SECTION 604 – MANHOLES, INLETS AND CATCH BASINS

604.01 Description. This section describes constructing and reconstructing manholes, inlets, catch basins and other types of drainage structures. This section also describes furnishing, installing, and adjusting steel and cast iron frames and covers. Manholes, inlets, catch basins and other types of drainage structures hereinafter referred to as structures unless otherwise noted.

604.02 Materials.

Structural Concrete 601
Asphalt Filler 702.07
Structure Backfill Material 703.20
Trench Backfill Material 703.21
Clay or Shale Brick 704.01
Concrete Brick 704.02
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
Cullet Materials for Drainage Systems 717.04

604.03 Construction.

(A) General. Excavate and backfill in accordance with Section 206 - Excavation and Backfill for Drainage Facilities.

When furnishing or installing precast units, combined precast and cast-in-place units, or cast-in-place structures in concrete sidewalks or portland cement concrete pavements, form isolation joints between
structures extending into and through concrete sidewalk or portland cement concrete pavement. Install 1/4-inch premolded expansion joint filler in these joints.

For connection of pipe to structures, provide hole 3 inches or larger than outside diameter of pipe through concrete wall and fill space around pipe with non-shrink grout or concrete.

Conform concrete construction to Section 503 - Concrete Structures.

Modify proportioning of concrete in accordance with Section 625 – Sewer System for structures in direct contact with sewage or sewage gases.

Conform reinforcing steel work to Section 602 - Reinforcing Steel.

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

Furnish and install structures as precast units, combined precast and cast-in-place units, or cast-in-place units. Conform units completed in place to required cast-in-place construction. If precast units or combination of precast and cast-in-place units are used, submit shop drawings and calculations for acceptance by Engineer prior to 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. Stamp calculations and shop drawings by a Structural Engineer licensed in State of Hawaii.

Brick and mortar may be used for manhole neck construction.

Dip brick in water prior to laying. Make joints fully mortared and not more than 1/2 inch wide. Finish all completed joints neatly on interior of manhole.

(B) Structures. Finish concrete while concrete is still workable. Remove forms in accordance with Subsection 503.03(D) – Removal of Falsework and Forms.
When height of structure measured from invert to finish grade exceeds four feet:

(1) Install lowest rung 16 inches above invert.

(2) Place rungs at 12 inches on center.

(3) Place top rung not more than 12 inches below finish grade of the frame and cover.

If height of structure is four feet or less, install one rung 16 inches above invert.

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

(C) Setting Frames. For cast-in-place structures, set frames in concrete. Tamp fresh concrete around frame.

For precast concrete structures, set frames in full mortar beds. Bring mortar up around bottom of frame.

(D) Excavation and Backfill. Excavate and backfill in accordance with Section 206 - Excavation and Backfill for Drainage Facilities.

(E) Reconstructing Manholes. Reconstruct existing neck of manhole to required elevation. Adjust manhole frame to required grade using brick and mortar. Remove, clean, and paint existing frame and cover with asphaltum paint before reinstallation.

604.04 Measurement. Manholes, inlets, and catch basins, and other types of drainage structure will be paid per each in accordance with contract documents.

Engineer will measure steel frame grates, steel grates, and cast iron frame and cover, and adjusting frame and cover per each in accordance with contract documents, for work on grates, frames, and covers that are not part of a newly constructed or reconstructed drainage structure.

604.05 Payment. Engineer will pay for accepted pay items listed below at contract price per pay unit, as shown in proposal schedule. Payment will be full compensation for work prescribed in this section and contract documents.
Engineer will pay for each of the following pay items when included in the proposal schedule:

**Pay Item**  
**Pay Unit**

Type ____ Manholes, ____ feet to ____ feet  
Each

Engineer will pay for:

1. 20 percent of contract bid price upon completion of excavating to depth established for manhole.

2. 60 percent of contract bid price upon completion of constructing manhole.

3. 20 percent of contract bid price upon completion of backfilling around manhole.

Type ____ Inlet, ____ feet to ____ feet  
Each

Engineer will pay for:

1. 20 percent of contract bid price upon completion of excavating to depth established for inlet.

2. 60 percent of contract bid price upon completion of constructing inlet.

3. 20 percent of contract bid price upon completion of backfilling around inlet.

Type ____ Catch Basin, ____ feet to ____ feet  
Each

Engineer will pay for:

1. 20 percent of contract bid price upon completion of excavating to depth established for catch basin.

2. 60 percent of contract bid price upon completion of constructing catch basin.

3. 20 percent of contract bid price upon completion of backfilling around catch basin.

Type ____ Structure, ____ feet to ____ feet  
Each
Reconstructed Type ____ Manhole, ____ feet to ____ feet Each

Engineer will pay for:

(1) 80 percent of contract bid price upon completion of reconstructing manhole.

(2) 20 percent of contract bid price upon completion of removing, cleaning, and painting existing frame and cover.

Reconstructed Type ____ Inlet, ____ feet to ____ feet Each

Engineer will pay for:

(1) 80 percent of contract bid price upon completion of reconstructing inlet.

(2) 20 percent of contract bid price upon completion of removing, cleaning, and painting existing frame and cover.

Reconstructed Type ____ Catch Basin, ____ feet to ____ feet Each

Engineer will pay for:

(1) 80 percent of contract bid price upon completion of reconstructing catch basin.

(2) 20 percent of contract bid price upon completion of removing, cleaning, and painting existing frame and cover.

Adjusting _____ Cast Iron Frame and Cover Each

Engineer will pay for:

(1) 80 percent of contract bid price upon completion of adjusting cast iron frame and cover.

(2) 20 percent of the contract bid price upon completion of installing, cleaning, and painting the frame and cover.

Adjusting _____ Steel Frame and Grates Each

Engineer will pay for:

(3) 80 percent of contract bid price upon completion of adjusting steel frame and grate.

(4) 20 percent of the contract bid price upon completion of installing,
cleaning, and painting the frame and grate.

Type ______ Steel Grates

Engineer will pay for:

(1) 100 percent of the contract bid price upon completion of furnishing and installing steel grate.

Type ______ Cast Iron Frame and Cover

Engineer will pay for:

(1) 100 percent of the contract bid price upon completion of furnishing and installing cast iron frame and grate.

END OF SECTION 604