The Mongstad Experience
Facilitating a transition in time, function and space

Elise van Herwaarden
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Building Technology Report

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Delta Interventions 2017/2018
North Sea: Landscapes of Coexistence
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I - Visitor Centre

1 - soil

The site as it is found: bare rocky soil with some vegetation.

2 - cleaned soil

Where the building will be located, the soil will be cleaned from any plants or vegetation.
The soil will partially be prepared to host a building. At the location where later on loadbearing walls will be constructed, holes with a flat bottom are excavated out of the rocks.

Not only the loadbearing walls will be poured onto the flattened soil; same goes for the other walls, closing off the pavilion.
5 - formworks
Formworks for the concrete loadbearing walls are placed.

6 - reinforcement + conduits
In the formworks, the reinforcement mesh and heating and electricity conduits are installed.
On site, concrete is poured into the formworks. By doing so, the conduits and reinforcement mesh are integrated and will together make these elements loadbearing walls.

The same method as for the walls is used to make a roof out of reinforced concrete. Because the surface is rather large, the roof is constructed out of several pieces. To connect it structurally to the walls, the reinforcement wires of the walls will be integrated in the roof too.
Conduits for electricity and heating are placed on the bottom of the formwork, to be included in the ceiling of the pavilion.

The conduits will be connected to the reinforcement mesh of the roof. The mesh stretches to all ends of the formwork to make the roof as strong as possible.
After integrating steel U-profiles at the sides of the formwork, concrete is poured. The steel profiles stick out of the roof slab and will connect the roof to the outer walls. A gutter for water drainage and the parapet are included.

By using the same method as for the loadbearing walls, the outer walls of the pavilion will be casted on site, connecting them to the pavilion.
The outer walls will not only serve as a shelter, but go up 1200 mm above the roof level to serve as parapet too.

The last step in constructing the shell of the building are the perpendicular walls. Those don't contribute in bearing the load of the roof, but do close the building. Now all the walls are in place, the flooring can be poured on top of the soil. The soil and walls serve as a formwork.
1. Exposed reinforced concrete wall with recycled aggregates casted in-situ.
2. Rocky soil.
3. Gravel band.
4. Drainage piping.
5. CorTen steel walkable grating.
7. Bag pipes.
9. CorTen steel drainage gutter.
10. Concrete leveling flooring with recycled aggregates poured in situ.
11. Sand cement screed trowel finish descending - 60 mm min.
12. Drainage piping.
13. Water tight layer.
15. Wall heating.
16. Rocky soil cleaned flattened.
17. Steel toggle.
18. Electricity conduit.
19. Movement sensor.
20. Spotlight.
22. Concrete wall seat casted in-situ.
23. Electric heating mat poured in construction.
24. Steel toggle poured in construction.
The roof of the building is accessible. To enhance the accessibility as well as maintaining a 30 mm opening in the roof, a CorTen steel grating is installed between the concrete roof and extended wall slab.

**Detail A**
Outer wall - u profile with light downscaled to 10

1. Walkable corten steel grating
2. Steel U profile 200 x 200 mm built-in light
The roof of the building is accessible. To enhance the accessibility as well as maintaining a 30 mm opening in the roof, a CorTen steel grating is installed between the concrete roof and extended wall slab.

Because the big surface of the roof catches much rainwater, an appropriate method of disposing this had to be found. A gutter is placed on the in-situ casted concrete and protrudes 500 mm. The chain connected to this gutter guides rainwater down to the ground.
The entrance of the pavilion is marked by a heavy CorTen steel door. Under this door, the CorTen steel grating ensures rainwater or snow can seep through - to be absorbed through drainage piping. Besides this, the gravel-filled trench leaves enough space for fresh air to enter the building.

Inside the pavilion, concrete benches are installed to comfort the visitor. Within the in-situ casted concrete, heating pipes are installed.
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Conduits are casted in the concrete shell. Electricity supplies are connected to wall heating and bench heating systems.

The pavilion is permeable to everything from outside, however, because of local-slab heating visitors can have a somewhat comfortable experience. Besides this, the toilet flushing systems are prevented from freezing.
The building is open to rain. Gutters on the side ensure drainage. On the roof water is drained as well. It can
leave via open gutters that extend beyond the pavilion.
MODULE II
CONSTRUCTION OF THE MODULE

Soil
Flattened where needed

Foundation
Concrete sticking above soil 150 mm

Beams
HE360 - CorTen

Walking path
See closeup

Columns
HE360 - CorTen

Beams
HE360 - CorTen
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II - Module

Beams
HE360 - CorTen

Columns
HE360 - CorTen

Slitting holes
Nuts + Bolts

HEB profile
200 x 200 mm - CorTen

U profile
175 x 175 mm - CorTen

Expanded metal
CorTen

Grating
h = 25 mm - CorTen

Tube profile
200 x 200 mm - CorTen

Main module
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Details

1. CorTen steel grating
2. CorTen steel tube profile 200 x 200 mm
3. CorTen steel HEB profile 200 x 200 mm
4. U profile - mounting
5. L profile with slitting holes
6. Security nuts and bolts
7. CorTen steel expanded metal

Detail F
Connection steel module - steel bridge
to 5 downscaled to 1 to 10 HORIZONTAL
Detail G
Connection steel bridge - concrete node
1 to 5 downscaled to 1 to 10 HORIZONTAL

1. CorTen steel grating
2. CorTen steel tube profile 200 x 200 mm
3. CorTen steel HEB profile 200 x 200 mm
4. U profile - mounting
5. U profiles with drilling holes
6. CorTen steel beaming 100 mm
7. CorTen steel expanded metal
8. Reinforced concrete 500 mm

Detail H
Connection steel module - steel bridge
1 to 5 downscaled to 1 to 20 VERTICAL

1. CorTen steel grating
2. CorTen steel U profile 200 x 200 mm
3. CorTen steel U profile 100 x 100
4. Metal spacer
5. CorTen steel tube profile 200 x 200 mm
6. Reinforced concrete 500 mm
7. CorTen steel expanded metal
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1. CorTen steel grating
2. CorTen steel U profile 150 x 150 mm
3. CorTen steel HEB profile 200 x 200 mm
4. CorTen steel I profile 175 mm
5. CorTen steel steps, perforated
6. L profile in both directions

Detail I
Connection steel stairs
to 5 downscaled to 1 to 10