





# BRNO UNIVERSITY OF TECHNOLOGY

VYSOKÉ UČENÍ TECHNICKÉ V BRNĚ

## FACULTY OF ARCHITECTURE

FAKULTA ARCHITEKTURY

## DEPARTMENT OF SPATIAL DESIGN

ÚSTAV PROSTOROVÉ TVORBY

## FROM SILOS TO ICONIC SPACE. LUDWIG'S MILL IN BRATISLAVA.

OD SIL K IKONICKÉMU PROSTORU. LUDWIGŮV MLÝN V BRATISLAVĚ.

### BACHELOR'S THESIS

BAKALÁŘSKÁ PRÁCE

#### AUTHOR

AUTOR PRÁCE

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#### SUPERVISOR

VEDOUCÍ PRÁCE

**Mag. arch. Oleksii Bykov**

BRNO 2025



## Assignment Bachelor's Thesis

Project no.: FA-BAK0068/2024  
Department: Department of Spatial Design  
Student: **Radovan Séleš**  
Study programme: Architecture and Urban Design  
Field of study: no specialisation (till 2022)  
Supervisor: **Mag. arch. Oleksii Bykov**  
Academic year: 2024/25

#### Title of Bachelor's Thesis:

From Silos to Iconic Space. Ludwig's Mill in Bratislava.

#### Bachelor's Thesis:

Silos, iconic remnants of the industrial era, stand out for their technological advancements and distinctive presence in urban settings. Typically cylindrical and constructed from reinforced concrete, they were designed to meet the storage needs of industrialization, offering a durable and cost-effective solution. However, as the 20th century progressed, shifts in logistics and the migration of industries from urban centers to suburban areas led to the decommissioning of many silos.

Despite their seemingly restrictive, enclosed design, recent decades have seen a rise in innovative efforts to repurpose these structures. Such projects highlight their cultural and historical importance, integrating them into modern urban landscapes. For example, Ricardo Bofill transformed a former cement factory near Barcelona into a combined office and residence in 1973, while Heatherwick Studio reimaged Cape Town's grain silos into the Zeitz MOCAA, the largest museum dedicated to contemporary African art, in 2017. These adaptations preserve industrial heritage while giving silos new relevance in contemporary contexts.

#### Graphics scope :

The aim of the project will be an architectural proposal of a multifunctional cultural center, which reflects the significance of the complex of Ludwig's Mill in Bratislava. Building will be located near the two largest transport hubs in Bratislava. The Silo belonged to the larger area of Ludwig's mill, in which very few original buildings have been preserved. However, this area offers a relatively cozy atmosphere. We will work with the potential of the industrial heritage, transforming it into a new cultural centre. We will make a project that can become a new attractive centre for the area.

Required documentation:

Annotation. Text note to the project

Koncept. Functional analysis. Program

Situation plan 1:2000 – 1:5000

Master plan 1:500 – 1:1000

Floor plans 1:100 – 1:200 including explication lists with floor areas

## Čestné prohášení

Prohlašuji, že svou závěrečnou práci jsem vypracoval samostatně pod vedením vedoucí/ho závěrečné práce a s použitím odborné literatury a dalších informačních zdrojů, které jsou všechny citovány v práci a uvedeny v seznamu literatury na konci práce

Radovan Séleš

v Brně, 12.05.2025

## Abstract

This Bachelor's Thesis focuses on a silo in the former complex of Ludwig's Mill in Bratislava and its reconstruction and conversion into a museum of industrial architecture and agricultural production. The goal of the thesis was to find a solution to make the unique building accessible to visitors while minimising impact to the original structure.

## Abstrakt

Bakalárska práca sa venuje rekonštrukcii sila v areáli bývalého Ludwigovho mlynu v Bratislave na múzeum industriálnej architektúry a poľnohospodárskej výroby. Cieľom práce bolo nájsť riešenie sprístupňujúce a sfunkčňujúce túto jedinečnú stavbu pre účely múzea s minimálnymi zásahmi do koštrukcie.

## Key words

Ludwig's Mill, technical heritage, museum, reconstruction

## Klíčové slová

Ludwigov mlyn, technická památka, muzeum, rekonstrukce

# Text part

## Summary report

The project's parcel is located in Bratislava in the Ružinov City District on Metodova Street. The Ludwig Mill had been operating in the area since the end of the 19th century, and the silo in question has been part of it since 1934 when it was constructed. Since the end of World War II, the area has remained unused, and in recent years, residential buildings have been built on neighboring plots - new mixed use construction and reconstruction of the steam mill warehouse. The rest of the surrounding development consists of civic amenities and mixed-use buildings. The area is listed as a stabilized area in the Bratislava City Plan. Maintenance and repair work has been carried out on the silo in previous years, which means that it is statically and structurally in good condition. The project's parcel also includes low-rise development consisting of a former machine shop and garages.

In this work, I propose the reconstruction of the silo into a museum in order to make this technical monument accessible to the public, to deepen public awareness of industrial and agricultural architecture in Bratislava, and to ensure the durability and longevity of this valuable building. I propose to adapt the former machine shop for the purposes of the museum employees' workplaces, and in place of the garages, I propose a new building with facilities for visitors and a conference hall for 40 people.

The reconstruction of the silo consists of making the smallest possible number and modifications, without disturbing its historical value and providing visitors with a unique insight into the production and logistics process of agricultural production, also by preserving the original technical equipment of the building. The visitor enters through a tunnel located under the axis of the former siding, which was used to bring grain. The elevator located in the former staircase area takes them to the top floor, where a café is located. The exhibition begins one floor below, in cylindrical storage tubes. The visitor passes through the individual cavities on footbridges and proceeds downwards in the exhibition using two spiral staircases. The exhibition ends on the second lowest floor, where the visitor has the option of exiting the silo, going back through the tunnel to the new building with facilities, or continuing to two rooms serving as gallery space for art interpreting the content of the main exhibition. The visitor's movement copies the movement of the grain in the original structure.

The ground floor of the extension houses all the functions necessary for the operation of the museum – an information desk with a cloakroom, toilets and staff facilities. The foyer provides access to the upper floor with a conference hall and the lower floor with a technical room and the access tunnel to the silo via inclined ramps running along the inner perimeter of the facade. The former machine shop is divided into two parts, both two-storey. The smaller one houses a workshop and technical equipment of the complex, and the upper floor serves as storage. The larger and main part is dedicated to the employees' workplace and retains an open layout, reinforced by the removal of the central part of the ceiling. The main entrance is equipped with a vestibule separated from the main space with a curtain. A new volume is inserted into the middle of the space. It contains sanitary facilities for the office and also serves as a staircase providing access to part of the original upper floor, which houses the meeting room and original balcony.

The structure of the machine shop is brick with concrete elements, which carry the ceiling and the truss structure. New window openings are designed into the perimeter walls, the separation of the technical part is solved with a brick structure and the inserted functional volume is formed by a wooden construction.

The new building is based on reinforced concrete foundations. The above-ground structure is carried by a subtle steel frame made rigid by a concrete inclined ramp and diagonal steel cables. The roof structure is placed on the conical skeleton structure and is made of a light layering of trapezoidal sheet metal, oriented strand boards and titanium zinc roofing. The facade consists of a triple glazed system with a frame fixed to the steel structural skeleton. A free-standing facade made of perforated titanium-zinc metal is placed in front of the glazing, serving as shading. Horizontal load-bearing structures consist of the frame's steel beams and reinforced concrete slabs laid on top of them.

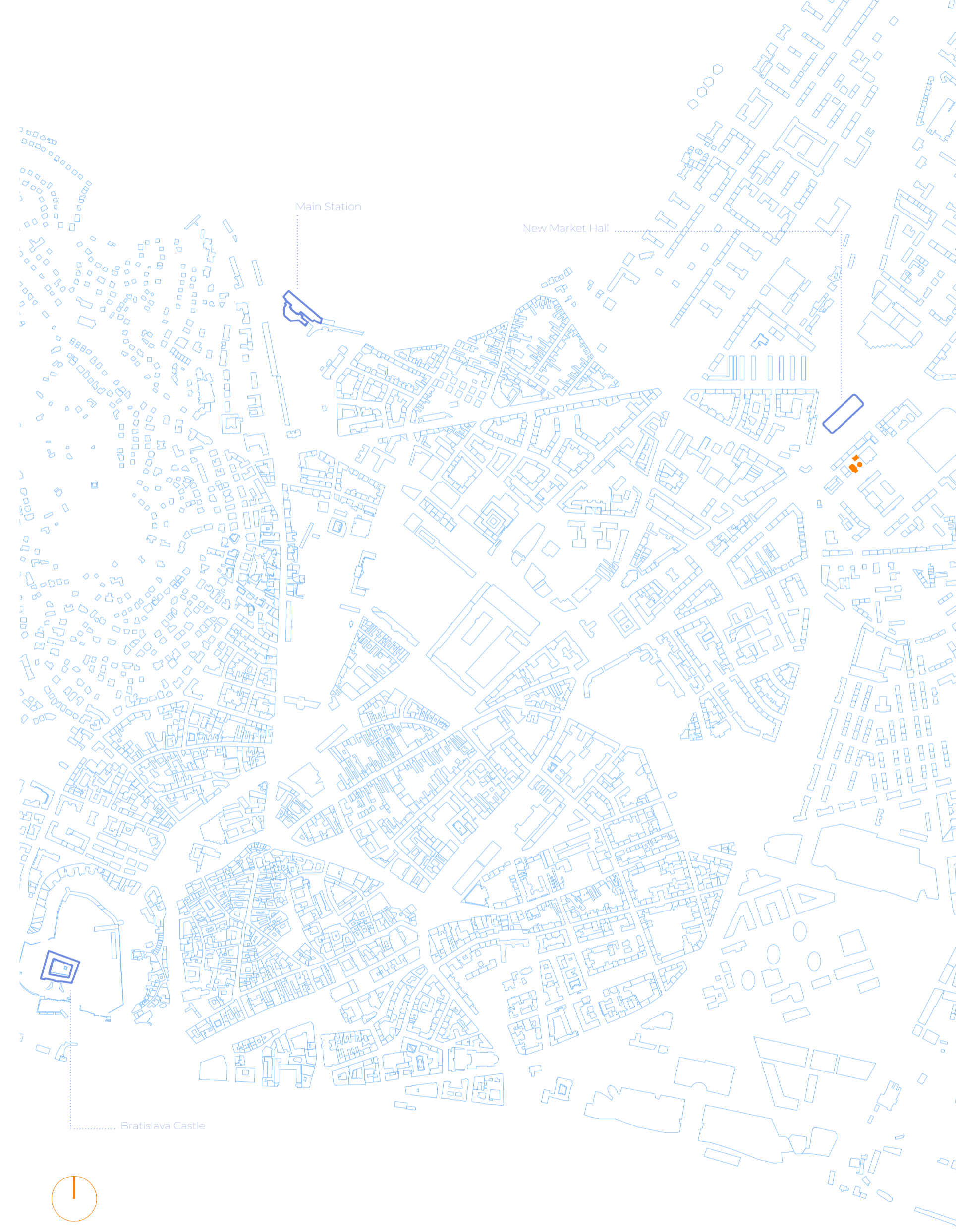
The structural system of the silo is completely made out of reinforced concrete and consists mainly of a thin cylindrical shell structure. A concrete slab placed on top of this shell distributes the load from the building's superstructure. A two-story structure made up of a reinforced concrete frame and infill masonry is placed above the original entrance and is connected to the shell structure.

The structure is intervened in necessary places by sawing out door openings, which are subsequently secured with steel frames. All new structural elements are made up of beams made of steel profiles and the walking surfaces consist of metal grating placed and secured on and secured to the beams. Spiral staircases made of porous grating carried by steel beams are placed on anchoring elements fixed to the silo's walls.

Due to its height, the building must have a protected escape route of type B. Situated within the silo are two and their staircases are isolated from the rest of the open space by fire doors and fire-resistant glass partitions. In the event of a fire, the escape staircase area is ventilated by overpressure.

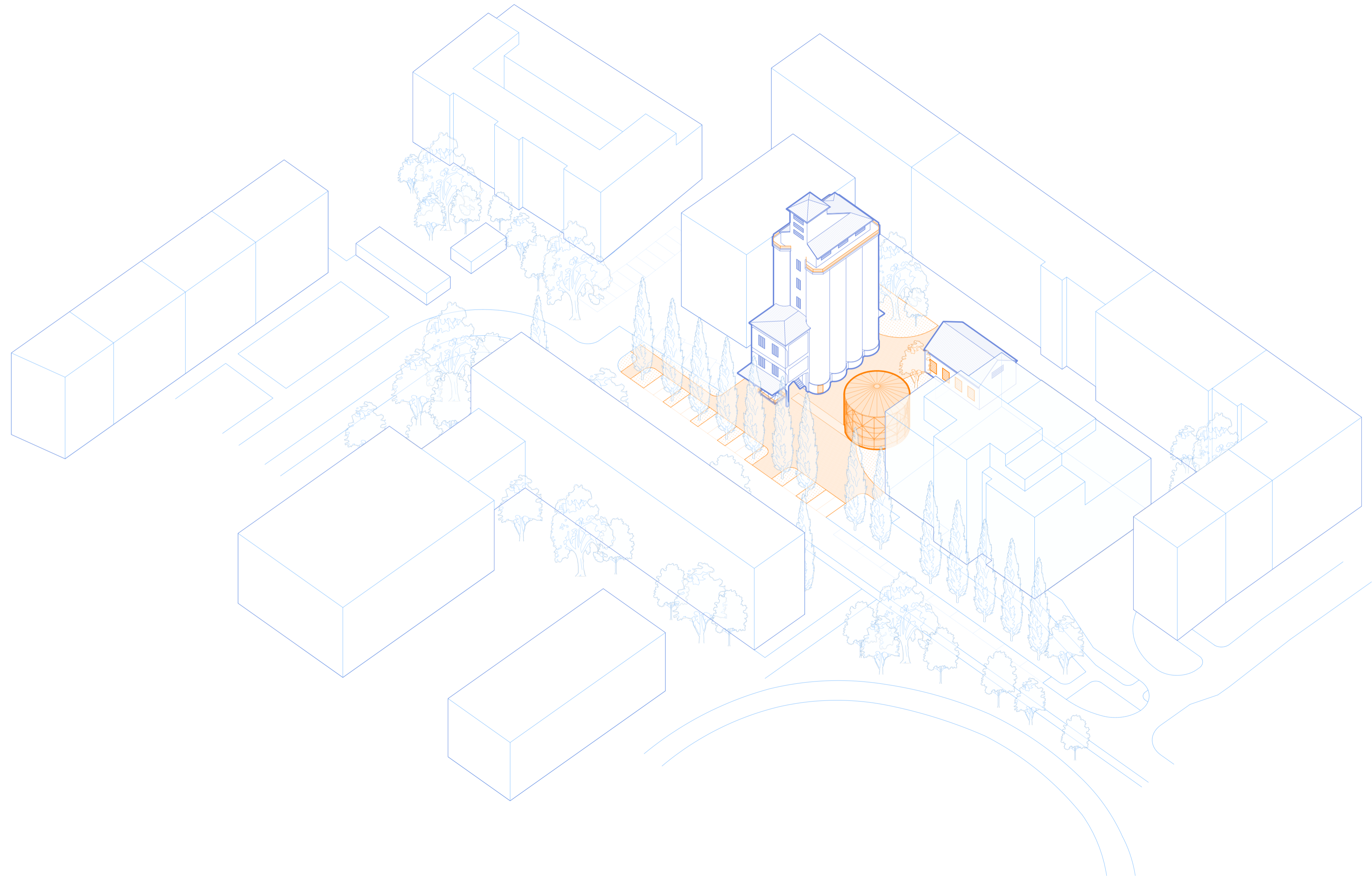
Ventilation machinery is located in the technical rooms on the first underground floor. The café on the seventh floor and its facilities are supplied with water, electricity and are freed from wastewater by a rising piping located in one of the narrower original storage columns.

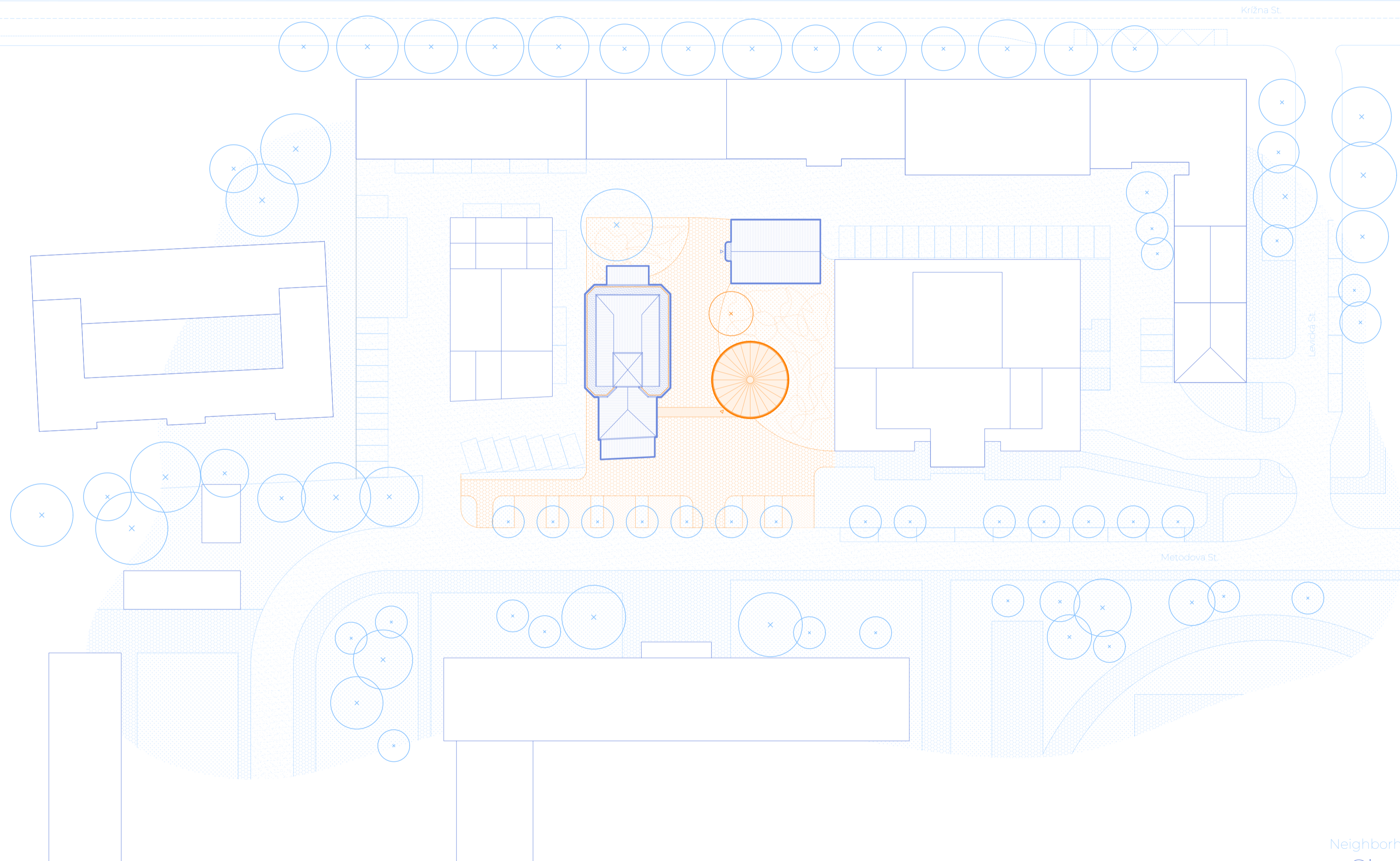
Access to the buildings is possible from the proposed central courtyard connected to a proposed extension of the sidewalk along the Metodova Street. The other areas are grassed over and planted with trees. Static traffic is solved by perpendicular parking along Metodova Street. In total, 11 parking spaces are needed according to the walkable area of the buildings.



1:10000 Bratislava

# Broader relations plan

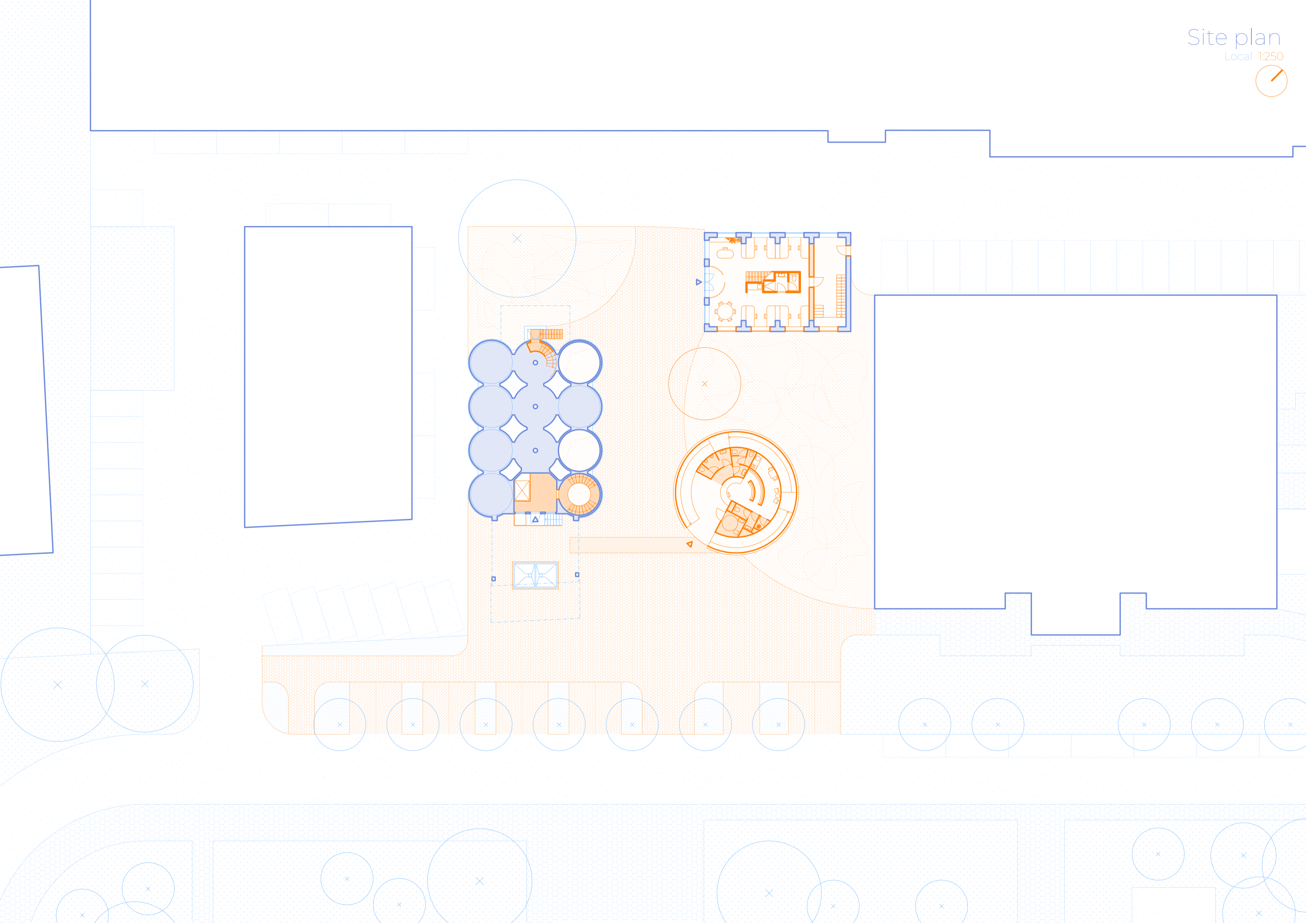




Křižna St.

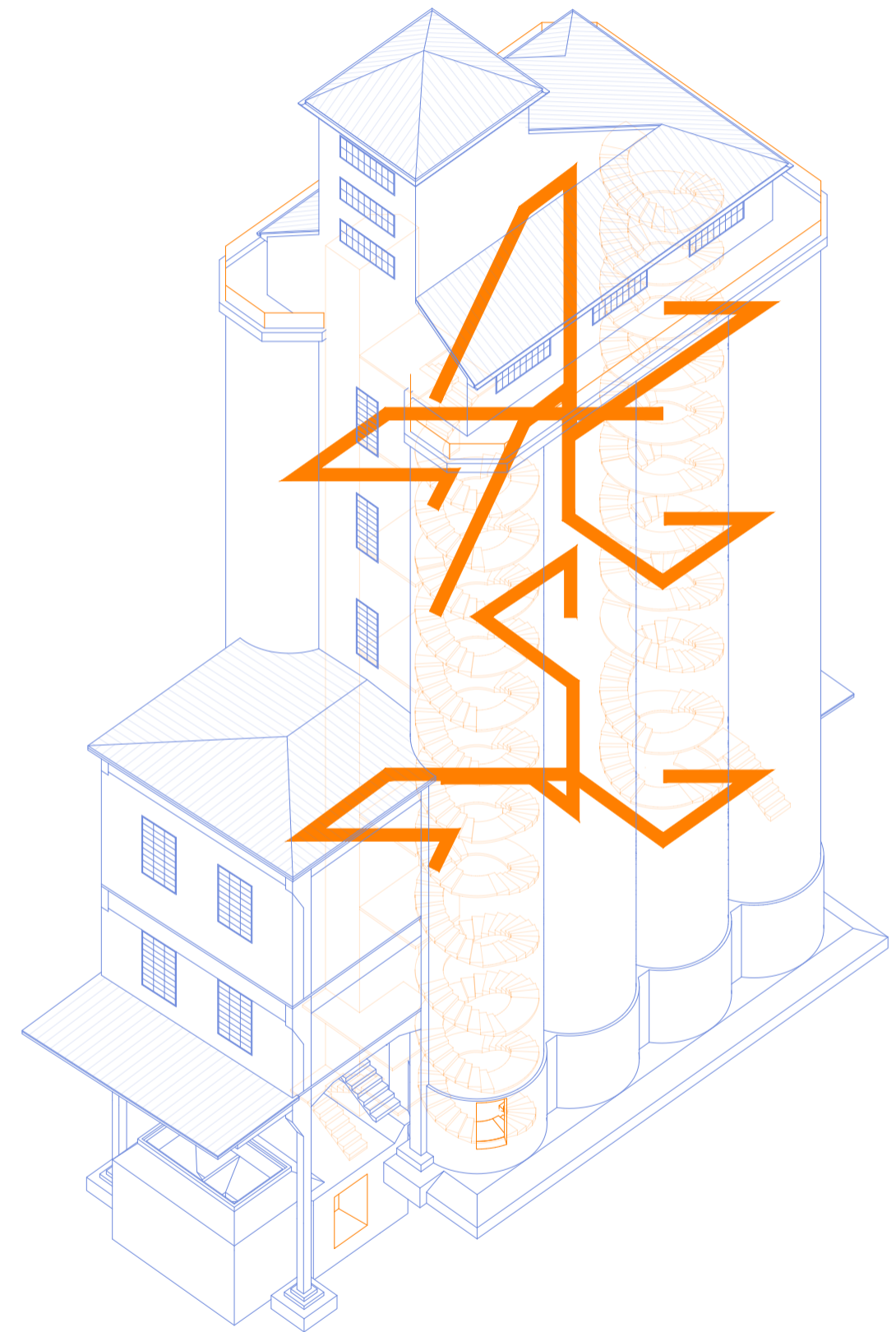
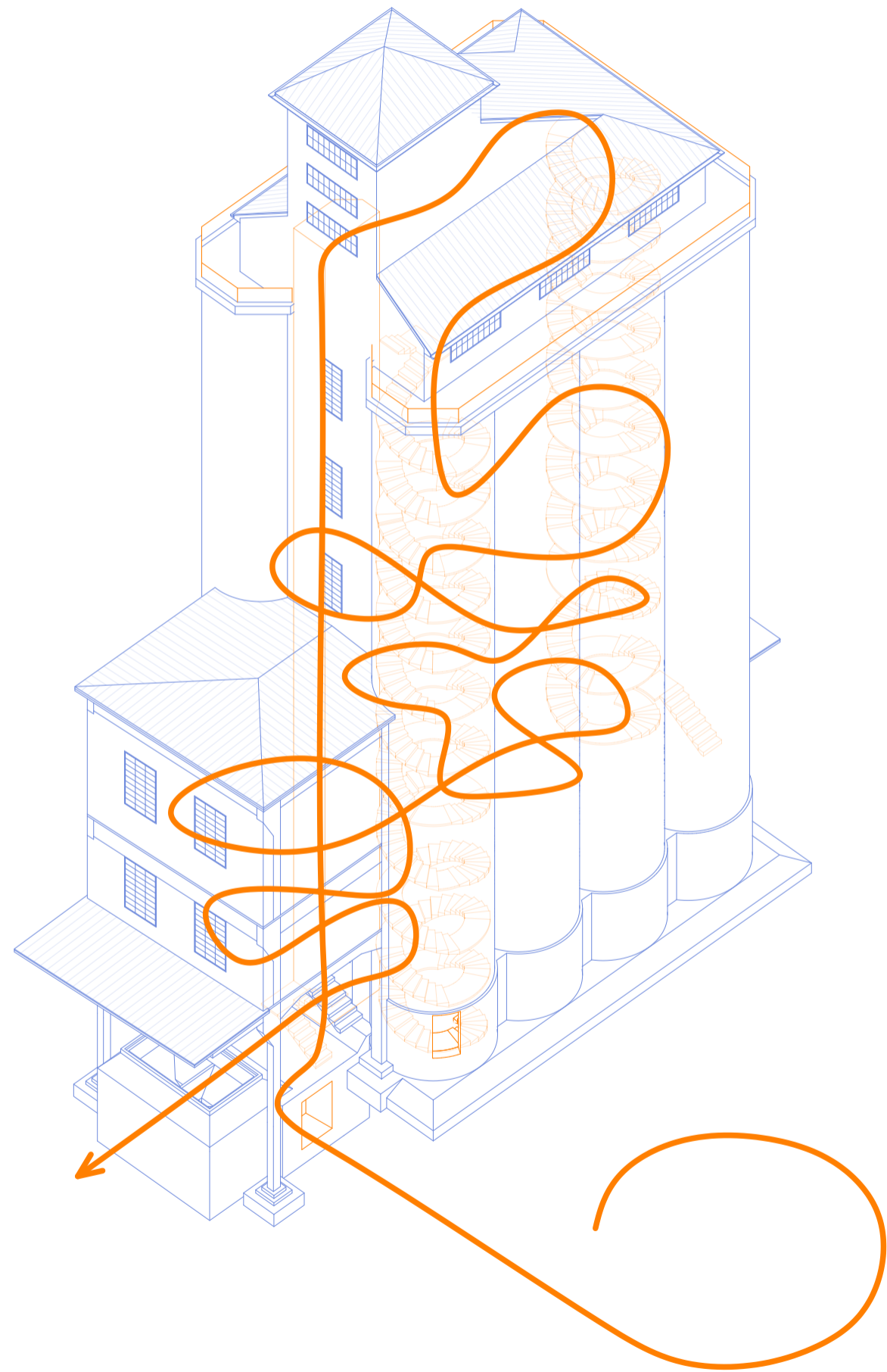
Levická St.

Metodova St.



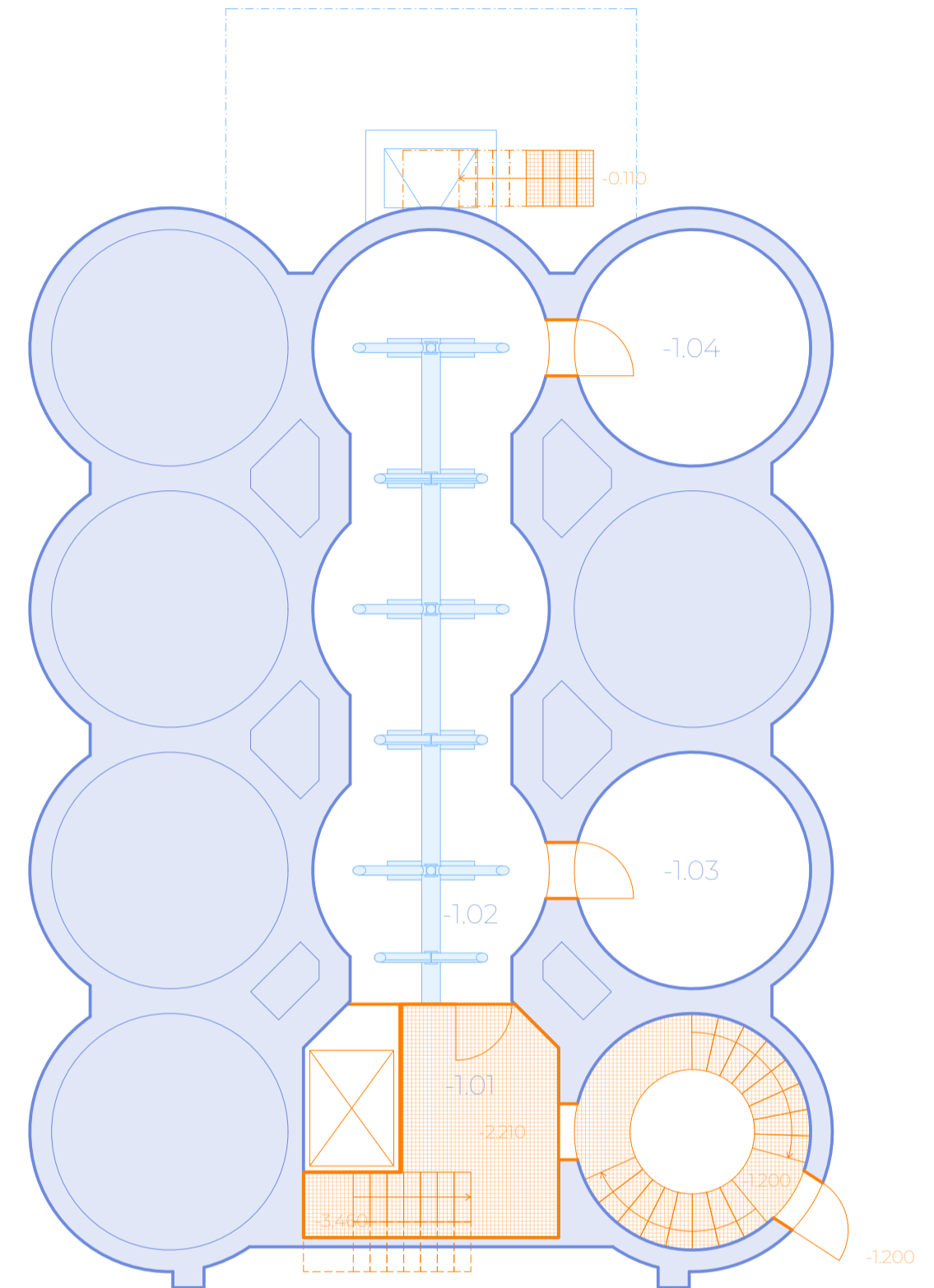
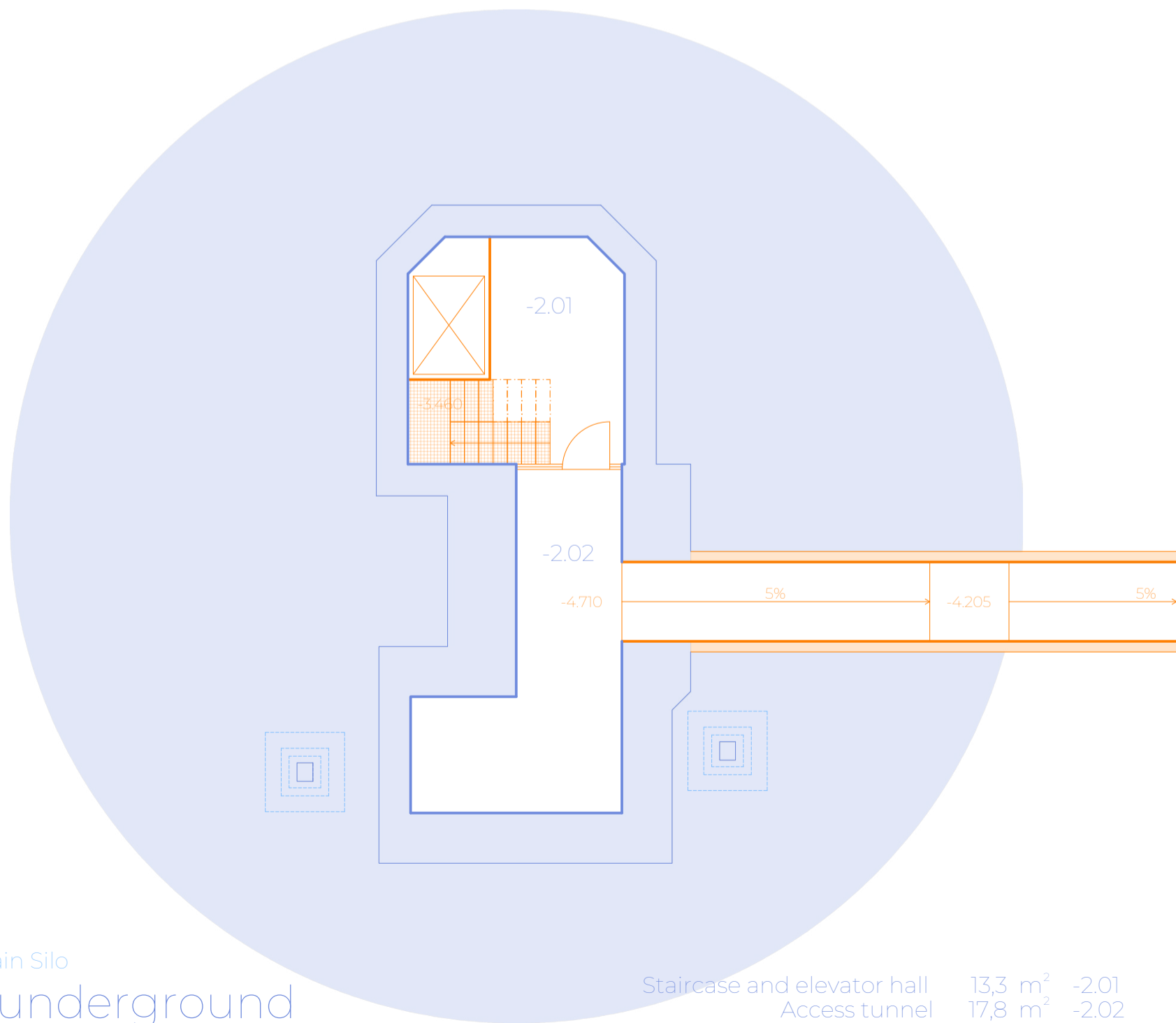
# Movement through silo

the way of the grain



piercing through the silo  
accessing the valuable space  
minimal intervention  
Catwalks

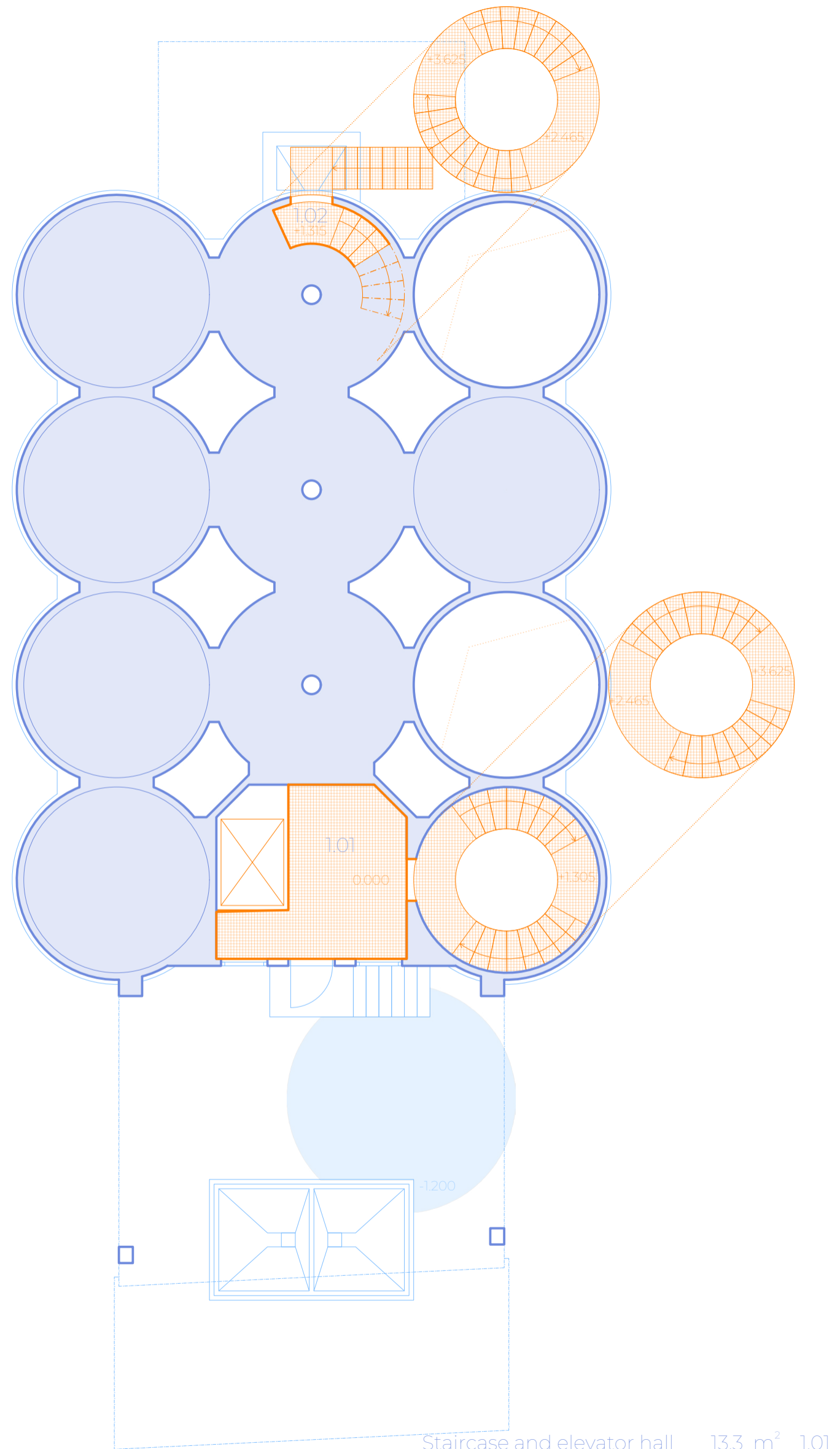




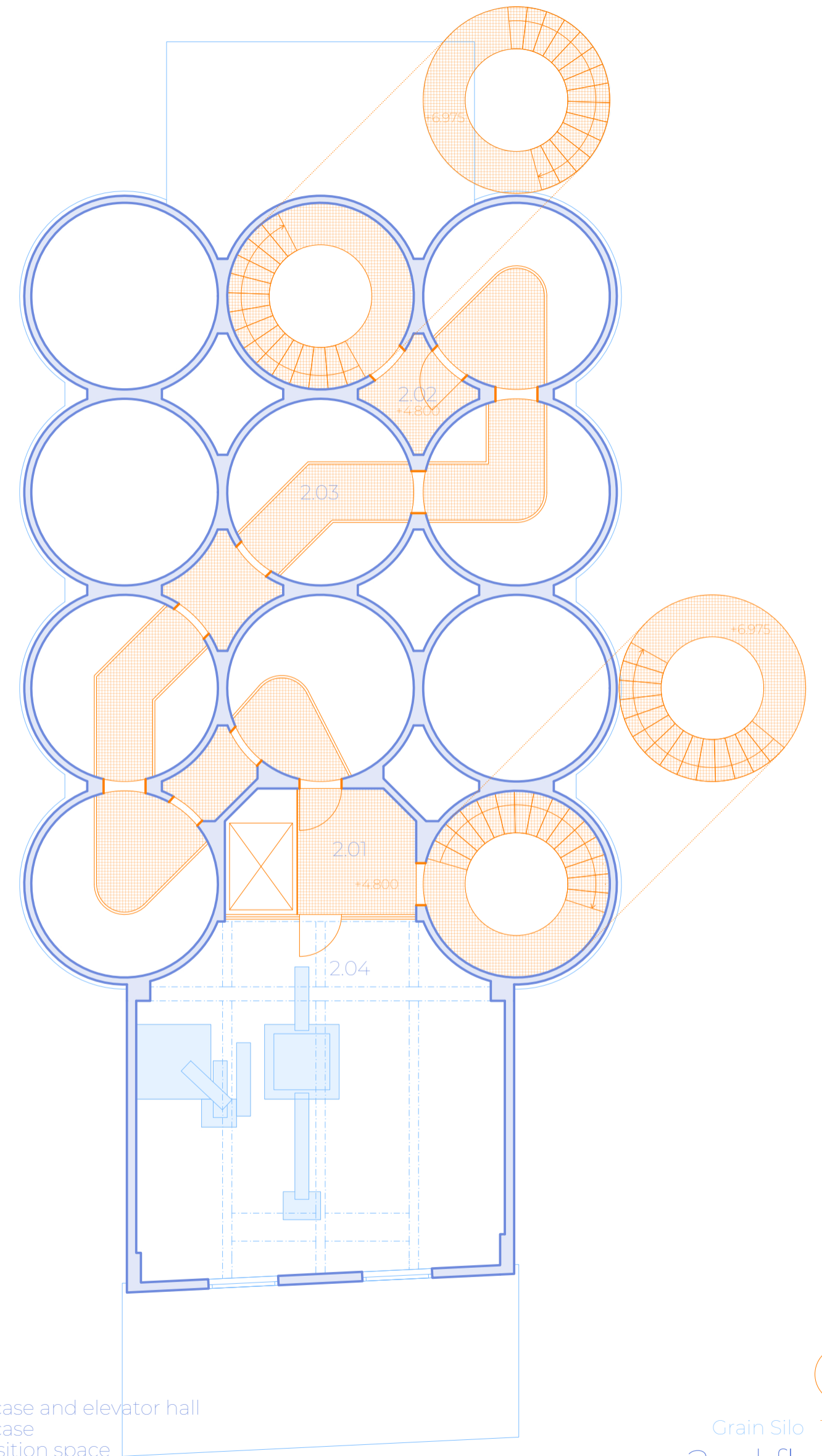
1:100 Grain Silo



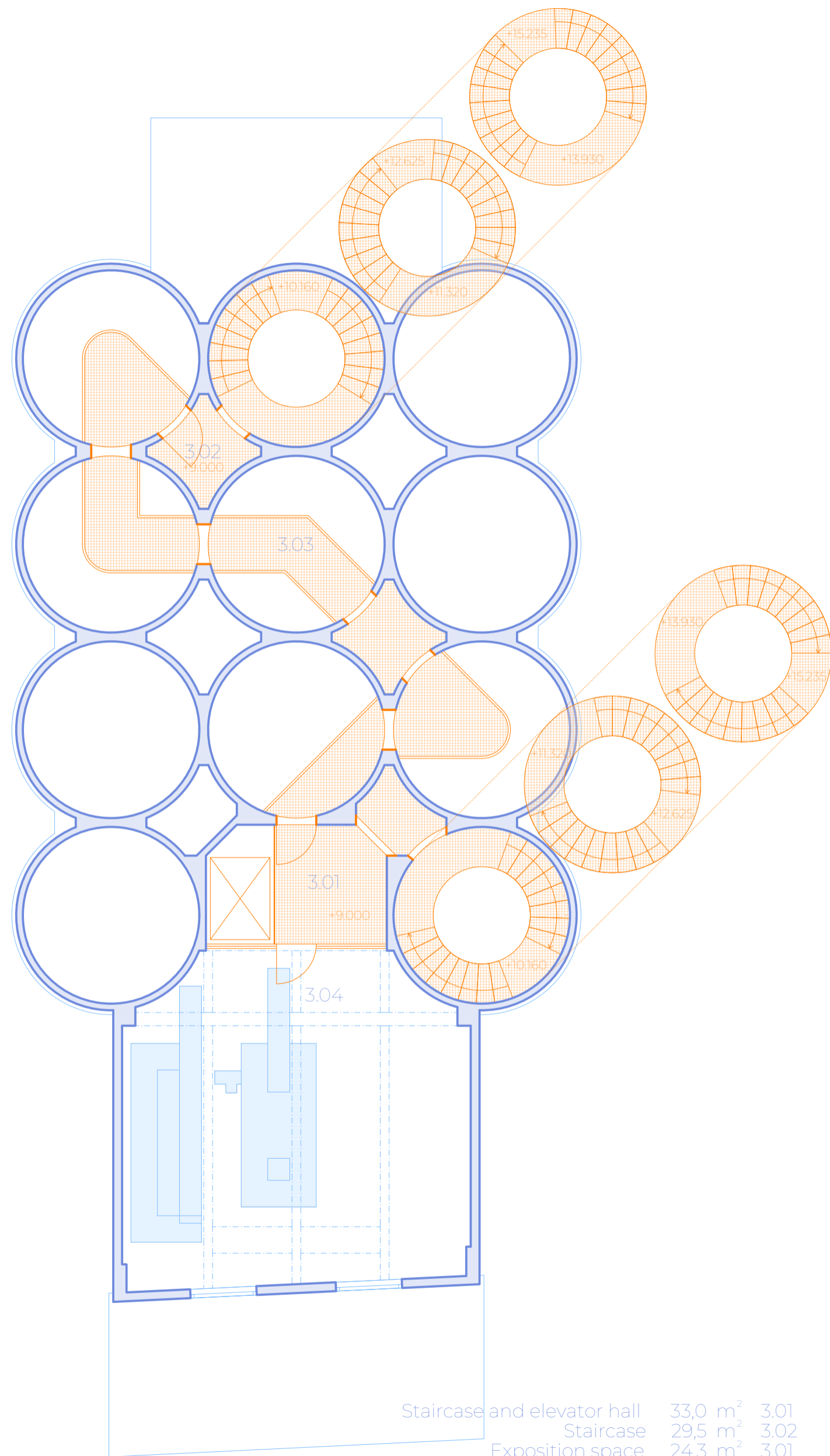
Grain Silo 1:100



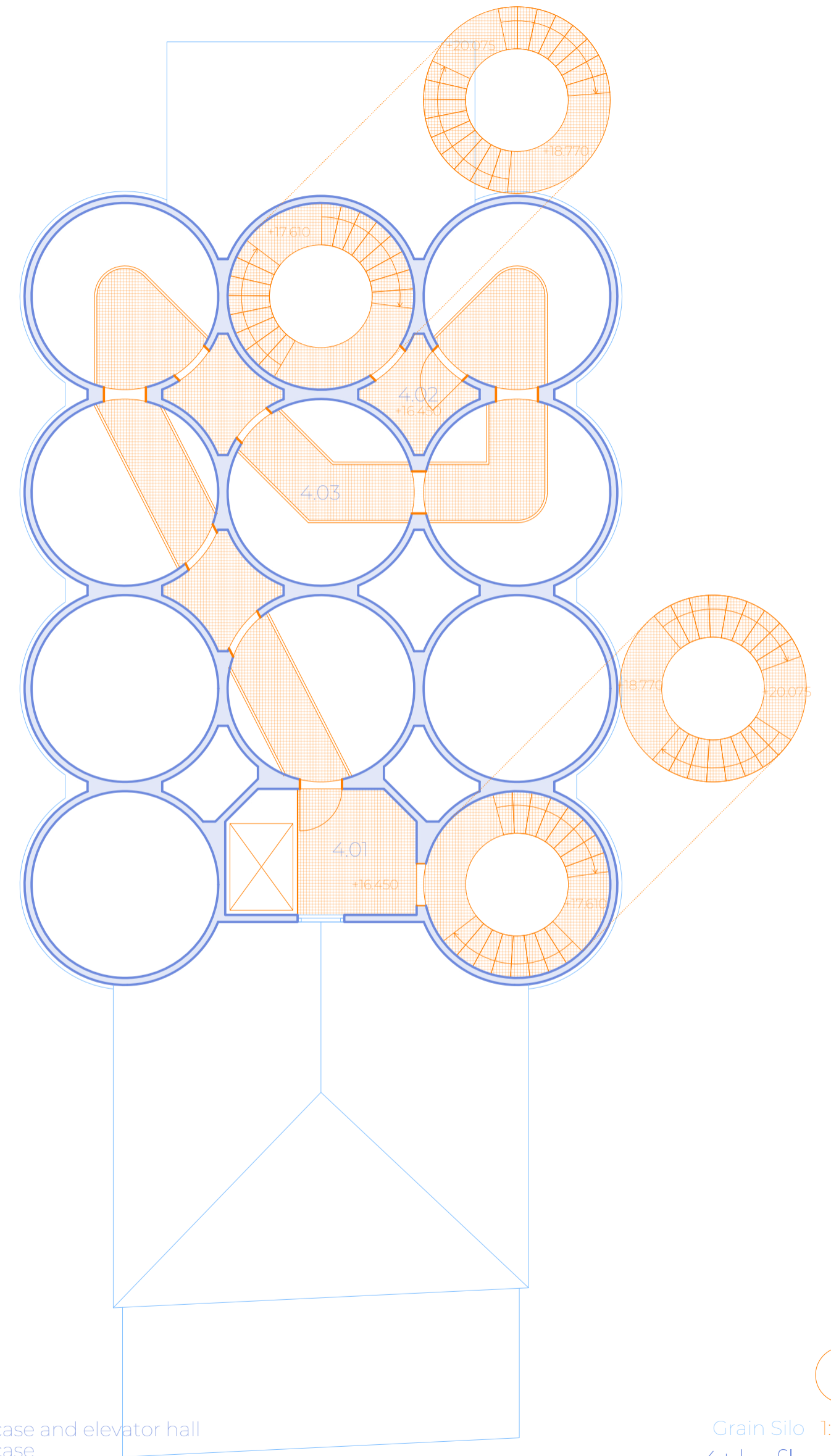
Staircase and elevator hall 13,3 m<sup>2</sup> 1.01  
 Staircase 10,8 m<sup>2</sup> 1.02



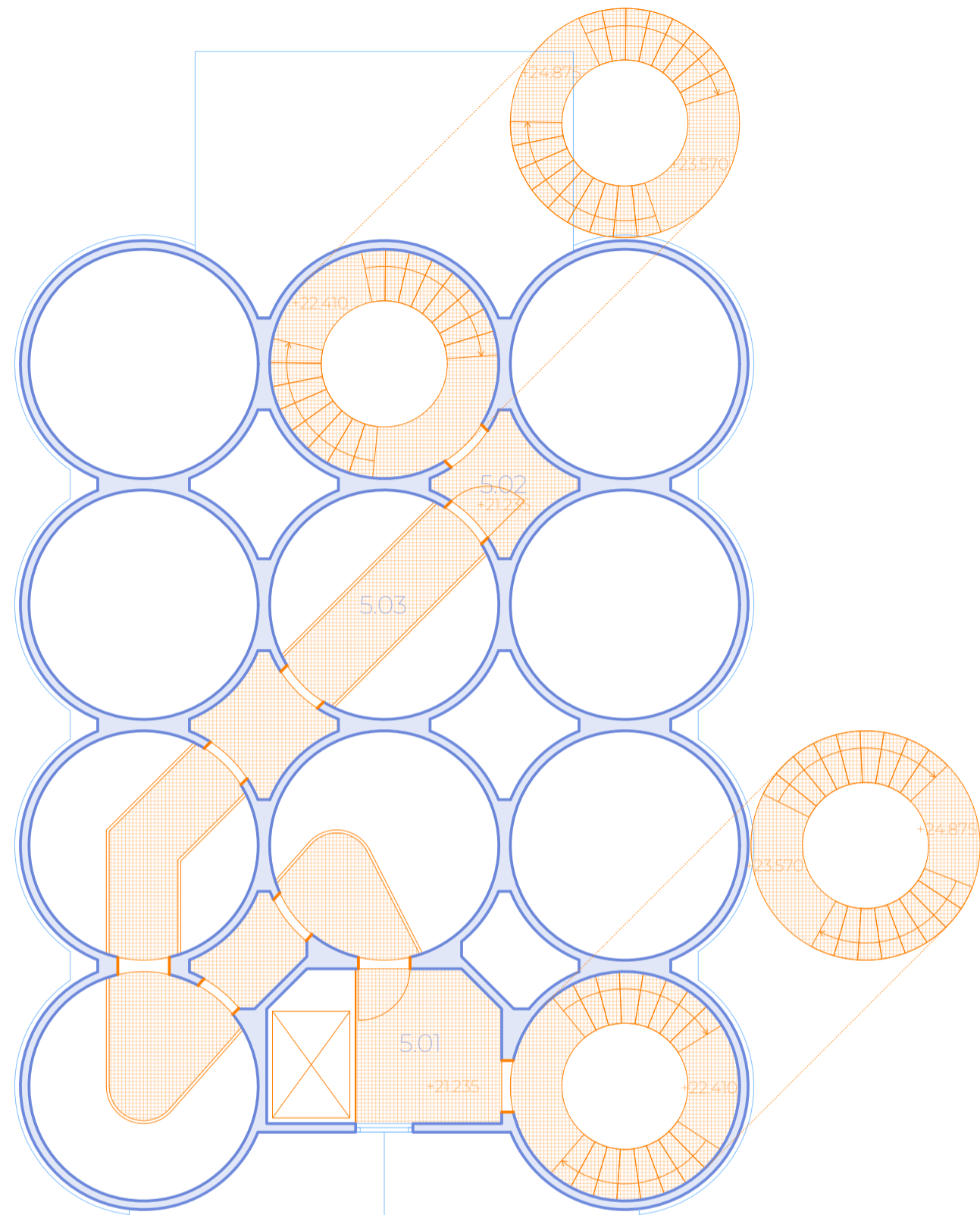
2.01 24,2 m<sup>2</sup> Staircase and elevator hall  
 2.02 20,7 m<sup>2</sup> Staircase  
 2.03 31,5 m<sup>2</sup> Exposition space  
 2.04 55,5 m<sup>2</sup> Secondary exhibition



Staircase and elevator hall	33,0 m <sup>2</sup>	3.01
Staircase	29,5 m <sup>2</sup>	3.02
Exposition space	24,3 m <sup>2</sup>	3.01
Secondary exhibition	55,5 m <sup>2</sup>	3.02

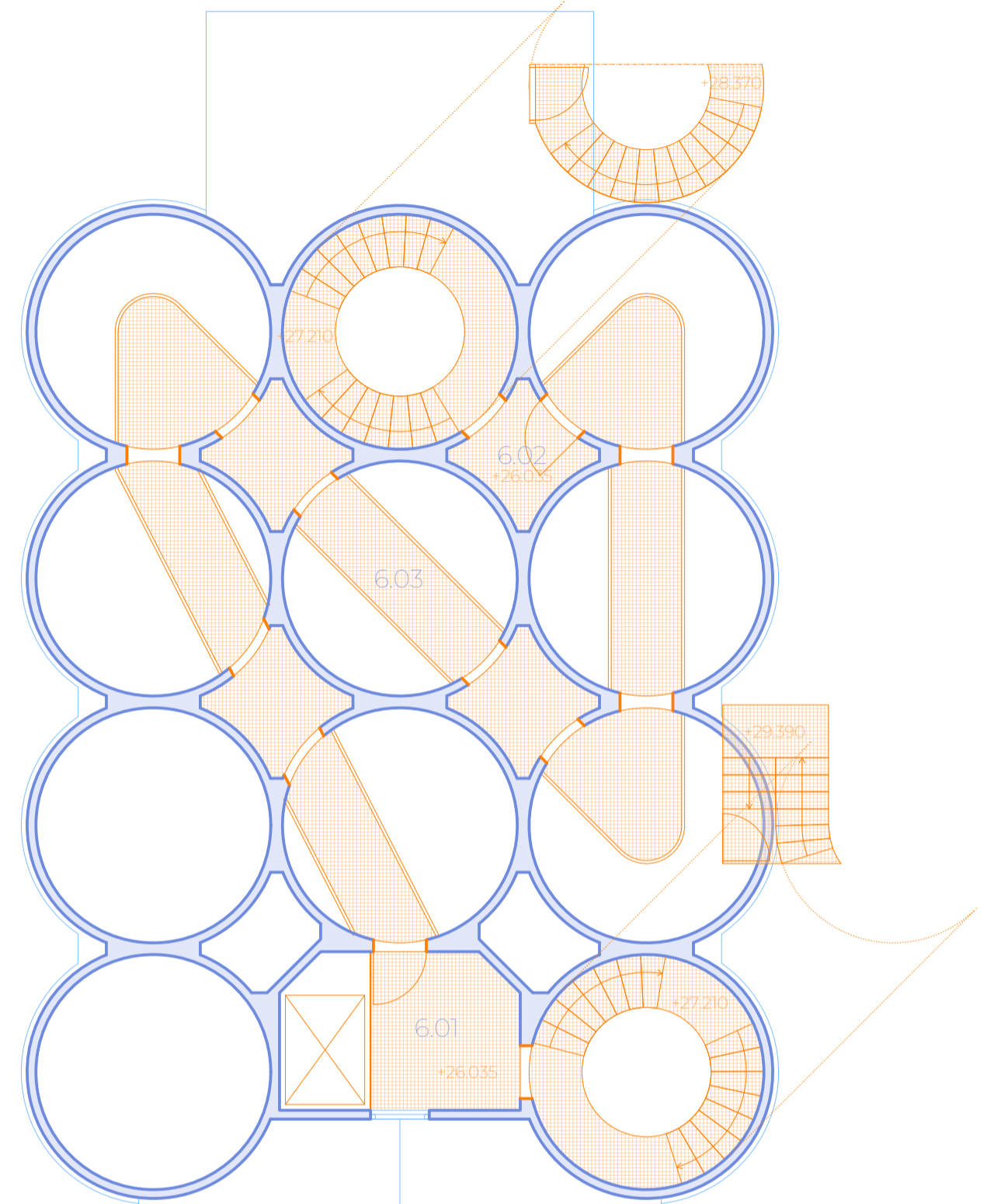


4.01	24,2 m <sup>2</sup>	Staircase and elevator hall
4.02	20,7 m <sup>2</sup>	Staircase
4.03	32,7 m <sup>2</sup>	Exposition space



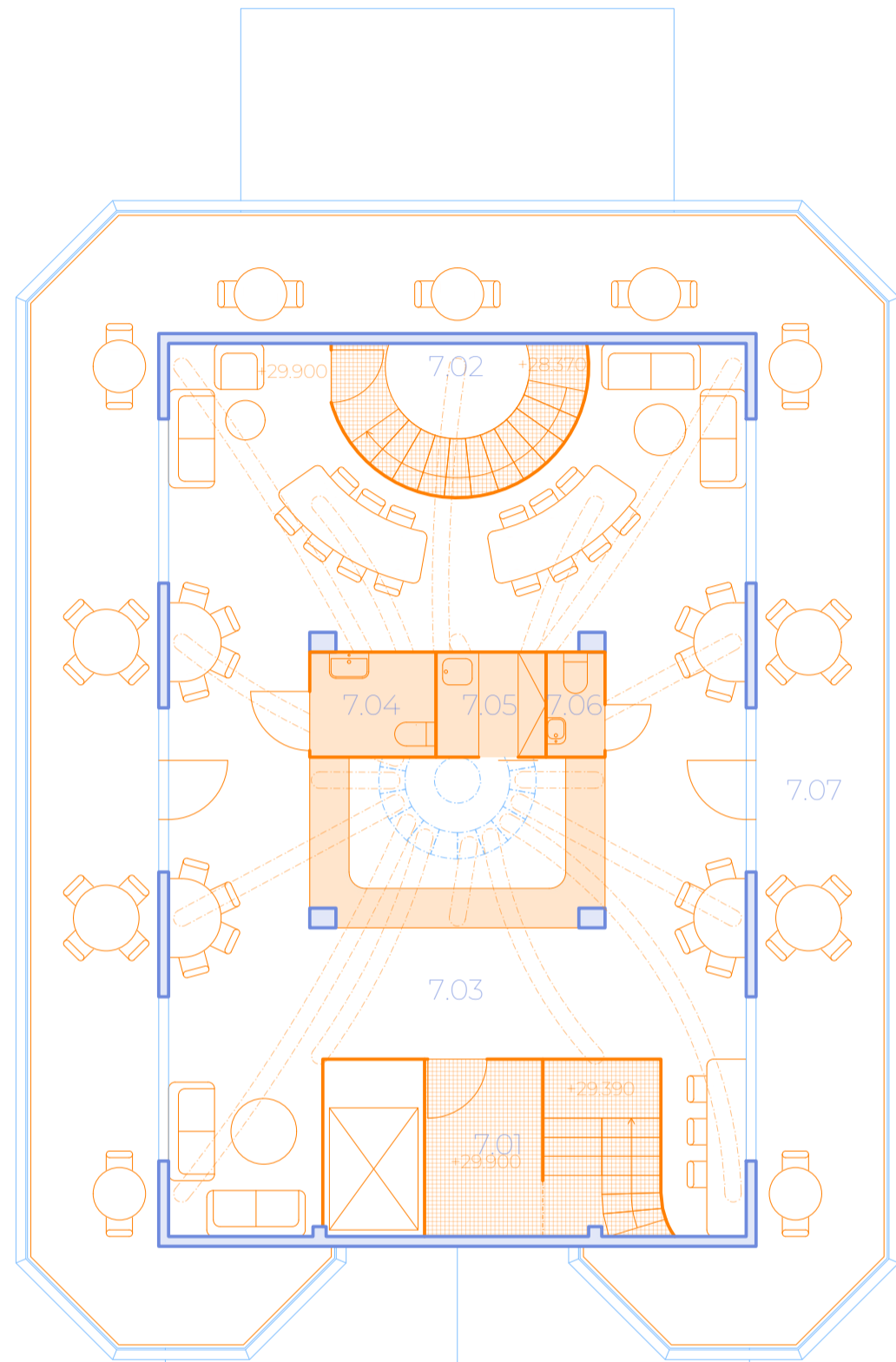
1:100 Grain Silo  
5th floor

Staircase and elevator hall	24,2 m <sup>2</sup>	5.01
Staircase	20,7 m <sup>2</sup>	5.02
Exposition space	22,4 m <sup>2</sup>	5.01

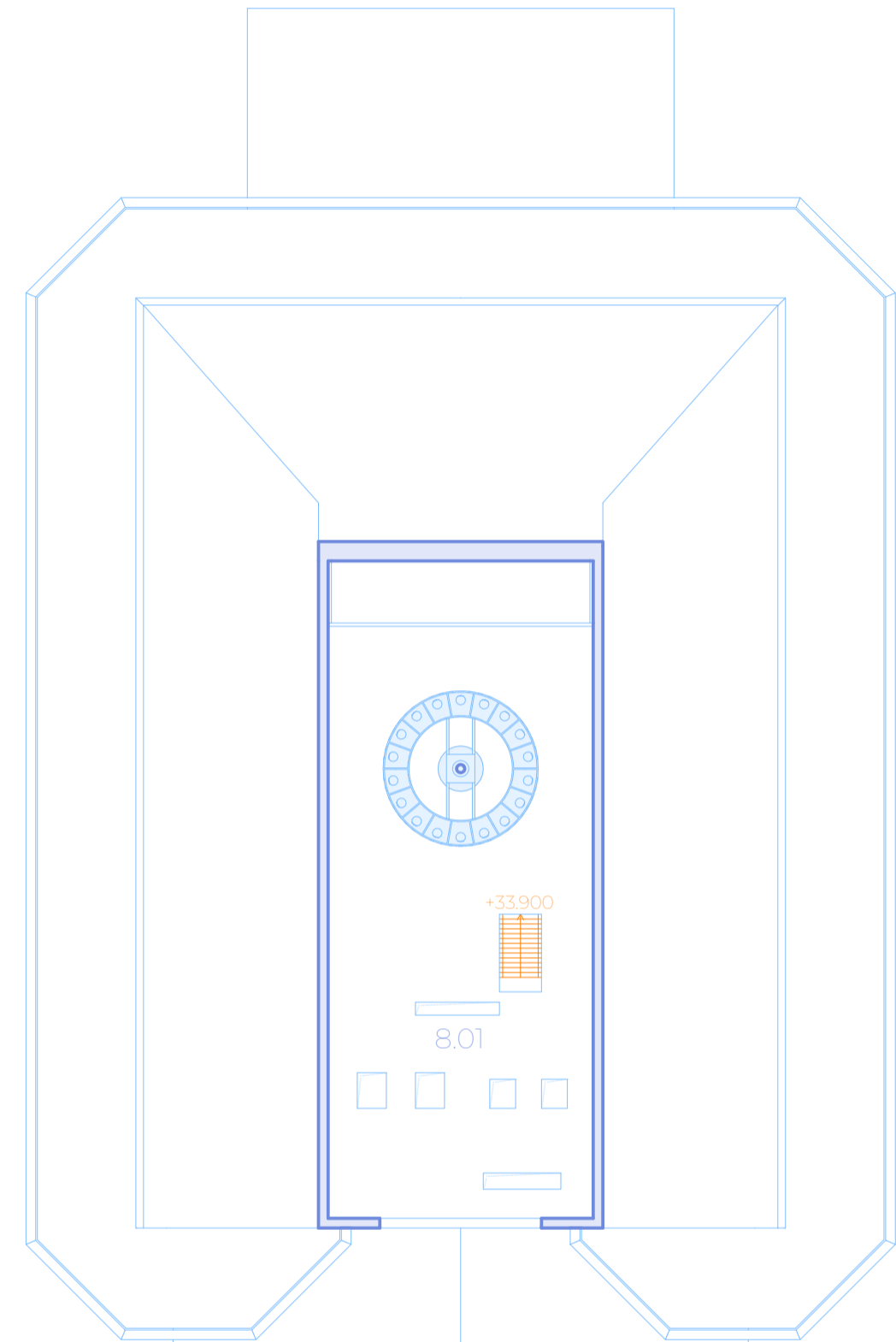


Grain Silo 1:100  
6th floor

6.01	15,4 m <sup>2</sup>	Staircase and elevator hall
6.02	11,9 m <sup>2</sup>	Staircase
6.03	32,7 m <sup>2</sup>	Exposition space

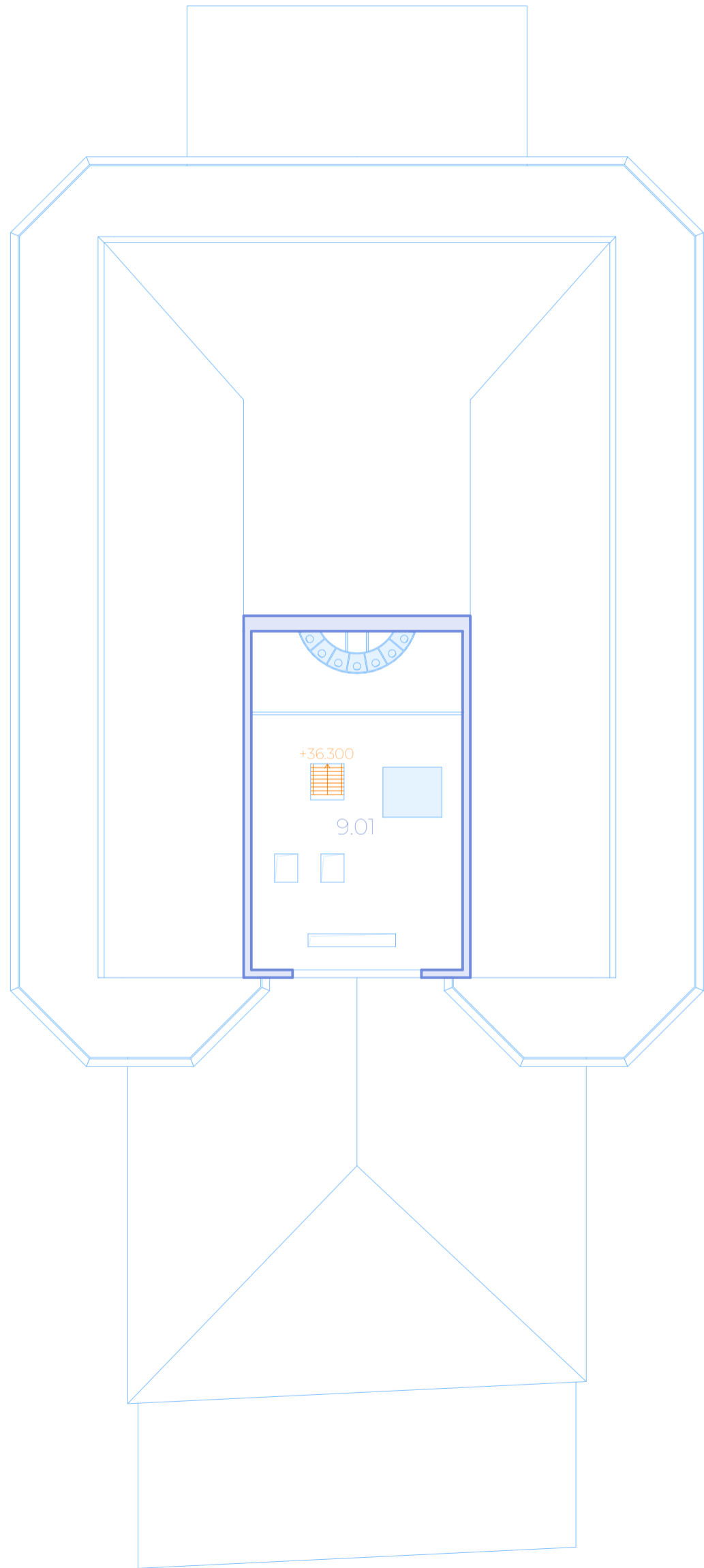


Staircase and elevator hall	9,7 m <sup>2</sup>	7.01
Staircase	5,0 m <sup>2</sup>	7.02
Café-bar	90,9 m <sup>2</sup>	7.03
Barrier-free restroom	3,2 m <sup>2</sup>	7.04
Service kitchenette	2,7 m <sup>2</sup>	7.05
Restroom	1,5 m <sup>2</sup>	7.06
Exterior terrace	70,5 m <sup>2</sup>	7.07

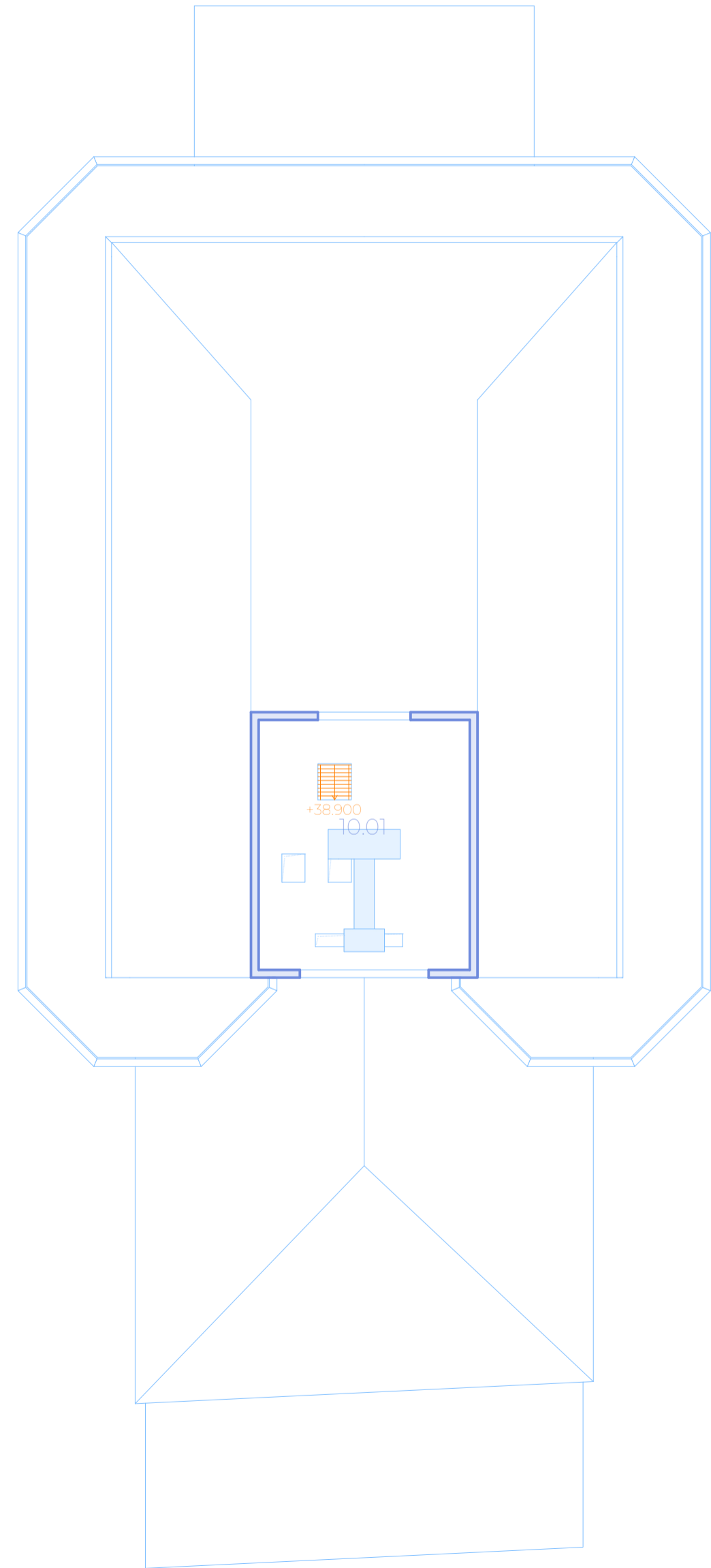


8.01 37,3 m<sup>2</sup> Service floor





Service floor 20,3 m<sup>2</sup> 9.01



10.01 19,9 m<sup>2</sup> Service floor



+42.390

+33.900

+29.900

+26.035

+21.235

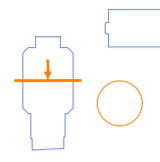
+16.450

+9.000

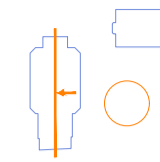
+4.800

-2.210

### Section Grain Silo 1:150



### Section 1:150 Grain Silo



+42.390

+33.900

+29.900

+26.035

+21.235

+16.450

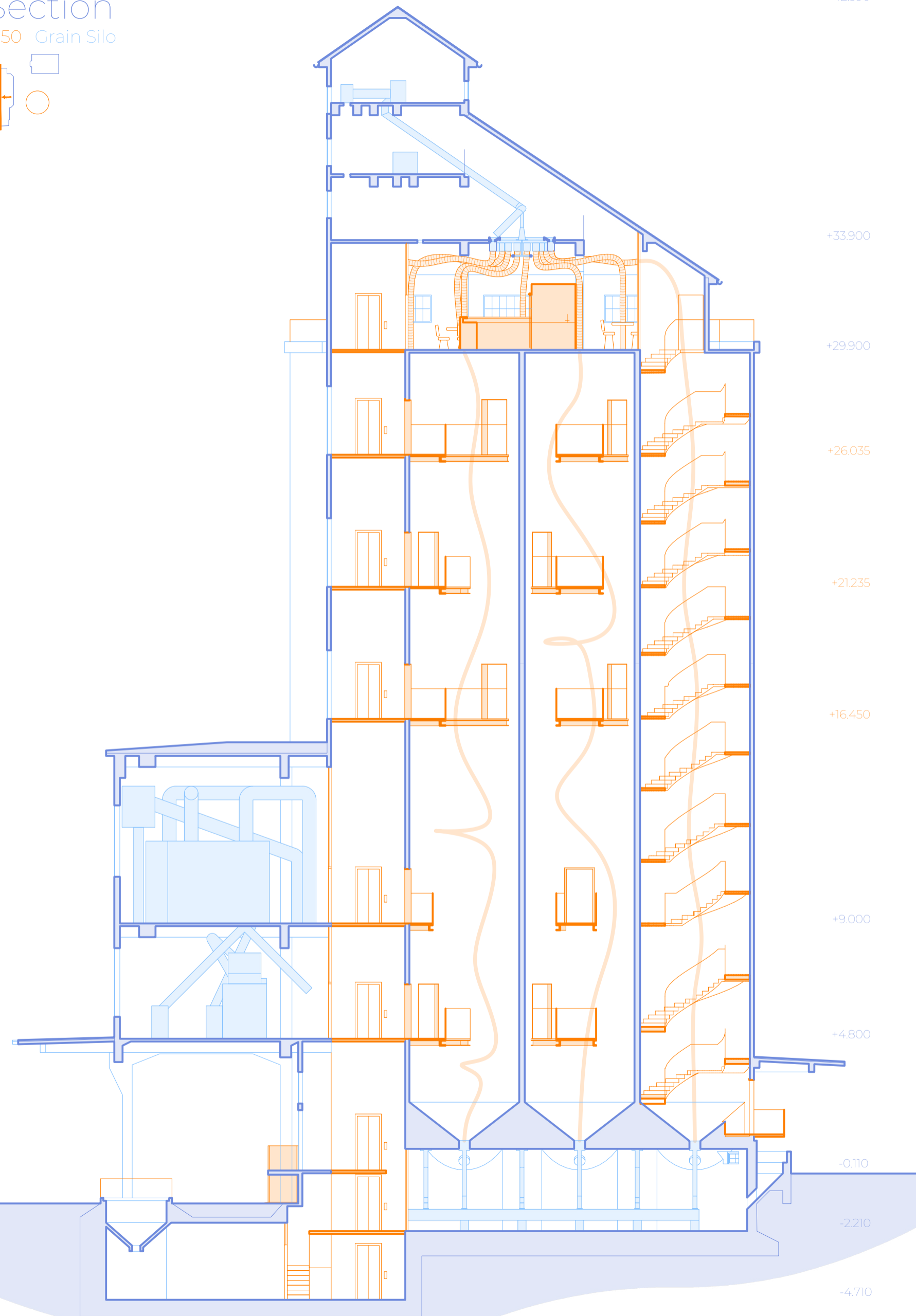
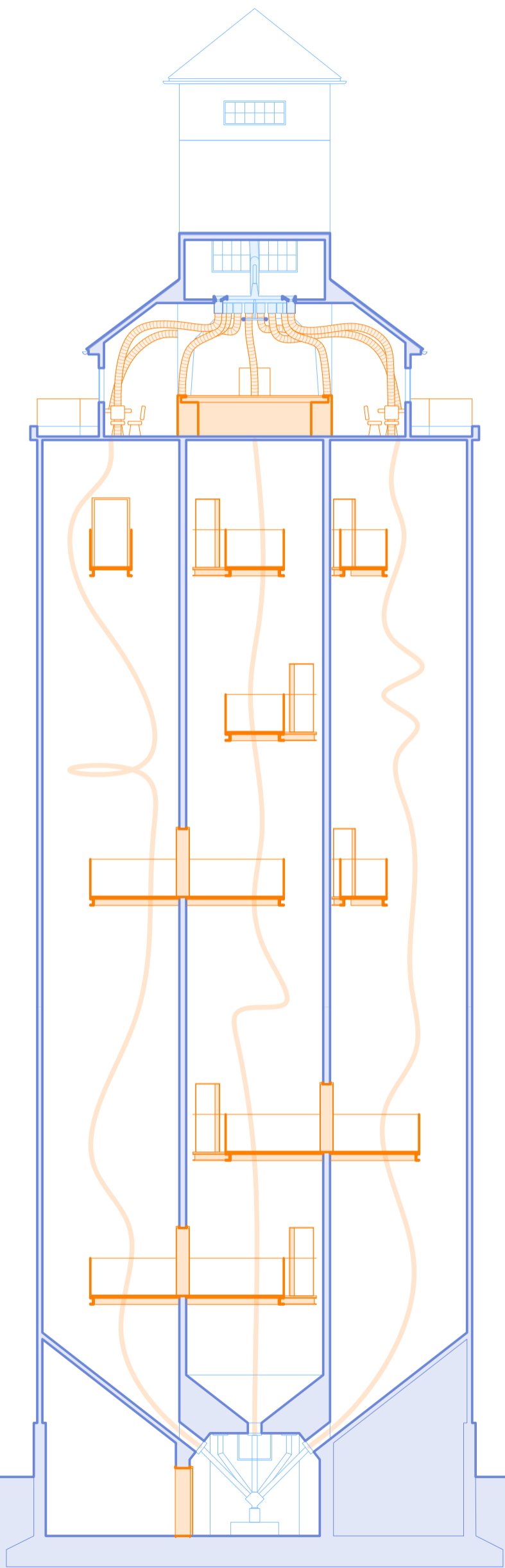
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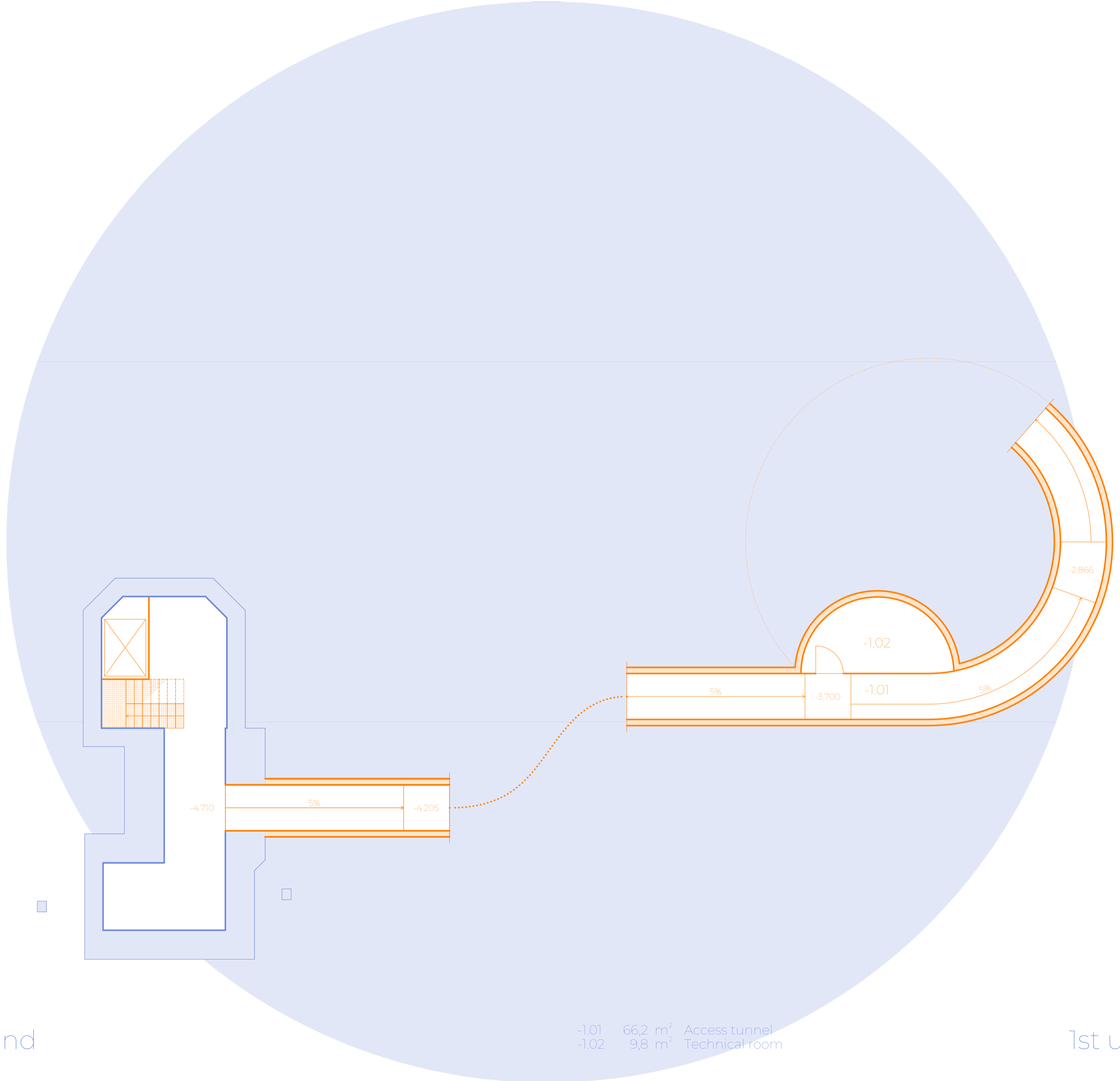
+4.800

-0.110

-2.210

-4.710





1:100 Grain silo

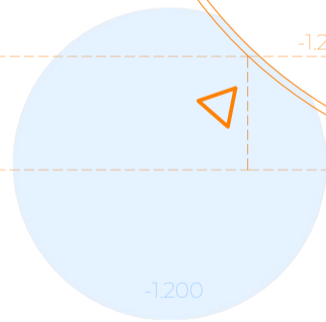
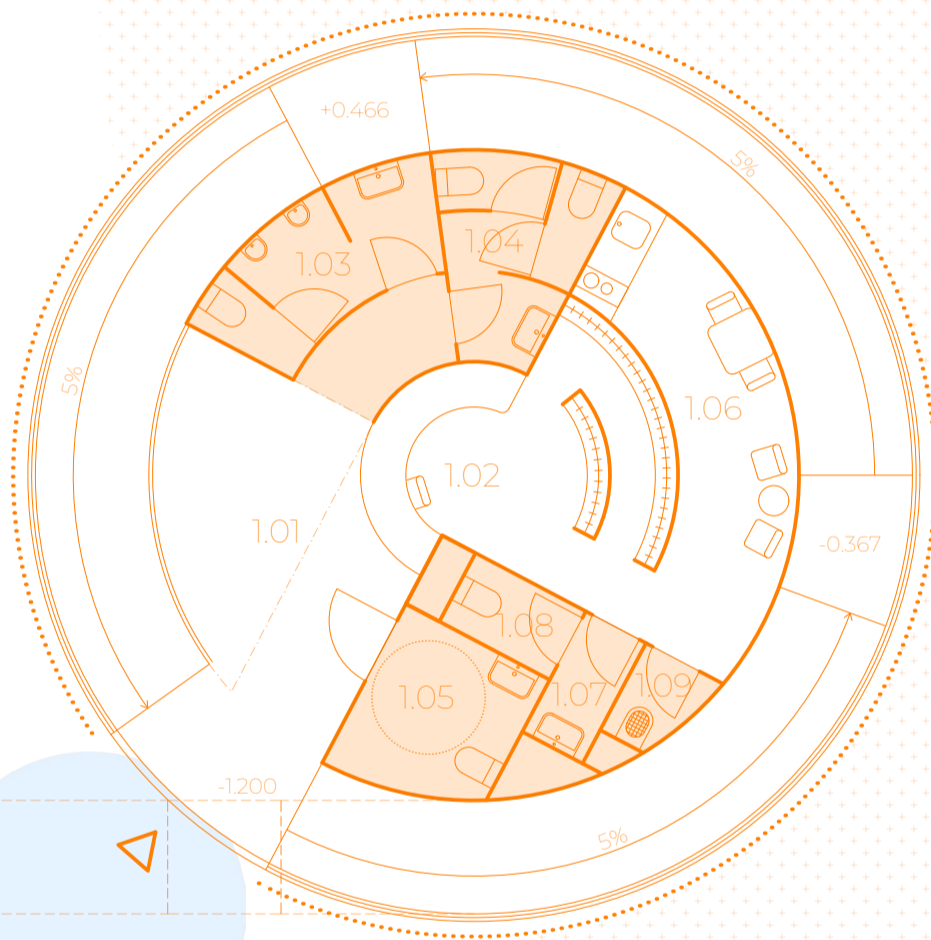
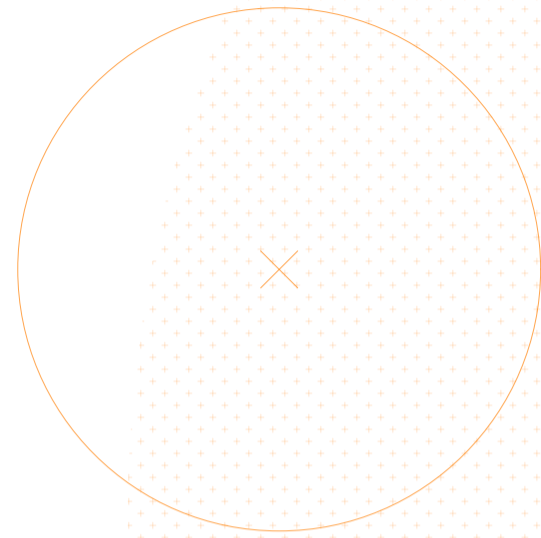
2nd underground

-1.01 66,2 m<sup>2</sup> Access tunnel  
 -1.02 9,8 m<sup>2</sup> Technical room



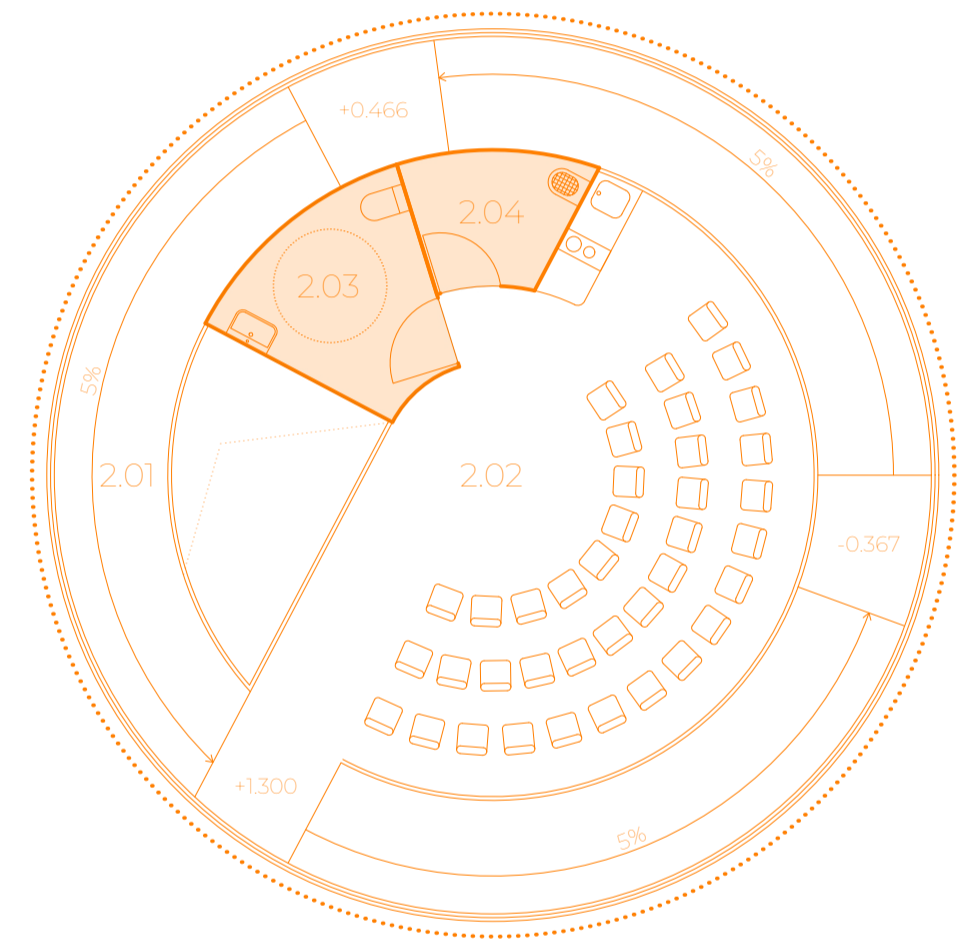
Grain Bin 1:100

1st underground



-1.200

Foyer	18,5 m <sup>2</sup>	1.01
Infodesk, wardrobe	11,6 m <sup>2</sup>	1.02
Men's restroom	5,3 m <sup>2</sup>	1.03
Women's restroom	5,4 m <sup>2</sup>	1.04
Barrier-free restroom	4,7 m <sup>2</sup>	1.05
Staff conveniences	10,2 m <sup>2</sup>	1.06
Staff washroom	1,6 m <sup>2</sup>	1.07
Staff toilet	1,7 m <sup>2</sup>	1.08
Cleaning cupboard	1,2 m <sup>2</sup>	1.09



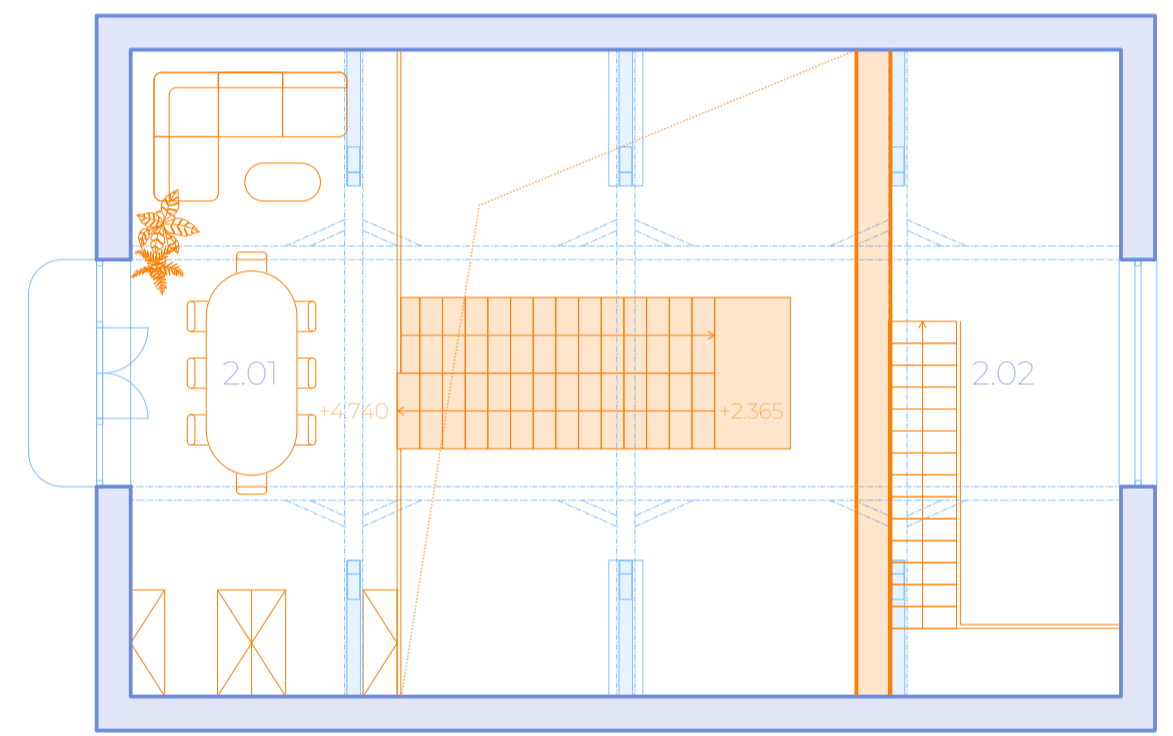
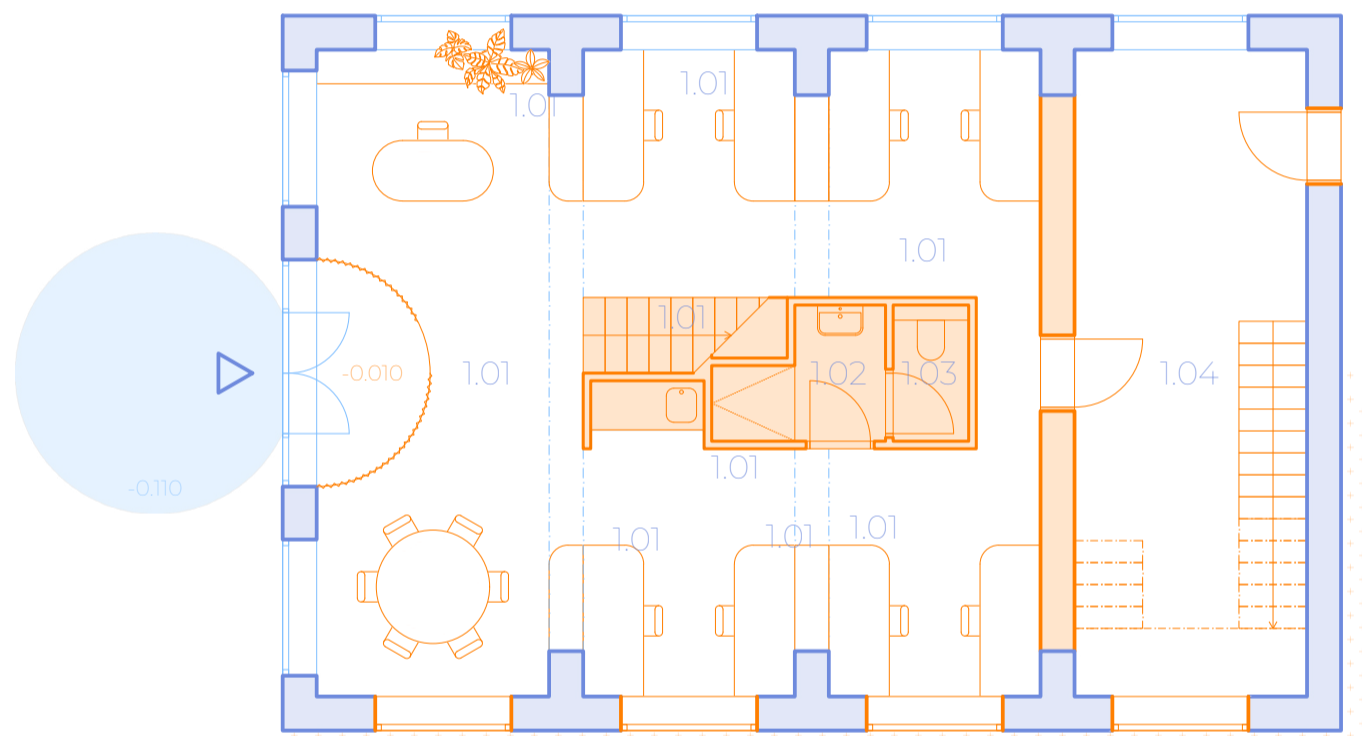
2.01	47,6 m <sup>2</sup>	Access ramp
2.02	39,5 m <sup>2</sup>	Conference hall
2.03	6,4 m <sup>2</sup>	Barrier-free restroom
2.04	3,6 m <sup>2</sup>	Storage



1:100 Grain Bin  
1st floor



Grain Bin 1:100  
2nd floor



1:100 Machine Shop  
1st floor

Office space	70,4 m <sup>2</sup>	1.01
Bathroom	3,2 m <sup>2</sup>	1.02
Toilet	1,8 m <sup>2</sup>	1.03
Technical room, workshop	26,3 m <sup>2</sup>	1.04

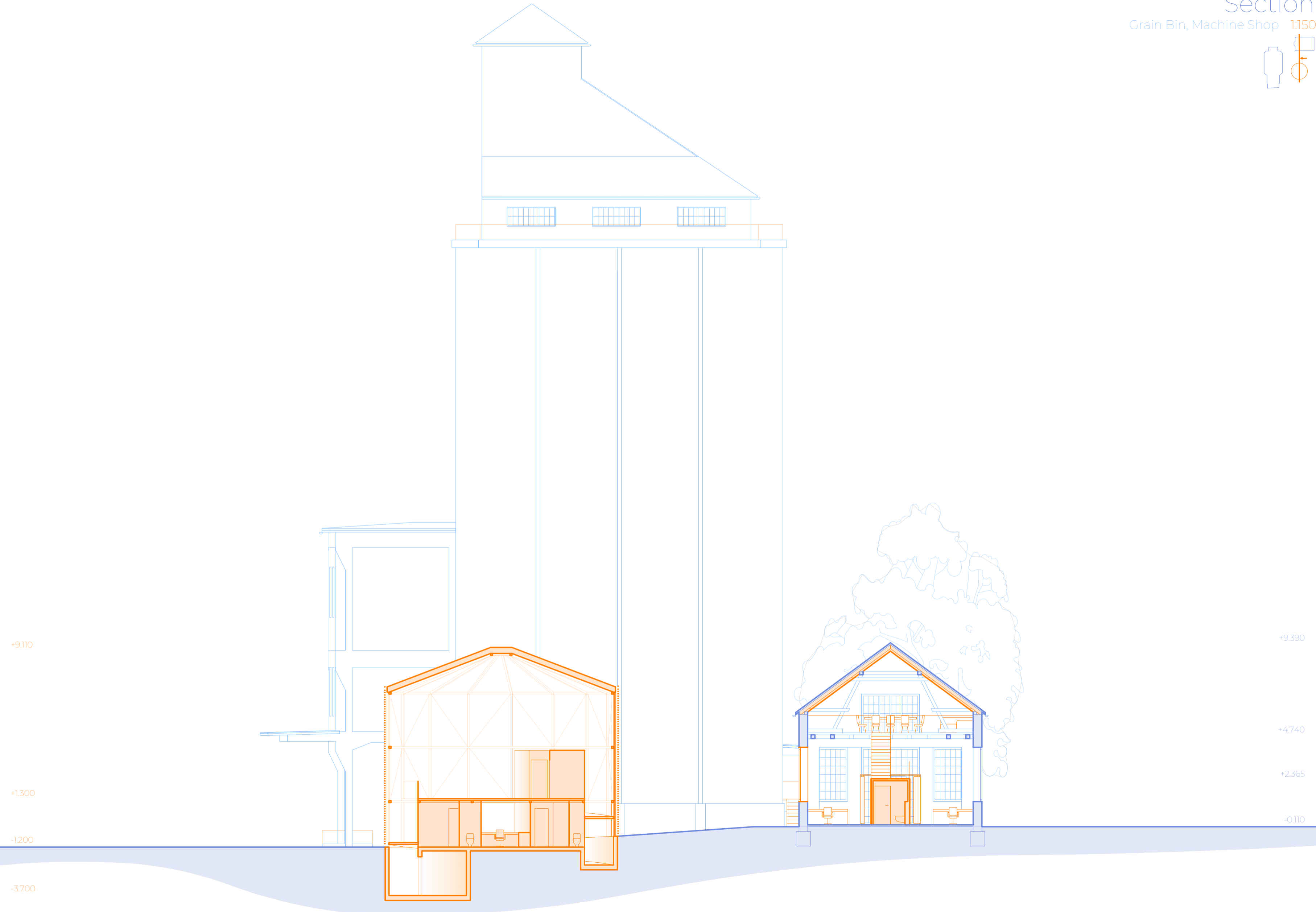
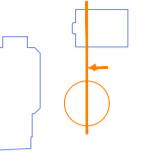
2.01	26,0 m <sup>2</sup>	Conference room
2.02	19,9 m <sup>2</sup>	Storage



Machine Shop 1:100  
2nd floor

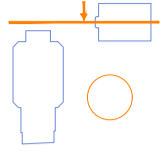
# Section

Grain Bin, Machine Shop 1:150



# Section

1:150 Grain Bin, Machine Shop

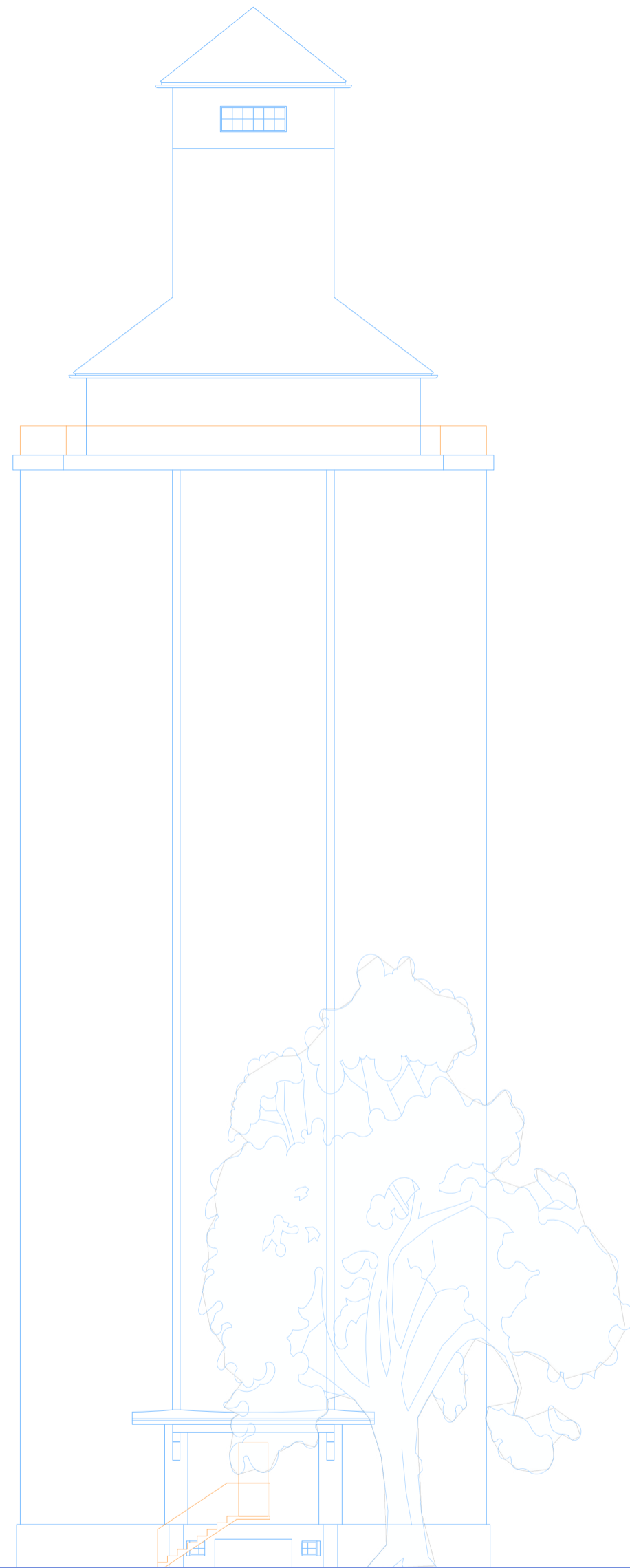
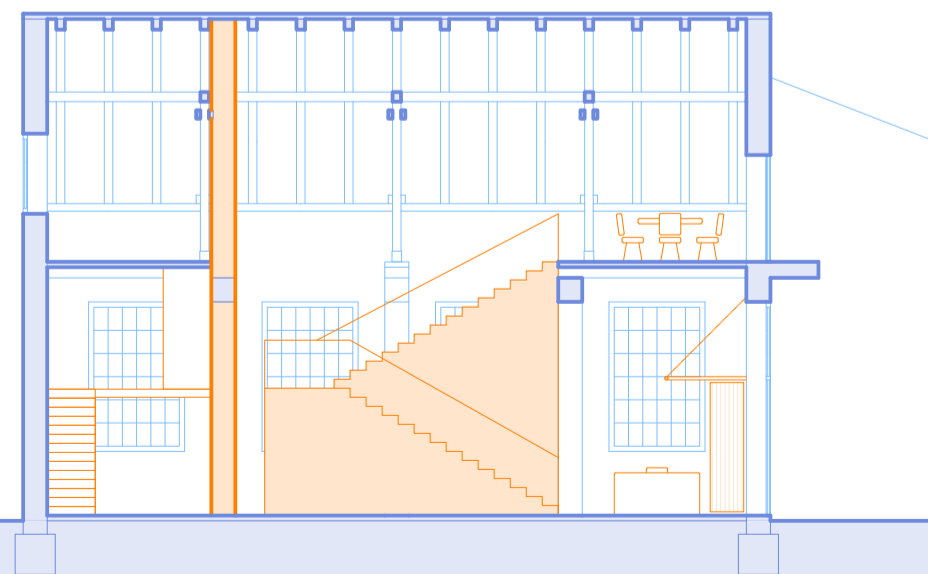


+9.390

+4.740

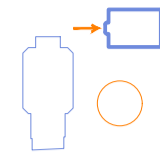
+2.365

-0.110



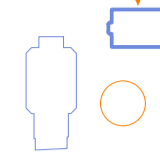
# Elevation NE

Machine Shop 1:150



# Elevation SE

Machine Shop 1:150

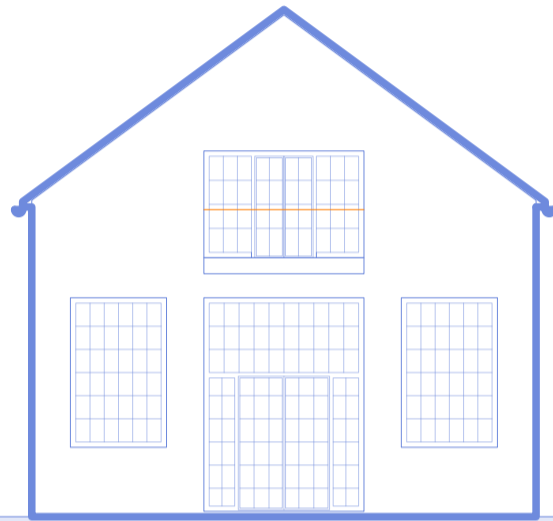


+9.390

+5.690

+4.740

-0.110

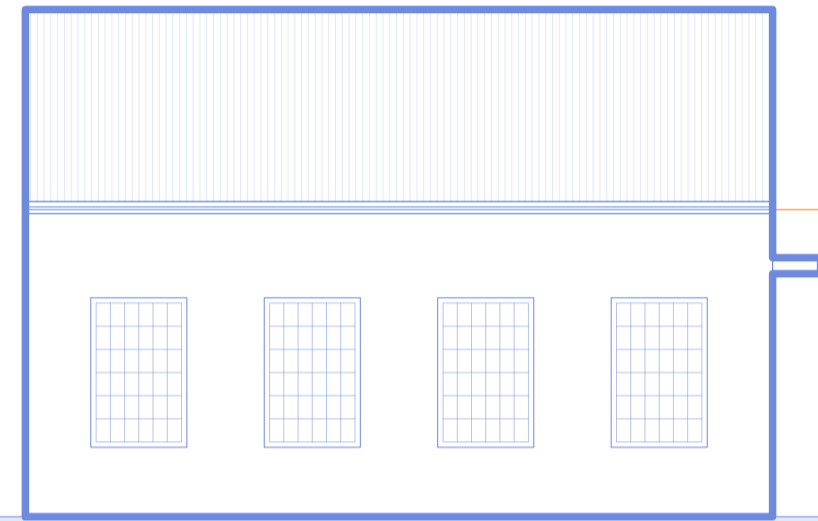


+9.390

+5.690

+4.740

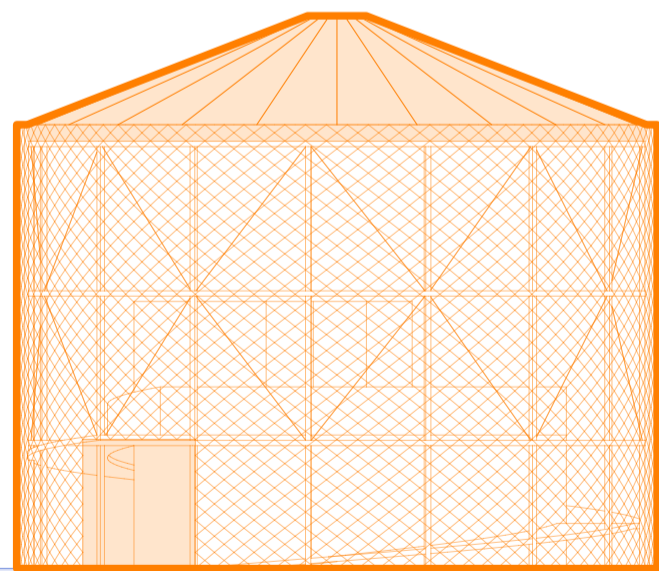
-0.110



+9.110

+7.110

-1.200

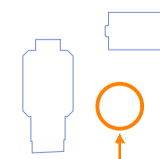
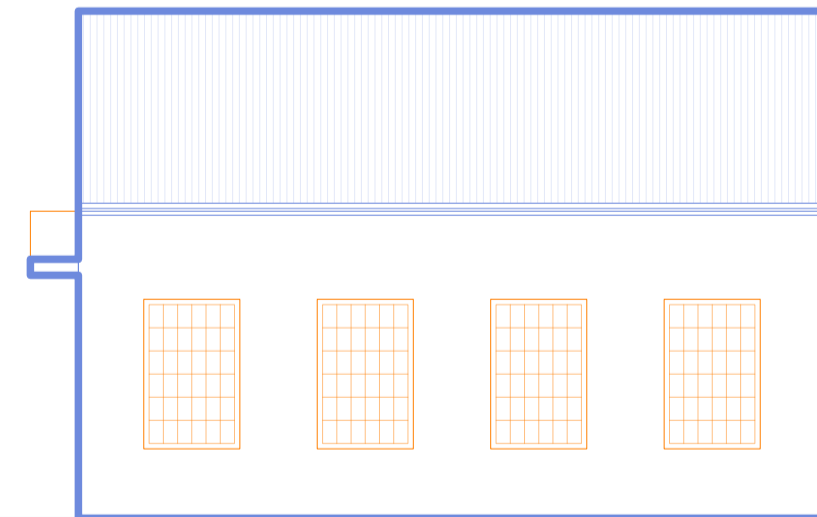


+9.390

+5.690

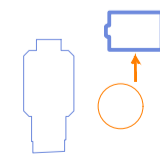
+4.740

-0.110



Grain Bin 1:150

# Elevation NW



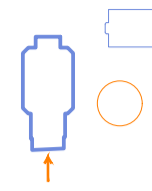
Machine Shop 1:150

# Elevation NW

+42.390

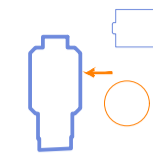
# Elevation NW

Grain Silo 1:150



# Elevation SW

1:150 Grain Silo



+42.390

+30.190

+30.190

+15.300

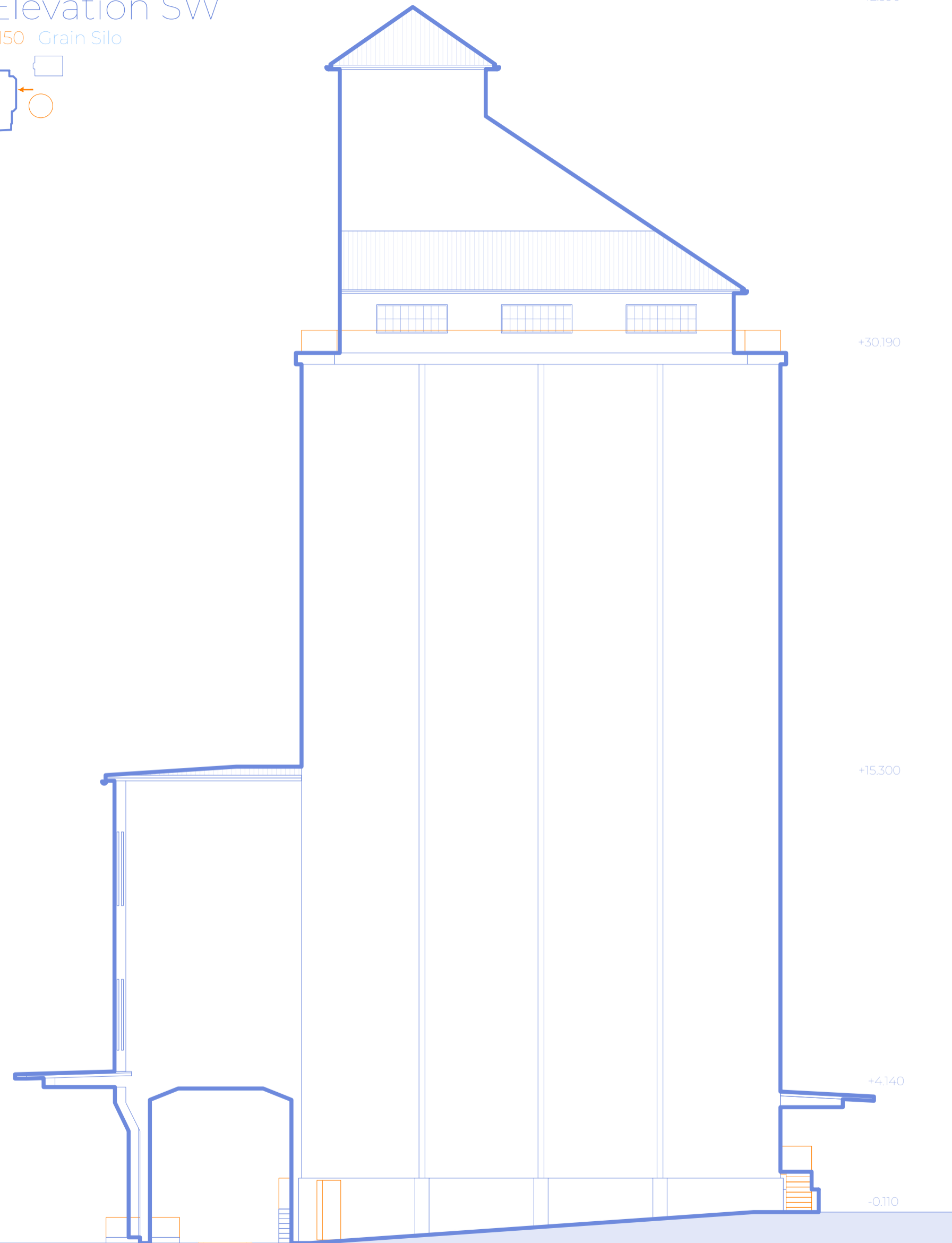
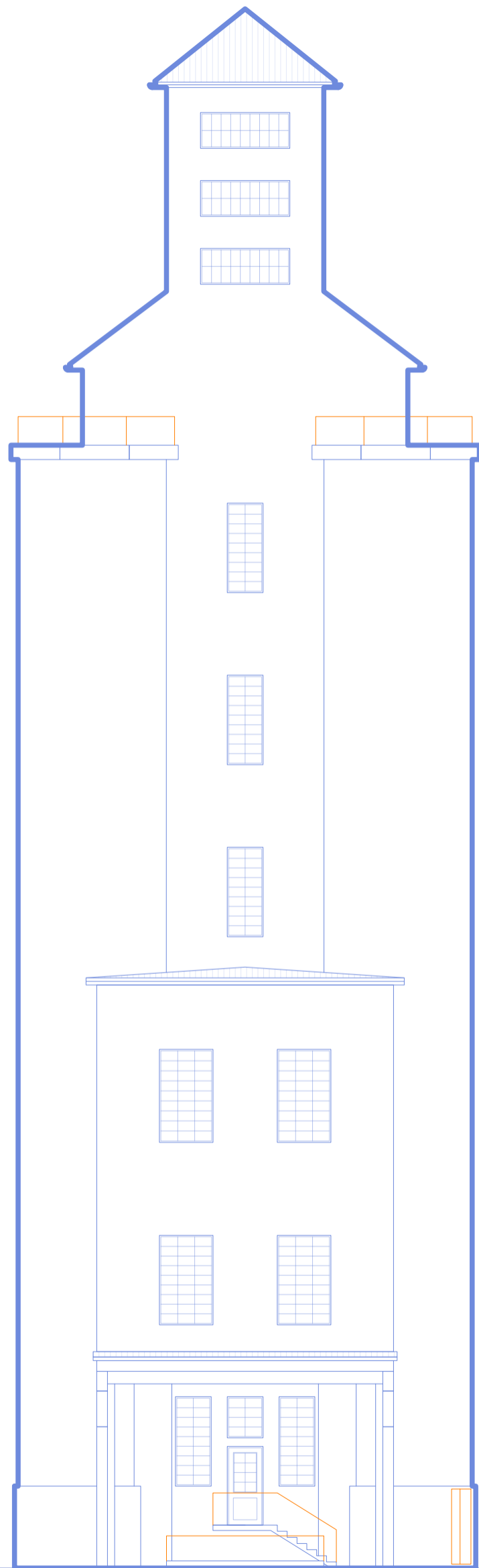
+15.300

+4.800

+4.140

-1.200

-0.110



+42.390

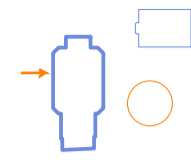
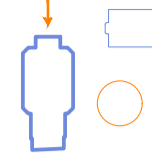
+42.390

# Elevation SE

# Elevation NE

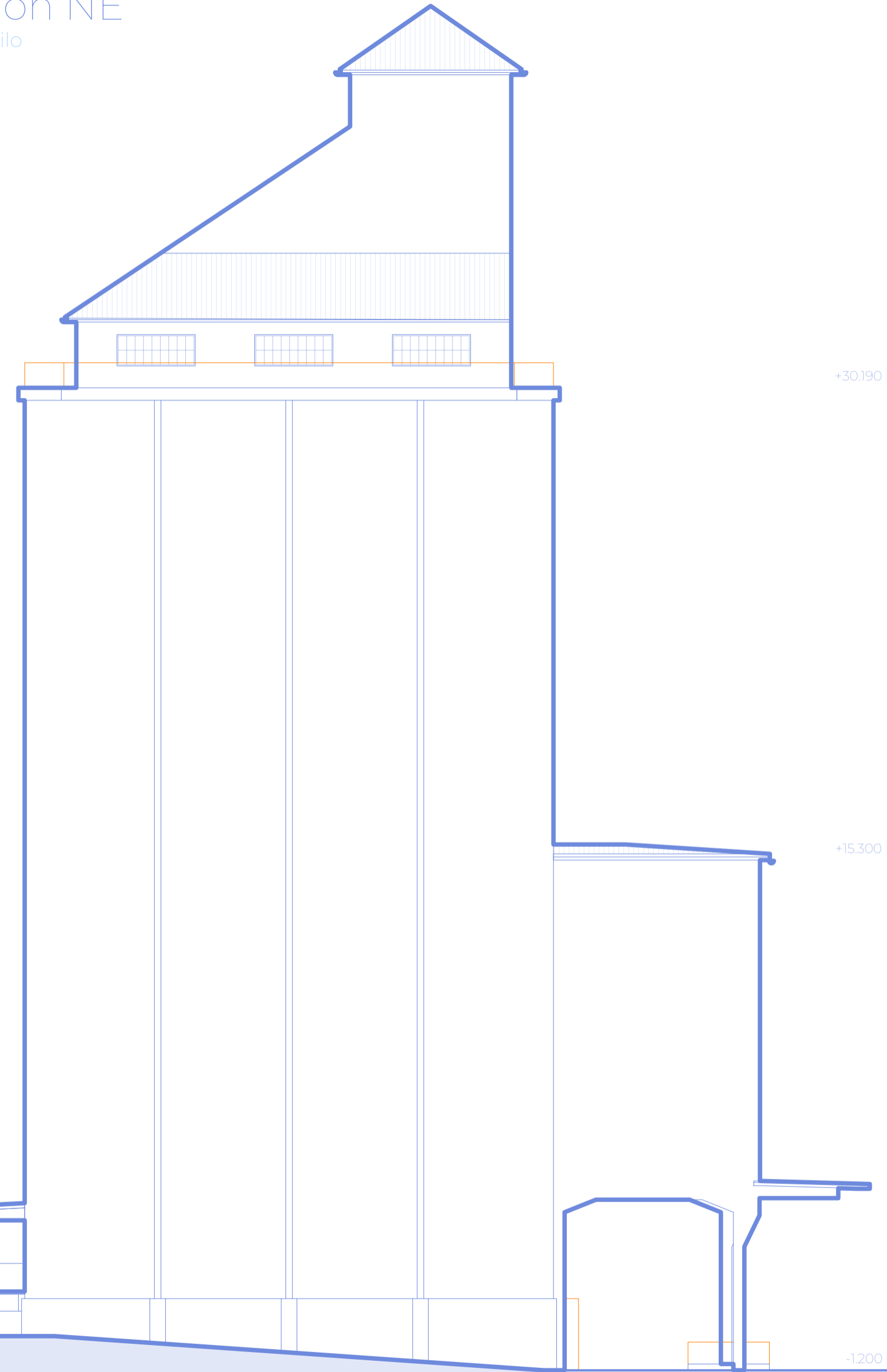
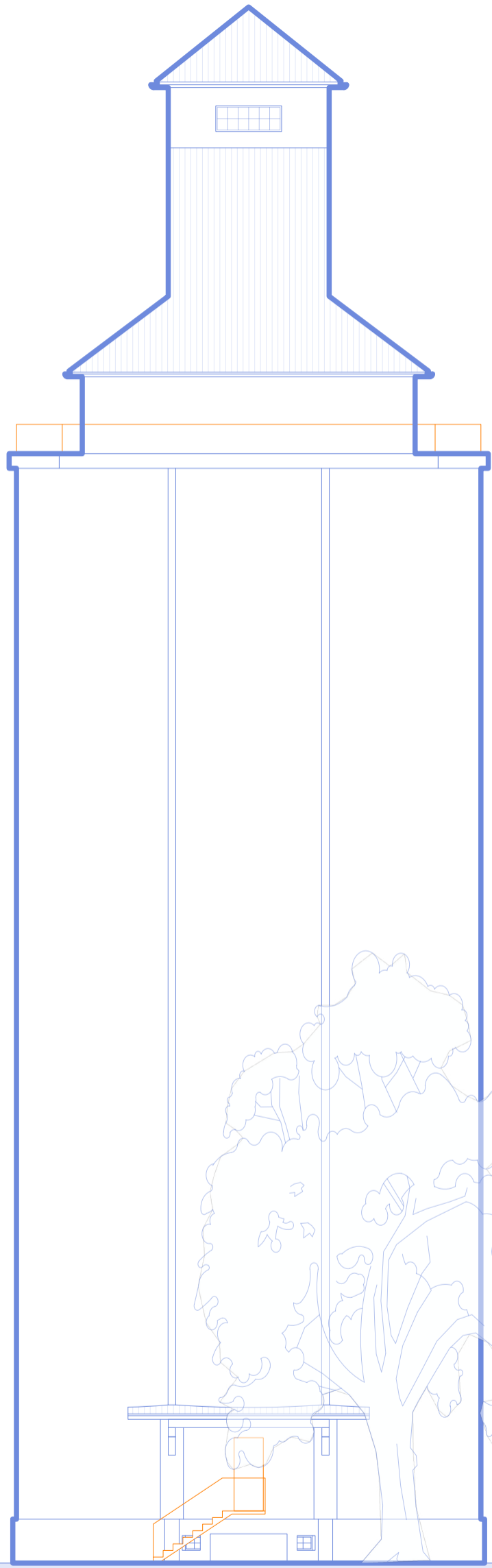
Grain Silo 1:150

1:150 Grain Silo



+30.190

+30.190



+4.140

+15.300

-0.110

-1.200

# Construction detail

1:25 Grain Bin - System boundary

## S1 ROOF LAYERING $U = 0.13 \text{ W/m}^2/\text{K}$

metal roof covering, Ti-Zn plated sheets	0,6 mm
vapor barrier, polyethylene film, 110 g/m <sup>2</sup> , welded to the lower vapor barrier on the perimeter	
OSB, tongue and groove fit	20 mm
air pocket, spaced out by wooden plank	50mm
OSB, tongue and groove fit	20 mm
mineral wool isolation, $\lambda_s = 0,038 \text{ W/m/K}$	260 mm
vapor barrier, polyethylene film, 110 g/m <sup>2</sup> , welded to the upper vapor barrier on the perimeter	
OSB, tongue and groove fit	20 mm
trapezoidal corrugated sheet, 0,8 mm	25 mm
load-bearing steel framework	100 mm

## S2 BASEMENT FLOOR LAYERING $U = 0.16 \text{ W/m}^2/\text{K}$

floor cover layers	10 mm
reinforced concrete slab	350 mm
damp-proofing, bitumen sheets	4 mm
thermal isolation - extruded polystyrene	200 mm
separation geotextile 200 g/m <sup>2</sup>	-
drainage - gravel, fraction 32/64	50 mm
drainage - gravel, fraction 8/16	50-150 mm
separation geotextile 200 g/m <sup>2</sup>	-
terrain	-

## KEY

W1	Schüco FWS 50 SG.SI triple-glazed facade $U_f = 0,8 \text{ W/m}^2/\text{K}$
W2	Schüco FWS 50 SG.SI frame profile, $U_f = 0,91 \text{ W/m}^2/\text{K}$
F1	curtain facade frame, 50x50 mm steel tubing
F2	curtain facade, Ti-Zn perforated metal sheet
P	peripheral roof covering, Ti-Zn plated sheet 0,6 mm, overlapping under main roof covering
G	rain gutter, Ti-Zn, 120x150 mm
D	drainage, perforated DN120 PVC pipe covered in geotextile, laid in a concrete channel

