BEYOND BUILDINGS

THE FUTURE OF MARITIME LEFTOVERS

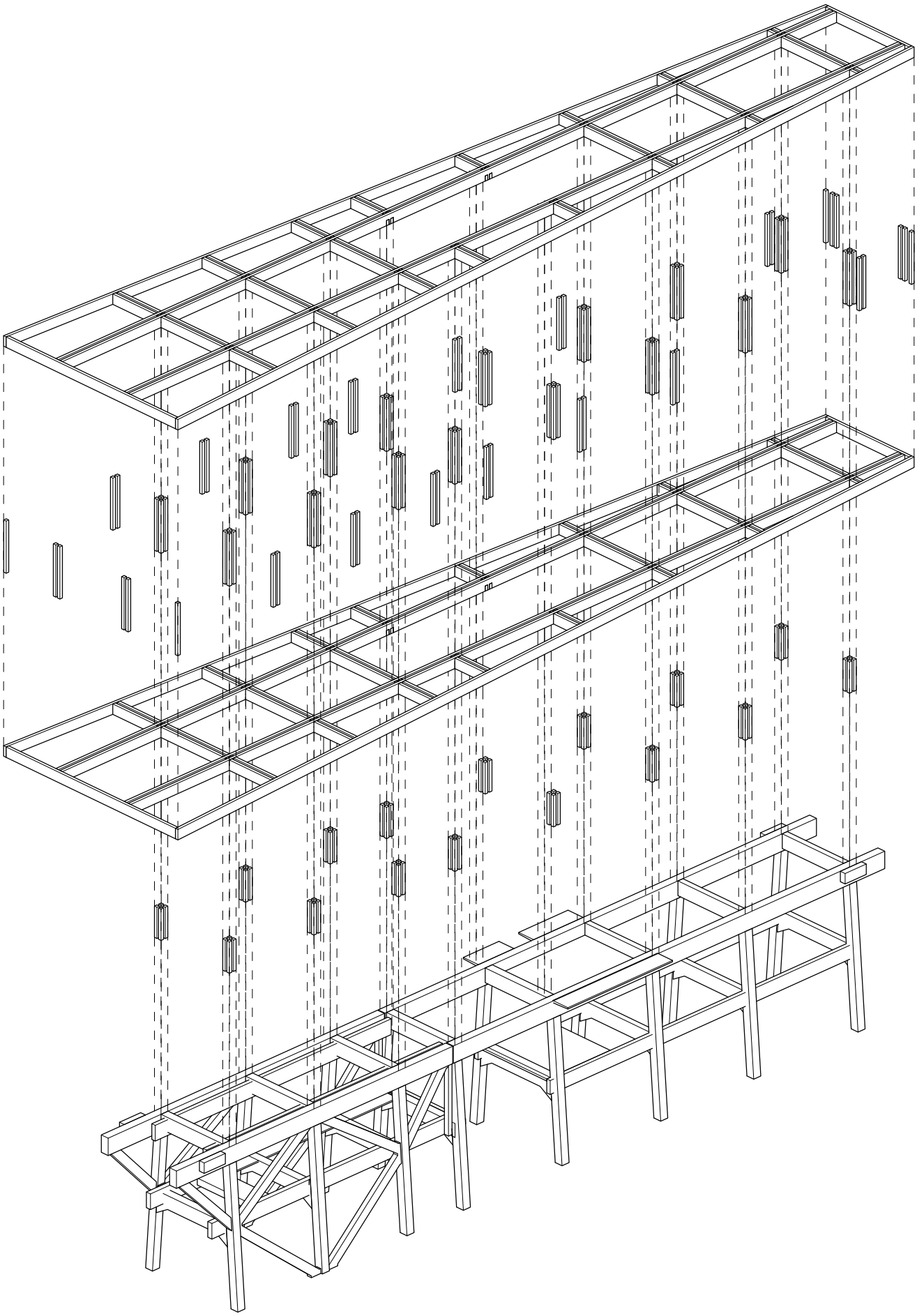
P5
BUILDING TECHNOLOGY

AR3AH0115

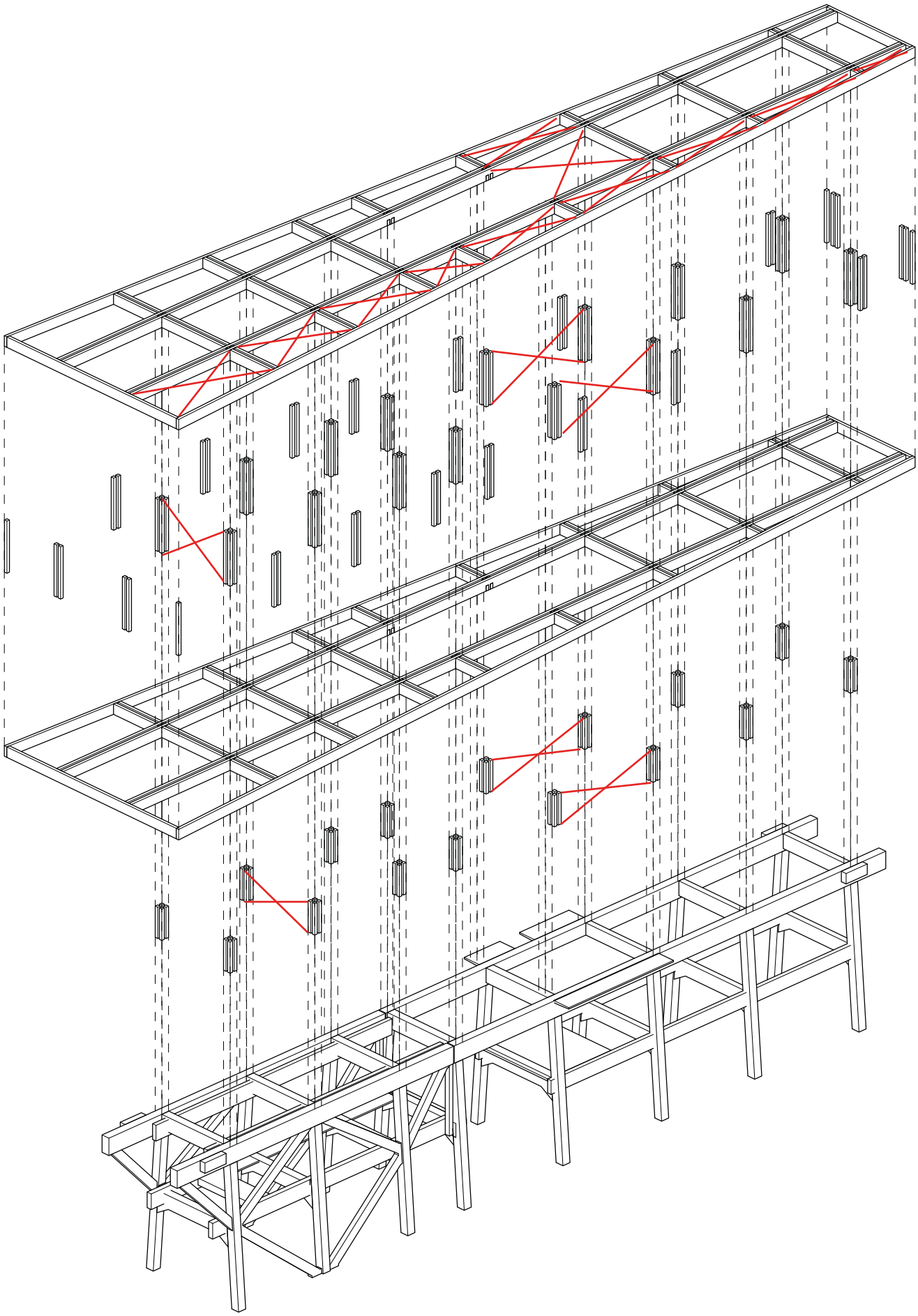
GRADUATION STUDIO: REVITALISING HERITAGE
DELFT UNIVERSITY OF TECHNOLOGY
2024/2025

ANNE KIKKERT – 4818288

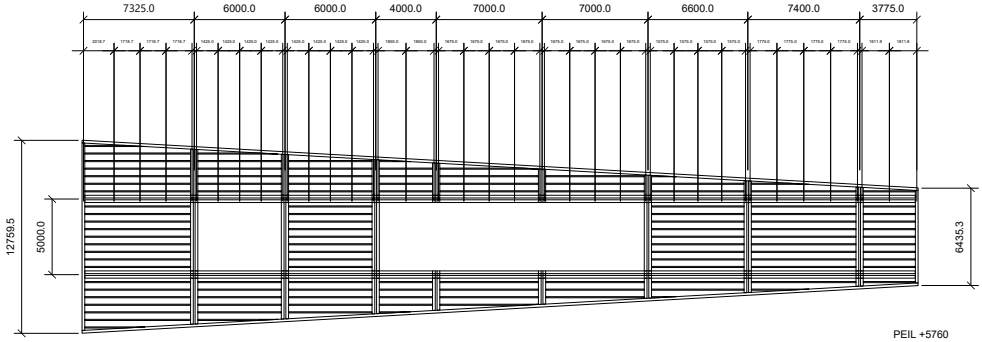
AXONOMETRIC



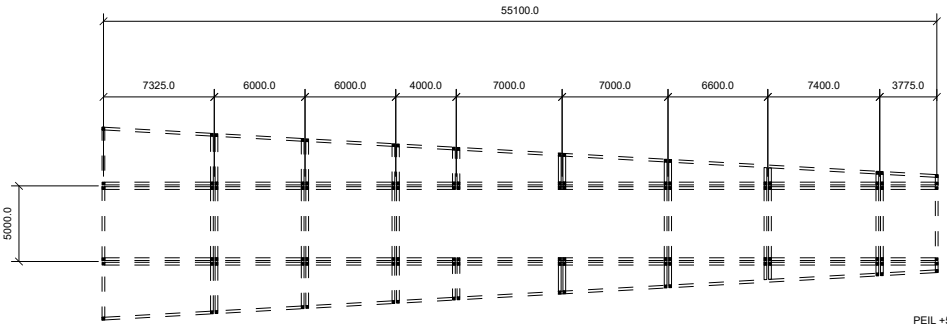
STABILITY



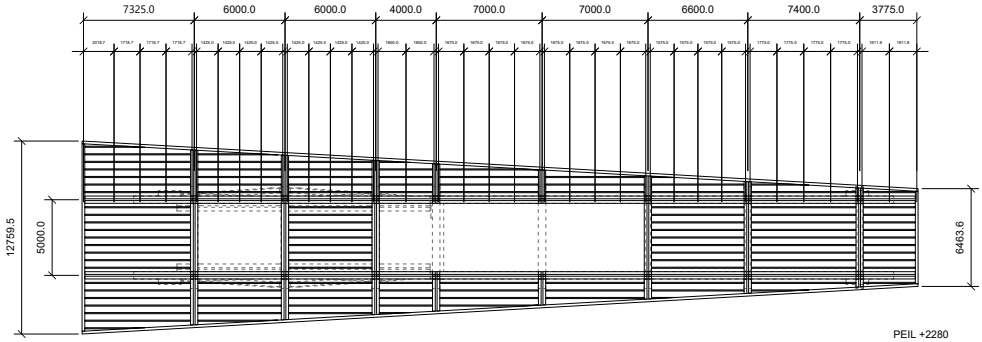
FLOORPLANS STRUCTURAL
1:500



PEIL +5760
Dak



PEIL +5280
Onderkant dak



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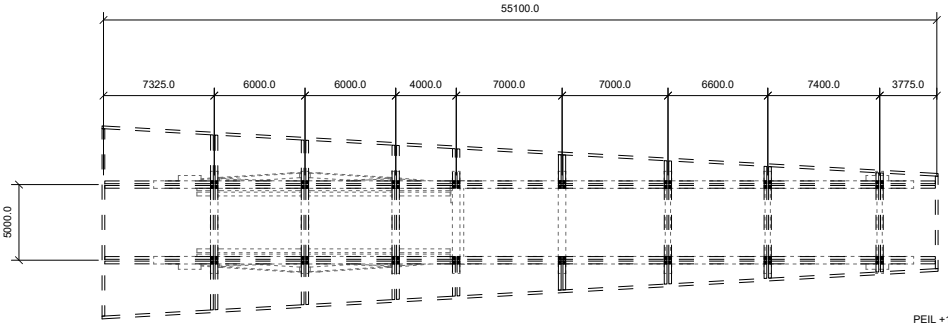
Vloer



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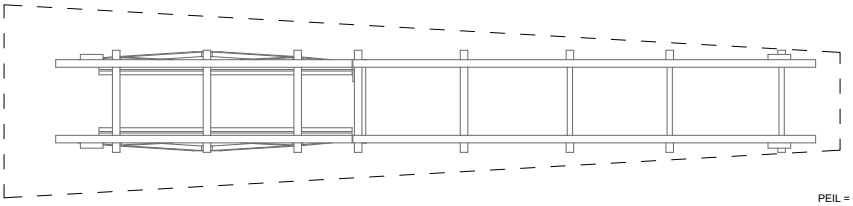
Onderkant vloer



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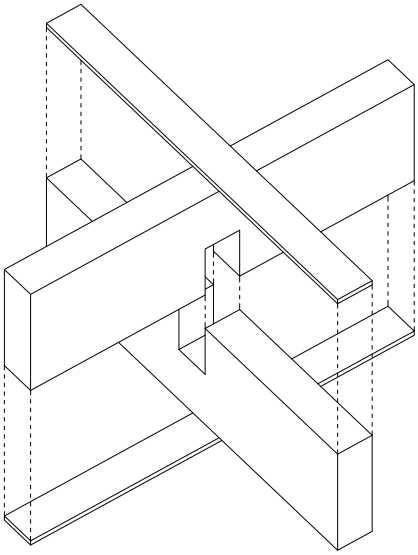
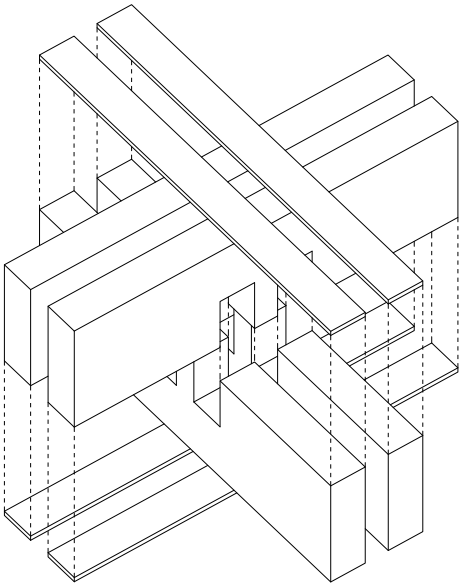
Bovenkant kraanbaan

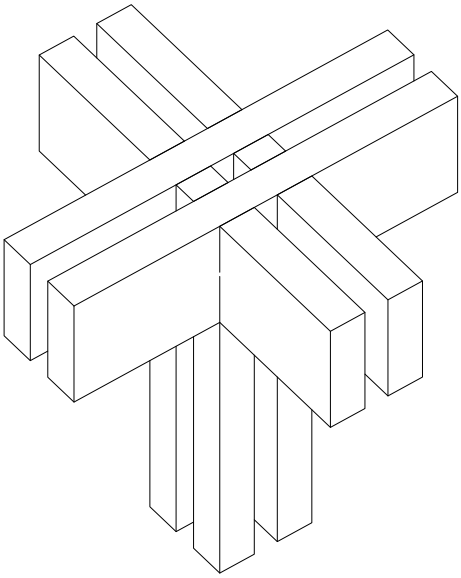
CONCEPT STRUCUTRE



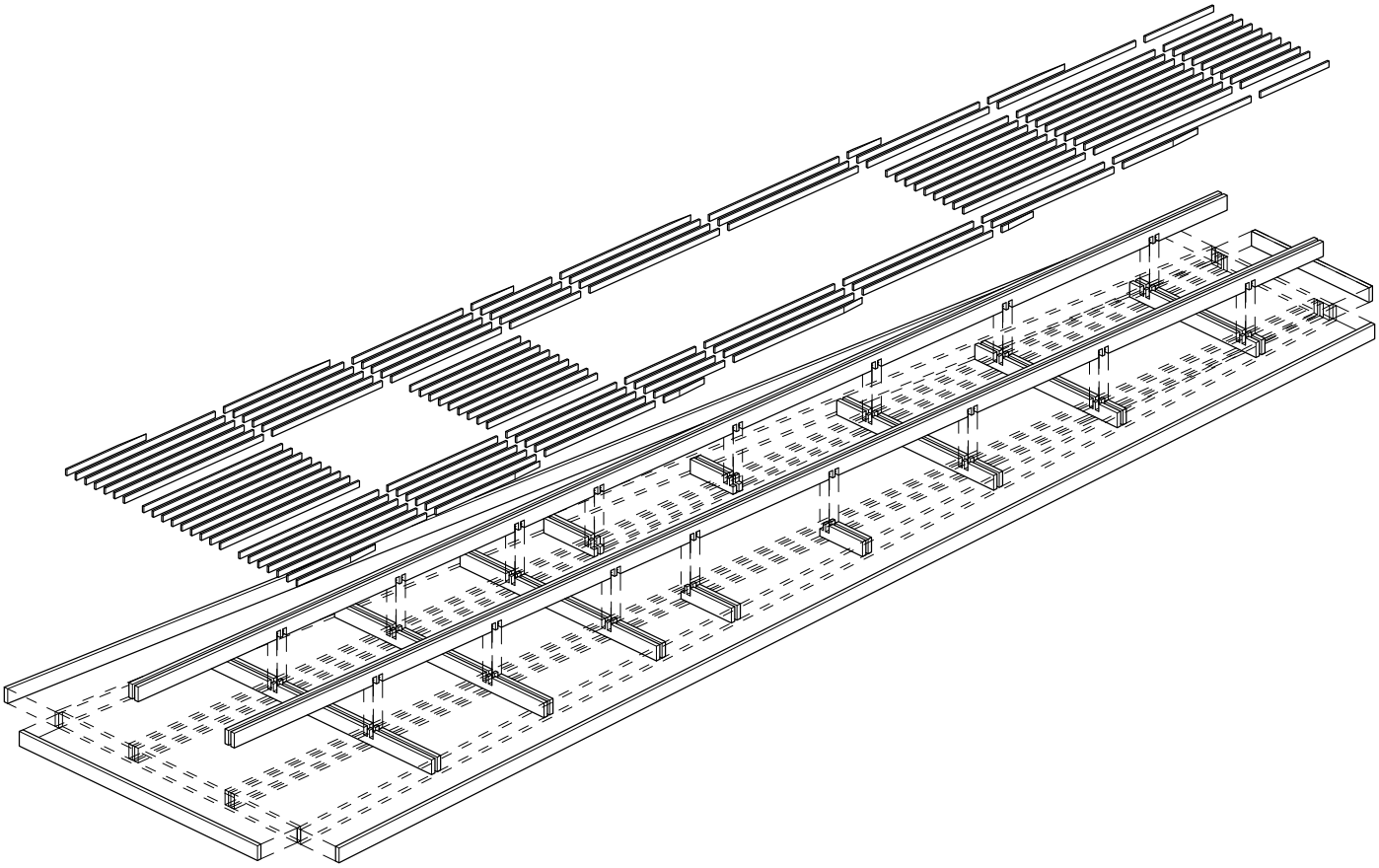
SINGLE



DOUBLE



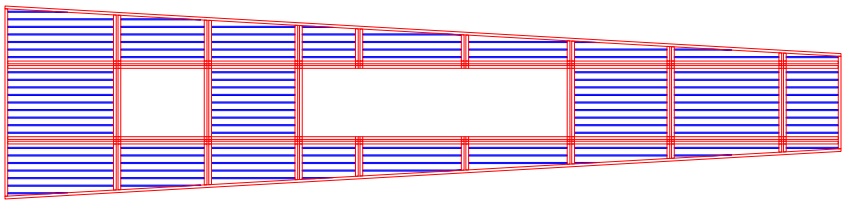
WITH COLUMNS

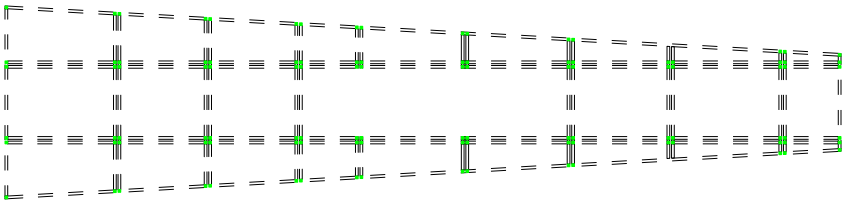


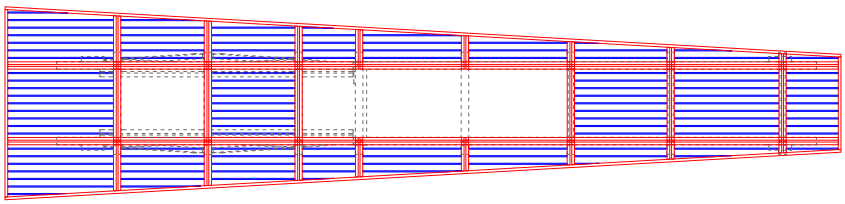
FLOOR/ROOF

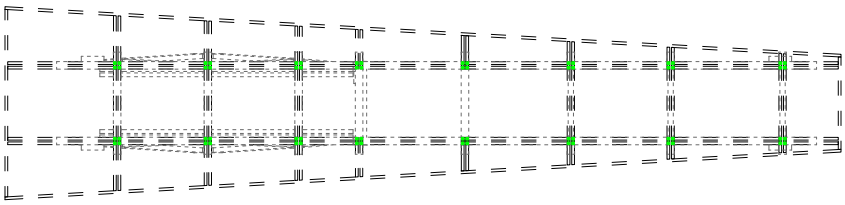
DIMENTIONS BEAMS AND COLUMNS

1:500









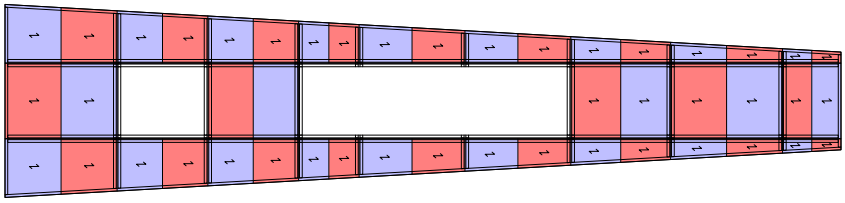
Onderkant vloer

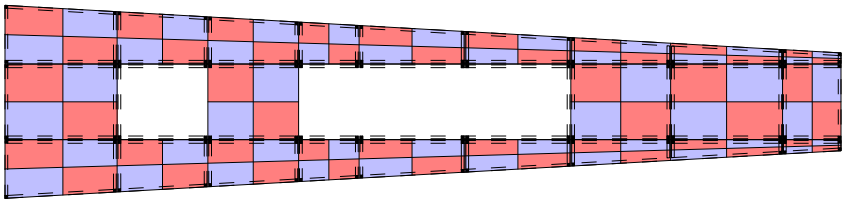
- Draagconstructie (180x600)
- Secundaire liggers
- Kolommen (180x180)

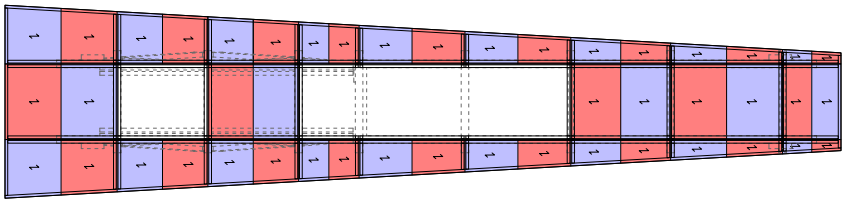
Profiel	eedte b (m	oogte h (m	mervlakte A (m	wicht (kN/	ly (mm^4)	Wy (mm^3)	terkteklass	m,d (N/mm	E (N/mm^2)
180x600	180	600	108000	0,43	3240000000	10800000	GL28h	21	11000
180x180	180	180	32400	0,13	87480000	9720000	GL28h	21	11000

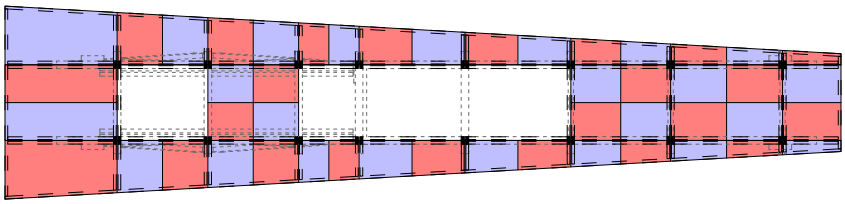
FLOORPLANS STRUCTURAL

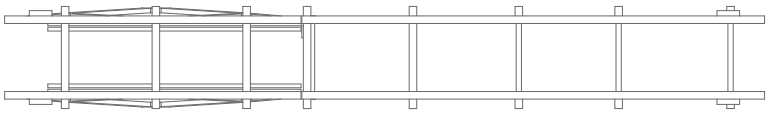
1:500





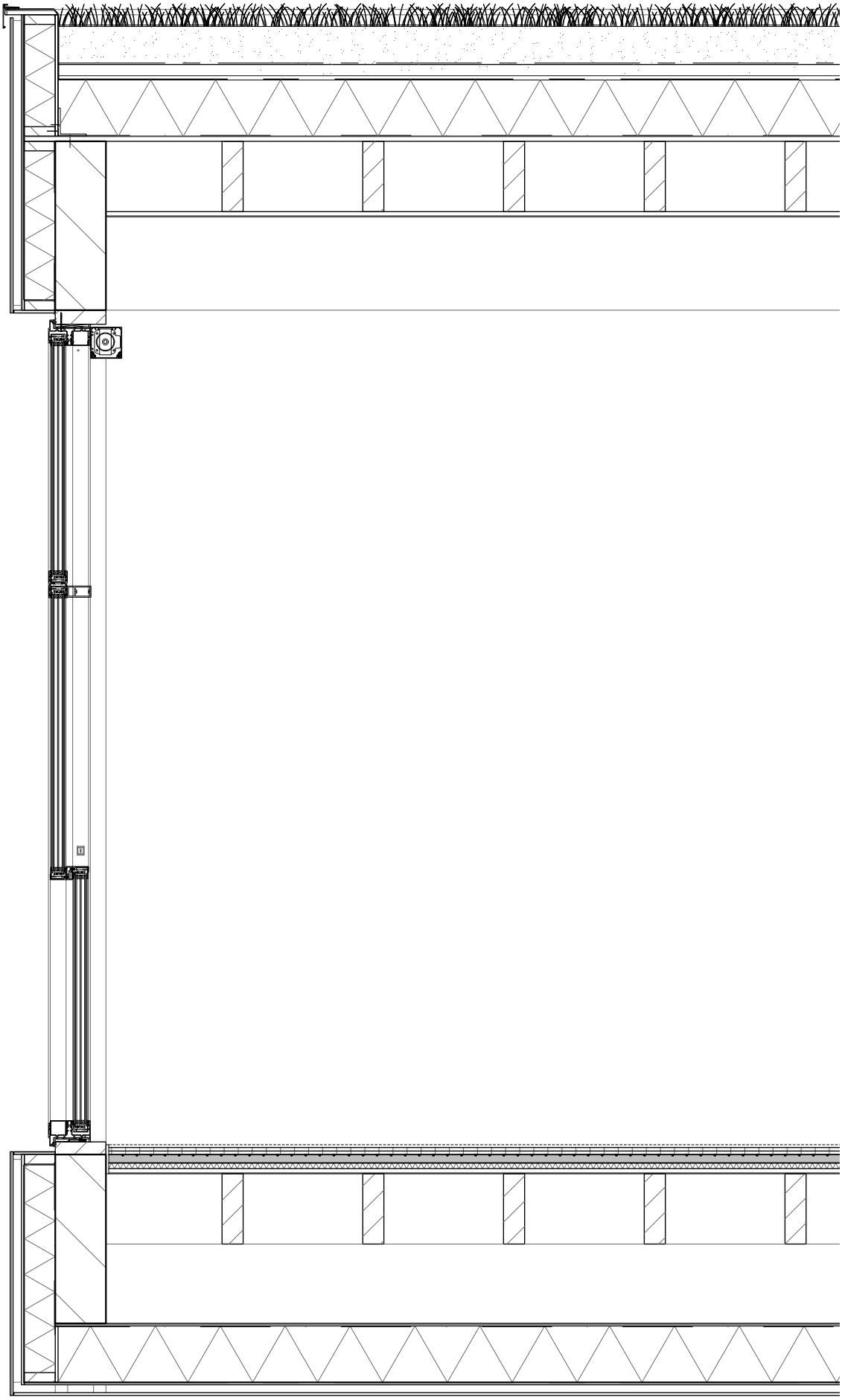






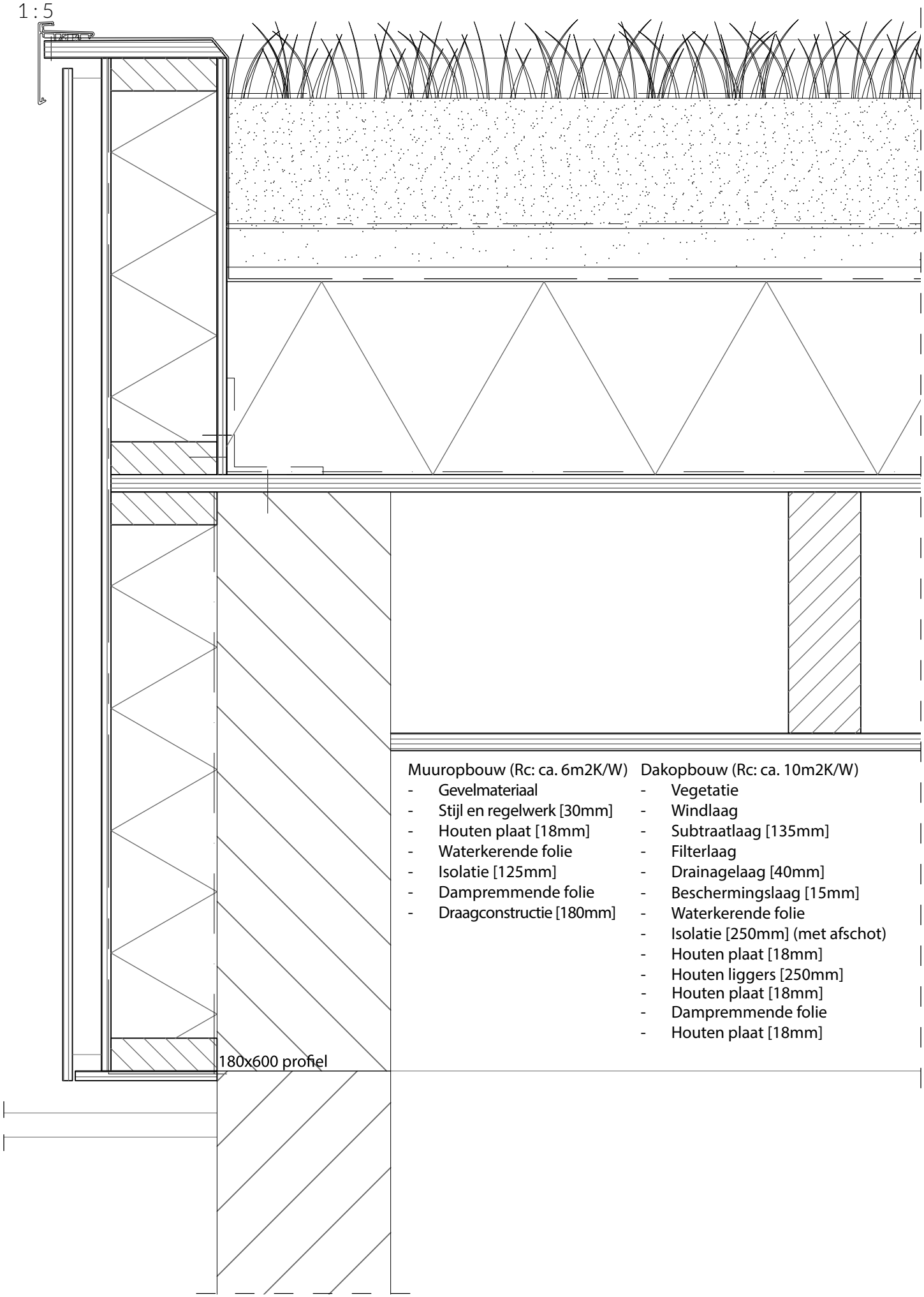
DETAILED SECTION (V)

1:20 (SCALED)



ROOF DETAIL (V)

1:5



Muuropbouw (Rc: ca. 6m2K/W)

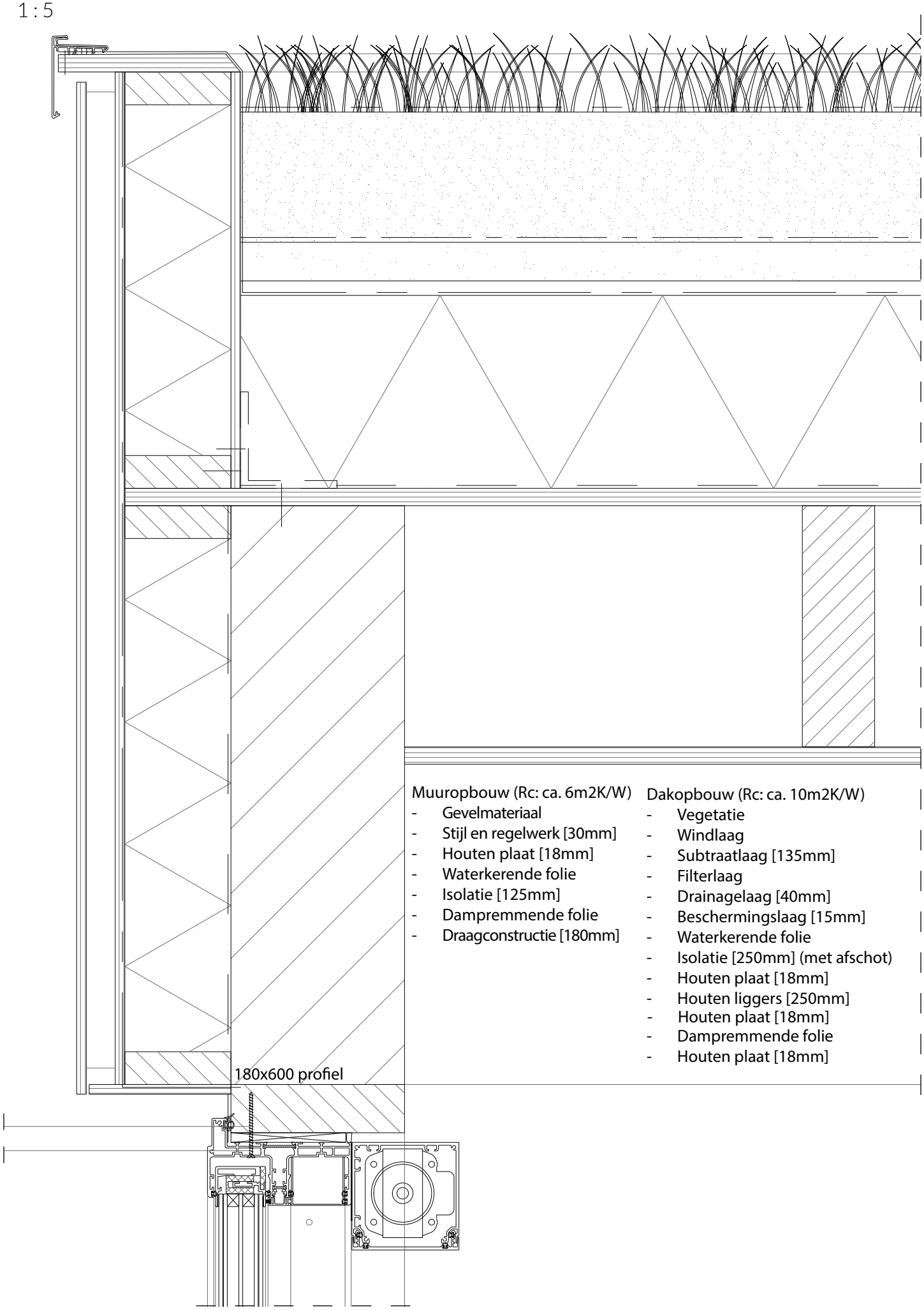
- Gevelmateriaal
- Stijl en regelwerk [30mm]
- Houten plaat [18mm]
- Waterkerende folie
- Isolatie [125mm]
- Dampremmende folie
- Draagconstructie [180mm]

Dakopbouw (Rc: ca. 10m2K/W)

- Vegetatie
- Windlaag
- Subtraatlaag [135mm]
- Filterlaag
- Drainagelaag [40mm]
- Beschermingslaag [15mm]
- Waterkerende folie
- Isolatie [250mm] (met afschot)
- Houten plaat [18mm]
- Houten liggers [250mm]
- Houten plaat [18mm]
- Dampremmende folie
- Houten plaat [18mm]

ROOF DETAIL - WINDOW (V)

1:5

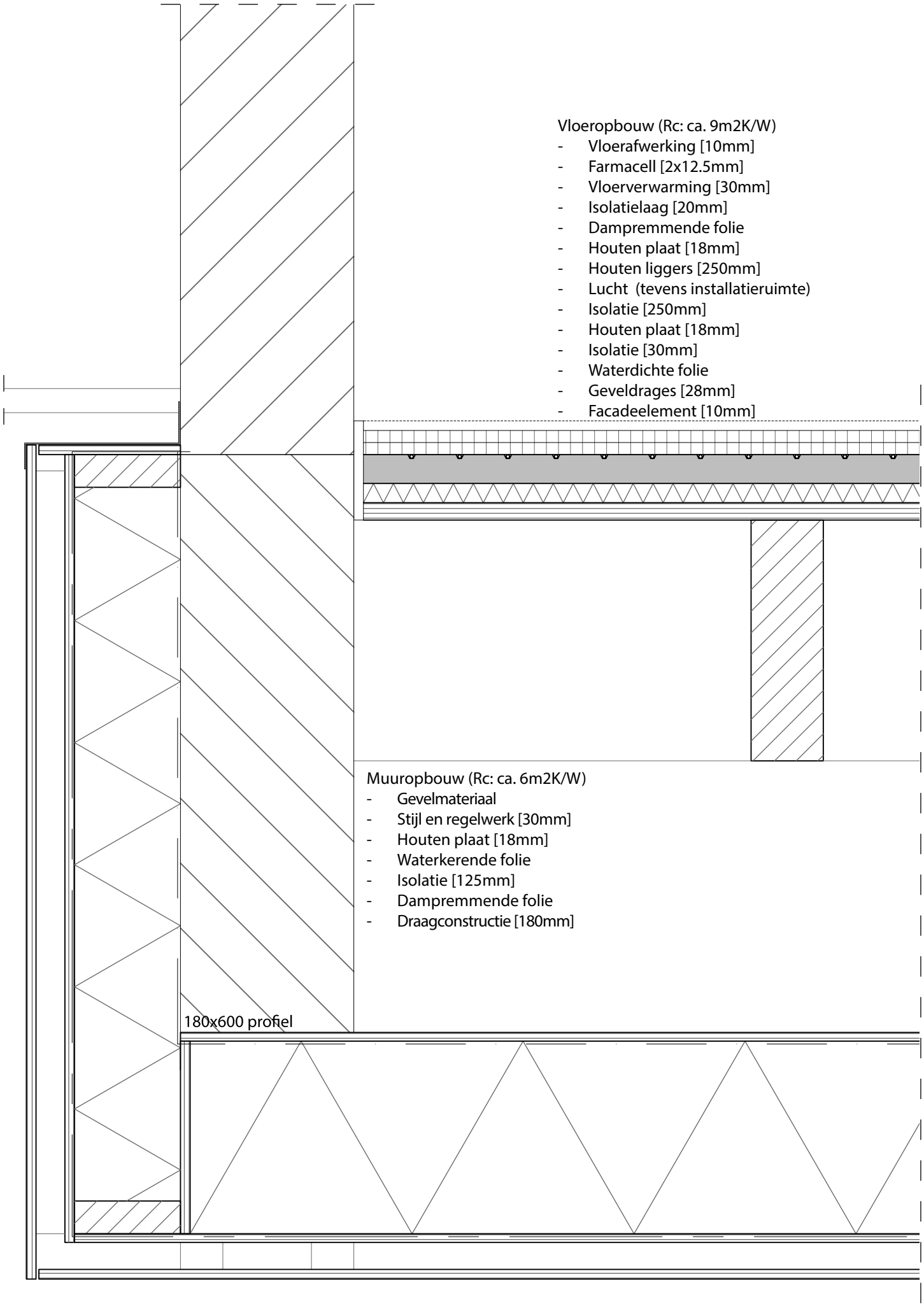


Muuropbouw (Rc: ca. 6m2K/W)
- Gevelmateriaal
- Stijl en regelwerk [30mm]
- Houten plaat [18mm]
- Waterkerende folie
- Isolatie [125mm]
- Dampremmende folie
- Draagconstructie [180mm]

Dakopbouw (Rc: ca. 10m2K/W)
- Vegetatie
- Windlaag
- Subtraatlaag [135mm]
- Filterlaag
- Drainagelaag [40mm]
- Beschermingslaag [15mm]
- Waterkerende folie
- Isolatie [250mm] (met afschot)
- Houten plaat [18mm]
- Houten liggers [250mm]
- Houten plaat [18mm]
- Dampremmende folie
- Houten plaat [18mm]

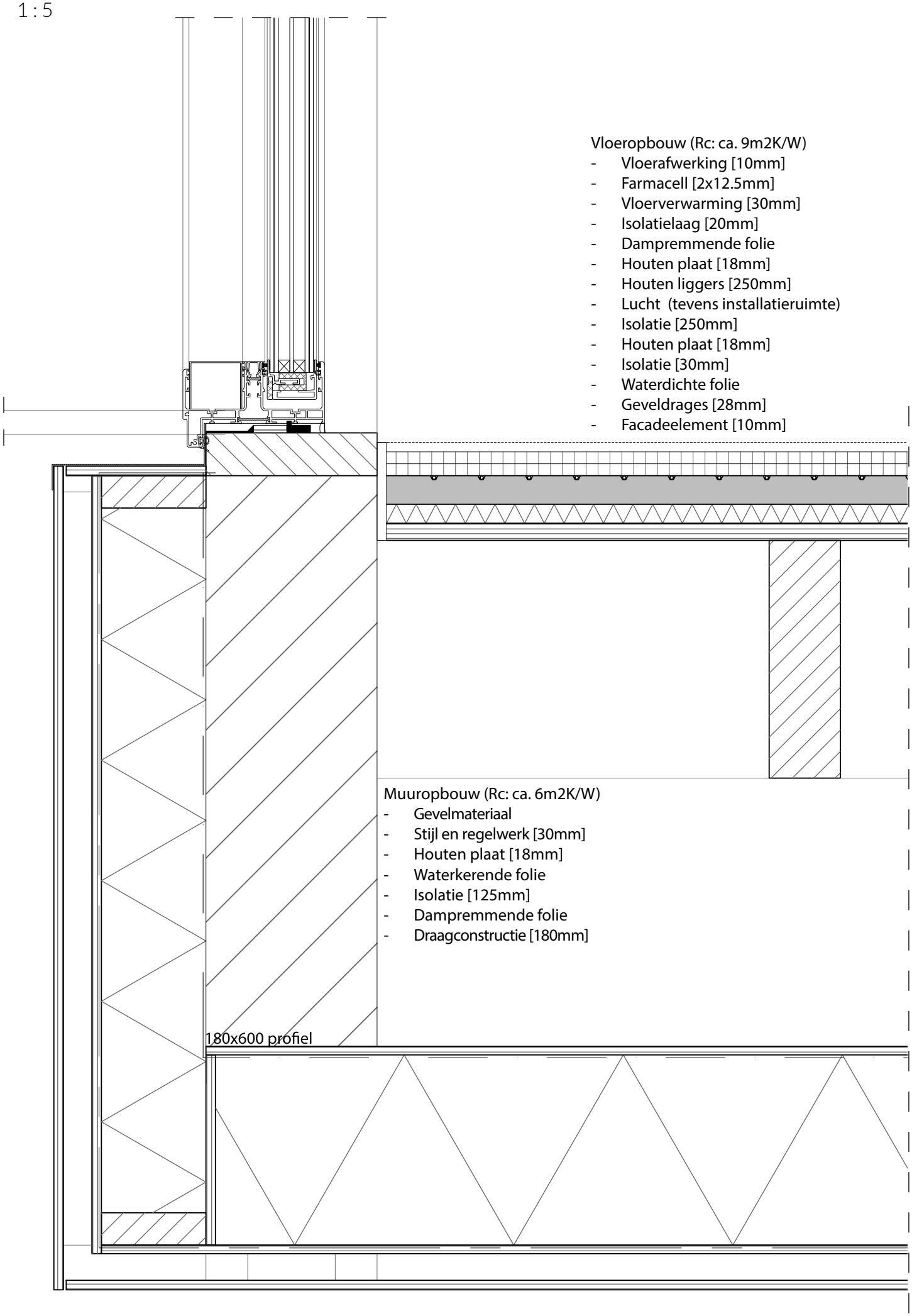
FLOOR DETAIL (V)

1:5



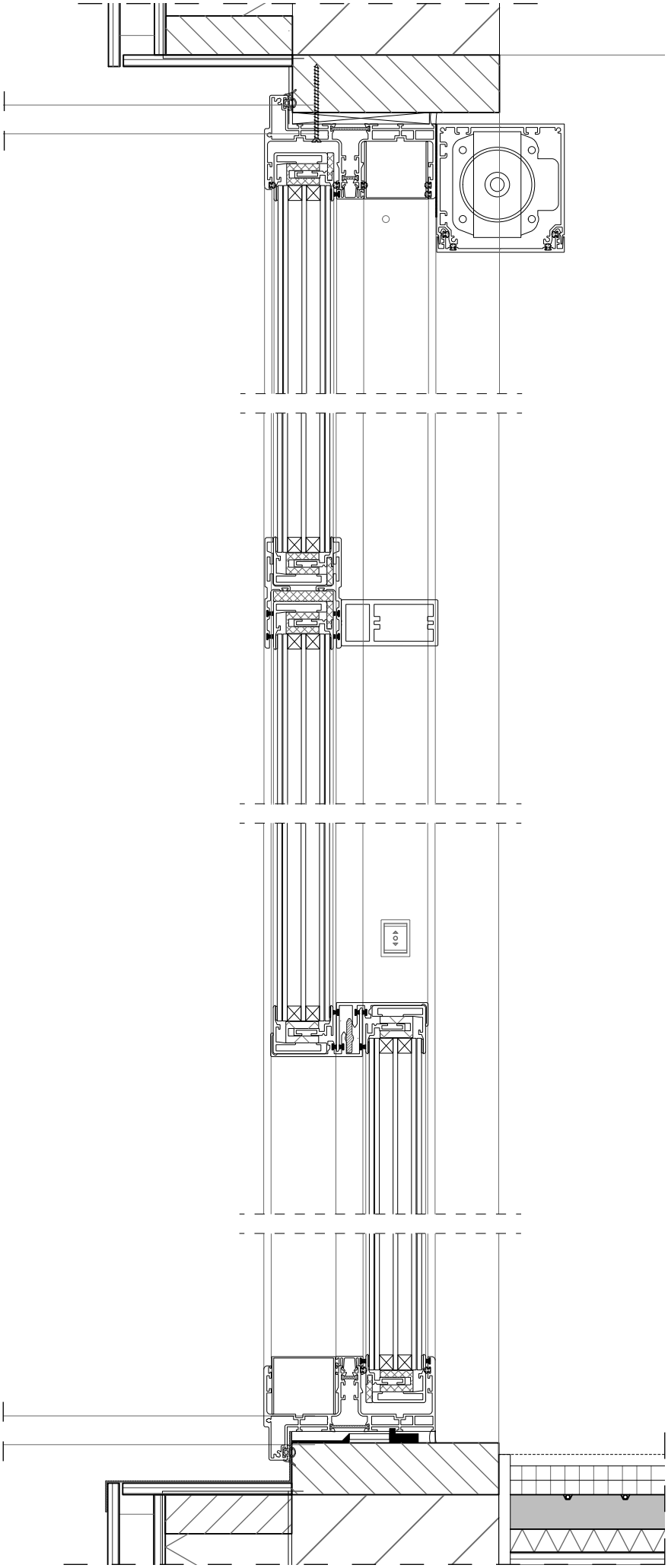
FLOOR DETAIL - WINDOW (V)

1:5



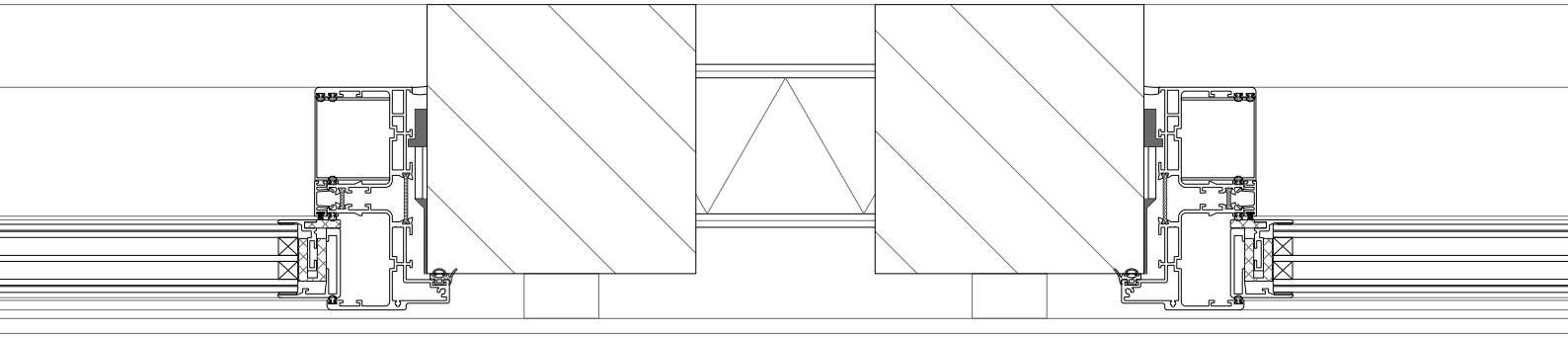
WINDOW DETAIL (V)

1:5



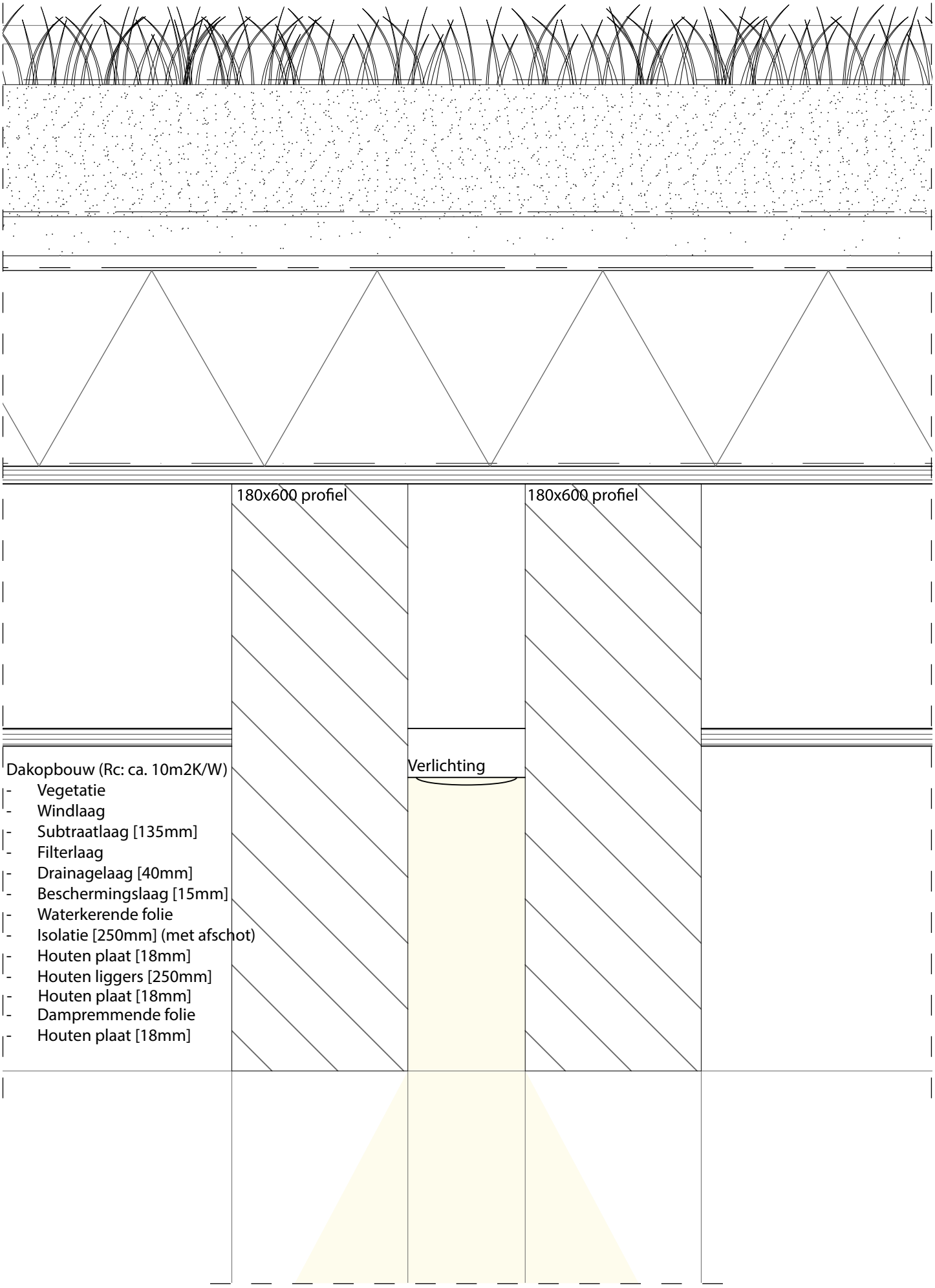
WINDOW DETAIL (H)

1:5



LIGHT DETAIL (V)

ROOF 1:5

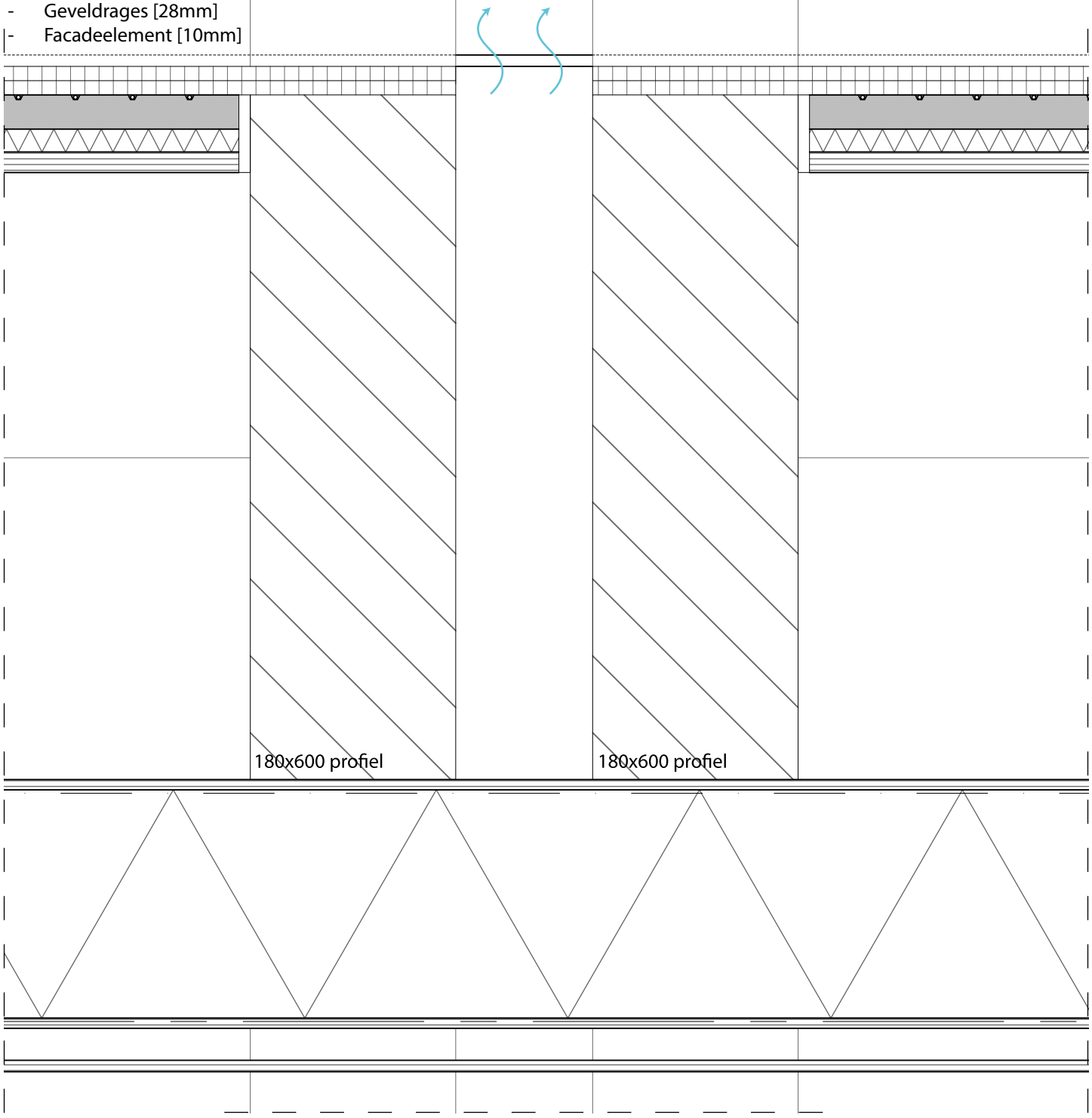


VENTILATION DETAIL

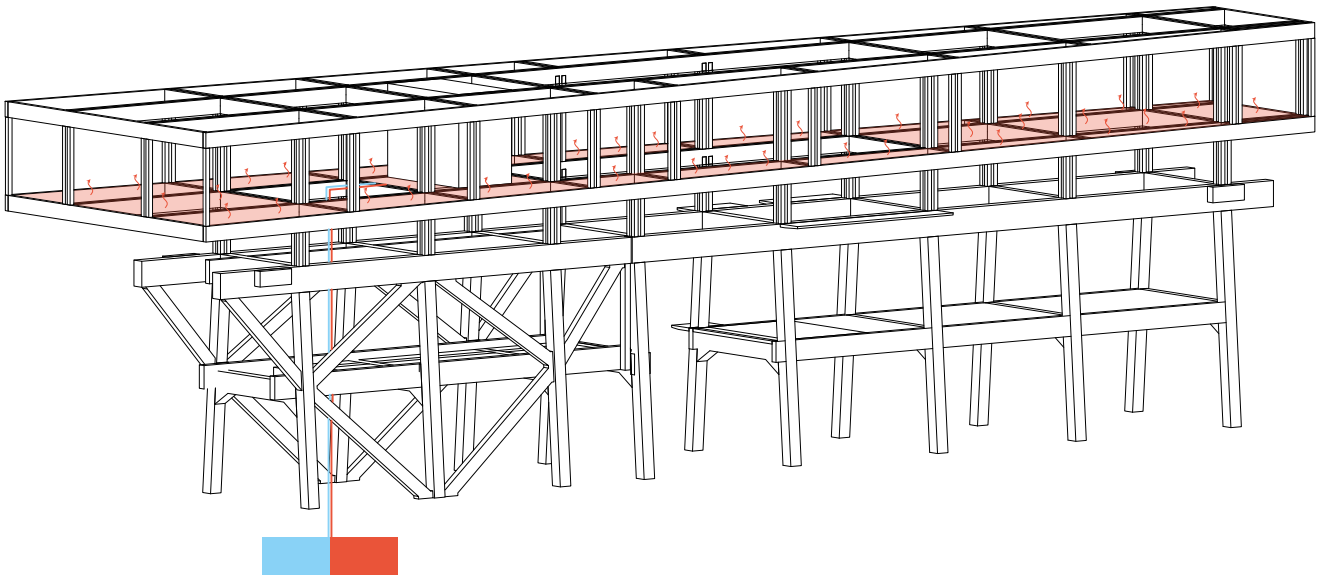
FLOOR 1:5

Vloeropbouw (Rc: ca. 9m2K/W)

- Vloerafwerking [10mm]
- Farmacell [2x12.5mm]
- Vloerverwarming [30mm]
- Isolatielaag [20mm]
- Dampremmende folie
- Houten plaat [18mm]
- Houten liggers [250mm]
- Lucht (tevens installatieruimte)
- Isolatie [250mm]
- Houten plaat [18mm]
- Isolatie [30mm]
- Waterdichte folie
- Geveldrages [28mm]
- Facadeelement [10mm]



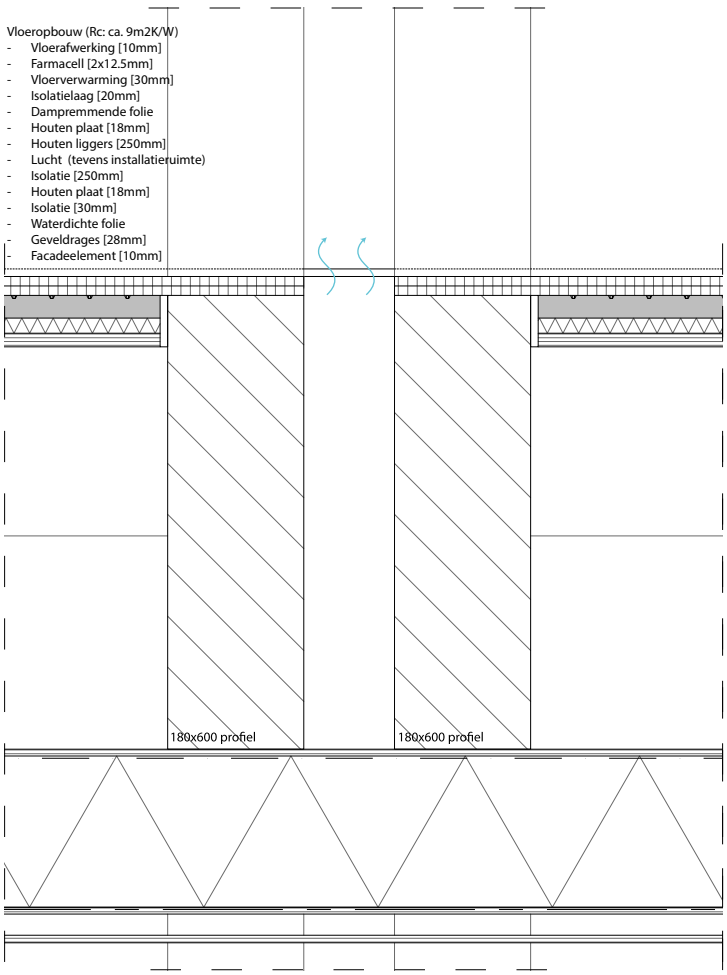
HEATING AND COOLONG
TROUGH INTERGRATED FLOOR SYSTEM



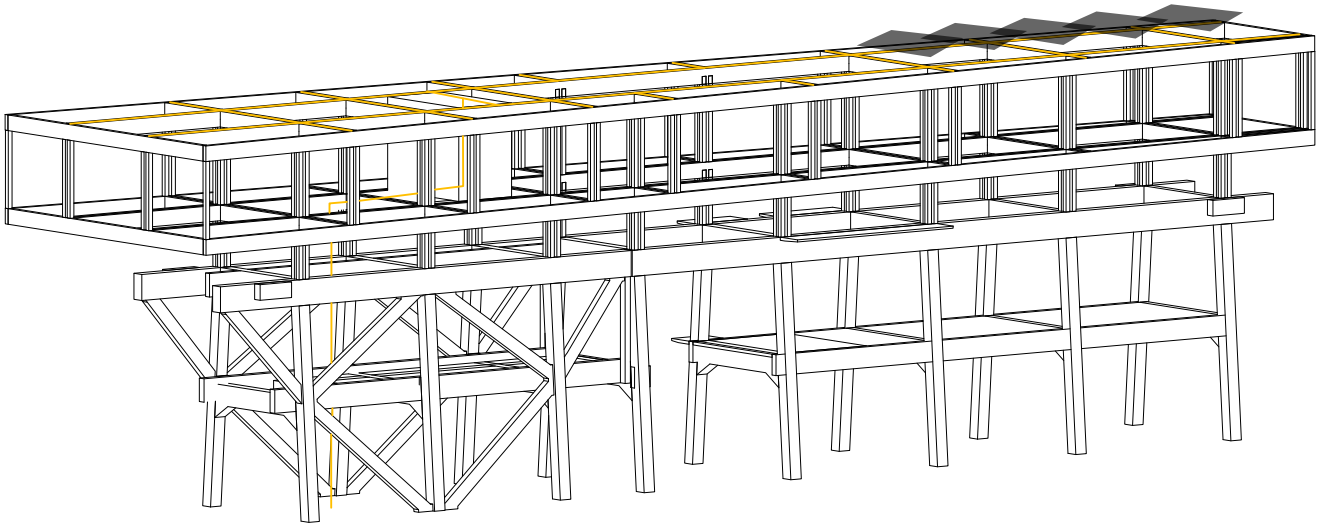
The building incorporates a radiant floor system that provides both heating and cooling, ensuring thermal comfort throughout the year. This system is connected to a seasonal Thermal Energy Storage (TES) installation, typically located underground. In winter, warm water is circulated through the floor to heat the interior spaces, while in summer, cool water helps regulate indoor temperatures. The radiant floor system ensures a stable and comfortable climate with low energy demand, as it operates efficiently at low temperatures.

The system is currently designed to draw energy from an underground aquifer (commonly referred to as a ground-source thermal storage). However, the concept is flexible: it could also be connected to a surface water source, such as a nearby river. In that case, the river acts as a thermal reservoir, absorbing excess heat in summer and providing cooler water in winter. This alternative setup can reduce the impact on the subsurface while still making use of renewable, locally available energy.

By combining radiant floors with a thermal storage system — whether underground or in surface water — the design supports sustainable, low-exergy heating and cooling strategies while maintaining user comfort in a discreet and architecturally integrated manner.



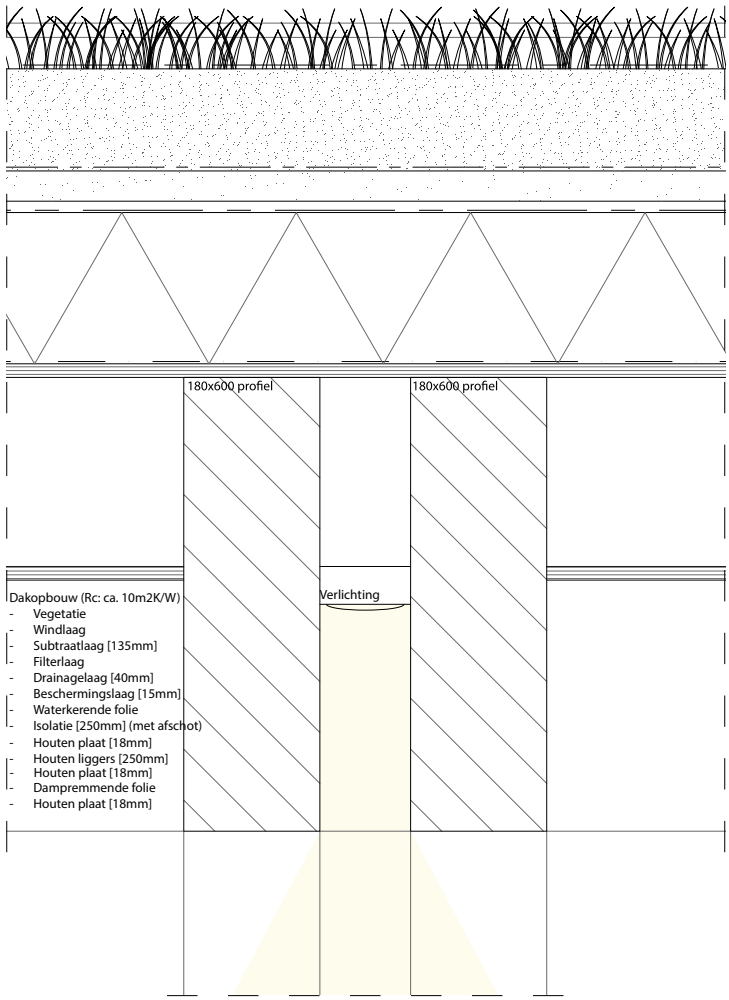
ELECTRICITY
SOLAR PANELS + LIGHT IN BEAMS



Integrated lighting is subtly embedded between twin beams in the ceiling structure. The fixtures are recessed within the space between the double beams, minimizing visual clutter and maintaining a clean architectural expression. This concealed positioning provides a soft, indirect lighting effect that enhances spatial quality without drawing attention to the technical elements.

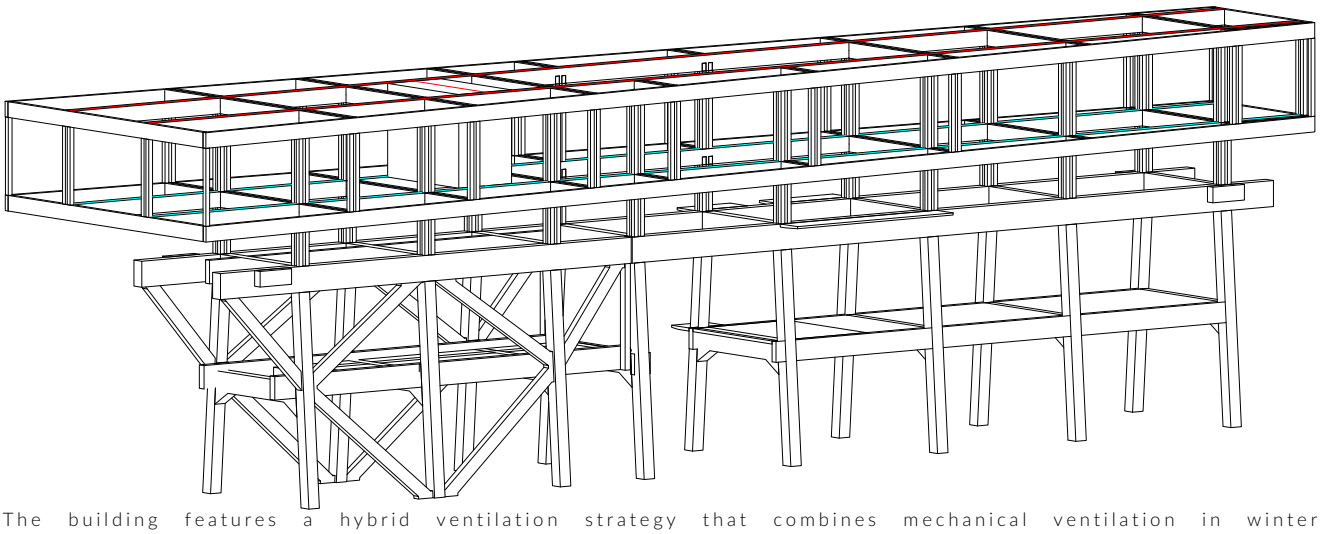
The lighting system is directly linked to PVT (Photovoltaic-Thermal) panels installed on the roof. These hybrid panels generate both electricity and thermal energy, improving overall energy efficiency. The electricity produced is used to power the integrated lighting, creating a closed-loop system that supports sustainability and self-sufficiency. During daylight hours, the building harnesses solar energy to supply artificial lighting when needed — for example, during darker winter days or late evenings — reducing dependency on the grid.

The technical principle is illustrated through a schematic layout showing the position of the lights within the structure, as well as a construction detail that explains the connection between the lighting fixtures and the energy system. This integration not only contributes to a minimal and thoughtful design aesthetic but also reflects a broader ambition to merge architectural detailing with renewable energy systems in a seamless and functional way.



1:5 scaled to 1:10

VENTILATING
TROUGH INTERGRATED SYSTEM WITHING BEAMS

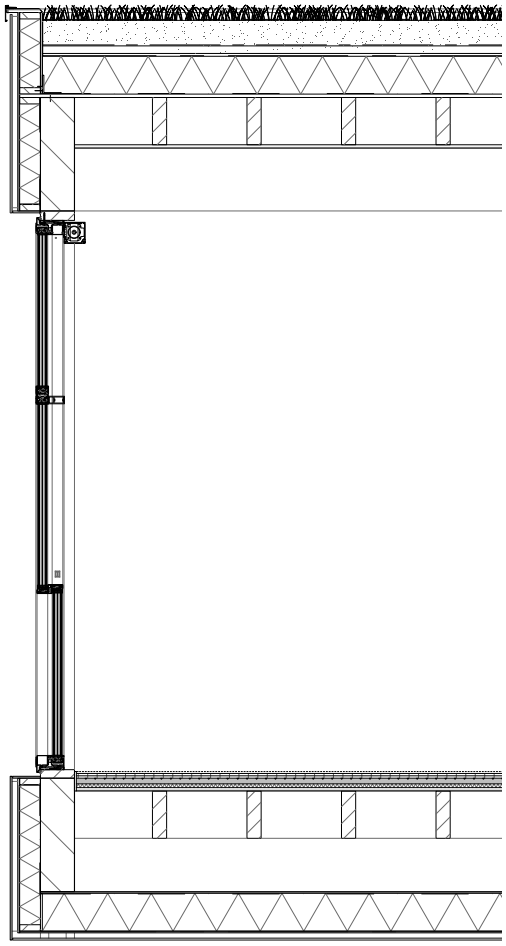


The building features a hybrid ventilation strategy that combines mechanical ventilation in winter with natural ventilation in summer. During the colder months, the façade remains closed to preserve indoor thermal comfort. Fresh air is mechanically supplied through floor-level inlets, allowing it to warm up as it moves through the space. Stale air is extracted at a higher level, taking advantage of natural convection and ensuring efficient vertical airflow. This setup minimizes heat loss, supports energy efficiency, and maintains a healthy indoor climate even when natural ventilation is not feasible.

In summer, the design allows the entire façade to open, enabling cross-ventilation and maximizing natural airflow. This passive strategy reduces reliance on mechanical systems, saving energy and creating a direct connection between the indoor and outdoor environments. The flexibility to switch between mechanical and natural ventilation ensures year-round comfort while responding to seasonal changes. Additionally, operable windows offer users a sense of control over their environment, which can enhance comfort and well-being.

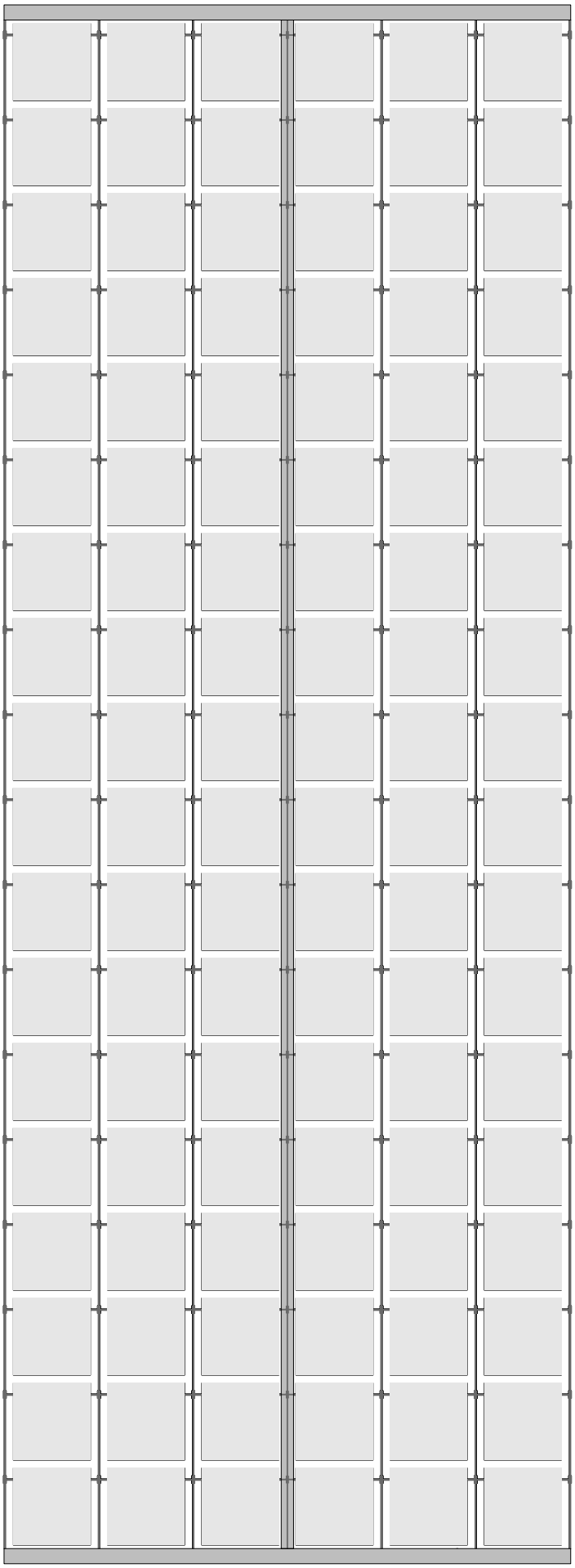
By combining controlled mechanical ventilation with the option for full natural ventilation, the system achieves both energy performance and spatial comfort, supporting sustainability goals while maintaining high indoor air quality throughout the year.

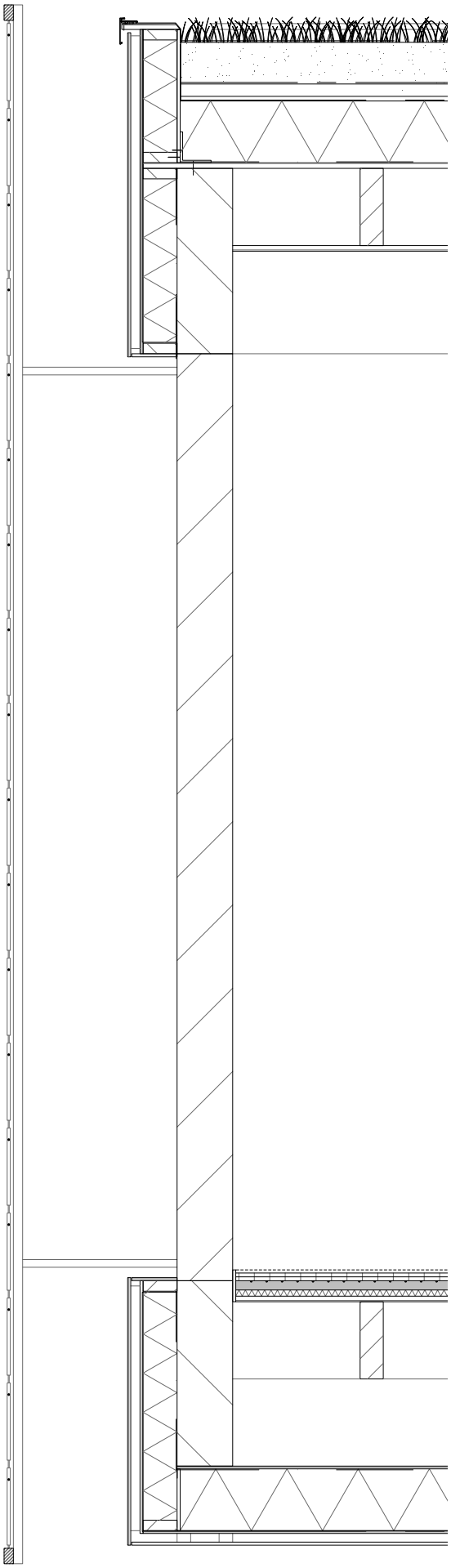
Winter situation
closed windows



Summer situation
Open windows

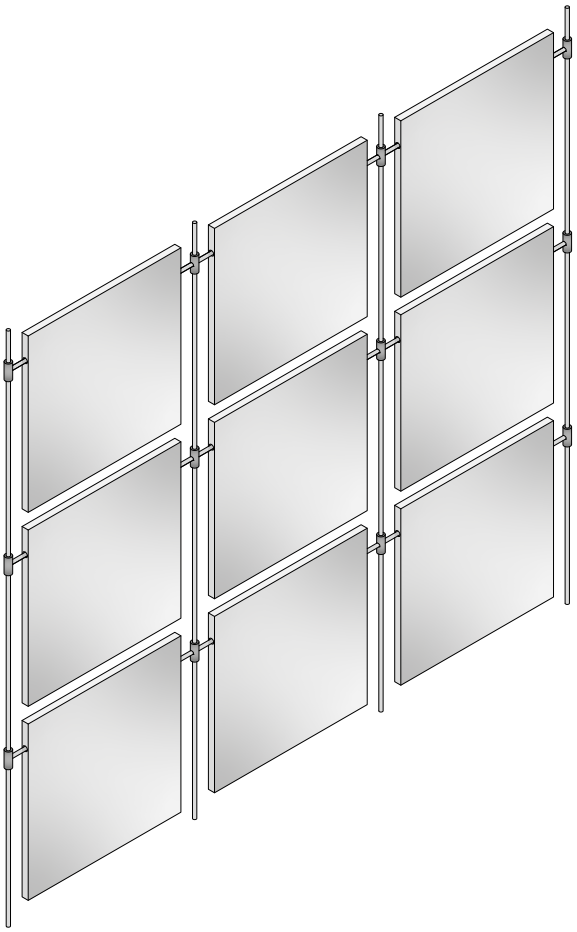
FACADE
PRINCIPLE



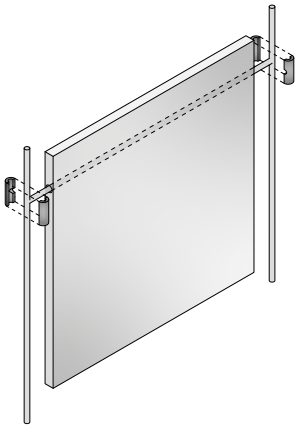


1:20 section facade

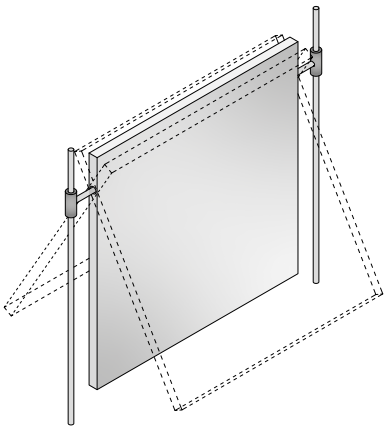
FACADE
SYSTEM



Facade elements connected



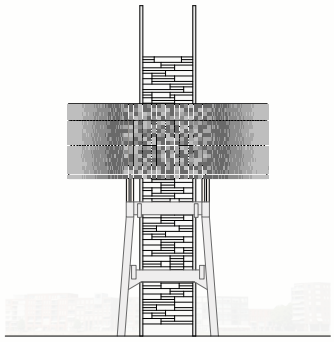
Idividual elemet connected



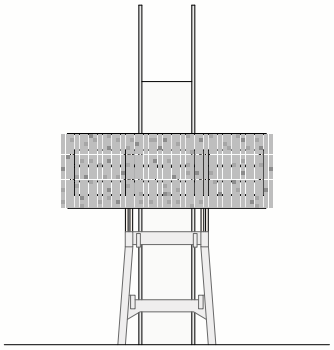
Ability to move

Reference Ned Kahn facade
https://nedkahn.com/portfolio-category/wind

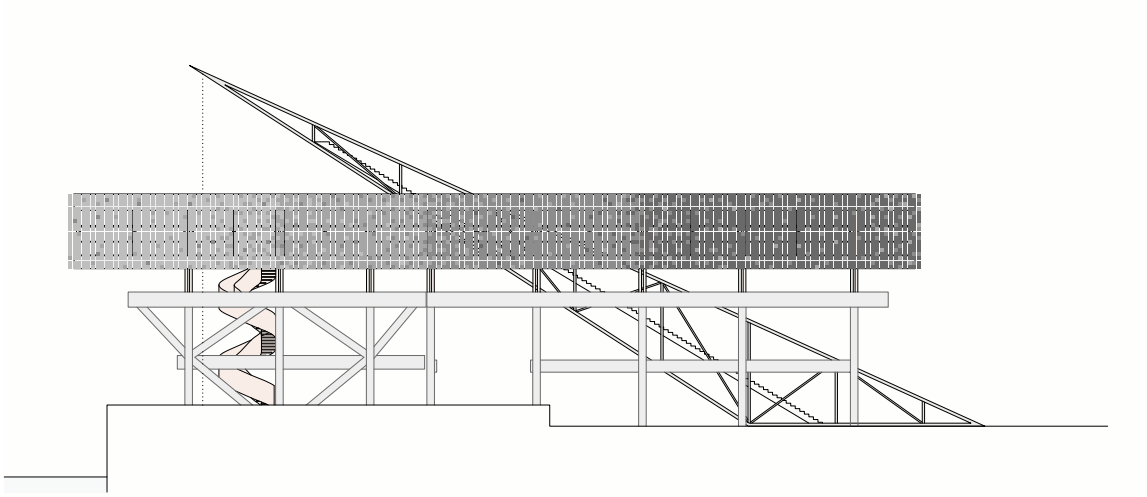
FACADE
ELEVATIONS 1:500



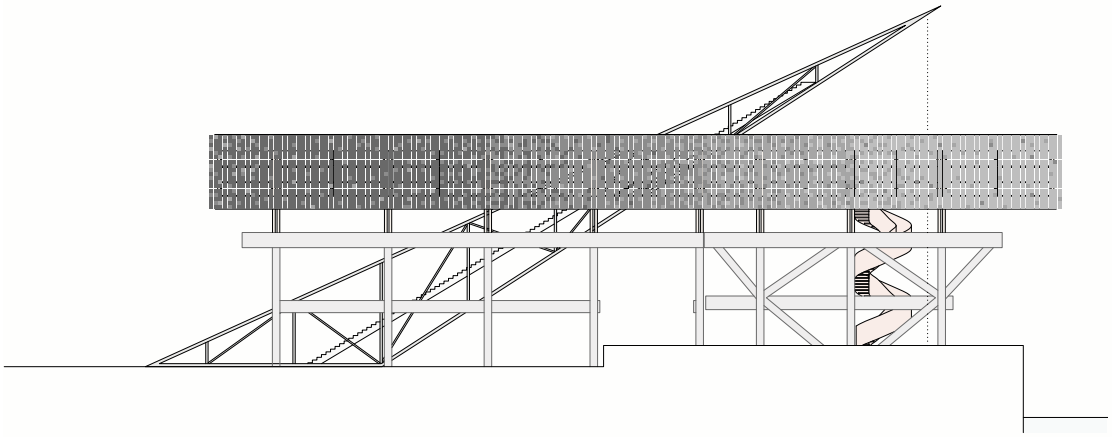
South



North



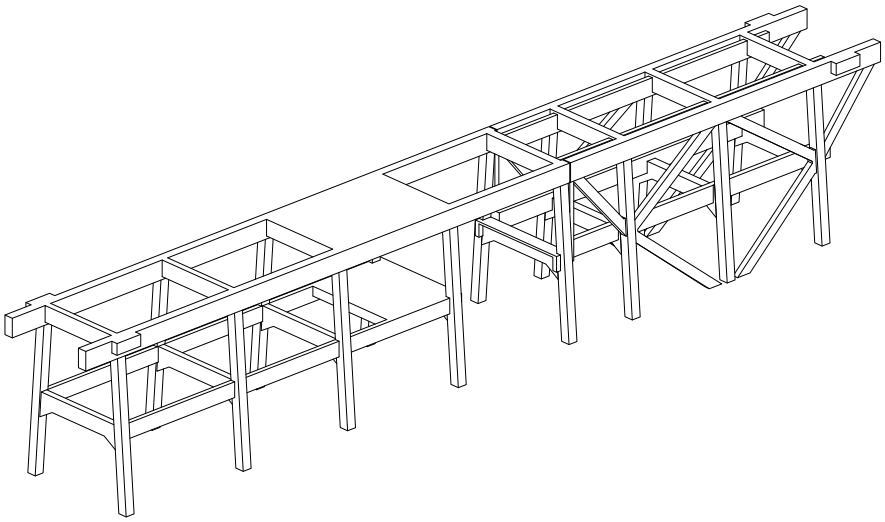
West



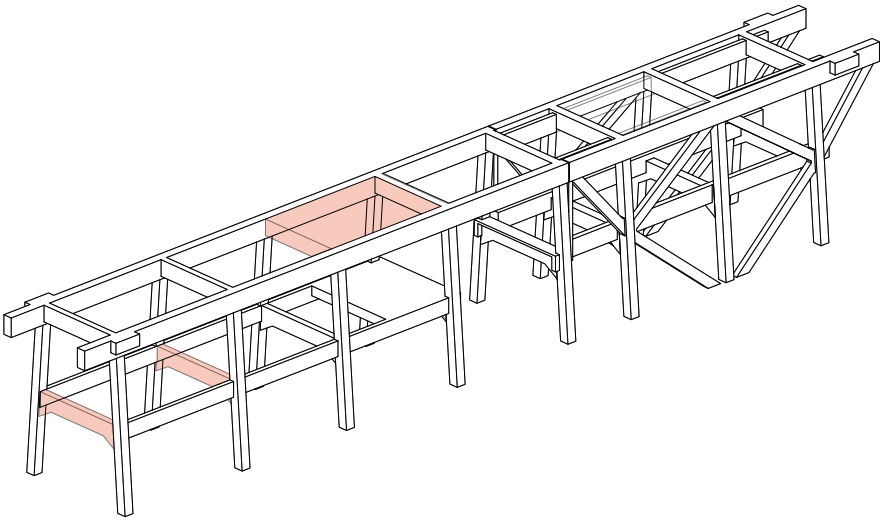
East

PLAN OF REMOVAL

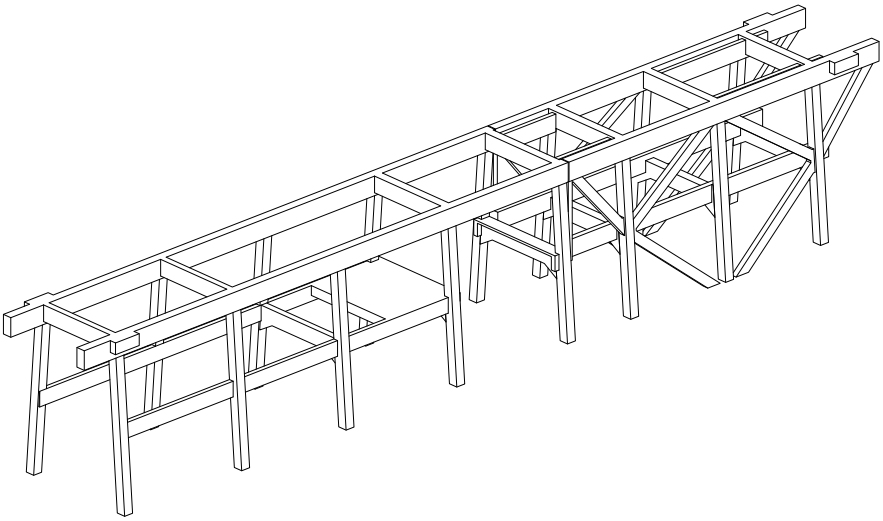
WHAT WILL BE REMOVED FROM THE ORIGINAL TRACK



Current situation



Removed parts highlighted



New situation

BEYOND BUILDINGS

THE FUTURE OF MARITIME LEFTOVERS

P5
ARCHITECTURE

AR3AH0115

GRADUATION STUDIO: REVITALISING HERITAGE
DELFT UNIVERSITY OF TECHNOLOGY
2024/2025

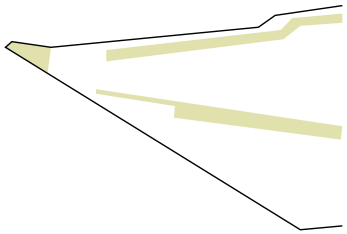
ANNE KIKKERT – 4818288

POINT OF INTEREST
KRAANBAAN

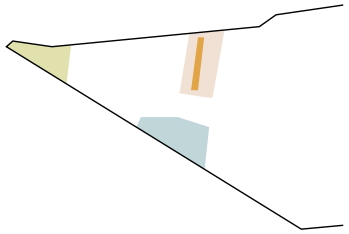
Figure 2: Strava route 14 September 2024
Own image

Figure 3-7: Strava route 4 September 2024
Own images

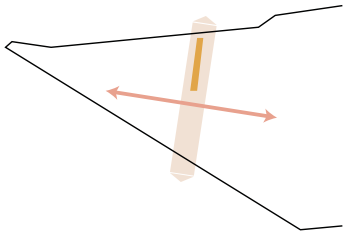
CONCEPTS SITE



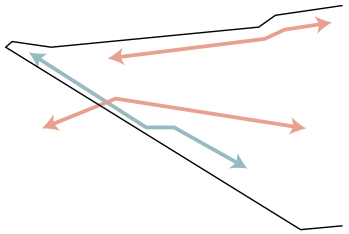
Greenery



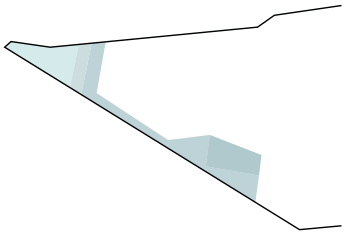
Different areas different characters



Central square

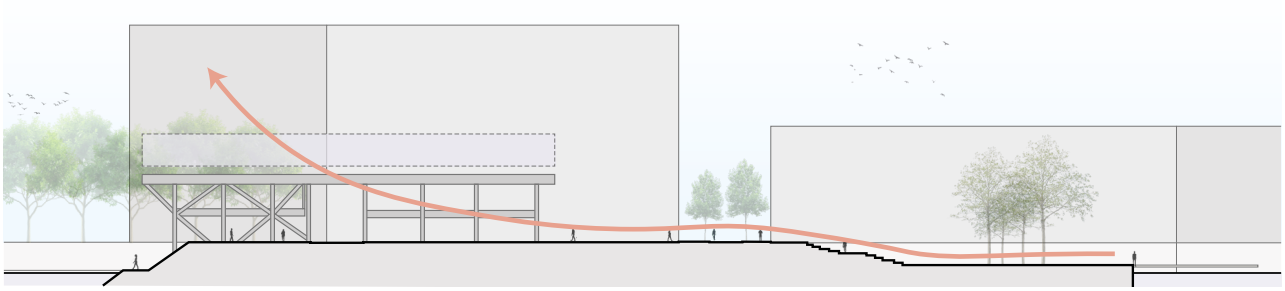


Connecting with the city and the water

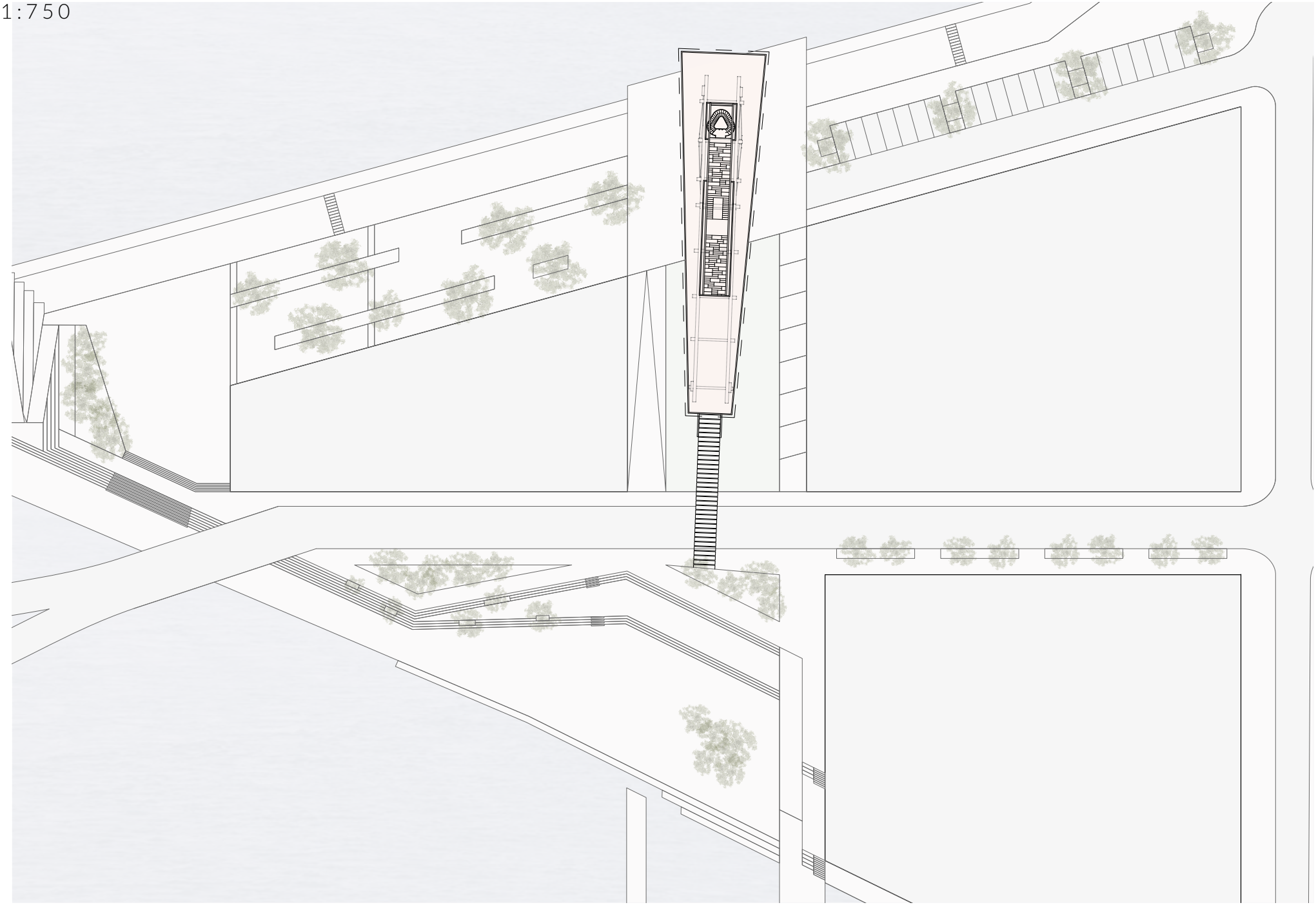


Use the water in the urban environment

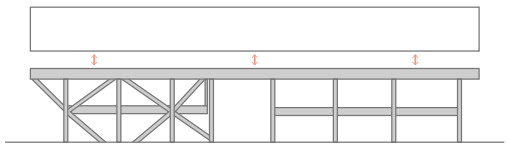
CONCEPTS INPLEMENTED



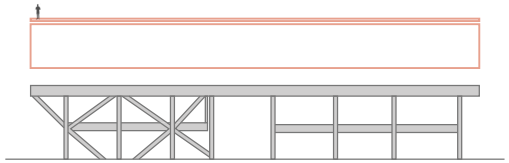
SITE
1:750



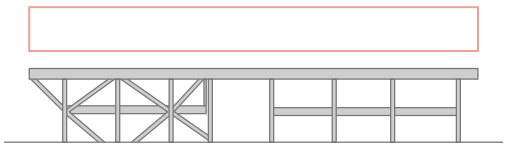
CONCEPTS KRAANBAAN



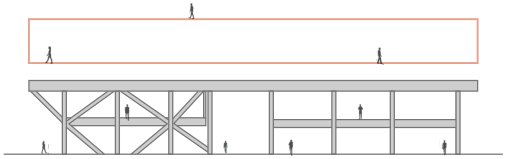
Distance between 'old' and 'new'



Function and viewpoint



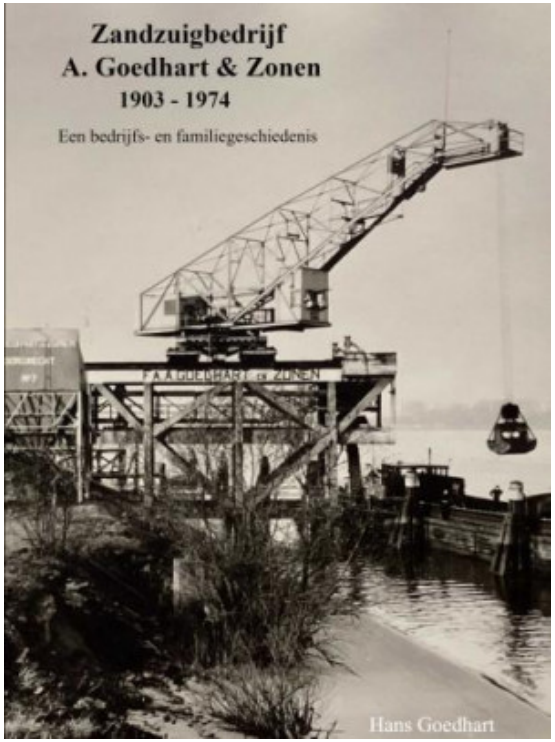
Physical difference between 'old' and 'new'

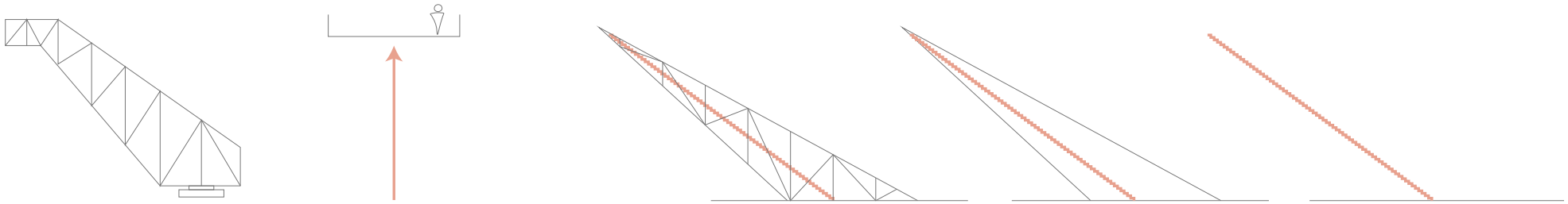


Place where people can meet

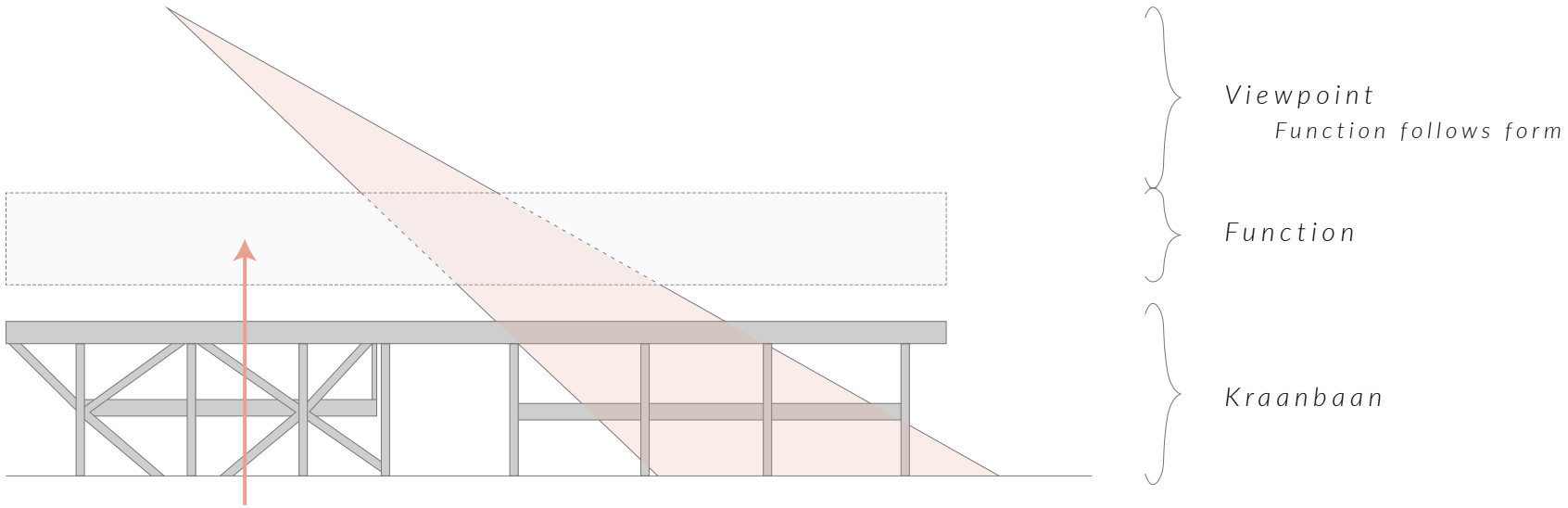
SITE
1:750


Overslagbedrijf
Hefvermogen kraan 5 ton
1953

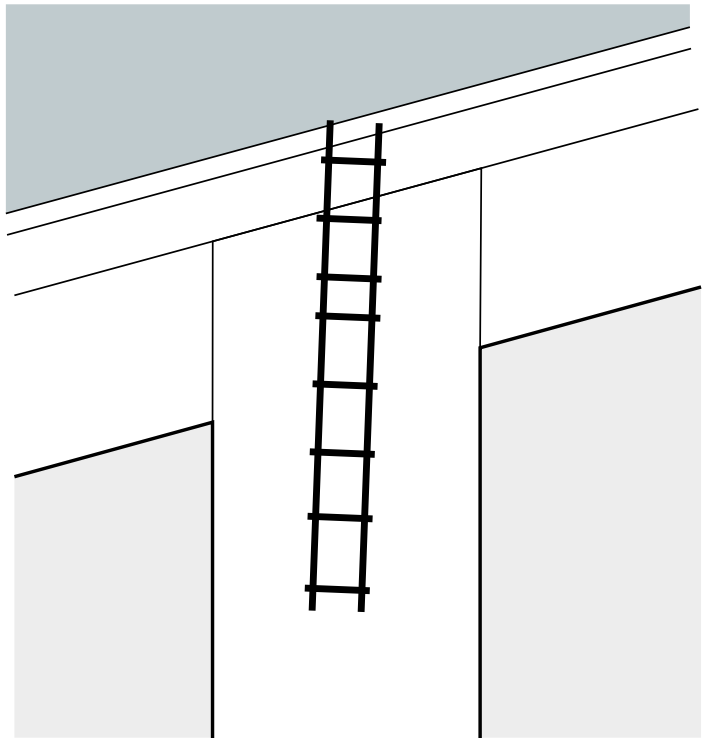

Zandzuigbedrijf
A. Goedhart & Zonen
1903 - 1974
Een bedrijfs- en familiegeschiedenis
Hans Goedhart

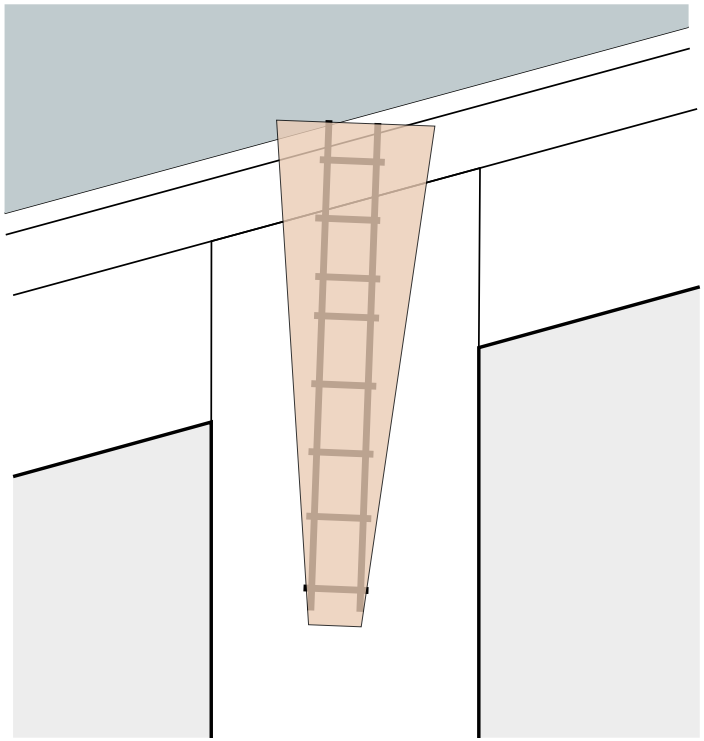


SITE
1:750

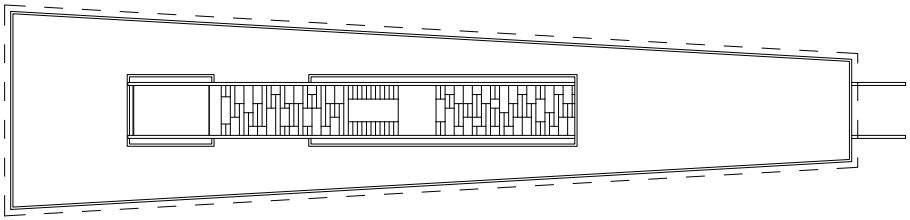


VOLUME
SHAPE

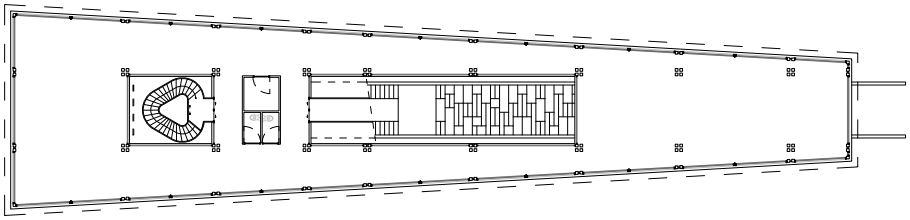




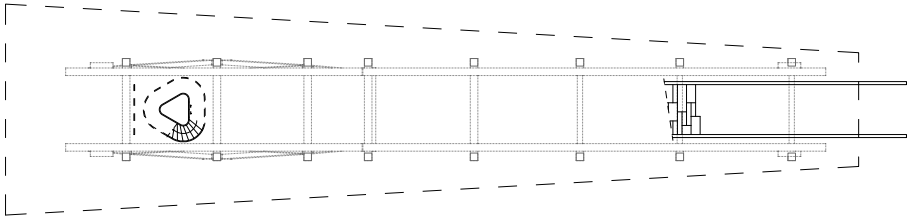
FLOORPLAN
OVERVIEW 1:500



ROOF

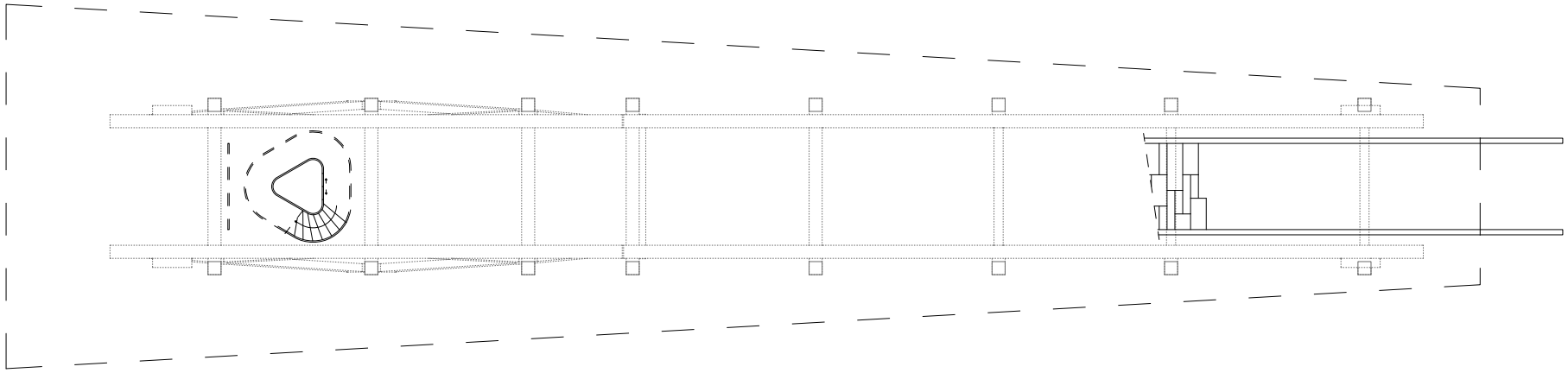


MAIN FLOOR

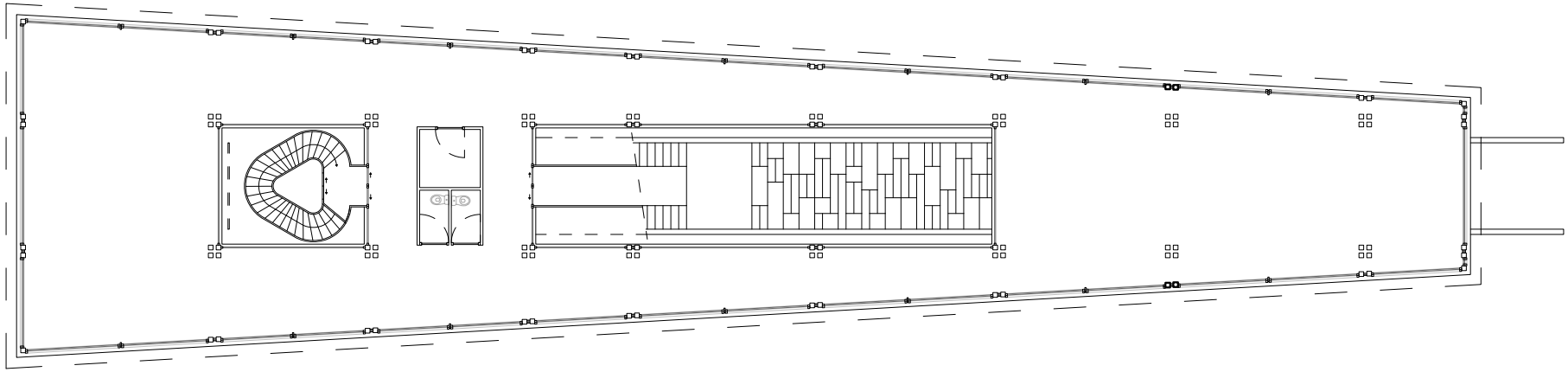


GROUND FLOOR

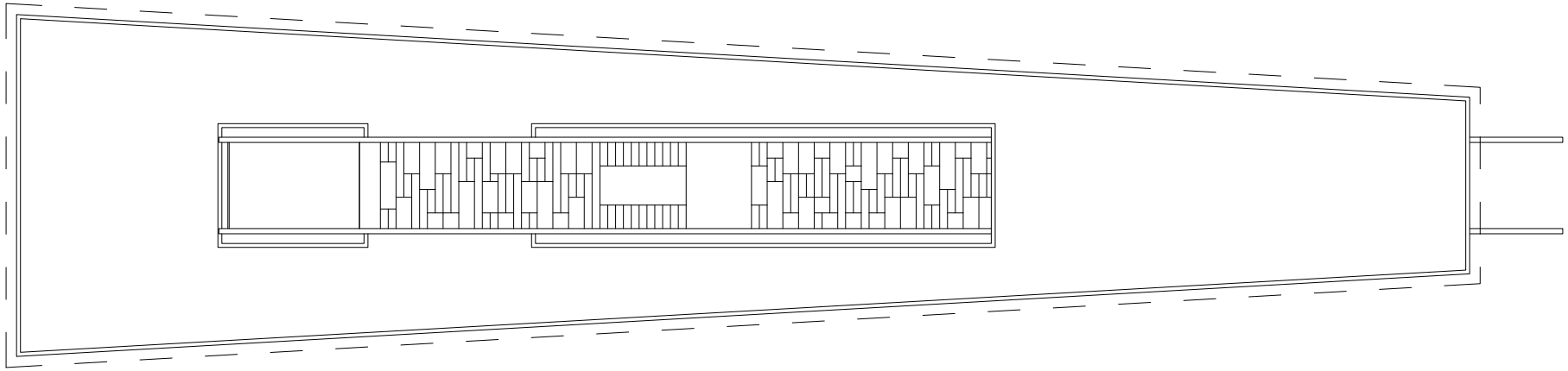
FLOORPLAN
GROUND FLOOR 1:250



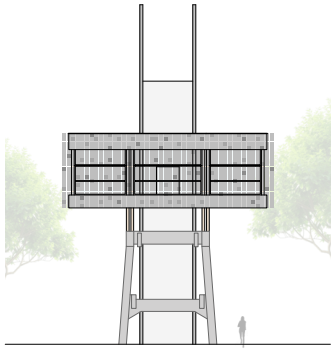
FLOORPLAN
MAIN FLOOR 1:250

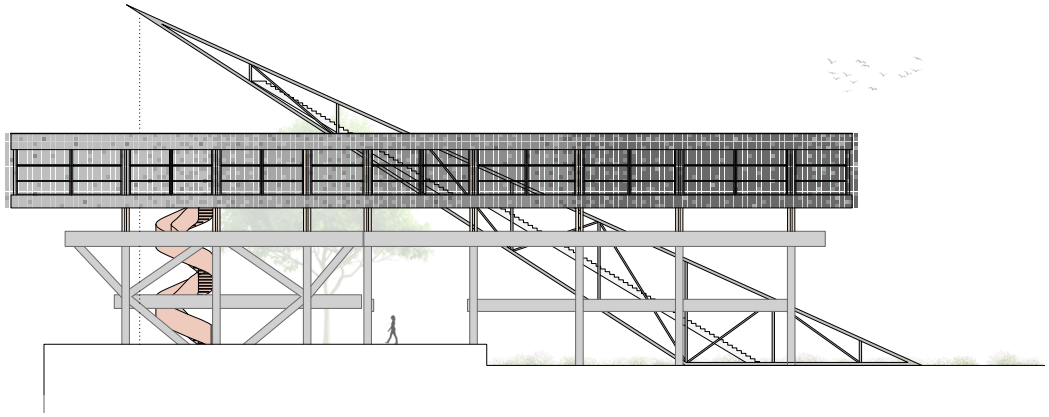


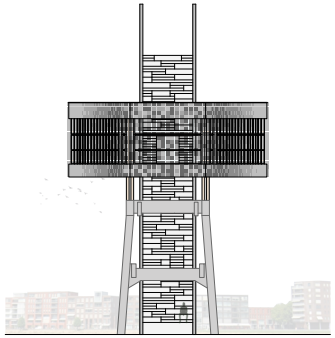
FLOORPLAN
ROOF 1:250

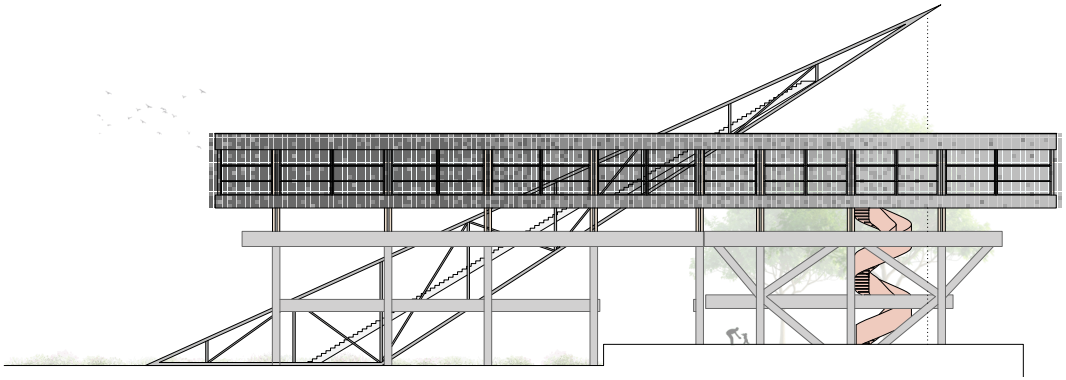


ELEVATIONS
OVERVIEW 1:500

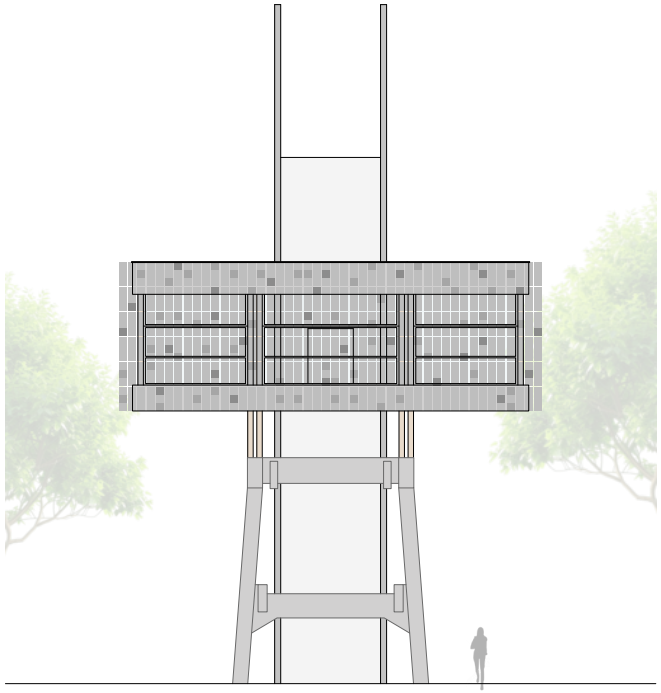




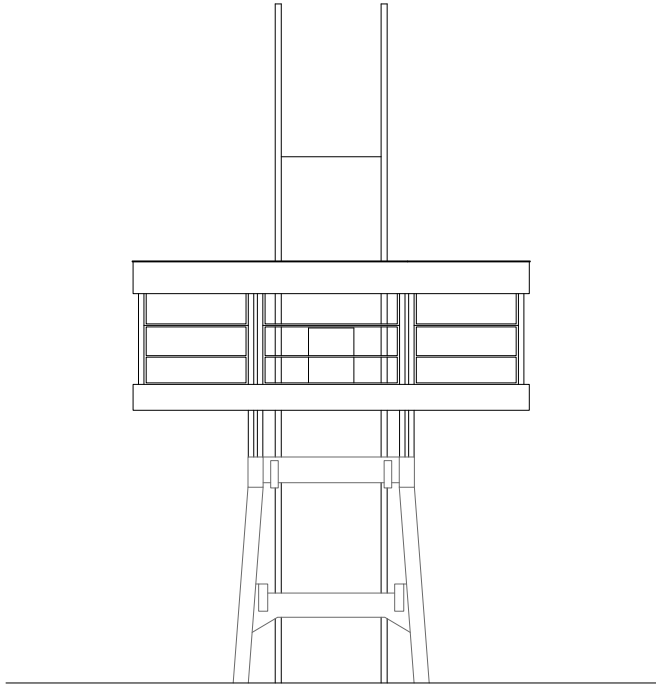




ELEVATION
NORTH 1:250



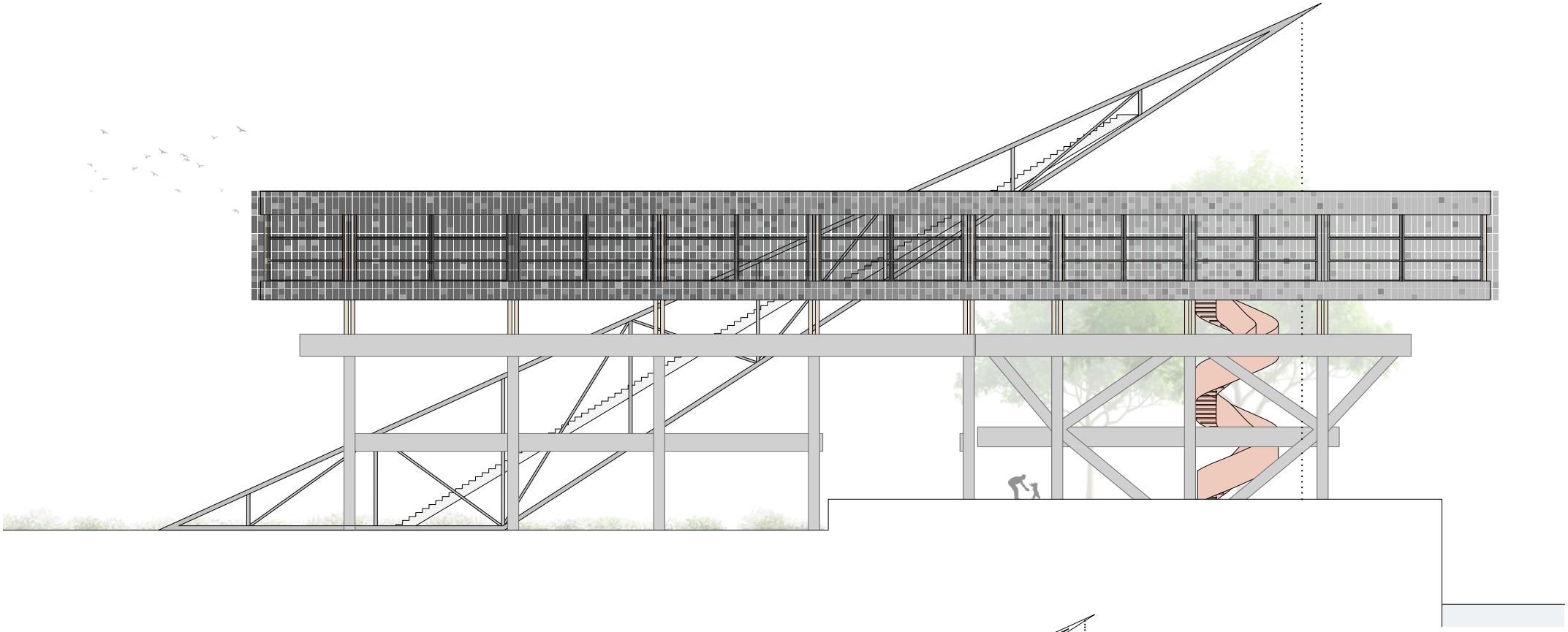
WITH SECOND FACADE

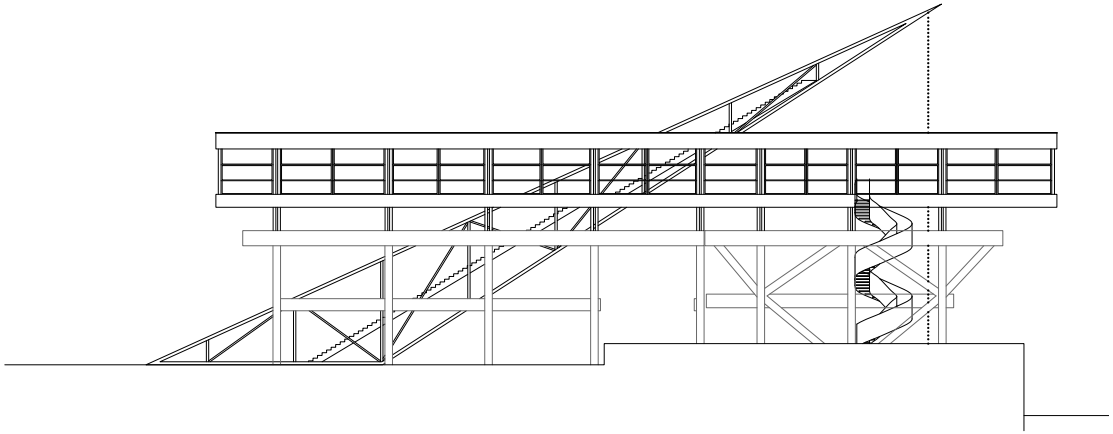


WITHOUT SECOND FACADE

ELEVATION
EAST

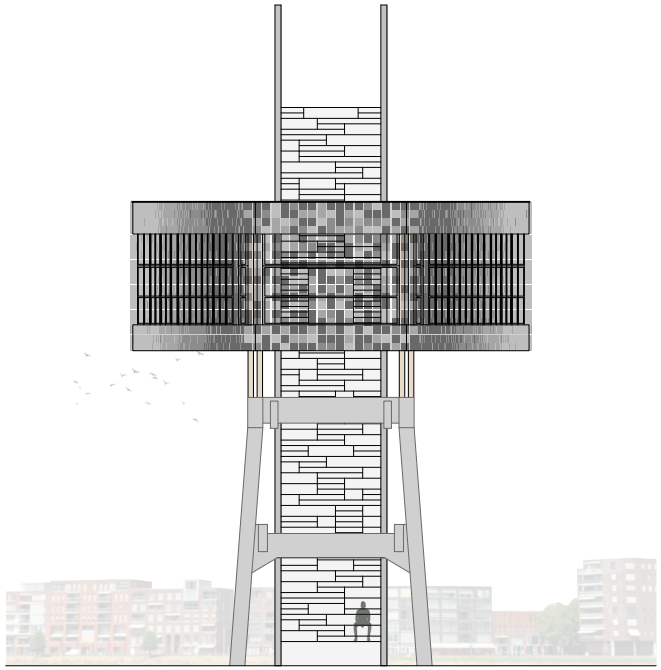
WITH SECOND FACADE
1:250



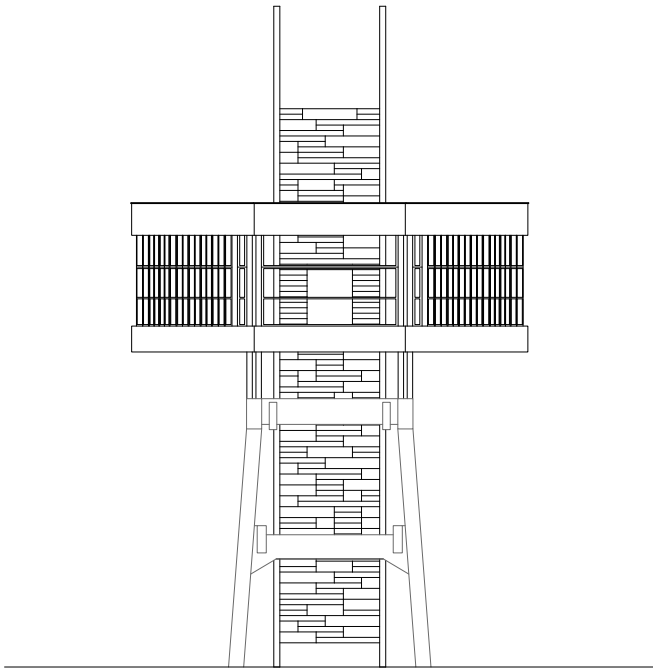


WITHOUT SECOND FACADE
1:500

ELEVATION
SOUTH 1:250



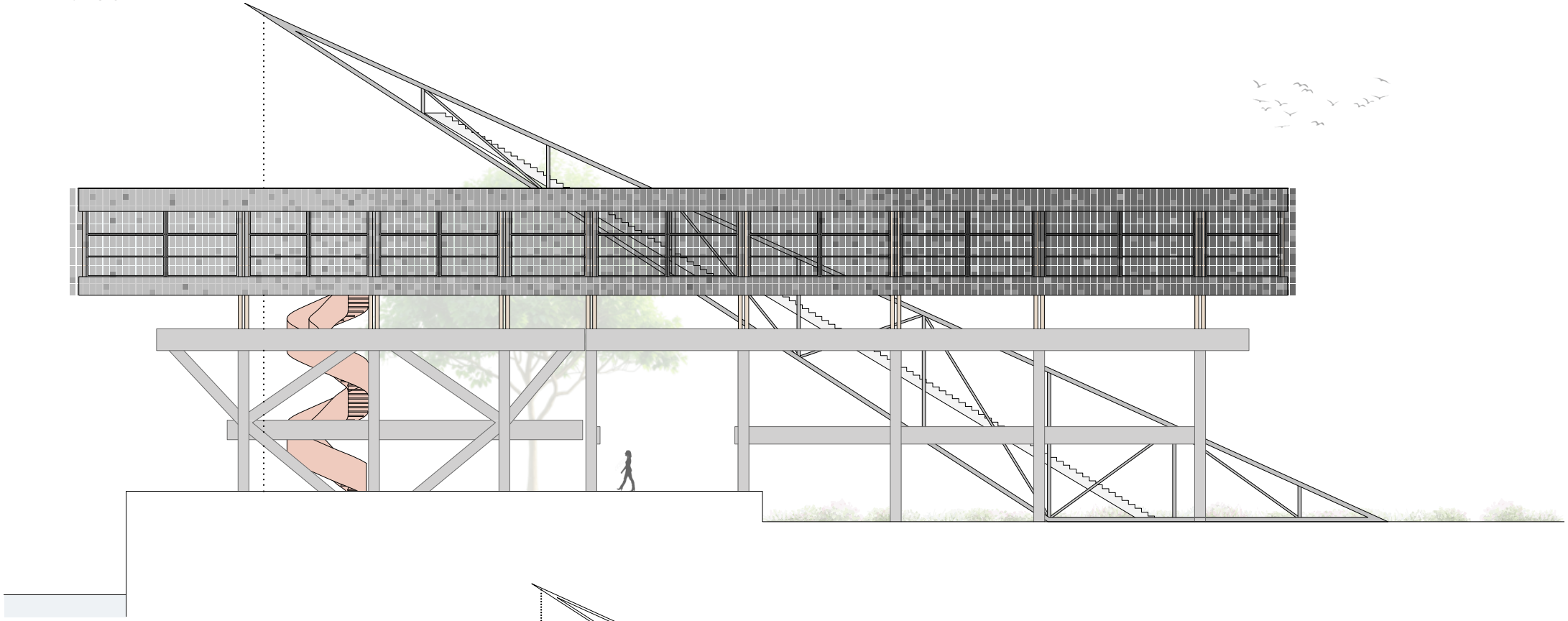
WITH SECOND FACADE

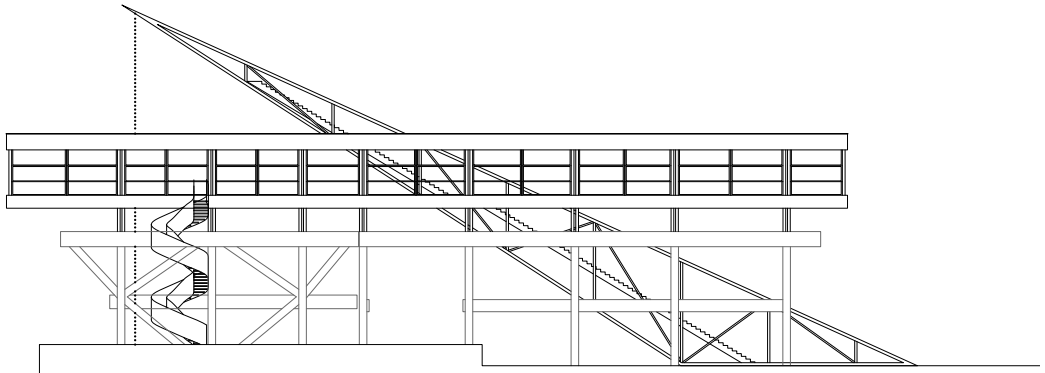


WITHOUT SECOND FACADE

ELEVATION
WEST 1:250

WITH SECOND FACADE
1:250

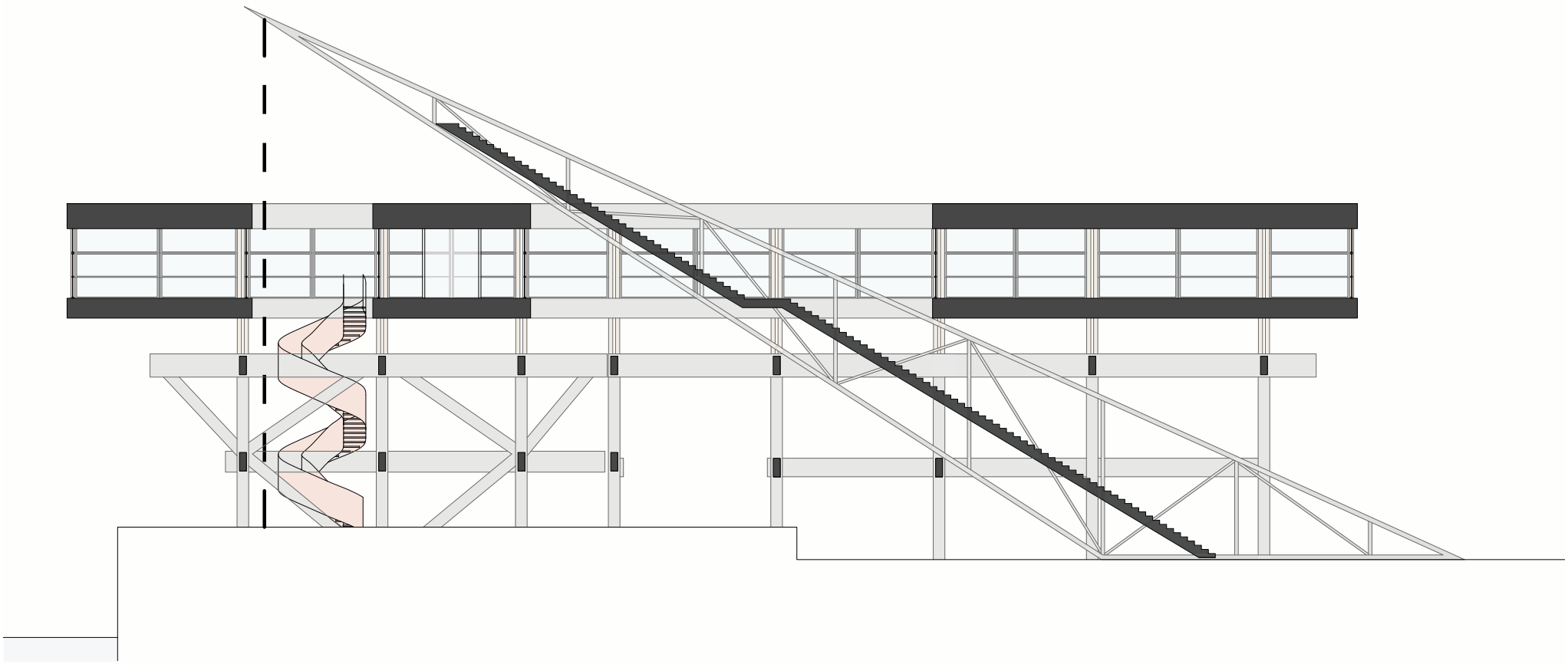


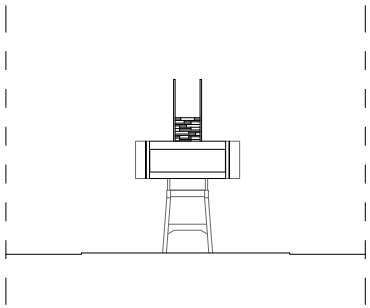


WITHOUT SECOND FACADE
1:500

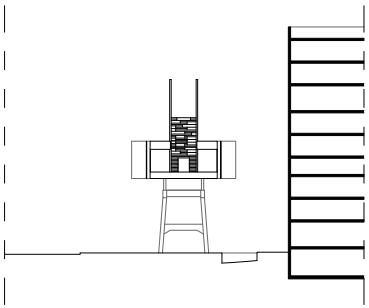
SECTIONS

SECTION 1-1' 1:250

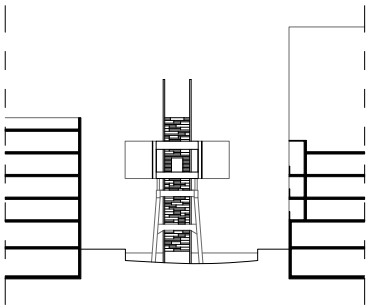




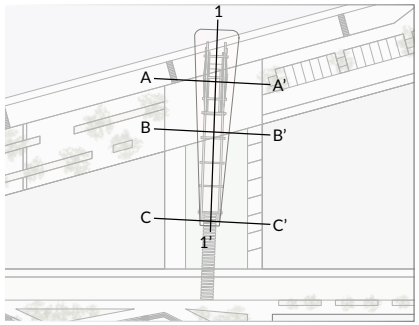
SECTION A-A' 1:500



SECTION B-B' 1:500

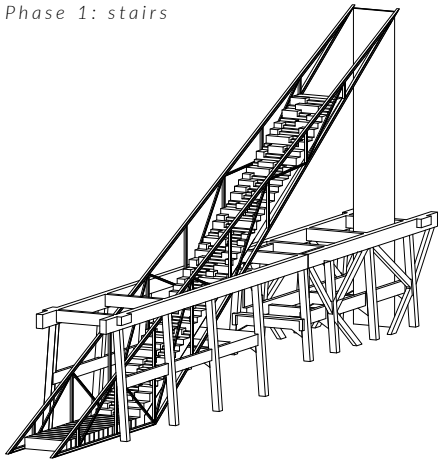


SECTION C-C' 1:500

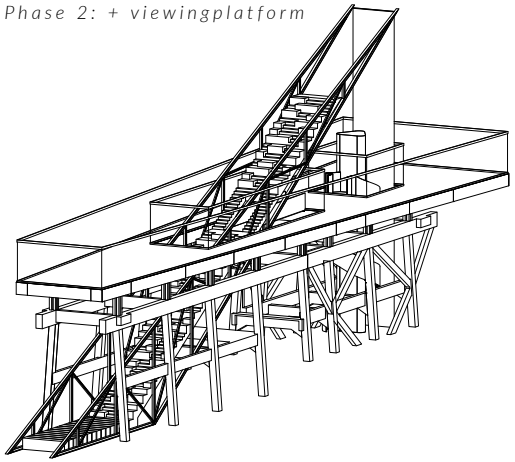


PHASES
POSSIBLE PHASES TO CONSTRUCT

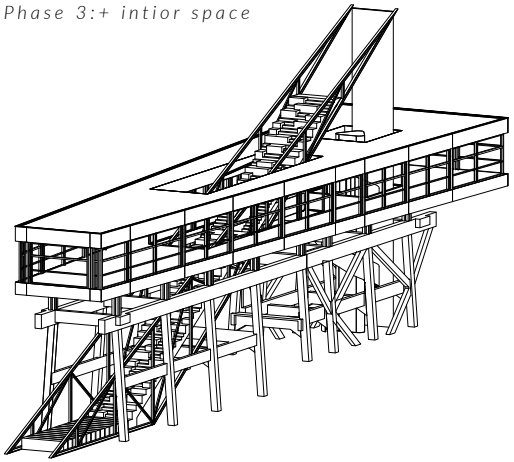
Phase 1: stairs



Phase 2: + viewingplatform



Phase 3:+ intior space



Phase 4: + exterior facade