

Conclusions and recommendations

1/ The prescribed and executed cement-based waterproofing coating Vandex Super on the walls of the water tank under investigation, meets the technical parameters laid down by the coating manufacturer The Swiss company Vandex SA.

Observed on the surface local defects and bursts are due to the more than 14 years of operation of the structure.

We do recommend the defects and bursts to be repaired with material, compatible with the available coverage and meeting the requirements for use in a drinking water tank.

2/ The monolithic construction of the tank is made of concrete with a very good internal structure and the reinforcement meets the requirements for such a facility.

As a result of settlement of the structure and the operating mode the walls of the inspected water chamber are with cracks in addition to the existing and already treated ones.

The cracks are with depth reaching the reinforcing bars of the structure. As a result this leads this leads to:

- Corrosion of the reinforcing bars and shorten the lifetime of the structure.
- The water that penetrates through the crack, may go through other eventual cracks in outer surface of the tank wall and have as a result leaks and water losses.
- Eventual cracks on outer walls, may have as a result underground water to penetrate to inner cracks and contaminate and compromise the quality of the water in the tank.

We do recommend the new inner cracks to be treated and waterproof, with materials that complied with the existing cover and meet the requirements for use for reservoirs with potable water.

3/ As of the risk for appearing of new cracks on the reservoir walls, we do recommend, a complete waterproof to be executed with elastic material, compatible with the existing layer, providing new water insulation cover with minimum of 3 mm. and meeting the requirements for use in potable water reservoirs.

4/The very strong corrosion on the metal piping in the water chamber, is going to have as a result shortening the life of the installation and contaminating the potable water in the tank.

We recommend removing and cleaning the rust from the metal pipes and treatment with zinc coating with a minimum thickness of 180 microns, meeting the requirements of ISO 12944 and permissible for use in reservoirs for potable water.

TECHNICAL DECISION

Based on the conclusions and recommendations in item IV, we recommend the following technical solution based on the materials and technology of:

VANDEX INTERNATIONAL Ltd. Switzerland - waterproofing of concrete and reinforced concrete structures, basements and hydro structures, including those for potable water, using isolations over cement base.

ZINGAMETALL B.V.B.A. Belgium- Materials for anti-corrosion treatment of a new and old metal structures, using zinc coating method by cold applying of the material, including zinc coating of built structures at spot without dismantling.

1. Repair of the water tightness of the investigated water chamber of the potable water tank (from inside)

1.1 Base preparation - walls and bottom

- Preparing of a clean concrete surface with open capillaries structure - hydro blasting of the concrete structure with water pressure above 200 atm.

1.2 Treating the joints and crevice - bottom- walls

1.2.1 Preparing and creating of solid base

- Making a groove 2X2 cm. and hydro-blasting of the surfaces
- Treating the groove with Vandex Super – manually
- Filling the groove with Vandex UNI Mortar 1.

1.2.2 Water-proofing of joints and crevices

- Applying Vandex Cemelast – manually, as a base for water-proofing band/tape – 1st bond.
- Applying water-proofing tape Vandex Construction Joint Tape
- Apply Vandex Cemelast manually – 2nd bond

1.3 Applying water-proofing on walls and bottom.

Applying water-proofing Vandex Cemelast manually and by machine, three layers, total 6.0 kg./sq.m. and thickness of 3 mm.

2. Corrosion protection of the piping by cold zinc galvanizing

2.1 Cleaning (preparing) the base/ surface.

- Mechanical cleaning of flaky and layered rust with metal brush;
- Providing clean concrete surface with open capillarity structure- hydro-blasting with water pressure more than 200 atm.

- 2.2 **Zinc cold galvanizing with Zinga**
- Applying Zinga – material for cold zinc galvanizing with thickness of 180 microns.

Quantities:

Hydro blasting concrete walls and bottom	298.40 sq.m.
Treating the joints and crevices Vandex Super, Vandex UNI Mortar 1	64.00 m.
Waterproofing of the joints bottom – walls Vandex Cemelast, Vandex Construction Joint Tape	64 m.
Waterproofing concrete walls and bottom Vandex Cemelast 6.0 kg./sq.m.	298 sq. m
Corrosion protection of piping with Zinga	1.5 sq.m.