

Rehabilitation of RCC Water Tank at a Tata Group Company

The RCC-built overhead water tank at a Tata group company serves as a crucial facility for water supply in the process operations. Over time, the structure exhibited signs of distress, including cracks at various areas of the ring beams and columns. This note outlines the structural assessment and repair work carried out to ensure the integrity and functionality of the water tank, with a specific focus on utilising the rope access method for accessing difficult-to-reach areas like this.

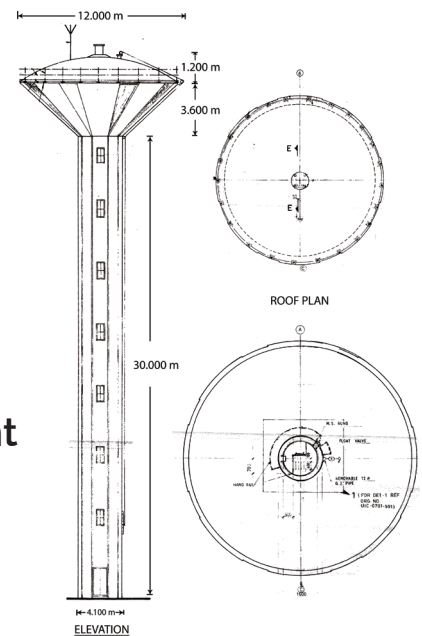
Inspection Findings

Visual inspection, revealed several issues.

- Cracks of varying widths were observed in different areas of the tank, with a higher concentration on the outer side wall compared to the inner side wall.
- Indications of chlorination and degradation of concrete inside the upper water tank.

Structural Assessment

To assess the structural integrity of the water tank using the rope access method, non-destructive tests (NDT) were conducted. Rope access technicians were instrumental in reaching these areas, ensuring a comprehensive evaluation.



The NDT methods included:

Rebound Hammer Test: to assess the hardness and strength of concrete.

Carbonation Test: to detects carbonation depth in concrete, which can indicate deterioration.

Ultrasonic Pulse Velocity Test: to measure the speed of sound waves through concrete to detect cracks and assess concrete quality.

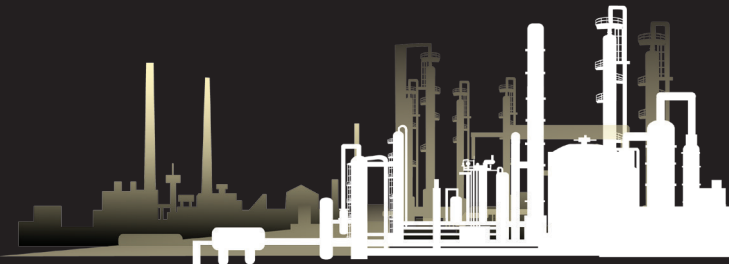
Rebar Mapping: to identify location and condition of reinforcement bars.

Chemical Tests: to analyse concrete composition and identify potential issues.

Findings

Rebound hammer and carbonation tests indicated potential weaknesses in the structure.

Ultrasonic pulse velocity tests confirmed the presence of cracks and revealed deterioration of concrete in various areas.



Solution Provided

Due to the complex geometry of the water tank, we leveraged the rope access method to inspect and repair the structure. The repair scheme of the distressed RCC tank involved the following steps:

Surface Preparation: Exposed steel surfaces were cleaned using mechanical wire-brushing and rust remover compound.

Concrete Removal: Degraded concrete was removed using chipping hammers from the affected areas.

Corrosion Protection: Two coats of epoxy-based zinc primer was applied to protect the reinforcement from further corrosion, following the manufacturer's instructions.

Bonding Agent Application: An epoxy bonding agent was applied to the existing concrete surface to ensure proper bonding with the repair material.

Polymer Modified Mortar (PMM) Application: Polymer modified mortar was used to repair the concrete members, restoring them to their original shape and size.



(Pictures from the site)

The rehabilitation of the RCC water tank at a Tata group company addressed structural concerns and restored the tank's integrity. The use of non-destructive tests provided critical insights into the condition of the structure, guiding the repair process. By implementing the rope access method, we used polymer modified mortar to restore the tank, and further corrosion was prevented.

Recognition by the Customer

"We would like to thank the SPS team for the outstanding work they did during the repair process. We recognise the group's skill and dedication to producing excellent results."