PROJECT SHEET

Flensburg Navy Barrack Conversion

2019

ABOUT THIS PROJECT:

Market Segment:
General Construction

Location:
Flensburg, Germany

Architect:
IGA Haus, Flensburg

Owner:
James B.O.N.E GmbH, Hörup

Building Company:
Davidsen Bauunternehmen GmbH

Concrete:
IONYS, Karlsruhe
IBBI, Dr.Ing. Frank Langer, Hamburg

Waterproofing:
WEISSENBACH Structural Waterproofing, Munich
BAWAX GmbH, Celle

Engineering:
IBS-GmbH, Hamburg and ROHWER INGENIEURE GmbH, Handewitt
Petersen-Ingenieure GmbH, Flensburg

Products Used:
Xypex Concentrate
Xypex Patch'n Plug
Xypex Modified
Xypex Admix

In the picturesque northernmost city of Flensburg, Germany an ambitious project was undertaken to transform a section of an old German navy base into a new focal point for tourism, leveraging its stunning views of the Baltic Sea harbor and the quaint old town center.

The James B.O.N.E GmbH investment group envisioned converting some old navy barrack buildings into a luxury hotel, situated next to the quay wall.

This conversion, completed on July 30, 2019, by the innovative team of architects from IGA Haus, structural engineers from Petersen-Ingenieure GmbH, and waterproofing specialists from BAWAX GmbH, among others, represents a remarkable feat of engineering and architectural prowess.

Despite several attempts over the decades to seal the structure, the hydrostatic pressure in the basement, ranging from two to three meters dependent on the water level in the harbor, led to persistent water infiltration.

This resulted in around one meter of standing water in the basement for many years. This extended period of water and capillary absorption, combined with CO2 exposure, caused carbonation up to one meter high and deep into the concrete. Testing showed a carbonation depth of up to 18 cm and compressive strength ranging from as low as 5 to 45 N/mm^2 in the concrete cores analyzed. The aging structure along with these factors resulted in major corrosion and damage to the concrete, exposing the rebar.

After extensive technical discussions among the owner, architects, engineers, and concrete specialists, the team decided to abandon the initial plan of using a sealing membrane system in favor of a superior crystalline technology with a proven track record: the unique Xypex Crystalline Technology. This technology provides permanent waterproofing and protection for concrete structures, including the extremely deteriorated concrete walls, slabs, and new concrete elements such as the elevator pits, piles, or perimeter walls.

The Xypex system comprised Xypex Patch'n Plug, Xypex Concentrate, Xypex Modified, and Xypex Admix C-Series. Xypex Patch'n Plug played a crucial role, applied to leaking joints and cracks to immediately stop the ingress of water. Subsequently, Xypex Concentrate was used as a dry pack in the joint and crack repairs. Xypex Concentrate and Xypex Modified were then applied to waterproof and protect approximately 2,600 m^2 of the basement and wall surfaces.

Additionally, the project team used Xypex Admix C-Series to address over 900 defects and to reprofile an area of 1,000 m^2. Workers removed any defective and deteriorated concrete to a depth of 18 cm up to 1 meter high and then reprofiled it with the Xypex Admix blended mortar in several layers of approximately 2 cm each. Xypex products provided a durable solution to render the concrete waterproof, chemically resistant, and capable of self-healing cracks up to 0.5 mm.

The successful application of the unique Xypex Crystalline Technology not only addressed the immediate waterproofing needs but also ensured the structural integrity and extended service life of the building's concrete elements. This value engineering Xypex system solution showcases the innovativeness of the project's team and the versatility and effectiveness of the Xypex product range.

Opened on July 10, 2020, the hotel stands as a testament to the collaborative effort of engineers, architects, and technologists who leveraged Xypex solutions to breathe new life into a historical structure, ensuring its legacy and functionality for years to come.