SECTION 626 – MANHOLES AND VALVE BOXES FOR WATER AND SEWER SYSTEMS

626.01 Description. This section describes constructing, reconstructing, and adjusting manholes and valve boxes for water and sewer systems.

626.02 Materials.

Structural Concrete 601
Asphalt Filler 702.07
Structure Backfill Material 703.20
Trench Backfill Material 703.21
Masonry Units 704
Joint Filler 705.01
Asphalt 705.06(C)
Mortar for Manhole 705.08
Reinforcing Steel 709.01
Non-Shrink Grout 712.04(A)
Precast Concrete Unit 712.06
Frames, Grates, Covers and Ladder Rungs 712.07
Pipe Collar for Valve Box 712.22
Cullet Materials for Utility Structures 717.03

If concrete in sewer structures will come in direct contact with sewage or sewage gases, modify proportioning of concrete in accordance with Subsection 625.02 - Materials.

626.03 Construction.

Design precast units, or combination of precast units and cast-in-place units, to most current AASHTO Load and Resistance Factor Design Bridge Design Specifications with subsequent interims. Have all calculations and shop drawings stamped by Structural Engineer licensed in the State of Hawaii.
For cast-in-place method, construct concrete base and finish concrete while still fresh. Allow concrete to set for at least 24 hours before removing forms and constructing concrete walls.

Provide 1/4-inch thick preformed expansion joint filler, for full depth of joint surrounding structures, when installing or adjusting structures in pre-cast concrete sidewalks or portland cement concrete. Form construction joints between structure extending through entire concrete sidewalk or portland cement concrete pavement.

Perform concrete construction in accordance with Section 503 – Concrete Structures.

Perform reinforcing steel work in accordance with Section 602 – Reinforcing Steel.

Use certified welder to perform shop and field welding in accordance with Section 501 – Steel Structures.

For connection of pipe to manhole, provide oversized hole through concrete wall and fill space around pipe with non-shrink grout or concrete of same psi as manhole. No bricks and mortar permitted. Provide grout or concrete surrounding pipe that is full wall depth and up to three inches in thickness.

Provide grout surrounding pipe that is full wall depth and up to three inches in thickness. When space around pipe is greater than three inches in thickness, use concrete of same psi as manhole.

(A) Excavation and Backfill. Excavate and backfill in accordance with Section 204 – Excavation and Backfill for Miscellaneous Facilities.

(B) Manholes.

(1) Concrete Manholes. Provide concrete manholes as precast units, or combined precast and cast-in-place units, or cast-in-place units. For precast units or combination of precast and cast-in-place units, submit shop drawings and calculations for acceptance by the Engineer prior to construction.

(2) Sewer Manholes. Manhole walls may be constructed entirely of brick, if following conditions are met:

(a) Vertical distance between invert to top of frame is 10 feet or less.

(b) Invert is not below ground water table.

(c) Sewer manhole is located in a dry area.
If conditions (b) and (c) above are met, upper 10 feet of sewer manhole may be constructed of brick. Construct portion of sewer manhole below 10 feet entirely of reinforced concrete.

Plaster outer portion of sewer manhole bricks with 1-inch thickness of mortar. Plaster interior brick work to present smooth surface.

Reinforce and construct precast concrete sewer manhole sections in accordance with ASTM C 478.

Shape and finish sewer manhole inverts using mortar and by employing cement finisher.

Dip brick in water prior to laying. Make joints full-mortar joints not more than 1/2-inch wide. Strike joints visible from interior of manhole.

(3) **Water Manholes.** Apply 5/8-inch minimum thick coat of mortar to waterproof both faces of walls and vertical exposed face of footing below 4-foot elevation, USGS datum, or ground water table for brick manholes.

Extend waterproofing from 4-foot elevation or ground water table:

(a) Down to bottom of floor slab on outside portion of manhole.

(b) To top of floor slab on inside portion of manhole.

Leave space of at least 2 inches between brick and pipe barrel. Fill upper half of space with asphalt filler. Fill bottom half of space with asphalt filler or mortar. If shown in contract documents, install reinforced concrete lintels, made from Class B concrete, in Type A manholes.

Upon completion, clean manhole of debris and paint frame and cover with one coat of asphaltum paint.

Dip brick in water prior to laying. Make joints full-mortar joints not more than 1/2-inch wide. Strike joints visible from interior of manhole.

(C) **Setting Frames.** Set frame in concrete, and tamp concrete around frame.

For full mortar beds, bring mortar up around bottom of frame and set frame.
(D) Reconstructing Manholes. Reconstruct existing manholes to required elevations. Reconstruct manhole frames to required grade using same type of material used in its original construction. Remove, clean, and paint existing frames and covers with one coat of asphaltum paint before reinstallation.

(E) Adjusting Manhole Frames and Covers. Adjust existing manhole frames and covers to required elevations. Remove, clean, and paint existing frames and covers with one coat of asphaltum paint before reinstallation.

(F) Constructing and Adjusting Valve Boxes. Construct valve boxes to required elevations. Set and center 8-inch pipe collar plumb over valve stem. Provide pipe collar with ends having smooth, machined edges. Backfill around gate valve and pipe collar with trench backfill by hand to 8 inches below surface of ground. Upon completion, clean valve box of debris and paint frame and cover with one coat of asphaltum paint before installation. Adjust existing valve boxes to required grade using same type of material used in its original construction. Remove, clean, and paint existing cast iron frame and cover with one coat of asphaltum paint. Cut existing pipe collar for downward adjustments, or install new pipe collar for upward adjustments. Place concrete slab and reinstall frame and cover.

626.04 Measurement. Pay items listed below will be paid on a lump sum basis. Measurement for payment will not apply.

626.05 Payment. The Engineer will pay for the accepted pay items listed below on a contract lump sum basis, as shown in proposal schedule. Payment will be full compensation for work prescribed in this section and in contract documents. The Engineer will pay for each of the following pay items when included in proposal schedule:

<table>
<thead>
<tr>
<th>Pay Item</th>
<th>Pay Unit</th>
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</thead>
<tbody>
<tr>
<td>_____ Manhole, _____ feet to _____ feet</td>
<td>Lump Sum</td>
</tr>
<tr>
<td>Reconstructing _________ Manhole, _____ feet to _____ feet</td>
<td>Lump Sum</td>
</tr>
<tr>
<td>Adjusting _________ Manhole Frame and Cover</td>
<td>Lump Sum</td>
</tr>
<tr>
<td>(_________) Standard Valve Box</td>
<td>Lump Sum</td>
</tr>
<tr>
<td>Adjusting (_________) Standard Valve Box</td>
<td>Lump Sum</td>
</tr>
</tbody>
</table>
The Engineer will pay for excavation and backfill in accordance with and under Section 204 -- Excavation and Backfill for Miscellaneous Facilities.

END OF SECTION 626