SP-151153
(Replaces SP-151110)

SPECIAL PROVISIONS
FOR
~~PRECAST~~ CONCRETE VAULTS

Polk County
EDP-PA26(001)--7Y-77

Effective Date
November 1, 2022

THE STANDARD SPECIFICATIONS, SERIES 2015, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

151153.01 DESCRIPTION.

A. General:

1. The work required under this specification consists of furnishing all labor and materials and performing all construction operations in connection with installation and erection of precast or cast-in-place concrete vaults, and all related embedded and attached items.

2. ~~Precast concrete~~ Concrete vaults on this project include the hydraulic control vault shown in the plans. The hydraulic control vault can either be pre-cast or cast-in-place construction. Pre-cast vaults shall comply with the concrete design specifications in this Special Provision and Cast-in-Place vaults shall comply with the concrete specifications in the Special Provisions for In-River Structural Concrete.

B. Related:

1. Section 2403 of the Standard Specifications.

2. Special Provisions for WaveShaper™ and Gates.

3. Special Provisions for In-River Structural Concrete.

151153.02 DESIGN.

A. Comply with ASTM C857 and C858.

B. Precast vaults shall be designed to accommodate AASHTO H-20 vehicle loading, as well as all dead and live loads indicated or illustrated on the Plans.

C. Vaults shall be designed to resist floatation with a groundwater level equal to finish grade elevation shown on the plans with no interior inundation. Calculations shall not consider the weight of items contained within the vault. Provide ballast, extended bottom slab, or other methods needed to prevent floatation of the vault analyze flotation using a safety factor of at least 1.3.

D. Pipe penetration openings shall be provided as shown on the plans or as otherwise required and shall be smooth core drilled in the field; percussion drilling shall not be used. Pipe openings shall be of sufficient diameter to accommodate the pipe and specified modular link seal. The roof opening(s) shall have additional reinforcement, set at 45 degrees from the edges of the vault and extending 2 feet beyond the opening(s). Pipe penetrations shall be above the 100 year flood elevation or be piped and routed in the interior above the 100 year flood elevation so as to prevent inflow during flooding.

E. Minimum dimensions of the vault shall be as shown on plans.

F. Vault design and fabrication shall include installation of ladders, inserts, access hatches, piping supports, and other appurtenances as needed.

G. ~~The Contractor shall submit design calculations signed and sealed by a Professional Engineer licensed in the State of Iowa and shall also submit~~ Submit shop drawings showing details of construction.

151153.03 MATERIALS AND EQUIPMENT.

A. Cement: ASTM C150.

B. Sealant Gaskets:
Preformed, continuous rope form plastic material, protected by removable two-piece wrapper. Conform to Federal Specifications SS-S-210 (210-A), AASHTO M-198 75 1 and ASTM C990-09.

C. Access Hatch:
Minimum clear opening dimensions of each hatch shall be as shown on the Plans. All non-aluminum components shall be Type 304 stainless steel.

1. Loading: 300 psf

2. Leaves: 1/4 inch thick aluminum, diamond pattern, reinforced to withstand the specified loads.

3. Frame: 1/4 inch thick aluminum channel with anchor flange around perimeter for embedment into concrete. Surfaces in contact with concrete shall be first coated with bituminous coating or mastic, to prevent aluminum/cement contact. Provide channel to collect rainwater and provide 1 1/2 inch drainage coupling for connection to drain lines. Drain lines shall be freely draining by gravity.

4. Doors: Doors shall open to 90 degrees and shall include an automatic hold-open arm with a positive automatic latch that will secure the door in the open position until the release handle is activated. Door hinges shall be recessed or flush.

5. Lock: Provide a slam-lock with removable handle and a hinged covered recess with a door to frame padlock hasp.

6. Lift-Assist Mechanism: Provide stainless steel compression spring(s) or pneumatic spring(s) enclosed in sealed telescoping tube(s).

7. Weather-Tightness: Hatch shall be rated "weather tight". Provide an EPDM or neoprene rubber rim gasket to prevent infiltration of rainwater. Include gaskets and O-rings for accessory penetrations as applicable.

8. Hatch shall be insulated.

D. Fixed Ladder:
Ladder shall be fabricated from aluminum and encapsulated in copolymer polypropylene for corrosion resistance. Comply with ASTM C497 and OSHA 1910.26 and 1910.27. Provide pull-up handrail extension that raises to 42 inches above the hatch when fully extended. Securely anchor to the vault wall and floor with Type 304 stainless steel anchors.

E. Sump Pump:
Self-contained package consisting of pump and float controls. 115V single phase (unless noted otherwise on the Plans), 1/3 HP max power draw. Automatic resetting thermal motor protection. Carbon-ceramic mechanical seal, field replaceable, standard size. 1/2 inch (minimum) solids handling size in pumped liquid. Cast iron or bronze body and impeller. Model shall be suitable for installation within an 18 inch diameter sump.

Sump pump discharge piping shall consist of schedule 40 PVC of the diameter equal to the discharge size of the pump. Provide a union, ball or swing check valve, and shutoff ball valve located on the discharge line just above the sump grate. Check valve on sump pump discharge line shall be low seating head type.

151153.04 CONSTRUCTION.

A. Submittals: Submit the following in accordance with Article 1105.03 of the Standard Specifications.

1. Product data: Descriptive details of the manufacturer's proposal products, including:
- **a.** Precast sections (if installing a precast vault).
- **b.** Steps, ladder rungs and other hardware.
- **c.** Minimum concrete 28 day compressive strength.
- **d.** Cement certification.
- **e.** Access Hatch.
- **f.** Sump pump.

2. Shop Drawings, including:
- **a.** Formwork.
- ~~**a**~~ **b.** Design criteria.
- ~~**b**~~ **c.** Floatation calculations.
- ~~**c**~~ **d.** Reinforcing steel location and concrete cover.
- ~~**d**~~ **e.** Layout of all inserts, attachments and openings.
- ~~**e**~~ **f.** Location and type of joints.

B. Installation:

1. ~~Comply~~ Installation of precast vaults shall comply with ASTM C891.

2. Instructions for field-casting tongue-and-groove joint in cast-in-place base slab to accept precast vault wall sections, if applicable.

3. Apply bituminous coating to aluminum access hatch frames where in contact with concrete at the factory, prior to casting in the top slab. Plumb drain coupling to discharge to exterior of top slab, as shown on the plans.

4. Apply primer to joint surfaces in accordance with manufacturer's instructions. Make all joints watertight with sealant gaskets.

5. Provide rigid foam insulation around the vault exterior as shown on the plans. Backfill around the vault with native fill. Compact the backfill material to 95% of relative density from the base up to final finish grade.

6. Plumb hatch drain line to drain as shown on the Plans.

7. Install the sump pump, discharge piping, and accessories in accordance with the manufacturer's instructions and test to verify proper operation.

151153.05 METHOD OF MEASUREMENT

Precast Hydraulic Vault will not be measured for payment.

151153.06 BASIS OF PAYMENT

Precast Hydraulic Vault: No separate measurement for payment will be made for any labor, equipment, and materials required for this item. The lump sum price will include all of the Contractor's costs. This bid item includes, but is not limited to:

A. Furnishing and installing the precast concrete vault, metal hatch, finishes, and appurtenances. Appurtenances do not include hydraulic controls or equipment installed in the vault for the operation of the WaveShaper. These items are paid for under the WaveShaper System and Controls bid item.

B. Coordination with other WaveShaper™ system components to ensure a fully functioning system.

C. Providing all other related and necessary labor, equipment, and materials to complete the work.