

Section 02085

VALVE BOXES, METER BOXES, AND METER VAULTS

PART 1 GENERAL

1.01 SUMMARY

This Section includes:

- A. Valve boxes for water service.
- B. Meter boxes for water service.
- C. Meter vaults for water service.

1.02 MEASUREMENT AND PAYMENT

- A. Unit Prices.
  - 1. No separate payment will be made for valve boxes under this Section. Include payment in unit price for Section 02521 - "Gate Valves".
  - 2. Payment for each size of meter vaults is on unit price basis per vault. Payment will be made for each vault installed, regardless of depth.
  - 3. Refer to Section 01270 - "Measurement and Payment" for unit price procedures.
- B. Stipulated Price (Lump Sum). If Contract is Stipulated Price Contract, payment for Work in this Section is included in total Stipulated Price.

1.03 REFERENCES

- A. ASTM A48/A48M - Standard Specification for Gray Iron Castings.
- B. ASTM D256 - Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics.
- C. ASTM D638 - Standard Test Method for Tensile Properties of Plastics.
- D. ASTM D648 - Standard Test Method for Deflection Temperature of Plastics Under Flexural Load in the Edgewise Position.
- E. ASTM D790 - Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.

F. SECTION 0512 - Water Tap and Service Line Installation [City of Houston Standard Specification]

1.04 SUBMITTALS

A. Conform to requirements of Section 01330 - "Submittal Procedures".

B. Submit manufacturers' product data for following items for approval:

1. Each type of valve box and lid.
2. Each type of meter box and cover.
3. Each type of meter vault frame and cover.

C. Submit design calculations and Shop Drawings for precast vault elements, sealed by an Engineer registered in State of Texas.

D. Submit Shop Drawings for cast-in-place meter vaults for approval if proposed construction varies from Plans.

E. Submit manufacturer's certification that plastic meter boxes meet requirements of Paragraph 2.02.E, Plastic Meter Boxes.

1.05 RELATED REQUIREMENTS

A. Section 01270 - "Measurement and Payment"

B. Section 01330 - "Submittal Procedures"

C. Section 02082 - "Precast Concrete Manholes"

D. Section 02084 - "Frames, Grates, Rings and Covers"

E. Section 02317 - "Excavation and Backfill for Utilities"

F. Section 02320 - "Utility Backfill Materials"

G. Section 02501 - "Ductile Iron Pipe and Fittings"

H. Section 02506 - "Polyvinyl Chloride Pipe"

I. Section 02511 - "Water Lines"

J. Section 02775 - "Concrete Sidewalks"

K. Section 02911 - "Topsoil"

L. Section 02921 - "Hydromulch Seeding"

M. Section 02922 – “Sodding”

N. Section 03315 – “Concrete for Utility Construction”

1.06 – 1.13 NOT USED

## PART 2 PRODUCTS

2.01 MANUFACTURER(S) (NOT USED)

2.02 MATERIALS AND/OR EQUIPMENT

### A. Valve Boxes

1. Provide Type A, cast-iron/ductile-iron, slide-type, valve boxes. Design of valve box shall minimize stresses on valve imposed by loads on box lid.
2. Cast letter “W” into lid, ½ inch in height and raised 3/32 inch, for valves serving potable water lines.
3. Unless otherwise specified, uncoated cast iron.
4. Riser Pipe.
  - a. Provide 6-inch PVC, Class 150, DR 18, riser pipes in accordance with Section 02506 – “Polyvinyl Chloride Pipe” or
  - b. Provide 6-inch ductile-iron, thickness Class 51 riser pipes in accordance with Section 02501 – “Ductile Iron Pipe and Fittings”.
  - c. Provide single section of pipe.
5. Concrete for valve box placement:
  - a. For locations in new concrete pavement, provide strength and mix design of new pavement.
  - b. For other locations, provide concrete conforming to requirements of Section 02775 - “Concrete Sidewalk”.

### B. Meter Boxes

1. Provide meter boxes for 5/8-inch through 1-inch meters of the following materials:
  - a. Non-traffic bearing locations: Cast iron, concrete or plastic.
  - b. Traffic bearing locations: Cast iron.

2. Provide meter boxes for 1½-inch and 2-inch meters of cast iron.
3. Provide meter box with reading lid. Provide lids with spring-type latching devices. Lids shall contain sufficient metal that meter box can be easily located with metal detector. Cast words “WATER METER” into lid with letters of ½-inch height and raised 3/32 inch.
4. Meter box dimensions shall conform to the following approximate dimensions:
  - a. Length: At top - 15½ inches; at bottom 20 inches
  - b. Width: At top - 12½ inches; at bottom 14¾ inches
  - c. Height: 12 inches
5. Extensions: Meter box extensions 3 inches and 6 inches in height shall be available from manufacturer as standard item.

C. Cast-Iron Meter Boxes

1. Cast-Iron Boxes: Clean and free from sand blow-holes or other defects conforming to requirements of ASTM A48/A48M, Class 30B. Bearing surfaces shall be machined so that covers seat evenly in frames.
2. Boxes and lids shall have dipped, coal-tar-pitch, varnish finish.
3. Provide lock-type meter boxes when required by Plans. Lock mechanisms shall work with ease.

D. Concrete Meter Boxes

1. Concrete Meter Boxes: Made of Class A concrete, with minimum 4,000 psi compressive strength, conforming to requirements of Section 03315 - “Concrete for Utility Construction”. Construct to dimensions shown on Plans.
2. Castings: Free from fractures, large or deep cracks, blisters or surface roughness or any other defects that may affect serviceability.

E. Plastic Meter Boxes

1. Plastic Meter Boxes: Made of high density polyethylene conforming to the following ASTM standards:

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 STANDARD SPECIFICATION

ASTM	REQUIREMENT
D256	Impact Strength = 1.9 ft.-lb./inch (Izod, Notched)
D256	Impact Strength = 6.4 ft.-lb./inch (Izod, Un-Notched)
D638	Tensile Strength (2.0 min.) = 3,400 psi
D648	Deflection Temperature = 170 degrees F
D 2240	Shore D, Hardness, 55-65 Impact Strength, Falling Dart Method, 160 inch-lb.
D790	Flexural Modulus = 90,000 psi

2. Meter boxes shall meet the following test requirements:
  - a. Static Load: Not less than 2,500 pounds using 6-inch disc with direct compression exerted at center of top of meter box with solid plastic lid.
  - b. Deflection: Not less than 1,000 pounds load required to deflect top edge of meter box 1/8-inch.
3. Meter box body, without lid, shall weigh approximately 7 pounds.

F. Meter Vaults

1. Meter vaults may be constructed of precast concrete or cast-in-place concrete unless a specific type of construction is required by Plans.
2. Concrete for Meter Vaults: Class A concrete, conforming to requirements of Section 03315 - "Concrete for Utility Construction" with minimum compressive strength of 4,000 psi at 28 days.
3. Reinforcing steel for meter vaults: Conform to requirements of Section 03315 Concrete for Utility Construction.
4. Grates and Covers: Conform to requirements of Section 02084 - "Frames, Grates, Rings, and Covers".

PART 3 EXECUTION

3.01 GENERAL / MANUFACTURER(S) (NOT USED)

3.02 PREPARATION

A. Examination

1. Obtain approval from Project Manager for location of meter vault.
2. Verify lines and grade are correct.

3. Verify compacted subgrade will support loads imposed by vaults.

### 3.03 ERECTION/INSTALLATION APPLICATION AND/OR CONSTRUCTION

#### A. Valve Boxes

1. Install riser pipe with suitable length for depth of cover indicated on Plans or to accommodate actual finish grade.
  - a. Install with bell on top of valve
  - b. Place riser pipe in plumb, vertical position
2. Install valve box and riser piping plumbed in a vertical position. Provide 6-inches telescoping freeboard space between riser pipe top butt end, and interior contact flange of valve box, for vertical movement damping. End of pipe resting on valve shall be notched out sufficiently to provide a snug fit around the valve bonnet and to center valve inside of pipe.
3. Set, align, and adjust valve box so that lid is level with final grade.
4. In unpaved areas, set valve box 2 to 3 inches above natural grade and pour 30 inch by 30 inch by 8 inch thick concrete pad around valve box. Center valve box horizontally within concrete pad and stamp "NHCRWA" in the concrete as shown in the Plans.

#### B. Meter Boxes

1. Install cast iron or plastic boxes in accordance with manufacturers' instructions.
2. Construct concrete meter boxes to dimensions shown on Plans.
3. Adjust top of meter boxes to conform to cover elevations specified in Paragraph 3.03.D, Frame and Cover for Meter Vaults.
4. Do not locate under paved areas unless approved by Project Manager. Use approved traffic-type box with cast iron lid when meter must be located in paved areas.

#### C. Meter Vaults

1. Construct concrete meter vaults to dimensions shown on Plans. Do not cast in presence of water. Make bottom uniform. Verify lines and grades are correct and compacted subgrade will support loads imposed by vaults. Vaults shall be designed to the same loading criteria and conditions of Section 02082 - "Precast Concrete Manholes", paragraph E. and F.

2. Precast Meter Vaults:
  - a. Install precast vaults in accordance with manufacturer's recommendations. Set level on a minimum 3-inch-thick bed of sand conforming to requirements of Section 02320 - "Utility Backfill Materials".
  - b. Seal lifting holes with cement-sand mortar or non-shrink grout.
3. Meter Vault Floor Slab:
  - a. Construct floor slabs minimum of 6-inch-thick reinforced concrete. Slope floor  $\frac{1}{4}$  inch per foot toward sump. Make sump 12 inches in diameter, or 12 inches square, and 4 inches deep, unless other dimensions are required by Plans. Install dowels at maximum of 18 inches, center-to-center for keying walls to floor slab.
  - b. Precast floor slab elements may be used for precast vault construction
4. Cast-in-Place Meter Vault Walls:
  - a. Key walls to floor slab and form to dimensions shown on Plans. Minimum wall thickness shall be 4 inches.
  - b. Cast walls monolithically. One cold joint will be allowed when vault depth exceeds 12 feet.
  - c. Set frame for cover in concrete

D. Frame and Cover for Meter Vaults

Set cast iron frame in a mortar bed and adjust elevation of cover as follows:

1. In unpaved areas, set top of meter box or meter vault cover 2 to 3 inches above natural grade.
2. In paved areas, set top of meter box or meter vault cover flush with adjacent concrete.

E. Backfill

1. Provide bank run sand in accordance with Section 02320 - "Utility Backfill Materials" and backfill and compact in accordance with Section 02317 - "Excavation and Backfill for Utilities".
2. In unpaved areas, grade surface at uniform slope of 5 to 1 from manhole frame to natural grade. Provide minimum of 4 inches of topsoil conforming to requirements of Section 02911 - "Topsoil". Provide seeding in accordance

**NORTH HARRIS COUNTY REGIONAL WATER AUTHORITY VALVE BOXES, METER  
STANDARD SPECIFICATION BOXES, AND METER VAULTS**

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with Section 02921 - "Hydro-mulch Seeding", or if sodding in accordance with Section 02922 - "Sodding".

END OF SECTION