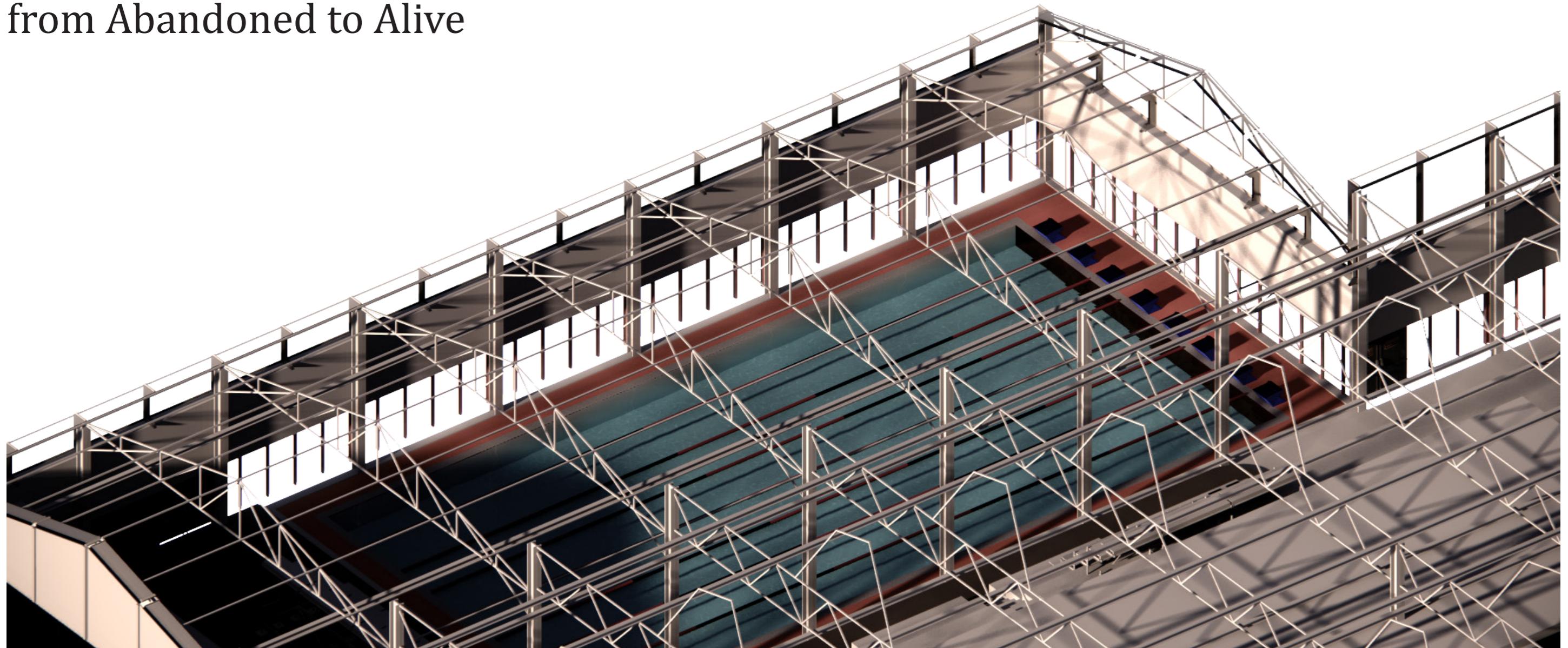
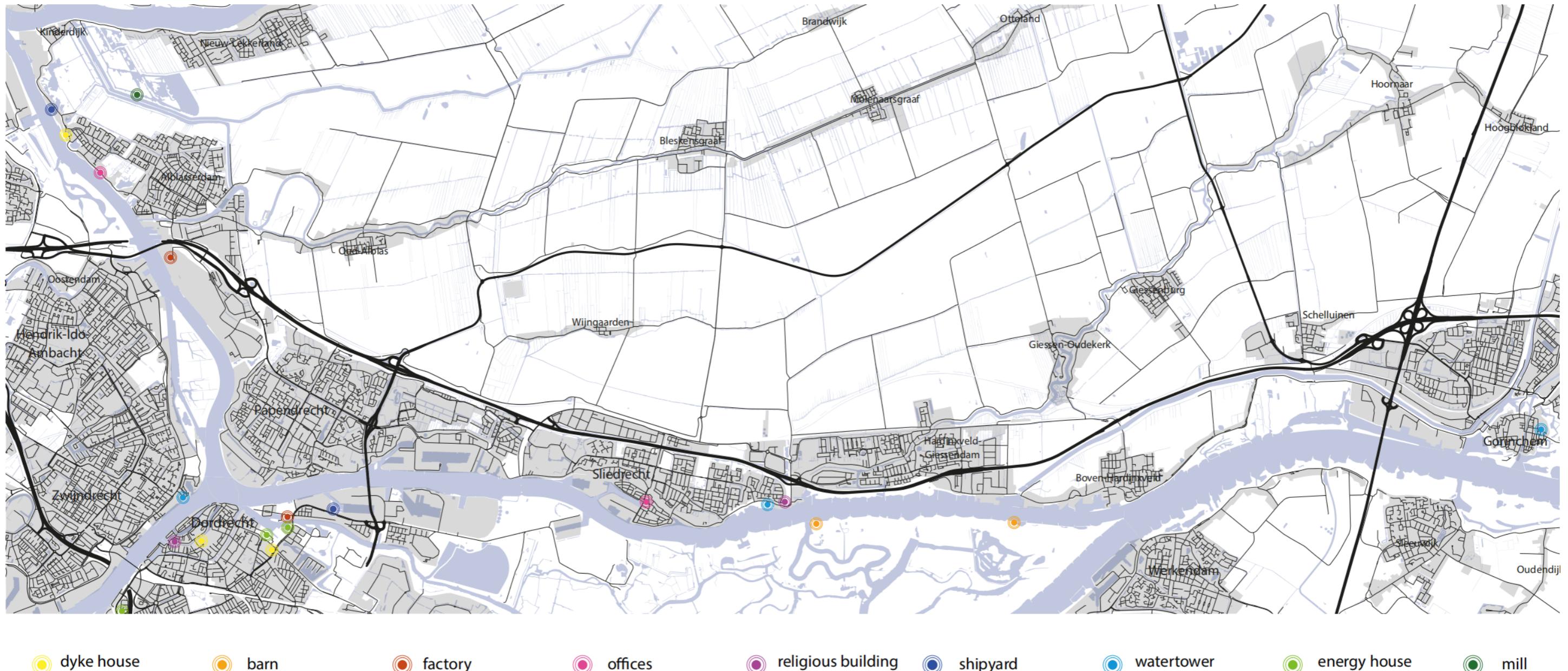


Regeneration of Value: Journey of a Waterfront Industrial Heritage from Abandoned to Alive



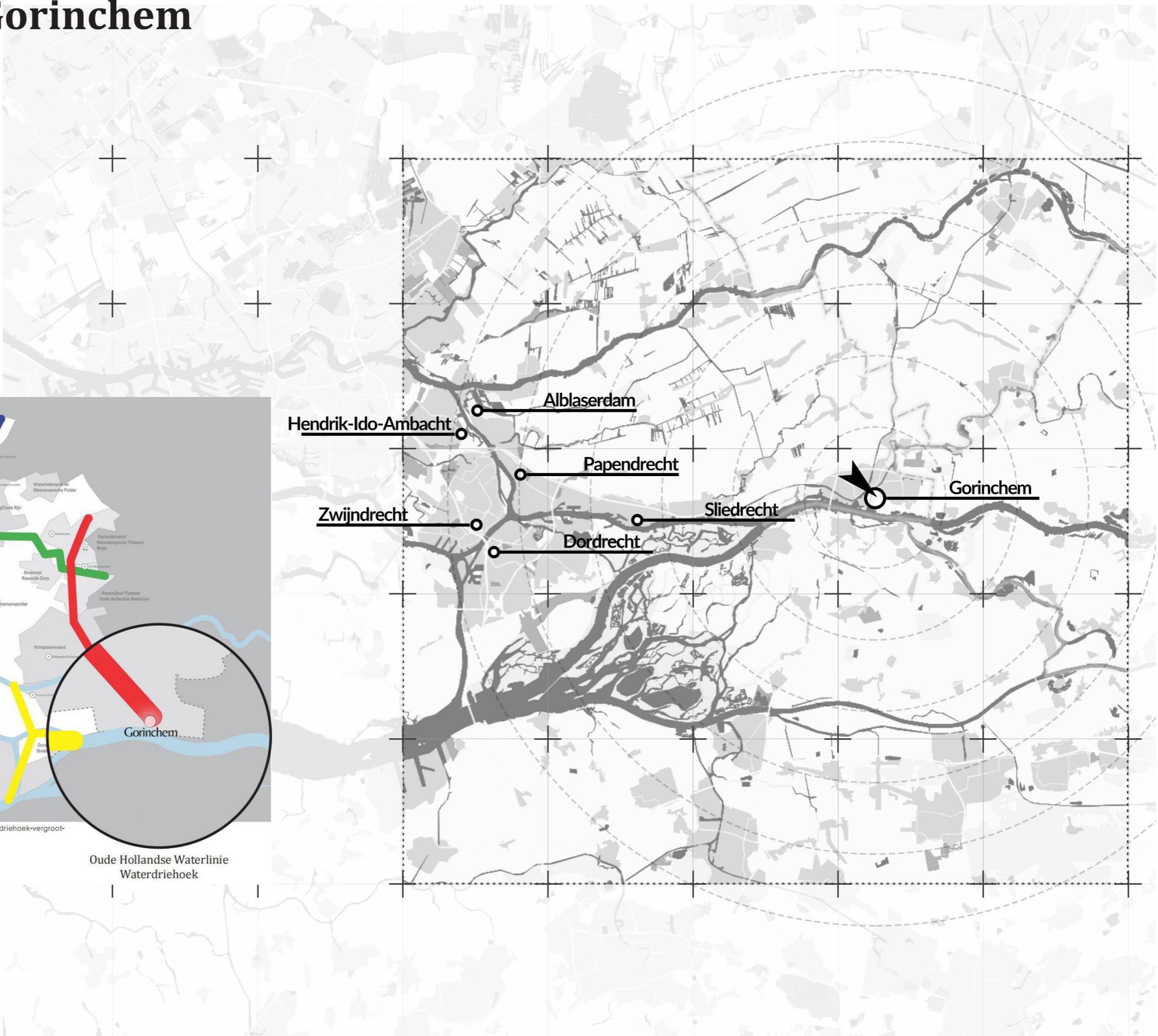
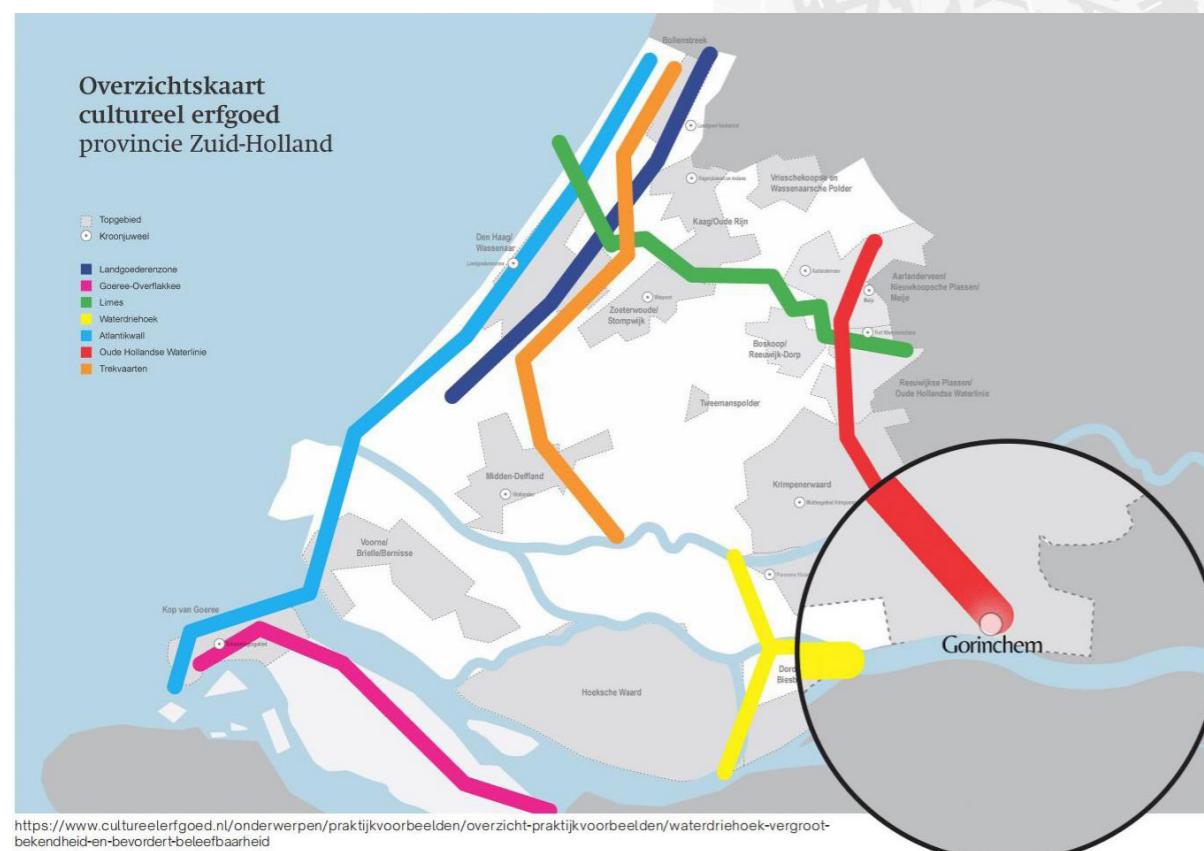
Water Sports Center Design in Gorinchem ©Xiaoling Wei (2025)

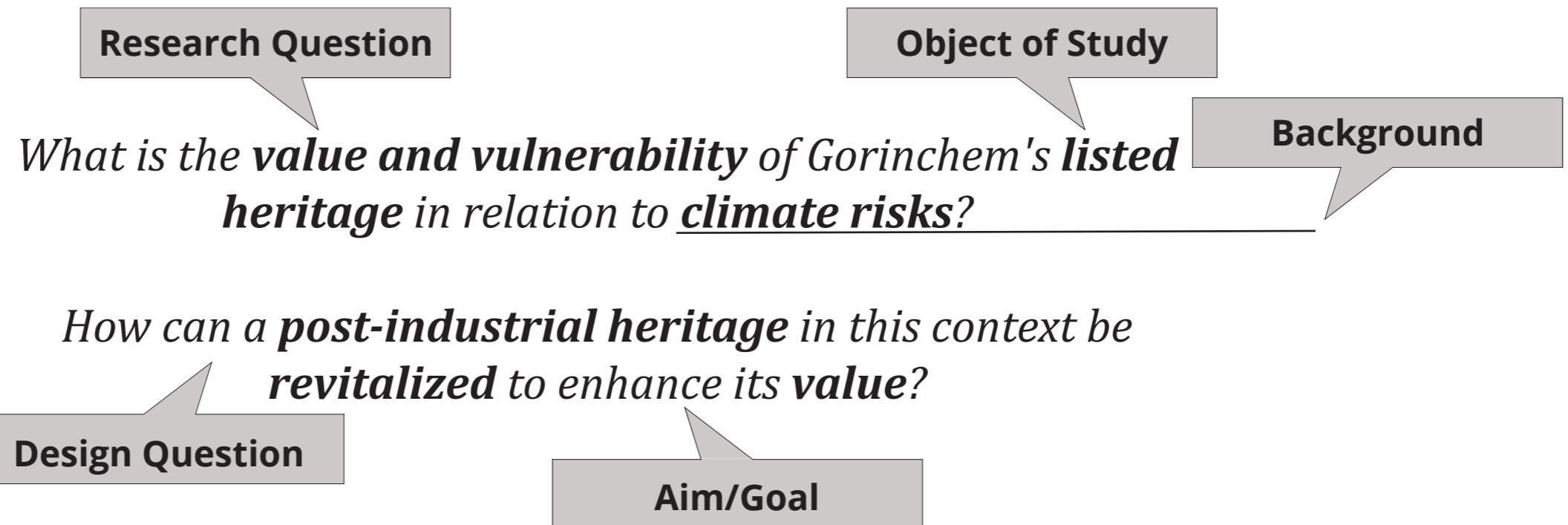
the "Waterdriehoek"



©AR3AH115 Studio Work. (2024)

Waterdriehoek & Gorinchem





Method from Literature Review: Climate-vulnerability and Value Assessment

A Qualitative Approach - Method by Brokerhof et al. (2023)

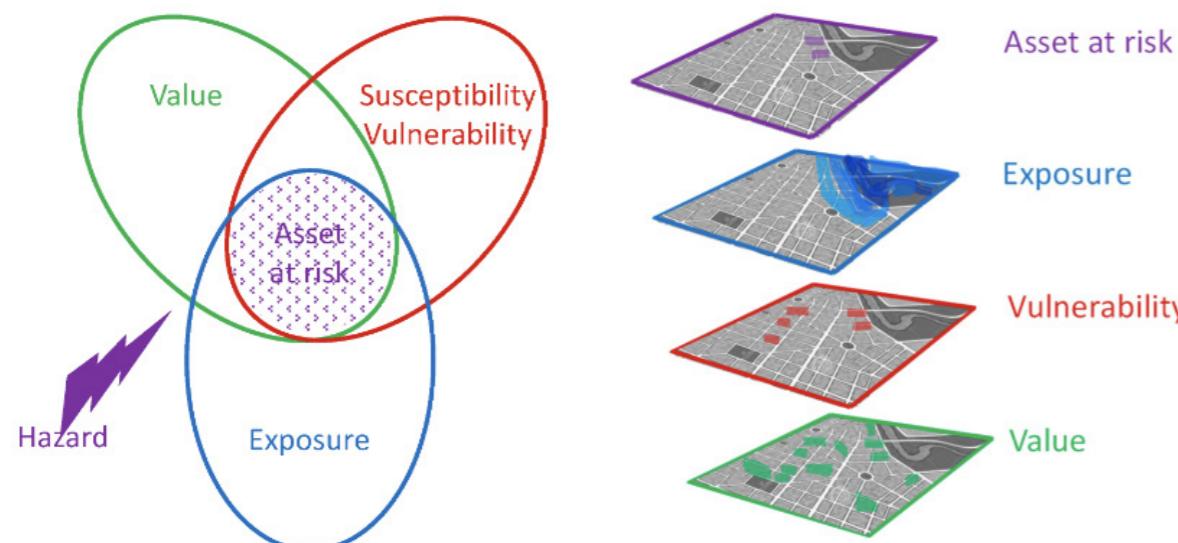


Fig. 2.1.1. Principle of the Quick Flood Risk Scan Method. ©Brokerhof et al.

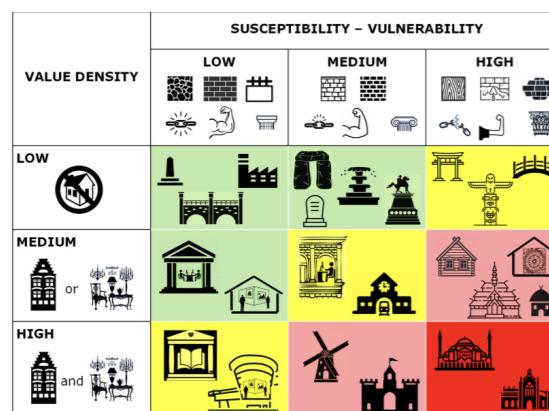


Fig. 2.1.2. Vulnerability-Value Matrix. ©Brokerhof et al.



Fig. 2.1.3. Mapping of Research Objects on Hazard Map. ©Brokerhof et al.

A Quantitative Approach - Method by Stephenson and D'Ayala (2022)

Descriptor	Response	VR
Age	Medieval/Tudor	100
	Jacobean	77.5
	Georgian	55
	Victorian	32.5
	Modern	10
Listed status	Grade I	100
	Grade II*	70
	Grade II	40
	Not listed	10
Storeys	4	100
	3	70
	2	40
	1	10
Construction	Earth	100
	Timber frame	70
	Brick masonry	40
	Stone masonry	10
Condition	Poor	100
	Good	55
	Excellent	10

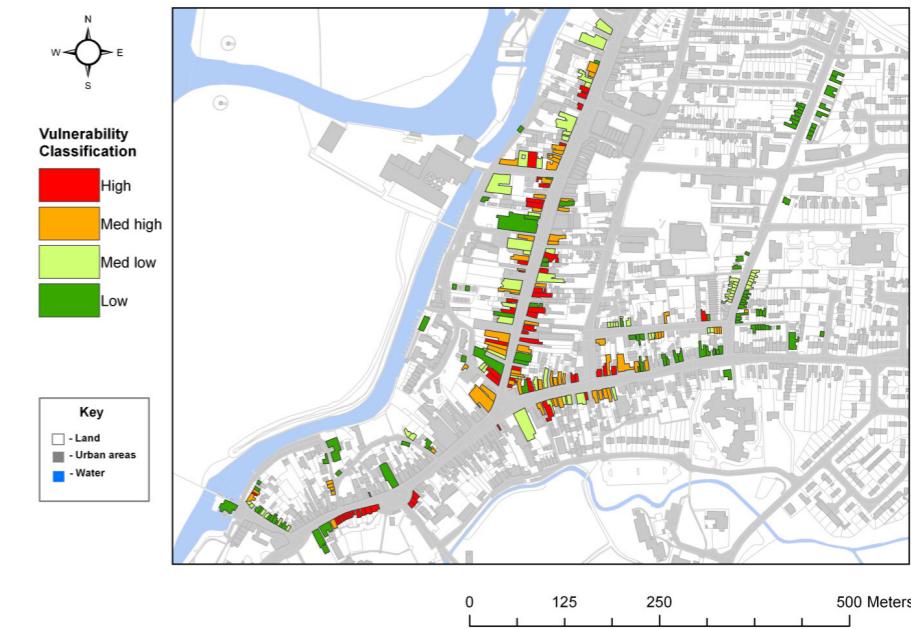
Table. 2.2. Vulnerability Descriptor Ratings.
©V. Stephenson and D. D'Ayala

Fig. 2.2. Vulnerability Map of Tewkesbury. ©V. Stephenson and D. D'Ayala

Research Objects in Gorinchem

1. Service Building



2. Sugar Factory



3. Housing Complex



16. Power Station



17. Industrial Hall



18. Religious Building



4. Housing Complex



5. Religious Building



6. Religious Building



19. Residential



20. Hotel "Metropole"



21. Educational Building



7. Educational Building



8. Arsenal



9. Windmill "De Hoop"



22. Educational Building



23. Religious Building



24. Farm House



10. "Nooit volmaakt"



11. "Oostmolen"



12. "Westmolen"



25. Farm House



26. Office/Residential



27. Mix - Cigar Factory



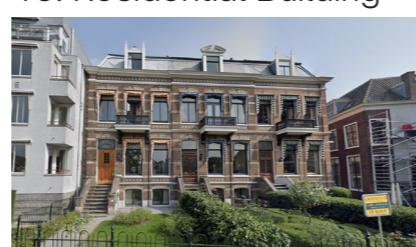
13. Healthcare Facility



14. Service/Residential



15. Residential Building



28. Residential Building

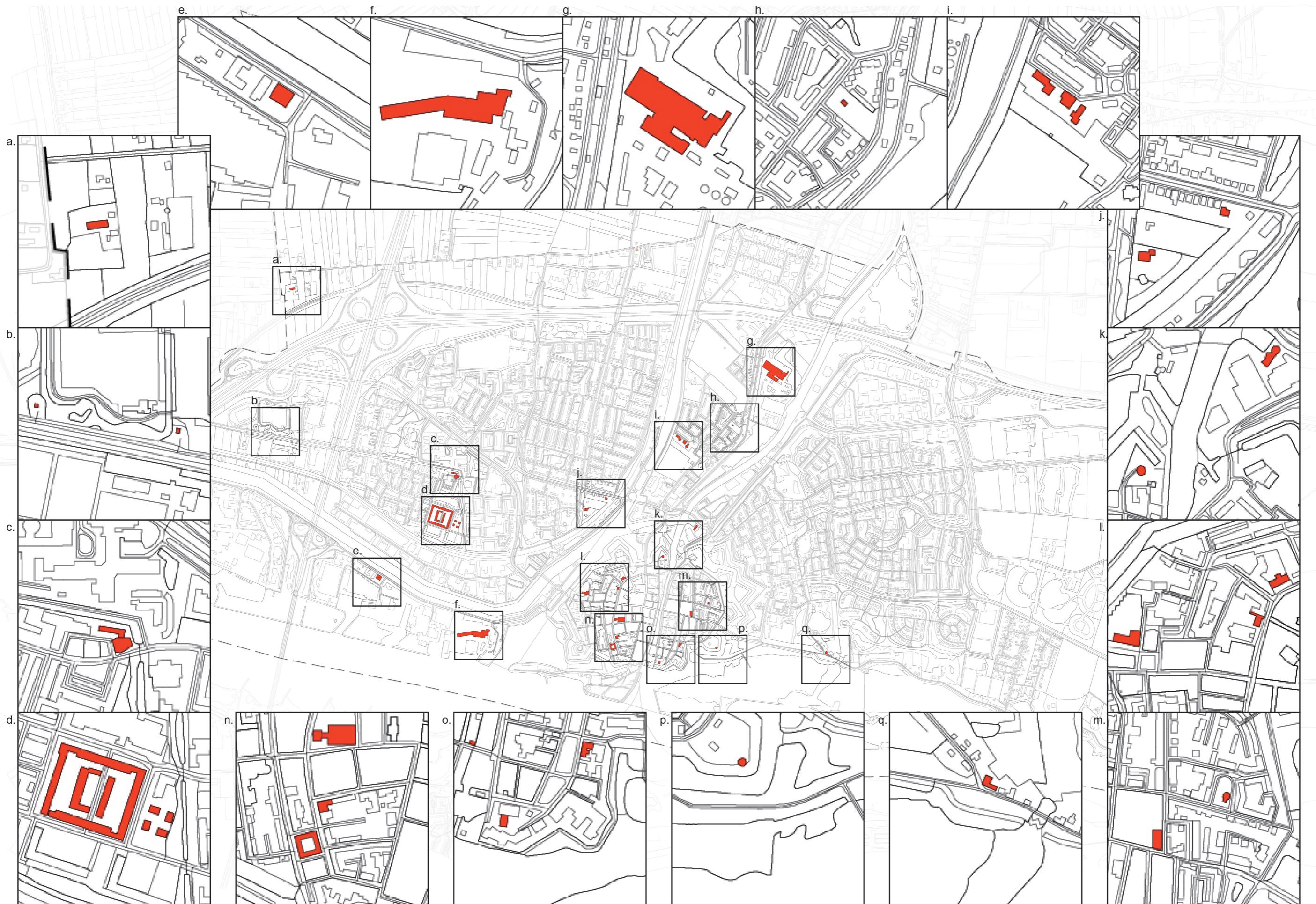


29. Mix - GP/Residential

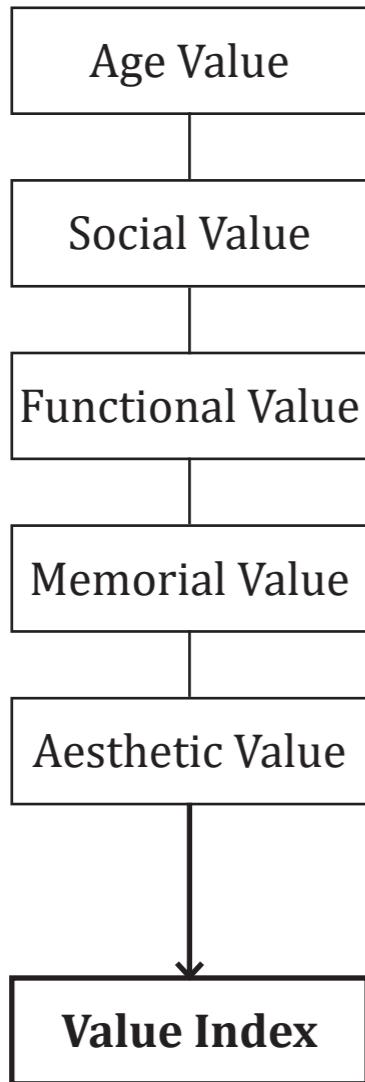


30. Rectory





Value Assessment

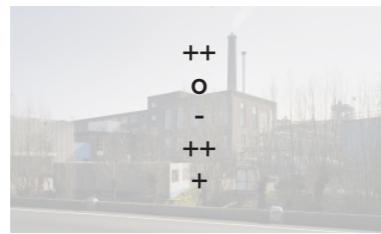


Reference Number	Value Assessment					Value Index (VI)
	Age Value	Social Value	Functional Value	Memorial Value	Aesthetic Value	
1	o	o	+	+	++	4
2	+	o	-	++	+	3
3	o	++	++	+	+	6
4	o	++	++	+	+	6
5	++	++	++	++	++	10
6	+	++	++	+	o	6
7	o	++	++	o	+	5
8	++	+	o	++	+	6
9	++	+	-	++	++	6
10	++	+	-	++	++	6
11	+	+	-	++	++	5
12	+	+	-	++	++	5
13	+	++	++	o	+	6
14	+	o	-	+	++	3
15	+	o	-	o	++	2
16	o	+	+	o	+	3
17	+	o	++	++	o	5
18	o	++	++	+	o	5
19	+	+	++	+	++	7
20	+	o	++	+	+	5
21	+	++	+	o	o	4
22	+	++	+	o	o	4
23	+	+	-	o	+	2
24	+	-	o	+	+	2
25	+	-	o	+	o	1
26	+	-	+	o	+	2
27	+	-	o	+	+	2
28	+	-	+	o	+	2
29	+	+	++	o	+	5
30	+	o	+	+	o	3

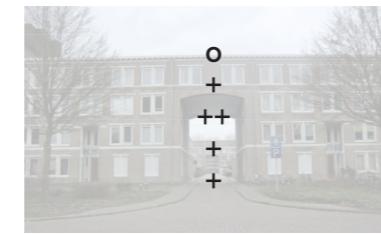
Value Assessment Results



Factory Reception Building



Sugar Factory



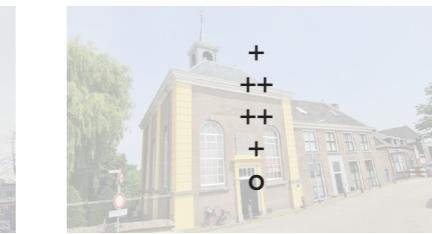
Housing Complex



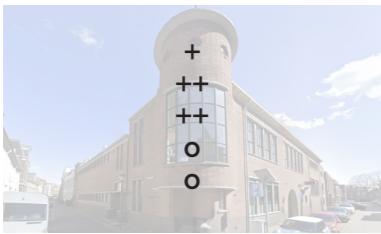
Housing Complex



Religiou Building



Religiou Building



Educational Building



Military Warehouse



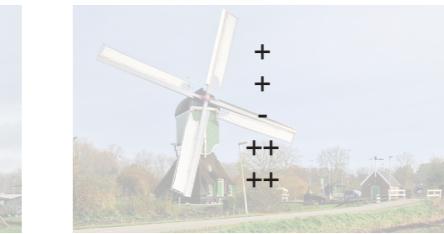
Windmill, "De Hoop"



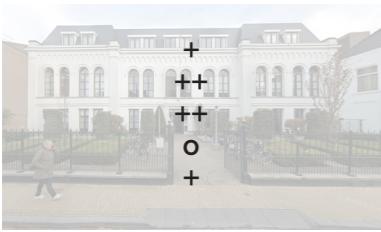
Windmill, "Nooit volmaakt"



Polder Mill, "Oostmolen"



Polder Mill, "Westmolen"



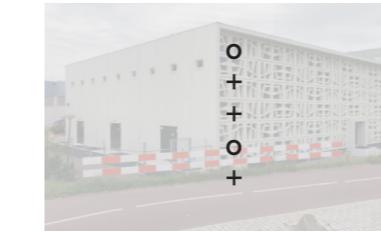
Hospital/Healthcare



Service/Residential Building



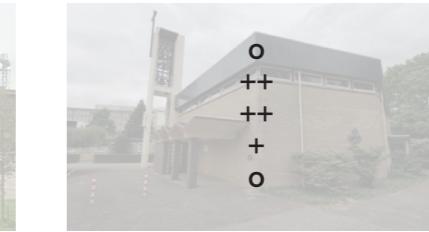
Residential Building



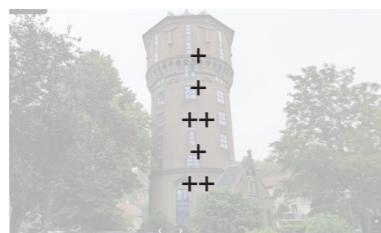
Electricity Distribute Station



Industrial Hall



Religious Building



Watertower - Residential



Hotel



Educational Building



Educational Building



Religious Building



Farm House



Farm House



Office/Residential Building



Cigar Factory/Residential



Residential Building



Residential Building - GP



Parsonage/Residential

Valuation Dimension	
Historic Value	++/+/o/-
Social Value	++/+/o/-
Functional Value	++/+/o/-
Memorial Value	++/+/o/-
Aesthetic Value	++/+/o/-

Vulnerability Assessment

Major Climate Risks:

Flood

Drought

Heat

1. Risk of Flooding from the Sea, Lake or River

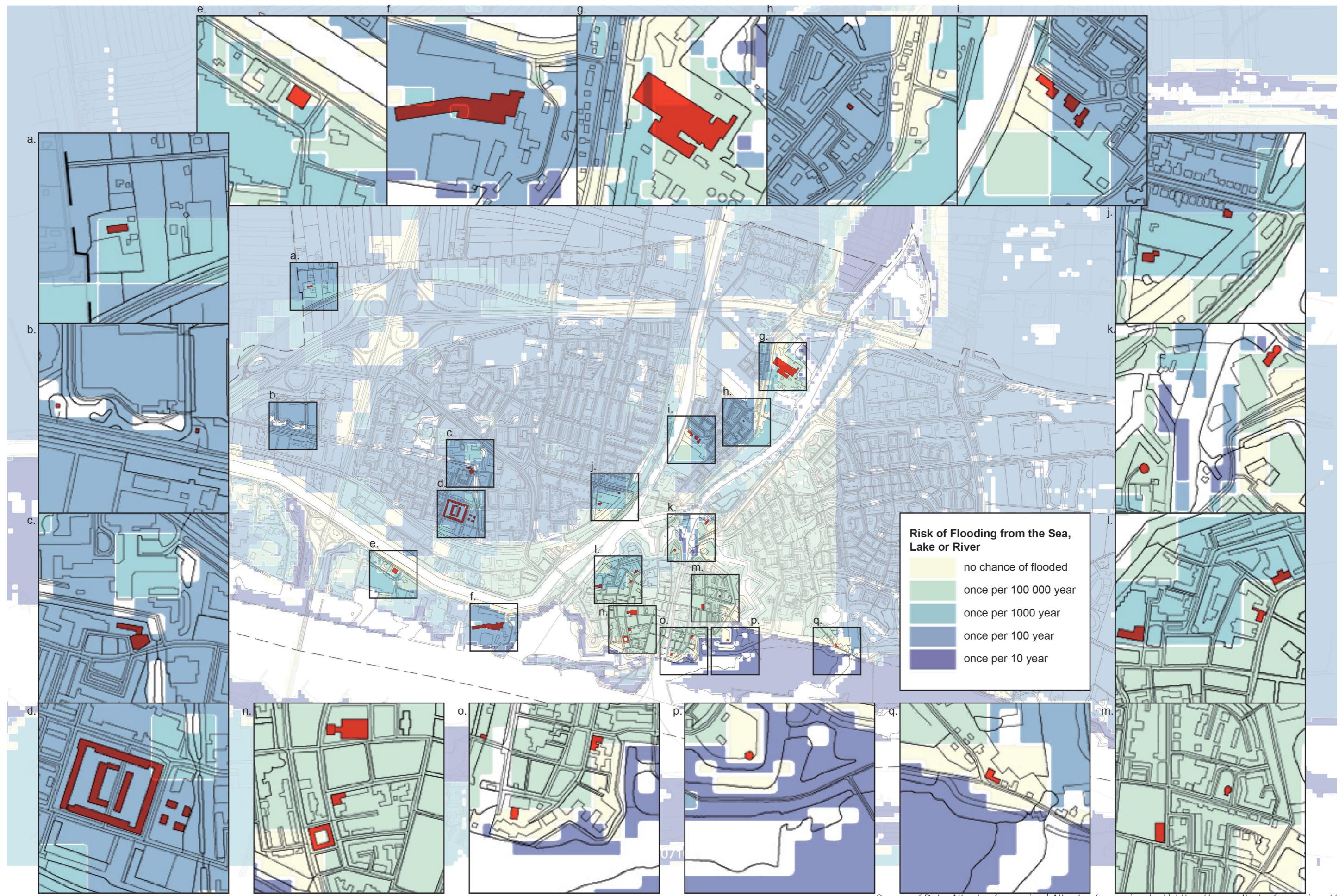
2. Maximum Water Depth in the Event of a Dike Breach

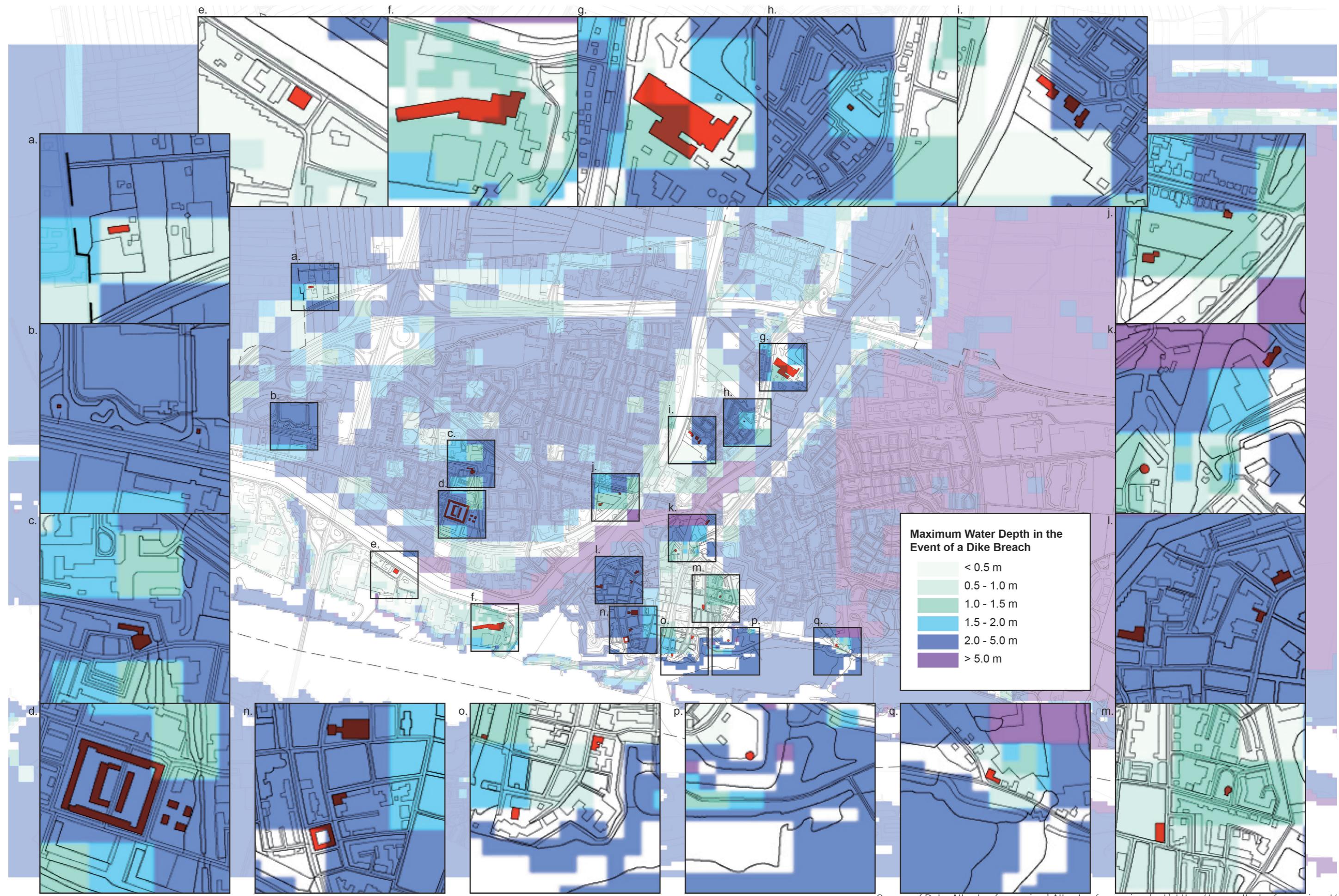
3. Areas with Vulnerable Foundations Due to Drought

4. Urban Heat Island Effect Index (UHI)

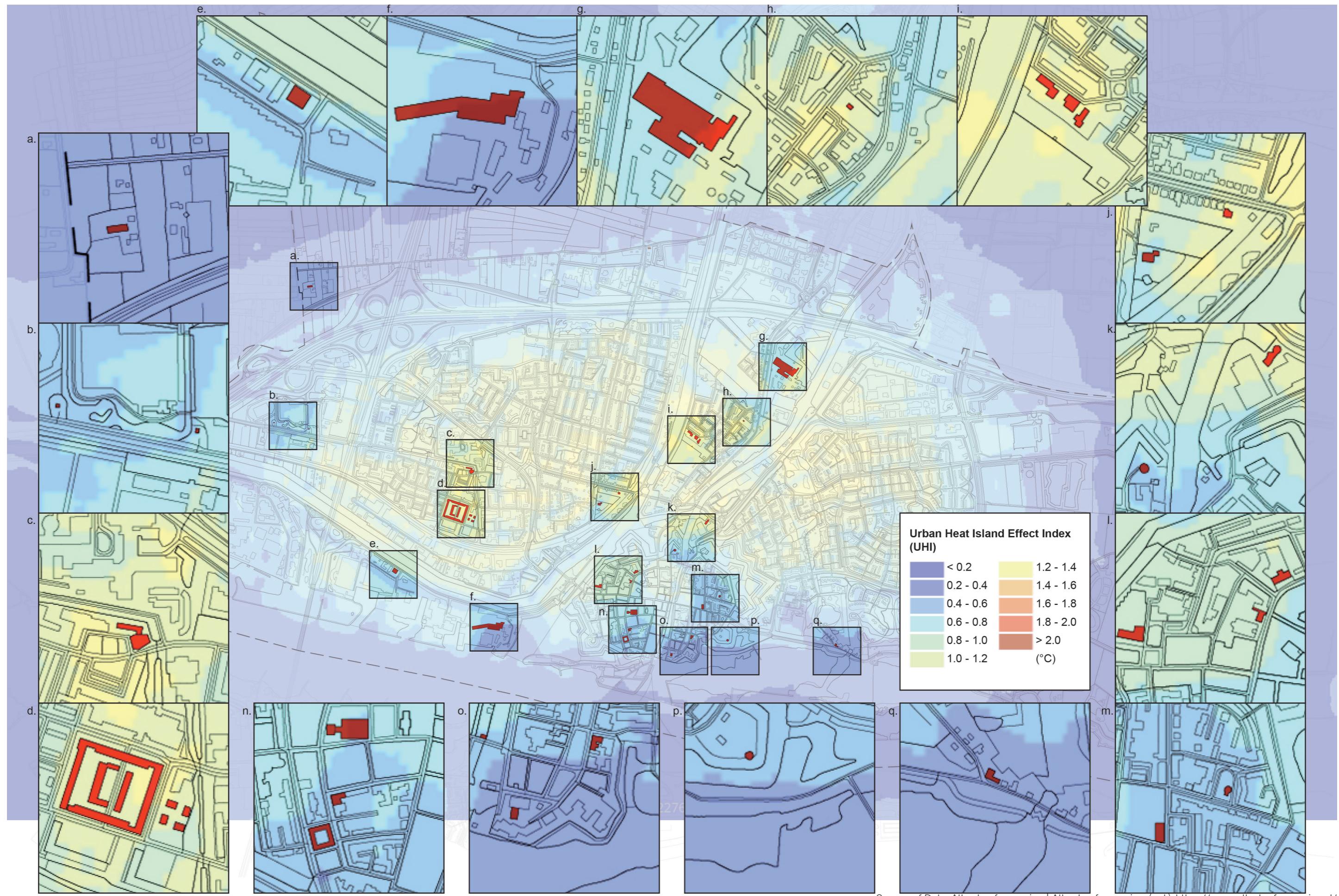


Overall Vulnerability (OV)



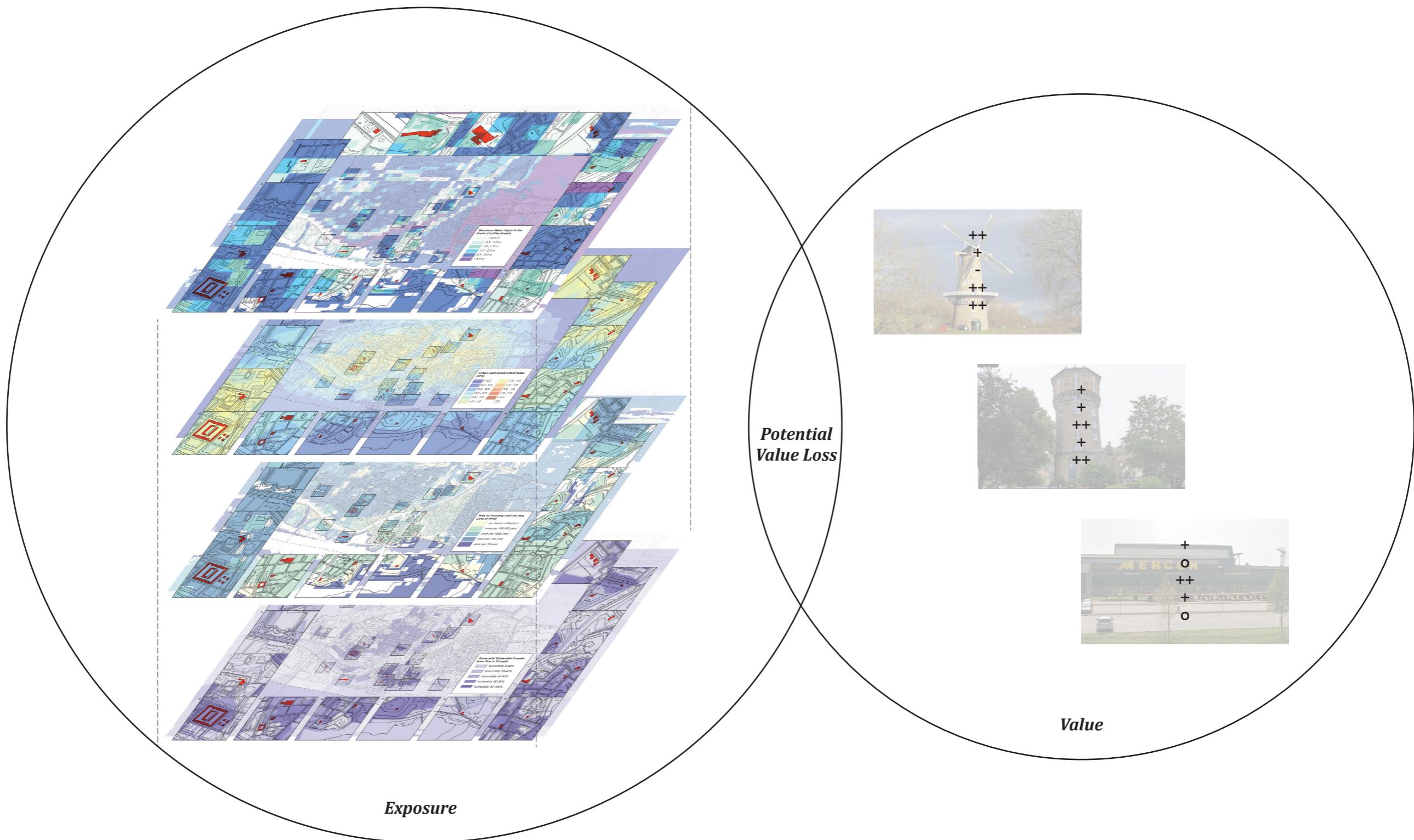




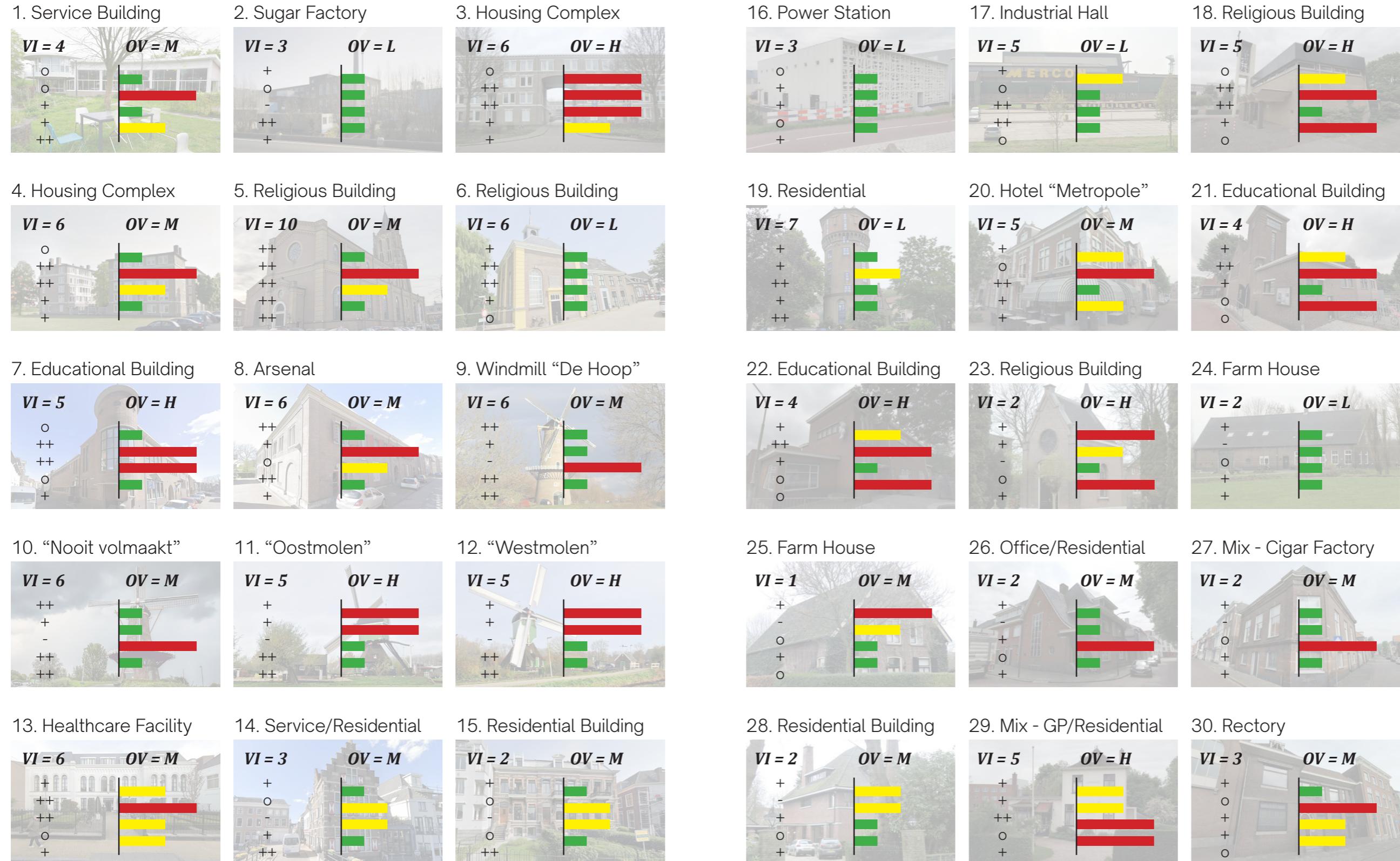
Source of Data: Atlas Leefomgeving | Atlas Leefomgeving. (n.d.). <https://www.atlasleefomgeving.nl/>

Vulnerability Assessment Results

Reference Number	Climate Vulnerability Assessment				Overall Vulnerability (OV)
	Flooding		Drought	Heat	
	1. Risk ... *	2. Maximum ... *	3. Areas ... *	4. ... UHI *	
1	low	high	low	medium	moderate
2	low	low	low	low	low
3	high	high	high	medium	high
4	low	high	medium	low	moderate
5	low	high	medium	low	moderate
6	low	low	low	low	low
7	low	high	high	low	high
8	low	high	medium	low	moderate
9	low	low	high	low	moderate
10	low	low	high	low	moderate
11	high	high	low	low	high
12	high	high	low	low	high
13	medium	high	medium	medium	moderate
14	low	medium	medium	low	moderate
15	low	medium	medium	low	moderate
16	low	low	low	low	low
17	medium	low	low	low	low
18	medium	high	low	high	high
19	low	medium	low	low	low
20	medium	high	low	medium	moderate
21	medium	high	low	high	high
22	medium	high	low	high	high
23	high	medium	low	high	high
24	low	low	low	low	low
25	high	medium	low	low	moderate
26	low	low	high	low	moderate
27	low	low	high	low	moderate
28	medium	medium	low	low	moderate
29	medium	medium	high	high	high
30	low	high	medium	medium	moderate



Results



Value Index (VI)

Value Dimentions

Age Value ++/+/o/-
 Social Value ++/+/o/-
 Functional Value ++/+/o/-
 Memorial Value ++/+/o/-
 Aesthetic Value ++/+/o/-

Overall Vulnerability (OV)

Risks

Flooding |
 Water depth |
 Drought |
 UHI |

Rating

high |
 middle |
 low |

Results

1. Service Building



2. Sugar Factory



3. Housing Complex



16. Power Station



17. Industrial Hall



18. Religious Building



4. Housing Complex



5. Religious Building



6. Religious Building



19. Residential



20. Hotel "Metropole"



21. Educational Building



7. Educational Building



8. Arsenal



9. Windmill "De Hoop"



22. Educational Building



23. Religious Building



24. Farm House



10. "Nooit volmaakt"



11. "Oostmolen"



12. "Westmolen"



25. Farm House



26. Office/Residential



27. Mix - Cigar Factory



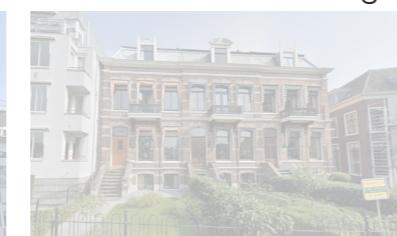
13. Healthcare Facility



14. Service/Residential



15. Residential Building



28. Residential Building



29. Mix - GP/Residential



30. Rectory





1 of the 30 —



De Vries Robbé Building, De Rotonde



De Vries Robbé & Co. N.V.

Spijksedijk 8, 4207 GN

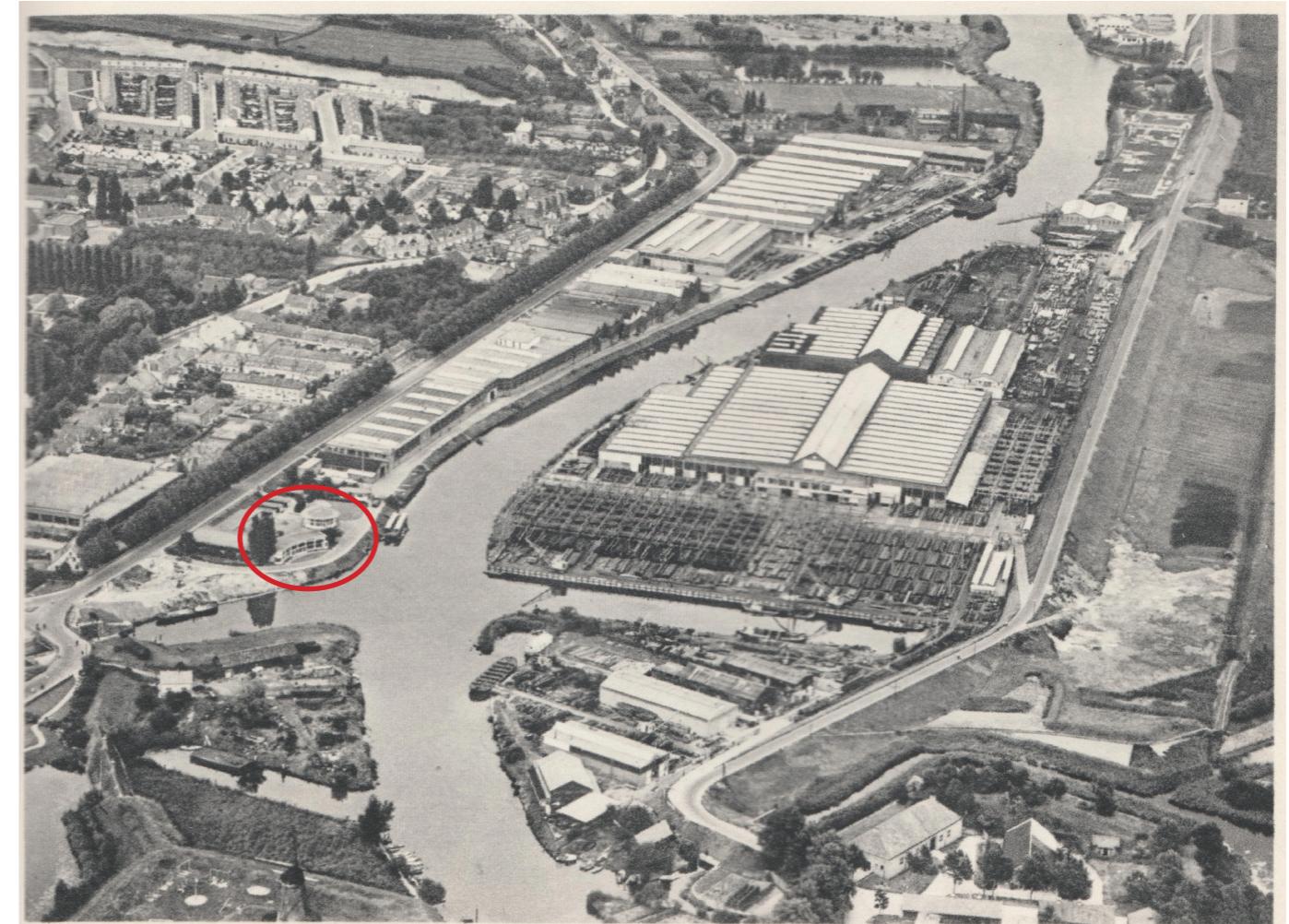
Construction Year: 1940

Original Function: Factory Reception

Year of Important Intervention: 1996, moved to and reconstructed in mirrored way on the other side of the Linge River

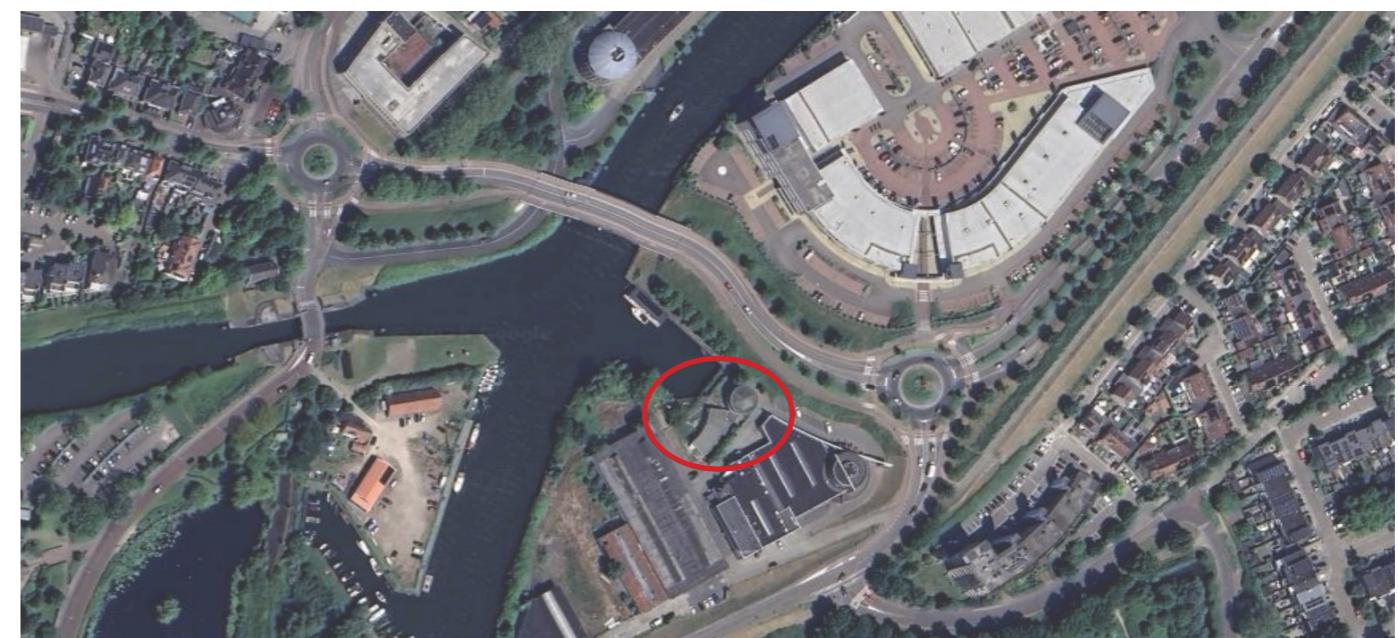
Current Position: Gallery, Office

Status: National Monument



De Vries Robbé & Co Gorinchem 1952 (luchtfoto K.L.M.)

©K.L.M. (1952)



©Google Maps (2025)

History of De Vries Robb   & Co. N.V.

1881

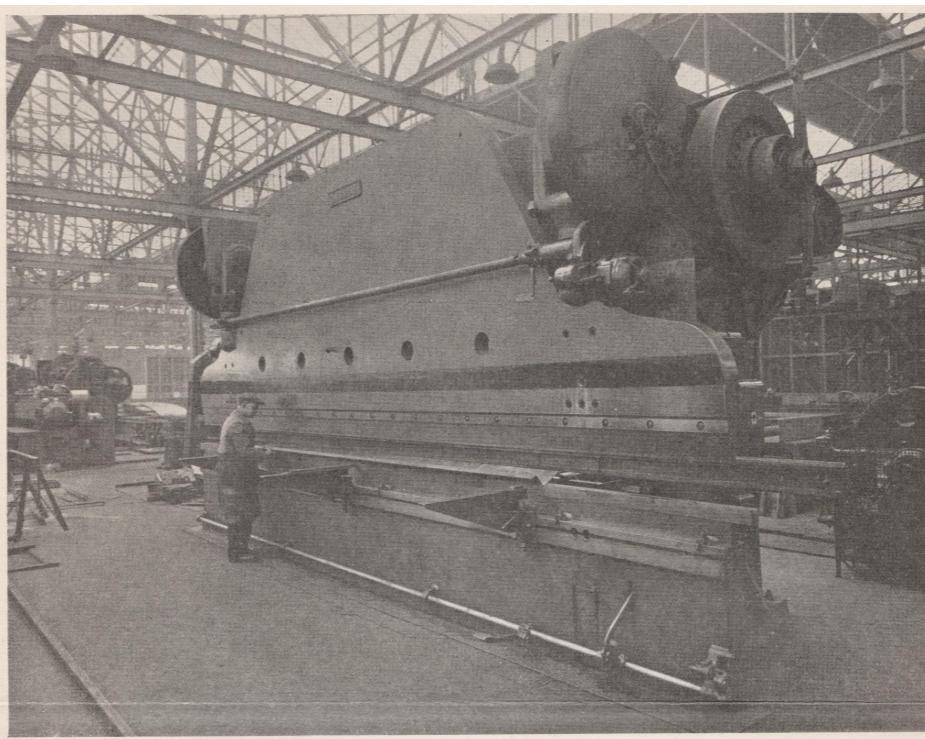
1920s - early 1960s

Founding ————— Prosperity —————

late 1960s - 1970s

1976

Founding ————— **Prosperity** ————— **Decline** ————— **Broke**



Willem de Vries Robb   responded to this advertisement for a commercial property on the Arkelsedijk.

©De Vries Robbé & Co. N.V. (1881)

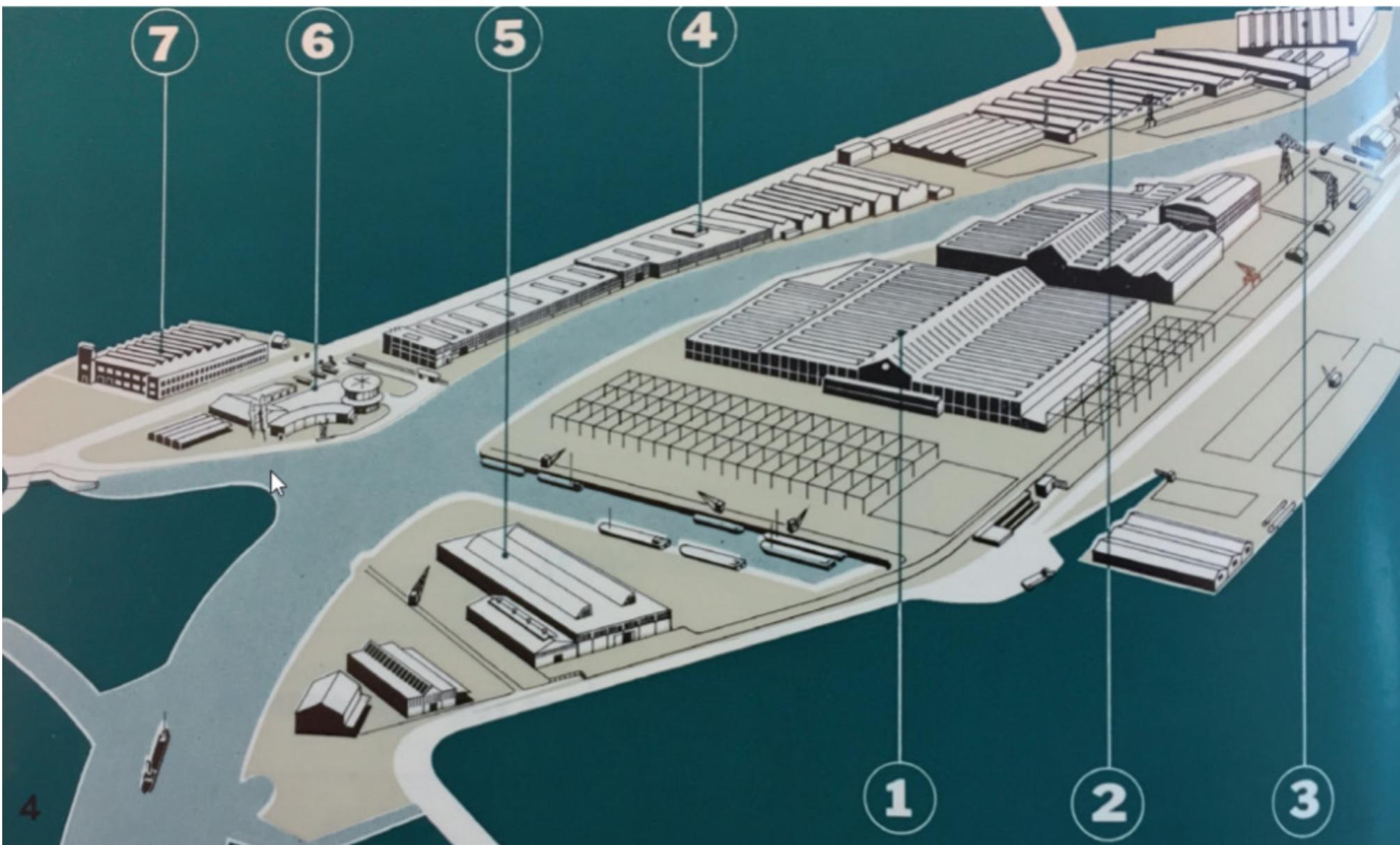
©De Vries Robbé & Co. N.V. (1939)

©De Vries Robb   & Co. N.V. (1939)

©Eddy Posthuma de Boer from the series 'Unemployment in the Netherlands' (1977)

De Vries Robbé Buildings

Map of De Vries Robbé site at its peak



©De Vries Robbé & Co N.V. Gorinchem

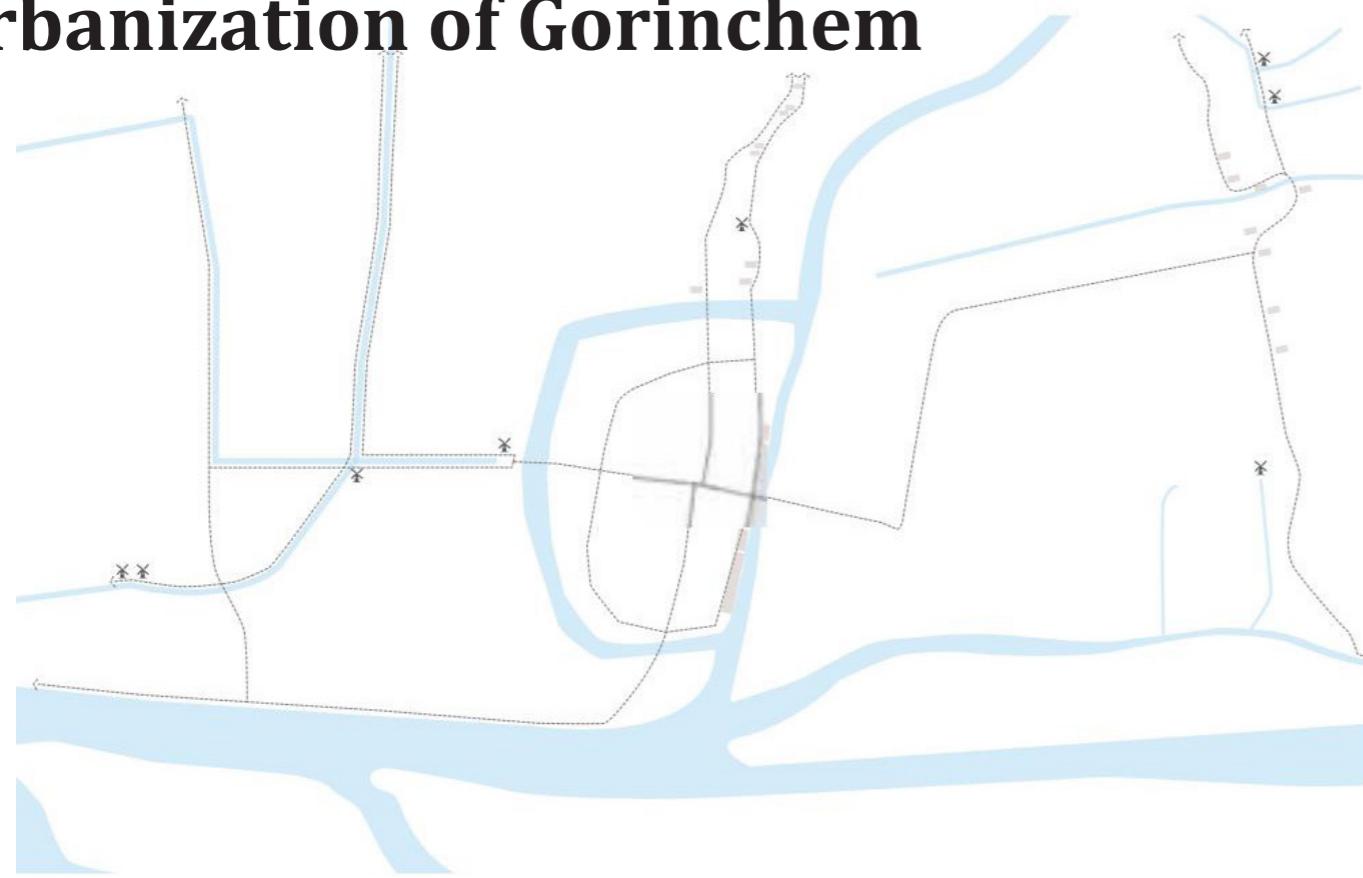
- 1) Construction workshops, welding shop and assembly site. → already demolished
- 2) Steel window and door factory. → Plan Arkelsedijk, will disappear
- 3) Aluminum window and door factory. → Plan Arkelsedijk, will disappear
- 4) Radiator factory. → Plan Arkelsedijk, will disappear
- 5) Central warehouse. → can still be saved!**
- 6) Reception building (De Rotonde) and canteen. → Moved to the other side of the Linge (national monument)
- 7) Head office (1928) De Vries Robbé → already demolished



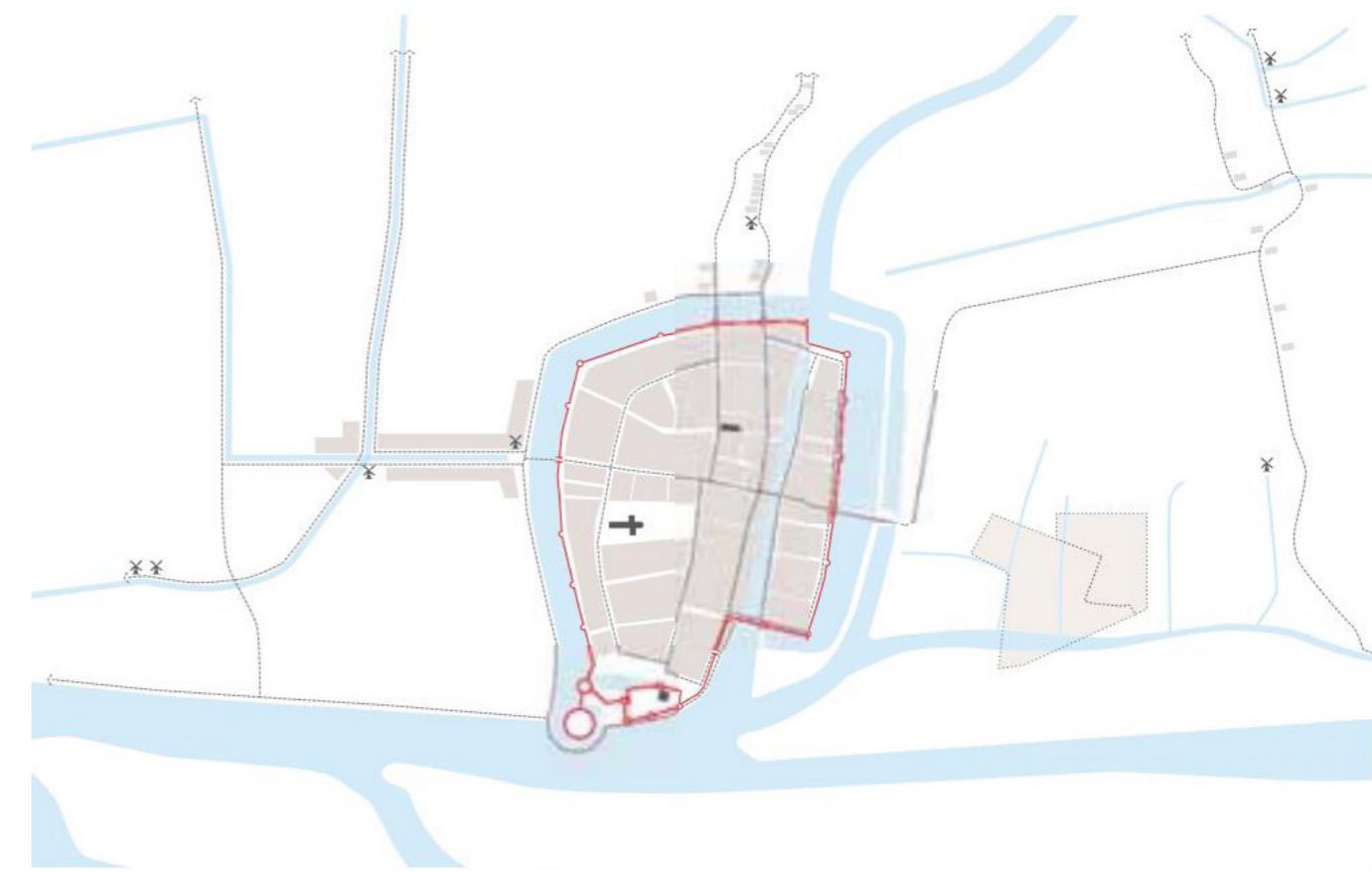


**A Site for
Gorinchem**

Urbanization of Gorinchem



1000



1400



1600



1600-1800



1800-1885



1885-1950

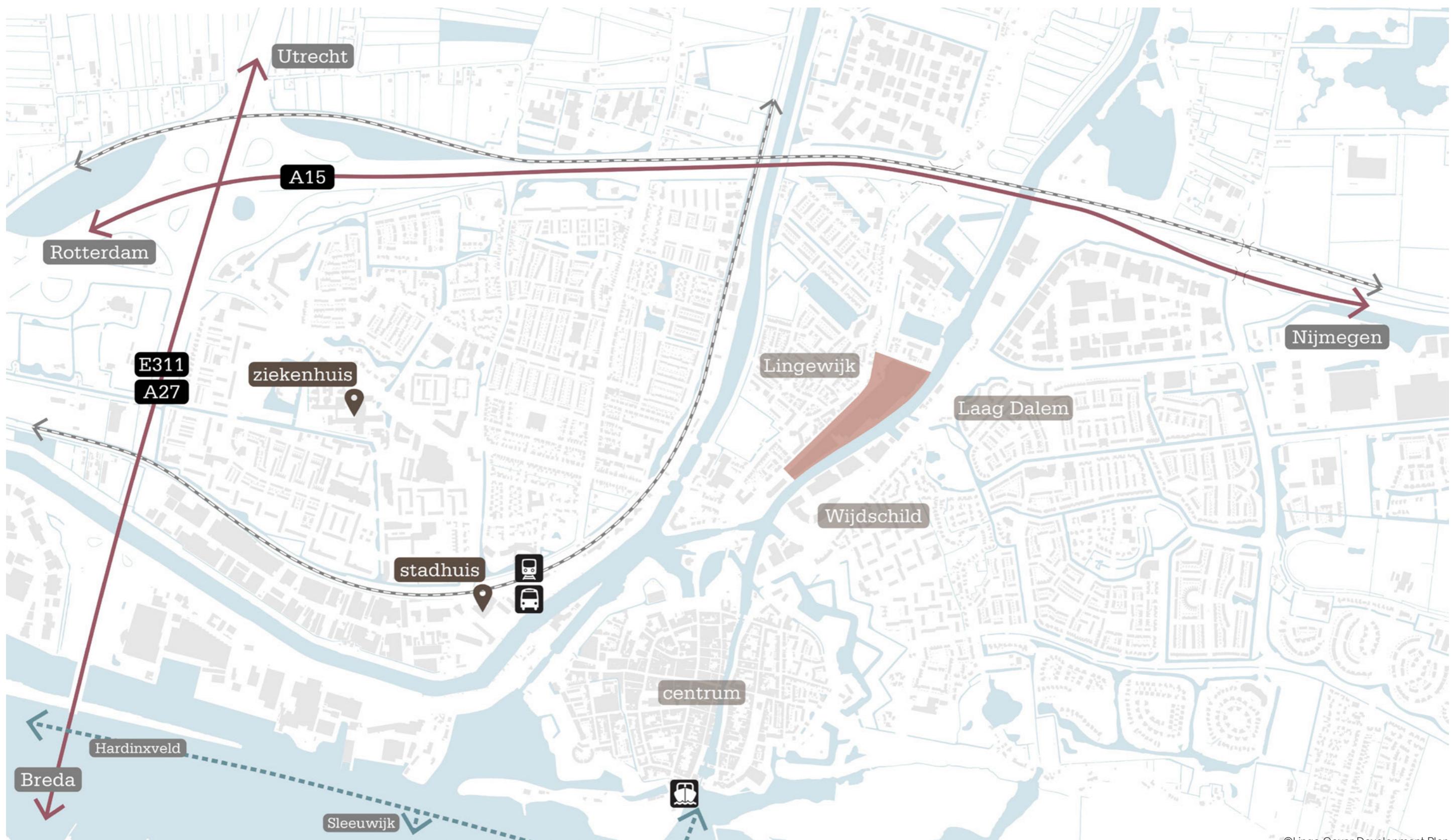


1950-1980



1980-2017

Future - Linge Oever Development Plan, Lingewijk



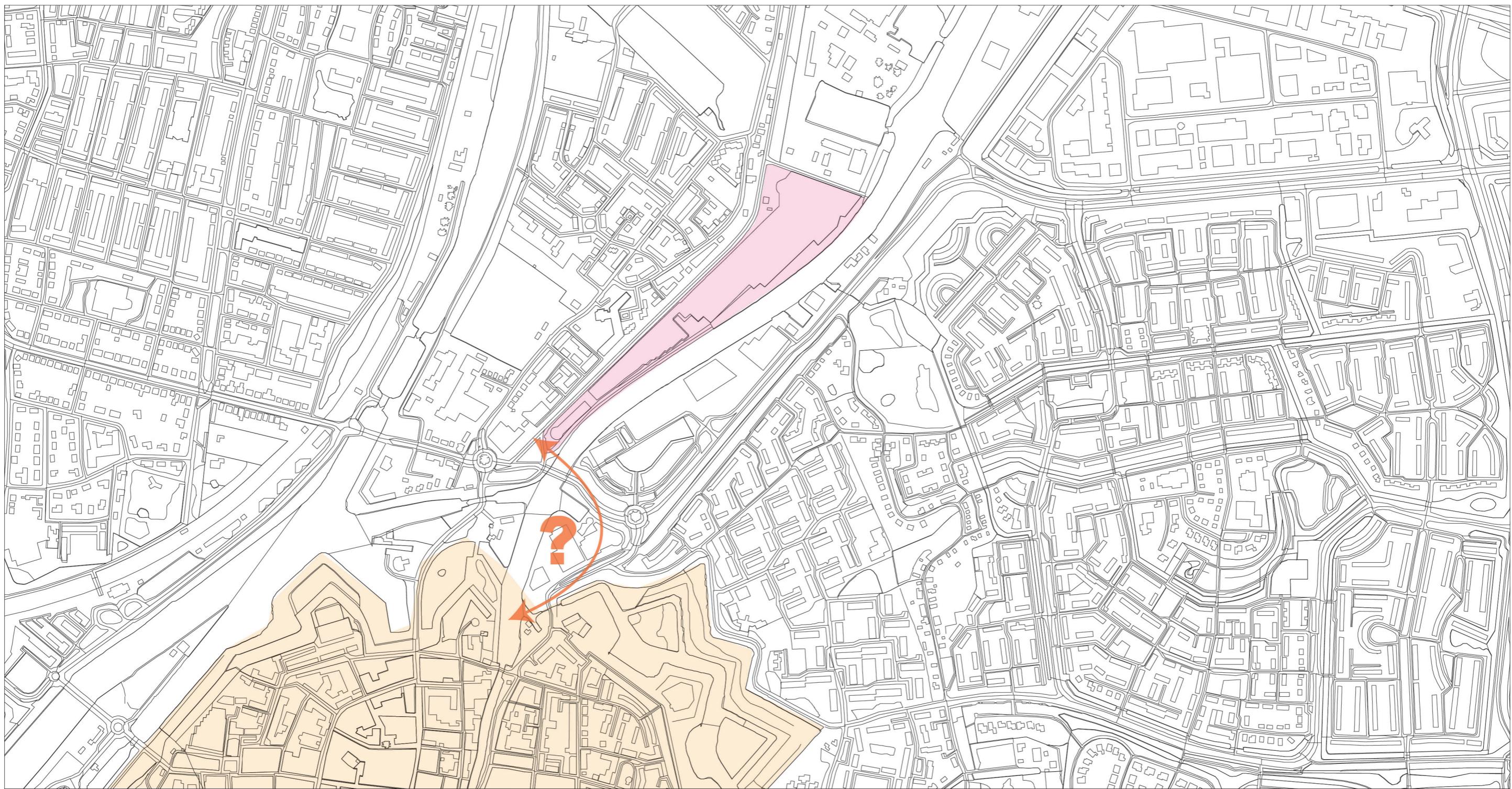


©Linge Oever Development Plan



©Google Maps (2024)

In Between History & Future



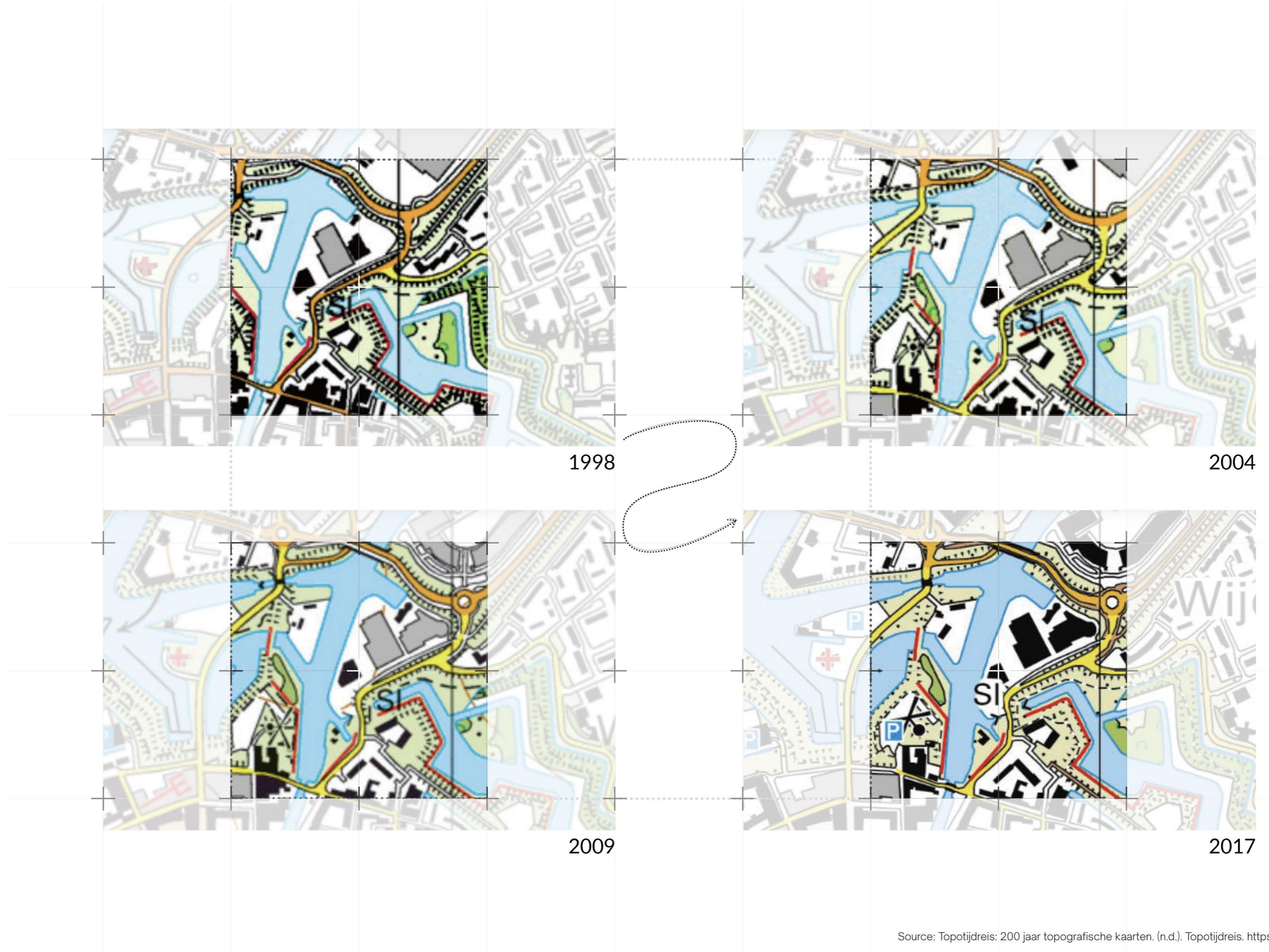
The Site Location



History of the Site

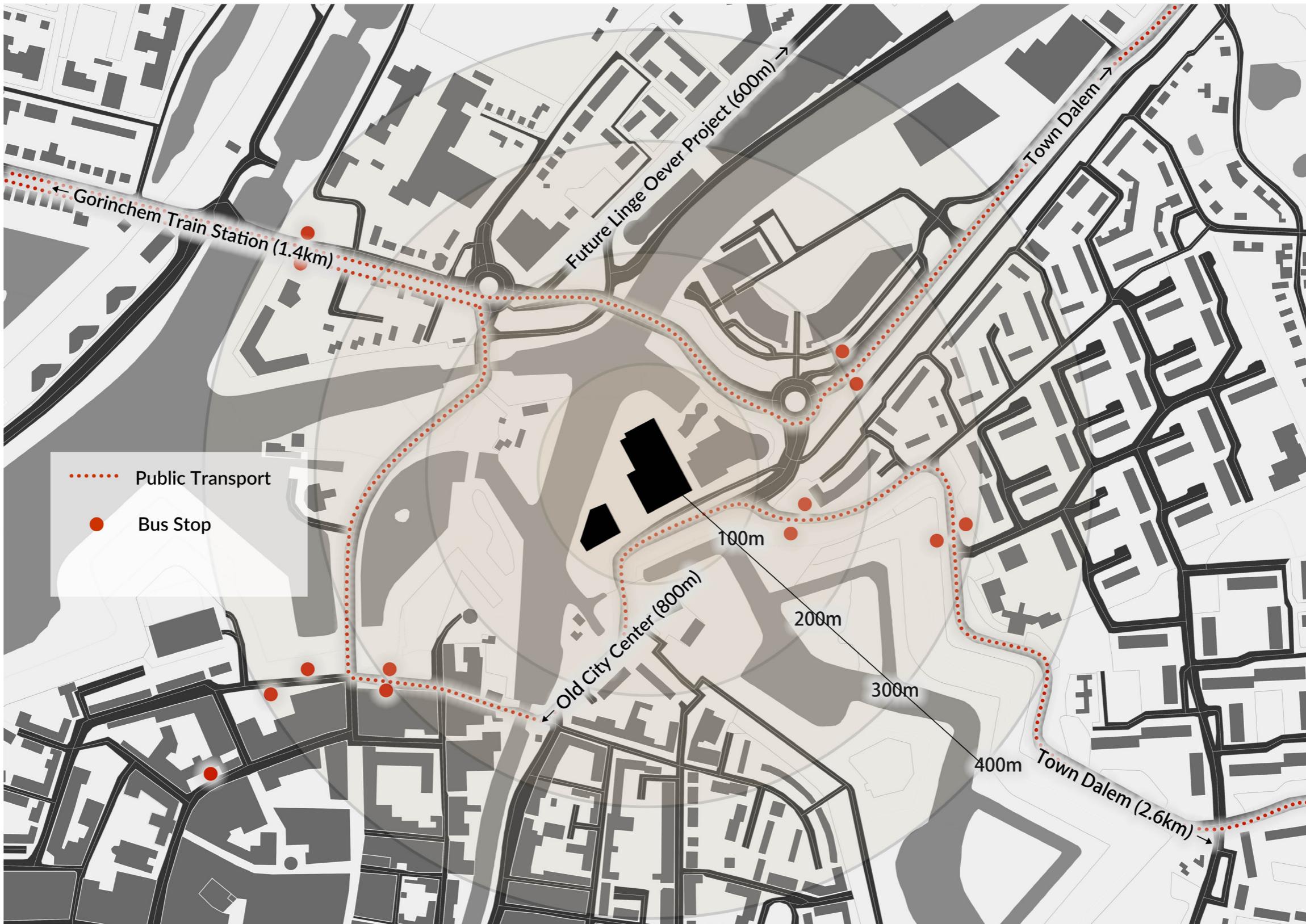


Source: Topotijdreis: 200 jaar topografische kaarten. (n.d.). Topotijdreis. <https://www.topotijdreis.nl/>

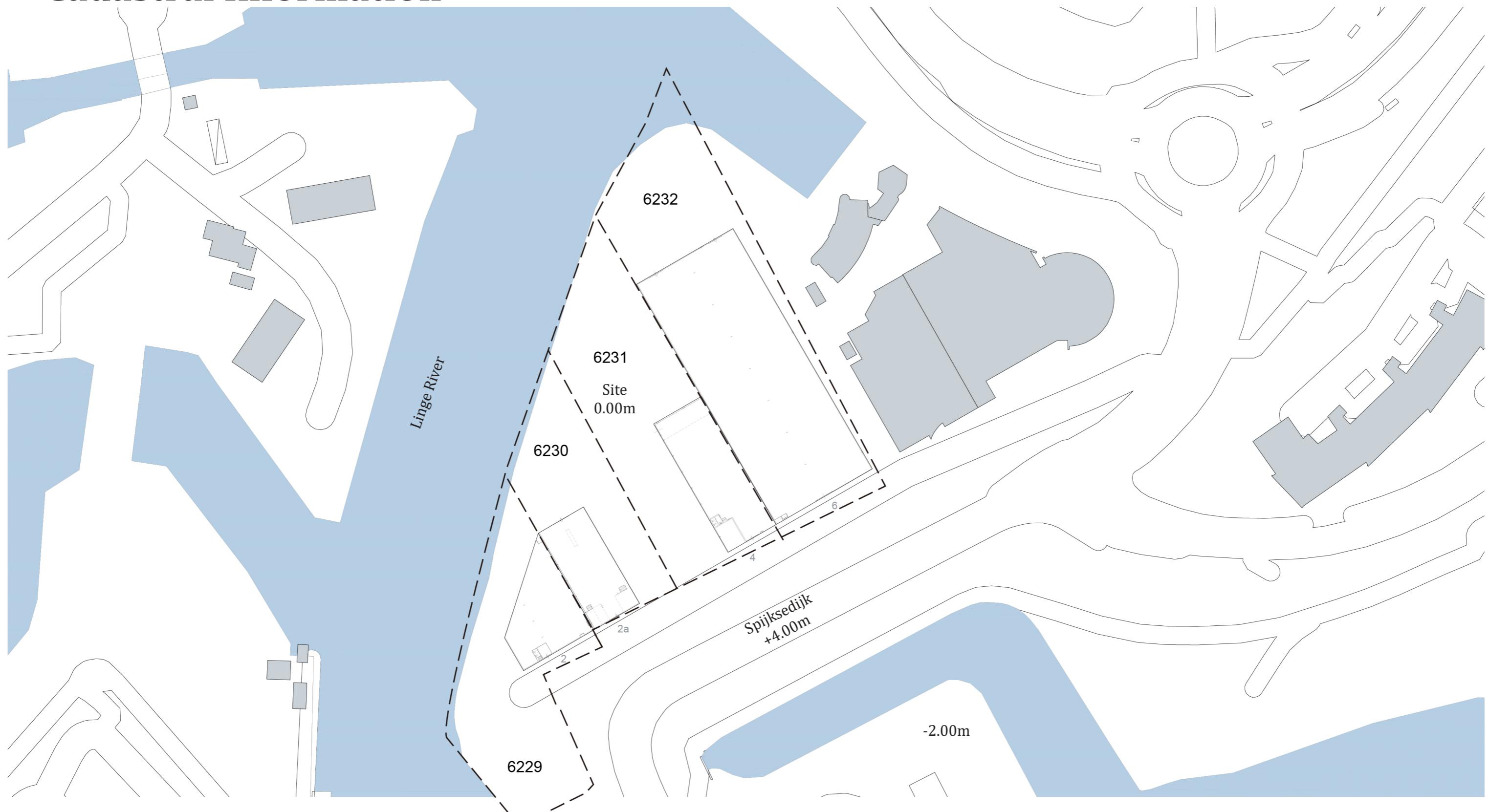


Source: Topotijdreis: 200 jaar topografische kaarten. (n.d.). Topotijdreis. <https://www.topotijdreis.nl/>

Urban Transportation

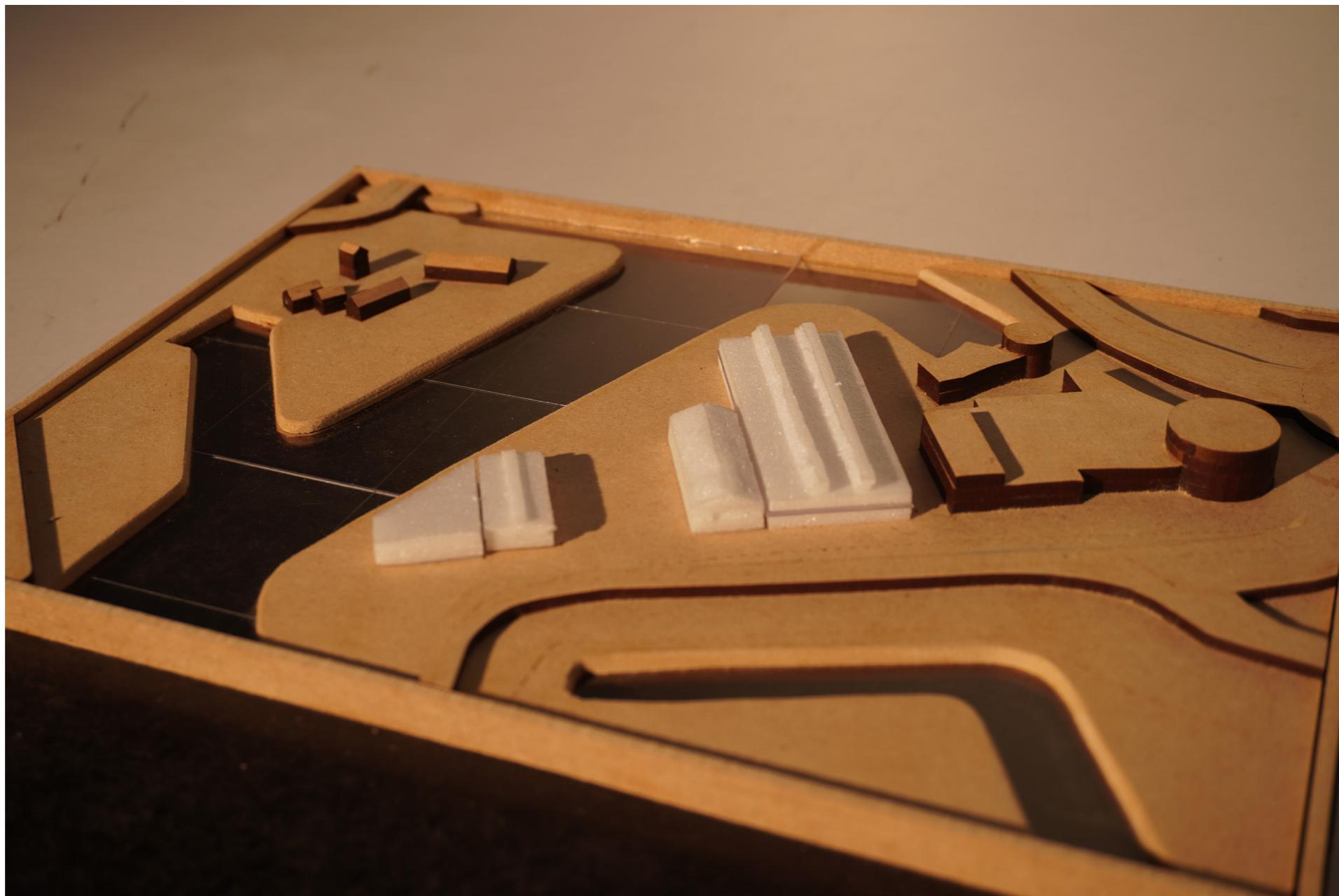


Cadastral Information



0 10 20 30 40 50m

Cadastral Information:
 n.6229 (2,170 m²); n.6230 (1,640 m²); n.6231(2,705 m²); n.6232(3,670 m²). Total Area = 10,185m²



Spiksedijk 2



Information

Built Year: 1928-05 (First Constructed), 1966-03 (Renewed)

Dimension: 10.3 m, 22 m, 29.7 m, 30.2 m (trapezoid plan)

Height: 6.7 m, 2 floors

Gross floor area (GFA): 910.52 m²

Original Function: De Vries Robbé & Co. N.V. Factory Storage



Facade

Material Scheme



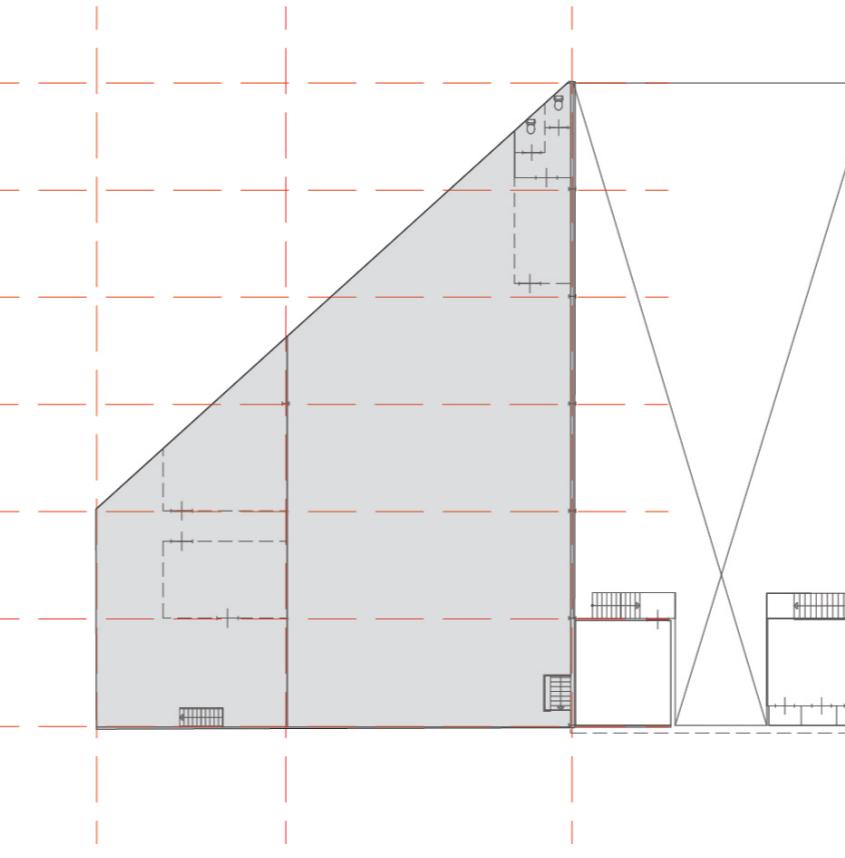
Perforated Metal Sheet



Brick



Metal Roller Shutter



Spiksedijk 2a



Information

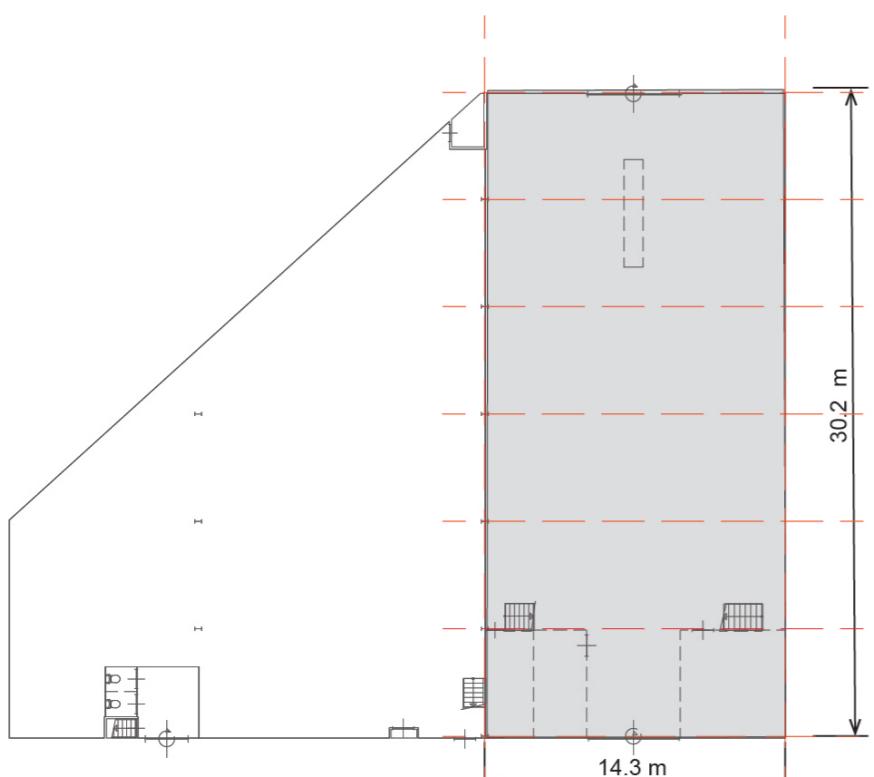
Built Year: 1928-05 (First Constructed), 1966-03 (Renewed)
 Dimension: 14.3 m * 30.2 m
 Height: 6.7 m (flat roof); 8.4 m (skylight), 1 floor with 2 mezzanines
 Gross floor area (GFA): 489.22 m²
 Original Function: De Vries Robbé & Co. N.V. Factory Storage



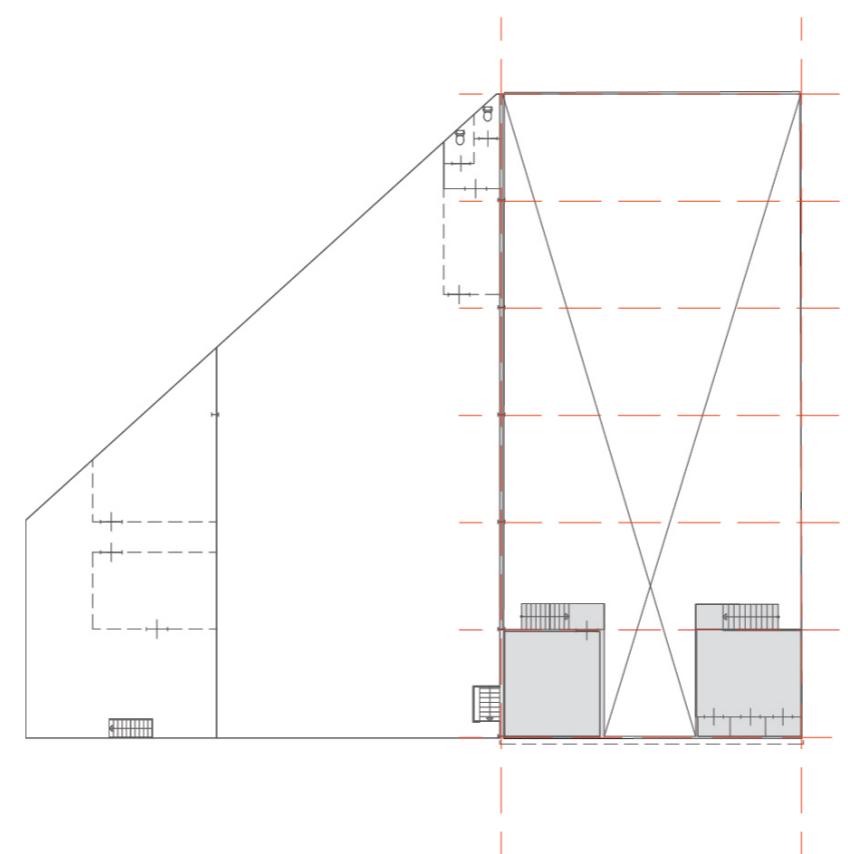
Facade

Material Scheme

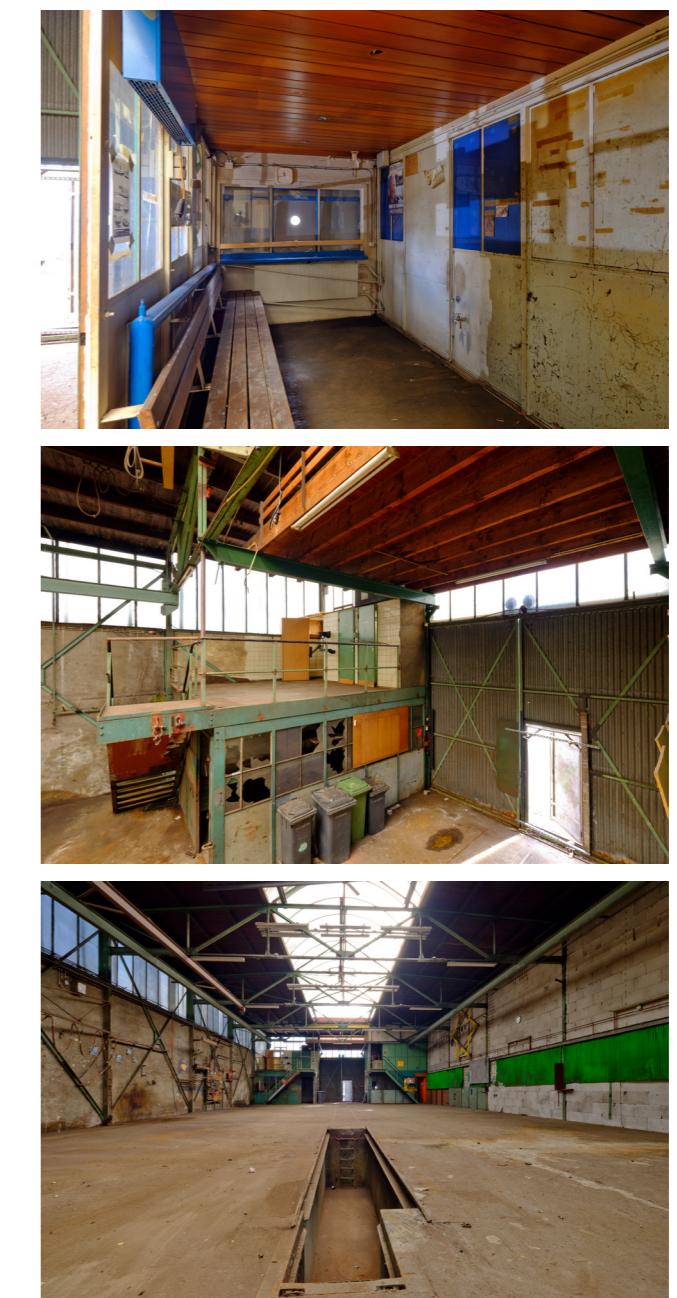
	Glass
	Corrugated Metal Sheet
	Green Metal Sheet
	Brick



Ground Floor Plan



First Floor Plan



Spiksedijk 4



Information

Built Year: 1950-01 (First Constructed), 1983-04 (Renewed)

Dimension: 15 m * 40.2 m

Height: 8 m, 1 floor with 1 mezzanine

Gross floor area (GFA): 659.71 m²

Original Function: De Vries Robbé & Co. N.V. Factory Storage



Facade

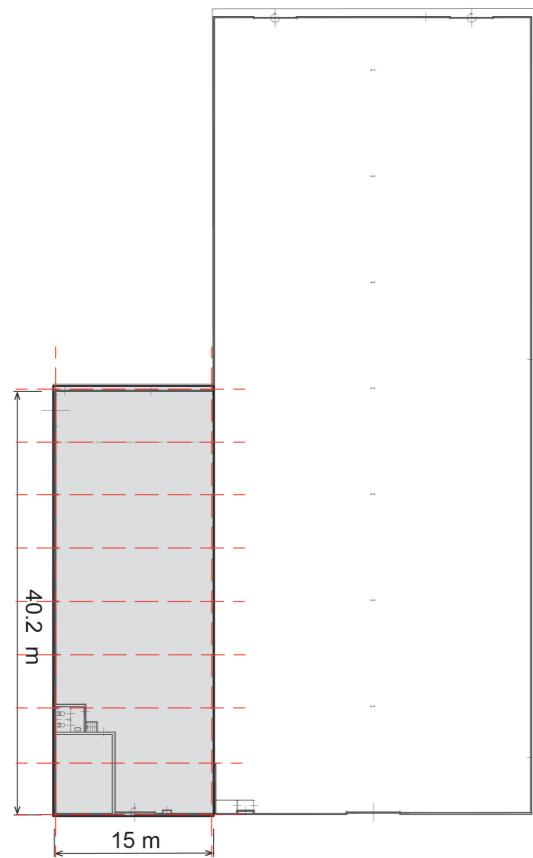
Material Scheme



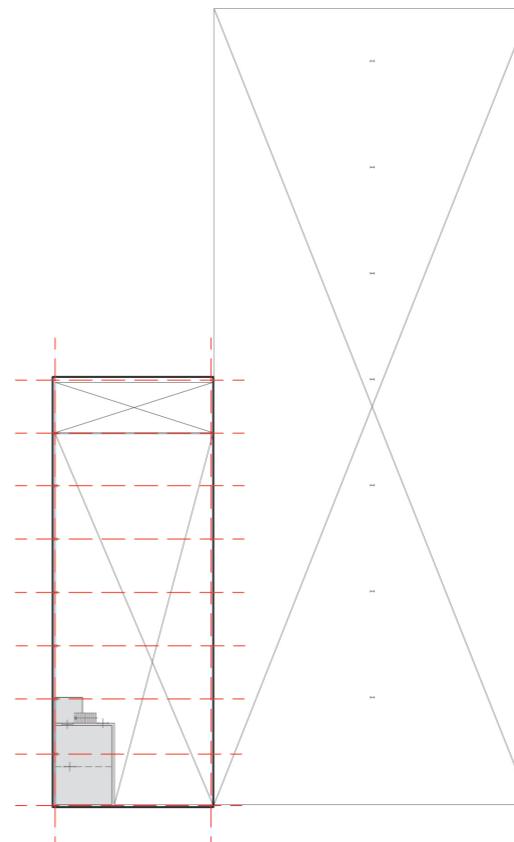
Brick



Corrugated Metal Sheet



0 5 10 15 20 25m



Spiksedijk 6



Information

Built Year: 1950-12 (First Constructed), 1995-03 (Renewed)

Dimension: 30.1 m * 75.2 m

Height: 7.7 m (flat roof); 10.7 m (skylight)

Gross floor area (GFA): 2,271.86 m²

Original Function: De Vries Robbé & Co. N.V. Factory Storage



Facade

Material Scheme



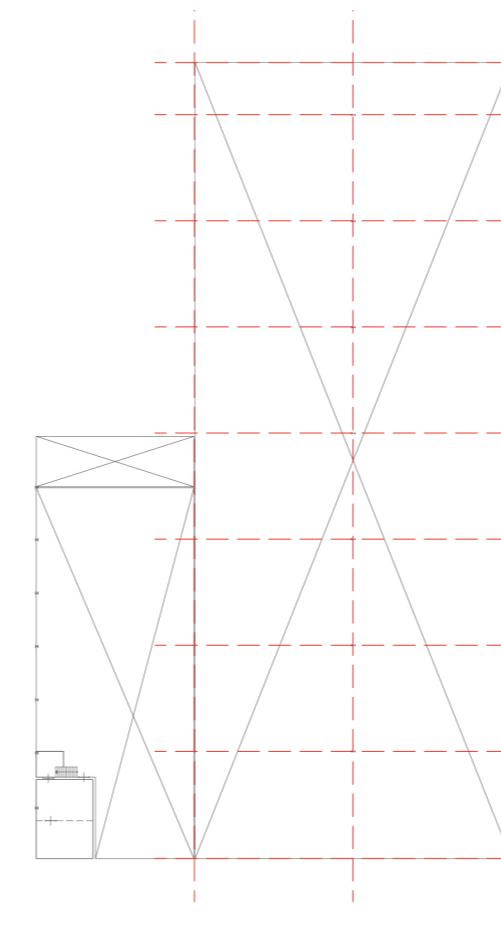
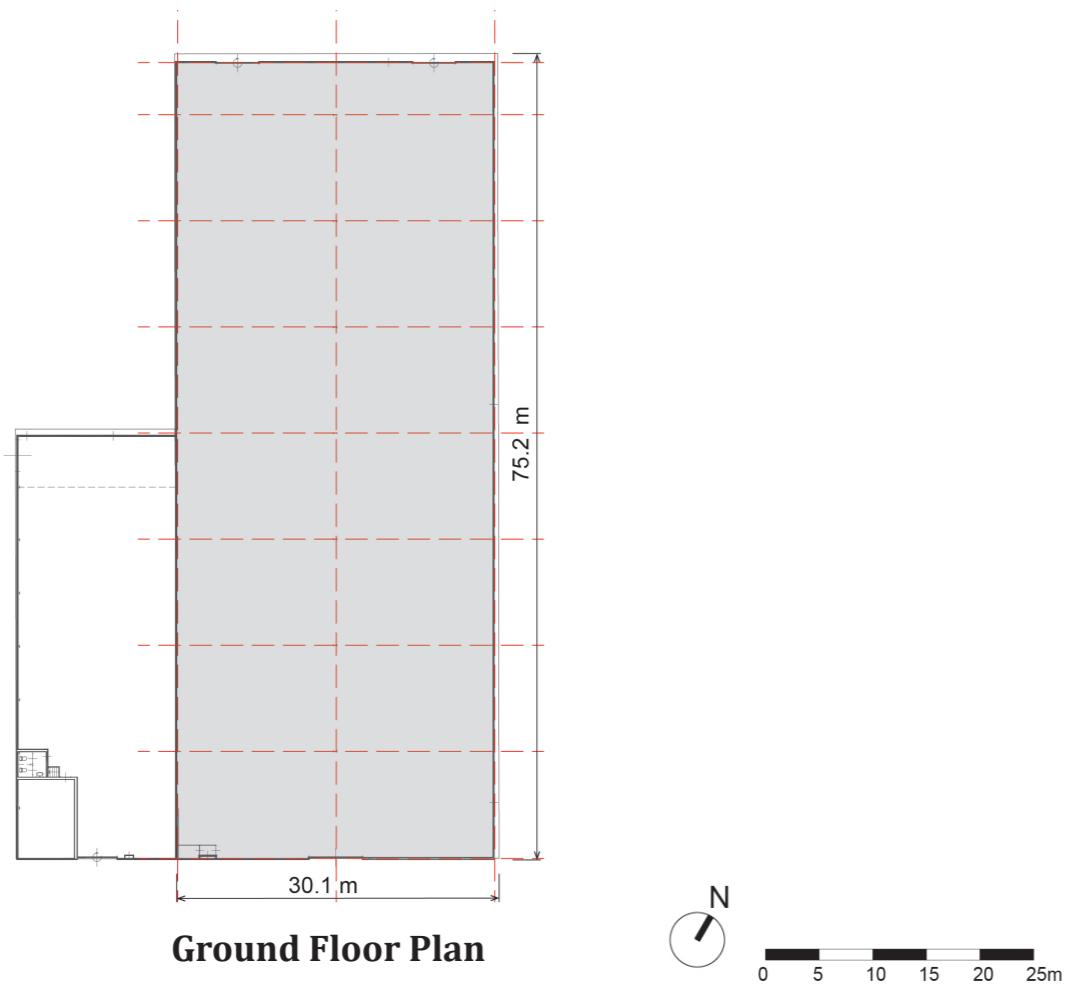
Glass



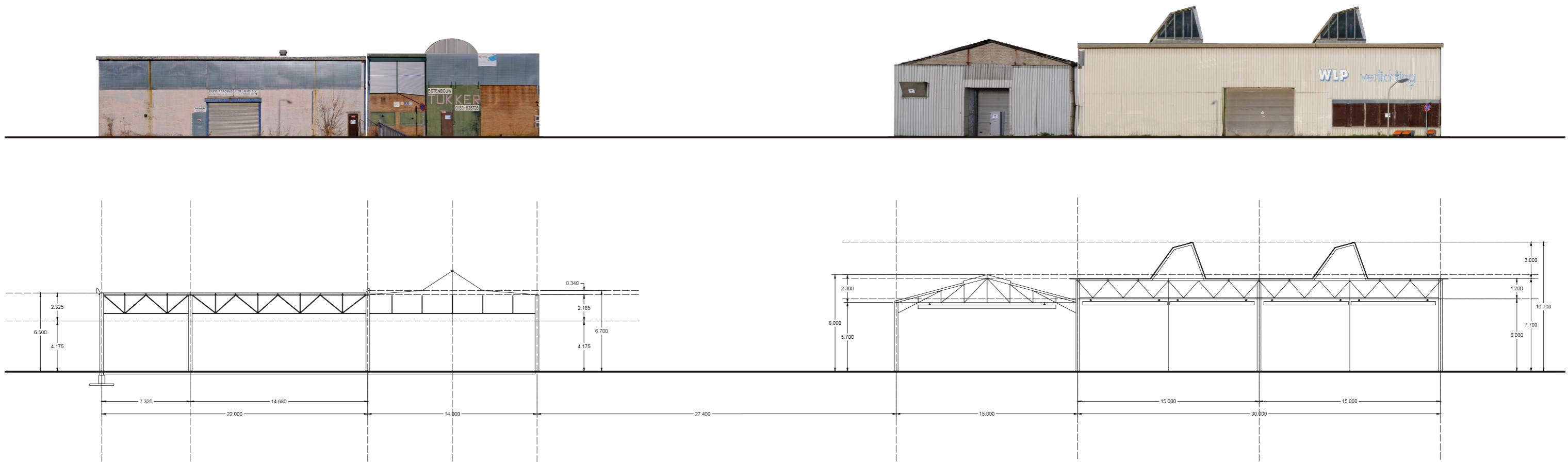
Corrugated Metal Sheet



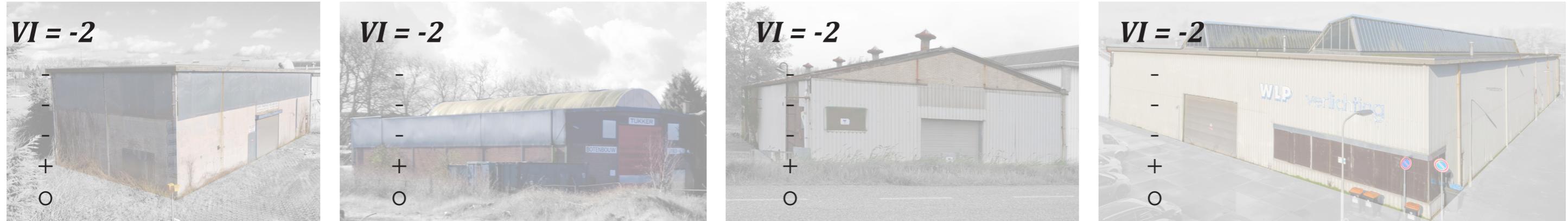
Perforated Metal Sheet



Current Facades and Section



Value Assessment



- age value, social value, functional value → **Negative: Low value, abandoned and decayed.**
- + memorial value
- o aesthetic value

Positive: Industrial relic - reminder of city memories

Value Index (VI)

Value Dimensions

Age Value	++/+/o/-
Social Value	++/+/o/-
Functional Value	++/+/o/-
Memorial Value	++/+/o/-
Aesthetic Value	++/+/o/-

Value Assessment



- o age value, social value
- +
- ++ functional value, memorial value
- aesthetic value



Positive: relatively high value, good maintenance.
Negative: private/introvert use with low public participation, low social value

Value Index (VI)

Value Dimensions

Age Value	++/+/o/-
Social Value	++/+/o/-
Functional Value	++/+/o/-
Memorial Value	++/+/o/-
Aesthetic Value	++/+/o/-

Value Assessment



- age value, social value, functional value →
- + memorial value
- o aesthetic value

Negative: Low value, abandoned and decayed.
Positive: Industrial relic - reminder of city memories

Extrovert and public-involving function,
Activate and regenerate the lost social & functional value
Preserve the age & aesthetic value (structure, material)



- o age value, social value
- + functional value, memorial value
- ++ aesthetic value

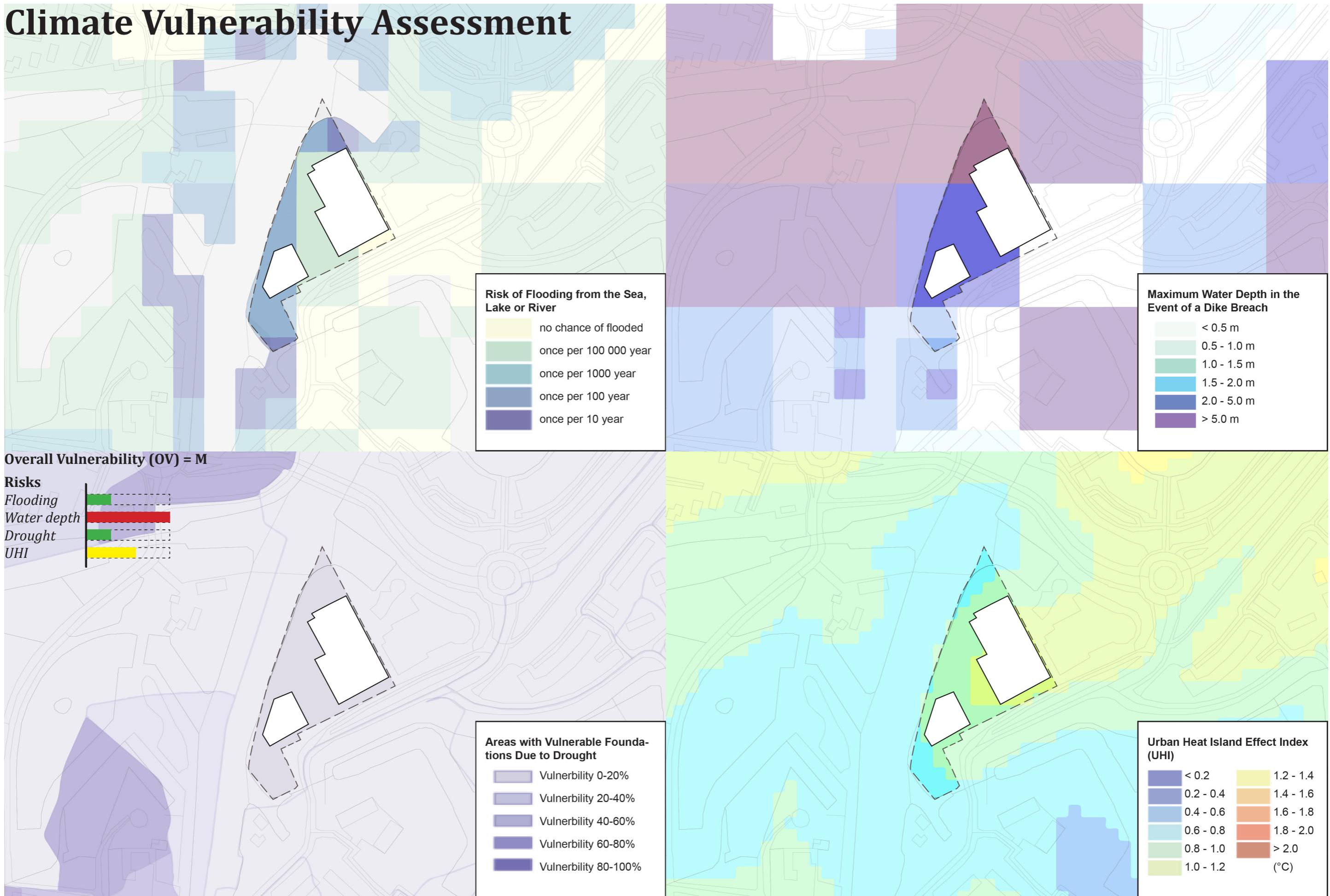
Complement to each other functionally,
collectively build a more complete value network.

Value Index (VI)

Value Dimensions

Age Value	++/+/o/-
Social Value	++/+/o/-
Functional Value	++/+/o/-
Memorial Value	++/+/o/-
Aesthetic Value	++/+/o/-

Climate Vulnerability Assessment

Source of Data: Atlas Leefomgeving | Atlas Leefomgeving. (n.d.). <https://www.atlasleefomgeving.nl/>

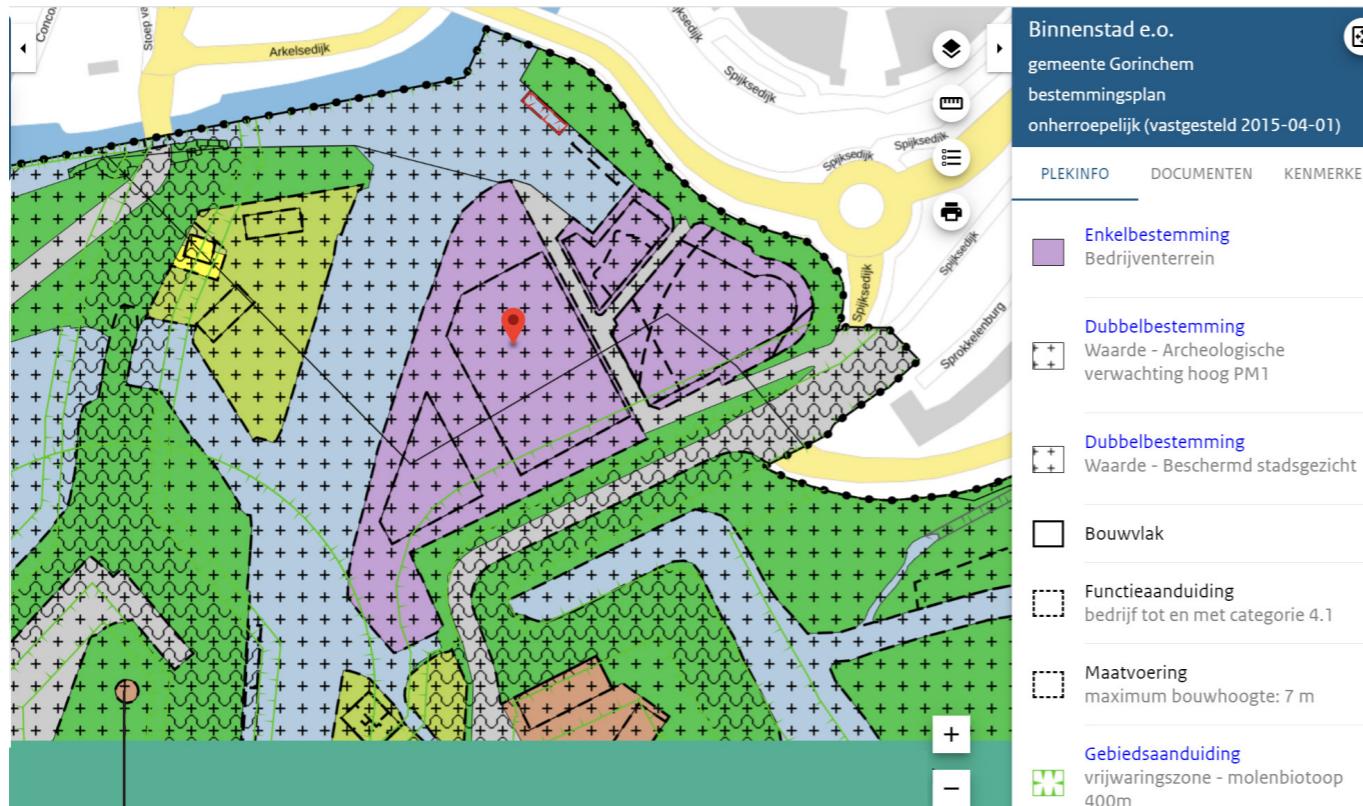
Hight Limits - local policy

Municipality Zoning Plan

This plot of land is single-destination for business use, featuring high archaeological significance, a protected cityscape, and it is within a 400m safeguarded mill biotope. The zoning allowances for industrial activities is up to category 4.1.

- Single Destination: Business Park
- Dual Destination Value: High archaeological potential (PM 1)
- Dual Destination Value: Protected Cityscape
- Function Designation: Company operations permitted up to and including Category 4.1
- Regional Designated Conservation Area: Mill Biome 400m, the building height should be 1/50 of the distance between the building and the height of the lowest point of the vertical mill wing.

Check Appendices for details on regulations & policies.



information: <https://www.ruimtelijkeplannen.nl/view>

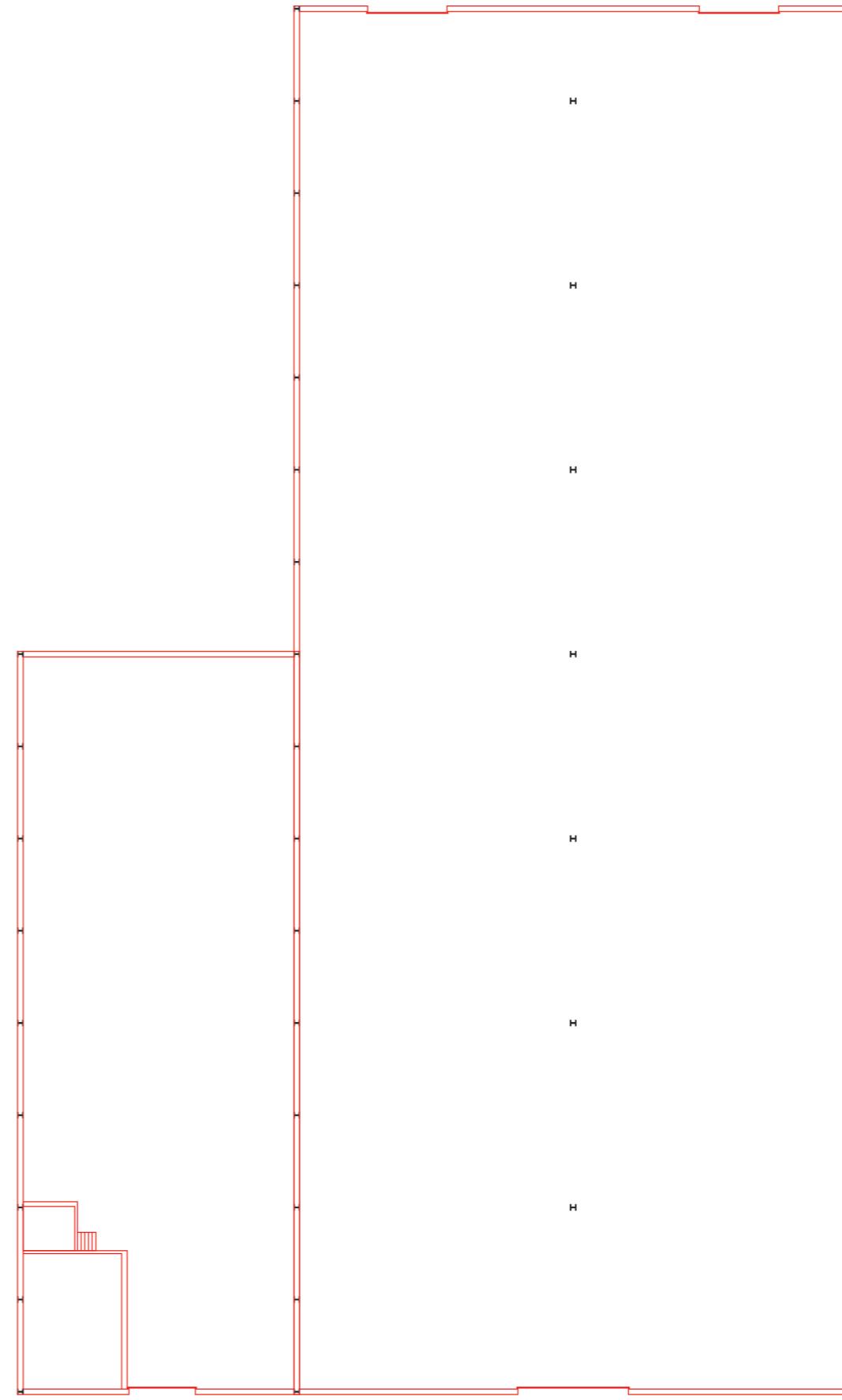
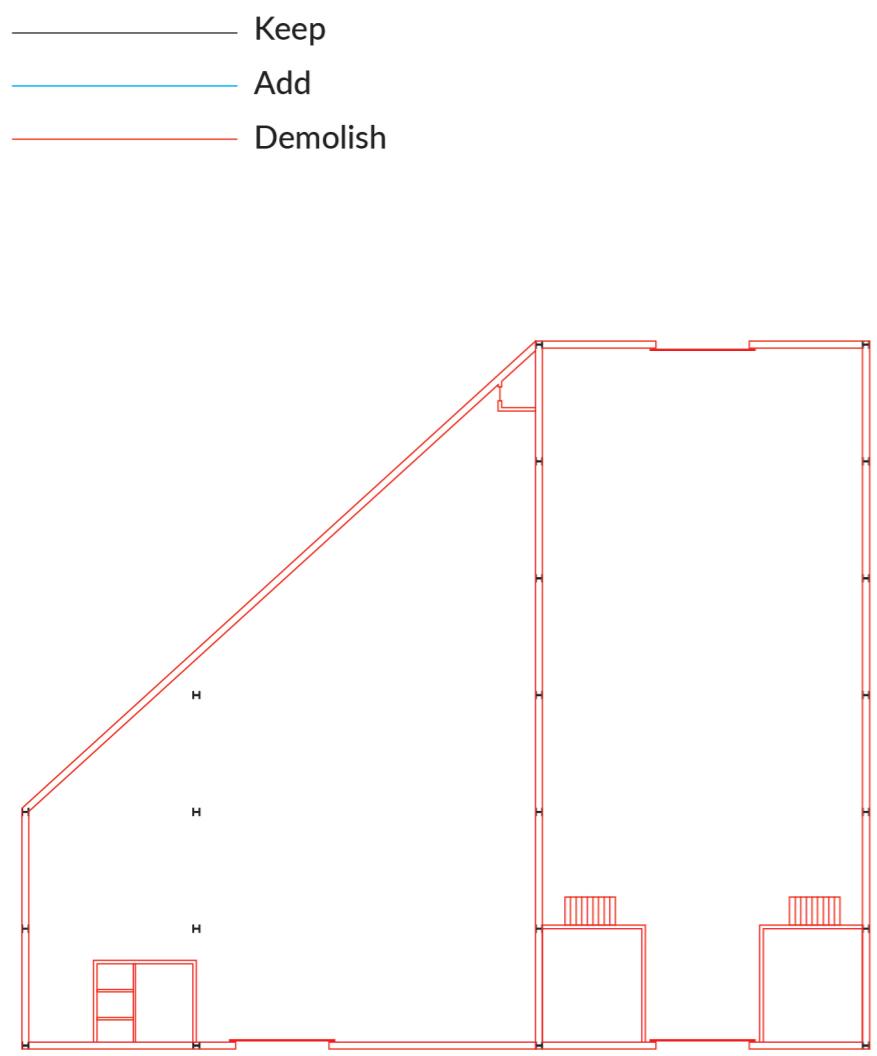


Windmill 'Nooit Volmaakt'

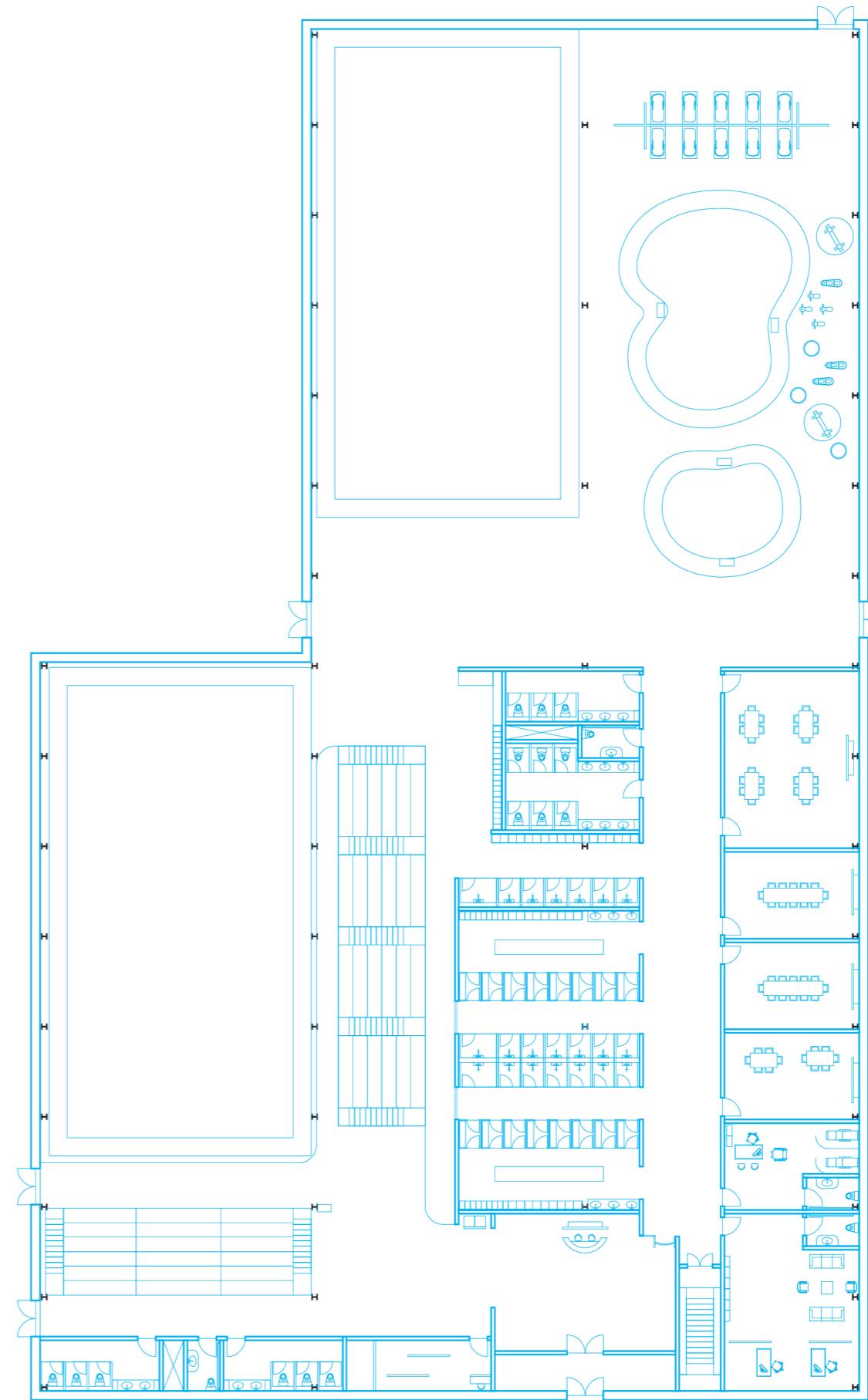
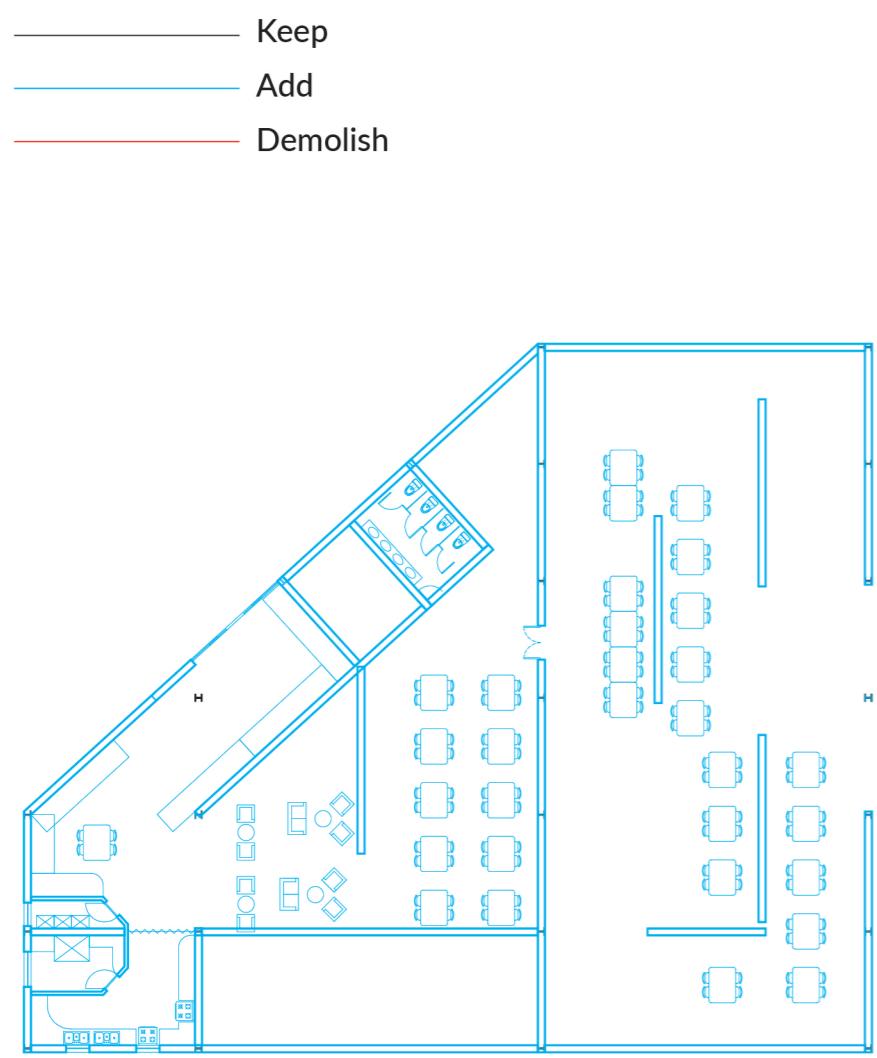
Location: Bagijnenwal 38
Construction Year: 1718
Original Function: Flour Mill
Current Use: Retail & Tourism
Status: National Monument

→ **Minimum Intervention
Strategy**

Intervention - Demolish, Keep, Add

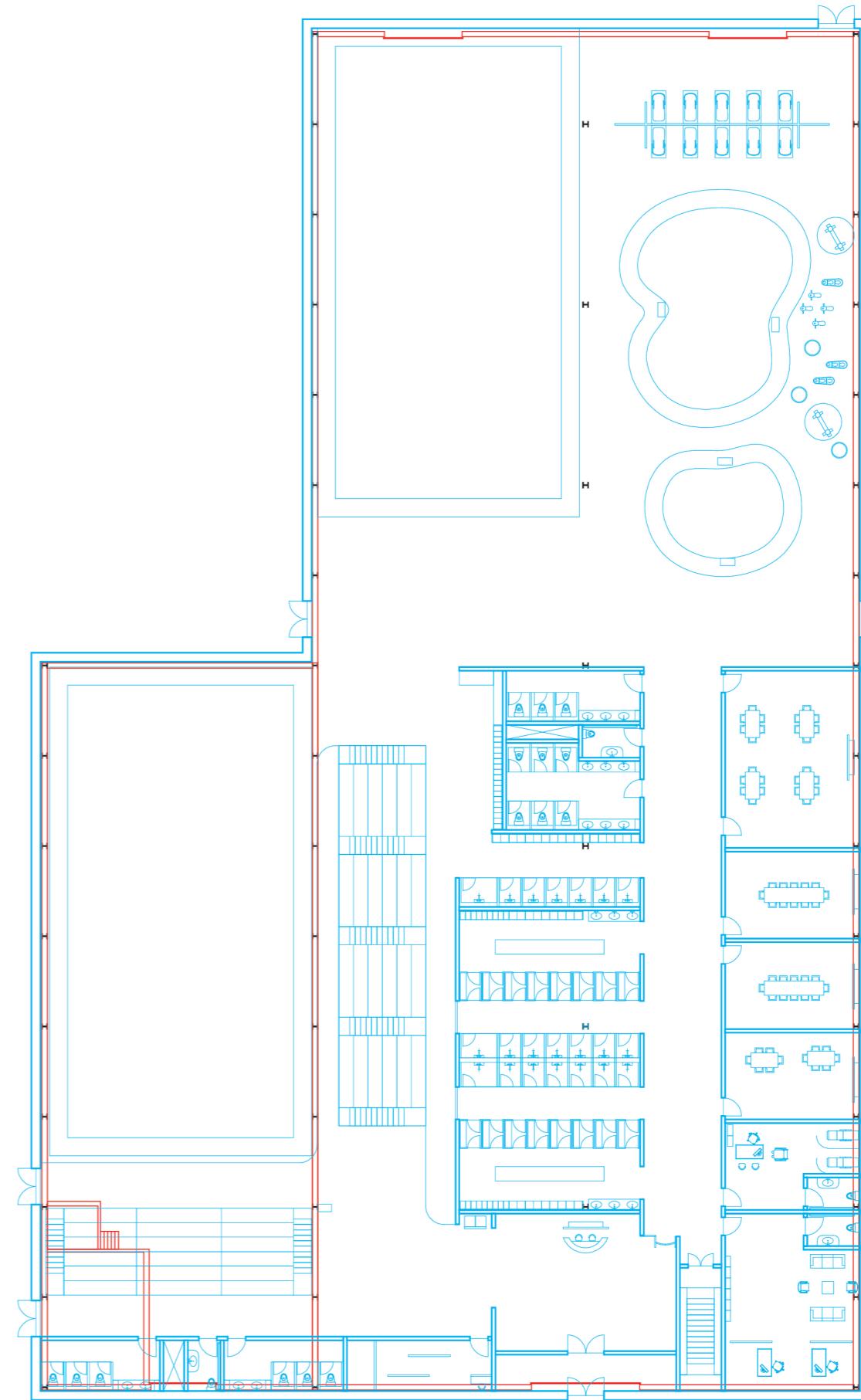
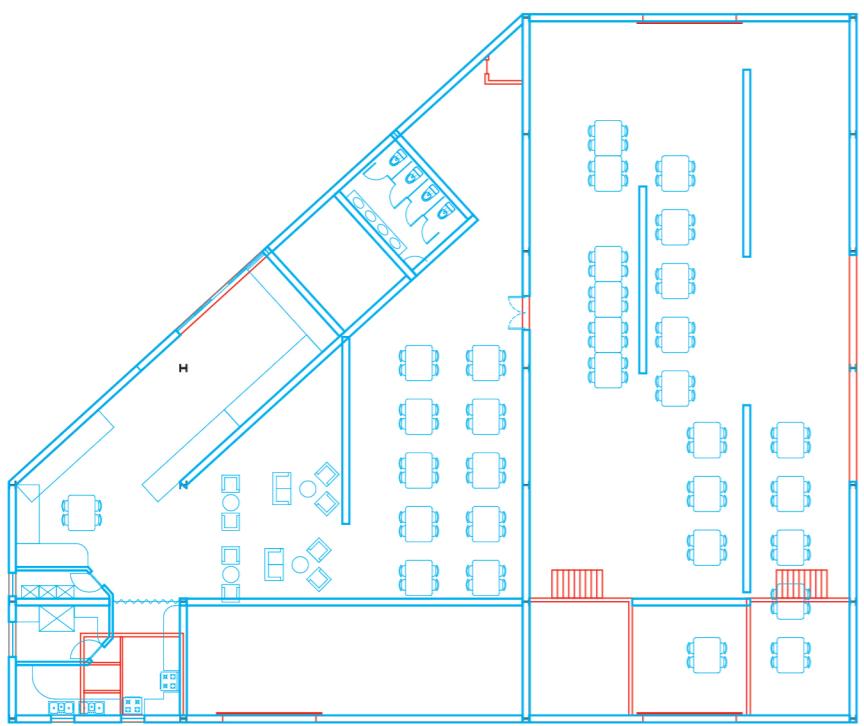


Intervention - Demolish, Keep, Add

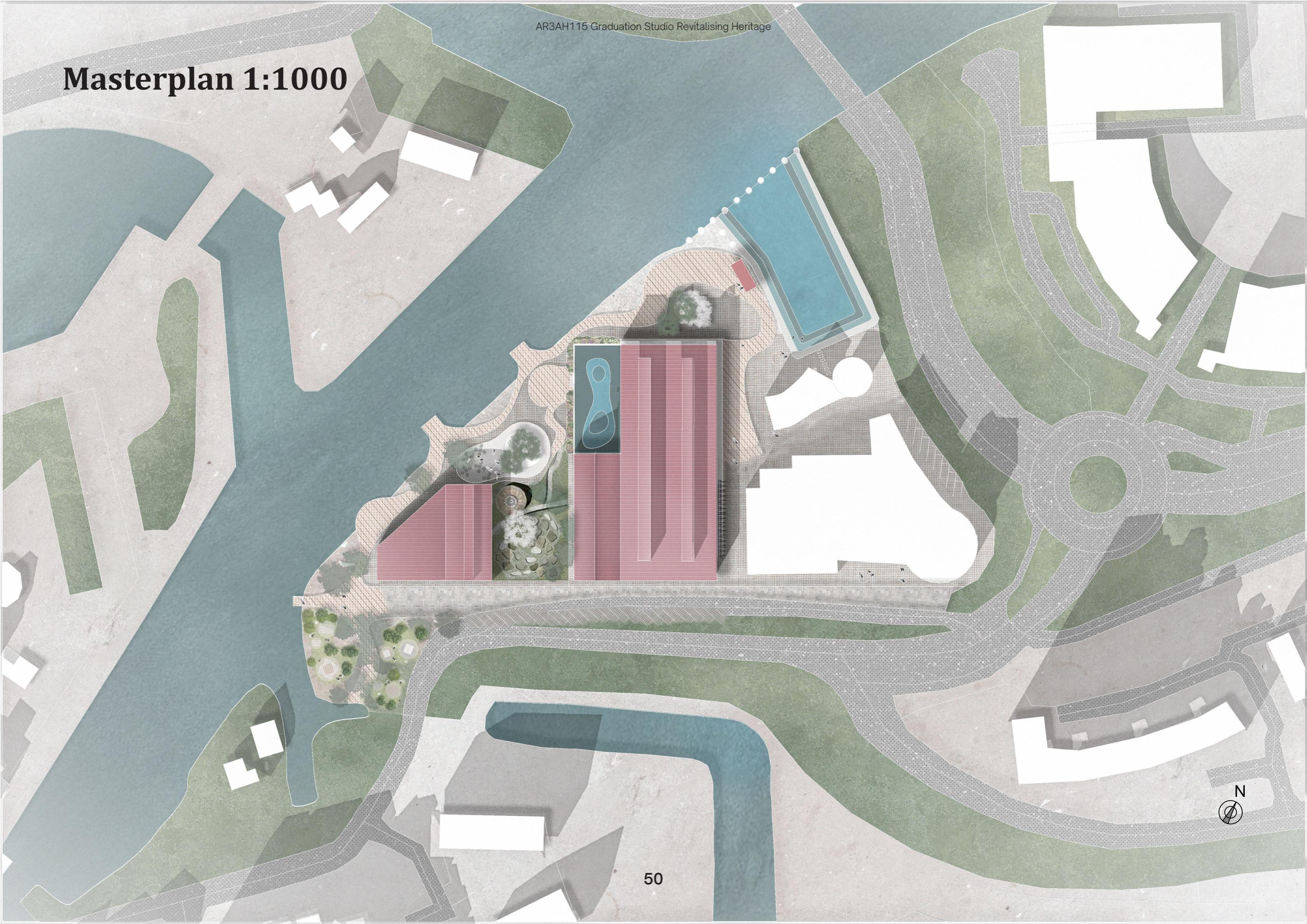


Intervention - Demolish, Keep, Add

— Keep
— Add
— Demolish



Masterplan 1:1000



Ground Floor Plan 1:500

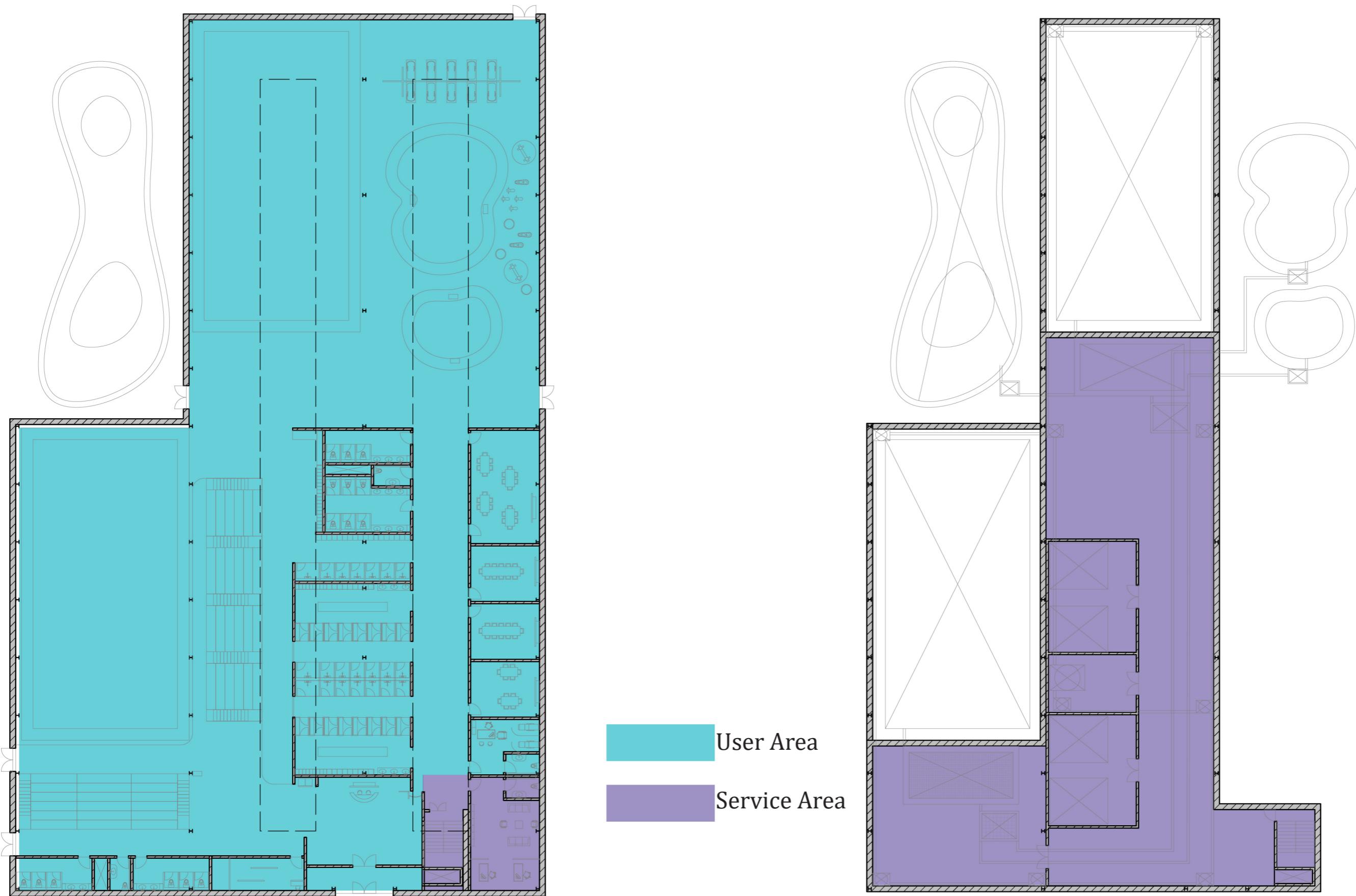
1. Main Entrance (Passengers & Bicycles)
2. Reception
3. Change Room & Bathroom
4. Family / Gender Neutral Change Room
5. Children's Area
6. Sauna / SPA / Water Therapy Area
7. Indoor Leisure Pool (0.9m)
8. Children's Pool (0.3m)
9. Change Room & Shower
10. Outdoor Leisure Pool (0.3m - 1.2m)
11. Indoor Sports Pool (0.9m - 1.8m)
12. Audience Seats
13. Rest / Waiting Area
14. Administration Office
15. Medical Room
16. Stairs to basement
17. Courtyard
18. Pavilion
19. Playing & Sitting Area
20. Waterfront Platform
21. External Change Room & Shower
22. Natural Public Pool (Linge River)
23. Dining Restaurant
24. Café
25. Outdoor Seats of the Restaurant & Café
26. Biophilic Land (installations: Bee's Nest, Insects Hotel, Worm Hotel, Birds Hotel, etc.)
27. Parking Area
28. Spijksdijk
29. Gallery & City Architect Office (National Monument)
30. Clinic & Vehicle Repairing Center
31. Linge River



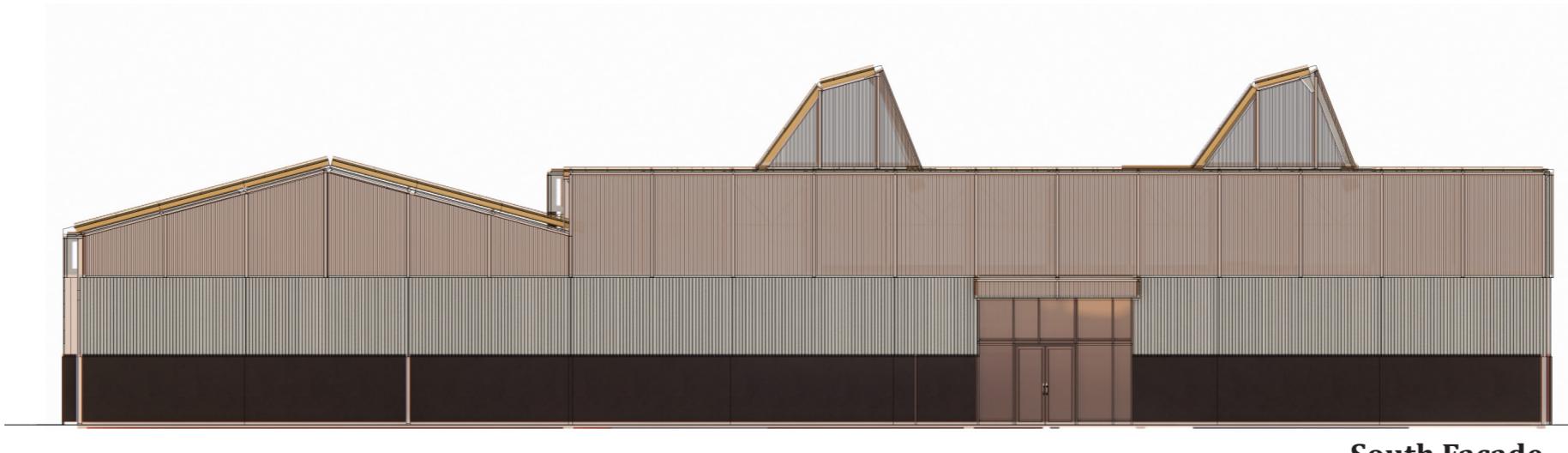
Ground Floor Plan 1:100



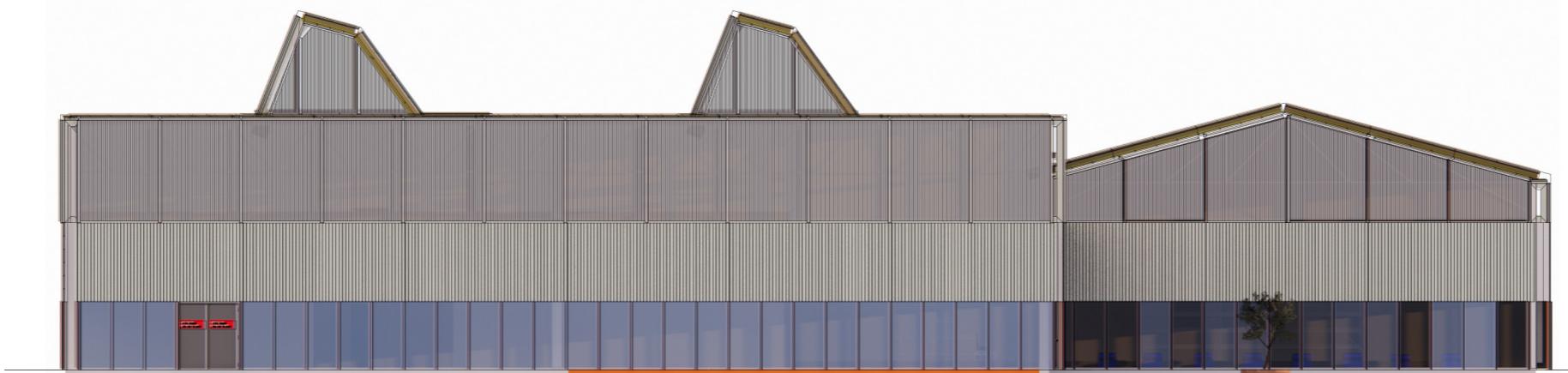
Ground Floor & Basement Plan 1:100



Elevation S/N



South Facade



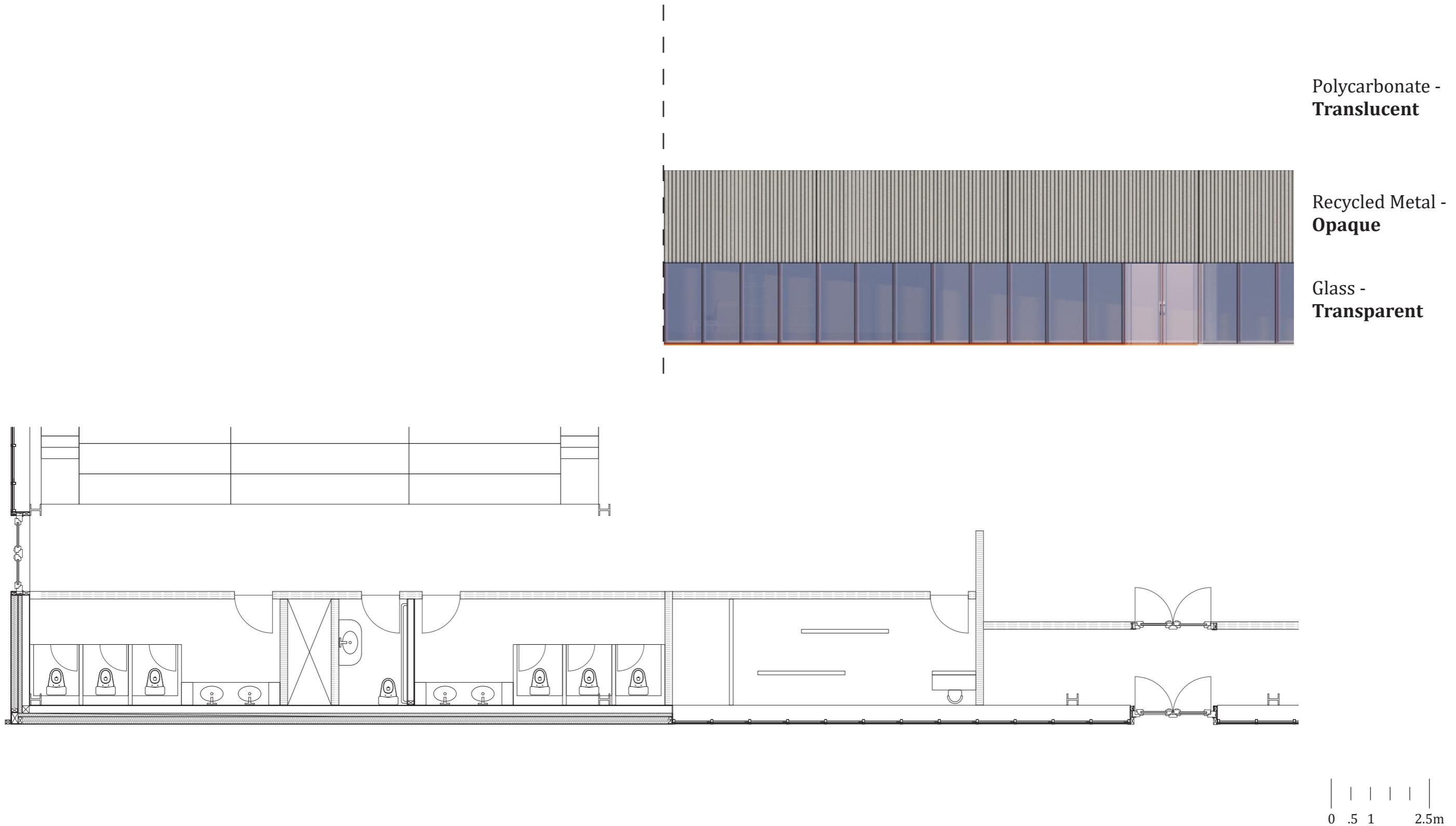
North Facade



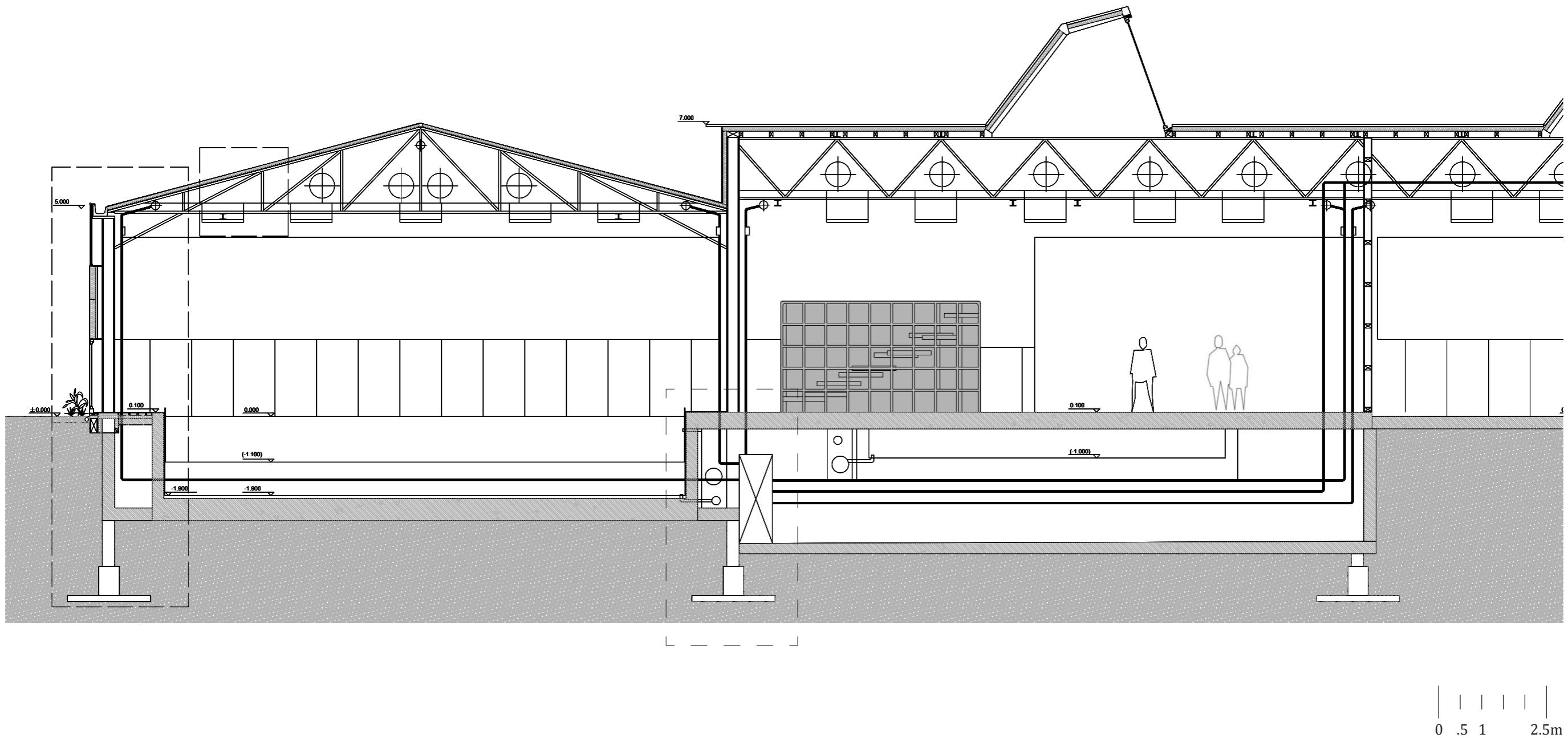
Elevation E/W



Facade Horizontal Section 1:50

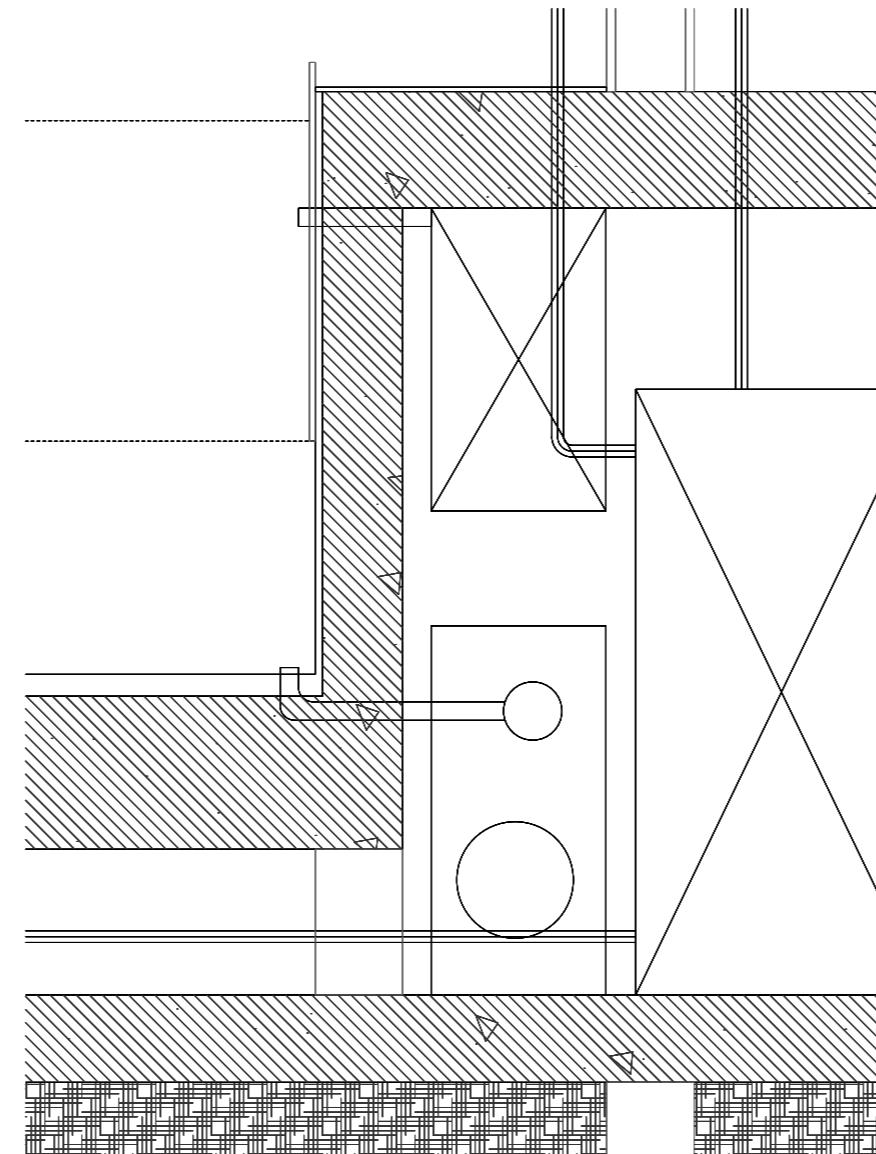


Vertical Section 1:50

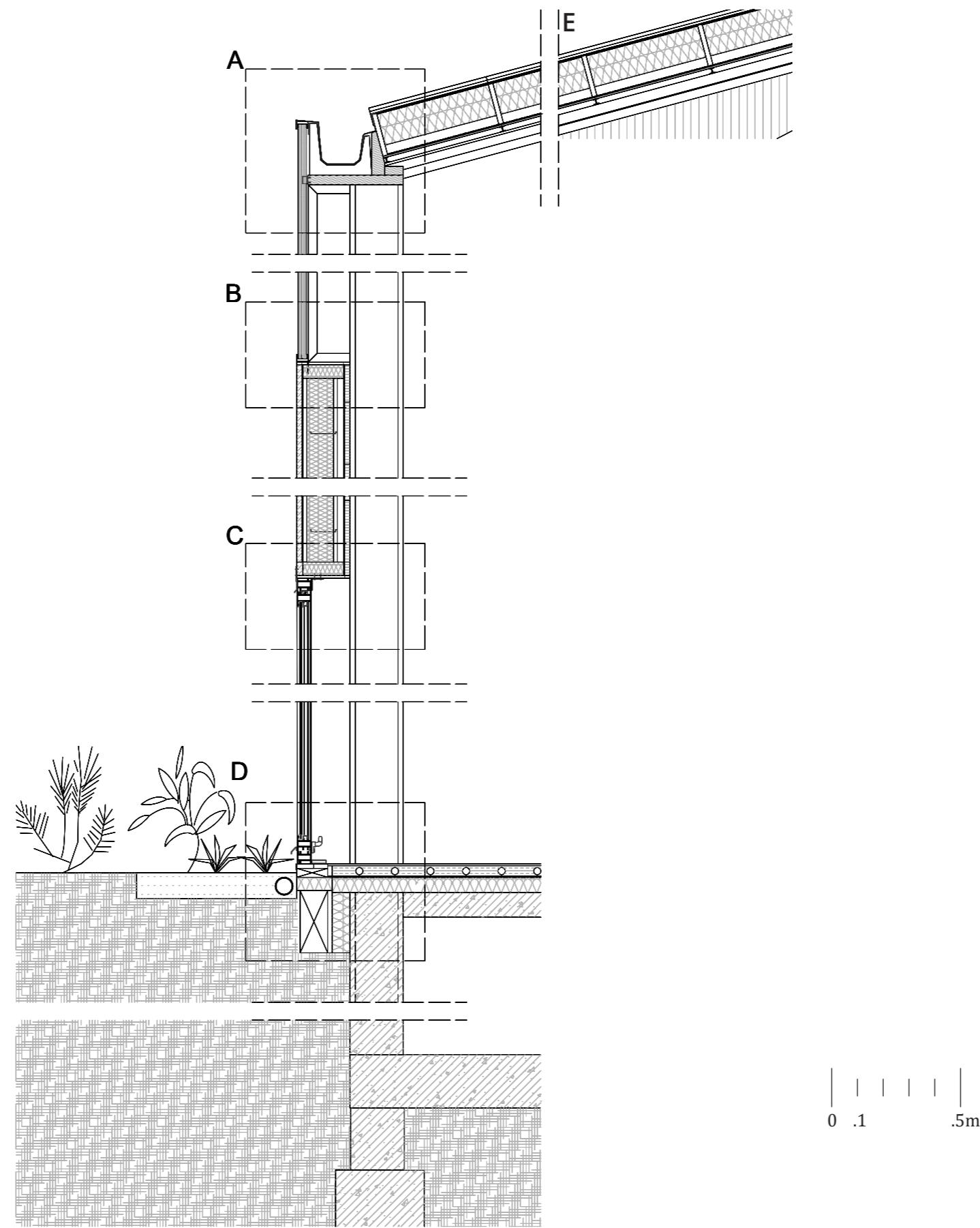


Equipment Space Detail 1:10

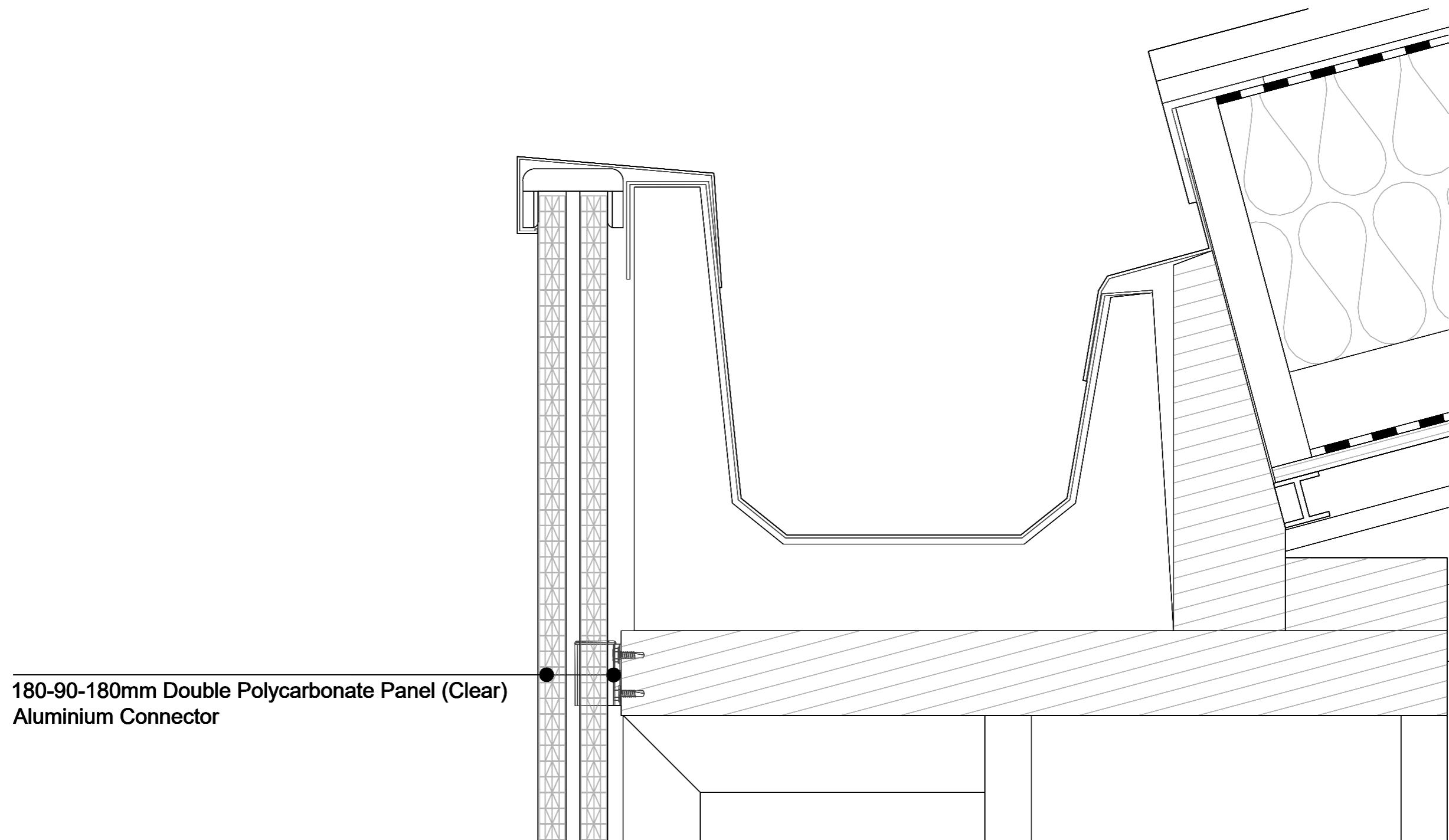
Mechanical Ventilation, Water Pumping and Heating System



Facade Fragment Vertical Section 1:10

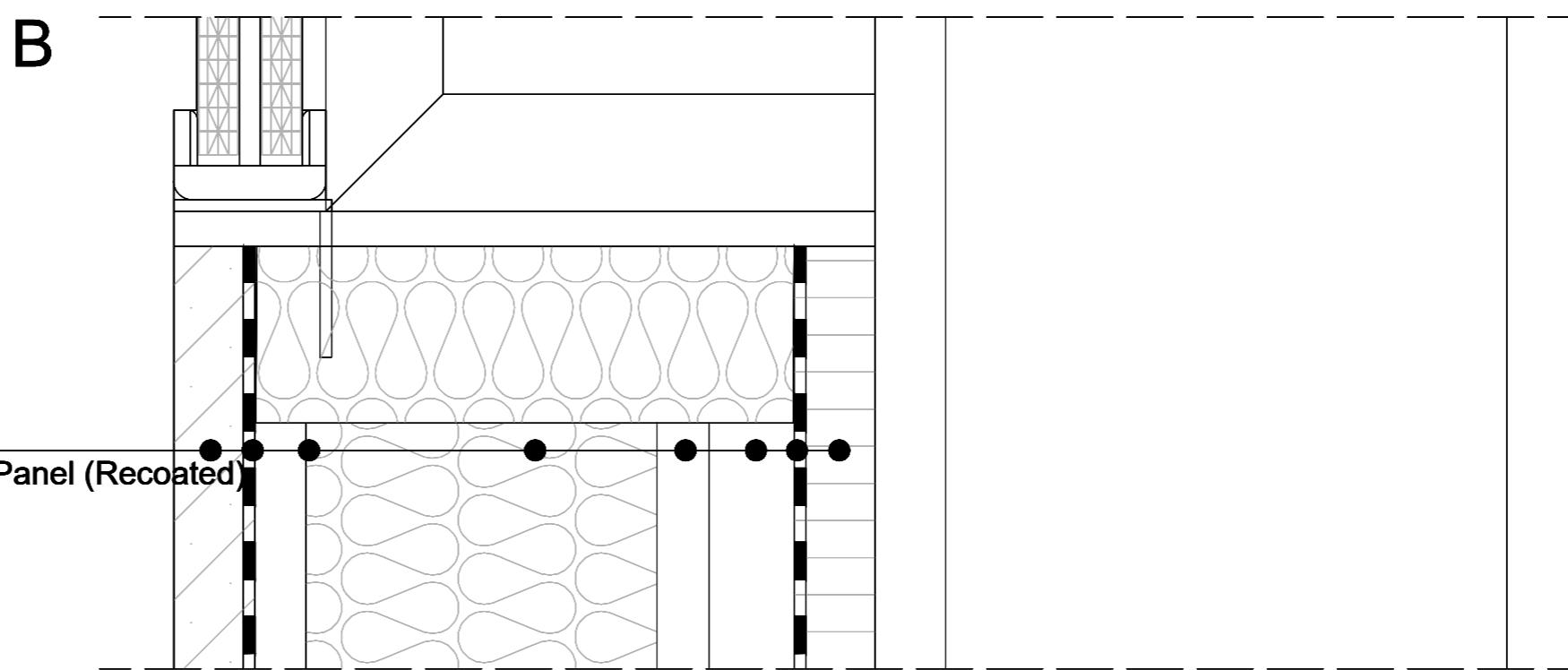


Construction Detail A 1:5

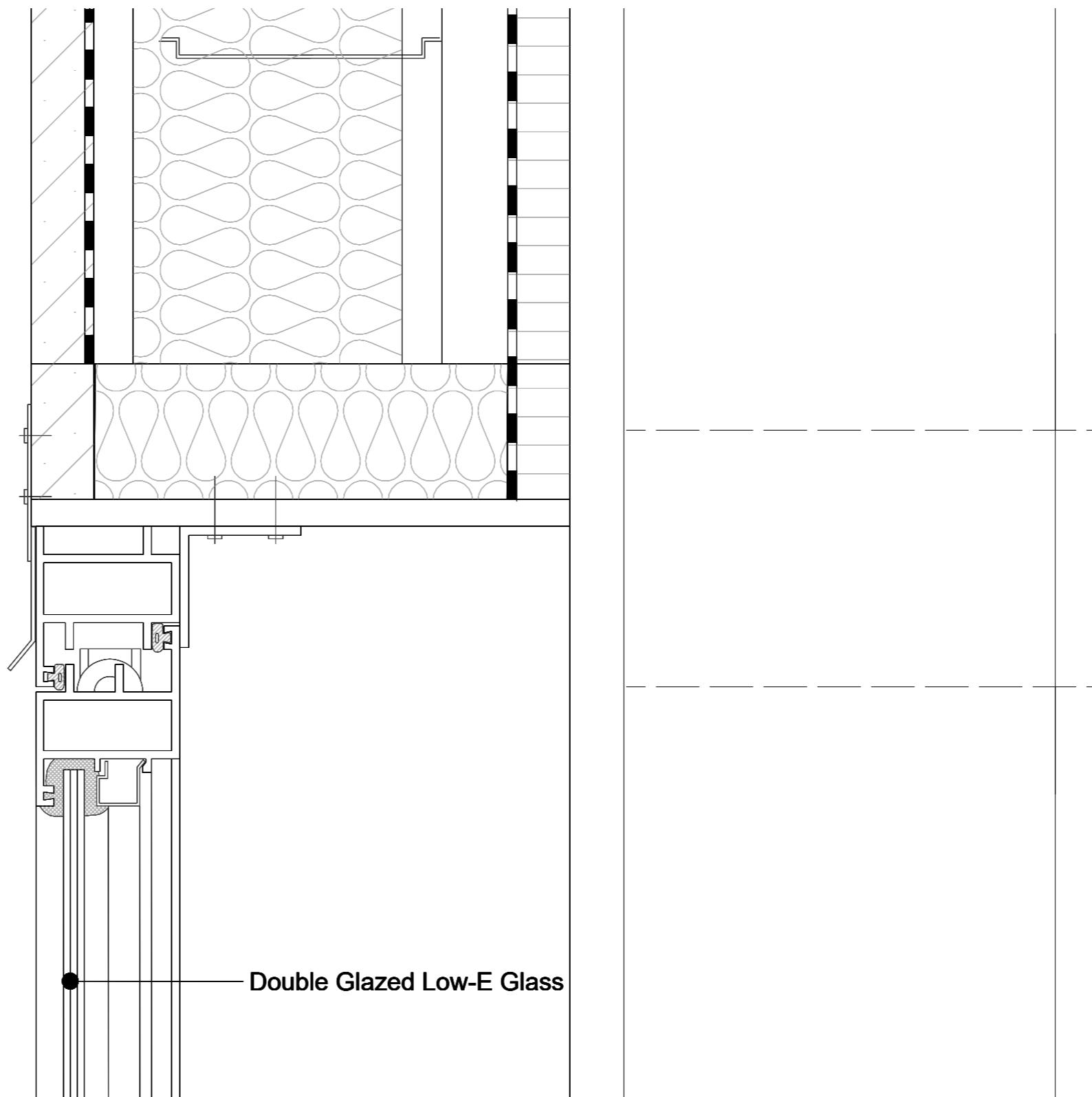


Construction Detail B 1:5

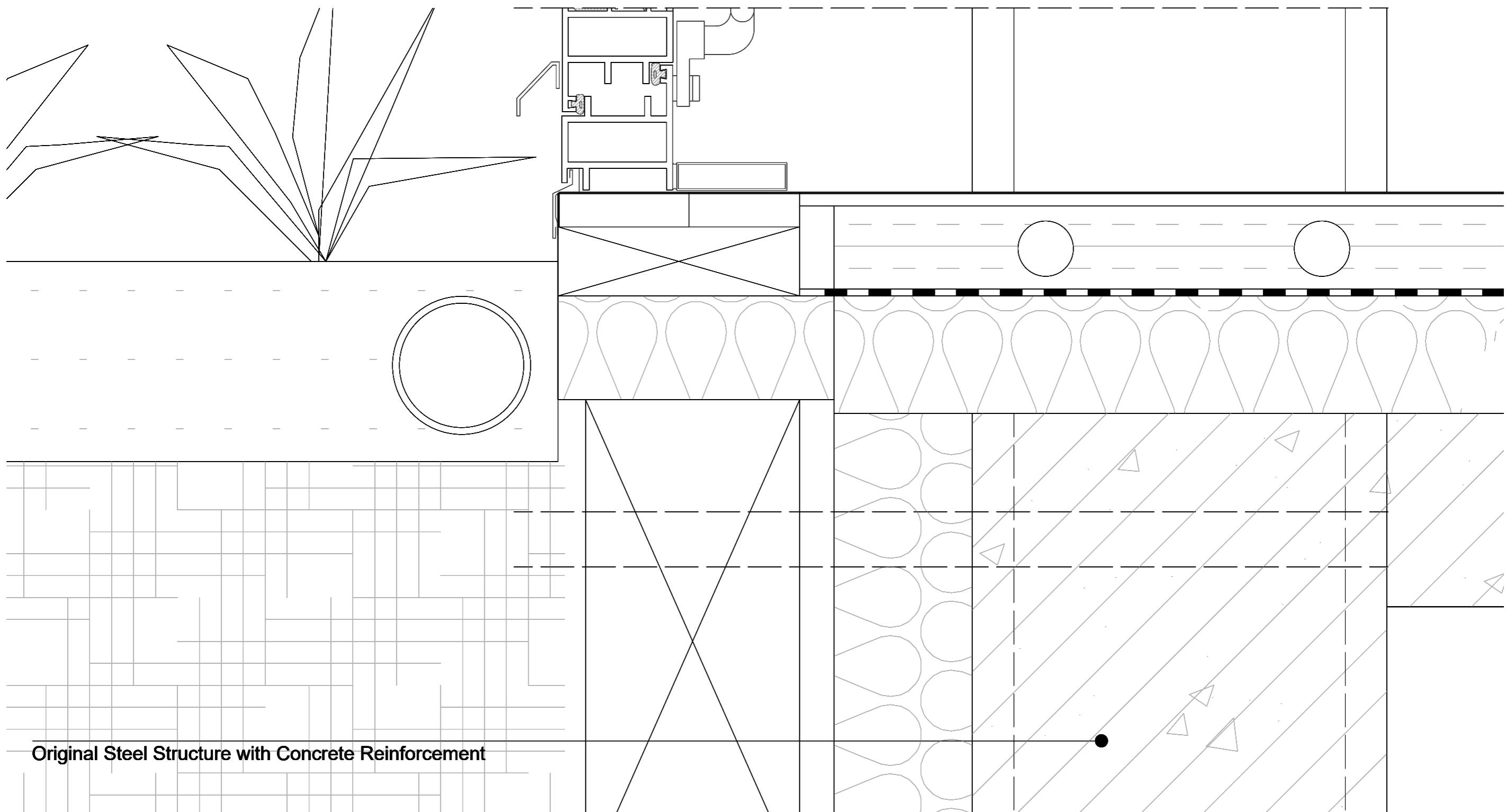
Recycled Corrugated Corten Steel Panel (Recoated)
Water-proof Membrane
150mm XPS Insulation
20mm Air Gap
Structural Frame
Vapor Control Membrane
Ceramic Tile



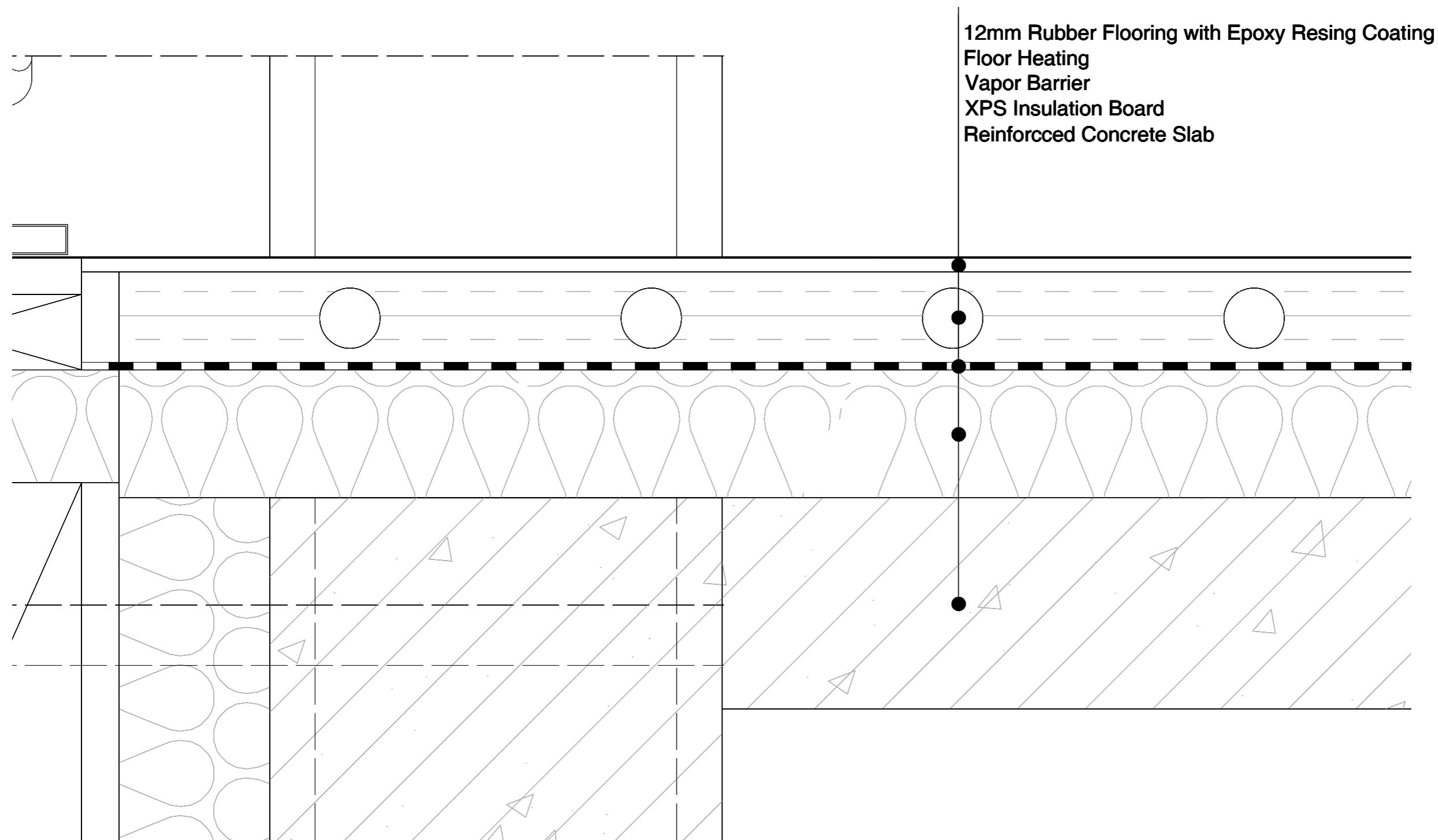
Construction Detail C 1:5



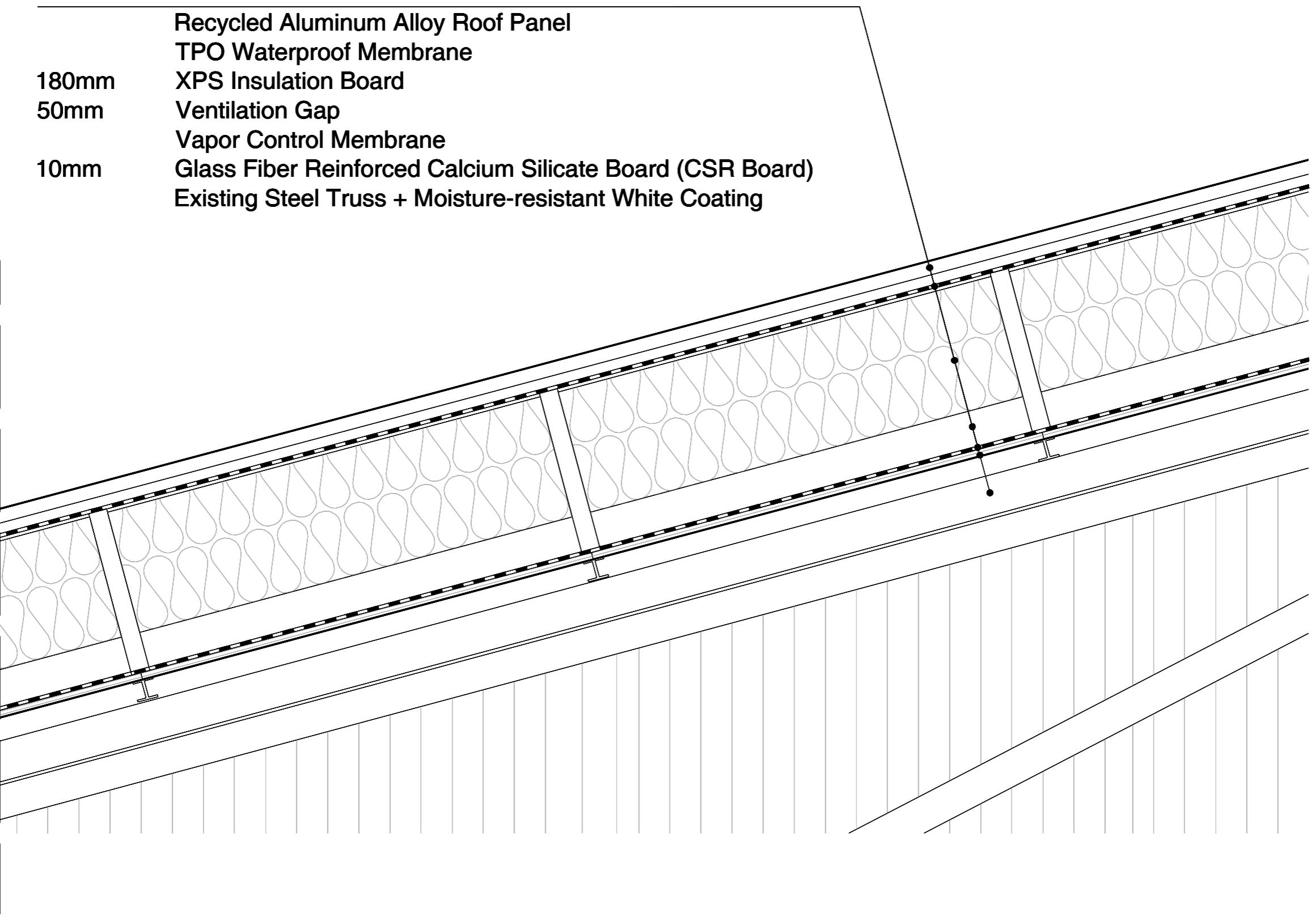
Construction Detail D1 1:5



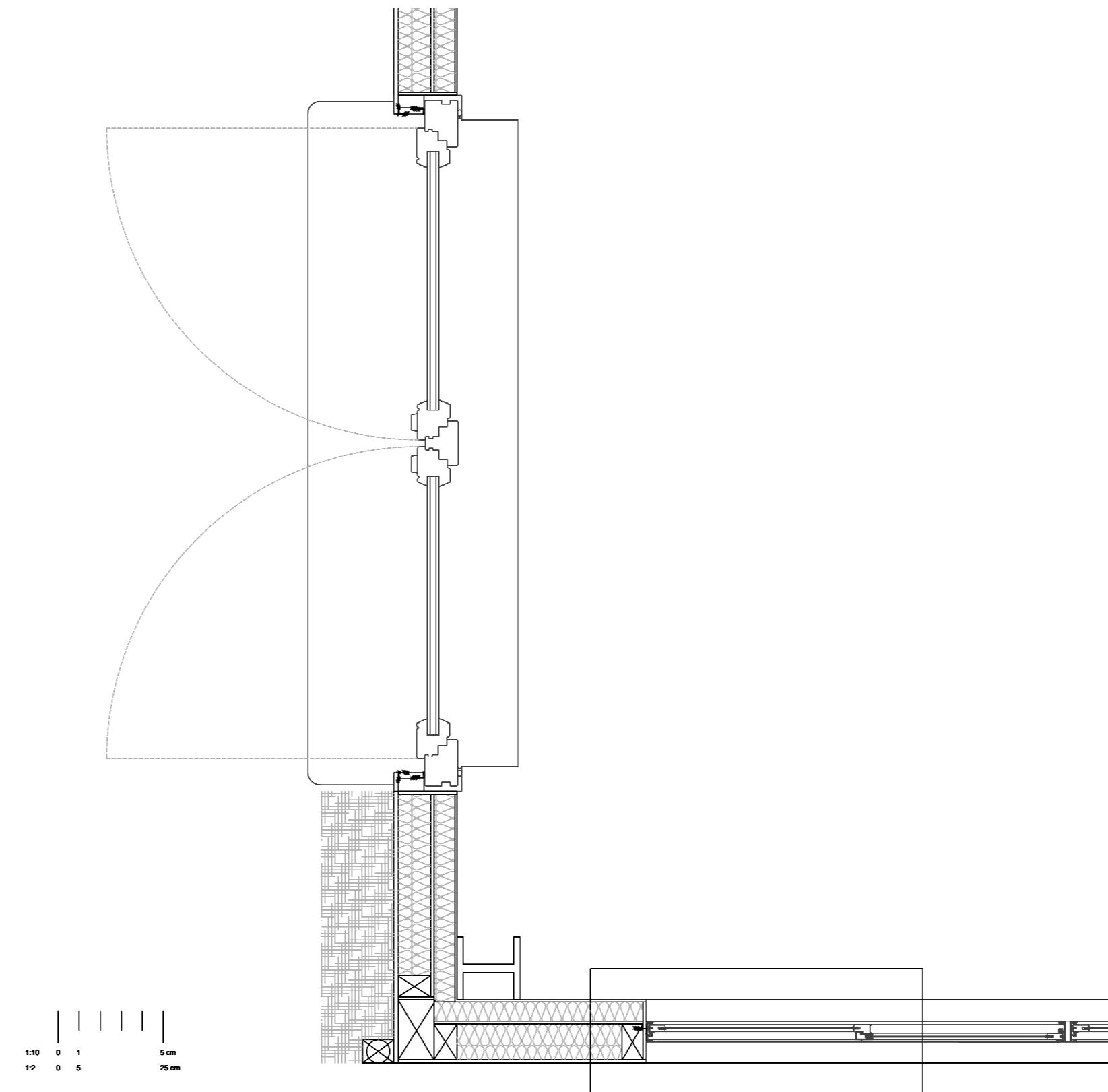
Construction Detail D2 1:5



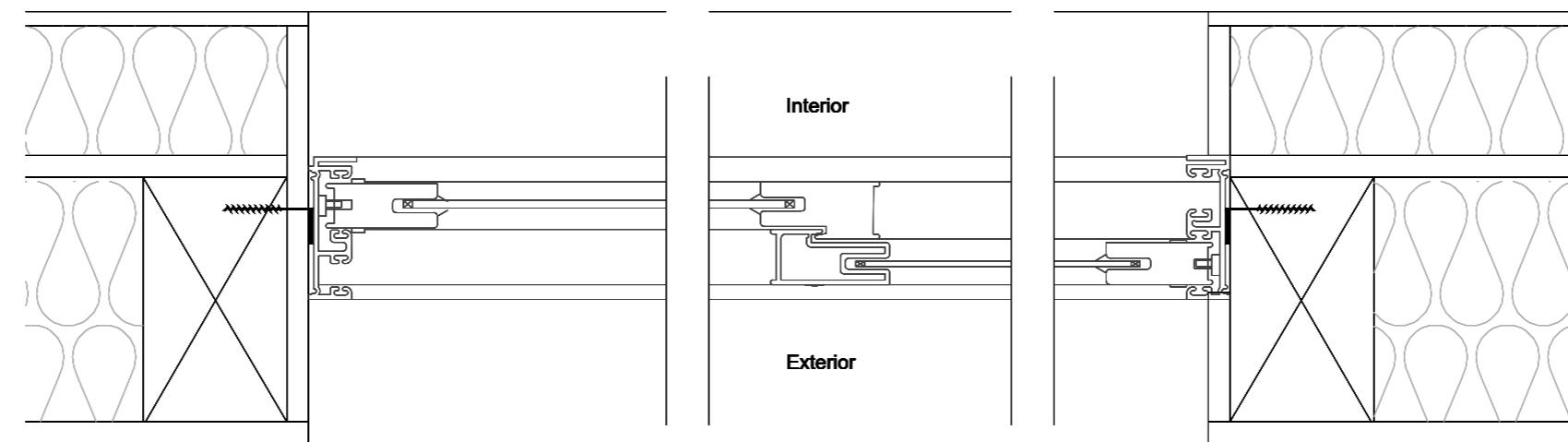
Construction Detail E 1:5



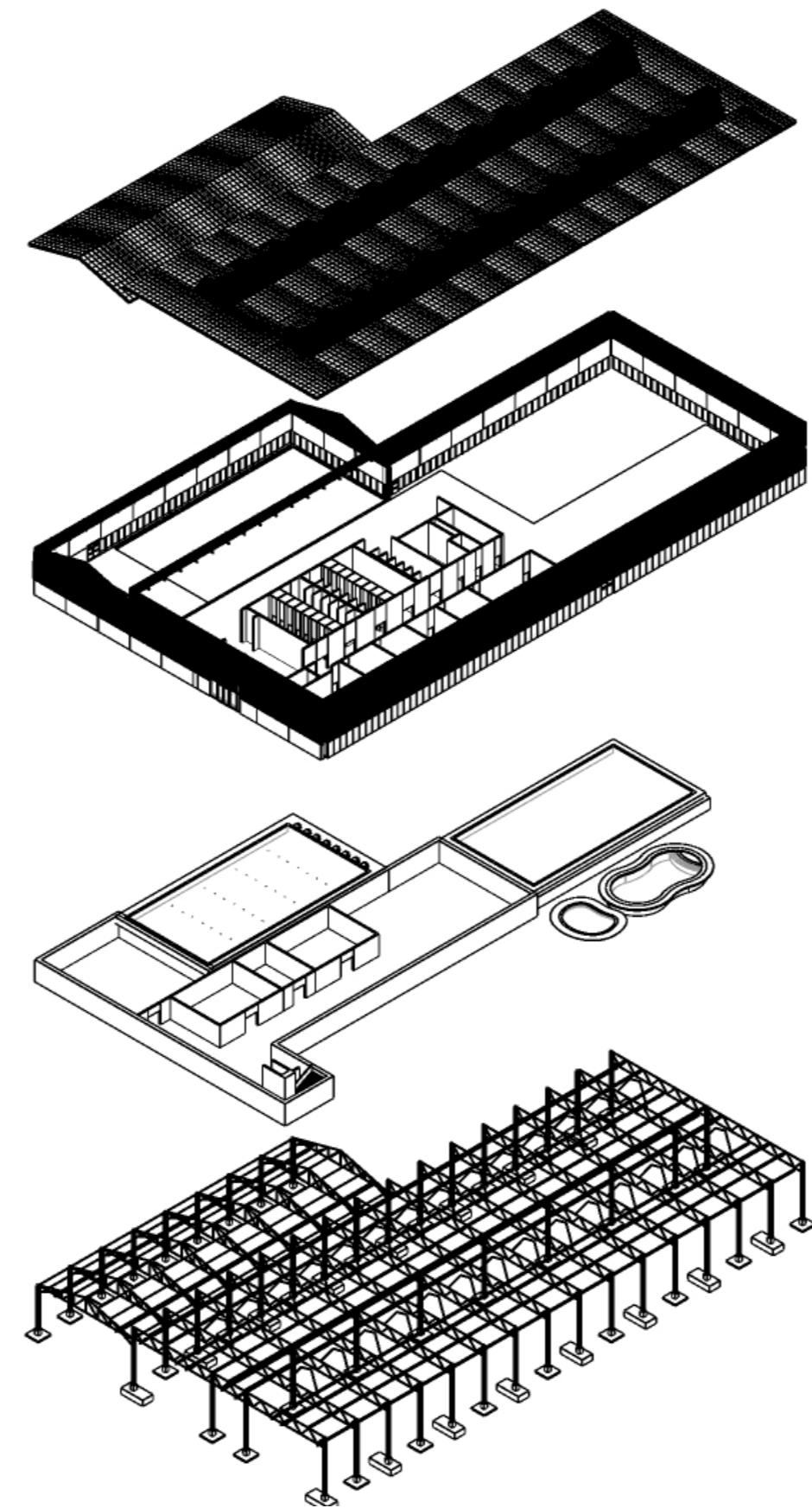
Facade Fragment Horizontal Section 1:10



Facade Fragment Detail 1:2



Exploded Axonometry



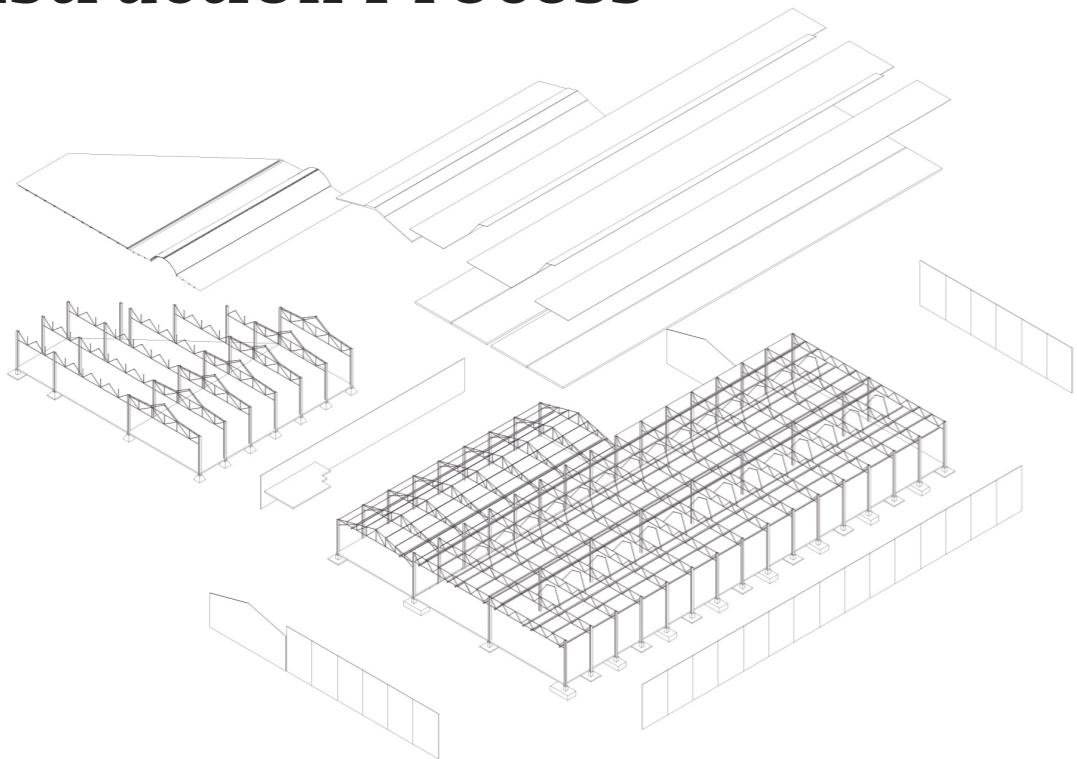
Roof

Skin

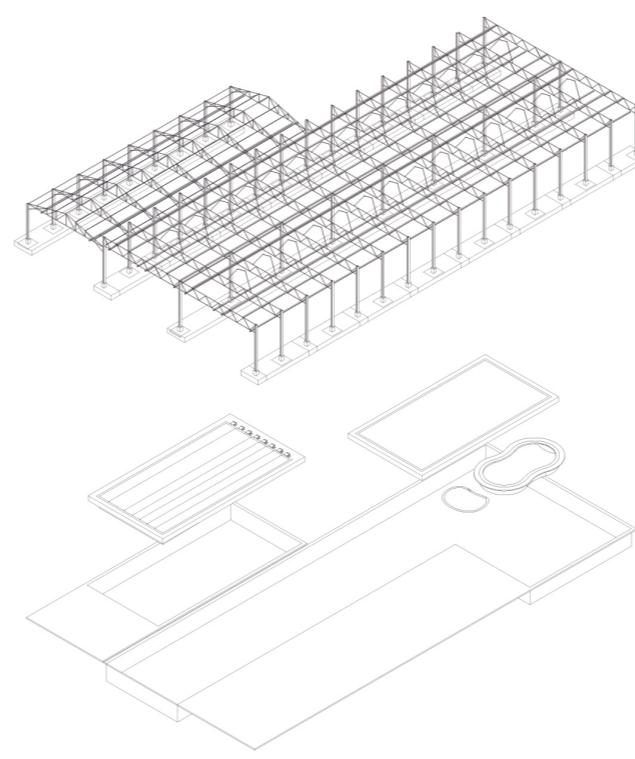
Space

Structure

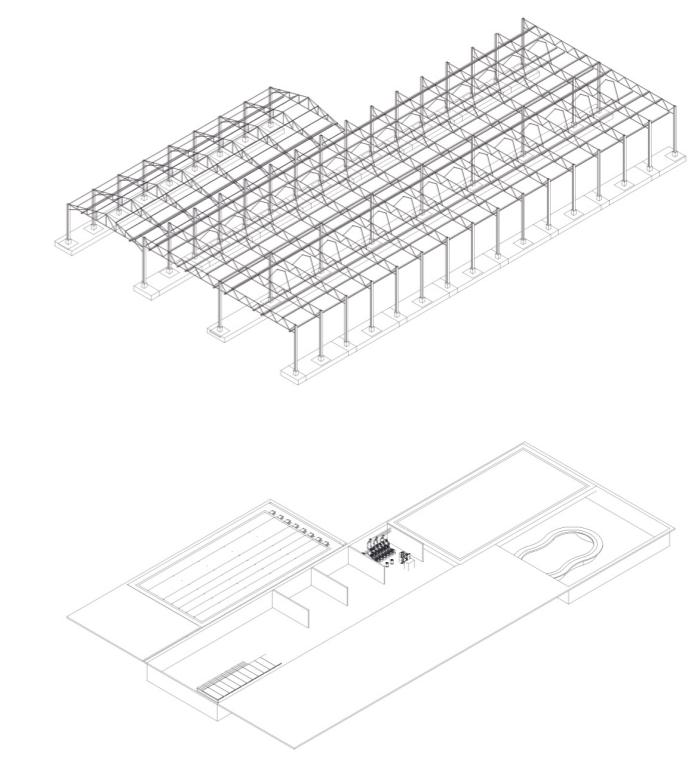
Construction Process



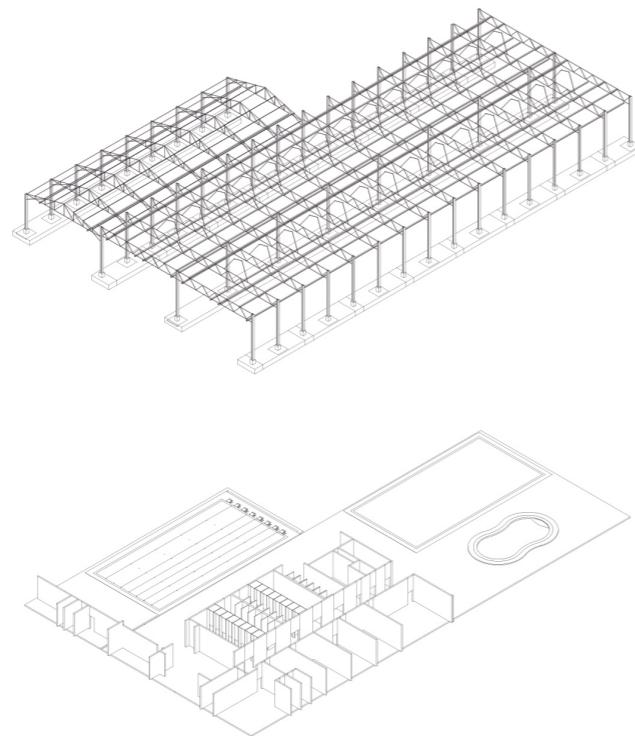
1. Removal of the existing skin, collect the taken down metal panels, repaint and prepare for reuse.



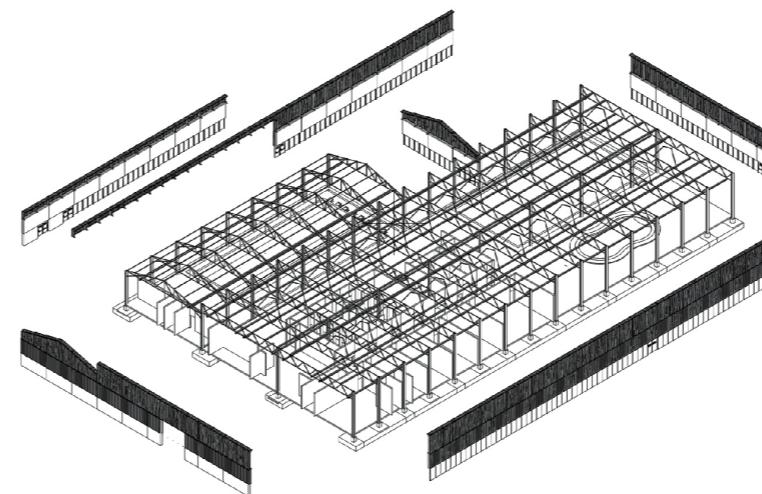
2. Dig in the earth to make space for the pools, and reinforce the foundation.



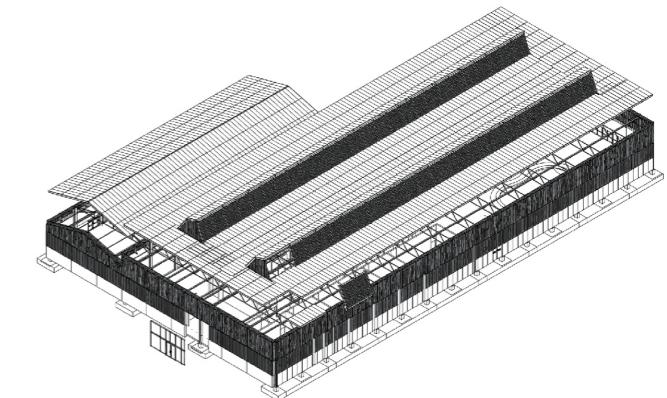
3. Set the machines in the underground equipment space, then construct the floor with prefab-concrete slab. Build in heating pipes.



4. Construct the internal walls with prefab wall panels.

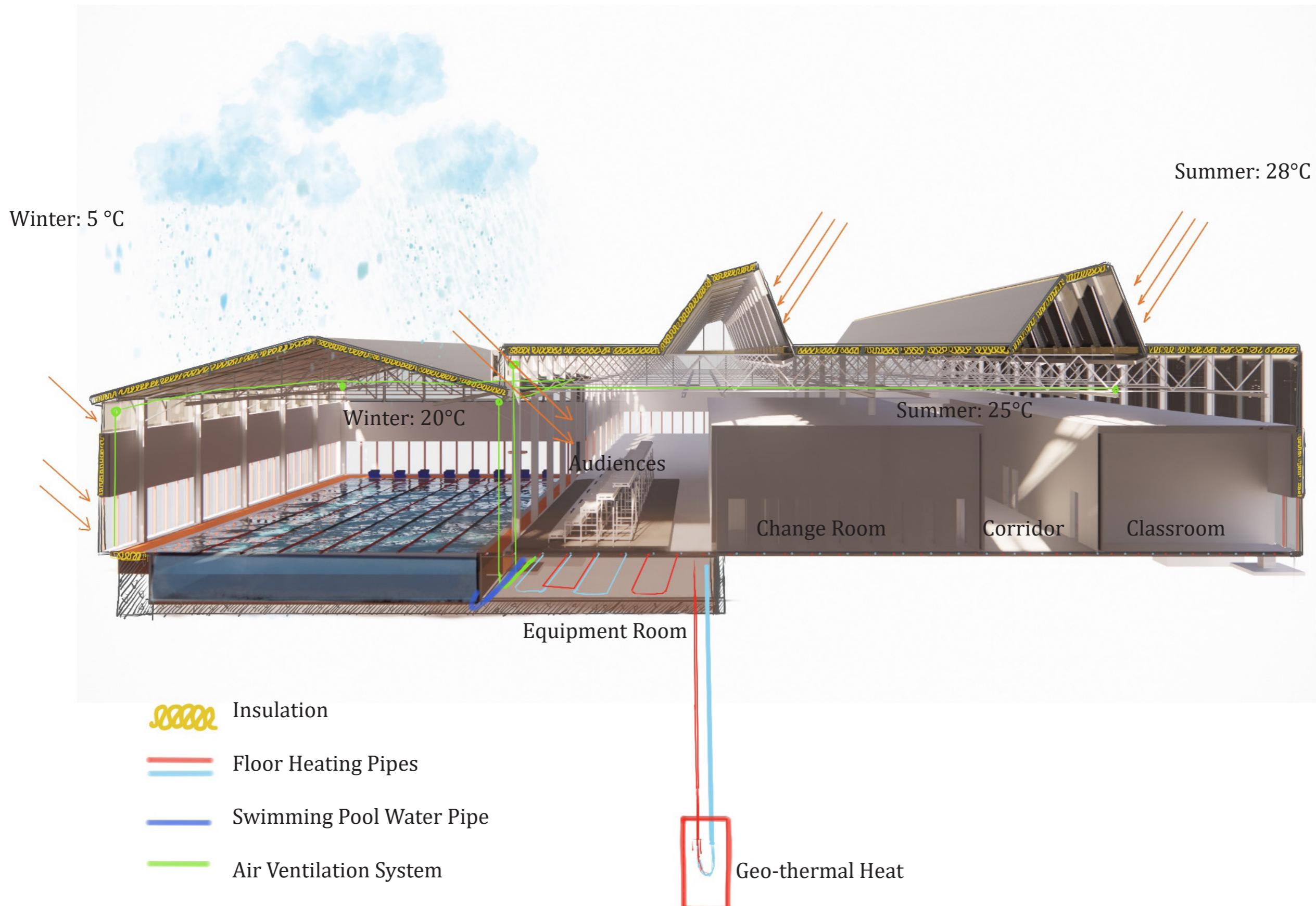


5. connect the external wall to the structure.



6. connect the roof panels (laminated timer panels & PC panels) to the trusses.

Climate Scheme



Scene 1: Swimming Pool



Scene 2: Corridor



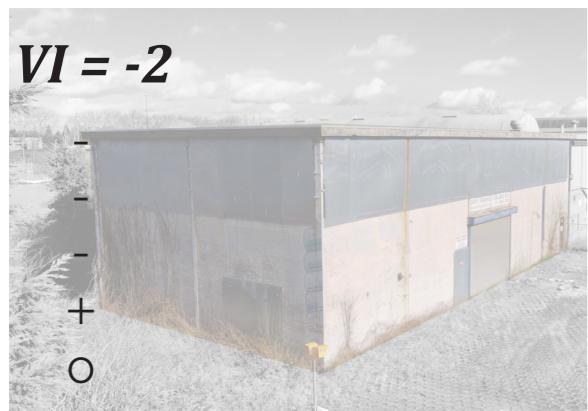
Scene 3: Preparation Area



Scene 4: Public Space



Regeneration of Value?



- age value, social value, functional value
- + memorial value
- o aesthetic value

$$VI = 5$$



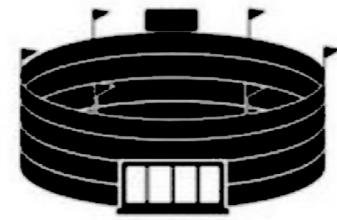
Social Value

- → ++



Functional Value

- → ++



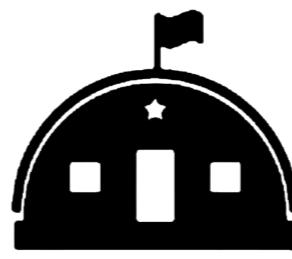
Memorial Value

+



Aesthetic Value

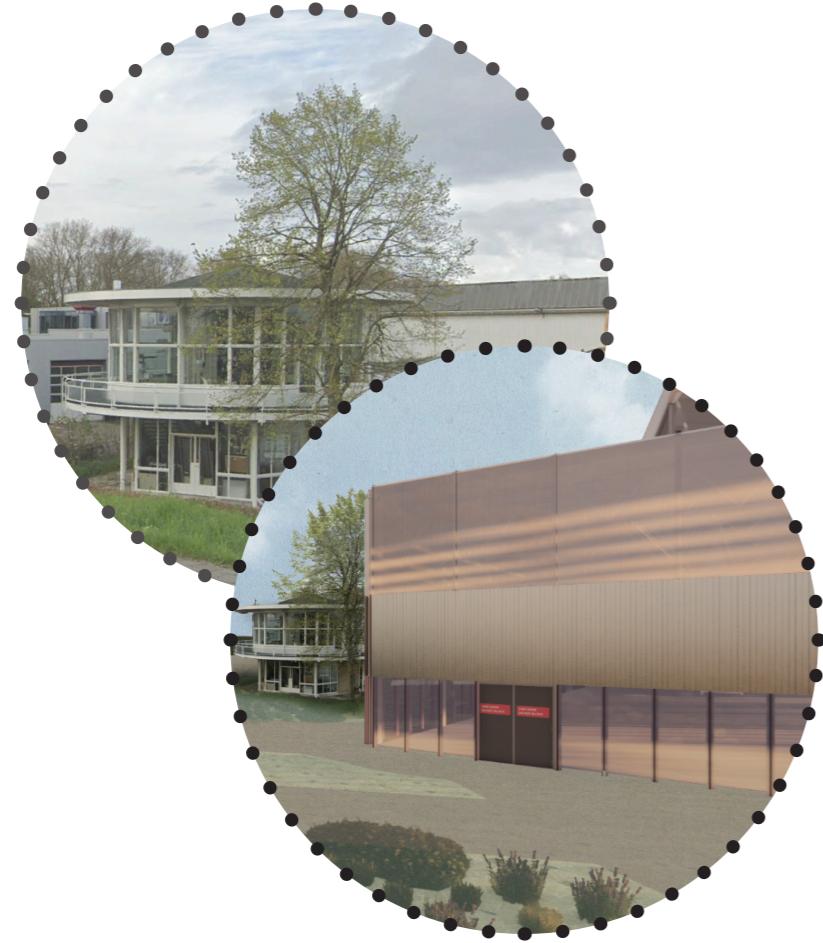
0 → +



Age Value

-





+ Symbiotic Value

Definition: a mutually beneficial relationship between the buildings, where their combined presence enhances the overall architectural value.



+ Regenerative Value

Definition: How the building revitalizes the area, bringing new energy, people, and economic activity.

Regeneration of Value: Journey of a Waterfront Industrial Heritage from Abandoned to Alive



©Xiaoling Wei, Aerial Photo, De Vries Robbé warehouse between Linge River and Spijksedijk, Gorinchem (2024)