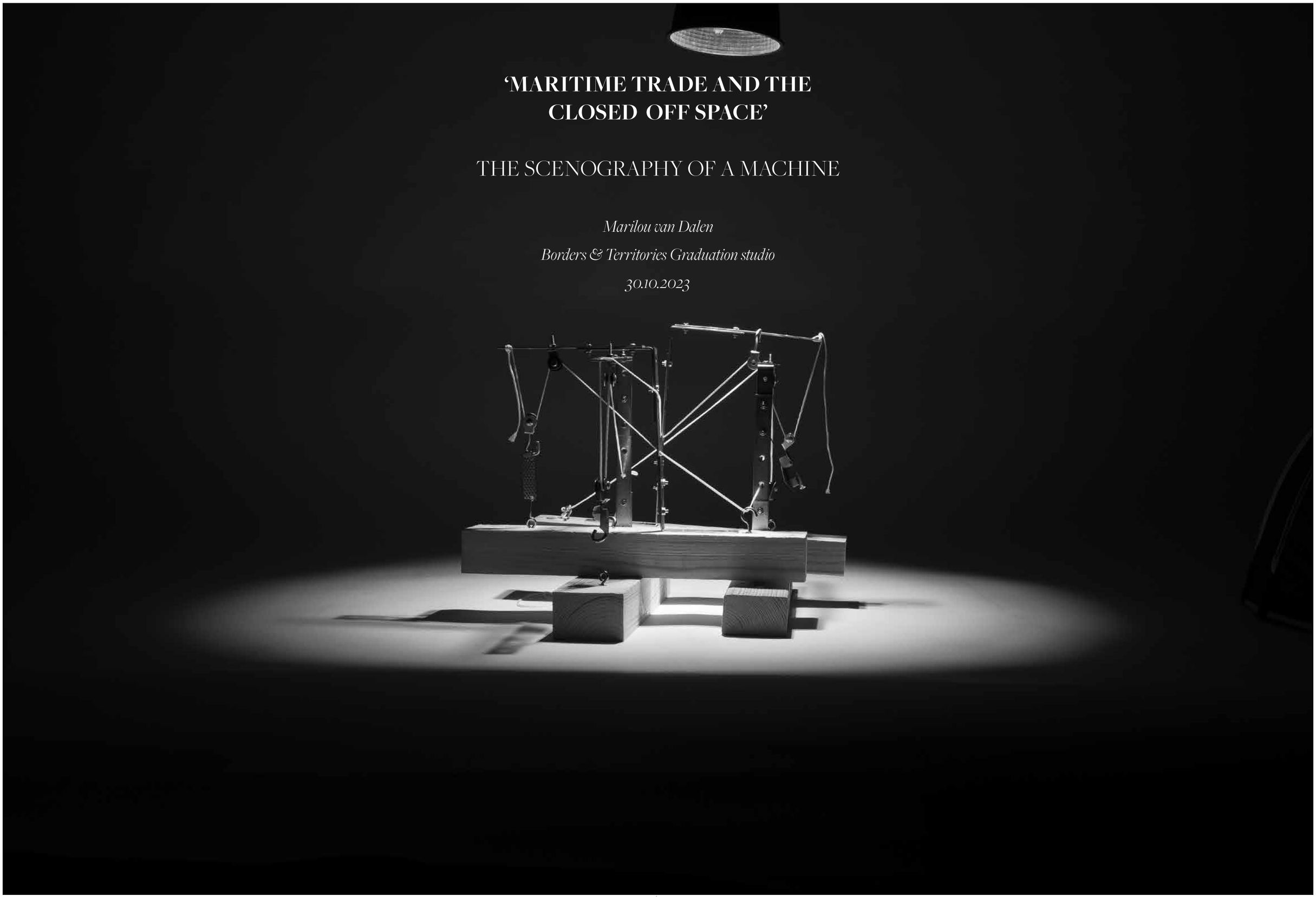
‘MARITIME TRADE AND THE CLOSED OFF SPACE’

THE SCENOGRAPHY OF A MACHINE

Marilou van Dalen

Borders & Territories Graduation studio

30.10.2023



INTRODUCTION

Istanbul and the global shipping industry

RESEARCH

site

context (the machine)

DESIGN

conditions

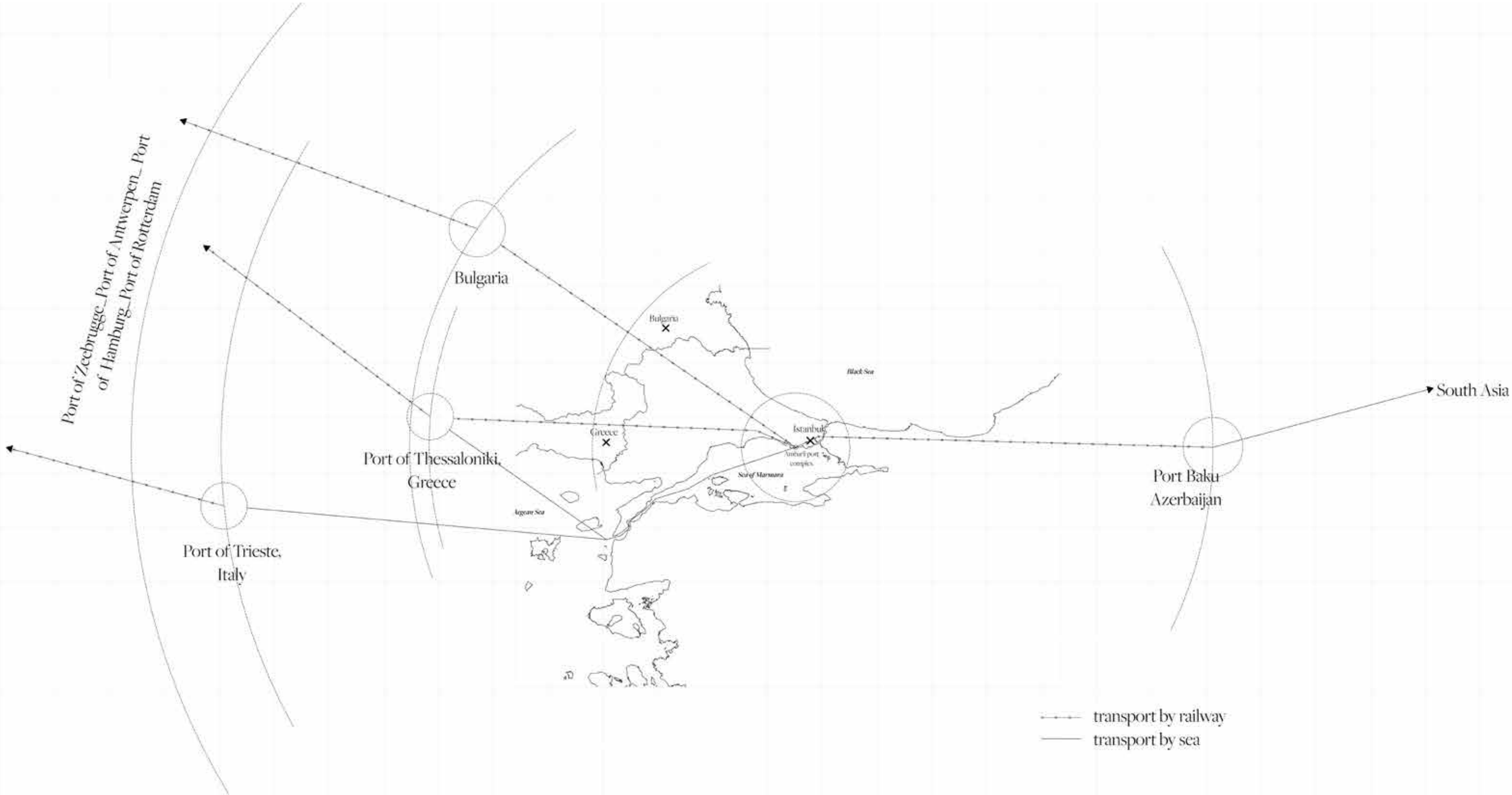
human and the machine

assembly

materials

INTRODUCTION

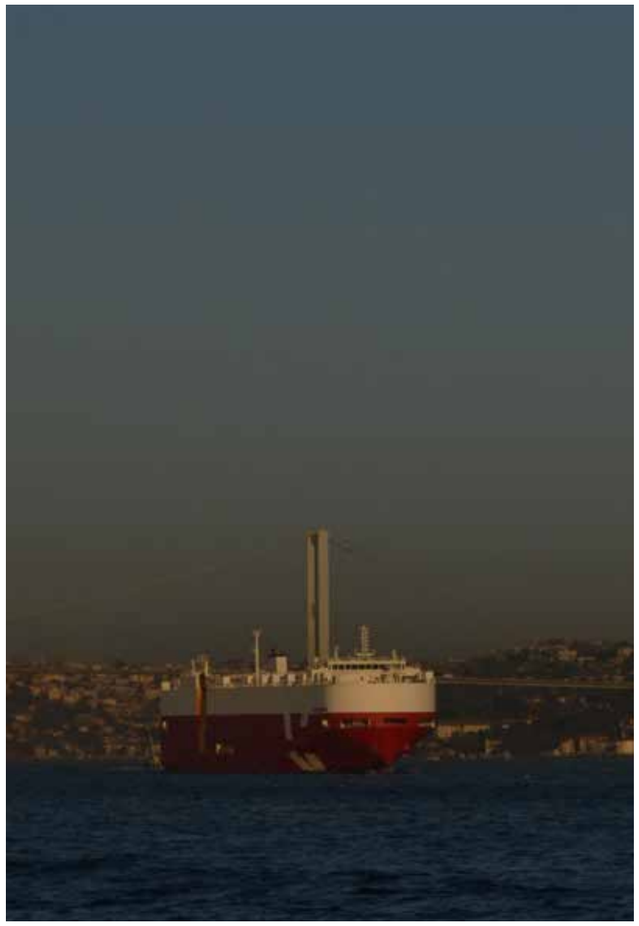
An Introduction to the Marmara region A transit hub between Asia and Europe



Turkey and the New Silk Road

INTRODUCTION

Container ports in Marmara Sea region

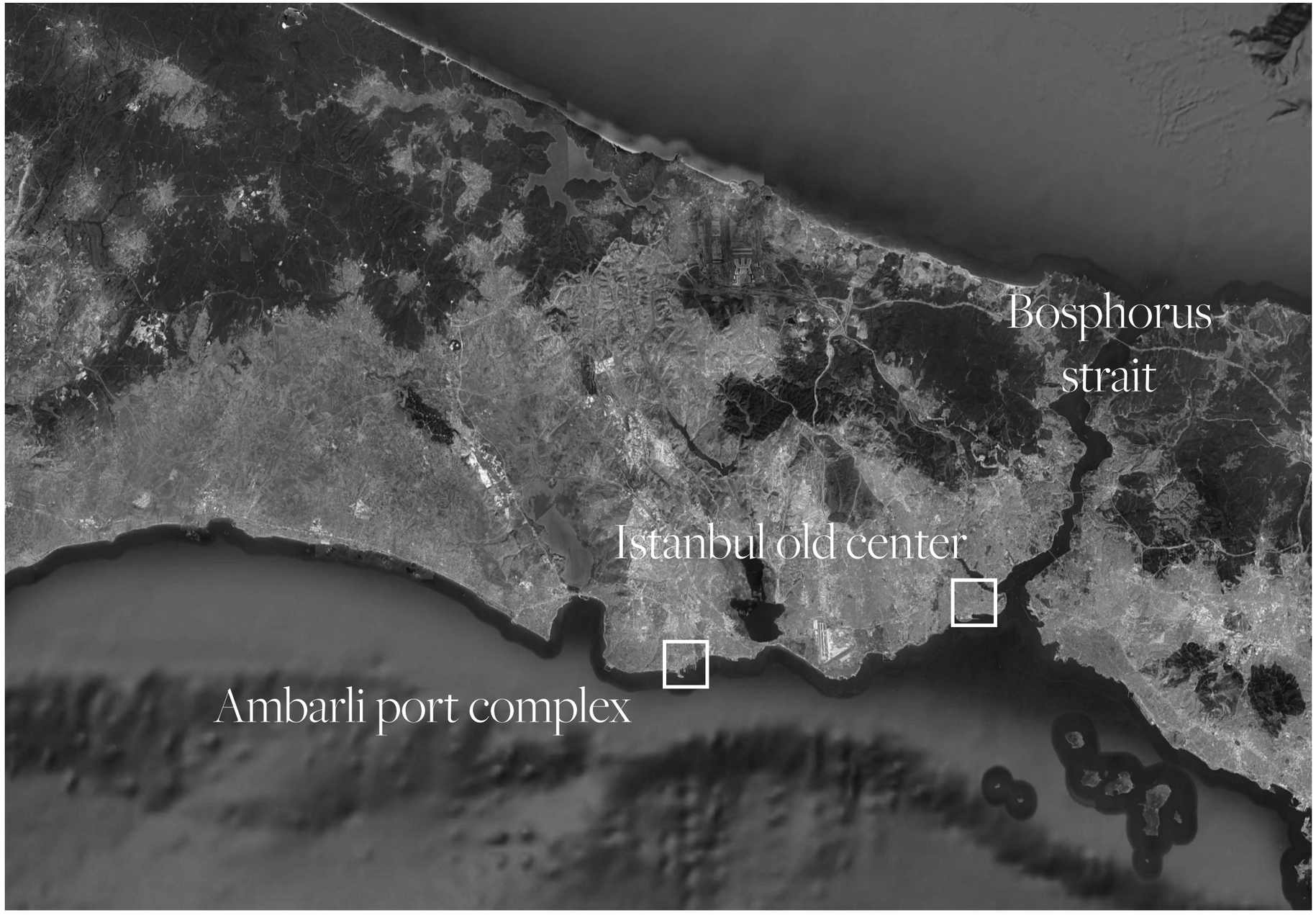


Maramara Sea region and faces of the shipping industry

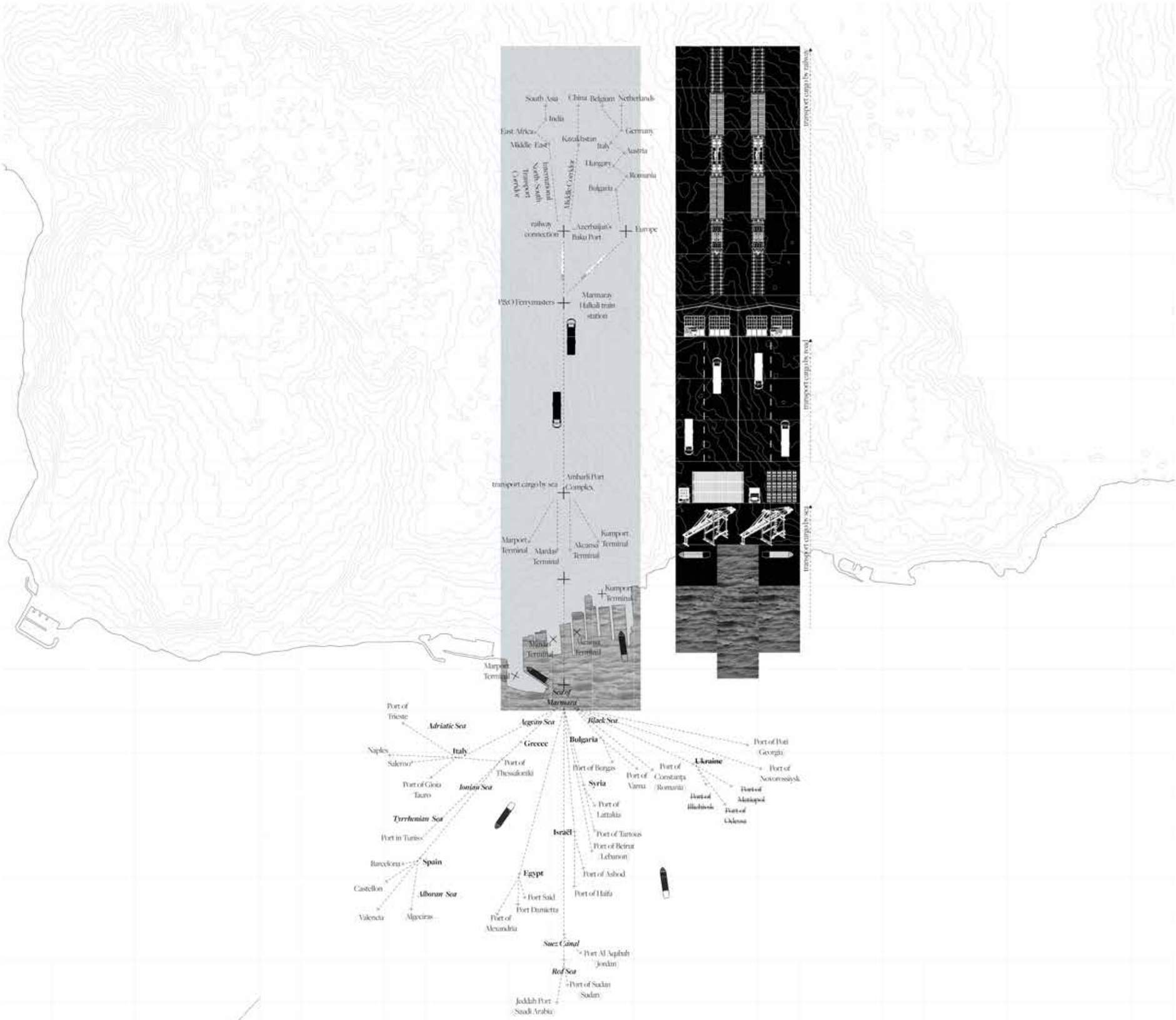
INTRODUCTION

RESEARCH

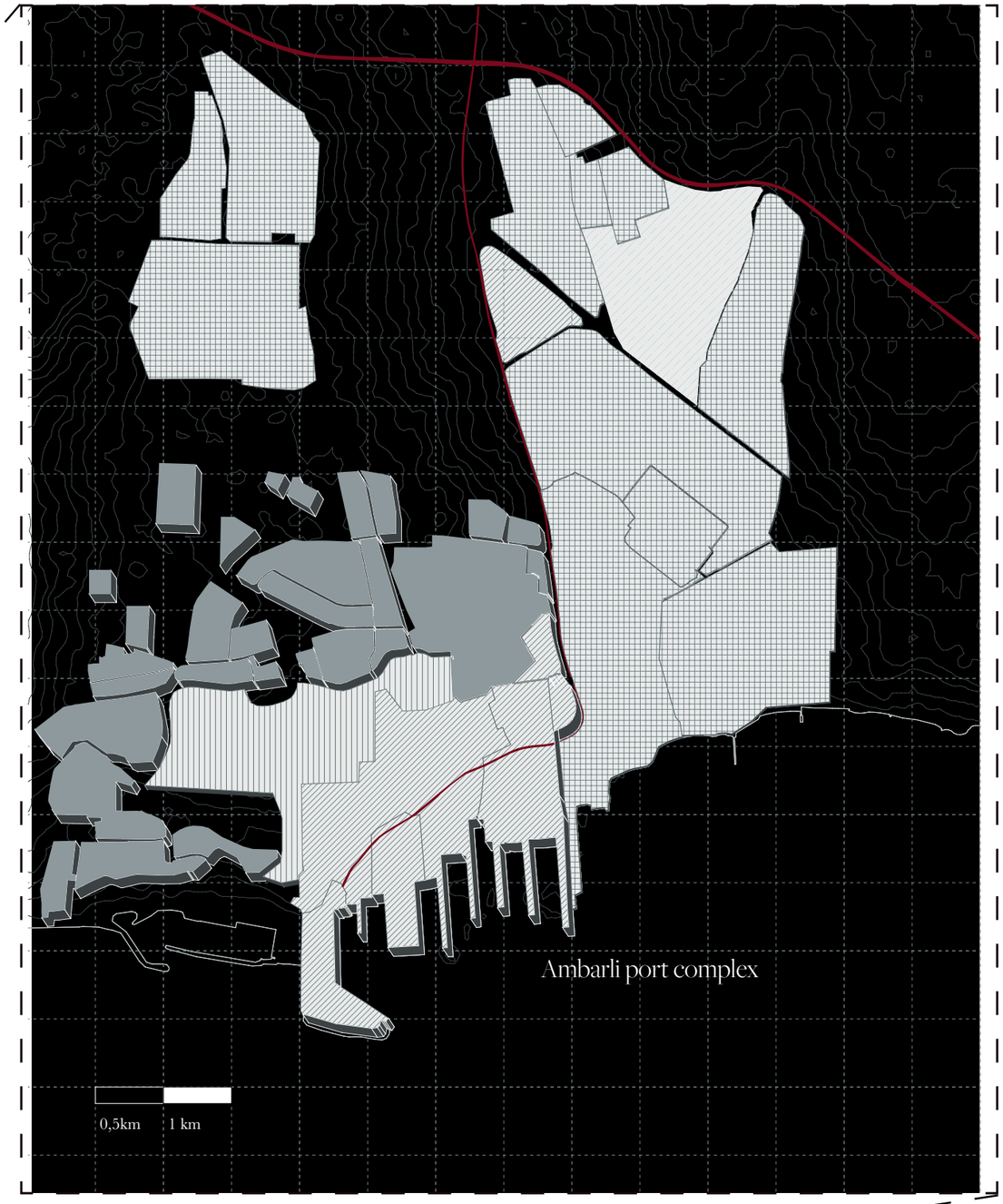
What is the spatial relation between the human and the machine we call; the shipping industry?



Site Ambarli Port complex


South Asia
China
Belgium
Netherlands
India
East Africa
Germany
Kazakhstan
Middle East
Italy
Austria
Hungary
Romania
Bulgaria
International North South Transport Corridor
Middle Corridor
railway connection
Azerbaijan's Baku Port
Europe
PSO Ferrymasters
Marmaray Halkali train station
transport cargo by sea
Ambarli Port Complex
Marport Terminal
Mardas Terminal
Akcansa Terminal
Kumport Terminal
Kumport Terminal
Mardas Terminal
Akcansa Terminal
Marport Terminal
Sea of Marmara
transport cargo by railway
transport cargo by road
transport cargo by vessel
Port of Trieste
Adriatic Sea
Aegean Sea
Black Sea
Port of Poti Georgia
Naples
Italy
Greece
Bulgaria
Salerno
Port of Thessaloniki
Port of Burgas
Port of Varna
Port of Constanta Romania
Ukraine
Port of Novorossiysk
Port of Gioia Tauro
Ionian Sea
Syria
Port of Latakia
Tyrrhenian Sea
Port in Tunisia
Israël
Port of Tartous
Port of Beirut Lebanon
Barcelona
Spain
Egypt
Port of Ashod
Castellon
Alboran Sea
Port Said
Port of Haifa
Port Damietta
Valencia
Algeciras
Port of Alexandria
Suez Canal
Port Al Aqabah Jordan
Red Sea
Port of Sudan Sudan
Jeddah Port Saudi Arabia

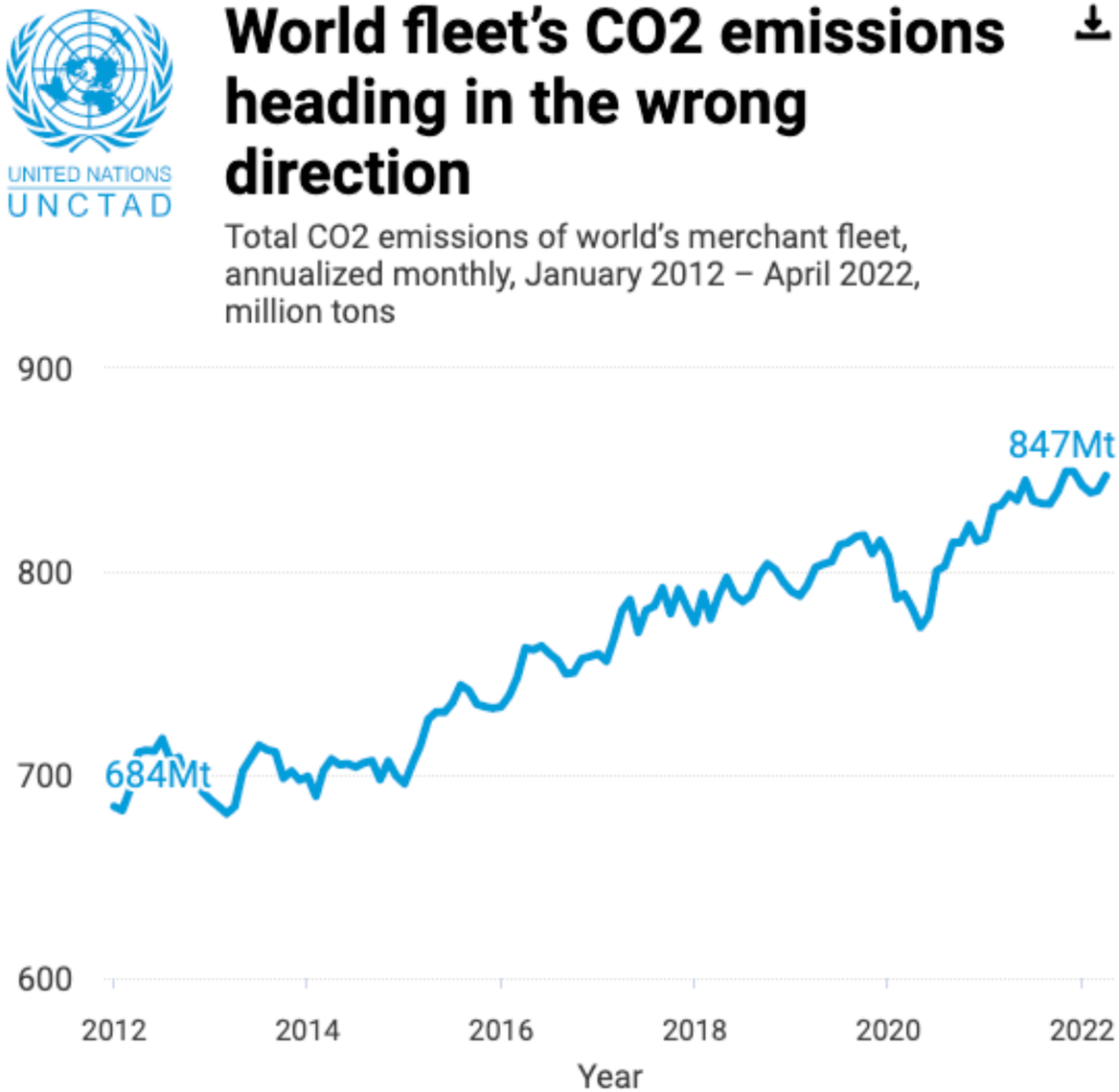
Büyükçekmece Lake
Büyükçekmece Lake
Ambarli port
area under construction
industrial green
industrial area
industrial area | Ambarli port complex
residential area
residential area | gated community
railway
highway


Ambarli port complex
0,5km
1 km

‘Flag of convenience’ registry

KEY FIGURES 2021

source: annual overview of marine casualties and incidents 2022 retrieved fromhttps://www.emsa.europa.eu



source: https://unctad.org/rmt2022

The closed off space

a disconnect that we don't notice|isolation

Scale

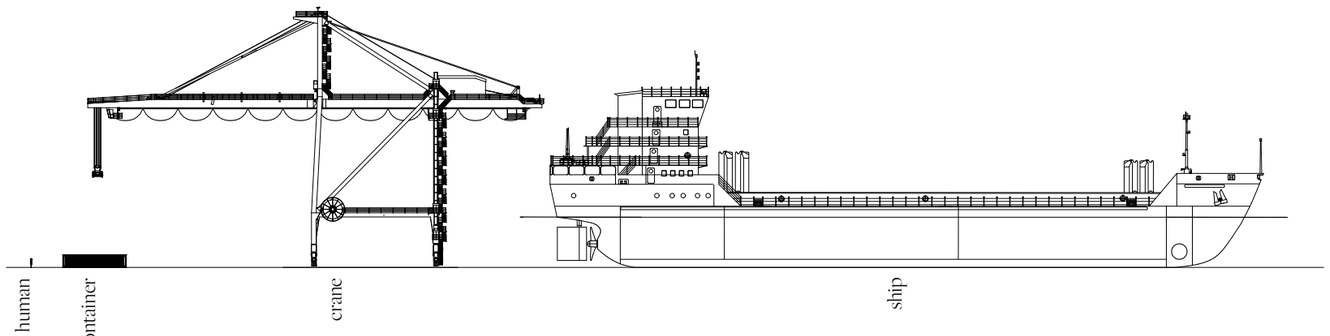
the human and the machine
humans replaced by machines

Efficiency and Automatisation

: an action designed to achieve efficiency. :
the ability to achieve an end goal with little to no waste, effort, or energy.
But for whom?

‘The biggest business that you know nothing about’
a business - to - business to industry

the closed off space



MEGASTRUCTURES

scale

efficiency and automatisation

efficiency and automatisation

According to the International Maritime Organization (IMO), the global maritime regulator, merchant ships are accountable for roughly more than 3% of the world's greenhouse gas (GHG) emissions, with heavy consequences for the planet.

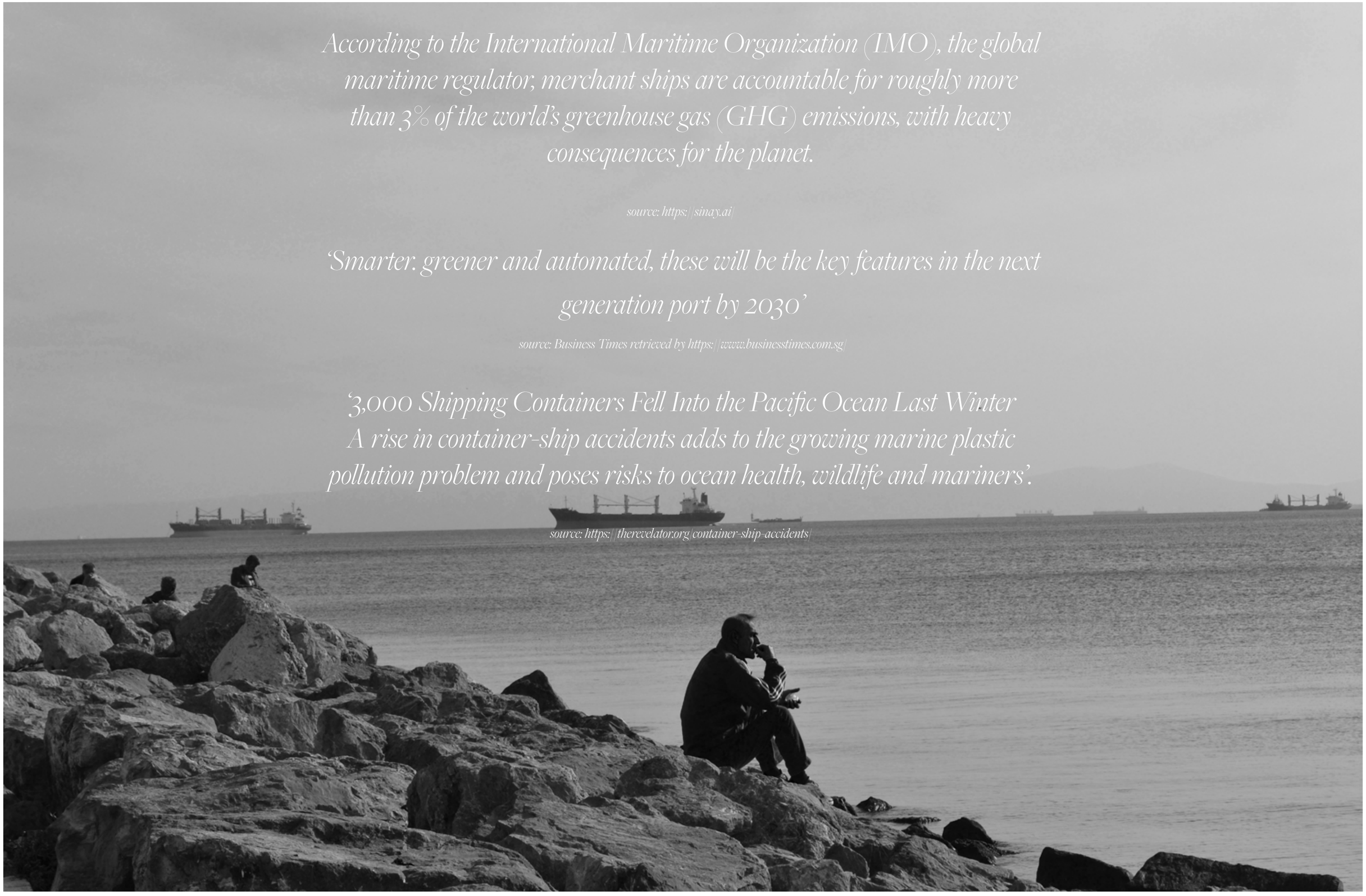
source: https://sinay.ai/

'Smarter. greener and automated, these will be the key features in the next generation port by 2030'

source: Business Times retrieved by https://www.businesstimes.com.sg/

'3,000 Shipping Containers Fell Into the Pacific Ocean Last Winter
A rise in container-ship accidents adds to the growing marine plastic pollution problem and poses risks to ocean health, wildlife and mariners'.

source: https://therevelator.org/container-ship-accidents/



DESIGN

How can architecture shape the invisble world of the consumers industry into a future space where human coexist with this automated machine?

conditions

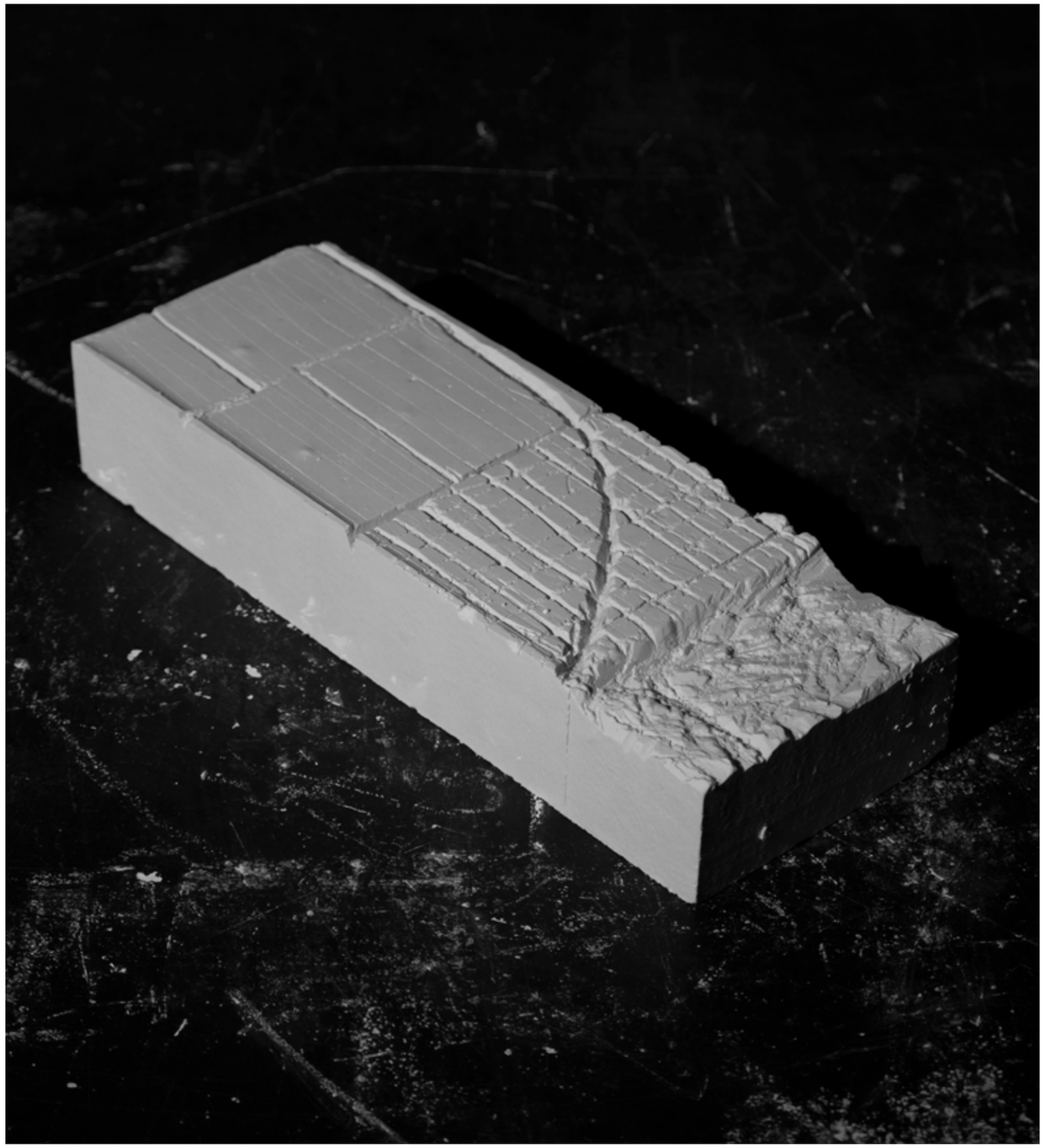
What is present on site?

_Soil

_Water

_Mobility

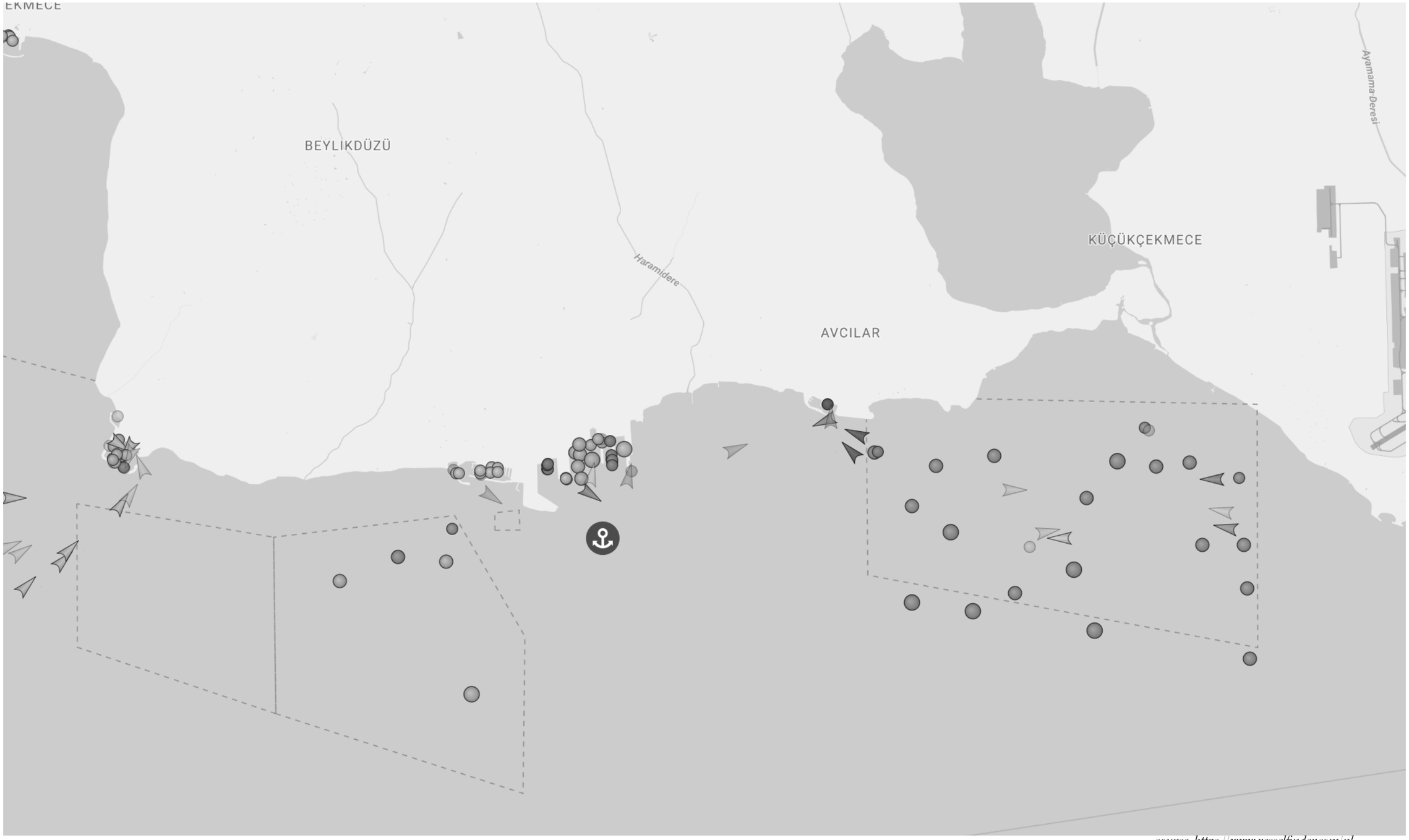
_ Machinery



soil and water

soil and water

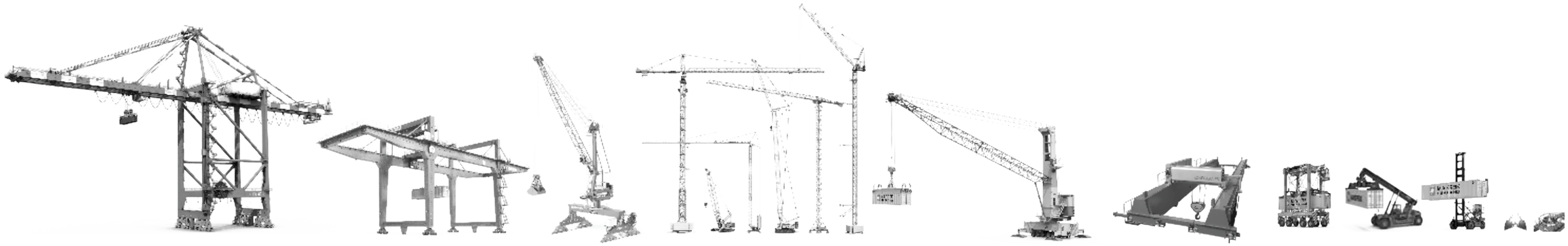
mobility



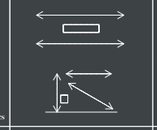
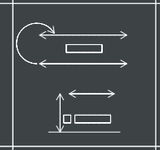
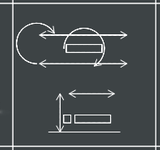
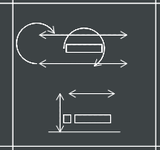
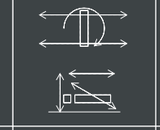
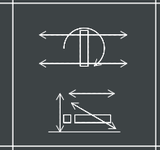
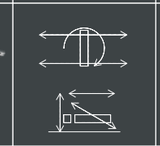
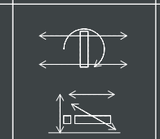
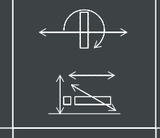
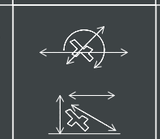
source: https://www.vesselfinder.com/nl

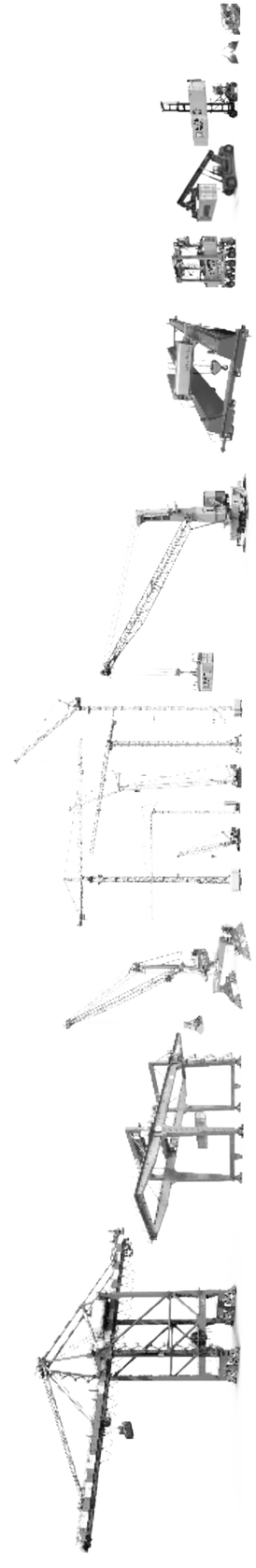
mobility

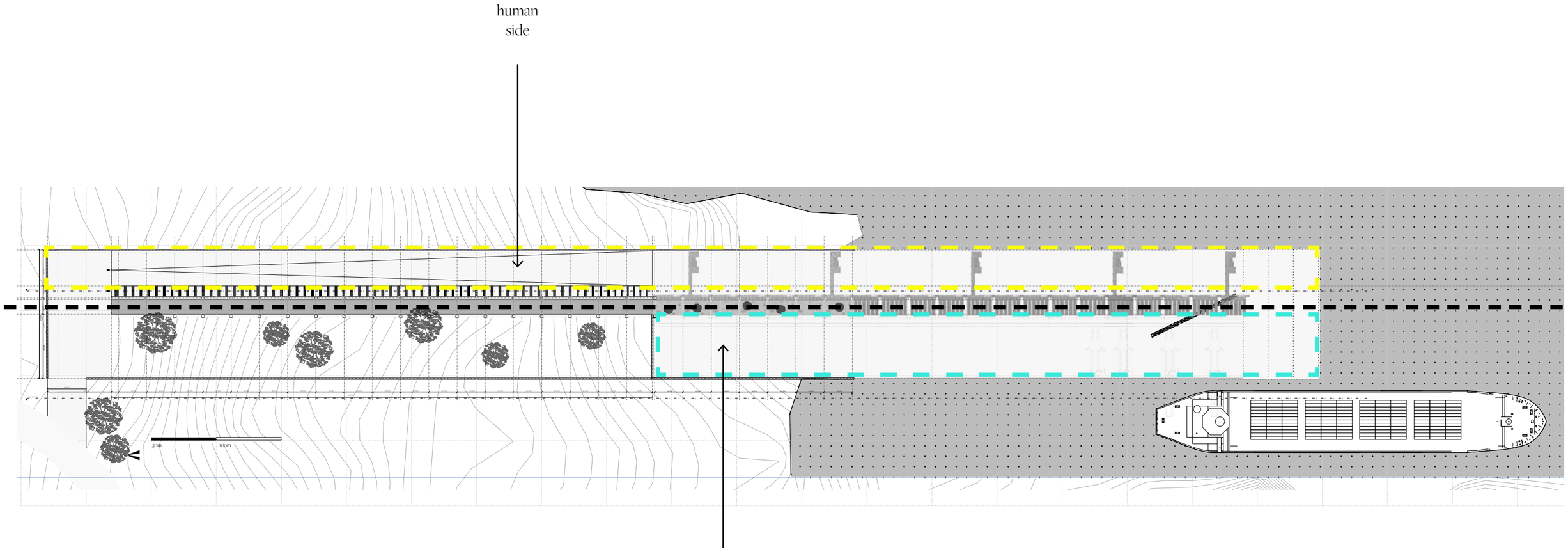
machinery

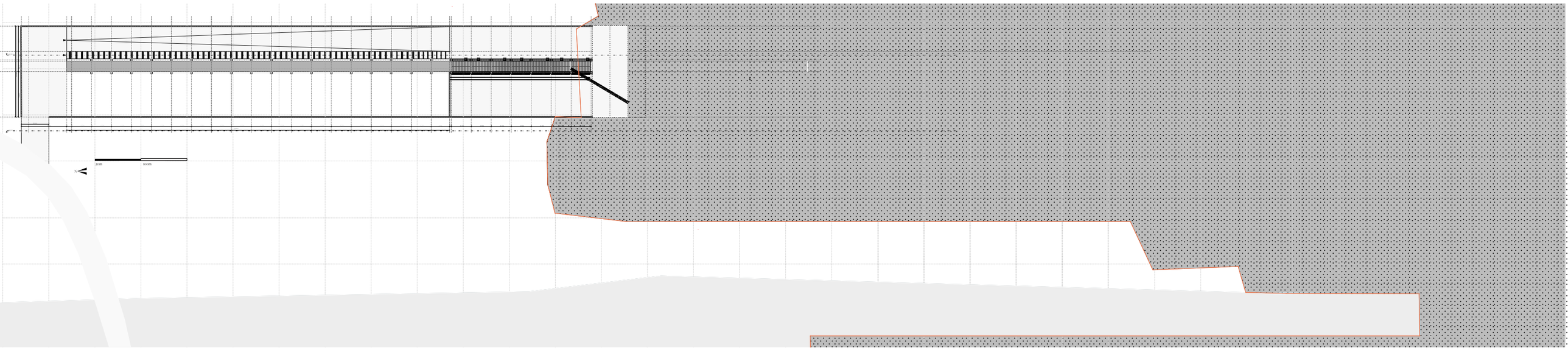


machinery

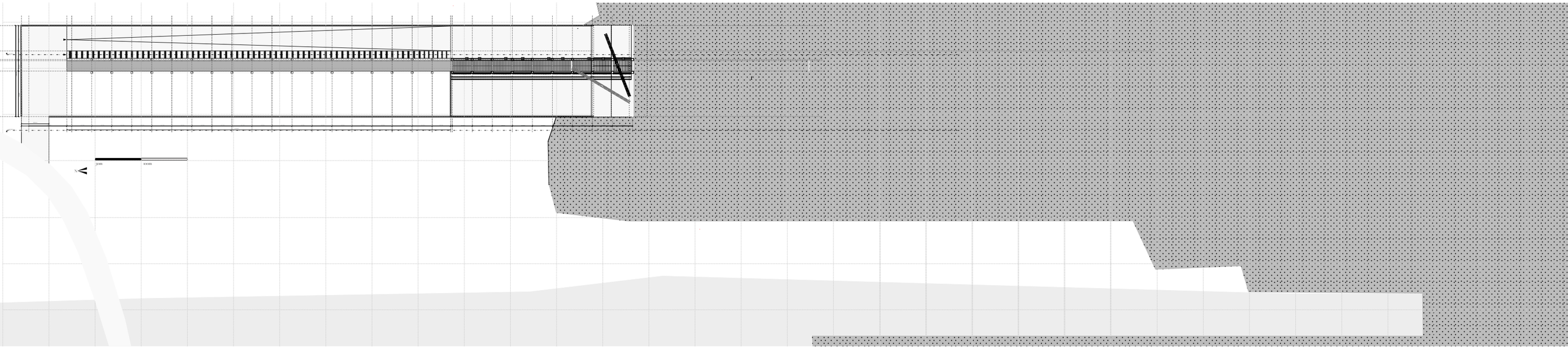
Port Machinery	Motions	Tasks
Container ship to shore STS cranes		Lifts containers on and off ships, using a long horizontal arm called the boom , a specialised operator sits in a glass cabin which is connected under a device called a trolley, the crane driver can lower by wires the 'spreader' onto the top of a container which then locks onto the container using devices called twist locks. They are electrically driven and have a supporting framework that sits steel wheels on rails so that they can move along the wharf to line up with the ship . A container ship may have up to 3 container cranes working on its simultaneously.
Straddle Carrier		Unregistered vehicles to move containers within a container terminal. They move containers either to or away from the dock. The straddles are also used to load unload trucks with containers. The straddles can be operated by a driver or they exist as automated, autonomous vehicles. The computers tell them which containers they need to pick up. They pick up containers by a 'spreader' which is placed on top of the container and locks onto it using specialised twist locks. Straddles stack an average of 3 containers high for storage in rows that allow the straddle to drive up and down over the stacks while carrying another container.
Reach Stackers		off-road vehicles used to transport containers from one mode of transport to another. They are faster and more flexible than forklifts. They are operate by a driver who sits in a cabin at the front of the vehicle which has a long arm. There are also autonomous automated reach stackers. Reach stackers can pick up containers by using a device called a 'spreader' at the end of its long arm. They can use their long and flexible arm to stack containers up to 4 rows deep.
Empty container handler		Transport containers and stack them in rows up to 7 containers high. They handle empty containers. They exist as automated vehicles or operated by specialised drivers who sit in a cabsile in the middle of the vehicle. The vertical arm can be about 20m high
Bulk grabs		Some cranes are used to unload load from ships of certain types of dry, loose, solid materials. They use a set of metal jaws called the bulk grab, attached to the end of cables from the crane.
double Traveling Girder overhead gantry crane		Commonly called a bridge crane, it consists of two parallel rails seated on longitudinal I-beams attached to opposite steel columns by means of brackets. The hoist is the lifting component of a crane, travels along the bridge If the bridge is rigidly supported on two or more legs running on two fixed rails at ground level, the crane is called a gantry crane. Integrate well into different building structures, they offer maximum flexibility, available in numerous configurations,. The travelling feature means mobility of the crane in the way it travels within a given area of operation.. They can be electric or hydraulic drive . They can be remotely controlled.
Rotary overhead crane		Rotary hosted crane are the system that can be charged to overhead cranes as well as gantry cranes. It contains a 4th axis (rotation movement) coupled to the trolley
mobile or fixed Rail mounted gantry crane (rotating Single girder gantry cranes, double girder gantry crane &		Type of heavy crane, travelling on fixed track. Steel frame, hoisting mechanism, spreader anti shaking mechanism, crane travel mechanism, trolley travers mechanism, container spreader. They exist in variations of (non - rotating trolleys)and are electrically powered. Semi-automated or automated deployment.
Portal cranes - mobile slewing cranes		The vertical support members on a portal crane may be anchored to the ground, or mounted on wheels or tracks that allow the crane to move throughout the area. "portal" being the empty space straddled by the gantry . are a type of crane used to straddle an object or workspace and the entire crane can be moved about a workspace. Slewing cranes: a slewing crane lifts its load, suspends that load in mid-air, and then rotates it via a boom rotating mechanism. Non-slewing cranes, on the other hand, lack a rotating base section ... A crane installation mounted on a portal with utmost mobility given through rubber tires. A portal crane on wheels.
Portal cranes - Fixed cargo slewing cranes		Areas of application: (container handling, stacking, bulk handling, scrap handling, heavy lift, general cargo) Fixed cargo cranes (FCC) are space-saving handling solutions for vessels up to post-Panamax class. The slewing cranes installed on fixed foundation pedestals comprise both cylinder luffing as well as wire luffing slewing or double girder cranes. They provide the optimum balance between restricted space and cost effective turnover.
Mobile slewing crane		Mobile cranes are designed to use a collection of simple machines in order to both raise and lower objects, as well as to move them horizontally. This type of crane can be easily moved from one location to the next
Portal cranes - Fixed cargo slewing cranes		Horizontal displacement of the trolley and movement by raising the jib Top-Slewing cranes are the large construction sites most strategic equipment for productivity. Whether on large infrastructure, high rise jobsites, crowded urban areas or wide open sites, they make it possible to hoist and distribute loads high and far.



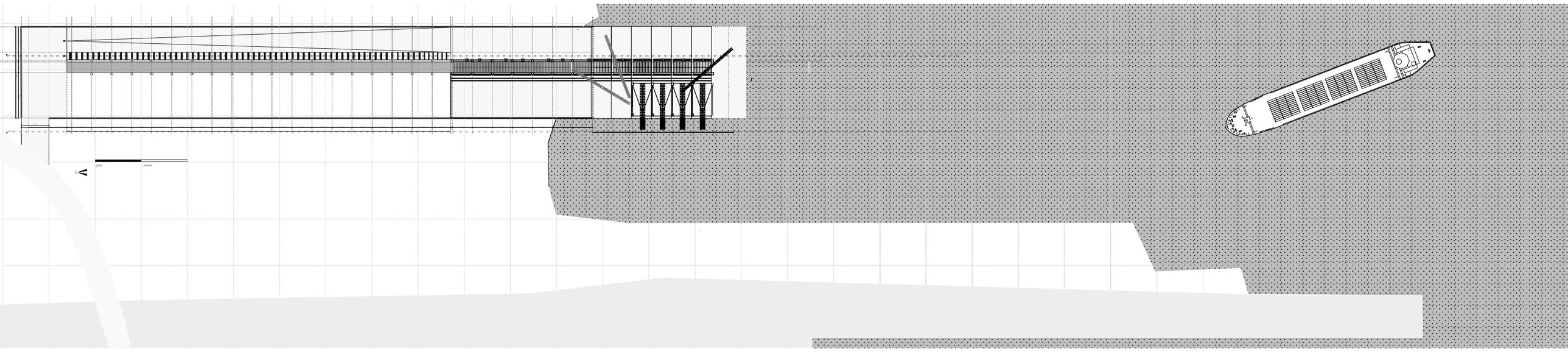

human
side
machine
side



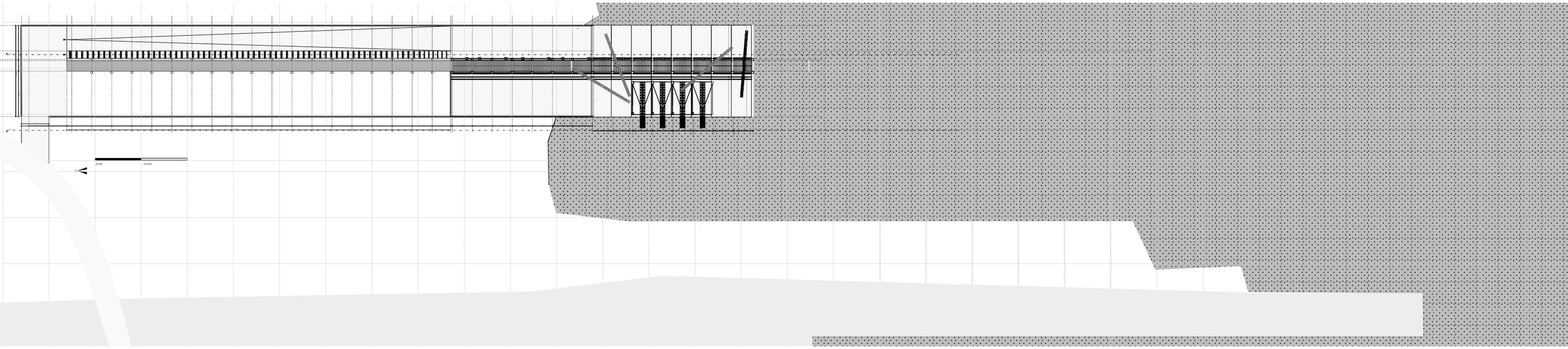
reconfiguration 00



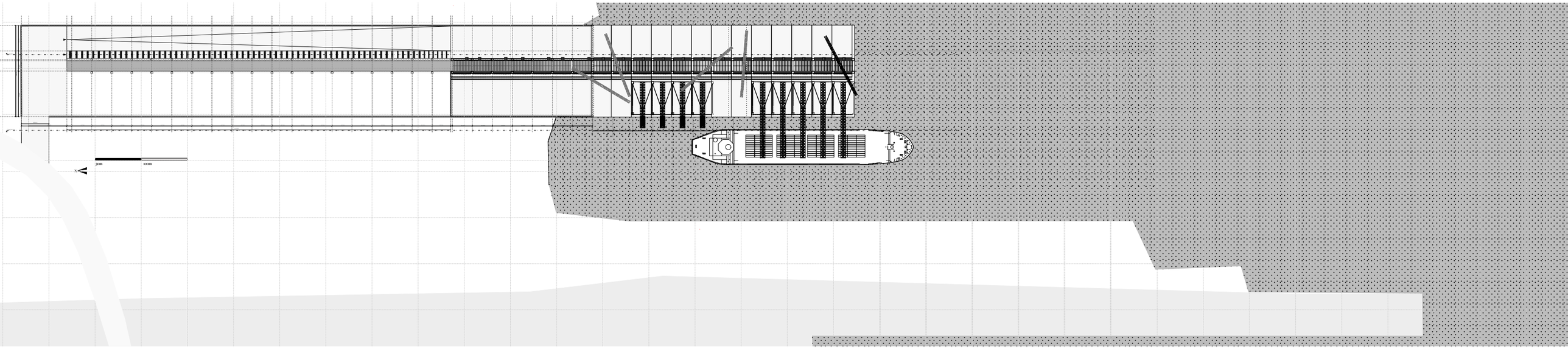
reconfiguration 01



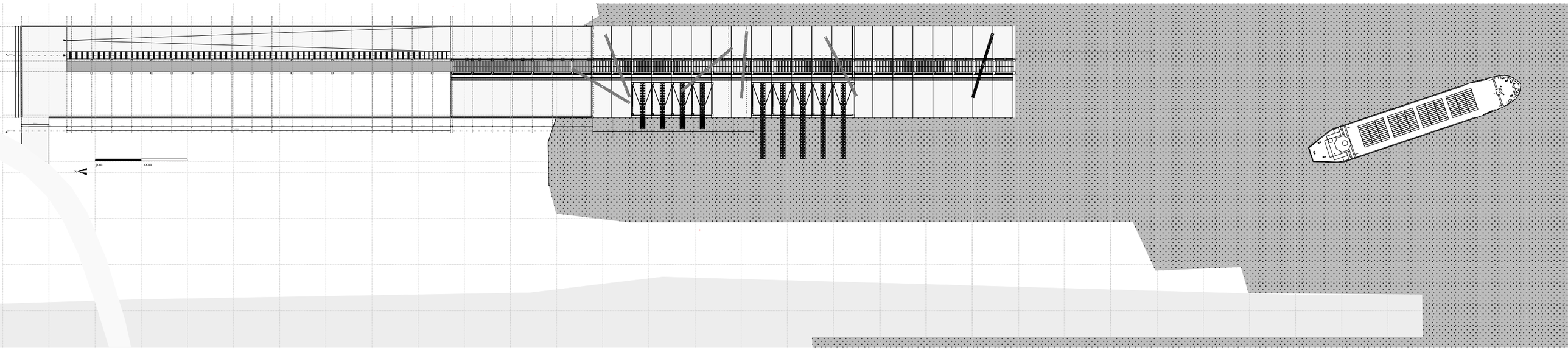
reconfiguration 02



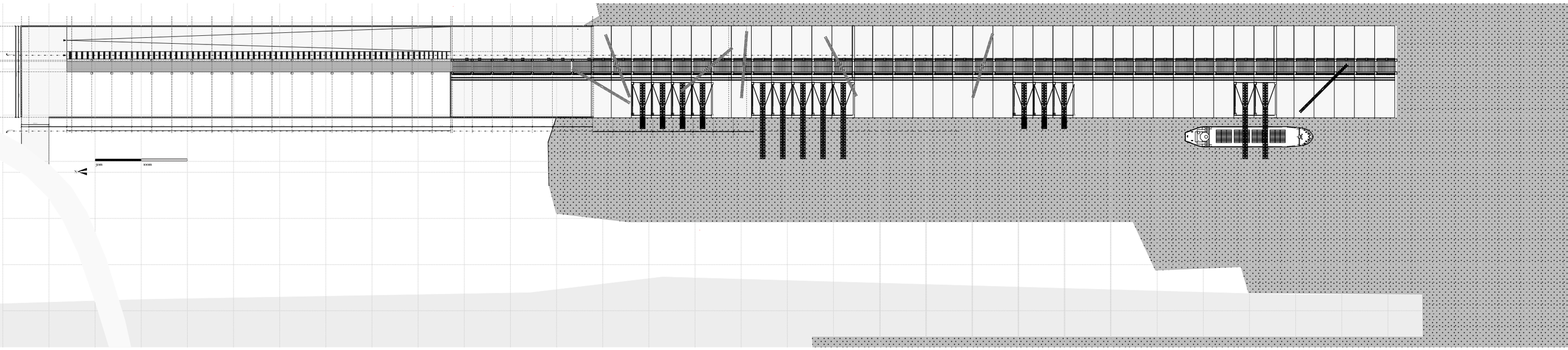
reconfiguration 03



reconfiguration 04



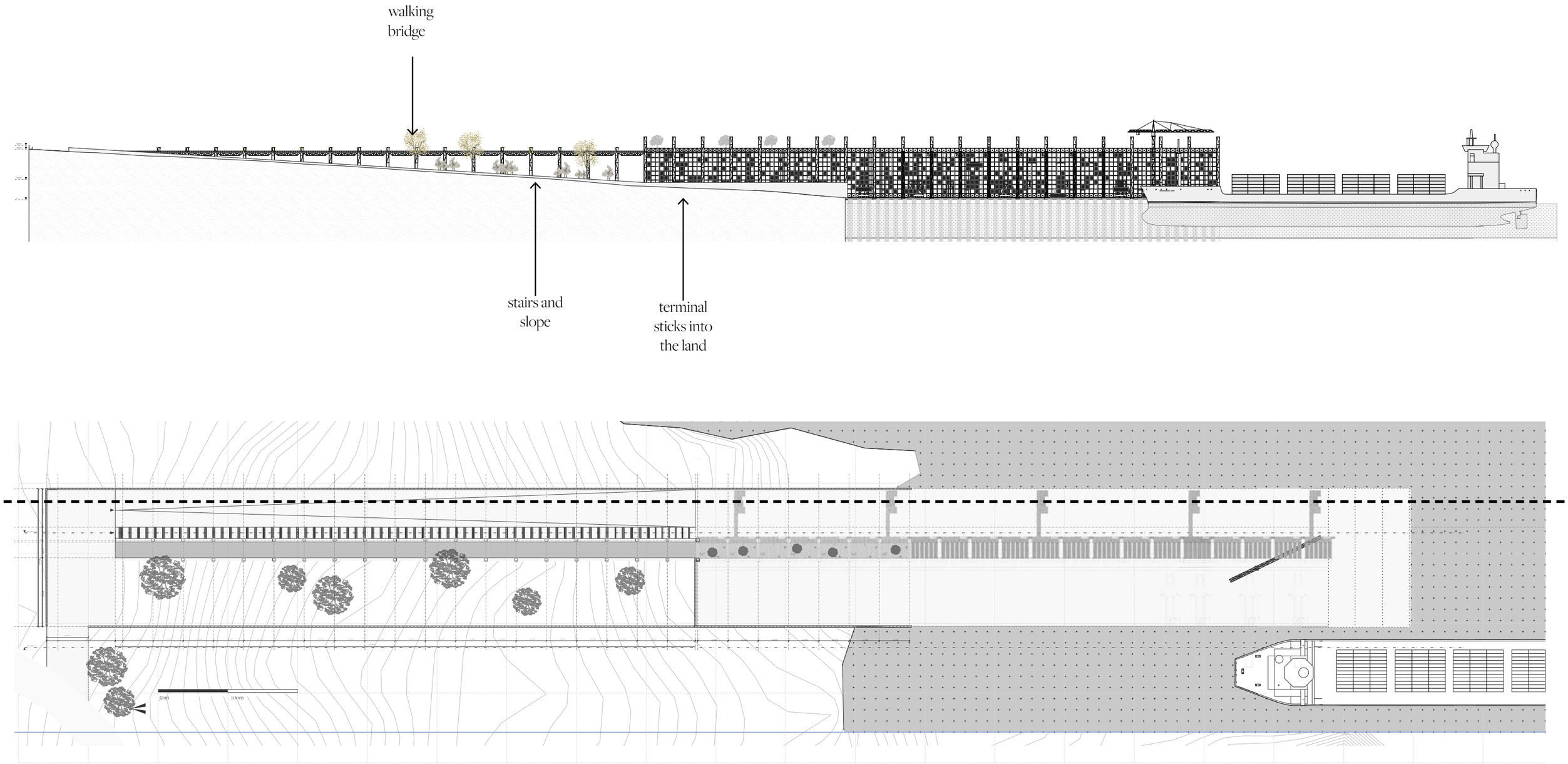
reconfiguration 05

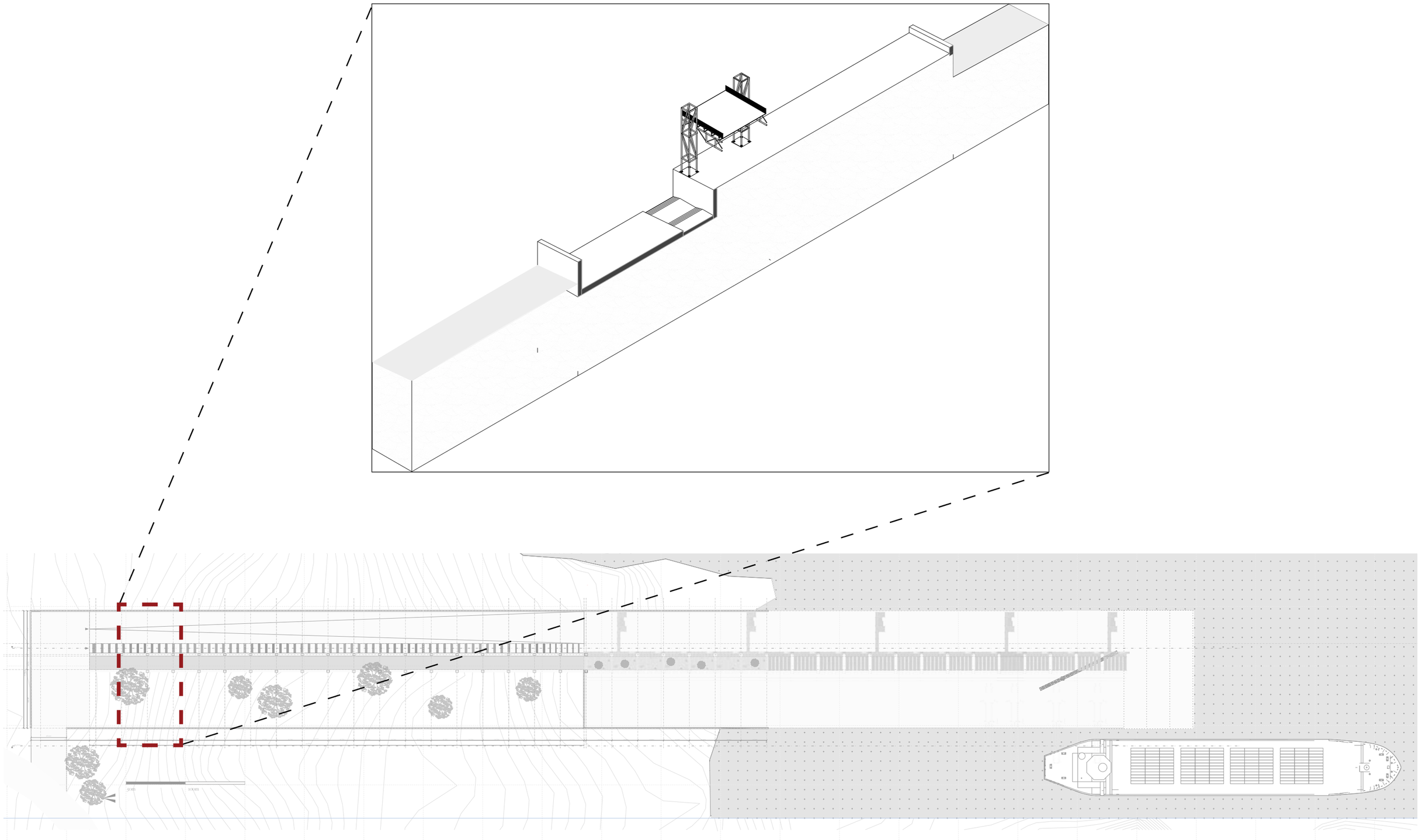


reconfiguration 06

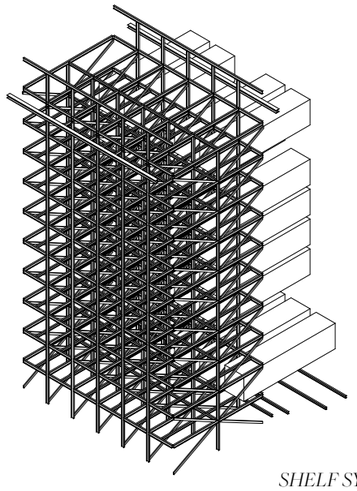
How does it work?

_accessibility
_containers and the the shelf system
_cranes
_promenade
_humans
_places of temporary stay

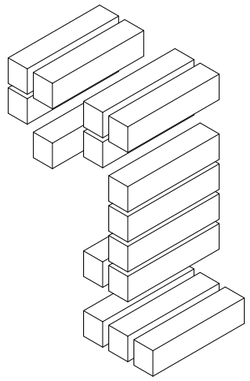

walking
bridge
stairs and
slope
terminal
sticks into
the land
50m
100m



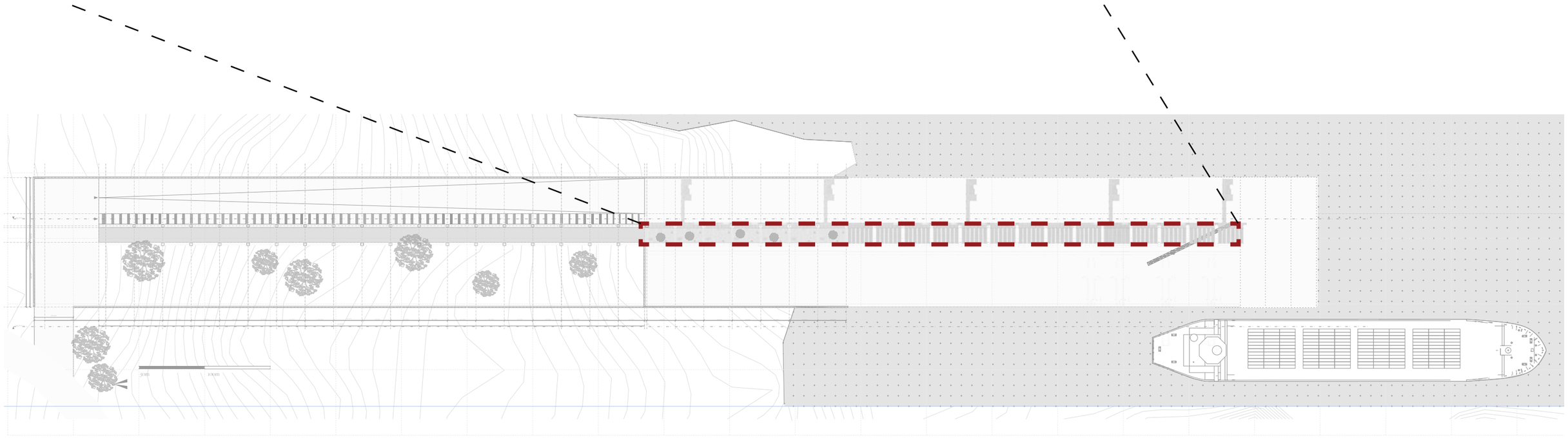
_accessibility



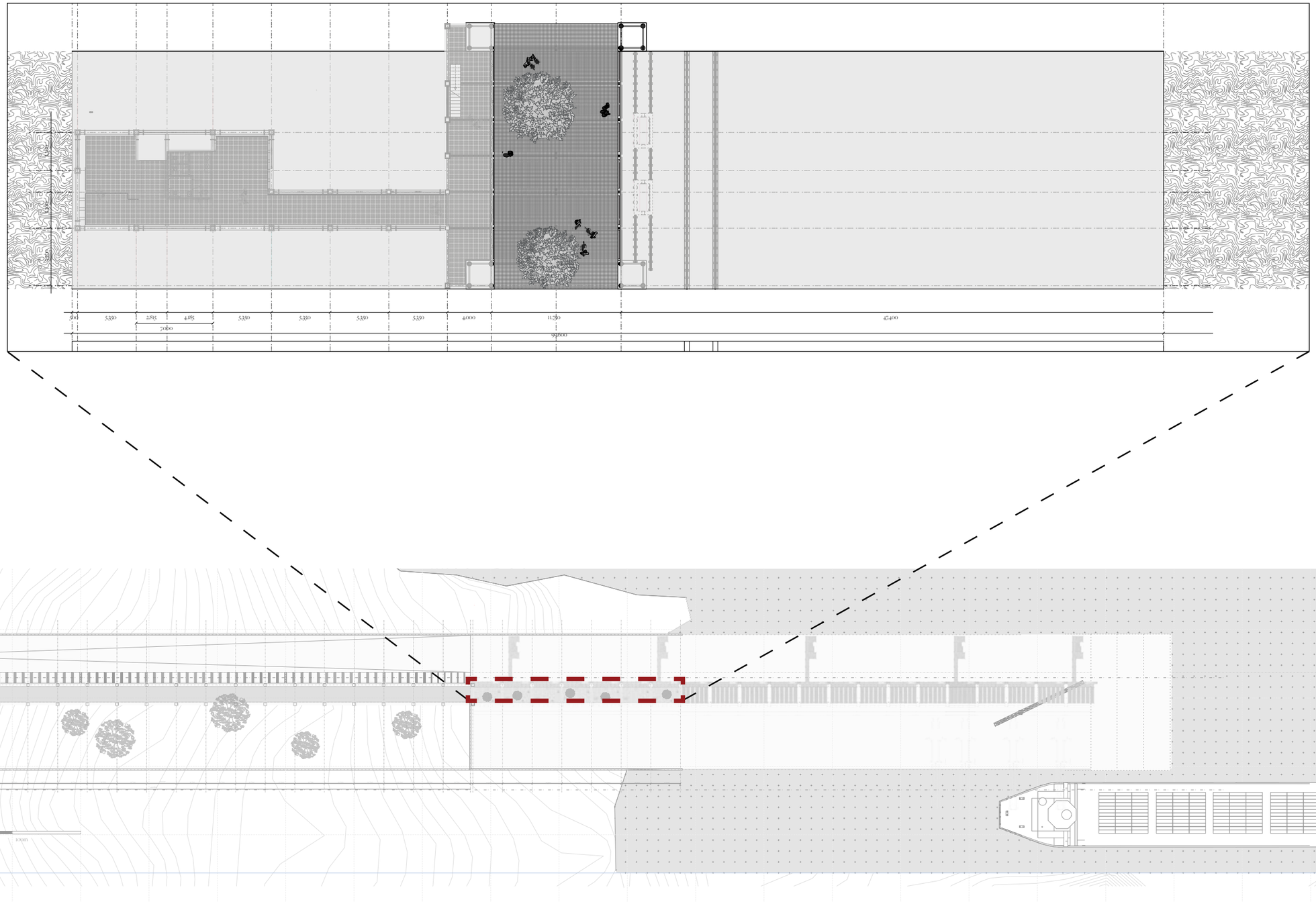
SHELF SYSTEM STEEL BEAMS



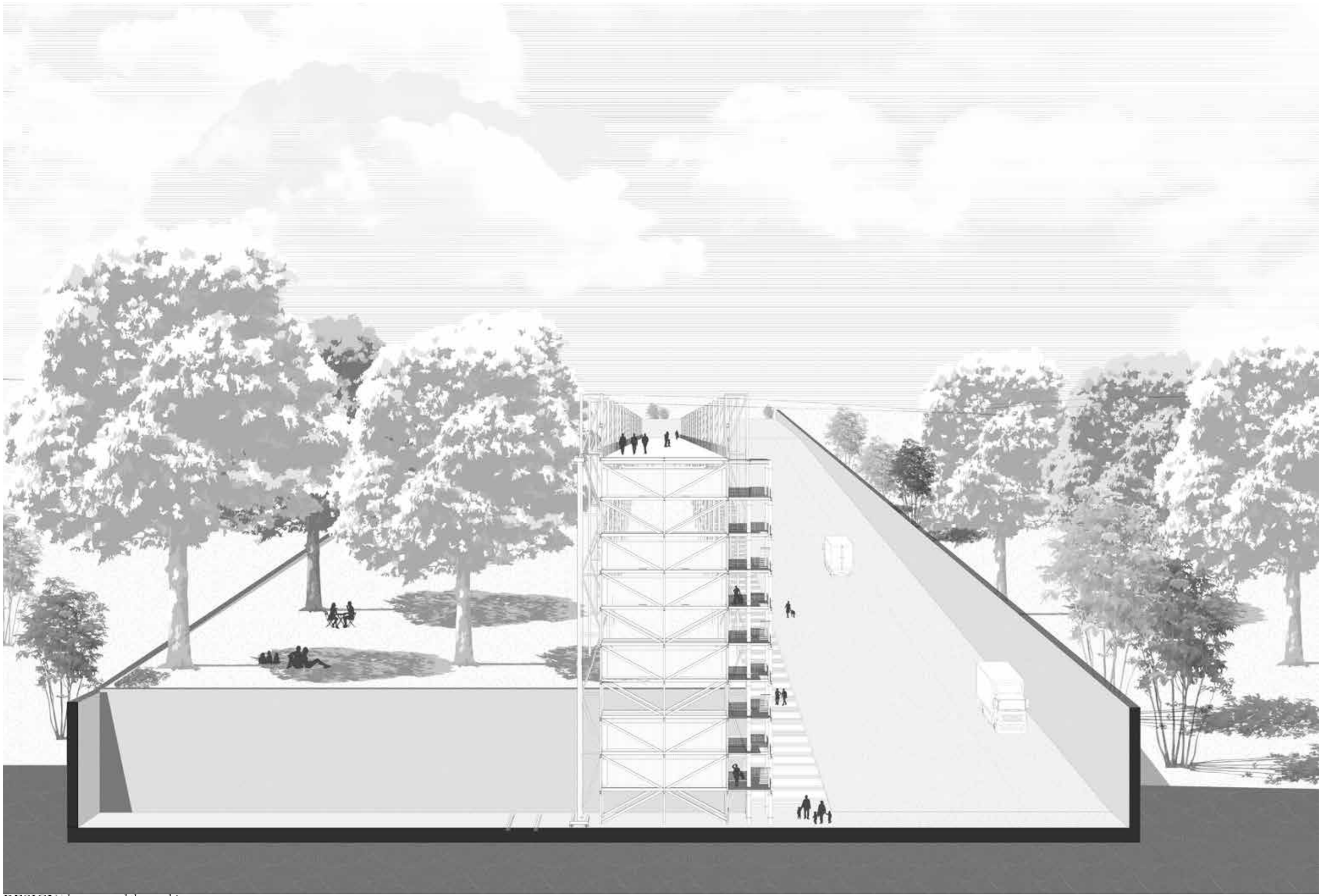
CONTAINERS

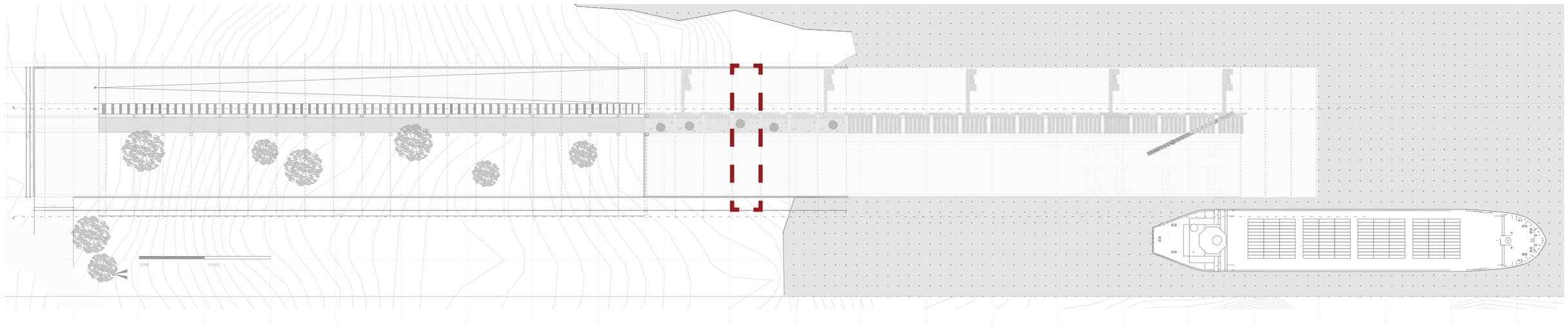


_containers and the the shelf system

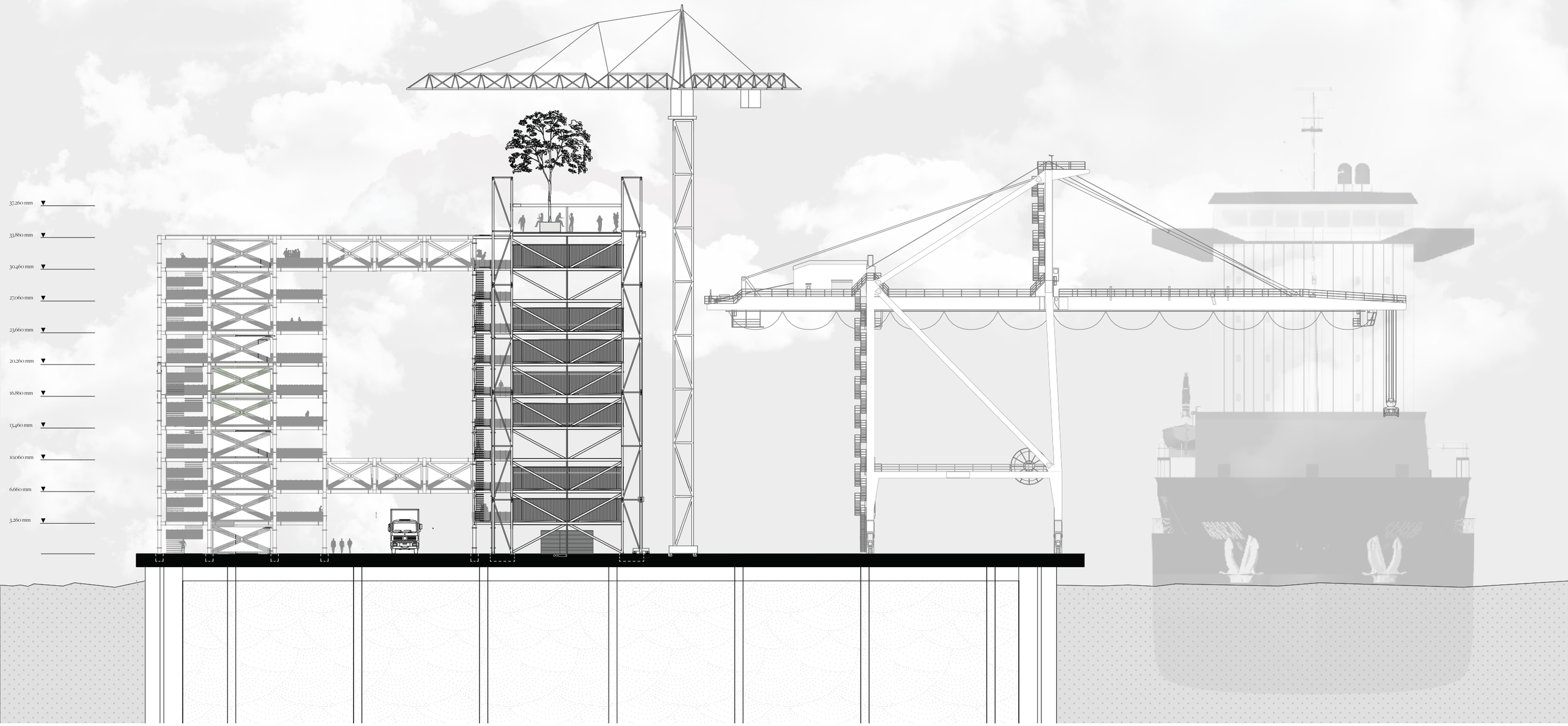

300
5350
285
4185
5350
5350
5350
5350
4000
11250
47400
7000
92000

_promenade

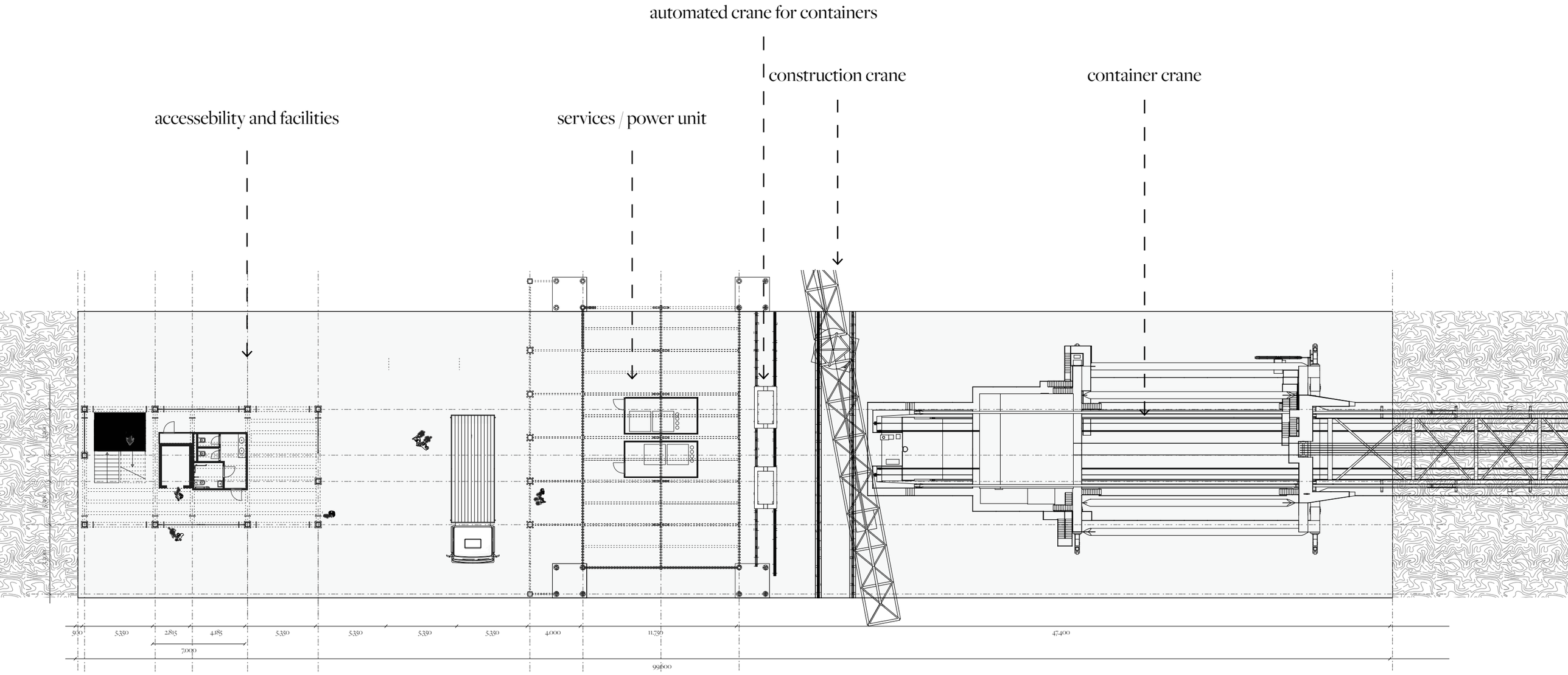




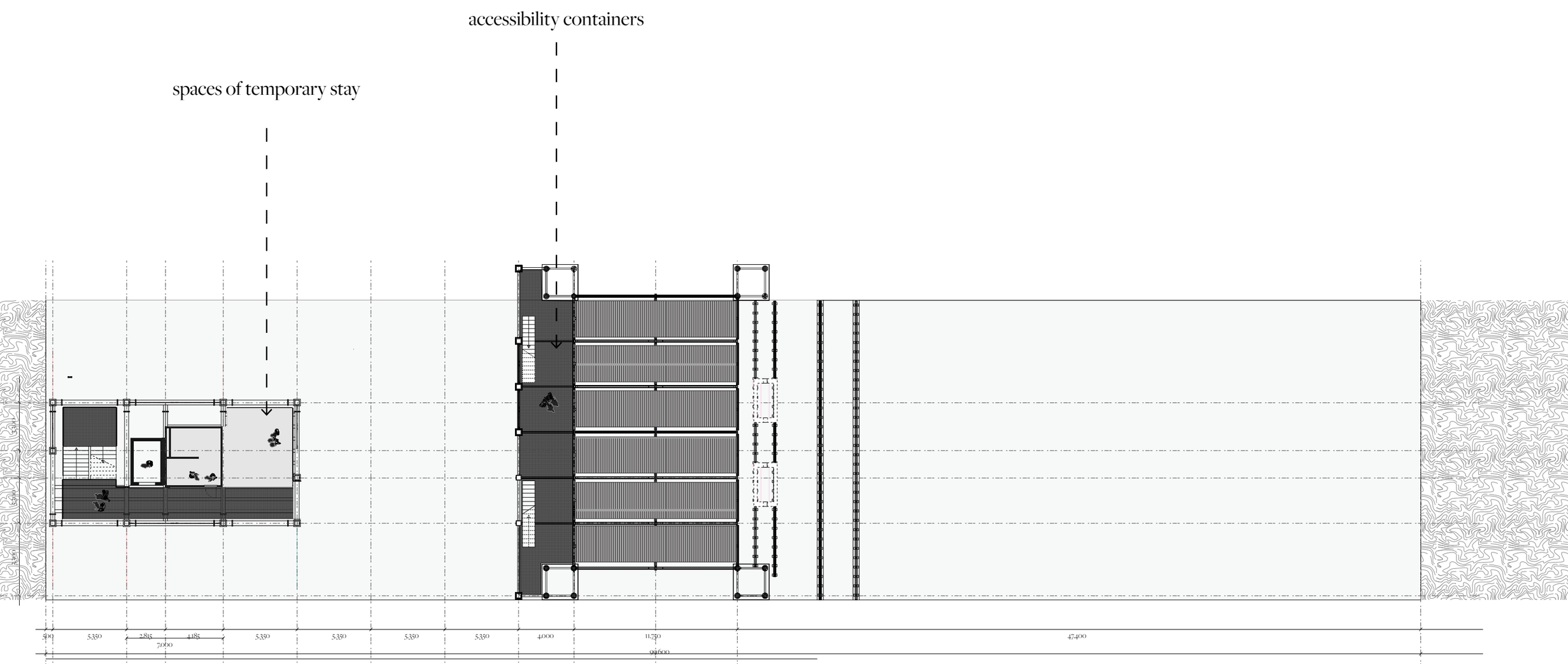
_unit



_section unit 1:200

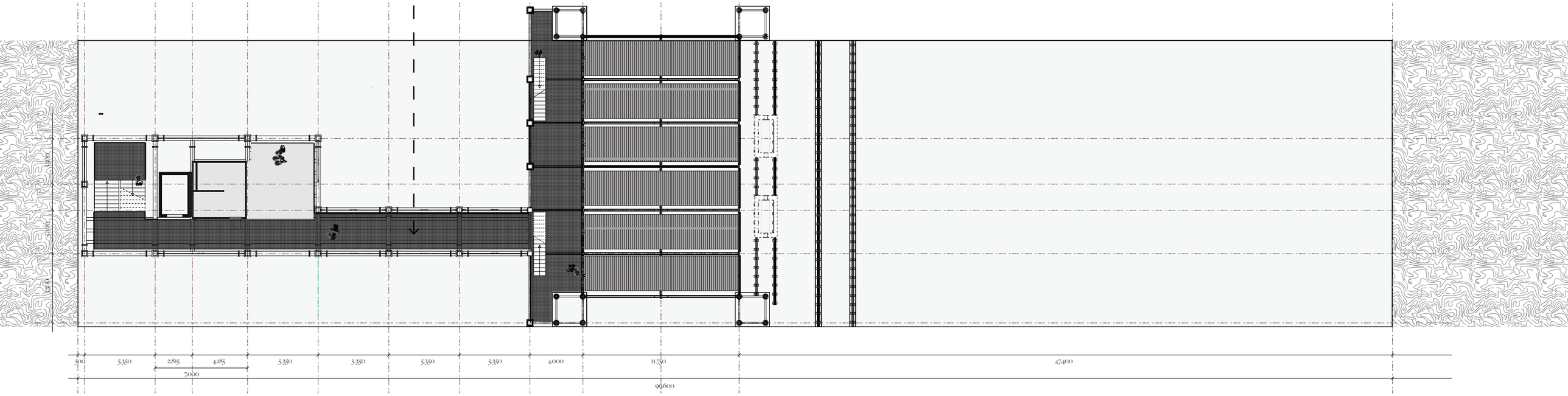


ground floor 1:200

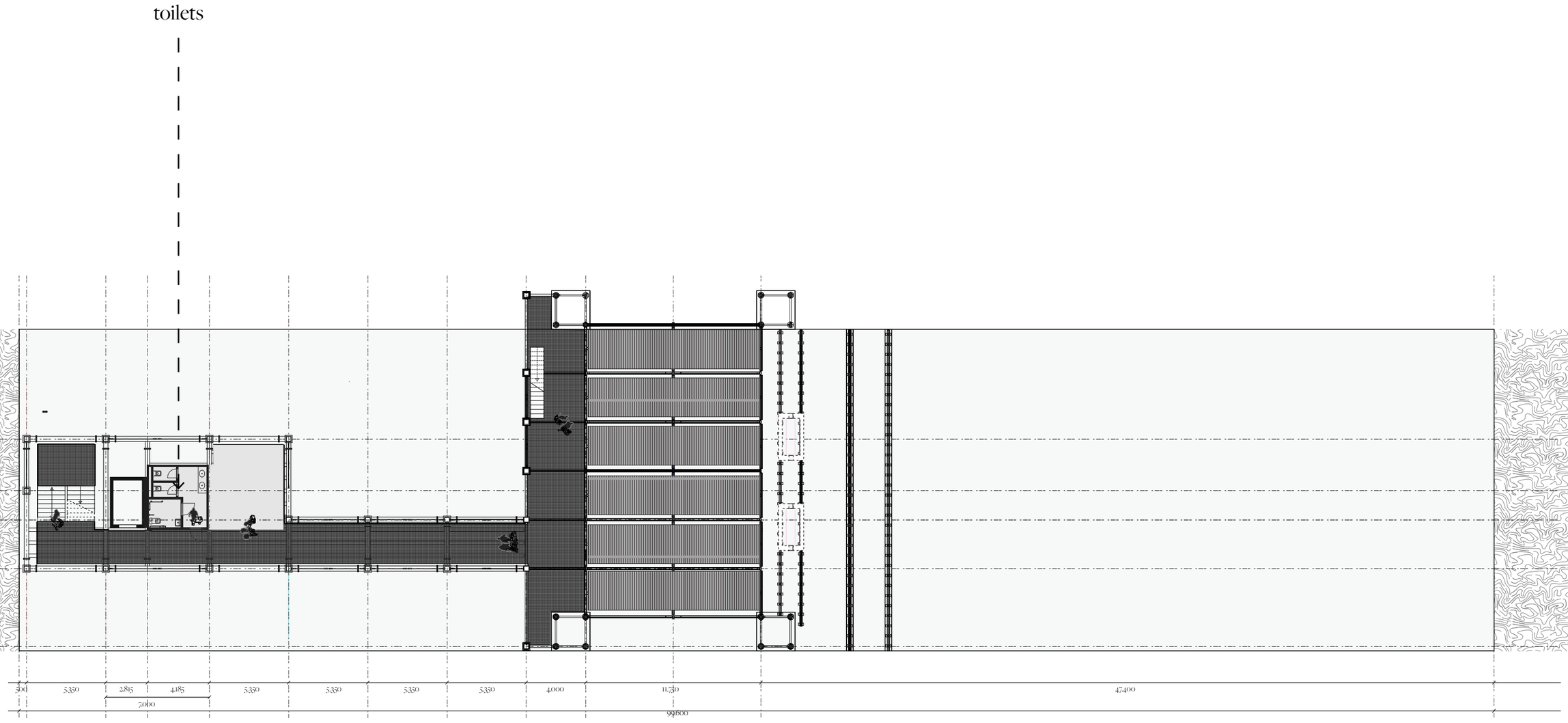


1th + 3th t/m 8th floor 1:200

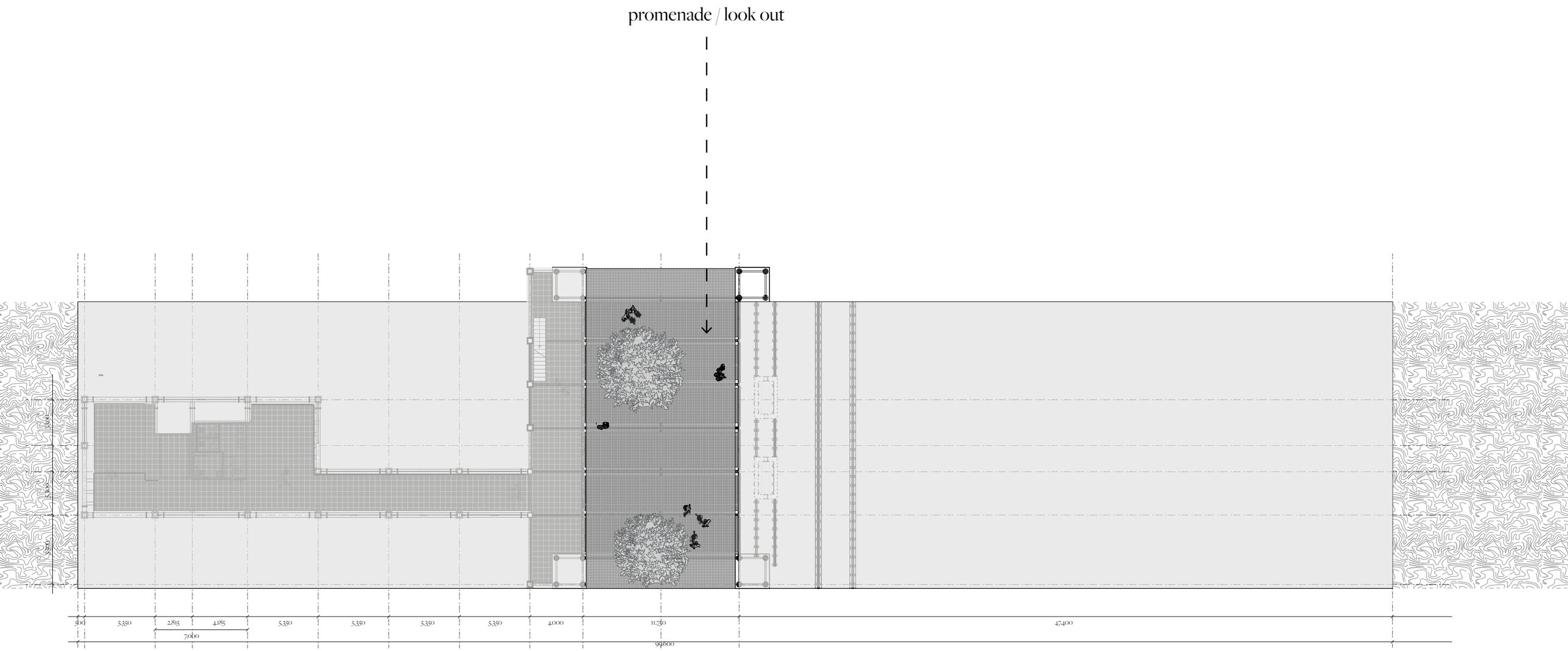
connection with container shelf system



2th floor 1:200



9th top floor 1:200



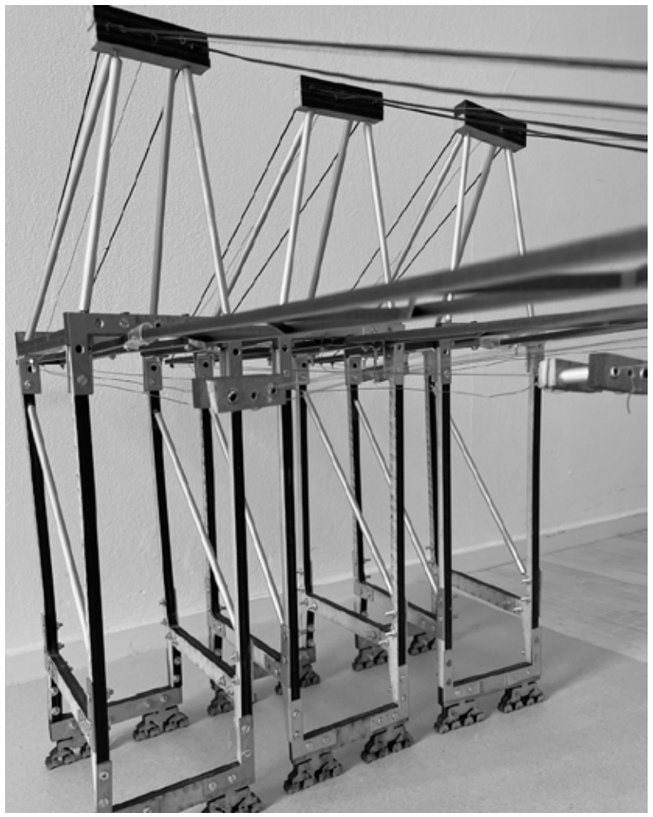
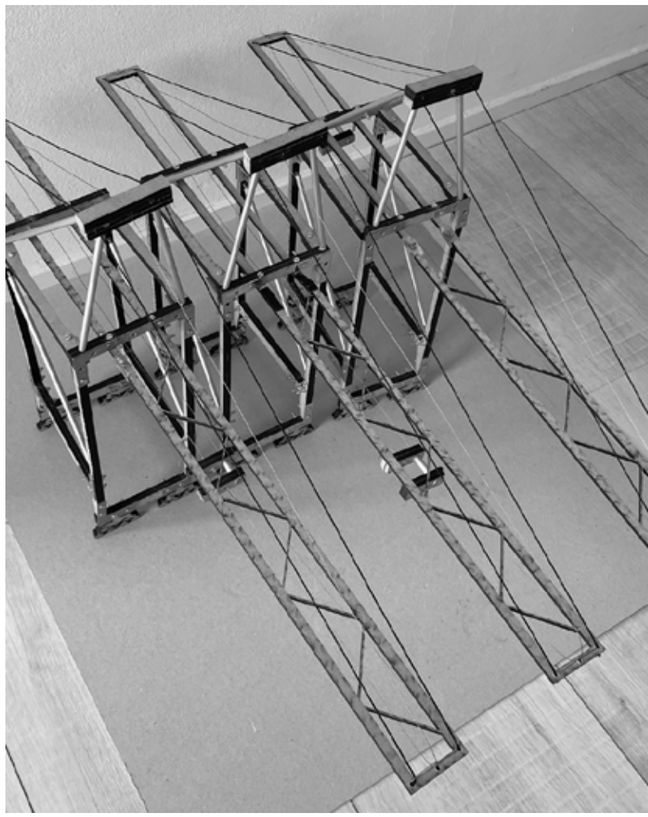
promenade 1:200

assembly

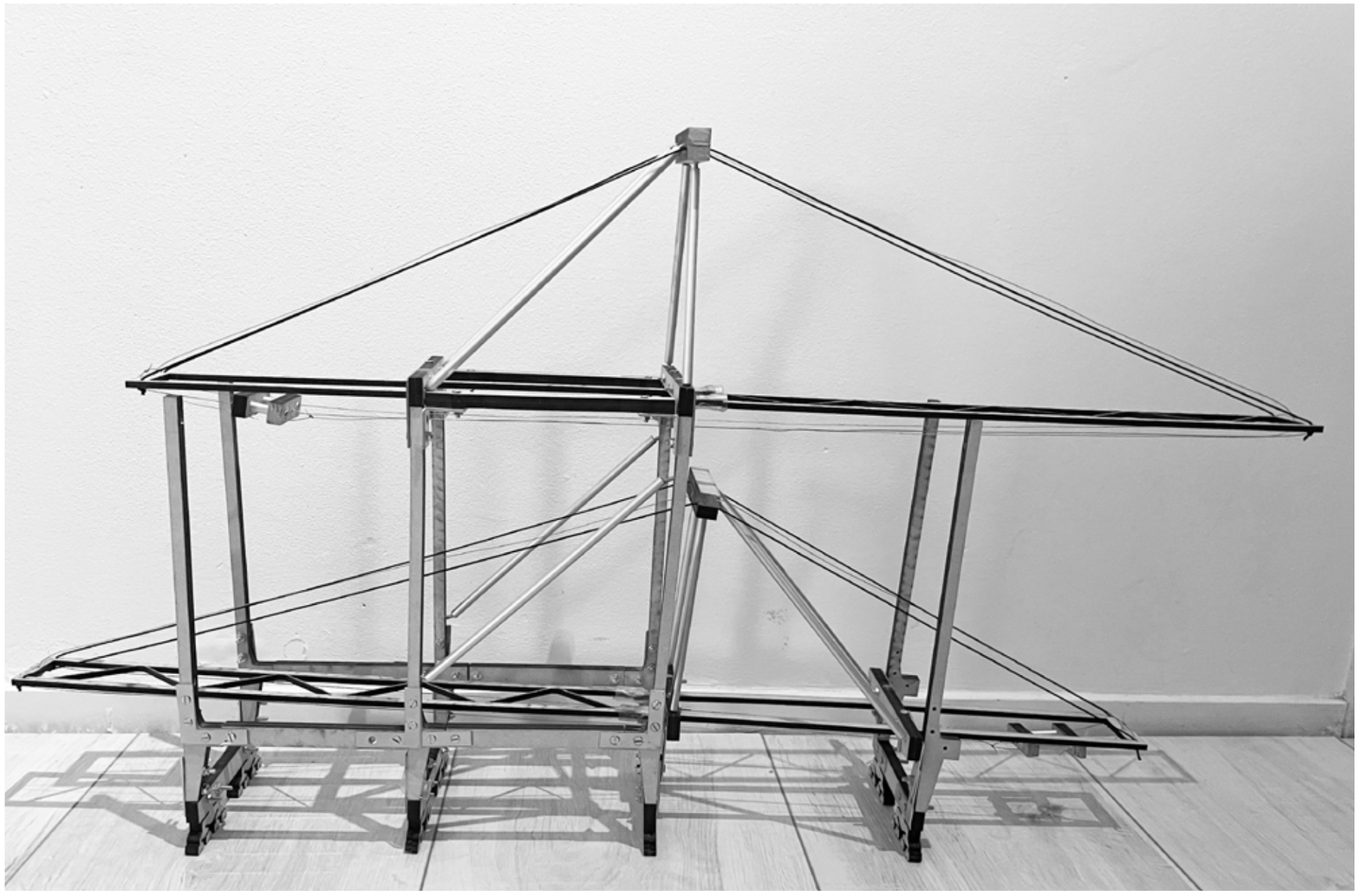
How are the units assembled?

recycle materials on site

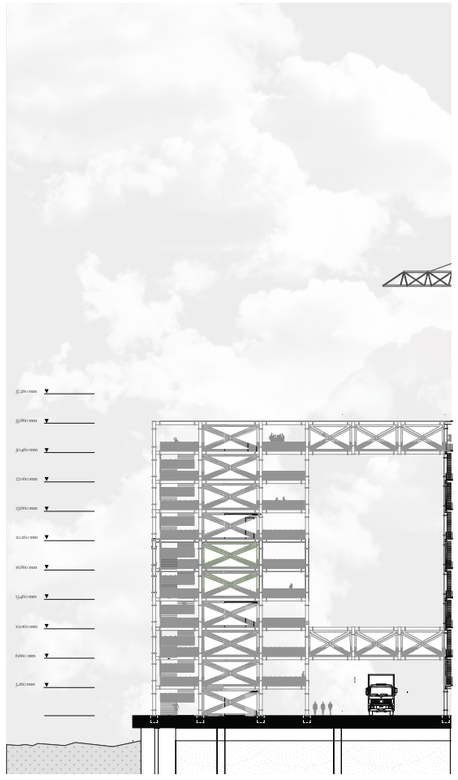
circulation of old machinery

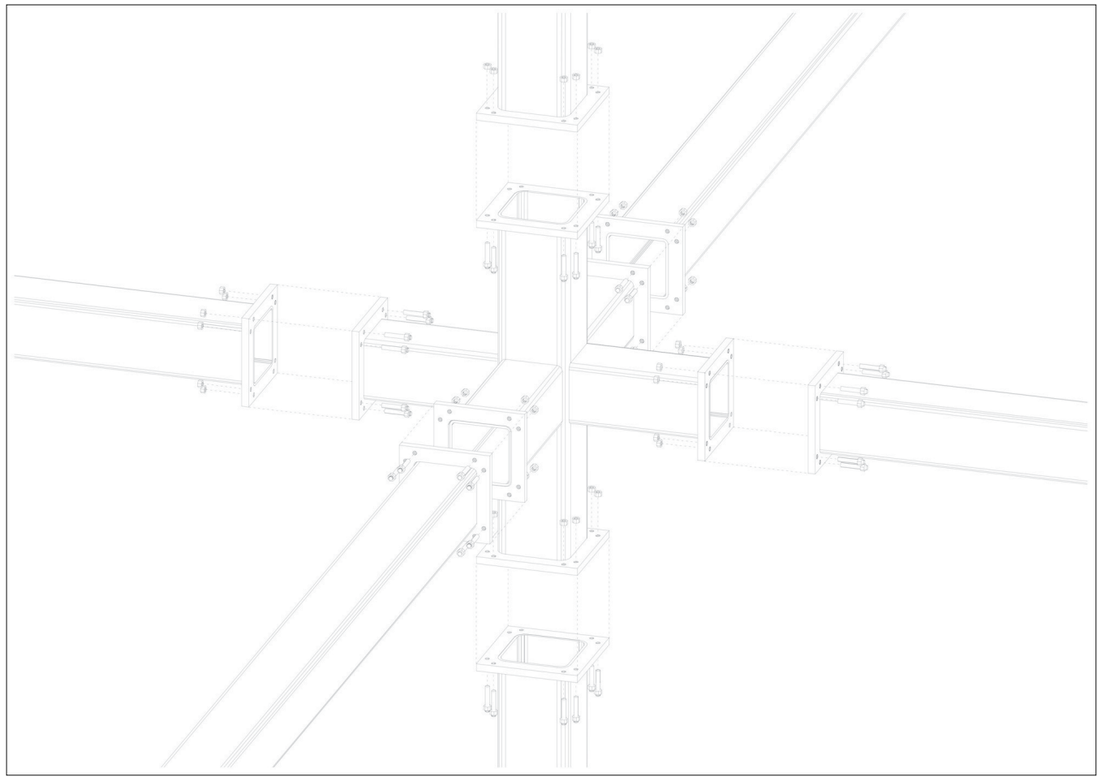



cranes and movements

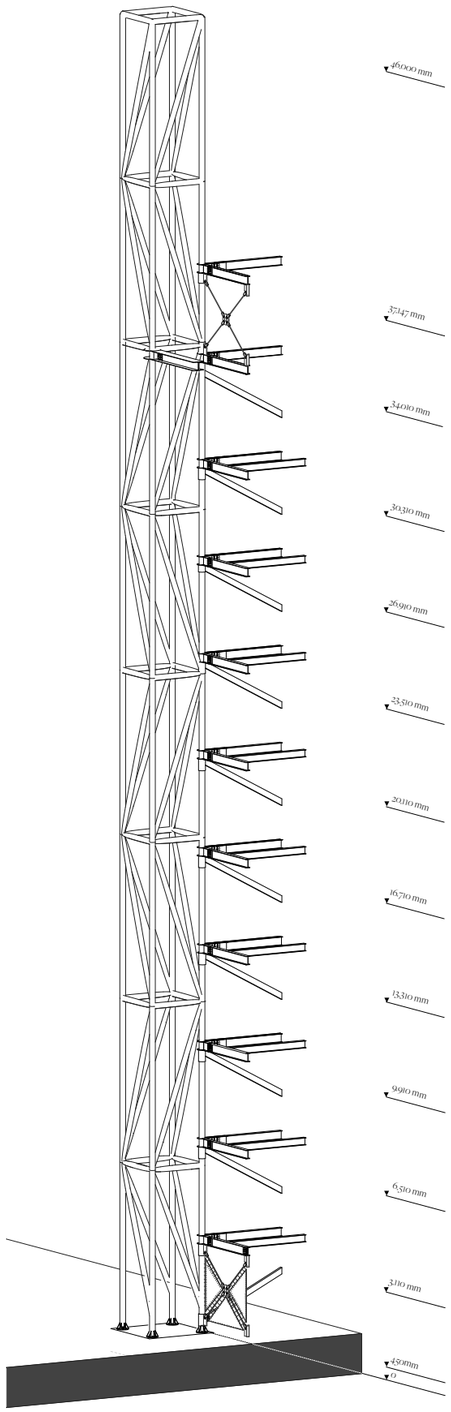


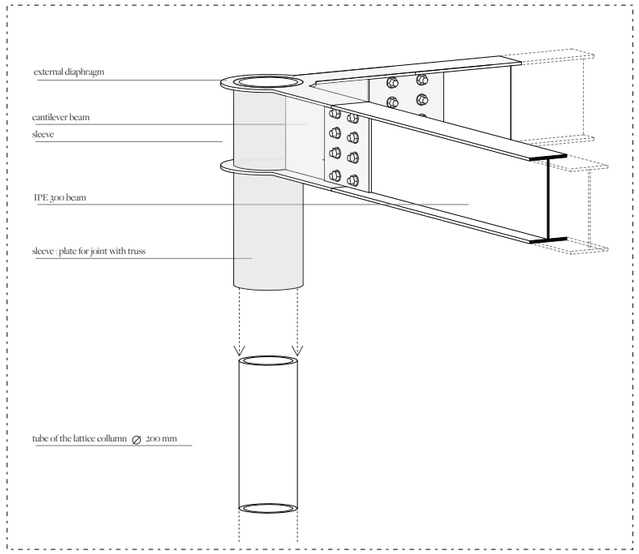
cranes and form



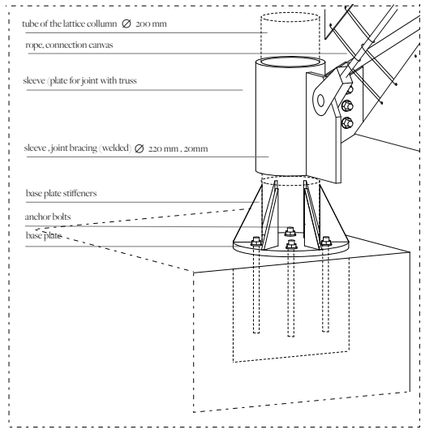


assembly tower





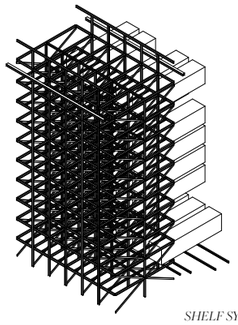
DETAIL STEEL SLEEVE IPE BEAM JOINT
1:5



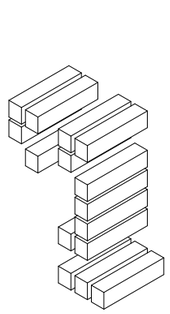
COLUMN BASE DETAIL
1:5

_steel truss columns | bracing | recycled pvc canvas

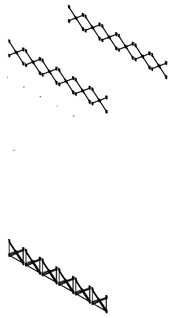
RAIL TRACKS



SHELF SYSTEM STEEL BEAMS



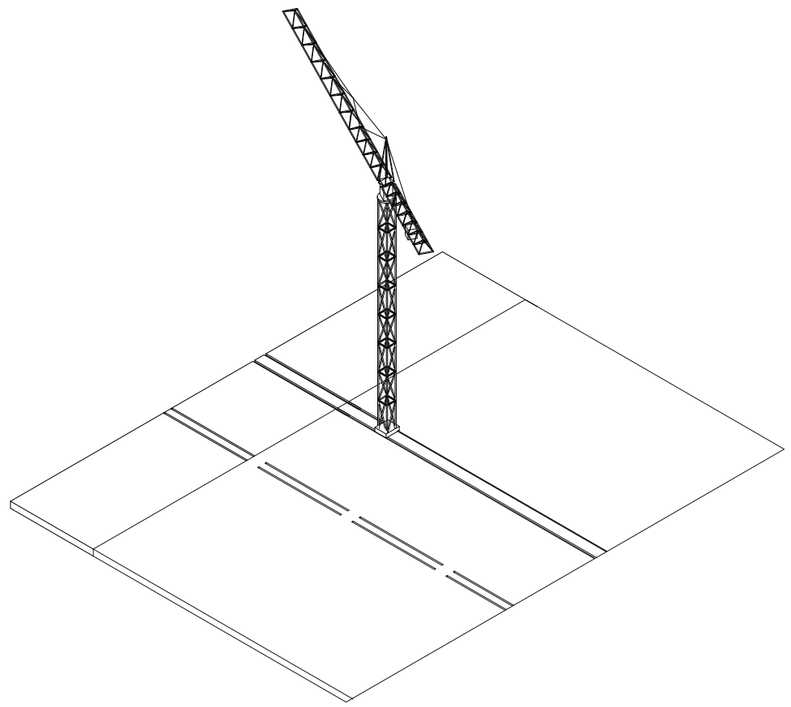
CONTAINERS



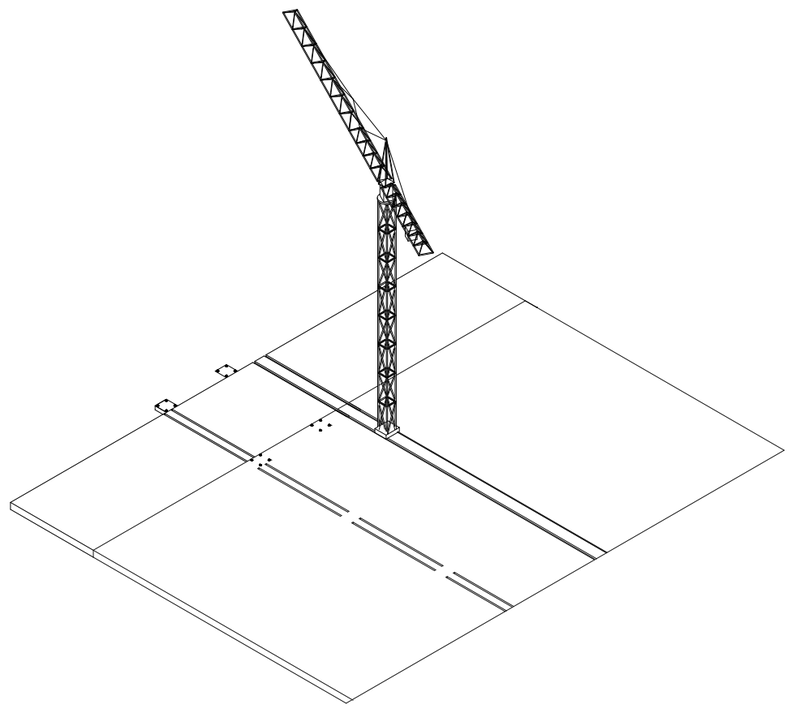
BRACING WITH CANVAS

CONTAINER HOIST MACHINE

assembly shelf system containers



__cranes



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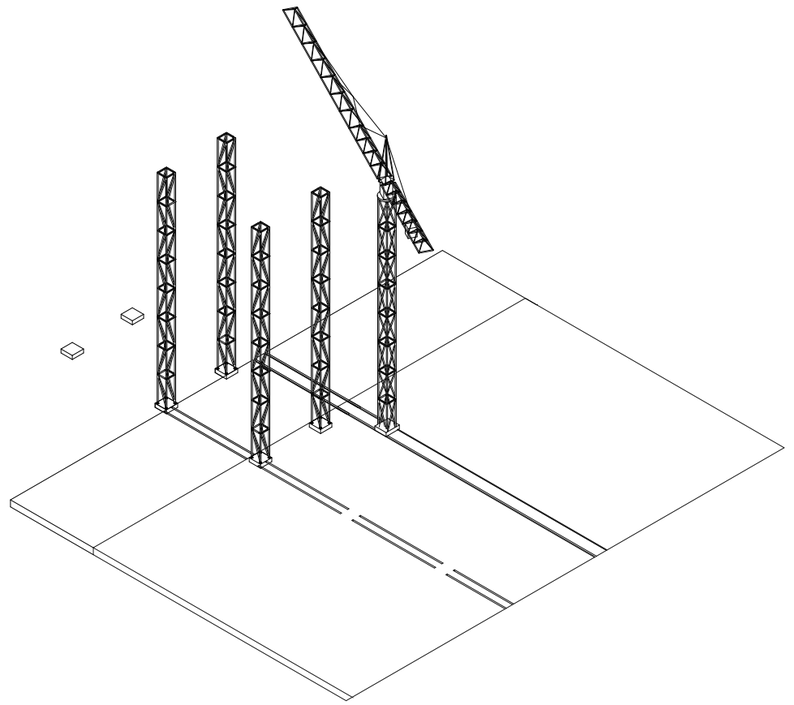

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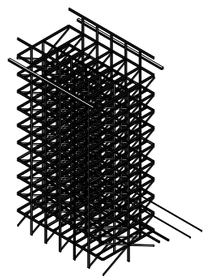

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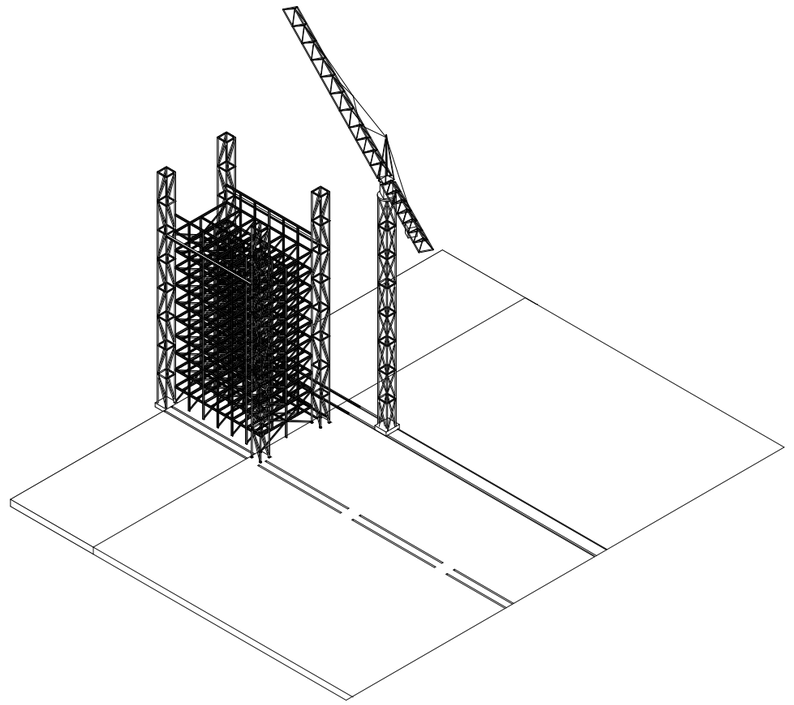

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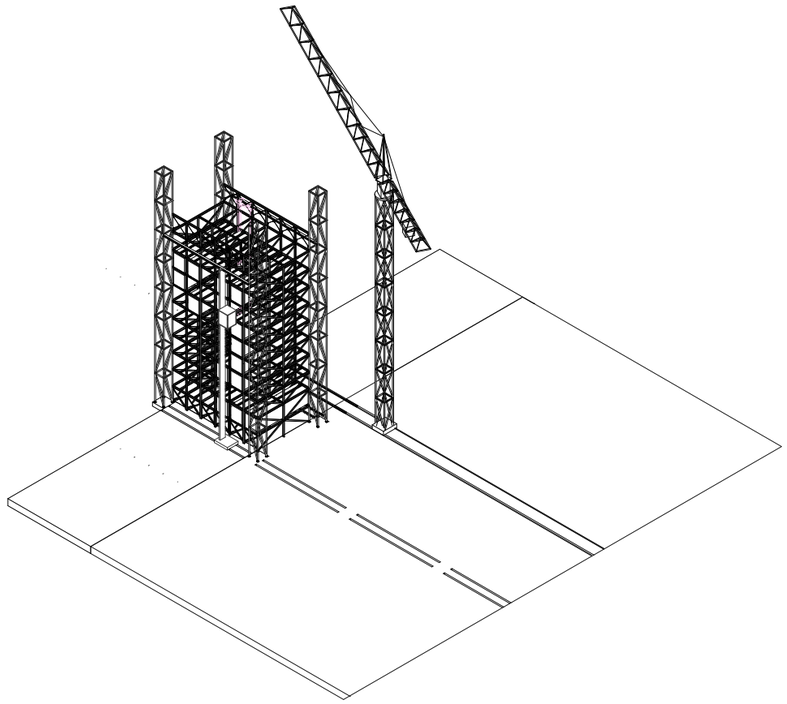

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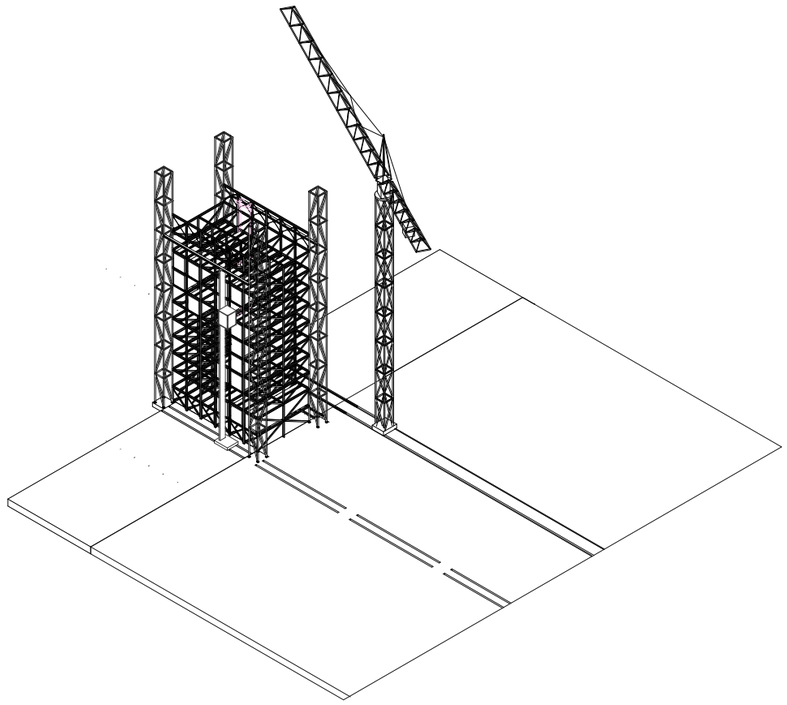

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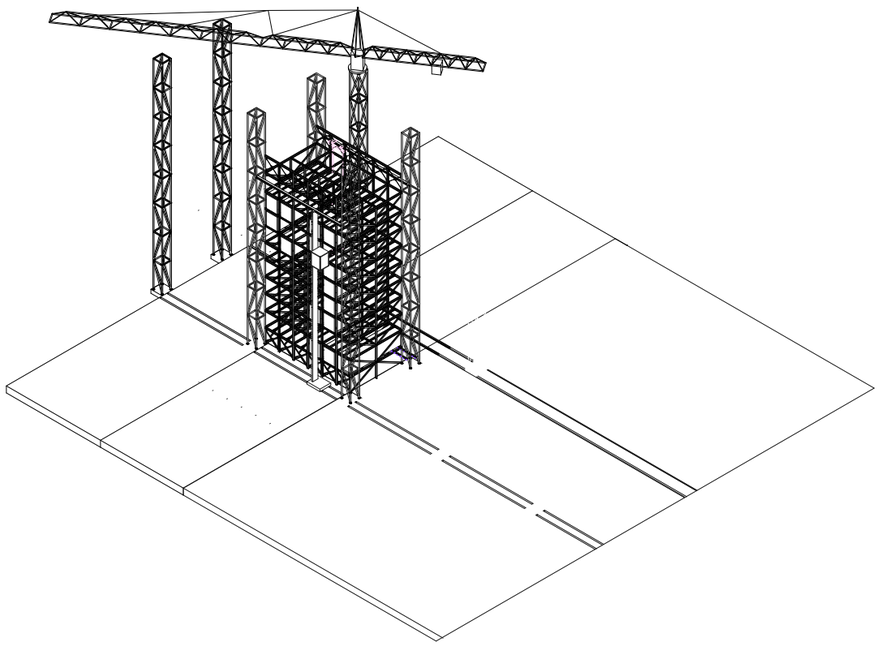
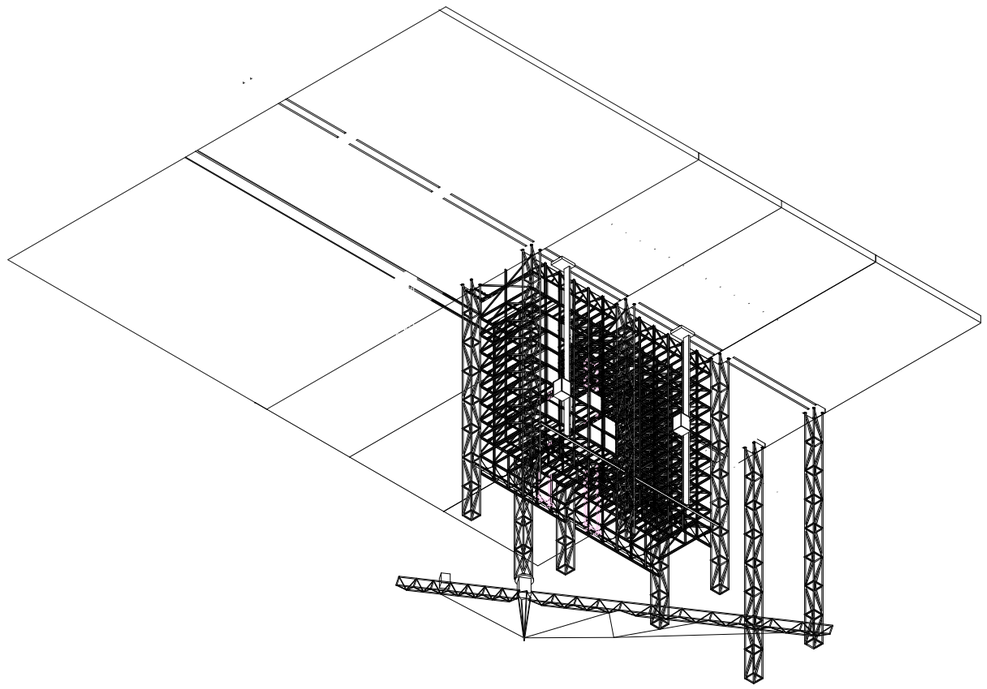


__cranes

_cranes



thank you