

GOOD CONSERVATION AND RESTAURATION PRACTICE FICHE

Composed by working party of: Germany

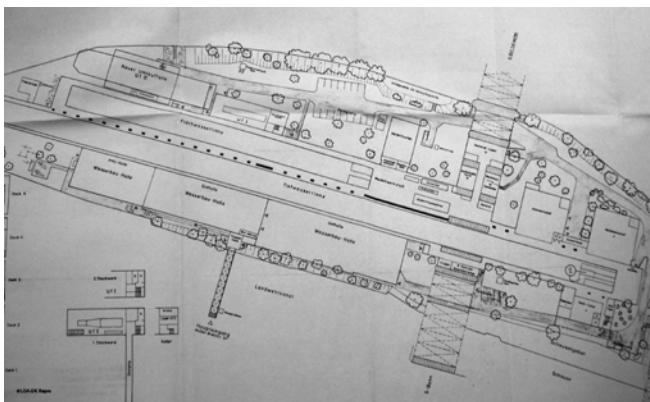
0. Name of building/ group of buildings/ urban scheme/ landscape/ garden & picture of before and after

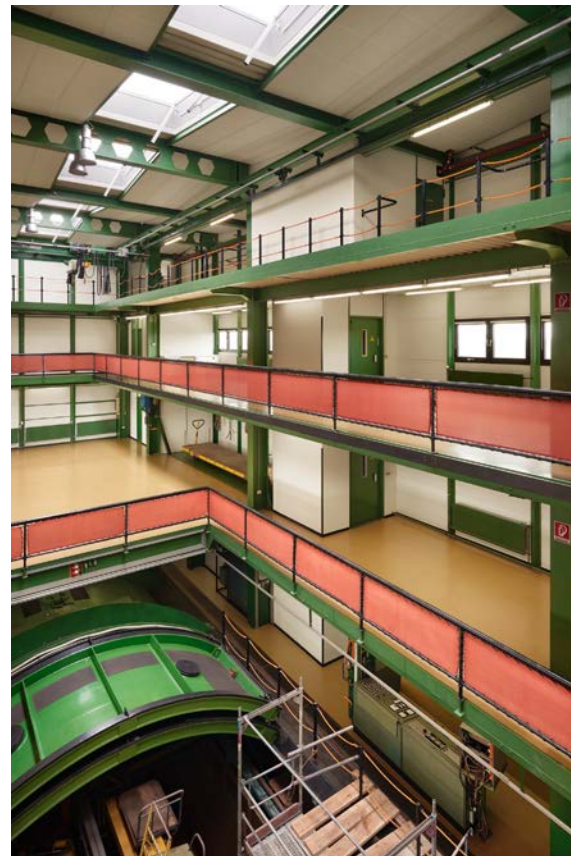
Circulation and Cavitation Tank

Before conservation/ restauration



After conservation/ restauration





Depicted item: Circulation and Cavitation Tank

Sources: before: Landesdenkmalamt Berlin (Wolfgang Bittner), site plan: Landesdenkmalamt Berlin, after: Landesdenkmalamt Berlin (Bernhard Kohlenbach), inside: Philipp Lohöfener / Wüstenrot Stiftung, press-photo

Dates: before: 2012, after: 2018, inside: 2017

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- **Other images or documents**

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- **Data for identification**

current name: Circulation Tank, Versuchsanstalt für Wasserbau und Schiffbau – VWS (Hydraulic Engineering and Shipbuilding Research Institute)

former/original/variant name: Circulation Tank, Versuchsanstalt für Wasserbau und Schiffbau – VWS (Hydraulic Engineering and Shipbuilding Research Institute)

address/ number(s) and name(s) of street(s): Müller-Breslau-Straße 15

town: Berlin

province/ state: Berlin

post code: 10623

country: Germany

geographic GPS coordinates: 52° 30' 45.00" N 13° 20' 1.00" E

current typology: EDU/TRC (Circulation and Cavitation Tank)

former/original/variant typology: EDU/TRC

comments on typology: The circulation tank generates currents in order to execute ship model tests.

- **Status of protection**

protected by: state Berlin

grade: /

date: 1995

valid for: historic monument, whole area

remarks: The circulation tank is located within the conservation area of the VWS (Hydraulic Engineering and Shipbuilding Research Institute) together with its other buildings dating to 1902-1904 and 1927-30.

“09050433 Müller-Breslau-Straße, Versuchsanstalt für Wasser und Schiffbau – VWS (Hydraulic Engineering and Shipbuilding Research Institute), haul water channel, 1903-04 by Thür, Nießigbrodt; enhancements 1927-30 by Körner; reconstruction and enhancements 1951-64; Circulation Tank including technical equipment, 1969-74 by Ludwig Leo and Christian Boes”

- **Accessibility**

opening hours/ viewing arrangements. University Institute, not open to public

1. History of building(s)

- **Chronology**

Commission date: 1967
design period (s): 1967-1969
start of site work: 1969
completion/inauguration: 1974

- **Summary of important changes after completion**

type of change: /
date(s): /
circumstances/reasons for change: /
effect of changes: /
persons/organizations involved: /

2. Summary of restoration

- **Summary of important changes after restoration**

type of change: conservation
date(s): 2012-2017
circumstances/reasons for change: The massive damage within the building's substance lead to a first encompassing conservation of the circulation tank since its completion in 1975.
effect of changes: replacement of the metal panels of the façade, repairing the ventilation conduit, conserving the interior, upkeep of the original use
persons/organisations involved: adb Ewerien and Obermann, Berlin (building research, construction management & monument conservation); H.G. Merz, Berlin (rehabilitation); Wüstenrot-Stiftung, Ludwigsburg (building owner during the project, financing), State Berlin / TU Berlin: Prof. Dr. Paul Uwe Thamsen (owner/occupier); Landesdenkmalamt Berlin

- **Current use**

of whole building/site: University Institutes of TU Berlin
of principal components (if applicable): circulation and cavitation tank, dynamics of maritime systems institute research laboratory, design of maritime systems institute research laboratory, fluid system dynamics institute research laboratory, experimental fluid mechanics institute research laboratory

Comments:

The buildings of the former VWS -Versuchsanstalt für Wasserbau und Schiffsbau are located on an island on Landwehrkanal East of TU-Berlin (Technische Universität Berlin). This research facility was erected in 1903-04, later expanded and mainly examined ship shapes as well as ship engines. By doing so they considerably contributed to the development and improvement of ship engineering. Originally ship models were drawn through one experimental channel. Today the facility holds one deep-water as well as one shallow water channel.

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The 1969-75 erected circulation tank for model ship experiments towers above the department buildings. The architect Ludwig Leo and the engineer Christian de Boës designed this biggest circulation tank worldwide. This structure is not a building in the traditional sense, but more of a research tool, a machine, which is encompassed by a steel skeleton structure including a sandwich panel cladding (type: Isowand, manufactured by: Hoech). A massive circulation tube cuts through the laboratory, which leans on a steel framework. In order to control the flow of the water channels a turbine is situated within the tube circulation. This enables researchers to perform streaming measurements and experiments on ship models as well as on objects in original size. The entire facility including the technical equipment is still fully functional.

3. Evaluation of restoration/conservation

Give the scientific reasons for selection for Docomomo documentation.

- **Intrinsic value**

history of technology: The circulation and cavitation tank is the largest of its kind worldwide and stands alone regarding its construction. The tank is not arranged horizontally, as would have been customary, but was erected vertically. Down to the present day the entire structure is fully operative and is still in use, even though comparable laboratories have been replaced by computer simulations.

urban planning: Located at Berlins main through road (Straße des 17. Juni) the circulation and cavitation tank is presenting itself similar to a city sculpture, due to its sheer size, unusual shape and strong dark blue as well as pink colours.

artistic: Ludwig Leo designed a futuristic laboratory using poetic colours as mysterious large-scale sculpture within Berlin.

- **Technical evaluation:**

The main goal of the rehabilitation measures was a basic maintenance of the highly damaged building according to conservation guidelines, i.e. repairing the structure with fewest possible interventions. As model project, it was supposed to determine, if an approach like this to a technical post-war era building is practicable. An academic advisory council consisting of conservationists, engineers, and art historians was included in the planning process. The opportunities of saving an artistic ambitious and distinctive industrial building of the 1970's in its materiality was investigated thoroughly.

Main issues were the repair of the circulation tube as well as the sandwich panel cladding of the building. The outside mantle of the tank, consisting of an industrial building construction with horizontally laid 60mm strong blue sandwich panels (steel covering shells with a polyurethane hard resistance foam core) displayed heavy corrosion damage on the out as well as the inside. The intention to exchange or mend individual panels was not realizable. The tank interior was in a very good condition, was merely cleaned and the floors were resealed.

It was determined, that the panels could not be exchanged or mend individually, since they could not be separated without heavy damages. The old panels were exchanged with similar same size panels, due to leaking, temperature and humidity gradients, as well as heavy corrosion damage. Additionally an asbestos-bearing fire protection cladding was fully replaced. A sample area of the original sandwich panel cladding could be saved in the weather protected range by the elevator. After removing the old panels, the steel skeleton was completely recoated, and the new panels were attached.

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Parts of the heavy damaged circular tubing lagging was removed, reapplied in the same material (polyurethane foam), and according to the findings coated in pink. The tube itself was barely corroded.

- **Social evaluation:** not specified

- **Cultural and aesthetic evaluation:**

As a result of its unusual and unconventional architecture the circulation tank calls attention to itself. He is not a classical building, but is situated on the borderline between architecture, an industrial building, a machine and a scientific device. Ludwig Leo designed a futuristic industrial building in poetic chromaticity, whose vivid communicative construction he directly deduced from the technical requirements. The circulation tube for stream tests was not as usual arranged horizontally, but was positioned vertically, which turns the tank into a widely visible “urban sculpture” within Berlin.

By structuring its elements, by playing with proportions, by considerably allocating the window openings and using eye-catching colourfulness, Leo took the massive machine’s sobriety and gave it a surreal and ironic expression. He developed a reduced but still connotation rich architectural form, which is reminiscent of the aesthetic pop-art strategies. Leos design illustrates the opportunities of architectural design between the priorities of strictly functional requirements, comparatively limited opportunities for action and complex form perceptions (quote Gregor Harbusch). The different functional areas were distinguished by Ludwig Leo through strong colouration. The tube of the circulation channel was painted in pink, while the box-shaped laboratory is clad with blue sandwich panels. This extraordinary building has turned into one of Berlin’s distinctive landmarks.

4. Documentation

- **Archives/written records/correspondence etc: (state location/ address)**

Legacy of Ludwig Leo at Baukunstarchiv der Akademie der Künste, Hanseatenweg 10, D-10557 Berlin

Partial legacy of Ludwig Leo (Furniture of his private apartment within the collection of Stiftung Bauhaus Dessau)

- **Principal publications (in chronological order):**

Ullmann, Gerhard: Die Poesie des Banalen. Ein Umlauftank in Berlin. In: Deutsche Bauzeitung 126 (1992), Heft 1, S. 76-79

Ruby, Andreas: Bildlichkeit der Formen. Der Umlaufkanal der Versuchsanstalt für Wasserbau und Harbusch, Gregor: Ludwig Leo (1924 - 2012). In: Bauwelt 47.2012

Schiffbau von Ludwig Leo. In: Das XX. Jahrhundert. Ein Jahrhundert der Kunst in Deutschland.

Architektur in Berlin. Hrsg. v. Andres Lepik und Anne Schmedding. Köln 1999, S. 88-89

Ludwig Leo Ausschnitt. Edited by Antje Buchholz, Jack Burnett-Stuart, Gregor Harbusch, Michael von Matuschka and Jürgen Patzak-Poor. London, 2015

Harbusch, Gregor: Farbe und Funktion. In: Bauwelt 5.2015

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- **Visual material (state location/ address)**

original visual records/drawings/photographs/others:

Legacy of Ludwig Leo at Baukunstarchiv der Akademie der Künste in Berlin: Hanseatenweg 10, D-10557 Berlin

Post restoration photographs and survey drawings:

<https://www.wuestenrot-stiftung.de/umlauftank-2-von-ludwig-leo-in-berlin/>

film/video/other sources:

<https://www.youtube.com/watch?v=-2lrfu1r0xU> (youtube, umlauftank 2)

- **List documents included in supplementary dossier**

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Fiche report

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date of report: 04.05.2018

Examination by DOCOMOMO national/regional section

approval by working party co-ordinator/registers correspondent (name): Monika Markgraf

sign and date: 30. May 2018

examination by DOCOMOMO ISC/R

type of ISC Registers/Urbanism/Landscape/Gardens:

name of ISC member in charge of the evaluation:

comment(s):

ISC approval:

Sign and date:

Working party/ID n°:

date:

NAi ref n°:

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