

# THE MONGSTAD EXPERIENCE

*Facilitating a transition in time, function and space*

Elise van Herwaarden

Delta Interventions 2017/2018  
North Sea: Landscapes of Coexistence

P5 - Graduation Presentation  
January 25th, 2019

A project done under the supervision of  
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ir. Sjap Holst

dr. ir. Hamed Khosravi  
dr. ir. Nicola Marzot





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North Sea

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# I - RESEARCH



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# NORTH SEA FISHING



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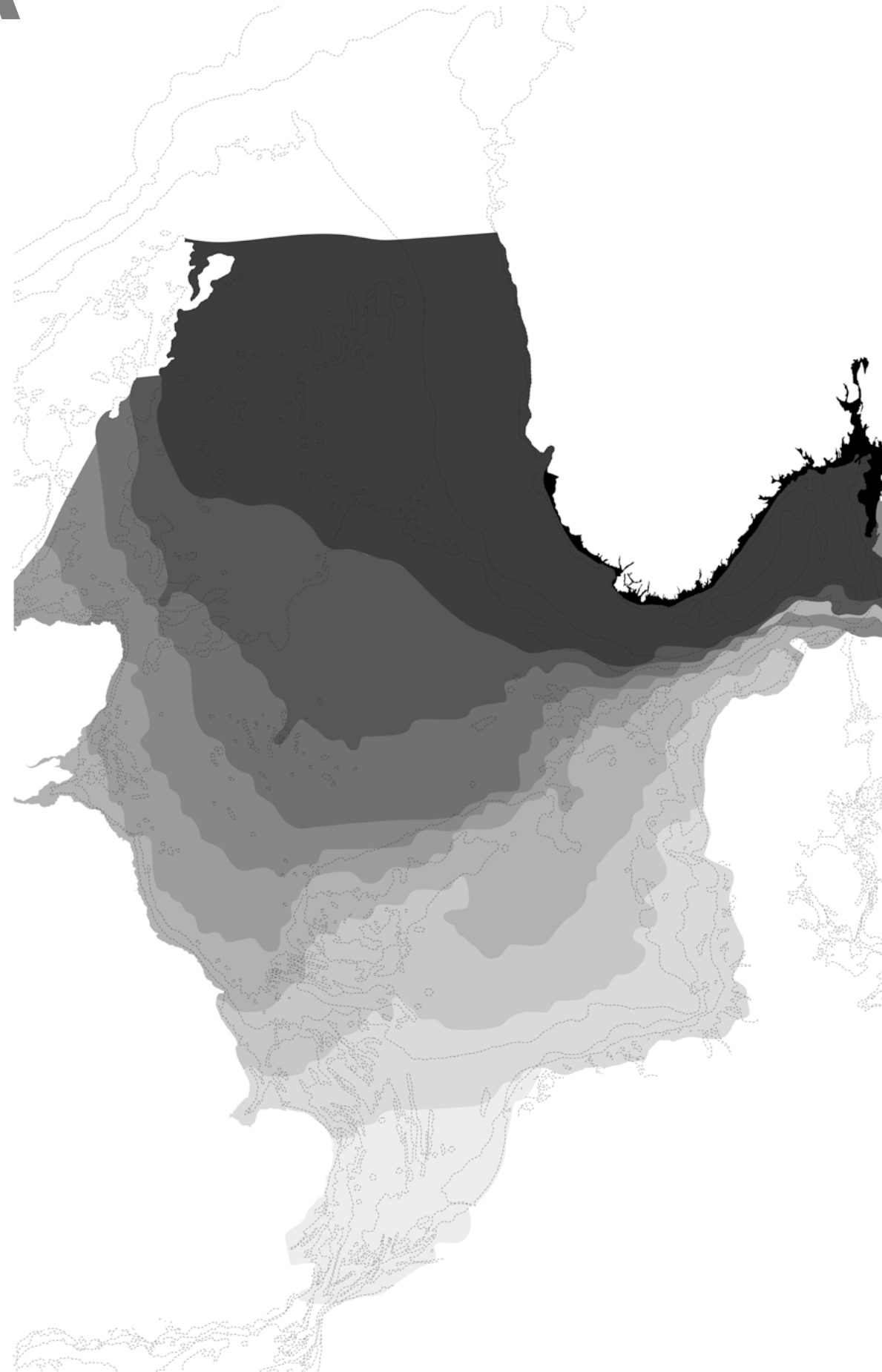
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# NORTH SEA FISHING



## I RESEARCH

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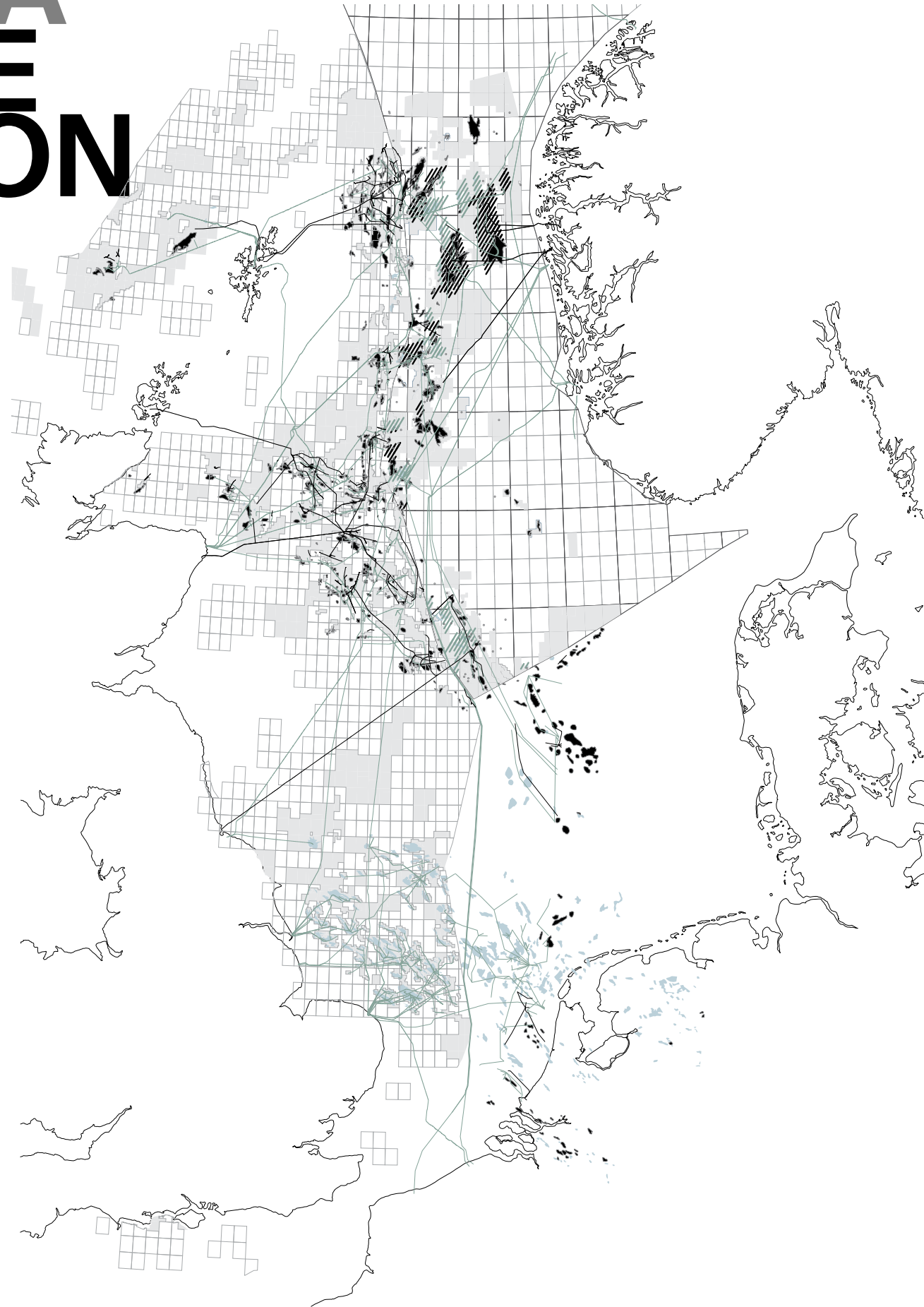
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# NORTH SEA RESOURCE EXTRACTION



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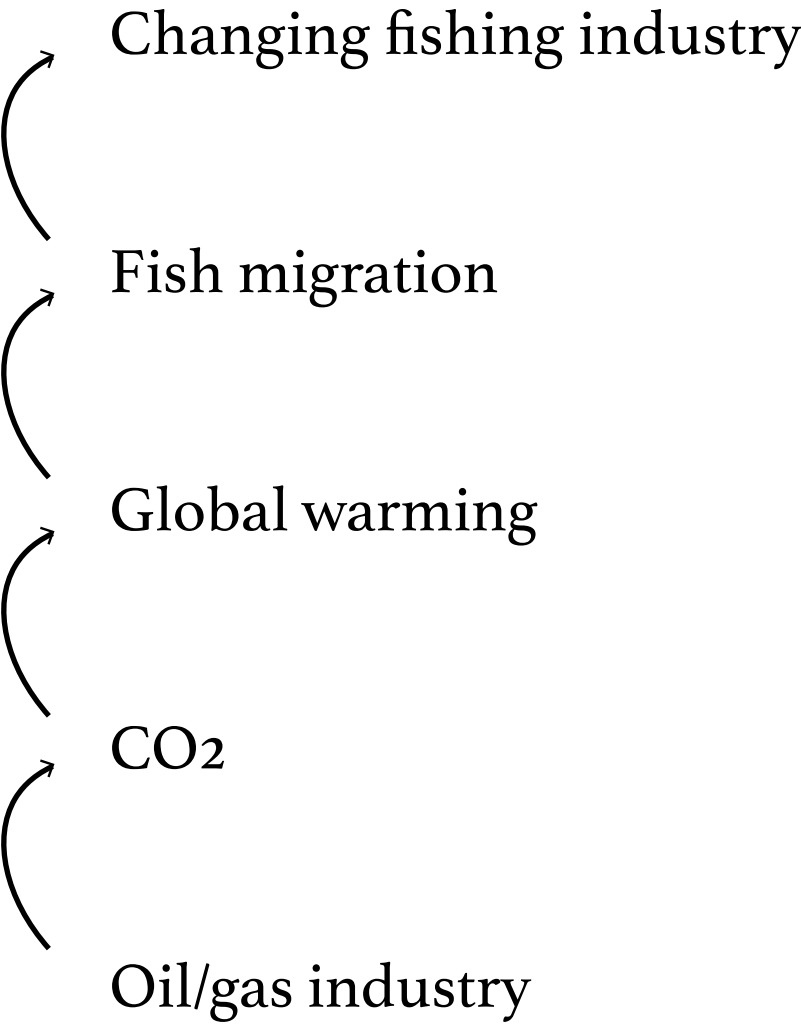
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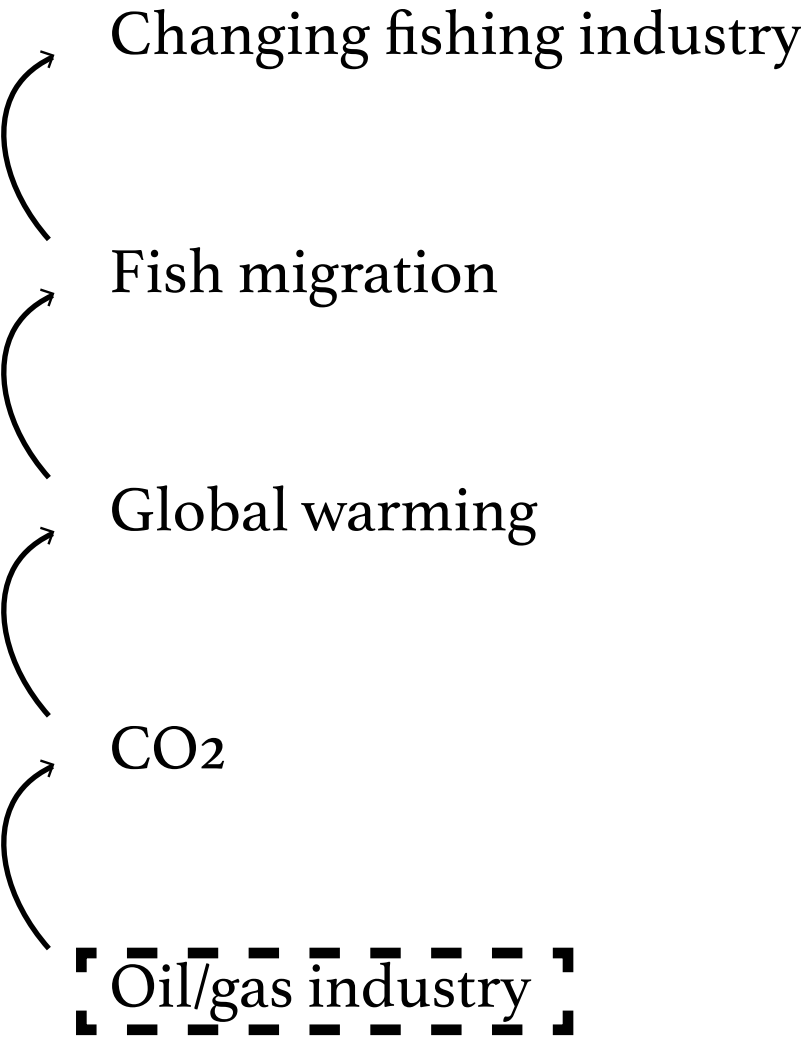
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# NORWAY ECONOMY

## World’s richest countries (2018)

Country	GDP per capita (USD)
1. Qatar	128,702
2. Macao	122,489
3. Luxembourg	110,870
4. Singapore	98,014
5. Ireland	79,716
6. Brunei Darussalam	79,924
7. <i>Norway</i>	<i>74,065</i>
8. United Arab Emirates	68,662
9. Kuwait	66,673
10. Hong Kong	64,533

© International monetary fund

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# NORWAY ECONOMY

Burundi .

Norway

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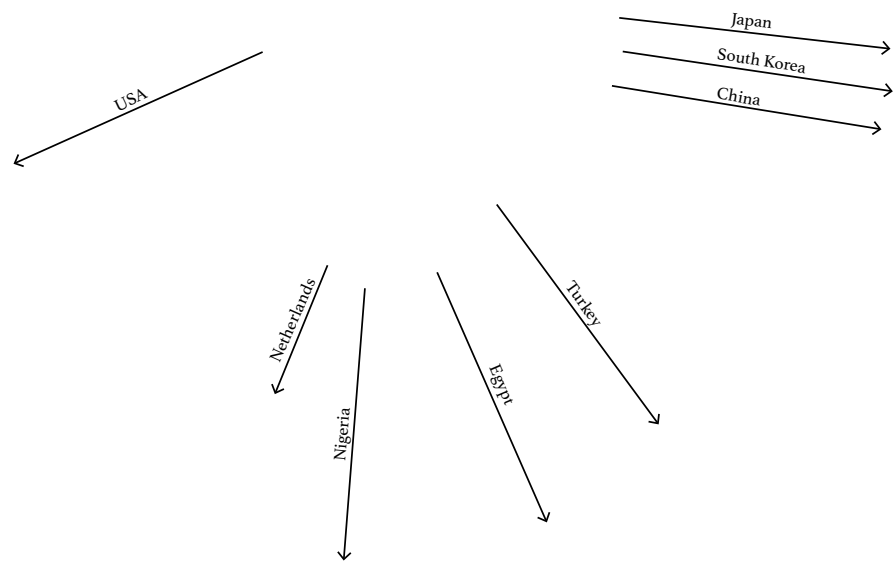
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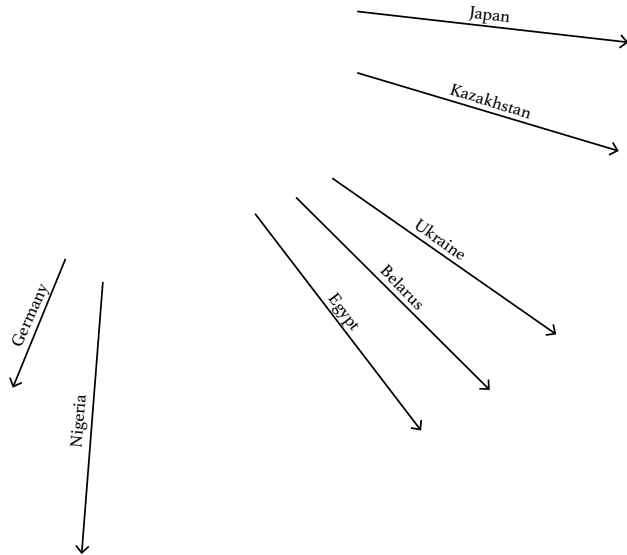


# NORWAY

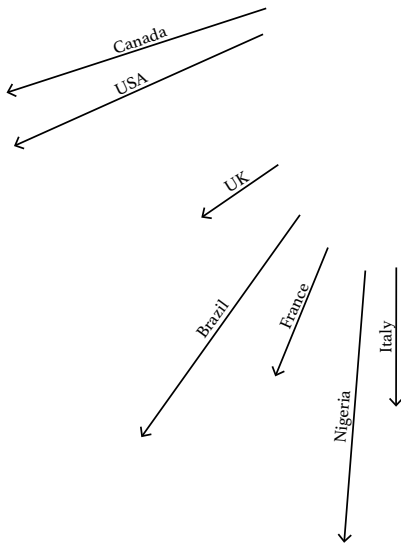
# ECONOMY



Mackarel



Herring



Cod

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# NORWAY OIL



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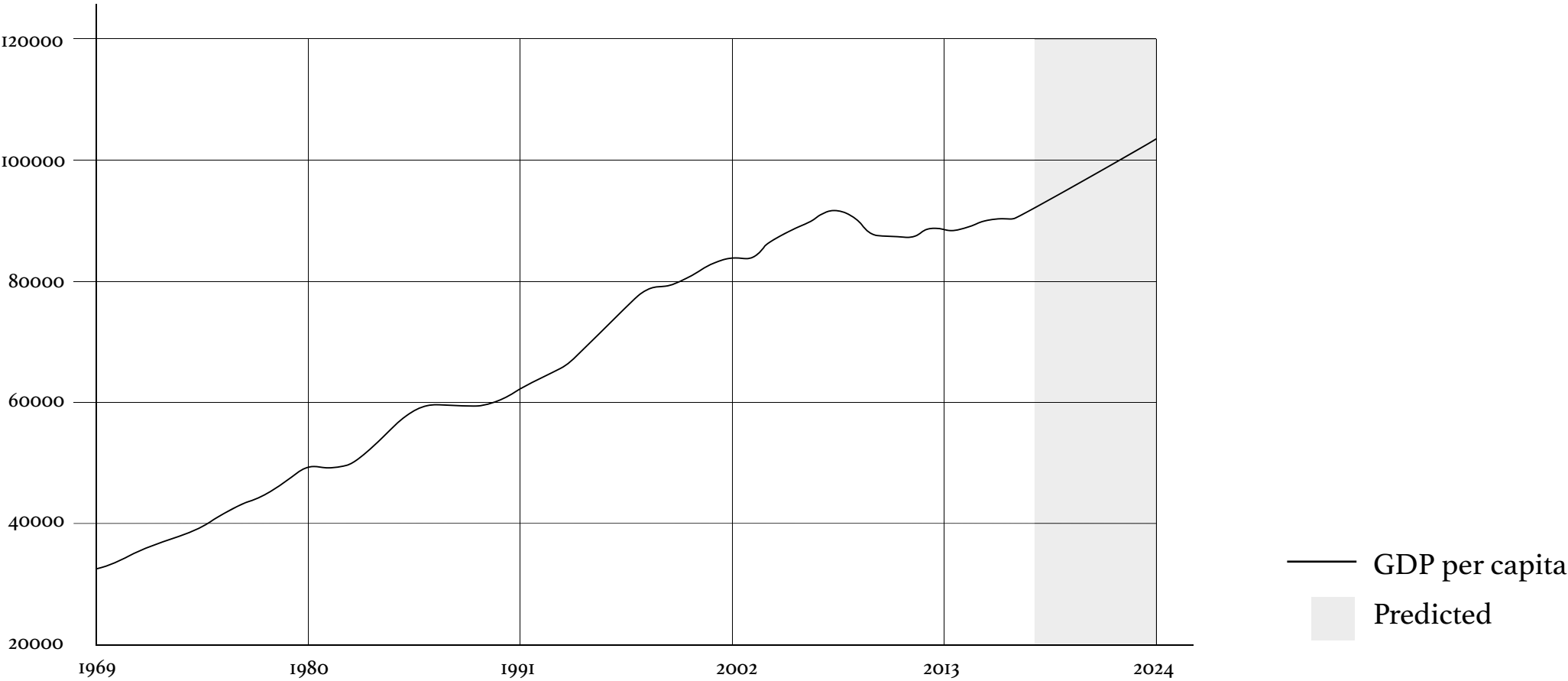
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# NORWAY OIL



*GDP per capita Norway (USD). Source: World Bank*

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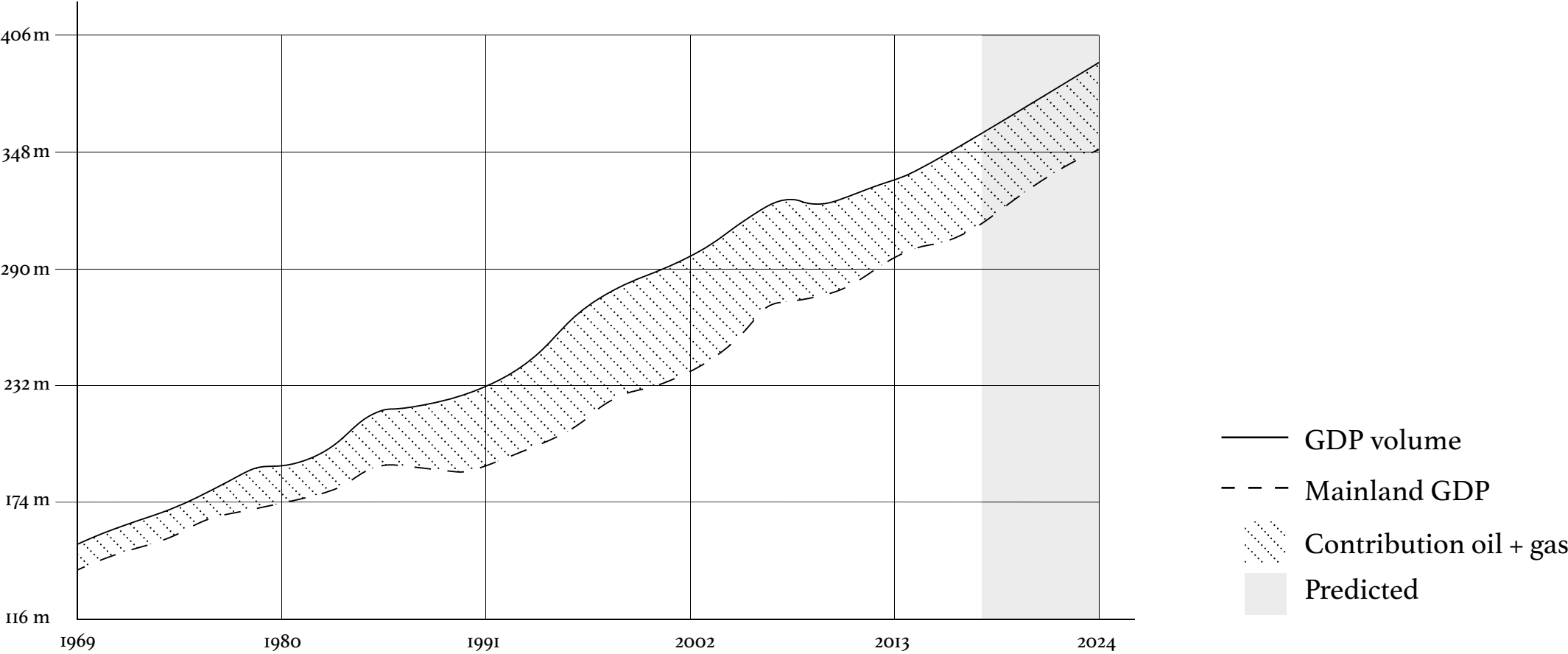
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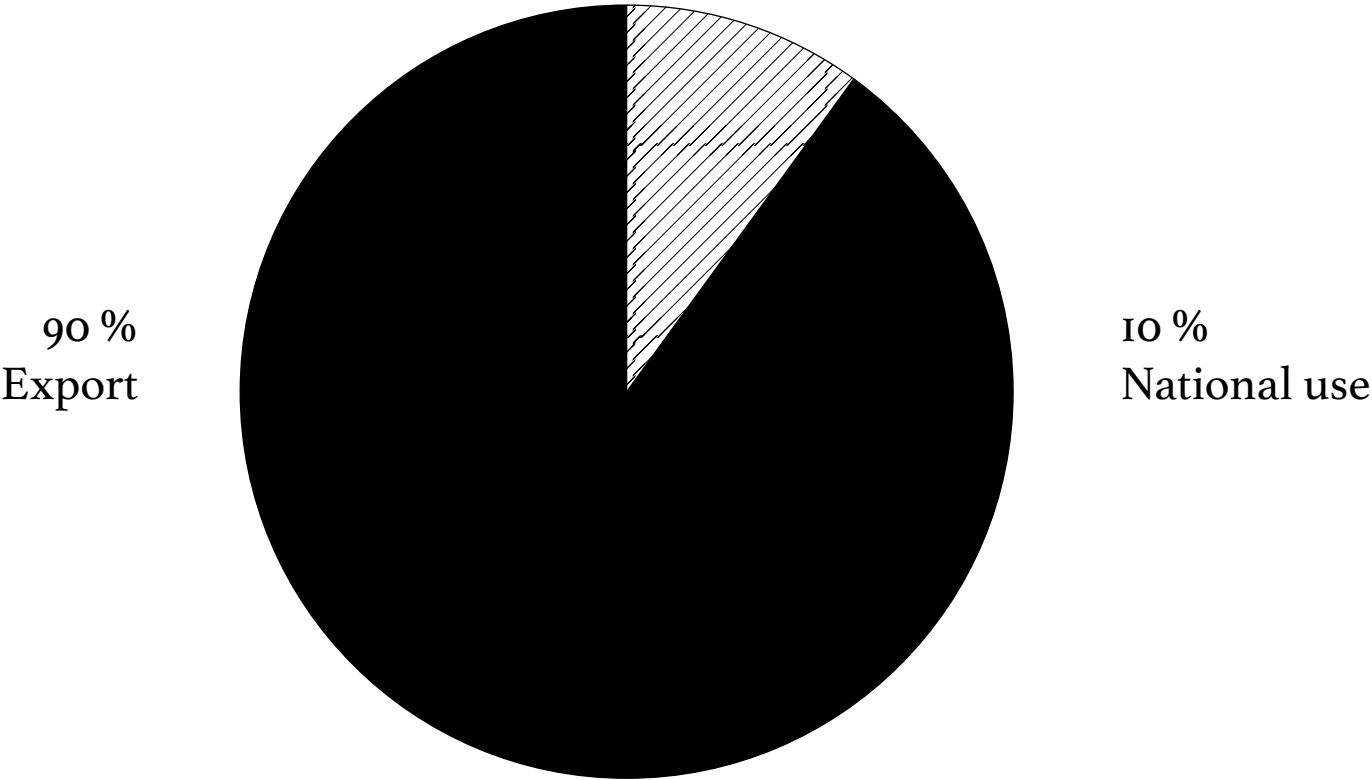
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*Oil + gas contribution to GDP volume Norway (USD). Source: Norwegian Petroleum Directorate & OECD Economic Outlook 102 Database*



# NORWAY OIL



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# NORWAY OIL

90 %  
Export

10 %  
National use

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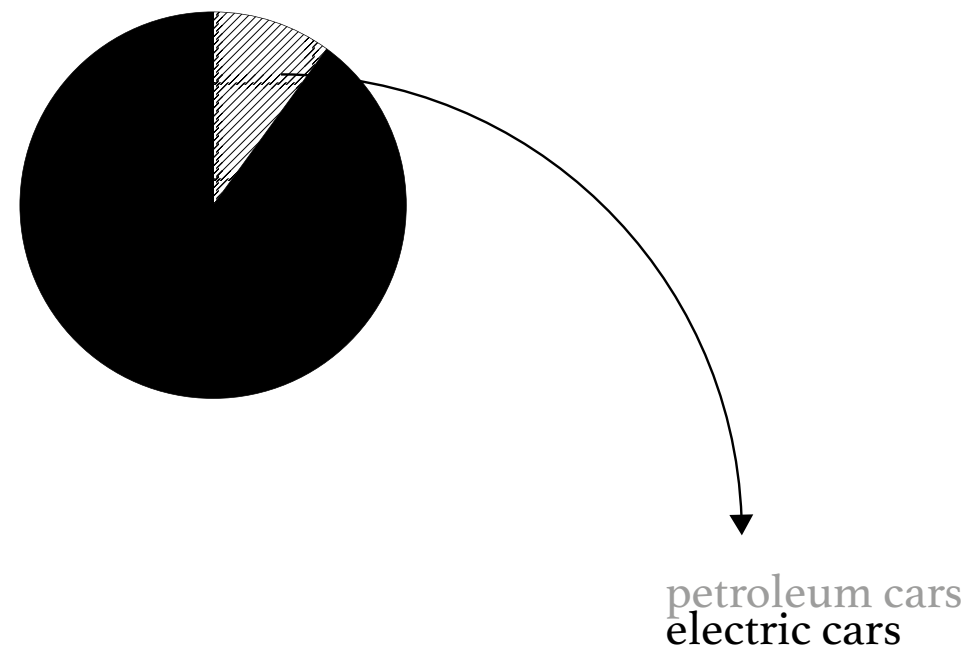
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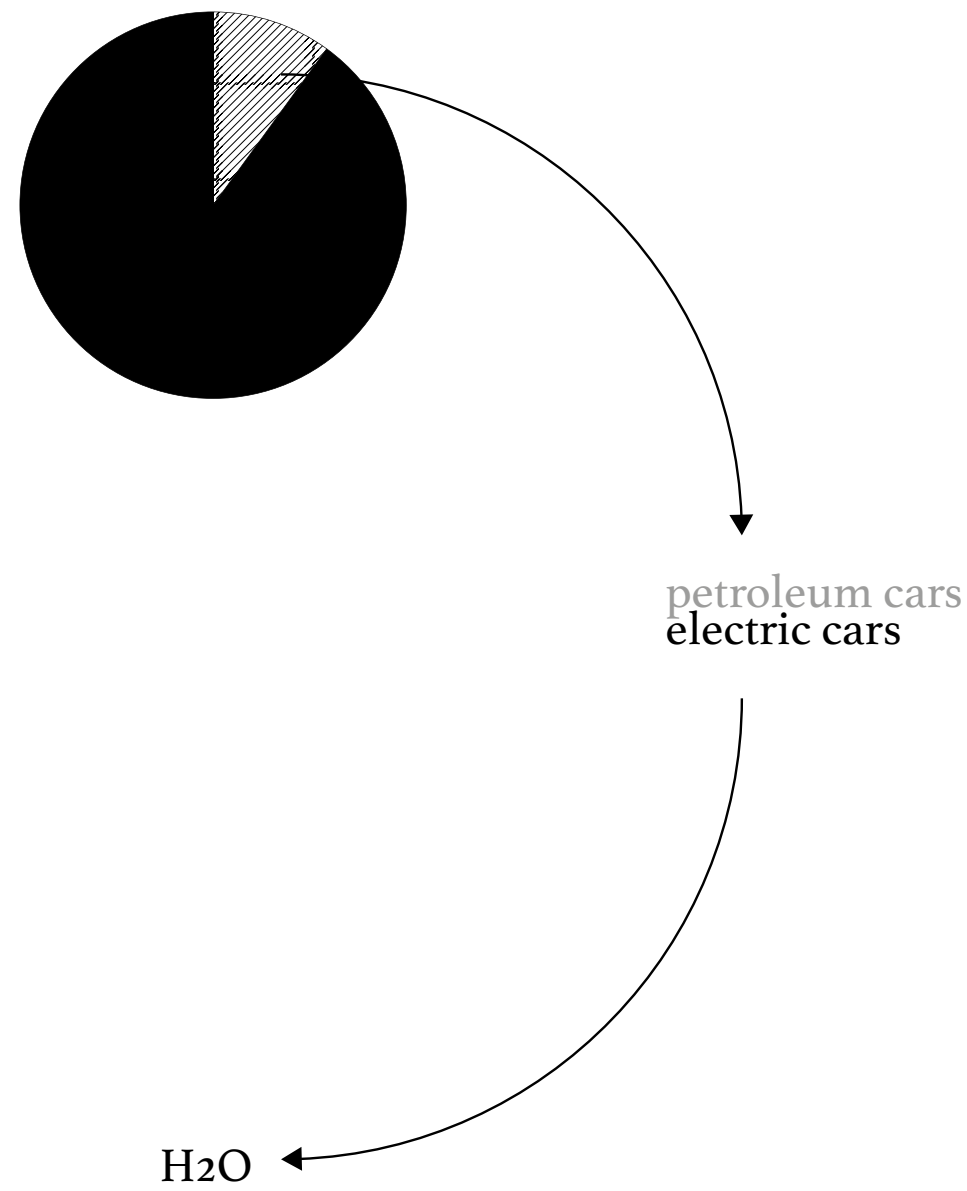
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## I RESEARCH

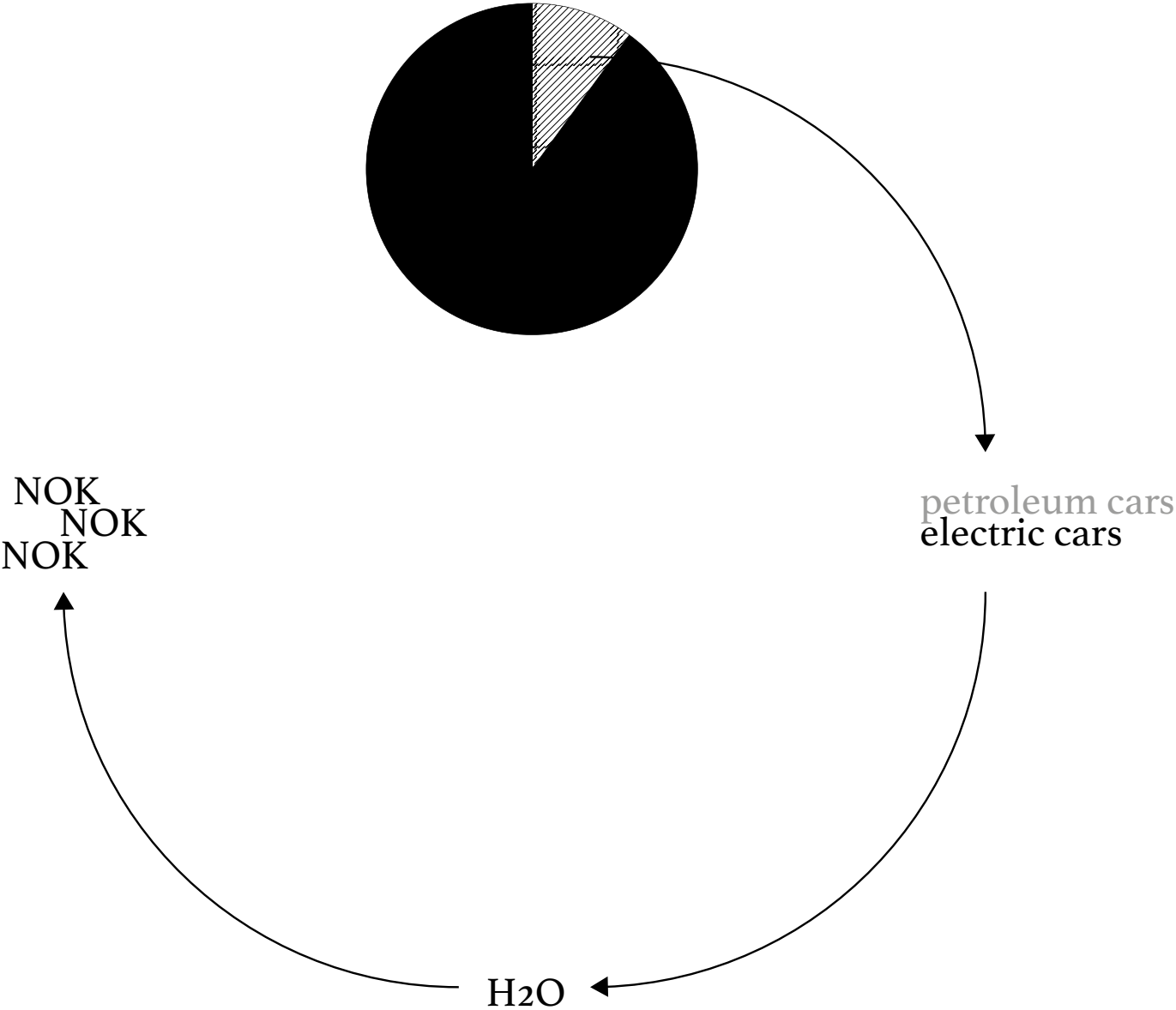
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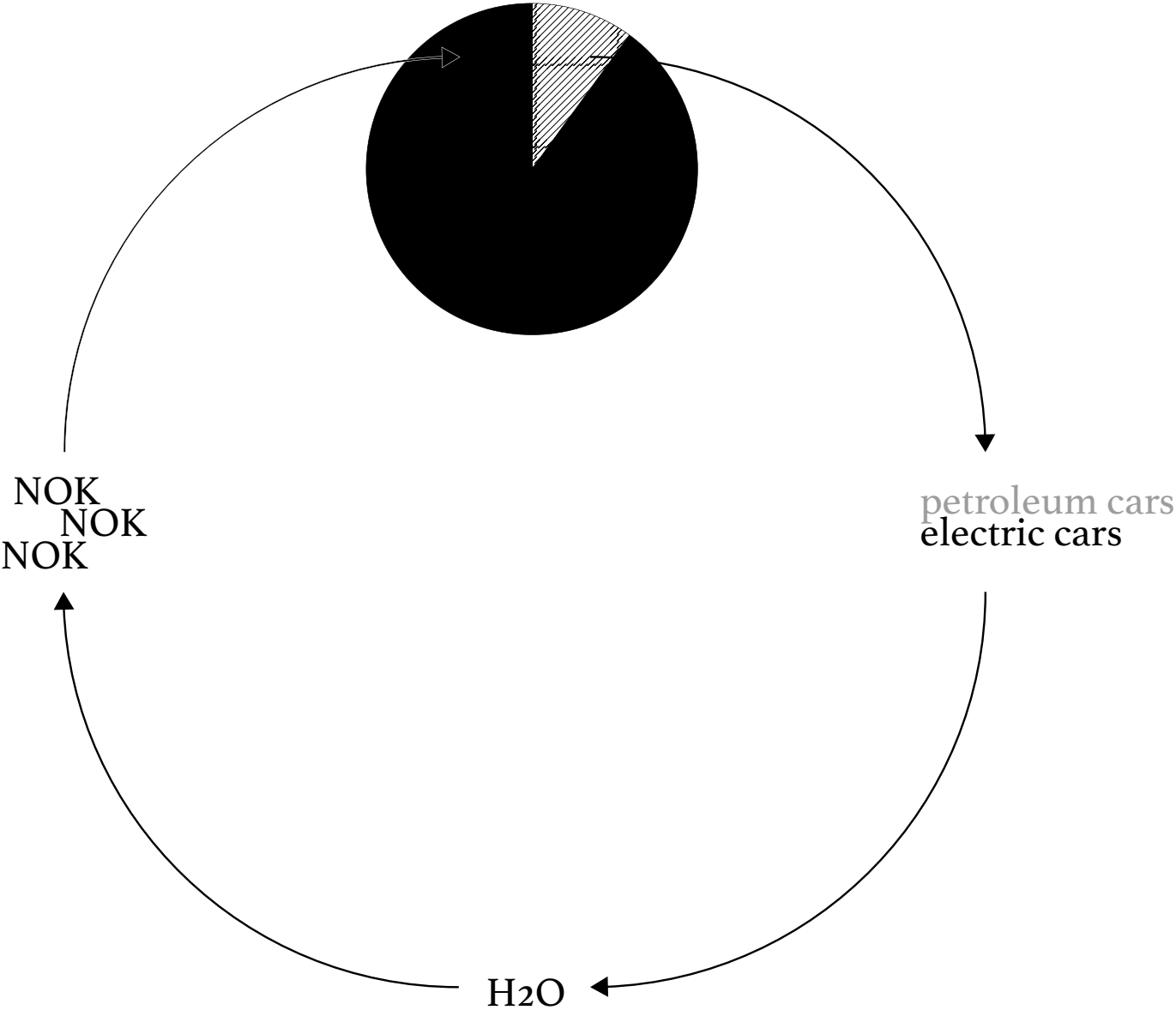
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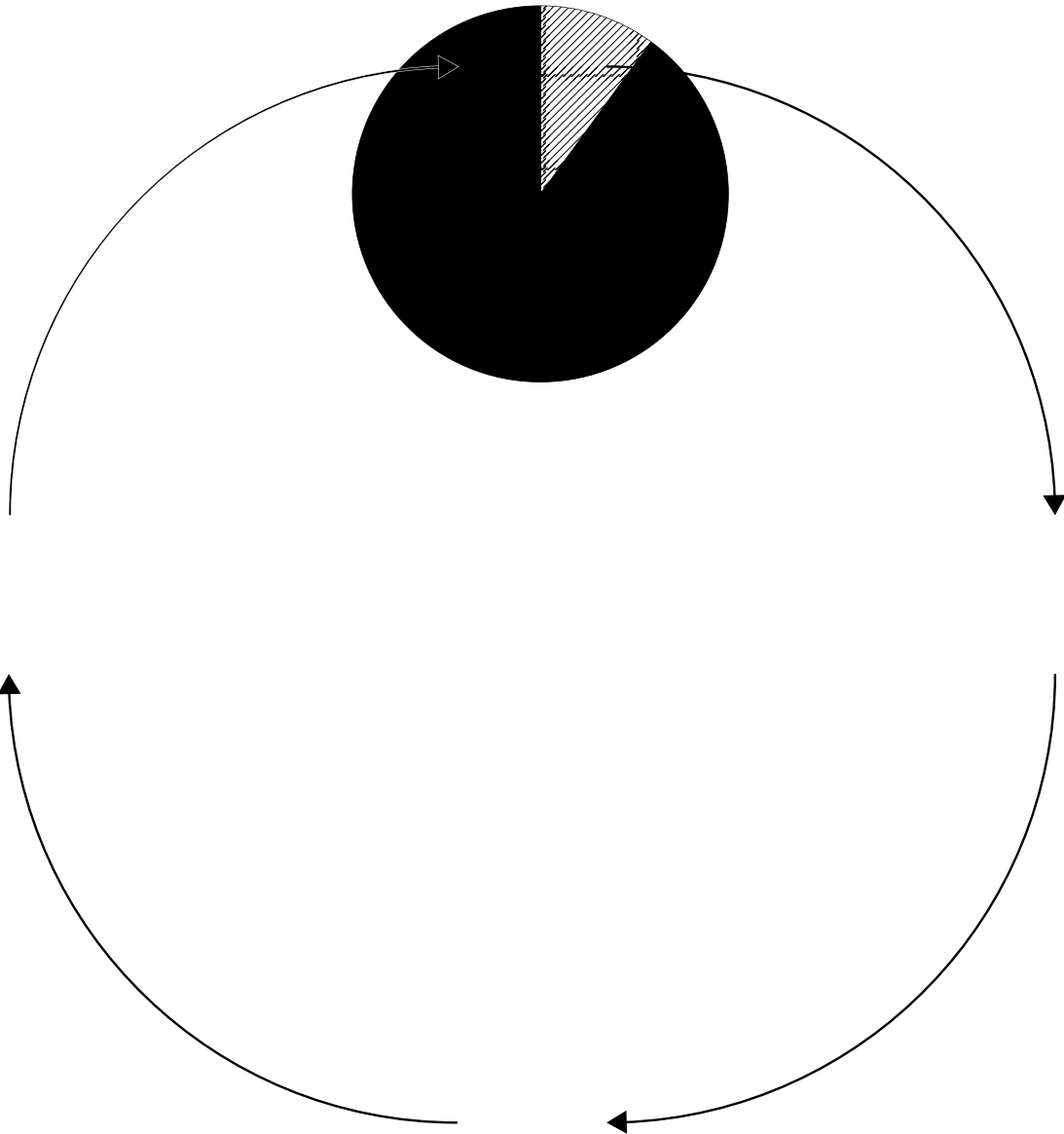
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# NORWAY OIL

The New York Times

## *Both Climate Leader and Oil Giant? A Norwegian Paradox*

<https://www.nytimes.com/2017/06/17/world/europe/norway-climate-oil.html>

June 17, 2017

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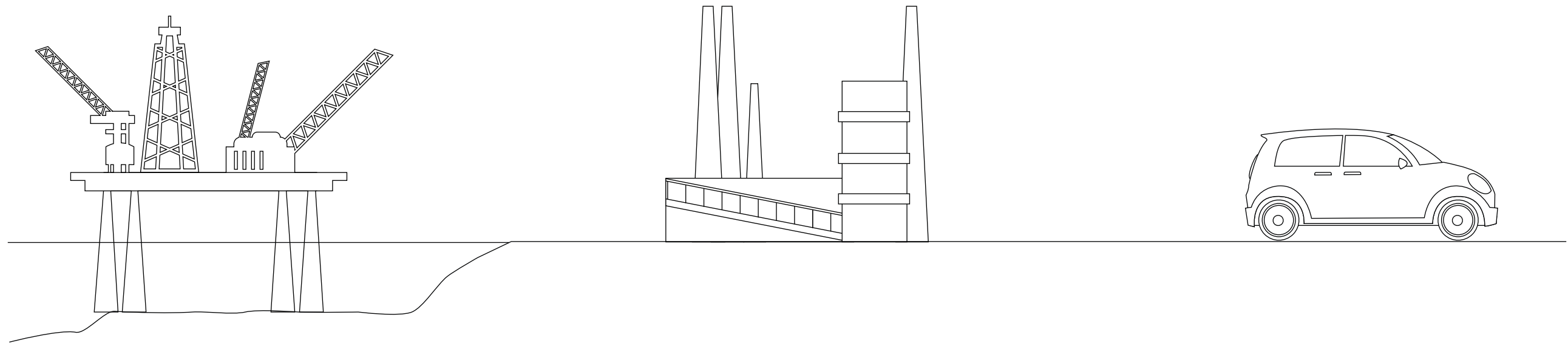
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# NORWAY OIL



**Upstream** - localising and extracting oil from underground/underwater fields.

**Downstream** - processing (refining) of oil into a finished product.

**Consumption** - commercial resale and use by companies and individuals.

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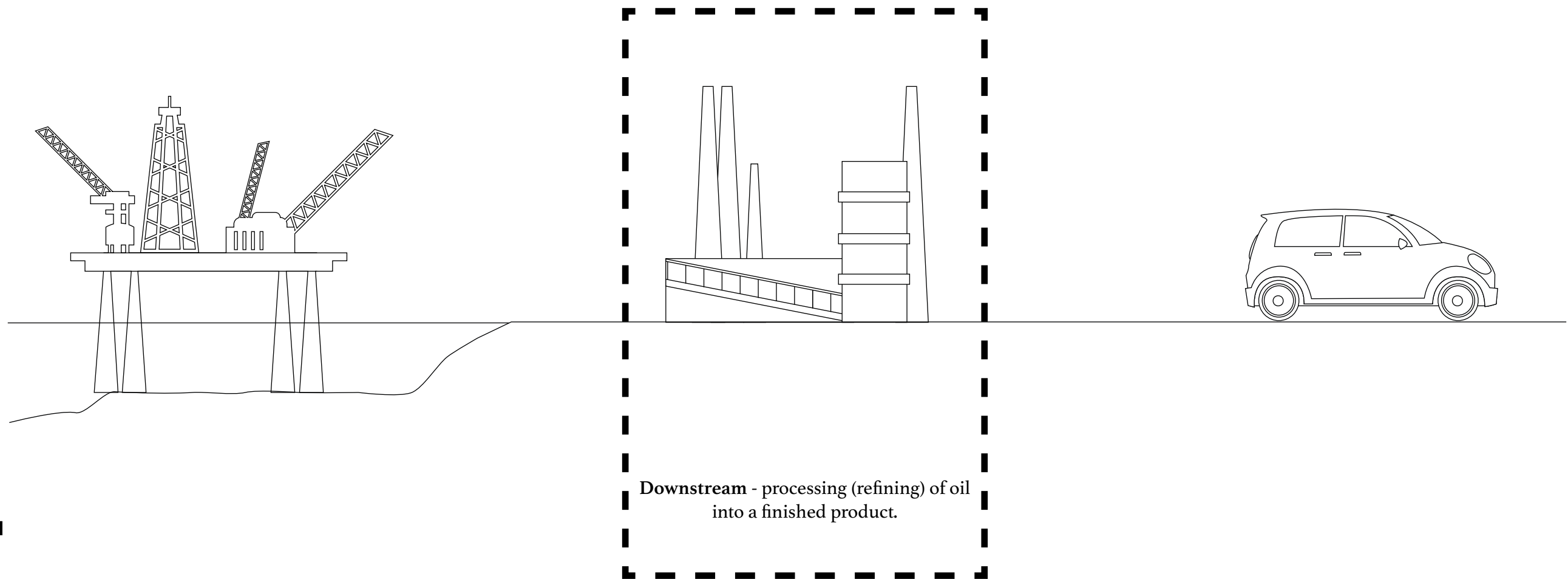
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# MONGSTAD REFINERIES

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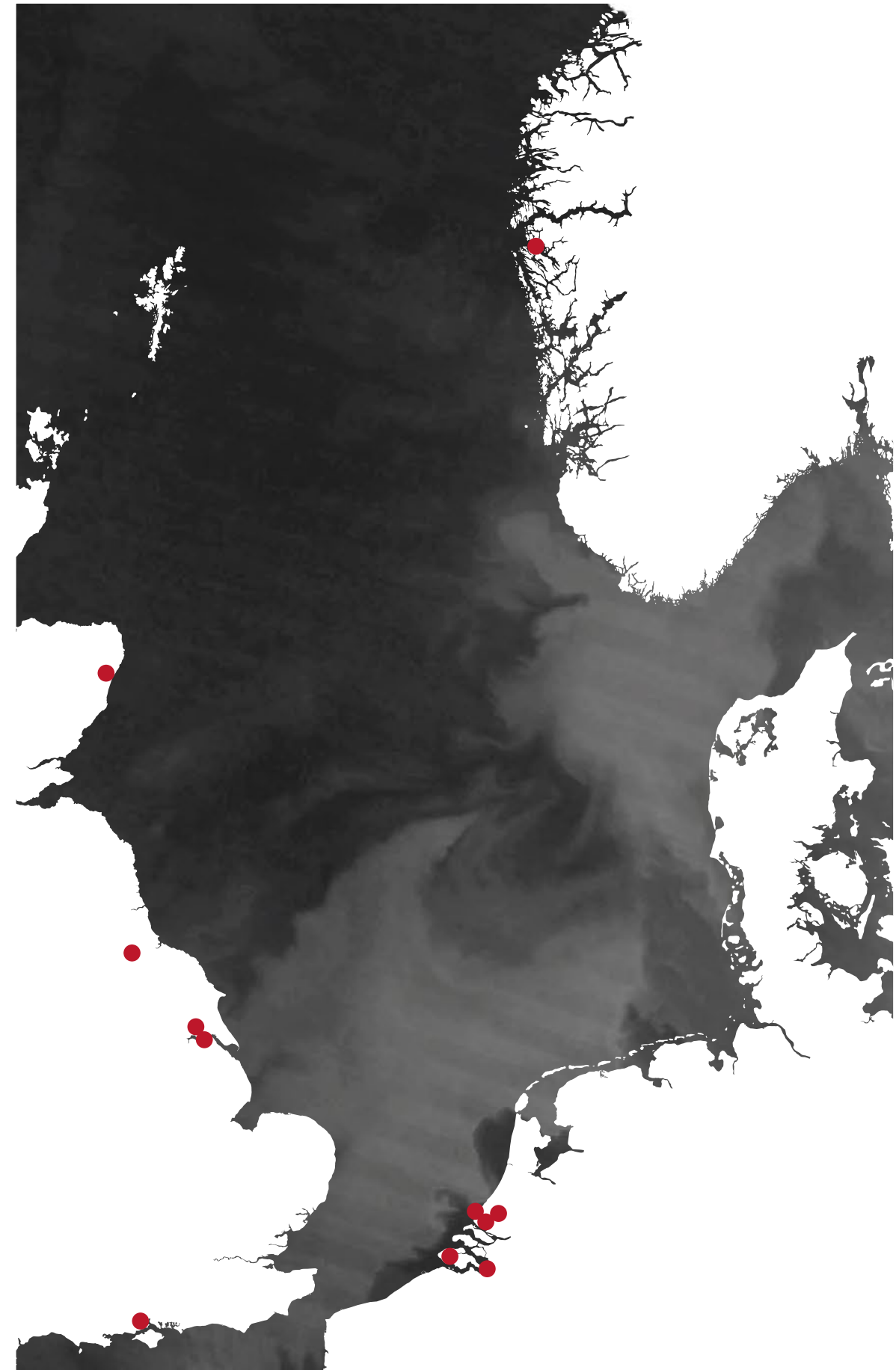
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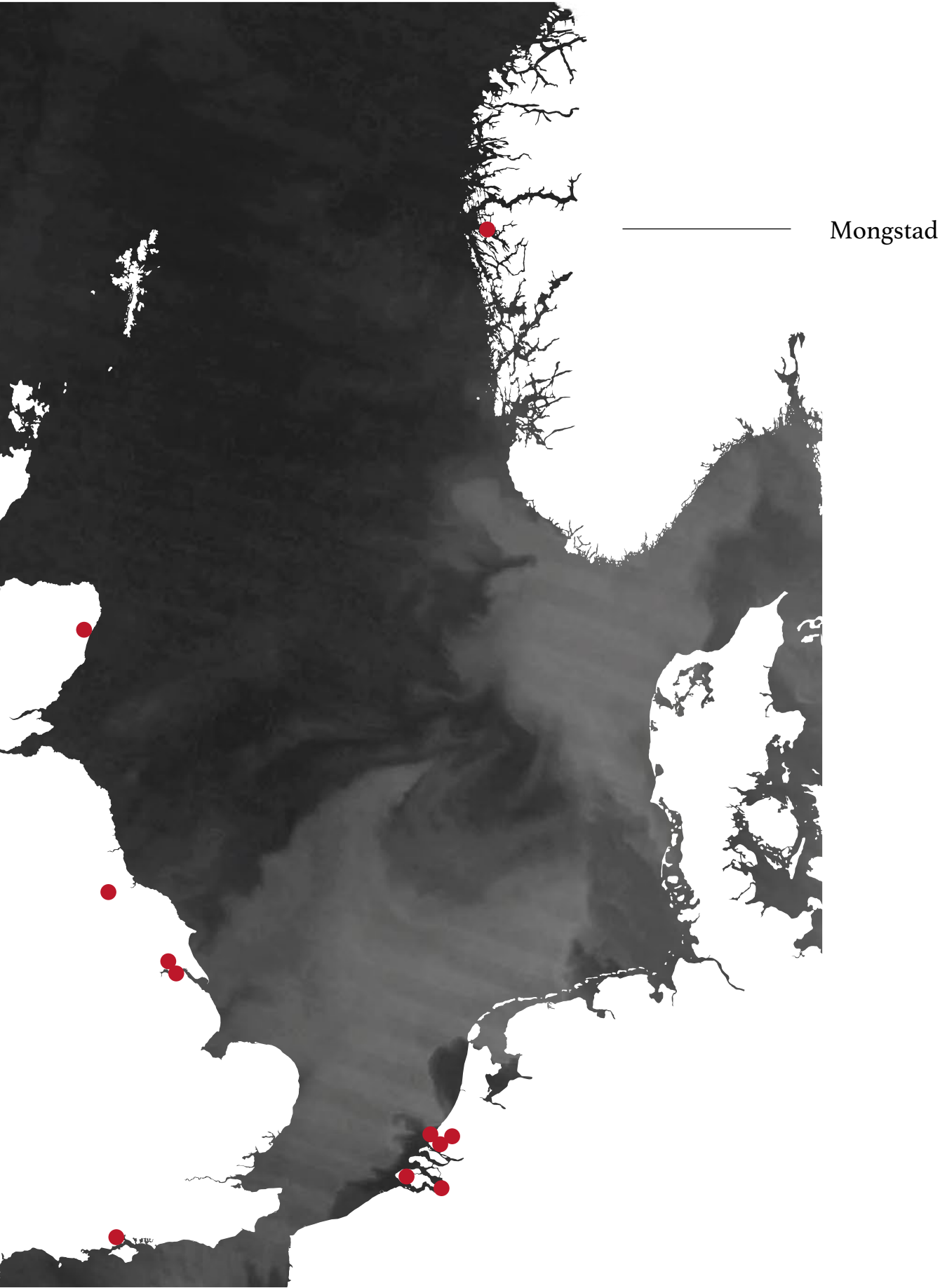
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# MONGSTAD

# GEOGRAPHIC

# SITUATION



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# MONGSTAD GEOGRAPHIC SITUATION

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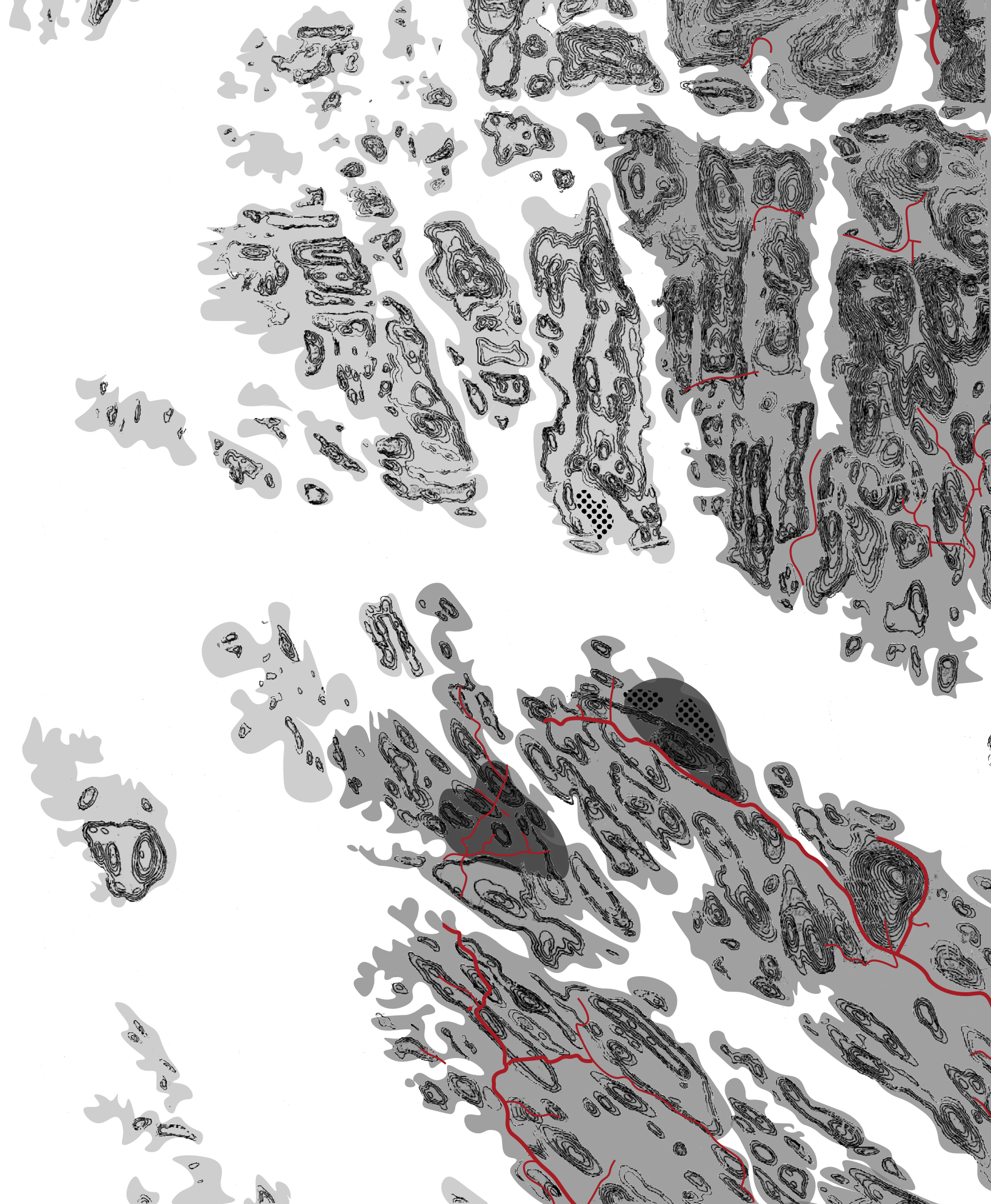
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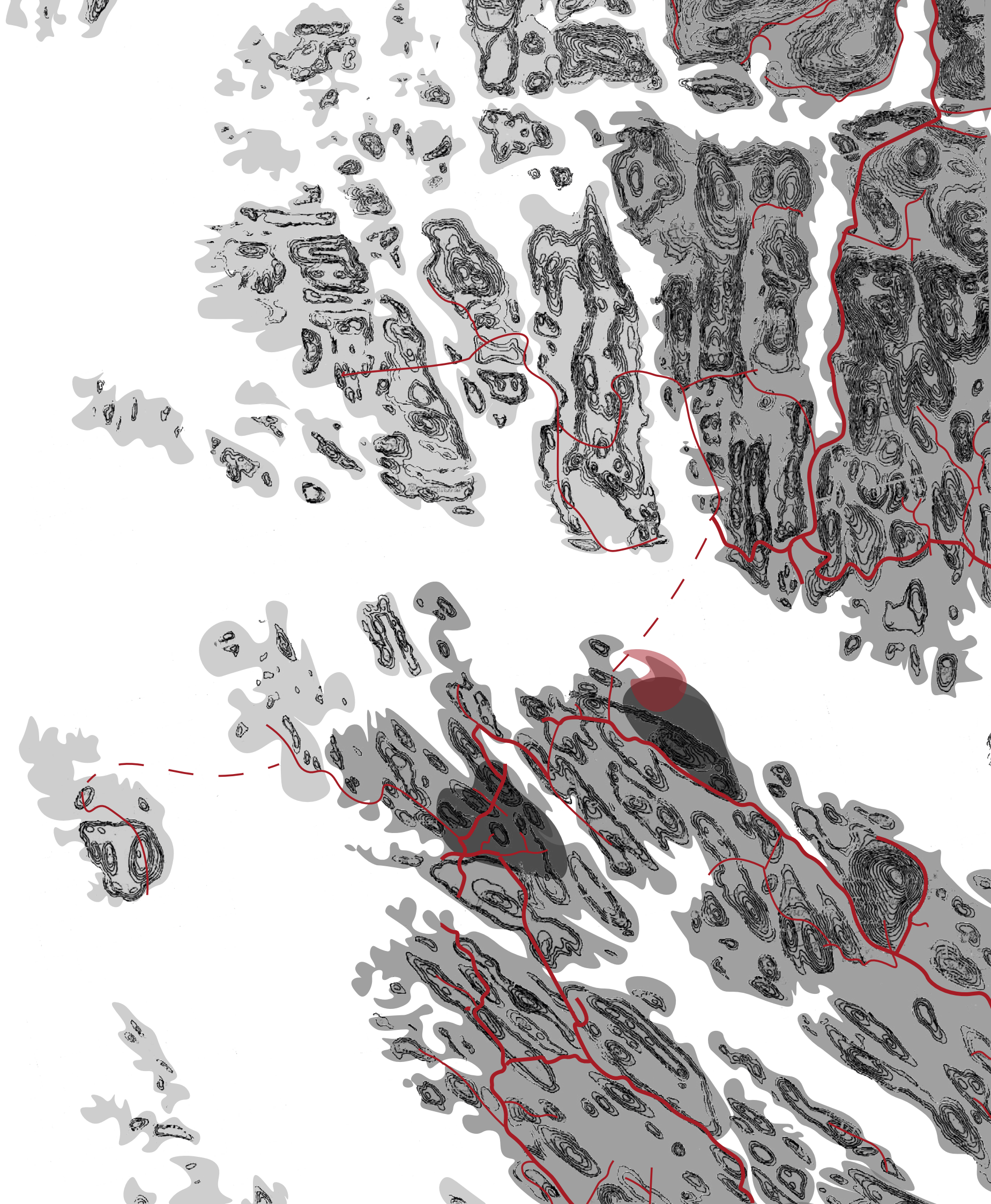
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troll 80 km



# MONGSTAD THE SITE

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# MONGSTAD SITE VISIT



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# PROBLEM STATEMENT

## Problem

- Mongstad is still a strictly closed off territory;
- Little to no awareness of the scale of impact to environment;
- Pollution in direct context and worldwide.

## Potential

- Mongstad's aim at being a 'sustainable' pioneer;
- Being well connected to sea and mainland;
- Beautifully located in the Fennsfjorden.

While acknowledging that the future of the oil industry is very uncertain.

# RESEARCH QUESTION

How to facilitate a transition in time, function and space within the scope of the Mongstad refinery and its potential future?

1. How to support a productive, yet more sustainable future for Mongstad?
2. How can different geographical conditions be enhanced within and connected by one infrastructural architectural intervention?
3. How to cause people to critically reflect on oil as an important source of income for Norway?

Creating a flexible building,  
which bridges the gap between

land and water,

industry and nature,

oil and post-oil,

pollution and sustainability,

perception and reality.

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An aerial photograph of a coastal region. A small town with a grid-like street pattern is situated on a narrow peninsula or coastal strip. The surrounding area is characterized by dark, rugged terrain, possibly volcanic or heavily forested, with numerous small, irregularly shaped landmasses and inlets. The water is a deep, dark blue-grey color. The overall scene is captured from a high angle, providing a clear view of the town's layout and its relationship to the surrounding landscape.

# II - PROJECT



# LINE

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PRODUCTION  
HEAVY WORK



RESEARCH  
INNOVATION



SEA

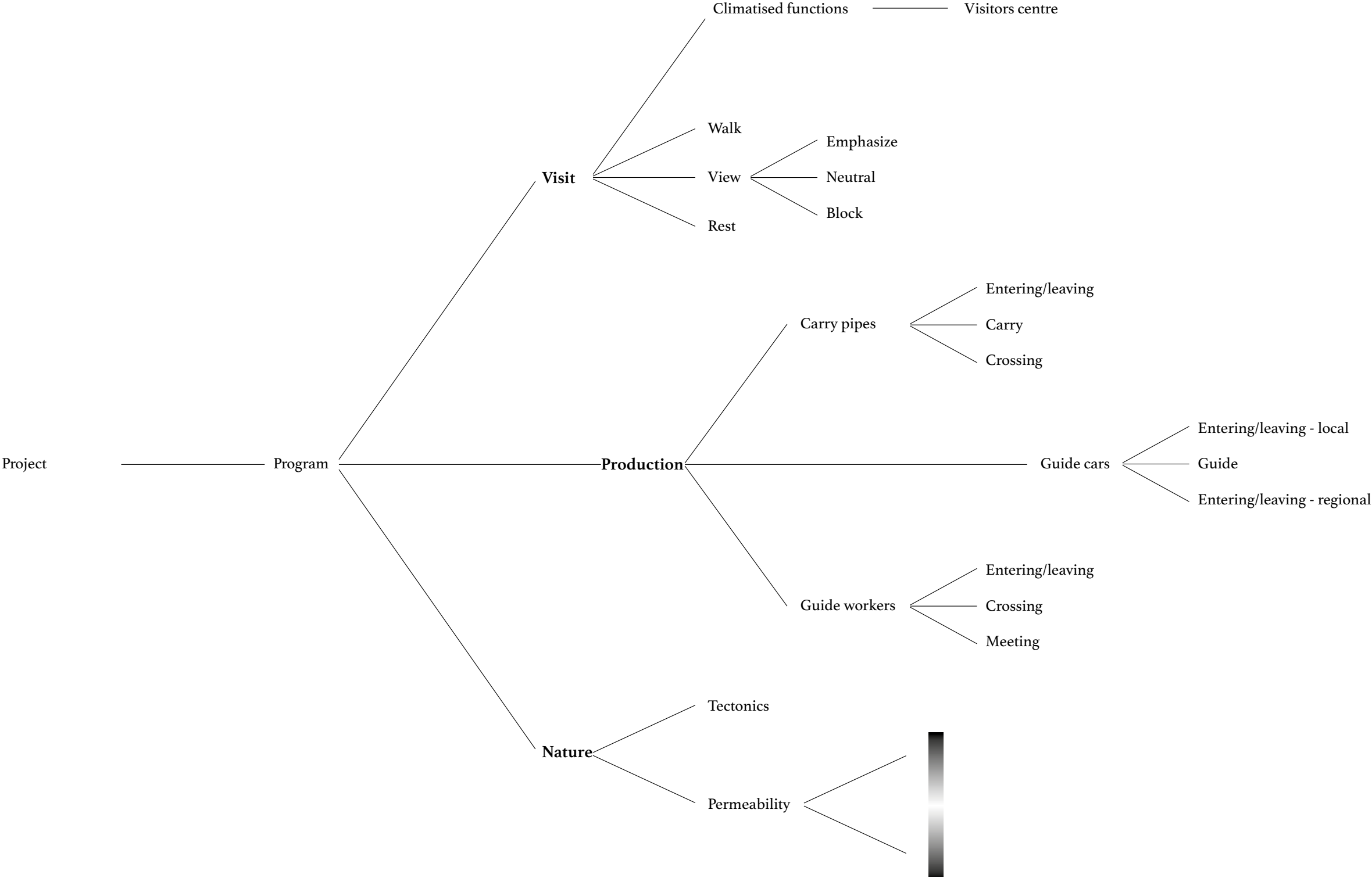
BORDER

MOUNTAINS





# LINE PROGRAM



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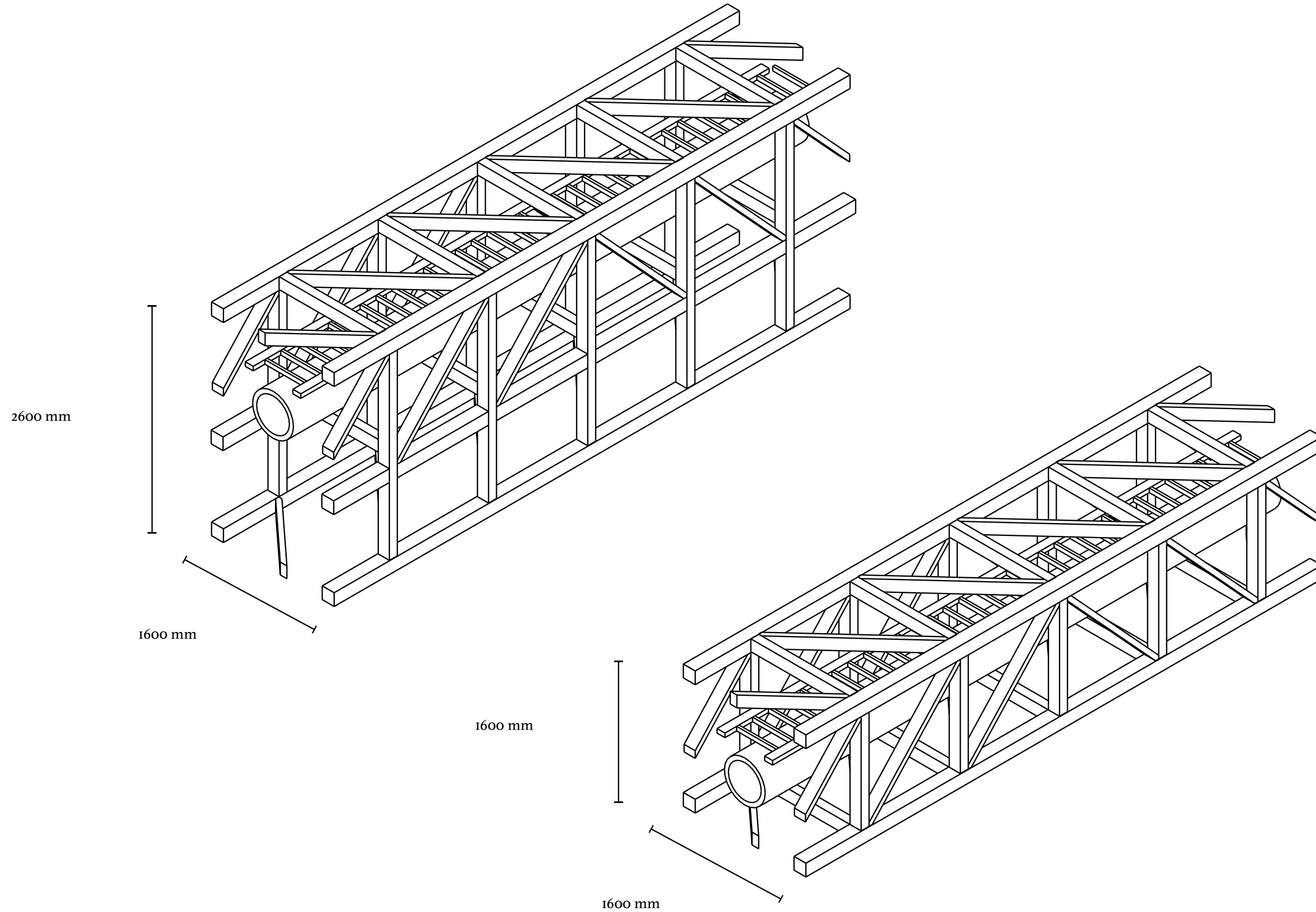
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# LINE SPATIALISE

# PRODUCTION



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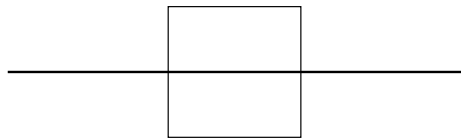
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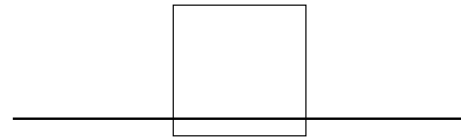
# LINE SPATIALISE

# NATURE

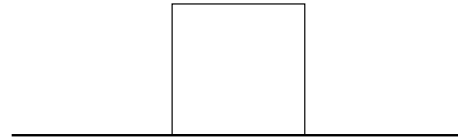
mountains



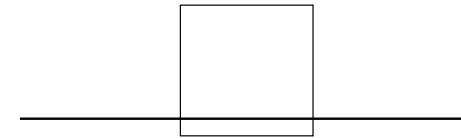
transition



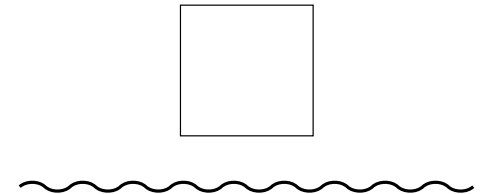
industrial land



transition



fjord



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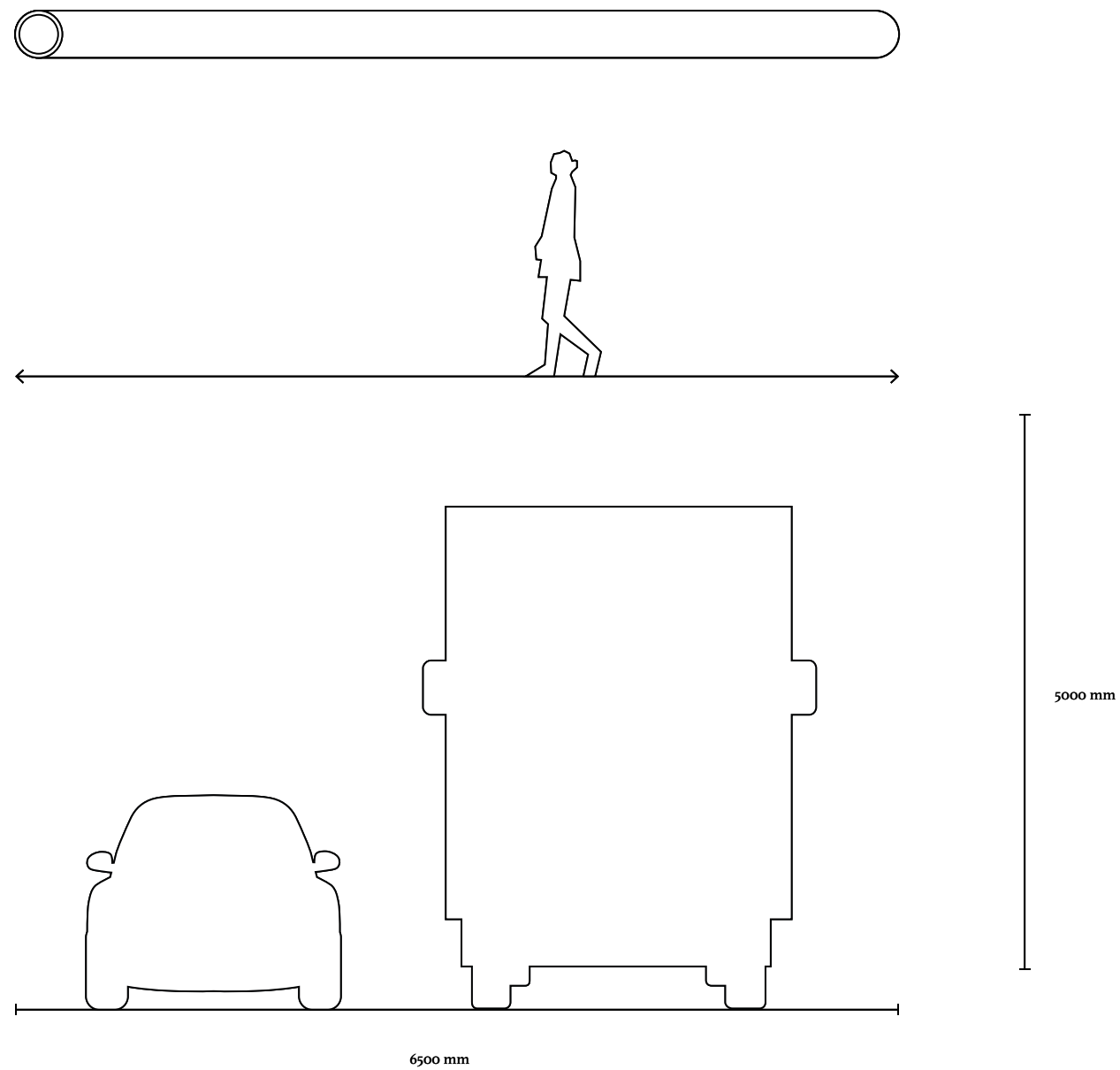
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# LINE SPATIALISE

# VISIT



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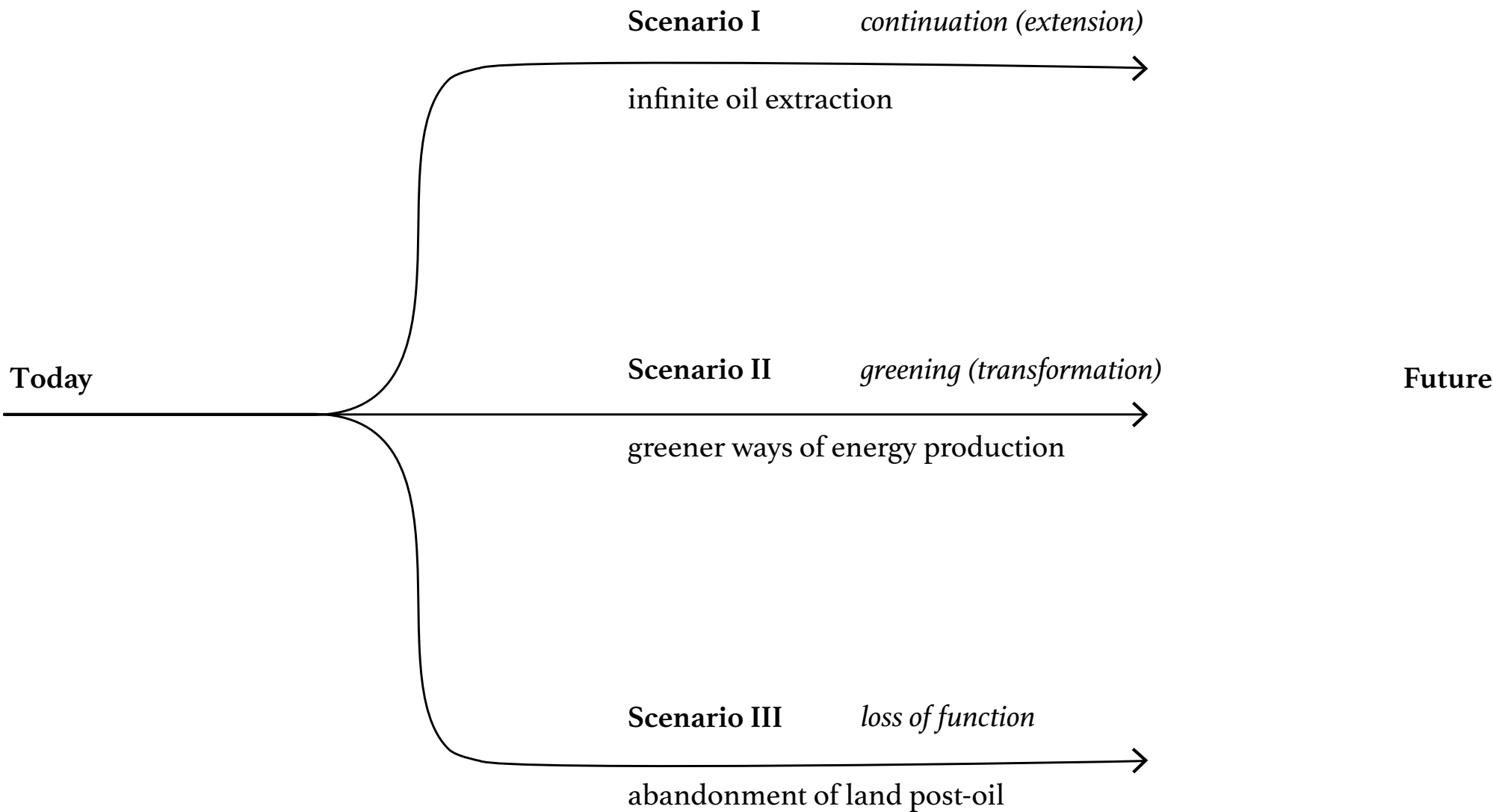
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# INFRASTRUCTURE SCENARIO'S



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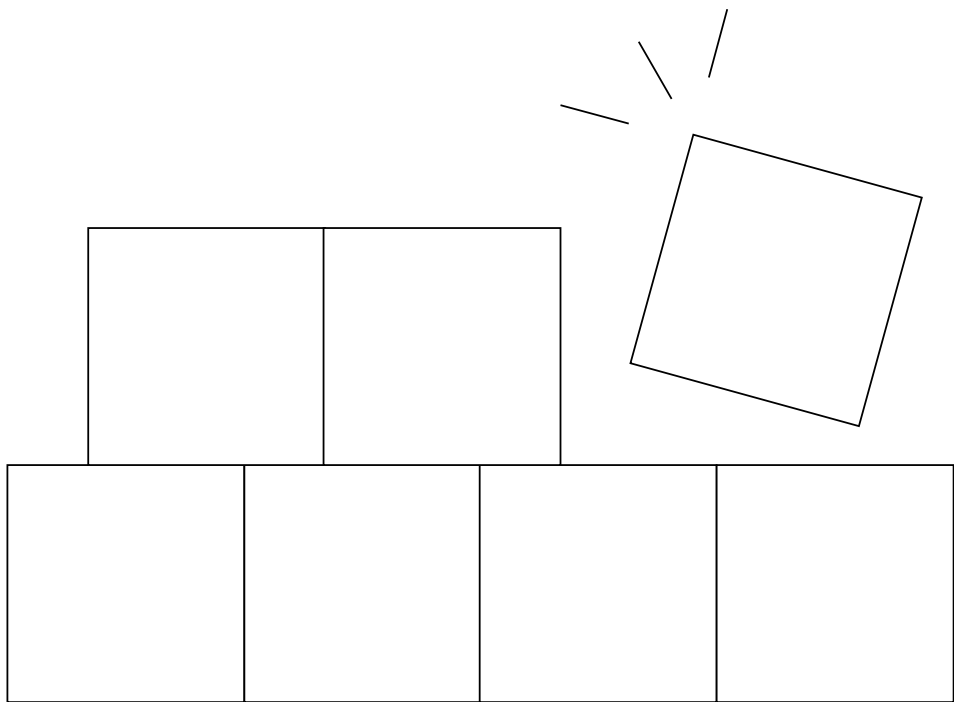
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# INFRASTRUCTURE MODULARITY



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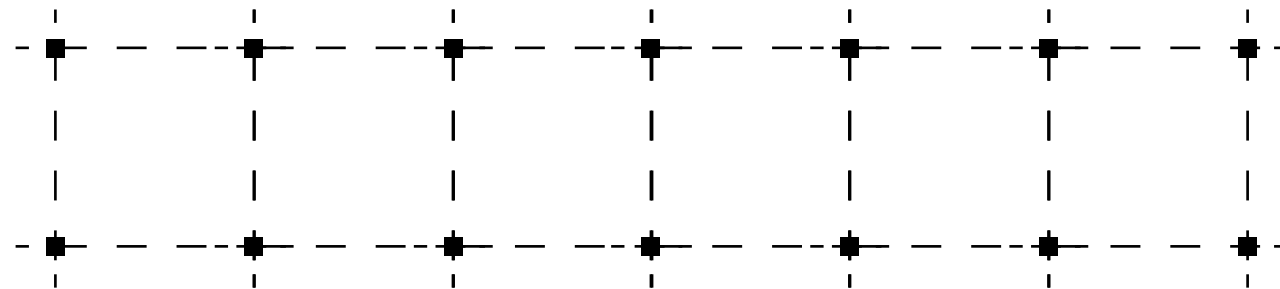
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# INFRASTRUCTURE MODULARITY



*“setting down traces of an architectural infrastructure that allows for flexible development to take place (...); a directed field within which the future life of the site can unfold” - Stan Allen*

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# INFRASTRUCTURE

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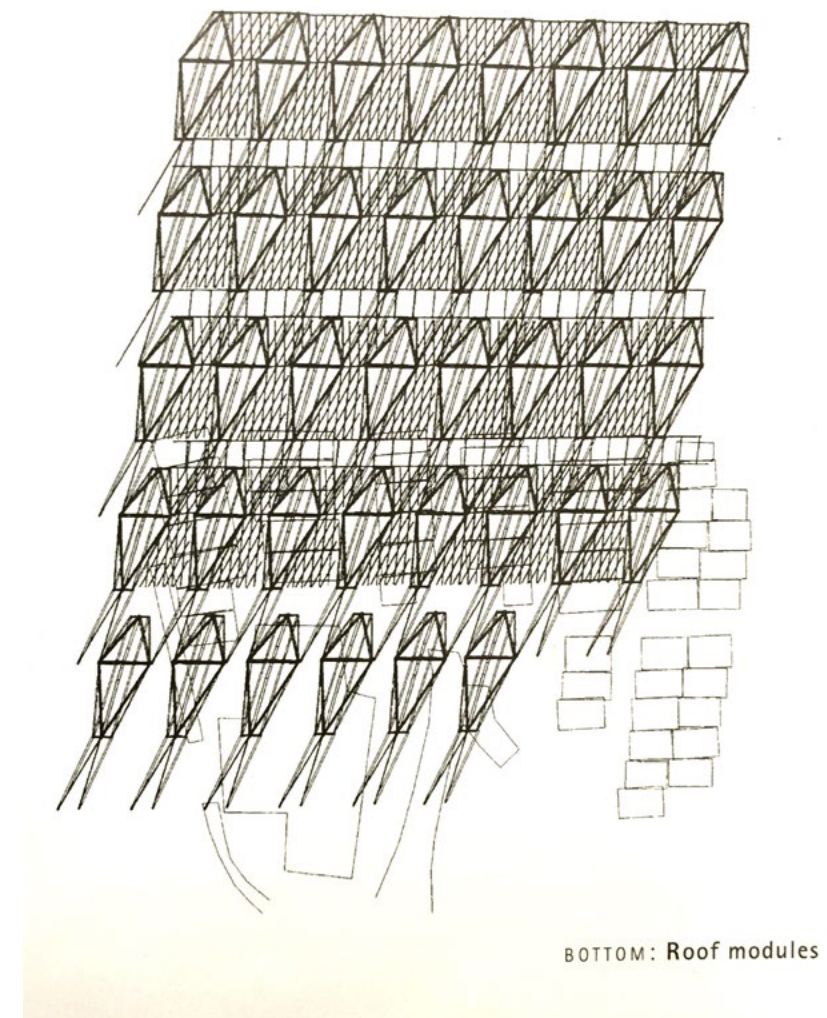
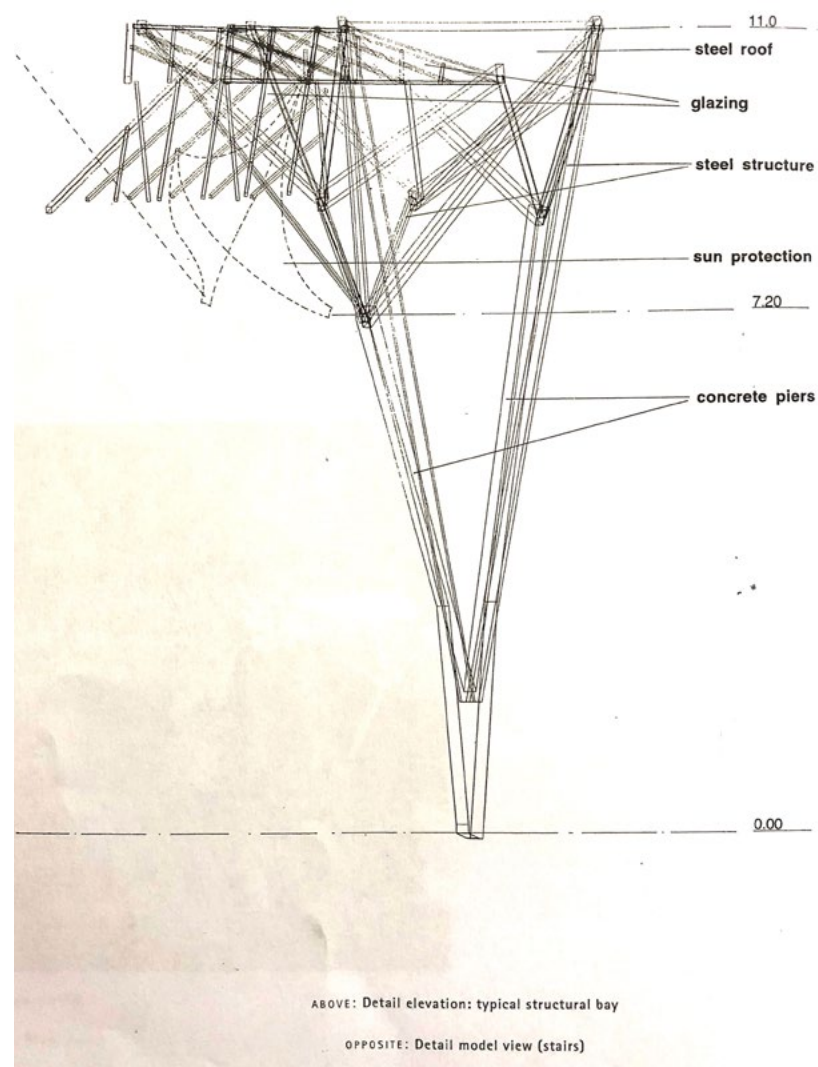
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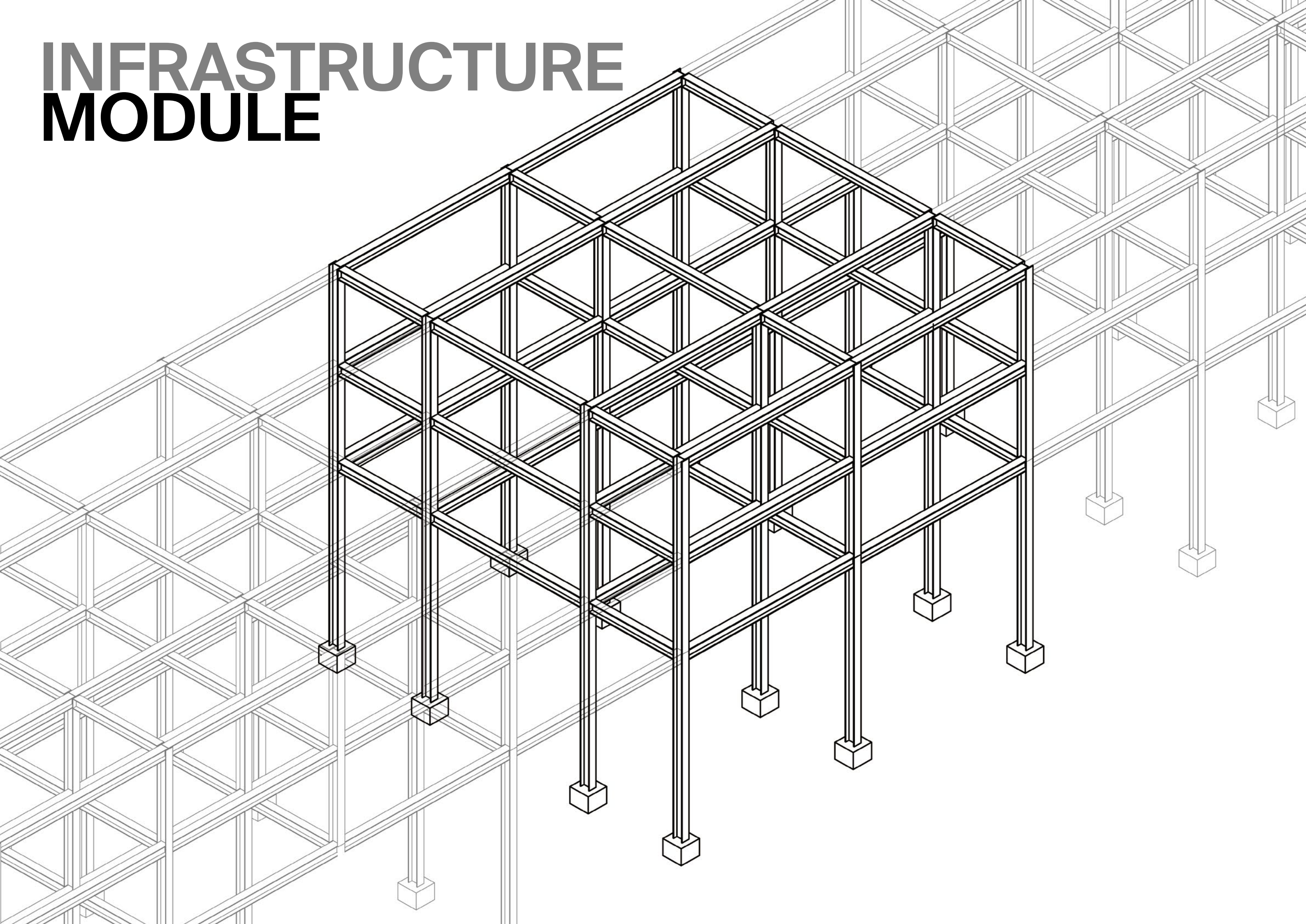
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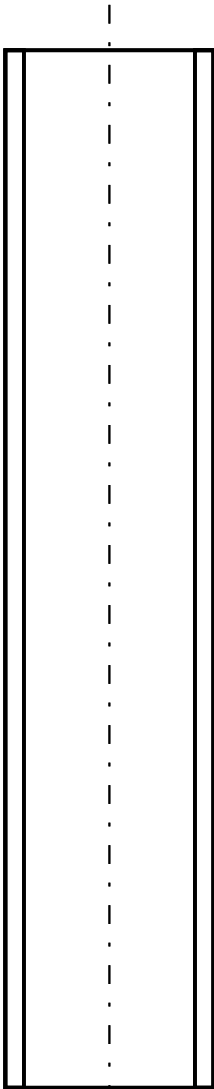


# INFRASTRUCTURE MODULE





# INFRASTRUCTURE MODULE



360

## I RESEARCH

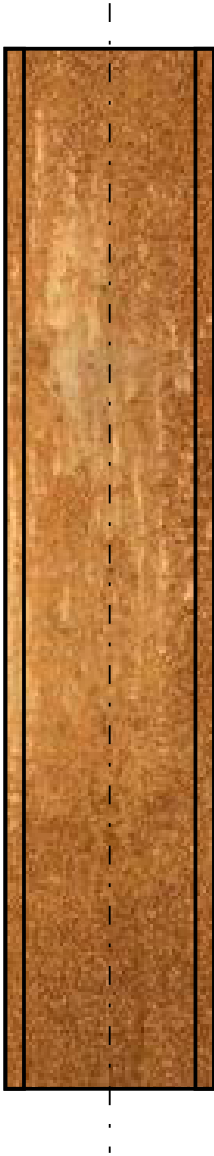
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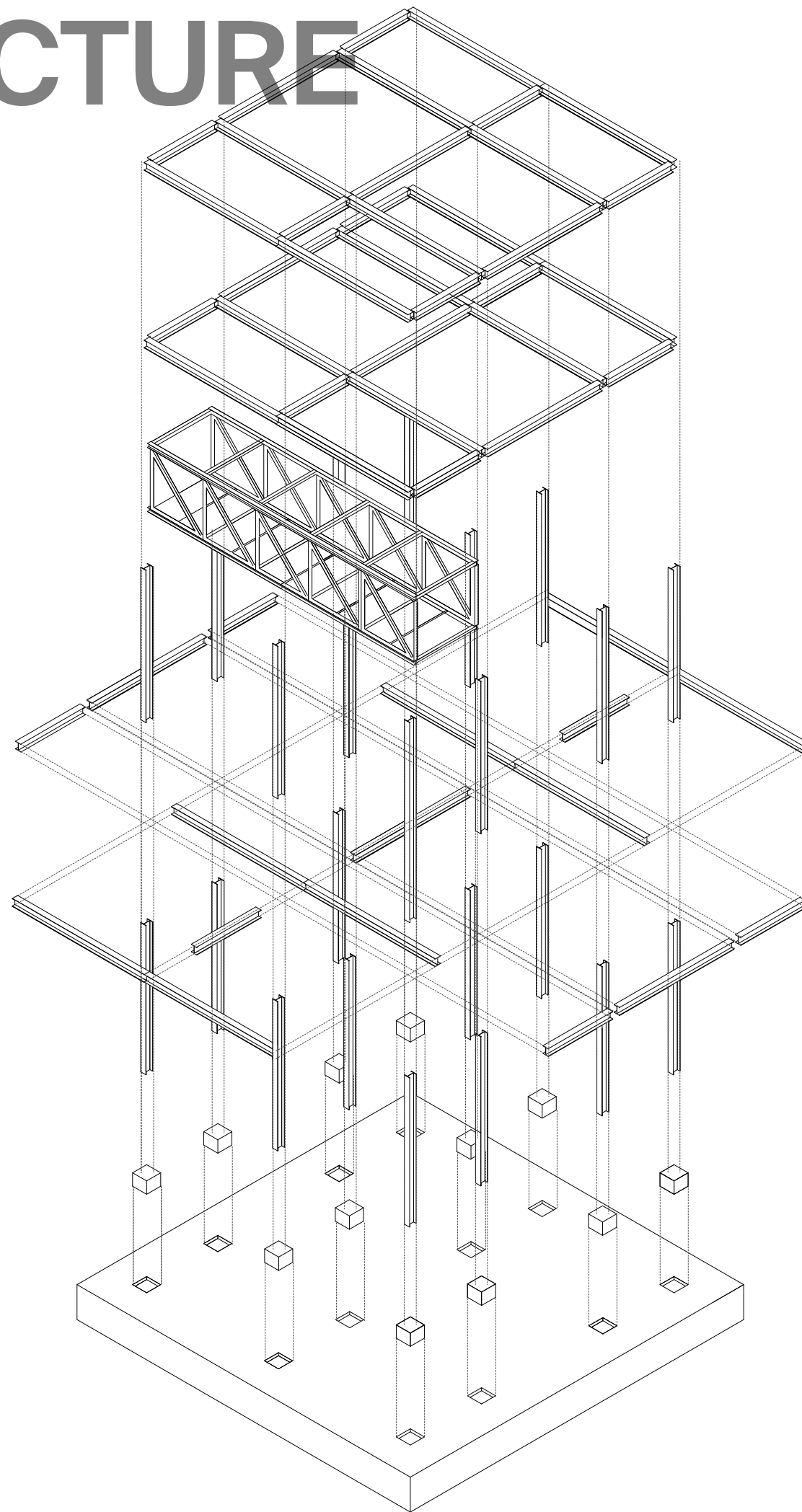
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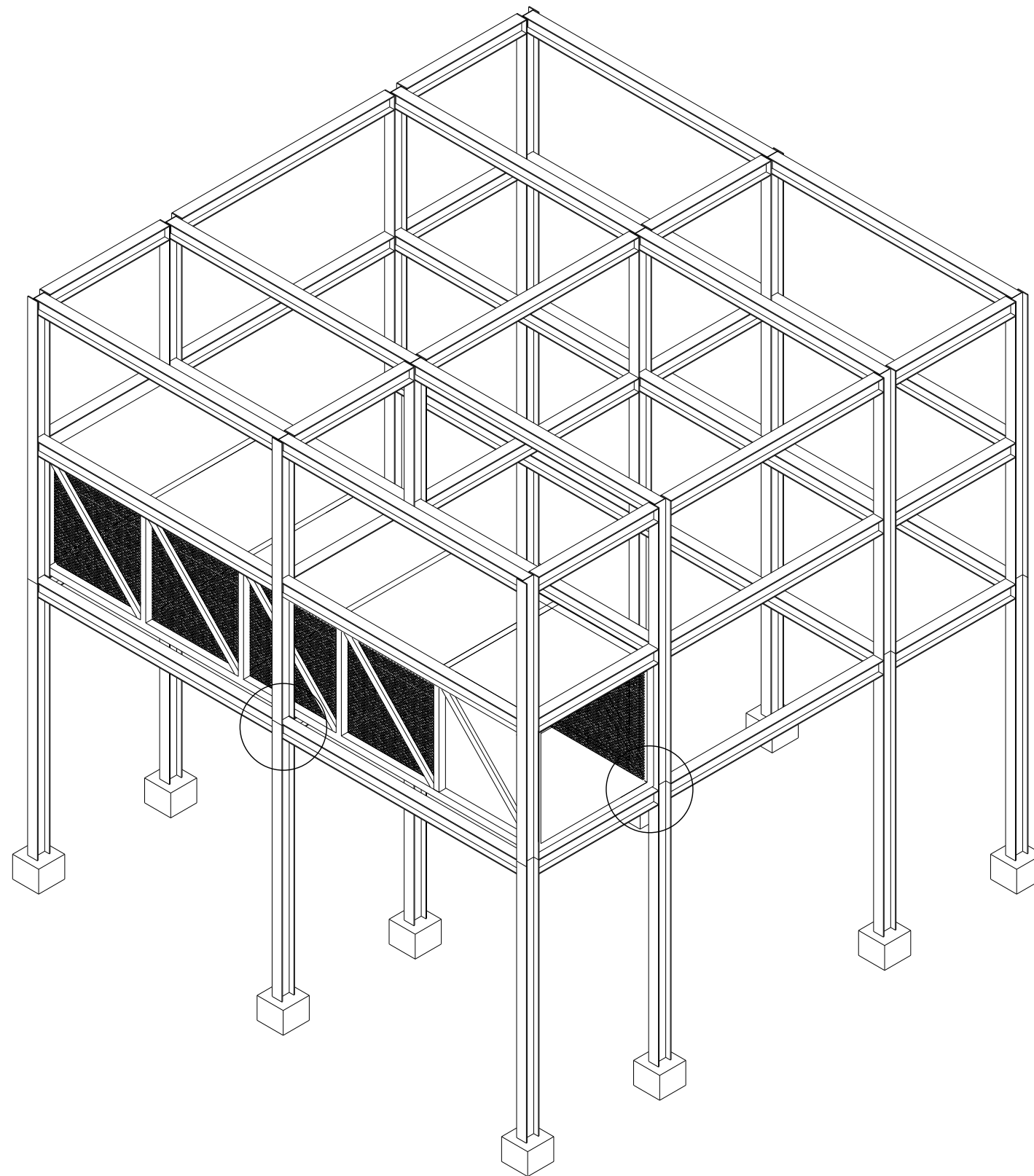
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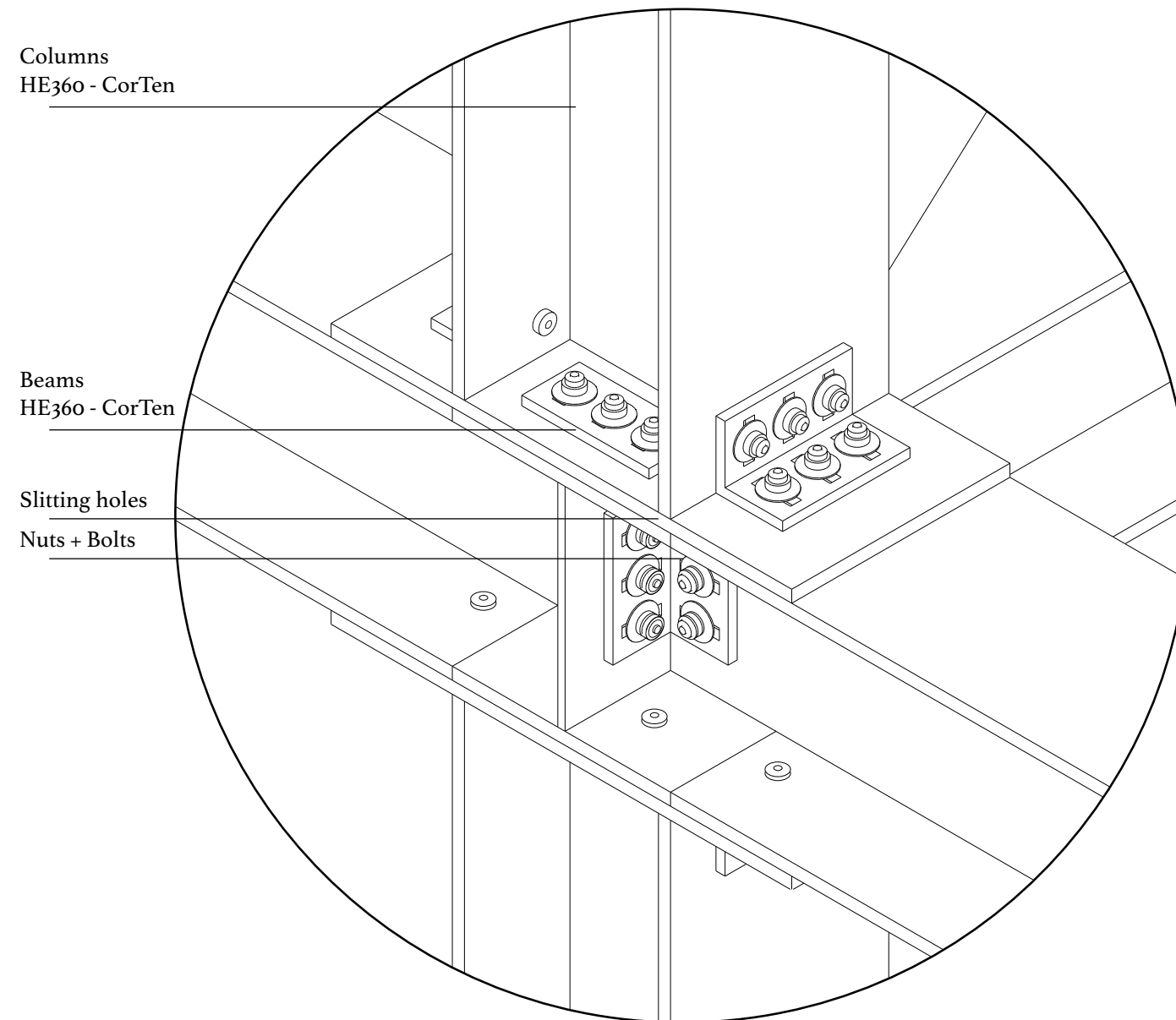
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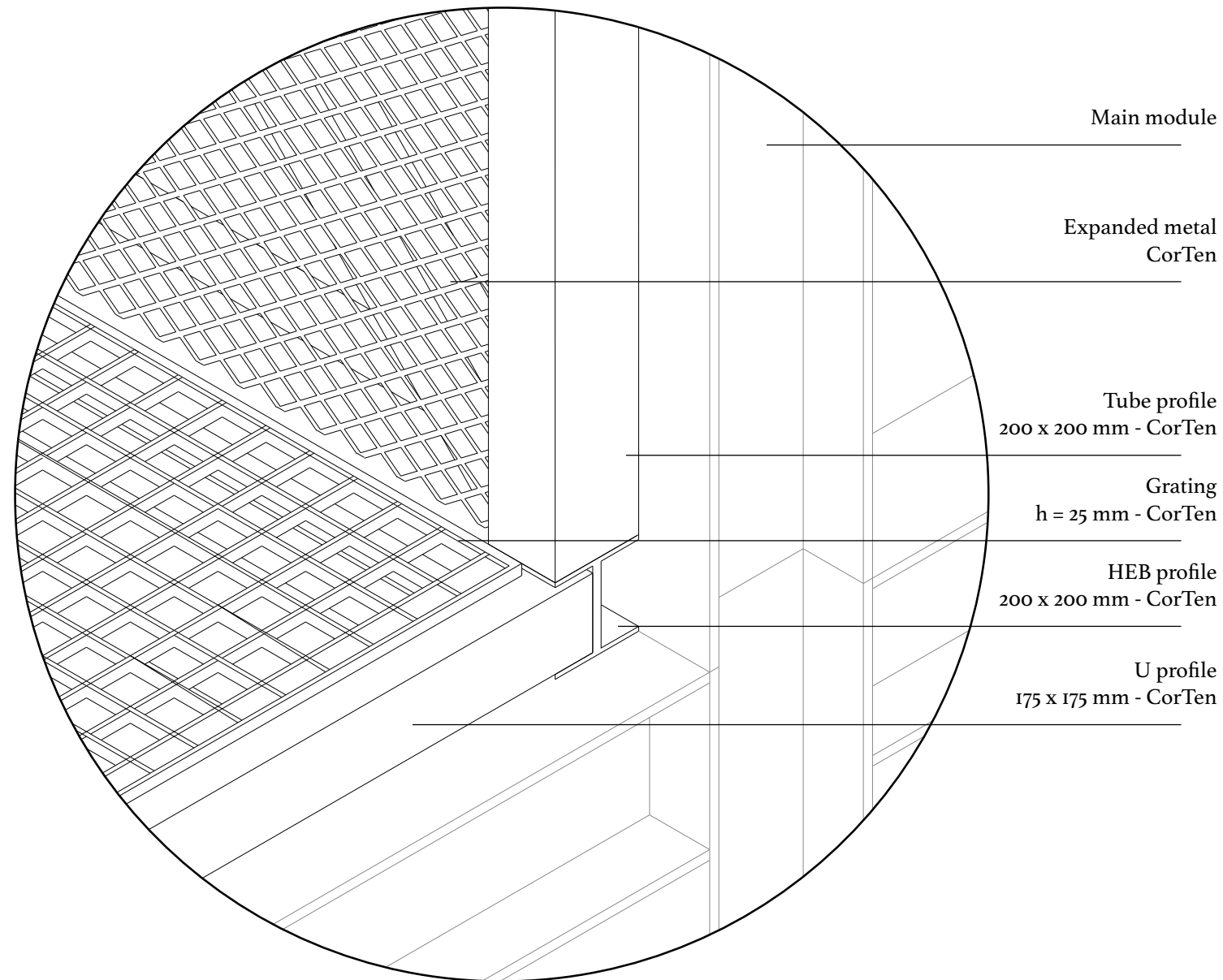
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Norway  
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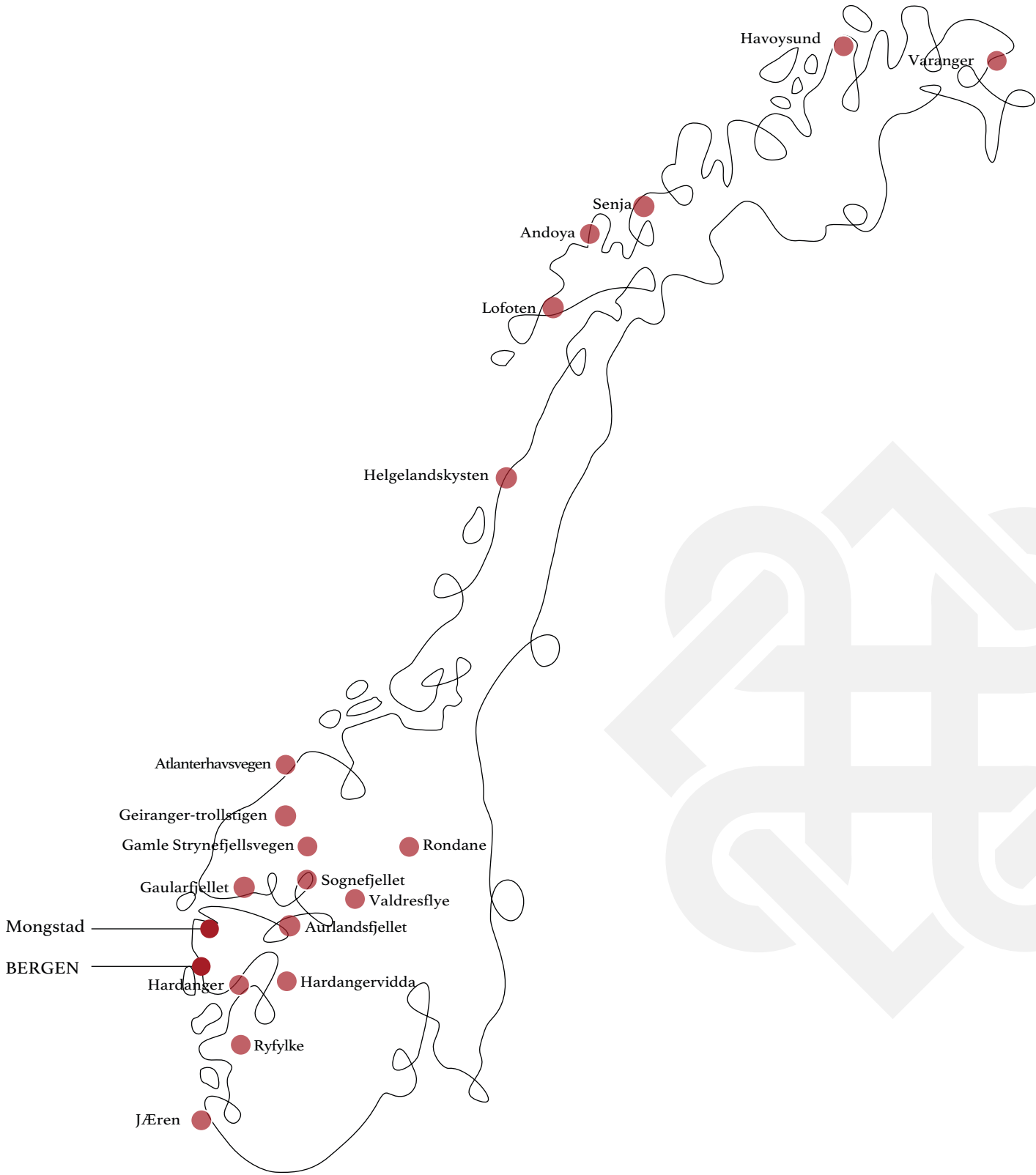
Problem Statement /  
Research Question

## II PROJECT

Line  
Infrastructure  
Masterplan

## III EXPERIENCE

# MASTERPLAN VISIT



## I RESEARCH

- North Sea
- Norway
- Mongstad
- Problem Statement / Research Question

## II PROJECT

- Line
- Infrastructure
- Masterplan

## III EXPERIENCE



# MASTERPLAN CONCRETE



## I RESEARCH

North Sea  
Norway  
Mongstad

Problem Statement /  
Research Question

## II PROJECT

Line  
Infrastructure  
Masterplan

## III EXPERIENCE

# MASTERPLAN CONCRETE

## I RESEARCH

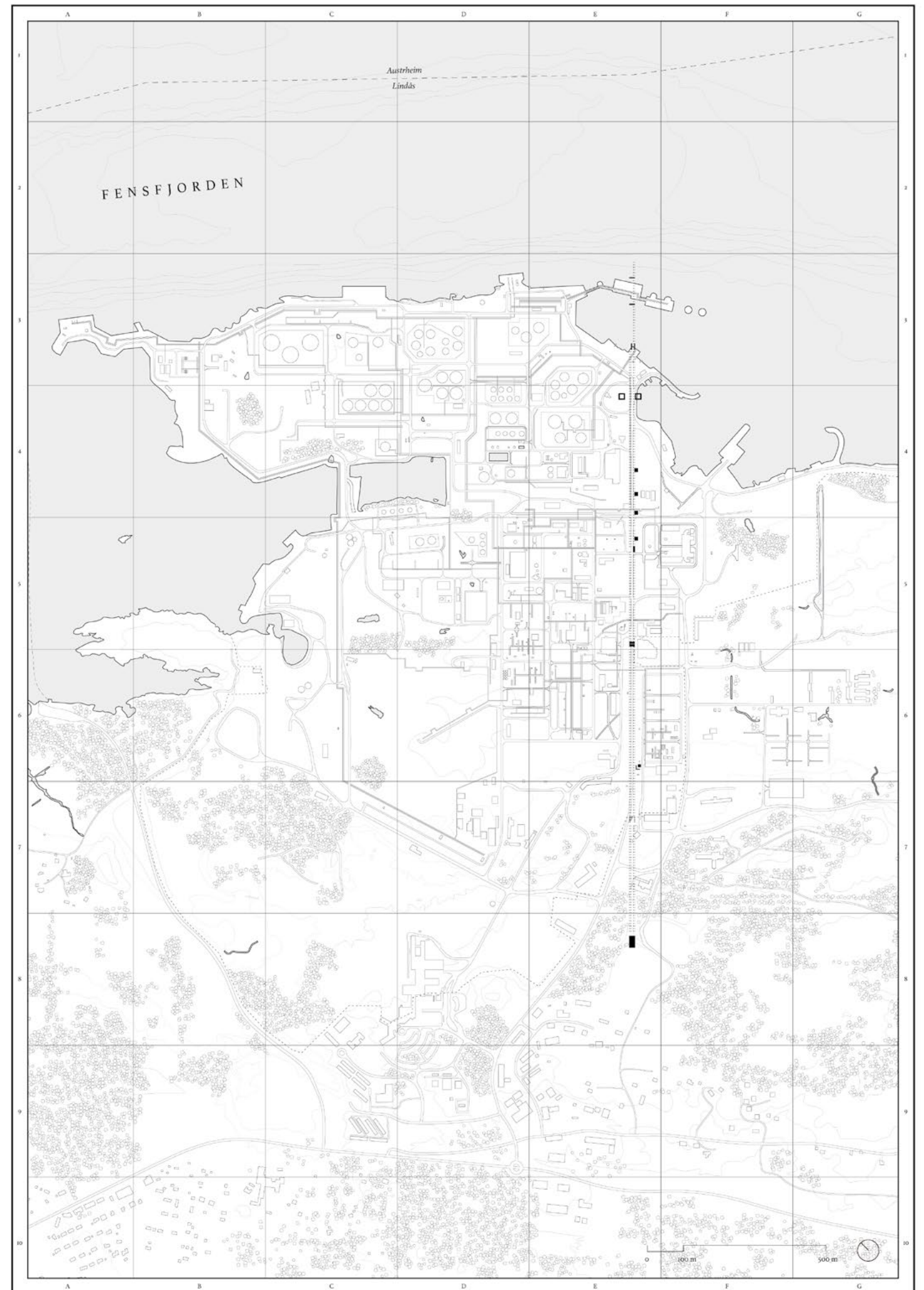
North Sea  
Norway  
Mongstad

Problem Statement /  
Research Question

## II PROJECT

Line  
Infrastructure  
Masterplan

## III EXPERIENCE





## I RESEARCH

North Sea  
Norway  
Mongstad

Problem Statement /  
Research Question

## II PROJECT

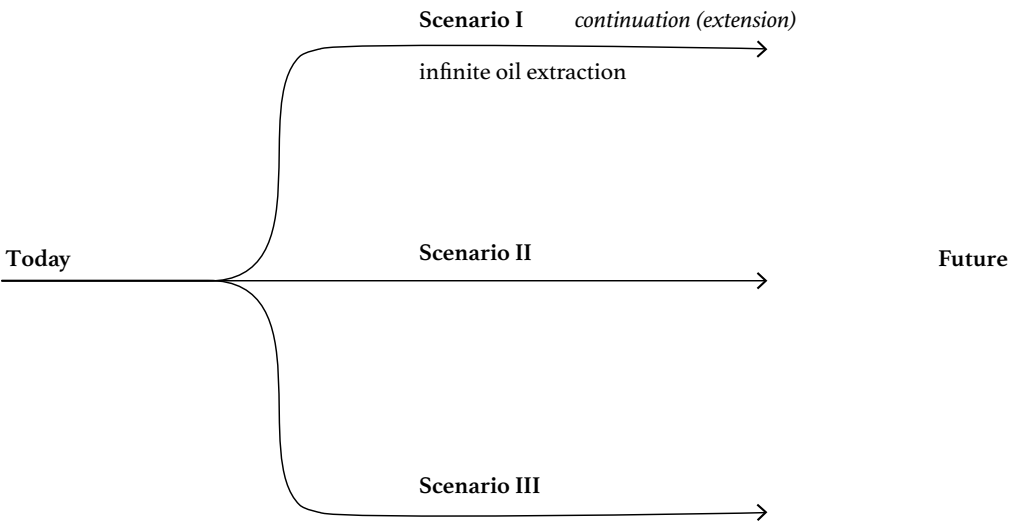
Line  
Infrastructure  
Masterplan

## III EXPERIENCE





# MASTERPLAN SCENARIO 1



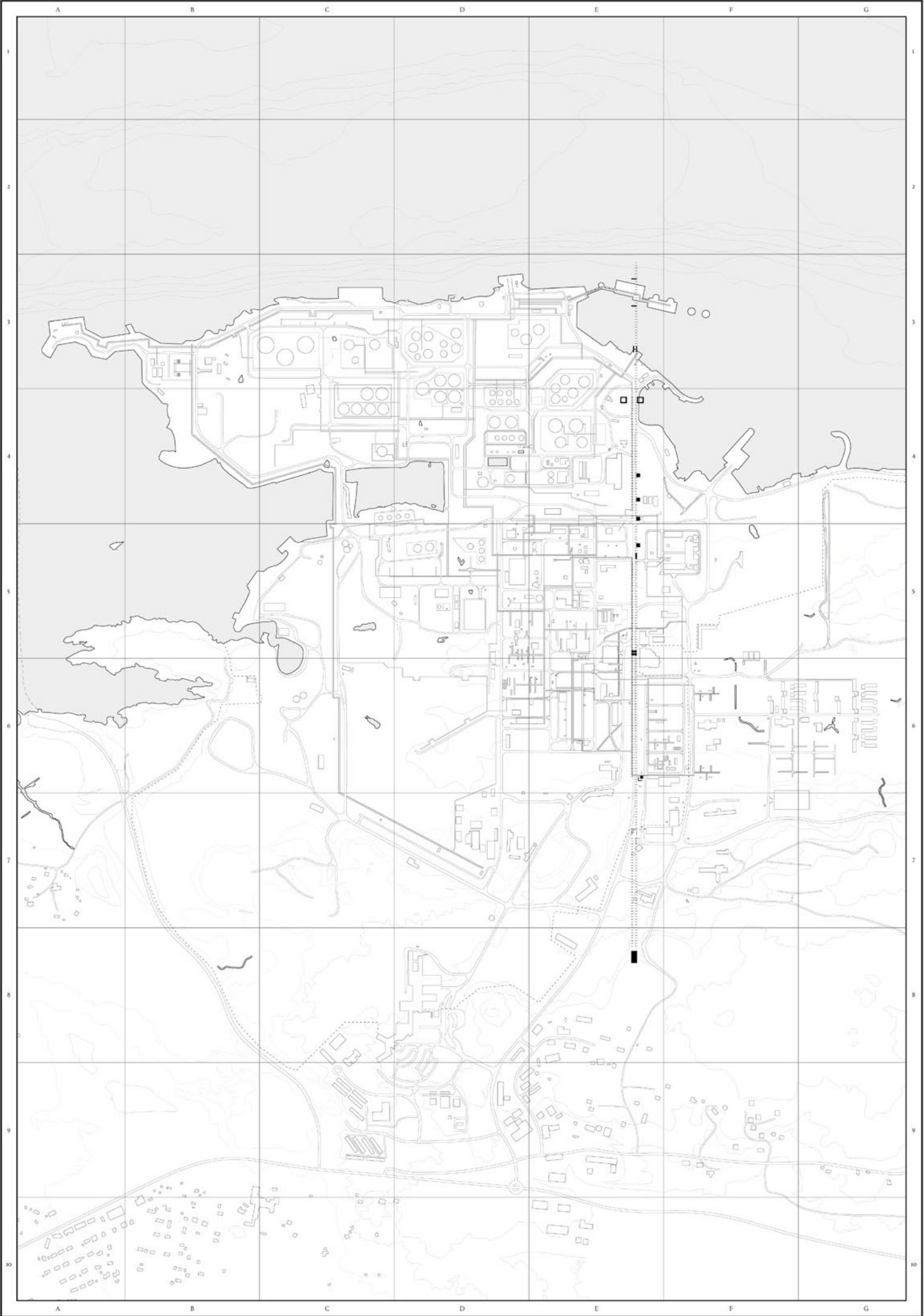
## I RESEARCH

North Sea  
Norway  
Mongstad  
Problem Statement /  
Research Question

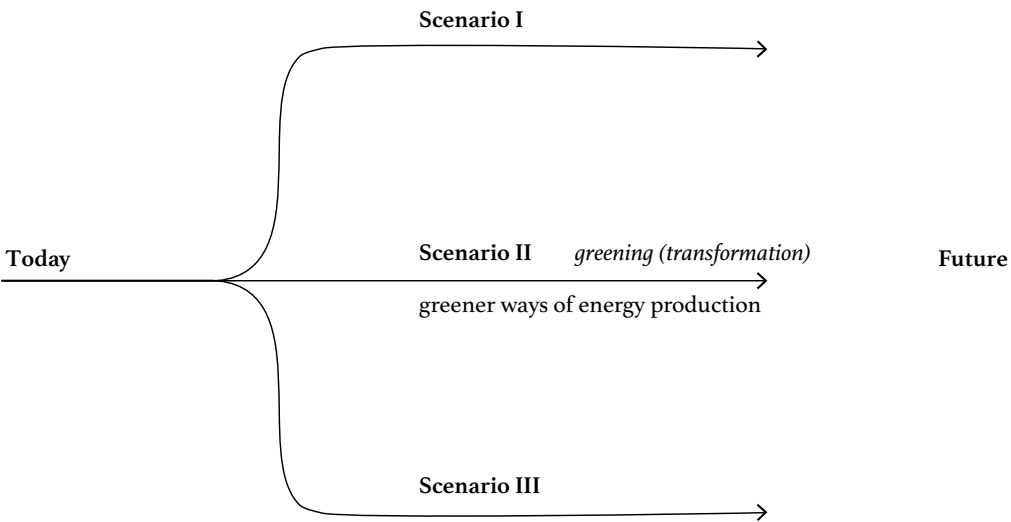
## II PROJECT

Line  
Infrastructure  
Masterplan

## III EXPERIENCE



# MASTERPLAN SCENARIO 2



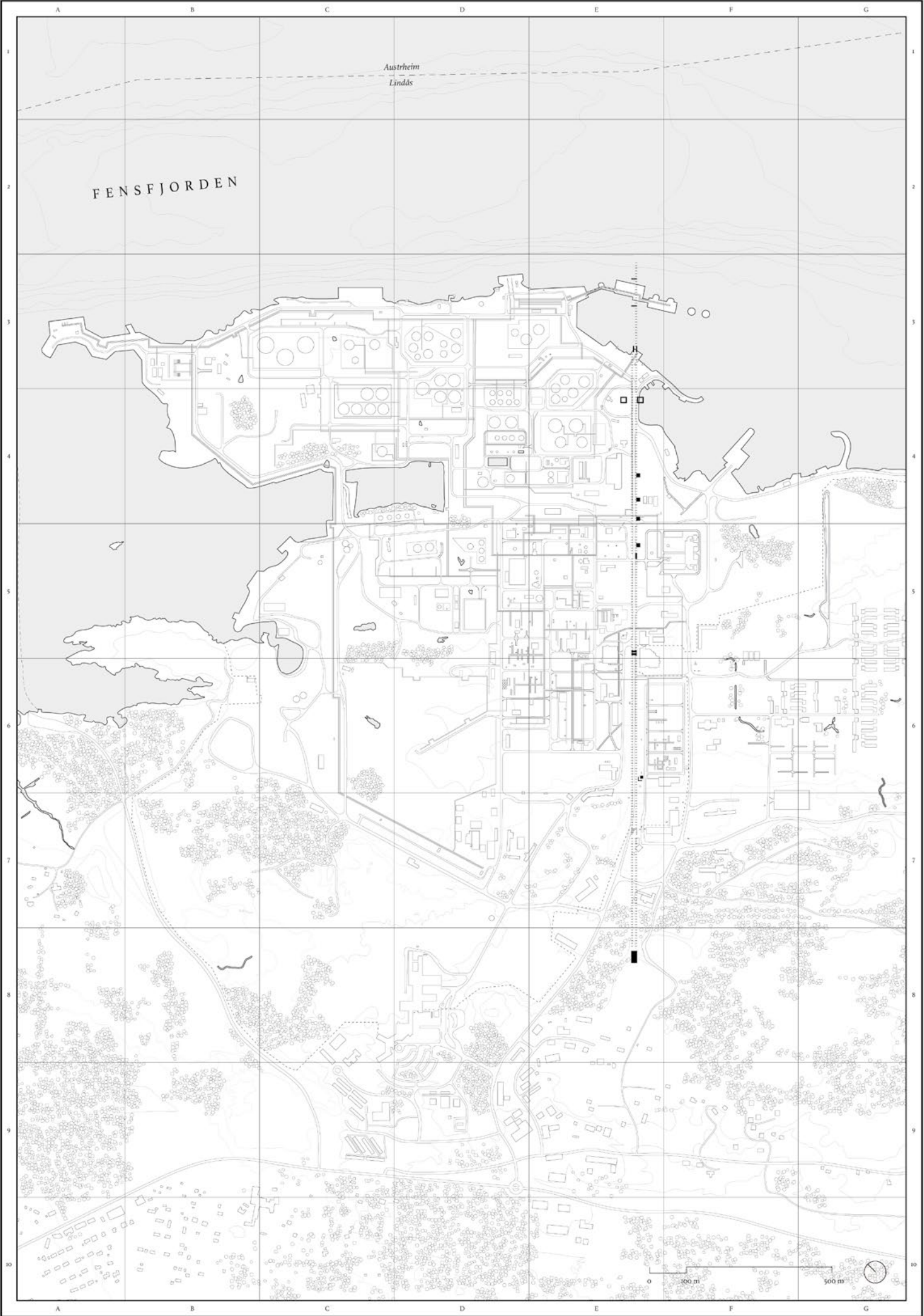
## I RESEARCH

North Sea  
Norway  
Mongstad  
Problem Statement /  
Research Question

## II PROJECT

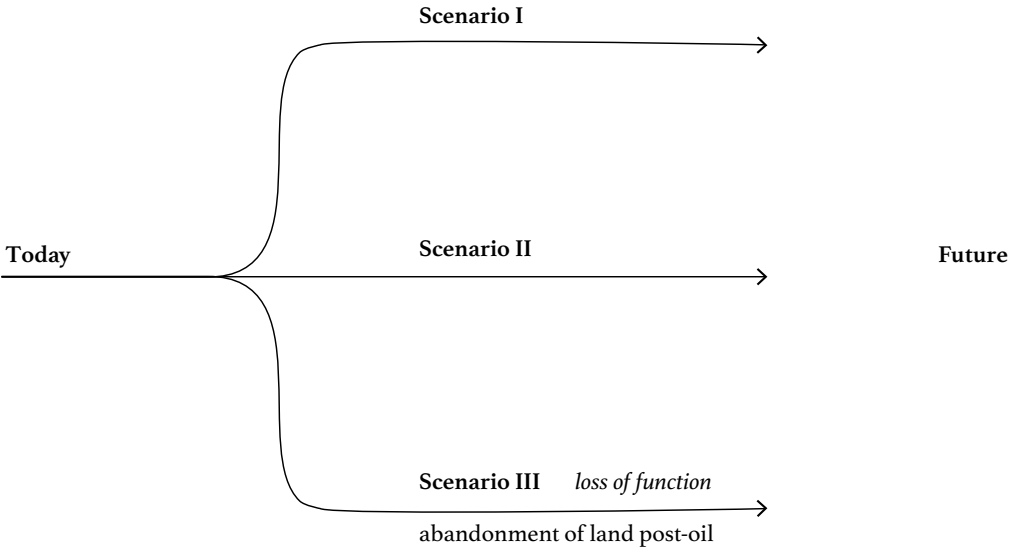
Line  
Infrastructure  
Masterplan

## III EXPERIENCE





# MASTERPLAN SCENARIO 3



I RESEARCH

- North Sea
- Norway
- Mongstad
- Problem Statement / Research Question

II PROJECT

- Line
- Infrastructure
- Masterplan

III EXPERIENCE



# MASTERPLAN CONCRETE

## Primary design rules

1. Only 90° or 45° angles
2. As minimal as possible
3. Grid: 3000 x 3000 x 3000 mm
4. Max dim 15000 x 15000 x 15000 mm
5. Symbolic element: concrete. Human element: steel
6. Visitor in enclosed space at all times

## Secondary design rules

- A. Loadbearing slabs 500 mm
- B. Secondary slabs 250 mm
- C. Window/ door openings 1 grid / 0.5 grid
- D. Narrow openings 300 mm \* ..

## Connection Infrastructure + Nodes

- A. Width steel path: 1500 mm ctc
- B. Height steel path: 3000 mm
- C. Distance to concrete: 0,5\*3000\*...

### I RESEARCH

North Sea  
Norway  
Mongstad

Problem Statement /  
Research Question

### II PROJECT

Line  
Infrastructure  
Masterplan

### III EXPERIENCE



# MASTERPLAN CONCRETE

	Tectonics	Relation to line	Focus on view	Stay / Continue	Service?	Experiential tools	Level of comfort	Comforting tools
I			+++	S/C			+++	
2			+	C	X		+	
3			+++	S			++	
4			++	S/C	X		+	
5			+++	S			+	
6			++	C	X		+	
7			+	S			++	
8			++	S/C	X		+	
9			+++	S	X		++	

- Directing view
- Framing view
- Directing visitor
- Roof/shelter
- Heated bench

## I RESEARCH

North Sea  
Norway  
Mongstad  
Problem Statement /  
Research Question

## II PROJECT

Line  
Infrastructure  
Masterplan

## III EXPERIENCE





# III - EXPERIENCE



## I RESEARCH

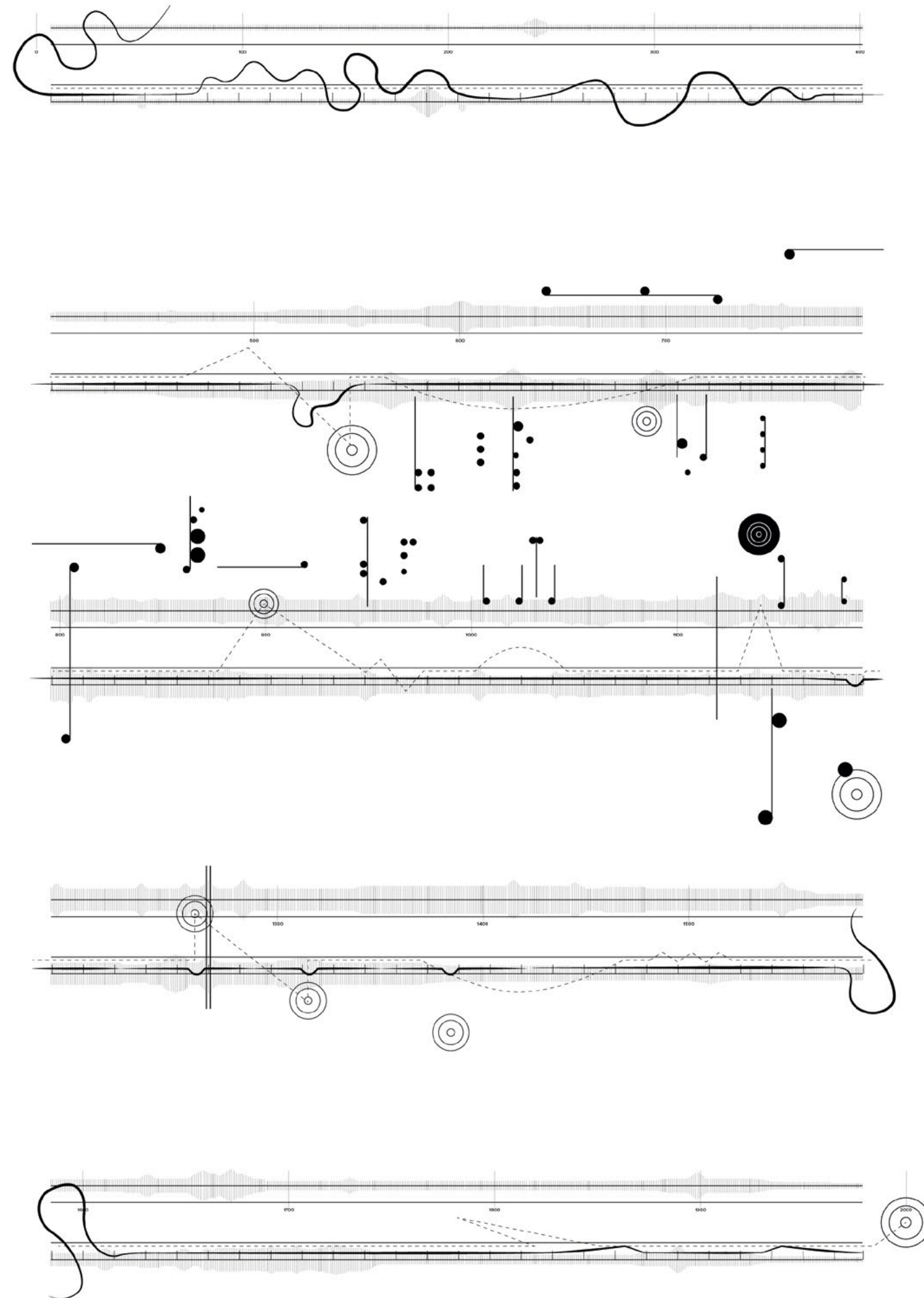
North Sea  
Norway  
Mongstad

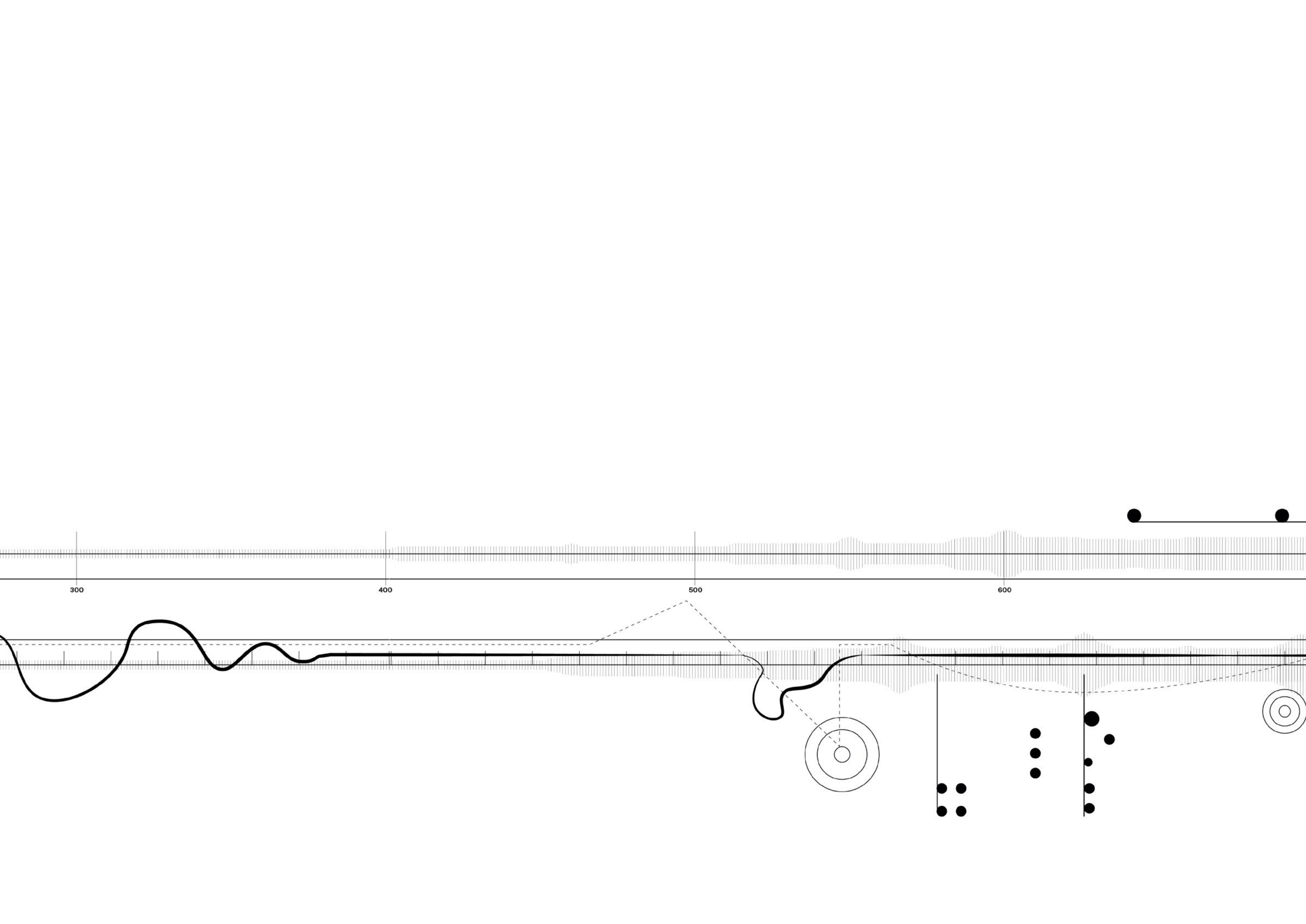
Problem Statement /  
Research Question

## II PROJECT

Line  
Infrastructure  
Masterplan

## III EXPERIENCE







# EXPERIENCE 9 NODES

## I RESEARCH

North Sea  
Norway  
Mongstad

Problem Statement /  
Research Question

## II PROJECT

Line  
Infrastructure  
Masterplan

## III EXPERIENCE





# EXPERIENCE

# 9 NODES

## I RESEARCH

North Sea  
Norway  
Mongstad  
Problem Statement /  
Research Question

## II PROJECT

Line  
Infrastructure  
Masterplan

## III EXPERIENCE

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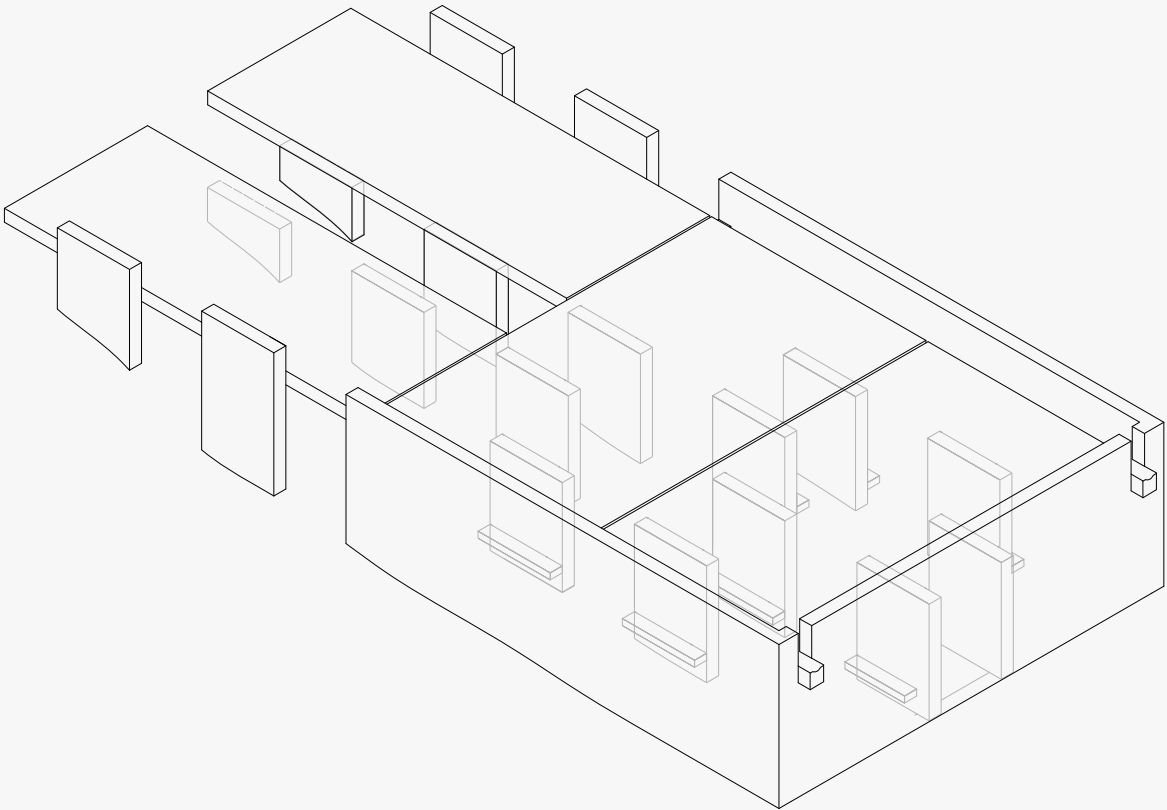
I





# EXPERIENCE

## 1 - VISITOR CENTRE



### I RESEARCH

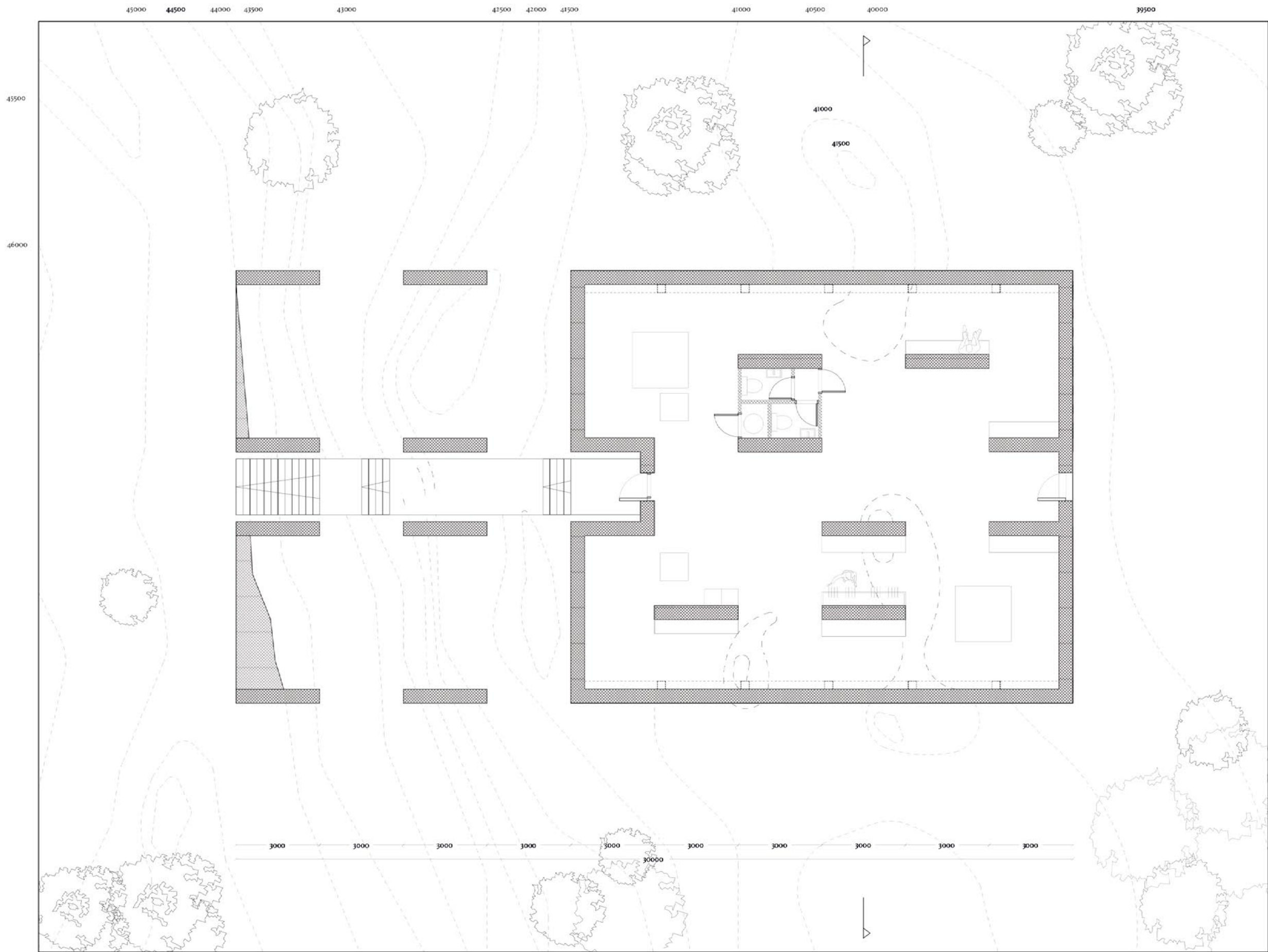
North Sea  
Norway  
Mongstad  
Problem Statement /  
Research Question

### II PROJECT

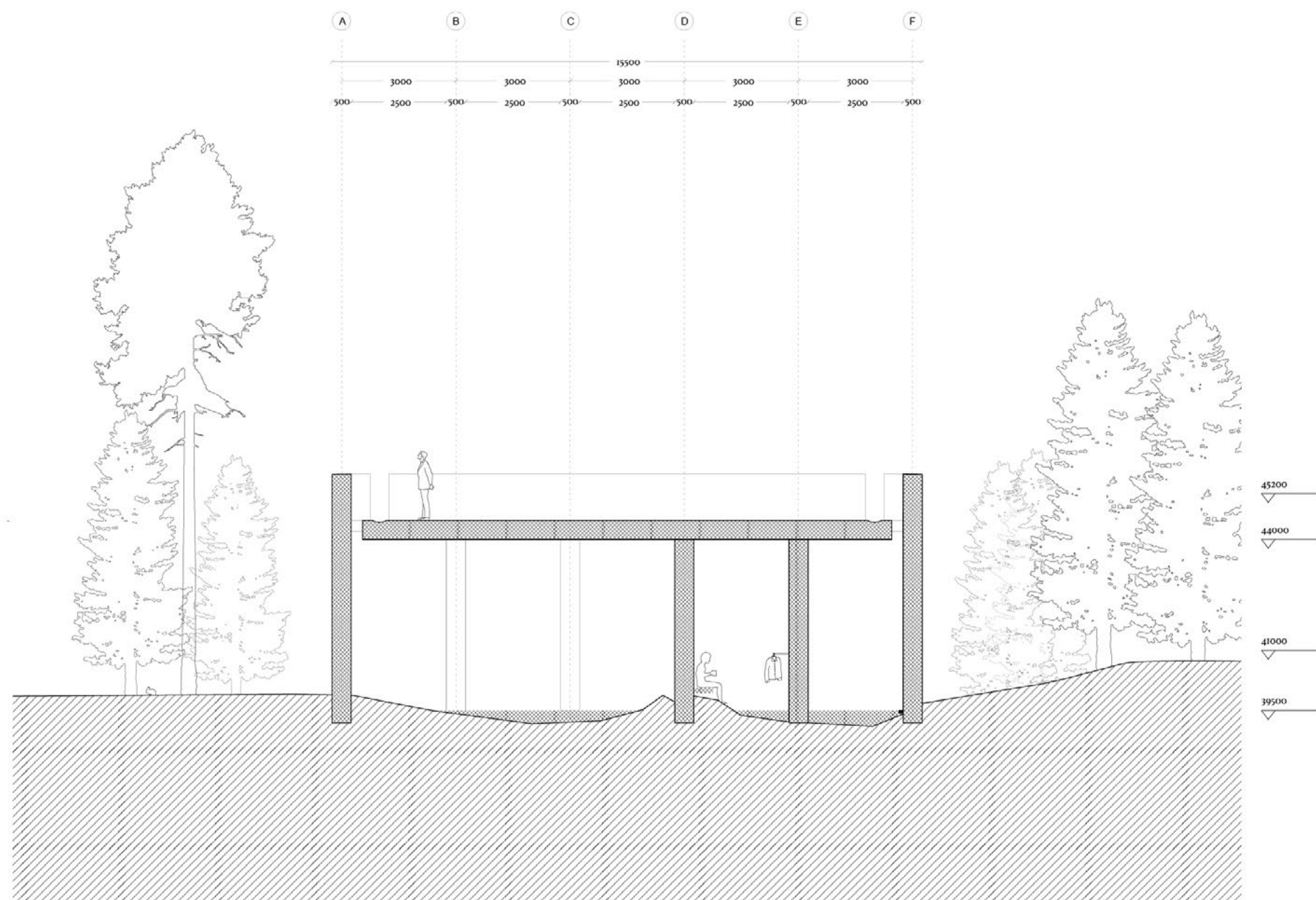
Line  
Infrastructure  
Masterplan

### III EXPERIENCE

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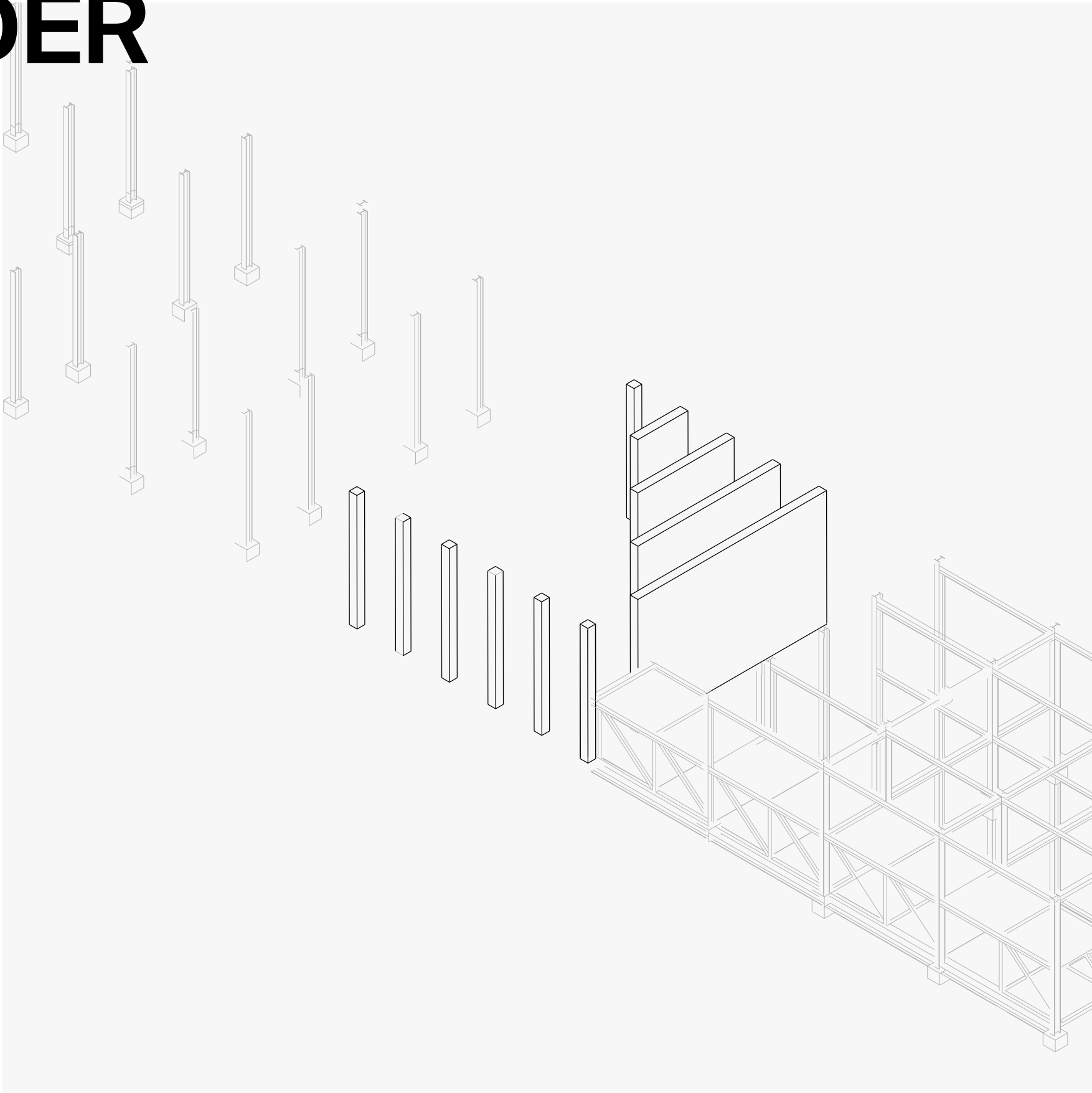
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# EXPERIENCE

## 2 - BORDER



### I RESEARCH

North Sea  
Norway  
Mongstad  
Problem Statement /  
Research Question

### II PROJECT

Line  
Infrastructure  
Masterplan

### III EXPERIENCE

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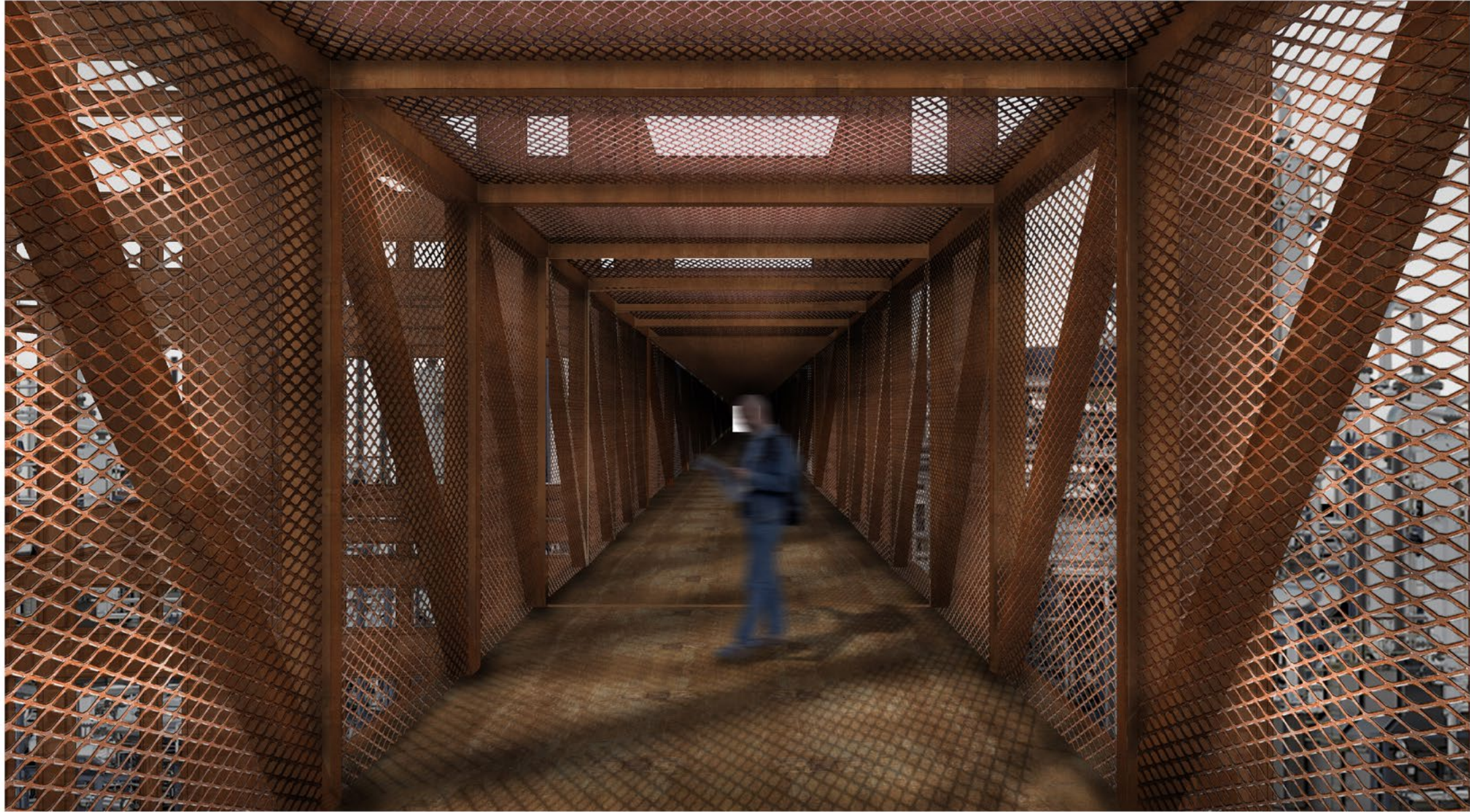
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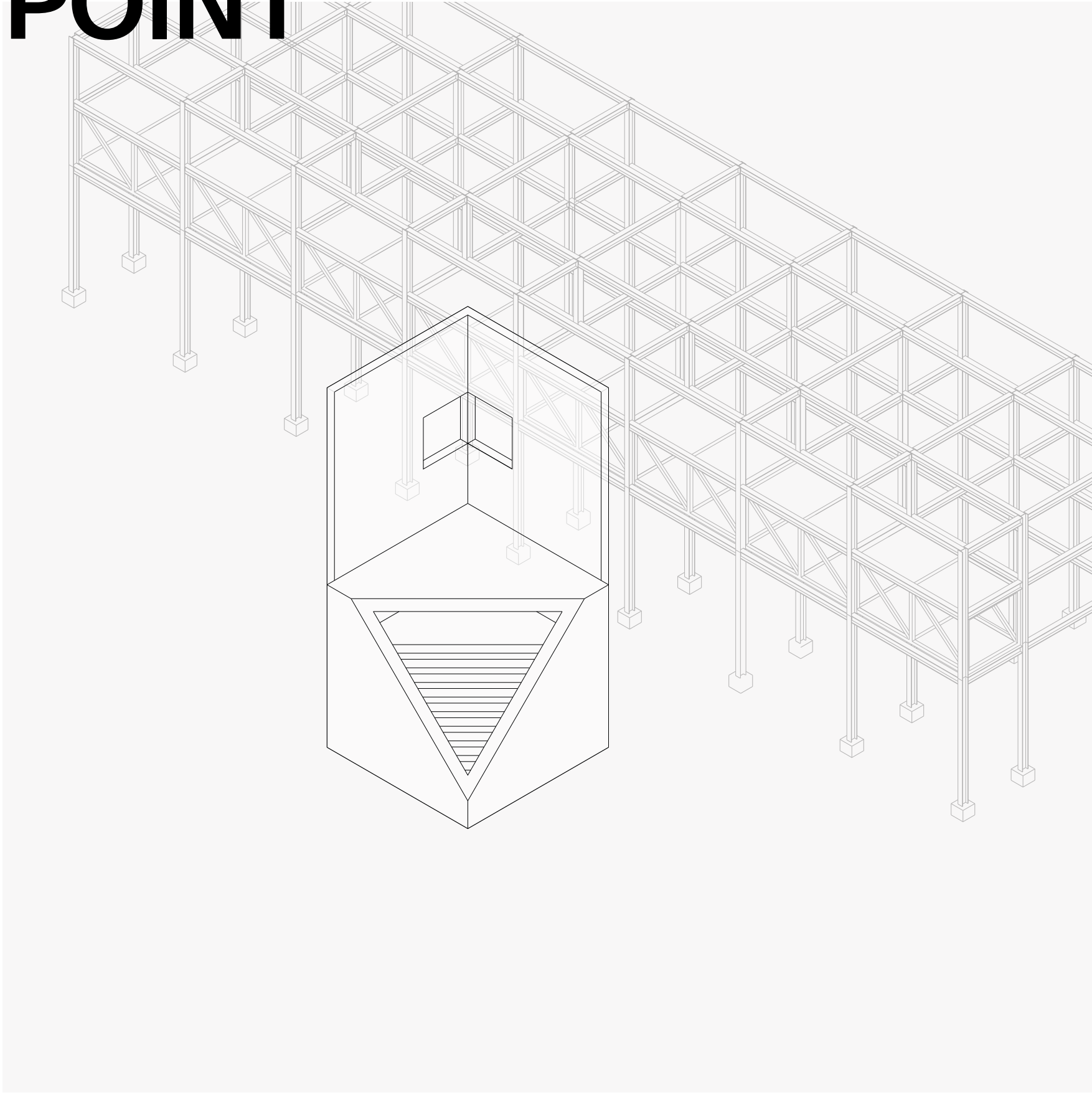
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# EXPERIENCE

## 3 - VIEWPOINT



### I RESEARCH

North Sea  
Norway  
Mongstad  
Problem Statement /  
Research Question

### II PROJECT

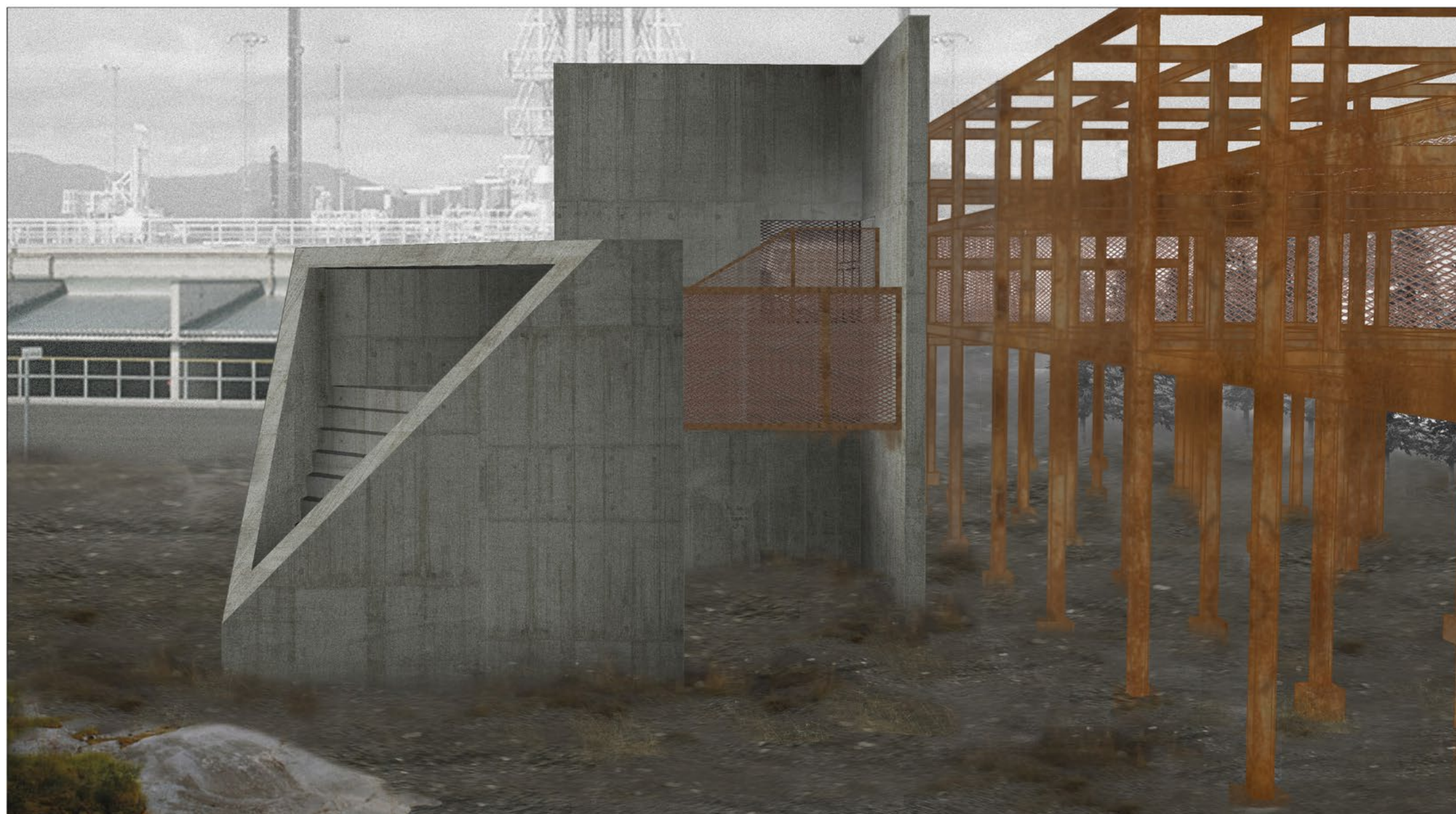
Line  
Infrastructure  
Masterplan

### III EXPERIENCE

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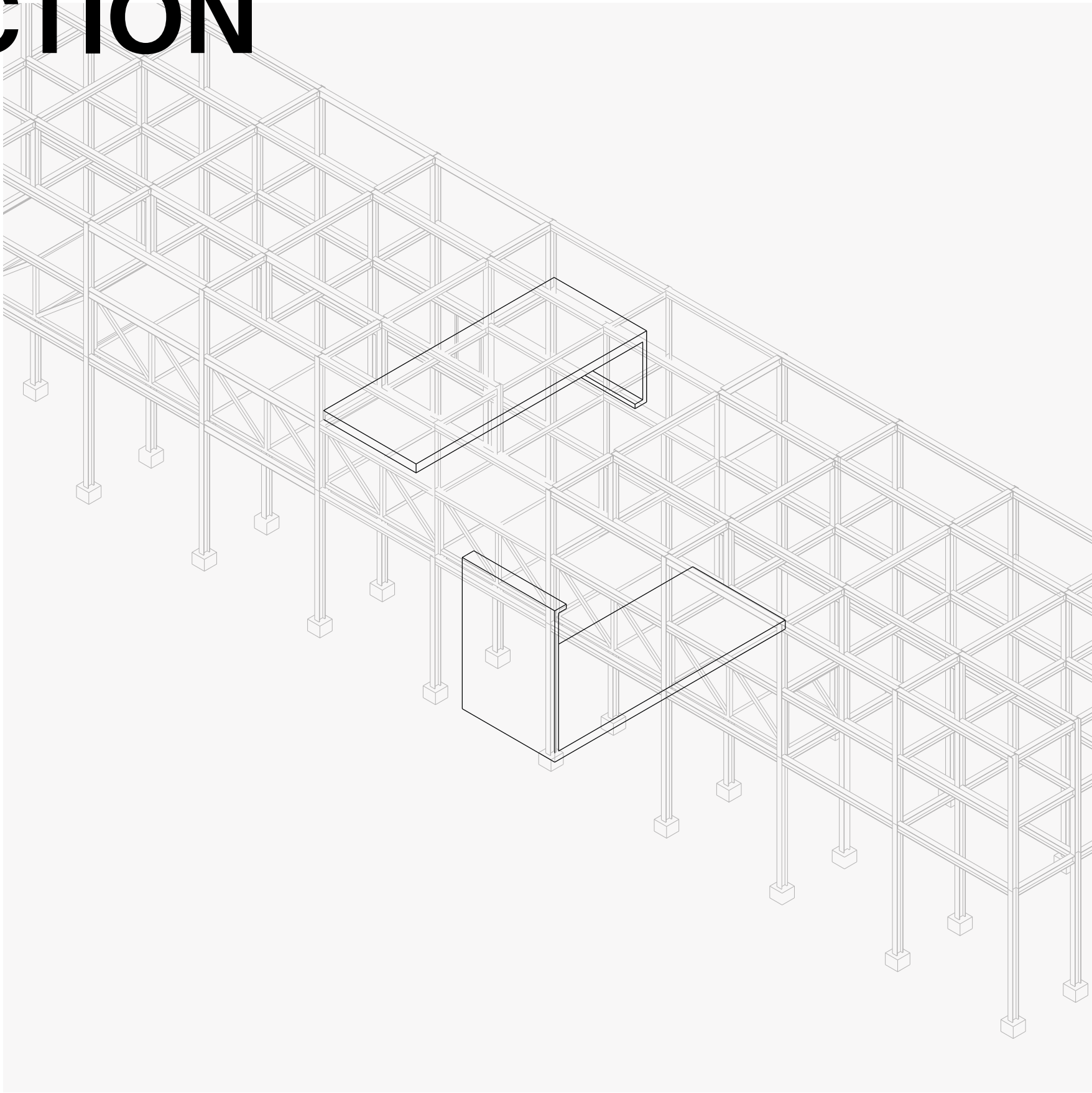
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# EXPERIENCE

## 4 - JUNCTION



### I RESEARCH

North Sea  
Norway  
Mongstad  
Problem Statement /  
Research Question

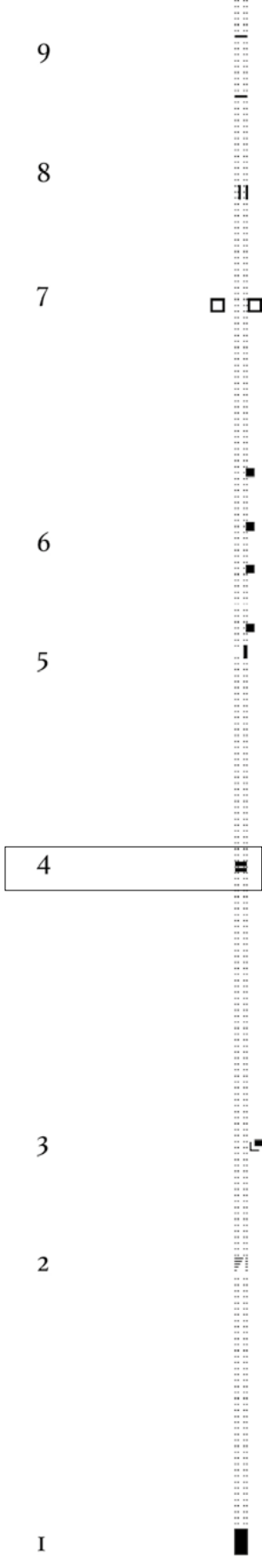
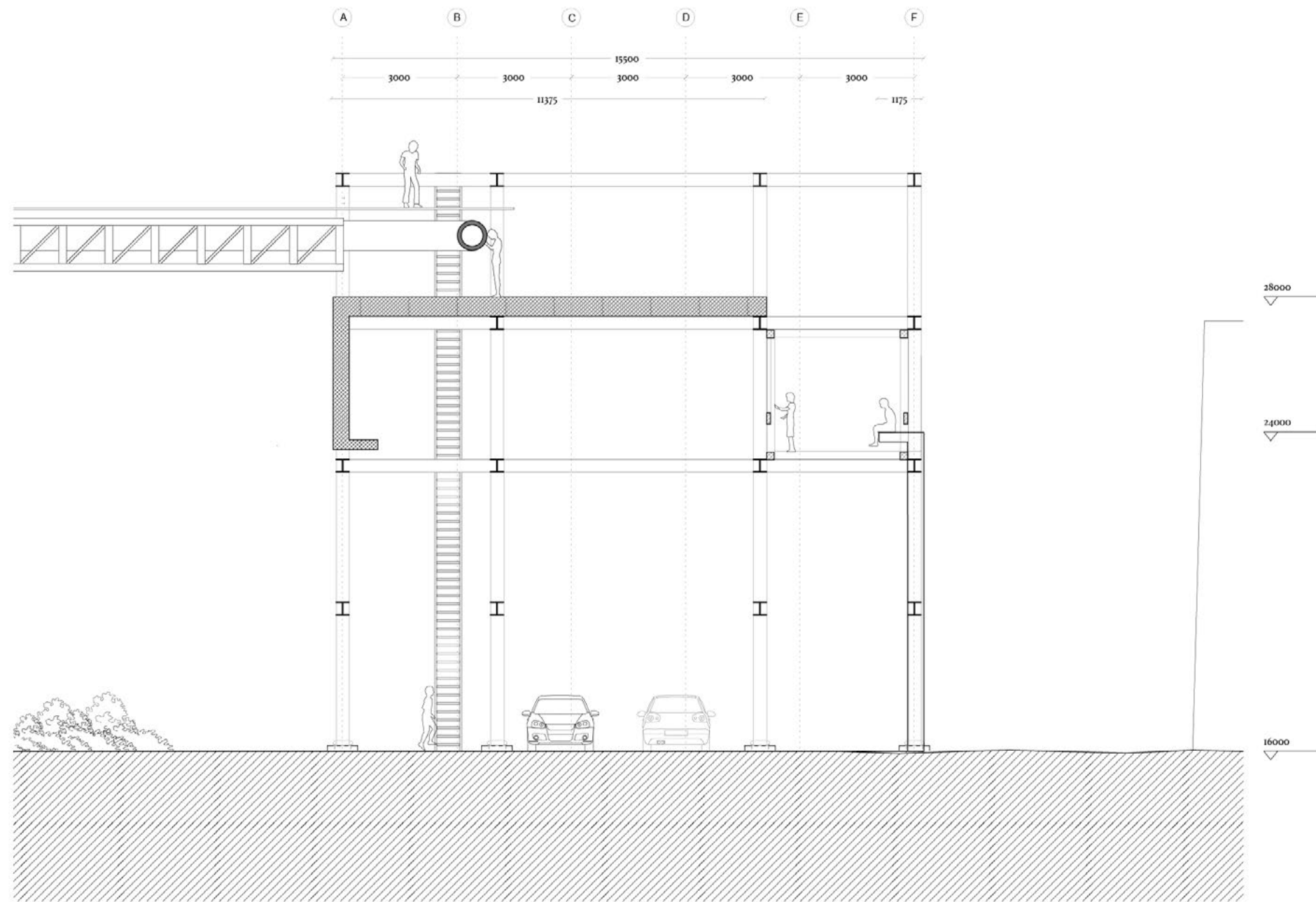
### II PROJECT

Line  
Infrastructure  
Masterplan

### III EXPERIENCE

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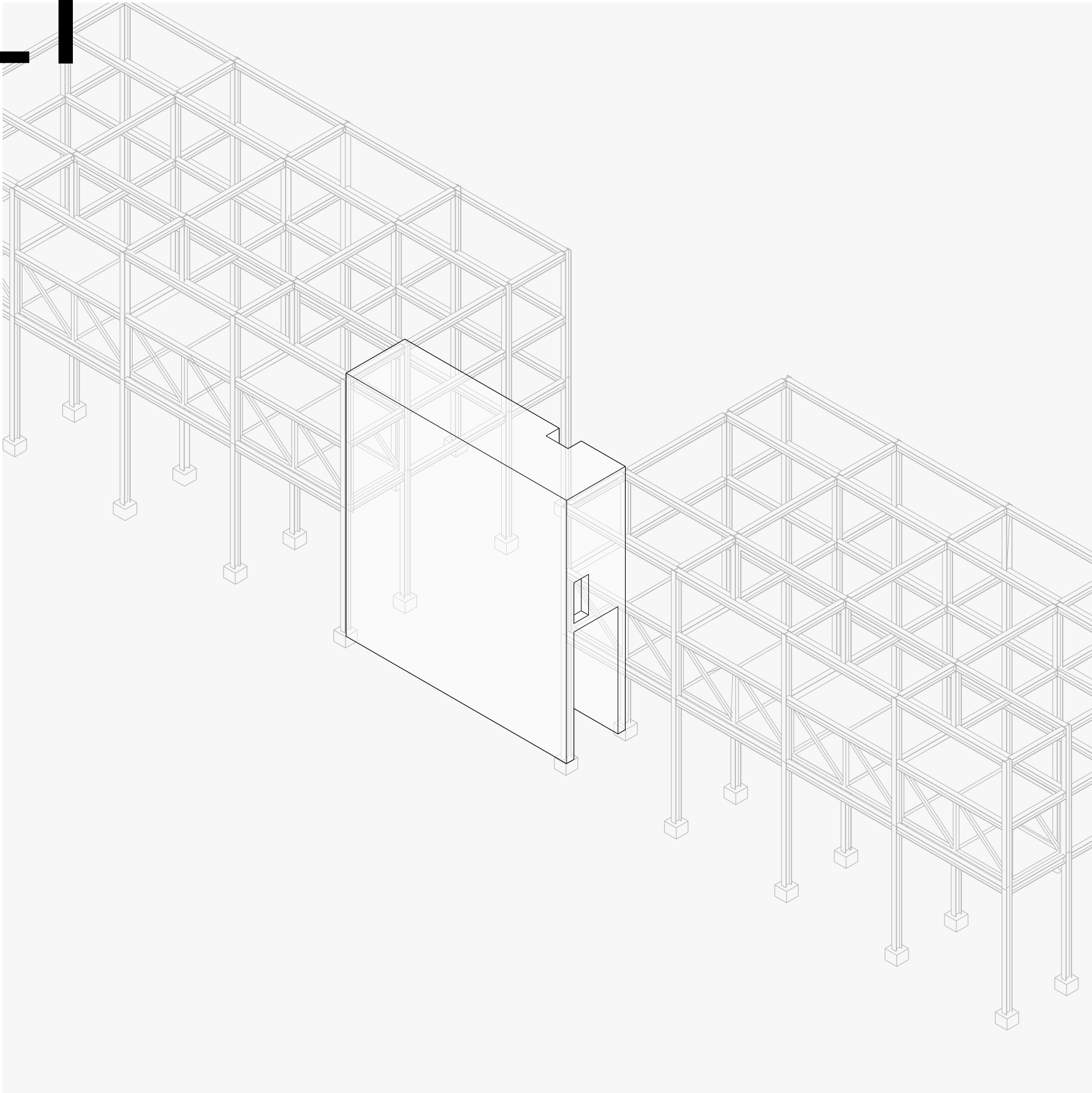






# EXPERIENCE

## 5 - WALL I



### I RESEARCH

North Sea  
Norway  
Mongstad  
Problem Statement /  
Research Question

### II PROJECT

Line  
Infrastructure  
Masterplan

### III EXPERIENCE

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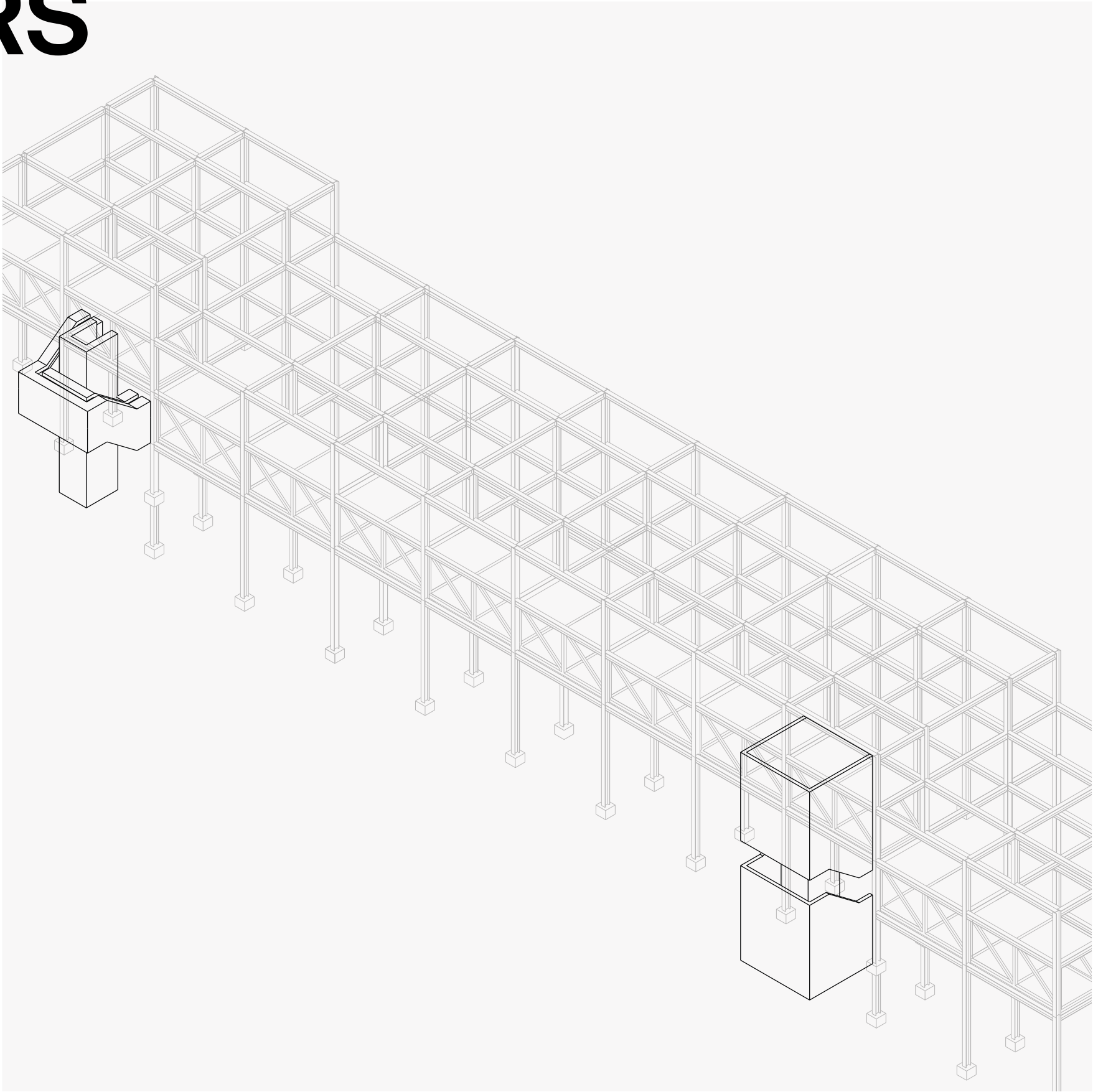






# EXPERIENCE

## 6 - STAIRS



### I RESEARCH

North Sea  
Norway  
Mongstad  
Problem Statement /  
Research Question

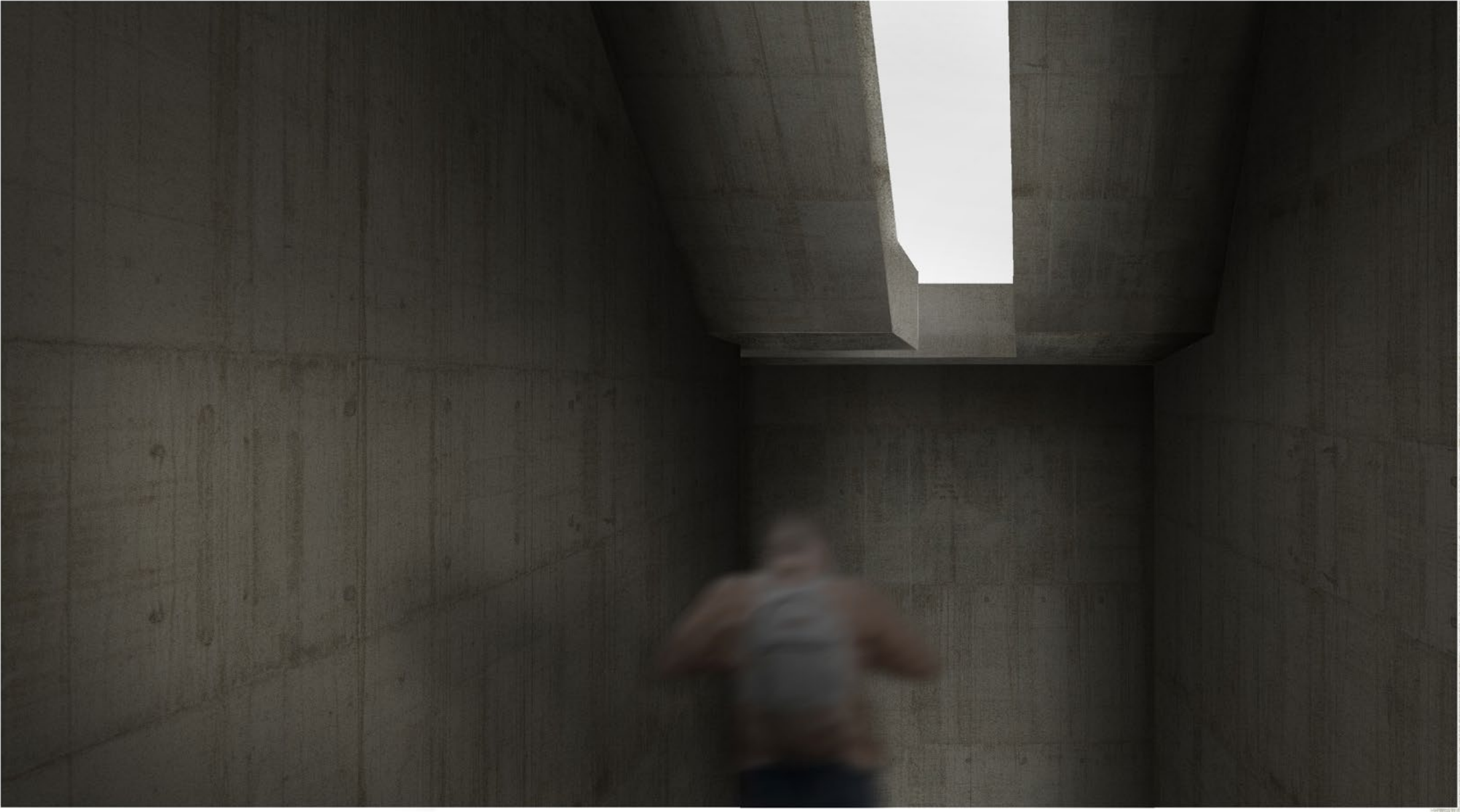
### II PROJECT

Line  
Infrastructure  
Masterplan

### III EXPERIENCE

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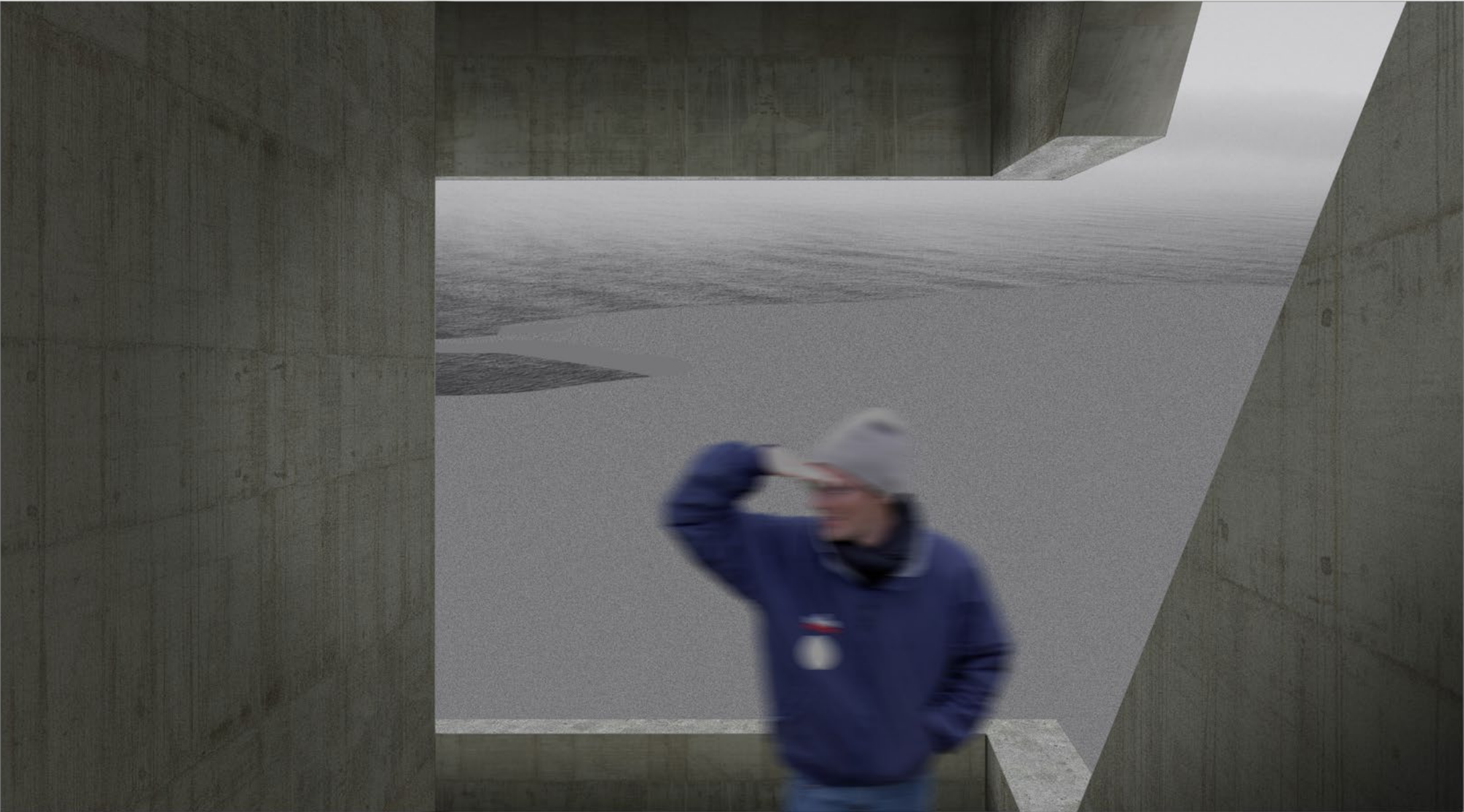
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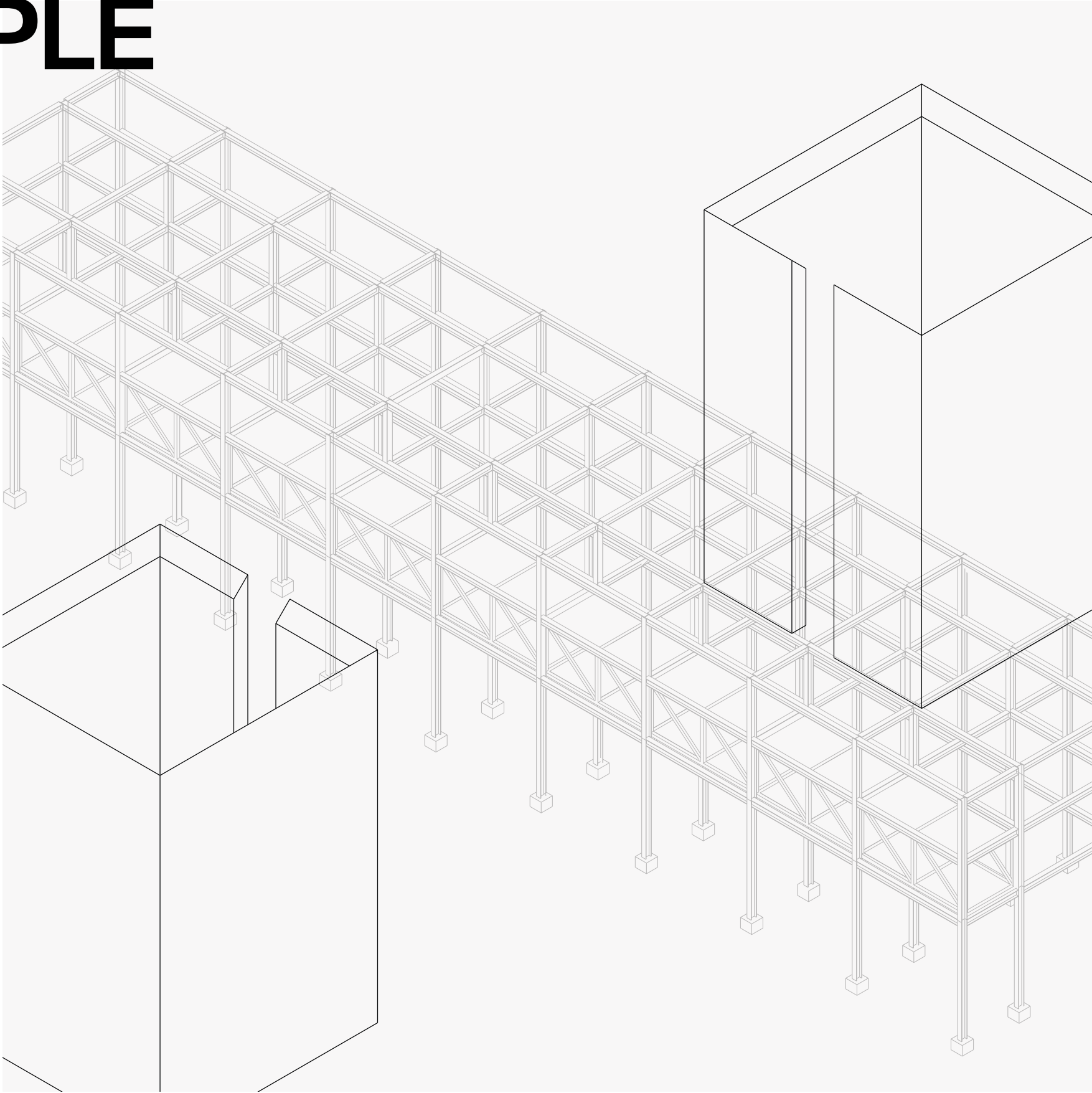
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# EXPERIENCE

## 7 - SAMPLE



### I RESEARCH

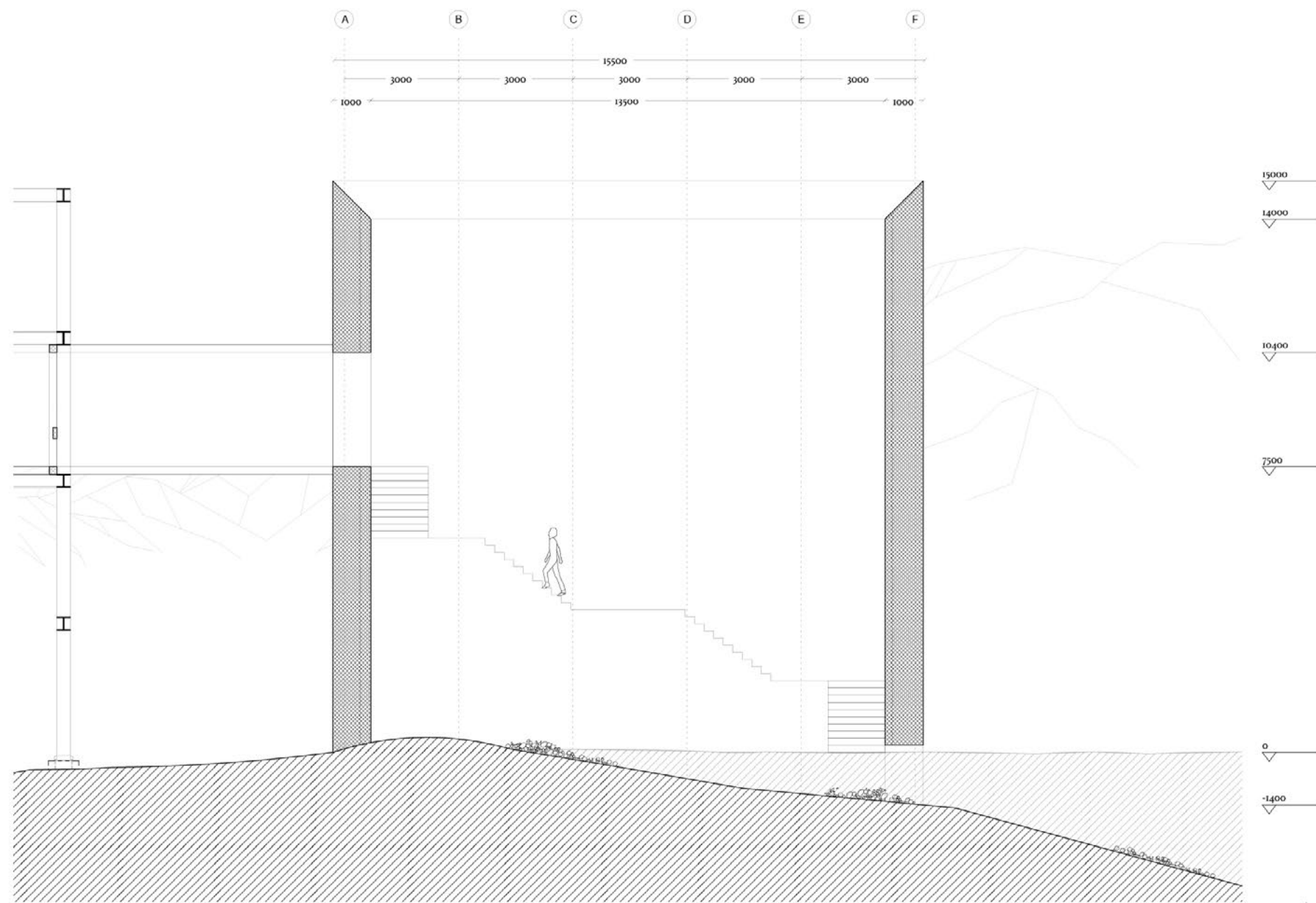
North Sea  
Norway  
Mongstad  
Problem Statement /  
Research Question

### II PROJECT

Line  
Infrastructure  
Masterplan

### III EXPERIENCE

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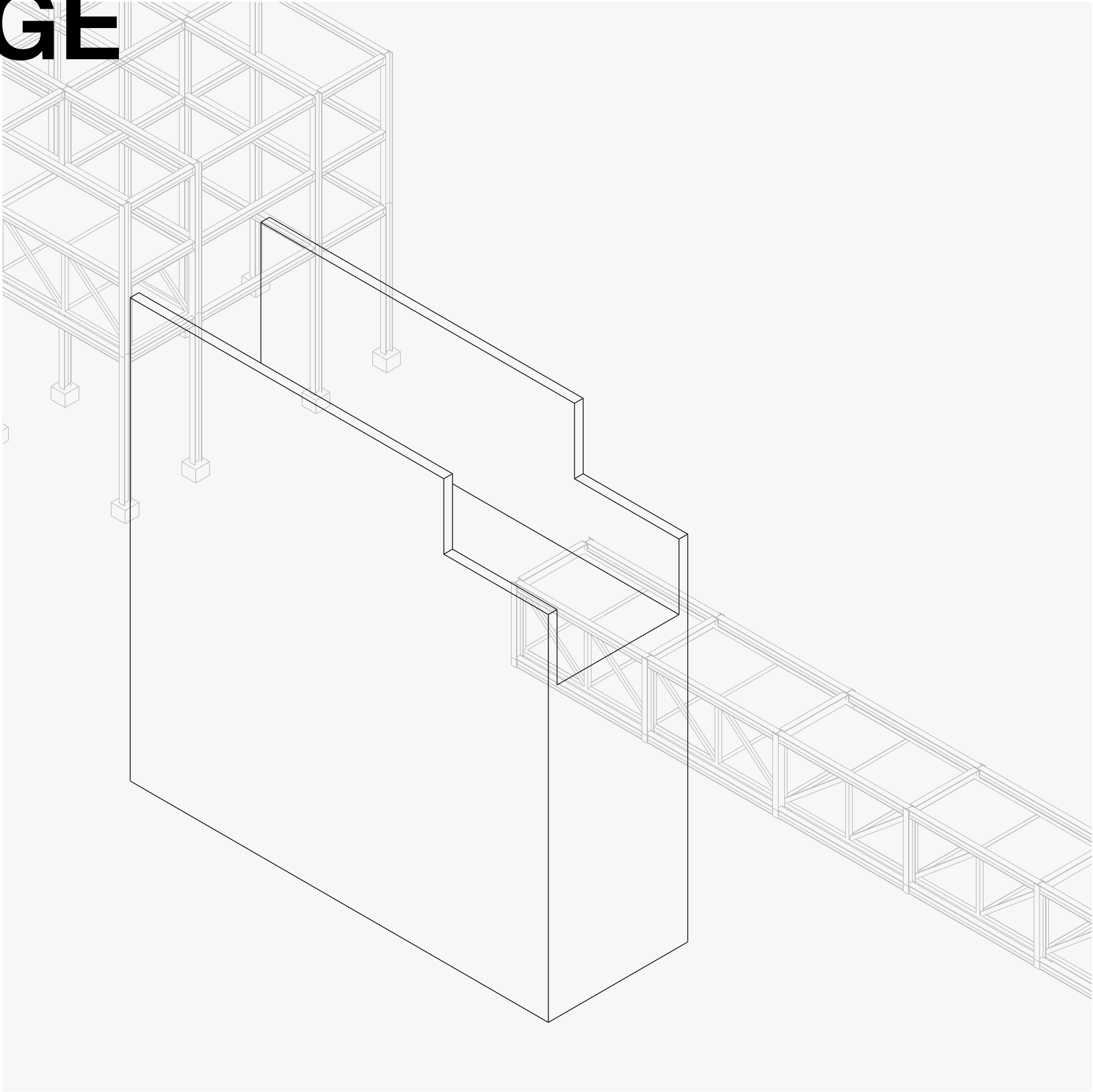
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# EXPERIENCE

## 8 - BRIDGE



### I RESEARCH

North Sea  
Norway  
Mongstad  
Problem Statement /  
Research Question

### II PROJECT

Line  
Infrastructure  
Masterplan

### III EXPERIENCE

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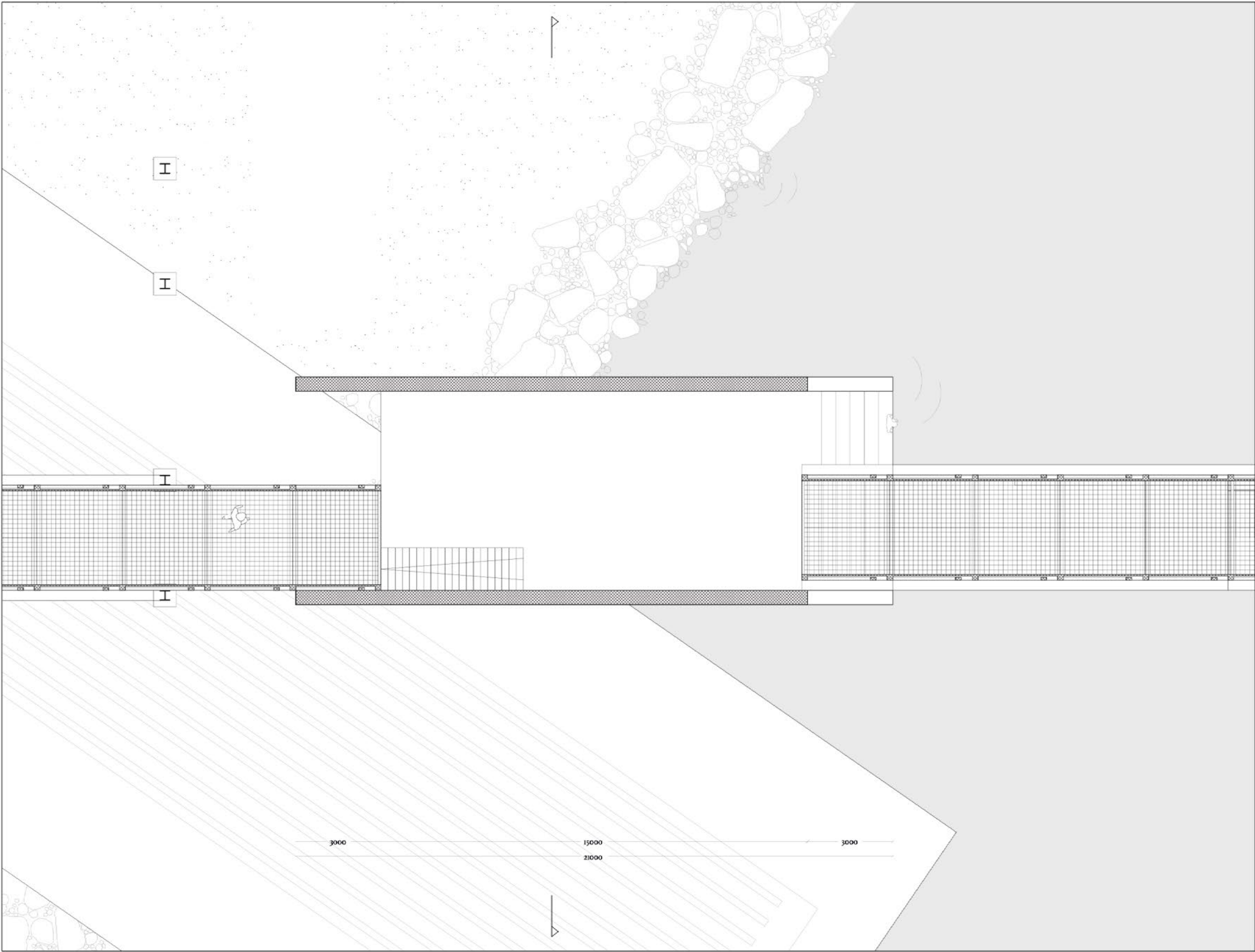
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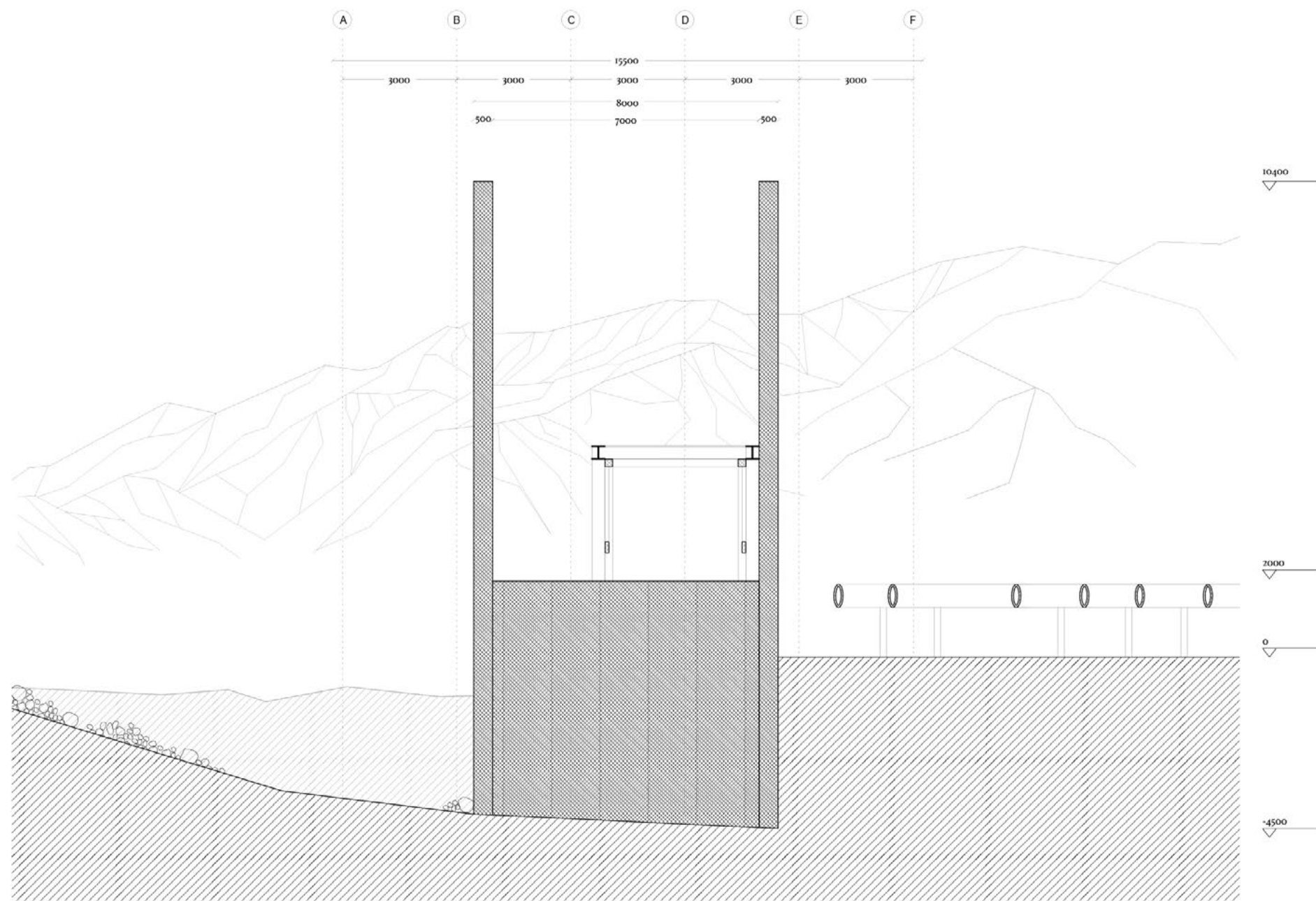
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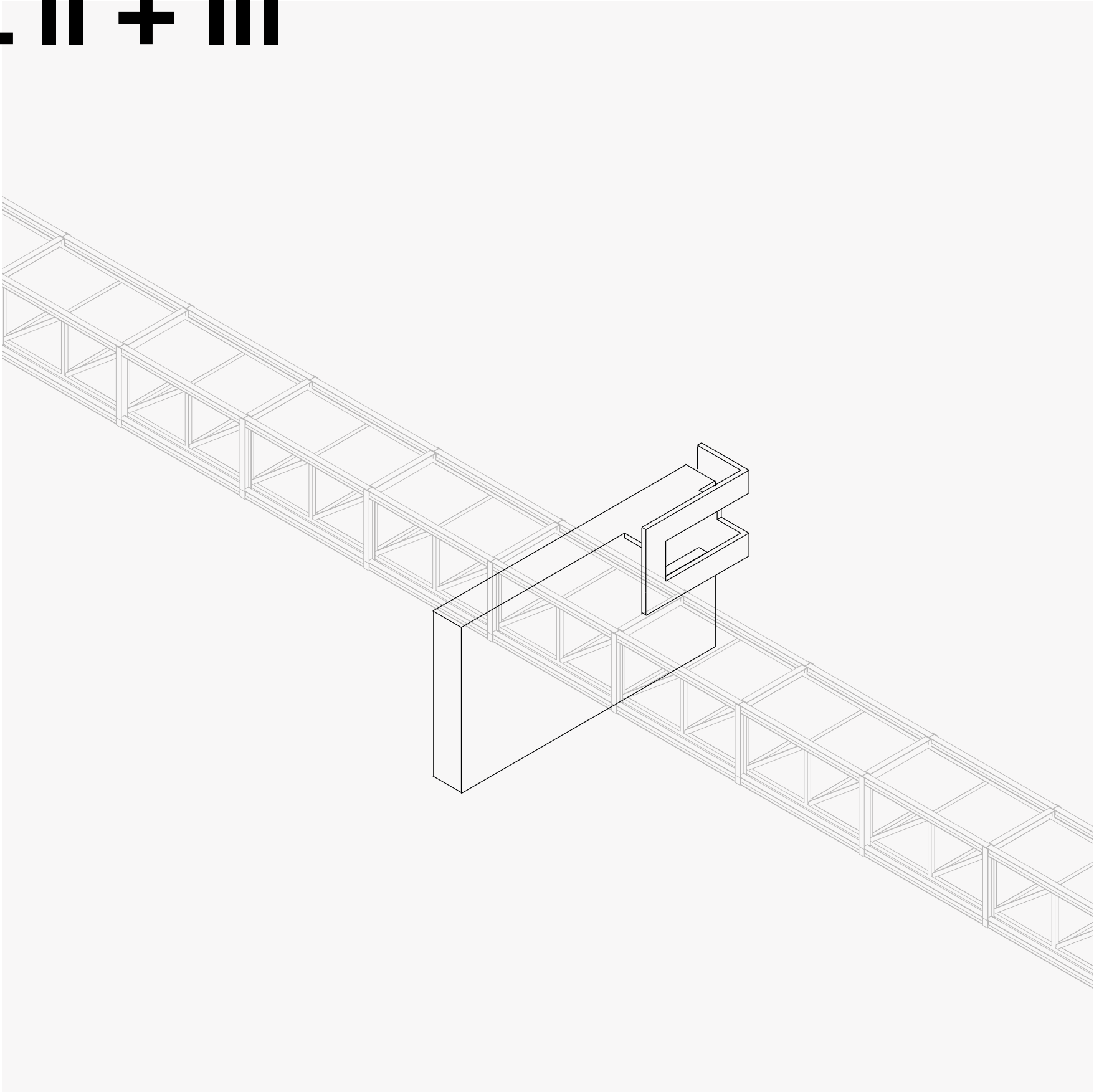
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# EXPERIENCE

## 9 - WALL II + III



### I RESEARCH

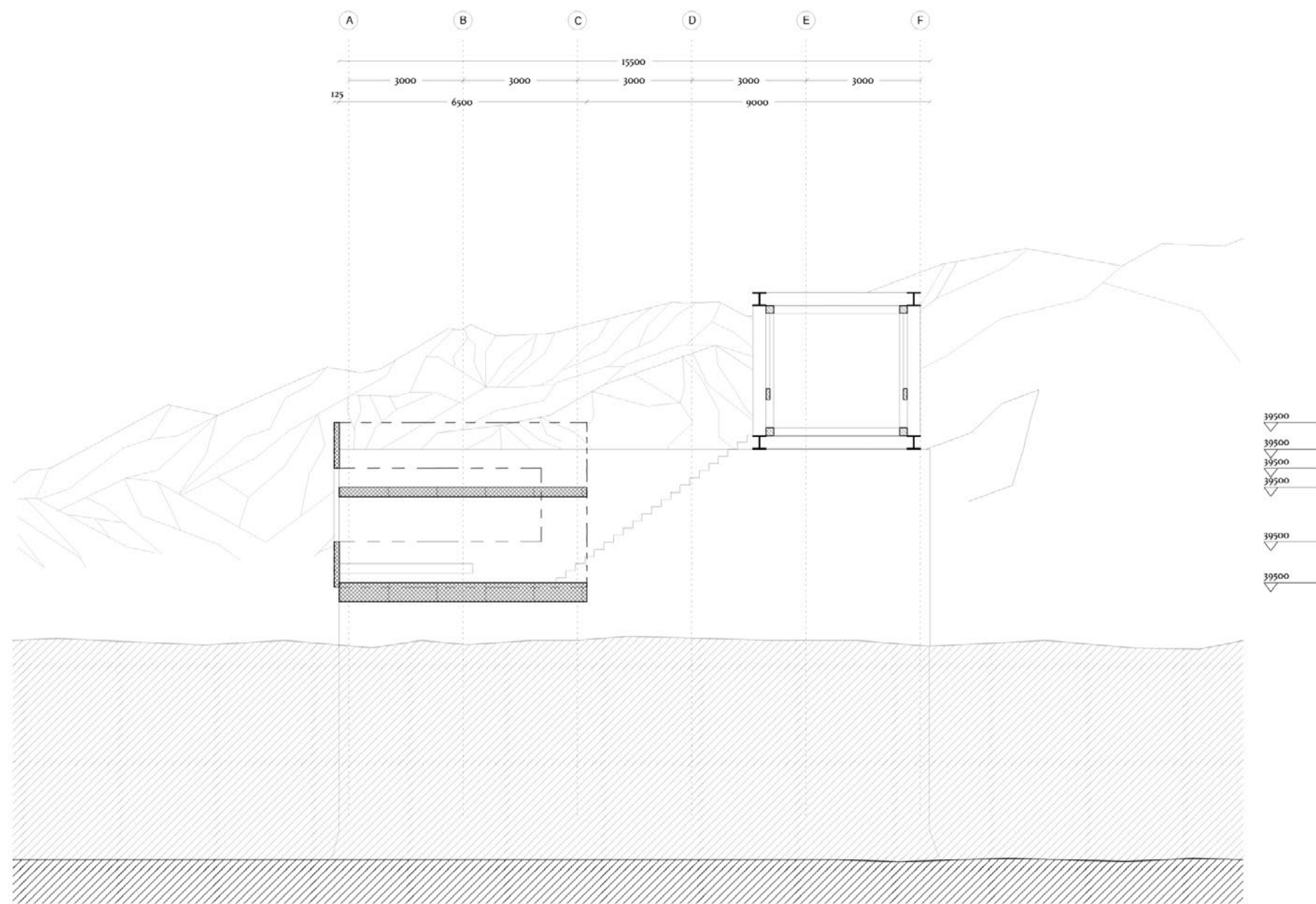
North Sea  
Norway  
Mongstad  
Problem Statement /  
Research Question

### II PROJECT

Line  
Infrastructure  
Masterplan

### III EXPERIENCE

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**CONCLUSION**



