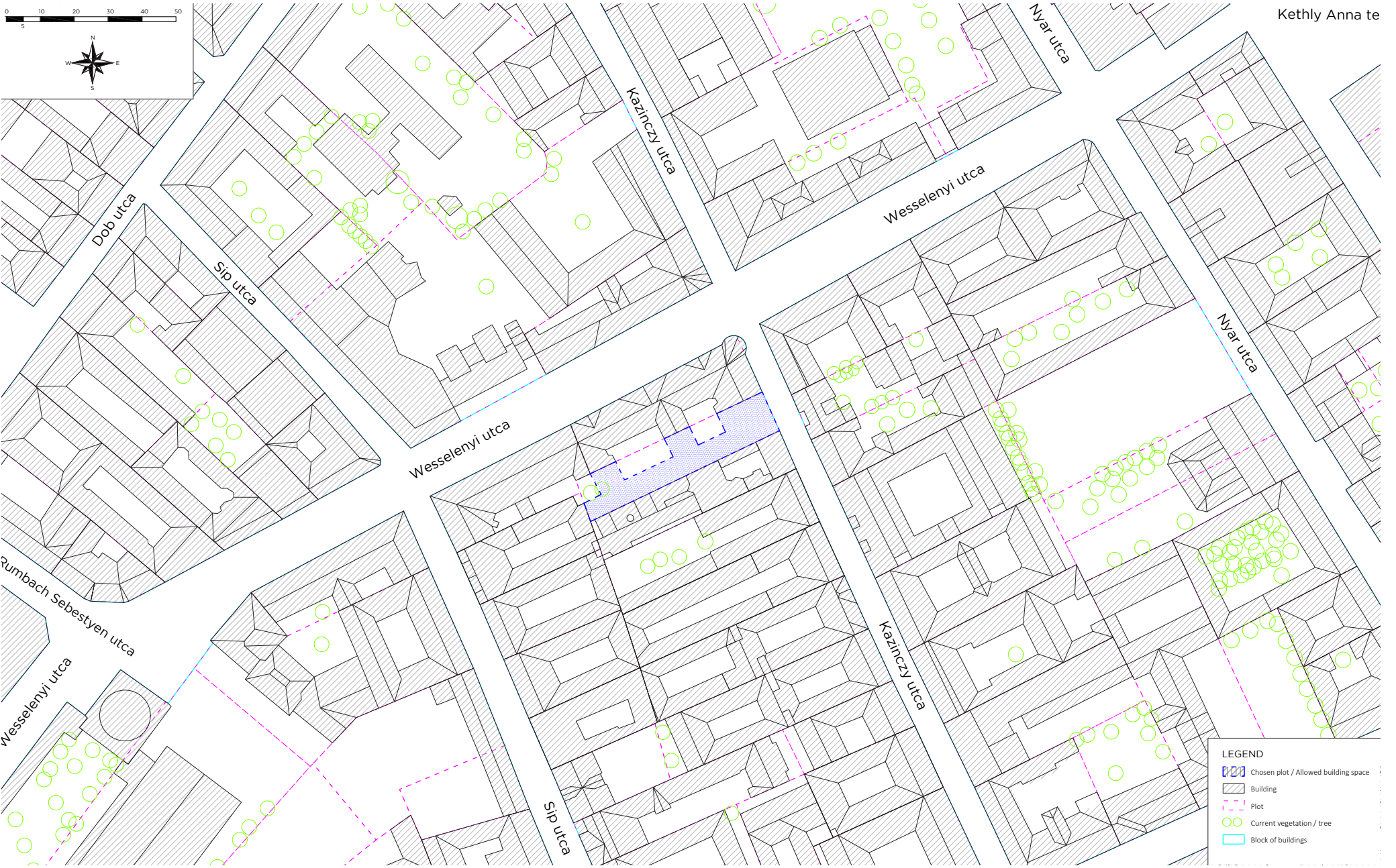
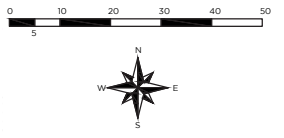
Source: whc.unesco.org
edited by Kyra Lyublyanovics








District: VII
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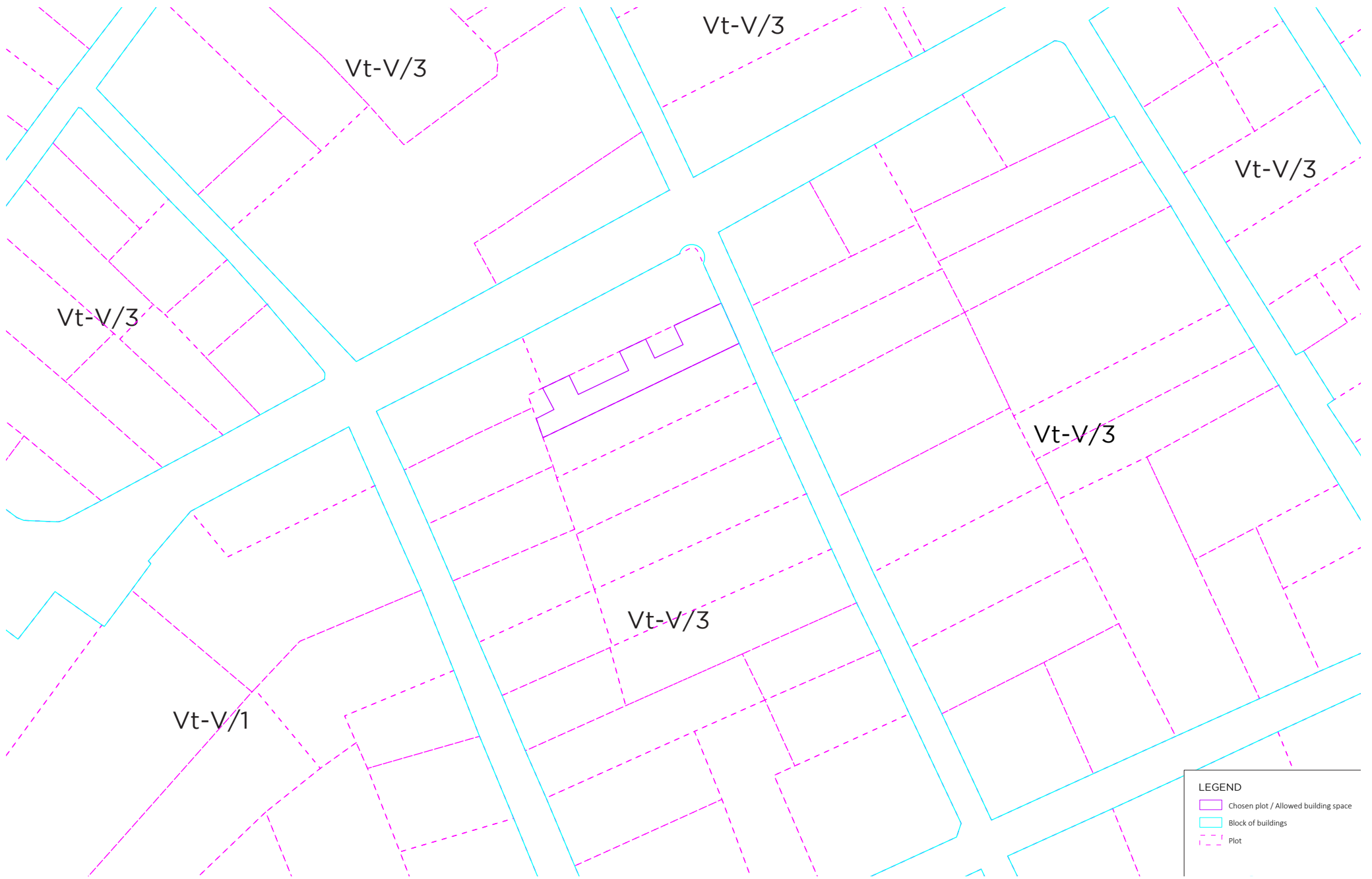




LEGEND

-  Chosen plot / Allowed building space
-  Building
-  Plot
-  Current vegetation / tree
-  Block of buildings

//SITEPLAN 1:500



In a city, they have special rules for how different areas can be developed, and they call it zoning. When they say “Vt-V,” that’s like a special term for the main part of the city, the city center. Inside this city center, they have smaller parts called subzones: “Vt-V/1,” “Vt-V/2,” “Vt-V/3,” and “Vt-V/4.”

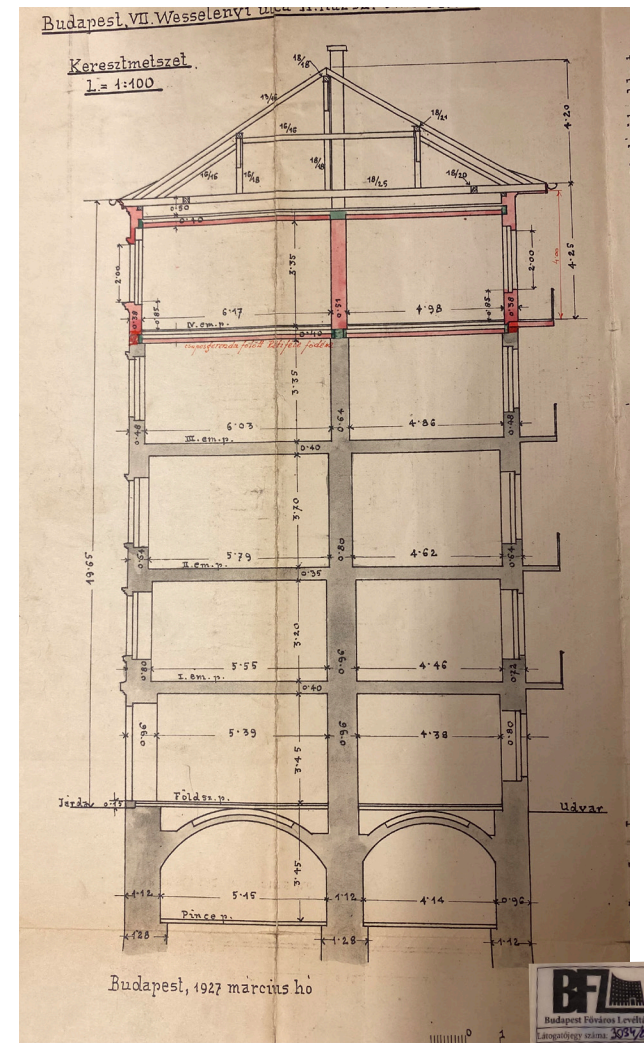
Now, let’s focus on “Vt-V/3.” In this specific subzone:

1. The tallest a building can be is 30 meters.
2. The highest point of the building (maybe like a rooftop) can go up to 22.5 meters.
3. The maximum number of floors a building can have is 5.
4. When they build on a piece of land, only 60% of that land can be covered by buildings.
5. They have to keep at least 10% of the land as green space, like parks or gardens.

In the specified zoning zone, all buildings are required to have basements, and these basements are located approximately 3.5 meters below ground level. This architectural requirement might be in place for various reasons, such as maximizing land use, providing additional space for utilities or storage, or conforming to specific design standards set by the local authorities.



The current photo was taken from Budapest City Archives for purposes of studying the neighboring buildings. Here the photo is about the building on the south with parcel number 34485.



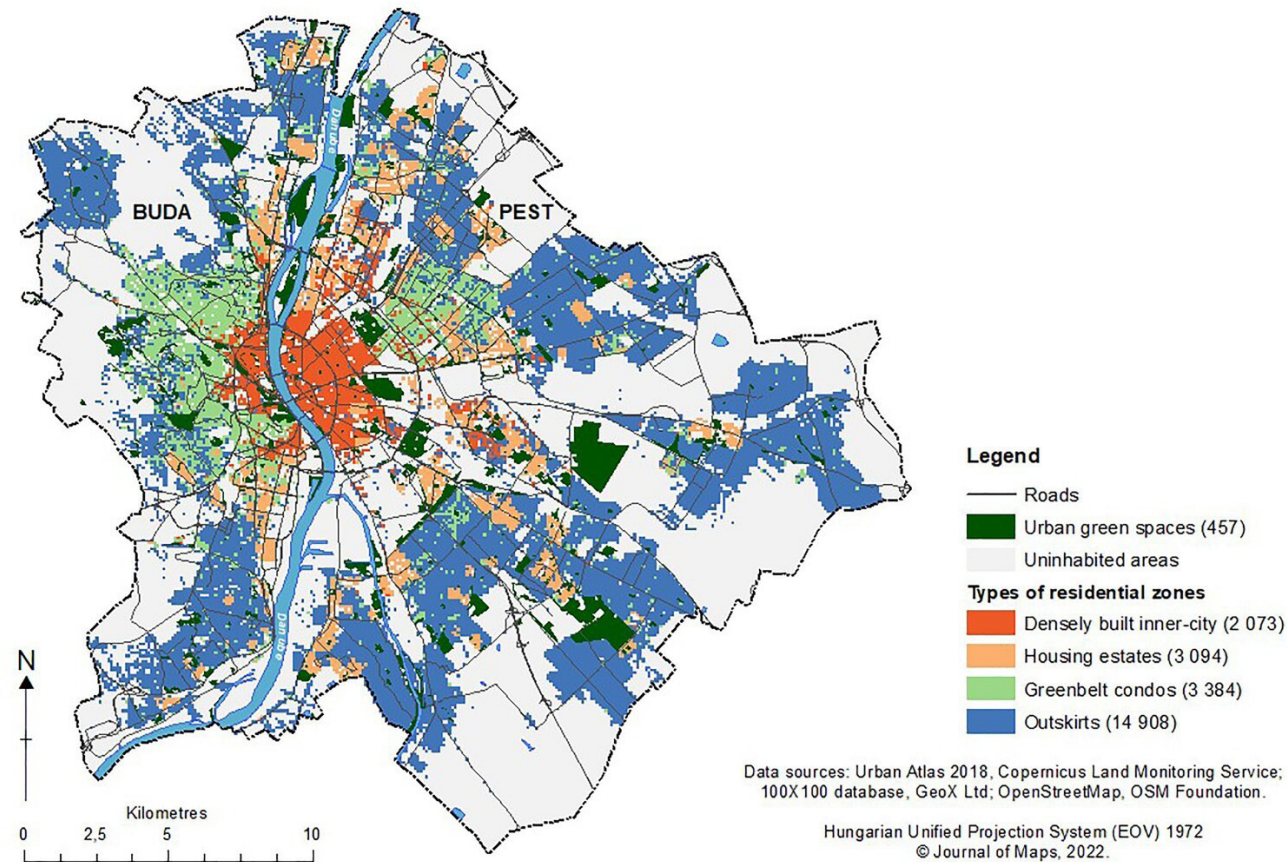


Green spaces analysis

- Public green space
- Private green space
- Tree

Site regulation on green spaces and built area of site

- 10% minimum green space / 60m²
- 60% maximum built space / 353.4 m² on ground floor



//The classification of Budapest’s inhabited area into different residential area types. Map of residential zone types in Budapest. On both banks of the Danube, a densely built inner city is located, surrounded by areas of greenbelt condos, and the outskirts on the edge of the city. High-rise housing estates are located randomly citywide.

IMPORTANCE OF GREEN SPACES

Green spaces in a city are vital because they make the city look nice and help us stay healthy. Trees and parks give us fresh air and a cool place to play and relax. When we see green trees and open areas, it makes us feel good and less stressed. These green spaces are like natural havens for animals and birds, making the city more lively and friendly. So, having green places in the city is like having a breath of fresh air and a happy, pretty spot where everyone can enjoy a break from the busy city life.

With a plot size of 749.4 m² and an allowed building space of 589.6 m², a portion of the land, equivalent to 75 square meters, must be designated as green space. This commitment to green space ensures a balance between construction and natural elements, contributing to a more environmentally friendly and aesthetically pleasing use of the land.

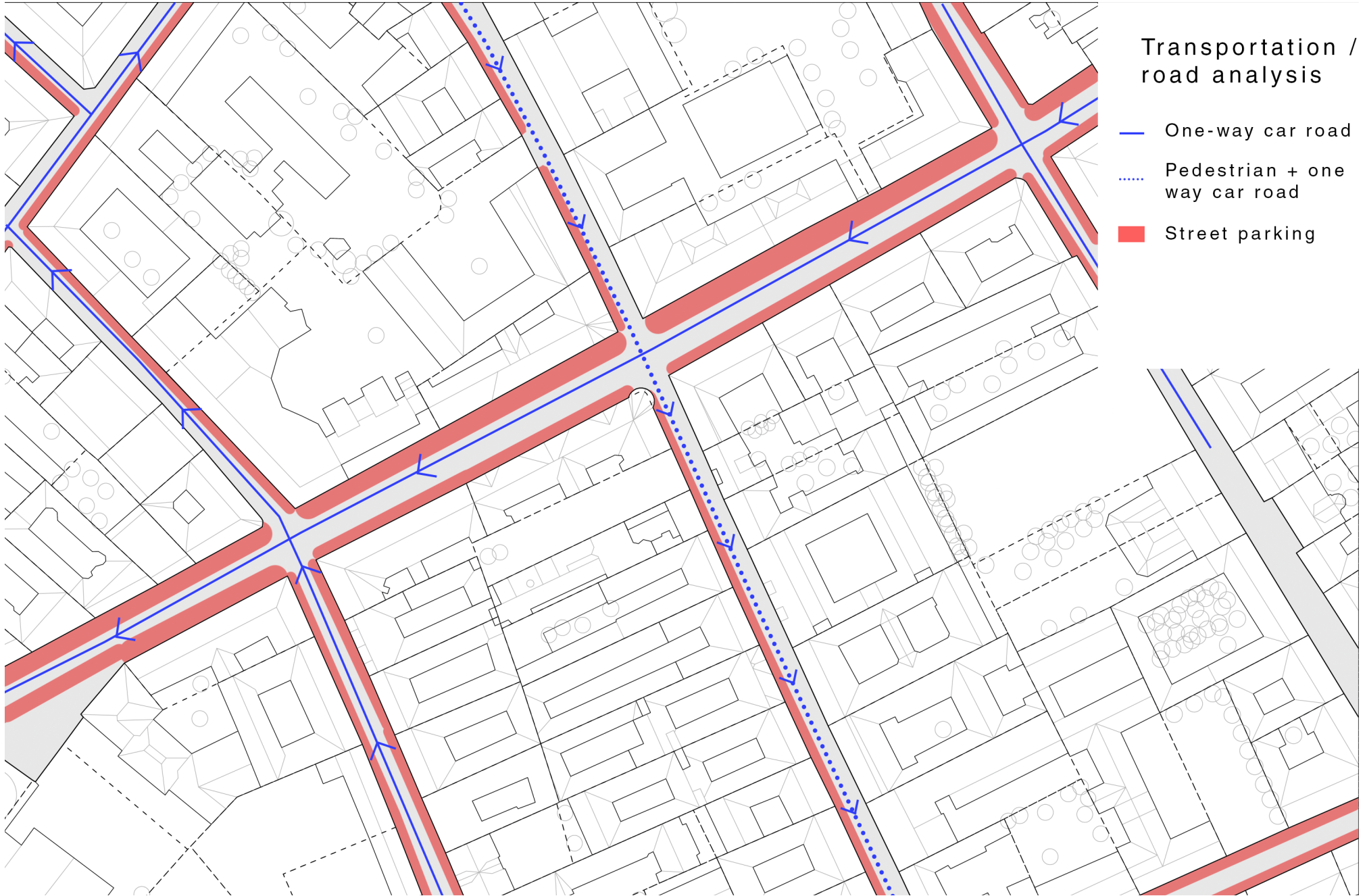




IMAGE OF KAZINCZY & WESSELENYI STREET

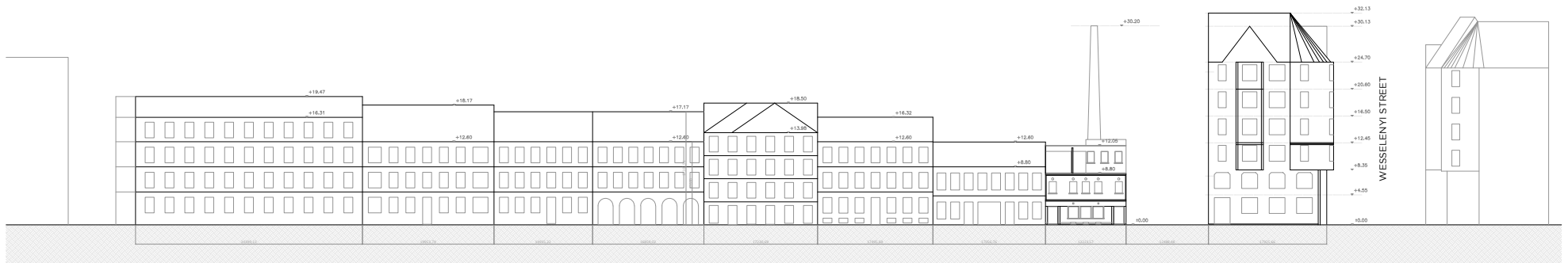
The primary entrance road to my plot is a one-way mixed-use road, accommodating both pedestrians and cars. Street parking is available on one side of the road, and the whole width of the road is approximately 7.5 meters. This configuration makes accessing parking spaces a bit challenging due to the shared use of the road.

On the other hand, Wesselenyi Street is considerably wider, spanning around 16.7 meters, and operates as a one-way thoroughfare for cars. This layout makes the road particularly well-suited for the possibility of underground or multi-level car parking, offering a more feasible solution for accommodating vehicles.





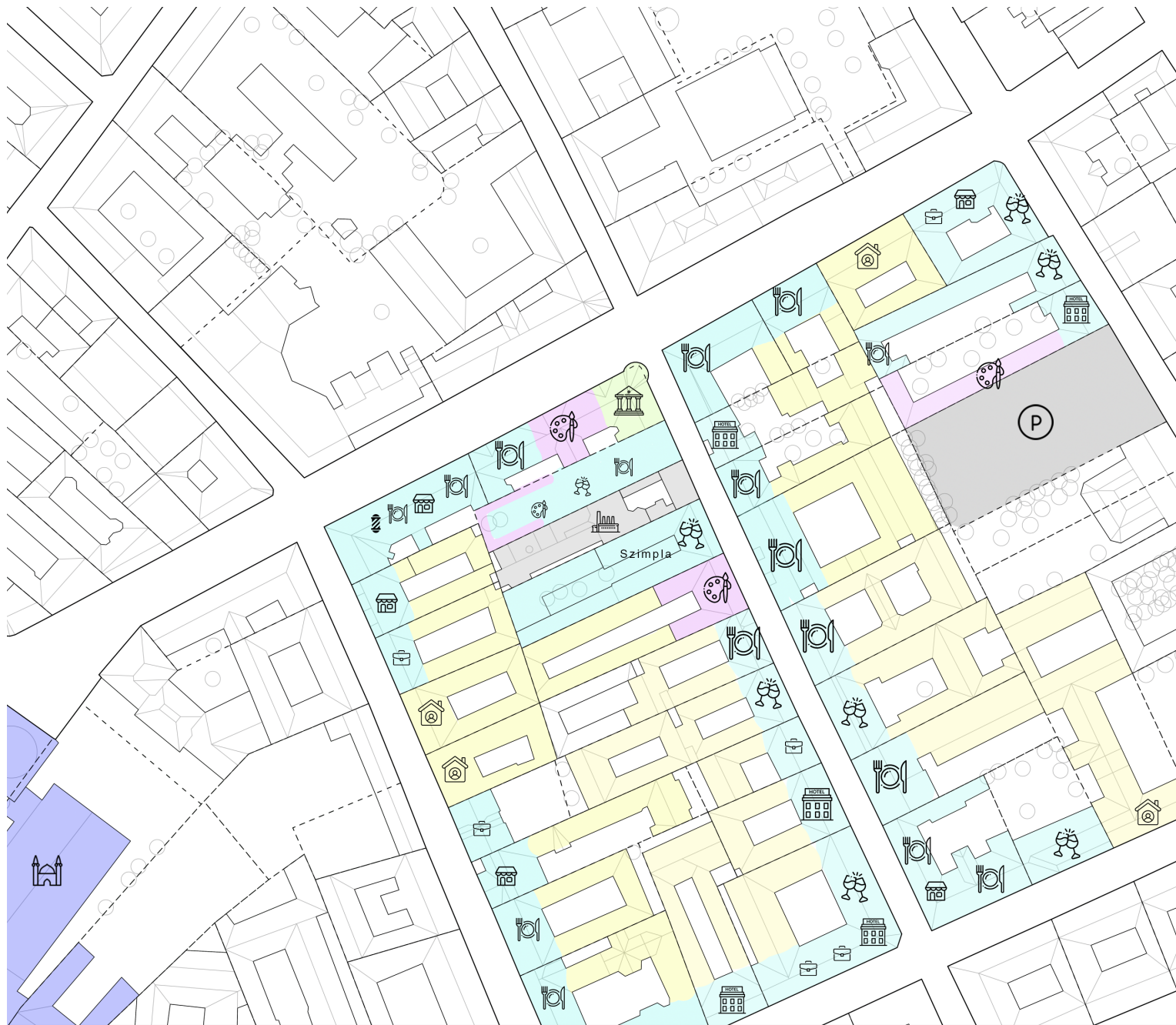
AVERAGE HEIGHT OF PLOT NEIGHBORING BUILDINGS FACADE (FULL BLOCK OF BUILDINGS) 18.30m



AVERAGE HEIGHT OF NEIGHBORING BUILDINGS FACADE ON THE OTHER SIDE (FULL BLOCK OF BUILDINGS) 20.00m



The structure to the north is a mikveh, a Jewish ritual bath, featuring a facade building height of 12 meters. On the opposite side, the building to the south is a six-story residential building, reaching a maximum height of 32.12 meters at its highest point. This creates the potential for ample direct sunlight on the plot, enhancing its suitability for various purposes, including residential, commercial, and green spaces.



Ground floor service analysis

- Bar, club
- Restaurant, cafe
- Gallery
- Government office
- Shop, supermarket
- Parking
- Barber
- Empty building
- Residential
- Office space

Zoning

- Service zone
- Entertainment, cultural
- Residential zone
- Mosque
- Car parking

Advantageously,

The area surrounding Karavan Food Market is a dynamic and bustling urban environment, characterized by a vibrant mix of service-oriented establishments. The blocks adjacent to the market boast a strategic urban design, with ground floors dedicated to various service functions, including restaurants, pubs, and galleries. This arrangement creates a lively and inviting atmosphere, fostering a sense of community and cultural engagement.

Additionally, the presence of cultural buildings in the area adds depth to the neighborhood, providing residents and visitors with opportunities for artistic exploration and entertainment. Notably, Kazinczy Street, where the Karavan Food Market is situated, is a magnet for tourists, ensuring a steady flow of foot traffic.

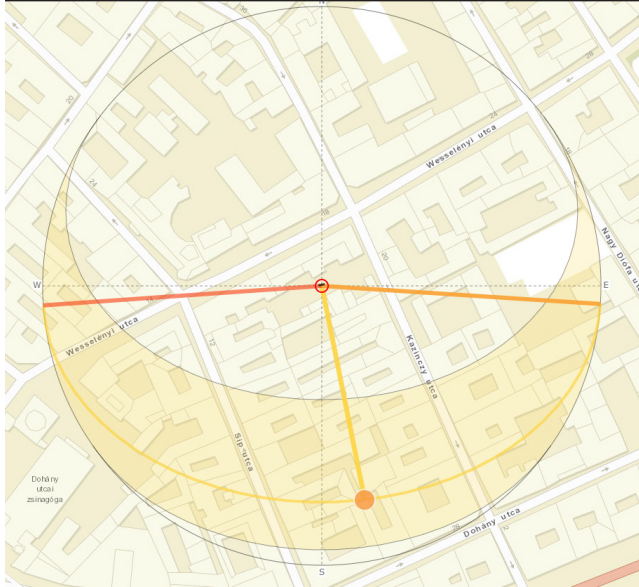
From an economic standpoint, locating service spaces on the ground floor of a project in the Karavan Food Market spot presents numerous advantages. It capitalizes on the high visibility and accessibility of the area, attracting both locals and tourists. The steady influx of visitors enhances the commercial viability of service establishments, promoting economic growth and contributing to the overall vitality of the neighborhood. This strategic positioning aligns with the dynamic character of the surroundings, creating a symbiotic relationship between commerce, culture, and community life.

Disadvantageously,

The activities in a food market, such as food preparation, customer chatter, and deliveries, can generate significant noise. This may disrupt the peace and quiet that residents expect in their homes, particularly during early morning or late-night hours.

A food market can attract a higher volume of traffic, both from customers and delivery vehicles. This may lead to congestion in the area, making it difficult for residents to find parking spaces and potentially causing traffic-related nuisances.

Cooking and food preparation can release strong odors, and the market is situated too close to residential buildings, residents may be exposed to unwanted smells. This could impact the overall air quality in the vicinity, affecting the living conditions for those nearby.



sunrise: 6:40 AM
 12:00 PM
 sunset: 6:20 PM

AUTUMN

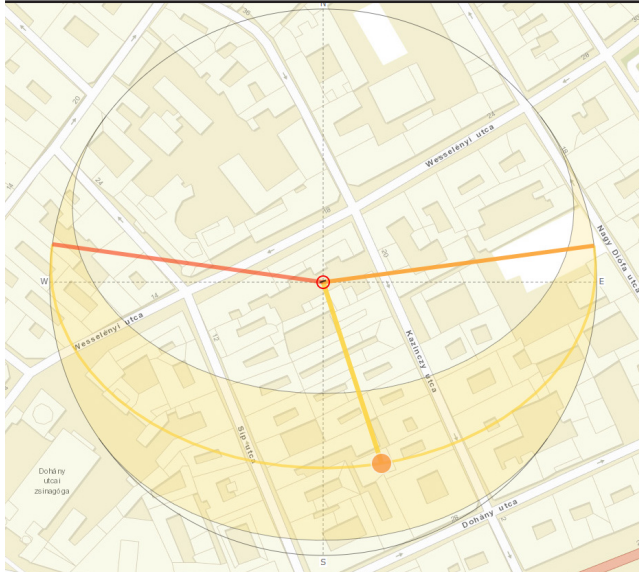
Budapest, the capital of Hungary, experiences a temperate continental climate with distinct seasonal variations. Summers in Budapest are warm, with average temperatures ranging from 25 to 30 degrees Celsius (77 to 86 degrees Fahrenheit).



sunrise: 7:30 AM
 12:00 PM
 sunset: 16:00 PM

WINTER

Winters, on the other hand, can be cold, with temperatures often dropping below freezing, especially from December to February.



sunrise: 6:20 AM
 12:00 PM
 sunset: 7:10 PM

SPRING

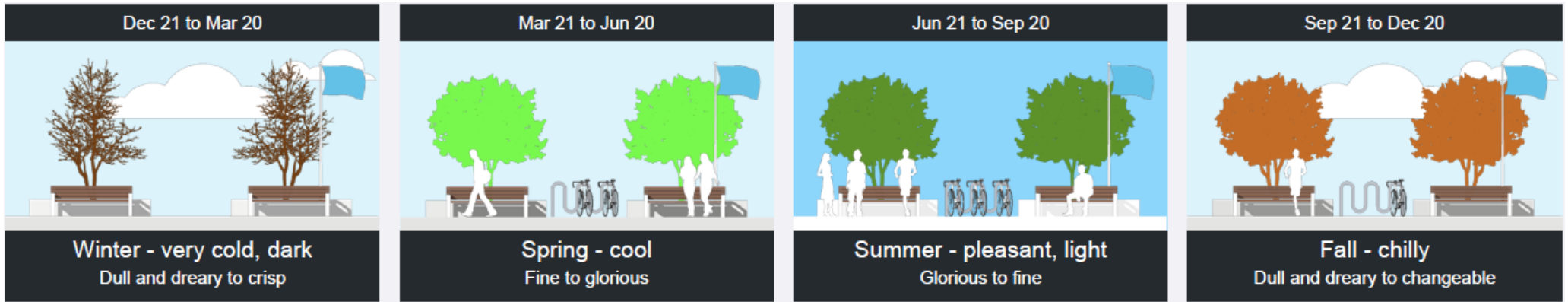
Spring and autumn serve as transitional periods, with mild temperatures and blossoming greenery in spring.



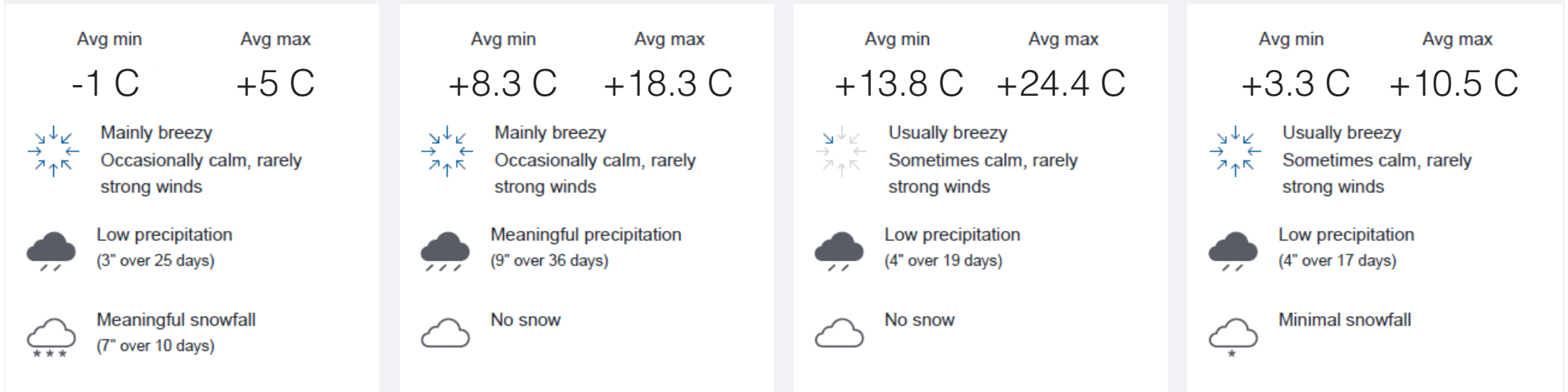
sunrise: 5:00 AM
 12:00 PM
 sunset: 20:45 PM

SUMMER

Summers in Budapest are warm, with average temperatures ranging from 25 to 30 degrees Celsius (77 to 86 degrees Fahrenheit).



Weather



Budapest has a temperate oceanic climate.

- Distinct climate during the year requires sufficient thermal insulation thickness.

-Ventilation required for both winter and summer.

Dec 21 to Mar 20
Winter - very cold, dark
 Dull and dreary to crisp

Mar 21 to Jun 20
Spring - cool
 Fine to glorious

Jun 21 to Sep 20
Summer - pleasant, light
 Glorious to fine

Sep 21 to Dec 20
Fall - chilly
 Dull and dreary to changeable

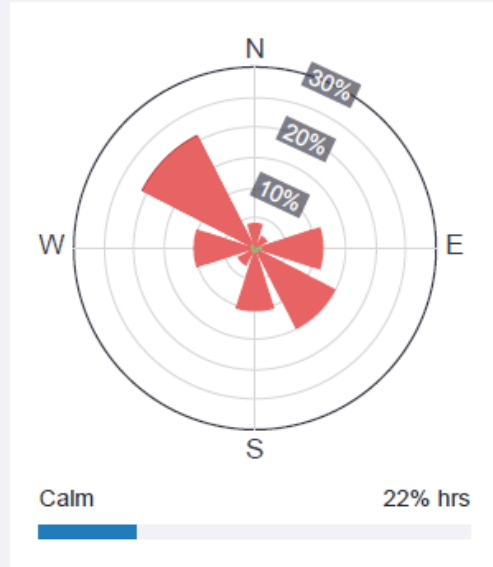
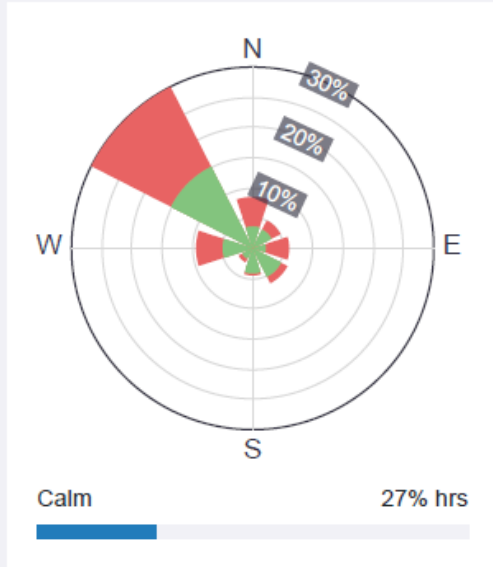
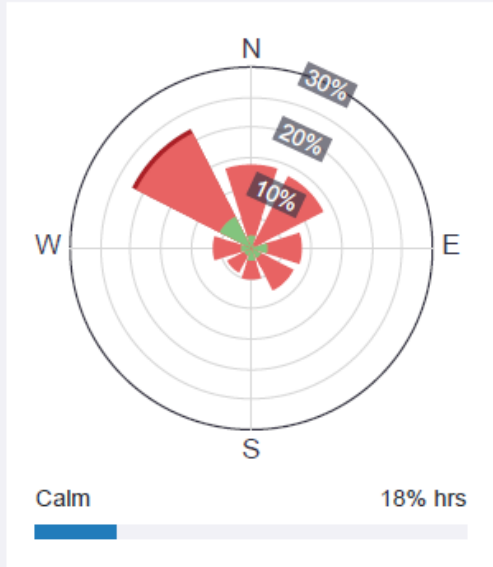
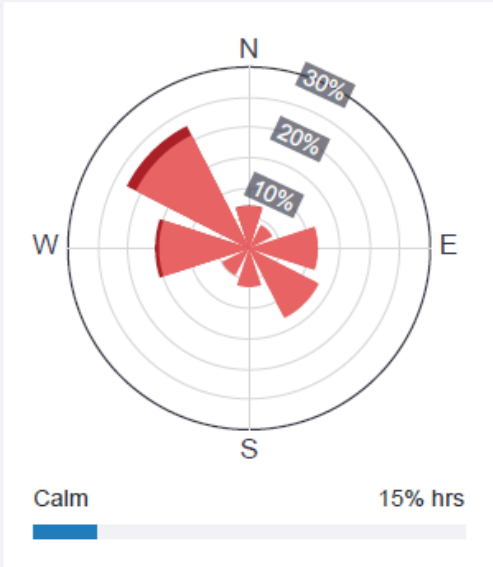
Impact of wind on comfort

● Cooling

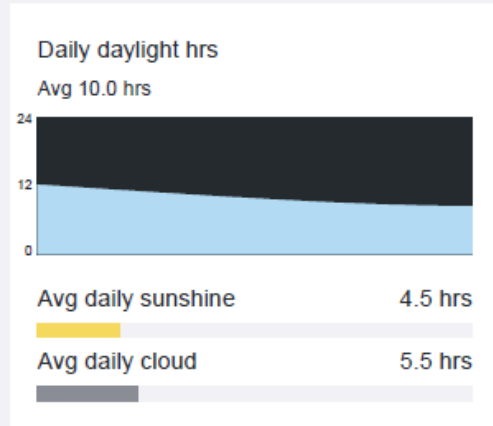
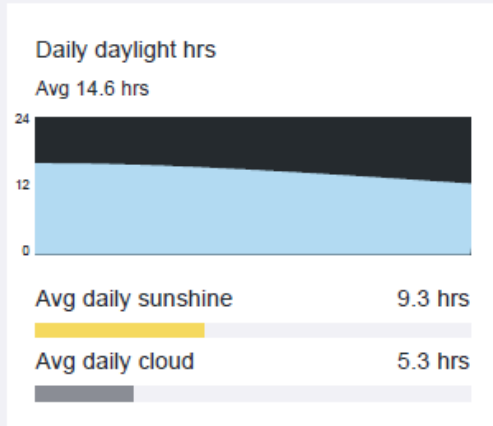
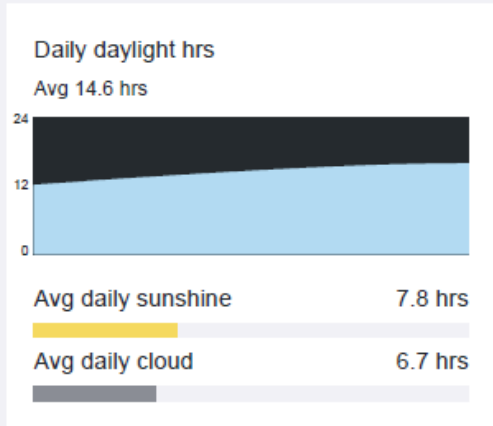
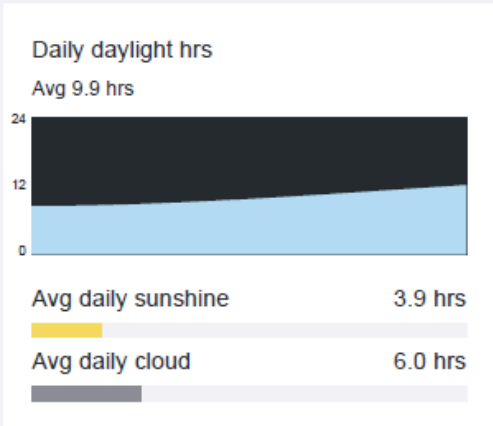
● Chilling

● Too windy

-Household wind turbine not effective



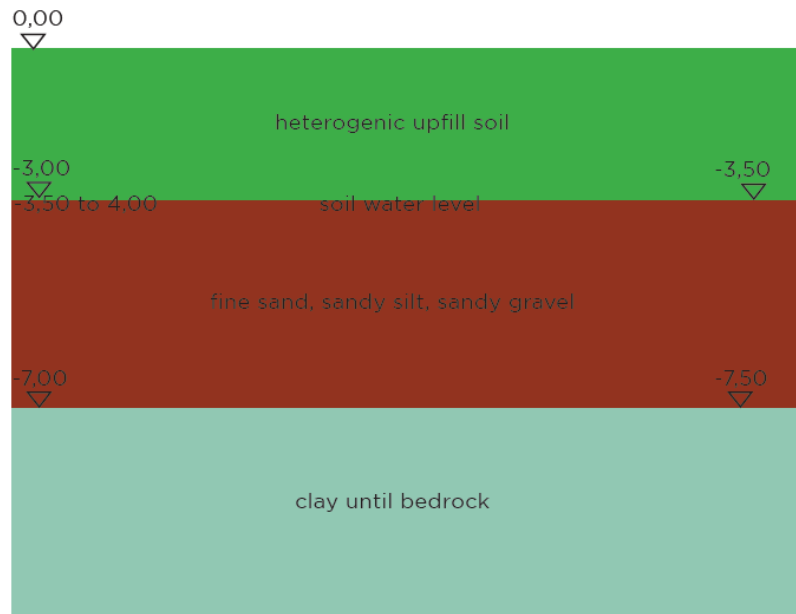
Daylight & sunshine



- Optimal for solar panel installation for green energy

- Having a bigger opening is advantageous from thermal pov

Soil layers



The ground level is assumed to be nearly even, close to horizontal.

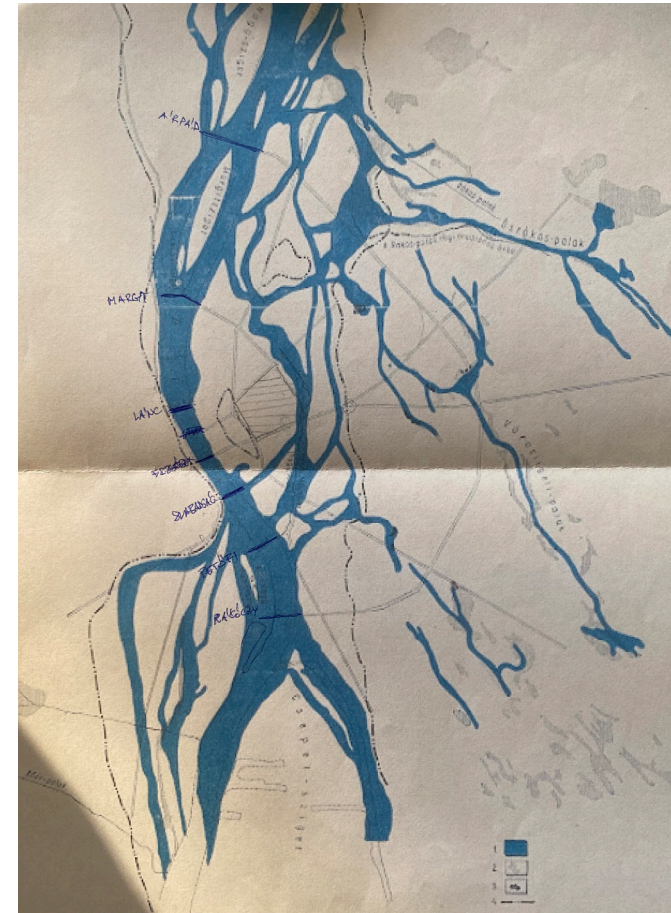
Soil layers under the ground level:

0.00m to -3.50m is a heterogenic upfill soil

-3.50m to -8.00m is fine sand, sandy silt, sandy gravel with different layer depth optimal for foundations.

from -8.00m is clay until bedrock

Fine sand, sandy silt, sandy gravel are suitable for foundations.



Soil water level: appr. 3,5 – 4,0 m under ground-level.

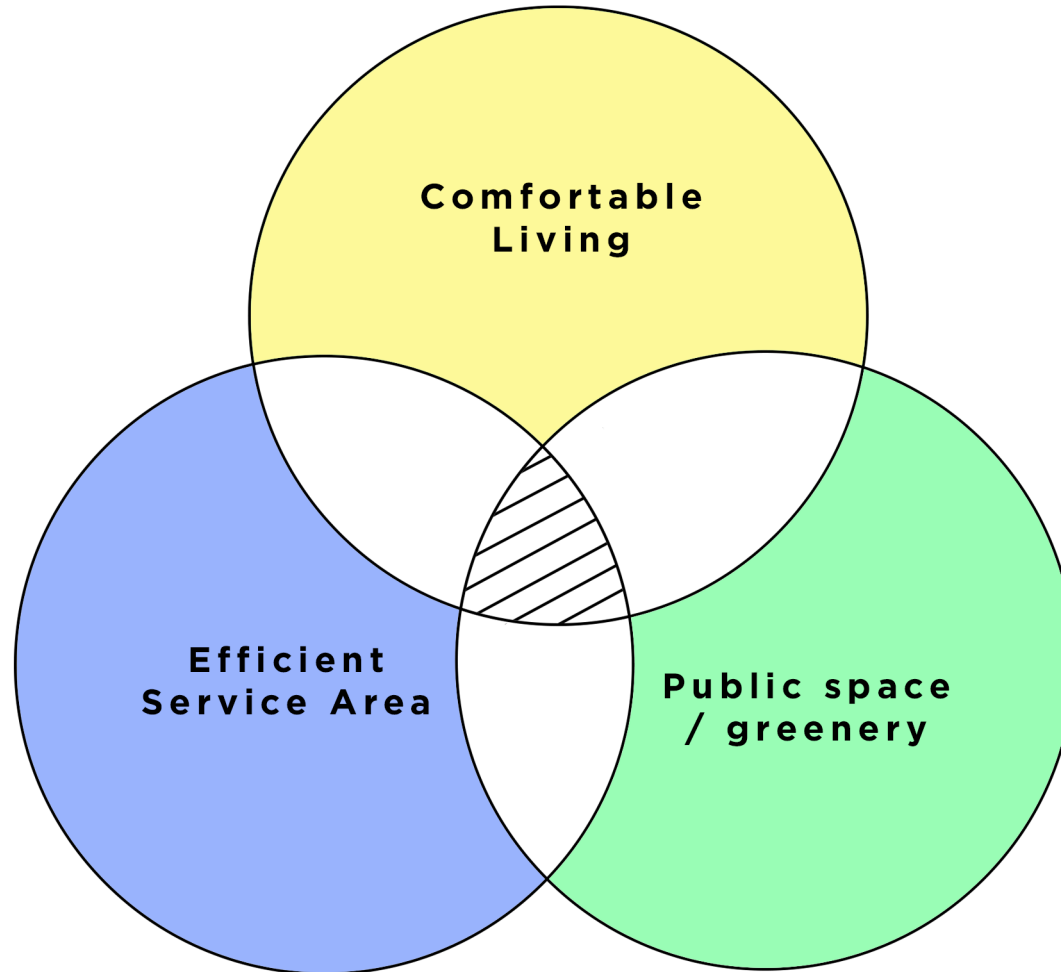
Historically, the Pest side of Budapest was characterized by a network of small rivers and water bodies that meandered through the landscape. However, as the city developed and expanded, strategic urban planning initiatives were undertaken, leading to the redirection and channeling of these waterways to accommodate the growing urban space.

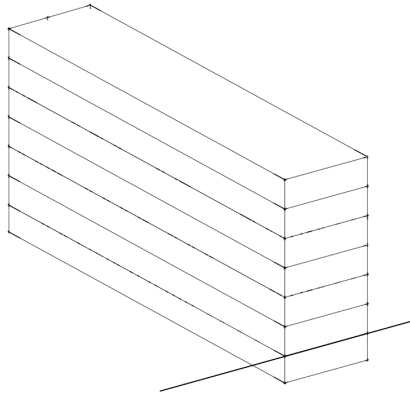




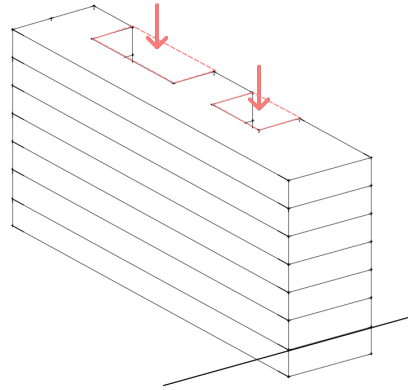
AIM

The core aim of my project is **to craft a lively multi-function structure that harmoniously weaves together three essential domains: comfortable residential spaces, a bustling market space, and a lush, inviting green spaces.**

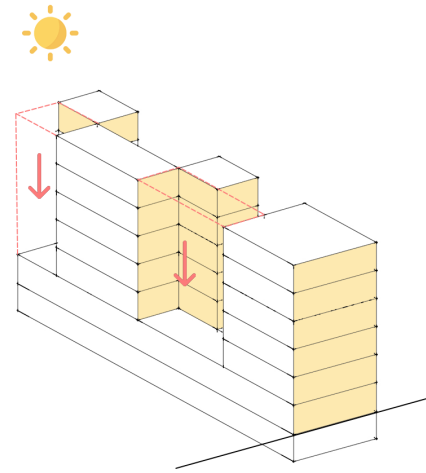




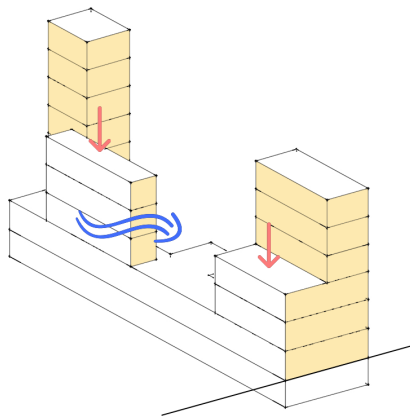
BUILDING BLOCK



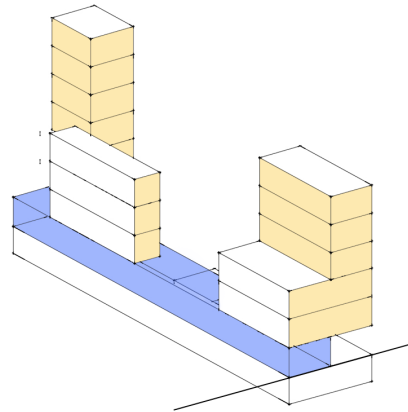
OPENINGS FOR NEIGHBORING BUILDING



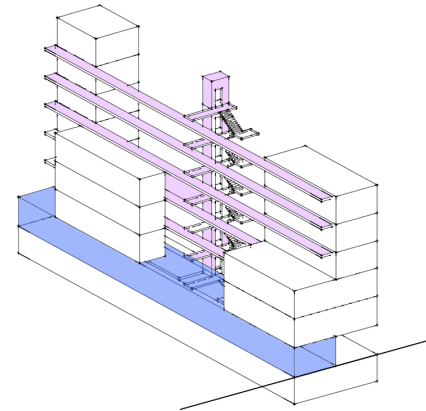
OPENINGS FOR SUNLIGHT



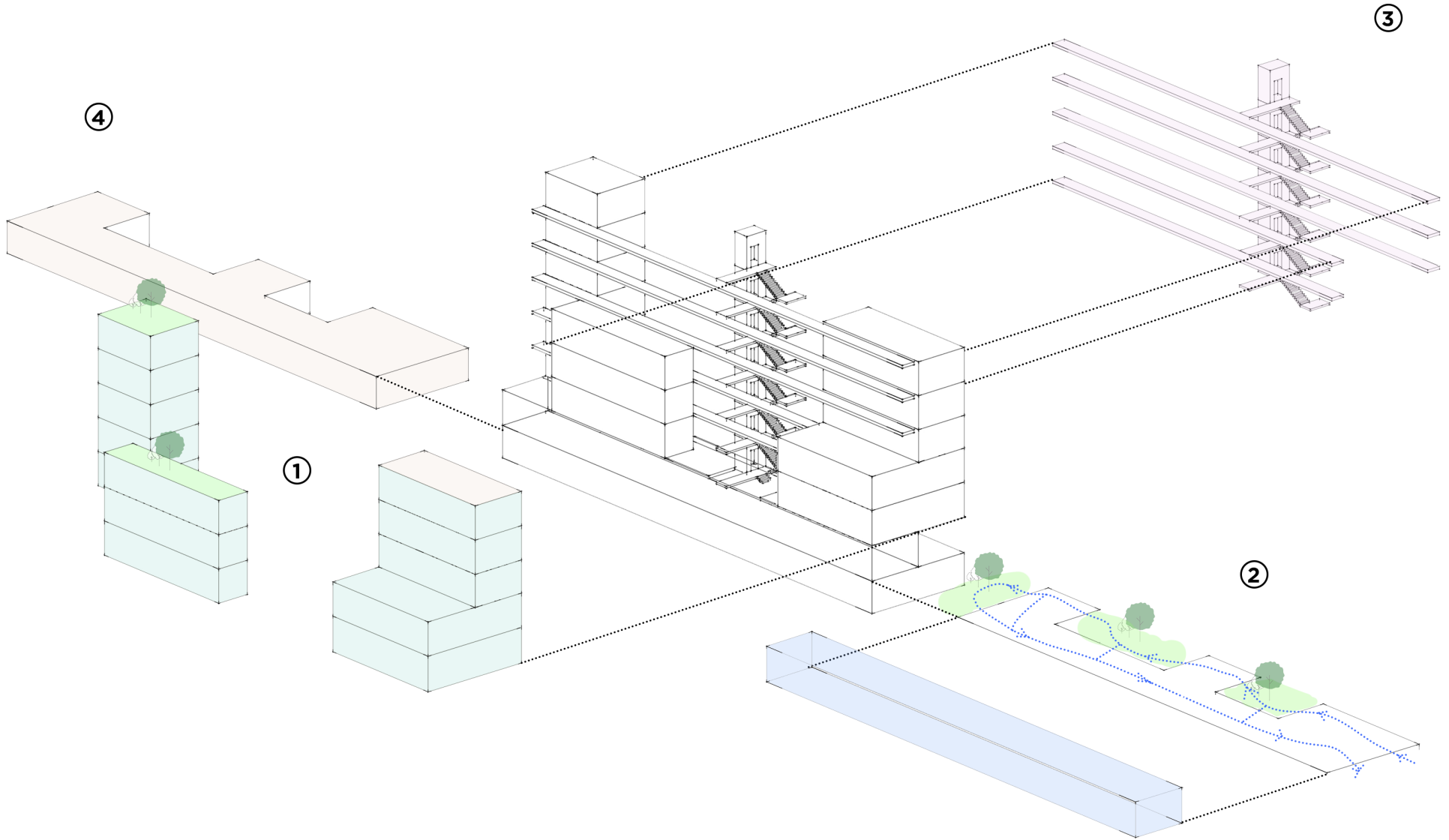
REDUCING HEIGHT TO NEIGHBORING BUILDING



GROUND FLOOR MODIFICATION



CIRCULATION



1. RESIDENTIAL BLOCKS

The design features a residential block above a lively market, connected by a corridor with stairs and an elevator. The residential blocks have openable glass facades, prioritizing passive heating, sunlight, and natural ventilation. This transparency fosters a connection with green spaces and provides residents with a view of market events. Varying floor levels respond to neighboring buildings, allowing for green spaces on lower block roofs, visible from multiple floors. The top floor is dedicated to solar panels and a rooftop garden, emphasizing sustainable design and providing residents with a panoramic retreat and eco-friendly amenities.

2. GROUND FLOOR

The ground floor features a market that opens towards a dynamic courtyard at specific hours, creating a unique environment for residents and visitors. The adaptable market can be temporarily closed for scheduled events. The courtyard is a versatile space, open to the public at designated hours and transforming into a private oasis for residents at other times. This flexible design enhances the overall appeal of the development, meeting diverse needs and creating a vibrant and adaptable community space.

3. CIRCULATION CORRIDOR

The circulation corridor, spanning the length of the 60-meter plot, is intentionally left unheated. To accommodate thermal expansion and contraction, the corridor is divided into sections. The design prioritizes the use of lightweight and compact materials for efficiency, ensuring that the construction consists of small, modular steel units. This approach not only addresses practical concerns related to thermal expansion but also emphasizes a cost-effective and sustainable design for the circulation corridor.

4. BASEMENT

The basement floor serves as a centralized hub encompassing essential support functions for both residential and market spaces. All residential blocks are integrated into a unified system for heating, water, and electricity, streamlining efficiency and maintenance. Additionally, the basement accommodates dedicated spaces for market staff, including a common room, storage facilities, cleaning storage, and public toilets. This comprehensive approach ensures optimal functionality, shared resources, and a cohesive infrastructure supporting both the residential and market components of the development.

BUILDING PROGRAM							
FLOOR	1. RESIDENTIAL BLOCK	SIZE m2	AREA PER F	FLOOR	1. RESIDENTIAL BLOCK	SIZE m2	AREA
1	Apartment 1	154.9	344.97	5	Apartment 9	41.62	274.87
	Apartment 2	52.78			Apartment 10	77.55	
	Apartment 3 (duplex)	41.34			Green space	59.75	
	Staircase	13.23			Staircase	13.23	
	Elevator	4.75			Elevator	4.75	
	Corridor	77.97			Corridor	77.97	
2	Apartment 3 (duplex)	41.34	344.99	0	SUM	1283.37	
	Apartment 4 (duplex)	52.8			2. GROUND FLOOR	SIZE m2	
	Apartment 5	154.9			Market space	320.5	
	Staircase	13.23			Bike park for 20	35.17	
	Elevator	4.75			Staircase	18.23	
3	Corridor	77.97	318.54	0	Elevator	9.75	
	Apartment 4 (duplex)	52.8			Gardening space	18.45	
	Apartment 5	41.62			Courtyard garden	56.02	
	Apartment 6	77.55				97.38	
	External space	50.62			SUM	624.54	
	Staircase	13.23			-1	3. BASEMENT	
Elevator	4.75	Public bathroom	40.13				
Corridor	77.97	Trash recollection room	25				
4	Apartment 7	41.62	274.87	Cleaning cupboard		10.68	
	Apartment 8	77.55		Electrical room		18	
	Green space	59.75		Water plant		23.7	
	Staircase	13.23		Heating plant	35.07		
	Elevator	4.75		Water pressure booster plant	53.5		
	Corridor	77.97		Common room	33.87		
				Corridor + storage locker	62.04		
		Corridor + storage locker (residen	111.17				
		Staircase	18.23				
		Elevator	9.75				
		SUM	441.14	2349.05			

SPECIFICATIONS OF CONSTRUCTIONS

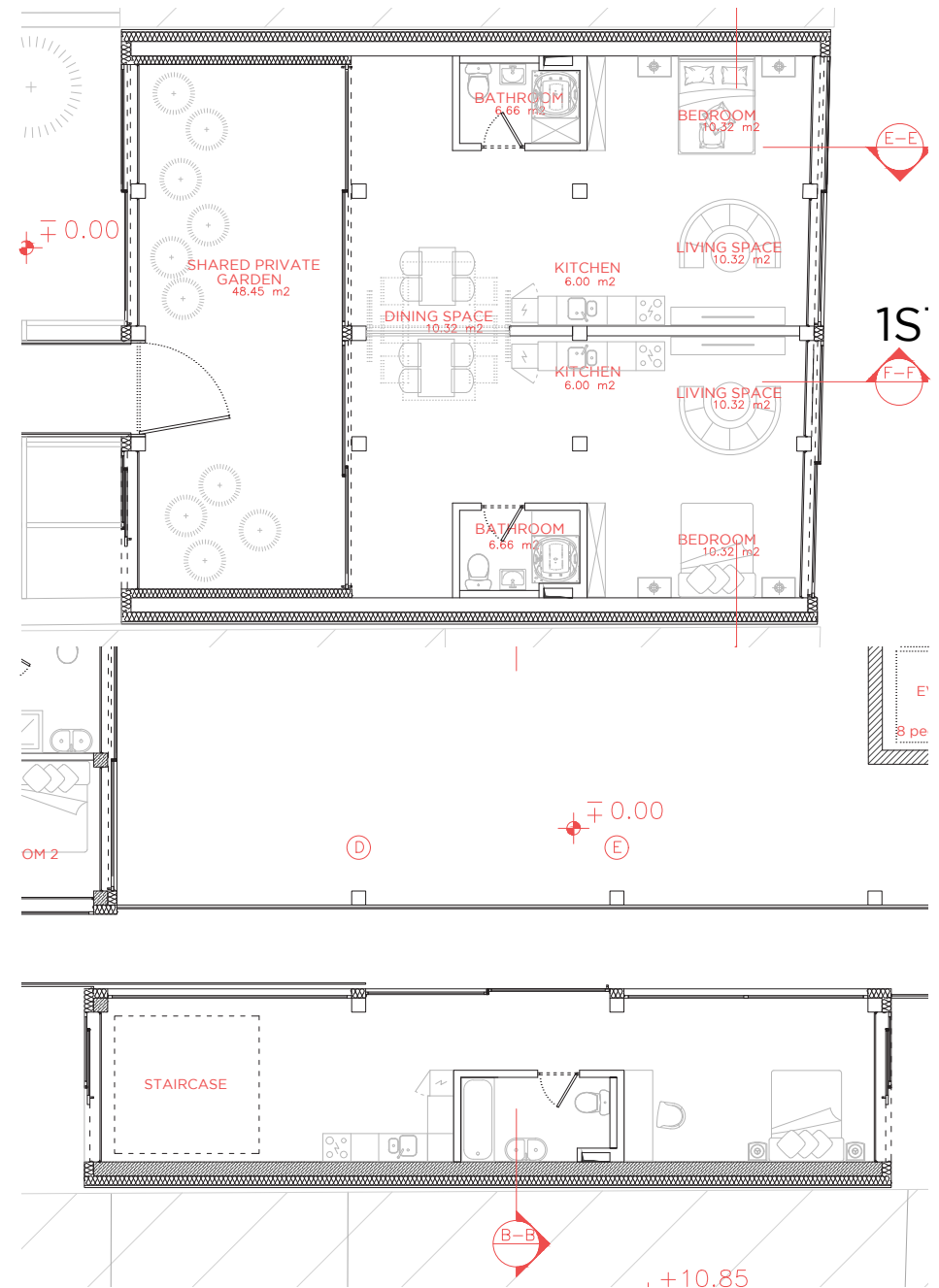
1. ACOUSTICS

Airborn sound insulation requirement in multi-story residential buildings between apartments above each other

room relationship		Noisy apartment or room & construction extended to noise load	Room which requires protection against noise	Airborne sound insulation				Impact noise protection	
				basic requirement		increased requirement		basic requirement	basic requirement
				R'_{w+C} dB	R'_{e+C} dB	R'_{w+C} dB	R_{w+C} dB	L'_{im+C_i} dB	L'_{im+C_i} dB
neighbouring apartments	1.	any room in the apartment	room of neighbouring apartment	51	—	54	—	56	53
	2.	kitchen, bathroom, larder, toilet, entrance	kitchen, bathroom, larder, toilet, entrance	46	—	51	—	56	53
apartment — corridor	3.	stair flight, landing, corridor, corrid. flooring	any room in the apartment	—	51	—	54	56	53

In adherence to acoustics regulations, a strategic placement of shafts was implemented to minimize noise impact on residential spaces. Specifically, these shafts were carefully positioned away from bedrooms and living rooms to enhance the overall living experience for occupants. Additionally, the shafts were situated in proximity to firewalls adjacent to neighboring buildings, optimizing both acoustic considerations and safety measures.

Furthermore, the placement of the shafts took into account areas with less sunlight, ensuring that these invaluable spaces were utilized effectively. This approach not only addresses acoustic concerns but also contributes to the overall well-being of the residents by considering factors such as natural light exposure in essential areas.



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M20 Acoustic Soundproofing Mat

- 1m by 1m by 20mm soundproofing mat
- 15kg/m²
- For use with existing brick walls to reduce sound transmission
- Up to 87% reduction in noise transference
- Made from recycled materials



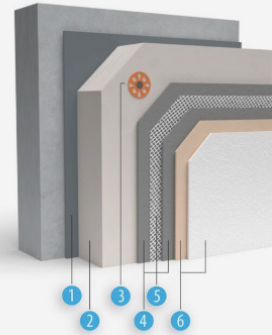
2. ETICS cladding system

External Thermal Insulation Composite Systems (ETICS) is a type of cladding system that provides exterior walls with an insulated finished surface and waterproofing in an integrated composite material system.

Advantages:

1. ETICS provides effective thermal insulation for buildings, helping to reduce heat loss and improve energy efficiency. This can contribute to lower heating and cooling costs.
2. ETICS contributes to overall energy efficiency, reducing the building's environmental impact and operating expenses.
3. The insulation layer in ETICS helps prevent condensation within the wall structure, reducing the risk of moisture-related issues such as mold growth and damage to the building materials.
4. ETICS systems offer a wide range of aesthetic finishes, allowing for design flexibility. The exterior appearance can be customized to meet architectural preferences, providing a cohesive and visually appealing look.
5. ETICS can enhance the durability of the building facade and provide protection against weathering, UV radiation, and environmental pollutants. This contributes to the longevity of the building envelope.
6. ETICS can work well together with the large opening system of the building.

ETICS with rendering system



These systems typically comprise of:

- 1 Adhesive
- 2 Thermal insulation board
- 3 Mechanical fixing devices (e.g. plate anchors)
- 4 Base coat
- 5 Reinforcement (e.g. glass fibre mesh)
- 6 Finishing layer: finishing coat with a key coat (optional) and/or decorative coat (optional)
- 7 Accessories, e.g. fabricated corner beads, connection and edge profiles, expansion joint profiles, base profiles, etc.

U value of ETICS system materials

Insulation Board	Thickness (mm)	Thermal Conductivity* K-Value [W/(m.K)]	Thermal Resistance R-Value [(m ² .K/W)]	Thermal Transmittance U-Value [W/(m ² .K)]
EPS	50	0.033	1.52	0.66
	100		3.03	0.33
	150		4.55	0.22
	200		6.06	0.17
G-EPS (Graphite enhanced)	50	0.030	1.67	0.60
	100		3.33	0.30
	150		5.00	0.20
	200		6.67	0.15
XPS	50	0.030	1.67	0.60
	100		3.33	0.30
	150		5.00	0.20
	200		6.67	0.15
MW	50	0.040	1.25	0.80
	100		2.50	0.40
	150		3.75	0.27
	200		5.00	0.20

3. Lifting/ sliding window with triple float glass

Triple Glazing Values per DIN EN 673

Ug 0.7 W/qmK

Triple glazing has a U-value of 0.7 W/qmK as defined by the DIN EN 673 standard . The glass construction is composed of 4mm of float glass, a 12mm separation between panes, another 4mm float glass, 12mm separation between panes and a third pane of 4mm float glass..

Ug 0.6 W/qmK

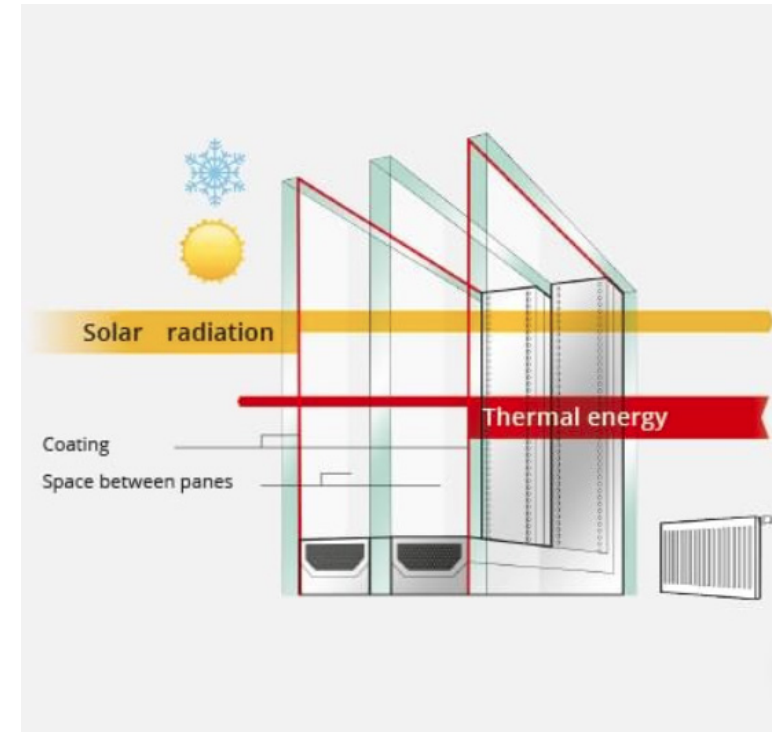
Another triple glazing option with a U-value of 0.6 W/qmK uses increased space between panes.They are configured with three 4mm thick pieces of glass with 14mm of separation between them.

The Uw-value is 0.8 W/qmK for Aluplast vinyl windows with 5-chamber system and pine wood windows. Meranti wood has a Uw-value 0.1 W/qmK higher.

On top of its excellent thermal performance, a hidden benefit of the triple glazed windows design is a reduction in exterior noise. Compared to double glazing, triple offers improved sound proofing and will lower outside noise from traffic, pedestrians and other noise pollution.

Bedrooms, living rooms and home offices are usually most affected and benefit most from improved insulation and noise reduction since they are most frequently used.

For effective soundproofing a number of factors must be taken into consideration. Triple glazing is particularly effective when a joint sealant is used between the frame and masonry. The joint sealant contributes considerably to reducing noise levels since gaps in the masonry can allow more noise in that you would expect.



SMOOVIO SLIDING DOOR

Manufacturer: Marshall Ablakgyár Kft



Thermal Insulation:
Up to $U_w=0.85$ W/m²K possible



Noise Reduction Value:
Up to 46 dB possible



Anti-burglary protection level:
From base security up to RC2



Design:
Narrow sash, Wood feeling,
Acrylcolor

Smoovio is an improved version of the sliding doors available so far, a perfect sealed sliding door, which stays in place even in stormy weather and maintains airtightness. The new sliding door is an improved version of the deservedly popular lift-and-slide door. The Smoovio utilizes a clamping closure and circumferential seals that provide an uncompromising seal.

- ✓ **PVC profile:** 5 air chamber cases, 5 air chamber sash
- ✓ **Glass:** 3 layer, max. 48 mm thick glass
- ✓ **Hinge/Fitting:** Innovative ROTO fitting

SIZES IN MM

Total thickness of door	165
Case and hinge apparent height	150
Maximum thickness of tripple-glazed glass	48
Case installation depth	150

OPENING TYPES

'A' scheme: sliding -> fix or fix <- sliding	Igen
'C' scheme: fix <- sliding, sliding -> fix	Nem

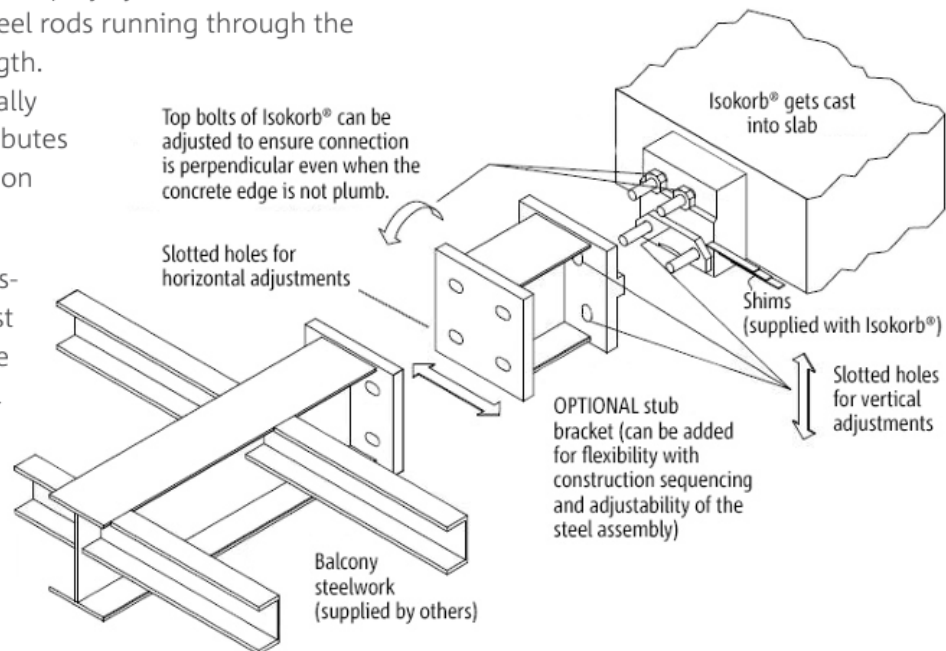
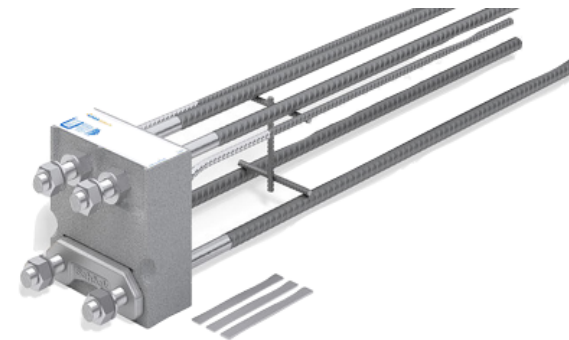
VALUES, OTHER INFORMATION

Uf value (profile heat transfer value, W/m ² K)	1.3
Uw value (extra glass)	up to 0.85
Number of circumferential seals	2
Steel reinforcement in case and sash	Closed profile

Insulate concrete-to-steel connections with Isokorb® Structural Thermal Breaks.

Isokorb® structural thermal breaks for concrete-to-steel connections consist of a graphite-enhanced expanded polystyrene insulation module with load-bearing stainless steel rods running through the insulation for tension and shear strength. Since stainless steel is 70% less thermally conductive than carbon steel, it contributes to the R value of the module, in addition to resisting corrosion.

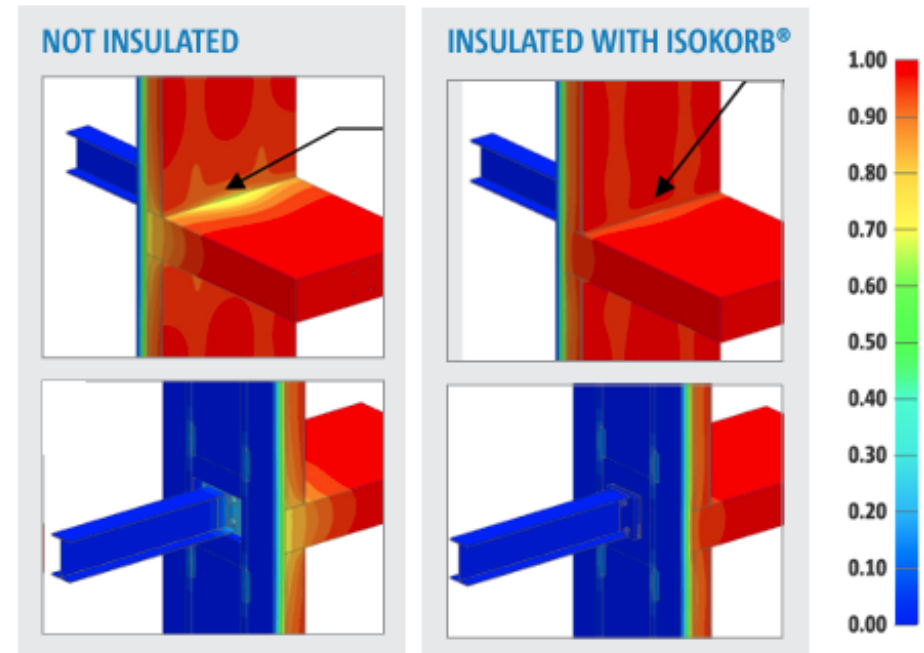
The interior/rebar side of the rod is fastened to the floor slab rebar. Once cast in concrete, the exterior/threaded side of the rod is simply bolted to the steel balcony or canopy support structures using backing plates and high strength nuts. The resulting assembly delivers the same structural strength as conventional cantilevers, while passively reducing heat loss.



Uninsulated vs. insulated connections >>

The images to the right show a thermal modeling analysis¹ of a wall detail with an interior concrete slab connected to an exterior steel balcony support. The comparison assesses the balcony support beam connected with standard uninsulated structural embeds (left) and a balcony support beam connected by the Isokorb concrete-to-steel thermal break (right). This analysis results in a 94% improvement in heat retention in the beam penetration with the thermal break compared to the beam connection with no thermal break.

¹ 2019 BC Hydro Power Smart, Building Envelope Thermal Bridging Guide (detail 5.7.7)

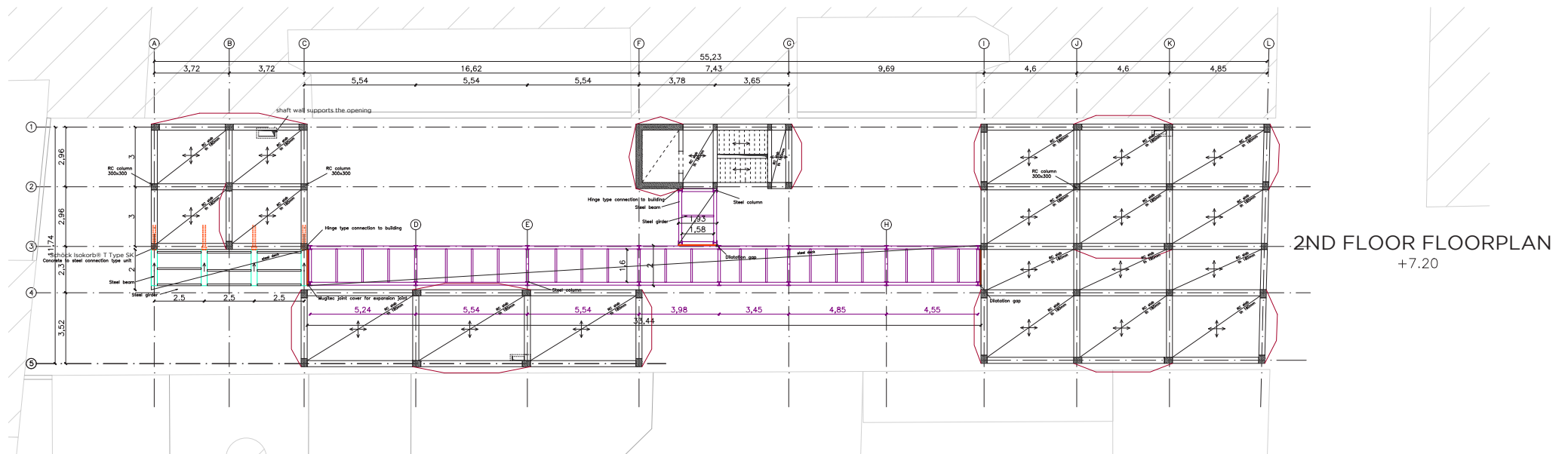
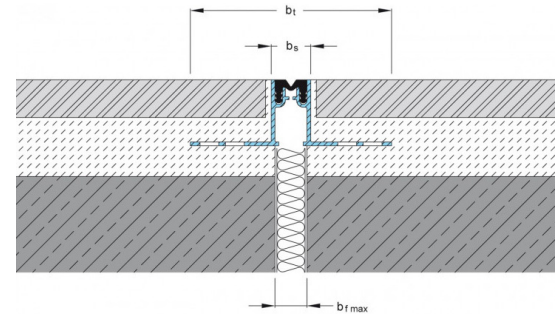
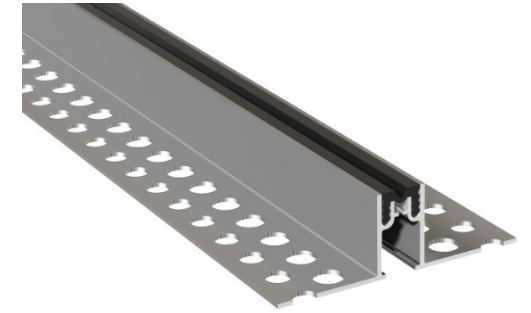


5. MIGUA DILATATION GAP COVER

Buildings are subject to temperature fluctuations throughout the year. Materials, especially those like concrete and metal, expand when exposed to heat and contract when temperatures drop. The dilatation gap allows for these natural movements, preventing structural damage that might occur if the building components were rigidly connected.

Without adequate provisions for movement, the building components might experience stress, leading to cracking or other structural issues.

Dilatation gap covers are essential for buildings, preventing debris buildup, improving safety, and enhancing aesthetics. With durability and easy installation, these covers reduce maintenance costs and accommodate the structure's movements. They provide waterproofing, fire resistance, and compliance with codes, ensuring the overall safety and longevity of buildings.



1. LAYER ARRANGEMENTS

BASEMENT FLOOR LAYER (500 mm)

- 10 mm recycled rubber finishing
- 80 mm screed
- 1 layer plastic sheet separating layer
- 80 mm mineral wool thermal insulation
- 1 layer damp-proof membrane
- 2 layer bituminous sheet waterproofing membrane
- 200 mm concrete ground slab
- 100 mm cushion for uplift effect

BASEMENT WALL LAYER (650 mm)

- 100 mm safety spacing
- 150 mm RC supporting wall
- 2 layer DPC waterproofing
- 100 mm mineral wool thermal insulation
- 300 mm insitu RC wall

INTERIOR MARKET FLOOR LAYER (thermally enclosed) (320 mm)

- 10 mm recycled rubber finishing
- 80 mm RC screed
- 30 mm service layer
- 200 mm insitu RC slab

RESIDENTIAL FLOOR LAYER (310 mm)

- 10 mm cement-bound filler
- 70 mm anhydrite screed with underfloor heating
- 1 layer polythylene film
- 20 mm acoustic insulation
- 20 mm thermal insulation
- 180 mm in situ RC slab

WALL TO NEIGHBORING BUILDING LAYER (650 mm)

- 100 mm safety spacing
- 50 mm RC formwork
- 200 mm mineral wool thermal insulation
- 300 mm insitu RC wall

HEATED FLAT ROOF SLAB LAYER (530 mm)

- 50mm concrete paving
- 50 mm gravel ballasting
- 1 layer synthetic filter layer
- 1 layer PVC waterproofing
- 1 layer separation layer
- 20 mm inclined layer EPS thermal insulation
- 200 mm EPS thermal insulation
- 1 layer bitumen vapour barrier membrane
- 180 mm insitu RC slab

FACADE WALL LAYER (520 mm)

10 mm plastering
10 mm reinforcement layer (base coat with glass fiber mesh embedded)
200 mm mineral wool thermal insulation anchored to the structural components
1 layer adhesive
300 mm RC beam

INTERNAL WALL LAYER (150 mm)

25 mm*2 12.5 mm fire retardant plasterboard
100 mm CW100 rib frame with mineral wool filling
25 mm*2 12.5 mm fire retardant plasterboard

FIRE PROTECTION

Introducing fire protection, especially in the context of reinforced concrete structures, is vital for ensuring the safety and longevity of buildings. Reinforced concrete is a widely used structural material known for its strength, durability, and fire resistance.

Structure:

Reinforced concrete possesses natural fire-resistant properties, making it a good choice for structural elements. The combination of concrete's composition and the steel reinforcement inside creates a material that can withstand high temperatures without compromising its structural integrity. Concrete has a high melting point, and while it may undergo some thermal expansion, it does not lose its load-bearing capacity as rapidly as materials like wood or steel in a fire.

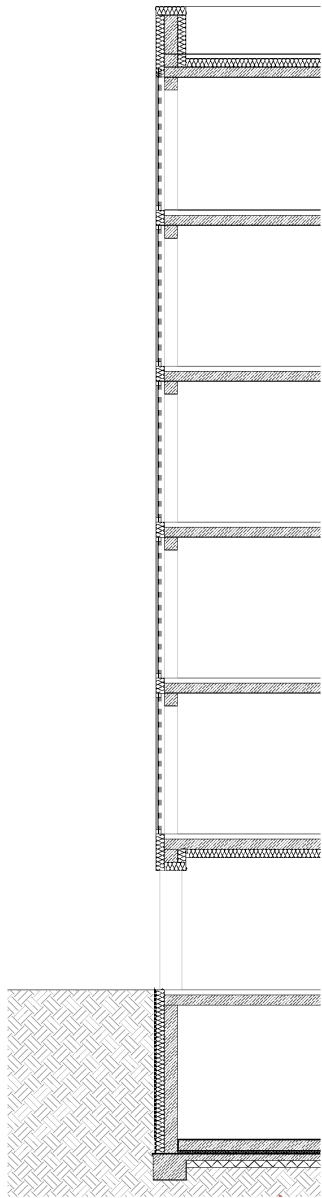
Fire alarm:

The fire alarm system is strategically placed throughout the building, covering every floor, corridor, and critical area. Utilizing cutting-edge sensors, it is designed to swiftly identify the presence of smoke, heat, or other indicators of fire. Upon detection, the fire alarm system activates a loud and distinct alarm, instantly alerting occupants and providing them with precious time for safe evacuation.

Circulation corridor:

Intumescent coating, or fire-resistant paint, is a simple and effective way to protect the main parts of the circulation corridor from fire as the structural material is steel. This coating helps slow down the building's collapse by adding insulation to the columns, beams, bracing, floors – the parts that hold up the structure. It helps the building meet specific time-based fire safety standards. So, its main job is to stop the building from falling down during a fire. This gives people more time to get out safely and makes it safer for firefighters and rescue teams to do their job. In simpler terms, intumescent coating is like a shield for a building's important parts, making sure they can handle a fire for a longer time, keeping everyone safer.





Dead load
Live load



Self weight



Slab



Self weight



Beam

Facade element

Self weight



Wind load



Self weight



Column



Self weight



Foundation



Earth

STRUCTURAL ELEMENTS

BUILDING ELEMENTS

RC column
C30/37

300

300

3300

RC beam
C25/30

300

300

180

maximum length

4300

RC slab
C20/25

180

BRIDGE ELEMENTS

Steel column
HE 200B

200

200

Steel girder
IPE A 100

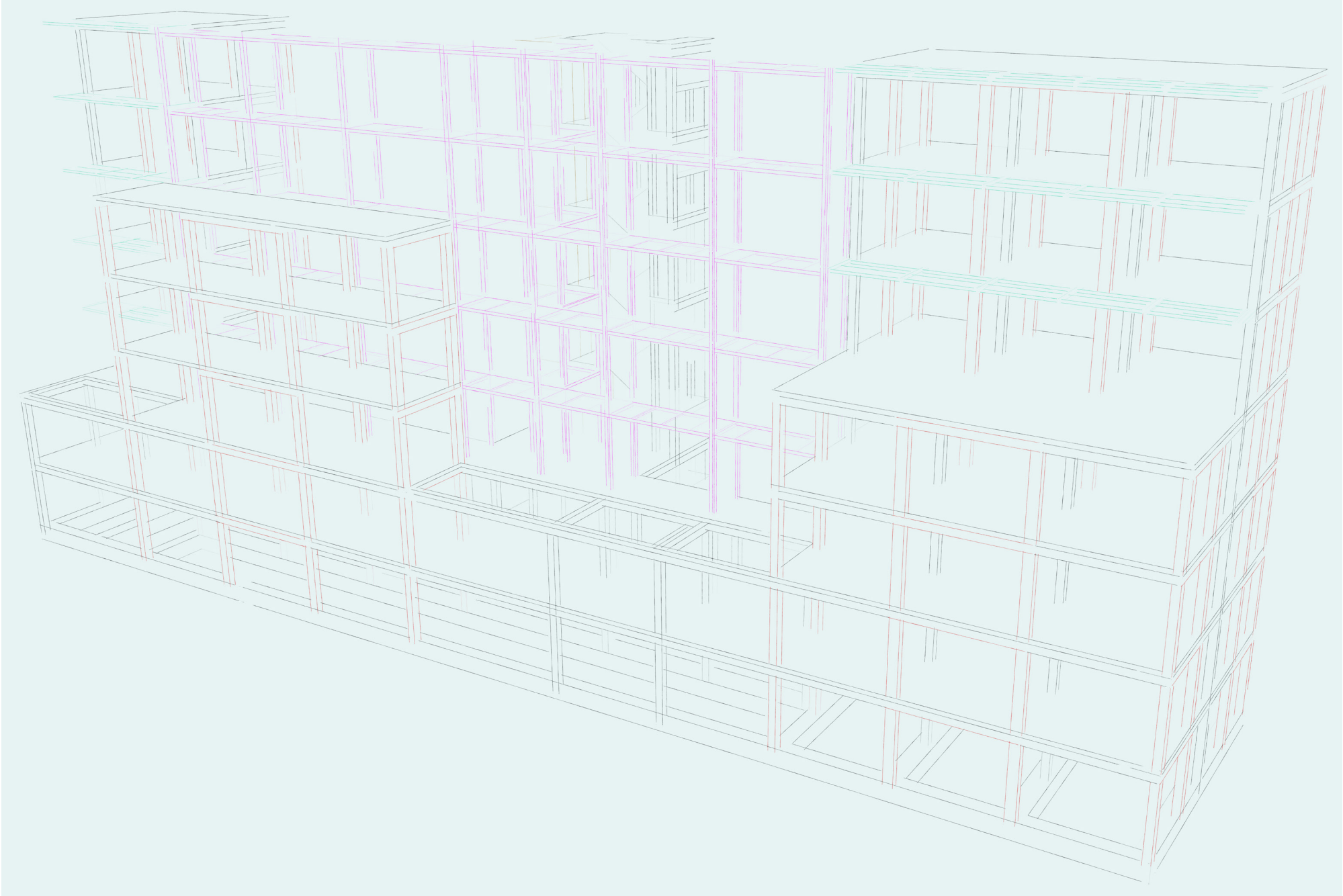
100

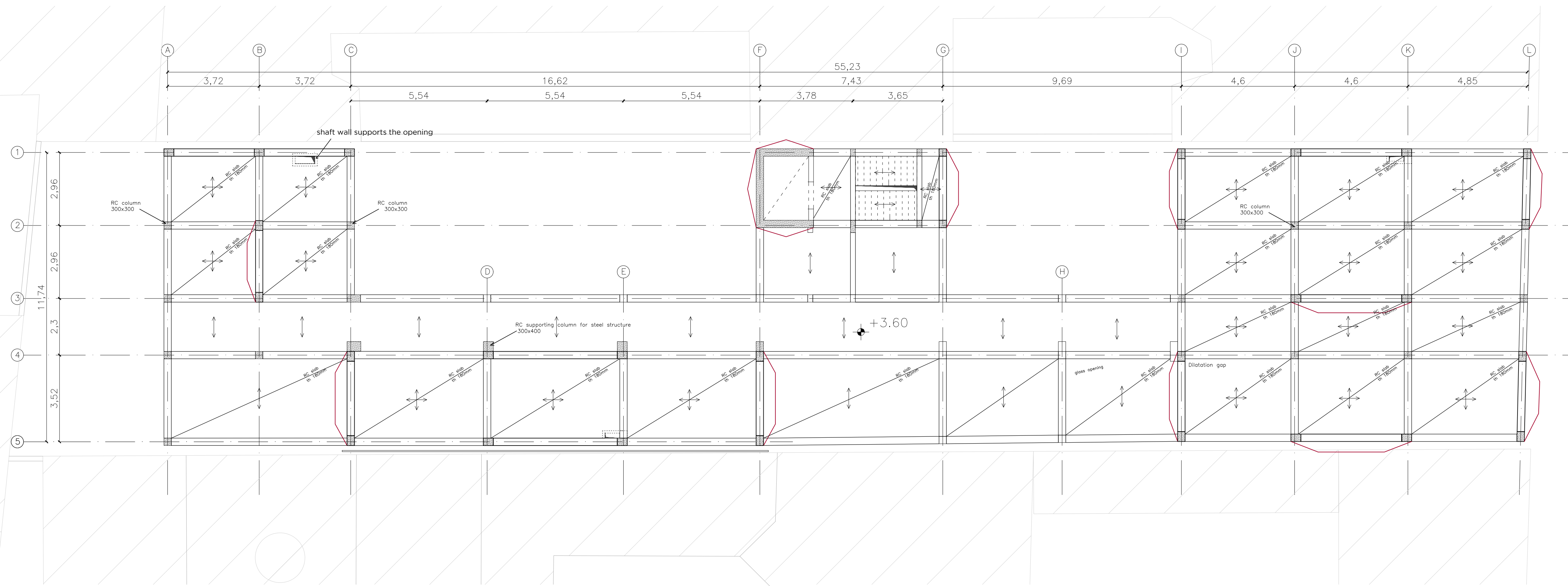
100

Steel beam
IPE A 160

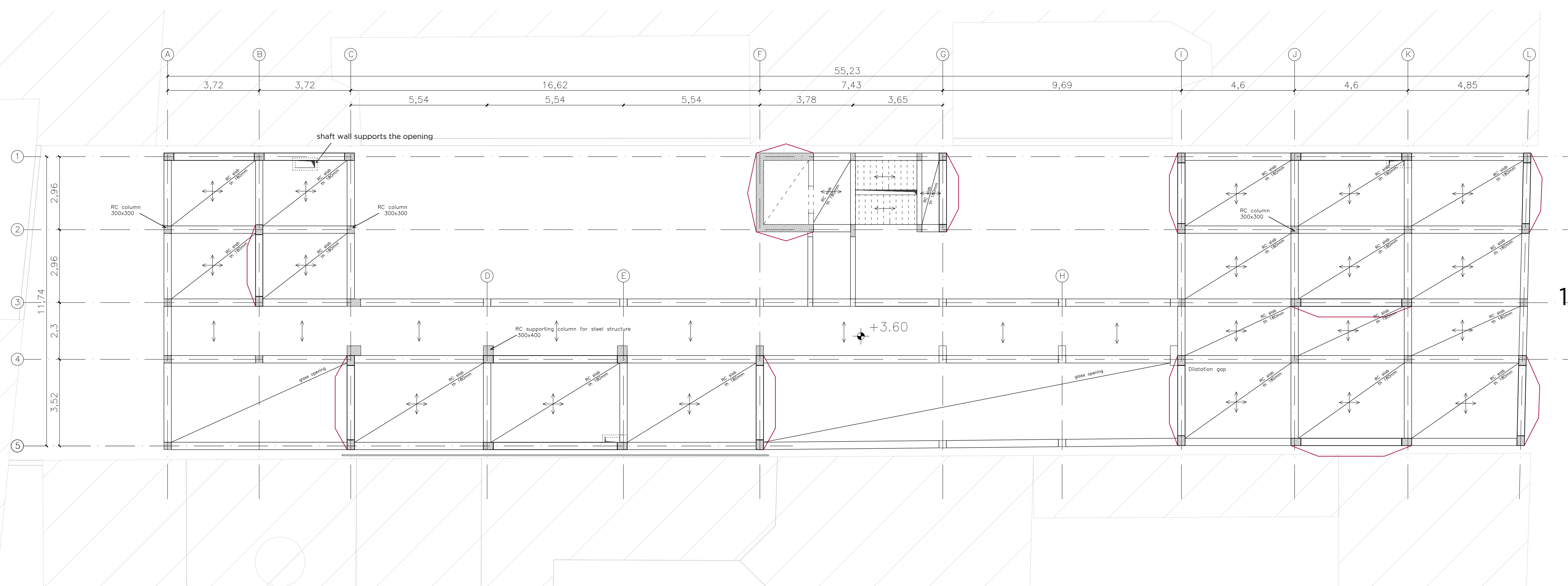
160

160

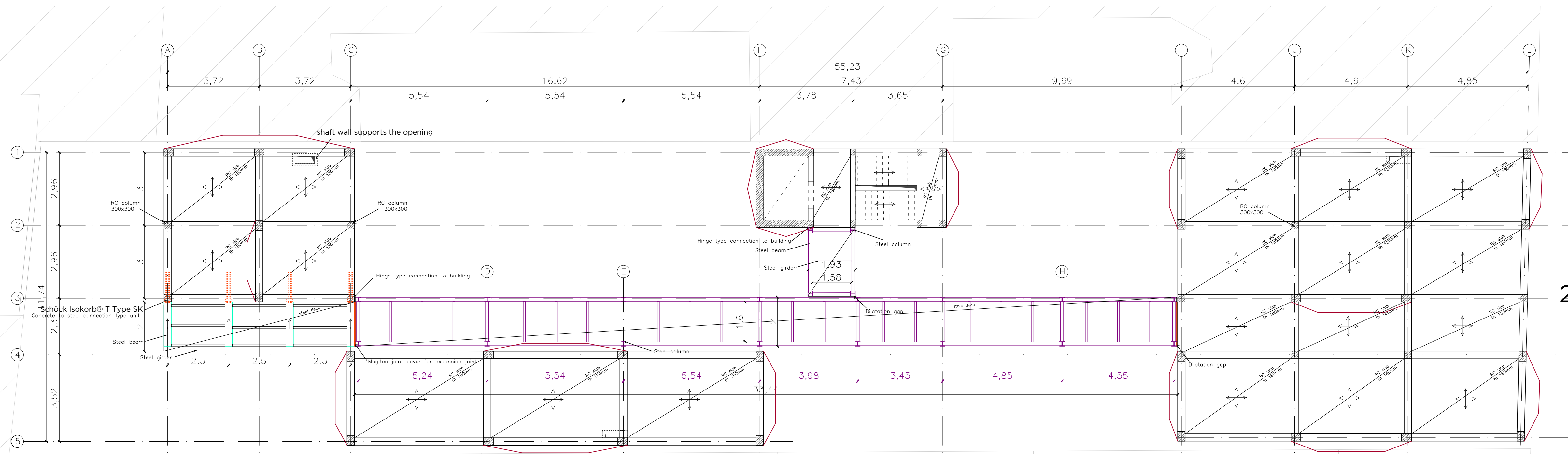




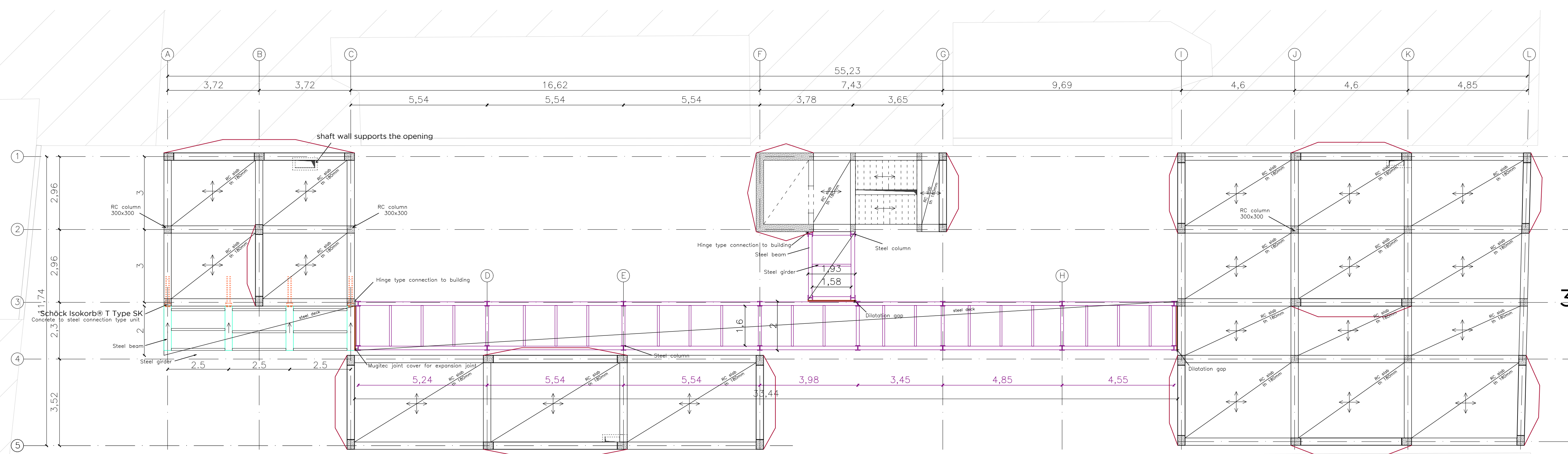
GROUND FLOORPLAN
± 0.00



1ST FLOOR FLOORPLAN
+3.60







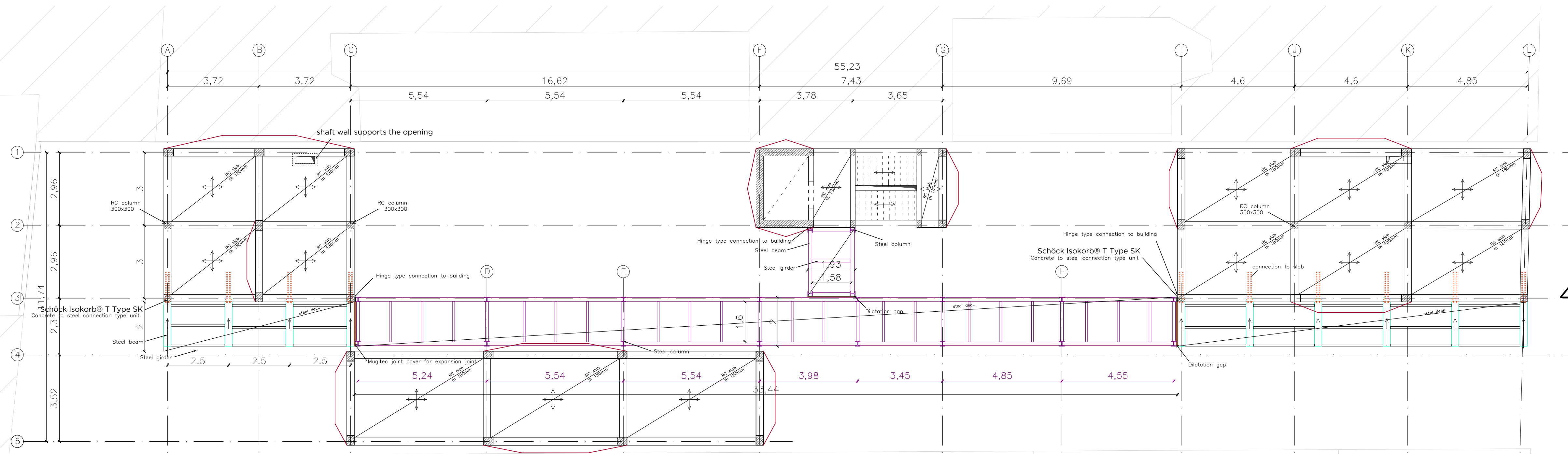
2ND FLOOR FLOORPLAN
+7.20



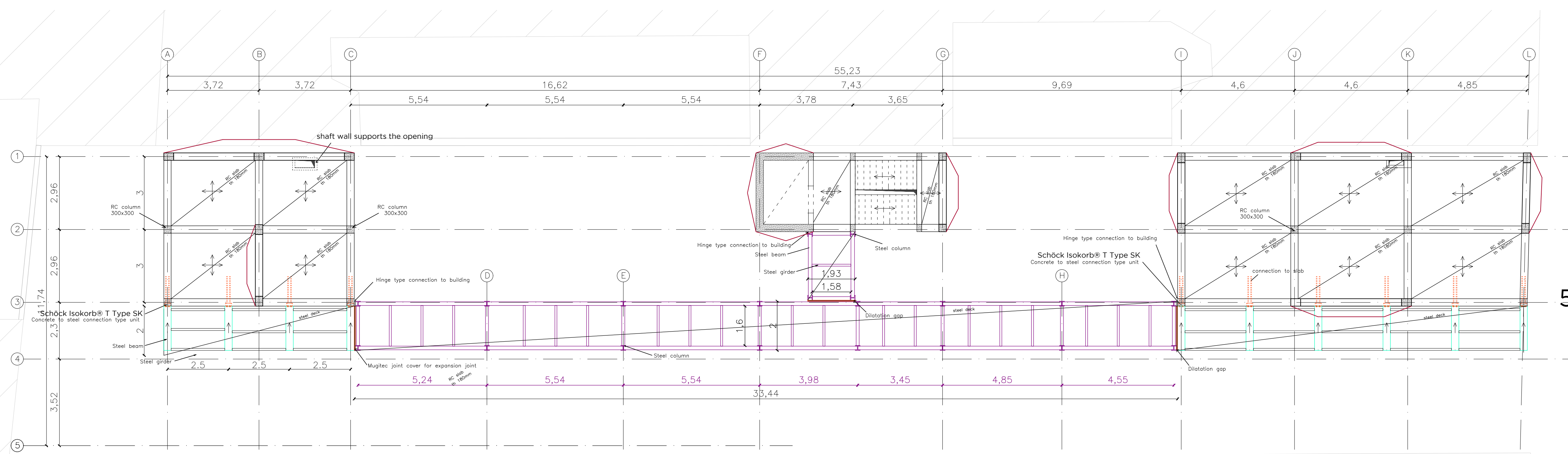
3RD FLOOR FLOORPLAN
+10.80

LEGEND

-  Moment frame
-  Shear wall
-  Steel structure
-  Cantilever







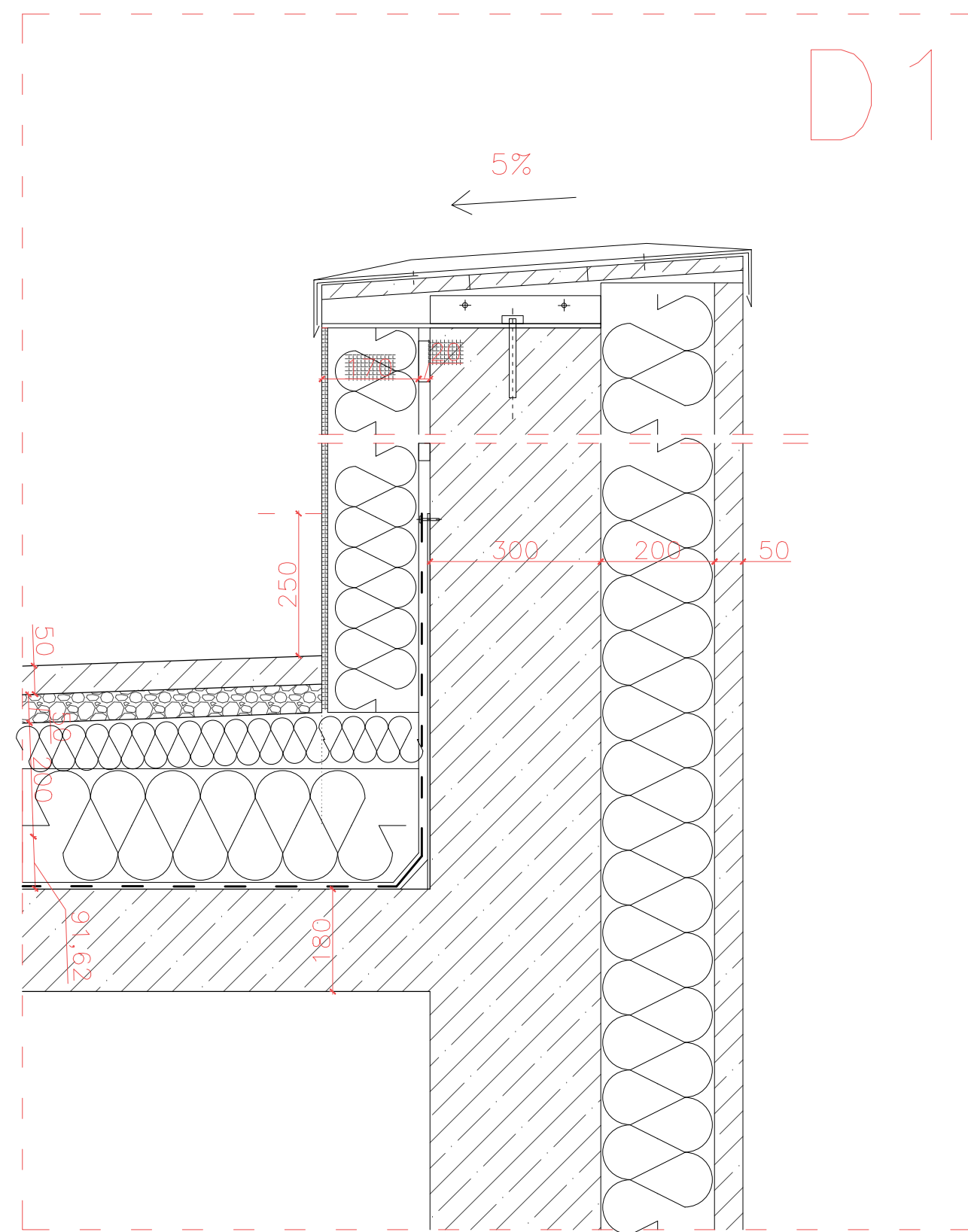
4TH FLOOR FLOORPLAN
+14.40



5TH FLOOR FLOORPLAN
+18.00

LEGEND

-  Moment frame
-  Shear wall
-  Steel structure
-  Cantilever



D1. Firewall and flat roof detail

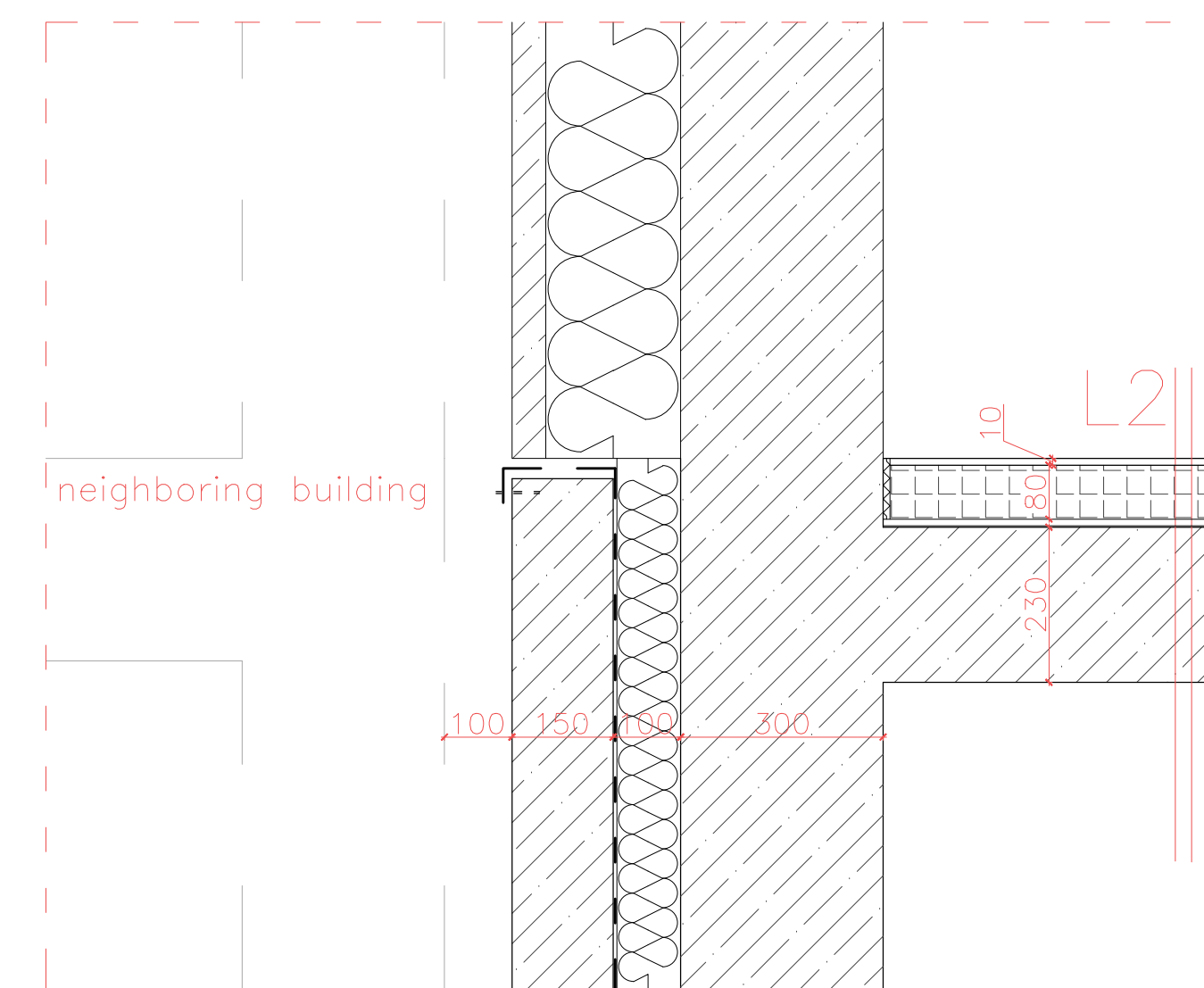
Perimeter wall layer

- 50 mm RC formwork
- 200 mm mineral wool thermal insulation
- 300 mm insitu RC wall
- bitumin waterproofing membrane
- 170 mm XPS thermal insulation with external protecting layer

Roof slab layer

- 50 mm concrete paving
- 50 mm gravel ballasting
- 1 layer synthetic filter layer
- 1 layer PVC waterproofing
- 1 layer separation layer
- 20 mm expanded polysterene foam (EPS) inclined, substructure
- 200 mm expanded polystyrene foam (EPS) thermal insulation
- 1 layer bitumen vapour barrier membrane
- 180 mm in situ RC slab

D3



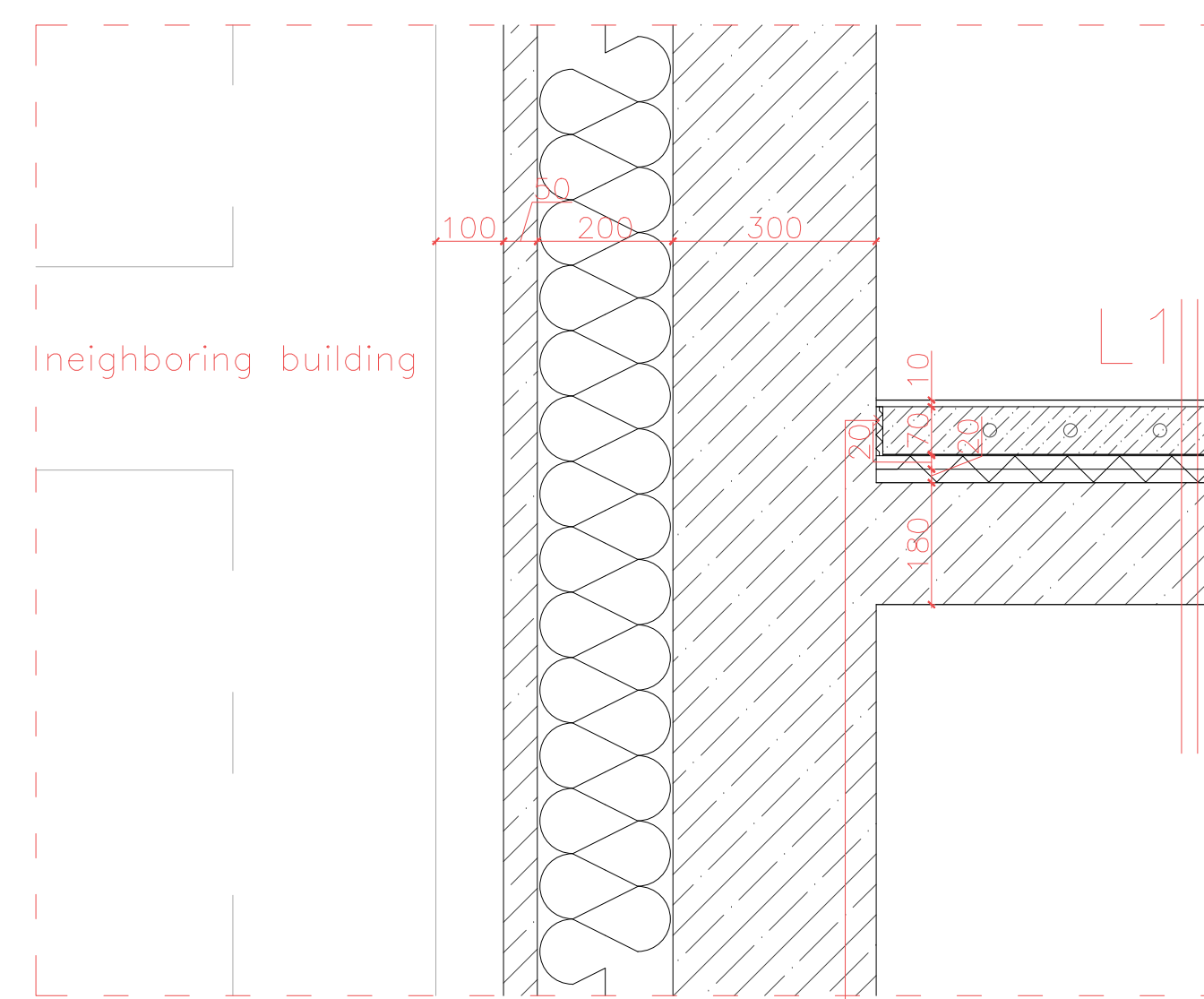
D2. Firewall and apartment flooring detail

- 100 mm safety spacing
- 50 mm RC formwork
- 200 mm mineral wool thermal insulation
- 300 mm insitu RC wall

L2. Market floor layer

- 10 mm recycled rubber finishing
- 80 mm RC screed 1% to falls
- 230 mm insitu RC slab

D2



D2. Firewall and apartment flooring detail

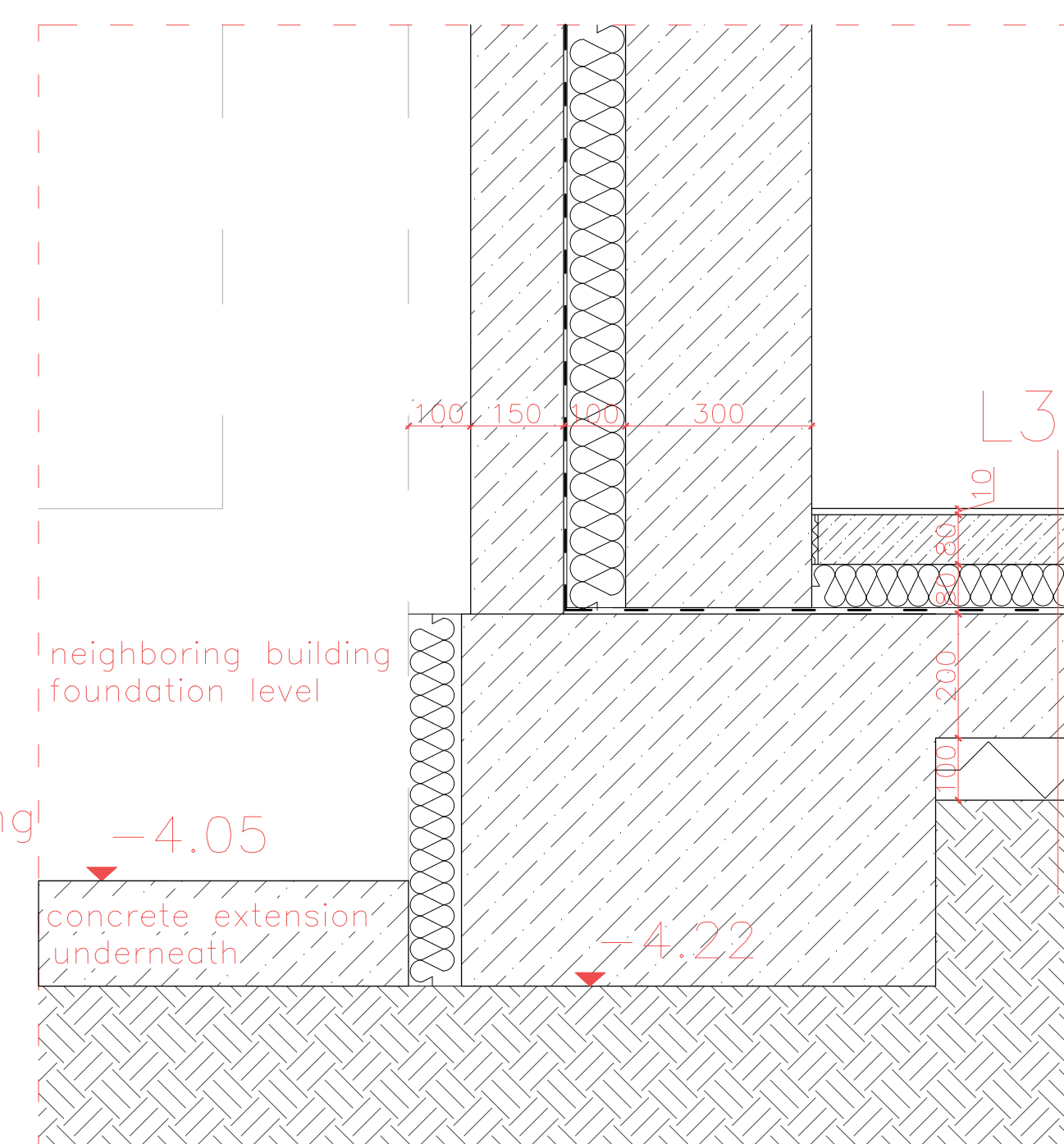
- 100 mm safety spacing
- 50 mm RC formwork
- 200 mm mineral wool thermal insulation
- 300 mm insitu RC wall

L1. Residential floor layer 350mm

- 10 mm cement-bound filler
- 70 mm anhydrite screed with underfloor heating
- polyethylene film
- 20 mm acoustic insulation
- 20 mm thermal insulation
- 230 mm insitu RC slab

10 mm expansion gap with EPS

D4



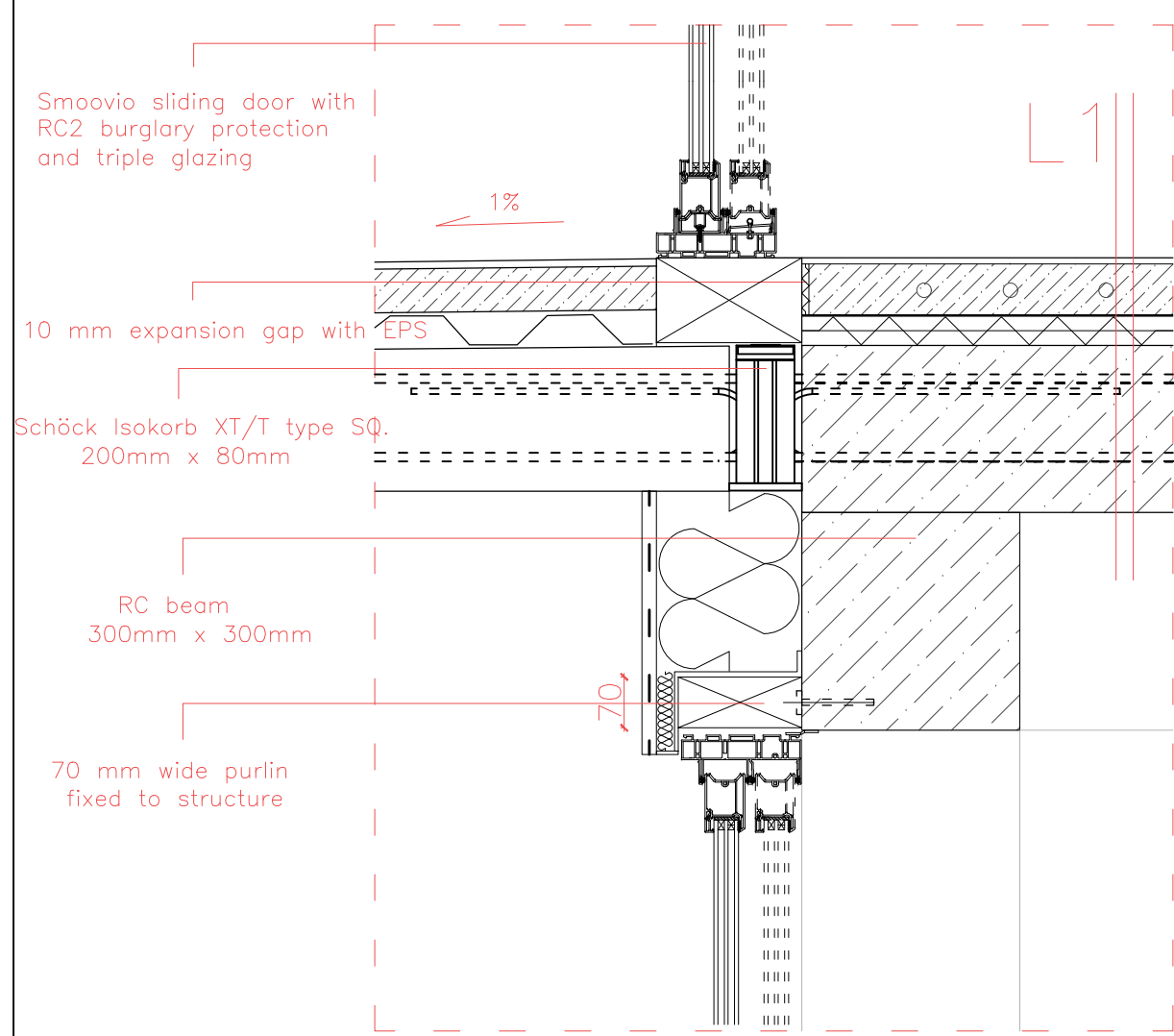
D4. Heated basement foundation detail

- 100 mm safety spacing
- 150 mm RC supporting wall
- 2 layer DPC waterproofing
- 100 mm mineral wool thermal insulation
- 300 mm insitu RC wall

L3. Foundation floor layer

- 10 mm recycled rubber finishing
- 80 mm screed
- 1 mm plastic sheet separating layer
- 80 mm mineral wool thermal insulation
- damp-proof membrane
- 1 layer bituminous sheet waterproofing membrane
- 200 mm concrete ground slab
- 100 mm cushion for uplift effect

D5



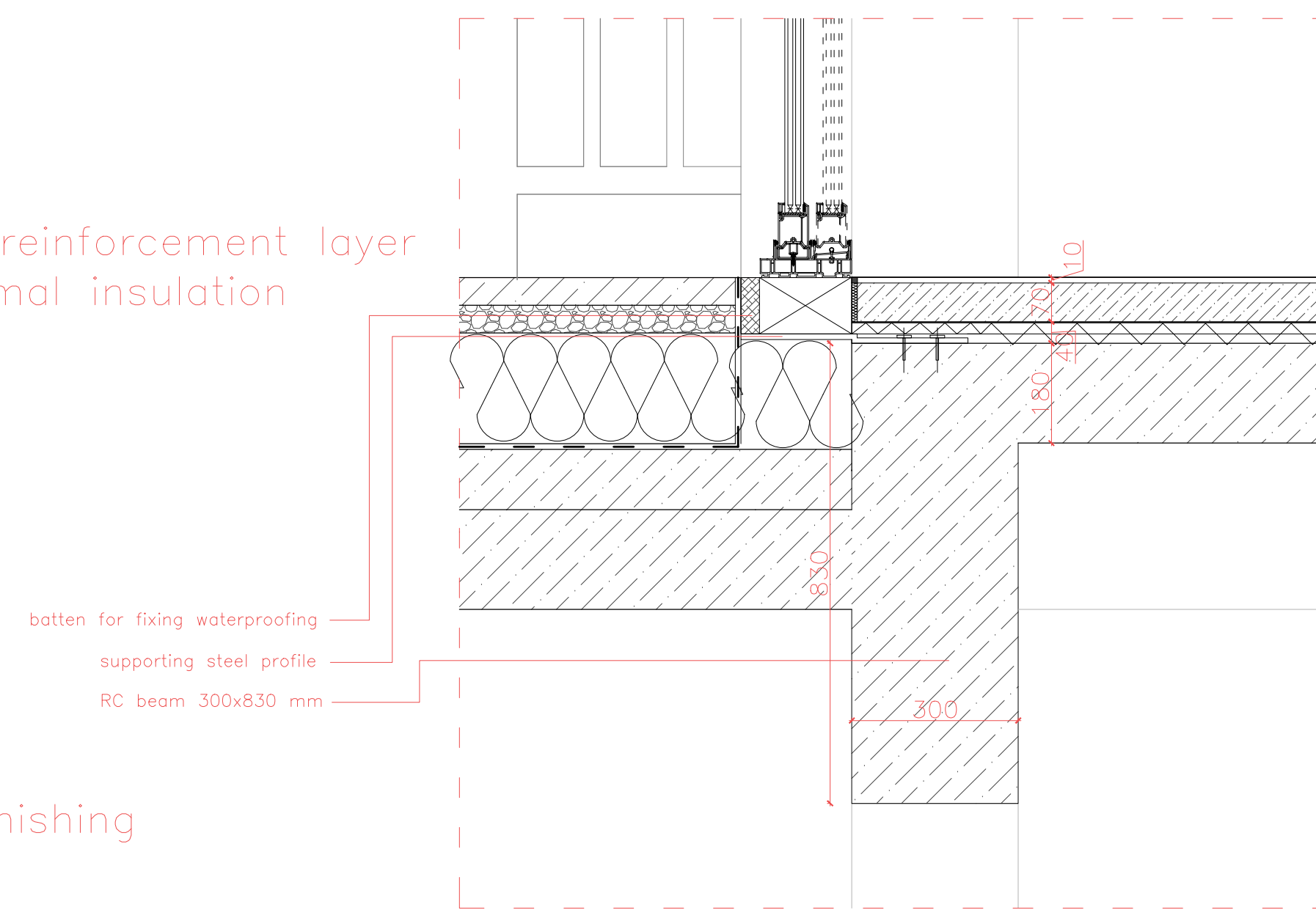
W4. Facade wall layer

- 10 mm plastering
- 10 mm glass fiber mesh reinforcement layer
- 200 mm mineral wool thermal insulation
- 1 layer adhesive
- 300 mm in situ RC beam

Cantilever slab layer

- 10 mm recycled rubber finishing
- 60 mm RC screed
- 1 layer adhesive
- 50 mm steel deck
- 200 mm steel beam

D7



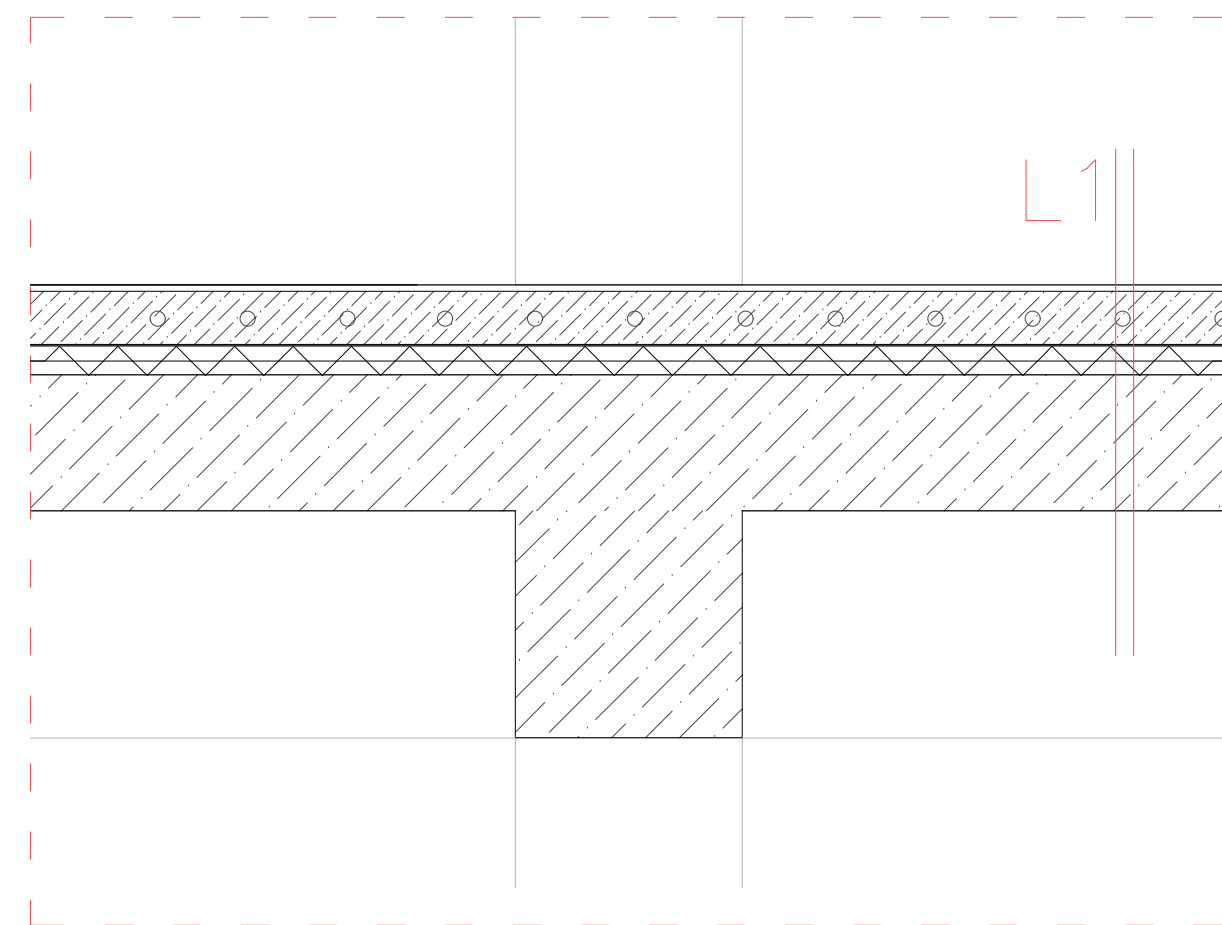
L4. Roof slab layer

- 50 mm concrete paving
- 50 mm gravel ballasting
- 1 layer synthetic filter layer
- 1 layer PVC waterproofing
- 1 layer separation layer
- 20 mm expanded polystyrene foam (EPS) inclined, substructure
- 200 mm expanded polystyrene foam (EPS) thermal insulation
- 1 layer bitumen vapour barrier membrane
- 180 mm in situ RC slab

L1. Residential floor layer 350mm

- 10 mm cement-bound filler
- 70 mm anhydrite screed with underfloor heating polyethylene film
- 20 mm acoustic insulation
- 20 mm thermal insulation
- 180 mm insitu RC slab

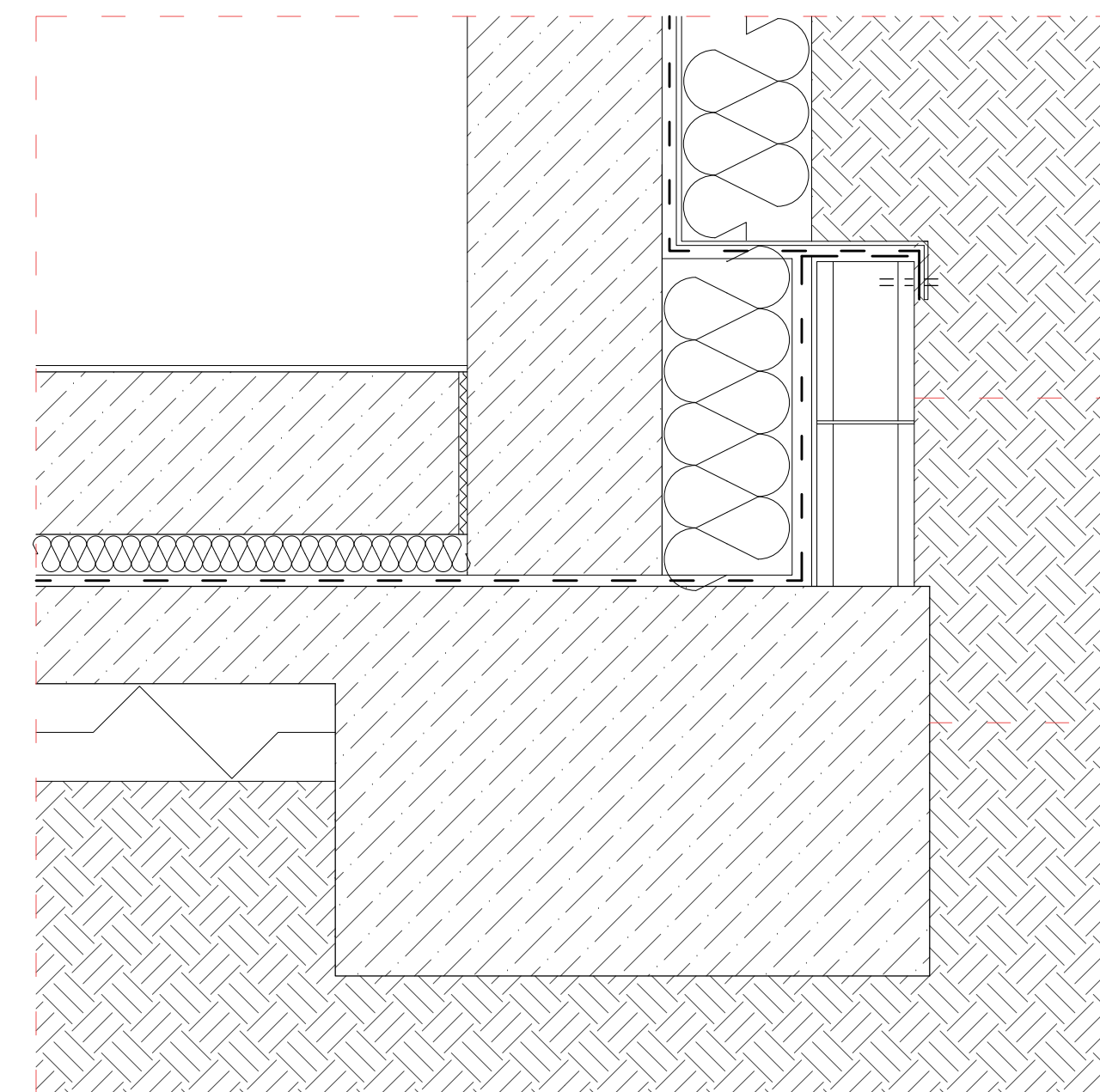
D6



L1. Residential floor layer 350mm

- 10 mm cement-bound filler
- 70 mm anhydrite screed with underfloor heating polyethylene film
- 20 mm acoustic insulation
- 20 mm thermal insulation
- 180 mm insitu RC slab

D8



L3. Foundation floor layer

- 10 mm recycled rubber finishing
- 80 mm screed
- 1 mm plastic sheet separating layer
- 80 mm mineral wool thermal insulation damp-proof membrane
- 1 layer bituminous sheet waterproofing membrane
- 200 mm concrete ground slab
- 100 mm cushion for uplift effect

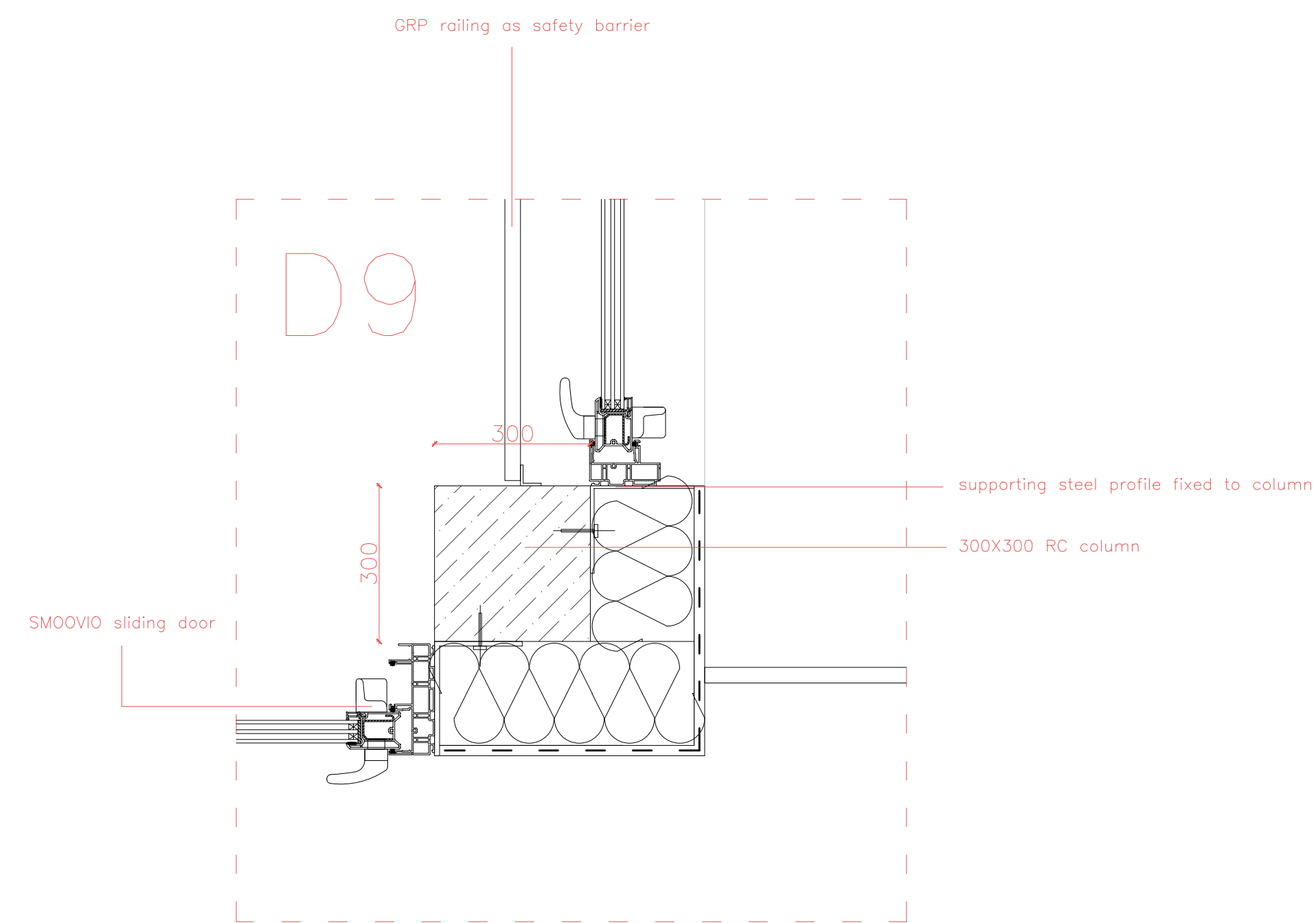
soil water level

W5. Basement wall layer 2

- 300 mm in situ RC wall
- 1 layer bituminous layer
- 2 layer SPS bituminous sheet waterproofing membrane
- 200 mm XPS thermal insulation layer with synthetic external protection layer

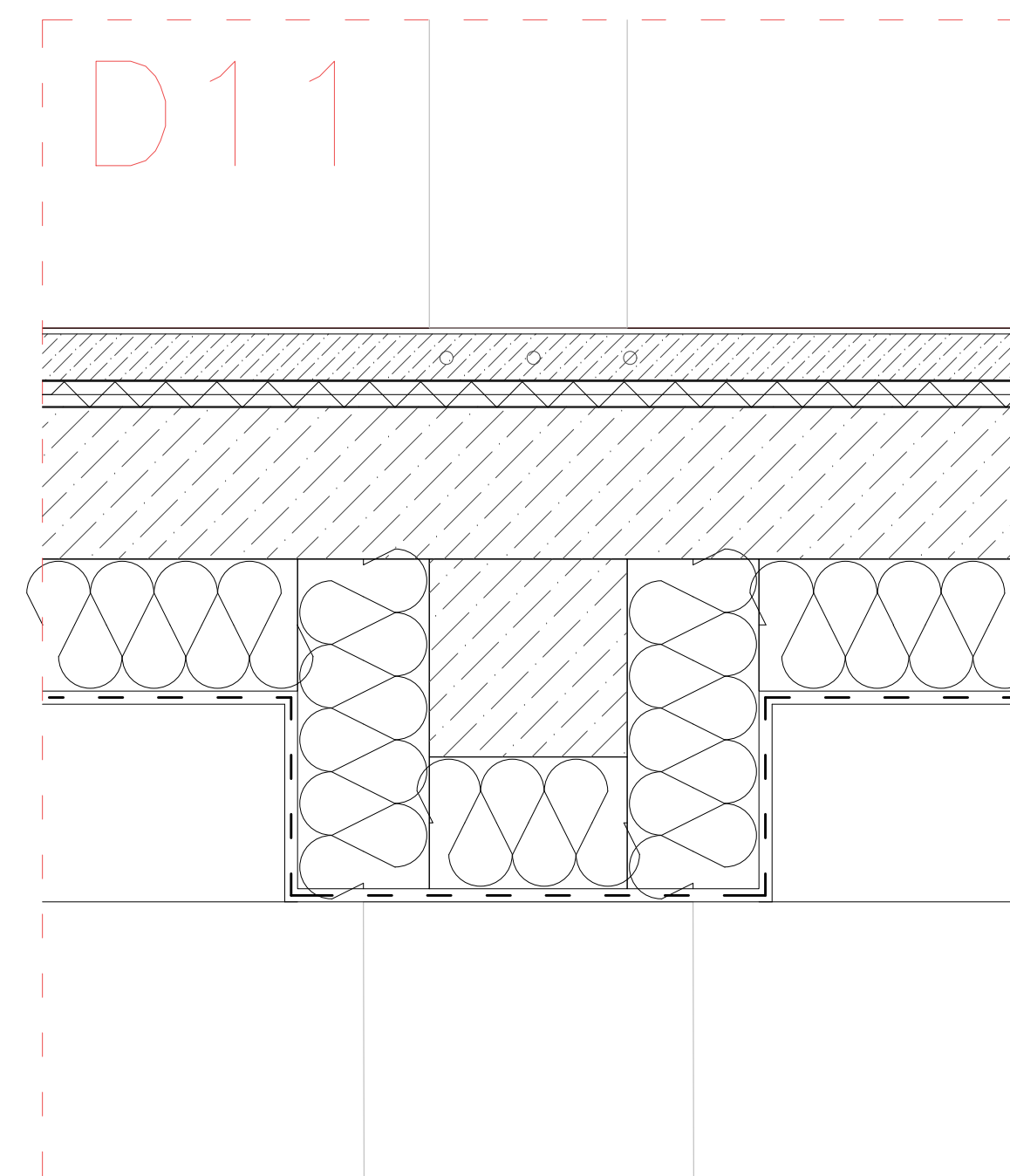
W5. Basement wall layer 2

- 300 mm in situ RC wall
- 200 mm XPS thermal insulation layer
- 1 layer bituminous layer
- 2 layer SPS bituminous sheet waterproofing membrane
- 150 mm concrete block protecting wall



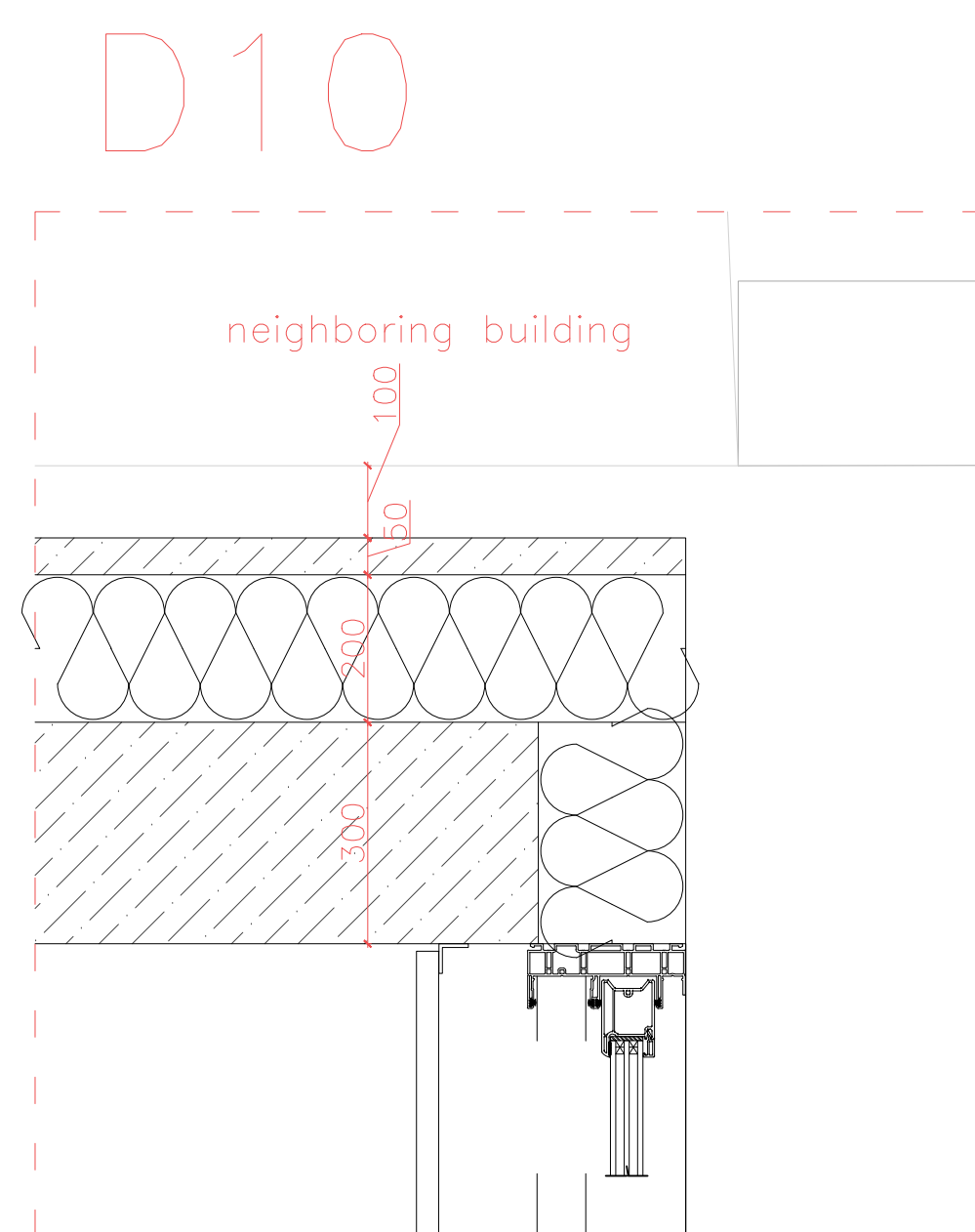
W4. Facade wall layer

- 10 mm plastering
- 10 mm glass fiber mesh reinforcement layer
- 200 mm mineral wool thermal insulation
- 1 layer adhesive
- 300x300 in situ RC column



L1. Residential floor layer 350mm

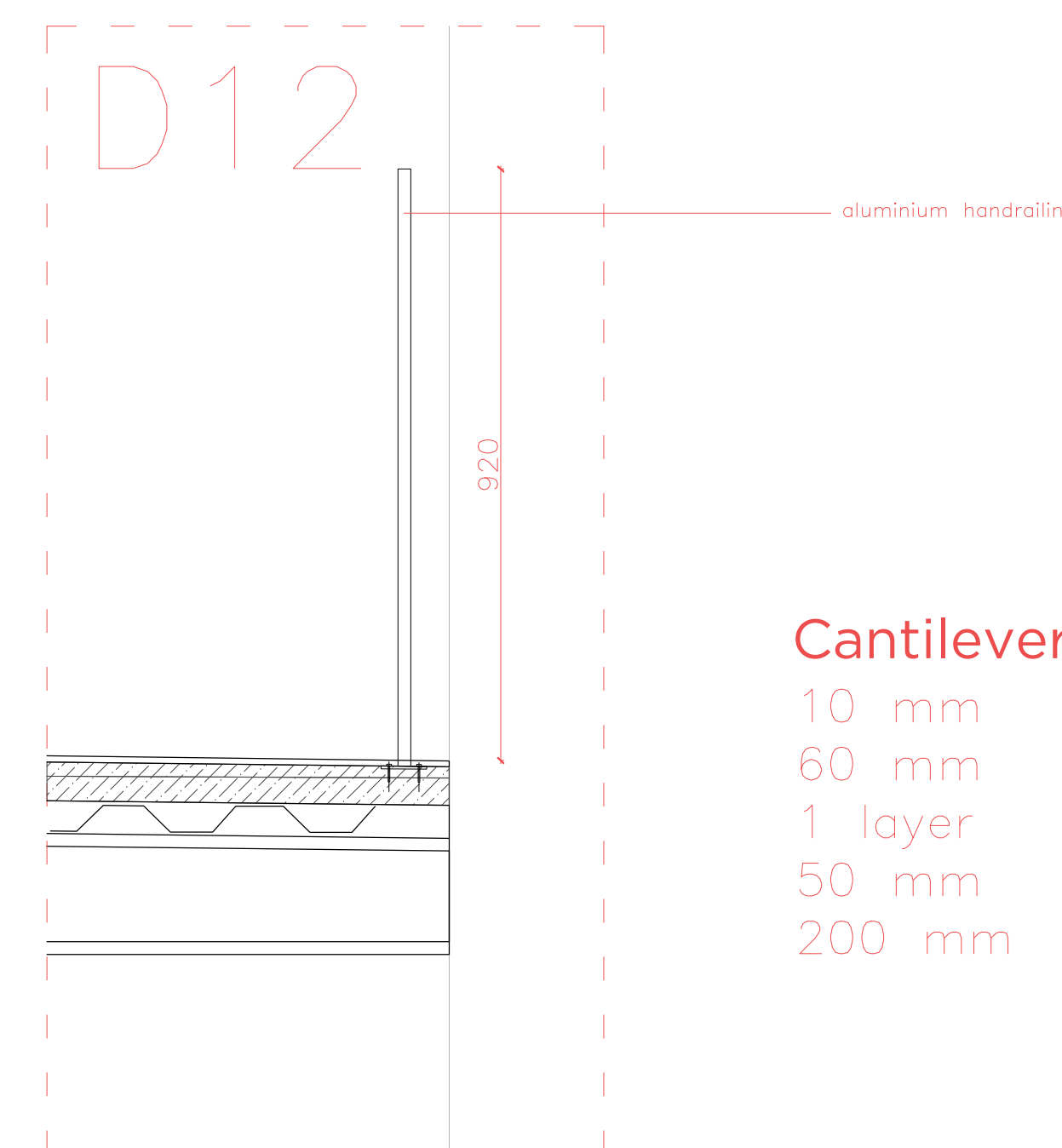
- 10 mm cement-bound filler
- 70 mm anhydrite screed with underfloor heating
- polyethylene film
- 20 mm acoustic insulation
- 20 mm thermal insulation
- 180 mm in situ RC slab
- 200 mm mineral wool thermal insulation
- 10 mm glass fiber mesh reinforcement layer
- 10 mm plastering



D2. Firewall and apartment flooring detail

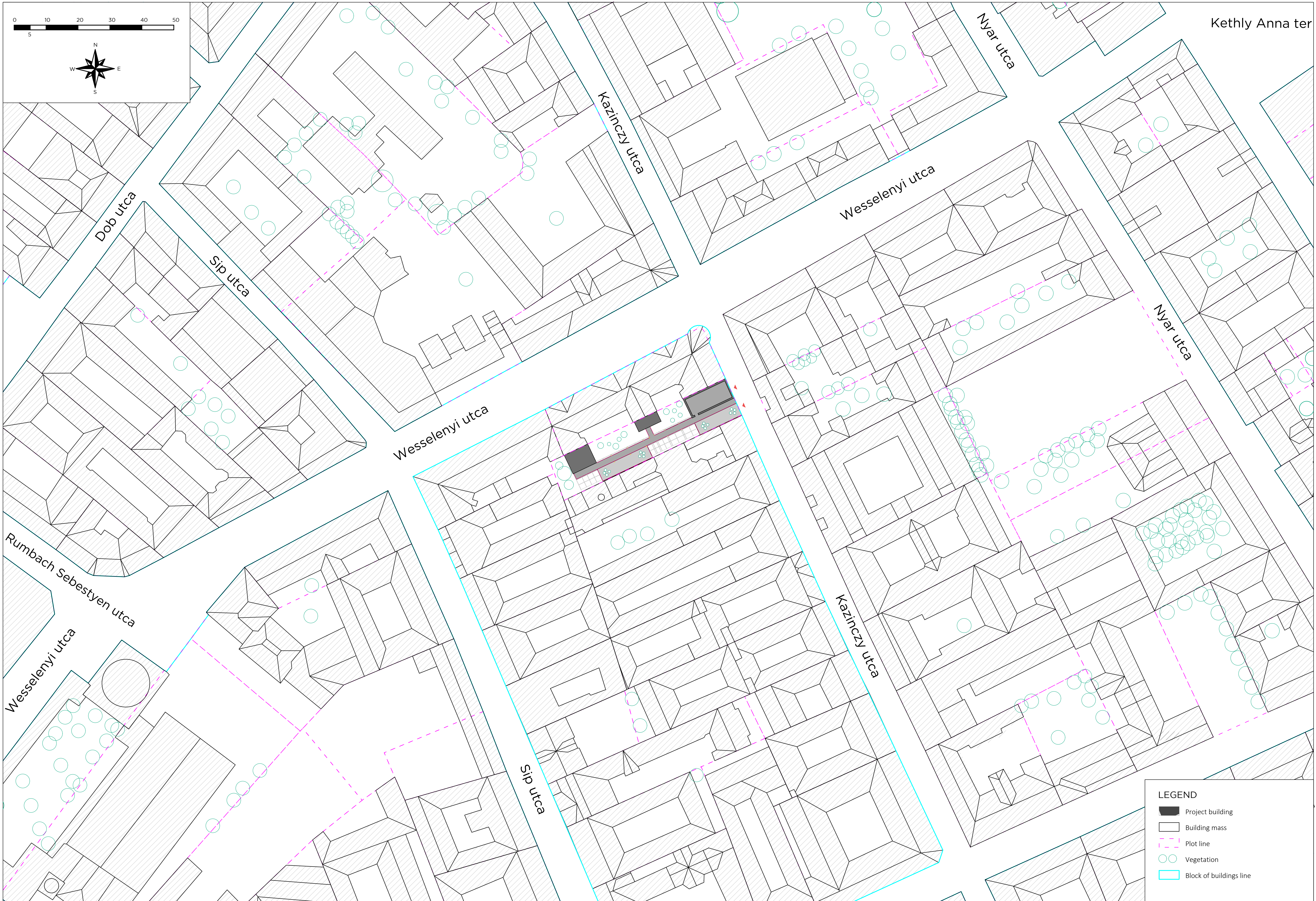
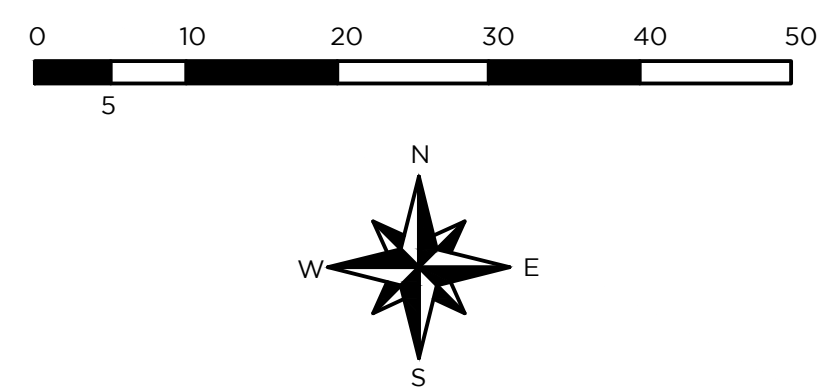
W1. Firewall layer

- 100 mm safety spacing
- 50 mm RC formwork
- 200 mm mineral wool thermal insulation
- 300 mm in situ RC wall








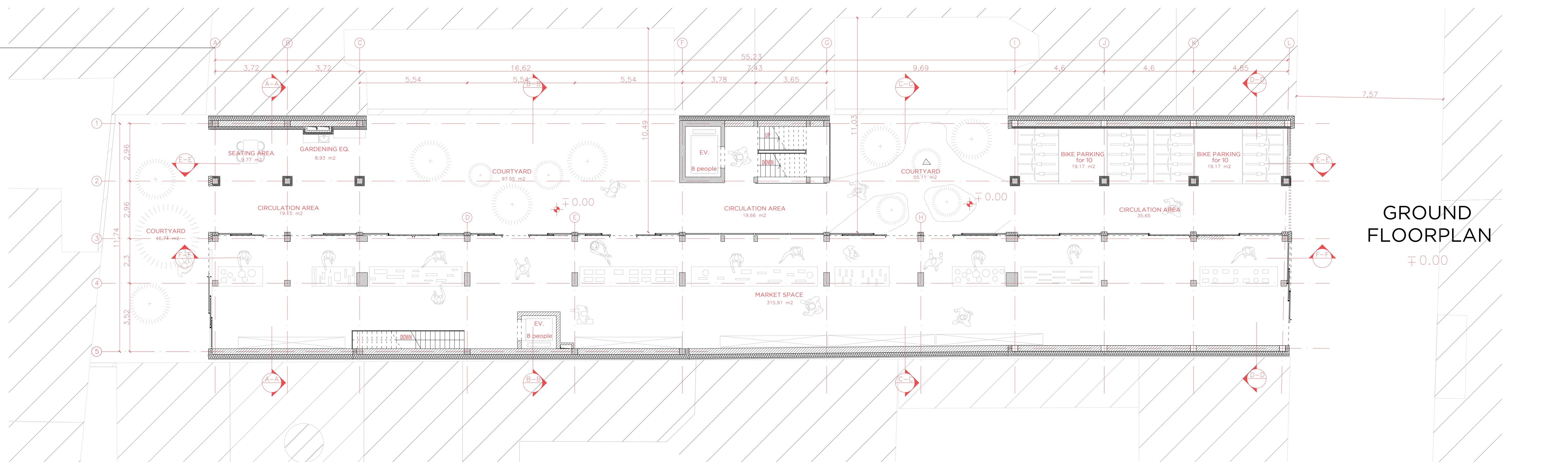
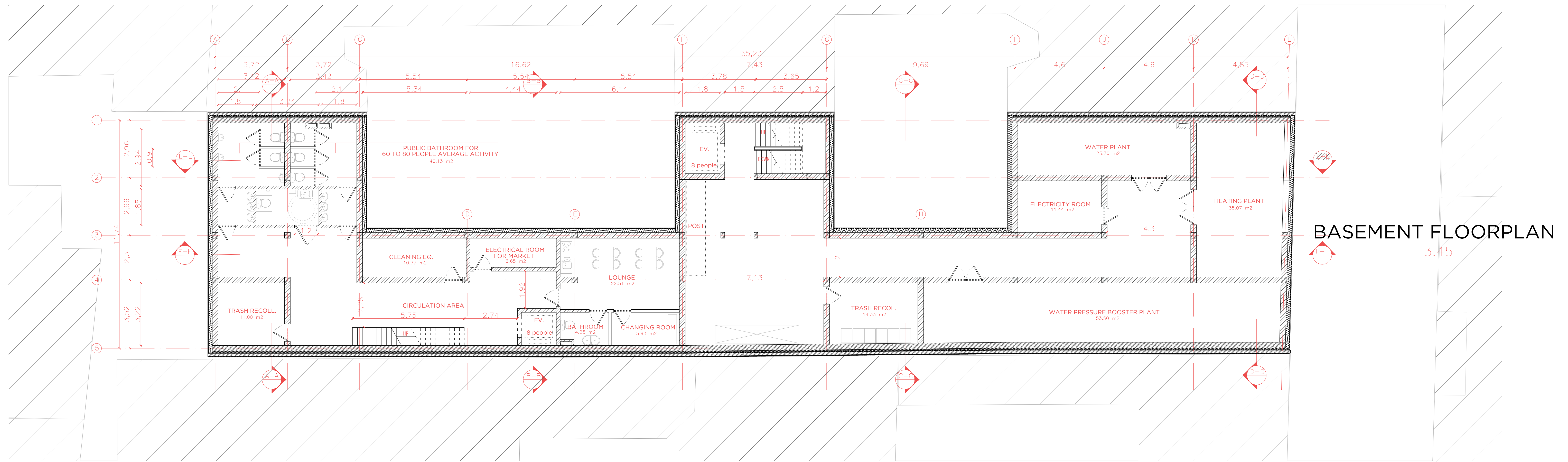
Cantilever slab layer

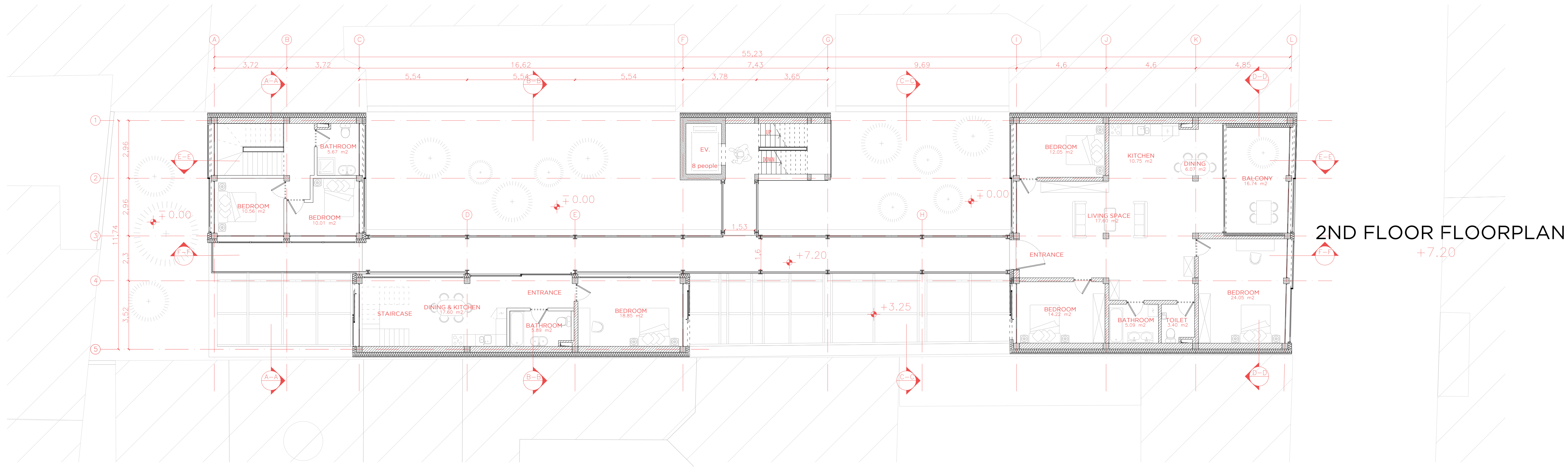
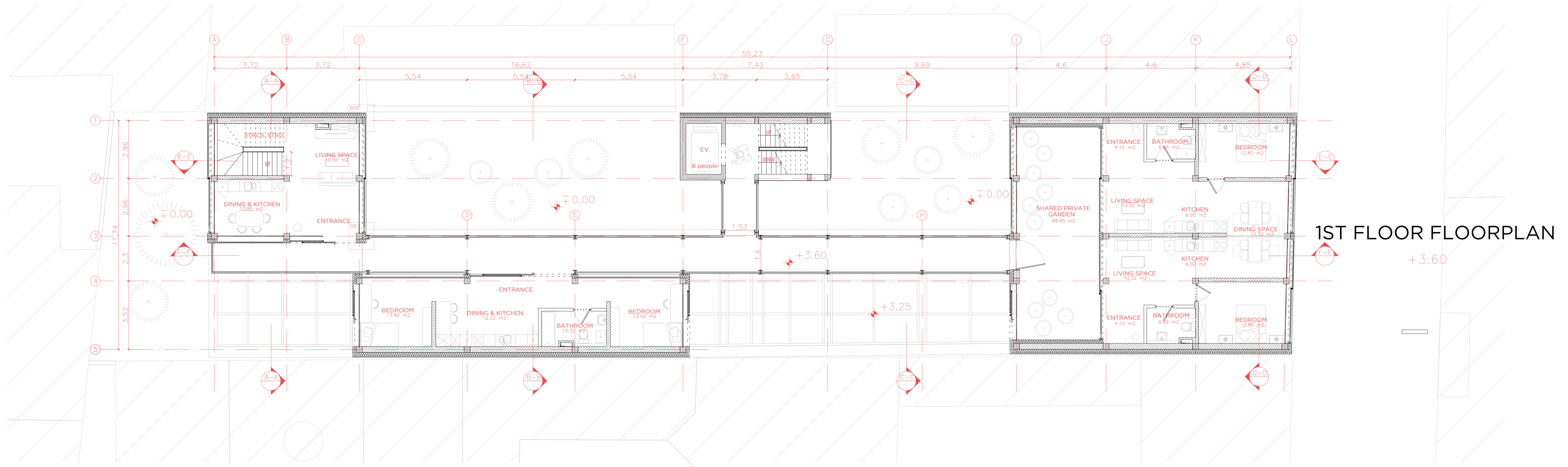
- 10 mm recycled rubber finishing
- 60 mm RC screed
- 1 layer adhesive
- 50 mm steel deck
- 200 mm steel beam cantilever

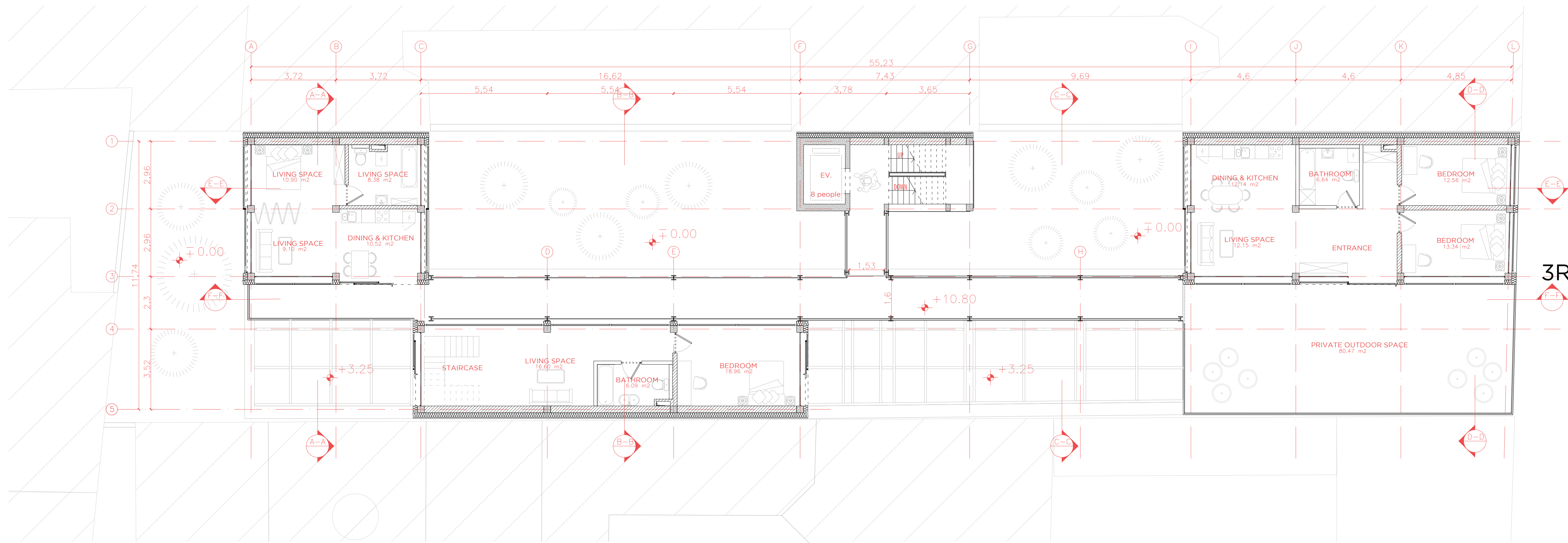


LEGEND

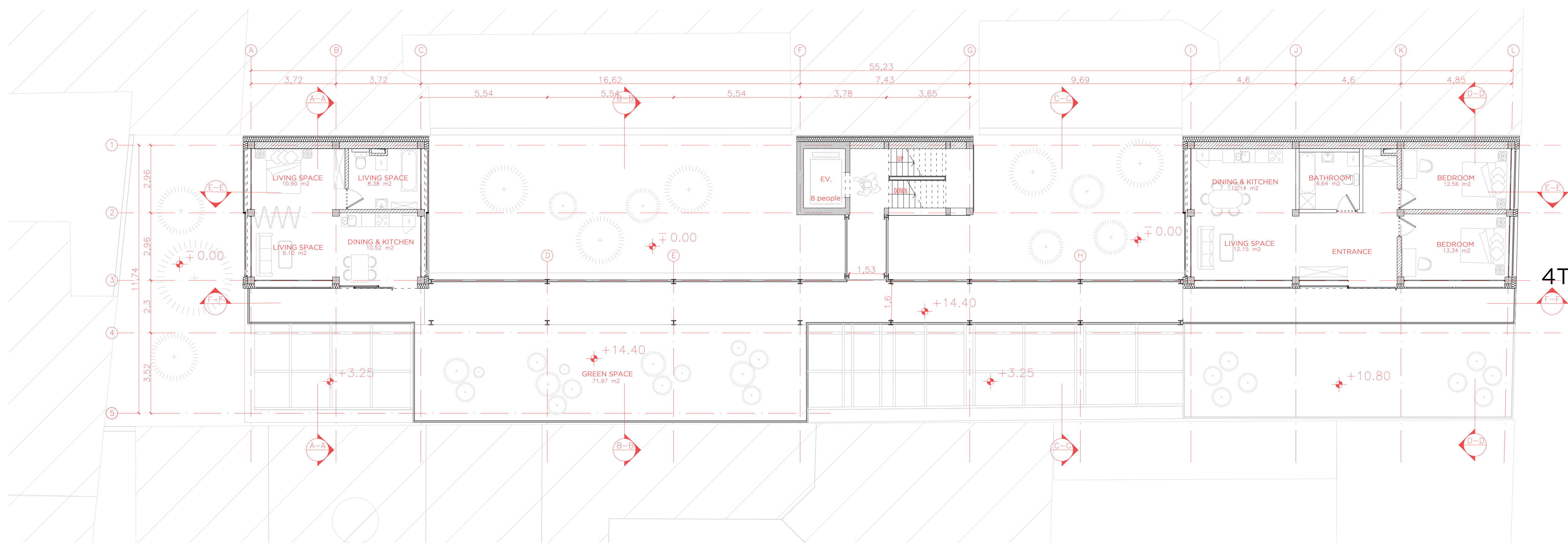
-  Project building
-  Building mass
-  Plot line
-  Vegetation
-  Block of buildings line



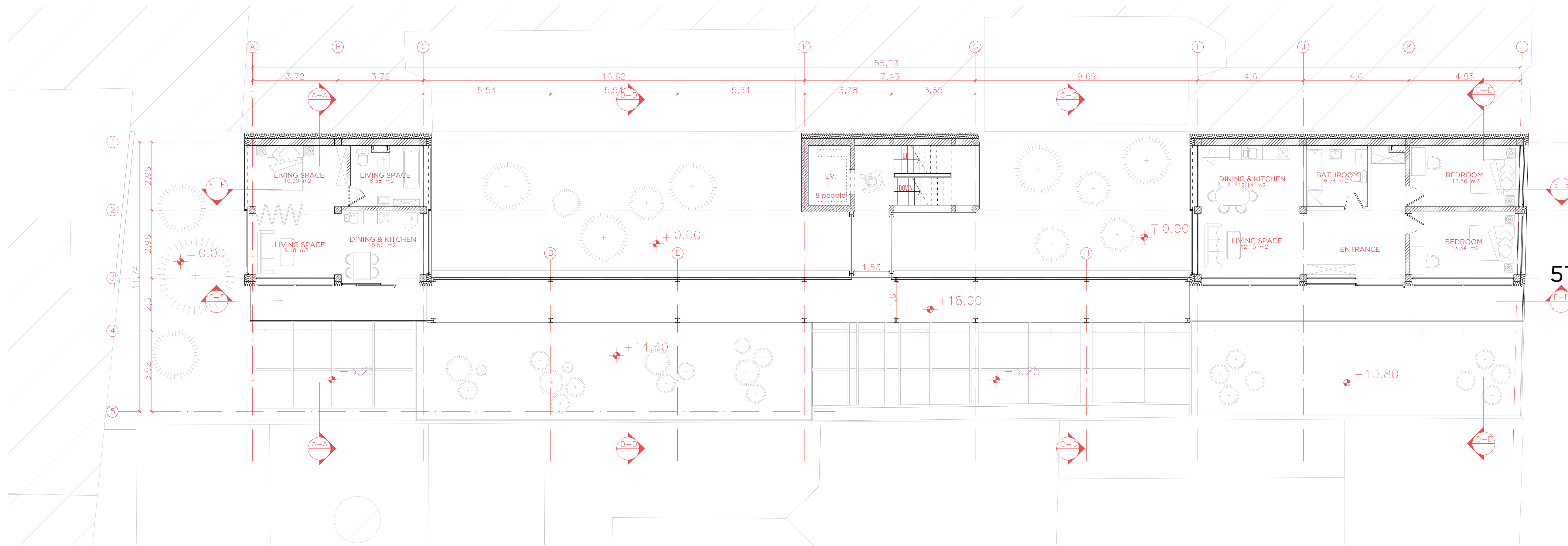




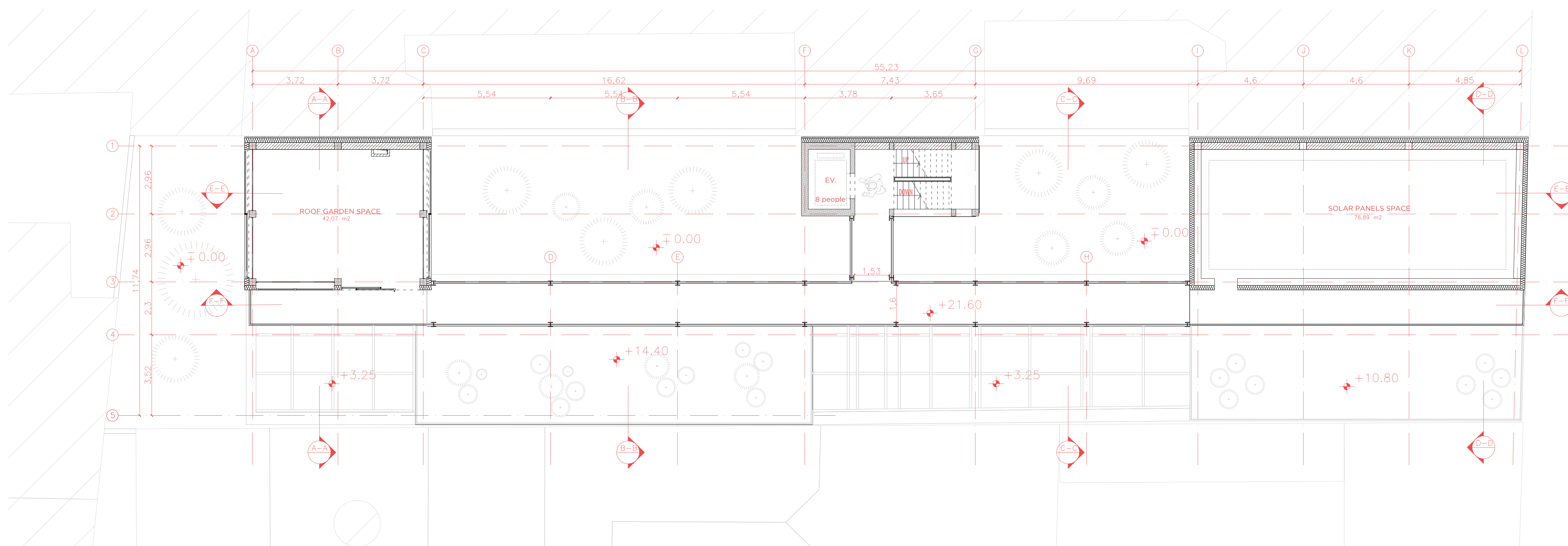
3RD FLOOR FLOORPLAN
+10.80



4TH FLOOR FLOORPLAN
+14.40

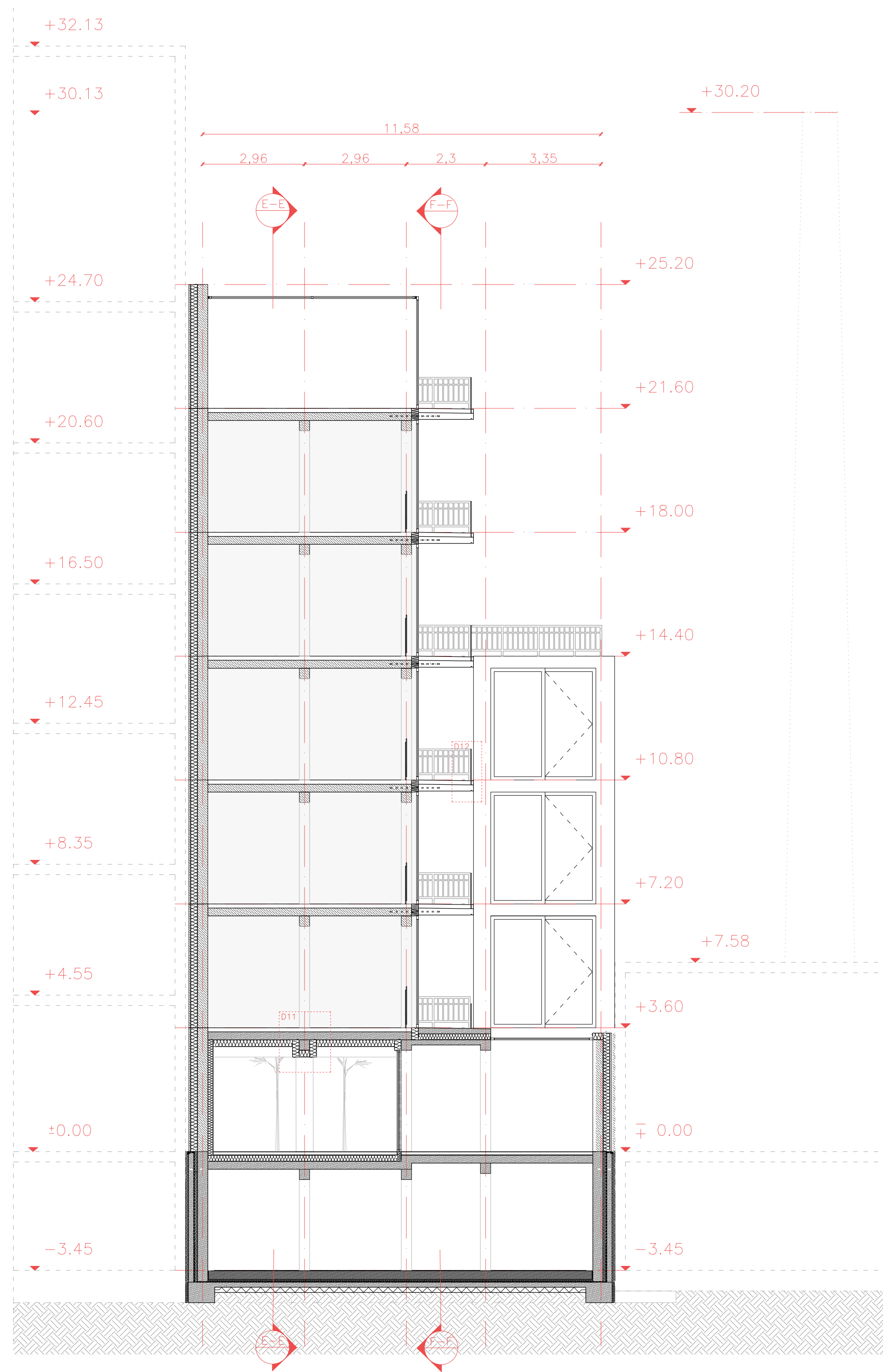


5TH FLOOR FLOORPLAN
+18,00

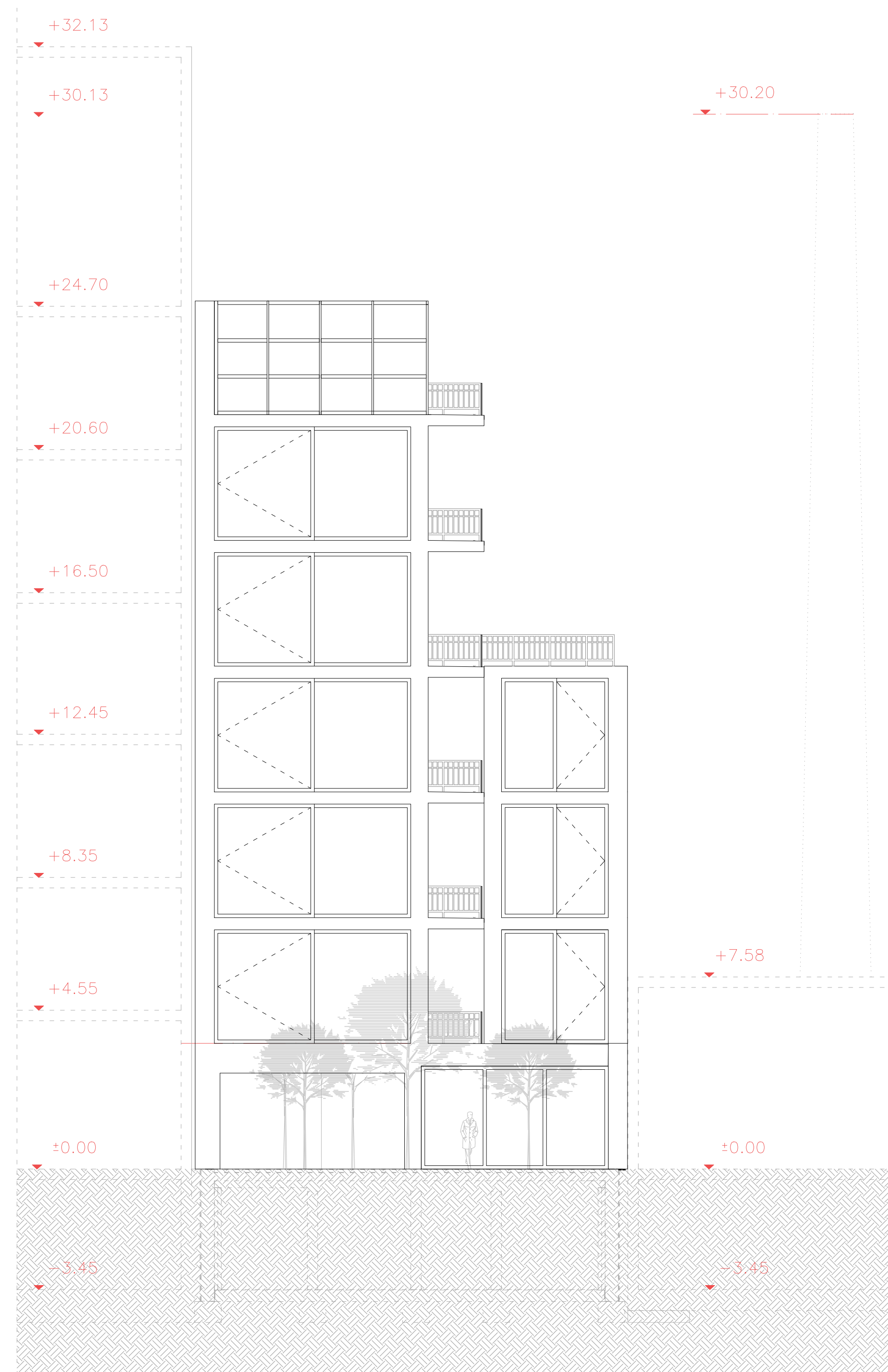


ROOF FLOORPLAN
+21,60

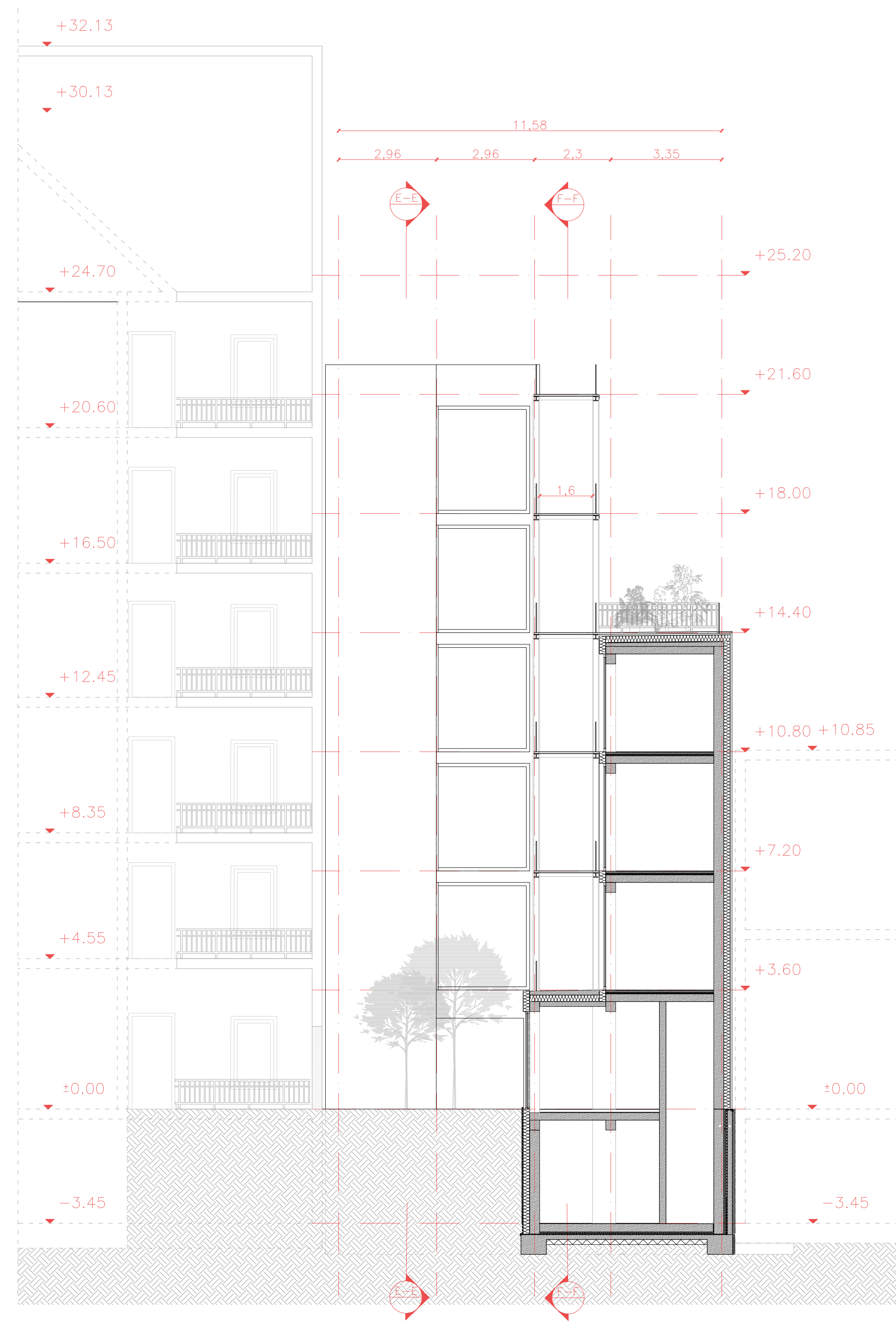
SECTION A-A



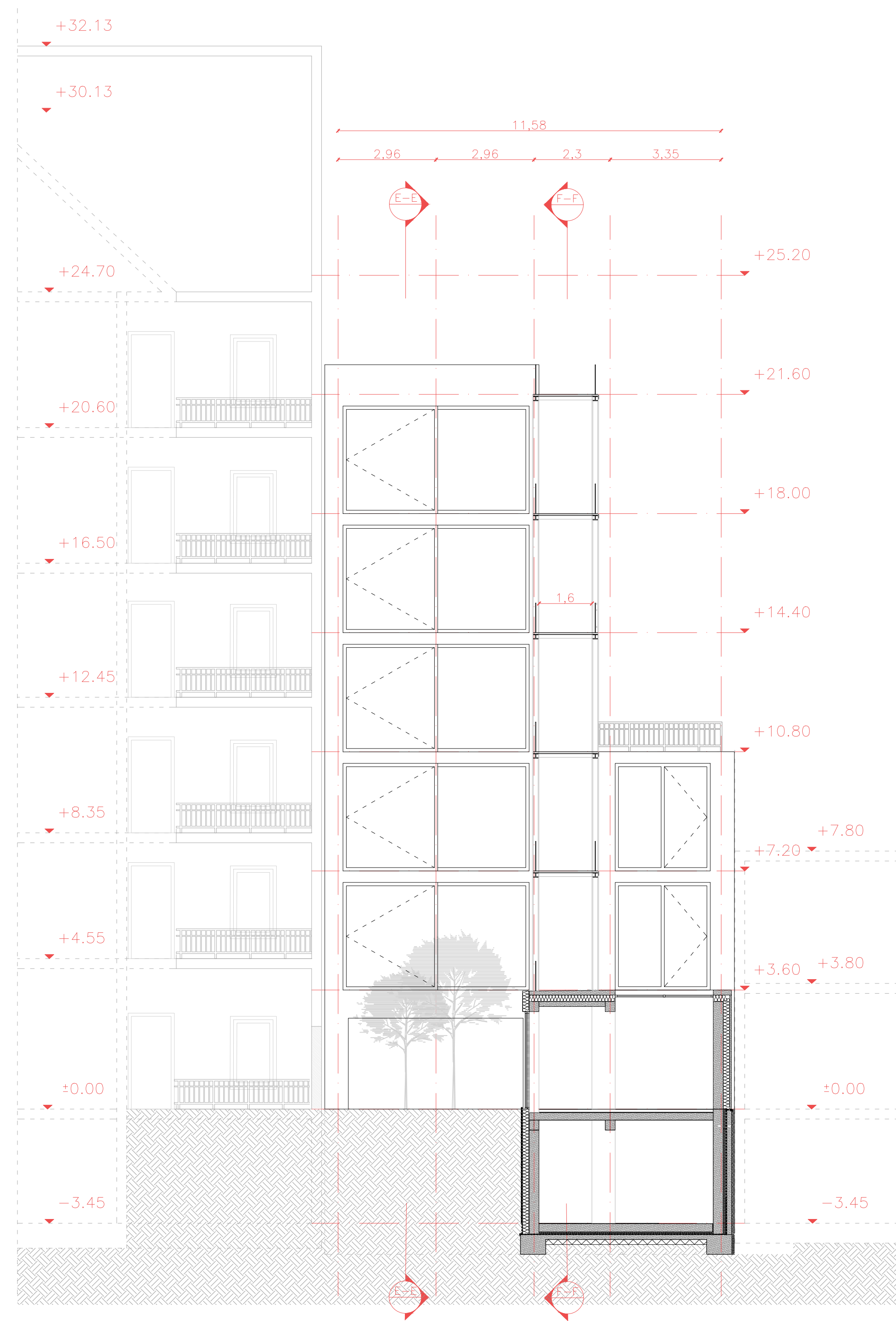
FACADE (GRID A)



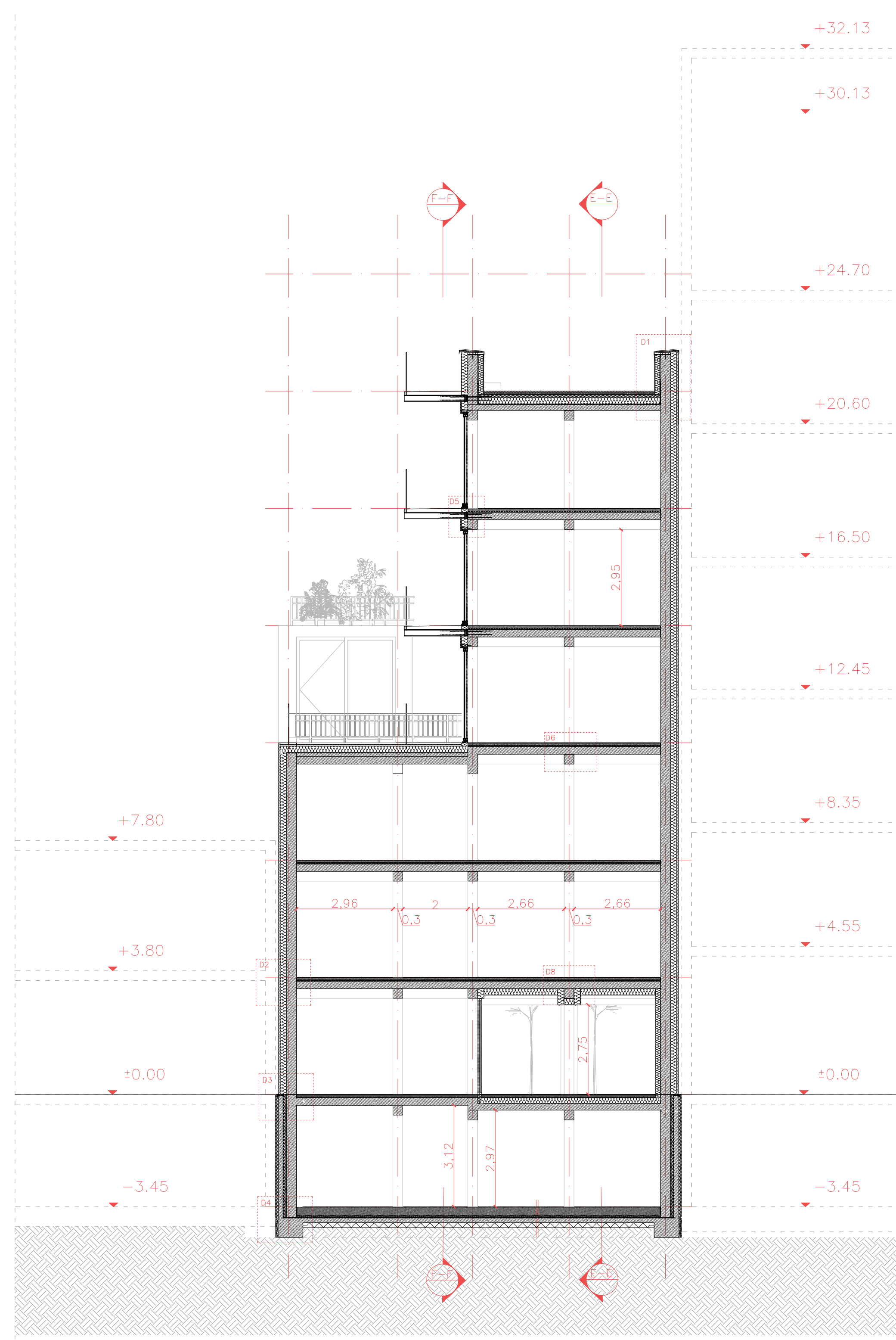
SECTION B-B



SECTION C-C

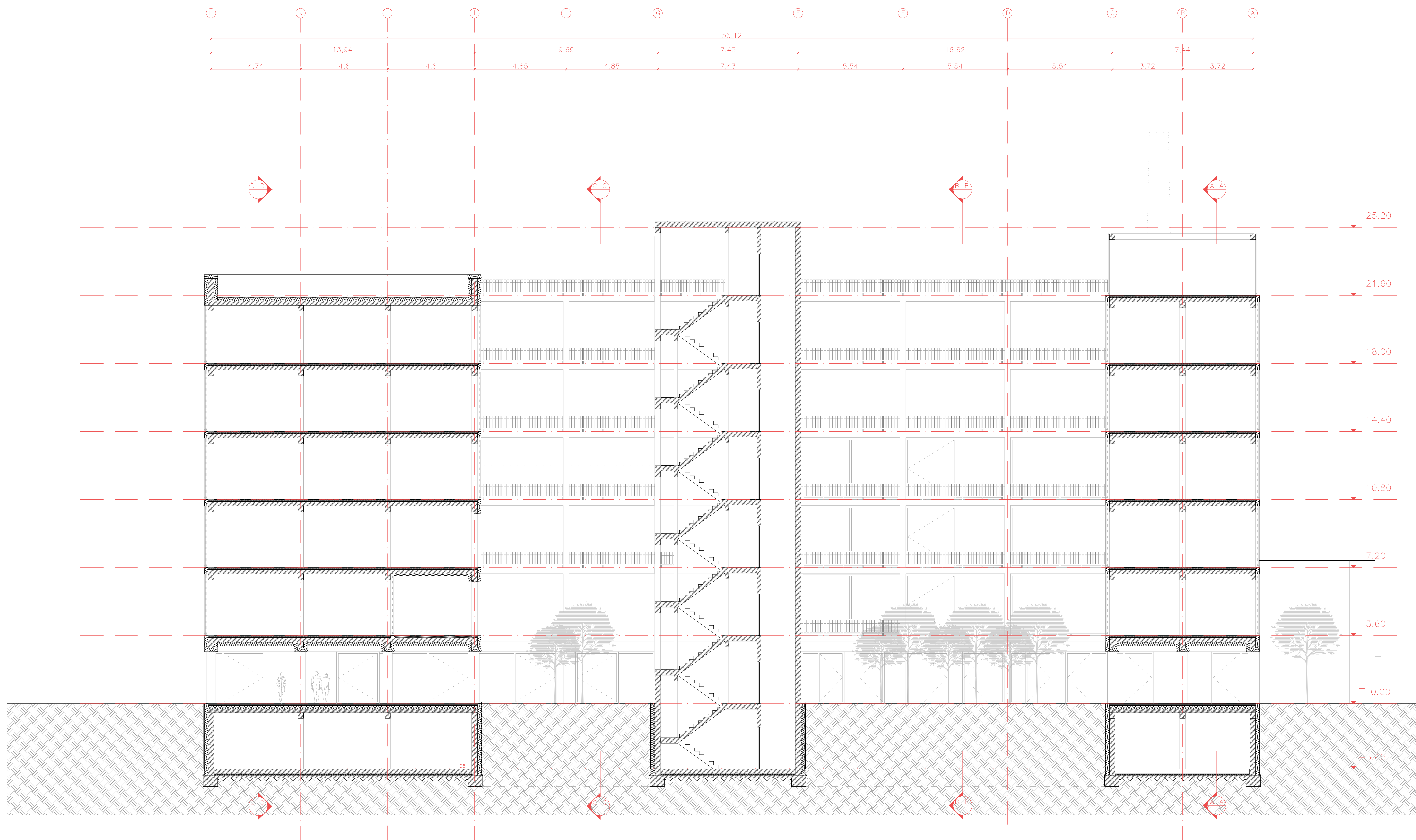


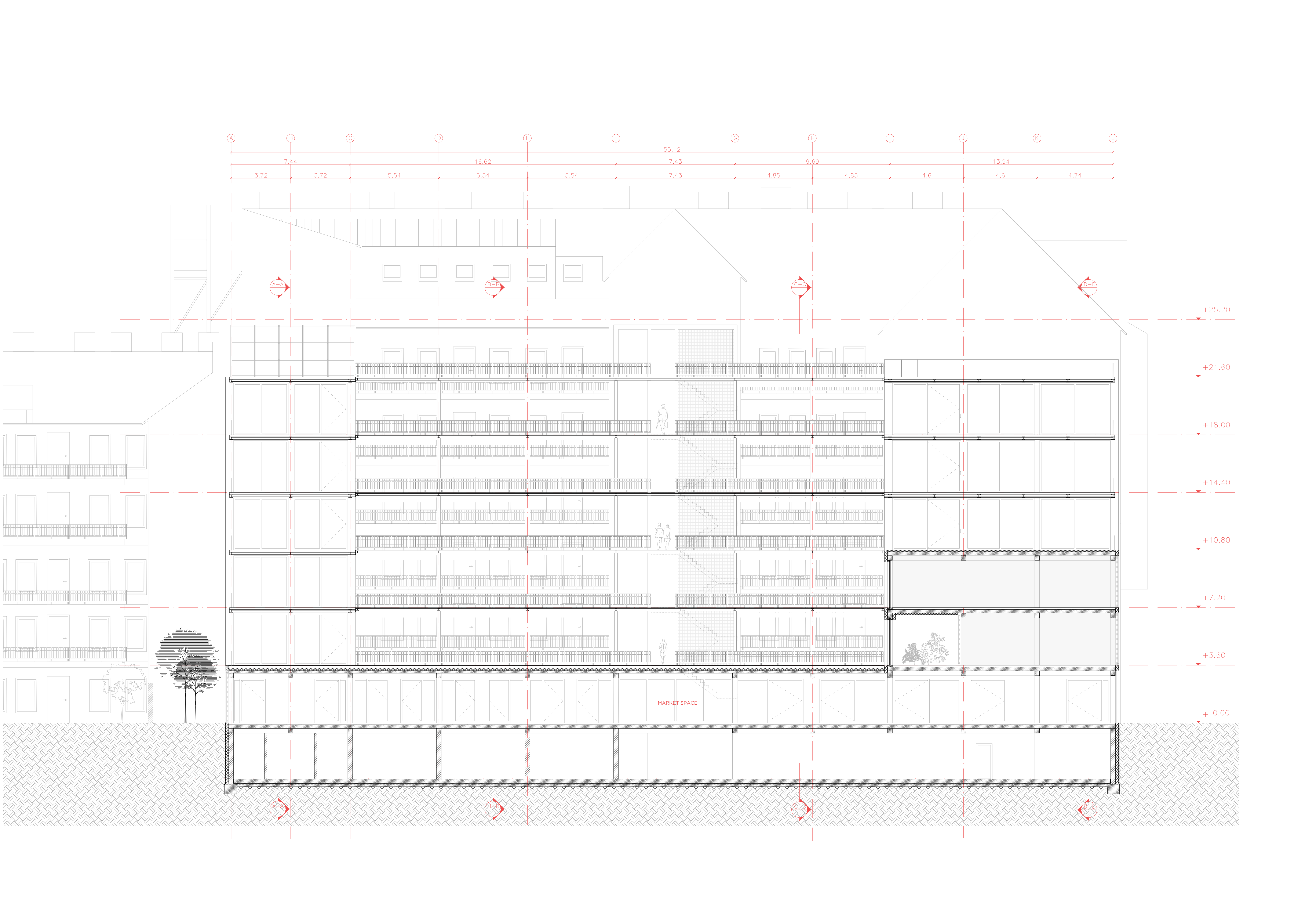
SECTION D-D



FACADE (GRID L)







BILGUUNTUGULDUR BOLDTUR - the KARAVAN - DIPLOMA PROJECT - URBAN DEPARTMENT - HORY GERGELY - SECTION F-F - 1:100

