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Building
Place
Urban Development
Leading Actor

Residential Development
Harbour Development
Phase I
1910

Architect - J.P. Stok

Place of labor
Phase II

1930

Architects - Brinkman & van der Vlugt

Place of labor
Phase III
1951

Architects - A.G. & J.D. Postma

Place of labor
Phase IV
1963

Architect - H. Haan

Place of labor
Phase V
2003

Architects - K. Hanenberg, H. de Jong, IOB & HUB

Place of (social) refuge
Phase VI
2021
Building vs. Machine

Mechanical composition

Mechanical operation
Anatomy of Volumes

Composition of Volumes

Tripartition
The Building as a Machine

From boat to silo to land

Machines

Research Approach (Incentive)
1. Arrival of Goods
2. Vertical Transport
3. Horizontal Transport
4. Storage
5. Supply and Discharge
6. Departure of Goods
Unused Volume

Density of the Volume

Daylight

Cross Section BB (1930)

Cross Section DD (1910)
<table>
<thead>
<tr>
<th>Area Description</th>
<th>Volume</th>
<th>Area</th>
</tr>
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<tbody>
<tr>
<td>Silos, vertical grain storage</td>
<td>130,000</td>
<td>4,850</td>
</tr>
<tr>
<td>Workfloor, horizontal transportation</td>
<td>33,500</td>
<td>6,900</td>
</tr>
<tr>
<td>Grain distribution floors</td>
<td>23,000</td>
<td>3,700</td>
</tr>
<tr>
<td>Factory, horizontal storage, washing, sorting</td>
<td>13,000</td>
<td>3,600</td>
</tr>
<tr>
<td>Vertical transport</td>
<td>4,000</td>
<td>100</td>
</tr>
<tr>
<td>Machine tower, weighing and vertical transport of grain</td>
<td>2,500</td>
<td>250</td>
</tr>
<tr>
<td>Technical / storage / other</td>
<td>5,700</td>
<td>800</td>
</tr>
<tr>
<td>Offices</td>
<td>3,400</td>
<td>600</td>
</tr>
<tr>
<td>Engine room</td>
<td>2,000</td>
<td>539</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>217,000</strong></td>
<td><strong>16,500</strong></td>
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**Note:** The Orange hall in BK City is similar to the average square meters/volume ratio of the massilo, with an area of 900 m² and a volume of 10,000 m³.
Contemporary Situation
Is the Maassilo *cultural heritage*?
Remains or Spirit
Historical Remnants

Historical Value
Identity
Unique Spirit
Palace of Concrete

Rarity Value
Scars
Display of Structural Power
Monumental
Facade Tarwewijk

Facade Maashaven
Cultural Values

Use & Rarity Value:
Unique position adjacent to the Maashaven

Historical Value:
Historic remnants of harbor/industrial activities

Use & Rarity Value:
The overdimensioned structure

Art Value:
Iconic octagonal shaped facades

Rarity Value:
The vastness and monumentality of the complex

Source: https://onthegrid.city/rotterdam/zuid/maassilo
Cultural Values

Use & Rarity Value: Unique position adjacent to the Maashaven

Historical Value: Historic remnants of harbor/industrial activities

Use & Rarity Value: The overdimensioned structure

Art Value: Iconic octagonal shaped facades

Rarity Value: The vastness and monumentality of the complex

Source: https://onthegrid.city/rotterdam/zuid/maassilo
The Conclusions

The conclusions:

Severed relation with the adjacent harbor
Proportioned for industry
Limited accessibility
Extremely dense volume
No clear routing
Construction = Skin = Material
“How can you re-design the Maassilo into a public space that incorporates both the human scale as the urban scale?”
The aim / goal

Restoring the relation with the adjacent harbor
Design according to the human scale
Make the building more accessible
Open up the dense volume
Create a navigable building
The Program
Why a cultural function?

Broaden and enlarge public reach

Interconnectivity

Development of Rotterdam South
Why a museum?

Conclusions and limitations from research

Inverted project

Natural versus Artificial lighting
What kind of museum?

Improvement existing museums
Affinity with Rotterdam
Subsidiary support
Restoring relation with the harbor

Maritiem Museum
Total surface: 5,130 m²
Exhibition Space: 1,300 m²
Depot Space: 1,300 m²
Source: https://qwa.nl/projecten/musea/maritiem_museum.html

Rotterdam Museum
Total Surface: 1,615 m²
Exhibition Space: 1,100 m²

The Program

Cultural Hub:

Primary functions:
- Museum

Secondary functions

1. Square/Main Entrance
2. Atrium/Café/Museum Store
3. Museum Offices/Restauration
4. Restauration
5. Atrium/Tickets/Classrooms
6. Museum
7. Restaurant/Rooftop Bar
8. Expedition/Technical Space
9. Storage/Depot
10. Museum Offices
11. Museum/Restaurant
12. Quay
13. Industrial Pontoon
14. Exterior Exhibition

Public:

Primary Function

Secondary Function
The Narrative
(Result of Research and Cultural Value Assessment)
As though I awakened on a summer gale
Filled with airy voices whispering voraciously
Blustering swiftly underneath the dangling sail
Thy shallow waves leaving the hull in agony

Morning was humming
And we sailed against the current effortlessly
As if it drew us in, like the soaring sounds of singing sirens
Once more into the odorous fog of morning labors
As the river paved our serpent path

And from the meadows rose a beast
The salt glaring on its freckled skin
Which curtain out the day with scars and wounds
Of days forgotten past
Under no veneer who dare to aspire
Bare and naked on the quay
And weathered with an houndstooth cloth,
And a metal claw leaps in the edges of the steeply bank with a shivering sound
While gulls are circling, chanting Orphean-like above its crown
Lauding choruses over this harvesting town

I never had behold such magnificent sight
That usurped the morning light and swallowed it whole
And in its shade,
Like ants, or bees or wasps
Soothing her eternal sleep
And breathing her breath and glancing her views
The grain-sized dockworkers were feeding their queen
While her dormant visage smiled never to be seen

She roars sick with famine
That echoes through her lungs
In the depths of her core
Dance those small kernels for love and for song

And as she grew, far beyond the reach of the sun
With tides of grain and the ashes of the earth
That gave her heart to all who she birth
She bore those children that outgrew her
Feeding under the breath of the river always to be near

And the day will come that the son of my son
Sees her rise that will obscure the light of the sun
Her mysteries forgone, as well as her lust
But there will be a time when rise, Oh rise she must.

(Marcus de Moes, 2020)
Design Framework

Complexity of the Building

Guidance Tool for Designing
Conceptual Design
“Sectional drawings are the only way to comprehend the building. Hence the building only exists in its section.”

Intervention = Section
Tidal Park

Docking places for inland shipping

Buffer zone

Softening the urban tissue
Heritage Position
(derived from Cultural Value Assessment)

“By preserving the exterior of the building, the project becomes inverted.”

(Restauration + Reconstruction)
Design (Approach)
Narrowed Scope

Size of the Building
What is the ‘Void’?

Stratification of history
Space of contemplation
Daylight
Monumental
Navigation
Spatial Sequence

Accessibility
Navigation
Daylight
Monumentality
Primary Flood Defense

Outside to Inside

Relation with the water (front)

Relation with the neighborhood
Relation + Organization

Public - Private
Transparency
Accessibility

Schematic Plan View
(Exterior/Contextual) Design
(Interior) Design
Plan Fifth Floor (+5)
scale 1:500
Climatic Design
Winter

Ground-coupled heat exchange

Solar thermal collector

Heat recovery unit (HVAC)

Floor heating and cooling

Stack effect by solar gain

Section I-I

scale 1:500

Maashaven water

Ground-coupled heat exchange

81/100
Technical Drawings
(Designing through different Scales, From Urban to Detail)
Existing Design Scale 1:100

P=0.00

3.850

8.066

2.500

New flood barrier able to withstand a water height of max. 1.65 meters above current barrier height.
Existing Design Scale 1:100

P=0.00

+ 3.850

- 8.066

New flood barrier able to withstand a water height of max. 1.65 meters above current barrier height.
Impact plug with saucer (50x250mm)

Laminated glass panel 28mm

Steel flood barrier profile (composite)

Drainage pipe in gravel box

Insulation (124mm)

Concrete floor (150mm)

Isosceles angle profile (160x160x16mm)

Grout

Concrete floor (150mm)

Flattening and moisture regulation (10mm)

Concrete floor (150mm)

Existing concrete basement wall 280mm

Source: https://aquobex.com/products-list/product-e/

Render (Flooding)
HEA 210 (beam)

IPE 210 (column)

Laminated glass panel 28mm

Double glass panel 26mm

Thermal break

Drainage

Adjusting wooden block (56x28mm)

Maximum height water barrier 1.65m above current barrier height

Source: https://aquobex.com/products-list/product-e/
Existing Design Scale 1:100

24,198

16,132

12,099

Scale 1:100
Ceiling support (5mm)
Ventilation tube (rectangular) 400x300mm
Steel angle profile (180x180x20mm)
INSIDE
Existing concrete wall silo 150mm
Plastic ceiling panel
Pressure layer on concrete floor (40mm)
Floor heating (20mm)
Steel composite deck floor (180mm)
Insulation (50-125mm)

Ceiling support (5mm)

Ventilation tube (rectangular) 400x300mm

Steel angle profile (180x180x20mm)

INSIDE (atrium)

Steel composite deck floor (150mm)

Ventilation roster 400x300mm

Pressure layer on concrete floor (40mm)

Floor heating (20mm)

Insulation (50-125mm)

Ceiling support (5mm)

Plastic ceiling panel

Existing concrete wall side 150mm

Render (Flooding)

The aim / goal

Restoring the relation with the adjacent harbor
Design according to the human scale
Make the building more accessible
Open up the dense volume
Create a navigable building

Reflection + Prospects

Reflection:
Integrated design
Narrow ‘the scope’ was too late

Possible Prospects:
Relation exhibition space and atrium
Silo as a light tube
“Thank you.”
Appendix
‘Het graan stroomde zoo snel in de lichters, het leek dikke gele olie. Zij lagen daar stil en vraatzuchtig, zij hadden het heele schip in hun macht, het bloedde aan hun zuignappen dood.’

Ferdinand Bordewijk, Karakter (1938)
Constructive Design Approach
Contemporary Condition

*Long Vertical Silo's*

*Dense Volume*
Removal Roof + Top Layer

Accessibility

New Roof Construction
Removal Silo's

Opening up the Volume

Daylight
Manufacturability

Construction Crane

Rappelling Construction Workers

Composite Steel Deck Floor

Wire Saw Cuts
Floor Composition

Only Removal

Arches
Atrium Roof

Lattice Girder

Glass Panels
Architectural Design Approach
(Experience, Composition of Spaces)
A. Performance Heptagram

*Museum performance (How does it operate?)*

*Experience of the visitor*


Delft: TU Delft: Heritage & Architecture, 2019
Metamorphosis – The transformation of the Maassilo

1900 – 2020

1986
Maritime Museum
1st museum

2016
Rotterdam Museum
2nd museum

2021
Rotterdam Museum of Maritime History
merged museum

Museum as a performance

1. Actor
2. Public
3. Collective representations
4. Mise-en-scène
5. Means of symbolic production
6. Script
7. Social contexts

Objects exhibited by form, use and subject, without strong unity in their coherence and chronology. Strong contrast between the exterior and interior collection.

Objects displayed in a fragmented composition, with no apparent sequence. Exhibition of the collections incoherent with the original identity of the museum.

Objects displayed by form, use and subject. Coherent relation between the human and industrial scale. Strong representation of both their individual as their collective importance within their exhibitions.
B. Warm Up & Cool Down

Transitional Spaces

Everyday Life versus Performance

Experience of the Visitor
B. Intermediate Space

Moment of Contemplation (Pause)
C. Sequences of Use

\textit{Different characters, different needs}

\textit{Subsequence of spaces}
D. Forms & Expression

Form Language

Emphasis on Line of Sight

Plan:
- Pure Forms
- Rational
- Stasis

Section:
- Hybrid
- Movement
- Navigation
- Spatial Relations

Ceiling Elevation:
- Organic
- Experience of Space
- Verticality
Routing

Double Helix

Denial and Reward
Renders