ITEM NO. 808
REINFORCED CONCRETE VAULTS

808.1 DESCRIPTION: Reinforced concrete vaults shall be cast-in-place and shall include reinforcing steel, forms, finishing, curing, and all other appurtenant work required to provide a complete and functional structure.

All cast-in-place concrete shall be accurately formed and properly placed and finished as shown in the contract documents.

The Contractor shall inform the Engineer at least 24 hours in advance, of time and location at which he/she intends to place concrete in order for inspection of forms, reinforcing steel placement, and other preparatory work.

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.

808.2 MATERIALS: 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 latest provision of ASTM Specifications C150 and C156 or most applicable approved equal provision.

808.3 CONSTRUCTION:

1. Forms: Forms shall be designed to produce hardened concrete having the shape, lines, and dimensions shown in the contract documents.

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
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 that the 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 in the contract documents, bar reinforcement shall be deformed and conform to the general requirements contained in Item No. 301, "Reinforcing Steel."

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.
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 plate, 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
compatible quality.

10. **Backfill**: The Contractor shall cover the openings at each end of the vault with ¼ inch plywood placed outside the vault. Selected backfill (consisting of job excavated materials, finely divided and free from debris, organic material and stones larger than two inches in greatest dimension) shall be placed in uniform layers not exceeding eight inches in uncompacted thickness and shall be carefully compacted around the sides of the vault until level with the surrounding ground.

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

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

- End of Specification -
**DROP HANDLE DETAIL**

- Cut groove in lid for drop handle to fit down into C Channel
- Weld C Channel to bottom of lid (9" long)
- Form 6/8" rod, threaded on each end

**KEYWAY DETAIL**

- 3 1/2"

**DRAIN DETAIL**

- 6" P.V.C.
- 12" P.V.C.
- Gravel Fill

**STANDARD DETAILS**

- ALL VAULTS

---

**PROPERTY OF**
SAN ANTONIO WATER SYSTEM
SAN ANTONIO, TEXAS

**APPROVED**
MARCH 2008

**REVISED**
APRIL 2014

**DD-808-01**
SHEET 1 OF 1
Cover Latch is to be located on the opposite side of where the ladder is positioned.

Ladder made of 2" x 2" x 1/4" Angle Steel.

2" x 1/4" Steel ladder supported with 3/8" wedge anchor bolts.

3" x 1/4" Steel Steps welded to ladder coated with acid resistant material.

14" x 14" Side Openings (Each end).

6" of 3/4" to 1-1/2" Gravel.

OPTION FOR DRAIN
1) Install 6" of 3/4" to 1-1/2" gravel under vault.
2) Provide 6" PVC Sleeve through vault floor.

SECTION A-A
12" PVC Sump drain.
6" PVC Gravel Fill.

C Channel 8" Long.

Form 5/8" Rods, Threading on each (2 Required).

Cut groove in Lid for Drop Handle to fit down into C channel.

7/8" Dia. Hole (2 Required)
5/8" Heavy Hex Nut.

DROP HANDLE DETAIL
Cover latch is to be located on the opposite side of where the ladder is positioned.

Ladder made of 2" x 2" x 1/4" Angle Steel

2" x 1/4" Steel ladder supports with 3/8" wedge anchor bolts

3" x 1 1/4" Steel Steps welded to ladder coated with acid resistant material

16" x 16" Side Opening at (Each end)

OPTION FOR DRAIN

1) Install 6" of 3/4" to 1-1/2" gravel under vault

2) Provide 6" PVC Sleeve through vault floor

8" PVC Sump Drain

12" PVC Gravel Fill

C Channel 8" Long

Fold 5/8" Rod Threaded on each end (2 Required)

DROP HANDLE DETAIL

Cut groove in Lid for Drop Handle to fit down into C channel

7/8" Dia. Hole (2 Required)

5/8" Heavy Hex Nut
(2) 2" x 2" x 1/4" Angle Steel 3'-7/8" or
3'-7/16" Long welded to underside of
on (1) plate only

(4) 3'-6" x 2'-4" x 5/16" Steel Safety
Plate with Drop Handles, painted
with one coat of Rust-Inhibitive Primer
and one coat of Aluminum Paint

(2) 3'-1 1/2" x 1'-6" x 5/16" Steel
Safety Plate with Drop Handles,
painted with one coat of Rust-Inhibitive
Primer and one coat of Aluminum Paint

(2) Heavy Steel Hinges with Brass
Pins, counter sunk and bolted to
Plate (Alamo Iron Works Catalog
#1302 1/4") or approved equal

(1) 3'-1 1/2" x 1'-5" x 5/16" Steel
Safety Plate with Drop Handle, painted
with one coat of Rust-Inhibitive Primer
and one coat of Aluminum Paint

(1) 2" x 2" x 1/4" Angle Steel 2'-6 1/2" Long
welded to underside at one (1) plate only

(2) 10" x 10" Manhole Step
staggered (Government - Type)

FLOW

SECTION A-A

Refer to DD-808-01
For Drain Detail

Block-Out Detail
For I Beams

Opening Detail
For Service Pipe

CONCRETE VAULT FOR
12" SERVICE WITH
10" TURBINE METER

DD-808-05 SHEET 1 OF 3
Floor Slab Thickness to range from 8" at walls, to 6" at drain and shall slope uniformly to drain.

Note:
See DD-808-05 Sheet 3 of 3 for Steel Schedule

Refer to DD-808-01 For Drain Detail

CONCRETE VAULT FOR 12" SERVICE WITH 10" TURBINE METER

PROPRIETARY OF
SAN ANTONIO WATER SYSTEM
SAN ANTONIO, TEXAS

APPROVED
MARCH 2008

REVISED
APRIL 2014

DD-808-05 SHEET 2 OF 3
### STEEL SCHEDULE

<table>
<thead>
<tr>
<th>Mark</th>
<th>Req’d</th>
<th>Size</th>
<th>Bending Detail</th>
<th>Placement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>5</td>
<td>20&quot;  5’-4”</td>
<td>20&quot; Floor Slab</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>5</td>
<td>20&quot; 10’-10”</td>
<td>20&quot; Floor Slab</td>
</tr>
<tr>
<td>3</td>
<td>11</td>
<td>5</td>
<td>5’-4”</td>
<td>Floor Slab</td>
</tr>
<tr>
<td>4</td>
<td>6</td>
<td>5</td>
<td>10’-10”</td>
<td>Floor Slab</td>
</tr>
<tr>
<td>5</td>
<td>4</td>
<td>4</td>
<td>10” 12”</td>
<td>Tie Bar - Floor Slab</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>To Vertical Walls</td>
</tr>
<tr>
<td>6</td>
<td>28</td>
<td>4</td>
<td>18” 12”</td>
<td>Tie Bar - Floor Slab</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>To Vertical Walls</td>
</tr>
<tr>
<td>7</td>
<td>28</td>
<td>4</td>
<td>4’-4”</td>
<td>Vertical In Walls</td>
</tr>
<tr>
<td>8</td>
<td>4</td>
<td>4</td>
<td>20”</td>
<td>Vertical In Walls</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(Above Openings)</td>
</tr>
<tr>
<td>9</td>
<td>10</td>
<td>4</td>
<td>16” 24” 4”</td>
<td>Horizontal In Walls</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5’-10” 14”</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>8</td>
<td>4</td>
<td>15” 4” 1’-10”</td>
<td>Horizontal In Walls</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>14” 16”</td>
<td></td>
</tr>
</tbody>
</table>

### STEEL SCHEDULE FOR CONCRETE VAULT

### STEEL DETAIL FOR CONCRETE VAULT

END VIEW

PROPERTY OF
SAN ANTONIO WATER SYSTEM
SAN ANTONIO, TEXAS

CONCRETE VAULT FOR
12” SERVICE WITH
10” TURBINE METER

APPROVED
MARCH 2008

REVISED

DD-808-05 SHEET 3 OF 3
3'-0" x 5'-0" Parkway Frame and Cover Cast-In Flush with Top of Vault

4' x 8' x 4' Rectangular Concrete Vault (Datwirth Quickset No. 408-2 Series) or approved equal (Non-Traffic Bearing)

Bolt Down Spring-assisted Lid
See DD-808-03, sheet 1 of 1

SECTION A-A

16" x 16" Side Openings (Each end)

SECTION B-B
3' x 5' x 3' Rectangular Concrete Vault
(Dalwurth Quickset No. 305-1 Series)
or approved equal (Traffic Bearing Location)

Bolt Down Spring-Assisted Lid
See DD-808-03, sheet 1 of 1

SECTION A-A

3/4" gravel

SECTION B-B

16" x 16" Side Openings
(Each end)
3' x 5' H-20 Traffic Frame and Cover

Drop Handles are to be installed flush with top of lid

4' x 8' x 3' Rectangular Concrete Vault (Dowler Quickset No. 408-1 Series) or approved equal (Traffic Bearing Location)

Bolt Down Spring-Assisted Lid
See DD-808-03, sheet 1 of 1

3/4" gravel

21" x 21" Side Openings (Each end)

SECTION A-A

SECTION B-B

CONCRETE VAULT FOR 10' x 12' DETECTOR CHECK INSTALLATION

DD-808-08
1/4" Steel Lid

Concrete Vault

1/2" Dia. Galvanized Bolt w/ 3/4" Hex Nut

3/4" Hex Nut welded to top of Angle Iron

Weld

Drill 5/8" Hole through Angle Iron

Weld

Teck weld 1/2" flat washer to shank of bolt

1/4" x 1/4" Angle Iron

DETAIL