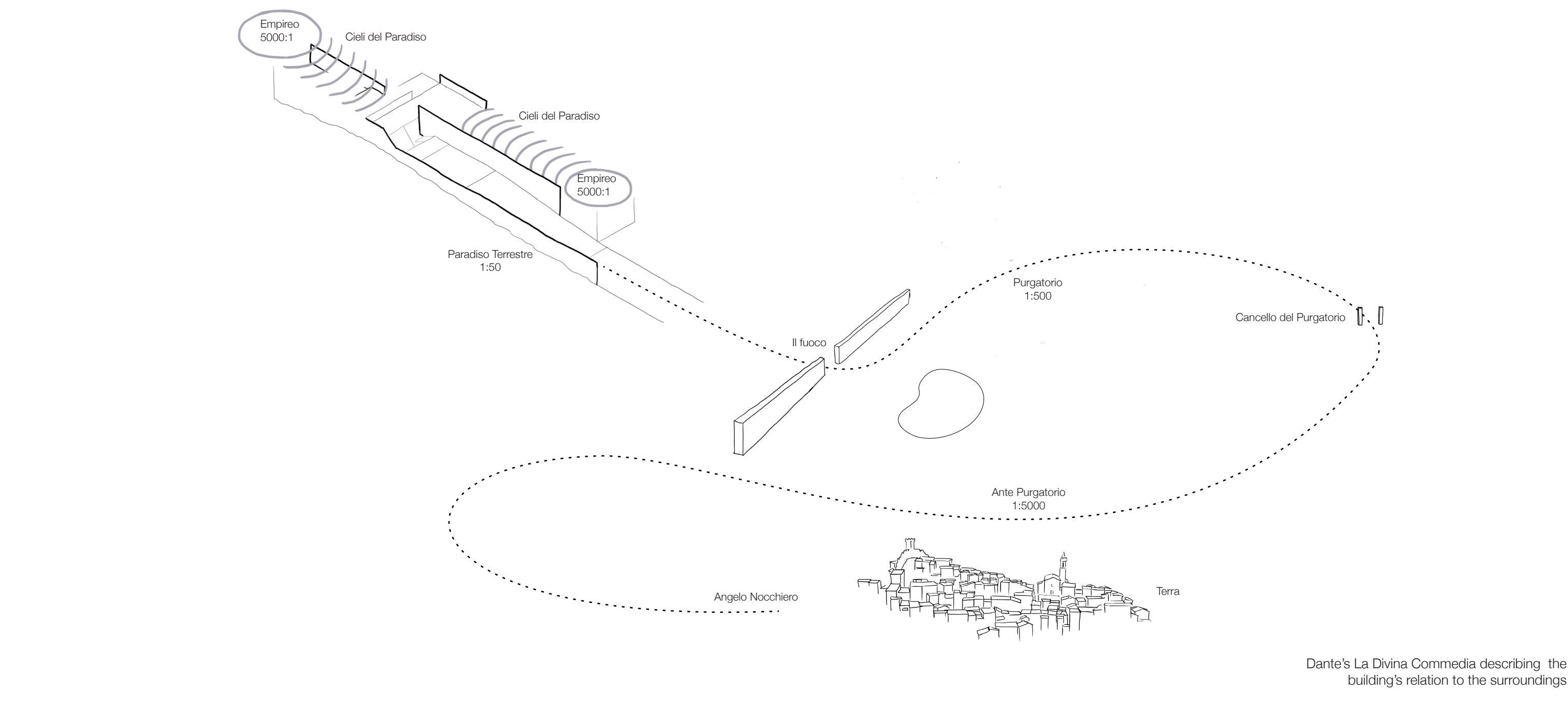
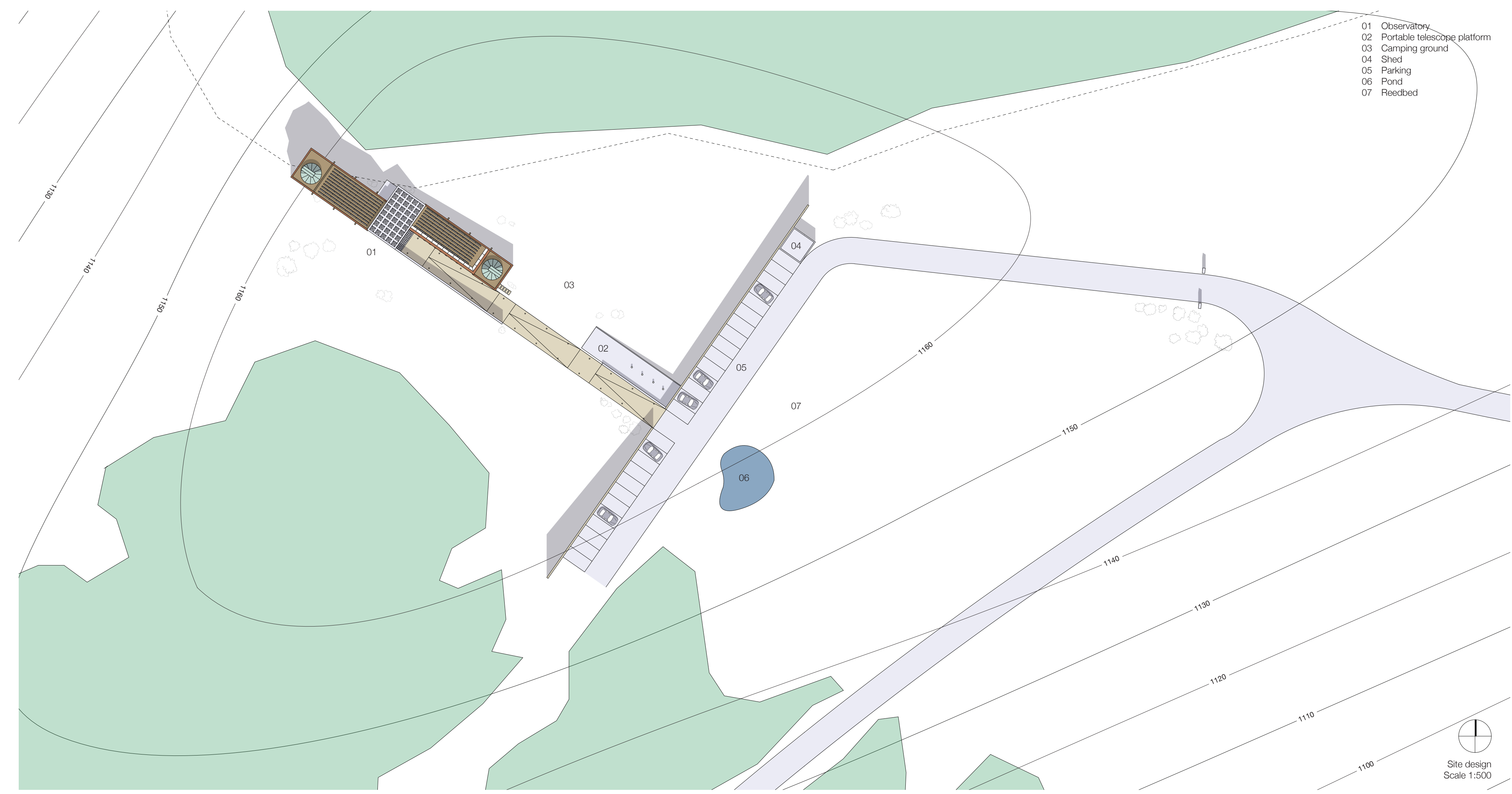
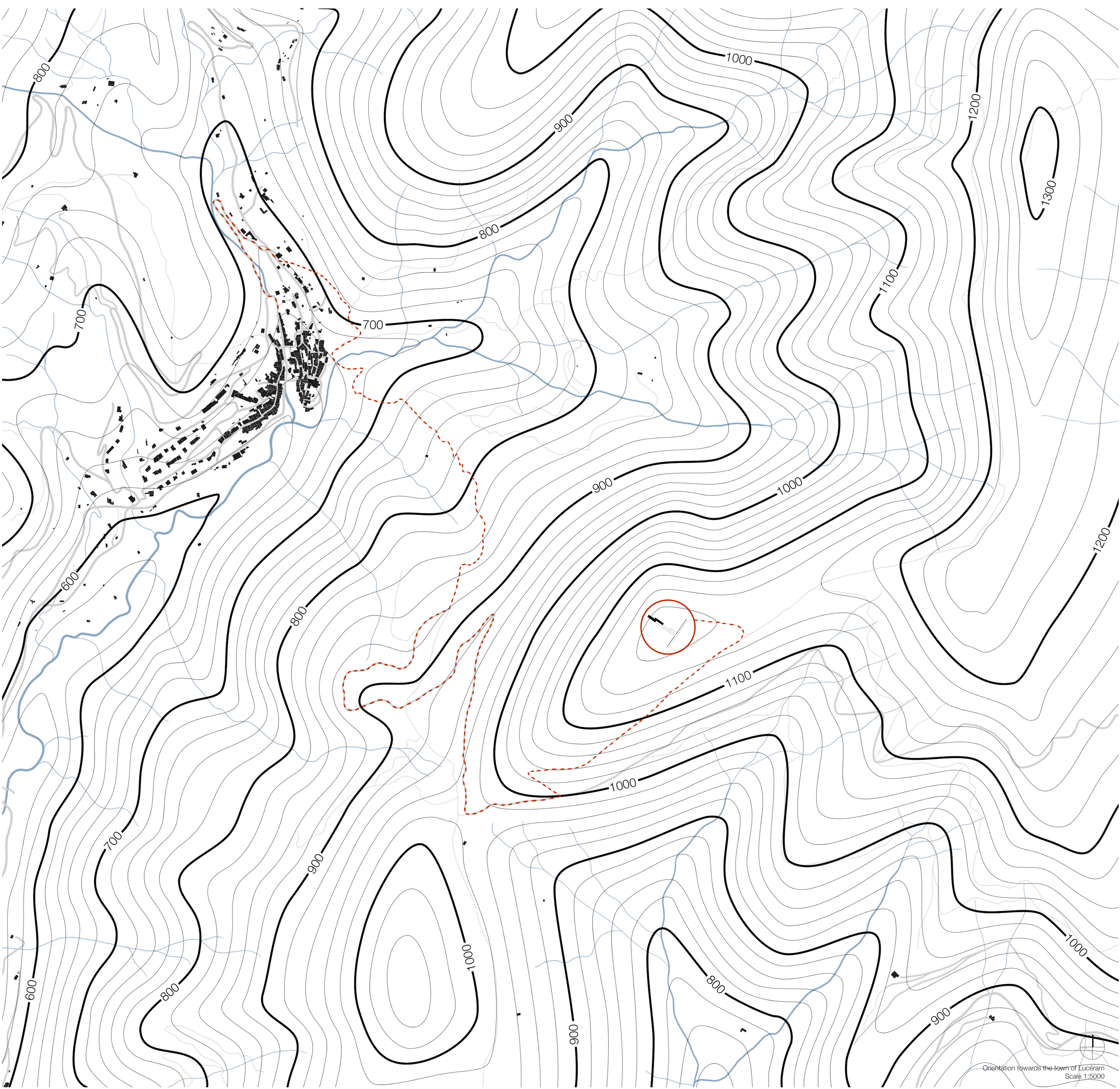


THE TYPOLOGY OF ASTRONOMICAL OBSERVATORIES

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PS 6 November 8, 2013
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ASSIGNMENT
One of the appealing characteristics of astronomy is that it is a good example of a **citizen science**. Mainly for this reason, it was chosen to design an amateur observatory consisting of a small lecture room, some offices, lodgings and two telescope rooms. The observatory is situated on a hillside near the Côte d'Azur, where the climate is exceptionally favorable for stargazing. This remote location asks for an autarchic design, in which water is filtered and electricity generated on site. By situating the design perpendicular to the hillside, an **important link** is created with the town of Lucéram, down in the valley. A visit to the observatory starts as soon as one leaves the village. From there, the long and winding road goes up, away from the developed world. Reaching the top of the hill, two axes define the layout of the site. One axis is directed straight to the Mediterranean Sea and is accentuated by a wall, protruded at the crossing of the two axes. The second axis points towards the town of Lucéram and is in the same line as the observatory. Inside the building too, one **moves up** yet at the same time visually returning back to the town.

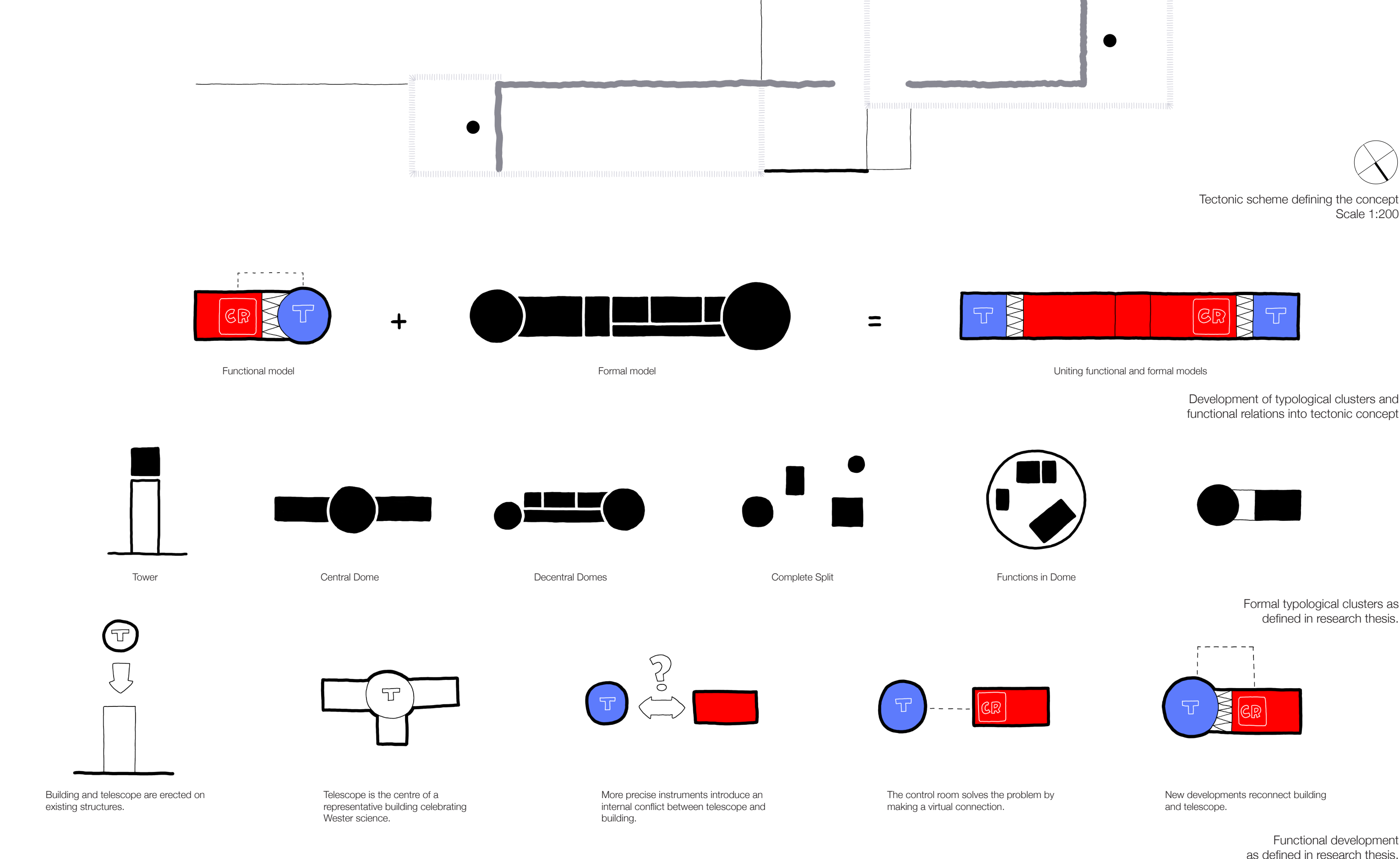
FUNCTIONAL AND FORMAL SCHEMES
The design is formed by combining two conclusions of the research thesis: the scheme of the **functional** development and the **formal** clusters. Functionally, the design builds on the discovery of the control room in the 70s, connecting the telescope with the observer only virtually. Formally six clusters were distinguished that are up to today still built, depending on program and location. Because of the program with two telescopes, the function of the building as representation of the organization's identity, and the lack of buildings nearby, the **decentral domes** cluster was chosen for the plan. This cluster is typified by a linear plan with wings ending in telescope rooms.

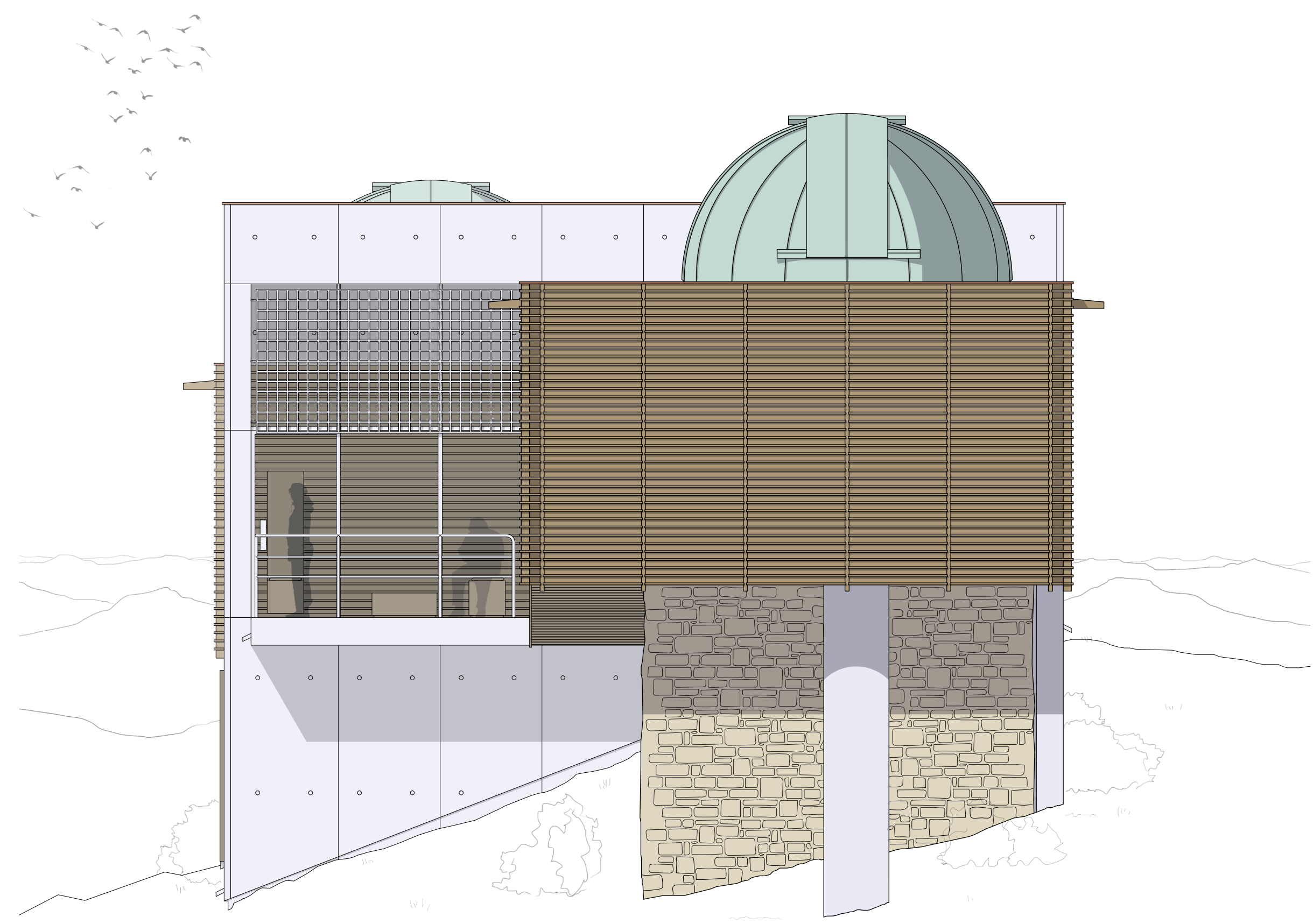
SETUP OF THE PLAN
The linear plan subsequently is **shifted**, resulting in the shape of a lightning bolt. Because of this shift, one can approach the main telescope room in a straight line, accentuating the most important function of the building. The program is divided twice; one time in public and private functions, one time in astronomical and supporting functions. Public functions are housed in the main wing, private functions in the narrower secondary wing. Astronomical functions are stacked on top of the supporting functions, bringing about a **dualism** so typical in astronomy. This duality is accentuated by a translation of the local building tradition of a wooden construction on a stone plinth. The wooden construction thus represents the spheres of heaven, only anticipating the true heaven, the Empyrean, that remains unreachable. The concrete plinth on the other hand represents a continuation of the earth.

ELABORATION OF THE PLAN
The plan is diversified by two additions that can be seen in the **tectonic scheme**. The first addition is the limestone middle wall, a differentiation of the earthly concrete. The wall keeps the design together while the S shape distances the telescope rooms from the rest of the building. Secondly, a "spine" was added, a circulation zone next to the middle wall. This circulation zone creates a horizontal hierarchy between the public and private wings, while at the same time breaking through the plan's cross symmetry.

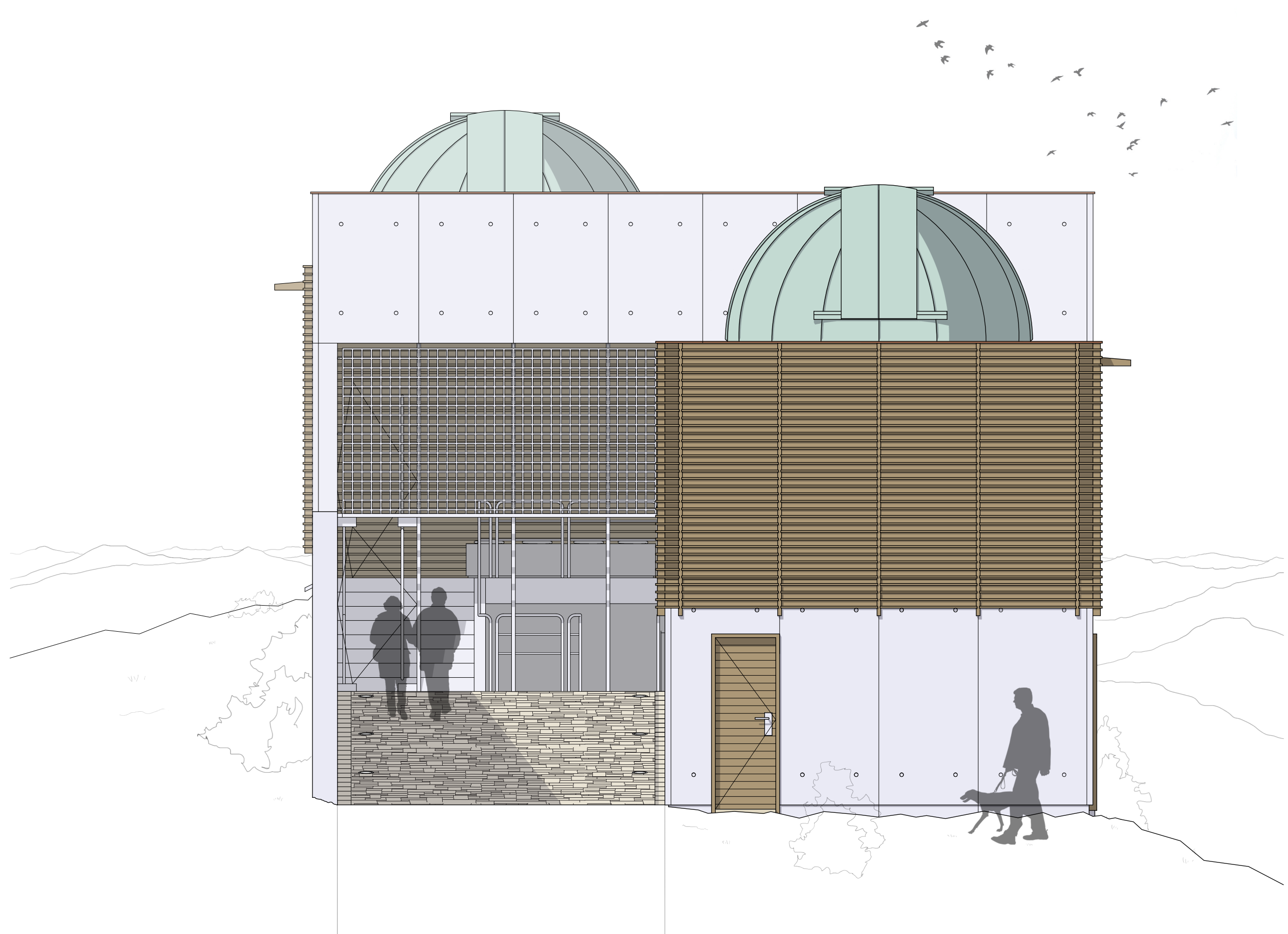
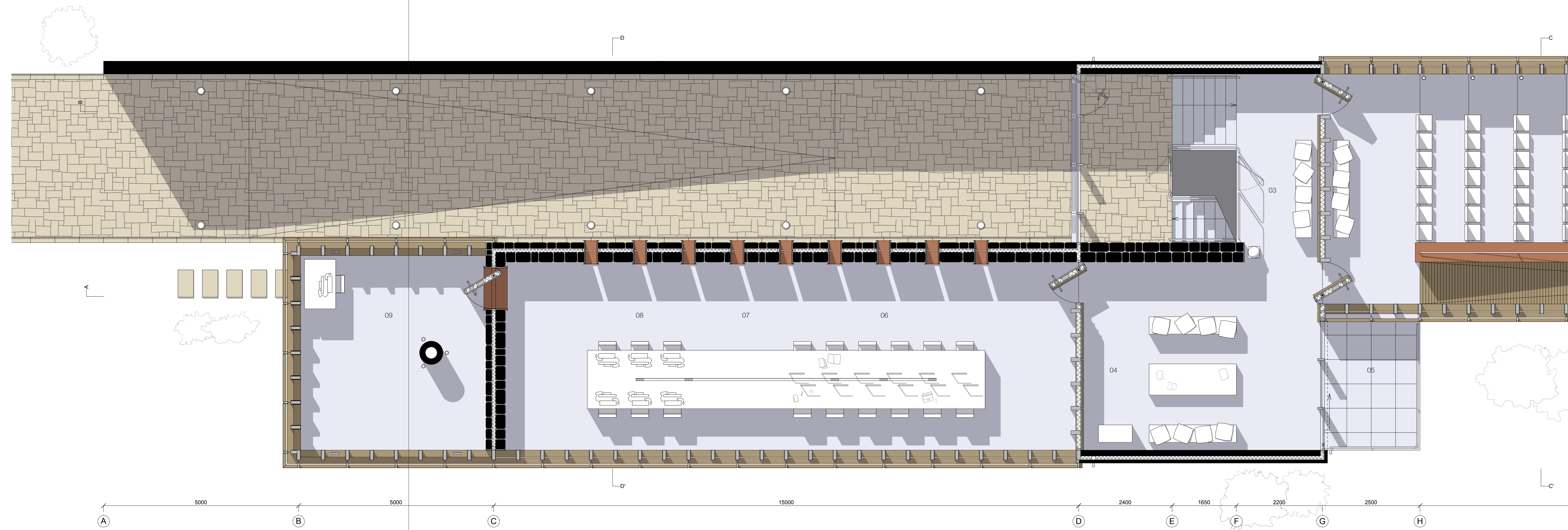
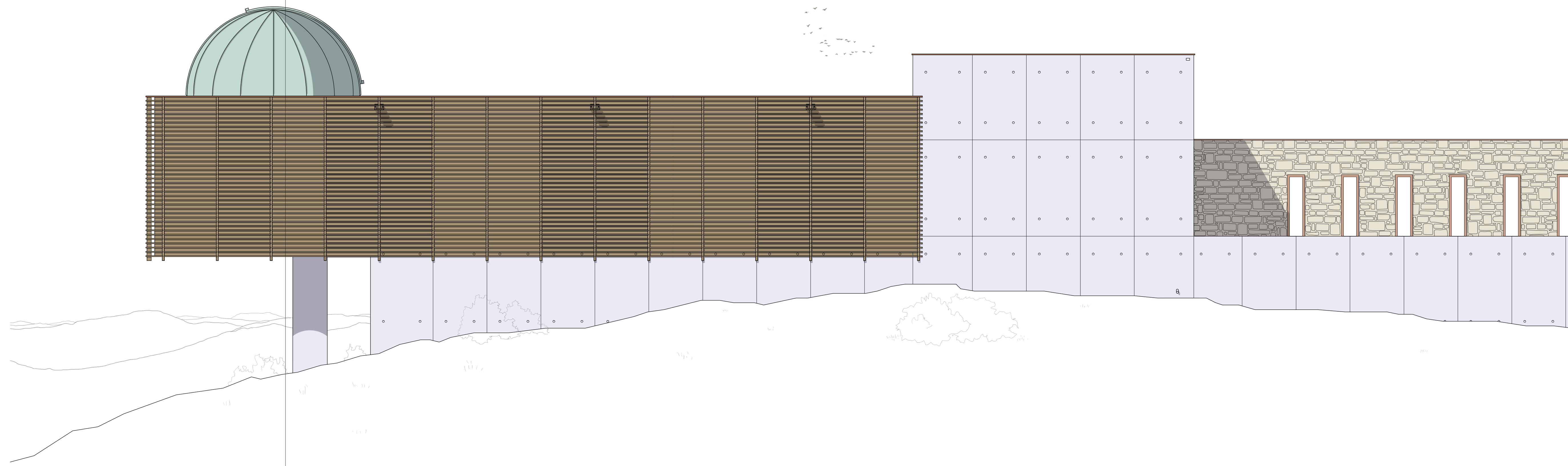
Since the central hall plays a vital connecting role in the composition of the plan, an extra effect was added to the space. Referring to archaeological astronomical constructions such as Stonehenge, optical prisms in the ceiling will focus the sunlight on Goethe's altar of good fortune at **solstice**. The altar is located in the center of the hall, the only point in the plan where an overview of the building can be seen, accentuating this important point.

MATERIALIZATION
Besides the wood representing the spheres of heaven and the concrete and limestone representing the earth, two extra materials were added. Copper represents the reflection of the sunlight, highlighting protrusions and edges of the middle wall. Where warm copper in this way corresponds to the heaven just like the wood, cold steel is used for necessary additions such as railings, corresponding to the earth. The use of these unprocessed materials and understandable construction turn the building into a design that challenges the user, yet remains **comprehensible**.





West elevation
Scale 1:50

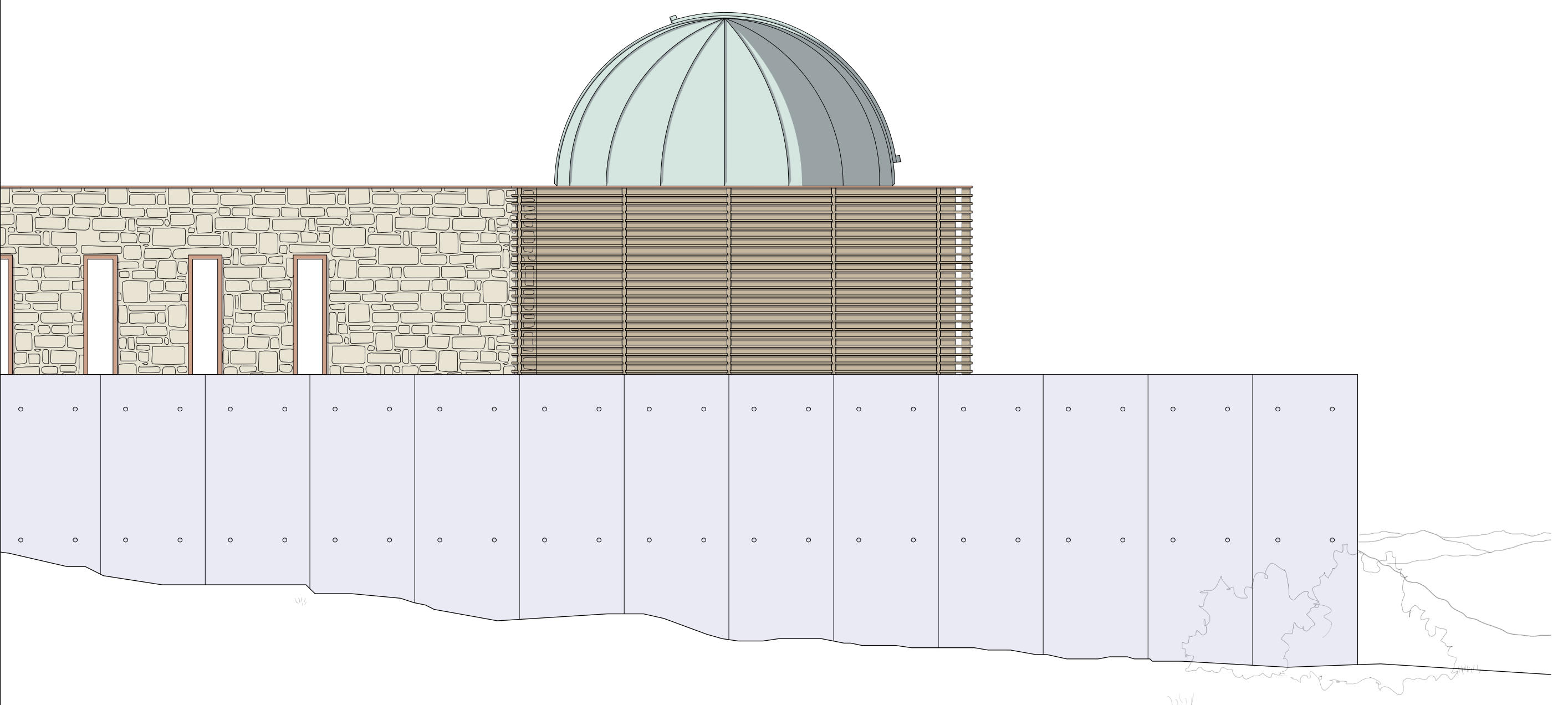


East elevation
Scale 1:50

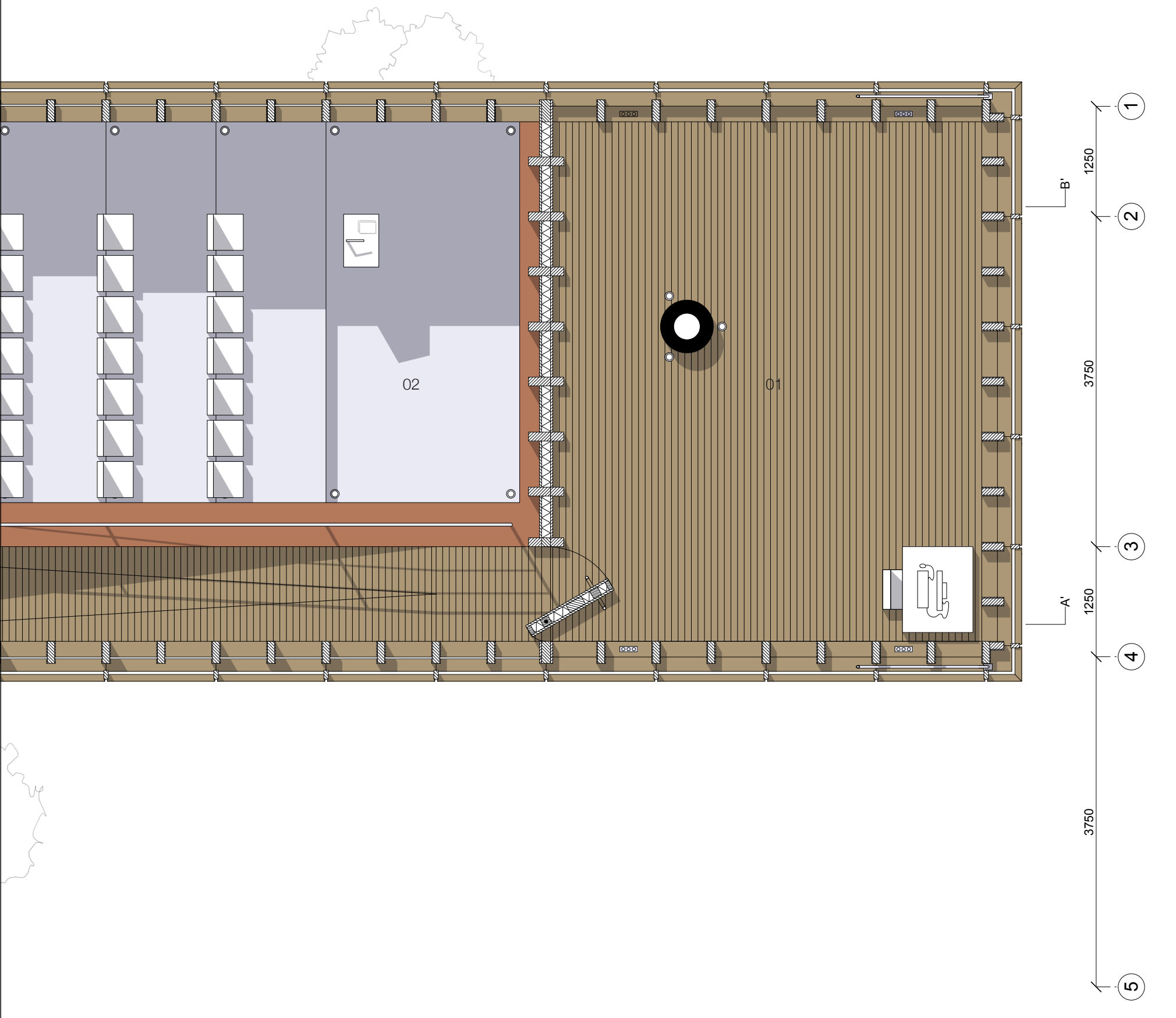


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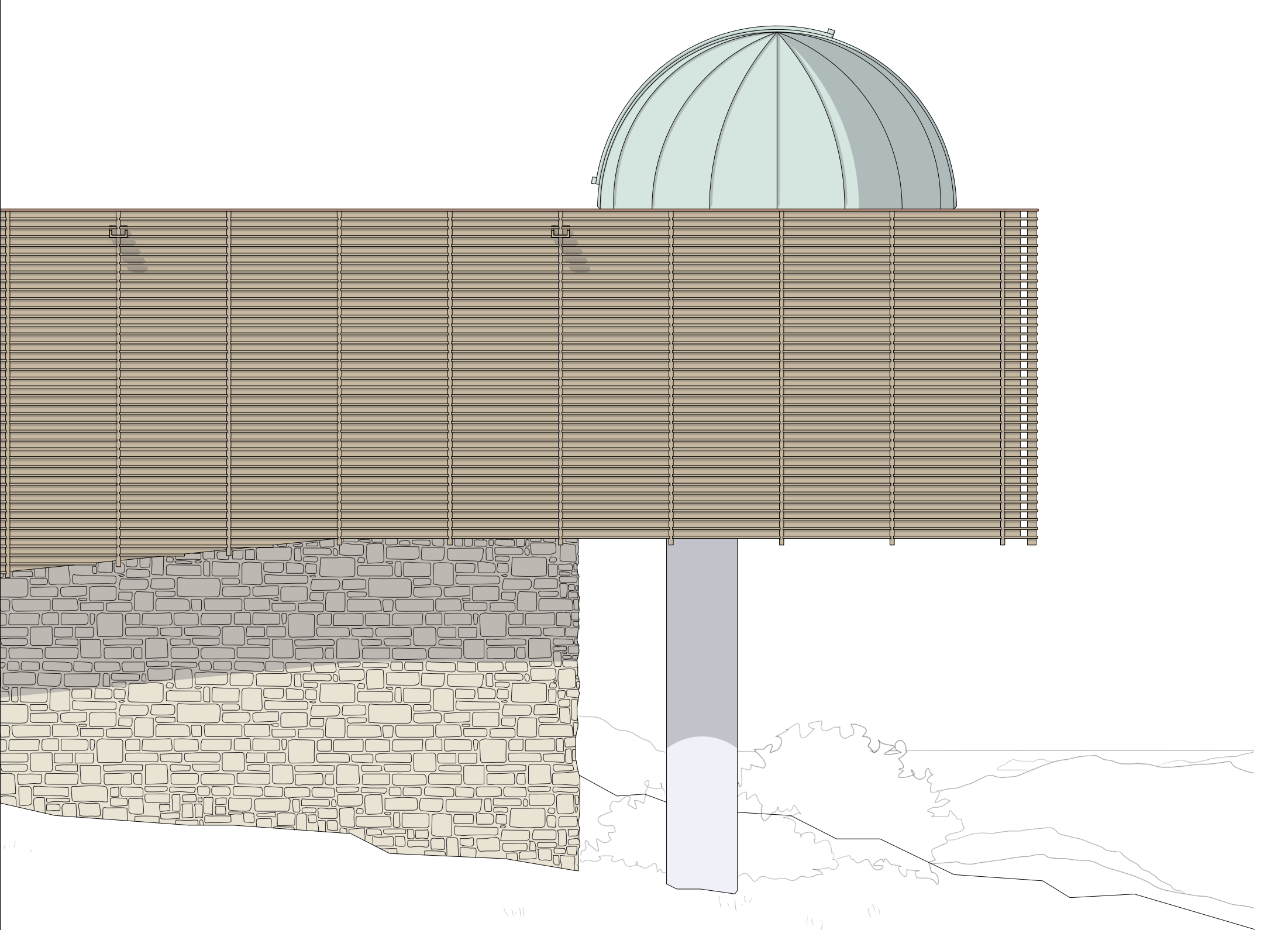


South elevation
 Scale 1:50

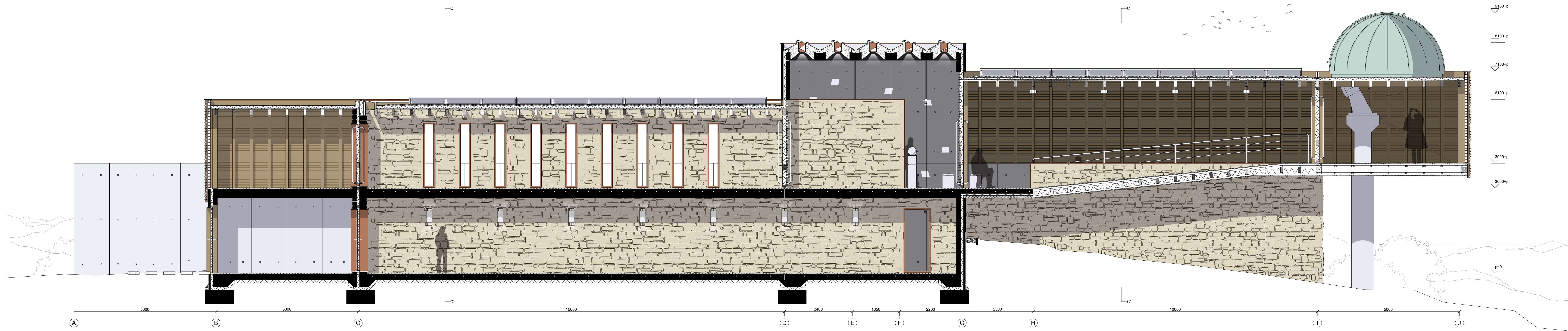


- 01 Main telescope room
- 02 Lecture hall
- 03 Central hall
- 04 Pantry
- 05 Panoramic balcony
- 06 Office space
- 07 Library
- 08 Control room
- 09 Second telescope room

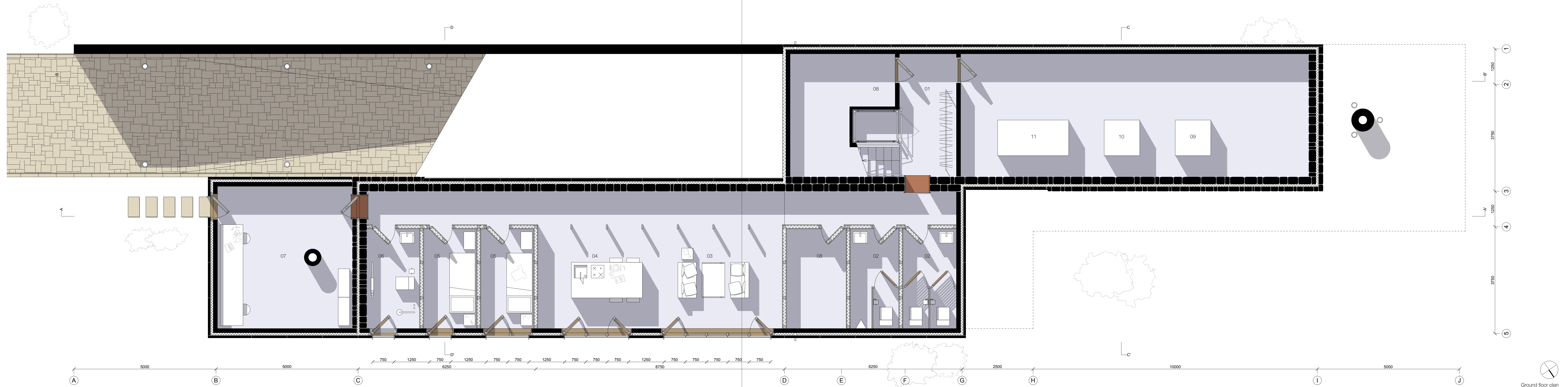
Main floor plan
 Scale 1:50



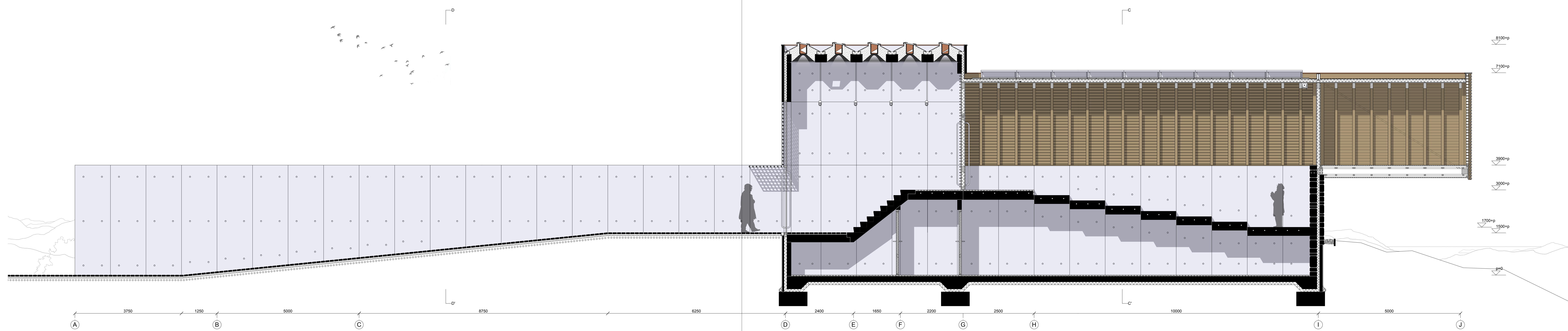
North elevation
 Scale 1:50



Section AA'
Scale 1:50



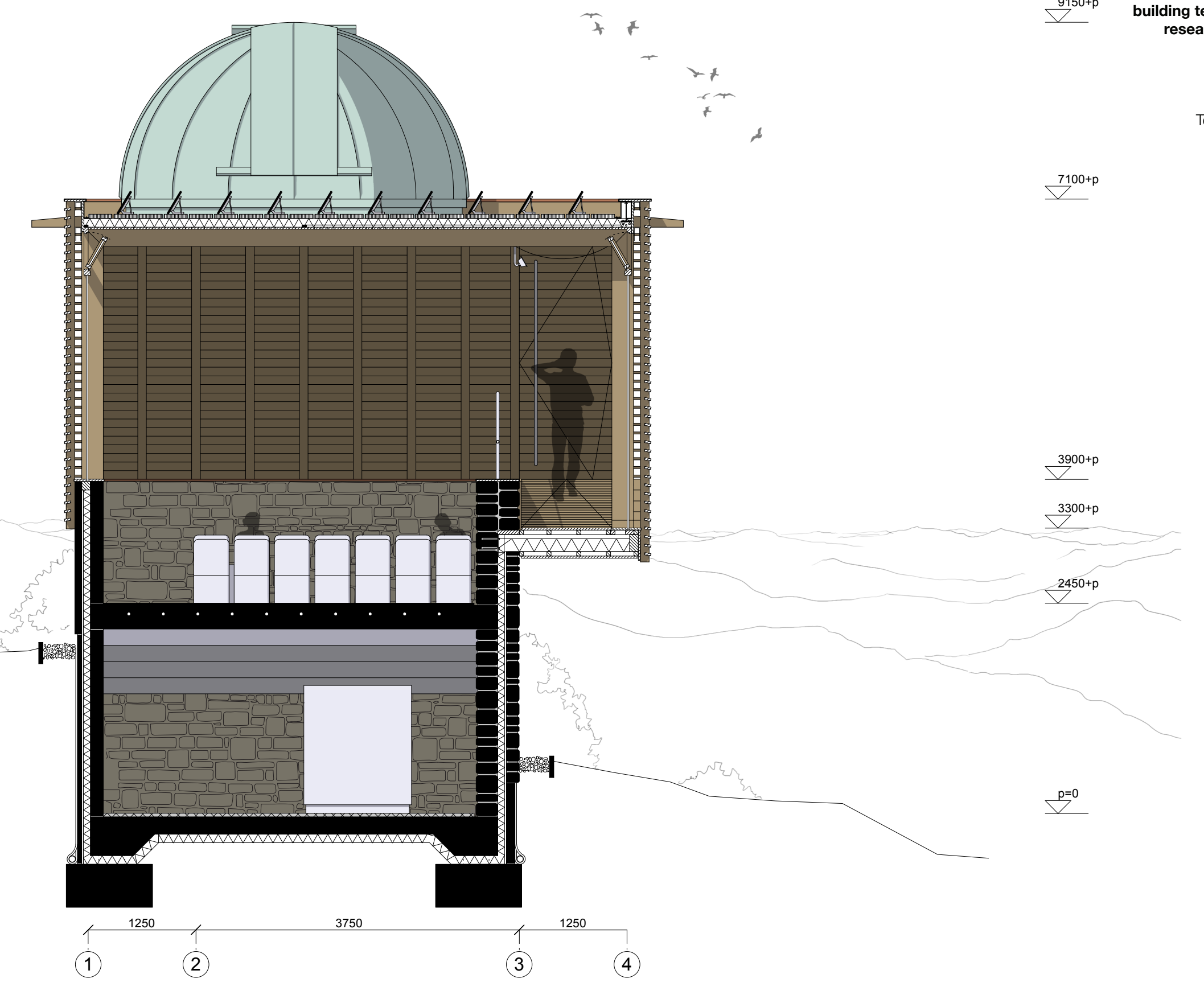
Ground floor plan
Scale 1:50



Section BB'
Scale 1:50

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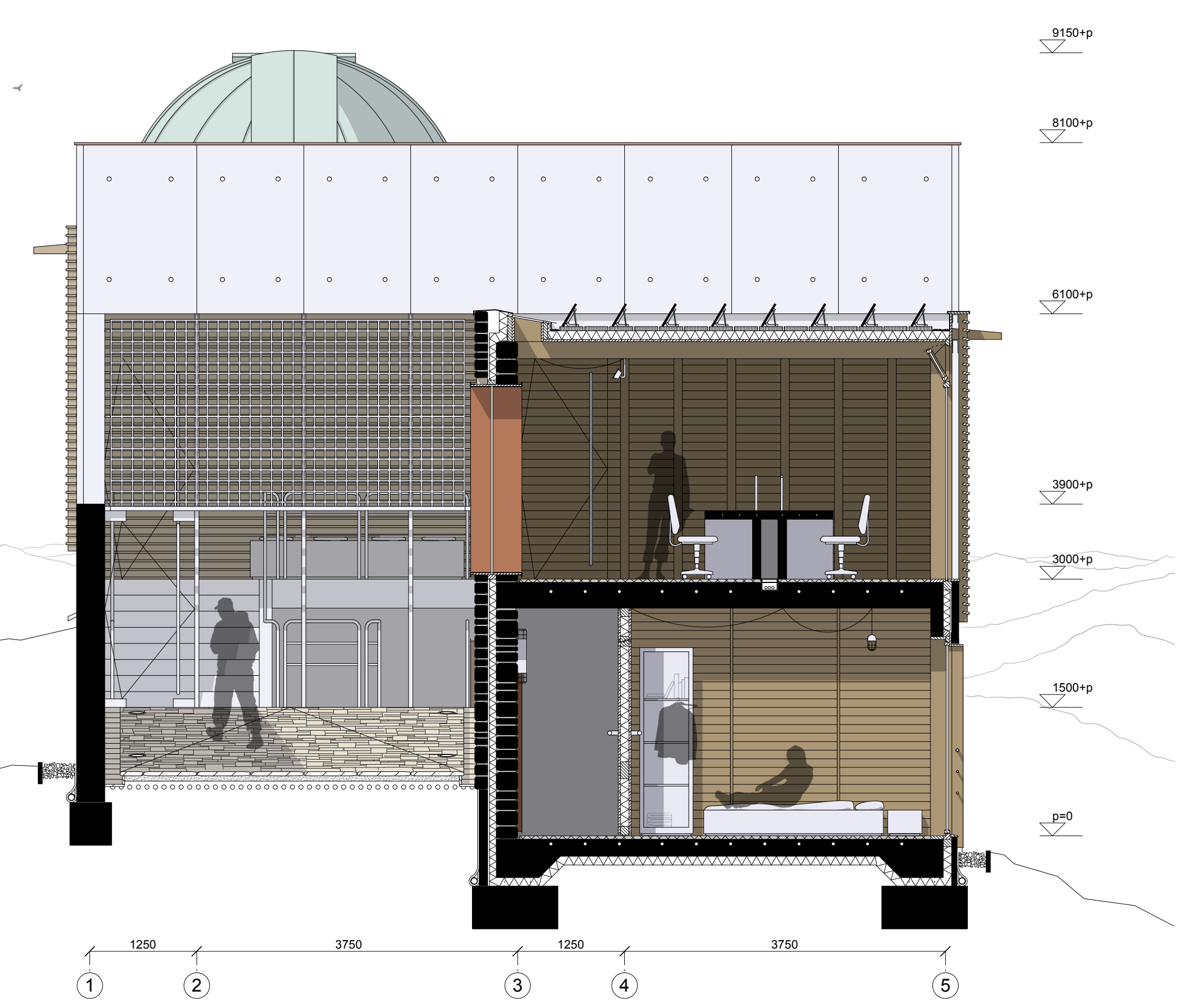
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9150+p
 7100+p
 3900+p
 3300+p
 2450+p
 0+p

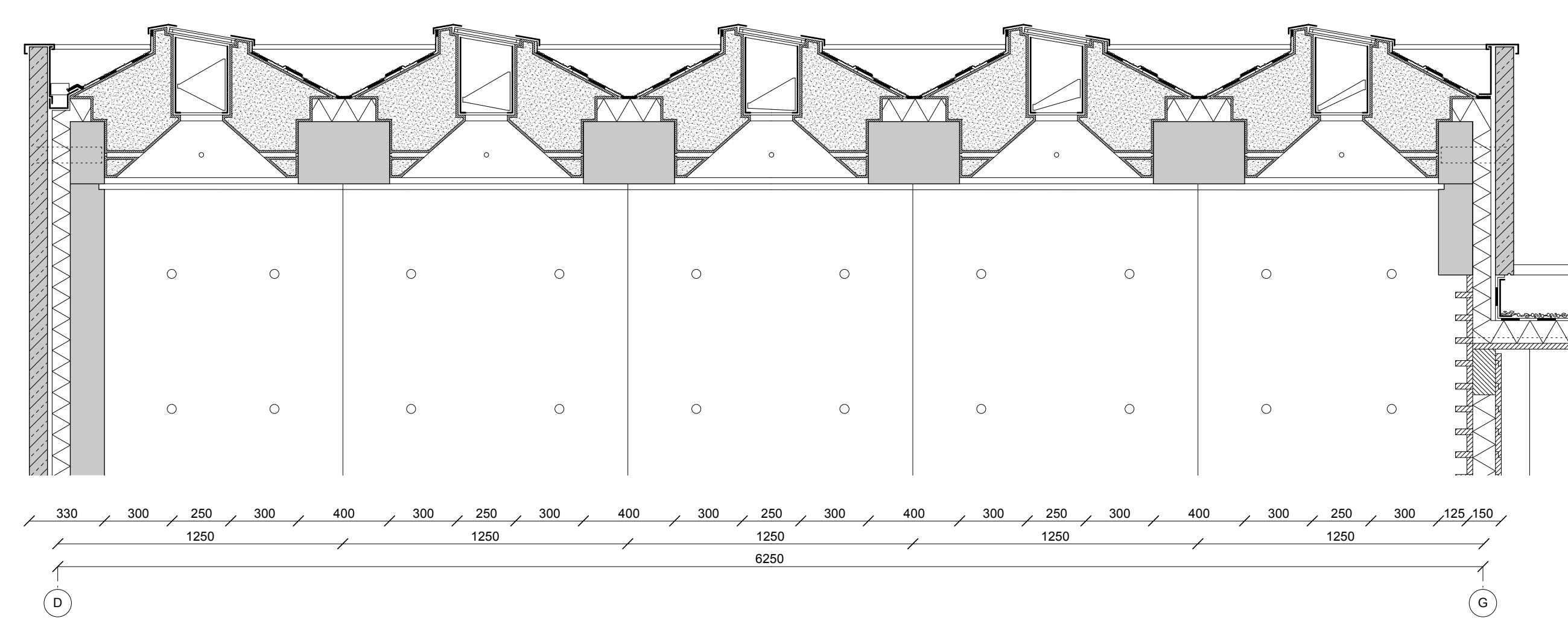
Section CC'
 Scale 1:50

- 01 Wardrobe
- 02 Restrooms
- 03 Lounge
- 04 Kitchen
- 05 Guest room
- 06 Bathroom
- 07 Workshop
- 08 Storage
- 09 Buffer container
- 10 Grade 1 cistern
- 11 Water treatment installations, batteries, and concrete core activation heat exchanger



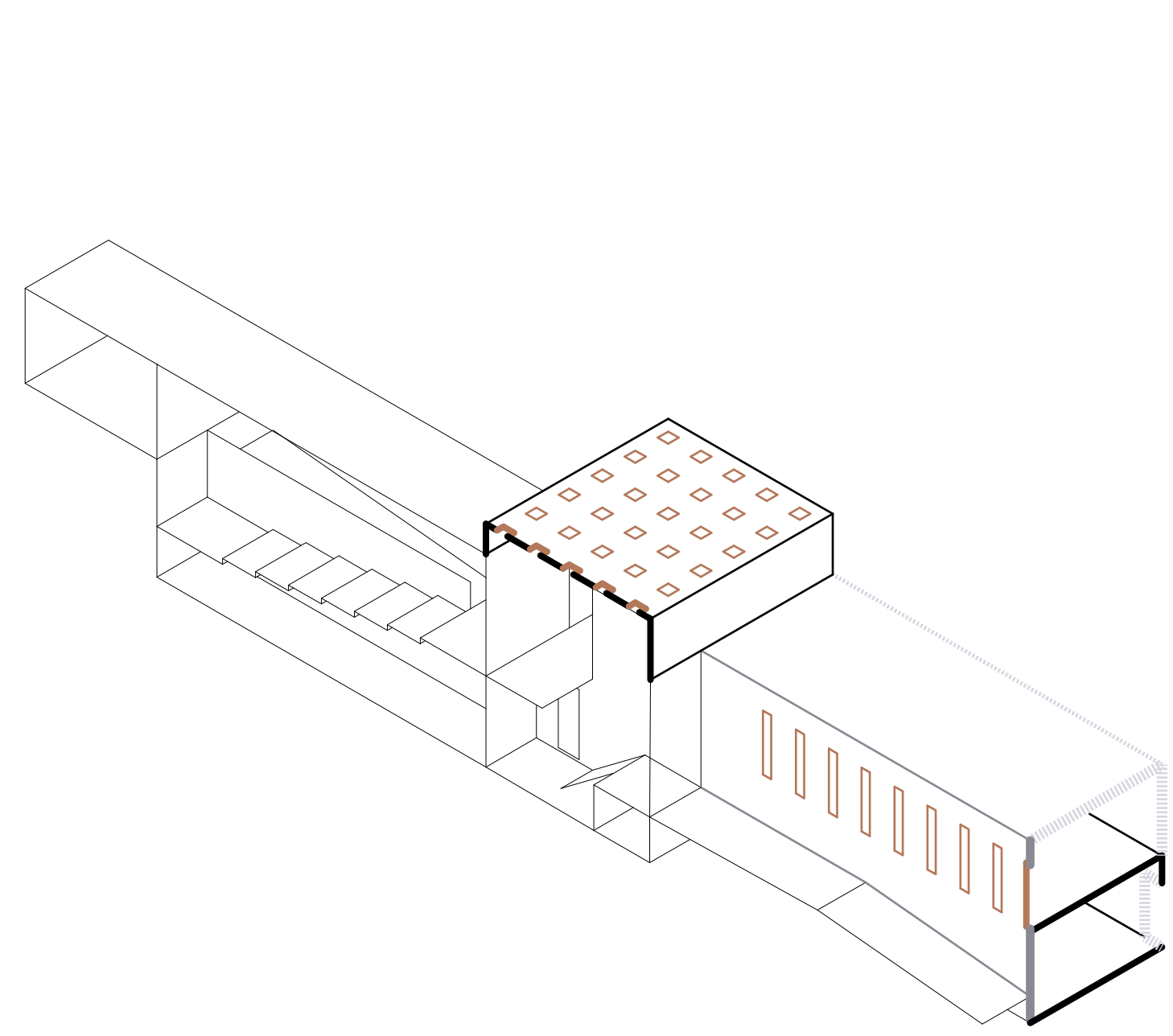
9150+p
 8100+p
 5100+p
 3900+p
 3000+p
 1500+p
 0+p

Section DD'
 Scale 1:50

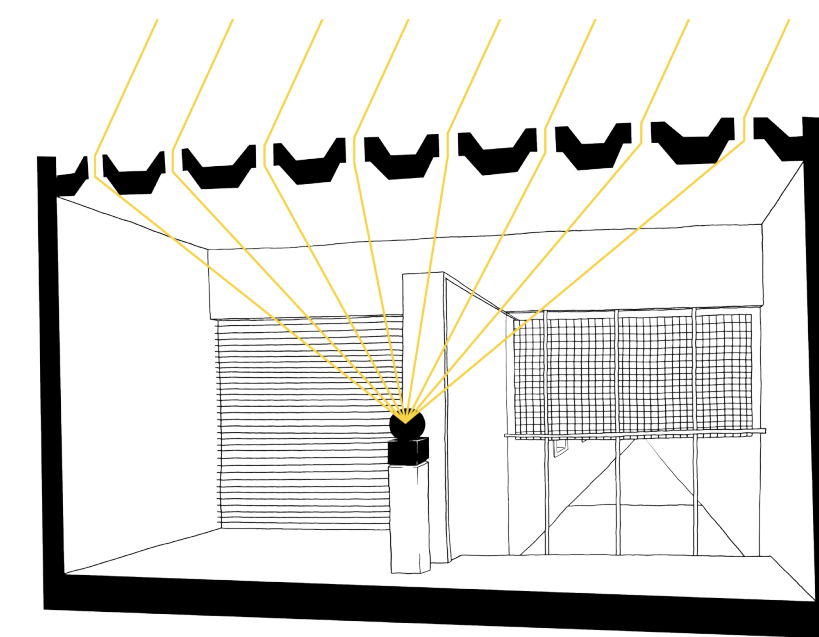


8100+0
7500+0
7100+0

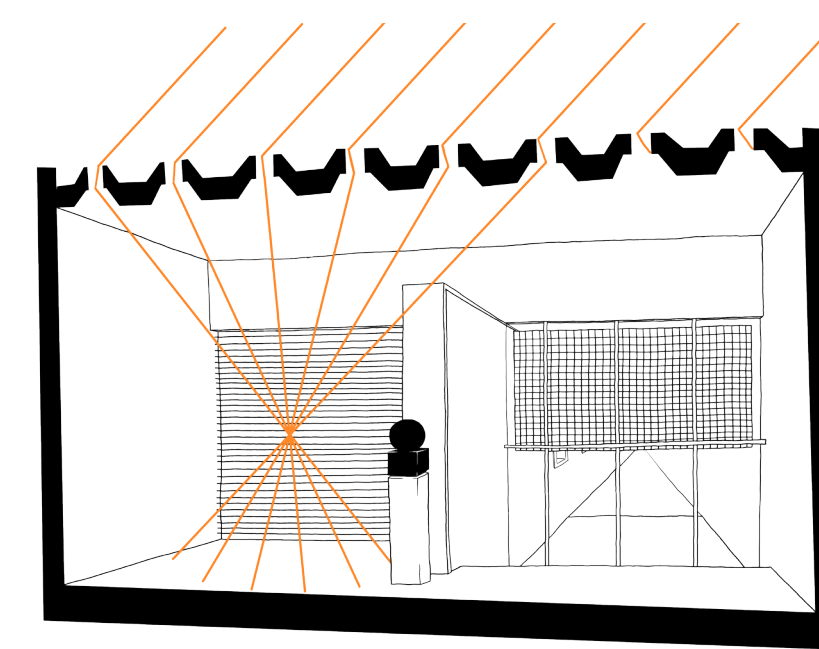
Main hall roof from section AA' and BB'
Scale 1:20



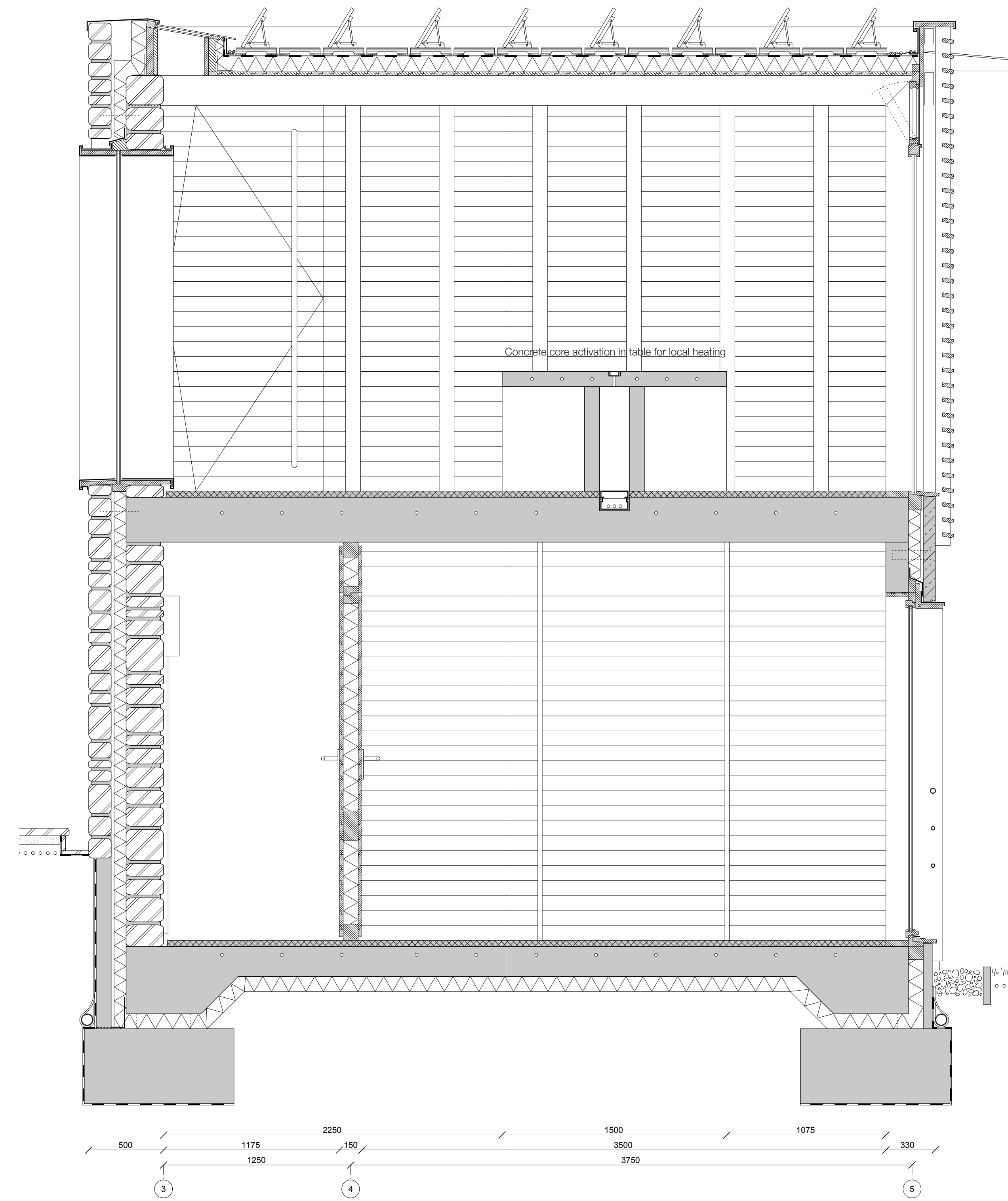
Transitions between the four main materials from the tectonic concept
Scale 1:200



Light effect of the central hall roof at solstice

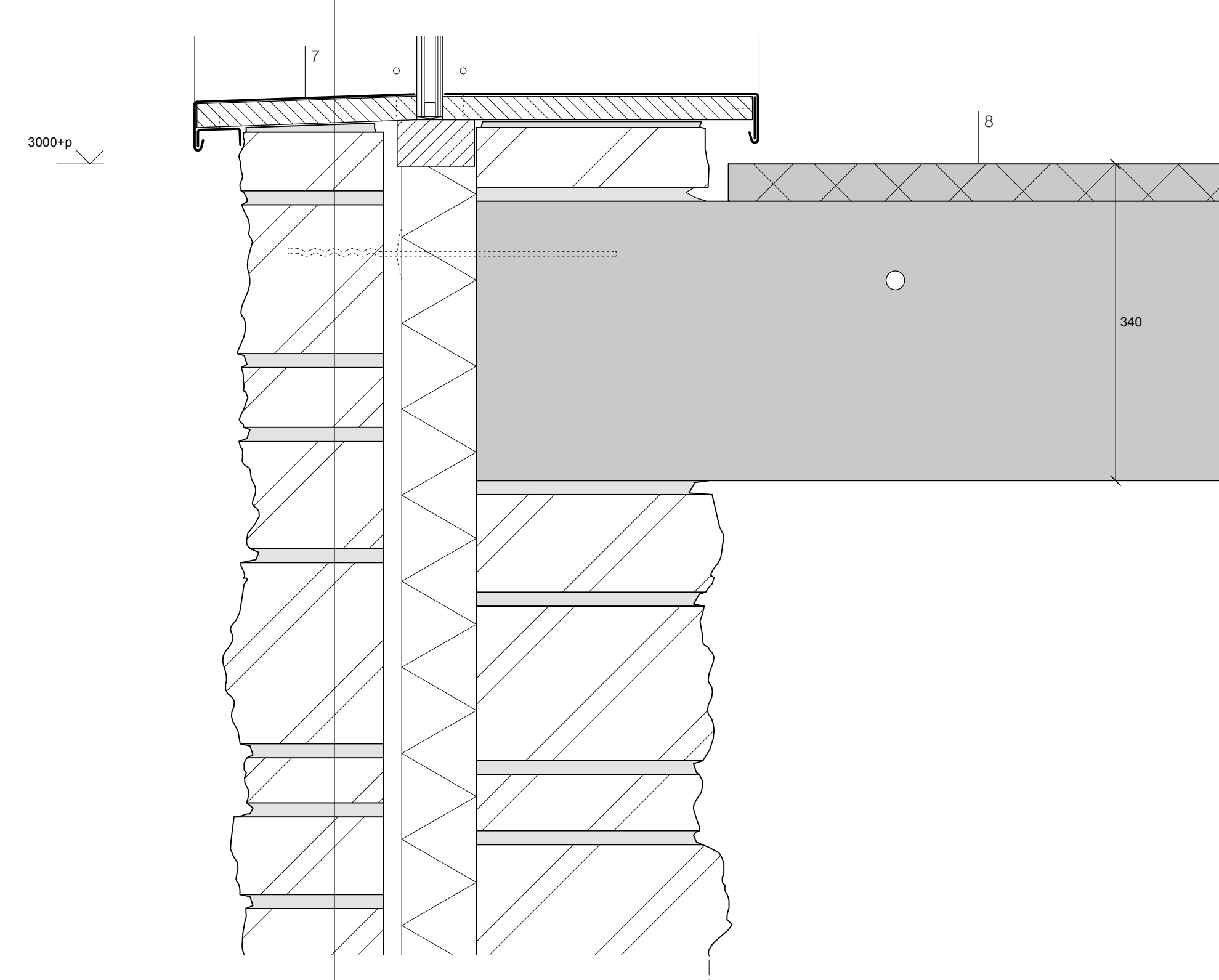
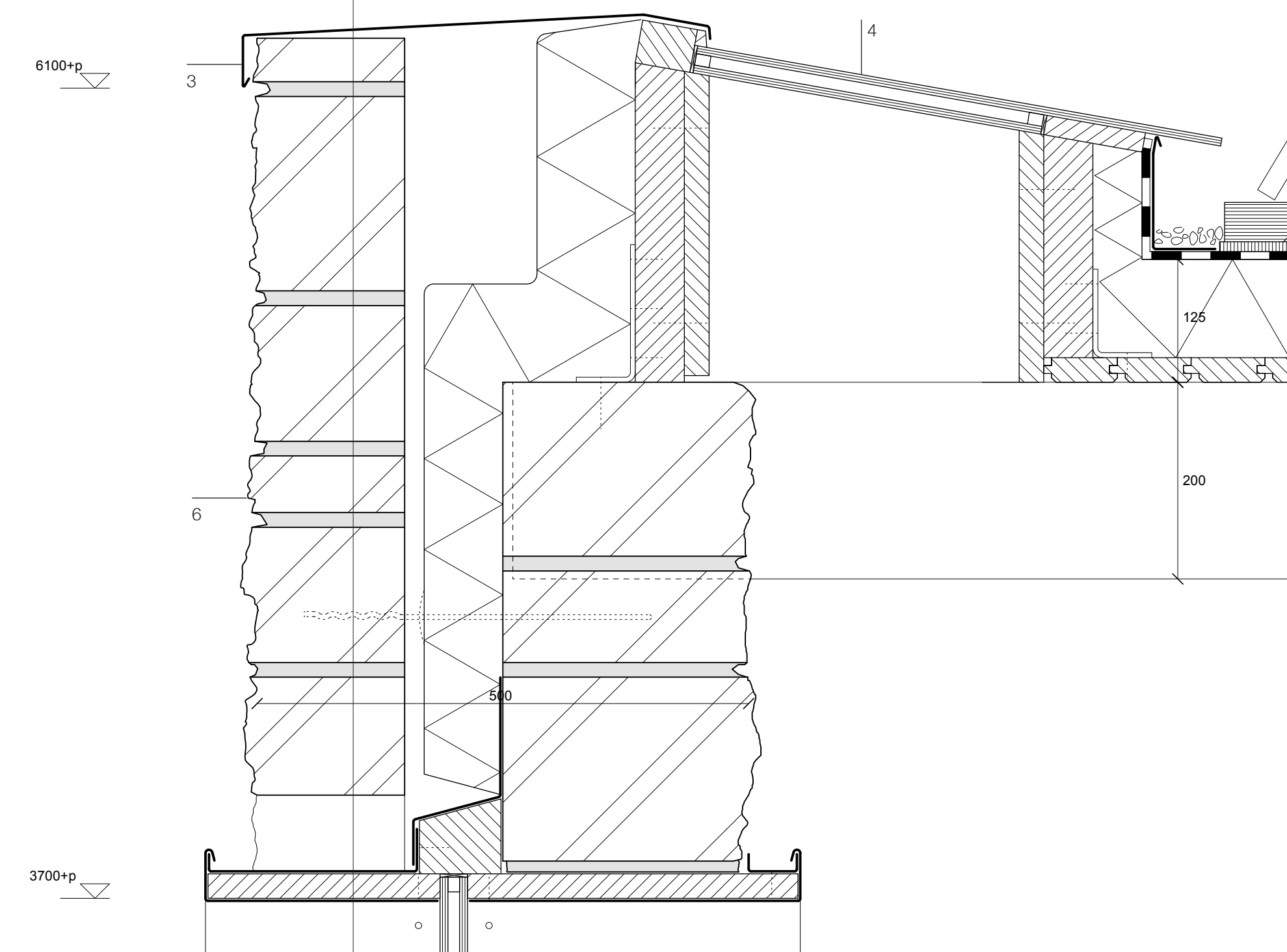
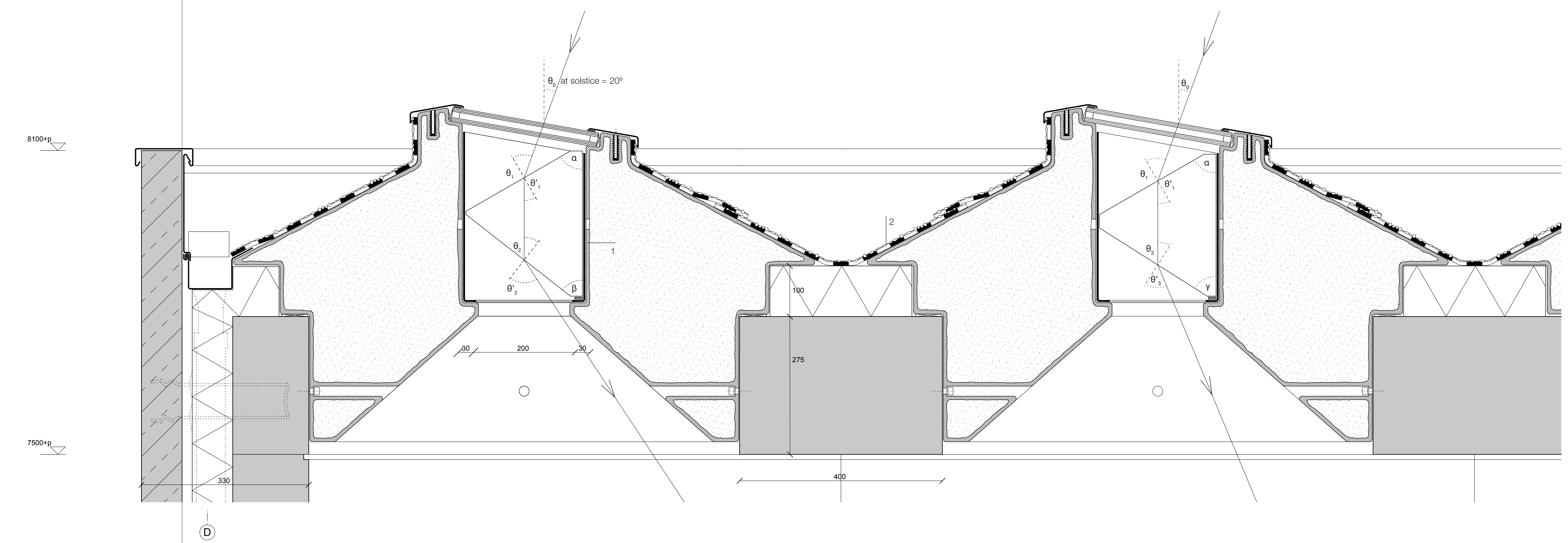


Light effect of the central hall roof at other time

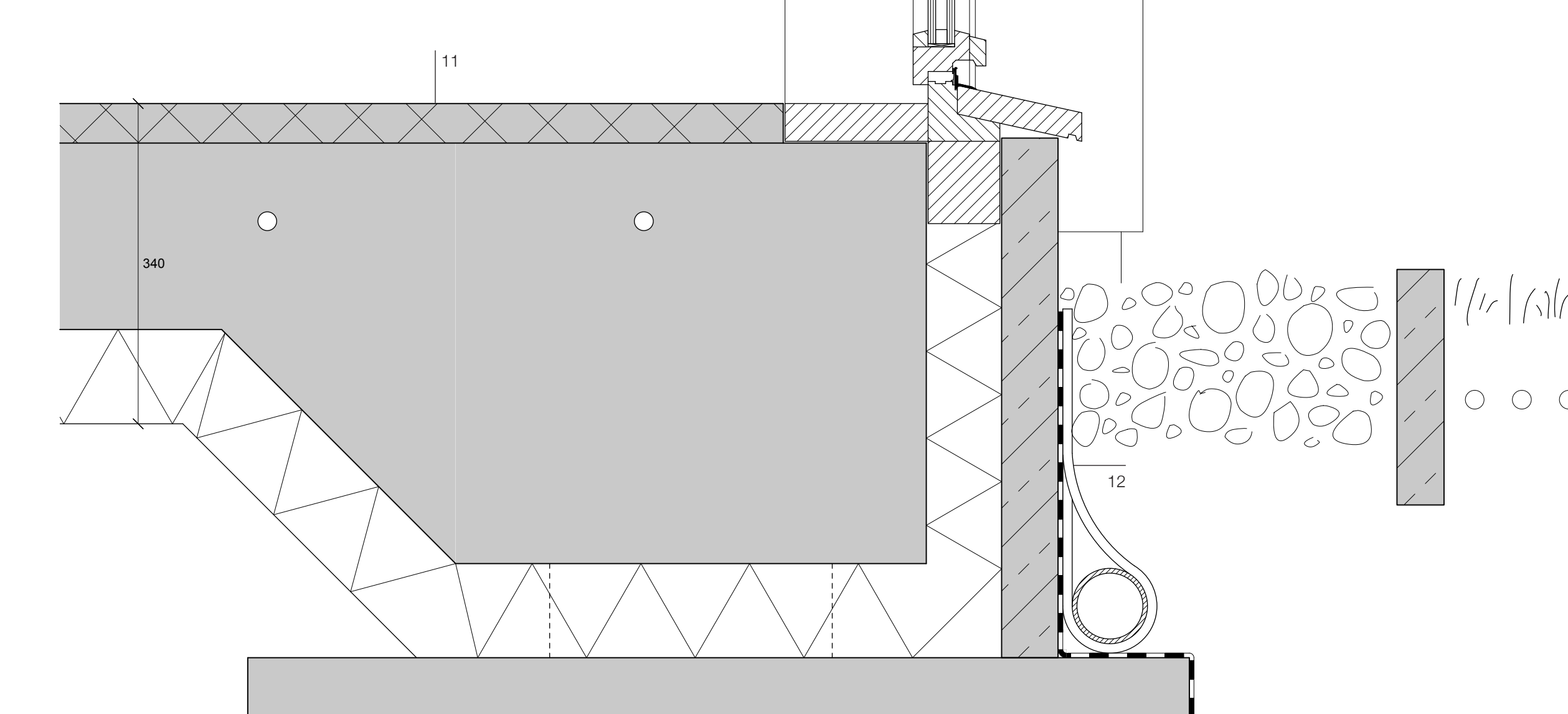
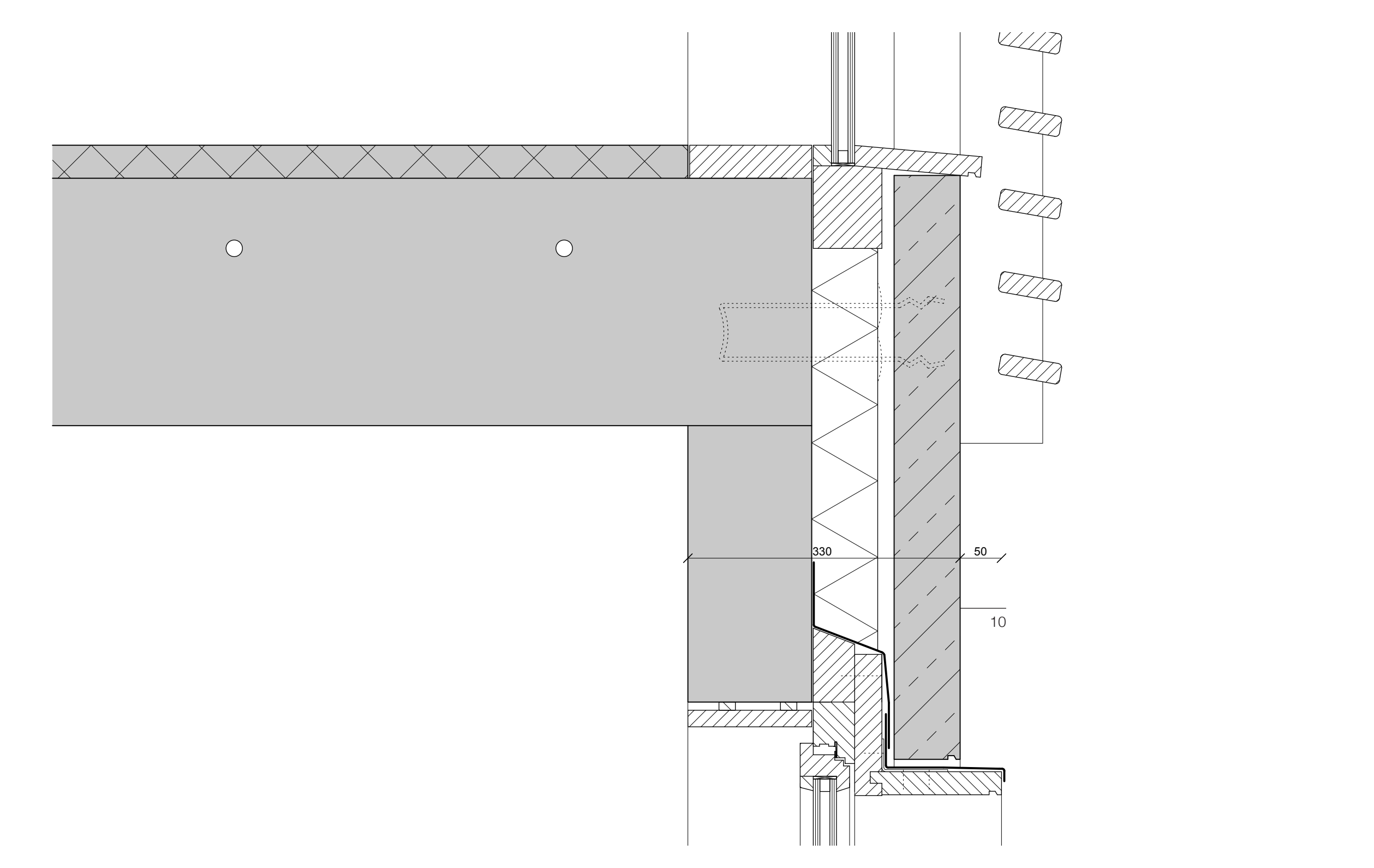
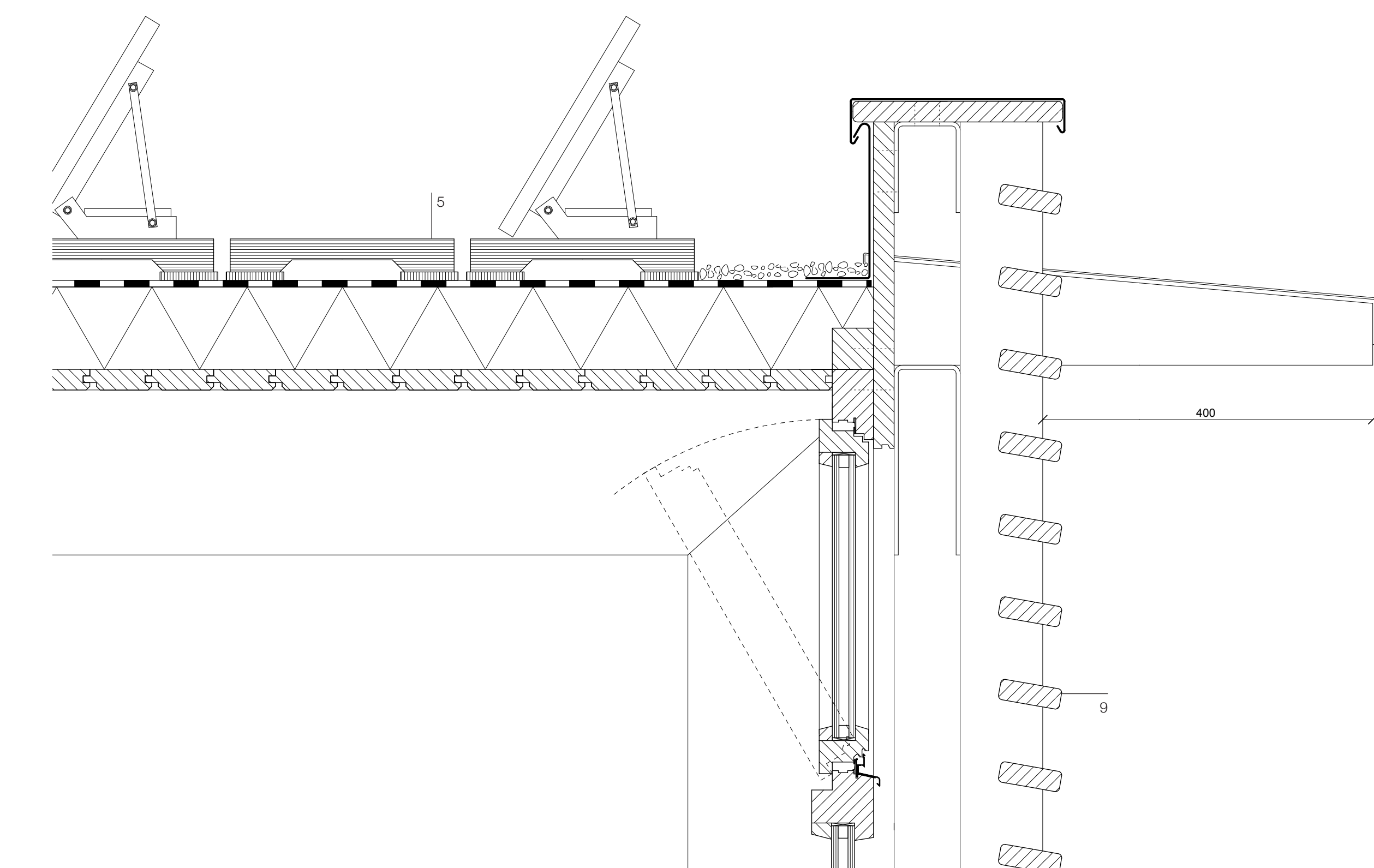


6100+0
5300+0
3900+0
3000+0
2300+0
P-0

Section DD'
Scale 1:20



- 1 Polyethylene rotational moulded prefab element, t = 7mm + 20% filled with Polyurethane foam, RAL 9005
240x240x2mm square polished copper tube, clear coating
Flint glass prism, constant top angle, variable bottom angles
- 2 10mm waterproofing layer, UV resistant Polyethylene rotational moulded prefab element, t = 7mm + 20% filled with Polyurethane foam, RAL 9005
100mm extruded polystyrene thermal insulation with vapour equalization layer
275mm cast in place concrete
- 3 2mm polished copper sheeting, clear coating
- 4 8mm toughened glass
12mm cavity
8mm laminated safety glass
- 5 Porous paving flag
10mm waterproofing layer
100mm extruded polystyrene thermal insulation with vapour equalization layer
25x75mm battens
100x200mm wooden beams
- 6 150mm limestone from local quarry
40mm ventilated cavity
100mm extruded polystyrene thermal insulation with vapour equalization layer
250mm limestone from local quarry
- 7 2mm polished copper sheeting, clear coating
25mm boarding
- 8 40mm exposed concrete screed, trowel finish
300mm cast in place exposed concrete with concrete core activation
- 9 25x75x150mm horizontal wooden louvers
- 10 60mm prefab exposed concrete element
40mm ventilated cavity
100mm extruded polystyrene thermal insulation with vapour equalization layer
150mm cast in place exposed concrete
- 11 40mm exposed concrete screed, trowel finish
300mm cast in place exposed concrete with concrete core activation, on pad footing
- 12 Enkadrain drainage mat
Waterproofing layer
60mm prefab exposed concrete element
100mm extruded polystyrene thermal insulation



Materialisation of tectonic transitions
Scale 1:5

