

1                   **SECTION 604 –MANHOLES, INLETS AND CATCH BASINS**  
 2  
 3

4   **604.01 Description.** This section describes constructing and reconstructing  
 5 manholes, inlets, catch basins and other types of drainage structures. This section  
 6 also describes furnishing, installing, and adjusting steel and cast iron frames and  
 7 covers. Manholes, inlets, catch basins and other types of drainage structures  
 8 hereinafter referred to as structures unless otherwise noted.  
 9

10 **604.02 Materials.**

11		
12	Structural Concrete	601
13		
14	Asphalt Filler	702.07
15		
16	Structure Backfill Material	703.20
17		
18	Trench Backfill Material	703.21
19		
20	Clay or Shale Brick	704.01
21		
22	Concrete Brick	704.02
23		
24	Joint Filler	705.01
25		
26	Asphalt	705.06(C)
27		
28	Mortar for Manhole	705.08
29		
30	Reinforcing Steel	709.01
31		
32	Non-Shrink Grout	712.04(A)
33		
34	Precast Concrete Unit	712.06
35		
36	Frames, Grates, Covers and Ladder Rungs	712.07
37		
38	Cullet Materials for Drainage Systems	717.04
39		

40 **604.03 Construction.**

41  
 42       **(A) General.** Excavate and backfill in accordance with Section 206 -  
 43 Excavation and Backfill for Drainage Facilities.  
 44

45               When furnishing or installing precast units, combined precast and  
 46 cast-in-place units, or cast-in-place structures in concrete sidewalks or  
 47 portland cement concrete pavements, form isolation joints between

### 604.03

48 structures extending into and through concrete sidewalk or portland cement  
49 concrete pavement. Install 1/4-inch premolded expansion joint filler in these  
50 joints.

51  
52 For connection of pipe to structures, provide hole 3 inches or larger  
53 than outside diameter of pipe through concrete wall and fill space around  
54 pipe with non-shrink grout or concrete.

55  
56 Conform concrete construction to Section 503 - Concrete Structures.

57  
58 Modify proportioning of concrete in accordance with Section 625 –  
59 Sewer System for structures in direct contact with sewage or sewage gases.

60  
61 Conform reinforcing steel work to Section 602 - Reinforcing Steel.

62  
63 Use certified welder to do shop and field welding in accordance with  
64 Section 501 - Steel Structures.

65  
66 Furnish and install structures as precast units, combined precast and  
67 cast-in-place units, or cast-in-place units. Conform units completed in place  
68 to required cast-in-place construction. If precast units or combination of  
69 precast and cast-in-place units are used, submit shop drawings and  
70 calculations for acceptance by Engineer prior to construction.

71  
72 Design precast units or combination of precast units and cast-in-place  
73 units to most current AASHTO Load and Resistance Factor Design Bridge  
74 Design Specifications with subsequent interims. Stamp calculations and  
75 shop drawings by a Structural Engineer licensed in State of Hawaii.

76  
77 Brick and mortar may be used for manhole neck construction.

78  
79 Dip brick in water prior to laying. Make joints fully mortared and not  
80 more than 1/2 inch wide. Finish all completed joints neatly on interior of  
81 manhole.

82  
83 **(B) Structures.** Finish concrete while concrete is still workable. Remove  
84 forms in accordance with Subsection 503.03(D) – Removal of Falsework and  
85 Forms.

86  
87  
88

88                   When height of structure measured from invert to finish grade  
89 exceeds four feet:

- 90                   (1)     Install lowest rung 16 inches above invert.  
91  
92                   (2)     Place rungs at 12 inches on center.  
93  
94                   (3)     Place top rung not more than 12 inches below finish grade of  
95 the frame and cover.  
96

97  
98                   If height of structure is four feet or less, install one rung 16 inches  
99 above invert.

100  
101                   Reinforce and construct precast concrete manhole sections in  
102 accordance with contract documents and ASTM C 478.

103  
104                   **(C)     Setting Frames.** For cast-in-place structures, set frames in concrete.  
105 Tamp fresh concrete around frame.

106  
107                   For precast concrete structures, set frames in full mortar beds. Bring  
108 mortar up around bottom of frame.

109  
110                   **(D)     Excavation and Backfill.** Excavate and backfill in accordance with  
111 Section 206 - Excavation and Backfill for Drainage Facilities.

112  
113                   **(E)     Reconstructing Manholes.** Reconstruct existing neck of manhole to  
114 required elevation. Adjust manhole frame to required grade using brick and  
115 mortar. Remove, clean, and paint existing frame and cover with asphaltum  
116 paint before reinstallation.

117  
118 **604.04    Measurement.** Manholes, inlets, and catch basins, and other types of  
119 drainage structure will be paid per each in accordance with contract documents.

120  
121                   Engineer will measure steel frame grates, steel grates, and cast iron frame  
122 and cover, and adjusting frame and cover per each in accordance with contract  
123 documents, for work on grates, frames, and covers that are not part of a newly  
124 constructed or reconstructed drainage structure.

125  
126 **604.05    Payment.** Engineer will pay for accepted pay items listed below at  
127 contract price per pay unit, as shown in proposal schedule. Payment will be full  
128 compensation for work prescribed in this section and contract documents.

129  
130

604.05

130 Engineer will pay for each of following pay items when included in the  
131 proposal schedule:

132  
133 **Pay Item** **Pay Unit**

134  
135 Type \_\_\_\_ Manholes, \_\_\_\_ feet to \_\_\_\_ feet Each

136  
137 Engineer will pay for:

138  
139 (1) 20 percent of contract bid price upon completion of excavating to  
140 depth established for manhole.

141  
142 (2) 60 percent of contract bid price upon completion of constructing  
143 manhole.

144  
145 (3) 20 percent of contract bid price upon completion of backfilling around  
146 manhole.

147  
148 Type \_\_\_\_ Inlet, \_\_\_\_ feet to \_\_\_\_ feet Each

149  
150 Engineer will pay for:

151  
152 (1) 20 percent of contract bid price upon completion of excavating to  
153 depth established for inlet.

154  
155 (2) 60 percent of contract bid price upon completion of constructing inlet.

156  
157 (3) 20 percent of contract bid price upon completion of backfilling around  
158 inlet.

159  
160 Type \_\_\_\_ Catch Basin, \_\_\_\_ feet to \_\_\_\_ feet Each

161  
162 Engineer will pay for:

163  
164 (1) 20 percent of contract bid price upon completion of excavating to  
165 depth established for catch basin.

166  
167 (2) 60 percent of contract bid price upon completion of constructing catch  
168 basin.

169  
170 (3) 20 percent of contract bid price upon completion of backfilling around  
171 catch basin.

172  
173 Type \_\_\_\_ Structure, \_\_\_\_ feet to \_\_\_\_ feet Each

174  
175

175	Reconstructed Type _____ Manhole, _____ feet to _____ feet	Each
176		
177	Engineer will pay for:	
178		
179	(1) 80 percent of contract bid price upon completion of reconstructing	
180	manhole.	
181		
182	(2) 20 percent of contract bid price upon completion of removing	
183	cleaning, and painting existing frame and cover.	
184		
185	Reconstructed Type _____ Inlet, _____ feet to _____ feet	Each
186		
187	Engineer will pay for:	
188		
189	(1) 80 percent of contract bid price upon completion of reconstructing	
190	inlet.	
191		
192	(2) 20 percent of contract bid price upon completion of removing,	
193	cleaning, and painting existing frame and cover.	
194		
195	Reconstructed Type _____ Catch Basin, _____ feet to _____ feet	Each
196		
197	Engineer will pay for:	
198		
199	(1) 80 percent of contract bid price upon completion of reconstructing	
200	catch basin.	
201		
202	(2) 20 percent of contract bid price upon completion of removing,	
203	cleaning, and painting existing frame and cover.	
204		
205	Adjusting _____ Cast Iron Frame and Cover	Each
206		
207	Engineer will pay for:	
208		
209	(1) 80 percent of contract bid price upon completion of adjusting cast	
210	iron frame and cover.	
211		
212	(2) 20 percent of the contract bid price upon completion of installing,	
213	cleaning, and painting the frame and cover.	
214		
215	Adjusting _____ Steel Frame and Grates	Each
216		
217	Engineer will pay for:	
218		
219	(3) 80 percent of contract bid price upon completion of adjusting steel	
220	frame and grate.	
221		
222	(4) 20 percent of the contract bid price upon completion of installing,	

**604.05**

223 cleaning, and painting the frame and grate.

224

225 Type \_\_\_\_\_ Steel Grates Each

226

227 Engineer will pay for:

228

229 (1) 100 percent of the contract bid price upon completion of furnishing  
230 and installing steel grate.

231

232 Type \_\_\_\_\_ Cast Iron Frame and Cover Each

233

234 Engineer will pay for:

235

236 (1) 100 percent of the contract bid price upon completion of furnishing  
237 and installing cast iron frame and grate.

238

239

240

**END OF SECTION 604**