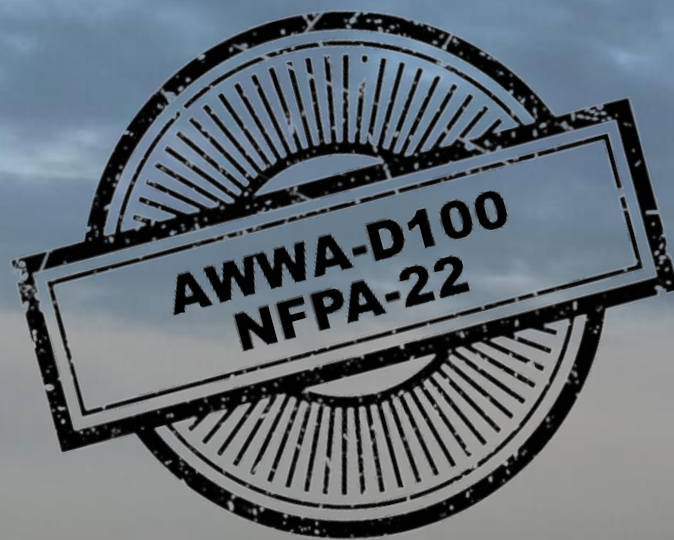


BS-AWWA-D100+

CARBON STEEL - WELDED TYPE
WATER TANKS



OVERVIEW

The AWWA D100 tank is a vital part of many industrial complexes, including:

- Power Plant
- Wastewater Treatment Facilities
- Industrial Process Plants
- Firewater Tanks
- Potable Water Tanks



WHAT IS AN AWWA D100 TANK?

The American Water Works Association (AWWA) developed the AWWA D100 standard to designate the minimum requirements for the design, fabrication, erection and testing of above ground, welded carbon steel tanks for water storage. The AWWA D100 standard was approved by the American National Standards Institute (ANSI) and accepted by the Saudi Building Code (SBC). AWWA D100 tanks are traditionally field erected and used for municipal or industrial potable water storage.

WHAT IS AN NFPA 22 TANK?

The National Fire Protection Association (NFPA) 22 standard designates the requirements for water tanks used for private fire protection. These tanks are used to store fire water and are AWWA D100 tanks with additional accessories and design conditions. For example, NFPA 22 tanks must have 360° handrails, internal ladders with fall arrest systems and a corrosive barrier on the underside of the floor.

OUR EXPERIENCE

We offers customized AWWA-D100 and NFPA-22 Design Code Tanks for the Storage of Water for various applications.

We optimized process design and comprehensive project management can produce a cost-effective package.



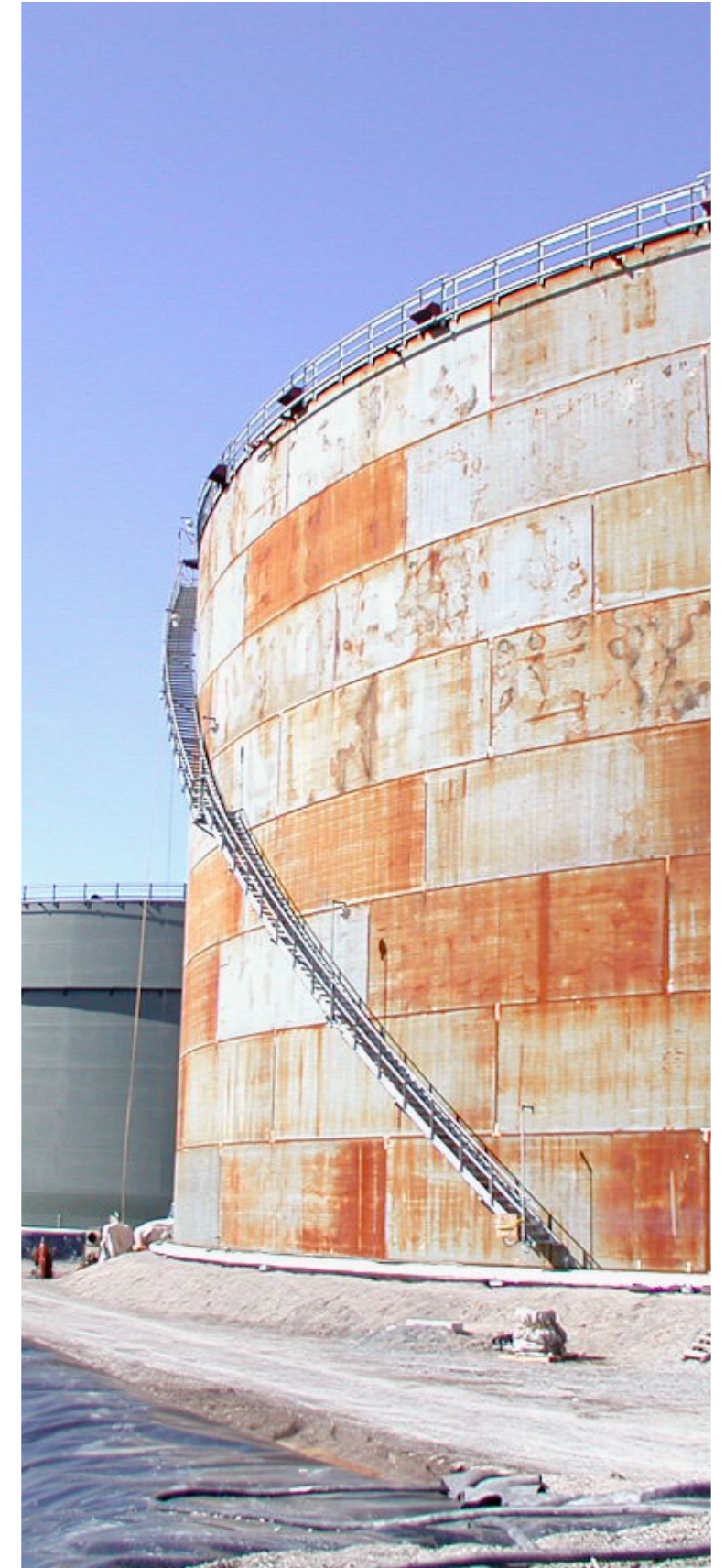
SPECIALIZED SERVICES

- Engineering, Design, Fabrication & Erection
- Tanks up to 120M diameter
- Mixing Systems
- Tank Heater
- Baffle Design and Installation

- Maintenance & Repair Services
- AWWA D100 Tank Vents
- Custom Tank Accessories
- Tank Coatings
- Insulation
- Cathodic Protection Systems

TANK MATERIAL TYPES

Adhering to the AWWA D-100 standard, our tanks are constructed with ASTM A36 carbon steel as the primary material, while other approved materials are used to construct external components. Ensuring the safety, integrity and function of your finished tank is our highest priority. That's why we support in-house, custom fabrication and hire certified welders with intimate knowledge of AWWA D-100 Section 10, which provides specific instructions for tank erection.



ROOF TYPES

- Cone
- Umbrella
- Open Top
- Knuckle
- Geodesic
- Flat



Regardless of how the roof is made, it must be strong enough to support 50 pounds per square foot (50 lb/ft²).

AWWA tanks need to be designed to contain a “live load” of 15 pounds per square foot (15 lb/ft²) and withstand a “wind load” of 100mph.

Of all the tanks we make, the AWWA water storage tanks are the largest and most exposed to the elements and the general public. To help protect it, we can coat your AWWA-D100 tank with a High-performance industrial coating at site.

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Column/ Structurally Supported Cone Roof

A common fixed-roof design for tanks with relatively low pressure. They contain a shallow cone roof utilizing a center column of pipe or structural steel. Intermediate columns are commonly used on larger diameter tanks.

Internal framing is used to support the roof plates; this may include supporting rafters, clips, tie bars and girders.

Highlights

- Permits for a large diameter roof design
- Rigid structure can be designed for large snow loads
- With an API 650 design, the tank can be re-purposed to store many additional liquids



Self Supporting Cone

Suitable for small diameter tanks. Roof is supported at the shell.

Highlights

- Roof can be sealed
- With an API 650 design, the tank can be re-purposed to store many additional liquids



Self Supporting Cone (Externally Stiffened)

Suitable for medium size diameter tanks. The external stiffening can allow additional support for platforms and structures on the roof.

Highlights

- Suitable for tanks with internal roof coating
- External Stiffening allows for a medium sized roof diameter
- Roof can be sealed
- With an API 650 design, the tank can be re-purposed to store many additional liquids



Self-Supporting Umbrella

Design Standard AWWA-D100

The umbrella roof consists of a modified dome, where the horizontal section is a regular polygon with multiple sides with roof plates, supported only at the periphery. Dome roofs are also possible at a higher cost.

Highlights

- Can often be built from thinner material than a cone
- The bulk of the roof work can take place at grade
- With an API 650 design, the tank can be repurposed to store many additional liquids



Geodesic Dome

These clear-span, space frame structures are corrosion-resistant, easy to maintain, and customizable.

Highlights

- They are Light weight
- Naturally corrosion resistant. No coatings required
- Can be constructed either on tank or elsewhere on site
- With an API 650 design, the tank can be re-purposed to store many additional liquids



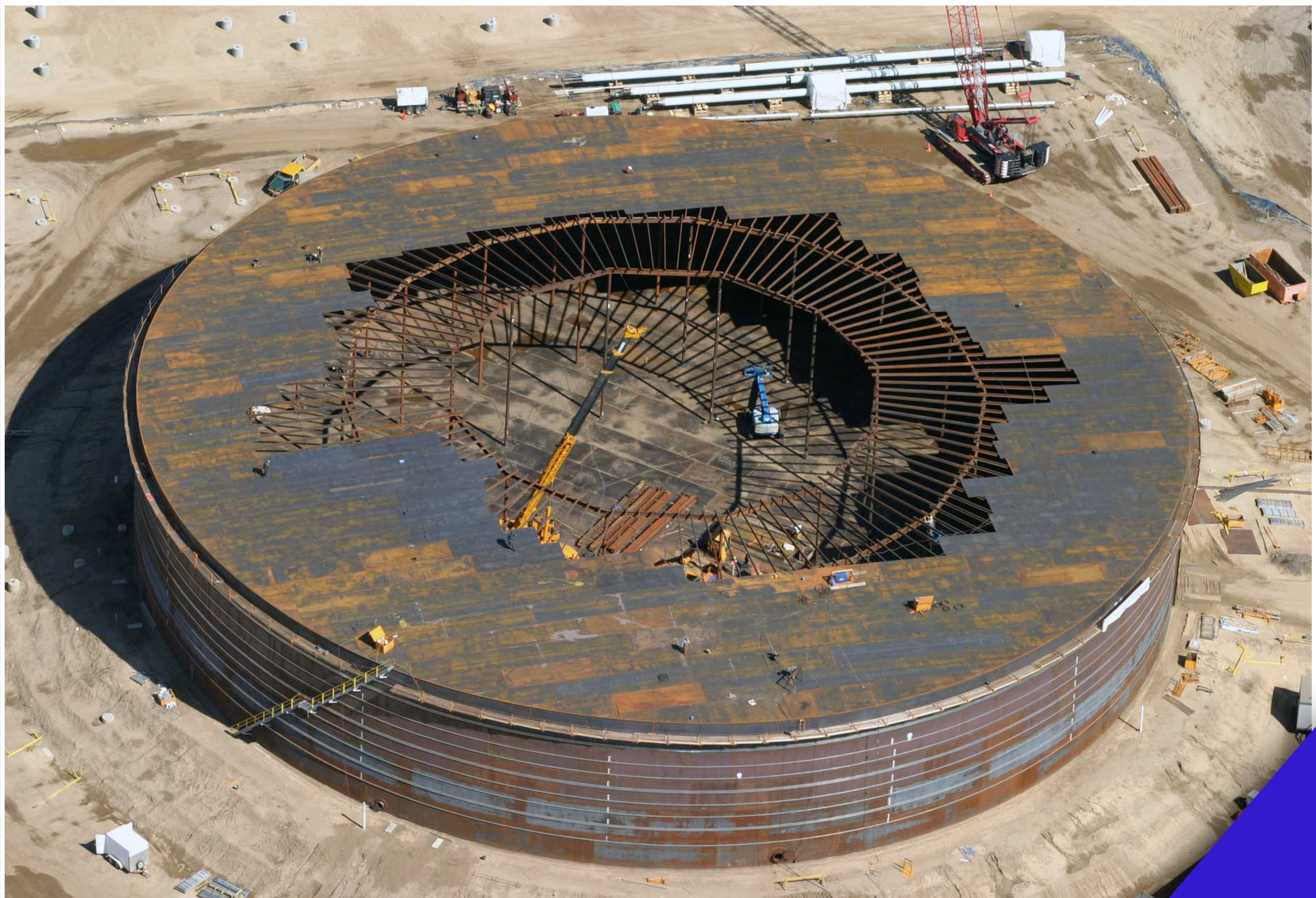
Open Top

These tanks are commonly found in mining and waste water facilities where the open top design does not have a negative effect on the stored product.

Highlights

- Simple Design
- Highly customizable
- Ideal for external process equipment. i.e. an agitator
- With an API 650 design, the tank can be repurposed to store many additional liquids





Considerations:

When designing an AWWA D100 tank for external loads, considerations typically include:

- **Environmental Conditions:** Assess the local weather conditions, seismic activity, and soil characteristics to determine potential external loads.
- **Wind Loads:** Calculate wind pressures on the tank surfaces based on wind speed, exposure category, and terrain conditions.
- **Seismic Loads:** Evaluate seismic forces acting on the tank due to ground motion. Consider the seismic design category and site-specific seismic coefficients.
- **Snow Loads:** Determine the maximum snow load on the tank roof and consider its effect on the structural integrity.
- **Foundation Design:** Ensure the tank's foundation is designed to withstand external loads and provide stability against overturning and sliding.
- **Anchorage Design:** Design tank anchorage to resist uplift forces induced by wind and seismic loads.
- **Tank Wall Thickness:** Determine the required thickness of the tank walls to withstand external loads while maintaining structural integrity.
- **Corrosion Protection:** Consider corrosion protection measures to ensure the long-term durability of the tank against environmental exposure.
- **Overflow and Venting:** Ensure adequate provision for overflow and venting to prevent damage due to excessive internal pressure caused by external loads.
- **Safety Factors:** Apply appropriate safety factors in design calculations to account for uncertainties and variations in load conditions.
- By considering these factors, engineers can ensure that the AWWA D100 tank is designed to withstand external loads and maintain structural integrity throughout its service life.





Access Systems

- Radial or spiral stairways
- Roof access systems

Corrosion Protection

- Linings, coatings
- Cathodic protection

Heat Conservation

- Various insulation products



EXAMINATION AND TESTING

Dry Film Thickness (DFT)

DFT readings will be taken at random locations to measure the paint thickness. Coatings Systems are specifically designed to perform when applied within a range of DFT as specified by the coatings manufacture.

Lead Based Paint Detection

- If there is lead in the paint, all local, state & federal environmental laws & regulations must be followed.
- If there are heavy concentrations of lead or other heavy metals, the coatings & blast residue may be considered hazardous and full-containment may be required during blasting operation followed by proper disposal of material.

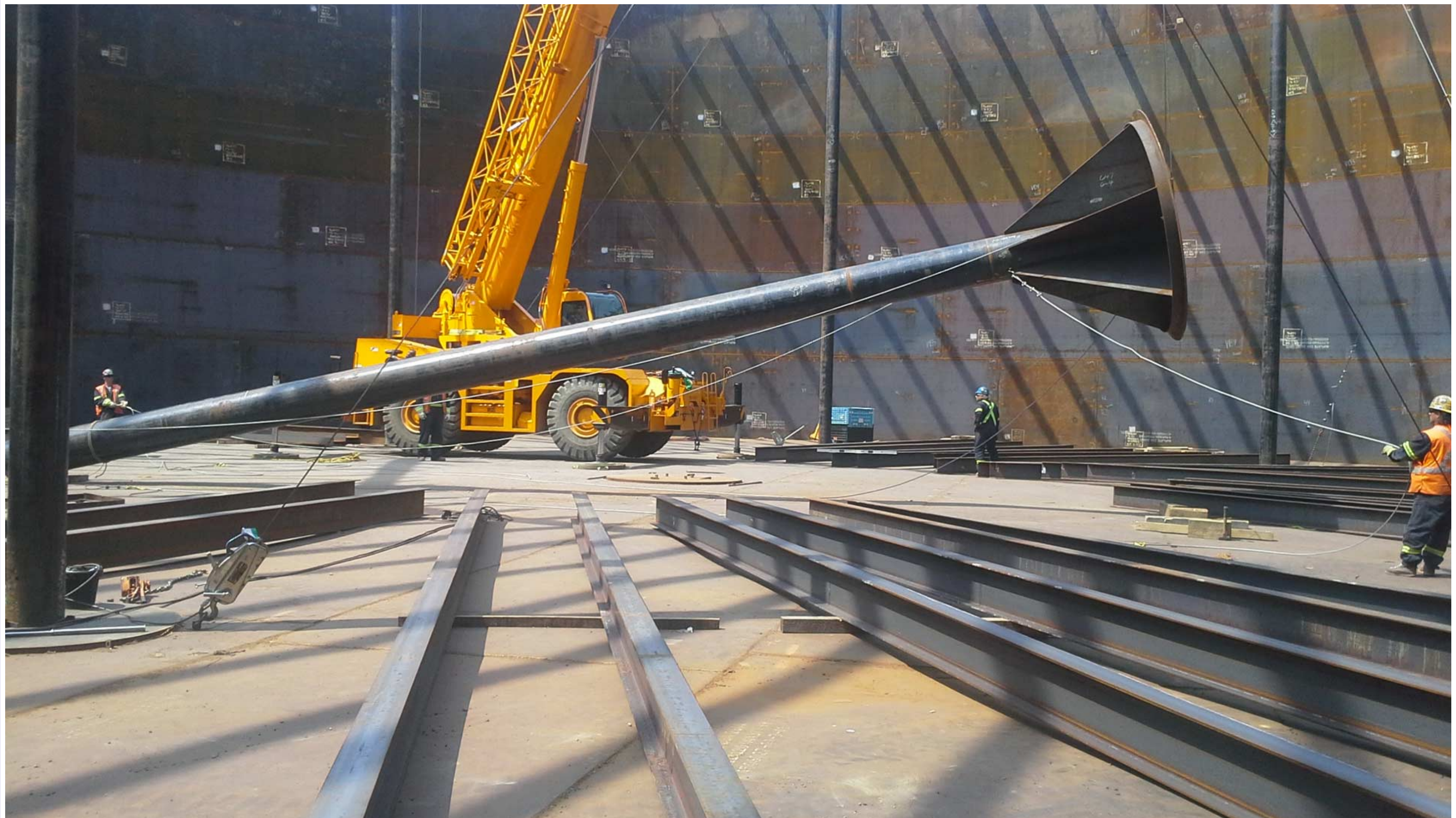


Adhesion Test

- Performed to test if the existing paint is sufficiently adhered to the substrate.

Visual Inspection

- Inspector will make note of areas experiencing coatings failures (de-lamination of coatings, rusting/ corrosion of steel surfaces, etc.).



SAMPLE PROJECT:

- PROJECT: GACA - KING KHALED INTERNATIONAL AIRPORT
- CAPACITY: 1,500 M3 (14 M DIA X 10MH)
- APPLICATION: SEWAGE WATER - AWWA-D100



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