

San Antonio Water System Standard Specifications for Construction

ITEM NO. 809
REINFORCED CONCRETE VAULTS FOR METERED FIRELINE SERVICES

809.1 **DESCRIPTION:** Reinforced concrete vaults shall be precast with reinforcing steel and include all other appurtenant work required to provide a complete and functional structure.

All precast concrete vaults shall be accurately formed and finished as shown on the plans, the Standard Drawings, and as specified herein.

Precast vaults conforming to the Standard Drawings and Specifications shall be acceptable as a substitute to the cast-in-place vaults or as approved by the Engineer. Contractor will give 24 hour notification to the Inspector assigned to the project before setting a metered fire line vault.

809.2 **MATERIALS:**

Concrete: Concrete used shall be transit mix and shall have a 28 day compressive strength of 3,000 psi with a maximum slump of 6 inches and a minimum slump of 3 inches. The use of admixtures shall not be permitted unless approved by the Engineer. Cement shall be Type I or Type III and shall conform to the general requirements contained in the Materials Specifications Item 100-10 and the ASTM Specifications C150-56.

809.3 **CONSTRUCTION:**

1. Forms: Forms shall be designed to produce hardened concrete having the shape, lines, and dimensions shown on the drawings.

Surfaces which will be exposed to view when construction is completed shall be prefabricated plywood panel forms, job-built plywood forms, or forms that are lined with plywood or fiberboard. The forms shall produce finished surfaces that are free from off-sets, ridges, waves, and concave or convex areas.

Plywood or lined forms will not be required for surfaces which are normally submerged or not ordinarily exposed to view. Other types of forms, such as steel or unlined wooden forms, may be used for surfaces which are not restricted to plywood or lined forms and may be used as

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backing for form linings.

Before concrete is placed, a film of light form oil shall be applied to the forms.

Forms shall be substantial and sufficiently tight to prevent leakage of mortar. Forms shall be thoroughly cleaned, braced, or tied to maintain the desired position, shape, and alignment during and after concrete placement.

Form ties shall be corrosion resistant and shall have sufficient strength and rigidity to support and maintain the form in proper position and alignment.

2. Form Removal: Forms shall be removed after 24 hours provided exposed surfaces can be immediately and effectively sealed to prevent loss of moisture; otherwise, the forms shall remain in place for 48 hours. Precautions shall be taken in form removal to avoid surface gouging, corner or edge breaking, and other damage to the concrete.
3. Reinforcing Steel: Reinforcing steel shall be accurately formed and shall be free from loose rust, scale, and contaminants which reduce bond. Unless otherwise shown on the drawings or specified herein, bar reinforcement shall be deformed and conform to the general requirements contained in the Material Specifications.
4. Reinforcing Steel Placement: Reinforcing steel shall be accurately positioned on supports, spaces, hangers, or other reinforcements and shall be secured in place with wire ties or suitable clips. All bars shall be shop fabricated and bent cold.
5. Concrete Placement: Concrete shall be placed as nearly as practicable in its final position to avoid segregation due to rehandling. When the concrete pour has commenced, it shall be carried on as a continuous operation until the placing of the panel or section is completed as a whole. All concrete shall be thoroughly compacted by suitable means during pouring operations and shall be thoroughly worked around reinforcement bars and into the corners of the forms. Mechanical vibration or other acceptable means shall be used to completely embed the reinforcement and eliminate honeycomb. Finished surfaces shall be brought to proper grade, struck off, and completed in a workmanlike manner. No honeycombing, rough spots or protruding stones shall be left exposed.

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6. Curing: Concrete shall be protected from loss of moisture for at least 7 days after placement. Curing of concrete shall be by methods which will keep the concrete surfaces adequately wet during the specified curing period.
 - a. Water Curing: Water saturation of concrete surfaces shall begin as quickly as possible after the initial set of the concrete. The rate of water application shall be regulated to provide complete surface coverage with a minimum of runoff.
 - b. Membrane Curing: Chlorinated, rubber-type, membrane curing compound may be used in lieu of water curing on concrete which will not be covered later with mortar or additional concrete.

Membrane curing compound shall be spray applied at coverage of not more than 300 square feet per gallon. If forms are removed before the end of the specified curing period, curing compound shall be immediately applied to the formed surfaces before they dry out.

Curing compound shall be suitably protected against abrasion during the curing period.

7. Finishing Surfaces: Fins and other surface projections shall be removed from all formed surfaces. All exposed exterior surfaces shall have a rubbed finish. The floor surface shall be brush finished, unless otherwise specified.
8. Repairing Defective Concrete: Defects in formed concrete surfaces shall be repaired to the satisfaction of the Engineer within 24 hours, and defective concrete shall be replaced within 48 hours after the forms have been removed. All concrete which is honeycombed or otherwise defective shall be cut out and removed to sound concrete with edges square cut to avoid feathering.

Concrete repair work shall be performed in a manner that will not interfere with thorough curing of surrounding concrete. Repair work shall be adequately cured.

9. Painting: All exposed metallic surfaces such as the cover plates, hinges, handles, and other exposed hardware shall be primed and painted with one coat of primer and one coat of aluminum paint of approved and

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compatible quality.

10. **Backfill**: The Contractor shall cover the openings at each end of the vault with grout placed around the pipe penetration inside and outside of the vault. Select backfill consisting of job excavated materials, finely divided and free from debris, organic material and stones larger than 2 inches in greatest dimension, shall be placed in uniform layers not exceeding 8 inches in uncompacted thickness and shall be carefully compacted around the sides of the vault until level with the surrounding ground.

809.4 **MEASUREMENT:** Reinforced concrete vaults shall be measured by the unit of the various sizes.

809.5 **PAYMENT:** Payment for reinforced concrete vaults will be made at the unit price for each size vault installed.