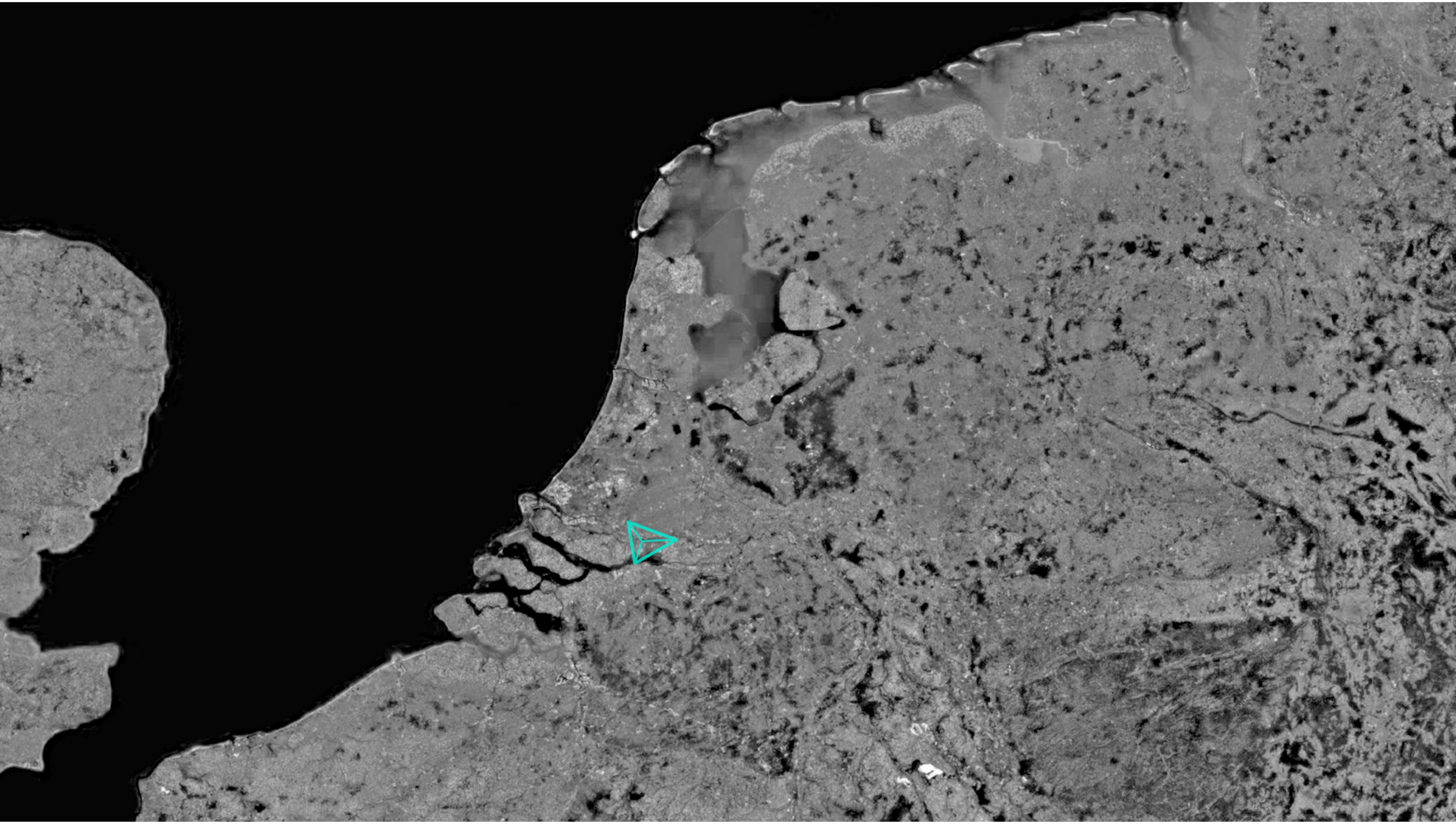
WATERBIOMES

HA 2024/25 Erfgoedlijn P5
Heritage & Architecture

Jan Panhuis

Introduction & Problem Statement

PROJECT LOCATION



Maritime Heritage Line

MIGRATORY ROUTES

Urban Metabolisms (2014) Gemeente Rotterdam - IABR - FABRIC - JFCFO - TNO

Research: Abundance of migratory fish pre 19th century

Historical rise of waterpower initiated the collapse of salmon stocks

H J R Lenders [1], T P M Chamuleau [1 2], A J Hendriks [1], R C G M Lauwerier [3], R S E W Leuven [1], W C E P Verberk [4]

Affiliations + expand

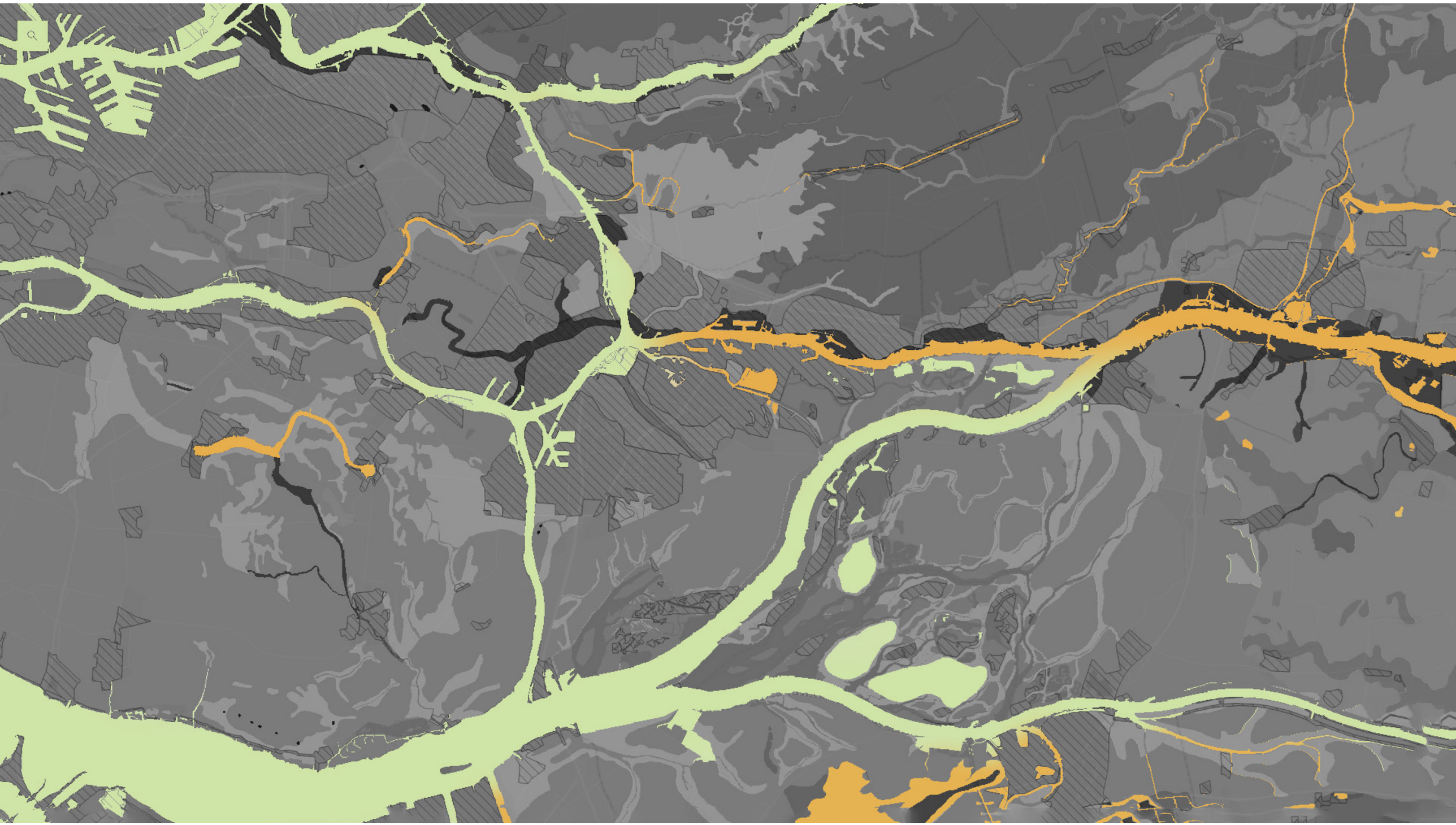
PMID: 27435118 PMCID: PMC4951639 DOI: 10.1038/srep29269

Abstract

The collapse of Atlantic salmon (Salmo salar) stocks throughout North-Western Europe is generally ascribed to large-scale river regulation, water pollution and over-fishing in the 19(th) and 20(th) century. However, other causes have rarely been quantified, especially those acting before the 19(th) century. By analysing historical fishery, market and tax statistics, independently confirmed by archaeozoological records, we demonstrate that populations declined by up to 90% during the transitional period between the Early Middle Ages (c. 450-900 AD) and Early Modern Times (c. 1600 AD). These dramatic declines coincided with improvements in watermill technology and their geographical expansion across Europe. Our extrapolations suggest that historical Atlantic salmon runs must have once been very abundant indeed. The historical perspective presented here contributes to a better understanding of the primary factors that led to major declines in salmon populations. Such understanding provides an essential basis for the effective ecological rehabilitation of freshwater ecosystems.

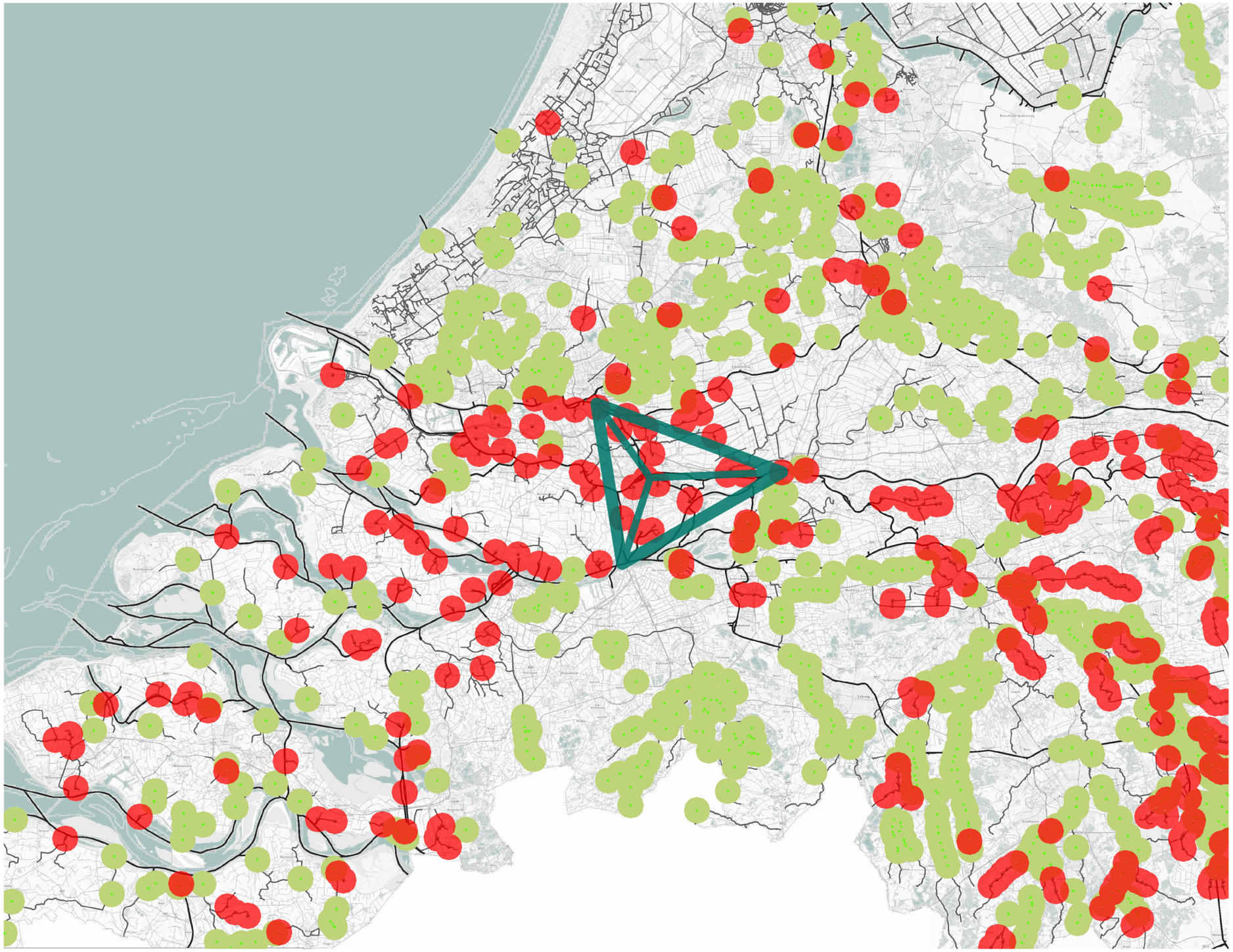
Based on historical records of fish catch the salmon population was enourmous throughout the European Rhine Delta

PROBLEM: WATER POLUTION



Excess agrecultural manure slips into the river poluting the water

HERITAGE LINE PROBLEM: CLOSED WATER TRANSITIONS



Transitional waterways unfit for fish migration

PROBLEM: DIFFICULT REINTEGRATION OF FISH

Herintroductie van de zalm: waarom lukt het niet?

Wageningen Marine Research

24-APR-2024 - De herintroductie van de Atlantische zalm in de Rijn leek eerst succesvol, maar de populatie is de laatste tien jaar volledig ingestort. Aan de hand van zenderdata hebben onderzoekers aangetoond dat de grootste verliezen, tot 94%, tijdens de migraties in zoetwater plaatsvinden. Dat blijkt uit een recent gepubliceerd artikel in het wetenschappelijk tijdschrift River Research and Applications.

Deel deze pagina

Wereldwijd zijn trekvissoorten zeer ernstig in de knel geraakt door klimaatverandering, vervuiling, migratiebarrières, invasieve soorten, verlies van paaihabitat en overbevissing. In het bijzonder in Europa is de achteruitgang sinds de jaren 70 zeer sterk geweest: een afname van ruim 90 procent in populaties.

Woensdag 6 november 2024 | Het laatste nieuws het eerst op NU.nl

Door onze nieuwsredactie

16 aug 2024 om 17:56
Update: 2 maanden geleden

235 reacties | Delen

Dertig jonge Europese steuren zijn vrijdag in de Waal bij de Millingerwaard uitgezet. Daar moet een begin worden gemaakt met de herintroductie van de soort in Nederland. De komende dagen worden nog eens 220 van deze vissen stroomafwaarts uitgezet.

De Europese steur is in 1953 officieel uitgestorven verklaard in Nederland. Het Wereld Natuur Fonds (WNF), dat samen met ARK Rewilding Nederland en Sportvisserij Nederland werkt aan de herintroductie van de Europese steur, meldt dat de 250 jonge steurtjes zijn uitgerust met identificatiechips.

De forel : een herintroductie met hindernissen

16 aug 2019

Categorieën Natuurbericht

Biodiversiteit | LIFE BNIP | Natura 2000 | Vissen | Water

In 2016 startte het Agentschap voor Natuur en Bos - samen met het Provinciaal Centrum voor Milieuonderzoek en het Centrum voor Visteelt in Linkebeek - met de herintroductie van de Beekforel in de Zwalm (Oost-Vlaanderen). Is dit een succes of zijn er nog een aantal hindernissen die de Beekforel moet overwinnen?

De Beekforel is een vissoort die vooral voorkomt in eerder snelstromende beken, met een goede waterkwaliteit, voldoende zuurstofrijk water en grindstroken waarin de eitjes worden afgezet.

Na een grondige evaluatie van de waterkwaliteit en het habitat werd beslist de beekforel uit te zetten in de Zwalm. In het voorjaar van 2016 werden de eerste juveniele exemplaren (die werden gekweekt in Linkebeek) uitgezet op verschillende locaties langsheen de Zwalm. Hierbij was ook de Vereniging Vliegvissen Vlaamse Ardennen (VVVA) betrokken.

Home | Over ons | Projecten | Kennis | Sturen op natuur | Natuurwinstplan | English

Rijksoverheid

29 okt 2020 om 14:05
895

Herintroductie steur: Actieplan terugkeer van de Europese steur in de Rijn

Ooit wemelden de Nederlandse rivieren van de steur. In de Rijn kwam deze vissoort veelvuldig voor. Door overbevissing, vervuild water en het kanaliseren van de rivieren ging het steeds slechter met de steur. In Nederland is de soort ondertussen uitgestorven en in Europa wordt deze vis ernstig bedreigd in zijn voortbestaan.

Zeeforel

In dergelijke situaties – of als gevolg van een ernstige calamiteit zoals een massale vissterfte door een giflozing, riooloverstort of een te lange ijsbedekking – kan het nodig zijn om een van nature voorkomende vissoort te herintroduceren. Zo was de zeeforel nagenoeg uit ons land verdwenen.

Ooit trokken deze salmoniden onze rivieren op om in de kleinste beekjes te paaien, maar het afsluiten van zeearmen en de aanleg van dammen en stuwen deden deze soort de das om. De verbeterde waterkwaliteit, het opheffen van migratiebelemmeringen en de herintroductie van deze soort in het Lauwersmeer doen echter hoop gloren voor de zeeforel.

Kwabaal

Een ander succesvol praktijkvoorbeeld is de herintroductie van de kwabaal. Deze bijzondere zoetwaterkabeljauw en vroeger relatief algemene soort, is nu een van de meest bedreigde en zeldzame vissoorten in ons land. Hij komt nog slechts in enkele diepe plassen voor, maar is uitgestorven in een aantal beken waar hij ooit van nature voorkwam.

Samen met Waterschap De Dommel werkt Sportvisserij Nederland daarom aan de terugkeer van deze unieke vissoort. In de Beerze is de biotoop hersteld en zijn juveniele kwabalen uitgezet. Met succes: bij monitoringen zijnonlangs een drachtig kwabaalvrouwtje én een net afgepaaid vrouwtje aangetroffen.

Attempts of reintroducing migratory fish futile in the long run

EUROPEAN ASPIRATION: RAPPORT RHINE 2040

Rhine
2040

International Commission for the Protection of the Rh

2.1 Networked habitats – more biodiversity

General objective

The functionality of the Rhine ecosystem with its tributaries has improved significantly: ecological passability has been restored and biodiversity has increased.

Specific goals for 2040

(1) The ecological passability for migratory fish has been achieved upstream and downstream in the main flow of the Rhine, from the mouth to the Rhine Falls and in the programme waters of the Master Plan Migratory Fish[8].
(2) Habitats typical of the Rhine have been preserved, protected or restored. The biotope network on the Rhine has improved significantly due to the expansion of core areas and the networking of suitable, sufficiently large stepping stone biotopes[9].
(3) The sediment balance in the Rhine is improved.
(4) The temperature and oxygen conditions are not negatively influenced by anthropogenic thermal discharges.

Framework conditions and measures

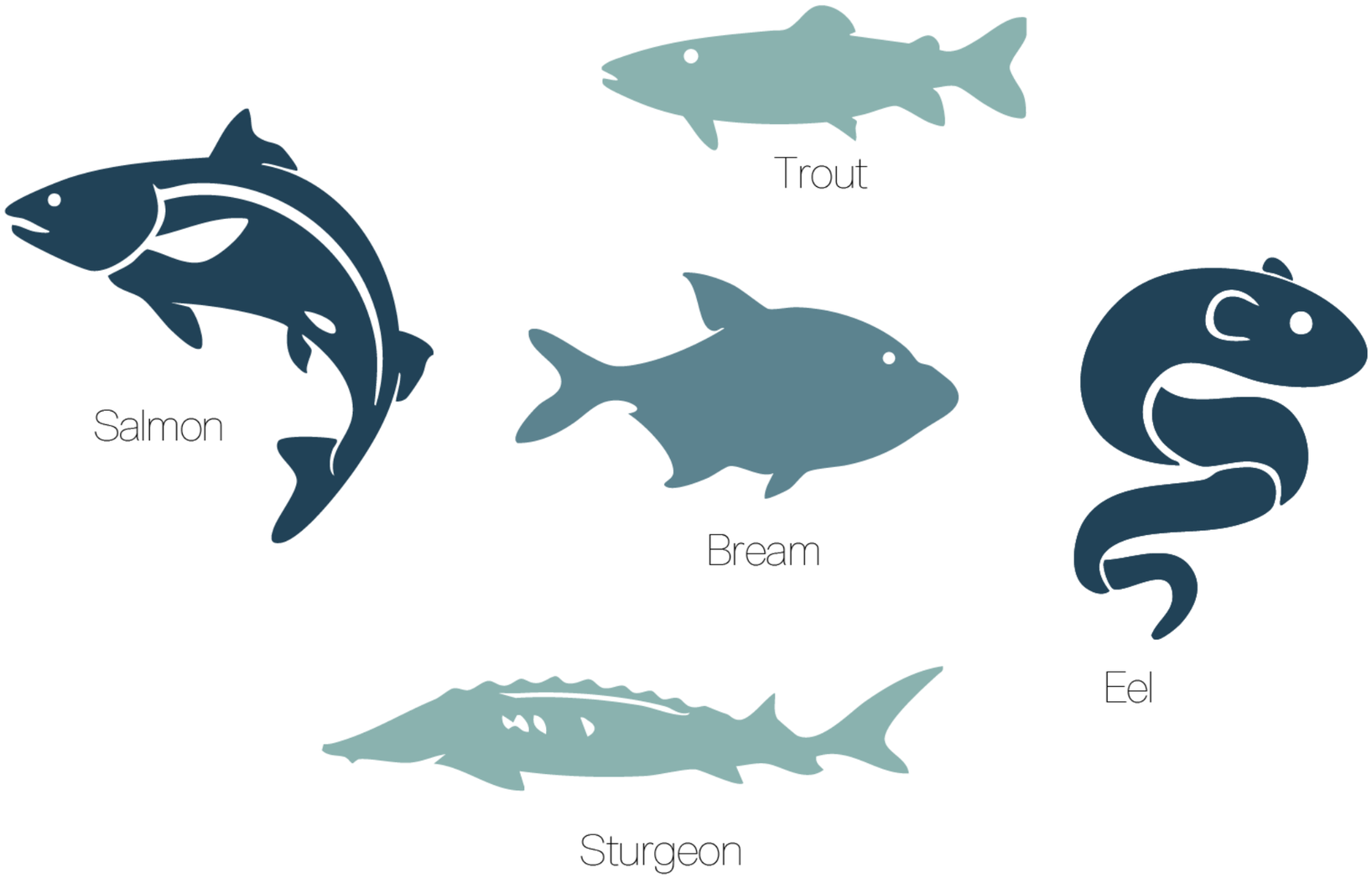
Goal (1): „The ecological passability for migratory fish has been achieved upstream and downstream in the main flow of the Rhine, from the mouth to the Rhine Falls and in the programme waters of the Master Plan Migratory Fish.

Framework conditions

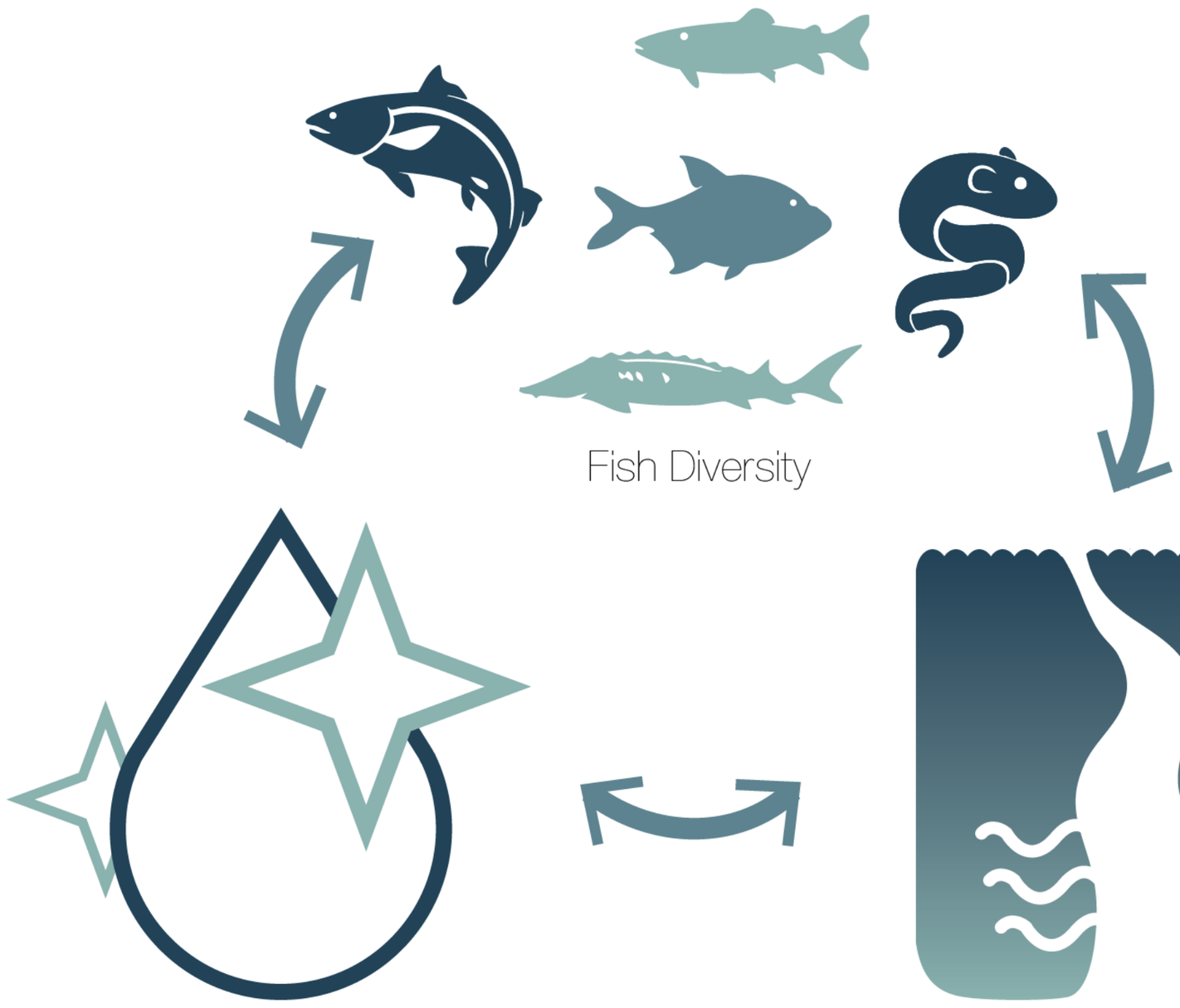
The basis for measures relating to water passability is the Master Plan Migratory Fish Rhine[10], which was updated in 2018 and relates to selected migratory fish. As leading fish species, these are, in particular, the salmon that alternate between fresh and salt water and the Lake Constance lake trout that migrate in the catchment area of the Lake Constance-Alpine

Aspirations are further improvement of the Rhine Delta concerning migratory fish

SPECIES OF MIGRATORY FISH ENDANGERED

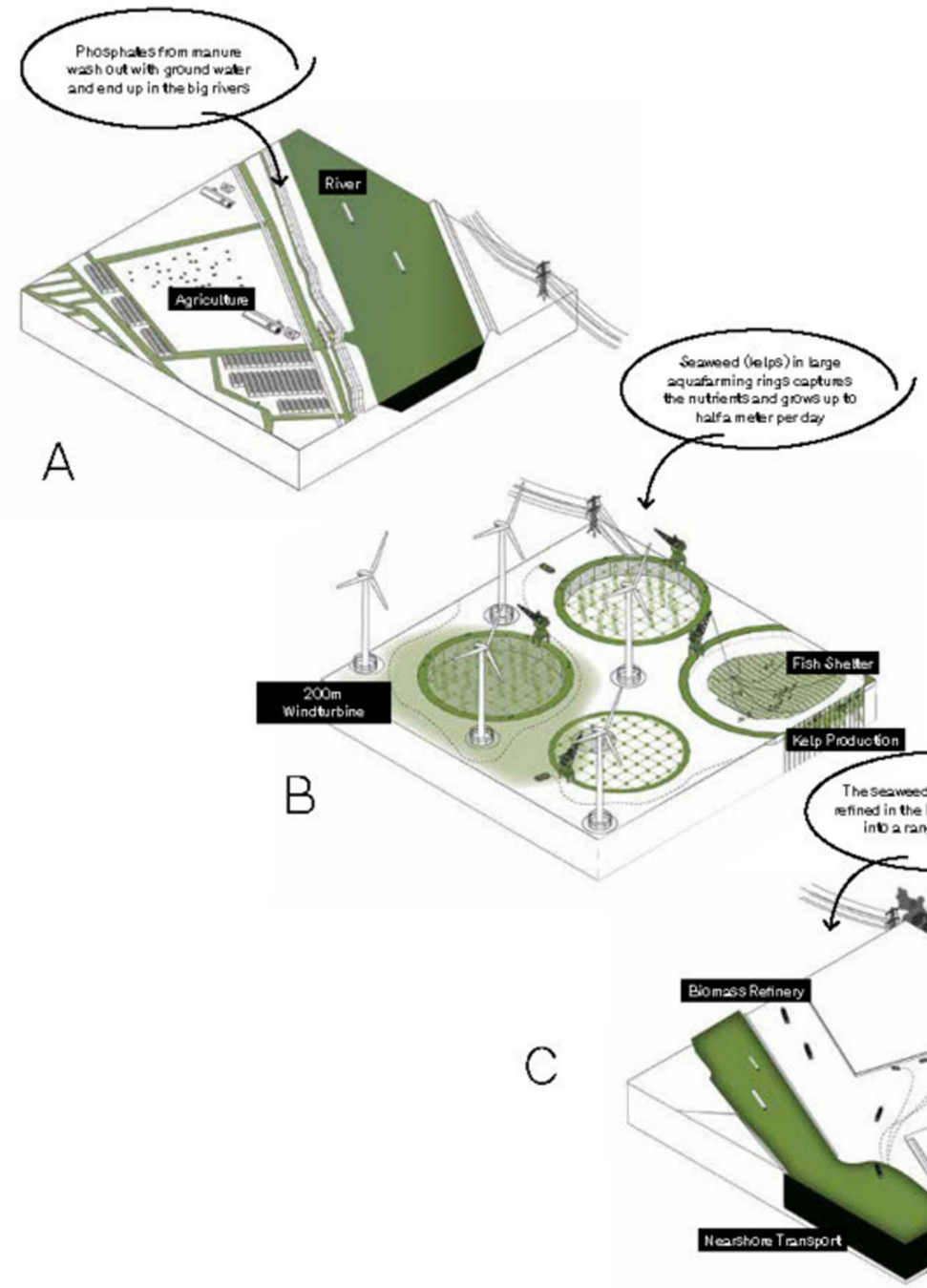


TRIANGLE OF FISH WELLBEING - RESEARCH CENTER EXPERTISE



Research into all aspects of this triangle can enhance well being of migratory fish

Key initiative: Floodplain engagement for Fish wellbeing



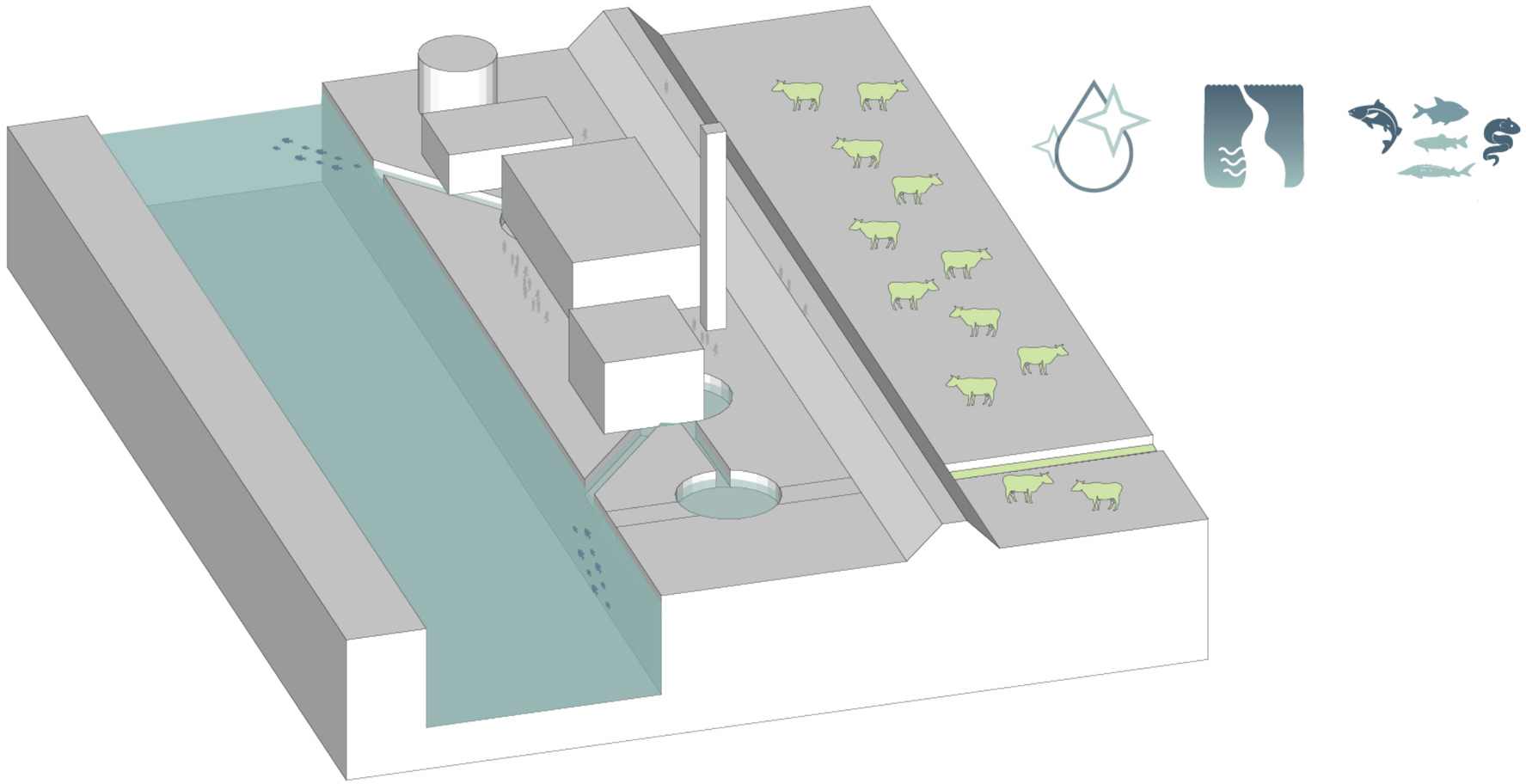
AQUAFARMING

Through agriculture alone, 28 million tons of phosphate are lost in the Netherlands on an annual basis. But valuable nutrients are also lost at many more points along the entire food production to consumption chain. Ultimately, most of the nutrients are washed out to sea, after which they can barely be traced. By using existing and planned *offshore* infrastructure on a larger scale to harvest not only energy but also nutrients from seawater using *aquafarming* techniques, it will be possible to recover these losses in the future.

Urban Metabolism

Urban Metabolisms (2014) Gemeente Rotterdam - IABR - FABRIC - JFCFO - TNO

ASPIRATION: Research center



Fish enter the floodplain, the innerdike agricultural micronutients are being utulized

PLOT ANALYSIS

Project Location Sliedrecht

Floodplain of the Beneden merwede

BIRDS EYE PERSPECTIVE

Situated Outerdike, on the Floodplain

Problem: Current devepment planned

building block focusses on internal square

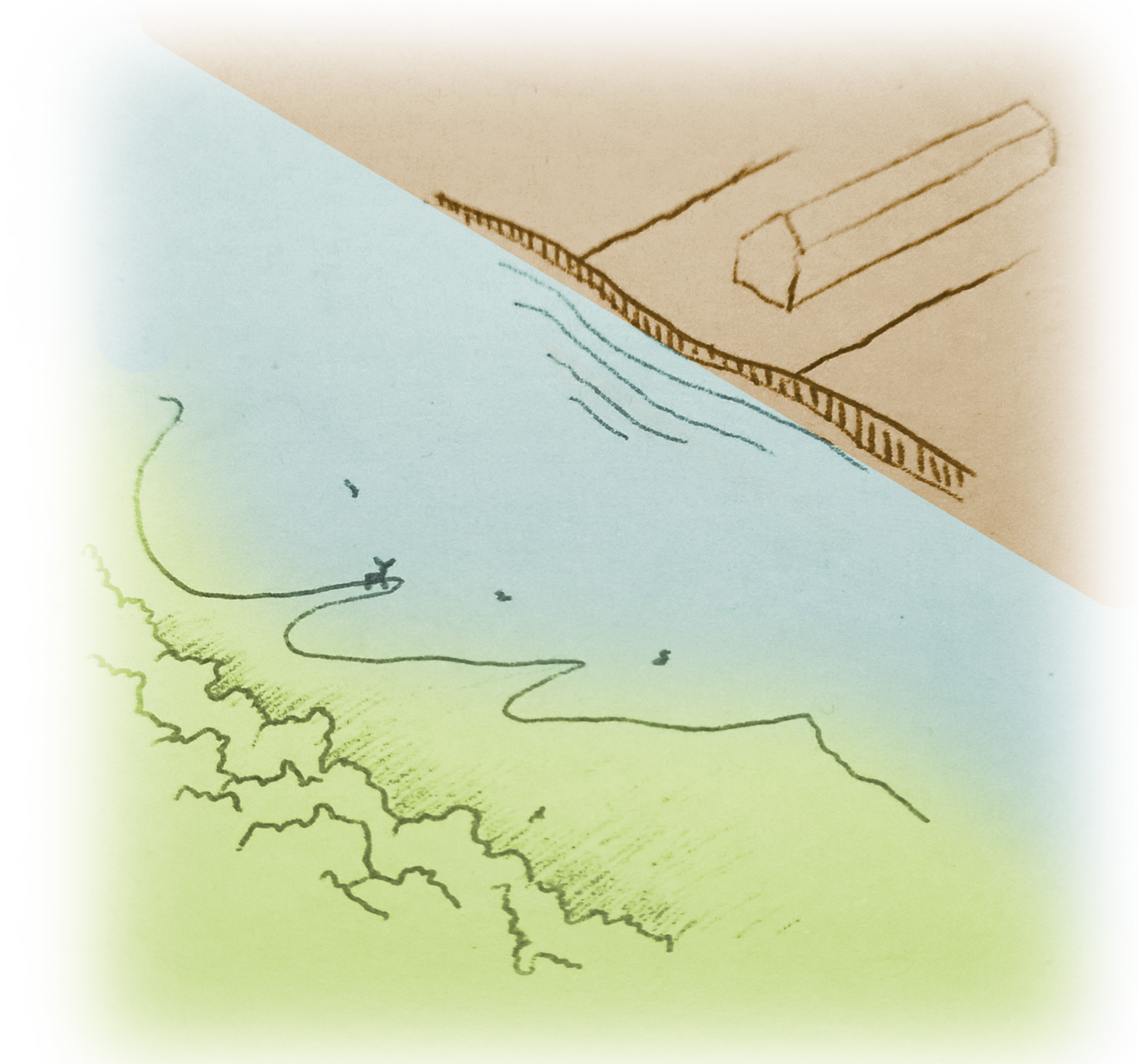
Minimal space is left for the water. existing buildings are blocked by the size of the appartments

The current plan maximizing profitability, The specific values of the place are disregarded

Problem: Boxed Industry

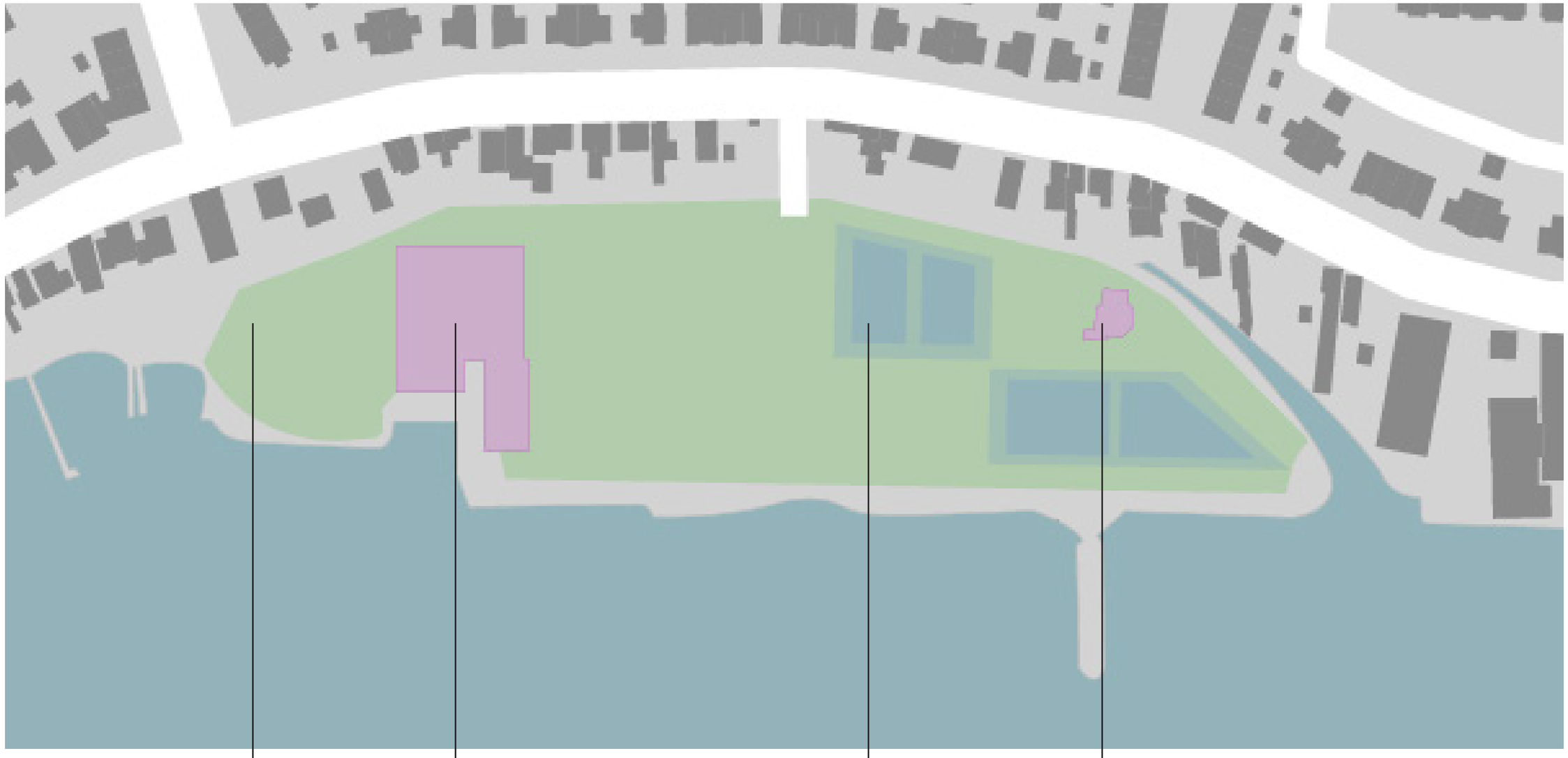
Current Industrial (anonymous) Appearance of the floodplain programme is invisible

Problem: rigid division industrial and natural



to restore the ballance between the two extremes

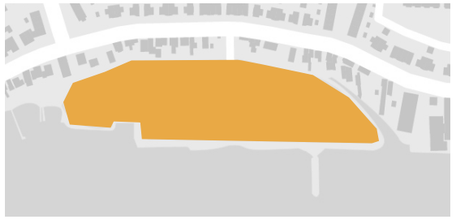
ELEMENTS TO BE INTEGRATED



VALUE ASSESMENT

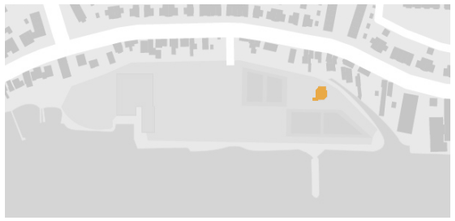
	age	historical	artistic	commemorative	use	newness	rarity
SURROUNDINGS	18th century - construction of the current dikes	THE DIKE- blocking the area from view	Early industrial style of the Watertower		LIVING SPACE - direct vicinity of the inhabitants of Sliedrecht	One of the 20 first Watertowers in the Area	
SITE/ LANDSCAPE	19th century - footprint of the site	BRINGER OF LIFE- water purification plant			OUTERDIKE AREA	WATER PURIFCATION AND WELL	BASSINS - underground bassins used for water cleaning
STORY/ SERVICES	FASCILITARY water purification shipyard area	PROVIDING economic and health benefits		LANDMARK ARCHITECTURE of the watertower			
EXTERIOR		Brick Material	Watertower details		Lightweight cladding materials		DETAILING ON WATERTOWER unique and expensive structure on watertower
INTERIOR		STEAMENGINE - coals storage piping	GATES in watertower		WATERPURIFYING/ SHIPBUILDING	PROGRESSING TECHNOLOGIES	
STRUCTURE	Brick wood and calcified top bassin				BIG SPANS used for shipyard THICK WALLS support the weight of water		
STUFF	OLD WATERMANAGMENT TECHNOLOGIES around bassins				INDUSTRIAL DOORS		

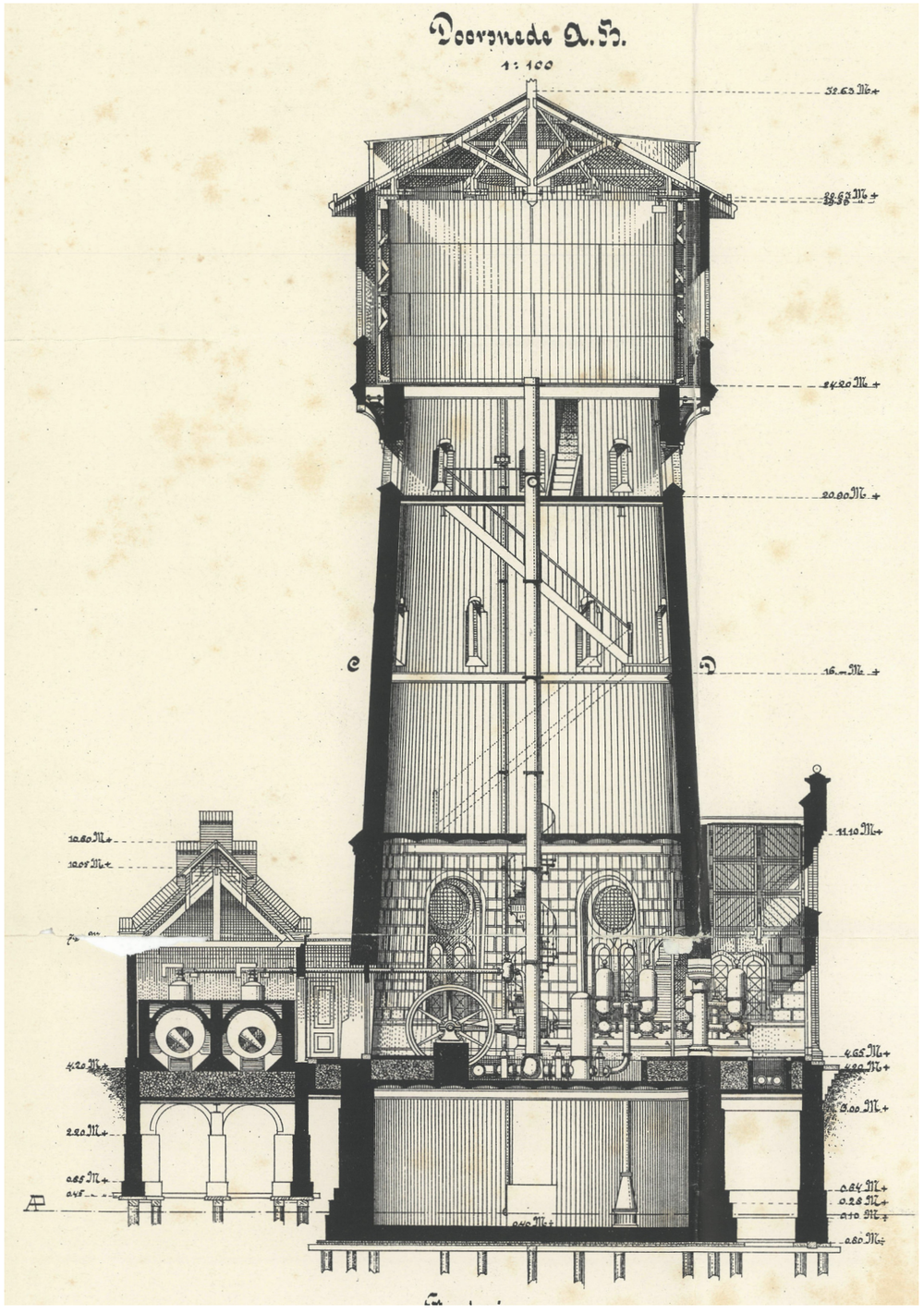
Site Value: Uiterwaarde



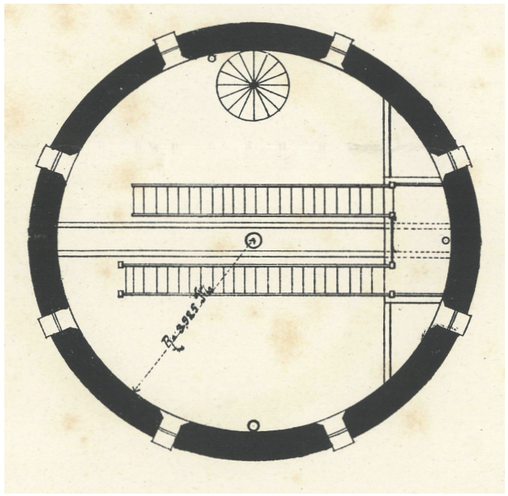
Situated Outerdike, on the Floodplain: Physical Reintegration of river Possible

Use Value Watertower Pumpstation

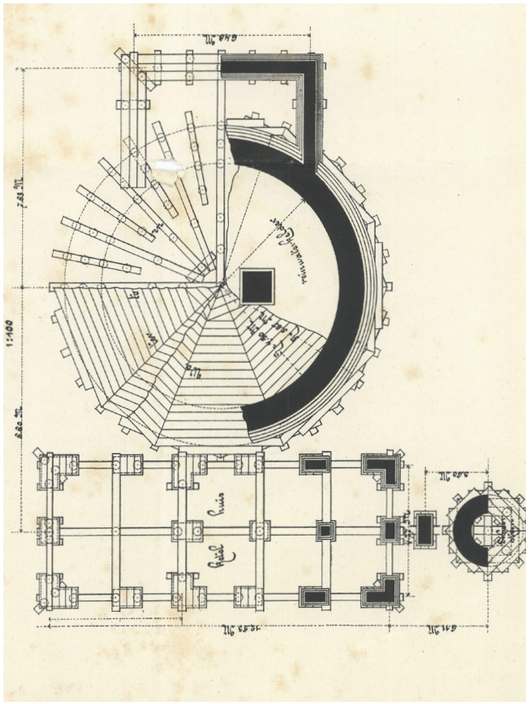




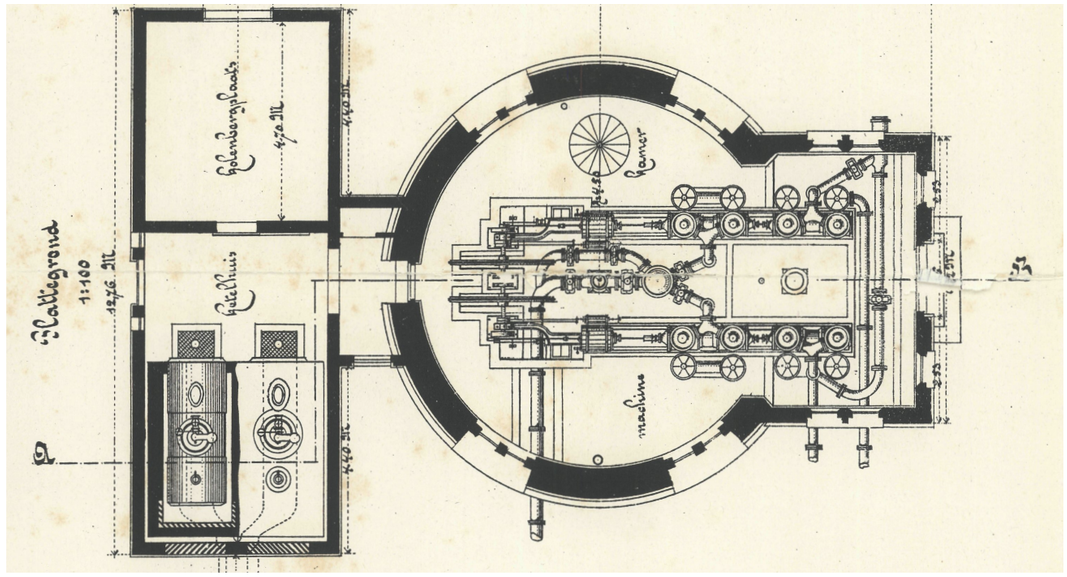
Pumpsystem 1886



Free form Staircase because of heavy construction

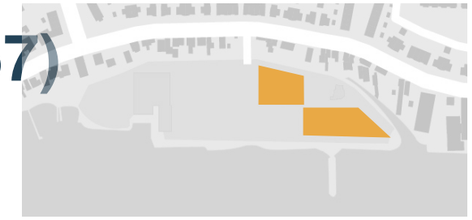


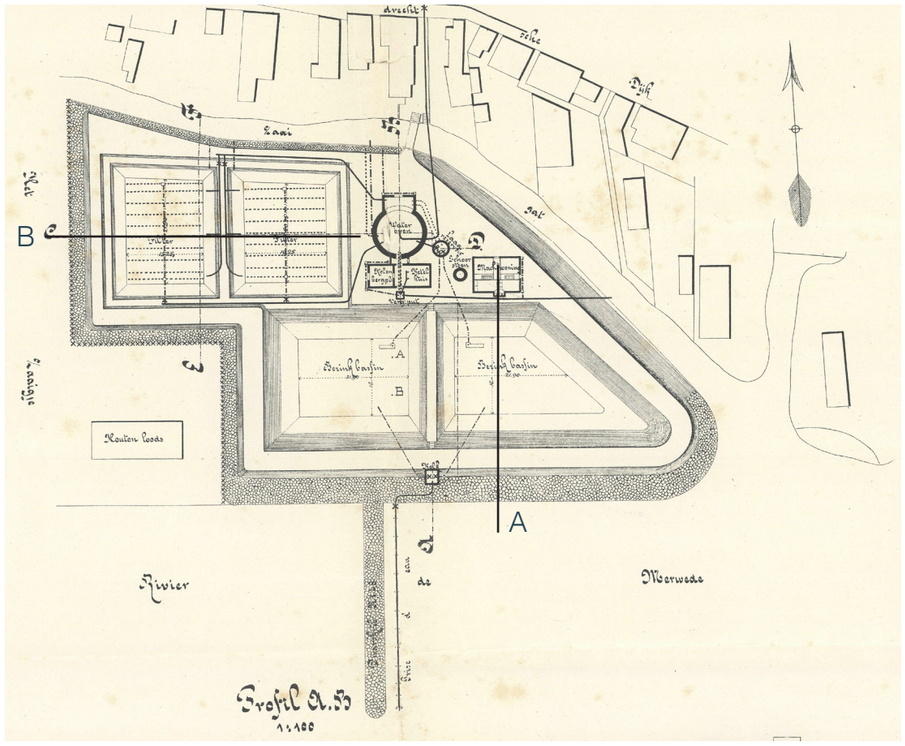
Foundation and Cellar

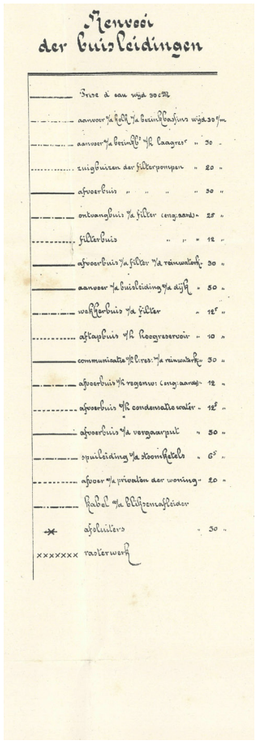


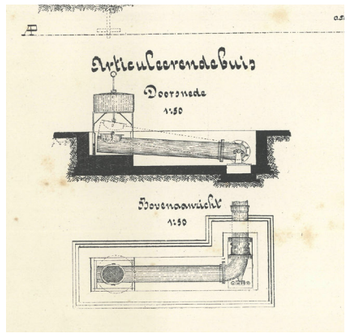
Pumpsystem coal storage and oven

Historic Value: underground basins (1886-1957)



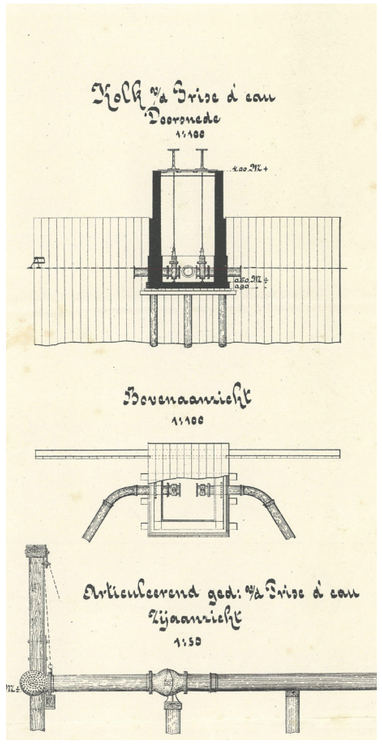


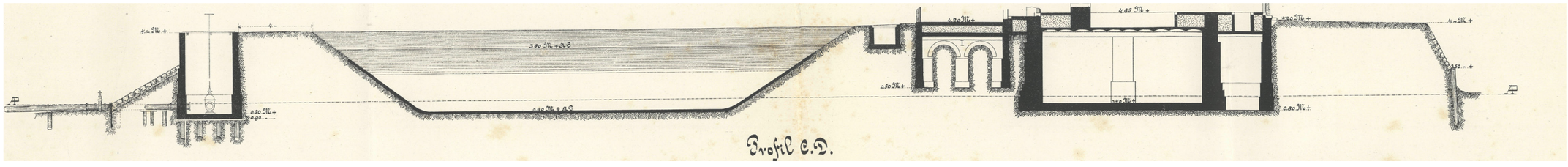




Articuleerende pompensystemen 1886

<Laagoppbouw Filterbassin



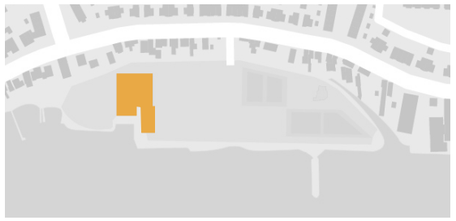


A Bezinkbassin

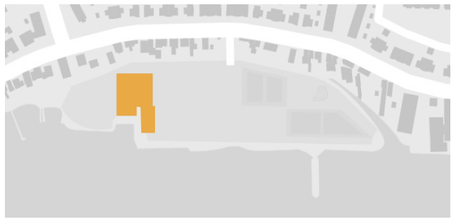
B Filterbassin

Adopt Old function in New Usecase

Industrial Heritage: Delta shipyard: ~1970

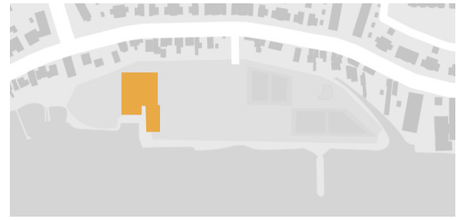


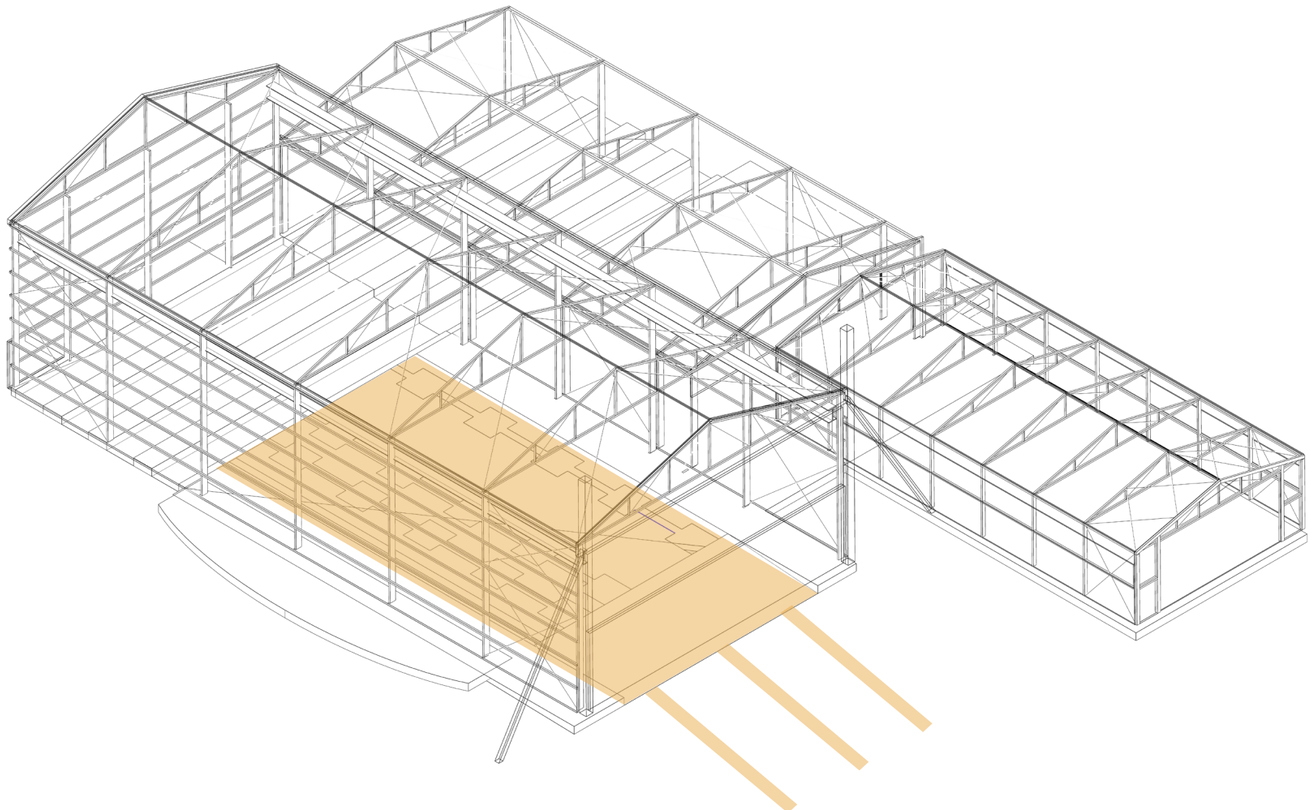
Delta Shipyard: Values

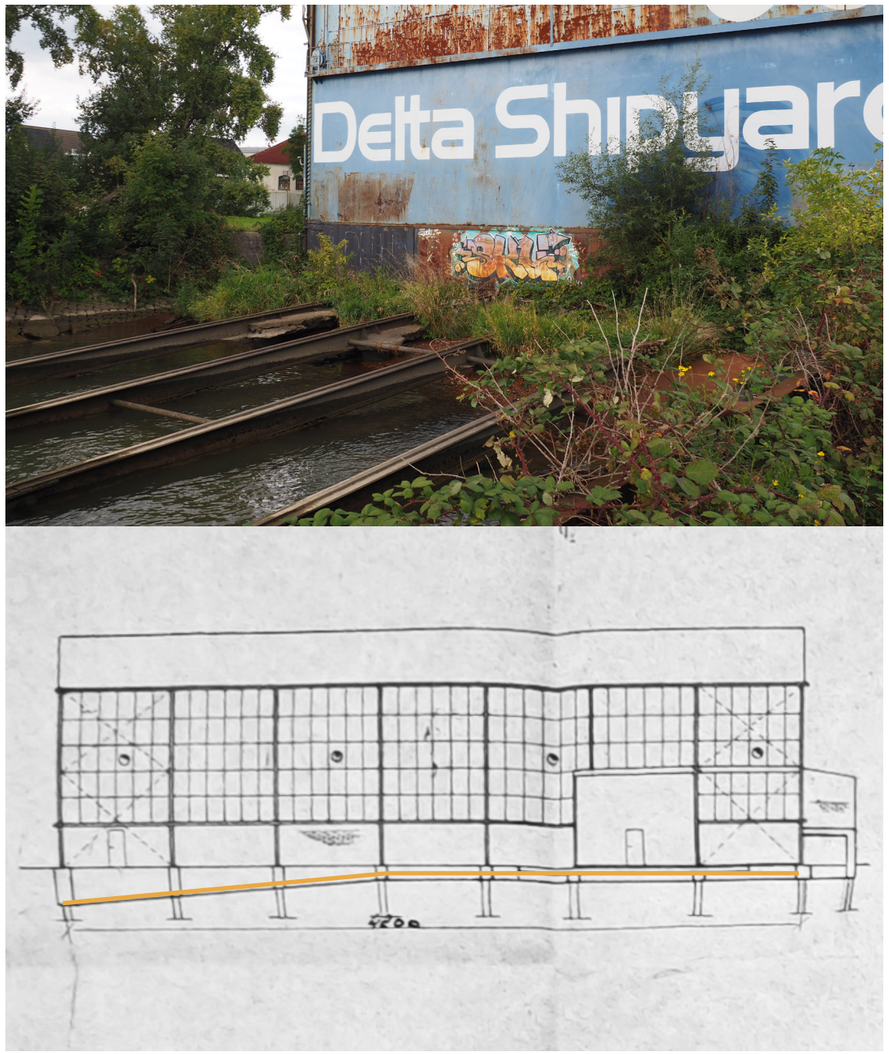


Composite of various Industrial workshops added through history, vocal point is the river

Value Delta Shipyard: Slope

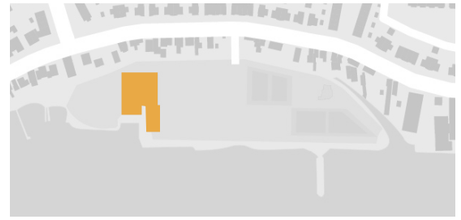


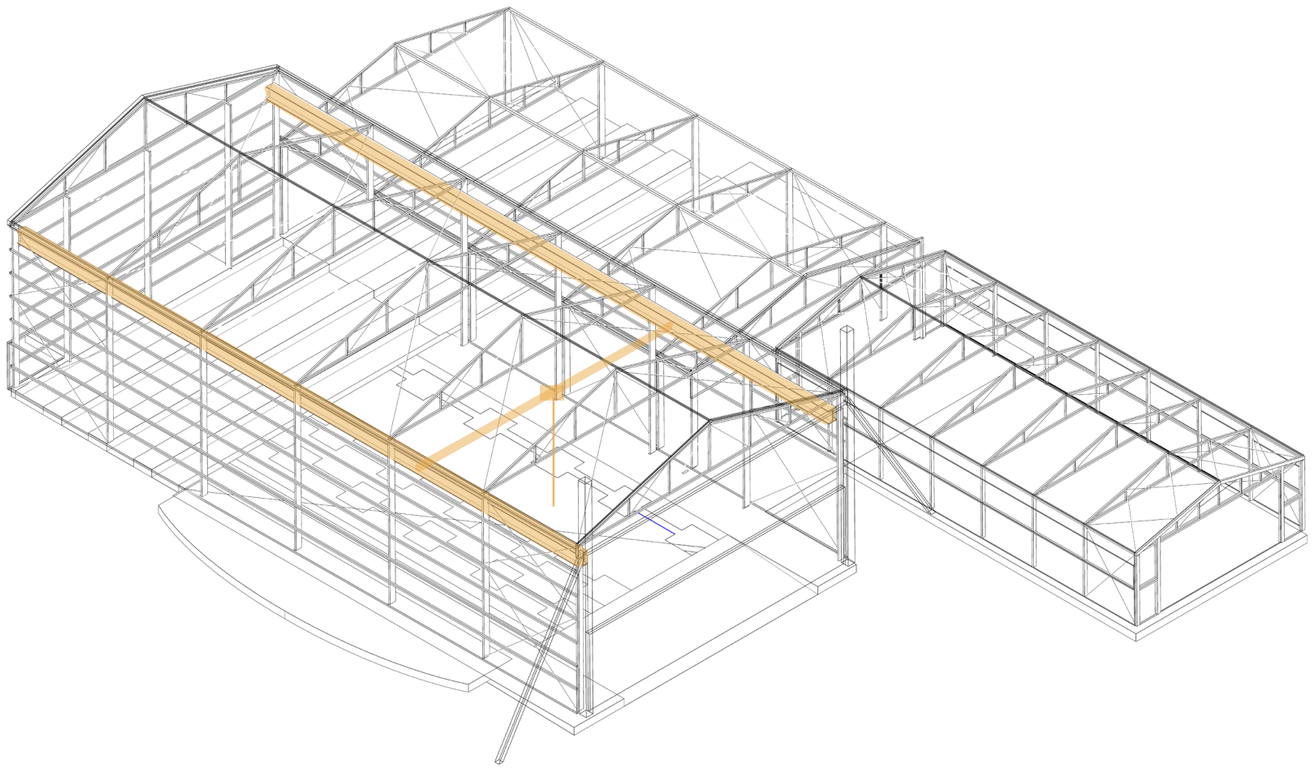


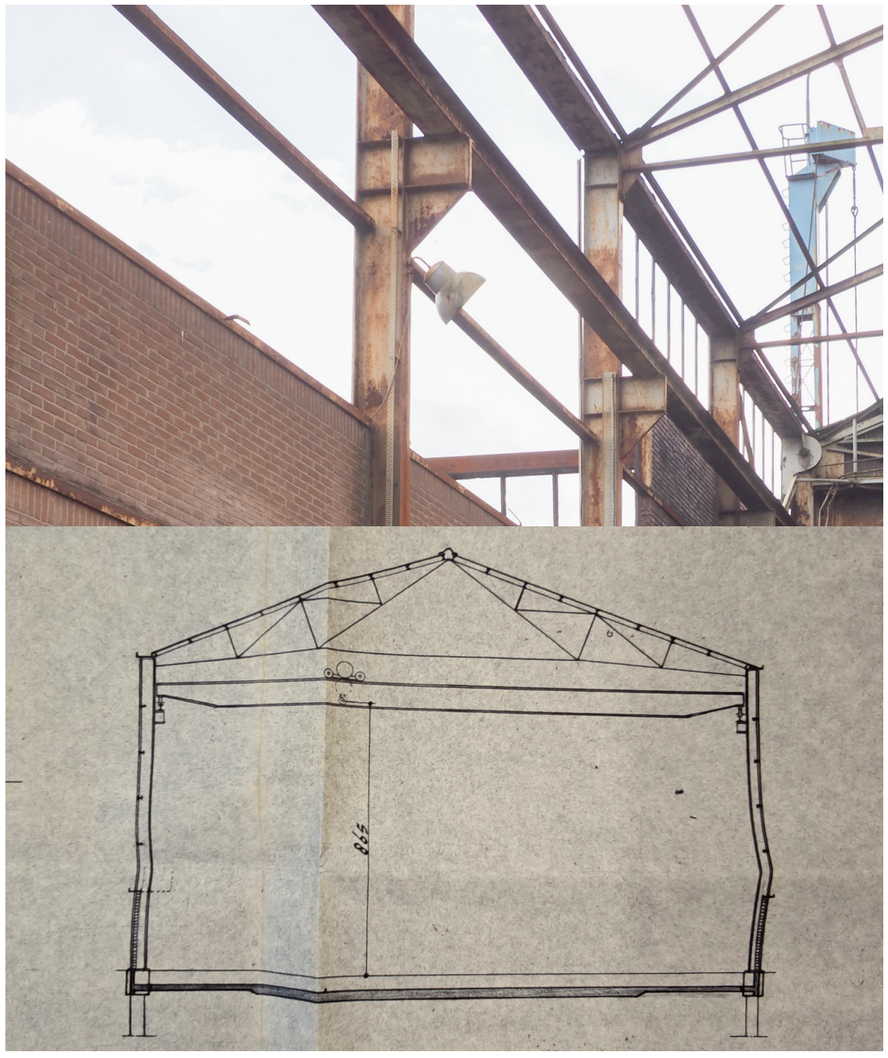


The slope is the forms connection of the shipyard to the water

Value Delta Shipyard: Loopkatbaan

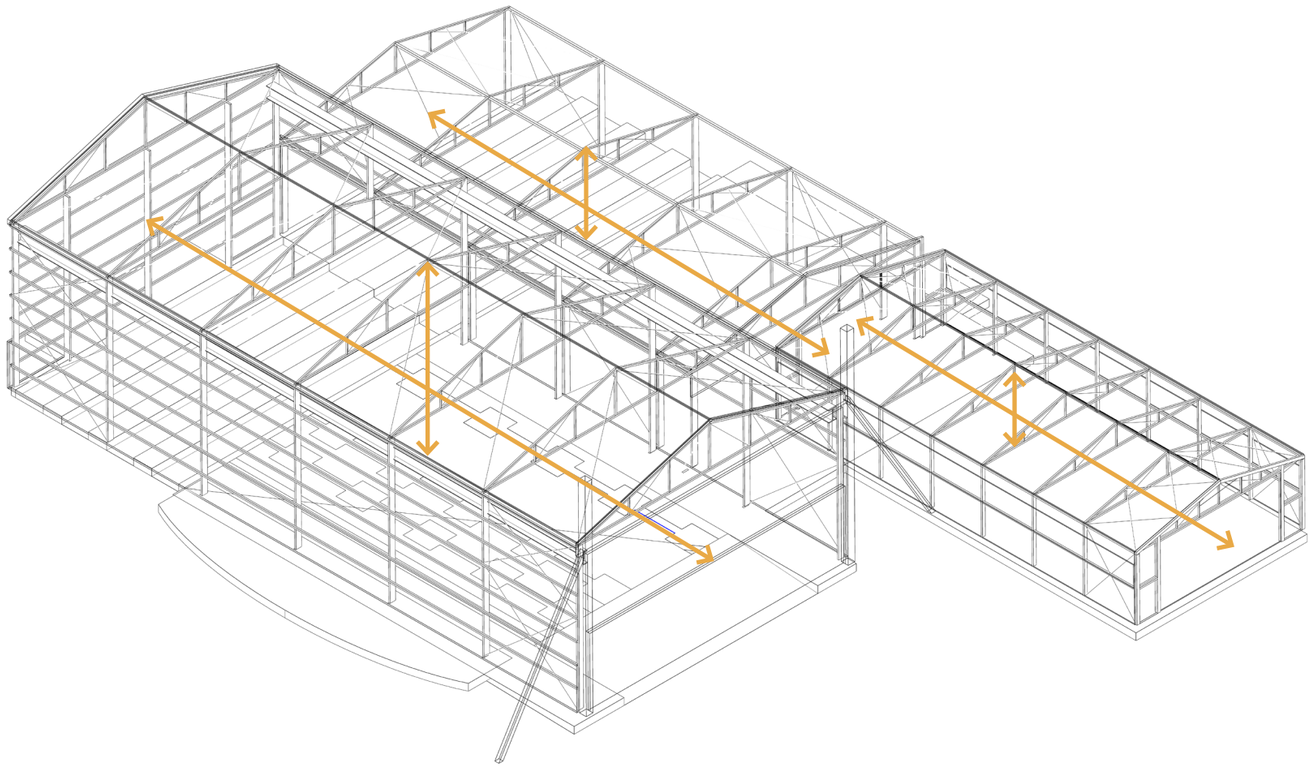






The main crane of the shipyard (max load: 10 tons)

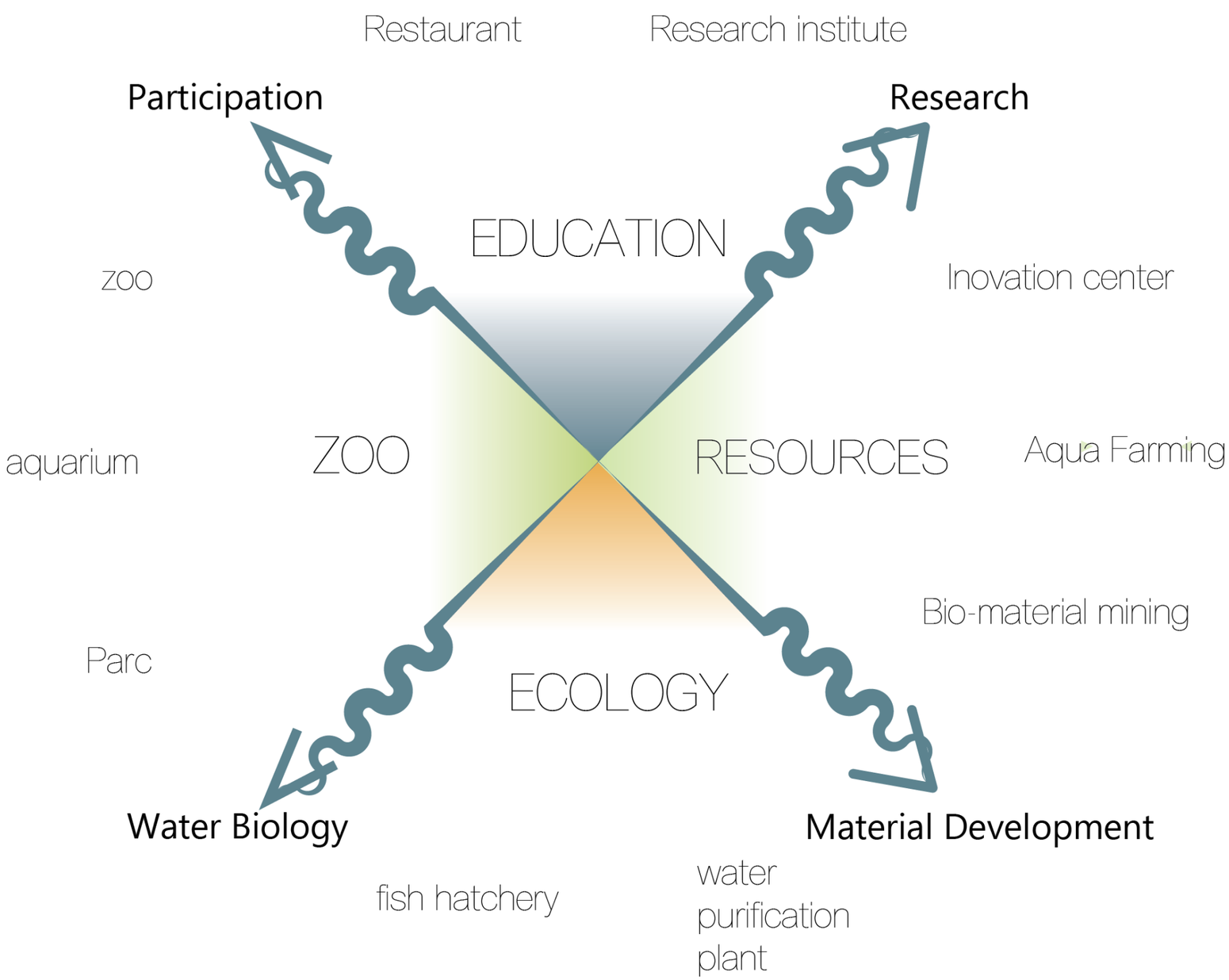
Value Delta Shipyard: Size



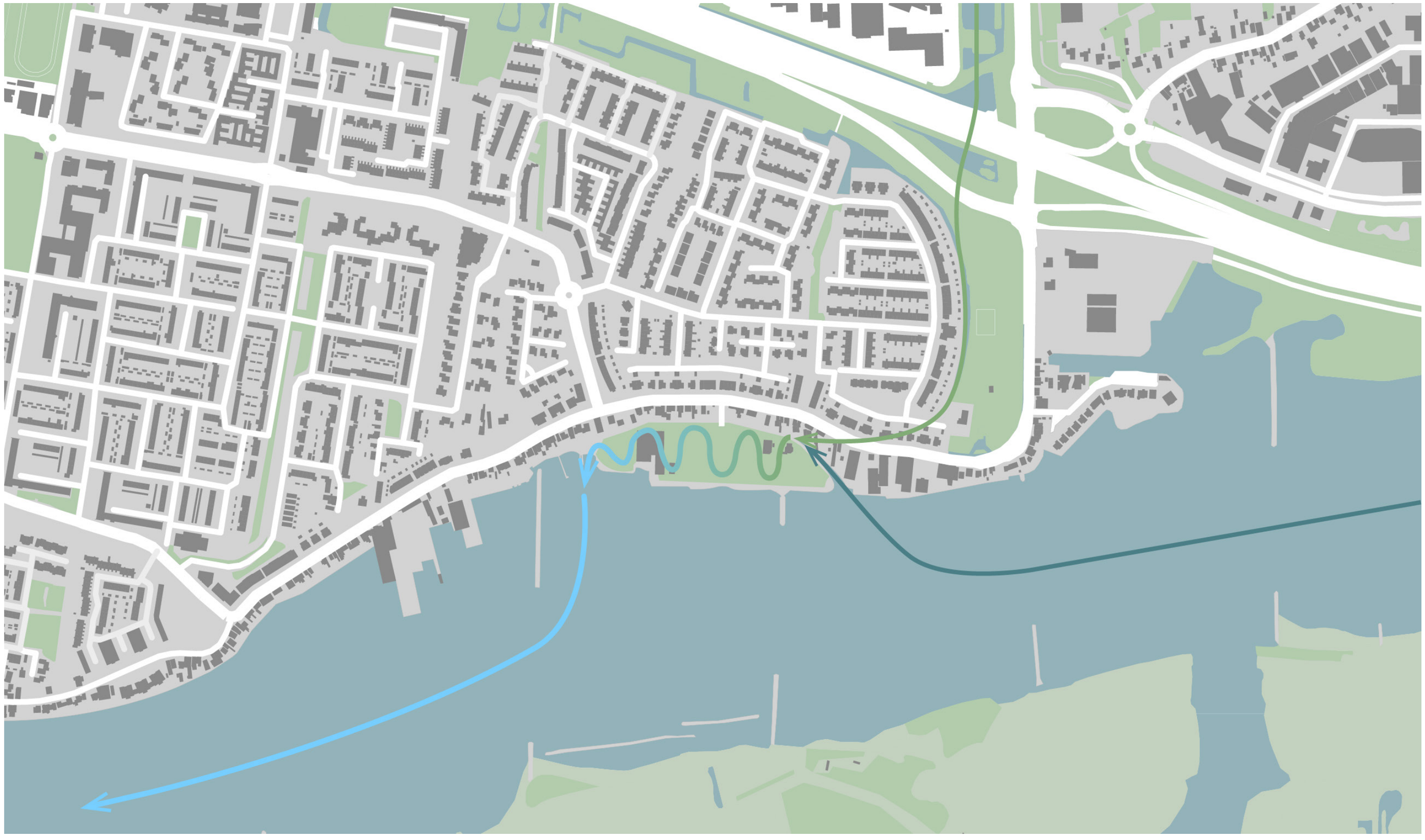
The height and with of this industrial hall allows for porgrams demanding a lot of space

Site Design

Functions

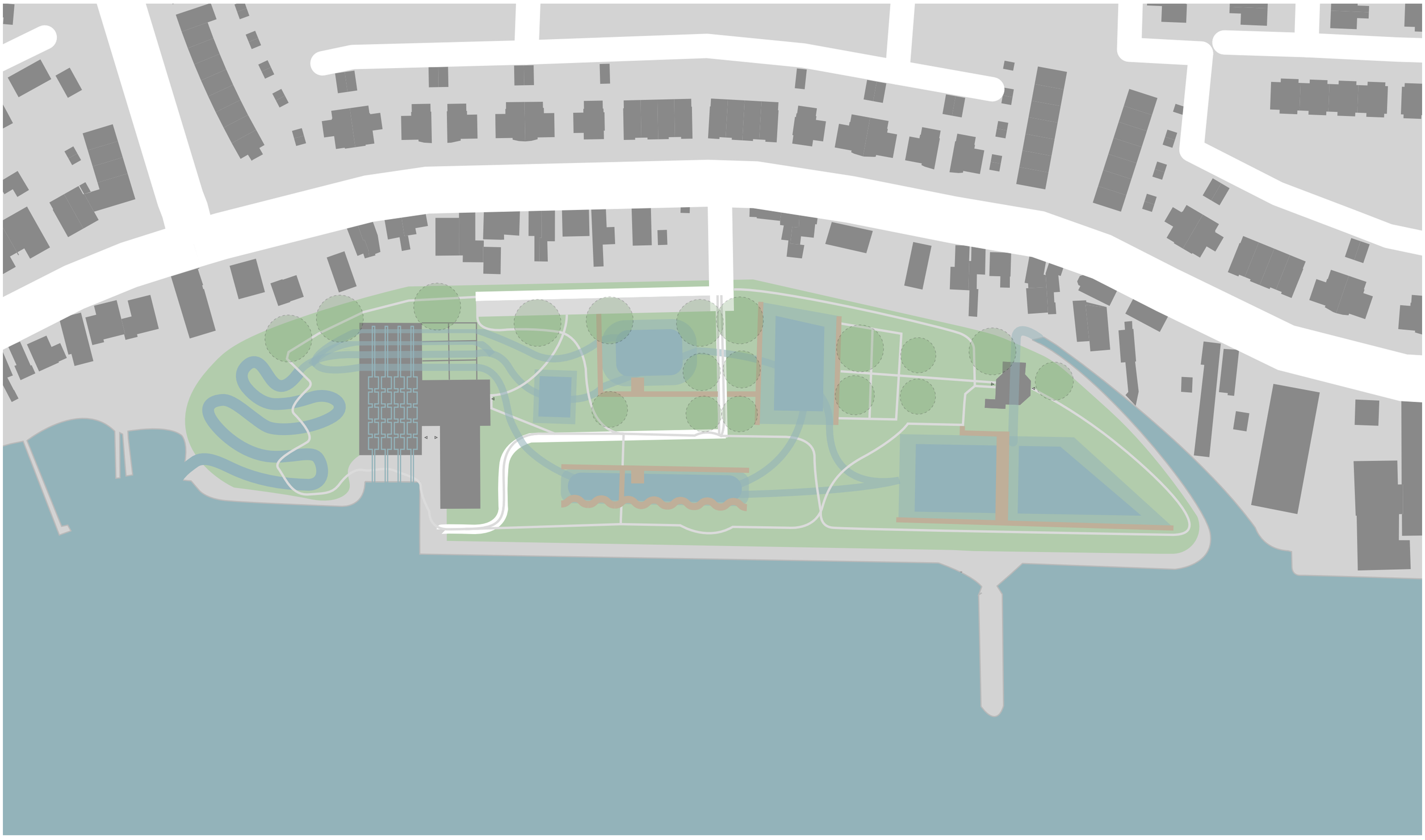

Restaurant
Research institute
Participation
Research
EDUCATION
zoo
Inovation center
aquarium
ZOO
RESOURCES
Aqua Farming
Bio-material mining
Parc
ECOLOGY
Water Biology
Material Development
fish hatchery
water
purification
plant

Flows in the area



Purified water and enhanced fish flow

Aspirations



a multi-staged flow throughout the basins

Environmental Design Toolkit

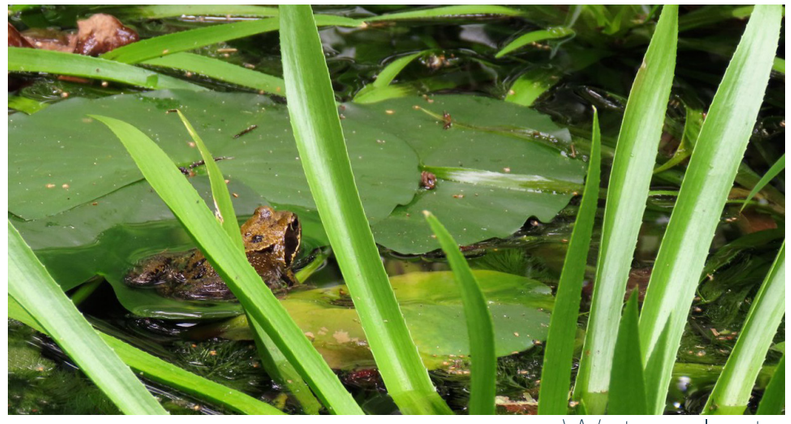
Delta River

Boulders

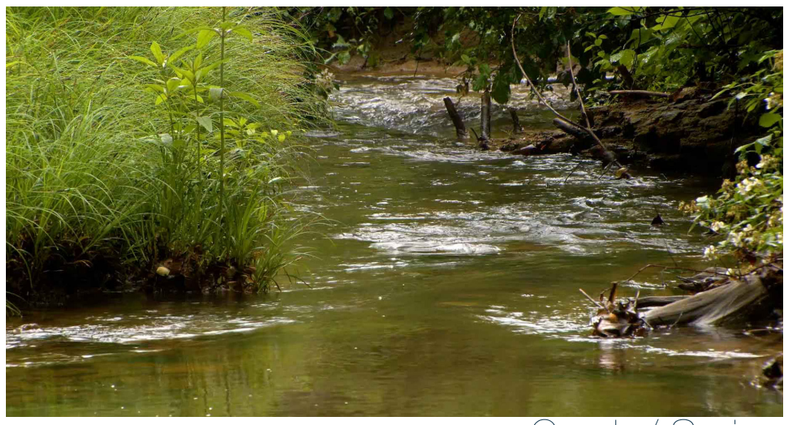
Algea/microbes

River merge point

Pebbles



Water plants



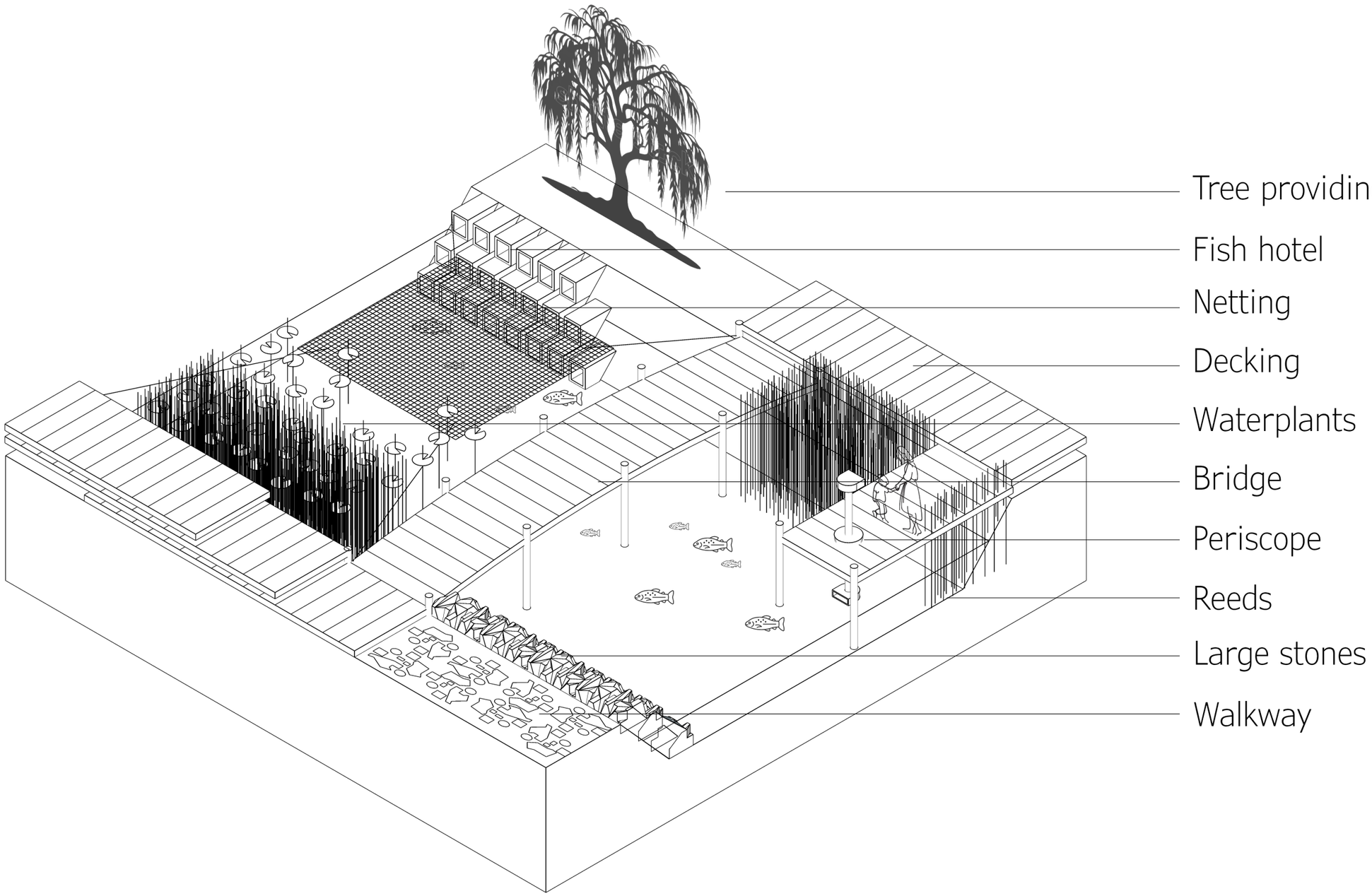
Creak / Spring

Sediments / Clay / Sand

Trees

Materiality of the different streams

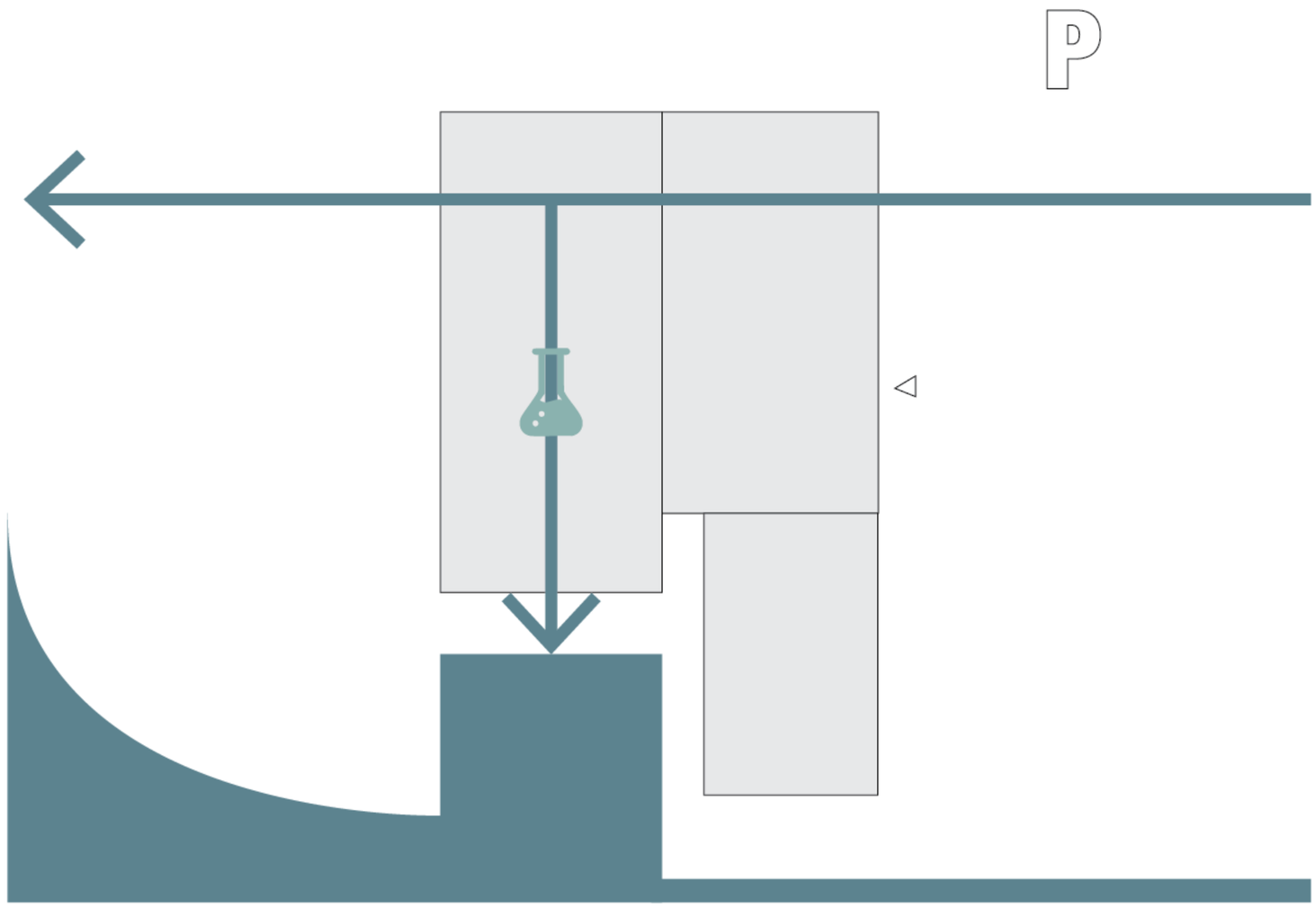
Concept section



types of shelters, ways of observing

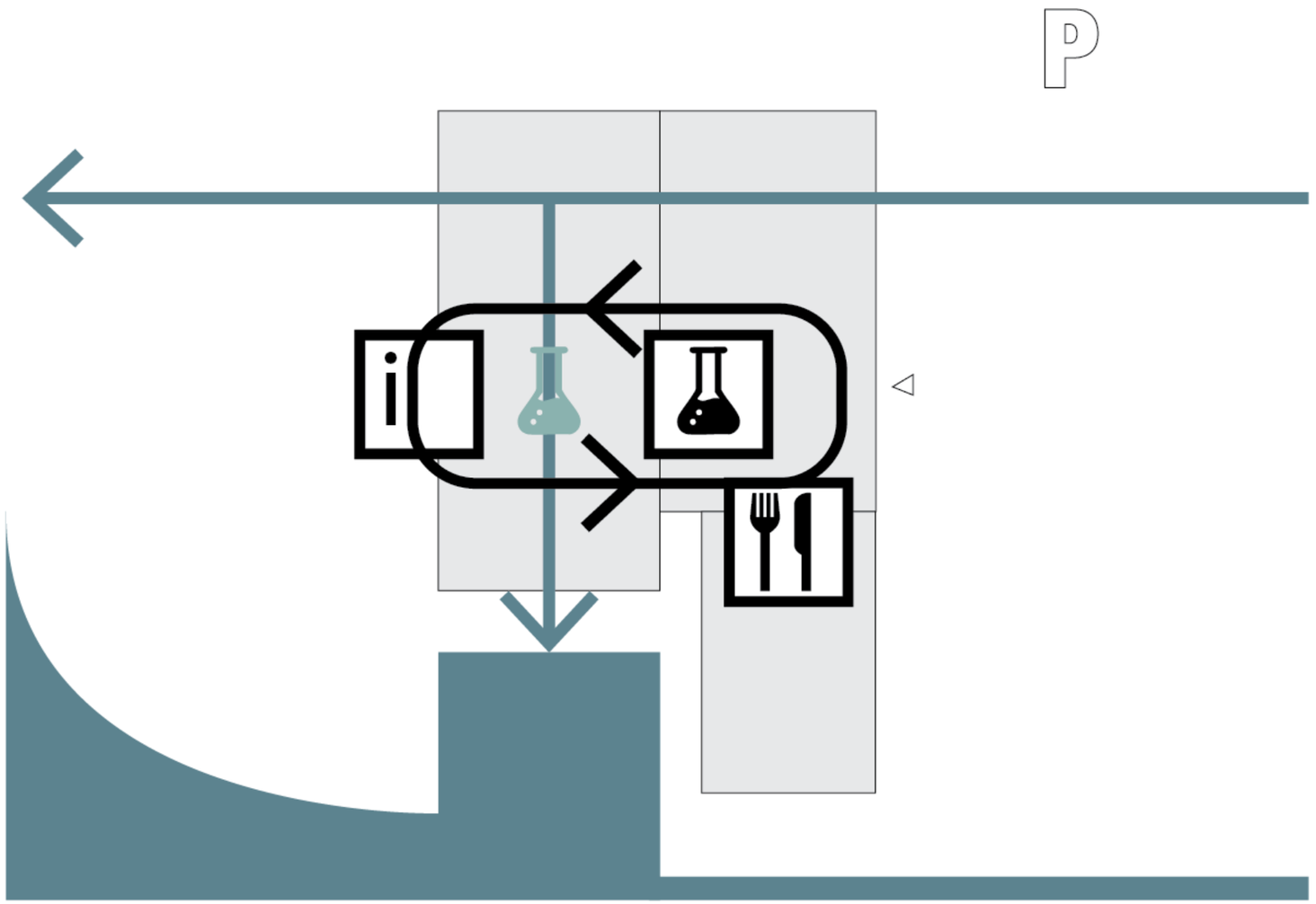
Delta Fishyard Design

Concept Design Diagram



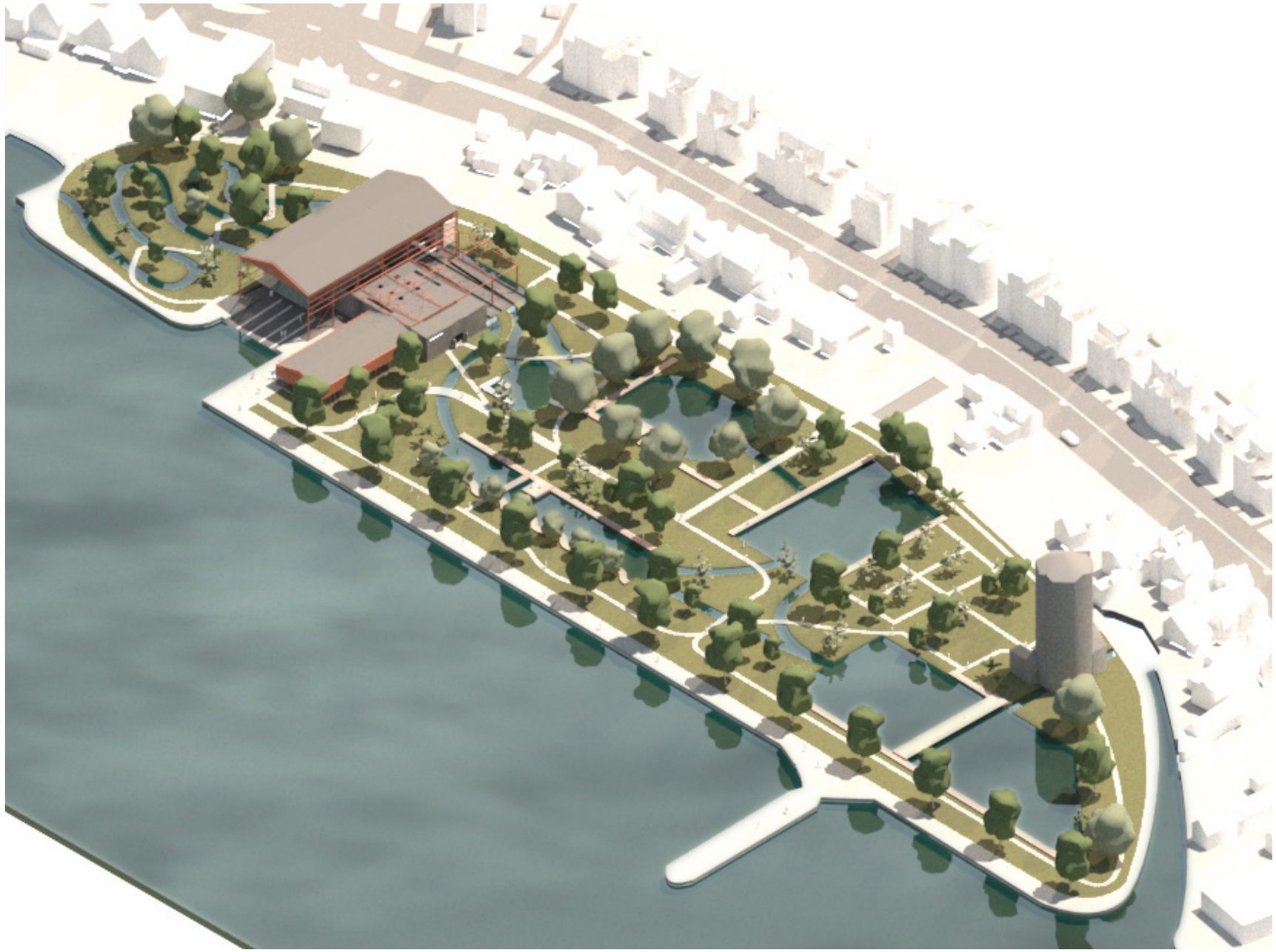
Fish Flow

Concept Design Diagram



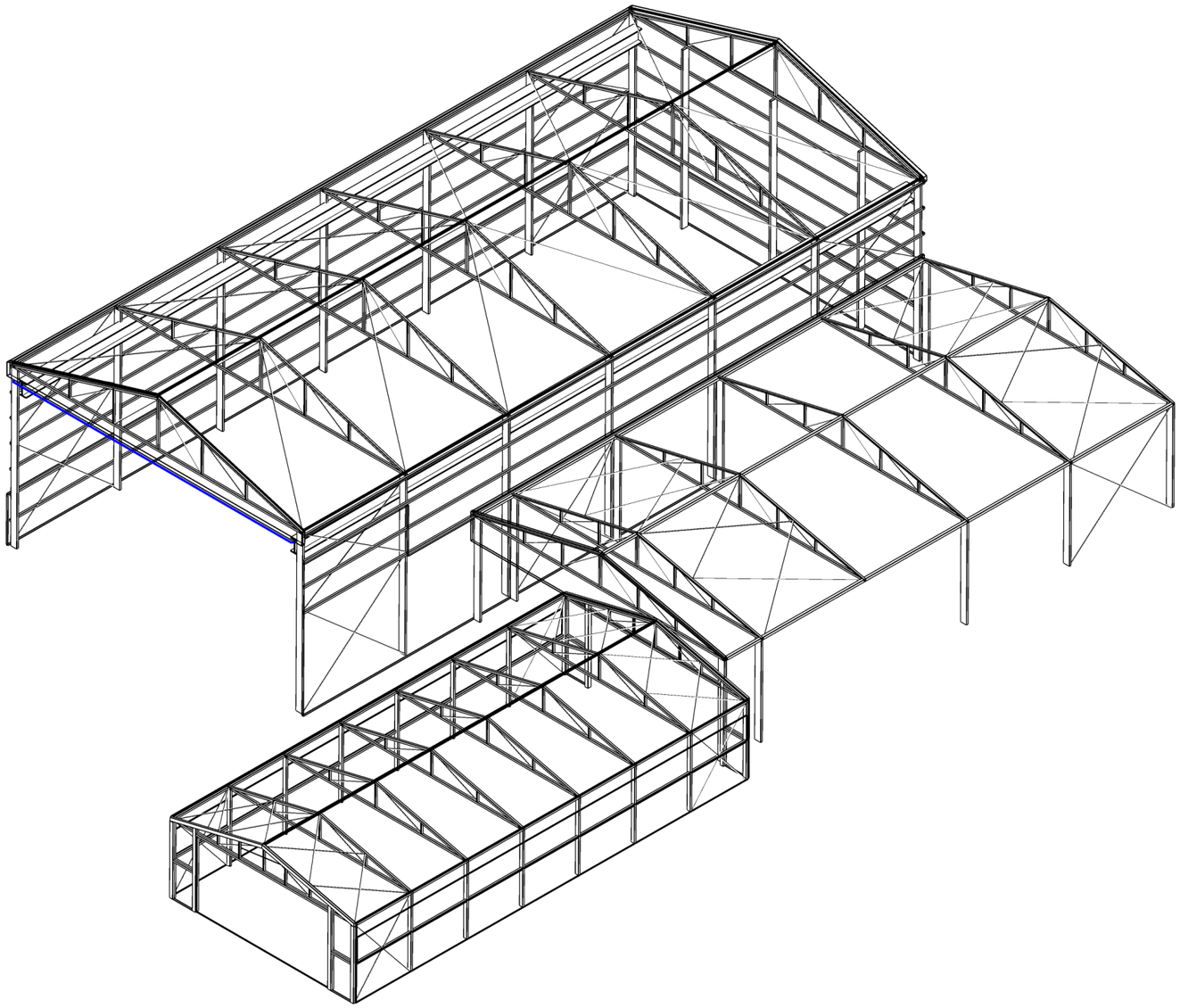
People flow

ISOMETRIC BUILDING PROGRESSION



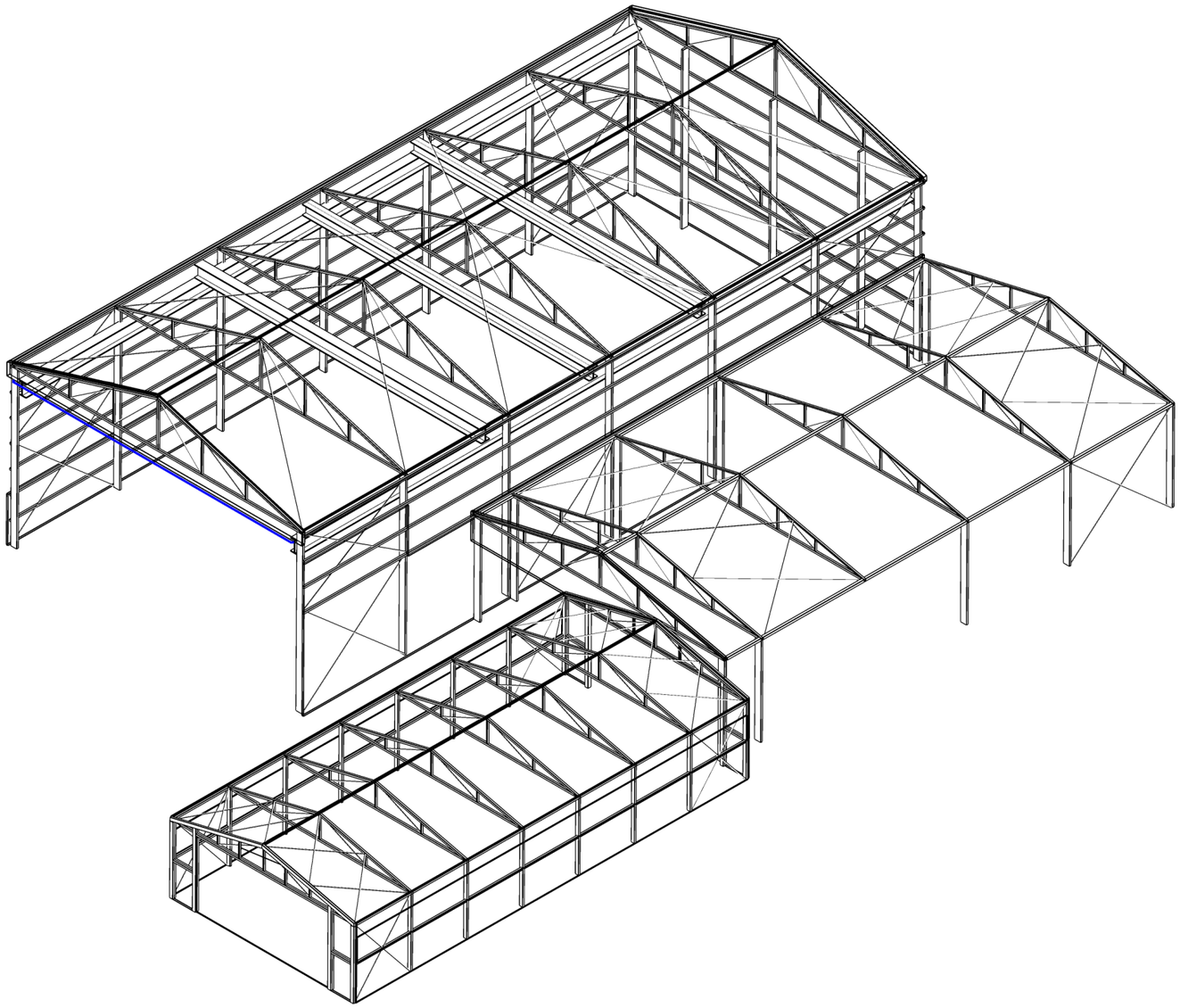
Existing structures remaine in place

ISOMETRIC BUILDING PROGRESSION



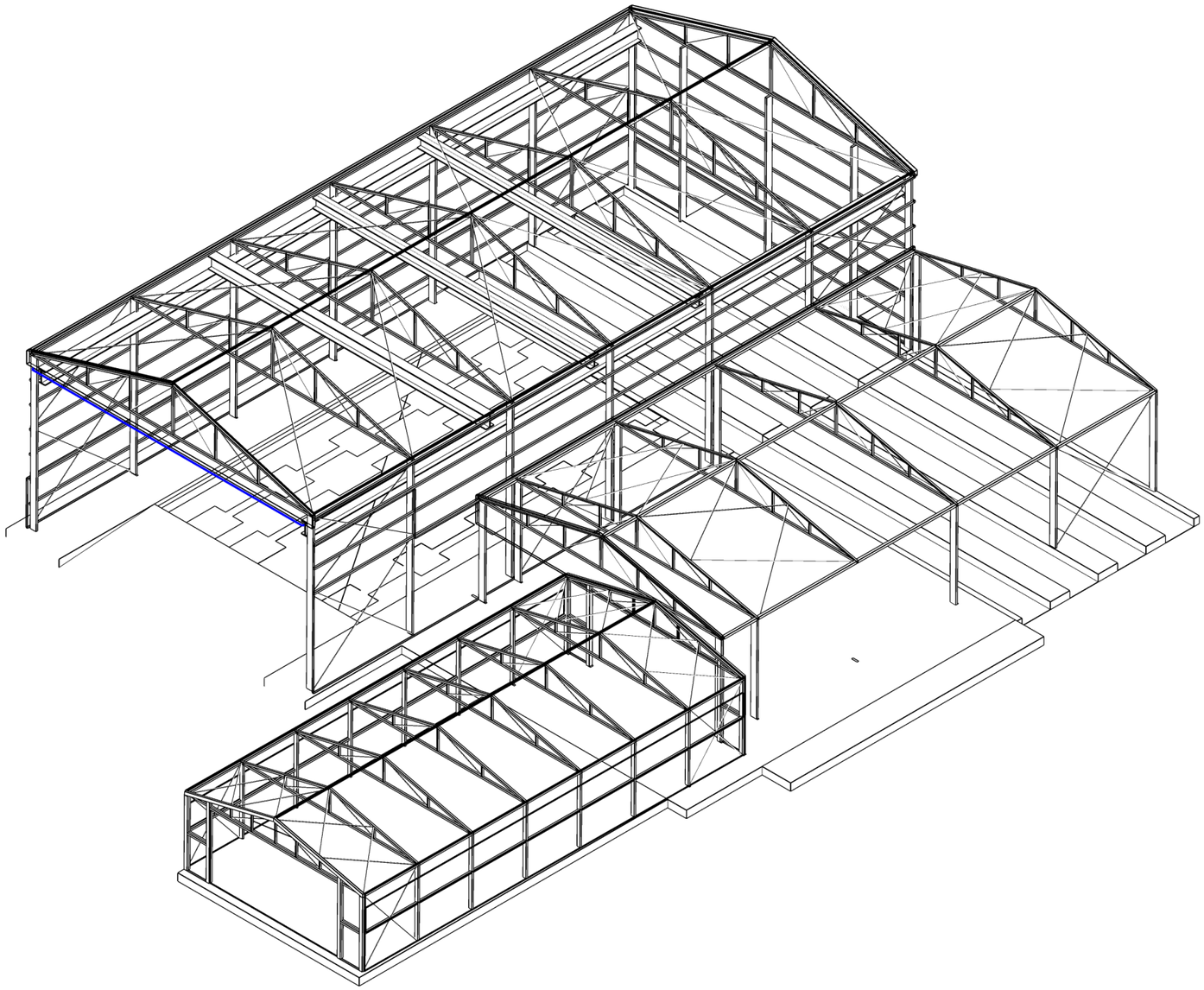
Existing contruction kept

ISOMETRIC BUILDING PROGRESSION



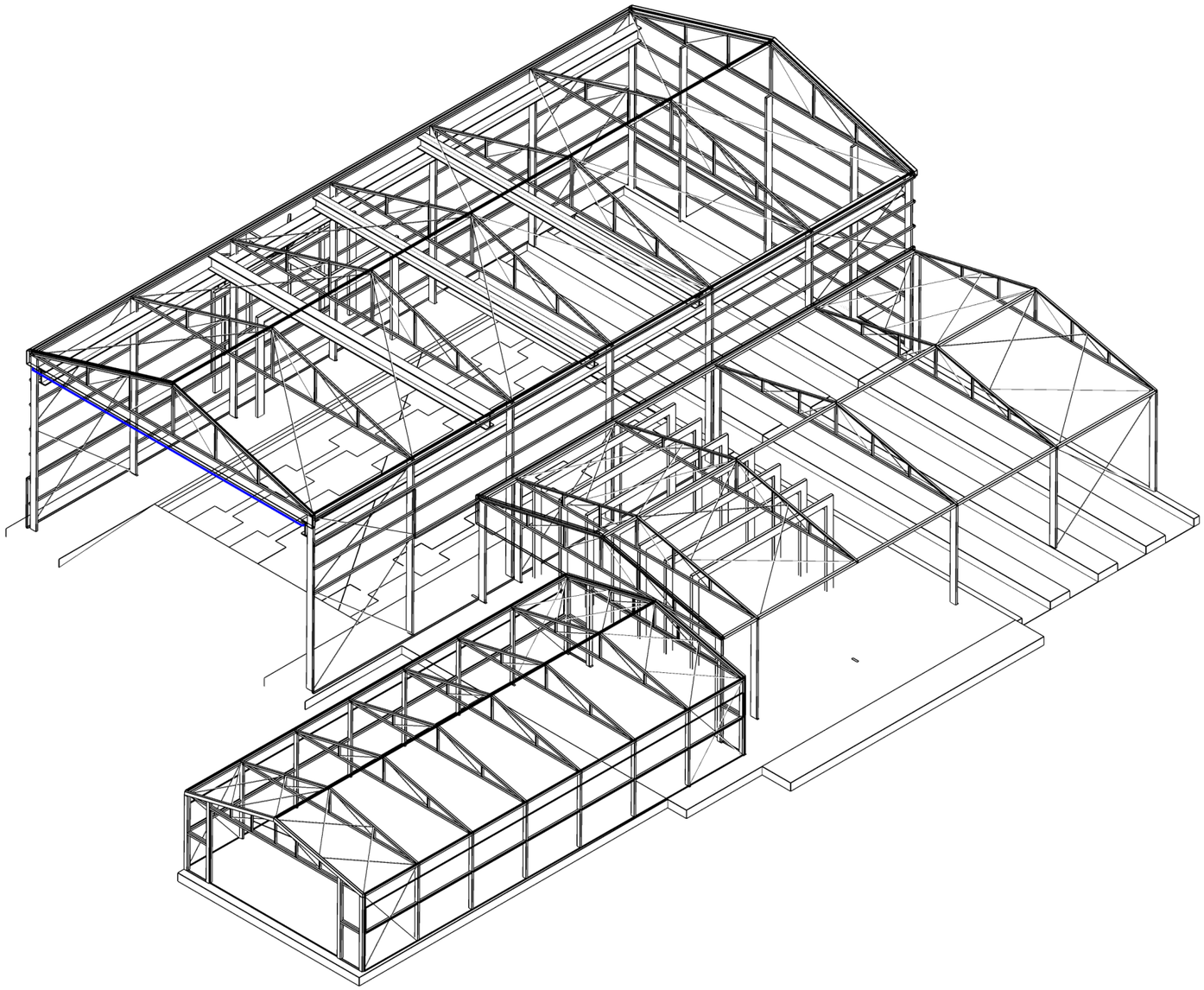
Loopkatbaan Trusses added

ISOMETRIC BUILDING PROGRESSION



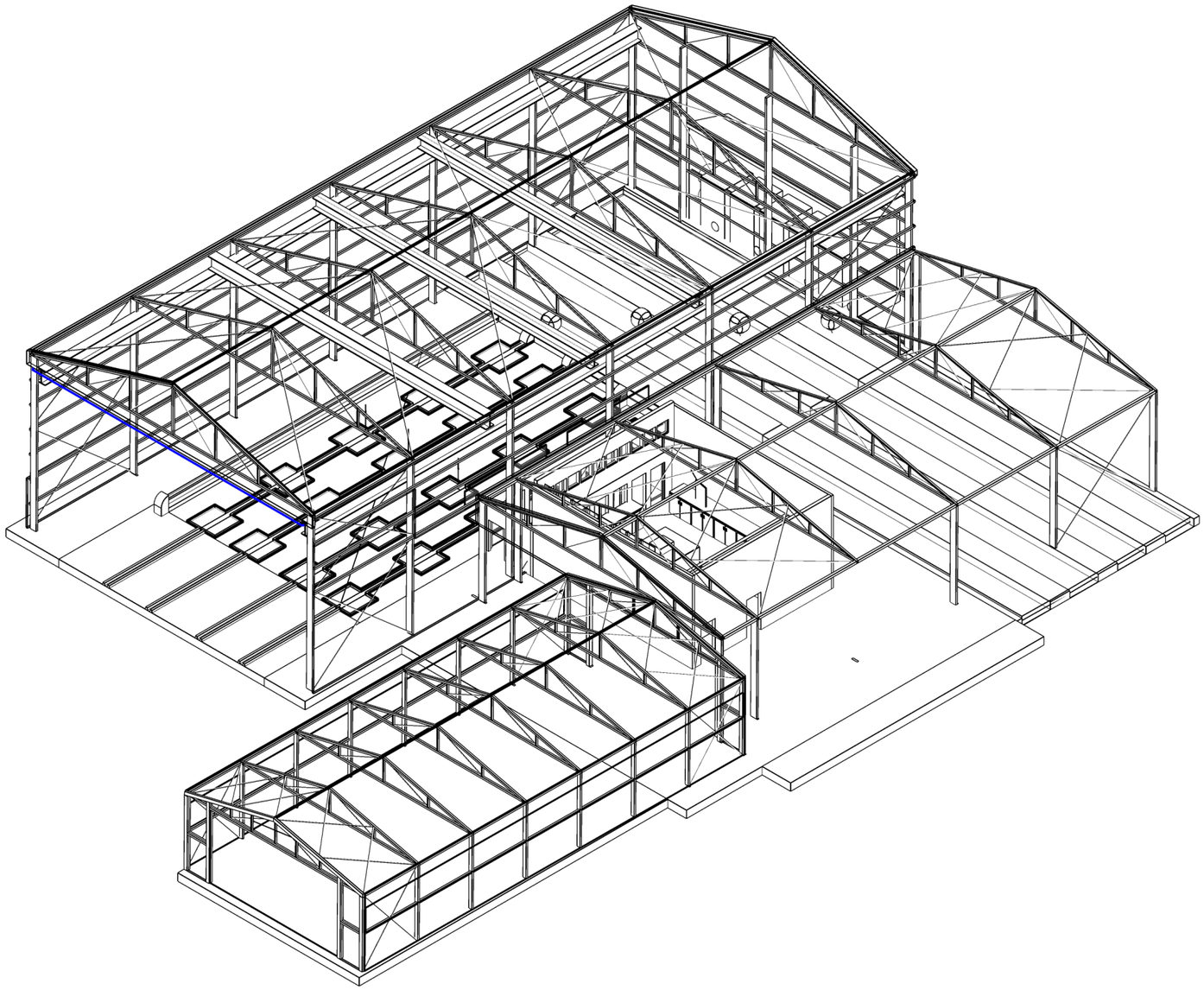
Existing concrete floor used for internal basins structure

ISOMETRIC BUILDING PROGRESSION



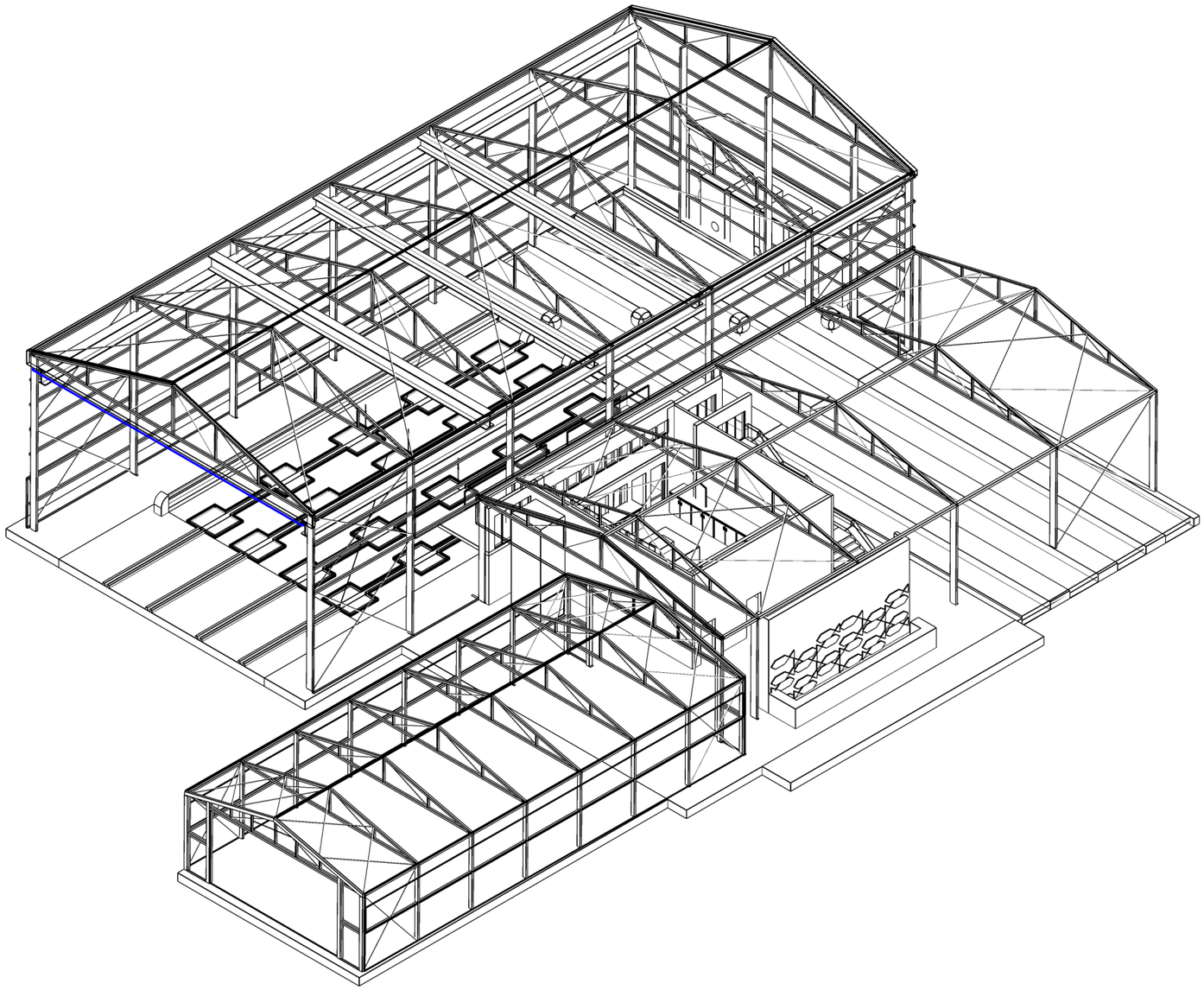
Construction added to support lab and visitors area

ISOMETRIC BUILDING PROGRESSION



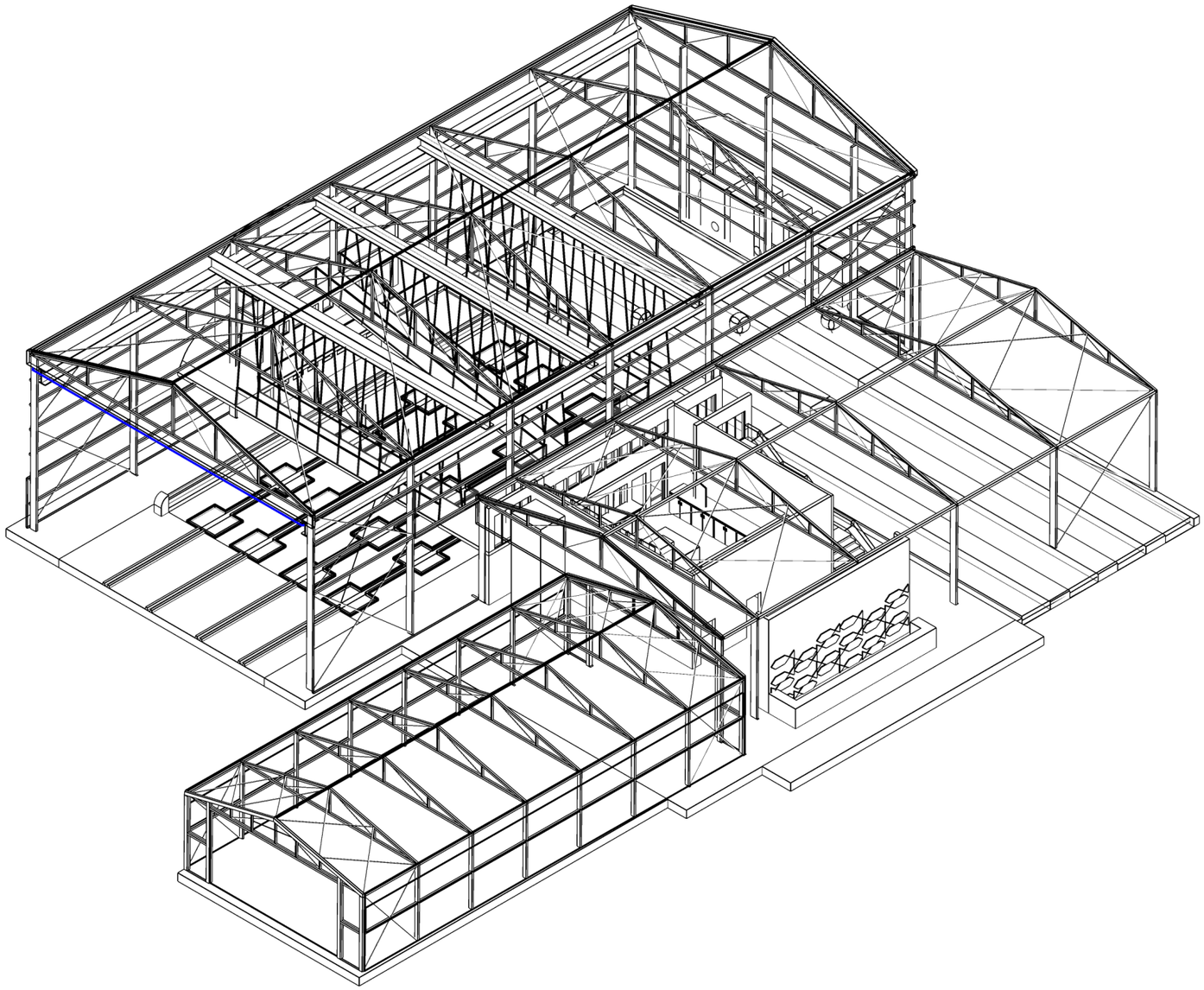
inside and outside lab added - controlled and outside climate zones

ISOMETRIC BUILDING PROGRESSION



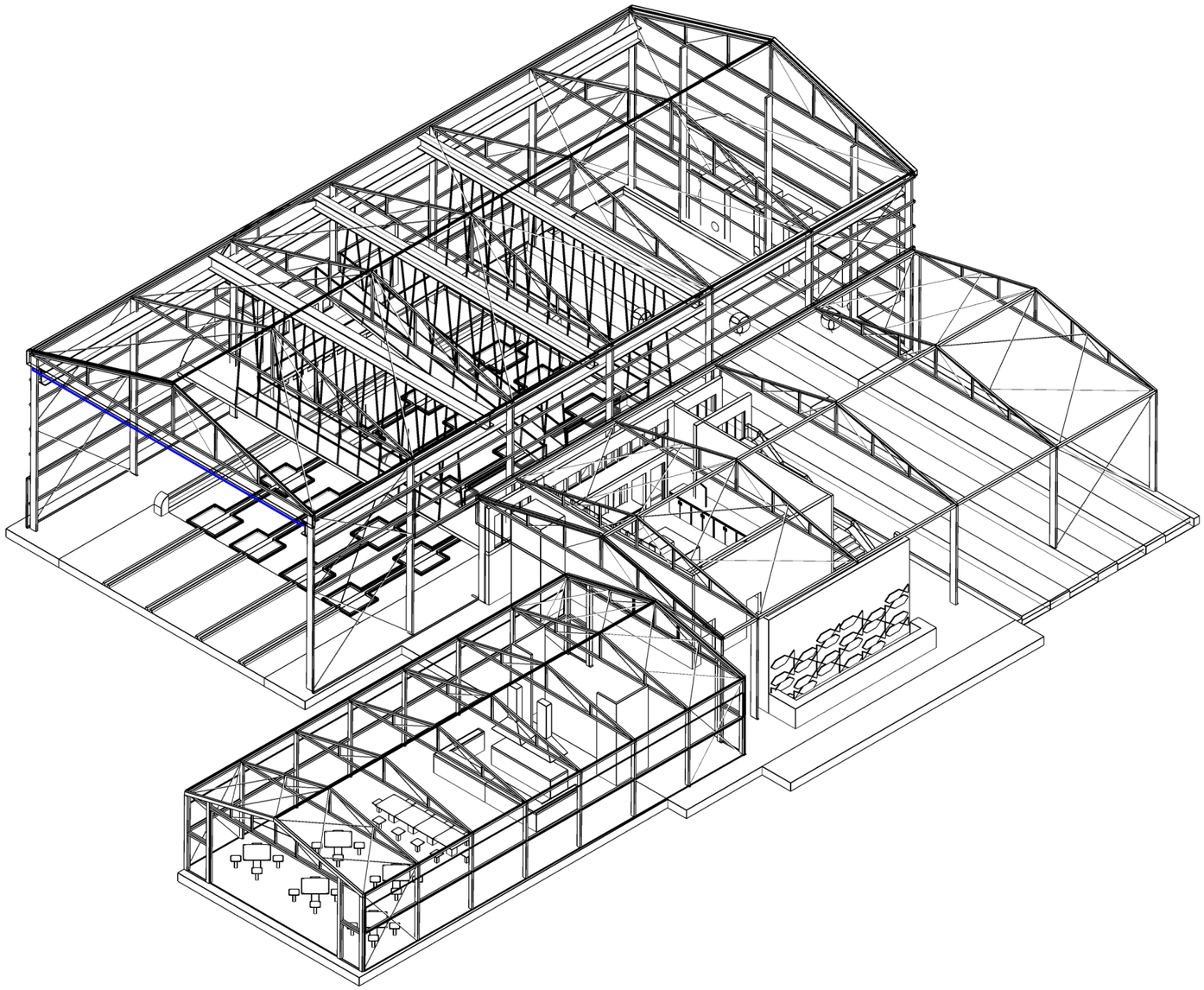
Reception Climate zone added

ISOMETRIC BUILDING PROGRESSION



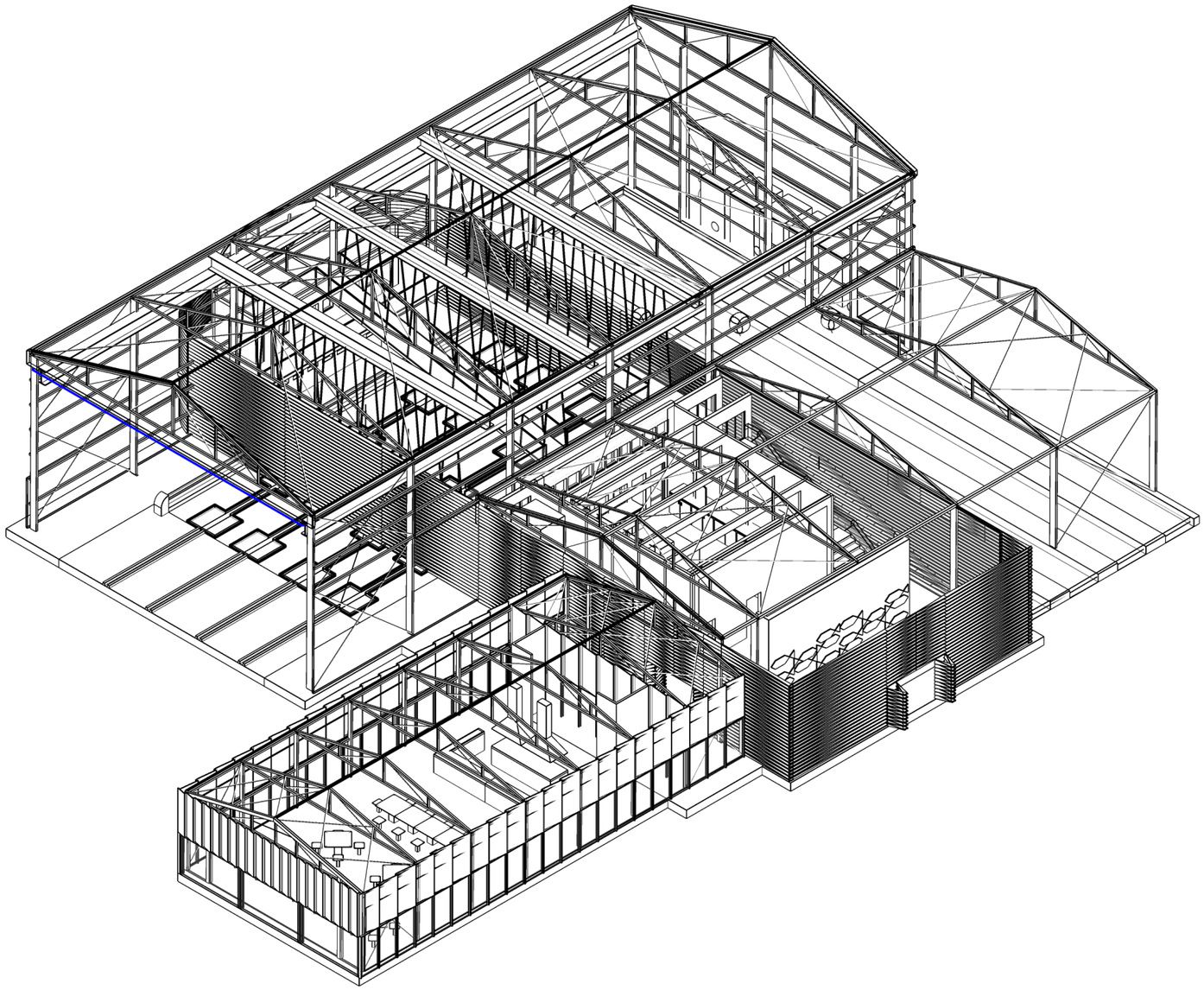
Bridges added hanging from loopkatbaan trusses

ISOMETRIC BUILDING PROGRESSION



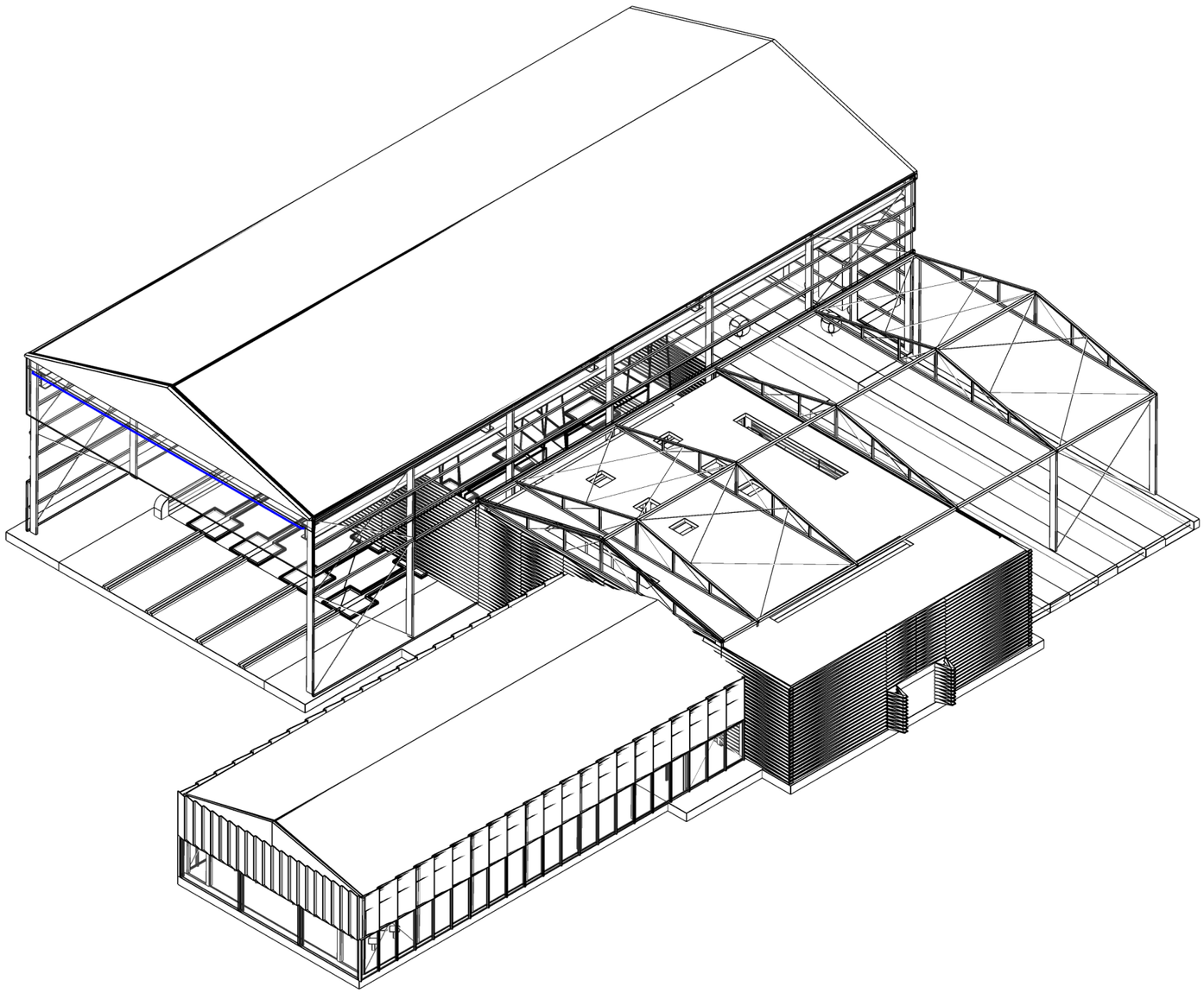
Restaurant added

ISOMETRIC BUILDING PROGRESSION



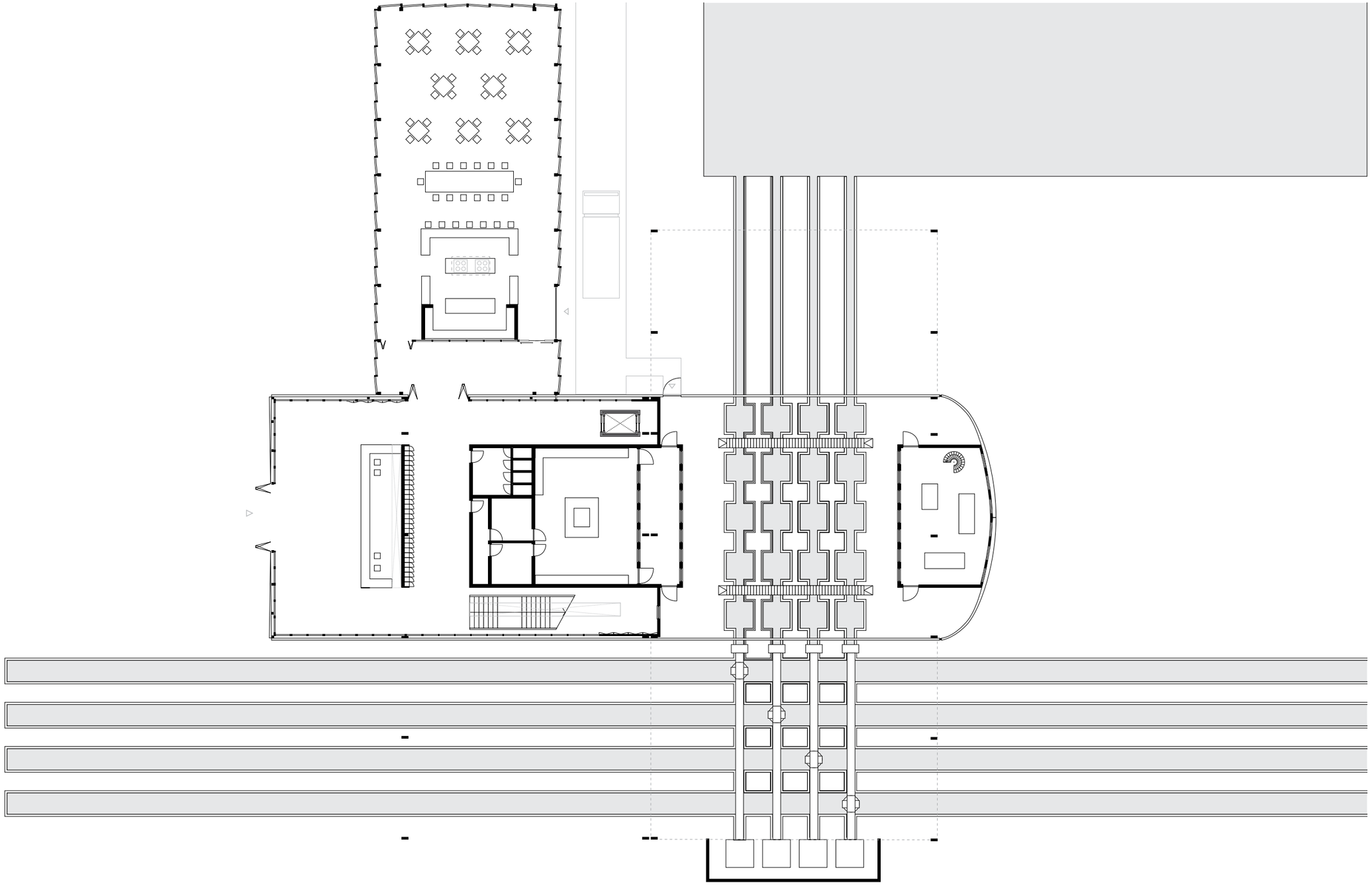
Facades added for climate zones Reception Outisde and Restaurant

ISOMETRIC BUILDING PROGRESSION



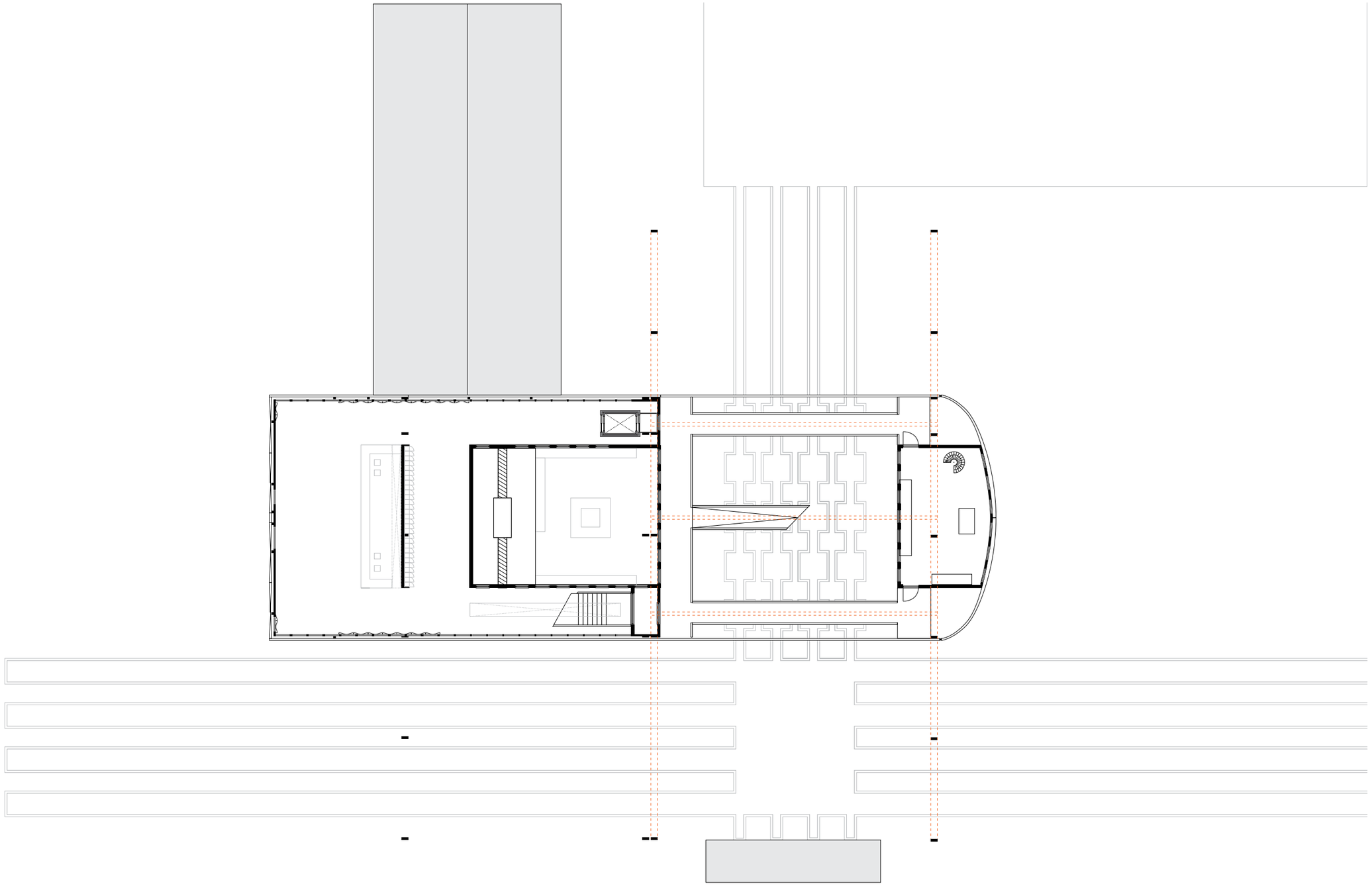
Roofs added for climate zones, Skylights added for receptions and inside lab

PLAN - FIRST FLOOR



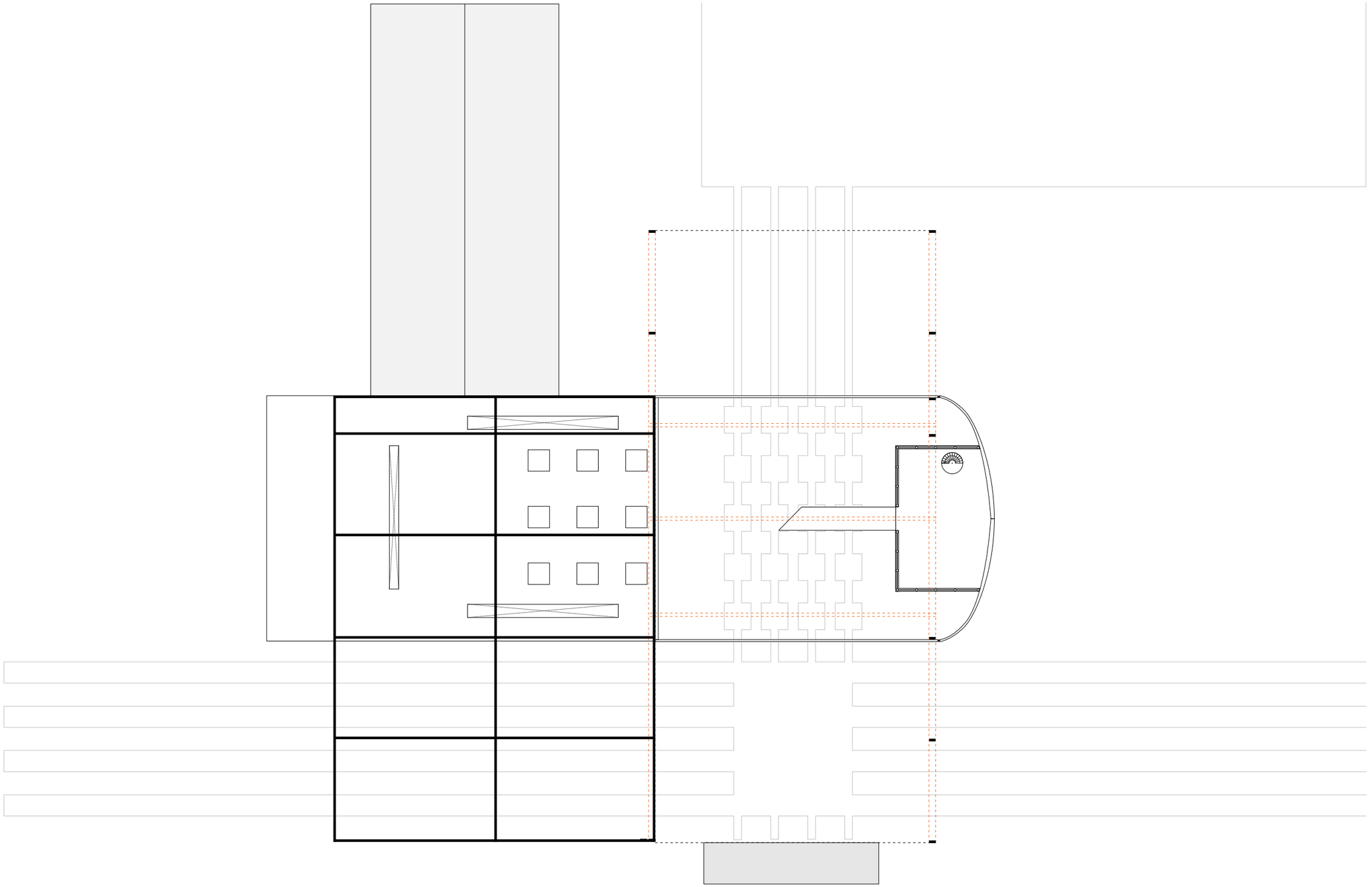
1:100

PLAN - FIRST FLOOR



1:100

PLAN - SECOND FLOOR



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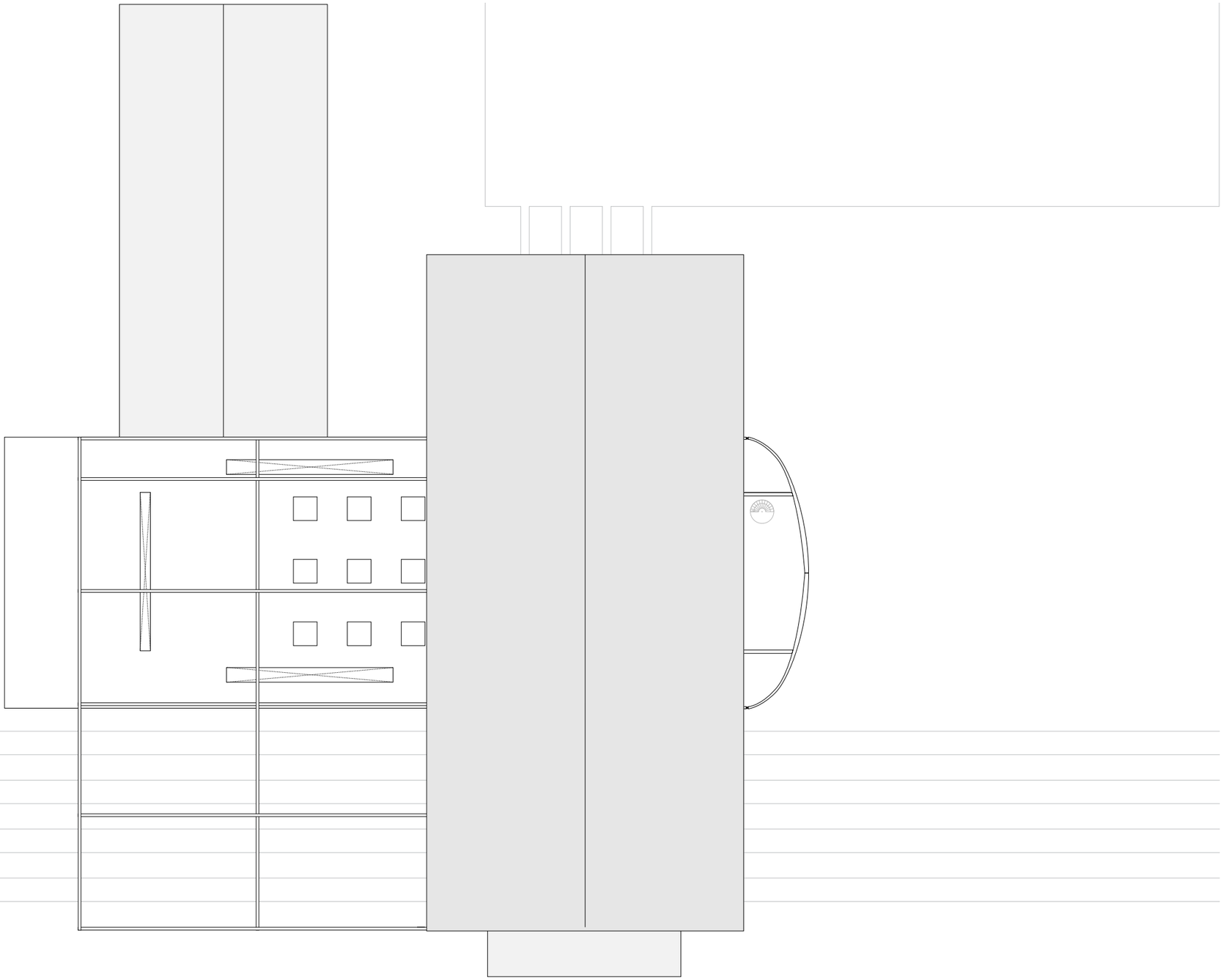
PLAN - ROOF PLAN



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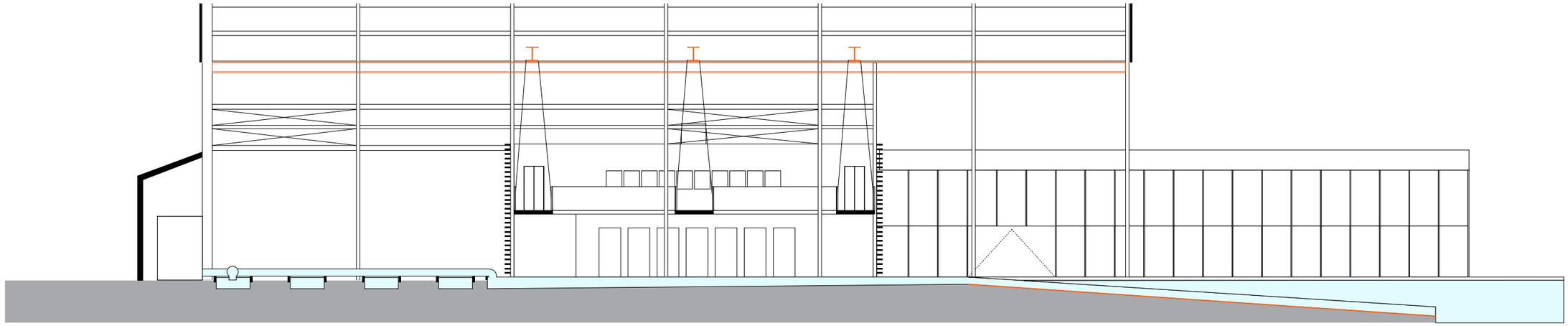
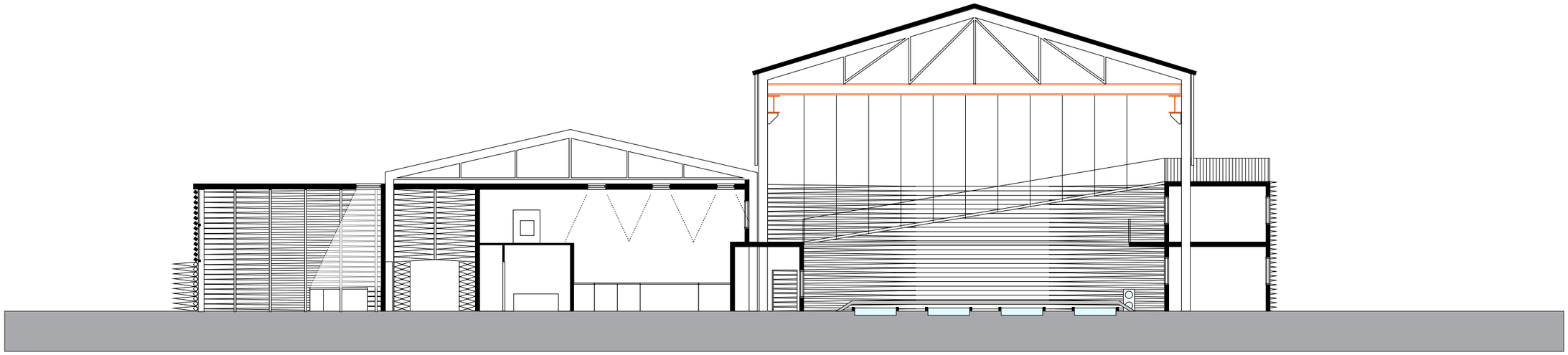
SECTIONS





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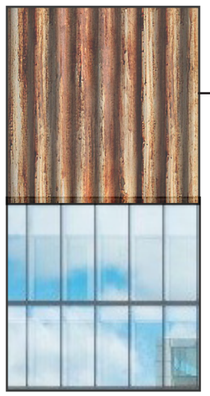
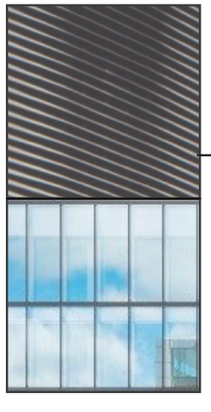
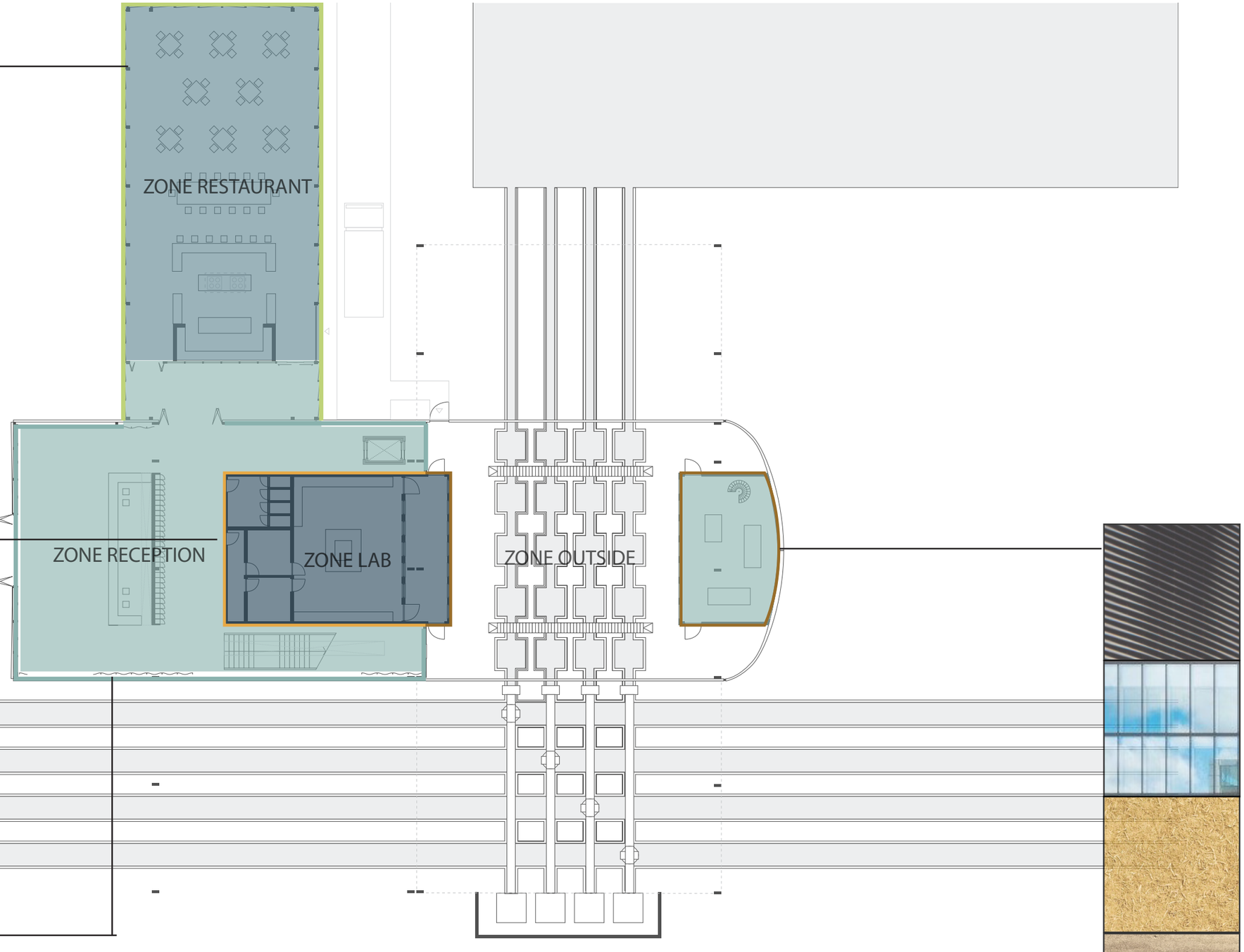
BUILDING DETAILS AND CLIMATE

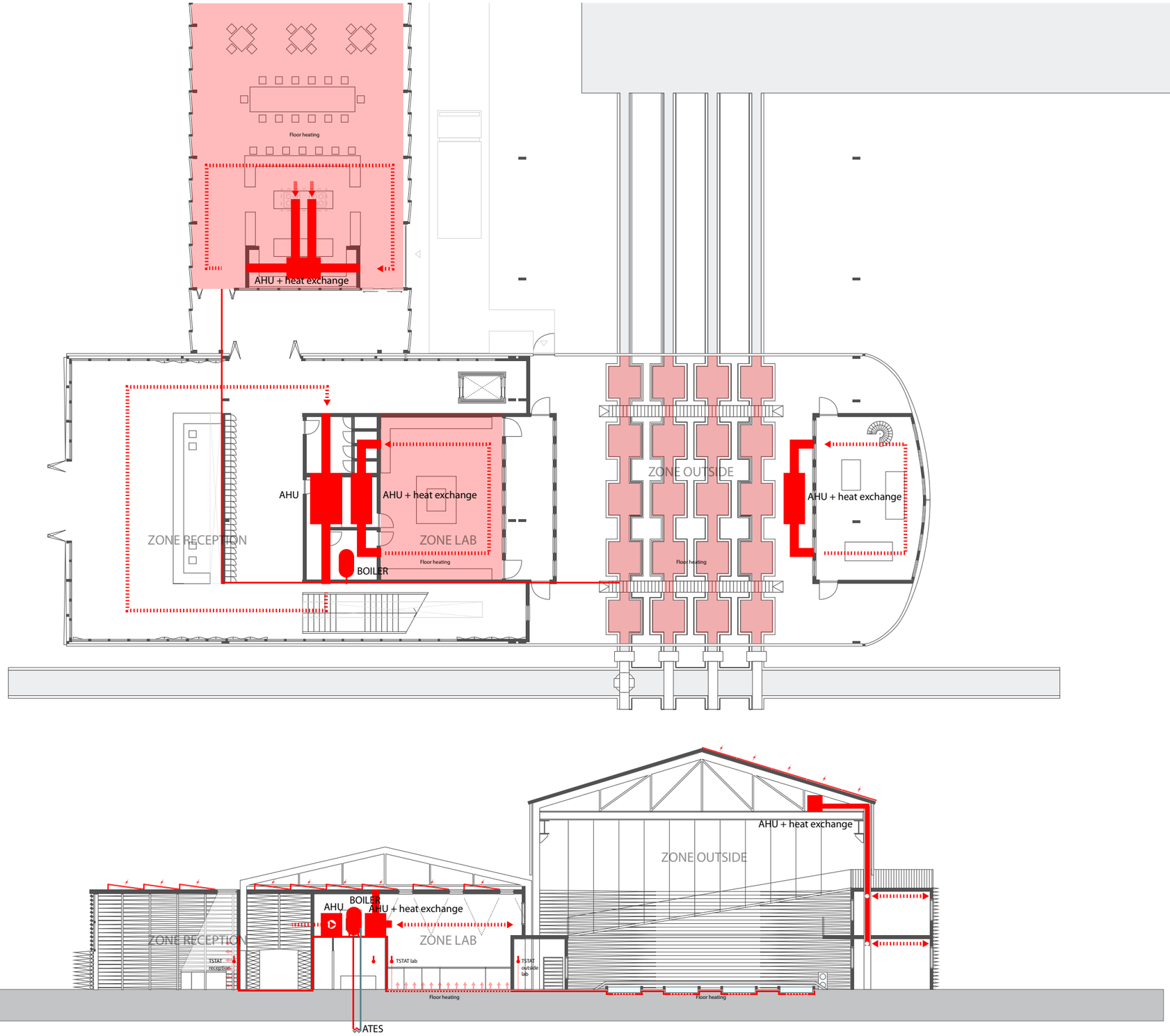
CLIMATE ZONES - facade appearance





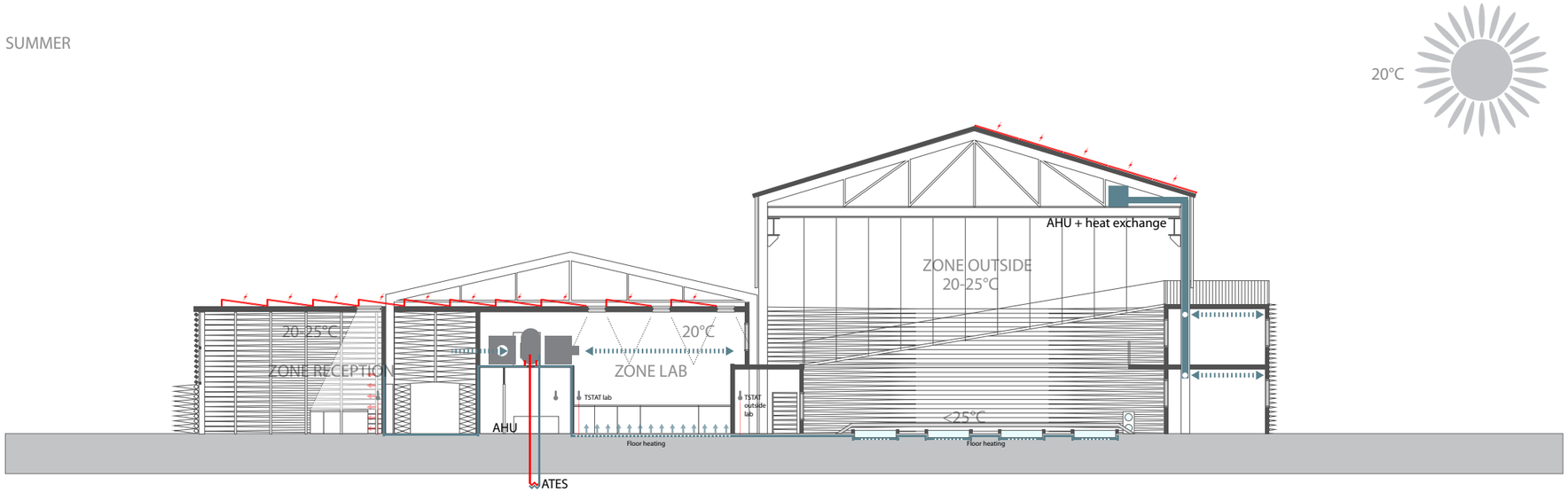


CLIMATE INSTALLATIONS

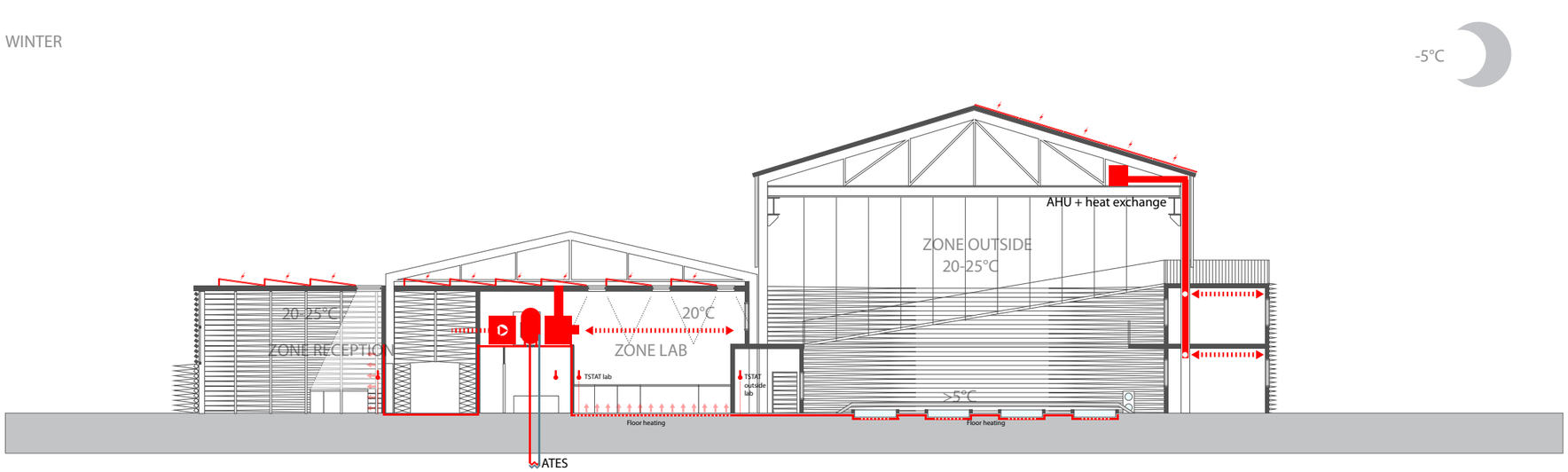


CLIMATE SITUATIONS

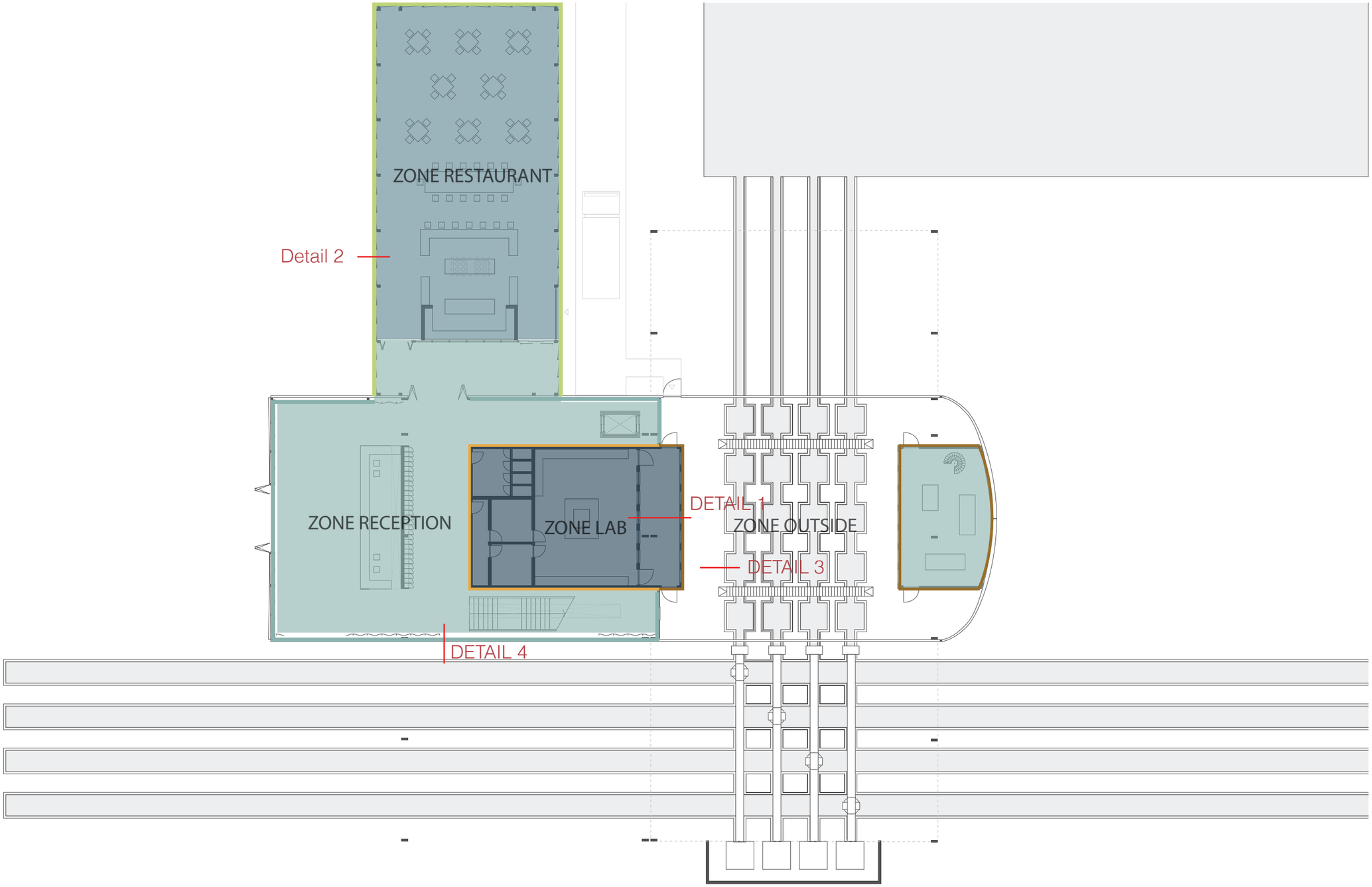
SUMMER



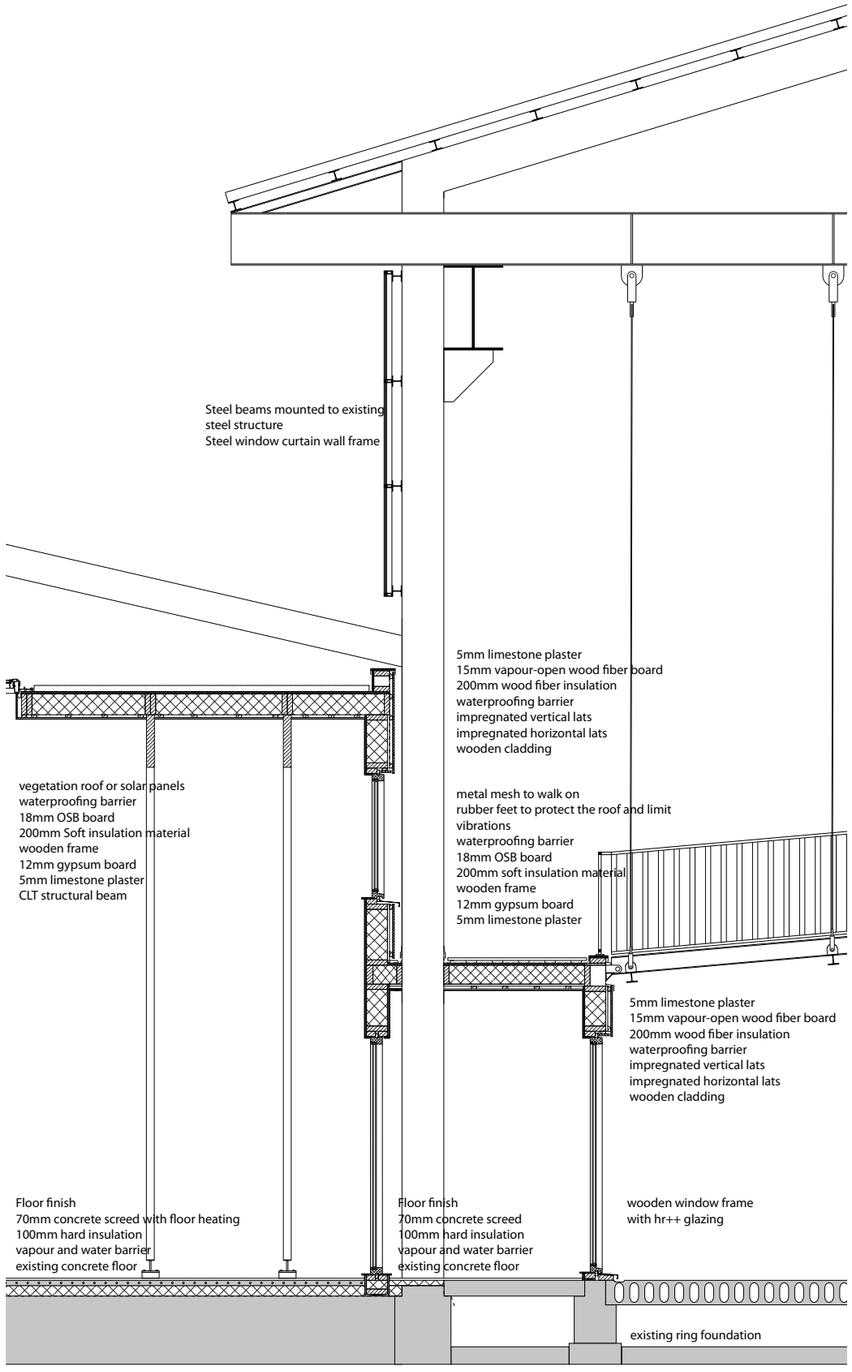
WINTER

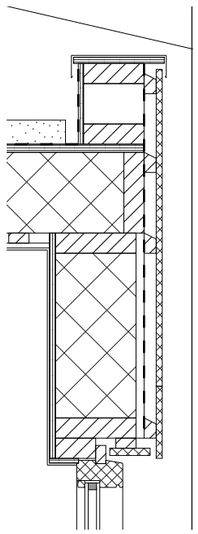


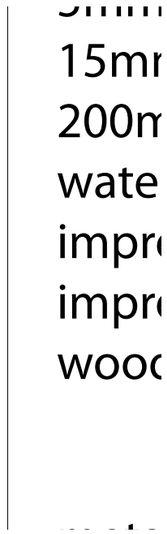
CLIMATE ZONES

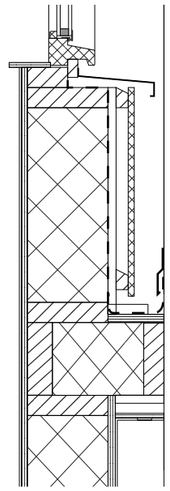


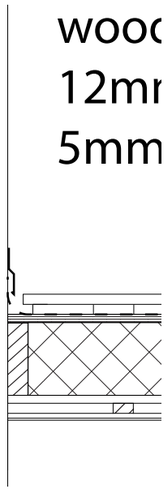
DETAIL TRANSITION INSIDE - OUTSIDE LAB

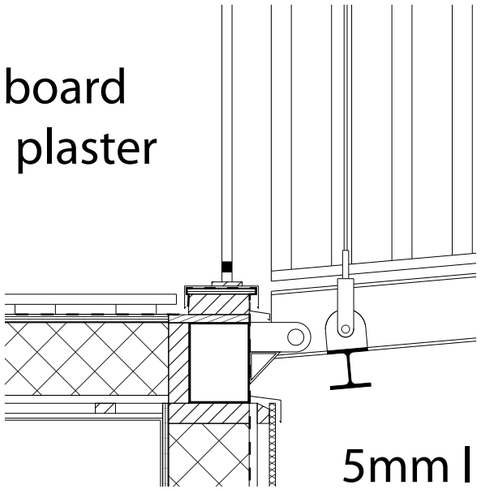


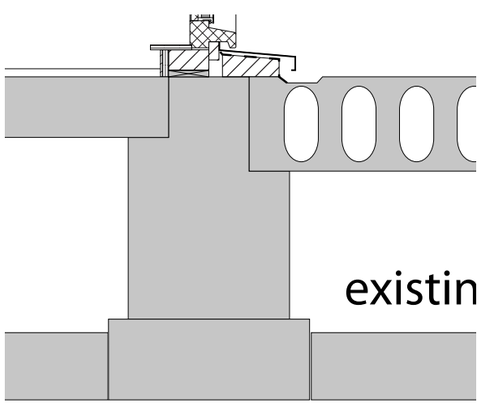






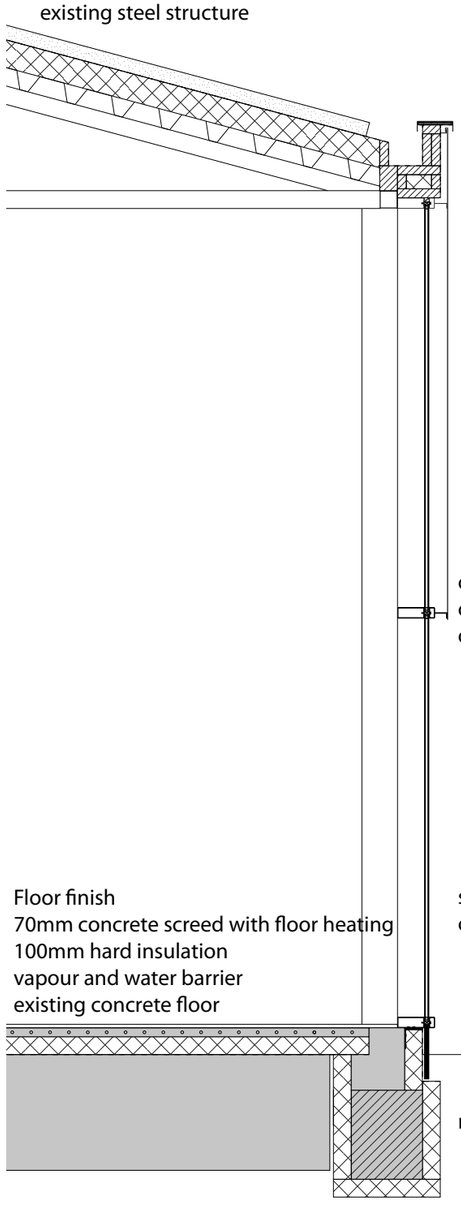






DETAIL TRANSITION INSIDE - OUTSIDE LAB

vegetation roof
water proofing barrier
150mm hard insulation
structural profiled steel sheet
existing steel structure

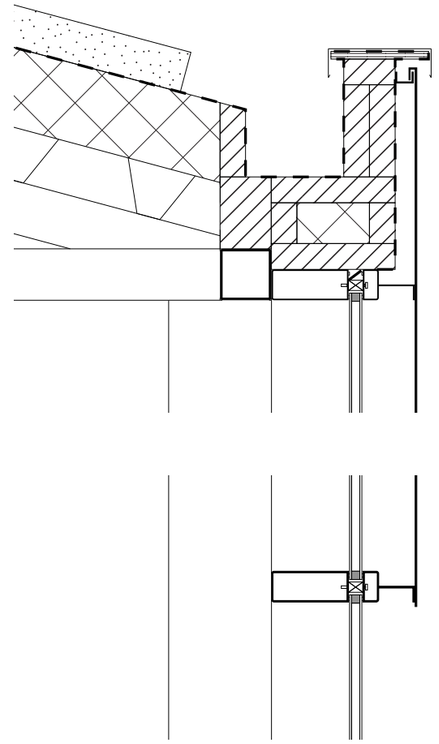


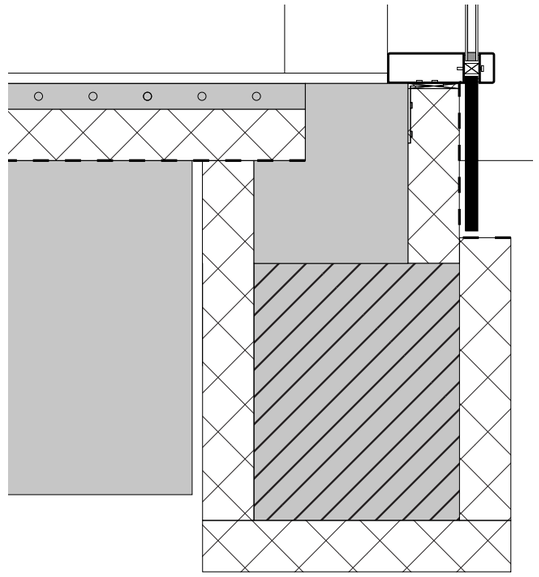
corten steel sheet, attached to
curtain wall via welded bracket
on curtain wall frame cover

steel frame
curtain wall with hr++ glazing

Floor finish
70mm concrete screed with floor heating
100mm hard insulation
vapour and water barrier
existing concrete floor

new ring foundation

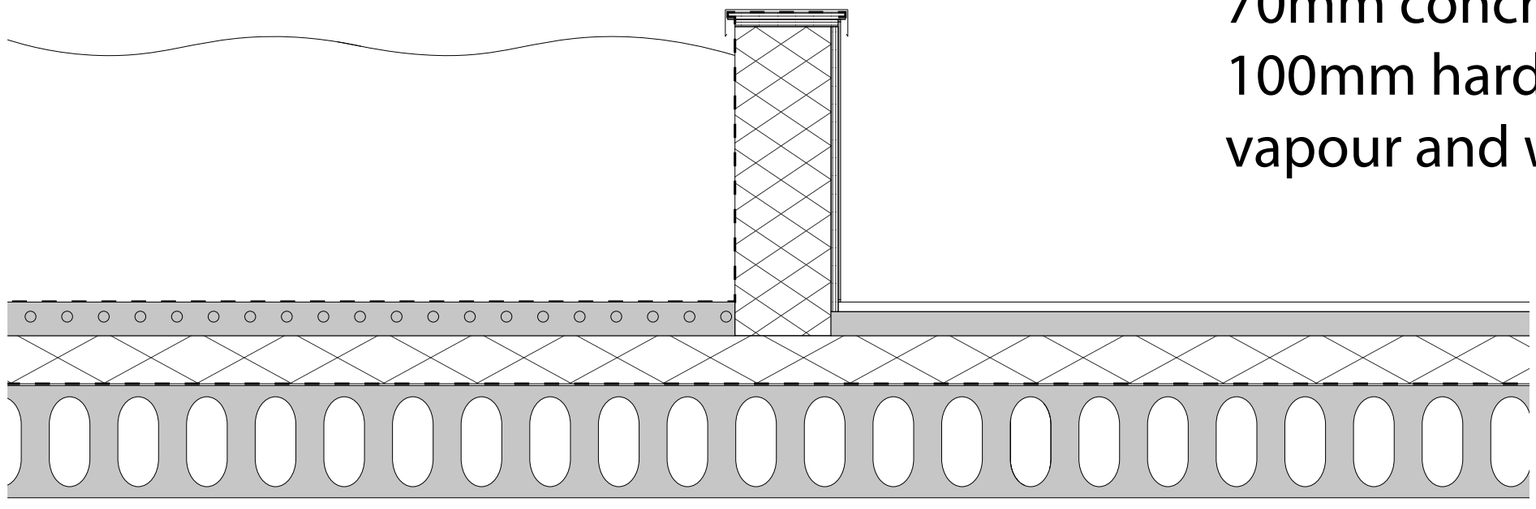




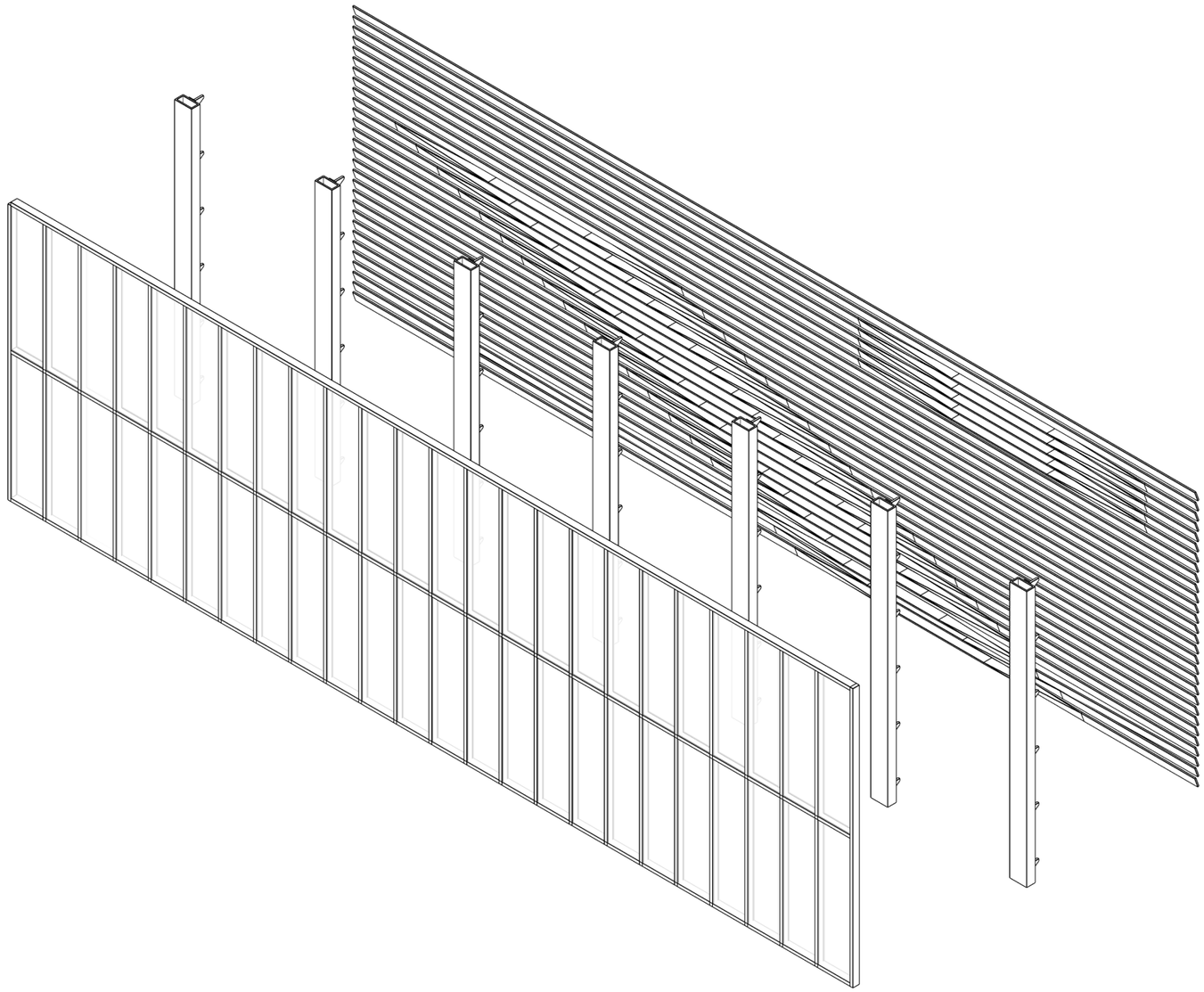
DETAIL BASIN ISOLATION AND HEATING

water basin
water barrier
70mm concrete screed with floor
heating and hemp block sides
100mm hard insulation
vapour and water barrier
hollow concrete slab

Floor finish
70mm concrete screed
100mm hard insulation
vapour and water barrier

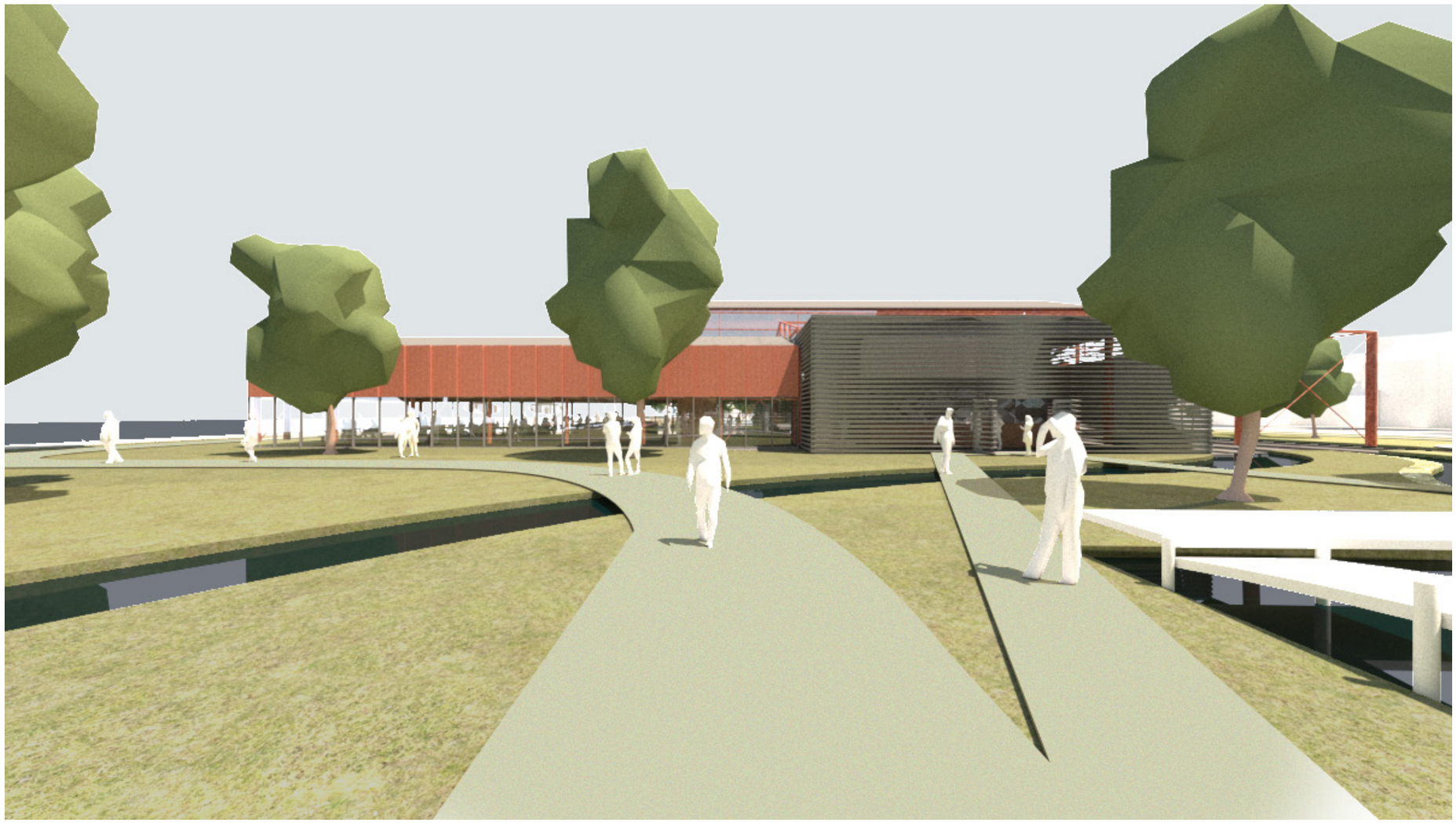


Architectural detail curtain wall metal mesh



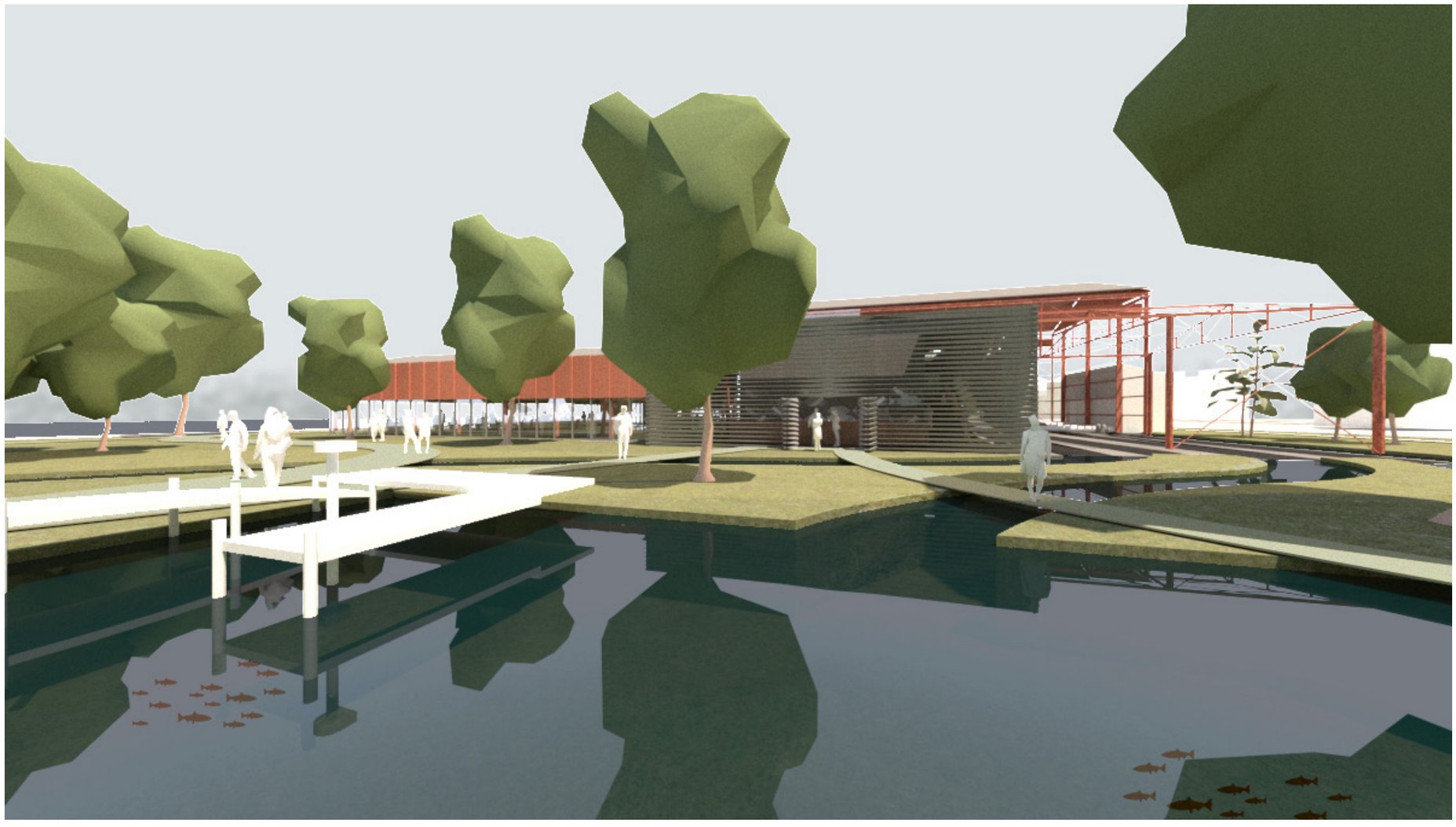
curtain wall facade follows the meshed bended steel facade

Entrance to the building



View of ouside lab and restaurant

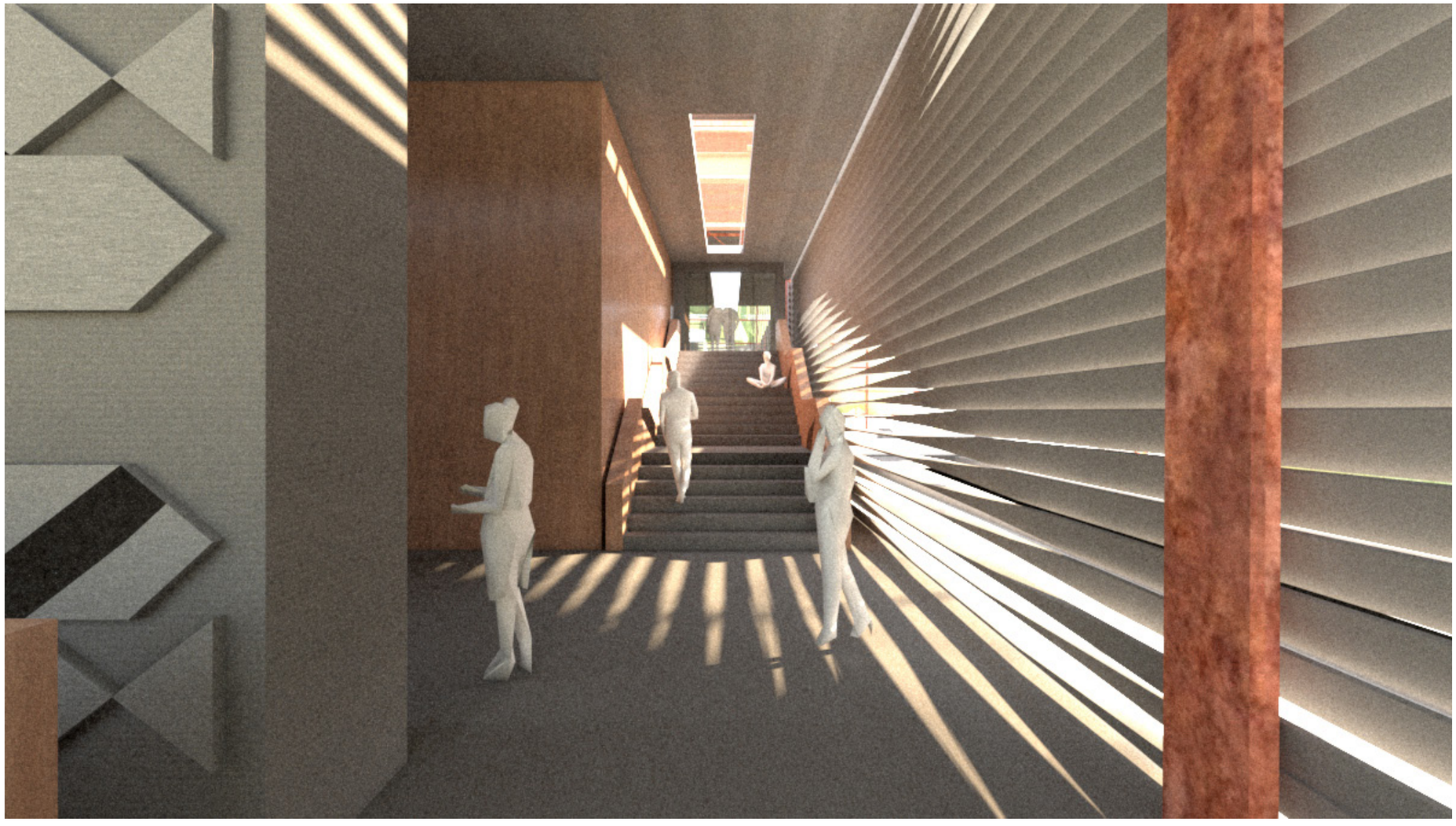
Render 1



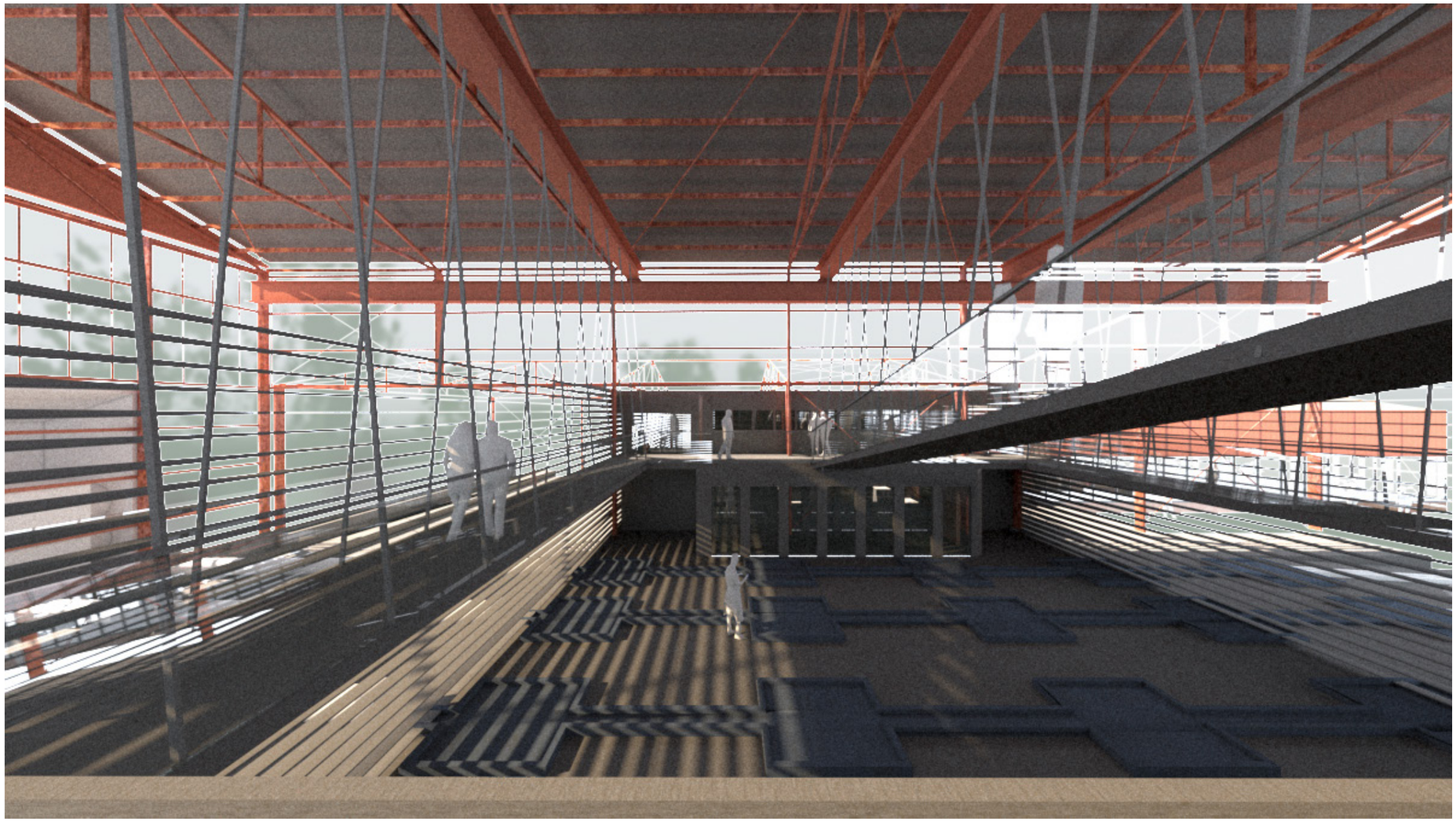
Reception

Lockers and view of restaurant

Stairs for Public Route



Outside lab

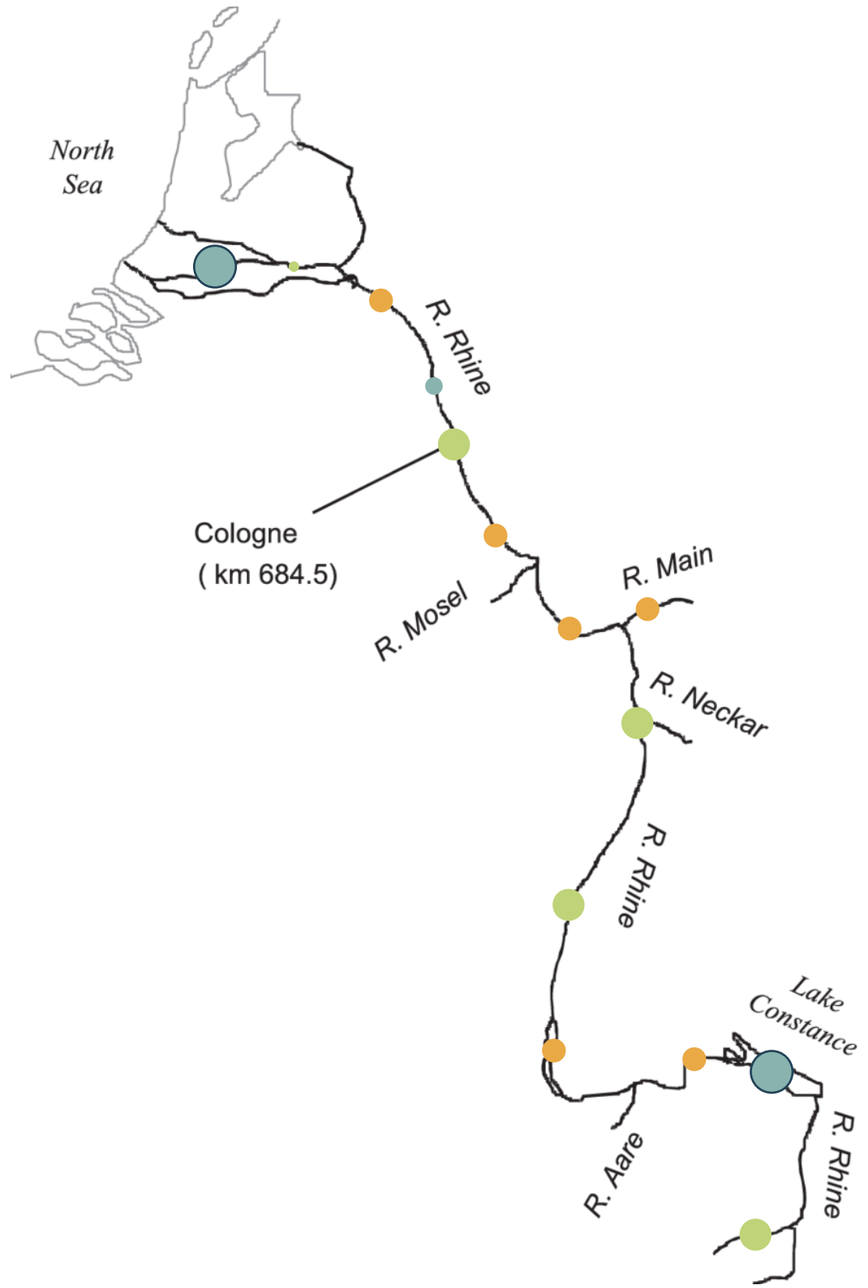


Inside Lab

Restaurant

Birds Eye Perspective

ASPIRATION OF INTERVENTION EUROPEAN SCALE

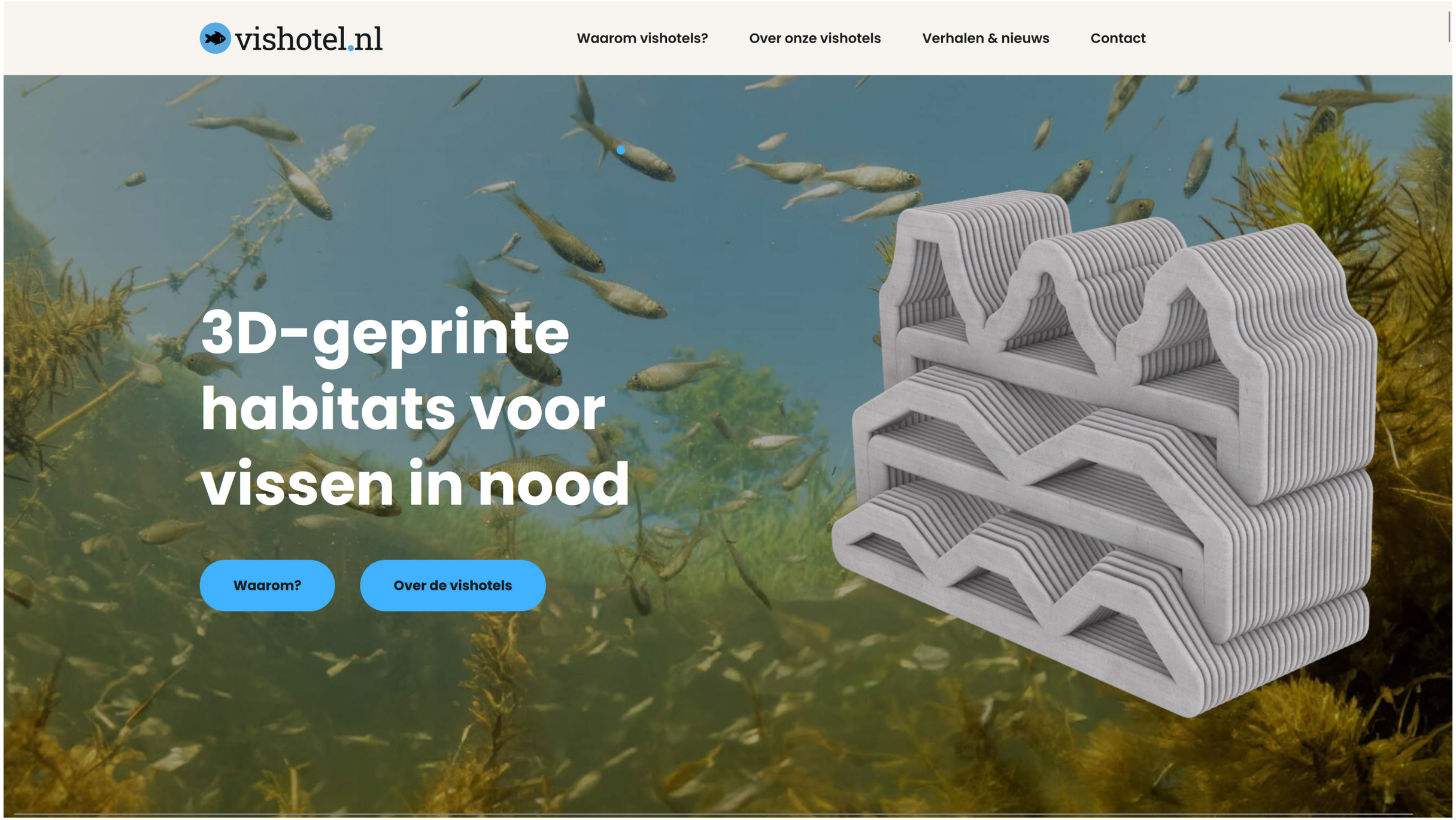


Centers can be added in part or as whole to expand monitoring efforts of migratory fish reintegration.
especially in areas with maratime infrastructure.


tha
nks!

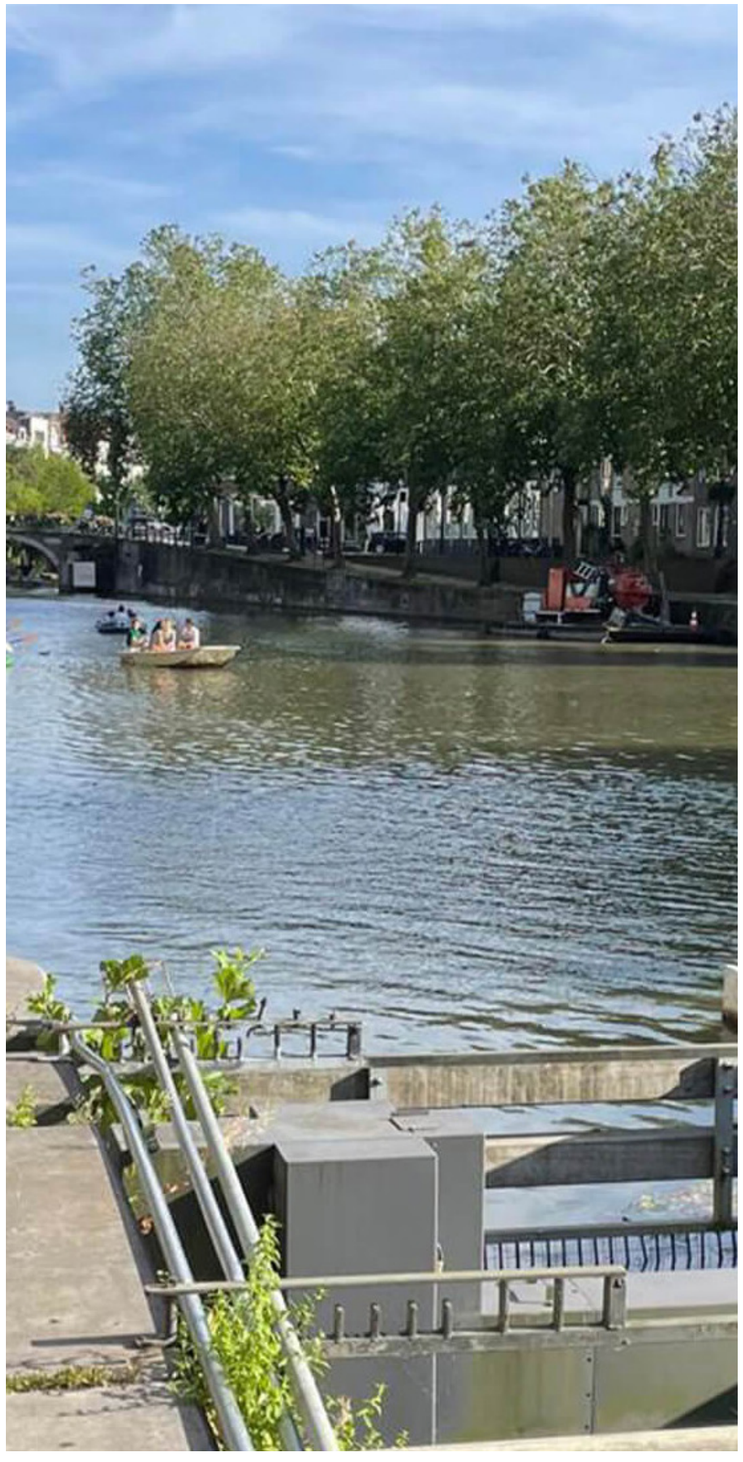
Refrence book

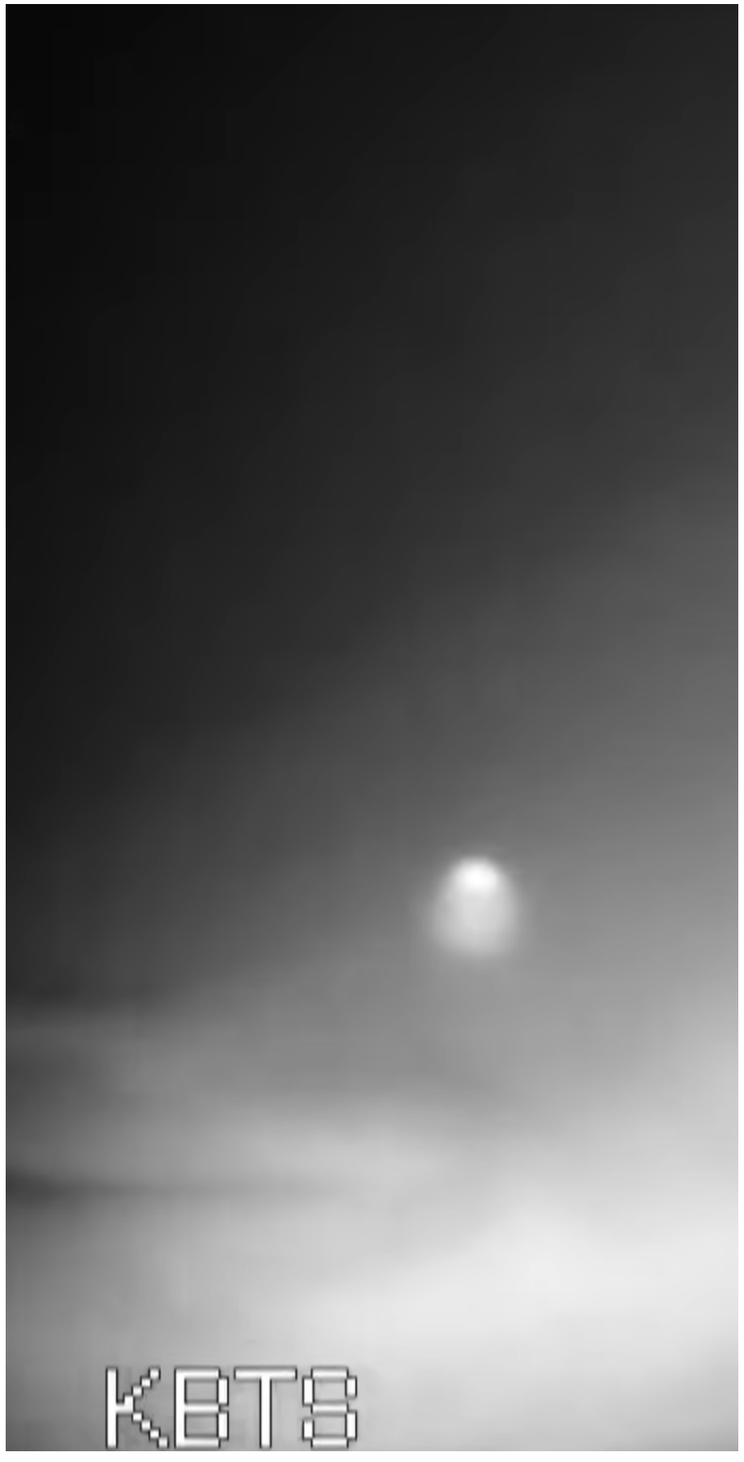
Recent Dutch riverine and migratory fish initiatives

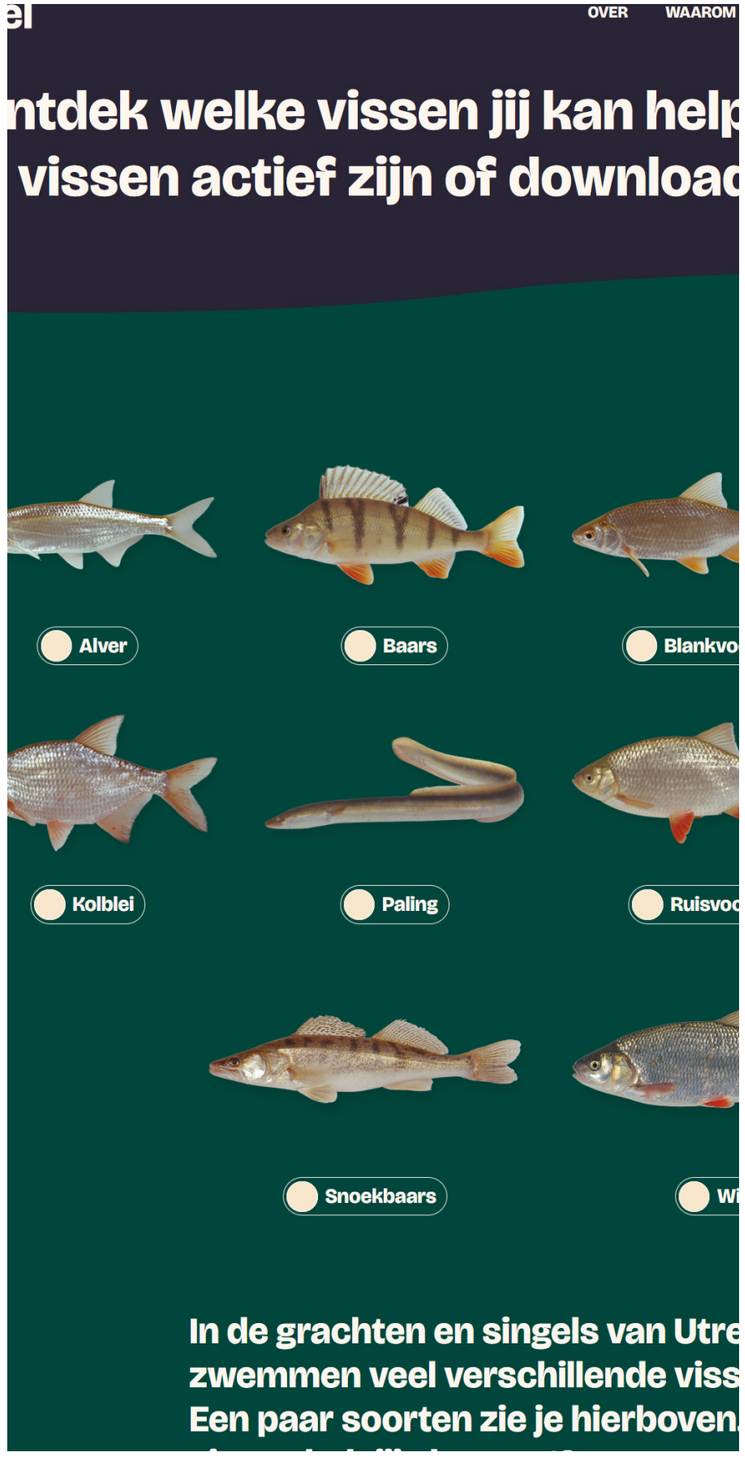


Fish hotels: mimicing natural fish habitats

Recent Dutch riverine and migratory fish initiatives

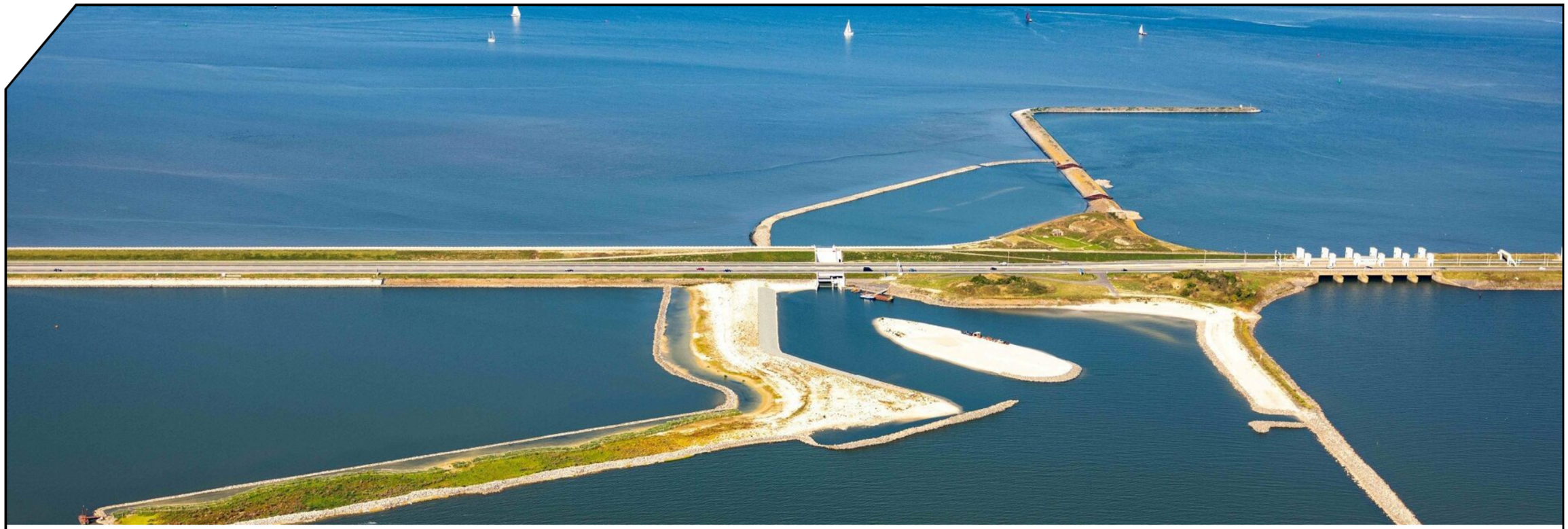






Fish Doorbell: Locke controled by the Residents, exposure through online involvement

Recent Dutch riverine and migratory fish initiatives



Vismigratierivier

In uitvoering

De Afsluitdijk beschermt het achterland tegen het water, maar vormt ook een hindernis voor veel soorten vissen. De Vismigratierivier gaat er straks voor zorgen dat vissen weer van zout naar zoet water kunnen zwemmen en vice versa. Dit hebben ze nodig om te overleven. De Vismigratierivier is een vernieuwend plan om de Waddenzee en het IJsselmeer weer met elkaar te verbinden. Ook draagt de Vismigratierivier bij aan gezond water, het herstel van rijkdom aan soorten planten en dieren in het gebied en het biedt mogelijkheden voor recreatie.

Fish Migration River: Free migratory acces while mitigation between sweet and salt water

Recent Dutch riverine and migratory fish initiatives

The Softening of the Riverdelta: prevents flooding and provides habitat for fish

European Projects To Study Biodiversity

Veldstation Saeftinghe
RO&AD

2023
Netherlands, Zeeland

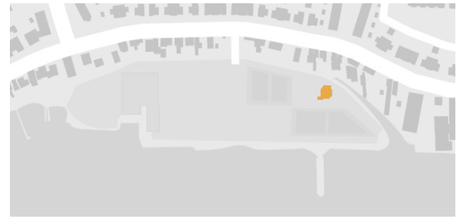
Kumak Masurian center for Biodiversity
Kwadratura

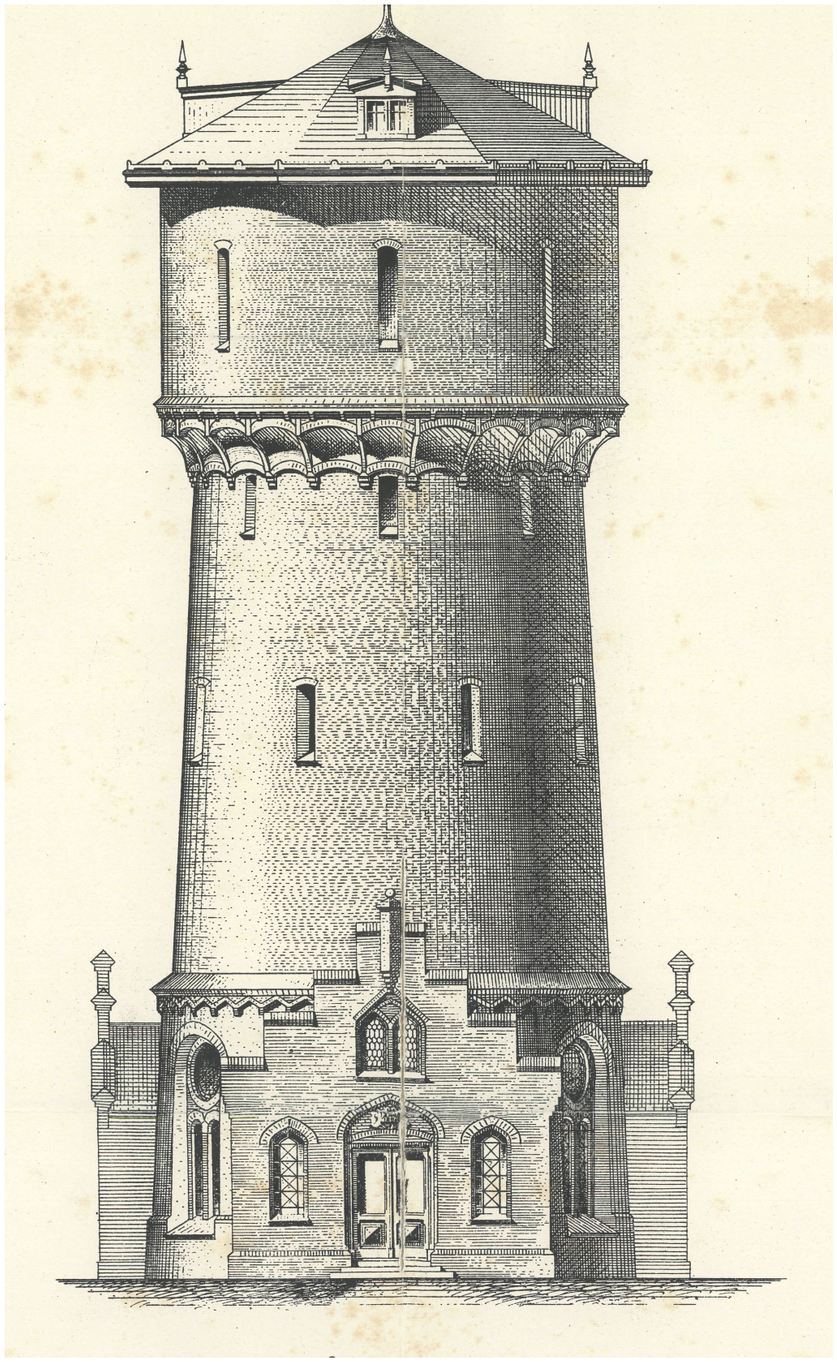
2023
Poland

Arctic Salmon Center
Cermaq AS

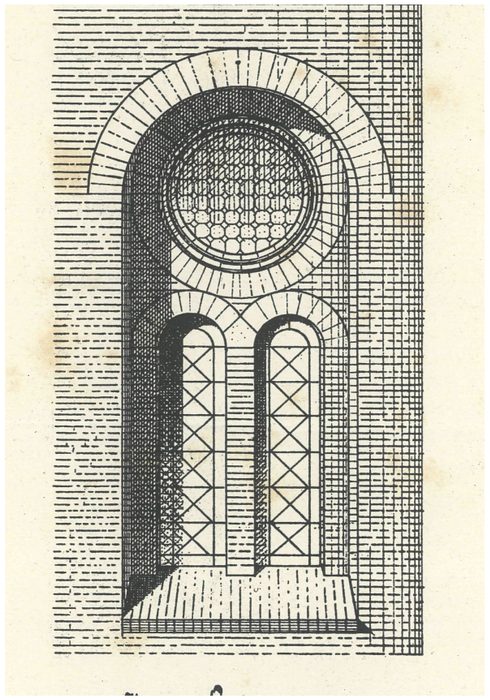
2020
Norway

Historical Value exterior

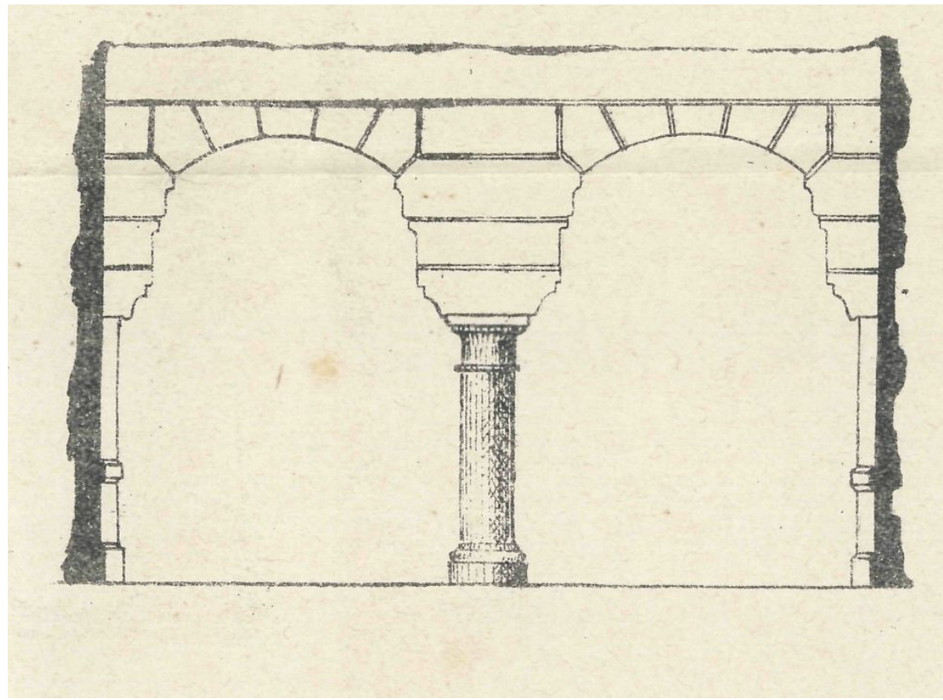




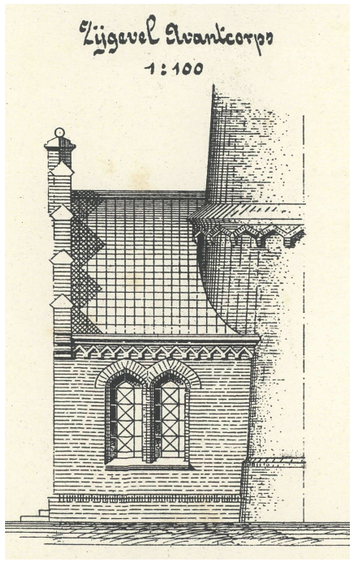
Brick building Gable roof top of calcified reservoir



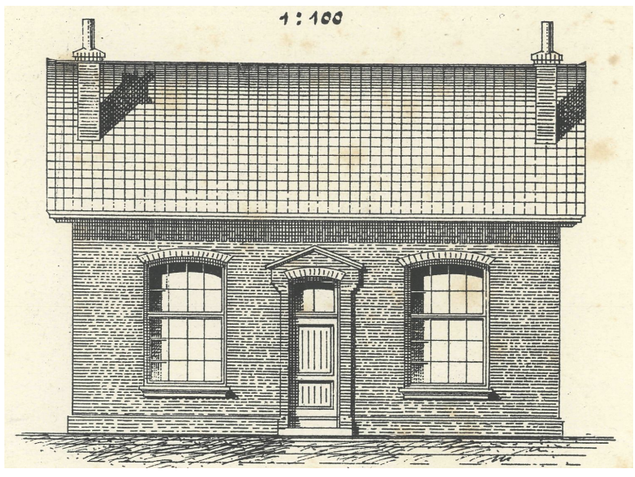
Detail of window ground floor



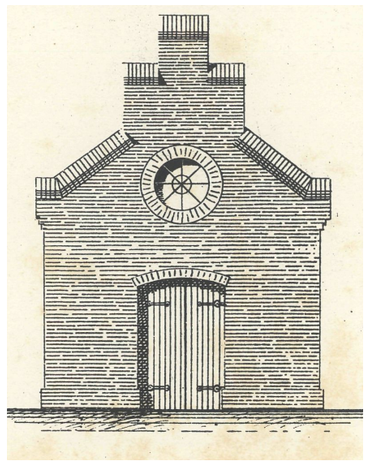
Detail of internal arch



Coal storage

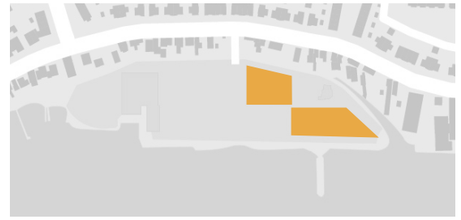


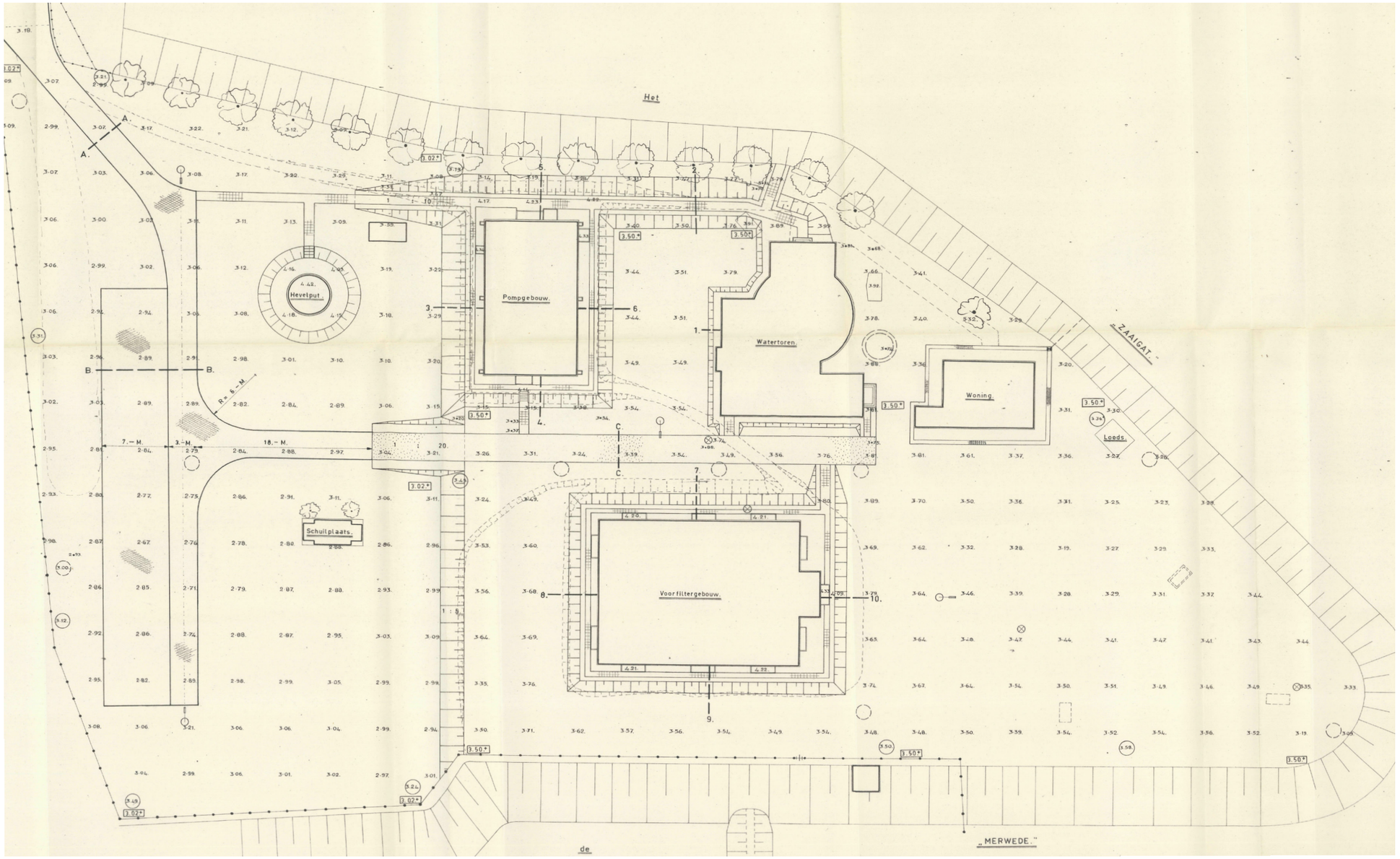
Operator dwelling



ketle house

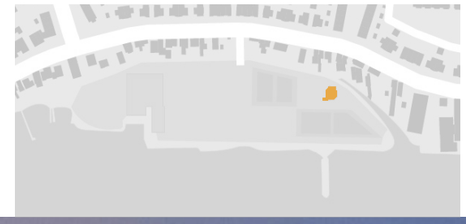
Site Value: Well and Pumpingstation 1959



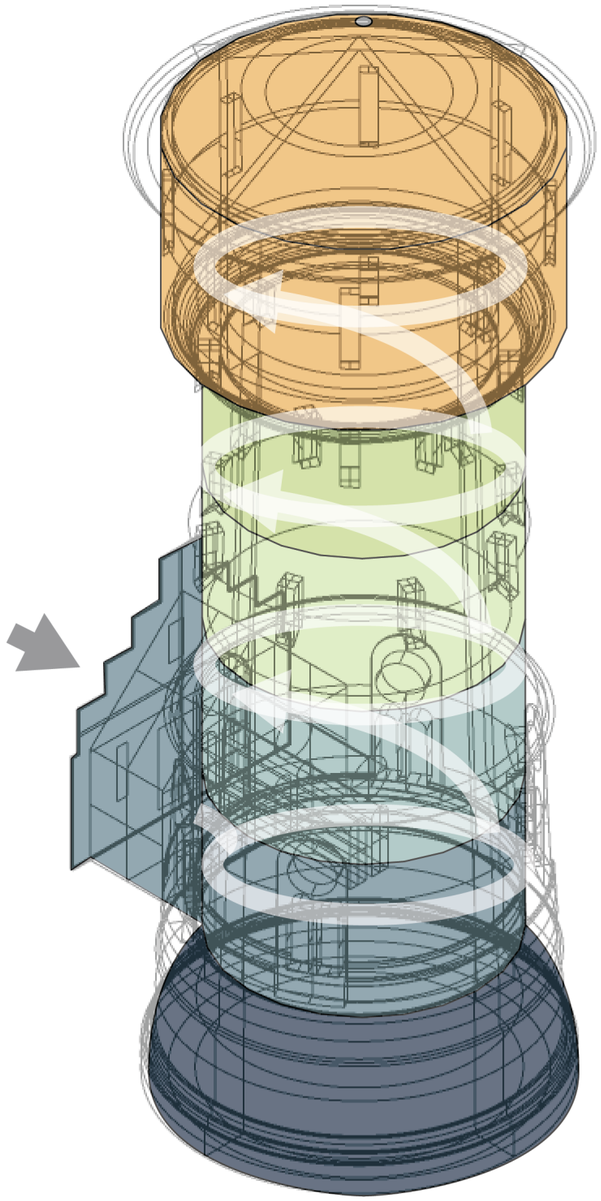


End of nessecity of the watertower, replacement by well and pumpstations which serve greater reliabiltity and water safety

Heritage Essential Infastruce: Watertower



Watertoren: Program



Viewing deck

Exposition Spaces:

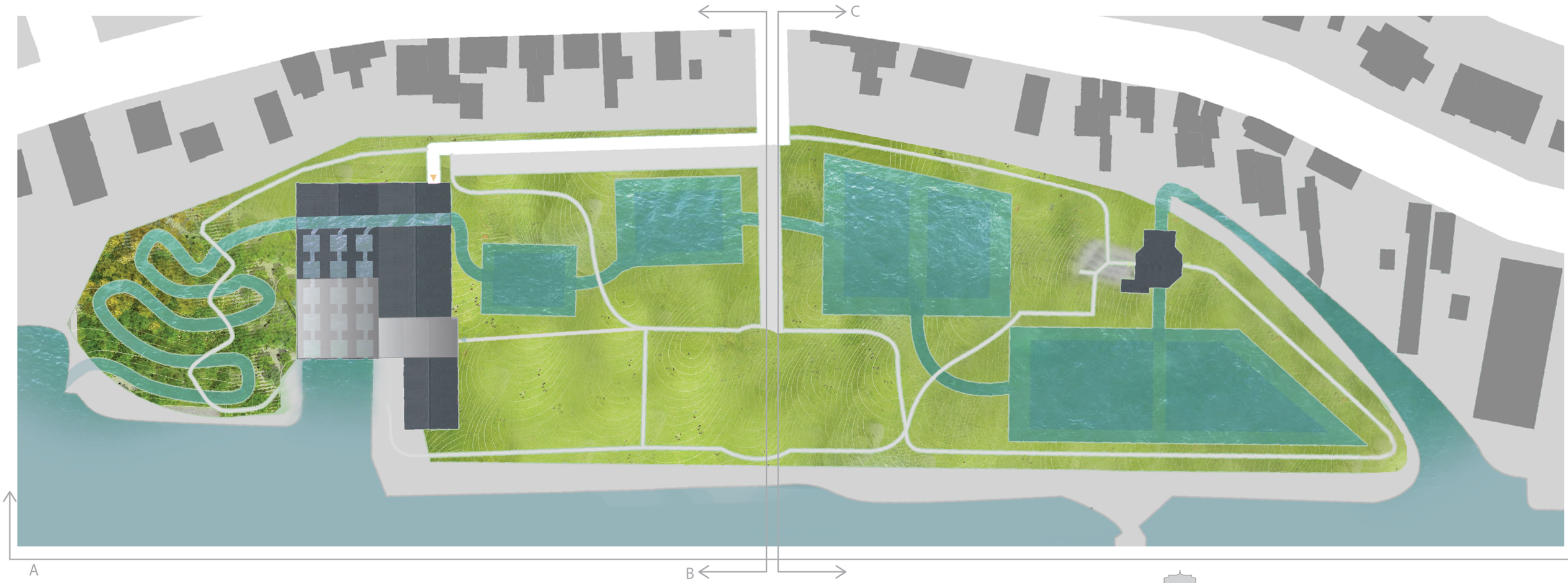
Water quality

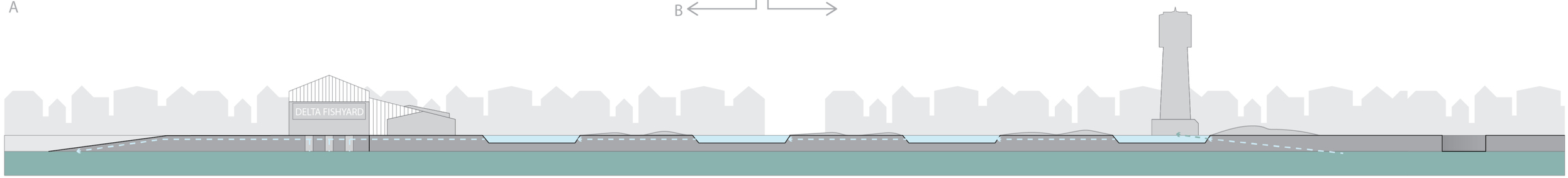
Fish quality

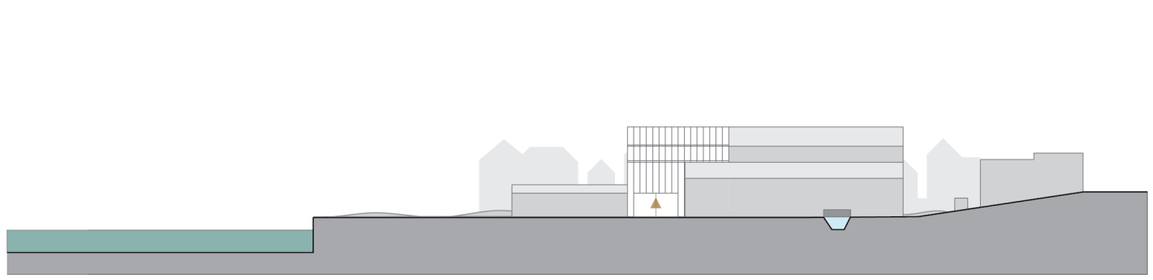
Entrance

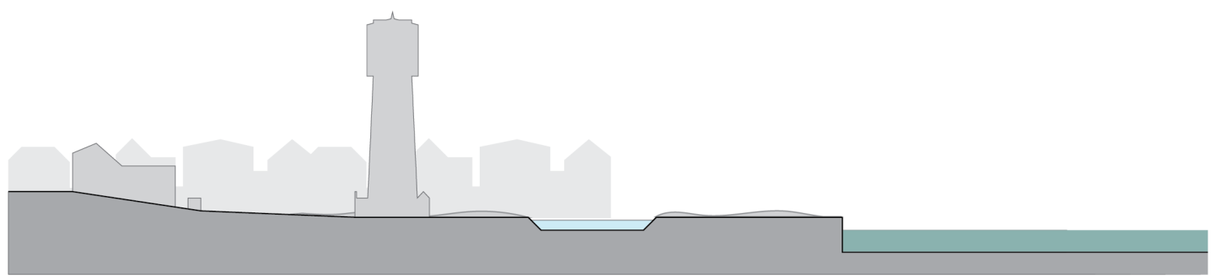
Storage space

Urban Plan









Industrial shell: Twisted Metal Plating

Industrial appearance, maximizes indoor outdoor connection