City of St Pete Beach
Request for Bid

Wastewater System Point Repairs

Bids due by November 3rd, 2016,
10:30 A.M. at City Hall, St. Pete Beach, FL

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I. CONTRACTOR'S BID SUBMITTAL

The company that is submitting a bid declares that he/she has extensive experience in underground utility construction and is also licensed to do so.

The undersigned, as Bidder, hereby declares that the only person or persons interested in the Bid as principal or principals are named herein, and that no other person than herein mentioned has any interest in the Bid or in the Contract to be entered into; that this Bid or Contract is made without connection with any other person, company, or parties making a Bid; and that it is in all respects fair and in good faith without collusion or fraud.

The Bidder further declares that he/she has examined the site of the work and informed himself/herself fully in regard to all conditions pertaining to the place where the work is to be done; that he/she has examined the RFB, Plans, and Specifications for the work and Contract Documents relative thereto, and has read all special provisions furnished prior to the opening of bids; and that he/she has satisfied himself/herself relative to the materials to supplied and work to be performed.

The bidder certifies that the information and responses provided within this bid are true, accurate, and complete. The City or its designated representatives may contact any entity or references listed in the response and investigate the company as defined in References & Qualifications to verify the bidder's abilities and quality of work. The contractor hereby grants permission for each entity or reference listed in the bidder's response may make any information concerning the Contractor available to the City.

The Bidder proposes and agrees, if the Bid is accepted, to contract with the City of St. Pete Beach, Florida, in the form of Contract/Agreement specified for: *"WASTEWATER SYSTEM POINT REPAIRS"*

In St. Pete Beach, Florida, in full and complete accordance with the shown, noted, described, and reasonably intended requirements of the RFP, Plans, Specifications, Contract Documents, and Addenda to the full and entire satisfaction of the City of St. Pete Beach, Florida, the Bidder proposes to furnish all materials, equipment, labor, and perform the work submitted in their bid schedule for the City of St. Pete Beach's project: "*WASTEWATER SYSTEM POINT REPAIRS*".

COMPANY: DATE:
ADDRESS: PHONE:

BY: _____
(SIGNATURE)

NAME: _____
(PRINT NAME & TITLE)

Sworn to and subscribed before me on this _____day of_____, 2016

_____
(Notary Public)

_____
(My Commission Expires)

SUBMIT BID ITEMIZATION WITH BID TO:
CITY OF ST. PETE BEACH

BID SCHEDULE

	DESCRIPTION	EST. QTY.	UNIT	UNIT RATE		PROPOSED TOTAL
1	Mobilization for Routine Response	20	EA			
2	Mobilization for Emergency Response	6	EA			
3	As-Built Survey	5	EA			
4	Excavation, Unsuitable Material	100	CY			
5	Select bed & backfill material- gravel	100	CY			
6	Sheeting & Bracing (Left in Place)	500	SF			
7	Sheeting & Bracing, Pipe Trenches (Removed)	2,500	SF			
8	Well Point Dewatering Initial - 6'-8' Deep	10	EA			
9	Well Point Dewatering Initial - 8'-10' Deep	10	EA			
10	Well Point Dewatering Initial - 10'-12' Deep	5	EA			
11	Well Point Dewatering Initial - 12'-14' Deep	5	EA			
12	Well Point Dewatering Initial - 14'-16' Deep	3	EA			
13	Well Point Dewatering Initial - > 16' Deep	3	EA			
14	Well Point Dewatering Additional - 6'-8' Deep	200	EA			
15	Well Point Dewatering Additional - 8'-10' Deep	200	EA			
16	Well Point Dewatering Additional - 10'-12' Deep	100	EA			
17	Well Point Dewatering Additional - 12'-14' Deep	100	EA			
18	Well Point Dewatering Additional - 14'-16' Deep	50	EA			
19	Well Point Dewatering Additional - > 16' Deep	50	EA			
20	Jack & Bore 12" x .188" Steel Casing (6" GS)	40	LF			
21	Jack & Bore 16" x .219" Steel Casing (8" GS)	40	LF			
22	Jack & Bore 20" x .250" Steel Casing (10" GS)	40	LF			
23	Jack & Bore 24" x .281" Steel Casing (12" GS)	40	LF			
24	2" Directional Drill HDPE DR 9, IPS OD	200	LF			
25	4" Directional Drill HDPE DR 11, DIPS OD	300	LF			
26	6" Directional Drill HDPE DR 11, DIPS OD	500	LF			
27	8" Directional Drill HDPE DR 11, DIPS OD	500	LF			
28	10" Directional Drill HDPE DR 11, DIPS OD	500	LF			
29	12" Directional Drill HDPE DR 11, DIPS OD	300	LF			
30	6" PVC Pipe, C-900 DR 18 (Gravity Sewer) 0' - 6' Depth	100	LF			
31	6" PVC Pipe, C-900 DR 18 (Gravity Sewer) 6' - 8' Depth	200	LF			
32	6" PVC Pipe, C-900 DR 18 (Gravity Sewer) 8' - 10' Depth	100	LF			
33	6" PVC Pipe, C-900 DR 18 (Gravity Sewer) 10' - 12' Depth	50	LF			

34	6" PVC Pipe, C-900 DR 18 (Gravity Sewer) 12' - 14' Depth	50	LF			
35	6" PVC Pipe, C-900 DR 18 (Gravity Sewer) 14' - 16' Depth	50	LF			
36	6" PVC Pipe, C-900 DR 18 (Gravity Sewer) 16' - 18' Depth	50	LF			
37	8" DI Pipe, CL 350 (Gravity Sewer) 0' - 6' Depth	50	LF			
38	8" DI Pipe, CL 350 (Gravity Sewer) 6' - 8' Depth	100	LF			
39	8" DI Pipe, CL 350 (Gravity Sewer) 8' - 10' Depth	100	LF			
40	8" DI Pipe, CL 350 (Gravity Sewer) 10' - 12' Depth	50	LF			
41	8" DI Pipe, CL 350 (Gravity Sewer) 12' - 14' Depth	50	LF			
42	8" DI Pipe, CL 350 (Gravity Sewer) 14' - 16' Depth	50	LF			
43	8" DI Pipe, CL 350 (Gravity Sewer) 16' - 18' Depth	50	LF			
44	8" PVC Pipe, C-900 DR 18 (Gravity Sewer) 0' - 6' Depth	200	LF			
45	8" PVC Pipe, C-900 DR 18 (Gravity Sewer) 6' - 8' Depth	400	LF			
46	8" PVC Pipe, C-900 DR 18 (Gravity Sewer) 8' - 10' Depth	400	LF			
47	8" PVC Pipe, C-900 DR 18 (Gravity Sewer) 10' - 12' Depth	400	LF			
48	8" PVC Pipe, C-900 DR 18 (Gravity Sewer) 12' - 14' Depth	400	LF			
49	8" PVC Pipe, C-900 DR 18 (Gravity Sewer) 14' - 16' Depth	200	LF			
50	8" PVC Pipe, C-900 DR 18 (Gravity Sewer) 16' - 18' Depth	200	LF			
51	10" DI Pipe, CL 350 (Gravity Sewer) 0' - 6' Depth	50	LF			
52	10" DI Pipe, CL 350 (Gravity Sewer) 6' - 8' Depth	100	LF			
53	10" DI Pipe, CL 350 (Gravity Sewer) 8' - 10' Depth	100	LF			
54	10" DI Pipe, CL 350 (Gravity Sewer) 10' - 12' Depth	50	LF			
55	10" DI Pipe, CL 350 (Gravity Sewer) 12' - 14' Depth	50	LF			
56	10" DI Pipe, CL 350 (Gravity Sewer) 14' - 16' Depth	50	LF			
57	10" DI Pipe, CL 350 (Gravity Sewer) 16' - 18' Depth	50	LF			
58	10" PVC Pipe, C-900 DR 18 (Gravity Sewer) 0' -6' Depth	100	LF			
59	10" PVC Pipe, C-900 DR 18 (Gravity Sewer) 6' - 8' Depth	400	LF			
60	10" PVC Pipe, C-900 DR 18 (Gravity Sewer) 8' - 10' Depth	400	LF			
61	10" PVC Pipe, C-900 DR 18 (Gravity Sewer) 10' - 12' Depth	400	LF			
62	10" PVC Pipe, C-900 DR 18 (Gravity Sewer) 12' - 14' Depth	400	LF			
63	10" PVC Pipe, C-900 DR 18 (Gravity Sewer) 14' - 16' Depth	200	LF			
64	10" PVC Pipe, C-900 DR 18 (Gravity Sewer) 16' - 18' Depth	200	LF			
65	12" DI Pipe, CL 350 (Gravity Sewer) 0' - 6' Depth	50	LF			
66	12" DI Pipe, CL 350 (Gravity Sewer) 6' - 8' Depth	100	LF			
67	12" DI Pipe, CL 350 (Gravity Sewer) 8' - 10' Depth	100	LF			
68	12" DI Pipe, CL 350 (Gravity Sewer) 10' - 12' Depth	100	LF			
69	12" DI Pipe, CL 350 (Gravity Sewer) 12' - 14' Depth	100	LF			
70	12" DI Pipe, CL 350 (Gravity Sewer) 14' - 16' Depth	50	LF			

71	12" DI Pipe, CL 350 (Gravity Sewer) 16' - 18' Depth	50	LF			
72	12" PVC Pipe, C-900 DR 18 (Gravity Sewer) 0' ' 6' Depth	100	LF			
73	12" PVC Pipe, C-900 DR 18 (Gravity Sewer) 6' - 8' Depth	200	LF			
74	12" PVC Pipe, C-900 DR 18 (Gravity Sewer) 8' - 10' Depth	200	LF			
75	12" PVC Pipe, C-900 DR 18 (Gravity Sewer) 10' - 12' Depth	100	LF			
76	12" PVC Pipe, C-900 DR 18 (Gravity Sewer) 12' - 14' Depth	100	LF			
77	12" PVC Pipe, C-900 DR 18 (Gravity Sewer) 14' - 16' Depth	50	LF			
78	12" PVC Pipe, C-900 DR 18 (Gravity Sewer) 16' - 18' Depth	50	LF			
79	16" DI Pipe, CL 350 (Gravity Sewer) 0' - 6' Depth	200	LF			
80	16" DI Pipe, CL 350 (Gravity Sewer) 6' - 8' Depth	400	LF			
81	16" DI Pipe, CL 350 (Gravity Sewer) 8' - 10' Depth	400	LF			
82	16" DI Pipe, CL 350 (Gravity Sewer) 10' - 12' Depth	200	LF			
83	16" DI Pipe, CL 350 (Gravity Sewer) 12' - 14' Depth	200	LF			
84	16" DI Pipe, CL 350 (Gravity Sewer) 14' - 16' Depth	100	LF			
85	16" DI Pipe, CL 350 (Gravity Sewer) 16' - 18' Depth	100	LF			
86	16" PVC Pipe, C-905 DR 18 (Gravity Sewer) 0' - 6' Depth	100	LF			
87	16" PVC Pipe, C-905 DR 18 (Gravity Sewer) 6' - 8' Depth	200	LF			
88	16" PVC Pipe, C-905 DR 18 (Gravity Sewer) 8' - 10' Depth	200	LF			
89	16" PVC Pipe, C-905 DR 18 (Gravity Sewer) 10' - 12' Depth	100	LF			
90	16" PVC Pipe, C-905 DR 18 (Gravity Sewer) 12' - 14' Depth	100	LF			
91	16" PVC Pipe, C-905 DR 18 (Gravity Sewer) 14' - 16' Depth	50	LF			
92	16" PVC Pipe, C-905 DR 18 (Gravity Sewer) 16' - 18' Depth	50	LF			
93	18" DI Pipe, CL 350 (Gravity Sewer) 0' - 6' Depth	200	LF			
94	18" DI Pipe, CL 350 (Gravity Sewer) 6' - 8' Depth	400	LF			
95	18" DI Pipe, CL 350 (Gravity Sewer) 8' - 10' Depth	400	LF			
96	18" DI Pipe, CL 350 (Gravity Sewer) 10' - 12' Depth	200	LF			
97	18" DI Pipe, CL 350 (Gravity Sewer) 12' - 14' Depth	200	LF			
98	18" DI Pipe, CL 350 (Gravity Sewer) 14' - 16' Depth	100	LF			
99	18" DI Pipe, CL 350 (Gravity Sewer) 16' - 18' Depth	100	LF			
100	18" PVC Pipe, C-905 DR 21 (Gravity Sewer) 0' - 6' Depth	100	LF			
101	18" PVC Pipe, C-905 DR 21 (Gravity Sewer) 6' - 8' Depth	200	LF			
102	18" PVC Pipe, C-905 DR 21 (Gravity Sewer) 8' - 10' Depth	200	LF			
103	18" PVC Pipe, C-905 DR 21 (Gravity Sewer) 10' - 12' Depth	100	LF			
104	18 PVC Pipe, C-905 DR 21 (Gravity Sewer) 12' - 14' Depth	100	LF			
105	18" PVC Pipe, C-905 DR 21 (Gravity Sewer) 14' - 16' Depth	50	LF			
106	18" PVC Pipe, C-905 DR 21 (Gravity Sewer) 16' - 18' Depth	50	LF			
107	21" DI Pipe, CL 350 (Gravity Sewer) 0' - 6' Depth	200	LF			

108	21" DI Pipe, CL 350 (Gravity Sewer) 6' - 8' Depth	400	LF			
109	21" DI Pipe, CL 350 (Gravity Sewer) 8' - 10' Depth	400	LF			
110	21" DI Pipe, CL 350 (Gravity Sewer) 10' - 12' Depth	200	LF			
111	21" DI Pipe, CL 350 (Gravity Sewer) 12' - 14' Depth	200	LF			
112	21" DI Pipe, CL 350 (Gravity Sewer) 14' - 16' Depth	100	LF			
113	21" DI Pipe, CL 350 (Gravity Sewer) 16' - 18' Depth	100	LF			
114	21" PVC Pipe, C-905 DR 21 (Gravity Sewer) 0' - 6' Depth	100	LF			
115	21" PVC Pipe, C-905 DR 21 (Gravity Sewer) 6' - 8' Depth	200	LF			
116	21" PVC Pipe, C-905 DR 21 (Gravity Sewer) 8' - 10' Depth	200	LF			
117	21" PVC Pipe, C-905 DR 21 (Gravity Sewer) 10' - 12' Depth	100	LF			
118	21" PVC Pipe, C-905 DR 21 (Gravity Sewer) 12' - 14' Depth	100	LF			
119	21" PVC Pipe, C-905 DR 21 (Gravity Sewer) 14' - 16' Depth	50	LF			
120	21" PVC Pipe, C-905 DR 21 (Gravity Sewer) 16' - 18' Depth	50	LF			
121	24" DI Pipe, CL 350 (Gravity Sewer) 0' - 6' Depth	200	LF			
122	24" DI Pipe, CL 350 (Gravity Sewer) 6' - 8' Depth	400	LF			
123	24" DI Pipe, CL 350 (Gravity Sewer) 8' - 10' Depth	400	LF			
124	24" DI Pipe, CL 350 (Gravity Sewer) 10' - 12' Depth	200	LF			
125	24" DI Pipe, CL 350 (Gravity Sewer) 12' - 14' Depth	200	LF			
126	24" DI Pipe, CL 350 (Gravity Sewer) 14' - 16' Depth	100	LF			
127	24" DI Pipe, CL 350 (Gravity Sewer) 16' - 18' Depth	100	LF			
128	24" PVC Pipe, C-905 DR 21 (Gravity Sewer) 0' - 6' Depth	100	LF			
129	24" PVC Pipe, C-905 DR 21 (Gravity Sewer) 6' - 8' Depth	200	LF			
130	24" PVC Pipe, C-905 DR 21 (Gravity Sewer) 8' - 10' Depth	200	LF			
131	24" PVC Pipe, C-905 DR 21 (Gravity Sewer) 10' - 12' Depth	100	LF			
132	24" PVC Pipe, C-905 DR 21 (Gravity Sewer) 12' - 14' Depth	100	LF			
133	24" PVC Pipe, C-905 DR 21 (Gravity Sewer) 14' - 16' Depth	50	LF			
134	24" PVC Pipe, C-905 DR 21 (Gravity Sewer) 16' - 18' Depth	50	LF			
135	Install PVC Cleanout	10	EA			
136	Remove Pipe 2" or 4" (Gravity Sewer)	200	LF			
137	Remove Pipe 6" or 8" (Gravity Sewer)	400	LF			
138	Remove Pipe 10" or 12" (Gravity Sewer)	400	LF			
139	Remove Pipe 15", 16" or 18" (Gravity Sewer)	200	LF			
140	Remove Pipe 21" or 24" (Gravity Sewer)	200	LF			
141	4" Pipe - Install or Adjust Service Lateral 0'-6' Deep	3	EA			
142	4" Pipe - Install or Adjust Service Lateral 6'-8' Deep	3	EA			
143	4" Pipe - Install or Adjust Service Lateral 8'-10' Deep	3	EA			
144	4" Pipe - Install or Adjust Service Lateral 10'-12' Deep	3	EA			

145	4" Pipe - Install or Adjust Service Lateral 12'-14' Deep	2	EA			
146	4" Pipe - Install or Adjust Service Lateral 14'-16' Deep	2	EA			
147	4" Pipe - Install or Adjust Service Lateral 16'-18' Deep	2	EA			
148	6" Pipe - Install or Adjust Service Lateral 0'-6' Deep	3	EA			
149	6" Pipe - Install or Adjust Service Lateral 6'-8' Deep	3	EA			
150	6" Pipe - Install or Adjust Service Lateral 8'-10' Deep	3	EA			
151	6" Pipe - Install or Adjust Service Lateral 10'-12' Deep	3	EA			
152	6" Pipe - Install or Adjust Service Lateral 12'-14' Deep	2	EA			
153	6" Pipe - Install or Adjust Service Lateral 14'-16' Deep	2	EA			
154	6" Pipe - Install or Adjust Service Lateral 16'-18' Deep	2	EA			
155	2" Sewer Line Manhole Connection	3	EA			
156	4" Sewer Line Manhole Connection	3	EA			
157	6" Sewer Line Manhole Connection	5	EA			
158	8" Sewer Line Manhole Connection	5	EA			
159	10" Sewer Line Manhole Connection	3	EA			
160	12" Sewer Line Manhole Connection	3	EA			
161	16" Sewer Line Manhole Connection	3	EA			
162	18" Sewer Line Manhole Connection	2	EA			
163	21” Sewer Line Manhole Connection	2	EA			
164	24” Sewer Line Manhole Connection	2	EA			
165	2" Inside Drop Connection	3	EA			
166	4" Inside Drop Connection	3	EA			
167	6" Inside Drop Connection	3	EA			
168	8" Inside Drop Connection	5	EA			
169	10" Inside Drop Connection	3	EA			
170	12" Inside Drop Connection	3	EA			
171	15"/16" Inside Drop Connection	3	EA			
172	18" Inside Drop Connection	2	EA			
173	21" Inside Drop Connection	3	EA			
174	24" Inside Drop Connection	2	EA			
175	Grouting Out of Service Pipe (Force Main)	30	CY			
176	Disconnect & Plug 2" or 4" Pipe	5	EA			
177	Disconnect & Plug 6" or 8" Pipe	5	EA			
178	Disconnect & Plug 10" or 12" Pipe	5	EA			
179	2" PVC Restrained Joint Pipe & Fittings FM, SDR 21	200	LF			
180	2" Restrained Joints	20	EA			
181	4" PVC Pipe, C-900 DR 18 (Force Main)	500	LF			

182	4" PVC Restrained Joint Pipe & Fittings FM, C-900 DR 18	100	LF			
183	4" Restrained Joints	20	EA			
184	6" PVC Pipe, C-900 DR 18 (Force Main)	500	LF			
185	6" PVC Restrained Joint Pipe & Fittings FM, C-900 DR 18	100	LF			
186	6" Restrained Joints	20	EA			
187	8" PVC Pipe, C-900 DR 18 (Force Main)	500	LF			
188	8" PVC Restrained Joint Pipe & Fittings FM, C-900 DR 18	100	LF			
189	8" Restrained Joints	20	EA			
190	10" PVC Pipe, C-900 DR 18 (Force Main)	500	LF			
191	10" PVC Restrained Joint Pipe & Fittings FM, C-900 DR 18	100	LF			
192	10" Restrained Joints	20	EA			
193	12" PVC Pipe, C-900 DR 18 (Force Main)	300	LF			
194	12" PVC Restrained Joint Pipe & Fittings FM, C-900 DR 18	100	LF			
195	12" Restrained Joints	20	EA			
196	2"-4" Forcemain Pipe and Appurtenances - Over Depth Excavation	400	LF			
197	6"-8" Forcemain Pipe and Appurtenances - Over Depth Excavation	500	LF			
198	10"-12" Forcemain Pipe and Appurtenances - Over Depth Excavation	200	LF			
199	Remove Out of Service Pipe 2" or 4" (Force Main)	500	LF			
200	Remove Out of Service Pipe 6" or 8" (Force Main)	1,000	LF			
201	Remove Out of Service Pipe 10" or 12" (Force Main)	500	LF			
202	2" Sleeved Connection	6	EA			
203	4" Sleeved Connection	6	EA			
204	6" Sleeved Connection	10	EA			
205	8" Sleeved Connection	10	EA			
206	10" Sleeved Connection	4	EA			
207	12" Sleeved Connection	4	EA			
208	Reverse Deadman for 2" or 4" Pipe	3	EA			
209	Reverse Deadman for 6" or 8" Pipe	5	EA			
210	Reverse Deadman for 10" or 12" Pipe	3	EA			
211	DI Fittings FM C 153 (Compact Body)	2	TN			
212	2" Air Release Assembly (In-line)	2	EA			
213	2" Air Release Assembly (Offset)	2	EA			
214	2" RWGV (Resilient Wedge Gate Valve) & Box	4	EA			
215	4" RWGV & Box C 515	4	EA			
216	6" RWGV & Box C 515	10	EA			
217	8" RWGV & Box C 515	5	EA			
218	10" RWGV & Box C 515	2	EA			

219	12" RWGV & Box C 515	2	EA			
220	Adjust Valve Box to Finished Grade (In Pavement)	5	EA			
221	Adjust Valve Box to Finished Grade (Outside of Pavement)	5	EA			
222	4" Line Stop	1	EA			
223	6" Line Stop	1	EA			
224	8" Line Stop	1	EA			
225	10" Line Stop	1	EA			
226	12" Line Stop	1	EA			
227	4" x 2" Tapping Saddle Valve & Box	2	EA			
228	4" x 4" Tapping Sleeve Valve & Box	2	EA			
229	6" x 2" Tapping Saddle Valve & Box	2	EA			
230	6" x 4" Tapping Sleeve Valve & Box	2	EA			
231	6" x 6" Tapping Sleeve Valve & Box	2	EA			
232	8" x 2" Tapping Saddle Valve & Box	2	EA			
233	8" x 4" Tapping Sleeve Valve & Box	2	EA			
234	8" x 6" Tapping Sleeve Valve & Box	2	EA			
235	8" x 8" Tapping Sleeve Valve & Box	2	EA			
236	10" x 2" Tapping Saddle Valve & Box	2	EA			
237	10" x 4" Tapping Sleeve Valve & Box	2	EA			
238	10" x 6" Tapping Sleeve Valve & Box	2	EA			
239	10" x 8" Tapping Sleeve Valve & Box	2	EA			
240	10" x 10" Tapping Sleeve Valve & Box	2	EA			
241	12" x 2" Tapping Saddle Valve & Box	2	EA			
242	12" x 4" Tapping Sleeve Valve & Box	2	EA			
243	12" x 6" Tapping Sleeve Valve & Box	2	EA			
244	12" x 8" Tapping Sleeve Valve & Box	2	EA			
245	12" x 10" Tapping Sleeve Valve & Box	2	EA			
246	12" x 12" Tapping Sleeve Valve & Box	2	EA			
247	4' Dia. - Precast Manhole Standard	30	VF			
248	4' Dia. - Precast Manhole Inside Drop	10	VF			
249	4' Dia. - Precast Manhole Outside Drop	10	VF			
250	5' Dia. - Precast Manhole Standard	30	VF			
251	5' Dia. - Precast Manhole Inside Drop	10	VF			
252	5' Dia. - Precast Manhole Outside Drop	10	VF			
253	5' Dia. - Precast Air Release Manhole	10	VF			
254	6' Dia. - Precast Manhole Standard	30	VF			
255	6' Dia. - Precast Manhole Inside Drop	10	VF			

256	6' Dia. - Precast Manhole Outside Drop	10	VF			
257	Removal of Existing Manhole	3	EA			
258	Remove Existing Manhole Additional	30	VF			
259	Initial Excavation - 0'-6' Deep	5	Ea			
260	Initial Excavation - 6'-8' Deep	6	Ea			
261	Initial Excavation - 8'-10' Deep	6	Ea			
262	Initial Excavation - 10'-12' Deep	6	Ea			
263	Initial Excavation - 12'-14' Deep	3	Ea			
264	Initial Excavation - 14'-16' Deep	3	Ea			
265	Initial Excavation - 16'-18' Deep	2	Ea			
266	Initial Excavation - 18'-20' Deep	2	Ea			
267	Additional Excavation - 0'-6' Deep	100	LF			
268	Additional Excavation - 6'-8' Deep	100	LF			
269	Additional Excavation - 8'-10' Deep	100	LF			
270	Additional Excavation - 10'-12' Deep	100	LF			
271	Additional Excavation - 12'-14' Deep	100	LF			
272	Additional Excavation - 14'-16' Deep	100	LF			
273	Additional Excavation - 16'-18' Deep	50	LF			
274	Additional Excavation - 18'-20' Deep	50	LF			
275	Wastewater Bypass Pumping, Set up, 6" - 10" diameter	5	EA			
276	Wastewater Bypass Pumping, Set up, 12" - 14" diameter	2	EA			
277	Wastewater Bypass Pumping, Set up, 15" - 21" diameter	2	EA			
278	Wastewater Bypass Pumping, Set up, 24" diameter	2	EA			
279	Wastewater Bypass Pumping, Operation, 6" - 10" diameter	10	DAY			
280	Wastewater Bypass Pumping, Operation, 12" - 14" diameter	5	DAY			
281	Wastewater Bypass Pumping, Operation, 15" - 21" diameter	5	DAY			
282	Wastewater Bypass Pumping, Operation, 24" diameter	2	DAY			
283	6" Dia. Pipe Gravity Sewer Point Repair (DI Replacement Pipe)	2	EA			
284	6" Dia. Pipe Gravity Sewer Point Repair (PVC Replacement Pipe)	5	EA			
285	8" Dia. Pipe Gravity Sewer Point Repair (DI Replacement Pipe)	2	EA			
286	8" Dia. Pipe Gravity Sewer Point Repair (PVC Replacement Pipe)	5	EA			
287	10" Dia. Pipe Gravity Sewer Point Repair (DI Replacement Pipe)	2	EA			
288	10" Dia. Pipe Gravity Sewer Point Repair (PVC Replacement Pipe)	5	EA			
289	12" Dia. Pipe Gravity Sewer Point Repair (DI Replacement Pipe)	2	EA			
290	12" Dia. Pipe Gravity Sewer Point Repair (PVC Replacement Pipe)	5	EA			
291	15"/16" Dia. Pipe Gravity Sewer Point Repair (DI Replacement Pipe)	2	EA			

292	15"/16" Dia. Pipe Gravity Sewer Point Repair (PVC Rplacement Pipe)	2	EA			
293	18" Dia. Pipe Gravity Sewer Point Repair (DI Replacement Pipe)	2	EA			
294	18" Dia. Pipe Gravity Sewer Point Repair (PVC Replacement Pipe)	2	EA			
295	21" Dia. Pipe Gravity Sewer Point Repair (DI Replacement Pipe)	2	EA			
296	21" Dia. Pipe Gravity Sewer Point Repair(PVC Replacement Pipe)	2	EA			
297	24" Dia. Pipe Gravity Sewer Point Repair (DI Replacement Pipe)	2	EA			
298	24" Dia. Pipe Gravity Sewer Point Repair (PVC Replacement Pipe)	2	EA			
299	6" Dia. Pipe Gravity Sewer Point Repair - Additional Length (DI Replacement Pipe)	20	LF			
300	6" Dia. Pipe Gravity Sewer Point Repair - Additional Length (PVC Replacement Pipe)	50	LF			
301	8" Dia. Pipe Gravity Sewer Point Repair - Additional Length (DI Replacement Pipe)	20	LF			
302	8" Dia. Pipe Gravity Sewer Point Repair - Additional Length (PVC Replacement Pipe)	100	LF			
303	10" Dia. Pipe Gravity Sewer Point Repair - Additional Length (DI Replacement Pipe)	20	LF			
304	10" Dia. Pipe Gravity Sewer Point Repair - Additional Length (PVC Replacement Pipe)	100	LF			
305	12" Dia. Pipe Gravity Sewer Point Repair - Additional Length (DI Replacement Pipe)	50	LF			
306	12" Dia. Pipe Gravity Sewer Point Repair - Additional Length (PVC Replacement Pipe)	50	LF			
307	15"/16" Dia. Pipe Gravity Sewer Point Repair - Additional Length (DI Replacement Pipe)	20	LF			
308	15"/16" Dia. Pipe Gravity Sewer Point Repair - Additional Length (PVC Replacement Pipe)	50	LF			
309	18" Dia. Pipe Gravity Sewer Point Repair - Additional Length (DI Replacement Pipe)	20	LF			
310	18" Dia. Pipe Gravity Sewer Point Repair - Additional Length (PVC Replacement Pipe)	50	LF			
311	21" Dia. Pipe Gravity Sewer Point Repair - Additional Length (DI Replacement Pipe)	20	LF			
312	21" Dia. Pipe Gravity Sewer Point Repair - Additional Length (PVC Replacement Pipe)	50	LF			
313	24" Dia. Pipe Gravity Sewer Point Repair - Additional Length (DI Replacement Pipe)	20	LF			
314	24" Dia. Pipe Gravity Sewer Point Repair - Additional Length (PVC Replacement Pipe)	50	LF			
315	2" Dia. Pipe Forcemain Point Repair	3	EA			
316	4" Dia. Pipe Forcemain Point Repair	3	EA			
317	6" Dia. Pipe Forcemain Point Repair	3	EA			
318	8" Dia. Pipe Forcemain Point Repair	3	EA			
319	10" Dia. Pipe Forcemain Point Repair	2	EA			
320	12" Dia. Pipe Forcemain Point Repair	2	EA			
321	2" Dia. Forcemain Pipe Offset	3	EA			
322	4" Dia. Forcemain Pipe Offset	3	EA			

323	6" Dia. Forcemain Pipe Offset	2	EA			
324	8" Dia. Forcemain Pipe Offset	2	EA			
325	10" Dia. Forcemain Pipe Offset	2	EA			
326	12" Dia. Forcemain Pipe Offset	2	EA			
327	Replace Manhole Ring & Cover (In Pavement)	5	EA			
328	Replace Manhole Ring & Cover (Outside of Pavement)	5	EA			
329	MANHOLE BENCH REPLACEMENT, 4' DIAMETER	2	EA			
330	MANHOLE BENCH REPLACEMENT, 5' DIAMETER	2	EA			
331	MANHOLE BENCH REPLACEMENT, 6' DIAMETER	2	EA			
332	Adjust Manhole Ring & Cover to Finished Grade (In Pavement)	5	EA			
333	Adjust Manhole Ring & Cover to Finished Grade (Outside of Pavement)	5	EA			
RESTORATION						
334	Flowable Concrete Fill	100	CY			
335	ROADWAY BASE, Lime Rock, Primed, Min. LBR 100, Variable Thickness	120	CY			
336	ROADWAY BASE, Crushed Concrete/Graded Aggregate, Min. LBR 100, Variable Thickness	120	CY			
337	SUPERPAVE ASPHALT BASE, Type B 12.5, Variable Thickness	50	TN			
338	SUPERPAVE ASPHALT CONCRETE, Type SP 9.5, Fine, Traffic Level C, Variable Thickness	100	TN			
339	SUPERPAVE ASPHALT CONCRETE, Type SP 12.5, Fine, Traffic Level C, Variable Thickness	100	TN			
340	PAVEMENT, Cement Concrete, 6" Min Thickness (Driveways)	100	SY			
341	PAVEMENT, Cement Concrete, 8" Thick	100	SY			
342	DRIVEWAY RESTORATION, In Kind, Decorative Block	50	SY			
343	MILLING EXISTING ASPHALT PAVEMENT, 1/2" Average Depth	150	SY			
344	MILLING EXISTING ASPHALT PAVEMENT, 3/4" Average Depth	150	SY			
345	MILLING EXISTING ASPHALT PAVEMENT, 1" Average Depth	150	SY			
346	CURB & GUTTER, Concrete, FDOT Type D	100	LF			
347	CURB & GUTTER, Concrete, FDOT Type F	100	LF			
348	CURB & GUTTER, Concrete, Miami Curb	300	LF			
349	VALLEY GUTTER, Concrete, PCED Index 1315	100	LF			
350	SIDEWALK, CONCRETE, 4" Min. Thickness, Remove and Replace	500	SF			
351	SIDEWALK, CONCRETE, 6" Min. Thickness, Remove and Replace	500	SF			
352	SODDING, In-kind	4,500	SY			
MOT						
353	Flagmen (Per-Flagmen)	20	HR			
354	Multi Lane (FDOT Index No. 613)	5	EA/DY			
355	Multi Lane (FDOT Index No. 614)	5	EA/DY			

356	Multi Lane (FDOT Index No. 615)	5	EA/DY			
357	Multi Lane (FDOT Index No. 616)	5	EA/DY			
358	Multi Lane (FDOT Index No. 617)	5	EA/DY			
359	Arrow Boards - 5' Minimum Horizontal Size	10	EA/DY			
360	Variable Message Board	10	EA/DY			
361	Concrete Barrier (FDOT Index No. 415)	10	EA/DY			
362	Low Profile Barrier (FDOT Index No. 412)	10	EA/DY			
363	Signs in Work Zones	10	EA/DY			
364	6" Solid line Thermo Plastic - Permanent	200	LF			
365	24" Stop Bar, Solid, Thermo Plastic, Perm.	200	LF			
366	6" Skip line (6'-10' Skip) Thermo Plastic-Perm.	200	LF			
367	Barricades Type III, with Warning Lights	1,000	EA/DY			
368	Barricades Type I or II, with Warning Lights	1,000	EA/DY			
			GRAND TOTAL			

II. GENERAL CONTRACT DOCUMENTS

REQUEST FOR BID
Wastewater System Point Repairs

BID DOCUMENTS

I. Contractor's Bid Submittal & Bid Schedule
II General Contract Documents
III. References & Qualifications
IV. Certificate of Insurance
V. Contractor's Education & Training
VI. System Map & Technical Specifications

The City of St. Pete Beach is soliciting bids from qualified General or Underground Contractors for the Wastewater System Point Repairs.

BID SUBMITTALS
Bid documents must include a signed bid, itemized bid description and fee schedule, project schedule, references, contractor's license and insurance certificates. Any major sub-contractor that will be hired by the contractor for this project must also submit references, contractor's license and insurance certificates. The contractor shall submit one original and two (2) copies of their bid documents with their sealed bid package.

BIDDER INFORMATION
All Contractors must contact the Project Manager, via e-mail, with their intention to bid, along with their company name and contact information. The City is not responsible for any Addendums or other supplementary information that is not received due to non-submittal of the aforementioned information. As always, it shall be the contractors' responsibility to refer back to the website (www.stpetebeach.org) for additional project information as it becomes available.

PRE-BID MEETING
A pre-bid meeting will be held on October 18th, 2016, at 10:00 AM. Meeting will be held at the Public Services Building located at 7581 Boca Ciega Dr., St. Pete Beach, FL, 33706. There will be no site tour. The pre-bid meeting will also include discussion regarding RFB's for Manhole Rehabilitation and Pipe Lining.

BID PACKAGES
Sealed bids will be received until 10:30 AM on November 3rd, 2016, in the Office of the City Clerk, 155 Corey Avenue, St. Pete Beach Florida at which time they will be publicly opened and read. All bidders are invited to attend this bid opening, which will be held immediately following the closing time specified. Bids received after the deadline will not be accepted.

Bids should be addressed to: City of St. Pete Beach - City Clerk's Office
155 Corey Ave.
St. Pete Beach, FL 33706

Plainly marked as: ***"Wastewater System Point Repairs"***

CONTACT INFORMATION

Ian Wade, P.E. - Project Manager
155 Corey Avenue
St. Pete Beach, Florida 33706
Office - (727) 363-9254 Fax - (727) 367-2736
E-mail (iwade@stpetebeach.org)

PROJECT BACKGROUND AND SCOPE OF WORK

Project Background

- The City of St. Pete Beach wastewater system consists of approximately 38 miles of gravity sewer pipe (primarily 8" VCP, also 10"-24" VCP and minimal CIP), 17 lift stations and approximately 826 manholes (mostly brick).
- As part of a Consent Order with the Florida Department of Environmental Protection, the City has retained Kimley-Horn to prepare a city-wide Inflow and Infiltration (I & I) Study.
- The City solicited bids for System Wide Inspection and Cleaning, which was awarded and recently completed by Underground Information Technologies, Inc. (UIT). These services included:
    - Pre-clean inspection and of all gravity sewer pipe according to the National Association of Sewer Service Companies (NASSCO) Pipeline Assessment Certification Program (PACP).
    - Various cleaning activities identified and approved during the pre-clean inspection
    - Final inspection of all pipe shown on the attached system map
    - Manhole Assessment Certification Program (MACP) Level 1 inspections for 100% of the system manholes

Scope of Work

- The City is soliciting proposals to perform the various repairs identified during the inspection by UIT, including point repairs, manhole rehabilitation, and pipe lining.
- For the sake of cost comparison and determination of lowest qualified bidder, the bid form presented above includes ***estimated*** quantities for each item requested. Since the cleaning and televising of the system was not complete as of the date of this solicitation, the City does not yet have a complete, final scope and quantities of repairs anticipated for this project.
- Upon completion of cleaning and televising and subsequent publication of Kimley-Horn's final report on Inflow & Infiltration, the City will establish the total quantities for each of the line items and will award Purchase Order(s) based on the unit rates presented in this bid.
- All work shall be made on an assignment-by-assignment basis, in the form of a Purchase Order authorized by the City. All work orders shall be issued during the initial two (2) year contract term or any extension thereof. Final work shall be completed no later than 120 days after the end of the term. The Contractor shall perform no work under this Contract without the City's written authorization to proceed for each Work Order. The Contractor hereby agrees to waive any claim for compensation for any work performed without authorization.
- This contract does not guarantee that work assignments requested will be typical start-to-finish projects. The Contractor may be asked to complete site restoration

following a repair or installation performed by the City, or pick up in the middle of an assignment. The Contractor shall be prepared to perform the work of any assignment from any point during a previous assignment.

- Prior to assignment of any Work Order, and based on mutual discussions between the City and the Contractor, the Contractor shall prepare a detailed work plan for each assignment, which shall include a work schedule and a not-to exceed budget amount.
- *To reiterate, the quantities included in the bid form presented above* ***are not*** *intended to accurately represent the actual, final scope of services. Therefore, the amount of the contract awarded will be determined upon completion of the I & I report using the unit rates submitted with this bid.*
- This RFB is for ***Point Repairs***. Manhole repairs and pipe lining are currently being solicited under separate RFB's. See City website for postings.

DETAILED SPECIFICATIONS

- **Refer to the Technical Specifications included in section VII of this RFB. Note that these specifications are taken from a past solicitation by Pinellas County. Therefore please disregard references which were specific to that solicitation, including the County, project number, and any items not listed in the bid form included with this solicitation. Furthermore, please disregard references to administrative procedures in the specifications, as these procedures are superseded by the City of St. Pete Beach's procedures outlined in this RFB.**
- Site and surrounding properties must be free of construction debris upon completion.
- Barricades, cones, and traffic control activities are the responsibility of the Contractor.
- Contractor is responsible for all utility locates through Sunshine One-Call.
- Contractor is responsible for field measurement and review of existing conditions.
- All work to be completed within the project limits or City Right-Of-Way.
- All work is to be done Monday through Friday unless approved by the City.
- Equipment left on site must be approved by Project Manager.
- Contractor will coordinate scheduling of work with Project Manager.
- Contractor is responsible for all cut and patch within the project limits as a direct result of work performed under this contract. All disturbed areas are to be patched back equal to or better than the existing.
- Contractor is responsible for all Stormwater BMPs. As per DEP's requirements for MS4's, please provide proof of Site Operator Training based on DEP's Stormwater, Erosion, and Sediment Inspector Training Class.

ADDITIONAL WORK DETAILS

Firms or persons wishing to bid on this project must be licensed, bondable and insured in accordance to the requirements of this bid package. Contractors and sub-contractors must be certified, registered and/or licensed by the proper construction licensing boards for the work being performed. The contractor will furnish all necessary labor, materials, tools, equipment and supplies to complete the scope of work. Bid must also include all costs for licenses, permits and any material disposal fees.

Bidders shall bring questions, discrepancies, omissions, conflicts or doubt as to meaning of any part of the attached project documents to attention of the City of St Pete Beach Public

Services Department at least five (5) days before due date for Bids. Clarification of intent of Contract Documents if necessary shall be made available to bidders in form of Addendum. Failure to request clarification of interpretation of Contract Documents shall not relieve bidders of their responsibilities to perform the work.

The City of St. Pete Beach reserves the right to reject any or all bids or parts of bids or accept any bid or part thereof deemed to be in the best interests to the City. The City of St. Pete Beach also reserves the right to award any bid or part thereof to multiple contractors.

STATEMENT OF WORK

The Contractor shall furnish and pay the cost, including sales tax and all other applicable taxes, licenses, permits and fees, of all the necessary materials not furnished by the City and shall furnish and pay for all the superintendence, labor, tools, equipment and transportation and perform all the work required for the execution of all services listed in the Bidder's Submittal and Bid Schedule attached hereto and in strict accordance with the Plans, Specifications, and requirements of the City of St. Pete Beach which are attached hereto and made a part hereof, and any amendments thereto and such supplemental Plans and Specifications which may hereafter be approved.

SCHEDULE

The Contractor shall, within ten (10) days after receipt of the Notice of Award and before commencement of any operations hereunder, execute the Contract. Additionally, the Contractor shall, within twenty (20) days after receipt of the Notice of Award, provide all required documentation to the City.

Each individual location contained in a Work Order assignment is to be considered an "individual project" such that all work, including cleanup, must be fully completed in a reasonable time frame, as determined by the Engineer. Unless otherwise approved by the Engineer, work on each work order must be commenced within 30 days of notice to proceed for the Work Order assignment. The project limits shown on the location maps and/or plans contained in each Work Order assignment are approximate; the Contractor shall verify exact limits with the Engineer prior to beginning construction. Construction shall be limited to a maximum of two (2) individual project locations at a time, unless otherwise approved by the Engineer.

Work shall not be performed on Saturdays, Sundays and all legal or City designated holidays, except for special operations that may be necessary in order to maintain, check, or protect work already performed. Work may be permitted on weekends or holidays with approval from the City Manager or designee. No work shall be done at night without prior approval of the City Manager or designee.

COMPLETION DATE

Individual work orders will be issued over the life of this contract, which shall have an initial term of two (2) years.

EXAMINATION OF SITE

Bidder shall carefully examine project site and be familiar with the work required for the project, investigate all site conditions that may affect execution of work as detailed in the

construction documents. Contact the City's Public Services Department or their designee for changes or alterations before proceeding.

ASSURANCES

The responding contractor shall provide a statement of assurance that the contractor is not presently in violation of any statutes or regulatory rules that might have an impact on the firms operations since submittal of the Statement of Qualifications to the City. All applicable laws and regulations of the State of Florida, and ordinances and regulations of the City of St. Pete Beach will apply.

TRAFFIC CONTROL AND STAGING AREA

Contractor shall include all costs associated with traffic control and maintenance during the project. Contractor shall be provided with a staging area but will be required to control the area with fencing or barricades.

ASSIGNMENT AND TRANSFER OF CONTRACT

The Contractor shall not assign or transfer this Contract or any part thereof or any interest therein without consent in writing of the City and the contractor's Surety, and any such assignment or transfer without such written consent shall be null and void.

SUBCONTRACTS

The Contractor shall not subcontract this Contract or any part thereof or any interest therein without consent in writing of the City and the contractor's Surety. Any Subcontractor approved by the City will be subject to the same standards and qualifications as stated in this Contract.

PERFORMANCE AND PAYMENT BOND

Contractor shall furnish the City with a performance and payment bond in a sum equal to the amount of the Contract price; conditioned upon the performance by the Contractor of all undertakings, covenants, terms, conditions, and agreements of this Contract, and upon the prompt payment by the Contractor to all persons supplying labor and materials in the prosecution of the work provided by the Contract. The Contractor shall execute such bond and a corporate bonding company licensed to transact such business in the State of Florida and acceptable to the City.

The expense of this bond shall be borne by the Contractor. If at any time a Surety on such bond becomes irresponsible or loses its right to do business in the State of Florida, the City may require another Surety that the Contractor shall furnish within ten (10) calendar days after receipt of written notice to do so. Evidence of authority of an attorney in fact, acting for the corporate Surety must be provided in the form of a certificate as to his power of attorney and to the effect that it is not terminated and remains in effect on the date of the bond. The form of the bond shall be subject to approval by the City.

LIQUIDATED DAMAGES

If the work embraced by this Contract is not completed on or before the date set for completion or any extension thereof, the actual damages for the delay will be impossible to determine and in lieu thereof, the Contractor shall pay to the City fixed, agreed and liquidated damages in the amount of Five-Hundred Dollars ($500) per day for each calendar day of delay until the work is satisfactorily completed.

PAYMENT

Payment shall be made to the Contractor for work performed under this Contract for the quantities of work as determined in accordance with Payments for Work Completed and Payments Withheld of this Contract. Payment for extra work will be made in accordance with the Changes in Work, Contract Amount, and Contract Time sections below.

CHANGES IN THE WORK

Without invalidating the Contract, the City may, at any time or from time to time, order additions, deletions or revisions in the work authorized by written Change Orders or directive. Upon receipt of a Change Order, the Contractor will proceed with the work involved. All such work shall be executed under the applicable conditions of the Contract documents. If any Change Order causes an increase or decrease in the Contract Amount or any extension or shortening of the Contract Time, an equitable adjustment will be made.

Additional Work performed by the Contractor without authorization of a Change Order will not entitle him/her to an increase in the Contract Amount or any extension of the Contract Time, except in the case of an emergency (subject to approval by City Manager or designee).

It is the Contractor's responsibility to notify his/her Surety of any changes affecting the general scope of the Work or change of the Contract Amount and the amount of the applicable bonds shall be adjusted accordingly, and an amended bond document furnished to the City. In the event the City directs the Contractor to make a change in the Work, and if the City and the Contractor do not arrive at a mutually acceptable increase or decrease in the Contract Amount, the contractor shall not use any such lack of mutual acceptance as a basis or cause to stop or otherwise delay the progress or the execution and completion of any of the work ordered, directed or required pursuant to the Contract Documents.

If the Contractor believes an event or situation has occurred which justifies a change in the Contract Amount or Contract Time, he shall deliver a written notice to the Project Manager. Each such written notice shall be delivered promptly, and in any event no later than fifteen (15) days after the Contractor first discovered the occurrence. The Contractor shall be deemed to have waived the right to collect any and all costs incurred more than fifteen (15) days prior to the date of delivery of the written notice, and shall be deemed to have waived the right to seek an extension of the Contract Time with respect to any delay in the Progress Schedule which accrued more than fifteen (15) days prior to the date of delivery of the written notice.

Any such notice shall include sufficient detail to explain the basis of entitlement to a claim for an adjustment to the Contract Amount of Contract Time. When requested by the City Manager, the Contractor shall furnish any additional information and details as may be required to determine the facts or allegations involved, which shall be provided within fifteen (15) days of the request unless a longer time period is allowed by the City Manager.

The Contractor shall prepare bids detailing proposed adjustments to Contract Amount and/or Contract Time and submit them to the City Manager within fifteen (15) days of the City's issuance of a proposed Change Order or the Contractor's submitting a written notice of a change or claim for an adjustment to the Contract Amount or Contract Time. Contractor's bids shall be irrevocable for a period of at least sixty (60) days after receipt by

the City. Any delay in the submittal of a complete, adequate and acceptable bid will not justify an increase in Contract Amount or Contract Time. Contractor agrees that it shall give the City access to any and all of Contractor's and Subcontractors' books, records and other materials relating to proposed Change Orders and other claims for adjustment to Contract Amount or Contract Time

CHANGE OF CONTRACT AMOUNT

The Contract Amount constitutes the total compensation payable to the Contractor for performing the Work. All duties, responsibilities and obligations assigned to or undertaken by the Contractor shall be at his expense without change in the Contract Amount. The Contract Amount may only be changed by written Change Order issued by the City. Any claim for an increase in the Contract Amount shall be in writing and delivered to the City Manager within fifteen (15) days of the occurrence of the event giving rise to the claim.

All claims for adjustment in the Contract Amount shall be determined by the City Manager. However, no claim for an adjustment to the Contract Amount will be considered for unforeseeable causes that were beyond the fault or negligence of the Contractor or his Subcontractors or supplier such as acts of God, floods, riots, etc. This restriction does not restrict submission of claims for additional Contract Time due to events of this nature. Any change in the Contract Amount shall be incorporated in a Change Order.

Contractor bids or claims shall cover all aspects of the Work involved and shall be fully documented and itemized as to all costs, quantities and charges for overhead and profit. Amounts for Subcontractors or Suppliers at any tier shall be similarly supported. When determining Subcontractors' costs, the methods to be used shall be those used for the Contractor's costs, except that the term "Subcontractor" shall replace the term "Contractor," context permitting.

Changes in Contract Amount for extensions in Contract Time shall exclude costs that are unaffected or do not relate to the extension in Contract Time, such as: (a) operating costs of construction equipment assigned to the Work on a continuing basis, (b) operating costs and owned/rental costs of construction equipment (crane used for specific lifts, concrete pump used for specific pours, etc.), and (c) fully paid site facilities, tools, etc.

The value of any Work covered by a Change Order or of any claim for an increase or decrease in the Contract Amount where the Work involved is covered by unit prices contained in the Contract Documents shall be determined by application of unit prices to the quantities of the items involved. If the quantities originally contemplated are so changed in a proposed Change Order, that application of the Unit Prices to the quantities proposed will cause substantial inequity to the City or the Contractor, the applicable unit price(s) shall be equitably adjusted by mutual agreement.

If the value of work covered by a Change Order cannot be established or mutually agreed to utilizing previously established unit rates, the value shall be determined by the City on the basis of an estimate of the out-of-pocket cost and percentages that are acceptable to the City for overhead and profit. The out-of-pocket cost shall only include those direct costs which are needed to perform the work such as labor (including payroll taxes, fringe benefits, labor burden and workers' insurance), materials, equipment, and other incidental out-of-pocket construction costs directly involved in the work, including but not limited to

small tools, expendables and material costs but shall not include project management or project supervisory costs unless the Change Order includes an increase in the Contract time.

In such case, the Contractor will submit in the form prescribed by the City an itemized cost breakdown together with supporting data.

The amount of credit to be allowed by the Contractor to the City for any such change which results in a net decrease in cost, will be the amount of the actual net decrease as determined by the City. When both additions and credits are involved in any one change, the combined overhead and profit shall be figured on the basis of the net increase, if any.

To be eligible for consideration, the Contractor's written claim for a change in the Contract price, including claim(s) from sub-contractors, shall include an itemized cost breakdown with supporting data as described below:

A. For labor: Provide written documentation from the Contractor and Subcontractors or others as appropriate in the form of a detailed breakdown by each labor classification involved indicating the number of hours of Work involved and the hourly payroll rate applicable to each to substantiate the basis and amount of the direct labor cost. The direct labor cost may be increased to provide an allowance for indirect payroll costs (labor burden), such as payroll taxes, fringe benefits, and workers insurance after all premium discounts, rebates and other appropriate reductions have been taken.

   Allowable labor costs shall be limited to craft labor (including foremen) in the direct employ of the Contractor (or Subcontractor) assigned to the site and engaged in furnishing and incorporating materials or equipment in the Work involved in the Change Order or Claim.

   When determining actual payroll costs, daily time sheets certified by the Contractor and verified by the City Manager along with certified payroll records shall be the valid records.

B. For material, supplies, equipment, furnishings, etc., to be installed or included in the Work: Provide written documentation from the Contractor and Subcontractors, suppliers, etc., to substantiate the basis and amount of the various cost items involved. Material costs shall reflect the Contractor's reasonably anticipated net actual cost after consideration of trade discounts and volume rebates.

C. For construction equipment: Provide written documentation in the form of a detailed breakdown by each construction equipment category indicating, the applicable unit rates (i.e., $'s per hour, $'s per day etc.,) and the number of hours, days, etc. to substantiate the basis and amount of the construction equipment out-of-pocket costs.

<u>CHANGE OF CONTRACT TIME</u>

The Contract Time may only be changed by written Change Order. Any claim for an extension in the Contract Time shall be in writing and include an analysis of the Progress Schedule as further described in the Specifications, and shall be delivered to the City

Manager within fifteen (15) days of the occurrence of the event giving rise to the claim. All claims for adjustment in the Contract Time shall be determined by the City Manager. Any change in the Contract Time resulting from any such claim shall be incorporated in a Change Order. The Contract Time may be extended for an amount equal to time lost due to unforeseeable causes beyond the control of the Contractor (and his Subcontractors and Suppliers) if he makes a claim therefore. Such delays shall include, but not be restricted to, acts or neglect by any separate Contractor employed by the City; fires; floods; labor disputes; epidemics or acts of God.

All time limits stated in the Contract Documents are of the essence to the Contract. The stated time limits are agreed to be adequate to complete the work, including the procurement, manufacture and delivery of all material and equipment required, and account for any and all potential impact, delays, disruptions and costs that may be expected.

PAYMENTS FOR WORK COMPLETED

Partial payments will be made as the work progresses at the end of each calendar month, or as soon thereafter as practicable on estimates made by the City Manager or designee and as approved by the City, provided that the Contractor is performing the overall job in a diligent manner. In making partial payments, there shall be retained ten percent (10%) on the amount of each estimate until final completion and acceptance of all work covered by the Contract. Upon completion and acceptance of the work, the City Manager or designee shall issue a certificate that the work has been completed and accepted by him under the conditions of this Contract, and shall make and approve the final estimate of the work. The entire balance found to be due the Contractor, including that retained by the City, should be paid to the Contractor. Such payment shall be conditioned, however, upon the submission by the Contractor of evidence satisfactory to the City that all claims for labor, material, and any other outstanding indebtedness in connection with this Contract have been paid. Such payment shall also be conditioned upon approval and acceptance of the construction and improvements by the City.

If after the work has been substantially completed, full completion thereof is materially delayed through no fault of the Contractor and the City Manager or designee so certifies, the City shall upon the Certificate of the City Manager or designee, and without terminating the Contract make payment for the balance due for that portion of the work fully completed and accepted. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of claim If such delay occurs and payment is made under this clause, the Contractor shall nevertheless be prepared to complete the work in a timely manner upon the remedy or removal of such delay, and shall be bound under this Contract for the completion of such work unless this Contract is otherwise terminated.

PAYMENTS WITHHELD

The City Manager or designee may withhold, or, on account of subsequently discovered evidence, nullify the whole or part of any estimate to such extent as may be necessary to protect the City from loss on account of:

(a). Defective work not remedied

(b). Claims filed or reasonable evidence indicating probable filing of claims

(c). Failure of the Contractor to make payments properly to Subcontractors or for material or labor.

(d). A reasonable doubt that the Contract can be completed for the balance then unpaid.
(e). Damage to another Contractor.
(f). Failure of the Contractor to keep his/her work progressing in accordance with his/her time schedule.

FINAL PAYMENTS

Upon the completion and acceptance of the work, the City Manager or designee shall issue a certificate that designates that the whole work provided for in this Contract has been completed and accepted by him under the conditions and the terms thereof and shall make the final estimate of the work. After issuance of the certificate, the entire balance found to be due the Contractor, including said retained percentage by the City in accordance with existing state laws as may be retained lawfully by said City, shall pay excepting such sums to the Contractor. Before the approval of the final payment, the Contractor shall submit evidence satisfactory to the City that states that all payrolls, materials, bills and outstanding indebtedness in connection with this Contract have been paid.

LIENS

If at any time there shall be evidence of any lien or claim for which the City might become liable and which is chargeable to the Contractor, the City shall have the right to retain out of any payment then due or thereafter to become due, an amount sufficient for complete indemnification against such lien or claim. In the event the City has already paid to the Contractor all sums due under this contract or the balance remaining unpaid is insufficient to protect the City, the Contractor and his Surety shall be liable to the City for any loss so sustained.

RESPONSIBILITY OF THE CITY MANAGER OR DESIGNEE

The term "City Manager or designee" wherever used in the Contract shall be the City of St. Pete Beach or its duly authorized representative. Notices of any change in the City Manager or designee shall be given in writing by the City to the Contractor. The City Manager or designee shall have full authority to interpret the Plans and Specifications and shall determine the amount, quality, and acceptance of the work and supplies to be paid for under the Contract and every question relative to the fulfillment of the terms and provisions therein. It shall be the duty of the City Manager or designee to enforce the Plans and Specifications in a fair and unbiased manner.

If a variation from any requirements is allowed the City Manager or designee shall grant the same in writing with the reasons for his action outlined, and such action will not invalidate or change the Contract in any other manner.

INTENT OF PLANS AND SPECIFICATIONS

The Contractor shall keep on the job a copy of the Plans and Specifications and shall at any time give the City Manager or designee access thereto. Anything mentioned in the Specifications and not shown on the Plans or shown on the Plans and not mentioned in the Specifications, shall be of like effect as if shown or mentioned in both. The Contractor shall not take advantage of any errors, discrepancies or omissions that may exist in the Plans and Specifications, but shall immediately call them to the attention of the City Manager or designee whose interpretation or correction thereof shall be conclusive. Should a conflict occur between the General Specifications and any Supplemental Specifications and/or Plans, the latter shall govern.

LICENSES AND PERMITS

The Contractor shall obtain and pay for all necessary City licenses and work permits and shall faithfully comply with all laws, ordinances and regulations, (Federal, State or local) which may be applicable to the operations to be conducted hereunder. Chapter II, Section II-4, "Registration of Licenses Obtained From Other Municipalities:" "Persons, partnerships, corporations, or other business entities doing business with the City who are not required to obtain a City occupational license, but who must have either a State or County or Municipal occupational license from another municipality, shall register such occupational license with St. Pete Beach Community Development Department. The City may charge a fee for such registration." The Contractor shall be responsible for obtaining all City, County, State and Federal permits required by those government agencies and must provide documentation of receipt of those permits prior to project commencement. This shall include a notice to commence work letter and the applicable fee, if required. Any sub-contractor hired by the contractor awarded the project, MUST also register their license with the City.

SUPERINTENDENCE

The Contractor shall constantly superintend all the work embraced in this Contract in person or by a responsible agent who shall have in writing, full authority to act for him/her and to carry out all the instructions given by the City Manager or designee.

LABOR PROVISIONS

The Contractor and his Subcontractors shall discharge, whenever ordered to do so by the City Manager or designee, any employee who is disorderly or whose conduct in the opinion of the City Manager or designee is detrimental to the prosecution of the work. No person whose age or physical condition is such as to make this employment dangerous to his/her health and safety or to the health and safety of others shall be employed on the work, and in no event shall any persons under the age of sixteen (16) years be employed.

LIABILITY INSURANCE

The Contractor shall procure and maintain at his/her own expense, during the life of the Contract, liability insurance as hereinafter specified. All such insurance shall be subject to the approval of the City for adequacy of protection, and shall include a provision preventing cancellation without twenty (20) days prior notice to the City in writing. The City shall be included as an additional insured on all liability insurance. The liability insurance required is as follows: Contractor's General Public Liability and Property Damage Insurance issued to the Contractor and protecting the Contractor from all claims for personal injury, including death, and all claims for destruction of or damage to property, arising out of or in connection with any operations under this Contract, whether such operations be by the Contractor or by any Subcontractor hired by the Contractor or anyone directly or indirectly employed by the Contractor or hired by the Contractor.

The successful Contractor shall supply and maintain insurance which defends, indemnifies and holds harmless the City of St. Pete Beach, its officers, employees and agents from and against any and all liability, damage claims, demands, costs, judgments, fees, attorney's fees or loss arising directly out of acts or omissions hereunder by the contractor or third party under the direction or control of the contractor. Such general and excess liability coverage shall be primary to any other coverage carried by the City of St Pete Beach. Contractor must furnish the City with Certificate of Insurance prior to commencement of work. An approved Certificate of Insurance furnished by the contractor's carrier to

guarantee the contractor being insured with the City of St Pete Beach must be named as a certificate holder for this contract. The following minimum coverage:

Commercial Liability Insurance $1,000,000.00.
Comprehensive General Liability Insurance of $1,000,000.00 each occurrence.
Personal Injury for $1,000,000.00 each occurrence.
Automobile Liability $1,000,000.00.
General Workers Compensation Insurance as required by Florida law.

PROTECTION OF WORK AND PROPERTY

The Contractor shall continuously maintain adequate protection of all his/her work and materials from damage or theft and shall protect the City's property and all adjacent property from injury or loss arising in connection with activities under his/her Contract. The Contractor shall make good any such damage, injury, or loss, except such as may be caused by agents or employees of the City.

The Contractor shall take, use, provide, and maintain all necessary precautions, safeguards, and protection to prevent accidents, or injury to persons or property on, about, or adjacent to the site of the work. Should the situation arise that physical security is needed the Contractor will provide security on off days and holidays. The Contractor shall be responsible for all charges incurred with such action.

The Contractor shall post danger signs warning against any hazards created by the work being done under his/her Contract. He/She shall designate a responsible member of his/her organization on the work, whose duty shall be the prevention of accidents, and the name of the person so designated shall be reported to the City Manager or designee and City in writing. In an emergency affecting the safety of life, or of the work or adjoining property, the Contractor, without special instruction or authorization from the City Manager or designee or City, is hereby permitted to act, at his/her own discretion, to prevent such threatened loss or injury, and he/she must take such action if so instructed or authorized by the City Manager or designee. The Contractor shall also protect adjacent property as required by law.

PARKING

Arrange with City's Project Manager for temporary parking areas to accommodate construction personnel and equipment.

TRANSPORTATION, HANDLING and STORAGE

Transport, handle, protect and store products in accordance with manufacturer's instructions and all environmental regulatory agencies.

VEHICLES

Business vehicles shall be identified on both sides with the name of the company or firm operating the vehicle.

ENVIRONMENTAL PROTECTION

It shall be the Contractor's responsibility to implement construction methods, best management practices, and erosion control methods that avoid water pollution as required by the State of Florida Department of Environmental Protection, City of St. Pete Beach and Pinellas County. Any Contractors in violation of the City of St. Pete Beach Regulations,

Pinellas County Regulations, Florida Department of Environmental Protection Regulations or any other regulatory agency regulations shall be the sole responsibility of the Contractor. The Contractor shall hold harmless the City of St. Pete Beach and the City Manager or designee from any fines and litigation resulting from the Contractor's actions. The Contractor shall pay all attorneys' fees, fines, penalties and any other such expenses resulting from the Contractor's actions. The Contractor shall provide all necessary measures to prevent any materials whatsoever from entering the waterway except for those materials, which are shown, on the plans as completed structures. The Contractor shall provide MSDS sheets to the City Manager or Designee on all applicable materials before applying those materials. The contractor shall secure the necessary education, certifications, licenses and permits required by state and local agencies to operate and manage a construction site. The contractor shall abide by all rules and regulations set forth and required by the City of St. Pete Beach's MS4 NPDES Permit.

TIMELY DEMAND FOR STAKES AND INSTRUCTIONS

The Contractor shall provide reasonable and necessary materials, opportunities and assistance for setting stakes and making measurements, including the furnishing of a rodman, or a chainman at intermittent times during the construction period. He /she shall not proceed until he/she has received such stakes and instructions as may be necessary as the work progresses. The work shall be done in strict conformity with such stakes and instructions. The Contractor shall carefully preserve bench marks, reference points and stakes, and in case of willful or careless destruction, he /she will be charged with the resulting expense and shall be responsible for any mistakes that may be caused by their unnecessary loss or disturbance.

WORKMANSHIP

The Contractor acknowledges that he/she has satisfied himself/herself as to the nature and location of the work; the general and local conditions including but not restricted to those bearing upon transportation, disposal, handling and storage of materials; availability of labor, water, electric power, roads; and uncertainties of weather, surface conditions, subsurface conditions, tides or similar physical conditions at the site, the character of equipment and facilities required to prosecute the work. Any failure by the Contractor to acquaint himself/herself with any aspect of the work or with any of the applicable conditions shall not relieve the Contractor from the responsibility to successfully perform the work under the Contract Documents, nor shall it be considered the basis for any claim for additional time or compensation.

UTILITIES

The Contractor shall anticipate all underground obstructions such as water lines, gas lines, sewer lines, utility lines, or any other public or private facility concrete and debris. In all cases where existing utility lines may be interfered with by the work, the Contractor shall give a minimum of thirty six (36) hours' notice to the owners of such utilities, to permit them to relocate the lines prior to construction. No extra payment shall be allowed for the removal, replacement, repair or possible increased cost caused by underground obstructions. The location of existing structures and utilities provided in the plans are approximate only. Any damage to existing structures to remain or work of any kind shall be repaired or restored promptly by, and at the expense of the Contractor.

The Contractor shall at all times protect all desirable trees, plants, curbs, sidewalks, irrigation components, and structures not requiring removal to accomplish the work,

whether or not they are shown on the plans. The Contractor must contact the City to obtain tree removal permits for the removal of any tree.

In matters of restoration all materials, construction and workmanship shall be acceptable to the City of St. Pete Beach and the City Manager or designee. No changes in size, shape, configuration, location, materials or construction shall be made without prior written authorization from the City Manager or designee.

No interruption of ingress and egress to private property shall be made unless the Contractor has made prior arrangements acceptable to the owner of the affected property. At the direction of the City Manager or his designee the Contractor shall be required to notify affected residents/property owners of impending activity or inconvenience via door hanger.

The Contractor shall provide all traffic control devices utilized during construction and meet the requirements set forth in the Florida State Department of Transportation "Manual on Traffic Control and Safe Practices for Street and Highway Construction, Maintenance, and Utility Operations."

CLEANING UP

Upon completion or termination of the work the Contractor shall, as directed by the City Manager or designee, remove from the vicinity of the work all equipment and temporary structures, waste materials and rubbish resulting from his operations, leaving the premises in a neat and presentable condition. All debris generated by the Contractor will be removed before leaving the area. All areas will be raked to remove smaller debris. All surrounding sidewalks, parking lots and roadways will be cleared of any dust or debris generated by the Contractor. In the event of his/her failure to do so, the City at the expense of the Contractor may do the same, and his/her Surety shall be responsible therefore.

DEFECTIVE WORK OR MATERIAL

The Contractor shall promptly remove from the premises all work and materials condemned by the City Manager or designee as failing to conform to the Contract, whether incorporated or not, and the Contractor shall promptly replace and re-execute his own work in accordance with the Contract and without expense to the City and shall bear the expense of making good all work of other Contractors destroyed or damaged by such removal or replacement.

If the Contractor does not remove such condemned work or materials within a reasonable time after notice, the City may remove them and store the materials at the expense of the Contractor. If the Contractor does not pay the expense of such removal within ten (10) days' time thereafter, the City may, upon thirty (30) days written notice sell such materials at auction or at private sale and shall account for the net proceeds thereof after deducting all the costs and expenses that should have been borne by the Contractor.

DISPUTE RESOLUTION

The Contract shall be construed under Florida law. The parties agree that all controversies, claims and other matters in question between the parties arising out of or relating to this Contract or its breach shall be resolved through mediation. Upon notice of any party to the Contract of a dispute, question or controversy, the parties shall agree to

the appointment of a qualified mediator. A qualified mediator is a person who has received at least forty (40) hours of mediation training and has actual experience as a mediator in resolving contract disputes. If the dispute, question or controversy is not resolved through mediation within sixty (60) days of a notice of the dispute between the parties, the city reserves the right to seek resolution through court action.

INDEMNITY

The Contractor shall indemnify and save harmless the City, and the City's agents and employees, from and against all losses and all claims, demands, payments, suits, actions, recoveries, and judgments of every nature and description brought or recovered against them by reason of any action or omission of the said Contractor, his agents, or employees, in the execution of the work or in guarding the same.

GENERAL WARRANTY

Neither the final certificate nor any provision in the Contract Documents nor partial or entire occupancy of the premises by the City shall constitute an acceptance of work not done in accordance with the Contract Documents or relieve the Contractor of liability in respect to any express warranties or responsibility for faulty materials or workmanship. The Contractor shall remedy any defects in the work and pay for any damage to other work resulting there from that shall appear within a period of eighteen (18) months from the date of final acceptance of the work, unless a longer period is specified. The City shall give notice of observed defects with reasonable promptness.

LAND OF CITY, USE OF, BY CONTRACTOR

The City shall provide the land upon which the work under this Contract is to be done, and will, so far as is convenient, permit the Contractor to use as much of the land as is required for the erection of temporary construction facilities and storage of materials, together with the right of access to same, but beyond this, the Contractor shall provide, at his/her cost and expense, any additional land required. It will be the responsibility of the Contractor to repair or restore to the satisfaction of the City, at their own expense, any damage to land used for the above stated activities or any other activities approved by the City.

OTHER WORK

Wherever work being done by the City or by other Contractors is contiguous to work covered by this Contract, the respective rights of the various interests involved shall be established by the City Manager or designee to secure the completion of the various portions of the work in general harmony.

OTHER CONTRACTS

The City may award other Contracts. The Contractor shall fully cooperate with such other Contractors and carefully fit his/her own work to that provided under other Contracts, as may be with the performance of work by any other Contractor or City.

DELAYS AND EXTENSION OF TIME

If the Contractor should be delayed at any time in the progress of the work by an act or neglect of the city or the City Manager or designee, or of any employee of either, or by any separate Contractor employed by the City, or by changes ordered in the work, or by strike, lockouts, fire, unusual delay in transportation, unavoidable casualties, or any cases beyond the Contractor's control, or by delay authorized by the City Manager or designee, or by any cause which the City Manager or designee shall decide to justify the delay, then the time of

completion shall be extended for such reasonable time as the City Manager or designee may decide. No such extension shall be made for a delay that occurs more than seven (7) days before a claim is made in writing to the City Manager or designee. In the case of a continued cause of delay, only one (1) claim is necessary. This section does not exclude the recovery of damages for delay by either party under other provisions in the Contract Documents.

CITY'S RIGHT TO TAKE OVER THE WORK

If the Contractor shall be adjudged bankrupt, or if he/she should make a general assignment for the benefit of his/her creditors, or if a receiver should be appointed to take over his/her affairs, or if he /she should fail to prosecute his/her work with due diligence and carry the work forward in accordance with his/her work schedule and the time limits set forth in the Contract Documents, or if he/she should fail to substantially perform one or more of the provisions of the Contact Documents to be performed by him, the City may serve written notice on the Contractor and the Surety on his/her performance bond, stating its intention to exercise one of the remedies hereinafter set forth and the grounds upon which the City bases its right to exercise such remedy. In any event, unless the matter complained of is satisfactorily cleared within ten (10) days after the service of such notice, the City may, without prejudice to any other right or remedy exercise one of such remedies at once; having first obtained a certificate from the City Manager or designee that such sufficient cause exists to justify such action.

(a) The City may terminate the services of the Contractor, which termination shall take effect immediately upon service of notice thereof on the Contractor and his Surety, whereupon the Surety shall have the right to take over and perform the Contract. If the Surety does not commence performance of the Contract within ten (10) ten days after service of the notice of termination, the City may itself take over the work, take possession of and use all materials, tools, equipment, and appliances on the premises and prosecute the work to completion by such means as it shall deem best. In the event of such termination of his service, the Contractor shall not be entitled to any further payment under his Contract until the work is completed and accepted. If the City takes over the work and if the unpaid balance of the Contract price when the City takes over the work exceeds the cost of completing the work, including compensation for damages or expenses incurred by the City through the default of the contractor, such excess shall be paid to the Contractor. In such event, if such cost, expenses, and damages shall exceed such unpaid balance of the Contract price, the Contract and his Surety shall pay the difference to the City. The City Manager or designee shall certify such cost, expenses, and damages.

(b) The City may take control of the work and either make good the deficiencies of the Contractor itself or direct the activities of the Contractor in doing so, employing such additional help as the City deems advisable. In such event, the City shall be entitled to collect from the Contractor and his Surety, or to deduct from any payment then or thereafter due the Contractor, the costs incurred by it through the default of the Contractor, provided the City Manager or designee approves the amount thus charged to the Contractor.

(c) The City may require the Surety on the Contractor's bond to take control of the work at once and see to it that all deficiencies of the Contractor are made good with due diligence. As between the City and the Surety, the cost of making good such

deficiencies shall all be borne by the Surety. If the Surety takes over the work, either upon termination of the services of the Contractor or upon instructions from the City to do so, the provisions of the Contract Documents shall govern in respect to the work done by the Surety, the Surety being substituted for the Contractor as to such provisions, including provisions as to the payment for the work and provisions of this section as to the right of the City to do the work itself or to take control of the work.

RIGHT OF OCCUPANCY

The City shall have the right, if necessary, to take possession of and to use any completed or partially completed portions of the work, if such use be approved by the City Manager or designee even if the time for completing the entire work or such portions of the work has not expired and even if the work has not been finally accepted. Such possession and use shall not constitute an acceptance of such possession and use if it materially interferes with the Contractor's operations. The City shall also have the right to enter the premises with the Contractor for the purpose of doing work not covered by its Contract.

ACCEPTANCE

Final inspection and acceptance of the work shall be made for the City by the City Manager or designee. Such inspection shall be made as soon as practical after the Contractor has notified the City in writing that the work is ready for such inspection.

WAIVER

It is expressly understood and agreed that any waiver granted by the City Manager or designee of any term, provision or covenants of the Contract shall not constitute a precedent or breach of the same or any other terms, provisions, or covenants of the Contract. Neither the acceptance of the work by the City nor the payment of all or any part of the sum due the Contractor hereunder shall constitute a waiver by the City of any claim which the City may have against the Contractor/Surety under this Contract or otherwise.

INSPECTION

The City Manager or designee and his representative shall, at all times, have access to the work during its construction and shall be furnished with every reasonable facility for ascertaining that the stock and materials used and employed, and the workmanship, are in accordance with the requirements and intentions of the Plans. All work done and all materials furnished shall be subject to their inspection and approval by the City Manager or his designee. If any work should be covered up without approval or consent of City Manager or designee, it must, if required by the City Manager or designee, be uncovered for examination at the Contractor's expense.

The City Manager or designee may order re-examination of questioned work and if so ordered, the Contractor must uncover the work. If such work were found in accordance with the Contract Documents, the City shall pay the cost of re-examination and replacement. If such work be found not in accordance with the Contract Documents, the Contractor shall pay such cost unless he /she shall show that the defect in the work was caused by another Contractor, and in that event, the City shall pay such cost.

The inspection of the work shall not relieve the Contractor of any of his/her obligations to fulfill his/her Contract as prescribed, and defective work shall be made good and unsuitable materials shall be rejected, notwithstanding that such defective work and

materials have been previously overlooked and accepted on estimates for payment. All work shall be tested to the satisfaction of the City Manager or designee before acceptance.

BID REVIEW AND CONTRACT AWARD

Failure to submit all documents requested at the time of bid may deem the contractor's bid ineligible for award. The City of St. Pete Beach reserves the right to reject any or all bids or parts of bids or accept any bid or part thereof deemed to be in the best interests to the City of St. Pete Beach. The City shall be the sole final judge of qualifications of the bidder to perform service and reserves the exclusive right to accept or reject any bids as it deems to be in the best interests of the City. The City may waive any informalities.

LOCAL, STATE AND FEDERAL COMPLAINCE REQUIREMENTS

The laws of the State of Florida do apply to any purchase made under this Request for Bid. Proposers shall comply with all local, state, and federal directives, orders and laws as applicable to their bid and subsequent contracts include but not limited to Equal Employment Opportunity, Minority Business Enterprise, and OSHA as applicable to this contract.

A PROVISION FOR OTHER AGENCIES

Unless otherwise stipulated by the proposer, the proposer agrees to make available to all Government agencies, departments, and municipalities the bid prices submitted in accordance with said bid terms and conditions therein, should any said governmental entity desire to buy under this bid. Eligible users shall meet all State of Florida agencies, the legislative and judicial branches, political subdivisions (counties, local district school boards, community colleges, municipalities, or other public agencies or authorities), which may desire to purchase under the terms and conditions of this contract.

BID BOND

This project will require a 5% bid bond to be submitted with the bid.

RESERVES THE RIGHT

The City reserves the right to accept or reject any and/or all bids, to waive irregularities and technicalities, and to request re-submission. If only one bid is received by the bid date and time listed, the bid may or may not be rejected by the City depending upon bid review and the needs of the City.

The City reserves the right to select a firm with or without additional interviews, and may decide to select any of the firms submitting bids. The City reserves the right to award the contract to a responsible proposer submitting a responsible bid, with a resulting negotiated agreement which is most advantageous and in the best interest of the City.
Proposers, bidders, their agents, and associates shall not contact or solicit any City Commission member, City employee, or official regarding this RFB during any phase of the bidding process. Failure to comply with the provision may result in disqualification of the bidder, at the option of the City. Only that individual listed, or an approved designee, as the contact person for this RFB shall be contacted.

Once bids are submitted to the City, they cannot be withdrawn.

III
REFERENCES & QUALIFICATIONS

Provide at least (3) three or more professional, business references with which you have contracted to provide similar services in the past (5) five years. Include the name of the person, their organization and telephone number, fax number, and e-mail address. Include any governmental agencies, with the same contact and descriptive information for which you have provided similar service within the past (5) five years.

Provide a brief description of the history and capabilities of the firm. Describe the types of projects or services the firm performs/has performed and the dollar value of each. Provide information regarding your firm's ability to complete this project. Demonstrate that the firm's personnel have experience with similar projects.

Identify all unresolved and ongoing claims and disputes against your firm in excess of $500,000. Include any claims against the principals of your firm or any claims your company may have against a third party. Provide a history of litigation, including the outcomes, for the past (5) five years.

The responding firm shall provide a statement of assurance that the firm is not presently in violations of any statutes or regulatory rules that might have an impact on the firms operations. All applicable laws and regulations of the State of Florida and ordinances and regulations of the City of St. Pete Beach will apply.

Provide the overall bonding capacity for the company and provide a history of any claims against the bidder's previous bonds for the past five years.

The City shall be the sole final judge of qualifications of bidder to perform service and reserves the exclusive right to accept or reject any bid as it deems to be in the best interests of the City. The City reserves the right to make such investigation, as it deems necessary, to determine the ability of any proposer to perform the work or service requested.

IV
CERTIFICATE OF INSURANCE

INSURANCE

Include in bid an approved Certificate of Insurance furnished by the contractor's carrier to guarantee the contractor is insured. **Some insurance coverage requirements may not be applicable to all RFB's and contracts.**

AWARD OF CONTRACT

The Contactor must file with the City of St Pete Beach certificates of insurance prior to commencement of work evidencing the City as a certificate holder with the following minimum coverage:

- Commercial Liability Insurance $1,000,000.00.
- Comprehensive General Liability Insurance of $1,000,000.00 each occurrence.
- Personal Injury for $1,000,000.00 each occurrence.
- Automobile Liability $1,000,000.00.
- General Workers Compensation Insurance as required by Florida law

V. Contractor Education & Training

City of St. Pete Beach
Public Services Department
155 Corey Avenue
St. Pete Beach, Florida 33706-1839
Phone: 727-363-9254 * Fax: 727-367-2736
www.stpetebeach.org

In concurrence with NPDES MS4 requirements, our staff has reviewed information and training materials on the topic of erosion and sediment control, illicit discharges, along with spill prevention and response as provided by the City of St. Pete Beach through the website and video links provided below.

Illicit Discharges:

Illicit Discharges Illicit Discharge Training Video - Part 1 Illicit Discharge Training Video - Part 2

Construction Activities & BMPs:

Discharges from Construction Activities Construction Site Stormwater Runoff Control
BMP Inspection and Maintenance Stormwater and the Construction Industry

Erosion and Sedimentation Control:

Erosion and Sedimentation Control

Spill Prevention and Control:

Spill Prevention and Control

Local Resources:

Pinellas County Watershed Management - Stormwater Runoff
Pinellas County Watershed Management City of St. Pete Beach Stormwater Fact Sheet
City of St. Pete Beach Public Services Department

Company Name: _____

Signature: _____

Name/Title: _____

Date: _____

All site inspectors and site operators must be certified through the Florida Stormwater, Erosion and Sedimentation Control Inspector Training and certification program or an equivalent program approved by FDEP. All certification documents and copies of licenses must be provided to the City.

VI.

SYSTEM MAP AND TECHNICAL SPECIFICATIONS

ST. PETE BEACH MODEL RESULTS
KEY SHEET
Legend
Page Number
ST. PETE BEACH
THE SUNSET CAPITAL OF FLORIDA
N
1,600 800 0 1,600 Ft.
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmap Community
Kimley»Horn

ST. PETE BEACH MODEL RESULTS

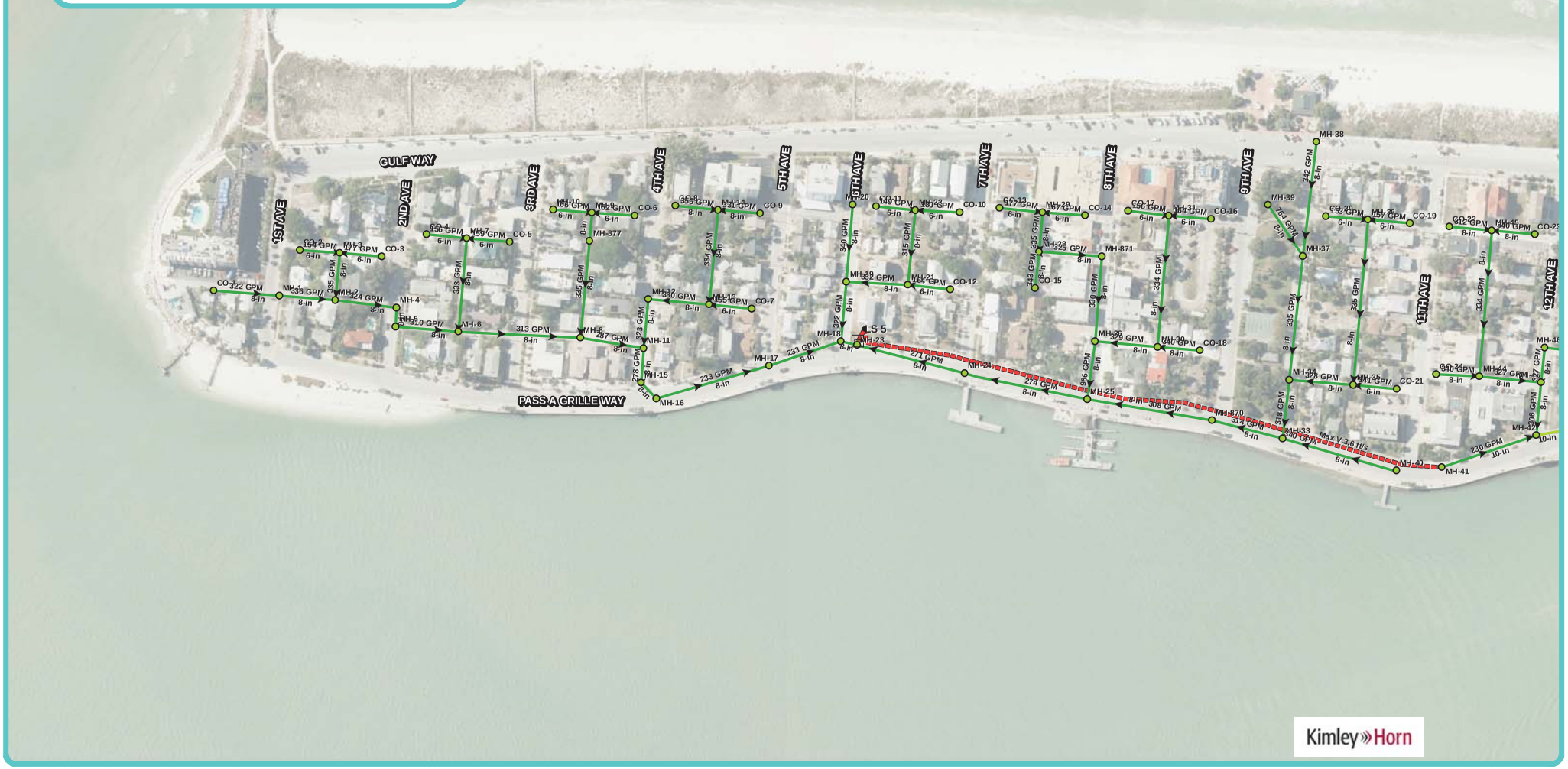
Service Area 5 - Page 1

Legend

Manholes
- Not Surchaged
- Surchaged
- Lift Station
- Force Main

Pipe Capacity
- 0 - 60%
- 60 - 80%
- 80 - 100%
- > 100%

Remaining Capacity
XXX GPM
PIPE SIZE



ST. PETE BEACH MODEL RESULTS

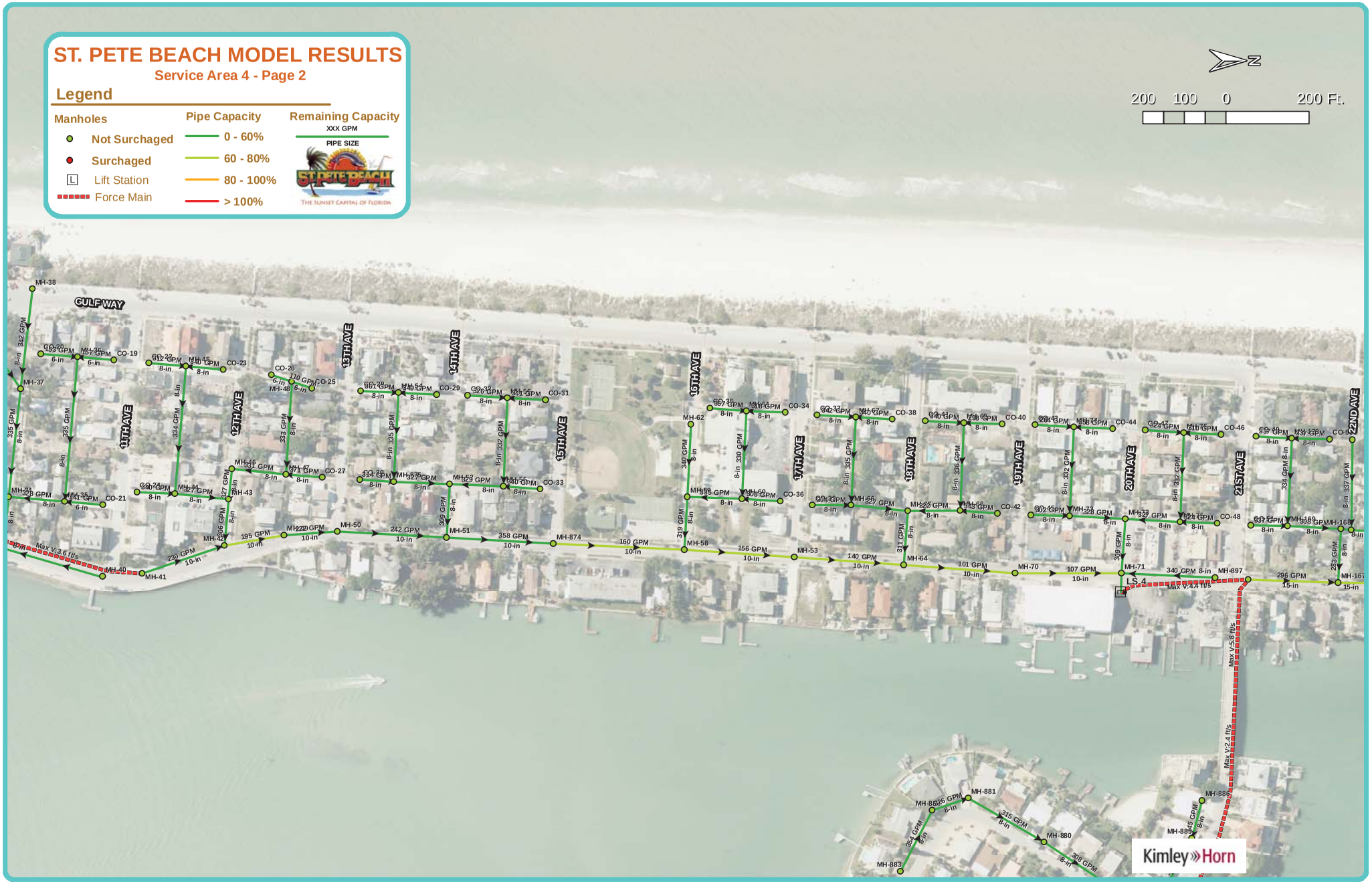
Service Area 4 - Page 2

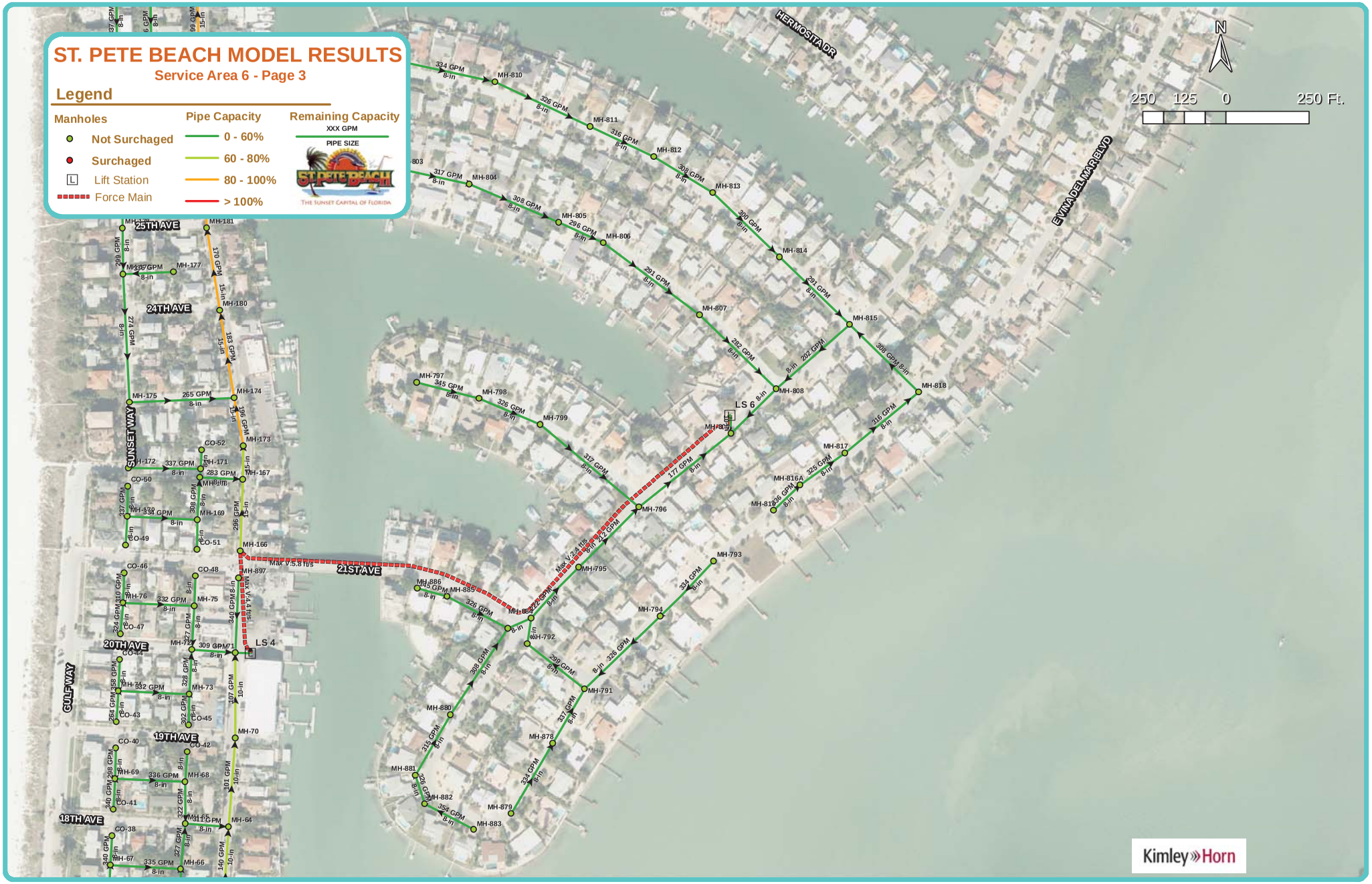
Legend

Manholes
- Not Surchaged
- Surchaged
- Lift Station
- Force Main

Pipe Capacity
- 0 - 60%
- 60 - 80%
- 80 - 100%
- > 100%

Remaining Capacity
XXX GPM
PIPE SIZE




ST. PETE BEACH MODEL RESULTS
Service Area 6 - Page 3
Legend
Manholes
Not Surchaged
Surchaged
Lift Station
Force Main
Pipe Capacity
0 - 60%
60 - 80%
80 - 100%
> 100%
Remaining Capacity
XXX GPM
PIPE SIZE
ST. PETE BEACH
THE SUNSET CAPITAL OF FLORIDA
N
250 125 0 250 Ft.
HERMOSITA DR
EVINA DEL MAR BLVD
25TH AVE
24TH AVE
SUNSET WAY
21ST AVE
20TH AVE
19TH AVE
18TH AVE
GULF WAY
LS 4
LS 6
Kimley»Horn

ST. PETE BEACH MODEL RESULTS

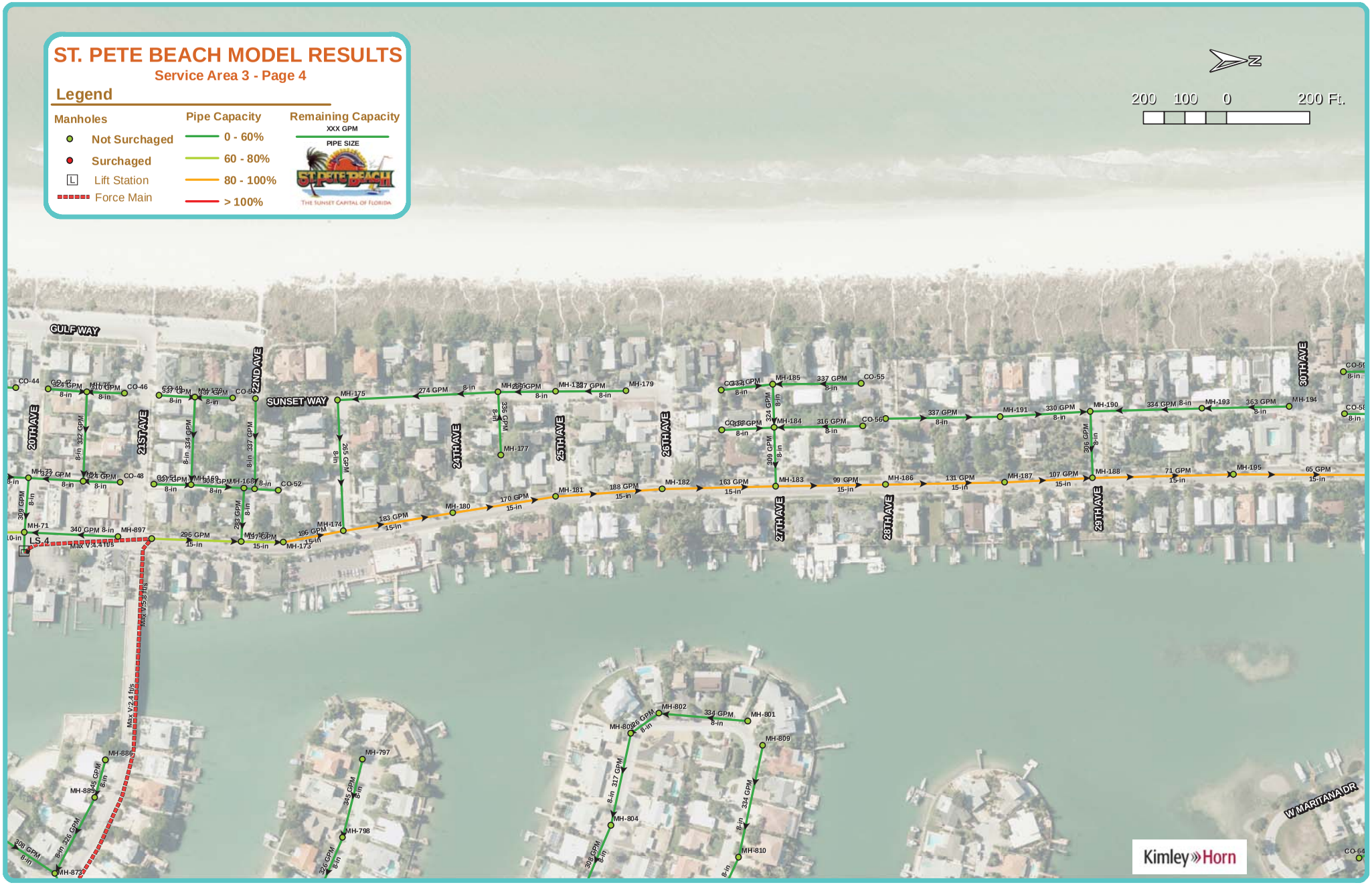
Service Area 3 - Page 4

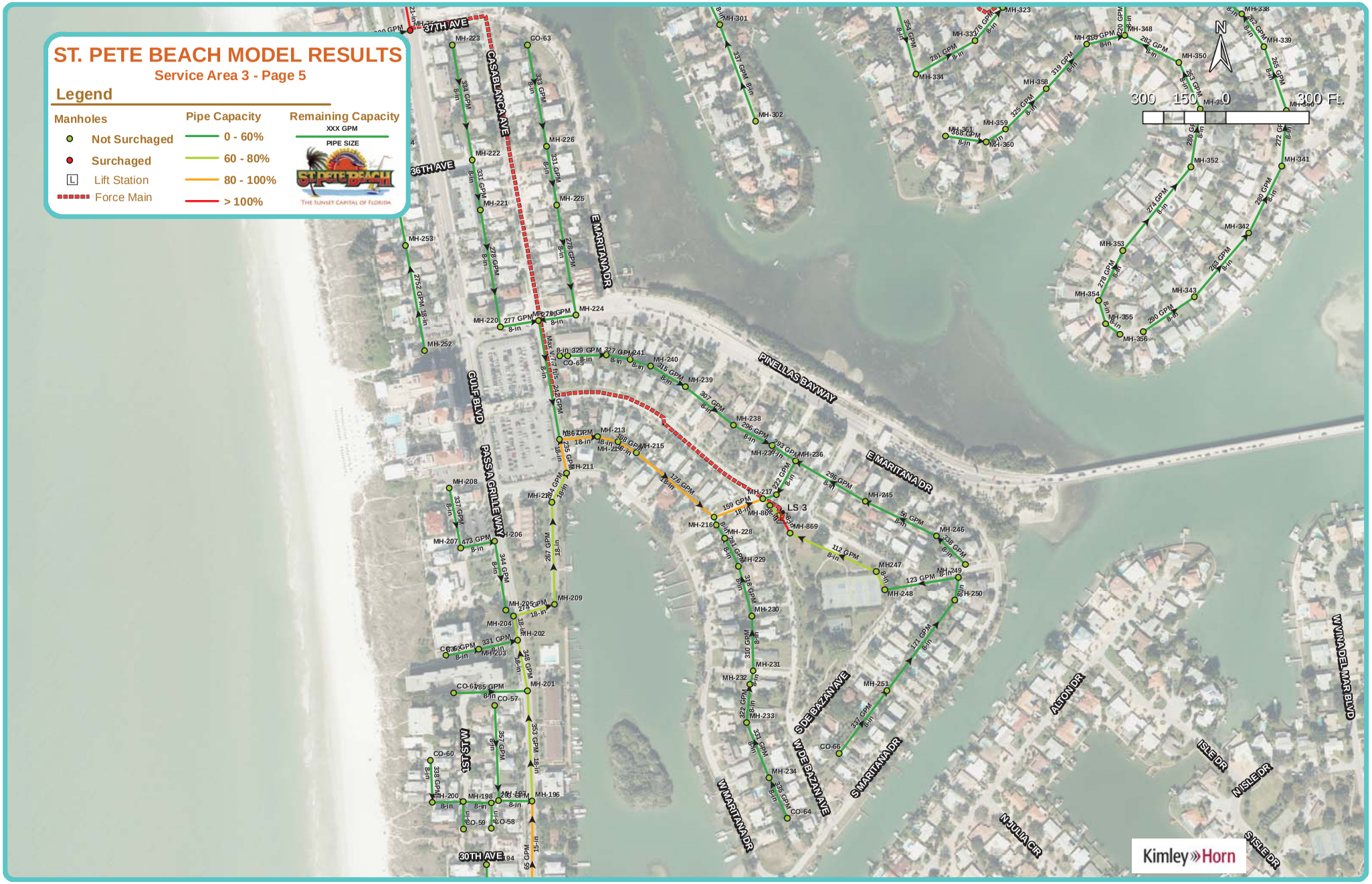
Legend

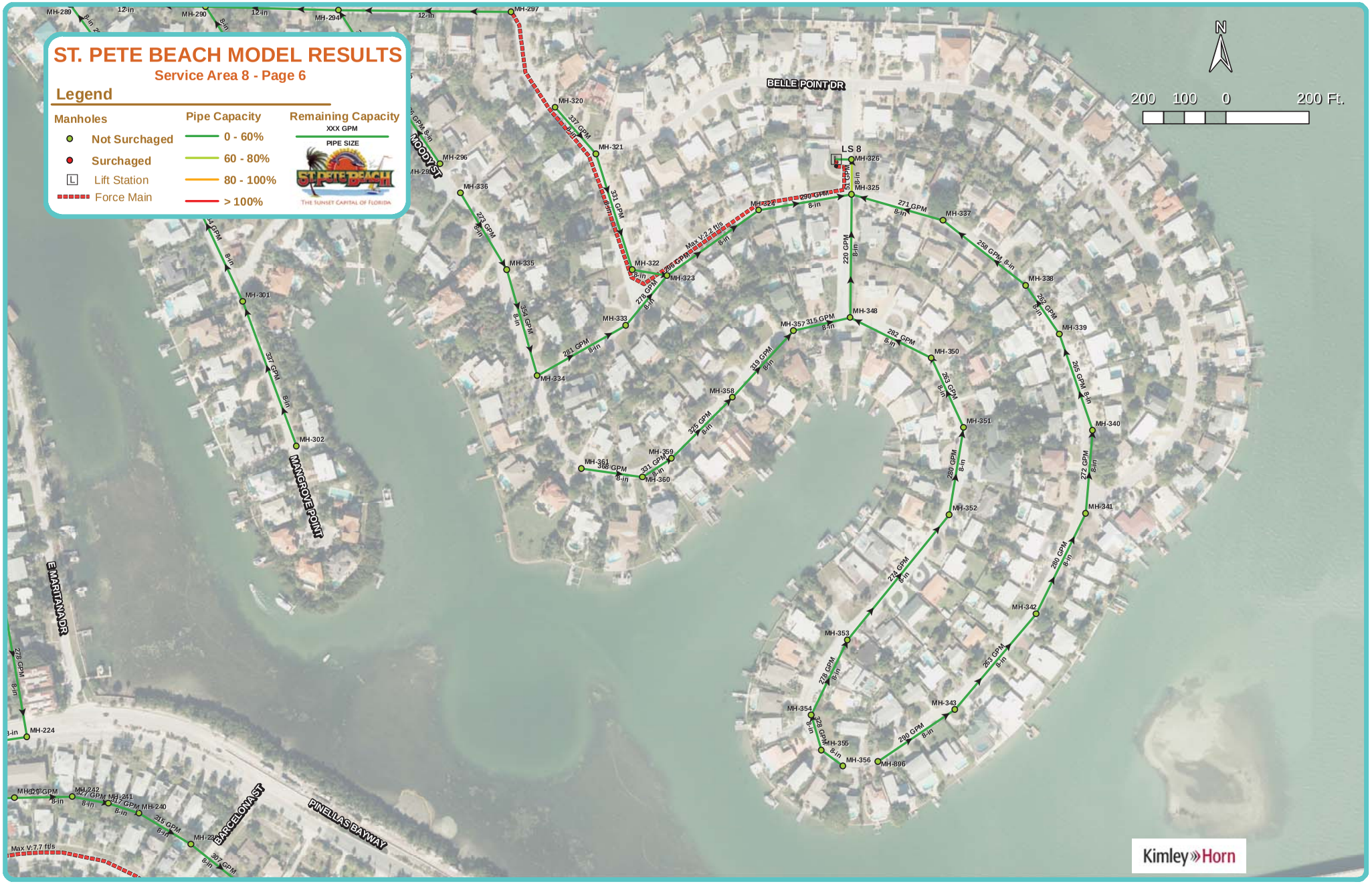
Manholes
- Not Surchaged
- Surchaged
- Lift Station
- Force Main

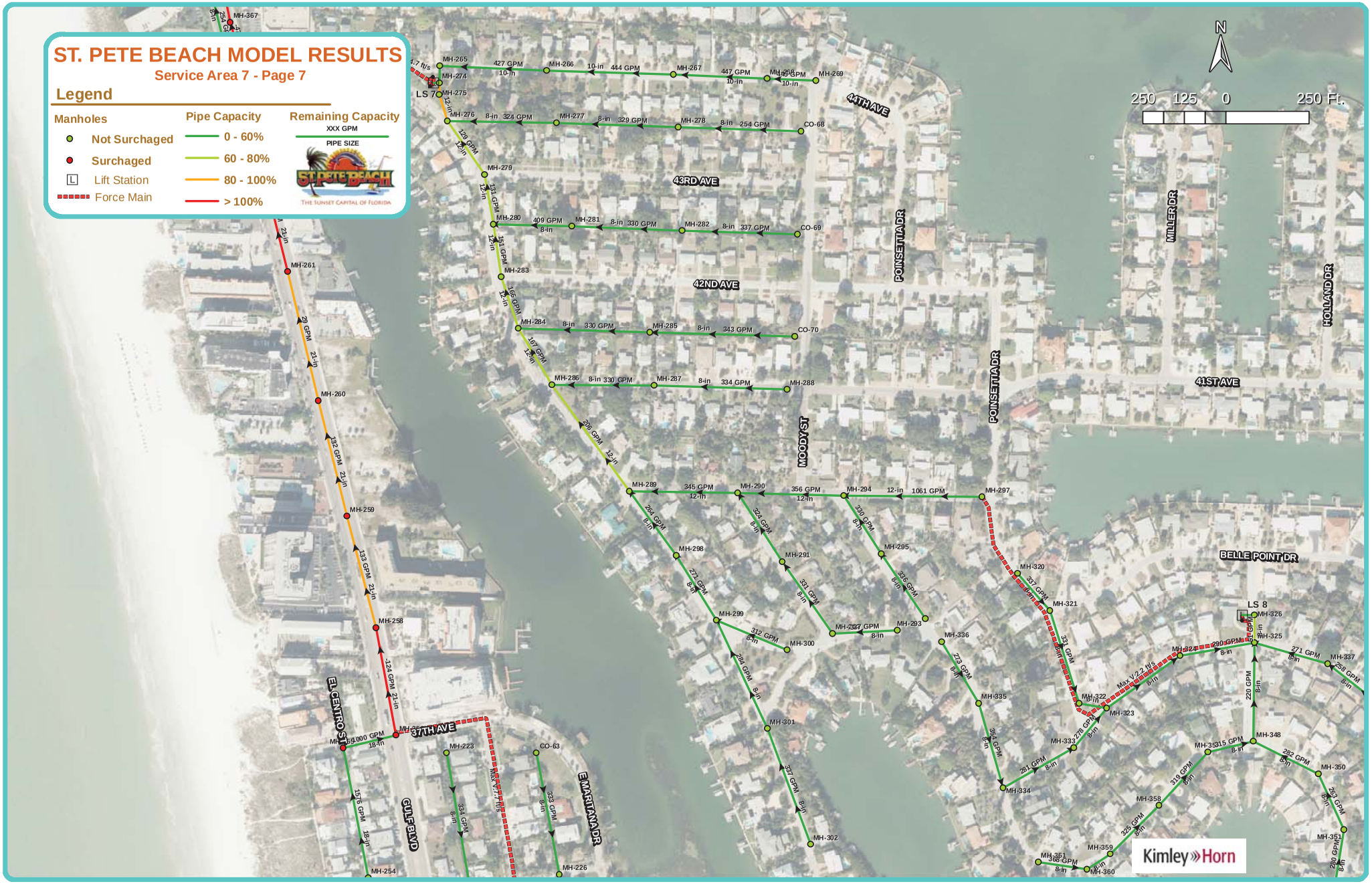
Pipe Capacity
- 0 - 60%
- 60 - 80%
- 80 - 100%
- > 100%

Remaining Capacity
XXX GPM
PIPE SIZE




ST. PETE BEACH MODEL RESULTS
Service Area 3 - Page 5
Legend
Manholes
Not Surchaged
Surchaged
Lift Station
Force Main
Pipe Capacity
0 - 60%
60 - 80%
80 - 100%
> 100%
Remaining Capacity
XXX GPM
PIPE SIZE
ST. PETE BEACH
THE SUNSET CAPITAL OF FLORIDA
N
300 150 0 300 Ft.
37TH AVE
36TH AVE
30TH AVE
CASABLANCA AVE
GULF BLVD
PASS A GRILLE WAY
1ST ST W
E MARITANA DR
PINELLAS BAYWAY
S DE BAZAN AVE
W DE BAZAN AVE
W MARITANA DR
S MARITANA DR
ALTON DR
N JULIA CIR
ISLE DR
N ISLE DR
S ISLE DR
W WADEL MAR BLVD
LS 3
Kimley»Horn


ST. PETE BEACH MODEL RESULTS
Service Area 8 - Page 6
Legend
Manholes
Not Surchaged
Surchaged
Lift Station
Force Main
Pipe Capacity
0 - 60%
60 - 80%
80 - 100%
> 100%
Remaining Capacity
XXX GPM
PIPE SIZE
ST. PETE BEACH
THE SUNSET CAPITAL OF FLORIDA
N
200 100 0 200 Ft.
BELLE POINT DR
MOODY ST
MANGROVE POINT
E MARITANA DR
BARCELONA ST
PINELLAS BAYWAY
LS 8
Max V:2.2 ft/s
Max V:7.7 ft/s
Kimley»Horn


ST. PETE BEACH MODEL RESULTS
Service Area 7 - Page 7
Legend
Manholes
Not Surchaged
Surchaged
Lift Station
Force Main
Pipe Capacity
0 - 60%
60 - 80%
80 - 100%
> 100%
Remaining Capacity
XXX GPM
PIPE SIZE
ST. PETE BEACH
THE SUNSET CAPITAL OF FLORIDA
N
250 125 0 250 Ft.
44TH AVE
43RD AVE
42ND AVE
41ST AVE
POINSETTIA DR
MILLER DR
HOLLAND DR
MOODY ST
BELLE POINT DR
EL CENTRO ST
GULF BLVD
37TH AVE
E MARITANA DR
LS 7
LS 8
Kimley»Horn

ST. PETE BEACH MODEL RESULTS
Service Area 9 - Page 8
Legend
Manholes
Not Surchaged
Surchaged
Lift Station
Force Main
Pipe Capacity
0 - 60%
60 - 80%
80 - 100%
> 100%
Remaining Capacity
XXX GPM
PIPE SIZE
ST. PETE BEACH
THE SUNSET CAPITAL OF FLORIDA
N
200 100 0 200 Ft.
SILVER DR
PLAZA WAY
LS 9
MAX VAC LS
MH-383
MH-382
MH-385
MH-386
MH-387
MH-388
MH-389
MH-390
MH-391
MH-392
MH-393
MH-394
MH-395
MH-396
MH-397
MH-398
MH-399
MH-400
MH-401
MH-402
MH-403
MH-404
298 GPM
10-in
223 GPM
298 GPM
10-in
298 GPM
10-in
84 GPM
8-in
258 GPM
8-in
269 GPM
8-in
270 GPM
8-in
277 GPM
8-in
275 GPM
8-in
274 GPM
8-in
279 GPM
8-in
220 GPM
8-in
281 GPM
8-in
228 GPM
8-in
283 GPM
8-in
Kimley»Horn

ST. PETE BEACH MODEL RESULTS

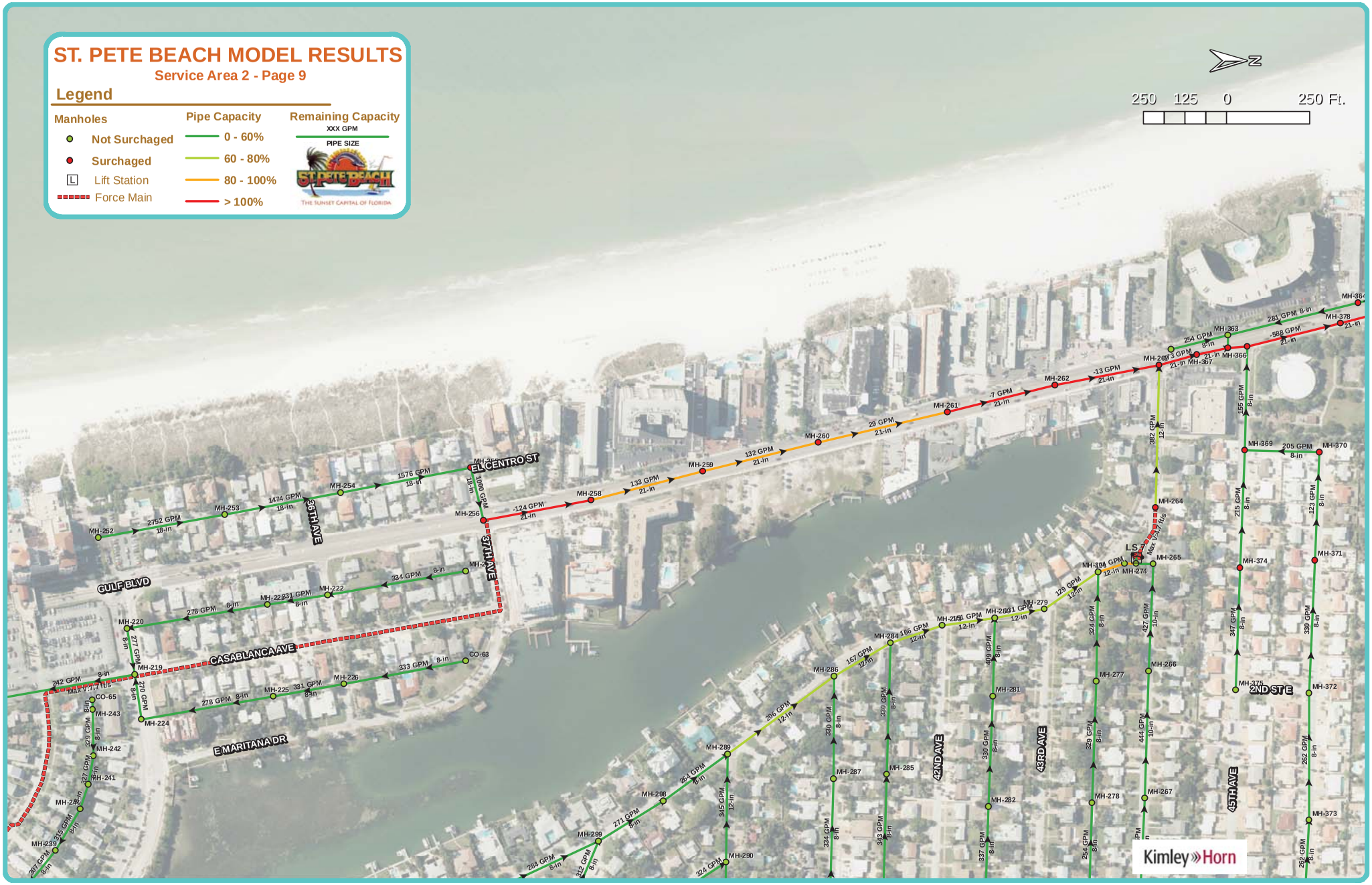
Service Area 2 - Page 9

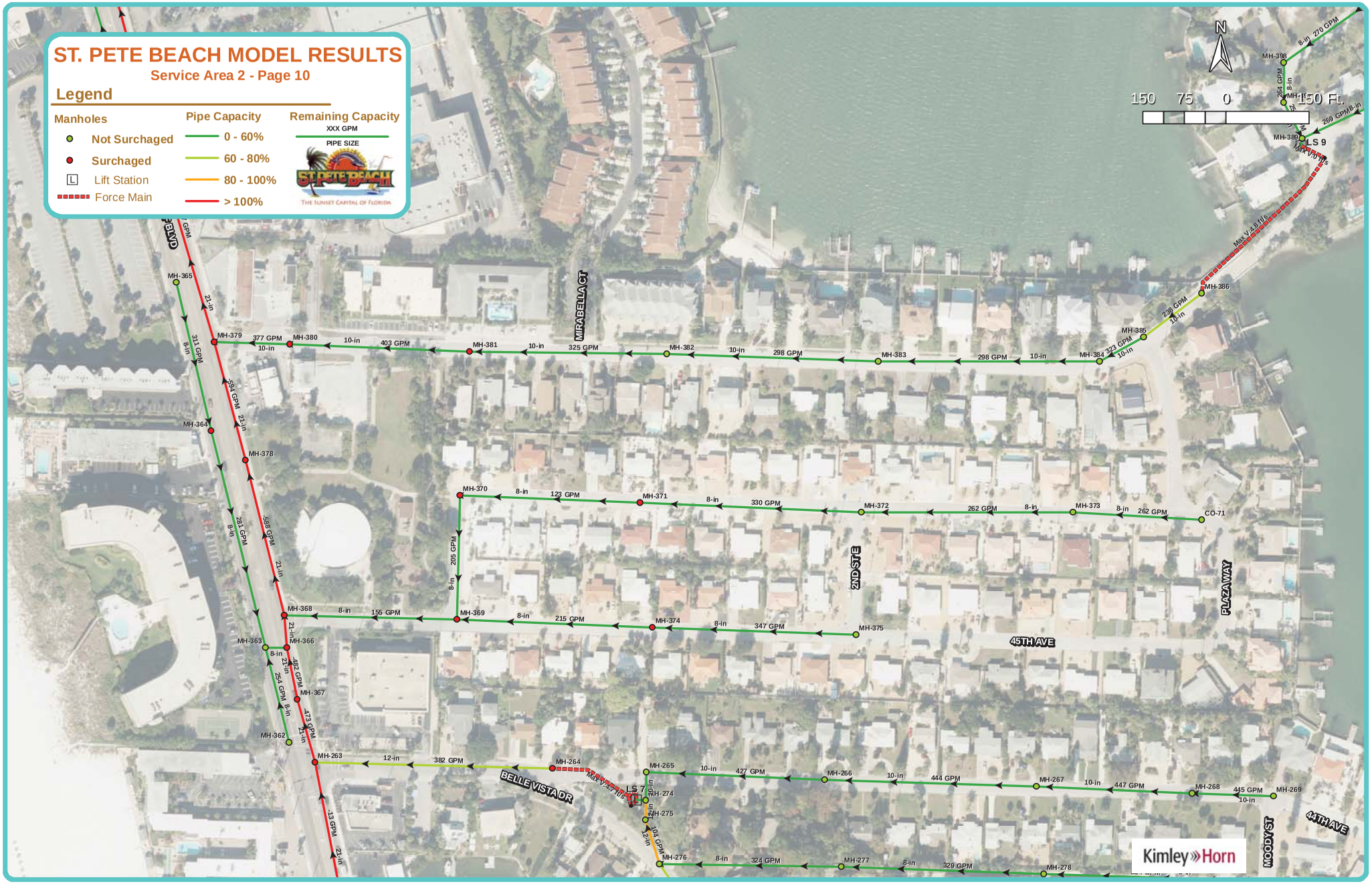
Legend

Manholes
- Not Surchaged
- Surchaged
- Lift Station
- Force Main

Pipe Capacity
- 0 - 60%
- 60 - 80%
- 80 - 100%
- > 100%

Remaining Capacity
XXX GPM
PIPE SIZE




ST. PETE BEACH MODEL RESULTS
Service Area 2 - Page 10
Legend
Manholes
Not Surchaged
Surchaged
Lift Station
Force Main
Pipe Capacity
0 - 60%
60 - 80%
80 - 100%
> 100%
Remaining Capacity
XXX GPM
PIPE SIZE
ST. PETE BEACH
THE SUNSET CAPITAL OF FLORIDA
N
150 75 0 150 Ft.
MIRABELLA CT
2ND ST E
PLAZA WAY
45TH AVE
BELLE VISTA DR
MOODY ST
44TH AVE
LS 7
LS 9
MH-365
MH-379
377 GPM
MH-380
10-in
403 GPM
MH-381
10-in
325 GPM
MH-382
10-in
298 GPM
MH-383
298 GPM
10-in
MH-384
323 GPM
10-in
MH-385
238 GPM
10-in
MH-386
MH-364
MH-378
MH-370
8-in
123 GPM
MH-371
8-in
330 GPM
MH-372
262 GPM
8-in
MH-373
8-in
262 GPM
CO-71
205 GPM
8-in
MH-368
8-in
155 GPM
MH-369
8-in
215 GPM
MH-374
8-in
347 GPM
MH-375
MH-363
MH-366
MH-367
MH-362
MH-263
12-in
382 GPM
MH-264
MH-265
10-in
427 GPM
MH-266
10-in
444 GPM
MH-267
10-in
447 GPM
MH-268
445 GPM
10-in
MH-269
MH-274
MH-275
MH-276
8-in
324 GPM
MH-277
8-in
329 GPM
MH-278
MH-398
8-in
270 GPM
MH-389
269 GPM
8-in
Kimley»Horn

ST. PETE BEACH MODEL RESULTS

Service Area 2 - Page 11

Legend

Manholes
- Not Surchaged
- Surchaged
- Lift Station
- Force Main

Pipe Capacity
- 0 - 60%
- 60 - 80%
- 80 - 100%
- > 100%

Remaining Capacity
XXX GPM
PIPE SIZE

ST. PETE BEACH MODEL RESULTS
Service Area 1 & 2 - Page 12
Legend
Manholes
Not Surchaged
Surchaged
Lift Station
Force Main
Pipe Capacity
0 - 60%
60 - 80%
80 - 100%
> 100%
Remaining Capacity
XXX GPM
PIPE SIZE
ST. PETE BEACH
THE SUNSET CAPITAL OF FLORIDA
250 125 0 250 Ft
SUNSET WAY
64TH AVE
65TH AVE
GULF BLVD
2ND ST E
55TH AVE
MEILANI DR
BIKINI WAY S
BIKINI WAY N
LS 2
LS 14
Kimley»Horn

ST. PETE BEACH MODEL RESULTS
Service Area 13 - Page 13
Legend
Manholes
Not Surchaged
Surchaged
Lift Station
Force Main
Pipe Capacity
0 - 60%
60 - 80%
80 - 100%
> 100%
Remaining Capacity
XXX GPM
PIPE SIZE
ST. PETE BEACH
THE SUNSET CAPITAL OF FLORIDA
N
200 100 0 200 Ft.
MH-460
8-in
289 GPM
MH-459
8-in
281 GPM
MH-458
8-in
317 GPM
MH-457
8-in
262 GPM
MH-456
8-in
266 GPM
65TH AVE
8-in
MH-454
317 GPM
LS 13
MH-451
8-in
8-in
MH-450
8-in
128 GPM
MH-447
8-in
LEILANI DR
360 GPM
MH-452
PALI WAY
333 GPM
8-in
MH-453
Kimley»Horn

ST. PETE BEACH MODEL RESULTS
Service Area 14 - Page 14
Legend
Manholes
Not Surchaged
Surchaged
Lift Station
Force Main
Pipe Capacity
0 - 60%
60 - 80%
80 - 100%
> 100%
Remaining Capacity
XXX GPM
PIPE SIZE
ST. PETE BEACH
THE SUNSET CAPITAL OF FLORIDA
N
200 100 0 200 Ft.
BAY ST
67TH AVE
64TH AVE
59TH AVE
LS 14
MH-534
MH-569
MH-570
MH-571
MH-572
MH-573
MH-514
MH-524
MH-526
MH-523
CO-80
MH-576
MH-895
MH-577
MH-578
MH-581
MH-580
MH-585
MH-588
MH-587
MH-582
MH-583
MH-589
MH-590
MH-591
MH-594
MH-593
MH-597
MH-595
MH-596
Kimley»Horn

ST. PETE BEACH MODEL RESULTS

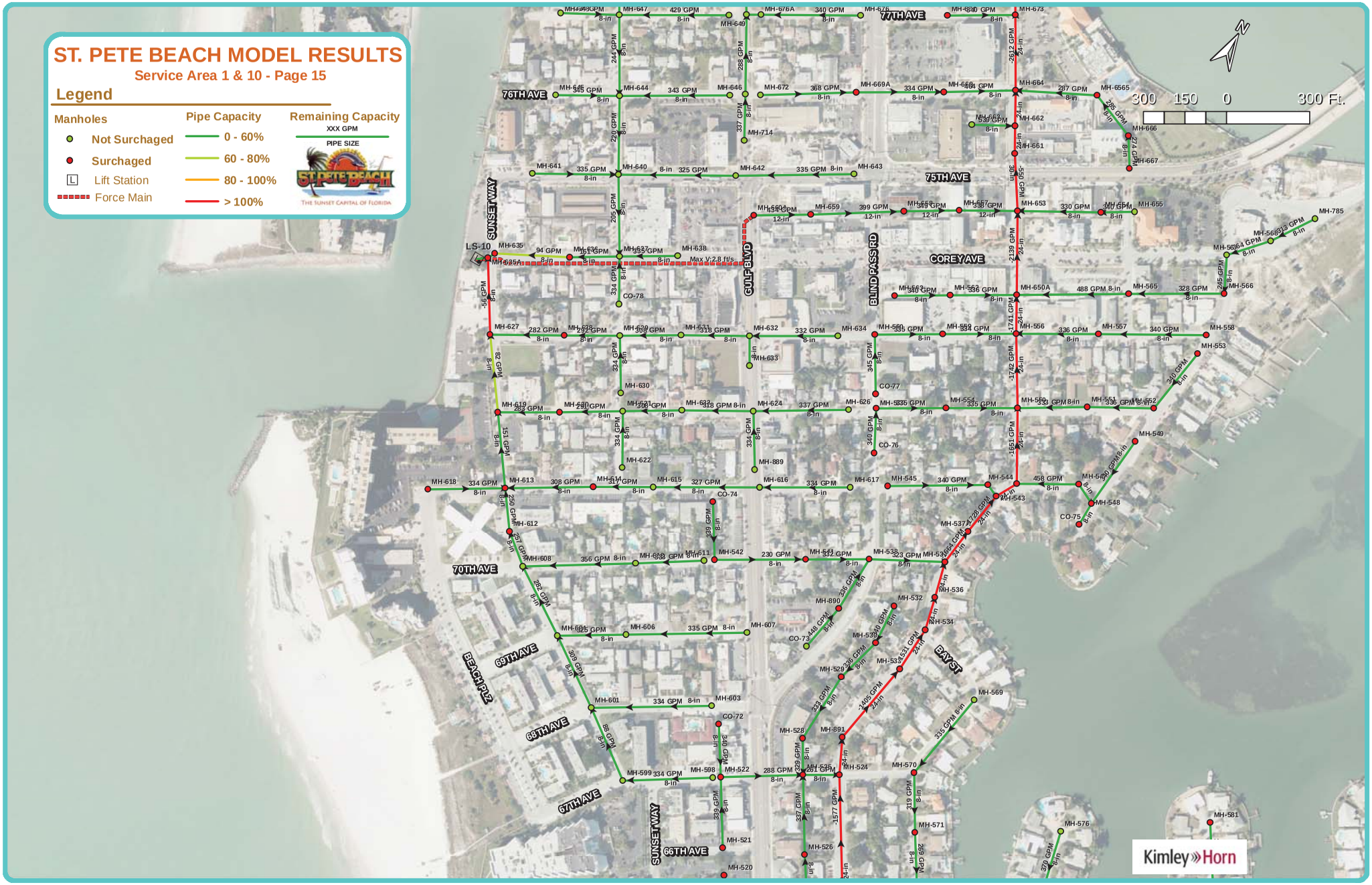
Service Area 1 & 10 - Page 15

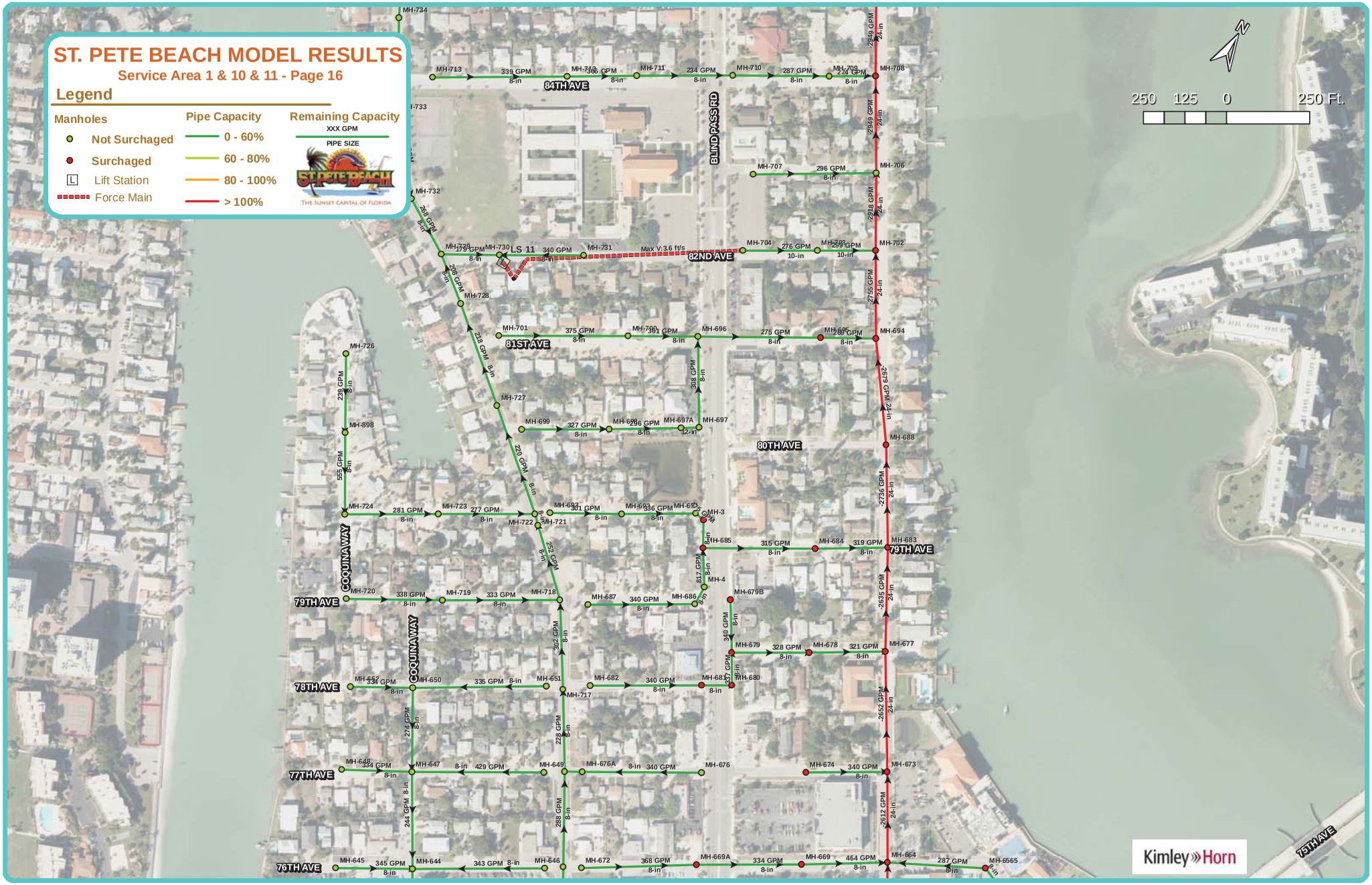
Legend

Manholes
- Not Surchaged
- Surchaged
- Lift Station
- Force Main

Pipe Capacity
- 0 - 60%
- 60 - 80%
- 80 - 100%
- > 100%

Remaining Capacity
XXX GPM
PIPE SIZE




ST. PETE BEACH MODEL RESULTS
Service Area 1 & 10 & 11 - Page 16
Legend
Manholes
Not Surchaged
Surchaged
Lift Station
Force Main
Pipe Capacity
0 - 60%
60 - 80%
80 - 100%
> 100%
Remaining Capacity
XXX GPM
PIPE SIZE
ST. PETE BEACH
THE SUNSET CAPITAL OF FLORIDA
N
250 125 0 250 Ft.
84TH AVE
BLIND PASS RD
82ND AVE
81ST AVE
80TH AVE
79TH AVE
78TH AVE
77TH AVE
76TH AVE
75TH AVE
COQUINA WAY
LS 11
Max V: 3.6 ft/s
Kimley»Horn

ST. PETE BEACH MODEL RESULTS

Service Area 1 & 10 & 11 - Page 17

Legend

Manholes
- Not Surchaged
- Surchaged
- Lift Station
- Force Main

Pipe Capacity
- 0 - 60%
- 60 - 80%
- 80 - 100%
- > 100%

Remaining Capacity
XXX GPM
PIPE SIZE

ST. PETE BEACH MODEL RESULTS
Service Area 12 - Page 18
Legend
Manholes
Not Surchaged
Surchaged
Lift Station
Force Main
Pipe Capacity
0 - 60%
60 - 80%
80 - 100%
> 100%
Remaining Capacity
XXX GPM
PIPE SIZE
ST. PETE BEACH
THE SUNSET CAPITAL OF FLORIDA
N
150 75 0 150 Ft.
MH-780
323 GPM
8-in
MH-779
302 GPM
8-in
MH-778
350 GPM
8-in
MH-776
8-in
MH-777
245 GPM
8-in
MH-775
226 GPM
8-in
MH-774
205 GPM
8-in
MH-773
LS-12
871 GPM
12-in
MH-768
264 GPM
8-in
MH-769
285 GPM
8-in
MH-770
8-in
MH-771
210 GPM
8-in
MH-772
323 GPM
8-in
GULF BLVD
MAX 1,31 Mile
CAPTIVA CIR
MH-765
206 GPM
10-in
Kimley»Horn

TECHNICAL SPECIFICATIONS

Annual Sanitary Sewer Repair & Extension Program

FY 2016 – FY 2020
Project #001272B
October 2015

SECTION 00 75 00

SPECIAL PROVISIONS

These Special Provisions provide additional information and modify the Pinellas County Engineering Standard Technical Specifications (STS) for Utilities Construction. Unless noted herein, all conditions of the standard specifications apply.

ARTICLE SP-1 SCOPE OF WORK

All work shall be made on an assignment-by-assignment basis, in the form of a Work Order authorized by the Director of Pinellas County Office of Engineering and Technical Support or a Designee. All work orders shall be issued during the initial five (5) year term or any extension thereof. Final work shall be completed no later than 120 days after the end of the term. The Contractor shall perform no work under this Contract without the County's written authorization to proceed for each Work Order. The Contractor hereby agrees to waive any claim for compensation for any work performed without authorization.

Each individual location contained in a Work Order is to be considered an "individual project" such that all work, including cleanup, must be fully completed in a reasonable time frame, as determined by the Engineer. Unless otherwise approved by the Engineer, work on each work order must be commenced within 30 days of notice to proceed for the Work Order. The project limits shown on the location maps and/or plans contained in each Work Order are approximate; the Contractor shall verify exact limits with the Engineer prior to beginning construction. Construction shall be limited to a maximum of two (2) individual project locations at a time, unless otherwise approved by the Engineer.

All work shall be performed in an expeditious and professional manner. The Contractor shall have sufficient crews and equipment to perform all work, including restoration, at the time the Work Order is assigned. The inability of the Contractor to meet contractual obligations, or to perform assigned work in a satisfactory manner, shall be grounds for termination of the Contract, and/or reassignment of the work for construction by other. The County reserves the right to add or delete sites and project locations from the Work Orders. There are no guaranteed Work Order locations. The Contractor shall only be compensated for that work satisfactorily completed. There will be no compensation to the Contractor for cancellation of the Contract or for any assigned work that is not satisfactorily constructed and accepted by the County.

The Contractor shall utilize products approved in the Pinellas County Materials Specifications Manual.

This contract does not guarantee that work assignments requested will be typical start-to-finish projects. The Contractor may be asked to complete site restoration following a repair or installation performed by the County, or pick up in the middle

of a project. The Contractor shall be prepared to perform the work of any assignment from any point of the work.

Prior to assignment of any Work Order, and based on mutual discussions between the County and the Contractor, the Contractor shall prepare a detailed work plan for each project, which shall include a work schedule and a not-to-exceed budget amount.

ARTICLE SP-2 ADDITIONAL INFORMATION AND STUDIES

Restoration for routine mainline installation within a 3'0" to 6'0" cut range shall be limited to a five (5) foot wide work area. Any restoration required outside of this limit shall be at the Contractors' expense.

Color Audio-Video Construction records per specifications shall be required for all installations with an estimated value greater than or equal to $50,000.00 that are not considered repairs.

Maintenance of traffic pay items shall be authorized for all emergency and routine response work when the work is located in the right-of-way of a County Functional Classification of Collector or higher and all FDOT right-of-ways as defined in the pay items.

Please reference the following web pages for classifications as presented by areas:

FUNCTIONAL CLASSIFICATION:

- PINELLAS COUNTY
http://www.pinellascounty.org/Plan/comp_plan/03trans/app-b/fig3-2.pdf
- NORTH PINELLAS COUNTY
http://www.pinellascounty.org/Plan/comp_plan/03trans/app-b/fig3-2a.pdf
- NORTH CENTRAL PINELLAS COUNTY
http://www.pinellascounty.org/Plan/comp_plan/03trans/app-b/fig3-2b.pdf
- SOUTH CENTRAL PINELLAS COUNTY
http://www.pinellascounty.org/Plan/comp_plan/03trans/app-b/fig3-2c.pdf
- SOUTH PINELLAS COUNTY
http://www.pinellascounty.org/Plan/comp_plan/03trans/app-b/fig3-2d.pdf

All county technical specifications apply including Pinellas County Office of Engineering & Technical Support Standard Technical Specifications for Roadway and Related Construction (latest edition), Pinellas County Standard Technical Specifications for Utilities and Related Construction (latest edition), Pinellas County Standard Details (latest edition) and the Florida Department of Transportation Standard Specifications for Road and Bridge Construction (latest edition):

The **Order of Precedence** for Pinellas County Office of Engineering and Technical Support requirements shall be as follows:

(1) Pinellas County Roadway Standard Technical Specifications – latest edition.

(2) Pinellas County Standard Technical Specifications for Utilities and Related Construction – latest edition.

(3) Pinellas County Standard Details – latest edition.

(4) FDOT Standard Specification for Road and Bridge Construction, Divisions II and III – latest edition (FDOT Specifications).

ARTICLE SP-3 SUPPLEMENTAL TECHNICAL SPECIFICATIONS

Note: The Supplemental Technical Specifications presented herein are project specific and are only related to this project and are not part of PCU's Standard Technical Specifications. All STS will be designated as such in lower right hand corner of document by DEI-STS. All Supplemental Technical Specifications will have a **(S)** designation following the section title in the Table of Contents and each specification will be designated in lower right hand corner as PC-001272B, where 001272B designates the specific Project Job Number.

01 20 01 MEASUREMENT AND PAYMENT

ARTICLE SP-4 MODIFICATIONS TO THE STANDARD TECHNICAL SPECIFICATIONS

01 32 33 COLOR AUDIO-VIDEO CONSTRUCTION RECORDS - 1.01 DESCRIPTION:

Remove paragraphs C, D and E.

01 35 00 SPECIAL PROJECT PROCEDURES – 1.02 REPAIRS – A. WORK SCHEDULE AND EMERGENCY RESPONSE TIME

Replace Paragraph 1.02.A.2 and 1.02.A.3

2. The first priority of the County and the Contractor shall be to stabilize conditions in need of emergency response so that the health and safety of the citizens of Pinellas are protected and Pinellas County's property, facilities and employees are protected.

Upon identifying the need for work to be performed which may require initial excavation under this contract, the Engineer, or his designee, will meet with the Contractor to review the scope of work. Following this initial meeting, the Engineer or his designee will provide the Contractor with a scope of work.

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3. The Contractor shall prepare a detailed cost estimate using the prices included in Section E, Bid Submittal. This cost estimate shall include the Contractor-developed and detailed statement of work showing the quantities of line items, required MOT and shop drawings/sketches for the project where appropriate. The Contractor shall ensure that its proposal is complete using the applicable specifications and standards included herein. As part of the price proposal, the Contractor shall also develop a schedule for completion of the work, based on the nature of the emergency response condition. The cost estimate and schedule for completion shall be provided within 24 hours of the initial notification of emergency response.

01 57 00 CONTROL OF WORK – 1.01 SCOPE OF WORK add paragraph:

I - No blasting shall be done except upon written approval by the Owner and any other governmental agency or political subdivision having jurisdiction.

01 78 39 PROJECT RECORD DOCUMENTS

Section - 1.05 SPECIAL REQUIREMENTS FOR WATER MAINS, RECLAIMED MAINS AND FORCE MAINS

add paragraphs:

E. As-Built record drawings for small diameter pipe installed by horizontal directional drilling shall reflect the bore locations (entry and exit) that shall be coordinated with the guidance system logs as required per specification 33 05 21.

F. As-Built record drawings for large diameter pipe installed by horizontal directional drilling shall reflect all information such as entry and exit points, drill entrance and exit angles, x, y and z coordinates based on North American Vertical Datum of 1988 (**NAVD 88**) and North American Datum of 1983, 1990 Adjustment (**NAD 83/90**), etc., and as required per specification 33 05 22.

Section - 1.08 SUBMITTAL

Replace paragraph B with:

B. As-Built Drawings: Contractor shall provide one set of As-Built drawings in clean, undamaged condition. As-built drawings shall be submitted as follows:

1. For sewer gravity main or force main installations less than 500 linear feet in length (including force main offsets), a contractor provided sketch shall be provided. Mark each drawing with a red erasable pencil, showing the as-built condition fully and accurately. Provide information as required under Paragraph 1.05 and any other information that is recognized to be of importance, but was for some reason not shown on the Work Order Drawings (if provided). Give particular attention to concealed work that would be difficult to measure and record at a later date. Organize record drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates, and other identification on the cover of each set.

2. For sewer gravity main or force main installations 500 linear feet or greater, as-built survey shall be provided by a Professional Surveyor licensed in the State of Florida. Provide information as required under Paragraph 1.05 and any other information that is recognized to be of importance, but was for some reason not shown on the Work Order Drawings (if provided). Give particular attention to concealed work that would be difficult to measure and record at a later date. Organize record drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates, and other identification on the cover of each set.

33 01 33 MANHOLE REHABILITATION

PART 2 – PRODUCTS – ADD THE FOLLOWING PARAGRAPH

2.09 – MATERIALS

A. All materials used in the Pinellas County Utilities System shall be as specified in the latest version of the Pinellas County Utilities Material Specification Manual at the time of Bid Award.

33 05 22 HORIZONTAL DIRECTIONAL DRILLING SUBAQEOUS CROSSINGS AND LARGE DIAMTER INSTALLATIONS

PART 3 – EXECUTION

3.02 PERSONNEL QUALIFICATIONS

Replace Paragraph C with:

C. The Contractor superintendent and drilling operators shall have demonstrated successful experience installing pipelines using HDD process on projects with similar diameters, installation lengths and groundwater conditions.

TECHNICAL SPECIFICATION CHECKLIST

Project Name: Sanitary Sewer Repair, Rehabilitation & Extensions
Project Number: 001272B

The following sections of the Standard Technical Specifications will apply to this contract if marked “X” as shown below:

00 75 00	X	Special Provisions - **S**
01 20 01	X	Measurement and Payment - **S**
01 32 33	X	Color Audio-Video Construction Records
01 35 00	X	Special Project Procedures
01 42 01	X	Reference Standards and Definitions
01 45 17	X	Pipeline Testing Requirements
01 55 26	X	Traffic Regulation
01 57 00	X	Control of Work
01 57 13	X	Erosion and Sedimentation Control
01 58 01	☐	Project Identification Signs
01 78 39	X	Project Record Documents
03 10 01	X	Concrete Materials
09 91 00	X	Painting and Protective Coatings
31 23 33	X	Excavation and Backfill for Pipes
31 23 34	X	Excavation and Backfill for Structures
32 12 01	X	Stabilized and Asphalt Roadway Restoration
32 13 01	X	Concrete Sidewalks, Driveways and Gutters
32 92 01	X	Seeding and Sodding
33 01 31	☐	Sanitary Sewer Cured in Place Pipelining
33 01 32	X	Sanitary Sewer Cleaning and Televising
33 01 33	X	Manhole Rehabilitation
33 01 34	X	Sanitary Sewer Pipe Repairs
33 01 35	☐	Multi-Component Stress Panel Liner System
33 05 20	☐	Jacking and Boring
33 05 21	X	Horizontal Directional Drilling
33 05 22	X	Horizontal Directional Drilling – Subaqueous Crossings and Large Diameter Installations
33 11 01	☐	Potable Water Main Piping and Appurtenances
33 13 01	☐	Disinfection of Potable Water Mains
33 32 00	☐	Submersible Wastewater Pumping Stations
33 33 01	X	Gravity Sewers
33 34 00	X	Sanitary Sewage Force Mains and Appurtenances
33 35 01	☐	Reclaimed Water Main Piping and Appurtenances
33 39 00	X	Sanitary Utility Sewerage Structures
40 95 01	☐	Wastewater Pump Station SCADA Remote Telemetry Unit (RTU)
48 11 30	☐	Standby Diesel Generators
13 34 19	☐	Metal Building Systems

END OF SECTION

SECTION 01 20 01

MEASUREMENT AND PAYMENT

PART 1 – GENERAL

1.01 SCOPE OF WORK

A. Separate payment will be made only for the items of work described herein and listed on the Bid Form. Any related work not specifically listed, but required for satisfactory completion of the work, shall be considered included in the scope of the appropriate listed work items. The Contractor shall be responsible for supervision and superintendence at all work sites, which shall be considered as contractor overhead and no additional payment will be made beyond the specified bid items.

B. The descriptions in the following sections generally define the work and materials, etc. associated with each Pay Item listed. This information is provided to assist the Contractor in assigning and accounting for costs associated with each pay item. It is the Contractor's sole responsibility to fully establish the cost for each item and the work in its entirety related to each Pay Item.

C. Payment for all work done in compliance with the Contract Documents, inclusive of furnishing all manpower, equipment, materials, Project Record Documents, and performance of all operations relative to construction of this project, will be made under Pay Items listed herein and in accordance with the accepted Proposal. Work for which there is not a Pay Item will be considered incidental to the Contract and no additional compensation will be allowed. Unless, such Item was previously approved by the Engineer, such incidental item will be paid under the terms and conditions of Unspecified Work.

1.02 BID ITEMS

The bid item descriptions, method of measurement and basis for payment are listed on the following pages:

GROUP A - MOBILIZATION

MOBILIZATION FOR ROUTINE RESPONSE

Pay Items:

101-0100-0001 Mobilization for Routine Response

Description - The work specified in this item consists of the preparatory work and operations in mobilizing for beginning work on the project This item includes, but is not limited to, those operations necessary for the movement of personnel, equipment, supplies and incidentals to and from the project site as a single occurrence per work site, and for the establishment of Subcontractor's temporary offices, buildings, safety equipment, first aid supplies, sanitary and other facilities, as required by these Specifications, special provisions, and State and local laws and regulations. The costs of bonds, permits and any required insurance, and any other preconstruction expense necessary for the start of the work, excluding the cost of construction materials, shall also be included in this item. Labor and equipment travel time from/to the site is included in this pay item.

Maintenance of Traffic for two lane roadways (as specified per FDOT Index 601, 602, 603, 604, 605, and 606) is included with this pay item unless otherwise determined by the Engineer; it shall in all cases include providing the maintenance of traffic plan.

For routine work, as identified by the Engineer or his designee, the Contractor will be required to respond to the request of the Engineer, or designated representative within ten (10) calendar days of notification. The Scope of Work will be developed by Project manager and will be executed in accordance with the terms and conditions of this contract.

For routine work required outside the normal working hours established in the contract, additional labor costs associated with overtime work will be paid for under Unspecified Line Item at the rates in Table-B, Column 4 included with this specification.

Measurement - The quantity of mobilization to be paid for under this item shall be measured as one unit each (EA) per job assignment. One (1) mobilization will be allowed for each job assignment, project, or work order no matter how many times the equipment must be relocated by loading, transporting and unloading, or under its own power to complete the job assignment or project.

MOBILIZATION FOR EMERGENCY RESPONSE

Pay Items:

101-0100-0002 Mobilization for Emergency Response

Description - The work specified in this item consists of the preparatory work and operations in mobilizing for beginning work on the project This item includes, but is not limited to, those operations necessary for the movement of personnel, equipment, supplies and incidentals to the project site, and for the establishment of Subcontractor's temporary offices, buildings, safety equipment, first aid supplies, sanitary and other facilities, as required by these Specifications, special provisions, and State and local laws and regulations. The costs of bonds, permits and any required insurance, and any other preconstruction expense necessary for the start of the work, excluding the cost of construction materials, shall also be included in this item. Labor and equipment travel time from/to the site is included in this pay item.

Maintenance of Traffic for two lane roadways (as specified per FDOT Index 601, 602, 603, 604, 605, and 606) is included with this pay item unless otherwise determined by the Engineer; it shall in all cases include providing the maintenance of traffic plan.

For emergency work, as identified by the Engineer or his designee, the Contractor will be required to respond to the request of the Engineer or his designated representative within one (1) hour from the notice by telephone, and mobilize with a competent crew and necessary equipment and materials within two (2) hours of verbal notification, including weekends. The Scope of Work will be executed in accordance with the terms and conditions of this contract.

For emergency work required outside the normal working hours established in the contract, additional labor costs associated with overtime work will be paid for under Unspecified Line Item at the rates in Table-B, Column 4 included with this specification.

Measurement - The quantity of mobilization to be paid for under this item shall be measured as one unit each (EA) per job assignment. One (1) mobilization will be allowed for each job assignment, project, or work order no matter how many times the equipment must be relocated by loading, transporting and unloading, or under its own power to complete the job assignment or project.

GROUP B – NEW SEWER INSTALLATION

PROJECT AS-BUILT SURVEY

Pay Items:

005-0900 As-Built Survey

Description: Reference Pinellas County Standard Technical Specifications for Utilities and Related Construction – latest edition (Spec. 01 78 39).

Measurement: The quantity to be paid for under this pay item shall per as-built survey completed by a professional surveyor based on the linear foot of sewer main installed.

REMOVE UNSUITABLE MATERIAL BELOW TRENCH GRADE

Pay Items:

120-0020 Excavation, Unsuitable Material

Description: The work specified in this item describes the removal of soil unsuitable for a proper foundation, encountered at trench grade. The unsuitable soil shall be removed and disposed of the full width of the trench and to the depth required by the Engineer and replaced with approved bedding material. The backfill shall be thoroughly compacted and shaped to form the pipe bed.

Measurement: The quantity to be paid for under this Item shall be the volume in cubic yards (CY), computed by the average end area method, of the unsuitable material removed within the limits of depth shown on the Plans or as directed by the Engineer or his representative.

SELECT BEDDING AND BACKFILL MATERIAL

Pay Items:

125-3001 Select bed & backfill material- gravel

Description: Reference Pinellas County Standard Technical Specifications for Roadway and Related Construction – latest edition (Spec 123-3000).

Measurement: The quantities to be paid for under this item shall be the number of cubic yards (CY) measured, compacted in place and accepted. Payment for furnishing, placing and compaction of all extra bedding ordered in writing by the Engineer, shall be on a cubic yard (CY) basis as measured in place.

SHEETING AND BRACING

Pay Items:

800-2100	Sheeting and Bracing (Left in Place)
800-2111	Sheeting and Bracing, Pipe Trenches (Removed)

Description: Reference Pinellas County Standard Technical Specifications for Roadway and Related Construction – latest edition (Spec 121).

Measurement: Reference Pinellas County Standard Technical Specifications for Roadway and Related Construction – latest edition (Spec 121).

WELL POINT DEWATERING INITIAL

Pay Items:

SS-312333-309-0608	Well Point Dewatering-Initial - 6' - 8' Depth
SS-312333-309-0810	Well Point Dewatering-Initial - 8' - 10' Depth
SS-312333-309-1012	Well Point Dewatering-Initial - 10' - 12' Depth
SS-312333-309-1214	Well Point Dewatering-Initial - 12' - 14' Depth
SS-312333-309-1416	Well Point Dewatering-Initial - 14' - 16' Depth
SS-312333-309-1699	Well Point Dewatering-Initial > 16' Depth

Description: Measurement and payment of this pay item is based on the mobilization and set up of dewatering equipment as required by the Contractor and allowed or directed by the Engineer to perform contracted work in accordance with the Technical Specifications. The work shall include all labor, equipment and materials, testing, and any required incidentals necessary to completely install, monitor and operate the dewatering system including the placement of up to twenty (20) well points to the various depths listed in the proposal per job assignment. The dewatering system shall stabilize the excavation and remain in operation until backfilling operations are complete. This pay item shall include the maintenance, repairs, pumps, fueling, oiling greasing, and other operational support procedures and supplies required for the operation of the system.

Well point dewatering is an authorized pay item only when the installation is below 6 feet in depth and site conditions warrant or on emergency response work where site conditions warrant as directed by the County representative.

Measurement: The quantities to be paid for under this item shall be based on the depth of each (EA) dewatering system per job assignment, installed and accepted.

WELL POINT DEWATERING – ADDITIONAL

Pay Items:

SS-312333-309-90608	Well Point Dewatering-Add'l - 6' - 8' Depth
SS-312333-309-90810	Well Point Dewatering-Add'l - 8' - 10' Depth
SS-312333-309-91012	Well Point Dewatering-Add'l - 10' - 12' Depth
SS-312333-309-91214	Well Point Dewatering-Add'l - 12' - 14' Depth
SS-312333-309-91416	Well Point Dewatering-Add'l - 14' - 16' Depth
SS-312333-309-91699	Well Point Dewatering-Add'l > 16' Depth

Description: This item provides all labor, materials and equipment for the placement and operation of additional well points over and above the twenty (20) well points paid for under Well Point Dewatering- Initial pay item. The work includes connection of the well points to the dewatering pumping equipment.

Measurement: The quantity to be paid under this item will be the actual number of each (EA) well points placed and operated in the work as directed by the County representative for the various depths listed in the proposal less the twenty (20) paid for under Well Point Dewatering- Initial pay item.

JACK AND BORE

Pay Items:

SS-330520-201-1206	Jack and Bore 12” x .188” Steel Casing (6” Sewer)
SS-330520-201-1608	Jack and Bore 16” x .219” Steel Casing (8” Sewer)
SS-330520-201-2010	Jack and Bore 20” x .250” Steel Casing (10” Sewer)
SS-330520-201-2412	Jack and Bore 24” x .281” Steel Casing (12” Sewer)

Description: The work consists of furnishing all labor, equipment and materials and installing the crossing listed on the Bid Form by the jack and bore method in accordance with the specifications. The unit price shall include all costs necessary

to install the crossing at the specified depth and size, including survey layout (based upon property monuments established by others), protection of property, materials, dewatering, pavement cutting, launching and receiving pits, exploratory pits, restrained joints, carrier pipe, tracer wire, tracer wire testing, casing pipe, casing spacers, casing end seals, fitting material including joints and jointing material, bracing, utility crossings, barricades, clearing, grubbing and stripping of the right-of-way, trenching, bedding and backfilling, protection of existing utilities; pigging, flushing and cleaning, pressure testing and As-built documentation. Surface restoration if specified or directed, will be paid for under other Pay Items.

Measurement: The quantity for furnishing and installing the pipe or casing shall be made on a per linear foot basis as measured horizontally above the centerline of the casing including the length of four (4) feet beyond the edge of pavement or back of the concrete curb from each side of the road or driveway.

DIRECTIONAL DRILL SEWER MAIN

Pay Items:

SS-330521-202-02PE9	2" Directional Drill HDPE DR 9, IPS OD
SS-330521-202-04PE11	4" Directional Drill HDPE DR 11, DIPS OD
SS-330521-202-06PE11	6" Directional Drill HDPE DR 11, DIPS OD
SS-330521-202-08PE11	8" Directional Drill HDPE DR 11, DIPS OD
SS-330521-202-10PE11	10" Directional Drill HDPE DR 11, DIPS OD
SS-330522-202-12PE11	12" Directional Drill HDPE DR 11, DIPS OD

Description: The work consists of furnishing and installing underground sewer mains using the horizontal directional drilling (HDD) method of installation. This work shall include all services, equipment, materials, labor, installation of two 14 guage minimum tracer wires, tracer wire testing, appurtenances, DI/HDPE mechanical joint adapters, pipe and joint restraints for connections to fittings, materials above or below ground along pipeline alignment; joints and jointing materials, bentonite clay slurry seal, launching and receiving pits, exploratory pits; bracing, bedding and backfill, disposal of spoil; pressure testing; pigging, flushing, cleaning erosion protection and control, surface grading, and all other related and necessary materials for the complete and proper installation, testing, and restoration of underground sewer mains

Measurement: Measurement for payment for furnishing and installing HDD pipe for drill depths up to 20 foot deep shall be made on a per linear foot (LF) basis as measured horizontally on the ground above the pipe centerline through valves and fittings for all pipe. Measurement for payment for finishing and installation HDD pipe

for drill depths greater than 20 foot depth shall be made on a per linear foot (LF) basis of the actual length of pipe installed.

Gravity Sanitary Sewer

Pay Items:

SS-333301-301-06P18-0006	6” PVC Pipe (C-900) DR 18 0’ – 6’ Depth (Gravity Sewer)
SS-333301-301-06P18-0608	6” PVC Pipe (C-900) DR 18 6’ – 8’ Depth (Gravity Sewer)
SS-333301-301-06P18-0810	6” PVC Pipe (C-900) DR 18 8’ – 10’ Depth (Gravity Sewer)
SS-333301-301-06P18-1012	6” PVC Pipe (C-900) DR 18 10’ – 12’ Depth (Gravity Sewer)
SS-333301-301-06P18-1214	6” PVC Pipe (C-900) DR 18 12’ – 14’ Depth (Gravity Sewer)
SS-333301-301-06P18-1416	6” PVC Pipe (C-900) DR 18 14’ – 16’ Depth (Gravity Sewer)
SS-333301-301-06P18-1618	6” PVC Pipe (C-900) DR 18 16’ – 16’ Depth (Gravity Sewer)
SS-333301-301-08D-0006	8” DI Pipe Class 350 0’ – 6’ Depth (Gravity Sewer)
SS-333301-301-08D-0608	8” DI Pipe Class 350 6’ – 8’ Depth (Gravity Sewer)
SS-333301-301-08D-0810	8” DI Pipe Class 350 8’ – 10’ Depth (Gravity Sewer)
SS-333301-301-08D-1012	8” DI Pipe Class 350 10’ – 12’ Depth (Gravity Sewer)
SS-333301-301-08D-1214	8” DI Pipe Class 350 12’ – 14’ Depth (Gravity Sewer)
SS-333301-301-08D-1416	8” DI Pipe Class 350 14’ – 16’ Depth (Gravity Sewer)
SS-333301-301-08D-1618	8” DI Pipe Class 350 16’ – 18’ Depth (Gravity Sewer)
SS-333301-301-08P18-0006	8” PVC Pipe (C-900) DR 18 0’ – 6’ Depth (Gravity Sewer)
SS-333301-301-08P18-0608	8” PVC Pipe (C-900) DR 18 6’ – 8’ Depth (Gravity Sewer)
SS-333301-301-08P18-0810	8” PVC Pipe (C-900) DR 18 8’ – 10’ Depth (Gravity Sewer)
SS-333301-301-08P18-1012	8” PVC Pipe (C-900) DR 18 10’ – 12’ Depth (Gravity Sewer)
SS-333301-301-08P18-1214	8” PVC Pipe (C-900) DR 18 12’ – 14’ Depth (Gravity Sewer)
SS-333301-301-08P18-1416	8” PVC Pipe (C-900) DR 18 14’ – 16’ Depth (Gravity Sewer)

SS-333301-301-08P18-1618	8” PVC Pipe (C-900) DR 18 16’ – 18’ Depth (Gravity Sewer)
SS-333301-301-10D-0006	10” DI Pipe Class 350 0’ – 6’ Depth (Gravity Sewer)
SS-333301-301-10D-0608	10” DI Pipe Class 350 6’ – 8’ Depth (Gravity Sewer)
SS-333301-301-10D-0810	10” DI Pipe Class 350 8’ – 10’ Depth (Gravity Sewer)
SS-333301-301-10D-1012	10” DI Pipe Class 350 10’ – 12’ Depth (Gravity Sewer)
SS-333301-301-10D-1214	10” DI Pipe Class 350 12’ – 14’ Depth (Gravity Sewer)
SS-333301-301-10D-1416	10” DI Pipe Class 350 14’ – 16’ Depth (Gravity Sewer)
SS-333301-301-10D-1618	10” DI Pipe Class 350 16’ – 18’ Depth (Gravity Sewer)
SS-333301-301-10P18-0006	10” PVC Pipe (C-900) DR 18 0’ – 6’ Depth (Gravity Sewer)
SS-333301-301-10P18-0608	10” PVC Pipe (C-900) DR 18 6’ – 8’ Depth (Gravity Sewer)
SS-333301-301-10P18-0810	10” PVC Pipe (C-900) DR 18 8’ – 10’ Depth (Gravity Sewer)
SS-333301-301-10P18-1012	10” PVC Pipe (C-900) DR 18 10’ – 12’ Depth (Gravity Sewer)
SS-333301-301-10P18-1214	10” PVC Pipe (C-900) DR 18 12’ – 14’ Depth (Gravity Sewer)
SS-333301-301-10P18-1416	10” PVC Pipe (C-900) DR 18 14’ – 16’ Depth (Gravity Sewer)
SS-333301-301-10P18-1618	10” PVC Pipe (C-900) DR 18 16’ – 18’ Depth (Gravity Sewer)
SS-333301-301-12D-0006	12” DI Pipe Class 350 0’ – 6’ Depth (Gravity Sewer)
SS-333301-301-12D-0608	12” DI Pipe Class 350 6’ – 8’ Depth (Gravity Sewer)
SS-333301-301-12D-0810	12” DI Pipe Class 350 8’ – 10’ Depth (Gravity Sewer)
SS-333301-301-12D-1012	12” DI Pipe Class 350 10’ – 12’ Depth (Gravity Sewer)
SS-333301-301-12D-1214	12” DI Pipe Class 350 12’ – 14’ Depth (Gravity Sewer)
SS-333301-301-12D-1416	12” DI Pipe Class 350 14’ – 16’ Depth (Gravity Sewer)
SS-333301-301-12D-1618	12” DI Pipe Class 350 16’ – 18’ Depth (Gravity Sewer)
SS-333301-301-12P18-0006	12” PVC Pipe (C-900) DR 18 0’ – 6’ Depth (Gravity Sewer)

SS-333301-301-12P18-0608	12” PVC Pipe (C-900) DR 18 6’ – 8’ Depth (Gravity Sewer)
SS-333301-301-12P18-0810	12” PVC Pipe (C-900) DR 18 8’ – 10’ Depth (Gravity Sewer)
SS-333301-301-12P18-1012	12” PVC Pipe (C-900) DR 18 10’ – 12’ Depth (Gravity Sewer)
SS-333301-301-12P18-1214	12” PVC Pipe (C-900) DR 18 12’ – 14’ Depth (Gravity Sewer)
SS-333301-301-12P18-1416	12” PVC Pipe (C-900) DR 18 14’ – 16’ Depth (Gravity Sewer)
SS-333301-301-12P18-1618	12” PVC Pipe (C-900) DR 18 16’ – 18’ Depth (Gravity Sewer)
SS-333301-301-16D-0006	16” DI Pipe Class 350 0’ – 6’ Depth (Gravity Sewer)
SS-333301-301-16D-0608	16” DI Pipe Class 350 6’ – 8’ Depth (Gravity Sewer)
SS-333301-301-16D-0810	16” DI Pipe Class 350 8’ – 10’ Depth (Gravity Sewer)
SS-333301-301-16D-1012	16” DI Pipe Class 350 10’ – 12’ Depth (Gravity Sewer)
SS-333301-301-16D-1214	16” DI Pipe Class 350 12’ – 14’ Depth (Gravity Sewer)
SS-333301-301-16D-1416	16” DI Pipe Class 350 14’ – 16’ Depth (Gravity Sewer)
SS-333301-301-16D-1618	16” DI Pipe Class 350 16’ – 18’ Depth (Gravity Sewer)
SS-333301-301-16P18-0006	16” PVC Pipe (C-905) DR 18 0’ – 6’ Depth (Gravity Sewer)
SS-333301-301-16P18-0608	16” PVC Pipe (C-905) DR 18 6’ – 8’ Depth (Gravity Sewer)
SS-333301-301-16P18-0810	16” PVC Pipe (C-905) DR 18 8’ – 10’ Depth (Gravity Sewer)
SS-333301-301-16P18-1012	16” PVC Pipe (C-905) DR 18 10’ – 12’ Depth (Gravity Sewer)
SS-333301-301-16P18-1214	16” PVC Pipe (C-905) DR 18 12’ – 14’ Depth (Gravity Sewer)
SS-333301-301-16P18-1416	16” PVC Pipe (C-905) DR 18 14’ – 16’ Depth (Gravity Sewer)
SS-333301-301-16P18-1618	16” PVC Pipe (C-905) DR 18 16’ – 18’ Depth (Gravity Sewer)

Description: The work consists of furnishing all labor, equipment and materials for installing pipe as shown on the plans or directed by the Engineer. All ductile iron pipe shall have polyethylene encasement. The unit price shall include all costs necessary to install the pipe including mobilization, maintenance of traffic, survey layout (based upon property monuments established by others), clearing and grubbing, excavation,

sheeting/shoring for excavation up to 6-ft deep, bracing, dewatering for excavations up to 6-ft deep, structural fill, material, polyethylene wrap on ductile iron pipe, testing, pavement cutting, trenching, utility crossings, barricades, clearing of the right-of-way, protection of property, backfilling, field layout, etc. Restoration will be paid for under separate pay items. Work performed for Point Repairs of gravity sewer pipes will be paid for under separate pay items.

Measurement: The quantities of pipe to be paid for under this item shall be the length in linear feet of pipe measured along the centerline of the pipe through manholes in place, completed, tested, and accepted.

INSTALL SANITARY SEWER PVC CLEANOUT

Pay Items:

SS-333301-301-8000	Install PVC Cleanout

Description: The work consists of furnishing all labor, equipment, and materials for installation of a new PVC riser pipe and cleanout at the ROW line (or other location as directed by the Engineer) on existing sewer lateral. The existing sewer lateral material may be PVC, Vitrified Clay, or DIP pipe. The unit price shall include all costs necessary to install riser pipe and cleanout including mobilization, maintenance of traffic, survey layout (based upon property monuments established by others), material, polyethylene wrap on ductile iron pipe, fittings, pipe cutting, wye unit on main, installation of riser pipe and cleanout, pavement cutting, trenching, dewatering for excavations up to 6-ft deep, sheeting for excavations up to 6-ft deep, bracing, utility crossings, barricades, clearing of the right-of-way, protection of property, backfilling, field layout, restoration, sodding, etc. The pay item shall include cleanout installation up to ten (10) feet in depth.

Measurement: The quantities of pipe to be paid for under this item shall be each measured and inspected in place, completed, and accepted.

Remove Out of Service Gravity Sewer Mains

Pay Items:

SS-333301-301-90204	Remove Out of Service Gravity Pipe 2" or 4"
SS-333301-301-90608	Remove Out of Service Gravity Pipe 6" or 8"
SS-333301-301-91012	Remove Out of Service Gravity Pipe 10" or 12"
SS-333301-301-91618	Remove Out of Service Gravity Pipe 16" or 18"

Description: The work consists of furnishing all labor and equipment to remove and dispose of out of service mains. Unless otherwise indicted by the Engineer or his

representative, the pipe removed becomes the property of the Contractor. The unit price shall include all costs necessary to remove the pipe (including fittings, valves, reverse deadmen, etc) including mobilization, maintenance of traffic, pavement cutting, trenching, replacement of base material, dewatering for excavations up to 6-ft deep, sheeting for excavations up to 6-ft deep, bracing, utility crossings, barricades, clearing of the right-of-way, protection of property, backfilling, restoration of pavement and grass, etc.

Measurement: The quantities of pipe removal to be paid for under this Item shall be the length in linear feet (LF) of pipe measured along the centerline of the pipe through valves and fittings actually removed.

INSTALLATION OR ADJUSTMENT OF SANITARY SEWER SERVICE COLLECTOR

Pay Items:

SS-333301-301-940006	Install or Relocate 4" SS Service Lateral 0'-6' Depth
SS-333301-301-940608	Install or Relocate 4" SS Service Lateral 6'-8' Depth
SS-333301-301-940810	Install or Relocate 4" SS Service Lateral 8'-10' Depth
SS-333301-301-941012	Install or Relocate 4" SS Service Lateral 10'-12' Depth
SS-333301-301-941214	Install or Relocate 4" SS Service Lateral 12'-14' Depth
SS-333301-301-941416	Install or Relocate 4" SS Service Lateral 14'-16' Depth
SS-333301-301-941618	Install or Relocate 4" SS Service Lateral 16'-18' Depth
SS-333301-301-960006	Install or Relocate 6" SS Service Lateral 0'-6' Depth
SS-333301-301-960608	Install or Relocate 6" SS Service Lateral 6'-8' Depth
SS-333301-301-960810	Install or Relocate 6" SS Service Lateral 8'-10' Depth
SS-333301-301-961012	Install or Relocate 6" SS Service Lateral 10'-12' Depth
SS-333301-301-961214	Install or Relocate 6" SS Service Lateral 12'-14' Depth
SS-333301-301-961416	Install or Relocate 6" SS Service Lateral 14'-16' Depth
SS-333301-301-961618	Install or Relocate 6" SS Service Lateral 16'-18' Depth

Description: The work consists of furnishing all labor, equipment, by-pass operations, customer coordination and materials for installation of a new or relocating a sanitary sewer service lateral found to be in conflict with proposed improvement or as directed by the Engineer. The unit price shall include all costs necessary to install up 30 linear feet of service pipe including mobilization, maintenance of traffic, survey layout (based upon property monuments established by others), material, polyethylene wrap on ductile iron pipe, fittings, pipe cutting, wye unit on main, installation of riser pipe and cleanout at the ROW line, pavement cutting, trenching, dewatering for excavations up to 6-ft deep, sheeting for excavations up to 6-ft deep, bracing, utility crossings, barricades, clearing of the right-of-way, protection of property, backfilling, field layout, etc. Service pipe lengths in excess of 30 feet will be paid for as Gravity Sewer Pipe. Restoration will be paid for under separate pay items.

Measurement: The quantities of pipe to be paid for under this item shall be each measured and inspected in place, completed, and accepted.

MANHOLE CONNECTION (INCLUDING CORING)

Pay Items:

SS-333301-307-1002	2” Sewer Line Manhole Connection
SS-333301-307-1004	4” Sewer Line Manhole Connection
SS-333301-307-1006	6” Sewer Line Manhole Connection
SS-333301-307-1008	8” Sewer Line Manhole Connection
SS-333301-307-1010	10” Sewer Line Manhole Connection
SS-333301-307-1012	12” Sewer Line Manhole Connection
SS-333301-307-1016	16” Sewer Line Manhole Connection
SS-333301-307-1018	18” Sewer Line Manhole Connection

Description: The work consists of all labor, equipment, investigative digging, and materials for repair of an existing connection into manhole wall or to install a new connection. All core drills shall be of sufficient diameter to accommodate pipe connection. Manhole connections may be either gravity sewer or sewer forcemain. All connections shall include a water stop or boot connection. Payment shall also include core drills, masonry or concrete patching, fiberglass and interior surface patching, shoring, dewatering for excavations up to 6-ft deep, , backfill, refill, compaction operations, compaction testing or re-testing, and traffic control. All sewer forcemain connections shall include installation of a drop bowl, paid for under MANHOLE INSIDE DROP CONNETION pay item. The work does not include

excavation or surface restoration which, if required, will be paid for, or is part of the work, under other Contract Pay Items.

Measurement: The quantities of connections into manholes to be paid under this item shall be each measured in place, completed, inspected, and accepted.

MANHOLE INSIDE DROP CONNECTION

Pay Items:

SS-333301-307-2002	2” Inside Drop Connection
SS-333301-307-2004	4” Inside Drop Connection
SS-333301-307-2006	6” Inside Drop Connection
SS-333301-307-2008	8” Inside Drop Connection
SS-333301-307-2010	10” Inside Drop Connection
SS-333301-307-2012	12” Inside Drop Connection
SS-333301-307-2016	16” Inside Drop Connection
SS-333301-307-2018	18” Inside Drop Connection

Description: This item provides for all labor, equipment and material to install a PVC drop connection inside an existing manhole. This work includes all interior piping, drop bowl and any masonry or concrete and coatings patching required to complete a repair connection or install a new drop connection to an existing manhole in accordance with Standard Details.

Measurement: The quantity to be measured for payment under this Pay Item will be the actual number each (EA) of manhole inside drop connections completed and accepted.

GROUTING OUT OF SERVICE PIPE

Pay Items:

SS-333400-105-9000	Grouting out of service pipe

Description: This item provides for all labor, equipment and material to install chemical grout or flowable fill into an existing pipe to be abandoned. Prior to grout filling the line, the Contractor shall verify that no live services remain connected to

the line. The underground conduit (pipe, waterline, sewer line, storm drain line, etc.) be completely filled with a low strength cement grout (or flowable fill). In order to achieve this, the grout to be pumped into the line shall have a consistency that will permit forced flow into the entire length of line. Blocking the line by intermediate excavation and gravity flow concrete or grout is NOT acceptable. The existing line to be grout filled shall be exposed and plugged with concrete bulkheads or plugs at both ends. The grout shall be pumped through the pipe until the grout is visible at the other end of the underground conduit. No more than 15 psi shall be used to pump the grout mixture, and care should be used to avoid grout filling adjoining voids.

Measurement: The quantities of pipe to be paid for under this Item shall be the volume in cubic yards of the inside pipe area times the length of pipe. No payment will be made for material that escapes the pipe or ends enclosures.

DISCONNECT AND PLUG SEWER MAIN

Pay Items:

SS-333400-105-90204	Disconnect & Plug 2" or 4" Pipe
SS-333400-105-90406	Disconnect & Plug 6" or 8" Pipe
SS-333400-105-91012	Disconnect & Plug 10" or 12" Pipe

Description: The work consists of furnishing all labor, equipment and materials to disconnect and cap/plug sewer mains that will remain in or out of service. The unit price shall include all nuts, bolts, gaskets, caps/plugs, restraint devices, thrust blocks, cutting existing pipe, removal of valve boxes, blow-off assemblies, scheduling and notification of service interruptions and all other operations required to disconnect and cap/plug the water mains.

Measurement: The quantity of disconnect and cap/plug water mains to be paid for under this item shall be the number each (EA) measured in place, completed and accepted.

INSTALL SANITARY SEWER FORCE MAIN

Pay Items:

SS-333400-304-02P21RJF	2” PVC Restrained Joint Pipe and Fittings Force Main, SDR 21
SS-333400-304-04P	4” PVC Pipe, C-900 DR 18 (Force Main)
SS-333400-304-04PRJ18	4” PVC Restrained Joint Pipe and Fittings, C-900 DR 18 (Force Main)

SS-333400-304-06P	6” PVC Pipe, C-900 DR 18 (Force Main)
SS-333400-304-06PRJ18	6” PVC Restrained Joint Pipe and Fittings, C-900 DR 18 (Force Main)
SS-333400-304-08P	8” PVC Pipe, C-900 DR 18 (Force Main)
SS-333400-304-08PRJ18	8” PVC Restrained Joint Pipe and Fittings, C-900 DR 18 (Force Main)
SS-333400-304-10P	10” PVC Pipe, C-900 DR 18 (Force Main)
SS-333400-304-10PRJ18	10” PVC Restrained Joint Pipe and Fittings, C-900 DR 18 (Force Main)
SS-333400-304-12P	12” PVC Pipe, C-900 DR 18 (Force Main)
SS-333400-304-12PRJ18	12” PVC Restrained Joint Pipe and Fittings, C-900 DR 18 (Force Main)

Description: The work consists of furnishing all labor, equipment and materials and installing sanitary forcemain pipe by the open-cut method in accordance with the specifications.

The unit price shall include all costs necessary to install the pipe up to 6 feet in depth, including: survey layout (based upon property monuments established by others); protection of property; protection of existing utilities, mailboxes and service connections; erosion protection (silt fence, hay bales, floating turbidity barriers, or other means, as required); materials, pavement cutting, extra pipe fitting material including joints/jointing material/restraints; shoring, sheeting for excavations up to 6-ft deep; bracing; utility crossings; barricades; clearing; grubbing and stripping of the right-of-way; trenching, bedding and backfilling; pigging; flushing and cleaning; pressure testing. Fittings shall be included in the cost of 2” pipe. Dual tracer wire and tracer wire testing shall be included in the price for PVC pipe items. Polyethylene encasement shall be included in the bid price for DI pipe items. Restoration will be paid for under separate pay items.

Additional payment will be made for extra depth installation over six feet. Well point dewatering is an authorized pay item only when the installation is below 6 feet in depth and site conditions warrant; all dewatering up to 6 feet in depth is included in this pay item.

Measurement: The quantities of pipe to be paid for under this Item shall be the length in linear feet of pipe measured along the centerline of the pipe in place, completed, tested, and accepted.

RESTRAINED JOINTS

Pay Items:

SS-333400-304-02RJ	2" Restrained Joints
SS-333400-304-04RJ	4" Restrained Joints
SS-333400-304-06RJ	6" Restrained Joints
SS-333400-304-08RJ	8" Restrained Joints
SS-333400-304-10RJ	10" Restrained Joints
SS-333400-304-12RJ	12" Restrained Joints

Description: The work specified in this item describes measurement and payment for furnishing all labor, equipment and materials and installing restrained joint hardware including mechanical joint restrainers, bell restrainers and PVC restrainers complete including bolts, gaskets, rods, special flanges, color coded polyethylene encasement , testing, acceptance, and ready for service. Restrained joints for pipe associated with fittings per the design of new pipe shall be paid for under separate pay item. This item shall only be used to restrain existing in service pipelines or to install additional restraints above the amount specified in Detail PGD GD 11, as directed by the Engineer or his representative.

Measurement: The quantities of retrained joints to be paid for under this item shall be the number of each (EA) measured in place and accepted. No restrained joint hardware or any part of a restrained joint hardware shall be included for payment under more than one Item.

FORCEMAIN OVER DEPTH EXCAVATION

Pay Items:

SS-333400-304-90204	2"-4" Forcemain pipe and appurtenances over depth excavation
SS-333400-304-90608	6"-8" Forcemain pipe and appurtenances over depth excavation
SS-333400-304-91012	10"-12" Forcemain pipe and appurtenances over depth excavation

Description: The work consists of furnishing all labor and equipment to excavate additional depth greater than 6 feet depth for installation of sewer forcemain pipe by the open-cut method in accordance with the specifications. The unit price shall include all costs necessary to excavate additional depth over 6 feet including: survey layout (based upon property monuments established by others); protection of property, existing utilities, mailboxes and service connections; erosion protection (silt fence, hay bales, floating turbidity barriers, or other means, as required); materials;

pavement cutting; bracing; utility crossings; barricades; clearing; grubbing and stripping of the right-of-way; trenching, bedding; and backfilling. Well point dewatering and sheeting are authorized pay items when the installation is below 6 feet in depth and site conditions warrant.

Measurement: Measurement for payment for excavating each additional foot of depth to install pipe or appurtenances shall be made on a per linear foot (LF) basis for each additional vertical foot of depth over 6 feet as measured horizontally above the pipe centerline through valves and fittings.

REMOVE OUT OF SERVICE SEWER FORCE MAINS

Pay Items:

SS-333400-306-90204	Remove Out of Service Pipe 2" or 4"
SS-333400-306-90608	Remove Out of Service Pipe 6" or 8"
SS-333400-306-91012	Remove Out of Service Pipe 10" or 12"

Description: The work consists of furnishing all labor and equipment to remove and dispose of out of service mains. Unless otherwise indicted by the Engineer or his representative, the pipe removed becomes the property of the Contractor. The unit price shall include all costs necessary to remove the pipe (including fittings, valves, reverse deadmen, etc) including mobilization, maintenance of traffic, pavement cutting, trenching, replacement of base material, dewatering for excavations up to 6-ft deep, sheeting for excavations up to 6-ft deep, bracing, utility crossings, barricades, clearing of the right-of-way, protection of property, backfilling, etc. Restoration will be paid for under separate pay items.

Measurement: The quantities of pipe removal to be paid for under this Item shall be the length in **linear feet (LF)** of pipe measured along the centerline of the pipe through valves and fittings actually removed.

SLEEVE CONNECTION

Pay Items:

SS-333400-309-02SC	2" Sleeved Connection
SS-333400-309-04SC	4" Sleeved Connection
SS-333400-309-06SC	6" Sleeved Connection
SS-333400-309-08SC	8" Sleeved Connection
SS-333400-309-10SC	10" Sleeved Connection
SS-333400-309-12SC	12" Sleeved Connection

Description: The work consists of furnishing all labor, equipment and materials for installing sleeve connections not included in other items. The unit price shall include notification of shutdown to property owners, establishing alignment, moving and aligning old and new pipe, cleaning and cutting old pipe, sterilization, restraint jointing materials, color-coded polyethylene encasement, and all other operations required to make the connection. All connections shall include the cost of the sleeve or coupling, joint restraints and removal & disposal of up to twenty feet of existing main. Valves, pipe, additional joint restraints on existing main and fittings for connections shall be paid for under separate pay items.

Measurement: The quantities of sleeve connection to be paid for under this item shall be the number each measured in place, completed, tested, and accepted

REVERSE DEAD-MAN

Pay Items:

SS-333400-309-90204RD	Reverse Deadman for 2" or 4" Pipe
SS-333400-309-90608RD	Reverse Deadman for 6" or 8" Pipe
SS-333400-309-91012RD	Reverse Deadman for 10" or 12" Pipe

Description: The work covered by this item consists of reverse deadman installation for mains up to 12 inch in diameter. The installation shall include the corresponding size restrained joint as shown in the standard detail. This pay item includes: the furnishing of all materials and for the proper installation of the reverse deadman in strict accordance with the appropriate pipe specifications, excavation, erosion protection and control, backfill, dewatering for excavations up to 6-ft deep, sheeting for excavations up to 6-ft deep, shoring, surface grading, disposal of water, appropriate sized joint restraint, and concrete, all tools, equipment, labor, and materials necessary to install the reverse deadman as shown, specified or required for the proper completion of the work. Concrete shall cure for 72 hours or as determined by concrete mix design before applying force. Construction shall conform to Pinellas County Utilities Engineering's Standard Details**.** Deadmen for mains greater than 12" in diameter require independent engineering design and shall be paid for under separate pay item.

Measurement: The quantities of reverse dead-man construction to be paid under this item shall be each measured in place, inspected, cured, and accepted.

DUCTILE IRON FITTINGS

Pay Items:

SS-333400-309-C153 DI Fittings C153 (Compact Body)

Description: The work consists of furnishing all labor, equipment and materials for installing ductile iron fittings not included in other items. All fitting shall include and be installed with joint restraints. The unit price includes furnishing and installing all fittings and materials above or below ground along the pipeline alignment; joints, joint restrainers, and jointing materials; bracing, shoring, and sheeting; dewatering, clearing, grubbing, and stripping; trenching, bedding and backfill; constructing the specified protection and adjusting of existing above ground and underground utilities and service connections; disposal of spoil; color coded polyethylene encasement; pressure testing; erosion protection and control, and all other related and necessary materials, work and equipment required to construct a complete, operable pipeline. The cost of furnishing and installing joint restraints shall be included in the unit price for Ductile Iron Fittings.

Measurement: The quantities of ductile iron fittings to be paid for under this Item shall be the weight of the fitting required as established weight per fitting, including bolts, in **tons** (2,000 pounds) measured in place, completed, tested, and accepted. The weight of gaskets, jointing materials, etc., shall not be included in the computation of ductile iron fitting tonnage. An established table of weights for acceptable fittings is attached in Table A-1.

AIR RELEASE VALVES

Pay Items:

SS-333400-310-02ARIL 2” Air Release Assembly (Inline)
SS-333400-310-02AROS 2” Air Release Assembly (Offset)

Description: The work consists of installing air release assemblies on sanitary sewer force mains. The unit bid price shall include installing the air release assembly, testing, excavation, backfill, bracing, shoring, sheeting for excavations up to 6-ft deep, dewatering for excavations up to 6-ft deep, surface grading, erosion protection and control, furnishing and installing tap saddle, tap, corporation stop, ball corporation, curb stop, automatic air release valve, enclosure, testing, miscellaneous brass nipples and fittings, and incidental items required to install a new assembly as shown on the standard detail. All assemblies shall include tracer wire access, drainage gravel and miscellaneous nipples and fittings as shown in the standard details, filter fabric, valve identification tags, paint reference stripe on curb, painting of valve cover and meter boxes.

Measurement: Measurement shall be on an individual basis for each (EA) assembly installed and accepted.

RESILIENT WEDGE GATE VALVE

Pay Items:

SS-333400-310-02RW	2” RWGV (Resilient Wedge Gate Valve) & Box
SS-333400-310-04RW515	4” RWGV & Box C515
SS-333400-310-06RW515	6” RWGV & Box C515
SS-333400-310-08RW515	8” RWGV & Box C515
SS-333400-310-10RW515	10” RWGV & Box C515
SS-333400-310-12RW515	12” RWGV & Box C515

Description: The work consists of furnishing all labor, equipment and materials for installing a valve not included in other items. The unit bid price includes furnishing and installing valves, valve boxes and covers, color coded polyethylene encasement, tracer wire access, filter fabric, valve identification tags, paint reference stripe on curb, painting of valve cover, concrete valve box pad, extension stems, joint restraints, pressure testing, excavation, backfill, dewatering for excavations up to 6-ft deep, sheeting for excavations up to 6-ft deep, shoring, surface grading and incidental construction associated with these items.

Measurement: The quantities of valves to be paid for under this Item shall be the number **each** measured in place, completed, tested, and accepted.

ADJUSTMENT OF VALVE BOX & COVER

Pay Items:

SS-333400-310-9001	Adjust Valve Box to Finished Grade (In Pavement)
SS-333400-310-9002	Adjust Valve Box to Finished Grade (Outside of Pavement)

Description: The work consists of furnishing all labor, equipment, and materials for the vertical adjustment of an existing valve box and cover to match proposed finish grade. The unit price shall include placement of the valve cover to finish grade as shown on plans or directed by the Engineer.

Measurement: the quantity of valve box and cover adjustments to be paid for under this item shall be the number **each** measured in place, on grade, inspected, and accepted.

LINE STOP

Pay Items:

SS-333400-311-LS04	4" Line Stop
SS-333400-311-LS06	6" Line Stop
SS-333400-311-LS08	8" Line Stop
SS-333400-311-LS10	10" Line Stop
SS-333400-311-LS12	12" Line Stop

Description: The work consists of furnishing all labor, equipment and materials, including but not limited to dewatering for excavations up to 6-ft deep, excavation, sheeting for excavations up to 6-ft deep, shoring, preliminary measurements of the pipe prior to ordering the saddle, installing concrete cradle and support, line stop tapping sleeve, valve, and performing line stop installation with and for the duration of the new valve installation, pressure testing of tap saddle/sleeve, polyethylene wrap, and valve box for constructing a line stop on an existing sewer main and the adjustment of its valve box to finish grade. If a by-pass line stop installation is required, the by-pass piping will be paid for under line items for piping.

Measurement: The quantities of Line Stops to be paid for under this Item shall be the number each measured in place, completed, tested, and accepted.

TAPPING SADDLE/SLEEVE, VALVE, AND BOX

Pay Items:

SS-333400-311-TV0402	4" x 2" Tapping Saddle Valve & Box
SS-333400-311-TV0404	4" x 4" Tapping Sleeve Valve & Box
SS-333400-311-TV0602	6" x 2" Tapping Saddle Valve & Box
SS-333400-311-TV0604	6" x 4" Tapping Sleeve Valve & Box
SS-333400-311-TV0606	6" x 6" Tapping Sleeve Valve & Box
SS-333400-311-TV0802	8" x 2" Tapping Saddle Valve & Box
SS-333400-311-TV0804	8" x 4" Tapping Sleeve Valve & Box
SS-333400-311-TV0806	8" x 6" Tapping Sleeve Valve & Box
SS-333400-311-TV0808	8" x 8" Tapping Sleeve Valve & Box
SS-333400-311-TV1002	10" x 2" Tapping Saddle Valve & Box
SS-333400-311-TV1004	10" x 4" Tapping Sleeve Valve & Box
SS-333400-311-TV1006	10" x 6" Tapping Sleeve Valve & Box
SS-333400-311-TV1008	10" x 8" Tapping Sleeve Valve & Box
SS-333400-311-TV1010	10" x 10" Tapping Sleeve Valve & Box
SS-333400-311-TV1202	12" x 2" Tapping Saddle Valve & Box

SS-333400-311-TV1204	12" x 4" Tapping Sleeve Valve & Box
SS-333400-311-TV1206	12" x 6" Tapping Sleeve Valve & Box
SS-333400-311-TV1208	12" x 8" Tapping Sleeve Valve & Box
SS-333400-311-TV1210	12" x 10" Tapping Sleeve Valve & Box
SS-333400-311-TV1212	12" x 12" Tapping Sleeve Valve & Box

Description: The work consists of the installation of tapping saddle or sleeve and associated valves. The quantity to be paid for under this item is the number of connections acceptably installed. Cut in tee and valve may be required in some locations due to utility conflicts and will be paid for as equal sized tap. The unit bid price includes all materials and installation from the point of connection to the main line including scheduling and notification of service interruptions, furnishing and installing tapping saddle, color coded polyethylene encasement, valves, taps, fittings, piping, joint restraints, valve boxes and covers, concrete valve box pads, valve extension stems, tracer wire access, valve identification tags, filter fabric, paint reference stripe on curb, painting of valve box cover, excavation, erosion protection and control, backfill, dewatering for excavations up to 6-ft deep, sheeting for excavations up to 6-ft deep, shoring, surface grading, disposal of water, pressure testing and all other related, necessary, and incidental materials, work and equipment required to complete the connection. All joints shall be restrained.

Measurement: The quantities of valves/taps to be paid for under this Item shall be the number **each** measured in place, completed, tested, and accepted.

MANHOLE

Pay Items:

SS-333900-302-4001	4’ dia. - Precast Manhole Standard
SS-333900-302-4002	4’ dia. - Precast Manhole Inside Drop
SS-333900-302-4003	4’ dia. - Precast Manhole Outside Drop
SS-333900-302-5001	5’ dia. - Precast Manhole Standard
SS-333900-302-5002	5’ dia. - Precast Manhole Inside Drop
SS-333900-302-5003	5’ dia. - Precast Manhole Outside Drop
SS-333900-302-5005	5’ dia. - Precast Air Release Manhole
SS-333900-302-6001	6’ dia. - Precast Manhole Standard
SS-333900-302-6002	6’ dia. - Precast Manhole Inside Drop
SS-333900-302-6003	6’ dia. - Precast Manhole Outside Drop

Description: The work consists of furnishing all labor, equipment, by-pass operations, customer coordination and materials for constructing a sanitary sewer manhole at location shown on plans or as directed by the Engineer. The unit price shall include all costs necessary to construct the manhole including survey layout (based upon property monuments established by others), material, pavement cutting, trenching, replacement of

base material, dewatering for excavations up to 6-ft deep, sheeting for excavations up to 6-ft deep, bracing, utility crossings, barricades, clearing of the right-of-way, protection of property, and backfilling. The depth of the manhole will be measured from the top of the cover down to the invert of the outlet sewer pipe. Excavation and well point dewatering for pipeline Manhole installations are separate pay items.

Measurement: The quantities of manholes to be paid under this item shall be vertical feet of depth measured in place, completed, inspected, and accepted.

ITEM NO. SS-333900-302-9001 Remove Existing Manhole - Initial

Pay Items:

SS-333900-302-9001 Removal of Existing Manhole – Initial

Description: This work item shall provide all labor, equipment and materials for the removal of existing manholes up to four feet in depth and plugging of existing lines with brick and mortar. The work does not include excavation, surface restoration, sheeting, MOT, or well point dewatering which, if required, will be paid for under other Pay Items.

Measurement: The quantity to be measured for payment under this Pay Item will be the actual number of manholes removals completed and accepted up to four (4) feet in depth.

ITEM NO. SS-333900-302-9002 Remove Existing Manhole – Additional

Pay Items:

SS-333900-302-9002 Remove Existing Manhole – Additional

Description: The work consists of all work contained in Pay Item Remove Existing Manholes and provides for manhole removal for depths greater than four (4') feet deep.

Measurement: The quantity to be measured for payment under this Pay Item will be the actual length in vertical feet of additional manhole removal in the work less the four (4) feet paid for under other Pay Items

GROUP C – SEWER REPAIRS AND OFFSETS

UTILITY INITIAL EXCAVATION

Pay Items:

SS-312333-303-0006	Initial Excavation, 0' - 6' Depth
SS-312333-303-0608	Initial Excavation, 6' - 8' Depth
SS-312333-303-0810	Initial Excavation, 8' - 10' Depth
SS-312333-303-1012	Initial Excavation, 10' - 12' Depth
SS-312333-303-1214	Initial Excavation, 12' - 14' Depth
SS-312333-303-1416	Initial Excavation, 14' - 16' Depth
SS-312333-303-1618	Initial Excavation, 16' - 18' Depth
SS-312333-303-1820	Initial Excavation, 18' - 20' Depth

Description: The work consists of furnishing all labor, equipment, materials, traffic control and supervision necessary for the excavation exposing up to 30 linear feet of existing sanitary sewer gravity or forcemain pipe as measured along the pipe in a horizontal plane. The unit price shall contain all costs necessary to expose the pipe, temporary sheeting/shoring/bracing up to 6-ft deep, dewatering, well point dewatering up to 6' deep, crushed stone, stabilization and protection of existing utilities, barricades and necessary traffic control, property protection, backfilling, compaction, and all other related and necessary materials required to expose the pipe to be repaired in accordance with the Contract Documents. There shall be one Initial Excavation per work site unless otherwise approved by the Engineer. The following items, if required or as determined by the Engineer, will be paid for under other Contract Pay Items: pipeline point repair, pipeline offset relocation, select backfill material, well point dewatering, by-pass pumping, surface restoration, sheeting for excavations greater than 6-ft deep, and pavement restoration.

Measurement: The quantity to be paid for under this item shall be the actual number of each (EA) per job assignment for initial excavation made in conjunction with exploration or pipe repair at the various cut ranges listed. The cut for Initial Excavation shall be the average of the pipe cut (grade elevation minus the pipe invert elevation) measured at each end of the trench, which measures 30 feet in length or less in conjunction of pipeline point repair or relocation offset.

ADDITIONAL EXCAVATION

Pay Items:

SS-312333-303-90006	Additional Excavation, 0' - 6' Depth
SS-312333-303-90608	Additional Excavation, 6' - 8' Depth

SS-312333-303-90810	Additional Excavation, 8' - 10' Depth
SS-312333-303-91012	Additional Excavation, 10' - 12' Depth
SS-312333-303-91214	Additional Excavation, 12' - 14' Depth
SS-312333-303-91416	Additional Excavation, 14' - 16' Depth
SS-312333-303-91618	Additional Excavation, 16' - 18' Depth
SS-312333-303-91820	Additional Excavation, 18' - 20' Depth

Description: The work consists of furnishing all labor, equipment, materials, traffic control and supervision necessary for the excavation to expose existing pipe as measured in the horizontal plane in excess of the original 30 linear feet included in Initial Excavation pay item. This Pay Item is applicable only in conjunction with, and includes the same work as listed in UTILITY INITIAL EXCAVATION pay item.

Measurement: Measurement of payment shall be the actual number of linear feet (LF) per job assignment for additional excavations made in conjunction with exploration of pipeline point repair or relocation offset.

BY-PASS PUMPING SET UP AND OPERATION

Pay Items:

SS-330134-307-B1-0810	8” – 10” Wastewater Flow Through Bypass Pumping
SS-330134-307-B1-1214	12” – 14” Wastewater Flow Through Bypass Pumping
SS-330134-307-B1-1521	15” – 21” Wastewater Flow Through Bypass Pumping
SS-330134-307-B1-2430	24” – 30” Wastewater Flow Through Bypass Pumping
SS-330134-307-B1-3642	36” – 42” Wastewater Flow Through Bypass Pumping
SS-330134-307-B2-0810	8” – 10” Wastewater Bypass Pumping Set up and Operation
SS-330134-307-B2-1214	12” – 14” Wastewater Bypass Pumping Set up and Operation
SS-330134-307-B2-1521	15” – 21” Wastewater Bypass Pumping Set up and Operation
SS-330134-307-B2-2430	24” – 30” Wastewater Bypass Pumping Set up and Operation
SS-330134-307-B2-3642	36” – 42” Wastewater Bypass Pumping Set up and Operation

Description: This item provides for mobilization, set up and operation of by-pass

sewage pumping equipment and temporary piping as required and as described in the Standard Technical Specifications. This Pay Item is applicable on projects or repairs that have high flow or require an over night by pass operation.

Measurement: The quantity to be measured for payment under this Pay Item will be the actual number of by-pass pumping set ups and operations, per part of day, required by the Engineer in the work. The minimum measurement for this pay item is eight (8) hours or 0.333 days and is measured from the time that the sewage is actually by-passed. This eight (8) hour minimum (0.333 days) includes full compensation for set up and operation for up to the first eight (8) hour period. Additional time will be in tenths of the day or twenty-four (24) hour period. The quantities determined shall be paid per day (DAY) or portion of day of by-pass pumping set up and operation.

SANITARY SEWER GRAVITY PIPE POINT REPAIR

Pay Items:

SS-333301-500-006D	6" Dia. Gravity Sewer Point Repair (DI Replacement Pipe)
SS-333301-500-006P	6" Dia. Gravity Sewer Point Repair (PVC Replacement Pipe)
SS-333301-500-008D	8" Dia. Gravity Sewer Point Repair (DI Replacement Pipe)
SS-333301-500-008P	8" Dia. Gravity Sewer Point Repair (PVC Replacement Pipe)
SS-333301-500-010D	10" Dia. Gravity Sewer Point Repair (DI Replacement Pipe)
SS-333301-500-010P	10" Dia. Gravity Sewer Point Repair (PVC Replacement Pipe)
SS-333301-500-012D	12" Dia. Gravity Sewer Point Repair (DI Replacement Pipe)
SS-333301-500-012P	12" Dia. Gravity Sewer Point Repair (PVC Replacement Pipe)
SS-333301-500-016D	16" Dia. Gravity Sewer Point Repair (DI Replacement Pipe)
SS-333301-500-016P	16" Dia. Gravity Sewer Point Repair (PVC Replacement Pipe)
SS-333301-500-018D	18" Dia. Gravity Sewer Point Repair (DI Replacement Pipe)
SS-333301-500-018P	18" Dia. Gravity Sewer Point Repair (PVC Replacement Pipe)

Description: This item provides all labor, equipment and materials for the replacement of up to twenty (20) linear feet of gravity sewer pipe with PVC or Ductile Iron pipe (Material as directed by the Engineer at each occurrence). The existing sewer pipe may be Vitrified Clay, PVC Ductile Iron, Cast Iron, or Concrete gravity sewer main. The work includes repair sleeves, cutting existing pipe, pipe bedding, new replacement pipe, disposal of existing pipe, and reconnection of lateral connections to sewer main. This item also includes maintaining of flow in low flow systems that can be accomplished with up to a four (4) inch mud hog, diaphram or centrifugal type pump and lay flat hose or temporarily blocking the sewer for a period of time to facilitate the repair. The cost of lengths of pipe greater than twenty (20) linear feet will be paid for under pay item SANITARY SEWER GRAVITY PIPE POINT REPAIR - ADDITIONAL LENGTH. The work does not include excavation, sheeting or well point dewatering which, if required, will be paid for, or is part of the work, under other Contract Pay Items.

Measurement: The quantity to be paid under this item will be in accordance with each (EA) pipe size to be repaired as noted in the contract pay items.

SANITARY SEWER GRAVITY PIPE POINT REPAIR – ADDITIONAL LENGTH

Pay Items:

SS-333301-501-006D	6" Dia. Gravity Sewer Point Repair - Additional (DI Replacement Pipe)
SS-333301-501-006P	6" Dia. Gravity Sewer Point Repair - Additional (PVC Replacement Pipe)
SS-333301-501-008D	8" Dia. Gravity Sewer Point Repair - Additional (DI Replacement Pipe)
SS-333301-501-008P	8" Dia. Gravity Sewer Point Repair - Additional (PVC Replacement Pipe)
SS-333301-501-010D	10" Dia. Gravity Sewer Point Repair - Additional (DI Replacement Pipe)
SS-333301-501-010P	10" Dia. Gravity Sewer Point Repair – Additional (PVC Replacement Pipe)
SS-333301-501-012D	12" Dia. Gravity Sewer Point Repair – Additional (DI Replacement Pipe)
SS-333301-501-012P	12" Dia. Gravity Sewer Point Repair - Additional (PVC Replacement Pipe)
SS-333301-501-016D	16" Dia. Gravity Sewer Point Repair - Additional (DI Replacement Pipe)
SS-333301-501-016P	16" Dia. Gravity Sewer Point Repair - Additional (PVC Replacement Pipe)
SS-333301-501-018D	18" Dia. Gravity Sewer Point Repair - Additional

	(DI Replacement Pipe)
SS-333301-501-018P	18" Dia. Gravity Sewer Point Repair - Additional (PVC Replacement Pipe)

Description: This item provides all labor, equipment and materials for the additional length of replacement gravity sewer pipe with PVC or Ductile Iron pipe (Material as directed by the Engineer at each occurrence). This Pay Item provides for an additional thirty (30) feet of replacement pipe. This Pay Item is used only in conjunction with pay item SANITARY SEWER GRAVITY PIPE POINT REPAIR and contains the same work therein described. Pipe point repairs requiring greater than fifty (50) feet of pipe will be constructed under separate Contract Pay Items.

Measurement: The quantity to be paid under this item will be in accordance with the linear feet (LF) installed above twenty (20) linear for each pipe size to be repaired as noted in the contract pay items.

SEWER FORCE MAIN PIPE POINT REPAIRS

Pay Items:

SS-333400-500-0002	2" Dia. Force Main Point Repair
SS-333400-500-0004	4" Dia. Force Main Point Repair
SS-333400-500-0006	6" Dia. Force Main Point Repair
SS-333400-500-0008	8" Dia. Force Main Point Repair
SS-333400-500-0010	10" Dia. Force Main Point Repair
SS-333400-500-0012	12" Dia. Force Main Point Repair

Description: This item provides all labor, equipment and materials for the replacement of up to ten (10) linear feet of pipe and may be used for routine response and emergency repairs at the discretion of the Engineer or his representative. The pipe being repaired may be PVC, HDPE, Ductile Iron, or Cast Iron. All ductile iron pipe shall have polyethylene encasement. The work includes furnishing and installing two full seal clamps, bell joint seal clamps or two solid sleeves, cutting existing pipe, pipe bedding, dewatering for excavations up to 6-ft deep, sheeting for excavations up to 6-ft deep, and disposal of existing pipe. Additional pipe materials over ten (10) linear feet in length will be paid for under pipe pay item for INTALL SANITARY SEWER FORCE MAIN PIPE. Excavations and well point dewatering for pipeline point repairs are separate pay items.

Measurement: The quantity to be paid under this item will be in accordance with each (EA) pipe size to be repaired as noted in the contract pay items.

SEWER FORCE MAIN PIPE OFFSET

Pay Items:

SS-333400-501-0002	2" Dia. Force Main Pipe Offset
SS-333400-501-0004	4" Dia. Force Main Pipe Offset
SS-333400-501-0006	6" Dia. Force Main Pipe Offset
SS-333400-501-0008	8" Dia. Force Main Pipe Offset
SS-333400-501-0010	10" Dia. Force Main Pipe Offset
SS-333400-501-0012	12" Dia. Force Main Pipe Offset

Description: The work consists of furnishing all labor, equipment, customer coordination/notification, and materials for the relocating of pipeline found to be in conflict with proposed improvements from other construction activities. The pipeline offset may be PVC, HDPE, Ductile Iron, or Cast Iron pipe. All ductile iron pipe shall have polyethylene encasement. The unit price includes up to 50 linear feet of pipe offset. Pipe relocation offsets greater than 50 linear feet shall be paid for under INSTALL SANITARY SEWER FORCE MAIN PIPE and other Pay Items. Pipe relocation offsets are often times in close proximity to other utilities. All hand digging and other special precautions required to protect other utilities is included in the unit price. The unit price shall include all costs necessary to complete the offset and removing existing main including: survey layout (based on property monuments established by others), material, connection sleeves, reverse deadmen, joint restraints, polyethylene wrap on ductile iron pipe, tracer wire, pavement cutting, dewatering for excavations up to 6-ft deep, backfilling, pressure testing, and field layouts. Excavation and well point dewatering for pipeline relocation offsets are separate pay items.

Measurement: The quantity to be paid under this item will be in accordance with each (EA) pipe relocation offset completed.

REPLACE MANHOLE RING AND COVER

Pay Items:

SS-333900-202-D001	Ring and Cover Replacement in Pavement
SS-333900-202-D002	Ring and Cover Replacement areas other than Pavement

Description: This pay includes replacement of existing manhole rings and covers in roadway paved areas, or other areas, as directed by the Engineer. The work includes all labor, equipment and material for replacement of manhole rings and covers. The work does not include excavation or surface restoration which, if required, will be paid for, or is part of the work, under other Contract Pay Items.

Measurement: The quantity to be measured for payment under this Pay Item will be the actual number each of manhole ring and covers replaced completed and accepted.

MANHOLE BENCH REPLACEMENT

Pay Items:

SS-333900-302-C004	4' Dia. Manhole – Bench Replacement
SS-333900-302-C005	5' Dia. Manhole – Bench Replacement
SS-333900-302-C006	6' Dia. Manhole – Bench Replacement

Description: This pay item includes the replacement of manhole benches and invert channels. The work includes all labor, equipment and material for rebuilding existing manhole inverts and benches as described in Standard Technical Specifications, Section 33 33 01 – Gravity Sewers and Section 33 39 00 – Sanitary Sewer Structures.

Measurement: The quantity of manhole bench replacement to be measured for payment under this Pay Item will be the actual number each (EA) of manholes that have manhole inverts and benches rebuilt.

ADJUST MANHOLE RIM & COVER

Pay Items:

SS-333900-302-K001	Adjust Manhole Rim & Cover to Finished Grade (In Pavement)
SS-333900-302-K002	Adjust Manhole Rim & Cover to Finished Grade (Outside Pavement)

Description: This item provides all labor, equipment and materials for adjusting existing manhole riser, C.I. frame, and cover. Adjustment includes removal of existing ring and cover and removal or placement of up to 6 courses of brick and reinstalling the existing ring and cover. The work does not include excavation, surface restoration, sheeting or well point dewatering which, if required, will be paid for, or is part of the work, under other Contract Pay Items.

Measurement: The quantities of manhole rim and cover adjustments to be paid under this item shall be each measured in place, on grade, inspected, and accepted.

GROUP D – RESTORATION

FLOWABLE FILL (EXCAVATABLE CONCRETE FDOT SECTION 121)

Pay Items:

121-1000	Flowable Concrete Fill

Description: Reference Pinellas County Standard Technical Specifications for Roadway and Related Construction – latest edition (Spec 121).

Measurement: Reference Pinellas County Standard Technical Specifications for Roadway and Related Construction – latest edition (Spec 121).

ROADWAY BASE

Pay Items

200-1000	ROADWAY BASE, Lime Rock, Primed, Min. LBR 100, Variable Thickness
204-1000	ROADWAY BASE, Crushed Concrete/Graded Aggregate, Min. LBR 100, Variable Thickness
234-1250-000	SUPERPAVE ASPHALT BASE, Type B 12.5, Variable Thickness

Description: Reference Pinellas County Standard Technical Specifications for Roadway and Related Construction – latest edition (Spec 200, 204, and 234).

Measurement: Reference Pinellas County Standard Technical Specifications for Roadway and Related Construction – latest edition (Spec 200, 204, and 234).

ROADWAY SURFACE COURSE

Pay Items

334-3095-000	SUPERPAVE ASPHALT CONCRETE, Type SP 9.5, Fine, Traffic Level C, Variable Thickness
334-3125-000	SUPERPAVE ASPHALT CONCRETE, Type SP 12.5, Fine, Traffic Level C, Variable Thickness

Description: Reference Pinellas County Standard Technical Specifications for Roadway and Related Construction – latest edition (Spec 334).

Measurement: Reference Pinellas County Standard Technical Specifications for Roadway and Related Construction – latest edition (Spec 334).

CONCRETE DRIVEWAY RESTORATION

Pay Items:

350-0206	PAVEMENT, Cement Concrete, 6" Min Thickness
350-0208	PAVEMENT, Cement Concrete, 8" Thick

Description: Reference Pinellas County Standard Technical Specifications for Roadway and Related Construction – latest edition (Spec 350-200).

Measurement: Reference Pinellas County Standard Technical Specifications for Roadway and Related Construction – latest edition (Spec 350-200).

DRIVEWAY RESTORATION – MISCELLANEOUS MATERIAL

Pay Items:

353-0102	DRIVEWAY RESTORATION, In Kind, Decorative Block

Description: Reference Pinellas County Standard Technical Specifications for Roadway and Related Construction – latest edition (Spec 353).

Measurement: Reference Pinellas County Standard Technical Specifications for Roadway and Related Construction – latest edition (Spec 353).

MILLING OF EXISITING ASPHALT:

Pay Items

380-1050	MILLING EXISTING ASPHALT PAVEMENT, 1/2" Average Depth
380-1075	MILLING EXISTING ASPHALT PAVEMENT, 3/4" Average Depth
380-1100	MILLING EXISTING ASPHALT PAVEMENT, 1" Average Depth

Description: Reference Pinellas County Standard Technical Specifications for Roadway and Related Construction – latest edition (Spec 380).

Measurement: Reference Pinellas County Standard Technical Specifications for Roadway and Related Construction – latest edition (Spec 380).

CURB AND GUTTER REPLACEMENT

Pay Items:

520-2000-1000	CURB & GUTTER, Concrete, FDOT Type A
520-1000-0700	CURB & GUTTER, Concrete, FDOT Type E
520-1000-1000	CURB & GUTTER, Concrete, FDOT Type F
520-1315-1000	VALLEY GUTTER, Concrete, PCED Index 1315

Description: Reference Pinellas County Standard Technical Specifications for Roadway and Related Construction – latest edition (Spec 520).

Measurement: Reference Pinellas County Standard Technical Specifications for Roadway and Related Construction – latest edition (Spec 520).

CONCRETE SIDEWALKS

Pay Items:

522-1004	SIDEWALK, CONCRETE, 4" Min. Thickness, Remove and Replace
522-1006	SIDEWALK, CONCRETE, 6" Min. Thickness, Remove and Replace

Description: Reference Pinellas County Standard Technical Specifications for Roadway and Related Construction – latest edition (Spec 522).

Measurement: Reference Pinellas County Standard Technical Specifications for Roadway and Related Construction – latest edition (Spec 522).

SODDING

Pay Items

575-0108	SODDING, In-kind

Description: Reference Pinellas County Standard Technical Specifications for Roadway and Related Construction – latest edition (Spec 575).

Measurement: Reference Pinellas County Standard Technical Specifications for Roadway and Related Construction – latest edition (Spec 575).

Payment: Reference Pinellas County Standard Technical Specifications for Roadway and Related Construction – latest edition (Spec 575).

GROUP E – MAINTENANCE OF TRAFFIC

MAINTENANCE OF TRAFFIC

Pay Items

102-1000-002	Flagmen (Per-Flagmen)
102-1000-613	Multi Lane (FDOT Index No. 613)
102-1000-614	Multi Lane (FDOT Index No. 614)
102-1000-615	Multi Lane (FDOT Index No. 615)
102-1000-616	Multi Lane (FDOT Index No. 616)
102-1000-617	Multi Lane (FDOT Index No. 617)
102-1076	Arrow Boards - 5' Minimum Horizontal Size
102-1099	Variable Message Board
102-1300	Concrete Barrier (FDOT Index No. 415)
102-1301	Low Profile Barrier (FDOT Index No. 412)
102-1600	Signs in Work Zones
711-11-121	6" Solid line Thermo Plastic - Permanent
711-11-125	24" Stop Bar, Solid, Thermo Plastic, Perm.
711-11-141	6" Skip line (6'-10' Skip) Thermo Plastic-Perm.

800-9001	Barricades Type III, with Warning Lights
800-9002	Barricades Type I or II, with Warning Lights

Description: This work consists of maintaining traffic within the limits of the project for the duration of the construction period, including any temporary suspensions of the work. All Maintenance of Traffic shall conform to County Standard Technical Specifications for Roadway and Related Construction – latest edition (Spec 102) and FDOT standards. This line item shall include labor and equipment to furnishing, installing and maintaining of traffic control and safety devices during construction; the construction and maintenance of any necessary detour facilities; providing necessary facilities for access to residences, businesses, pedestrian, schools, etc., control of dust and any other special requirements for safe and expeditious movement of traffic as may be called for on the plans. The term, Maintenance of Traffic, shall include all of such facilities, devices and operations as are required for the safety and convenience of the public, as well as for minimizing public nuisance. The Contractor, however, shall not obstruct nor create a hazard to any traffic during the performance of the work and shall be responsible for repair of any damage to existing pavement or facilities caused by his operations. Traffic Control Devices include all types of barricades, arrow boards, signs, temporary pavement markers, lights, concrete barriers and permanent striping. All travel, equipment, labor overhead or any other associated expenses in transportation and setting out the MOT will be included in the price. All MOT line items for Multi-Lane work shall include all costs for items associated with the appropriate FDOT Index (no separate payment for signs, barricades, etc included with index will be allowed).

Measurements: Maintenance of Traffic (MOT) shall be measured as units of work, each/day (EA/DY), hourly (HR) or by linear foot (LF) accordingly completed and priced on an individual project basis. The lump sum price for each assignment will be based on the specific MOT requirements for the assignment. The Contractor shall provide the Engineer with a proposal for the MOT that includes a break down of the costs, which are included in the lump sum price, and receive written acceptance from the Engineer prior to the installation of the MOT.

GROUP E – UNSPECIFIED WORK

UNSPECIFIED WORK

Pay Item

9999-1000	Unspecified Work

Description: The work under this Section includes an allowance for any unspecified work that may be associated with the work in this contract or as otherwise identified by the Engineer. Any amount of extra work and/or alternations to this contract

charged to the allowance “Unspecified Work” shall be fully documented and approved in writing in advance. All work performed under the allowance of “Unspecified Work” shall be completed in accordance with all conditions and requirements of this contract and shall include the work to be done by all necessary subcontractors and/or suppliers.

“Unspecified Work” shall mean the stated fixed sum of money to be used only at the Engineer’s specified direction. The particular requirements and items for the allowances will be provided to the Contractor at the appropriate time and shall apply only to additional items over and above those specified/indicated in the plans for this contract.

For equipment under the control of the Contractor through direct ownership, leasing, renting or other method of acquisition not included in the bid, the Contractor shall furnish cost data, which may assist the Engineer in the establishment of an equitable rate.

Measurement: The work in this Section shall be paid for by a portion of the allowance under “Unspecified Work” in the bid form of this contract. Use of any portion of this pay item shall require written pre-approval. This work, materials, and equipment, when required, will be ordered in writing by the Engineer, at a lump sum price or at a non lump sum price.

Lump Sum/Unit Price

When a lump sum/unit price is used, the lump sum/unit price will be determined by negotiation, and only require written pre-approval by the Director of Engineering and Technical Support or designee as backup documentation for payment purposes. The total compensation for work negotiated under a unit price will be a measurement (i.e. linear feet) or a count (i.e. each) of the item as installed.

Non Lump Sum

When a non lump sum price is used, compensation shall be limited to the Contractor’s reasonable costs plus markup percentages stipulated in this contract. The basis of the non lump sum negotiated prices and subcontractor invoices will be included in pay application; copies of invoices, equipment cost estimations and other supporting documentation will be included.

SECTION 01 32 33

COLOR AUDIO-VIDEO CONSTRUCTION RECORDS

PART 1 - GENERAL

1.01 DESCRIPTION

A. Audio/Video DVDs of all work areas in the Contract shall be prepared by the Contractor.

B. Contractor To Prepare Audio/Video Recording - Prior to commencing the Work, the Contractor shall have a continuous color audio/video recording taken along the entire length of the Project including all affected project areas. Streets, easements, rights-of way, lots or construction sites within the Project must be recorded to serve as a record of pre-construction conditions. Two copies of the recordings and video log shall be submitted to the County. The ENGINEER shall designate those areas, if any, to be omitted from or added to the audio-visual coverage. All DVDs and written records shall become property of the County.

C. Scheduling Of Audio/Video Recording - No construction shall begin prior to review and approval of the recordings covering the Project construction area(s) by the County. The County shall have the authority to reject all or any portion of a recording not conforming to specifications and order that it be redone at no additional charge. The Contractor shall reschedule unacceptable coverage within seven days after being notified. Recordings shall not be made more than 30 days prior to construction in any area.

D. Professional Videographers - The Contractor shall engage the services of a professional videographer known to be skilled and regularly engaged in the business of preconstruction color audio-video documentation. The videographer through the Contractor shall furnish to the Engineer a list of all equipment to be used for the audio-video recording, i.e., manufacturer's name, model number, specifications and other pertinent information.

E. Additional information to be furnished by the videographer is the names and addresses of two references that the videographer has performed color audio-video taping for on projects of a similar nature within the last 12 months. Engineer's approval of the selected videographer is required prior to taking first audio-video recording.

F. Equipment - All equipment, accessories, materials and labor to perform this service shall be finished by the Contractor. The total audio-video

system shall reproduce bright, sharp, clear pictures with accurate colors and shall be free from distortion, tearing, rolls or any other form of imperfection. The audio portion of the recording shall reproduce the commentary of the camera operator with proper volume, clarity and be free from distortion and interruptions. In some instances, audio-video coverage may be required in areas not accessible by conventional wheeled vehicles. Such coverage shall be obtained by walking. The color video camera used in the recording shall be of Industrial Grade and shall have EIA Standard NTSC type color - 1.0V 75 OHMS. Video output from camera shall be capable of horizontal resolution of 350 lines at center and utilize a minimum of 8:1 zoom with a 2/3" Newvicon tube or CCD pick-up element for optimum color imagery plus minimum lag through of one foot candle. The recording shall be transferred to DVDs compatible for playback with any Region 1 American TV Standard DVD player.

G. Recorded Information, Audio - Each recording shall begin with the current date, project name and be followed by the general location, i.e., viewing side and direction of progress. Accompanying the video recording shall be a corresponding and simultaneously recorded audio recording. This audio recording, exclusively containing the commentary of the camera operator or aide, shall assist in viewer orientation and in any needed identification, differentiation, clarification, or objective description of the features being shown in the video portion of the recording. The audio recording shall also be free from any conversations.

H. Recorded Information - Video - All video recordings must continuously display transparent digital information to include the date and time of recording. The date information shall contain the month, day and year. The time information shall contain the hour, minutes and seconds. Additional information shall be displayed periodically. Such information shall include, but not be limited to, project name, contract number, direction of travel and the viewing side. This transparent information shall appear on the extreme upper left hand third of the screen. Camera pan, tilt, zoom-in and zoom-out rates shall be sufficiently controlled such that recorded objects will be clearly viewed during video playback. In addition, all other camera and recording system controls, such as lens focus and aperture, video level, pedestal, chrome, white balance, and electrical focus shall be properly controlled or adjusted to maximize picture quality. The construction documentation shall be recorded in SP mode.

I. Viewer Orientation - The audio and video portions of the recording shall maintain viewer orientation. To this end, overall establishing views of all visible house and business addresses shall be utilized. In areas where the proposed construction location will not be readily apparent to the video viewer, highly visible yellow flags shall be placed, by the Contractor, in such a fashion as to clearly indicate the proposed centerline of

construction. When conventional wheeled vehicles are used as conveyances for the recording system, the vertical distance between the camera lens and the ground shall not exceed 10 feet. The camera shall be firmly mounted such that transport of the camera during the recording process will not cause an unsteady picture.

J. Lighting - All taping shall be done during time of good visibility. No taping shall be done during precipitation, mist or fog. The recording shall only be done when sufficient sunlight is present to properly illuminate the subjects of recording and to produce bright, sharp video recordings of those subjects.

K. Speed Of Travel - The average rate of travel during a particular segment of coverage shall be directly proportional to the number, size and value of the surface features within that construction areas zone of influence. The rate of speed in the general direction of travel of the vehicle used during taping shall not exceed 44 feet per minute.

L. Video Log/Index - All DVDs shall be permanently labeled and shall be properly identified by number and project title. Each DVD shall have a log of its contents. The log shall describe the various segments of coverage contained on the DVD in terms of the names of the streets or location of easements, coverage beginning and end, directions of coverage, video unit counter numbers, engineering survey or coordinate values (if reasonably available) and the date.

M. Area Of Coverage - Recording coverage shall include all surface features located within the zone of influence of construction supported by appropriate audio coverage. Such coverage shall include, but not be limited to, existing driveways, sidewalks, curbs, pavements, drainage system features, mailboxes, landscaping, culverts, fences, signs, Contractor staging areas, adjacent structures, etc. within the area covered by the project. Of particular concern shall be the existence of any faults, fractures, or defects. Coverage shall be limited to one side of the site, street, easement or right-of-way at any one time.

N. Costs Of Video Services - The cost to complete the requirements under this section shall be included in the contract items provided in the proposal sheet. There is no separate pay item for this work.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 35 00

SPECIAL PROJECT PROCEDURES

PART 1 – GENERAL

1.01 EXISTING UTILITIES

A. Where existing utility lines (water, gas, telephone, power, etc.) are intersected by proposed Work, the Contractor shall give a minimum of forty-eight (48) hours notice to the owners of such utilities to permit them to locate their lines prior to construction. The "Call Sunshine" Utility Notification Center shall be contacted at 1-800-432-4770 at least forty-eight (48) hours prior to start of excavation. Utilities, which are not members of the Utility Notification Center, shall be contacted individually by the Contractor.

1.02 REPAIRS

A. WORK SCHEDULE AND EMERGENCY RESPONSE TIME

1. Emergency response by the Contractor will be required within one hour of notice by telephone of required repair. The arrival of a repair crew will be required within two hours of the Contractor's assessment of the emergency situation.

2. The County will furnish the Contractor with the size, approximate depth and general location of the proposed repair. The Contractor shall be required to commence work on each assignment within ten (10) consecutive calendar days after the date contained in each written Notification to Proceed (unless such time is extended in writing by the County), and will be obligated to pursue the Work on each assignment with expeditious continuity until completion. The County may order the Contractor to proceed with the Work at a faster rate should a backlog of projects develop. In all cases, the Contractor will be required to begin restoration work within two working days and complete restoration work within ten (10) consecutive calendar days following approval of the repair by the Engineer. At the County's option, the maximum number of repairs assigned to the Contractor at one time may be a maximum of fifteen (15).

3. Each notification to proceed shall be accompanied by or preceded by two copies of the appropriate Atlas Sheet(s), plus other information including photographs (when available).

B. Field Layout

1. The County supplied Atlas Sheet, street address and other pertinent information will identify the general location of the repair. If there is evidence of the defect visible from the surface, such as a depression, the Contractor shall center his excavation on the evidence. If there is any question as to the general location described by the County, the Contractor shall approach the Engineer and address the questions before beginning with the excavation.

C. Restoration Schedule

1. All restoration work must be completed within ten (10) consecutive calendar days following approval of work at any given site. If the restoration work does not progress to the satisfaction of the Engineer, the Contractor may be directed to cease repair operations until such time as the Engineer may deem the restoration work completed to a degree permitting the resumption of repair work or the County may elect to perform any such restoration work and bill the Contractor for same. (At Engineer's discretion, payment shall be made by the Contractor direct to the County, or a like amount deducted by the County from monies due the Contractor for Work completed under this Contract).

1.03 POTABLE WATER, RECLAIMED WATER AND SANITARY SEWER SYSTEM CONSTRUCTION

A. Starting Project

1. The Contractor shall notify the Pinellas County Inspector and the Engineer FORTY-EIGHT (48) HOURS prior to starting construction (Saturday, Sunday and Holidays excluded). Upon notification, a meeting will be scheduled between the Pinellas County Inspector and the Contractor to review the plans.

B. Required Field Documents

1. The Contractor MUST have the following on the job site at all times and readily available prior to any construction:

a. The Pinellas County approved "Contractor's Copy" of construction plans stamped by the Florida Department of Environmental Protection (FDEP) or other permitting agency.

2. All required permits including:

a. F.D.O.T.
b. County
c. Florida Department of Environmental Protection (FDEP)
d. City/Municipality

C. If field conditions require deviation from the approved plans, the Contractor shall notify the Project Engineer of the required change. The Project Engineer will make the necessary changes and submit a revised set of plans to the appropriate agency or agencies for approval.

D. All construction is subject to inspection and certain tasks require that the Pinellas County Inspector be on the site to properly document the procedure, test results and/or material used. On the occasions that the Pinellas County Inspector is required on site to observe these tasks, FORTY-EIGHT (48) hours advance notice will be required (Saturday, Sunday and Holidays excluded).

E. Should the Contractor suspend work on any given project, the Contractor shall provide written notification detailing the reason for the suspension to Pinellas County within two business days. Additionally, forty-eight (48) hours advance, written notice will be required for a restart of the project.

F. Should any materials be installed or backfilled prior to inspection by the Pinellas County Inspector, the facilities are subject to uncovering, exposing, and/or disassembly for inspection. It is preferred that all material expected to be required for the project be on site for initial material inspection prior to commencing the project. Material thus delivered to the job site will be protected and stored as to insure preservation of quality and fitness.

G. Meters shall not be installed on potable and reclaimed water systems until all cleanup work is completed and a final inspection has been made by the Pinellas County Utilities Inspector.

H. All projects requiring a or Florida Department of Environmental Protection Permit will not receive water service until the Pinellas County Utilities receives a SEALED copy of the Engineer's Certificate of Completion and Compliance (As-built plans, if applicable) and a Release Form from the Florida Department of Environmental Protection (FDEP). The following must also be provided, if applicable:

1. Deed and Agreement to Deed to pipelines and appurtenances as additions to Pinellas County Utilities.

2. Deed of Conveyance to pipelines

3. Release of Lien/Cost Statement

4. Easement

I. Taps

1. All taps on existing, in service, pressurized mains for development projects will normally be made by Pinellas County personnel. All taps for pressure testing and chlorination will be saddle taps, made by the Contractor.

2. The Pinellas County Inspector must be present when the Contractor is working on an existing, in service, pressurized main. The Contractor shall notify all Pinellas County customers (via doorknob hangers) forty-eight (48) hours in advance of any discontinuance of service associated with this work. UNDER NO CIRCUMSTANCES WILL THE CONTRACTOR PERFORM ANY TASK THAT INVOLVES AN EXISTING, IN SERVICE, PRESSURIZED MAIN WITHOUT THE PINELLAS COUNTY INSPECTOR PRESENT ON SITE.

3. On development projects, the Project Engineer and/or Contractor will be responsible for staking the location of taps after verifying that the field conditions will permit said location and obtaining concurrence of the Pinellas County Inspector. Following the inspector's field check of the tap location, the inspector will schedule the tap through Pinellas County providing all required paperwork is in order. The inspector will be notified of the day and time for the tap.

J. Additional Requirements for Tapping Asbestos Cement Pipe

1. All taps in asbestos cement (AC) pipe shall be made with the pipe under pressure using only a tap machine having a built-in flush valve and the flush valve must remain open during the entire procedure. All taps shall be made with the pipe in a wet condition. The pipe shall remain wet throughout the entire tapping process. Extreme care should be taken to prevent any cutting dust from becoming airborne and personal protective equipment should be worn as the condition warrants.

2. Coupons from the tapping procedure shall be placed in a "zip lock" type bag in the wet condition. The bag shall be marked with the address where the tap was made and kept for disposal.

3. Water samples shall be taken, as special situations arise or as determined necessary by Utilities Water Quality Management, from the closest in line point downstream from the tap position. Samples shall be taken from this same point before and after the tap has been completed.

4. Open sample source and let water run for three to five minutes. Collect sample in an approved container, available from the Utilities lab, marking the container with the same location information as the coupon. Fill out the chain of custody sheet, also available from the Utilities lab. and deliver sample to the Utilities lab. The Utilities lab will send the sample off for analysis.

5. Disposal of the removed coupons shall follow procedures issued by Pinellas County Utilities, Solid Waste Department. Removed and bagged coupons shall be delivered to Utilities General Maintenance facility located at 6730 142nd Avenue N. Largo, where an authorized disposal barrel shall be located. The person delivering the coupon shall be required to sign a drop off log.

K. Additional Requirements for Tapping Concrete Pressure Pipe

1. Requirements for tapping concrete pipe shall be addressed on a case-by-case basis and specifications for such shall be included in the Special Provisions. Specifications shall be developed based on the pipe manufacturer's recommendations for the specific application.

2. All requirements shall be in accordance with the pipe manufacturer's and the tapping device manufacturer's recommendations.

PART 2 – PRODUCT (Not Used)

PART 3 – EXECUTION (Not Used)

END OF SECTION

SECTION 01 42 01

REFERENCE STANDARDS AND DEFINITIONS

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

A. Abbreviations and acronyms are used in the Contract Documents to identify reference standards.

1.02 QUALITY ASSURANCE

A. Application: When a standard is specified by reference, comply with requirements and recommendations stated in that standard, except when requirements are modified by the Contract Documents, or applicable codes establish stricter standards.

B. Publication Date: The publication in effect on the date of issue of Contract Documents, except when a specific publication date is specified.

1.03 ABBREVIATIONS, NAMES, AND ADDRESSES OF ORGANIZATIONS

A. Obtain copies of referenced standards direct from publication source, when needed for proper performance of Work, or when required for submittal by Contract Documents.

AA	Aluminum Association 900 19th Street NW Washington, DC 20006
AASHTO	American Association of State Highway and Transportation Officials 444 North Capitol Street, NW Suite 249 Washington, DC 20001
ABPA	American Backflow Prevention Association PO Box 3051 Bryan, Texas 77805-3051
ACI	American Concrete Institute 38800 Country Club Drive Farmington Hills, MI 48331

AI	Asphalt Institute 2696 Research Park Drive Lexington KY 40511
AISC	American Institute of Steel Construction One East Wacker Drive Suite 3100 Chicago, IL 60601-2001
AISI	American Iron and Steel Institute 1140 Connecticut Avenue Suite 705 Washington DC 20036
ANSI	American National Standards Institute 1819 L Street, NW Washington, DC 20036
ASME	American Society of Mechanical Engineers Three Park Avenue New York, NY 10016-5990
ASTM	American Society for Testing and Materials 100 BarrHarbor Drive West Conshohoken, PA, 19428
AWWA	American Water Works Association 6666 W. Quincy Avenue Denver, CO 80235
AWS	American Welding Society 550 N.W. LeJeune Road Miami, FL 33126
CRSI	Concrete Reinforcing Steel Institute 933 N. Plum Grove Road Schaumburg, IL 60173-4758
CSI	Construction Specifications Institute 99 Canal Center Plaza, Suite 300 Alexandria, VA 22314
FS	Federal Specification General Services Administration Specifications and Consumer Information Distribution Section (WFSIS) 470 L'enfant Plaza – Suite 8100 Washington, DC 20407

NEMA	National Electrical Manufacturers' Association 1300 North 17th Street Suite 1847 Rosslyn, VA 22209
PCA	Portland Cement Association 5420 Old Orchard Road Skokie, IL 60077
PCI	Prestressed Concrete Institute 209 W. Jackson Blvd. Chicago, IL 60606
SSPC	Society for Protective Coatings 40 24th Street,. 6th floor Pittsburgh, PA 15222
UL	Underwriters' Laboratories, Inc. 333 Pfingston Road Northbrook, IL 60062
USC	University of Southern California Foundation for Cross-connection Control and Hydraulic Research Los Angeles, CA 90089

B. The following terms when used within these specifications shall be defined as follows:

ADMINISTRATION – shall mean the Pinellas County Administration.

APPLICANT – Shall mean any person making a request for service to be rendered or furnished by the County.

BACKFLOW PREVENTION DEVICES – shall mean either double check valves (DPV) or reduced pressure (RP) principle devices which protect the potable water system at the service connection by isolating within the customers premises actual or potential pollution or contamination through cross-connection.

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION (FDEP) – shall mean the particular agency that is the delegated authority for the Safe Drinking Water Act Program effective July 9, 2007 which includes all permitting and compliance for public drinking water programs..

PRIVATE FIRE LINES – shall mean unmetered fire lines installed on private property which serves fire hydrants, sprinkler systems or such intermittent usages.

PRESSURE REDUCING VALVE – shall mean a device utilized to reduce the pressure in a water or reclaimed water main to a preset value, usually to provide proper service pressures. Also known as a PRV.

WATER QUALITY DIVISION – shall mean that division of the Pinellas County Utilities that is responsible for the supervision of proper chlorination of new or existing water lines. Works in conjunction with the inspector to flush, chlorinate and draw samples for testing. They do not get involved past master meters, dual check valve assembly (DCVA)'s or domestic water lines.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 45 17

PIPELINE PRESSURE AND LEAKAGE TESTING REQUIREMENTS

PART 1 – GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall pressure and leakage test all pressure pipelines as specified herein. All piping, and equipment shall be tested in the field in the presence of the Engineer or the County's representative.

B. Prior to testing, all mains shall be flushed and pigged to remove all sand and other foreign matter. Flushing shall be terminated at the direction of the Engineer or County's representative. The Contractor shall dispose of the flushing water without causing a nuisance or property damage and in compliance with the National Pollution Discharge Elimination System (NPDES) and all applicable jurisdictions.

C. No testing shall be done until all joints are restrained. Temporary thrust blocks or reverse deadmen may be used with the County's prior approval.

1.02 SCHEDULING

A. All leakage testing, as defined herein, shall be completed by the Contractor under the supervision of the Pinellas County Utilities Inspector.

B. All leakage tests must be scheduled through the Pinellas County Utilities Inspector, with twenty-four (24) hours minimum notice and ONLY AFTER THE CONTRACTOR ACHIEVES A SUCCESSFUL PRE-PRESSURE TEST.

PART 2 – PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 GENERAL

A. All corporation stops used for testing and service lines shall be installed by the Contractor prior to pressure testing.

B. All hydrant control valves must be open while pressure testing.

C. All blow-off standpipes and injection points shall be removed upon satisfactory completion of sampling and testing. Corporation stops shall remain in line.

D. Teflon tape shall be used on all threaded joints to avoid contamination (No pipe dope allowed).

E. It is the Contractor's sole responsibility to place sample points where designated by the Pinellas County Health Department.

F. The Contractor shall backfill all pipe and thrust blocking before pressure testing unless the Engineer directs certain joints or connections left uncovered. Where thrust blocking is provided the pressure test shall not be made until at least five days after the thrust blocking has been installed. A high early strength concrete may be used to reduce this time.

G. Each valved section of pipe shall be slowly filled with water and a pump shall be hooked to the pipe in a manner satisfactory to the Engineer to supply the test pressure. The pump, pipe connection and all necessary apparatus shall be furnished by the Contractor.

H. While the system is being filled with water, air shall be carefully and completely exhausted. If permanent air vents are not located at all high points, the Contractor shall install corporation stops or fittings and valves at such points so the air can be expelled as the pipe system is slowly filled with water. Service shall be tested as part of the main pipeline.

3.02 PRESSURE TEST FOR DUCTILE IRON AND PVC PIPE

A. All newly laid pipe, including fitting and valves shall be pressure tested by the Contractor, in accordance with AWWA C600 and C605 to verify the integrity of the pipeline before the leakage test is scheduled with the County.

B. Test pressures and durations shall be as follows:

		Pressure (psi)	Duration (hrs)
1.	Sewage force mains	150	2
2.	Reclaimed water mains	150	2
3.	Potable water mains	150	2
4.	Fire mains	200	2

C. All exposed pipe, fittings, valves, joints and appurtenances shall be carefully examined during the open-trench test. Any cracked or defective pipe, fittings, valves or appurtenances discovered in consequence of this test shall be removed and replaced with acceptable material and the test shall be repeated to the satisfaction of the Engineer.

3.03 LEAKAGE TEST FOR DUCTILE IRON AND PVC PIPE

A. A leakage test shall be conducted in the presence of the Engineer and County Inspector, after the pressure test has been satisfactorily completed. The Contractor shall, as before, furnish all pumps, pipe, connections and other items required to satisfactorily complete the leakage test. The leakage test shall have a duration of two hours at the pressure specified for the pressure test. No pipe installation will be accepted if the leakage is greater than that determined by the formula for mechanical and push-on joints per hour:

$$L = \frac{SDP^{1/2}}{148{,}000}$$

L= Allowable leakage [gph]
S= Length of pipe tested [feet]
D= Nominal diameter of pipe [inches]
P= Average pressure during test [psig]

150 psi (per 1000ft.) (Table 5.4 AWWA C 600-05 & Table 2 C605-5)	
2	0.17
4	0.33
6	0.50
8	0.66
10	0.83
12	0.99
16	1.32
18	1.49
20	1.66
24	1.99
30	2.48
36	2.98
42	3.48
48	3.97
54	4.47

B. The Engineer, or his duly authorized representative, shall witness these tests. The Contractor shall be responsible for finding and repairing leaks. No additional cost may be incurred by the County due to repairs because of failure of either test. The Engineer has the authority to determine the number of repairs that will be made within a given length of pipe and has the right to request the Contractor to remove and relay a section of pipe if such does not comply with the established leakage rates as calculated using the formula above.

C. For the duration of the test, the pressure in the main shall not be allowed to drop more than 5 psi below the test pressure per AWWA C600 & C605. Should the pressure drop 5 psi, makeup water shall be added to the line to restore the pressure to the test pressure. This makeup water shall be measured and shall be included in the total leakage measured. If loss is greater than 5 psi, the test fails.

3.04 PRESSURE AND LEAKAGE TESTS OF UNDERGROUND HDPE PRESSURE PIPING INCLUDING COMBINATIONS HDPE & PVC OR DUCTILE IRON

A. Filled pipelines shall be allowed to thermally stabilize such that the temperature of the water and the pipe are equal. At temperatures above one hundred (100) degrees F, the Engineer shall be consulted regarding the need to reduce the test pressure.

B. The piping shall be tested between valved sections to a maximum length of five thousand (5,000) feet.

C. For any test pressure from 1.0 to 1.5 times the system design pressure, the total test time including initial pressurization, initial expansion, and time at test pressure, shall not exceed eight hours. If the pressure test is not completed due to leakage, equipment failure or other reason, the test section shall be depressurized, and allowed to “relax” for at least eight hours before bringing the test section up to test pressure again.

D. The test procedure consists of initial expansion, and the test phase:

1. During the initial expansion phase, the test section is pressurized to 10 psi above the test pressure (see Table A for Expansion Pressure), and sufficient make-up water is added each hour for three hours to return to the expansion phase pressure.

2. After the initial expansion phase, about four hours after pressurization, the test phase begins.

3. During the test phase, the pipe is stabilized at the test pressure (see Table A). The pressure shall remain steady within five percent of this target value for two hours. If the pressure falls below five percent of the test pressure (see Table A), leakage or insufficient expansion is indicated, and the test shall be repeated after the pipe is allowed to “relax” as indicated above. Make-up water is not allowed during the test phase.

Table A

Pipe Class	Expansion Pressure	Test Pressure	5% Pressure Reduction
SDR 17	150 psi	140 psi	133 psi
SDR 13.5	170 psi	160 psi	152 psi
SDR 11	170 psi	160 psi	152 psi
SDR 9	210 psi	200 psi	190 psi

3.05 REPAIRS

A. The Contractor shall repair all leaks in the piping at no additional cost to the County.

END OF SECTION

SECTION 01 55 26

TRAFFIC REGULATION

PART 1 – GENERAL

1.01 WORK INCLUDED

A. This item will consist of providing, installing, moving, replacing, maintaining, cleaning and removal upon completion of Work, all signs, barricades, pavement markings, barriers, cones, lights, signals and other devices necessary for the safe movement of all vehicular and pedestrian traffic through and within the Project.

B. The Contractor shall arrange his work so that there will be as little disruption of traffic as possible.

C. The Contractor shall have a Certified Worksite Traffic Supervisor in accordance with the General Conditions.

1.02 REFERENCES

A. U.S. Department of Transportation (FHWA) Manual of Uniform Traffic Control Devices as adopted by the Florida Department of Transportation (latest edition).

B. Florida Department of Transportation Design Standards, latest edition.

C. Florida Department of Transportation Standard Specification for Road and Bridge Construction, latest edition.

1.03 SUBMITTALS

A. The Contractor shall obtain approval from the City, County or State Agency having jurisdiction over the road or highway for any road crossings and detours required.

B. Maintenance of Traffic (MOT) plans, if provided in the Contract Drawings, are considered a minimum requirement and it is the Contractor's responsibility to provide a safe traffic, pedestrian and working environment in accordance with the governing regulations. Contractor shall adjust the MOT plan as necessary to meet the field conditions at no additional cost to the County.

C. If MOT plans are not provided in the Contract Drawings, a detailed traffic control plan and MOT plan shall be developed and submitted by the Contractor to such Agencies having jurisdiction over the road for their approval, and said approval shall be obtained prior to commencing construction.

D. Any deviations from the Contract Drawings, or MOT plans specifically developed by the Contractor, shall be submitted to the applicable permitting entity for approval, and said approval shall be obtained, prior to commencement of construction. If the alternative MOT plan is deemed incomplete or unacceptable the Contractor will be required to submit a revised plan. This process will repeat itself until the revised plan is accepted by all parties. Contractor will not be granted or approved any costs or delay resulting from the review process or field adjustments.

E. All traffic control plans shall be prepared by a Florida Certified Traffic Planner.

PART 2 – PRODUCTS

2.01 INSTALLATION STANDARDS

A. All signs, barricades, pavement markings, traffic signals and channelizing devices used to handle traffic shall be provided for and erected in accordance with the FDOT Design Standards (latest edition) and to the details indicated in the above referenced standards. Traffic signs shall be high-intensity flat-surface reflective sheeting.

PART 3 – EXECUTION

3.01 GENERAL

A. In order that the Contractor may properly provide required traffic controls, the Contractor shall notify the appropriate agencies a minimum of two working days prior to any construction affecting traffic flow.

3.02 MAINTENANCE OF TRAFFIC LANE AND ROAD CLOSURES

A. The Contractor shall arrange his work so that there will be as little disruption of traffic as possible.

B. The Contractor shall be approved by the City, County or State Agency having jurisdiction over the road or highway for any road crossings and detours required. A detailed traffic control plan shall be submitted by the Contractor to such Agencies having jurisdiction over the road for their approval at least three weeks prior to commencing construction.

C. In the event that a road closure is approved by the permitting Agency, the Contractor will be responsible for any rerouting of traffic occasioned by the closure and will provide all necessary barricades, signs, guards, lights, etc. in accordance with the Agency's approval of such closure.

3.03 ACCESS TO PROPERTIES

A. When construction activities necessitate the closing of a street to through-traffic, the Contractor shall notify all affected emergency services entities of the closed road. If no other means of access is available, the Contractor shall maintain, at all times, a 10-foot-wide lane adjacent to the work area, free of construction equipment and obstructions, for the use of emergency vehicles.

B. The Contractor shall provide continuous access to properties adjacent to work areas.

3.04 LOCAL TRAFFIC

A. The roads shall be kept open to two-way traffic during construction, except one lane traffic will be permitted provided experienced flag personnel are used. Necessary barricades, safety vests and flags shall be used. No residences or places of business will be isolated. Suitable access shall be provided whenever construction interferes with the existing means of access.

3.05 PEDESTRIAN TRAFFIC

A. The Contractor shall take precautions to ensure the safety of pedestrians passing near work areas. This may entail the erection of a temporary fence on the construction side of pedestrian passageways to delineate out-of-bounds areas. The pedestrian passageways shall remain open and clean of dirt and debris at all times unless pedestrian safety cannot be assured, then the Contractor may close off the sidewalk(s) with signs and fences and shall direct pedestrians to use other suitable routes. Pedestrian passageways shall be cleared and swept in the vicinity of construction.

B. The Contractor shall pay close attention to the issue of pedestrian safety. The Contractor shall institute measures, including, but not limited to, temporary surfaces and channeling devices, to ensure the safe passage of pedestrians.

3.06 BUS STOPS

A. The Contractor shall take care to minimize disruption to existing bus stops. If a bus stop cannot be preserved, then the Contractor shall make provisions for its relocation. The Contractor shall be responsible for all coordination regarding the temporary relocation of bus stops

END OF SECTION

SECTION 01 57 00

CONTROL OF WORK

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. The Work to be done consists of the furnishing of all labor, materials and equipment, and the performance of all Work included in this Contract.

B. The Contractor shall furnish all labor, superintendence, materials, plant, power, light, heat, fuel, water, tools, appliances, equipment, supplies and other means of construction necessary or proper for performing and completing the Work. He shall perform and complete the Work in the manner best calculated to promote rapid construction consistent with safety of life and property and to the satisfaction of the County, and in strict accordance with the Contract Documents. The Contractor shall clean up the Work and maintain it during and after construction, until accepted, and shall do all Work and pay all costs incidental thereto. He shall repair or restore all structures and property that may be damaged or disturbed during performance of the
Work.

C. The Contractor shall supervise and direct the Work in accordance with Pinellas County Utilities Standard Technical Specifications.

D. The cost of incidental work described in these Construction Specifications, for which there are no specific Contract Items, shall be considered as part of the general cost of doing the Work and shall be included in the prices for the various Contract Pay Items.

E. The Contractor shall provide and maintain such modern plant, tools, and equipment as may be necessary to perform in a satisfactory and acceptable manner all the Work required by this Contract. Only equipment of established reputation and proven efficiency shall be used. The Contractor shall be solely responsible for the adequacy of his workmanship, materials and equipment, prior approval of the County notwithstanding.

F. Public Utilities and Structures

1. Public utility installations and structures shall be understood to include all poles, tracks, pipes, wires, conduits, house service connections, vaults, manholes and all other appurtenances and facilities pertaining thereto whether owned or controlled by the County, other governmental bodies or privately owned by individuals, firms or corporations, used to serve the public with transportation, traffic control, gas, electricity,

telephone, sewerage, drainage, water or other public or private property which may be affected by the Work shall be deemed included hereunder. The Contractor shall protect all public utility installations and structures from damage during the Work, except those specifically designated to be removed or relocated. The Contractor shall so arrange his operations as to avoid any damage to any buried public utility installation or structure. All required protective devices and construction shall be provided by the Contractor at his expense. All existing public utilities damaged by the Contractor, which are shown on the Plans or have been located in the field by the utility, shall be repaired by the Contractor, at his expense. No separate payment shall be made for such protection or repairs to public utility installations or structures.

2. Public utility installations or structures owned or controlled by the County or other governmental body, which are shown on the Plans to be removed, relocated, replaced or rebuilt by the Contractor, shall be considered as a part of the general cost of doing the Work and shall be included in the prices Bid for the various contract items. No separate payment shall be made therefor.

3. Where public utility installations or structures owned or controlled by the County or other governmental body are encountered during the course of the Work, and are not indicated on the Plans or in the Specifications, and when, removal, relocation, replacement or rebuilding is necessary to complete the Work under this Contract, such work shall be accomplished by the utility having jurisdiction, or if required, by the Contractor.

4. The Contractor shall give written notice to governmental utility departments and other owners of public utilities of the locations of his proposed construction operations, at least forty-eight (48) hours in advance of breaking ground in any area or on any unit of the Work. This can be accomplished by making the appropriate contact with the "Underground Utility Notification Center for Excavators (Call Sunshine)."

5. The maintenance, repair, removal, relocation or rebuilding of public utility installations and structures, when accomplished by the Contractor as herein provided, shall be done by methods approved by the utility and the County.

G. The Contractor shall not enter upon private property for any reason without securing prior permission from the property owner.

H. During the progress of the Work the Contractor shall keep the work site free from an accumulation of rubbish, waste materials or any type of debris resulting from the construction.

1.02 DRAWINGS AND SPECIFICATIONS

A. The Contractor shall furnish each of the subcontractors, manufacturers, and suppliers such copies of the Contract Documents as may be required for their work.

1.03 MATERIALS AND EQUIPMENT

A. All transactions with the manufacturers or subcontractors shall be through the Contractor.

B. All materials and equipment shall be new, unless otherwise provided. The Contractor shall furnish satisfactory evidence as to the type and quality of materials or equipment to be furnished and installed on this Project.

C. Materials of fabrication and construction to be furnished and permanently installed in the Project shall be of the best quality. The workmanship of construction, fit and finish on the Project shall be equal to the highest standards of the industry. As indicated above, all materials and equipment and/or components thereof shall be new and shall not have been in service at any other installation.

D. The Contractor shall deliver materials in ample quantities to insure the most speedy and uninterrupted progress of the Work so as to complete the Work within the allotted time. The Contractor shall also coordinate deliveries in order to avoid delay in, or impediment of, the progress of the work of any related Contractor. The Contractor shall replace, at his own expense, all such material(s) found to be damaged in shipment or handling or defective in manufacture. The cost of the replacement material and labor of installation for the replacement of previously installed material found to be defective prior to the final acceptance of the work shall also be the responsibility of the Contractor.

E. All materials and equipment to be incorporated into the Project shall be loaded and unloaded by a method that will provide protection against damage. Every precaution shall be taken to prevent damage or injury to the equipment and material during transporting and handling. Proper and suitable power equipment shall be used in the loading or unloading process. Under no condition shall any items of equipment be dropped or rolled from a truck or dragged over the ground after being unloaded. When a crane or similar type equipment is used in loading or unloading, a suitable lifting sling and hook shall be used.

F. It will be the responsibility of the Contractor to store delivered materials or equipment in a secure area. The Contractor will be responsible for any damages resulting from vandalism or other reasons. Replacement of materials or equipment lost, stolen, damaged or destroyed, due to careless or improper storage, will be the Contractor's responsibility. All stored materials shall be easily and readily accessible for inspection by the County's representative.

G. The Contractor shall, unless otherwise stated in the Contract Documents, furnish with each type, kind or size of equipment, one complete set of suitably marked high grade special tools and appliances which may be needed to adjust, operate, maintain or repair the equipment. Such tools and appliances shall be furnished in approved painted steel cases, properly labeled and equipped with good grade cylinder locks and duplicate keys.

H. Each piece of equipment shall be provided with a substantial nameplate, securely fastened in place and clearly inscribed with the manufacturer's name, year of manufacture, serial number, weight and principal rating data.

I. The Contractor shall have on hand sufficient proper equipment and machinery of ample capacity to facilitate the Work and to handle all emergencies normally encountered in work of this character.

J. Equipment shall be erected in a neat and workmanlike manner on the foundations at the locations and elevations shown on the Drawings. All equipment shall be correctly aligned, leveled and adjusted for satisfactory operation and shall be installed so that proper and necessary connections can be made readily between the various units.

K. The Contractor shall furnish, install and protect all necessary anchor and attachment bolts and all other appurtenances needed for the installation of the devices included in the equipment specified.Stainless steel anchor bolts shall be ample size and strength for the purpose intended. Substantial templates and working drawings for installation shall be furnished.

L. The Contractor shall, at his own expense, furnish all materials and labor for, and shall properly bed in non-shrink grout, each piece of equipment on its supporting base that rests on masonry foundations. Grout shall completely fill the space between the equipment base and the foundation. All metal surfaces coming in contact with concrete or grout shall receive a coat of coal tar epoxy.

M. Obtaining Materials From Pinellas County Utilities

1. Any material obtained from the Utilities Department shall be thoroughly inspected by the Contractor so as to determine any

defects, damage or unsoundness of the materials. Items accepted by the Contractor shall be signed for by his authorized representative, and the Contractor shall be responsible for such items from the time he picks them up to the time they are installed and accepted by the Utilities Department.

2. Upon acceptance of any material from Pinellas County Utilities, the Contractor shall be responsible for loading the material at the storage yard and unloading the material at the job site and for the safe transportation of the material between those locations

1.04 INSPECTION AND TESTING

A. The Contractor shall be fully responsible for the proper operation of equipment during tests and instruction periods and shall neither have, nor make any claim for damage, which may occur to equipment prior to the time when the County formally takes over the operation thereof.

B. When requested, the Contractor shall furnish authoritative evidence in the form of Certificates of Manufacture that the materials to be used in the work have been manufactured and tested in conformity with the Contract Documents. These certificates shall be notarized and shall include copies of the results of physical tests and chemical analyses, where necessary, that have been made directly on the product or on similar products of the manufacturer.

C. As soon as conditions permit, the Contractor shall furnish all labor, materials, and instruments and shall make preliminary field tests. If the preliminary field tests reveal that the system does not comply with the requirements of the Contract Documents, the Contractor shall, prior to the acceptance tests, make all changes, adjustments and replacement required.

D. Upon completion of the Work and prior to final payment, all equipment and piping shall be subjected to acceptance tests as specified or required to prove compliance with the Contract Documents.

E. The Contractor shall furnish labor, fuel, energy, and all other materials, equipment and instruments necessary for all acceptance tests, at no additional cost. The Supplier shall assist in the final field tests as applicable.

F. Any defects in the materials and equipment or their failure to meet the tests, guarantee or requirements of the Contract Documents shall be promptly corrected by the Contractor. If the Contractor fails to make these corrections or if the improved materials and equipment, when tested, shall again fail to meet the guarantees or specified requirements, the materials and equipment may be rejected and removed from the site at the Contractor's expense.

1.05 FIRST AID

A. The Contractor shall keep upon the site, at each location where work is in progress, a completely equipped first aid kit and shall provide ready access thereto at all times when people are employed on the work.

1.06 ADJACENT STRUCTURES AND PROPERTY

A. The Contractor shall also be entirely responsible and liable for all damage or injury as a result of his operations to all other adjacent public and private property, structures of any kind and appurtenances thereto met with during the progress of the Work. The cost of protection, replacement in their original locations and conditions or payment of damages for injuries to such adjacent public and private property and structures affected by the Work, whether or not shown on the Drawings or specified, shall be included in the various Contract Items and no separate payments will be made therefore.

B. Contractor is expressly advised that the protection of buildings structures, tunnels, tanks, pipelines, etc. and related work adjacent to and in the vicinity of his operations, wherever they may be, is solely his responsibility. Conditional inspection of buildings or structures in the immediate vicinity of the Project, which may reasonably be expected to be affected by the Work, shall be performed by and be the responsibility of the Contractor.

C. Contractor shall, before starting operations, make an examination of the interior and exterior of the adjacent structures, buildings, facilities, etc., and record by noted, measurements, photographs, etc., conditions which might be aggravated by open excavation and construction. Repairs or replacement of all conditions disturbed by the construction shall be made to the satisfaction of the County. This does not preclude conforming to the requirements of the Insurance Underwriters.

1.07 PROTECTION, REMOVAL AND REPLACEMENT OF TREES AND SHRUBS

A. The Contractor shall comply with all local tree ordinances. When, in the opinion of the Engineer, trees or shrubs can be protected in place, the Contractor shall endeavor to protect the trees or shrubs as necessary. When, in the opinion of the Engineer, trees must be removed to permit construction, the Contractor shall consider the price for removing, cutting, trimming, replacing trees and shrubs incidental to the laying of pipe and no additional payment shall be made unless specifically called for in the Contract Documents.

B. The Contractor is responsible for acquiring necessary permits and replacing trees as required by local ordinances and the Pinellas County Department of Environmental Management. The Contractor shall provide the services of an approved tree specialist when it is necessary to trim or cut a branch from a

tree.

1.08 PROTECTION OF WORK AND PUBLIC

A. Barriers and Lights

1. The Contractor shall provide and maintain proper and adequate barricades, construction signs, torches, flashers, construction tapes, flagmen, guards or other traffic control devices as may be necessary to provide the required safety and protection to the public at and around the perimeter of the construction areas. The Contractor shall provide suitable barricades, red lights, "danger" or "caution" or "street closed" signs and watchmen at all places where the work causes obstructions to the normal traffic or constitutes in any way a hazard to the public. The Contractor shall comply with all City, County or State regulations.

B. Smoke Prevention

1. A strict compliance with ordinances regulating the production of emission of smoke will be required. No open fires will be permitted.

C. Noise

1. The Contractor shall eliminate noise to as great an extent as practicable at all times. Air compressing plants shall be equipped with silencers and the exhaust of all gasoline, diesel, motors or other power equipment shall be provided with mufflers. The Contractor shall strictly observe all local regulations and ordinances covering noise control.

2. If mufflers and silencers cannot achieve the necessary noise reduction, other noise abatement procedures shall be instituted by the Contractor, such as installation of 3/4-inch plywood baffles positioned to break off line-of-sight from the noise source to affected residences and/or commercial structures.

D. Access to Public Services

1. Neither the materials excavated nor the materials or plant used in the construction of the work shall be placed to prevent free access to all fire hydrants, valves or manholes.

E. Dust Prevention

1. It is the responsibility of the Contractor to control all dust problems that may occur during the construction, with required watering.. Dust control will be required seven days a week.

F. Safety

1. The Contractor will be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Project. He will take all necessary precautions for the safety of and will provide the necessary protection to prevent damage, injury or loss to all employees on the Project and other persons who may be affected thereby, all the work and all material or equipment to be incorporated therein, whether in storage on or off the site.

2. The Contractor shall comply with all applicable laws, ordinances, rules, regulations and orders of any public body having jurisdiction. He will erect and maintain, as required by the conditions and progress of the work, all necessary safeguards for safety and protection. He will notify owners of adjacent utilities when prosecution of the work may affect them. The Contractor will remedy all damage, injury or loss of any property caused, directly or indirectly, in whole or in part, by the Contractor, any subcontractor or anyone directly or indirectly employed by any one of them or anyone for whose acts of any of them be liable.

3. In emergencies affecting the safety of persons or the work or property at the site or adjacent thereto, the Contractor, without special instruction or authorization from the Engineer or Pinellas County Inspector, shall act to prevent threatened damage, injury or loss. He will give Pinellas County prompt written notice of any significant change in the Work or deviations from the approved plans required relating to the emergency.

4. It is the Contractor's responsibility to comply with the Occupational Safety and Health Administration safety standards.

5. Standard 29 CFR 1926.650, Subpart P, trench safety standards are in effect during the period of construction of the Project.

6. The Contractor shall comply with all Occupational Safety and Health Association (OSHA) requirements for work in confined spaces. This shall include, but not be limited to, provision of a force-ventilated working space.

7. Hard hats shall be worn at the work site by all personnel as required by all local, state and federal guidelines. The Engineer is authorized to halt the work if this requirement is not met.

G. Pollution Control

1. The Contractor shall provide for adequate protection against polluting any private or public lands, streams, ponds, lakes, sanitary or storm drainage systems, etc., by the disposal of surplus materials in the form of solids or liquids or any other deleterious materials (fuels, oils, bitumens, etc.)

1.09 CUTTING AND PATCHING

A. The Contractor shall do all cutting, fitting or patching of his portion of the work that may be required to make the several parts thereof join and coordinate in accordance with the Drawings and Specifications. The work must be done by competent workmen skilled in the trade required.

1.10 CLEANING

A. During construction of the Work, the Contractor shall, at all times, keep the site of the work and adjacent premises as free from material, debris and rubbish as is practicable and shall remove the same from any portion of the site.

B. At the conclusion of the Work, all erection plant, tools, temporary structures and materials belonging to the Contractor shall be promptly taken away, and he shall remove and promptly dispose of all water, dirt, rubbish or any other foreign substances.

C. The Contractor shall thoroughly clean all equipment and materials installed by him and shall deliver such materials and equipment undamaged in a bright, clean, polished and new operating condition.

1.11 EROSION CONTROL, WETLANDS AND STORM SEWERS

A. Protection Against Siltation and Bank Erosion

1. The Contractor shall arrange his operations to minimize siltation and bank erosion on construction sites and on existing or proposed water courses, drainage ditches, wetlands and other areas of concern.

2. The Contractor, at his own expense, shall remove any siltation deposits and correct any erosion problems, which result from his construction operations.

3. The Contractor shall be solely responsible for any fines resulting from

the encroachment of any environmentally protected areas.

B. Protection of Wetland Areas

1. The Contractor shall properly dispose of all surplus material, including soil, in accordance with Local, State and Federal regulations. Under no circumstances shall surplus material be disposed of in wetland areas as defined by the Florida Department of Environmental Protection, Southwest Florida Water Management District, U.S. Army Corps of Engineers, etc.

C. Sanitary & Storm Sewer Systems

1. The Contractor shall be entirely responsible for the satisfactory replacement of storm sewer and installation of sanitary sewer systems in substantial conformance to the approved Drawings. It is strongly recommended that no roadway base or paving be constructed until the Contractor has performed televising of these lines to his and the County's satisfaction, and all storm sewer and sanitary sewer invert grades are verified in the field. The lamping of lines and verification of elevations in no way absolves the Contractor from any of his contractual obligations.

1.12 RESTORATION OF PROPERTY

A. Responsibility. All damage as a result of construction work done to existing structures, wetland areas, roadway pavement, driveways, other paved areas, fences, utilities, traffic control devices and any other obstruction not specifically named herein, shall be repaired, restored or replaced by the Contractor unless otherwise specified.

B. Temporary Repairs. All damage named in Paragraph A above shall be at least temporarily repaired, restored or replaced immediately following construction efforts at that location. Temporary restoration shall mean putting the affected area back into a safe, usable condition. In no case shall trenches remain open over night within a street right-of-way unless specific approval is granted by the County.

C. Permanent Repairs. All damage named in Paragraph A above shall be permanently repaired, restored, or replaced before final completion. Permanent repairs shall be accomplished in a professional workmanship-like manner.

D. In all areas disturbed by the work, the Contractor shall grade and restore the site to a condition as good or better than existed before construction.

Sodded areas shall be sodded with sod matching the existing adjacent sod. Any drives, walks, pavements, structures, survey monuments, property corner markers, trees, shrubs, or any other public or private property damaged or destroyed by the work shall be restored or replaced at the Contractor's expense.

1.13 MAINTENANCE OF TRAFFIC

A. Maintenance of Traffic shall be in accordance with Specification 01 55 26, Traffic Control.

1.14 MATERIALS

A. All materials installed in the County's easements or rights-of-way shall be approved in the County's Materials Specification Manual regardless of whether these facilities are to be owned by the County or are to be privately owned.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF SECTION

SECTION 01 57 13

EROSION AND SEDIMENTATION CONTROL

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Take every reasonable precaution throughout construction to prevent the erosion of soil and the sedimentation of streams, bays, storm systems or other water impoundments, ground surfaces, or other property as required by State and Local regulations.

1.02 RELATED WORK

A. Provide protective covering for disturbed areas upon suspension or completion of land-disturbing activities. Permanent vegetation shall be established at the earliest practicable time. Temporary and permanent erosion control measures shall be coordinated to assure economical, effective, and continuous erosion and siltation control throughout the construction and post construction period.

1.03 REGULATORY REQUIREMENTS

A. Prevent damage to properties outside the construction limits from siltation due to construction of the project. Assume all responsibilities to the affected property owners for correction of damages, which may occur. Erosion control measures shall be performed conforming to the requirements of, and in accordance with plans approved by applicable state and local agencies and as per the erosion control portion of the construction drawings and these specifications. The Contractor shall not allow mud and debris to accumulate in the streets. Should the Contractor pump water from trenches during construction, appropriate siltation preventative measures shall be taken prior to discharge of pumped water into any storm drain or stream. The Contractor shall dispose of the water without causing a nuisance, property damage and in compliance with the National Pollution Discharge Elimination System (NPDES) and all applicable jurisdictions.

PART 2 - PRODUCTS

2.01 GENERAL

A. Open mesh biodegradable mulching cloth.

B. Fertilizer shall be 10-10-10 grade or equivalent.

C. Lime shall be Dolomitic Agricultural Ground limestone, per FDOT Section 982.

D. Provide permanent grass seed in accordance with Section 32 92 01.

E. Provide temporary grass seed in accordance with Section 32 92 01.

F. Silt fence shall consist of non-biodegradable filter fabric (Trevira, Mirafi, etc.), per FDOT Section 985, wired to galvanized wire mesh fencing and supported by wood or metal posts.

G. Floating turbidity barriers per FDOT Section 985 and FDOT Standard Index 103.

H. Staked turbidity barriers

I. Rock bags

J. Erosion Stone: FDOT Section 530
   1. Sand-Cement Riprap
   2. Concrete Block
   3. Rubble 20 to 300 pounds each

K. Filter Fabric for placement under Riprap shall meet the requirements FDOT Section 985.

L. Baled hay or straw in accordance with FDOT Section 104.

M. Drain pipe with sock (sedimentation control) shall be used to prevent and control soil erosion runoff and intrusion into stormwater drainage systems.

   1. Drain sock products such as “ADSSock” or approved equal.
   2. Sock material shall be on ultra-porous filter (synthetic wrap material) fitted snuggly over pipe. Material shall be 100 percent knitted polyester (or approved equal), equivalent opening size of 30 to 40, burst strength of 100-135 (ASTM D 3786), fiber size of 100-200 denier filament, 2.5 to 3.5 ounces per square yard (ASTM D 3776).
   3. Approval of material is required by County prior to use.
   4. Drain pipe with sock shall span the entire opening of the inlet.

PART 3 - EXECUTION

3.01 CLEARING

A. Clearing and grubbing shall be scheduled and performed in such a manner that subsequent grading operation and erosion control practices can follow immediately thereafter. Excavation, borrow, and embankment operations will be conducted as a continuous operation. All construction areas not otherwise protected shall be planted with permanent vegetative cover within 30 working days after completion of active construction.

3.02 STABILIZING

A. The angle for graded slopes and fills shall be no greater than the angle, which can be retained by vegetative cover or other adequate erosion control devices or structures. All disturbed areas outside of embankment left exposed will, within 30 working days of completion of any phase of grading, be planted or otherwise provided with either temporary or permanent ground cover, devices, or structures sufficient to restrain erosion.

3.03 REGULATORY REQUIREMENTS

A. Whenever land disturbing activity is undertaken on a tract, a ground cover sufficient to restrain erosion must be planted or other wise provided within 30 working days on that portion of the tract upon which further active construction is to be undertaken.

B. If any earthwork is to be suspended for any reason whatsoever for longer than 30 calendar days, the areas involved shall be seeded with vegetative cover or otherwise protected against excessive erosion during the suspension period. Suspension of work in any area of operation does not relieve the Contractor of the responsibility for the control of erosion in that area.

PART 4 - CONSTRUCTION PHASE

4.01 PRACTICES

A. Avoid dumping soil or sediment into any stream bed or watercourse.

B. Maintain an undisturbed vegetative buffer where possible between a natural watercourse and trenching and grading operations.

C. Avoid equipment crossings of streams, creeks, and ditches where practicable.

PART 5 - SEDIMENT CONTROL FEATURES

5.01 GENERAL

A. All devices (silt fences, retention areas, etc.), for sediment control shall be constructed at the locations indicated prior to beginning excavation on the site. All devices shall be properly maintained in place until a structure or paving makes the device unnecessary or until directed to permanently remove the device.

5.02 DESIGN APPLICATIONS

A. Mulch shall be used for temporary stabilization of areas subject to excessive erosion, and for protection of seed beds after planting where required.

B. Filter Fabric, drain pipe with sock, or other approved methods shall be placed and secured over the grates of each existing inlet, grating or storm pipe opening near the area of excavation to prevent silt and debris from entering the storm systems.

C. Silt fences, hay bales and floating turbidity barriers shall be used as shown on the plans or as directed by the Project Representative to restrict movement of sediment from the site.

D. Establish vegetative cover on all unpaved areas disturbed by the work.

1. Preparation of Seedbed. Areas to be seeded shall be scarified a depth of four inches until a firm, well pulverized, uniform seedbed is prepared. Fertilizer shall be applied during the scarification process in accordance with the following rates.
   a. Fertilizer - 10 to 15 pounds per 1,000 square feet
2. Seeding. Disturbed areas along embankments shall be permanently seeded with mix specified in Section 32-92-01.

3. Mulch all areas immediately after seeding. Mulch shall be applied and anchored as specified herein before.

5.03 MAINTENANCE

A. Maintain all temporary and permanent erosion control measures in functioning order. Temporary structures shall be maintained until such time as vegetation is firmly established and grassed areas shall be maintained until completion of the project. Areas which fail to show a suitable stand of grass or which are damaged by erosion shall be immediately repaired. No additional payment will be made to the

Contractor for the re-establishment of erosion control devices, which may become damaged, destroyed, or otherwise rendered unsuitable for their intended function during the construction of the Project.

B. Remove all silt, sediment and debris buildup on a regular basis to maintain functioning storm systems and erosion control devices.

5.04 REMOVAL OF SEDIMENT CONTROL DEVICES

A. Near completion of the project, when directed by the County's's agent, the Contractor shall dismantle and remove the temporary devices used for sediment control during construction. All erosion control devices in seeded areas shall be left in place until the grass is established. Seed areas around devices and mulch after removing or filling temporary control devices. Cleanup all areas.

END OF SECTION

SECTION 01 78 39

PROJECT RECORD DOCUMENTS

PART 1 – GENERAL

1.01 REQUIREMENTS INCLUDED

A. Contractor shall maintain at the site one record copy of:

1. Drawings.
2. Specifications.
3. Addenda.
4. Change Orders and other modifications to the Contract.
5. Engineer's field orders or written instructions.
6. Approved shop drawings, working drawings and samples.
7. Field test records.
8. Construction photographs.
9. Detailed Progress Schedule.

1.02 MAINTENANCE OF DOCUMENTS AND SAMPLES

A. Store documents and samples in Contractor's field office apart from documents used for construction.

B. File documents and samples in accordance with CSI format.

C. Maintain documents in a clean, dry, legible, condition and in good order. Do not use record documents for construction purposes.

D. Make documents and samples available at all times for review by the Engineer and County.

E. As a prerequisite for monthly progress payments, the Contractor is to exhibit the currently updated “record documents” for review by the Engineer.

1.03 RECORDING

A. Label each document "PROJECT RECORD" in neat large printed letters.

B. Record information concurrently with construction progress. Do not conceal any work until required information is recorded.

C. Drawings; Legibly mark to record actual construction:

1. Elevations of various structure elements in relation to grade.
2. All underground piping with elevations and dimensions. Changes in piping location. Horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements. Actual installed pipe material, class, etc.
3. Location of internal utilities and appurtenances concealed in the construction, referenced to visible and accessible features of the structure.
4. Field changes of dimension and detail.
5. Changes made by Field Order or by Change Order.
6. Details not on original Contract Drawings.
7. Equipment and piping relocations.
8. Intersection details: At least three ties to every valve and fitting, blowoff, fire hydrant and air release.
9. Services based on distance from main line pipe and property lines.
10. Backflow preventer assemblies locations, with ties to physical features.

D. All horizontal locations, if not in the right-of-way, must relate to easement.

E. All elevations shall be in feet and tenths, referenced to NAVD 1988.

F. Specifications and Addenda; Legibly mark each Section to record:

1. Manufacturer, trade name, catalog number and supplier of each product and item of equipment actually installed.
2. Changes made by Field Order or by Change Order.

1.04 SPECIAL REQUIREMENTS FOR MAIN REPAIRS

A. The Contractor will not be required to furnish as-built drawings for main repairs, but shall be required to furnish a complete "bill of materials" used at each repair, if requested by the County.

1.05 SPECIAL REQUIREMENTS FOR WATER MAINS, RECLAIMED WATER MAINS AND FORCE MAINS

A. In addition to that specified above, the following information shall be provided on the Record Drawings:

1. Location (vertical and any horizontal) at intervals not to exceed two hundred (200) feet and at all locations where the direction changes by more than ten (10) degrees.
2. Pipe size and material.

3. Air release manhole (rim and bottom elevation and horizontal location) i.e. ties to back of curb and nearest property corner or permanent control point.
4. Detailed location of valves (horizontal), i.e., ties to back of curb and nearest property corner or permanent control point.
5. Service connection locations for each designated meter.

B. All top of pipe elevations shall be accompanied by a finished grade elevation at the same location.

C. Horizontal location of the pipe shall be defined using ties to back of curb and nearest property corner, property line or permanent control point.

D. Should supplemental information be compiled or be available related to the “As-Built” condition of the Project, the Contractor shall provide that information, along with the “As-Built Record Drawing” documentation outlined above, which is required under the terms of the contract. Such supplemental information may include but not be limited to:

1. Length of pipe between fittings with depth every one hundred (100) feet.
2. Elevation of top of pipe at grade changes.
3. Manufacturer of pipe.
4. Manufacturer, number of turns to open and depth of valves
5. Define location of transition point between differing pipe materials
6. Flow capacity of fire hydrants if such field information was obtained during construction.

1.06 SPECIAL REQUIREMENTS FOR GRAVITY SEWER

A. In addition to that specified above, the following information shall be provided on the Record Drawings:

1. Manhole rim and invert elevations (include pipe inverts).
2. Manhole horizontal location (i.e. ties to back of curb and nearest property corner or permanent control point.)
3 Service laterals located from nearest down stream manhole (indicate any laterals out of manholes).
4. Distance between manholes.
5. Size and material of all pipe.

1.07 SPECIAL REQUIREMENTS FOR WASTEWATER PUMP STATIONS

A. In addition to that specified above, the following information shall be provided on the Record Drawings:

1. Location ties to back of curb and nearest property corner or permanent control point.
2. Wet well invert elevations.
3. Pipe invert elevations.
4. Valve vault inverts.
5. Top of slab elevations.
6. "As Built" elevations of all construction elevations shown on the Drawings.

1.08 SUBMITTAL

A. At Final Completion Date, deliver Record Documents to the Engineer.

B. Provide certified Record Drawings in electronic format (AutoCAD r14 or later version) meeting Pinellas County Standards and one hardcopy signed and sealed by a Florida registered surveyor and mapper.

C. Accompany submittal with transmittal letter in duplicate, containing:

1. Date.
2. Project title and number.
3. Contractor's name and address.
4. Title and number of each Record Document.
5. Signature of Contractor or his authorized representative.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF SECTION

SECTION 03 10 01

CONCRETE MATERIALS

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. The work shall include the furnishing of all materials, equipment and labor required to construct all concrete work shown on the Drawings, or incidental to the proper execution of the work.

1.02 RELATED SECTIONS

A. Section 32 13 01- Concrete Sidewalks, Driveways, and Gutters

1.03 DESIGN MIX

A. Prior to placing any concrete, the Contractor shall submit for the Engineer's approval, a design mix, calculated by a recognized testing laboratory, and using the approved aggregates to produce a workable mix of the desired strength, together with certified copies of seven day and twenty-eight (28) day tests of cylinders taken from concrete made according to the design mix. The mixes shall be designed to secure concrete having a minimum compressive strength at age twenty-eight (28) days as shown on the Plans or covered in other sections of these Specifications.

PART 2 - PRODUCTS

2.01 CEMENT

A. Portland cement shall conform to the latest revision of Federal and/or ASTM Specifications enumerated below:

1. For general concrete construction, ASTM designation C-150, Type I or Type II, or Federal Specifications SS-C-192, Type I or II.

2. For construction of sewage treatment plant and pump station structures Type II cement shall be used.

3. Slag cement shall conform to ASTM designation C-465.

4. Slag cement may be used in the maximum ratio of one part of slag cement by weight to six parts of total cement by weight, if approval by the Engineer, is obtained prior to use.

B. Concrete Bag Mix

1. Quickete 5000 High Early Strength Concrete Mix #1007 or Engineer approved equal.

2. Use of bag mix is strictly limited to non-structural use and Engineer designated locations only.

3. The Contractor is required to strictly adhere to the mixing and installation instructions set forth by the manufacturer.

4. Testing to be performed at Engineers discretion. Concrete not meeting design strength or not properly installed per the manufacturer is subject to removal and replacement at no additional cost to the County.

2.02 FINE AGGREGATE

A. Fine aggregate shall be clean, hard, strong, durable uncoated particles of natural sand known as Lake Wales, Interlachen or approved equal. The source, composition, quality and gradation of the fine aggregate shall be subject to the approval of the Engineer. Samples of the sand shall be furnished, together with certified copies of the gradation and analysis from a recognized testing laboratory.

B. The weight of extraneous or deleterious substances shall not exceed the following percentages:

Loss by decantation - 3 percent
Shale -1 percent
Clay lumps - 1 percent
Coal and lignite - 1 percent

C. The fine aggregate shall be reasonably well graded from coarse to fine and when tested by means of laboratory sieves, shall meet the following requirements in percent of total weight:

Total Retained On	Percent Retained
No. 4 Sieve	0 - 5
No. 10 Sieve	3 - 30
No. 30 Sieve	30 - 70
No. 50 Sieve	65 - 95
No. 100 Sieve	95 - 100

Deficiencies in the percentages of the fine aggregates passing the No. 50 and No. 100 sieves may be remedied by the addition of pozzolanic or

cementitious materials excepting Portland cement. Such materials must meet the approval of the Engineer.

2.03 COARSE AGGREGATE

A. Coarse aggregate shall consist of hard, tough, durable components, free from adherent coatings and vegetable matter, and shall not contain soft, friable, thin or elongated particles in quantities considered deleterious by the Engineer. Coarse aggregate shall be properly graded from fine to coarse to produce concrete of the desired strength, density, and workability. The source, composition, quality and gradation of the coarse aggregate shall be subject to the approval of the Engineer. Samples of the coarse aggregate shall be furnished together with certified copies of the gradation and analysis from a recognized testing laboratory.

B. All coarse aggregate shall be washed and shall be free from disintegrated pieces, salt, alkali, vegetable matter and adherent coatings. The total percentage of all deleterious substances shall not exceed five percent by weight. The substances designated shall not be present in excess of the following amounts:

Loss by decantation - 1 percent
Clay lumps or other soluble materials - 1/4 percent
Soft fragments - 5 percent

C. Where the cover over reinforcing is two inches or more, the maximum size of aggregate shall be one and one-half inches. Where the cover over reinforcing is less than 2-inches, the maximum size of aggregate shall be three-quarter inch. The maximum size of aggregate shall not exceed one-fifth of the narrowest dimension between forms nor three quarters of the minimum clear spacing between reinforcing bars. The grading of the coarse aggregate in the concrete shall be within the following limits:

	Percent Passing
Maximum size square mesh screen	97 - 100 percent
Maximum size square mesh screen	40 - 70 percent
No. 4 Sieve	0 - 6 percent

2.04 WATER

A. The water used in mixing concrete shall be fresh, clean and free from injurious amounts of oil, acid, alkali or organic matter.

B. Water from any source other than a municipal water supply shall be shown by test to comply with Florida State Road Department requirements for mixing water.

2.05 REINFORCEMENT

A. Reinforcing bars shall conform to the requirements of the latest revision of Federal Specification QQ-S-632 and shall be as follows unless indicated otherwise on the plans:

1. Bent: Type II (deformed), Class B40
2. Straight: Type II (deformed), Class B40
3. Column Ties: Type I (plain), Class B40

B. Wire mesh, unless otherwise shown on the drawings or specified, shall be 6" x 6" No. 10 woven, or electrically welded wire fabric conforming to the requirements of ASTM designation A 185, latest revision.

C. Reinforcing steel shall be detailed, fabricated and placed according to the methods and standards recommended in the "Manual of Standard Practice for Detailing Reinforced Concrete Structures" of the American Concrete Institute.

2.06 JOINTS

A. Water Stops

1. Materials for stops shall be 1/8-inch steel plate welded into a continuous strip, or an approved alternate material.

2.07 GROUTING AND PATCHING

A. Cement for use in grouting and patching shall be non-shrinking material free of stain-causing agents and matching the adjacent concrete in appearance.

B. Bonding Agent: To be structural epoxy adhesive conforming to ASTM-C881 Type I & II, Grade 2, Class B & C with a minimum bond strength of 1900 psi.

PART 3 - EXECUTION

3.01 REINFORCING STEEL

A. The reinforcing fabricated to shapes and dimensions shown, shall be placed where indicated on the Drawings. Before placing, all reinforcements shall be thoroughly cleaned of rust, mill scale or coatings, which would reduce or destroy the bond.

B. Splices in reinforcing mats shall be staggered. Horizontal mats shall be supported on metal chairs with all sills or pads below subgrade. Spacers

shall be provided for wall and column steel and shall be removed as the concrete is placed.

C. The concrete covering over steel reinforcement shall be as shown on the Plans.

3.02 PROPORTIONING

A. All materials, except water, shall be proportioned into the mix by weight. Water may be proportioned either by weight or volume.

B. Delivery tickets for transit mix concrete shall show the weight of cement of each type incorporated in the batch.

C. Precise control of the proportions and amounts of all materials will be required. Unauthorized changes in proportions, or addition of water, shall be sufficient cause for rejection of the batch. The proportions of the approved design mix may be changed only upon specific approval of the Engineer. The use of admixture to improve workability will not be approved, unless such admixture is a part of the design mix and the submitted design mix test data. Only admixture of pozzolanic, cementitious or silicious nature will be considered.

D. The amount of water used in the mix shall be kept at the minimum necessary to produce concrete of a workable consistency. Consistency shall be measured at the time of pouring by slump tests, when directed by the Engineer. The slump shall fall within the following tabulated limits:

	Slump in Inches	
Type of Structure	Minimum	Maximum
Massive sections, pavement and slabs on ground	1	4
Heavy slabs, beams or walls	3	5
Thin walls and columns, ordinary slabs or beams	3	6

3.03 MIXING AND PLACING

A. General

1. Concrete shall be machine-mixed in standard equipment in good condition, operated within its rated capacity. The batching plant shall be equipped with facilities for measurement of dry materials by weight, and water by weight or volume. Mixing equipment may be a portable plant (job-mix), or truck mounted (transit-mix). The use of transit-mix concrete will be limited by length of haul. Transit-mixing will be required to meet the requirements for mixing time. Batching plant and handling equipment shall be of sufficient capacity to produce and place concrete without interruption or cold joints. All equipment shall be subject to the approval of the Engineer.

B. Time

1. The minimum time for mixing each batch after all materials are in the mixer shall be one minute for 1/2 to 1 1/2 cubic yard mixers, and 1 1/2 minutes for mixers over 1 1/2 cubic yard capacity. The mixer shall revolve at a uniform speed, a minimum of twelve (12) revolutions after all materials have been placed therein.

2. Neither the speed, nor the volume capacity of the mixer, shall exceed those recommended by the manufacturer. Excessive over-mixing, requiring addition of water to preserve the consistency, will not be permitted.

C. Placing

1. Concrete shall be placed before the initial set has occurred and in no event after it has contained its water content for more than sixty (60) minutes, unless documented by the testing laboratory justifying a longer truck residence time without deleterious effect.

2. The concrete shall be compacted and worked in an approved manner into all corners and angles of the forms and around reinforcement and embedded fixtures in such a manner as to prevent segregation of the coarse aggregate.

3. All concrete shall be placed with the aid of mechanical vibrating equipment supplemented by hand forking or spading. Vibration shall be transmitted directly to the concrete and not through the forms. The duration of vibration at any location in the forms shall be held to the minimum necessary to produce thorough consolidation.

4. The concrete shall be placed by suitable equipment as nearly as possible to its final location and without any segregation of the aggregate. Any free vertical drop shall not exceed three feet.

5. Before depositing new concrete, on or against concrete which has set, the existing surfaces shall be cleaned of all laitance, foreign matter and loose particles, and covered with a neat cement grout. Grout for horizontal construction joints shall be of cement and fine aggregate in the same proportions as in the concrete to be placed, and shall be from one-half to one inch thick.

6. Exposed formed surfaces shall be rubbed with Carborundum brick or, otherwise dressed to produce a smooth, true surface. Interior surfaces of tanks, wet wells, etc., shall be considered as exposed to a point six inches below low water level. Special care shall be taken in dressing circular structures to obtain a true circular surface.

D. Slabs

1. No special concrete or cement mortar topping course, shall be used for slab finish, unless shown on the drawings. The slab shall be brought to a true and even finish by power or hand-floating. Unless otherwise specified, the surface shall be floated to a true, regular surface with a wood float and shall be steel-troweled to a smooth finish. Troweling shall be the minimum to obtain a smooth, dense surface and shall not be done until the mortar has hardened sufficiently to prevent excess fine material from being worked to the surface. All floor surfaces except those which are to be painted, shall immediately after troweling, be brushed lightly with a soft bristle janitor's push broom to produce a non-slip surface. The brushing shall be sufficient to mark the surface only, without appreciably disturbing the troweled finish.

3.04 FINISHING

A. Top surfaces which are not covered by forms, and which are not to be covered by additional concrete or backfill, shall be carried slightly above grade and struck off by board finish.

3.05 CURING AND PROTECTING

A. Curing

1. All concrete shall be kept wet by covering with water, or approved water saturated covering, or by other method approved by the Engineer, which will keep all surfaces continuously wet, for a period of seven days unless otherwise directed by the Engineer.

2. Water for curing shall be clear and entirely free from any elements which might cause staining or discoloration of the concrete.

3. Where wood forms are left in place during curing, they shall be kept wet at all times to prevent opening at the joints and drying out of the concrete.

B. Weather Protection

1. No concrete shall be mixed or placed when the air temperature in the shade and away from artificial heat is as low as forty (40) degrees Fahrenheit, and falling. Concrete may be mixed and placed when the air temperature in the shade, and away from artificial heat is thirty-five (35) degrees Fahrenheit, and rising.

2. Fresh concrete shall be protected from rain, flowing water and mechanical injury and all concrete shall be protected from injurious action by the sun.

3.06 SAND CEMENT AND/OR SOIL CEMENT RIP-RAP

A. Where directed, the Contractor shall prepare sand cement, or if satisfactory material is available from the excavation, soil cement rip-rap.

B. The mixture shall be mixed dry at 4:1 ratio by volume of sand, or soil and Portland cement. The dry mixture shall be placed in burlap or fiberbags as required to form a basic rip-rap unit approximately eighteen (18) inches long, twelve (12) inches wide, and six (6) inches high.

C. Rip-rap shall be placed as directed to provide protection of slopes, pipe ends and bulkheads.

3.07 JOINTS

A. Water Stops

1. Water stops shall be installed at all expansion, contraction and construction joints subject to water pressure and where indicated.

B. Expansion Joints

1. Expansion joints shall be placed as indicated on the Plans. Joint material shall be installed as indicated and as directed by the Engineer.

C. Construction Joints

1. Vertical construction joints will not be allowed unless detailed in the Drawings.

2. Construction joints shall be located as shown on the Plans and/or in accordance with an approved schedule of pours.

3.08 TESTS

A. Procedures

1. Compressive strength tests shall be made by breaking standard 6-inch diameter by 12-inch high test specimens prepared, cured and broken in accordance with the American Society for Testing Materials Standard Methods, C-31 and C-39, latest revision. Four specimen test cylinders shall be taken from each concrete pour of five cubic yards or more. One additional test shall be taken from each thirty (30) cubic yards or fraction, thereof, in each pour in excess of thirty (30) cubic yards. Test specimens shall be taken from manhole bottom pours of less than five cubic yards as directed by the Engineer. Test specimens shall be taken in the presence of the Engineer. One cylinder from each pour shall be broken at seven days, the remainder at twenty-eight (28) days. Additional test cylinders may be ordered for determining the characteristics of a new design mix or changes in equipment or methods, and under adverse weather, or curing conditions.

2. Slump test shall be made in accordance with ASTM C143, latest revision and shall be made whenever directed by the Engineer.

B. Responsibility for Tests and Reports

1. The Contractor shall supply all cylinder molds, slump cones, tools and labor for preparing specimens, and shall provide clean, moist sand or burlap for curing. Cylinders shall not be shipped to the testing laboratory until the third day following preparation, and shall be protected from accidental damage at all times.

2. The test cylinders shall be tested in a recognized commercial testing laboratory.

3.09 CAUSE FOR REJECTION

A. Should the concrete fail to conform to all the requirements of this Section, the Engineer may require the Contractor to remove the defective concrete and reconstruct the Work as directed.

END OF SECTION

SECTION 09 91 00

PAINTING AND PROTECTIVE COATINGS

PART 1 - GENERAL

1.01 DESCRIPTION

A. Provide all labor, materials, apparatus, scaffolding, and all appurtenant work in connection with painting and protective coatings, complete as indicated, specified and required.

B. Principal items include, but are not limited to:

1. All exposed piping, conduits, tanks, equipment and other metal surfaces, interior and exterior, except as hereinafter specifically excluded.

2. All submerged and intermittently submerged metal surfaces, except stainless steel.

3. All structural and miscellaneous steel.

4. Equipment furnished without factory finished surfaces.

5. Equipment, on which factory applied finishes have been marred, abraded, scratched, nicked, or otherwise damaged.

6. The interior of concrete tanks, manholes, and similar structures, unless otherwise lined.

7. Paint coatings on scheduled interior concrete walls and undersides of slabs.

8. Plasterwork, gypsum drywall surfaces, woodwork, and other architectural work as specified or shown on the Drawings.

9. Exposed steel lintels.

10. Interior and exterior CMU walls unless otherwise specified.

11. Exterior of concrete tanks.

12. Undersides of aluminum access hatches and aluminum checkered plate.

13. Fire hydrants, valve box lids, meter box lids, bollard/ guard post above ground meter and backflow assemblies.

14. All exterior wall surfaces of existing tanks and structures from 6-inches below grade to the top of the wall or structure.

C. The following surfaces, in general, shall not be painted:

1. Concrete surfaces subject to pedestrian or vehicular traffic, except as herein specified.

2. Nonferrous metals and stainless steel unless otherwise noted or indicated. Galvanized metal shall not be considered as a nonferrous metal.

3. Mechanical equipment with factory finish as specified herein.

4. Electrical and instrumentation equipment with approved factory finish or of stainless steel/nonferrous metal construction, unless otherwise specified.

5. Water proofing, dampproofing and roof covering work.

6. Anodized aluminum.

7. Aluminum handrails and ladders.

8. Fiberglass grating and tread plate.

9. Nuts and bolts.

10. Name tags and data tags.

D. Related work not included in this Section:

1. Pavement striping.

2. Sealants and caulking.

3. Waterproofing and dampproofing.

E. The Contractor shall furnish to the Engineer, at no charge for use during this project, one dry film thickness gages and one electrical flaw detection equipment system.

1.02 GUARANTEE

A. A three (3) year guarantee which commences on the date of acceptance against failure of all coatings shall be provided, unless more stringent requirements are specified hereinafter. Failure of any coating during the guarantee period shall be repaired by the Contractor who shall absorb all costs related to the repair of the coating. Failure shall be defined as peeling, blistering, delamination or loss of adhesion of any of the coatings.

1.03 REFERENCE SPECIFICATIONS AND STANDARDS

A. Without limiting the generality of other requirements of these Specifications, all cleaning, surface preparation, and coating shall conform to the applicable requirements of the referenced portions of the standards specified herein to the extent that the requirements therein specified are not in conflict with the provisions of this Section.

B. Unless otherwise specified, all work and materials for the preparation and coating of all metal surfaces shall conform to the applicable requirements specified in the Steel Structures Painting Manual, Volume 2, Systems and specifications Revised, latest edition, published by the Steel Structures Painting Council.

C. The following referenced surface preparation specifications of the Steel Structures Painting Council shall form a part of this Section.

1. White Metal Blast Cleaning (SSPC-SP5). Removal of all visible rust, mill scale, paint, and foreign matter by blast cleaning by wheel or nozzle (dry) using sand, grit, or shot. (For very corrosive atmosphere.)

2. Near-White Blast Cleaning (SSPC-SP10). Blast cleaning nearly to White Metal Cleanliness, until at least 95 percent of each element of surface area is free of all visible residues. (For high humidity, chemical atmosphere, marine or other corrosive environment.)

3. Commercial Blast (SSPC-SP6). Blast cleaning until at least 67 percent of each element of surface area is free of all visible residues.

4. Brush-Off Blast Cleaning (SSPC-SP7). Blast cleaning of all except tightly adhering residues of mill scale, rust and coatings, exposing numerous evenly distributed flecks of underlying metal.

5. Solvent Cleaning (SSPC-SP1). Removal of oil, grease, dirt, soil, salts, and contaminants by cleaning with solvent, vapor, alkali, emulsion or steam.

D. Quality Assurance. Evaluation of surface preparation for ferrous metals will be based upon NACE Standard TM-01-Visual Standard for Surface Preparation.

1.04 SUBMITTALS

A. Submittals shall be in accordance with the following:

1. Samples. Prepare and submit for Engineer's approval copies of color samples on 8-1/2" x 11" size cards for each paint and protective coating system. Each sample card shall clearly show each coat of the finish system, and shall be clearly marked with the manufacturer's name and product identification, and shall be submitted in sufficient time to allow for approval and, if necessary, disapproval and resubmittal without causing any delay of the project.

2. Coating Materials List.

a. The Contractor shall provide copies of a paint and coating materials list which indicates the manufacturer and paint number, keyed to the coating schedule herein, for approval by the Engineer prior to or at the time of submittal of samples required herein.

b. The Contractor shall include with his submittal, his protective coating schedule for shop and field coatings of items to receive protection. The schedule shall conform to the specified requirements for surface preparation, priming, and coating for items covered, and shall follow the same requirements for similar work where such work has not been specifically called-out. No bare ferrous nonworking surfaces shall be omitted from the schedule. Particular care shall be taken to cover in sufficient detail the coating of mechanical joints and other mechanical devices which shall conform to the recommended practice of the manufacturer of the joint or other mechanical devices.

c. Coatings to be used on plastic and fiberglass materials shall be certified as acceptable by all plastic and fiberglass manufacturers whose products are to be coated. Certification copies shall be submitted to the Engineer. The

Contractor shall be certified in writing by the painting and coating material manufacturers as qualified applicators of their products with copies of the certification submitted to the Engineer.

3. Product Data Sheets. Contractor shall submit paint and coatings material manufacturers' printed technical data sheets for products intended for use in each paint and coating system. Data sheets shall fully describe material as to its intended use, makeup, recommended surface preparation and application conditions, primers, material mixing and application (including recommended dry mil thickness recoat time), precautions, safety and maintenance cleaning directions.

4. Material Safety Data Sheets. Material Safety Data Sheets (MSDS) shall accompany all paint submittals and shall be prominently displayed at the job site during all painting activities.

1.05 PROTECTION OF WORK

A. The Contractor shall be responsible for any and all damage to his work or the work of others during the time his work is in progress.

1.06 EXTRA STOCK

A. One (1) gallon of each type and color of finish paint and coating used on the project shall be provided as extra stock. Extra stock paint shall be supplied in appropriate sealed containers and be clearly labeled as to paint type, formula, and color.

1.07 RIGHT OF REJECTION

A. The Engineer shall have the right to reject all material or work that is unsatisfactory, and require the replacement of either or both at the expense of the Contractor.

1.08 ONE MANUFACTURER

A. To the maximum extent possible, all products shall be the product of one manufacturer unless a specific specialty coating system is `specified. Without exception, all coatings for any service condition specified herein shall be by one manufacturer. Once a paint manufacturer has been selected by the Contractor and approved by the Engineer, the Contractor shall ensure that all equipment manufacturers prime their equipment with the same or a compatible primer. If this cannot be or is not done for any reason, the Contractor shall apply a "universal primer" and recoat with the approved manufacturer's product in the field.

1.09 JOB CONFERENCE

A. Prior to commencing painting work a pre-job conference shall be held for the purpose of reviewing the painting and coating requirements of the project. The County, Engineer, Contractor, Applicator, and the Coatings and Paint Manufacturer shall be present. A schedule of work to be accomplished will be established.

PART 2 - PRODUCTS

2.01 GENERAL

A. Surfaces to receive paint and protective coating materials as herein specified in this Section shall be coated in conformance with the applicable coating systems specified herein. All materials specified by name and/or manufacturer or approved for use under these Specifications, shall be delivered unopened at the job site in their original containers and shall not be opened until inspected by the Engineer.

B. Whenever a manufacturer's brand name is specified, it is intended to define the general type and quality of paint or coating desired. Other coatings or paints of equal quality may be used. Coating materials shall be a product of TNEMEC, unless otherwise specified, or approved equal. All paint and coatings shall be produced and applied as herein called for or, if not specifically called for, it shall be applied in accordance with the manufacturer's printed recommendations as approved by Engineer. So far as possible, all paint and coating materials shall be provided by a single source supplier. Coating materials shall meet Volatile Organic Compounds (VOC) requirements of not more than 3.5 lb./gal. as applied after thinning.

C. General.

1. Paint and protective coating materials shall be sealed in containers that plainly show the designated name, formula or specification number, batch number, color, date of manufacture, manufacturer's directions, and name of manufacturer, all of which shall be plainly legible at the time of use. Pigmented paints shall be furnished in containers not larger than five (5) gallons. Materials shall conform to the specifications shown herein and to the requirements hereinafter specified.

2. Products shall be standard of recognized manufacturer engaged in production of such materials for essentially identical or similar applications in the water and wastewater treatment industry.

D. Compatibility. Only compatible materials shall be used in the work. Particular attention shall be directed to compatibility of primers and finish coats. If necessary, subject to approval of the Engineer, a compatible barrier coat shall be applied between all existing prime coat and subsequent field coats to ensure compatibility.

1. Ductile iron pipe that has an exterior bituminous coating shall not be painted unless the bituminous coating is removed by sand blasting or an appropriate, compatible, intermediate coat is applied before top coating in accordance with this specification.

E. Colors. All colors and shades of colors of all coats of paints and protective coating material shall be as identified in the architectural sketches or schedules or as modified/selected by the County. Each coat shall be of a slightly different shade, as directed by the Engineer to facilitate inspection of surface coverage of each coat.

2.02 SERVICE CONDITION A

A. Ferrous and galvanized metals, other than stainless steel, within wet wells or similar corrosive atmospheres, submerged or intermittently submerged in sludge, sewage, chemical mixtures or similar corrosive liquids shall be prepared and coated in accordance with the following requirements.

B. Surface Preparation. All metal surfaces shall be field sandblasted in accordance with Steel Structures Painting Council Specification SSPC-SP10 (Near White Blast Cleaning). Weld surface, edges, and sharp corners shall be ground smoothly and all weld splatter removed per SSPC-SP3 "Power Tool" or SP2 "Hand Tool" Cleaning. Galvanized metals shall be cleaned per SSPC SP-7 (brush off blast cleaning).

C. Application. Application shall be in strict conformance with the manufacturer's printed recommendations. All sharp edges, nuts, bolts, or other items difficult to coat shall receive a brush-applied coat of the specified coating prior to application of each coat.

D. Except as otherwise noted, the prime coat shall have a minimum thickness of 3 mils and the two finish coats shall have a minimum total dry film thickness of 13 mils. If the finish coat is not applied within manufacturer's recommended time period, an intermediate special surface conditioner shall be applied in advance of finish coats or a light brush blast. The total system shall have a minimum dry film thickness of 16 mils.

TNEMEC System:	Shop Primer - Series 66-1211
	Field Primer - Series 104

Finish Coats - Series 104

2.03 SERVICE CONDITION B

A. Ferrous and galvanized metals, other than stainless steel, subject to seacoast salt air exposures or equivalent chemical attack, shall be prepared and coated in accordance with the following requirements.

B. Surface Preparation. All surfaces shall be free of dirt, dust, grease, or other foreign matter before coating. Ferrous surfaces shall be cleaned in accordance with the Steel Structures Painting Council Specification SSPC-SP7 (Brush-Off Blast Cleaning), and galvanized surfaces shall be cleaned in accordance with SSPC-SP1 (Solvent Cleaning). Weld surface, edges and sharp corners shall be ground smooth and all weld splatter shall be removed per SSPC-SP3 or SP2. Galvanized metal shall be cleaned per SSPC SP-7 (brush off blast cleaning).

C. Application. Application shall be in strict conformance with the manufacturer's printed recommendations. All sharp edges, nuts, bolts, or other items difficult to coat shall receive a brush-applied coat of the specified coating prior to application of each coat.

D. Except as specified below, the prime coat shall have a minimum thickness of 3 mils, intermediate coat shall have a minimum thickness of 4 mils and one or more finish coats minimum total dry film thickness of 10.0 mils.

TNEMEC System:	Primer - Series 66
Intermediate Coat:	Series 66
Finish Coats:	Series 73

2.04 SERVICE CONDITION C

A. Ferrous and galvanized metals, other than stainless steel, subject to mild to moderately severe air exposures or equivalent chemical attack, shall be prepared and coated in accordance with the following requirements.

B. Surface Preparation. All surfaces shall be free of dirt, dust, grease, or other foreign matter before coating. Ferrous surfaces shall be cleaned in accordance with the Steel Structures Painting Council Specification SSPC-SP7 (Brush-Off Blast Cleaning), and galvanized surfaces shall be cleaned in accordance with SSPC-SP1 (Solvent Cleaning). Weld surface, edges and sharp corners shall be ground smooth and all weld splatter shall be removed per SSPC-SP3 or SP2. Galvanized metal shall be cleaned per SSPC SP-7 (brush off blast cleaning).

C. Application. Application shall be in strict conformance with the manufacturer's printed recommendations. All sharp edges, nuts, bolts, or other items difficult to coat shall receive a brush-applied coat of the specified coating prior to application of each coat.

D. Except as specified below, the prime coat shall have a minimum thickness of 3 mils, intermediate coat shall have a minimum thickness of 4 mils and one or more finish coats minimum total dry film thickness of 10.0 mils.

TNEMEC System:	Primer - Series 66
Intermediate Coat:	Series 66
Finish Coats:	Series H2
PORTER System:	Primer – PP286 or PP296
Intermediate Coat:	2200
Finish Coat:	2200

2.05 SERVICE CONDITION D

A. Coating aluminum and non-ferrous metal surfaces, including undersides of aluminum access hatches, frames, and checkered plate, subject to corrosive atmosphere and condensation shall be prepared and coated in accordance with the following requirements.

B. Surface Preparation. Clean non-ferrous surfaces in accordance with SSPC-SP7 (brush-off blast cleaning).

C. Application. Application shall be in strict conformance with manufacturer's printed recommendations, as approved by the Engineer.

D. The prime coat shall have a minimum 3.0 mil DFT and finish coast shall have a minimum 4 mil DFT for a minimum total dry mil thickness of 7 mils:

TNEMEC System:	Primer - Series 66
	Finish Coats - Series 66

2.06 SERVICE CONDITION E

A. Plastic and fiberglass reinforced plastic (FRP) products subject to seacoast salt air exposures shall be prepared and coated in accordance with the following requirements. Coatings to be used for piping and tankage shall be certified by the manufacturer to be completely acceptable and non-injurious.

B. Surface Preparation. Clean surfaces with SSPC-SP1 solvent cleaner. Lightly sand all surfaces.

C. Application. Application shall be in strict conformance with manufacturer's printed recommendations.

D. The prime coat shall have a minimum 3.0 mil DFT and finish coat shall have a minimum of 3.0 mil DFT for a minimum total dry film thickness of 6 mils.

TNEMEC System: Primer - Series 66
Finish Coat - Series 73

2.07 SERVICE CONDITION F

A. Concrete which is subject to submergence and intermittent submergence in water and groundwater shall be prepared and coated in accordance with the following requirements.

B. Surface Preparation. All surfaces shall be cleaned of all dirt, dust, oil, curing compounds, and other deleterious compounds. In general, the concrete shall be reasonably smooth and free of pockets and cavities. All surfaces shall be cleaned by brush blasting (NACE #4 or SSPC-SP7). All surfaces shall be completely dry before application of the coating.

For painting of existing structures, in addition to above, patch concrete with non-shrink grout, replace damaged stucco, and repair cracks in exterior concrete wall surfaces by epoxy injection.

C. Application. Application shall be in strict conformance with the manufacturer's printed recommendations. All coats shall be applied within 24 hours of the previous coat.

D. The prime coat shall have a minimum dry film thickness of 3 mils and intermediate and finish coat shall have a minimum total dry film thickness of 5 mils each. The total system shall have a minimum dry film thickness of 13 mils.

TNEMEC System: Primer - Series 66
Intermediate Coat - Series 66
Finish Coat I - Series 66

2.08 SERVICE CONDITION G

A. Concrete sanitary sewer manholes or similar corrosive atmospheres which are subject to submergence and intermittent submergence in domestic sewage, water and groundwater shall be prepared and coated in accordance with the following requirements.

1. Surface Preparation. All surfaces shall be cleaned of all dirt, dust,

oil, curing compounds, and other deleterious compounds. In general, the concrete shall be reasonably smooth and free of pockets and cavities.

2. Allow new concrete to cure for 28 days. All surfaces shall be cleaned by brush blasting (NACE #6 or SSPC-SP13). All surfaces shall be completely dry before application of the coating.

3. For painting of existing structures, in addition to above, patch concrete with non-shrink grout, repair cracks in concrete wall surfaces by epoxy injection.

B. Application. Application shall be in strict conformance with the manufacturer's printed recommendations. All coats shall be applied within 24 hours of the previous coat.

C. A prime coat is not required on concrete. Coating can be applied in one or two coats. When applied in two coats each coat shall have a minimum dry film thickness of 8 to 10 mils. The total system shall have a minimum dry film thickness of 15 to 20 mils.

TNEMEC System:	Primer – Not required
	Intermediate Coat - Series 46H-413
	Finish Coat I – Series 46H-413

2.09 ARCHITECTURAL PAINT FINISHES

A. Manufacture. Unless otherwise noted, products listed below are the products of TNEMEC coatings. Approved equivalent products will be acceptable.

B. Interior Finishes:

1. Interior Wet Concrete Surfaces (Non-Aggressive Areas)
Surface Preparation: Prefer SSPC-SP7: Brush off Blast Cleaning. If brush off Blast Cleaning is not possible, a double acid etching is recommended. Properly prepared surface should have a profile similar to 100 grit sandpaper. A test patch is recommended when applying epoxy coatings over old, existing coatings.

Materials:
Primer: TNEMEC Series 66 @ 3.0 - 5.0 mils
DFT 2nd Coat: TNEMEC Series 66 @ 4.0 - 6.0 mils DFT (optional)
Finish: TNEMEC Series 66 @ 4.0 - 6.0 mils DFT 11.0 - 17.0 mils DFT

2. Concrete Block Walls (Non-aggressive Environment)
Surface Preparation: Cure 14 days. Remove mortar spatter. Surfaces must be clean and dry.

Materials:
Filler: TNEMEC Series 130 or 54-562 @ 80 SF/Gal
Finish Ct.: TNEMEC Series 113 or 114 @ 4.0 - 6.0 mils DFT

3. Poured Concrete Walls (Non-aggressive Environment)
Surface Preparation: Cure for 28 days. All surfaces must be clean and dry.

Materials:
Primer: TNEMEC Series 113 or 114 @ 4.0 - 6.0 mils DFT.
Finish: TNEMEC Series 113 or 114 @ 4.0 - 6.0 mils DFT.

C. Concrete in aggressive areas (CBW)

1. Surface Preparation. Surfaces shall be cured for 28 days, clean, dry and free from curing compounds, oil, grease, dirt or chalk.

2. Filler. TNEMEC Series 54-660 (block walls only).

3. Prime Coat. One coat of TNEMEC Series 66 applied at 5 mils DFT.

4. Finish Coats. Two coats of TNEMEC Series 66 applied at 5 mils DFT per coat.

D. Concrete Sealed (ECB). Huls Chem-Trete PB at a rate of between 50 and 100 sf/gal. Application shall be sufficient to guarantee complete water repelling for five (5) years.

E. Concrete Waterproof (CWP). One coat, minimum 2lbs. per square yard of Thoroseal by Thoro System Products or approved equal.

2.10 PATCH COAT FOR GALVANIZED SURFACES

A. All galvanized surfaces which are scratched, marred, or otherwise damaged shall be patched with TNEMEC Series 90-97 @ 2.5 - 3.5 mils DFT.

2.11 PRIMER OVER BITUMINOUS COATING

A. Two coats, TNEMEC Series 66, at 4 mils DFT each. Allow bituminous coating to bleed through on first coat. Apply second coat, third coat shall be per service condition schedule.

2.12 UNIVERSAL PRIMER

A. The "universal-primer" shall be a primer which can be applied over any other type of solvent based primer, and be compatible with alkyds, epoxies and urethane finish coats.

PART 3 - EXECUTION

3.01 MANUFACTURER'S RECOMMENDATIONS

A. Unless otherwise specified herein, the paint and coating manufacturer's printed recommendations and instructions for thinning, mixing, handling, applying, and protection of his coating materials; for preparation of surfaces for coating; and for all other procedures relative to coating shall e strictly observed. No substitutions or other deviations will be permitted without written permission of the Engineer.

3.02 DELIVERY AND STORAGE

A. Materials shall be delivered in manufacturer's original, sealed containers, with labels and tags intact. Coating materials and equipment shall be stored in designated areas. Coating containers shall be opened only when required for use. Coatings shall be mixed only in designated areas and in the presence of the Engineer, unless otherwise directed. Coatings shall be thoroughly stirred or agitated to uniformly smooth consistency and prepared and handled in a manner to prevent deterioration and inclusion of foreign matter. Unless otherwise specified or approved, no materials shall be reduced, changed, or used except in accordance with the manufacturer's label or tag on container.

3.03 SAFETY REQUIREMENTS

A. In accordance with the requirements of applicable OSHA Regulations for Construction, the Contractor shall provide and require the use of personal protective equipment for all persons working in or about the project site.

B. Respirators shall be worn by all persons engaged in, and assisting in, spray painting. In addition, workers engaged in or near the work during sandblasting shall wear eye and face protection devices meeting the requirements of A7NSI Z87.1 latest revisions, and approved OSHA Regulations for sand blasting operations and equipment including approved air-purifying, half-mask or mouthpiece respirator with appropriate filter.

C. Ventilation. Where ventilation is used to control potential exposure to workers as set forth in Section 1910.94 of the OSHA Regulations for Construction. Ventilation shall be adequate to reduce the concentration of the air contaminant to the degree that a hazard to the worker does not exist. Methods of ventilation shall meet the requirements set forth in ASNI-Z9.2, latest revision.

D. Sound Levels. In accordance with Sections 1926.52 and 1926.101 of OSHA Regulations for Construction, whenever the occupational noise exposure exceeds maximum sound levels as set forth in Table D-2 ear protective devices shall be fitted and used, and a continuing, effective hearing conservation program shall be administered.

E. Cloths and cotton waste that might constitute a fire hazard shall be placed in closed metal containers or destroyed at the end of each workday.

3.04 STORAGE, MIXING AND THINNING

A. Paint and coating materials shall be protected from exposure to cold weather, and shall be thoroughly stirred, strained, and kept at a uniform consistency during application. Materials of different manufacturers shall not be mixed together. Packaged materials shall be thinned immediately prior to application in accordance with the manufacturer's directions.

3.05 WORKMANSHIP

A. Skilled craftsmen and experienced supervision shall be used on all work.

B. All paint and coatings shall be applied in a workmanlike manner so as to produce an even film of specified uniform thickness. Edges, corners, crevices, and joints shall receive special attention to ensure that they have been thoroughly cleaned and that they receive an adequate thickness of paint. The finished surfaces shall be free from runs, drops, ridges, waves, laps, brush marks, and variations in color, texture, and finish. The hiding shall be so complete that the addition of another coat of paint would not increase the hiding. All coats shall be applied so as to produce a film of uniform thickness. Special attention shall be given to ensure that edges, corners, crevices, welds, and similar areas receive a film thickness equivalent to adjacent areas, and installations shall be protected by the use of drop cloths or other approved precautionary measures.

3.06 PREPARATION FOR PAINTING AND PROTECTIVE COATING

A. All surfaces to receive paint and protective coatings shall be cleaned as specified herein prior to application of coating materials. The Contractor shall examine all surfaces to be coated, and shall correct all surface defects before application of any coating material. Beginning the work of

this Section without reporting unsuitable conditions to the Engineer constitutes acceptance of conditions by the Contractor. Any required removal, repair, or replacement of this work caused by unsuitable conditions shall be done at no additional cost to the County. All marred or abraded spots on shop-primed and factory-finished surfaces shall receive touch-up restoration prior to any other coating application.

B. Mildew shall be removed and neutralized by scrubbing affected areas thoroughly with a solution made by adding two (2) ounces of tri-sodium phosphate and eight (8) ounces of sodium hypochloride to one (1) gallon warm water. Use a scouring powder, if necessary, to remove mildew spores. Rinse with clean water and allow to dry thoroughly before painting.

3.07 ITEMS NOT TO BE COATED

A. Hardware (including all nuts, bolts, shafts, and bolt heads on CV plates), aluminum, stainless steel, switch and receptacle plates, escutcheons, hardware accessories, name plate data tags, machined surfaces and similar items shall be removed or masked prior to surface preparation and painting operations. Following completion of coating of each piece, removed items shall be reinstalled. Such removal and installation shall be done by workmen skilled in the trades involved.

3.08 SANDBLASTING

A. All sandblasting shall be done in strict accordance with the referenced specifications of the Steel Structures Painting Council.

B. When items are to be shop primed or shop primed and finish coated in the shop, surface preparation shall be as specified in this Section. The County or his representative shall have the right to witness, inspect, and reject any sandblasting done in the shop.

C. When sandblasting is done in the field, care shall be taken to prevent damage to structures and equipment. Pumps, motors, and other equipment shall be shielded, covered, or otherwise protected to prevent the entrance of sand. No sandblasting may begin before the Engineer inspects and approves the protective measures.

D. After sandblasting, dust and spent sand shall be removed from the surfaces by brushing or vacuum cleaning.

3.09 APPLICATION OF PROTECTIVE COATINGS

A. Shop Coating. Fabricated metalwork and equipment which requires coating shall be shop primed with specified primer. Any such work

delivered to the job site with any other shop coat shall either have this coating removed or shall be recoated with "universal-primer", and the specified coating applied in the field. Manufactured equipment with approved corrosion resistant factory finishes and galvanized finishes shall be exempt from this requirement.

B. Application of Field Coatings.

1. Except where in conflict with the manufacturer's printed instructions, or where otherwise specified herein, the Contractor may use brush, roller, air spray, or so-called airless spray application; however, any spray painting must first have the approval of the Engineer. Rollers for applying enamel shall have a short nap. Areas inaccessible to spray coating or rolling shall be coated by brushing or other suitable means.

2. The Contractor shall give special attention to the work to ensure that edges, corners, crevices, welds, bolts, and other areas, as determined by the Engineer, receive a film thickness at least equivalent to that of adjacent coated surfaces.

3. All protective coating materials shall be applied in strict accordance with the manufacturer's printed instructions.

4. Prime coat shall be applied to all clean surfaces within a four hour period of the cleaning, and prior to deterioration or oxidation of the surface, and in accordance with the manufacturer's recommendations. Drift from sand-blasting procedures shall not be allowed to settle on freshly painted surfaces.

5. All coatings shall be applied in dry and dust-free environment. No coating or paint shall be applied when the surrounding air temperature, measured in the shade, is below 40 degrees F. No coating or paint shall be applied to wet or damp surfaces and shall not be applied in rain, fog or mist, or when the relative humidity exceeds 90 percent. No coating or paint shall be applied when it is expected that the relative humidity will exceed 90 percent or that the air temperature will drop below 40 degrees F within 8 hours after the application of the coating or paint. Dew or moisture condensation should be anticipated and if such conditions are prevalent, coating or painting shall be delayed until mid-morning to be certain that the surfaces are dry. The day's coating or painting shall be completed well in advance of the probable time of day when condensation will occur, in order to permit the film sufficient drying time prior to the formation of moisture.

6. Each coat shall be applied evenly, at the proper consistency, and free of brush marks, sags, runs, and other evidence of poor workmanship. Care shall be exercised to avoid lapping paint on glass or hardware. Coatings shall be sharply cut to lines. Finished coated surfaces shall be free from defects or blemishes. Protective coverings shall be used to protect floors, fixtures, and equipment. Care shall be exercised to prevent paint from being spattered onto surfaces from which such paint cannot be removed satisfactorily. Surfaces from which paint cannot be removed satisfactorily shall be painted or repainted as required to produce a finish satisfactory to the Engineer. Whenever two (2) coats of a dark colored paint are specified, the first cost shall contain sufficient powdered aluminum to act as an indicator of proper coverage, or the two (2) coatings shall be of a contrasting color.

7. Touch-up of all surfaces shall be performed after installation.

8. All surfaces to be coated shall be clean and dry at the time of application.

C. Time of Coating.

1. Sufficient time shall be allowed to elapse between successive coats to permit satisfactory recoating, but, once commenced, the entire coating operation shall be completed without delay. No additional coating of any structure, equipment, or other items designated to be painted shall be undertaken without specified permission of the Engineer until the previous coating has been completed for the entire structure, piece of equipment, or other items.

2. Piping shall not be finish coated until it has been pressure tested and approved.

D. Thickness of Coating. The dry film mil-thickness specified shall be achieved and verified for each coat.

E. Safety Color Coatings. Existing surfaces to remain which have been previously safety-color coated to identify a potential tripping or low head-room area shall be prepared and recoated with a similar safety color scheme unless directed otherwise by the Engineer.

Any newly constructed areas which will present a potential tripping or low head-room area shall be coated safety yellow in accordance with the appropriate coating system as directed by the Engineer.

3.10 TESTING AND INSPECTION

A. Inspection Devices. The Contractor shall furnish, until final acceptance of coating and painting, inspection devices in good working condition for detection of holidays and measurement of dry-film thickness of coatings and paints. The Contractor shall also furnish U.S. department of Commerce, National Bureau of Standards certified thickness calibration plates to test accuracy of dry-film thickness gauge and certified instrumentation to test accuracy. Dry-film thickness gauges shall be made available for the Engineer's use at all times until final acceptance of application.

B. The Contractor shall conduct film thickness measurements and electrical inspection of the coated surfaces with equipment furnished by him and shall recoat and repair as necessary for compliance with the Specifications.

C. After repaired and recoated ferrous metals areas have cured, final inspection tests will be conducted by the Engineer with equipment provide by the Contractor. Coating thickness specified in mils on ferrous substrates will be measured with a nondestructive magnetic type dry-film thickness gage such as the Elecometer, manufactured by Gardner Laboratories, Inc. Discontinuities, voids, and pinholes in the coatings will be determined with a nondestructive type electrical holiday detector. Epoxy coatings and other thin film coatings will be checked for discontinuities and voids with a low voltage detector of the wet-sponge type, such as Model M1 as manufactured by Tinker and Rasor. Use a non-sudsing type wetting agent, such as Kodak Photo-Flo, which shall be added to the water prior to wetting the sponge. A high voltage, low current, spark type detector such as Model EP, manufactured by Tinker and Rasor, will be used for electrical inspection of only coal tar enamel. Tape type coatings will be inspected for holidays using a device designed for use in detecting such flaws. All pinholes shall be marked, repaired in accordance with the manufacture's printed recommendations and retested. No pinholes or other irregularities will be permitted. Film thickness discrepancies shall be measured and verified with a micrometer or other approved measuring instrument with 5 readings taken every 100 ft^2 of painted surface. Coatings not in compliance with the Specifications will not be acceptable and shall be replaced, and reinspected at Contractor's expense until the Specifications are met.

D. On non-ferrous surfaces, dry film thickness readings shall be taken at random locations with a Tooke Gauge at the rate of approximately five readings per 100 square feet of surface. Grooves cut into coatings shall be repaired by application of all coats of paint or coating film being tested. The average of all readings for a given area or surface shall be within required dry film thickness range and no individual reading shall be more

than 20 percent below the recommended dry film thickness. Any areas that are found to be below standard shall be marked and recoated to obtain proper film thickness.

3.11 CLEAN-UP

A. Upon completion of the work, staging, scaffolding, and containers shall be removed from the site or destroyed in an approved manner. Paint spots, oil, or stains upon adjacent surfaces shall be removed.

3.12 PAINT AND COATING SCHEDULE

A. General. The following schedule shall indicate the coating systems to be used and applies to all new and renovated facilities, unless otherwise specified. Color selection shall be as selected by the County. The list shall not be construed as a complete list of all surfaces to be coated but rather as a guide as to the application of the various coating systems. All surfaces shall be painted except those specifically excluded herein. Where reference is made to ferrous metal in this schedule, it shall not include stainless steel.

B. General Coating System. The following table shall indicate the coating system. For the coating systems, "Piping" shall be defined as all pipes, valves, fittings, supports, and guides. Mechanical equipment shall include all motors, pumps and accessory equipment requiring a protective coating.

TABLE I

COATING SYSTEM SCHEDULE

Item	Service Condition
Exposed ferrous and galvanized metal piping and equipment (interior and exterior).	B
Exterior exposed ferrous metal, Fire hydrants, valve box lids, meter box lids, ballard/ guard post, above ground meter and backflow assemblies not exposed to a corrosive atmosphere	C
Exposed plastic and FRP pipe, conduit, and tankage.	E
Exterior of manholes, storm inlets, and interior/exterior of reject pond intake structure.	F
Exterior exposed wall surfaces of new and existing concrete tank or structure walls	F
Interior of sanitary manholes.	G
Guard posts (bollards) and hydrants.	B
Interior concrete and concrete block surfaces.	FDB
Exterior new and existing stucco surfaces	FDB

END OF SECTION

SECTION 31 23 33

EXCAVATION AND BACKFILL FOR PIPES

PART 1 – GENERAL

1.01 SCOPE OF WORK

A. This work covers clearing and grubbing, site work, excavation, and backfill for sanitary sewers, force mains, potable water mains, reclaimed water mains and their appurtenances.

1.02. BURNING

A. Burning of debris will not be permitted.

1.03 CLEAN-UP

A. Clean-up is an essential part of the work. As the work progresses and is completed, the Contractor shall clean the various sites of all operations and completely restore all work areas to the satisfaction of the Engineer and the County. This clean-up shall be done as promptly as practical and shall not be left until the end of the construction period. No part of the work shall be considered complete, and no payment will be made, until clean-up is completed.

B. It is the Contractor's responsibility to assure that all construction sites and all other affected properties are restored to a condition equal to, or better than, the existing conditions prior to construction. All restoration is subject to the approval of the Engineer and/or Property Owners.

1.04 DRAINAGE

A. It is the responsibility of the Contractor to maintain the existing drainage systems during construction. Any damage done to an existing drainage structure or system is to be immediately repaired to a condition equal to or better than its original condition.

1.05 DUST CONTROL

A. It is the responsibility of the Contractor to control all dust problems that may occur during the construction with required watering. Dust control will be required seven days a week.

1.06 SPRINKLERS

A. The Contractor shall be responsible for sprinklers encountered within the area of excavation and shall make sure that if disturbed or damaged, they shall be rebuilt to the satisfaction of the Engineer or property Owner and with no additional cost to the County.

1.07 EROSION CONTROL

A. It is the Contractor's responsibility to erect suitable silt fences, hay bales or other erosion runoff control devices prior to commencement of earth moving or excavation activities. The Contractor shall be responsible for maintaining the silt fences, hay bales or other erosion runoff control devices in an effective manner, repairing or replacing damaged or ineffective section during the course of the work until a ground cover of grass is established and final environmental approval has been obtained.

1.08 PERMITS FOR DEWATERING OPERATIONS

A. The Contractor is responsible for obtaining all permits required for dewatering discharges, including a Florida Department of Environmental Protection Generic Permit for Produced Groundwater.

PART 2 - PRODUCTS

2.01 MATERIALS

A. General

1. Materials for use as fill are described below. For each material, the Contractor shall notify the testing lab of the source of the material at least ten (10) calendar days prior to the date of anticipated use of such material.

2. Materials shall be furnished as required from off site sources and hauled to the site.

3. Disposal of unsuitable material is specified in this Section.

B. Common Fill

1. Common fill shall consist of mineral soil, free of organic material, loam, wood, trash and other objectionable materials, which may be compressible or which cannot be compacted properly. Common fill shall not contain stones larger than four inches in any dimension, broken concrete, masonry, rubble, or other similar materials. It

shall have physical properties such that it can be readily spread and compacted during filling.

2. Material falling within the above Specification, encountered during the excavation, may be stored in segregated stockpiles for reuse. All material, which in the opinion of the Engineer, is not suitable for reuse shall be spoiled as specified herein for disposal of unsuitable materials.

C. Crushed Stone

1. Crushed stone for pipe bedding shall be FDOT No. 57 in accordance with Section 901-2 of the FDOT Standard Specifications for Road and Bridge Construction.

D. Select Fill

1. Select fill shall be noncohesive, non-plastic material free of all debris, lumps or clods. Fill material shall be clean earth fill composed of sand or an approved mixture of clay and sand. Backfill material placed within one foot of piping and appurtenances shall not contain any stones or rocks larger than two inches in diameter, or three-quarter inch in diameter for PVC pipe.

PART 3 - EXECUTION

3.01 SAFETY PRECAUTIONS AND TEMPORARY WORKS

A. The Contractor shall provide and maintain adequate barricades, construction signs, torches, flashers and guards as required in pedestrian and vehicular traffic areas. All safety rules and regulations of local authorities shall be observed. Local fire officials shall be kept advised of roads closed and roads re-opened.

B. Where required, the Contractor shall provide suitable crossings at street intersections and driveways, and supply such aid, as may be required for pedestrians and motorists, including delivery vehicles, to safely negotiate the construction area. "Street Closed to Through Traffic" signs and "Detour" routes shall be indicated and maintained by the Contractor when the job is located in a public or private street or way. In the case of dead end streets, the Contractor shall advise all concerned residents and make all arrangements to maintain reasonable ingress and egress for the residents. Particular attention shall be given to residents in bad health, emergencies and emergency vehicles. The Contractor shall be responsible for building and maintaining all by-pass roadway areas and restoring those areas to their original condition.

C. The Contractor shall furnish temporary or permanent support, adequate protection and maintenance of all underground facilities and utilities

encountered. Support, protection, maintenance and restoration are the Contractor's responsibility at no additional cost to the County.

3.02 CLEARING AND GRUBBING

A. The Contractor shall remove only vegetation such as trees, shrubs, and grass which interferes with the construction, as may be determined by the Engineer, and he shall preserve and protect all other existing vegetation.

3.03 EXCAVATION

A. General

1. The Contractor shall perform all excavation of every description, and of whatever substances encountered, to the depth indicated on the Drawings, or as otherwise specified.

2. Trench excavation shall be such that the pipe can be laid to the alignment and grade required. Trenches shall be shored and drained in such a manner that work may proceed safely and efficiently.

3. Trench dewatering pumps shall discharge to natural drainage channels, drains or sewers and shall be adequate to remove accumulated storm and/or subsurface water. The Contractor shall take necessary action to prevent surface water from flowing into the trenches. It is the responsibility of the Contractor to assure that all trench walls and trench bottoms are dry and remain dry during pipeline construction.

4. The Contractor shall separate, remove and dispose of excavated material not suitable for backfill, as directed by the Engineer.

5. All excavated material retained for backfill shall be piled in such a manner as not to endanger the work or obstruct the sidewalks, driveways or drainage. Fire hydrants, valve pit covers and hoses, curb stop boxes, fire and police call boxes and other utility controls shall be unobstructed and accessible at all times during construction.

B. Unclassified Excavation

1. Unclassified excavation shall include soil, clay, silt, sand, muck, gravel, hardpan, loose shale, loose stones in masses and boulders measuring less than one-half cubic yard in volume.

C. Classified Excavation

1. Classified excavation shall be rock further defined as follows: boulders, measuring one-half cubic yard or more in volume, rock material in ledges, bedded deposits and unstratified masses, conglomerate deposits firmly cemented and concrete or masonry structures, except sidewalks and paving, that in the opinion of the Engineer required for its removal drilling and blasting, wedging, sledging, barring or breaking up with a power operated hand tool.

2. No soft or disintegrated rock that can be removed with a hand pick or power operated excavator or shovel, no loose, shaken, or previously blasted rock or broken stone in rock fillings or elsewhere, and no rock exterior to the minimum limits of measurement allowed, which may fall into the excavation, will be considered as rock.

3.04 TRENCH PREPARATION

A. Unsupported trench width shall be limited to the minimum practicable width allowing working space to place and compact the haunching material. The maximum width shall be the pipe diameter plus one foot on each side of the pipe at springline for pipe in unsupported trenches. In sheeted trenches the width of trench between faces of the sheeting shall be adequate to allow the pipe bedding and haunching to be placed and completed, and the sheeting removed without disturbing the bedding and haunching material within two) pipe diameters on each side of the pipe. Trench boxes and moveable sheeting shall be wide enough to allow moving without disturbing the bedding and haunching within two pipe diameters on each side of the pipe. Trench boxes and moveable sheeting shall be constructed and used in the trench to avoid disturbing the piping, bedding and haunching when being moved forward in the trench.

B. Dewatering of the trench bottom shall be accomplished using adequate means to allow preparation of bedding, placement of haunching and pipe in a trench environment without standing water. Dewatering shall continue until sufficient backfill is placed above the pipe to prevent flotation.

C. The trench shall be dug so that the pipe can be laid to the alignment and depth required, and it shall be excavated only so far in advance of the pipe laying as allowed by the Engineer. The trench shall be so braced and drained that the workmen may work in it safely and efficiently. All trench preparation shall comply with all of the latest applicable Local, State (Florida Trench Safety Act) and Federal Regulations (OSHA: Safe Trench Act). It is essential that the discharge of the trench dewatering pumps be conducted to natural drainage channels, drains or storm sewers.

D. Bell holes shall be provided at each joint to permit the joint to be made properly. Ledge rock, boulders and large stones shall be removed to

provide a clearance of six inches on all pipe twenty-four (24) inches and smaller and nine inches on pipe larger than twenty-four (24) inches. If such removal is required, backfilling will be done with selected material approved by the Engineer and tamped to establish the proper grade.

E. Trench Bottom

1. Where the bottom of the trench at subgrade is found to be unstable or to include ashes, cinders, refuse, vegetable or other organic matter, or large pieces or fragments of inorganic material that, in the judgment of the Engineer, should be removed, the Contractor shall excavate and remove such unsuitable material to the width and depth as directed by the Engineer. Before the pipe is laid, the subgrade shall be made by backfilling with an approved material in three inch uncompacted layers. The layers shall be thoroughly tamped as specified by the Engineer to provide the uniform and continuous bearing support as heretofore described.

2. The trench shall be dry when the bottom is prepared. The trench bottom shall be excavated, or filled and compacted, as required to bring it to grade and shaped to receive and support the pipe barrel. In addition, bell holes shall be excavated so that after placement only the barrel of the pipe receives bearing pressure from and is uniformly supported by, the bottom of the trench. Preparation of the trench bottom and placement of the pipe shall be such that the final position of the pipe is true to line and grade, and uniformly supported throughout the barrel of each length. When pipe is placed in refill material, additional refill of the same material shall be tamped on each side of the barrel to the springline, thus forming a trough of firm bedding.

F. All materials that, in the opinion of the Engineer, are suitable for reuse in restoring the disturbed surface shall be kept separated from the general excavation material and can only be used as directed by the Engineer.

G. All excavated material shall be piled in a manner that will not endanger the work and that will avoid obstructing sidewalks and driveways. Hydrants, valve pit covers, valve boxes, curb stop boxes, fire and police call boxes, or other utility controls shall be left unobstructed and accessible until the work is completed. Gutters, drainage inlets, natural water courses and miscellaneous drainage structures shall be kept clear or other satisfactory provisions made for their proper operation.

H. Hand methods for excavation shall be employed when damage to existing facilities is likely if heavy equipment is utilized or as directed by the Engineer.

3.05 DEPTH

A. Gravity Sewers

1. The depth of trenches for gravity sewers shall be such that the invert of the pipe will be at elevations shown on the plan .Gravity sewers shall be on straight alignment and constant grade between manholes.

B. Overdepth

1. When classified excavation is required, the rock shall be excavated to a minimum depth of six inches below the trench depths as indicated on the drawings or Specifications. Authorized overdepths in rock excavation shall be refilled to grade with loose granular moist earth or shell thoroughly tamped in place.

C. Trench shall be excavated to the depth required so as to provide a uniform and continuous bearing and support for the pipe on solid and undisturbed ground at every point between bell holes, except as necessary for removal of pipe slings or other lifting tackle. Any part of the bottom of the trench excavated to a point below the specified grade shall be corrected with approved material at the Contractor's expense and thoroughly tamped as directed by the Engineer.

D. Wherever unstable soil or muck that is determined by the Engineer to be incapable of properly supporting the pipe is encountered in the bottom of the trench, such material shall be removed to the required depth and the trench refilled as specified to proper grade. If, in the opinion of the Engineer, removal of the unstable material by this method is impractical, then the Contractor shall support the pipe as detailed on the plans, or as directed by the Engineer.

3.06 BACKFILL

A. General

1. The Contractor shall not perform any of the backfilling operations until after he has inspected the lines and found them to be acceptable to the County.

2. Backfill material shall consist of earth, loam, sandy clay, sand, gravel, soft shale or other materials, free from organic materials, large clods of earth, or stones. Where excavated material is not suitable for

backfill, it shall be replaced by excess excavated material from other areas.

3. In all areas, backfill material shall be deposited in six -inch layers and carefully tamped until the compacted backfill depth reaches one foot above the top of pipe.

4. No mechanical equipment, or machinery other than a hand operated mechanical vibrator, will be allowed within the trench area until the backfill has been properly tamped to one foot above the top of pipe. The remainder of the backfill shall be deposited in one foot layers and thoroughly tamped. Settling the backfill with water will be permitted, if approved by the Engineer.

5. Where trenches are improperly backfilled, or where settlement occurs, the trenches shall be reopened to the depth required for proper compaction, refilled and compacted, and the surface restored to the required grade and compaction, mounded over and smoothed off.

B. Gravity Sewers

1. Haunching of native material shall be placed to the springline and compacted. If ground water, or trench bottom conditions, is such as to require use of Class I material, either to aid in dewatering, or to provide foundation and bedding for the pipe, the haunching shall also be of Class I material. Class I material contains angular, 1/4 inch to 1 1/2 inch graded stone. Care shall be taken to place the haunching material, without voids, completely filling the trench from pipe wall to trench wall.

C. Compaction Requirements

1. Trenches located under pavement or inside the two feet horizontal to one foot vertical slope, downward from roadway shoulder or the back of curb and from spring line to bottom of sub-grade or the finished surface of the embankment, as appropriate, shall be compacted to a density of one hundred (100) percent as determined by AASHTO T-99 Method C.

2. Trenches located outside of the two feet horizontal to one foot vertical slope downward from roadway shoulder or the back of curb and where no vehicular traffic will pass over the trenches, back fill shall be compacted to a density approximately equal to that soil adjacent to

the trench but not less than ninety-five (95) percent of the maximum density as determined by AASHTO T-99, Method-C.

3. Backfill testing shall be performed in accordance with Pinellas County Minimum Testing Frequency Requirements, latest edition, unless called out differently by the Engineer on the plan documents.

D. Testing of Backfill

1. Trenching within, or across roadways, or other areas to be paved, or stabilized shall be backfilled and compacted to their full depth. Compaction shall be as specified in the Special Provisions or on the Plans.

2. Density tests for backfilled trenches within, or across roadways, shall be performed as specified or as directed by the Engineer, with at least one test taken at different locations for each vertical foot beginning from two feet over pipe to ground level.

3. Backfill testing shall be performed in accordance with Pinellas County Minimum Testing Frequency Requirements, latest edition, unless called out differently by the Engineer on the plan documents.

4. Where unsatisfactory compaction is revealed by the test, the Contractor shall re-excavate, backfill, re-compact and/or rework the backfill as required, to obtain the required degree of compaction over the entire depth of the trench.

5. Satisfactory backfill compaction is an integral part of pipe laying, paving, and stabilizing. Satisfactory density reports shall be on file before each Contractor's statement is submitted for payment.

E. Disturbance of Sewer Mains

1. Sewer mains shall be checked by the Contractor to determine whether any displacement of the pipe has occurred after the trench has been backfilled to two feet above the pipe. If such inspection shows poor alignment, displaced pipe or any defects, these defects shall be remedied to the satisfaction of the Engineer by the Contractor at his expense.

3.07 DISPOSAL OF SURPLUS MATERIAL

A. All excavated material not required or not suitable for fill, or backfill, shall be disposed of by the Contractor, as directed by the Engineer.

B. Material suitable for backfill is to be stockpiled on, or near site, until released by the Engineer for disposal.

3.08 SHEETING AND BRACING

A. The Contractor shall do all shoring and sheeting required to perform and protect the excavation and, as required, for the safety of the employees.

B. All trenches shall be sheeted and braced as required by the Engineer and all applicable Federal, State, County and Municipal regulations. Sheeting and bracing shall be used to prevent shifting of adjacent soil and to prevent damage to structures or the work. The sole responsibility for the design, methods of installation, and adequacy of the sheeting and bracing, shall be and shall remain that of the Contractor.

C. Sheeting and bracing or approved laying box shall be used in all trenches unless the slopes are excavated until the natural angle of repose of the soil is encountered.

D. In general, sheeting and bracing shall be removed as the excavation is backfilled in such a manner as to avoid the caving in of the bank or disturbance of adjacent areas or structures. The voids left by withdrawal of the sheeting and bracing shall be carefully filled by jetting, ramming or other means approved by the Engineer. Permission shall be obtained from the Engineer prior to removal of any sheeting or bracing. Permission shall not relieve the Contractor of any responsibility for damage due to failure to leave such sheeting and bracing in place.

E. The Engineer may order, in writing, any or all sheeting or bracing to be left in place for the purpose of preventing injury to adjacent structures, property, etc. If left in place, such sheeting shall be cut off at the elevation ordered, but in no case less than thirty-six (36) inches below the existing grade. Bracing remaining in place shall be driven in tight. The right of the Engineer to order sheeting and bracing to remain in place shall not be construed as creating any obligation on his part to issue such orders. Payment for sheeting and bracing, unless specifically called for on the Drawings shall not be paid under separate item, but shall be included in the payment for other items of Work.

3.09 DEWATERING BY WELLPOINT

A. Wellpoints shall be spaced and at sufficient depths as required to eliminate water during the excavation period until the work is completed. Ample means and equipment shall be provided with which to remove promptly, and dispose properly all water entering any excavation. This

includes the use of sand or gravel as required to maintain adequate flow during the pipe laying or installation of other items of work within the excavation.

B. Water pumped or drained shall be disposed of in a suitable manner without damage to adjacent property to other work under construction or to street pavements or public parks. Water shall not be discharged onto streets without adequate protection of the surface at the point of discharge. All gutter, drains, culverts, sewers and inlets shall be kept clean and open for surface drainage. Water shall not be directed across or over pavements except through approved pipes or properly constructed troughs. Contractor shall obtain permission from the owner of any property involved before digging ditches or constructing water courses for removal of water, and provide for disposal of the water without ponding or creating a public nuisance. Water may be discharged into storm sewers. Payment for dewatering shall not be paid for under a separate item, but shall be included in the payment for other items of work, unless it is specifically included as a Pay Item in the Contract.

3.10 APPURTENANCES

A. Excavation for manholes and other appurtenances shall be made to size that will allow at least twelve (12) inches between their outer surfaces and the embankment or shoring. Overdepth excavation and backfill to required depth below such appurtenances that have not been directed by the Engineer shall be at the expense of the Contractor.

END OF SECTION

SECTION 31 23 34

EXCAVATION AND BACKFILL FOR STRUCTURES

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. This work involves clearing and grubbing, site work, excavation and backfill for sanitary sewer manholes, wet wells and other buried utility structures.

1.02 BURNING

A. Burning of debris will not be permitted.

1.03 CLEANUP

A. Cleanup is an essential part of the work. As the work progresses and is completed, the Contractor shall clean the site of all operations and completely restore the area to the satisfaction of the Engineer. This cleanup shall be done as promptly as practicable and shall not be left until the end of the construction period. No part of the work shall be considered complete and no payment will be made until cleanup is completed.

B. It is the Contractor's responsibility to assure that all construction sites and all other affected properties are restored to a condition equal to, or better than, the existing conditions prior to construction. All restoration is subject to the approval of the Engineer.

1.04 DRAINAGE

A. It is the responsibility of the Contractor to maintain the existing drainage systems during construction. Any damage done to an existing drainage structure or system is to be immediately repaired to a condition equal to or better than its original condition.

1.05 DUST CONTROL

A. It is the responsibility of the Contractor to control all dust problems that may occur during the construction with required watering. Dust control will be required seven days a week.

1.06 SPRINKLERS

A. The Contractor shall be responsible for sprinklers encountered within the area of excavation and shall make sure that if disturbed or damaged, they shall be rebuilt to the satisfaction of the Engineer and with no additional cost to the County.

1.07 EROSION CONTROL

A. It is the Contractor's responsibility to erect suitable silt fences, hay bales or other erosion runoff control devices prior to commencement of earth moving or excavation activities at the locations indicated on the plans. The Contractor shall be responsible for maintaining the silt fences, hay bales or other erosion runoff control devices in an effective manner, repairing or replacing damaged or ineffective section during the course of the work until a ground cover of grass is established.

1.08 PERMITS FOR DEWATERING OPERATIONS

A. The Contractor is responsible for obtaining all permits required for dewatering discharges, including a Florida Department of Environmental Protection Generic Permit for Produced Groundwater.

PART 2 – PRODUCTS

2.01 FILL MATERIALS

A. Compacted granular fill which will provide support for building or structure foundations will be referred to as "structural fill." Backfill which is placed against the exterior side of the building walls or structures, or as fill over pipe lines, will be referred to as "common fill."

B. Materials for compacted structural granular fill shall be gravel, sandy gravel, or gravely sand free of organic material, loam, wood, trash, and other objectionable material and shall be well-graded within the following limits:

Sieve Size	Percent Finer by Weight
6-in.	100
No. 4	20 - 95
No. 40	0 - 60
No. 200	0 - 8

C. Common Fill

1. Common fill shall consist of mineral soil, free of organic material, loam, wood, trash and other objectionable material which may be compressible or which cannot be compacted properly. Common fill

shall not contain stones larger than ten (10) inches in any dimension, broken concrete, masonry, rubble or other such materials. It shall have physical properties such that it can be readily spread and compacted during filling.

2. Material falling within the above Specification, encountered during the excavation, may be stored in segregated stockpiles for reuse. All material which, in the opinion of the Engineer, is not suitable for reuse shall be spoiled as specified herein for disposal of unsuitable materials.

D. Crushed Stone

1. Crushed stone shall be used for a drainage layer below structures with underdrains and at other locations indicated on the Drawings.

2. Crushed stone shall be size No. 57 with gradation as noted in Table 1, Section 901 of Department of Transportation, Construction of Roads and Bridges.

2.02 UNSUITABLE MATERIAL

A. Highly organic soil ASTM D 2487 Group PT, topsoil, roots, vegetable matter, trash and debris.

PART 3 – EXECUTION

3.01 SAFETY PRECAUTIONS AND TEMPORARY WORKS

A. The Contractor shall provide and maintain adequate barricades, construction signs, torches, flashers and guards as required in pedestrian and vehicular traffic areas. All safety rules and regulations of local authorities shall be observed. Local fire officials shall be kept advised of roads closed and roads re-opened.

B. Where required, the Contractor shall provide suitable crossings at street intersections and driveways, and supply such aid, as may be required for pedestrians and motorists, including delivery vehicles, to safely negotiate the construction area. "Street Closed to Through Traffic" signs and "Detour" routes shall be indicated and maintained by the Contractor when the job is located in a public or private street or way. In the case of dead end streets, the Contractor shall advise all concerned residents and make all arrangements to maintain reasonable ingress and egress for the residents. Particular attention shall be given to residents in bad health, emergencies and emergency vehicles. The Contractor shall be responsible for building and maintaining all by-pass roadway areas and restoring those areas to their original condition.

C. The Contractor shall furnish temporary or permanent support, adequate protection and maintenance of all underground facilities and utilities encountered. Support, protection, maintenance and restoration are the Contractor's responsibility at no additional cost to the County.

3.02 CLEARING AND GRUBBING

A. The Contractor shall remove only vegetation such as trees, shrubs, and grass which interfere with the construction, as may be determined by the Engineer, and he shall preserve and protect all other existing vegetation.

3.03 JOB CONDITIONS

A. Lateral Support of Excavation for Structures

1. Furnish, put in place, and maintain sheeting and bracing required to support the sides of the excavations, to prevent any movement which could in any way diminish the width of the excavation below that necessary for proper construction, and to protect structures, pipe and utilities from damage due to lateral movement or settlement of ground. If the Engineer is of the opinion that at any point sufficient or proper supports have not been provided, he may order additional supports put in at the expense of the Contractor, and compliance with such order shall not relieve or release the Contractor from his responsibility for the sufficiency of such supports.

B. Dewatering for Structures

1. Furnish, install, maintain, operate, and remove a temporary dewatering system, as required to lower and control the groundwater level, so that the structures may be constructed in the dry. The Contractor shall, at his own expense, correct all damage resulting from inadequacy of the dewatering system or from flooding or the construction site from other causes.

2. The dewatering system shall be adequate to drain any excavated area, to maintain the water at such a level as to permit construction in the dry, and to maintain the lowered water table until the structure has been completed to the required stages.

3. Continuously maintain excavation in a dry condition to prevent damage to the subsoil or fill during interruptions due to weather, labor strikes, power failures or other delays. Provide and have ready for immediate use at all times diesel or gasoline powered

standby pumping units to serve the system in case of failure of the normal pumping units.

4. Piping and boiling, or any form of uncontrolled seepage, in the bottom or sides of the excavation shall be prevented at all times. If for any reason the dewatering system is found to be inadequate to meet the requirements set forth herein, the Contractor shall, at his own expense, make such additions, changes and/or replacements as necessary to provide a satisfactory dewatering system.

C. Control of Groundwater Level

1. Maintain the groundwater level at or below subgrade of the structure until the concrete structures are up high enough to: (1) prevent flooding the structure, (2) support both bottom and top levels of walls, and (3) prevent flotation.

2. After the structure has been completed in its entirety, backfill as described hereinafter.

3. Flotation shall be prevented by maintaining a positive and continuous operation of the dewatering system. The Contractor shall be fully responsible and liable for all damages which may result from failure of this system.

4. Disposal of drainage water shall be in an area approved by the Engineer. Precautions shall be taken to prevent the flow or seepage of drainage back into the drainage area. Particular care shall be taken to prevent the discharge of unsuitable drainage to a water supply or surface water body.

5. Removal of the dewatering system shall be accomplished after the dewatering system is no longer required.

3.04 EXCAVATION

A. General

1. The Contractor shall perform all excavation of every description, and of whatever substances encountered, to the depth indicated on the Drawings, or as otherwise specified.

2. Excavation shall be such that the structures can be installed at the grades required. Excavations shall be shored and drained in such a manner that work may proceed safely and efficiently.

3. Dewatering pumps shall discharge to natural drainage channels, drains or sewers and shall be adequate to remove accumulated storm and/or subsurface water. The Contractor shall take necessary action to prevent surface water from flowing into the excavations. It is the responsibility of the Contractor to assure that all excavation walls and bottoms are dry and remain dry during construction.

4. The Contractor shall separate, remove and dispose of excavated material not suitable for backfill, as directed by the Engineer.

5. All excavated material retained for backfill shall be piled in such a manner as not to endanger the work or obstruct the sidewalks, driveways or drainage. Fire hydrants, valve pit covers and hoses, curb stop boxes, fire and police call boxes and other utility controls shall be unobstructed and accessible at all times during construction.

B. Unclassified Excavation

1. Unclassified excavation shall include soil, clay, silt, sand, muck, gravel, hardpan, loose shale, loose stones in masses and boulders measuring less than one-half cubic yard in volume.

C. Classified Excavation

1. Classified excavation shall be rock further defined as follows: boulders, measuring one-half cubic yard or more in volume, rock material in ledges, bedded deposits and unstratified masses, conglomerate deposits firmly cemented and concrete or masonry structures, except sidewalks and paving, that in the opinion of the Engineer required for its removal drilling and blasting, wedging, sledging, barring or breaking up with a power operated hand tool.

2. No soft or disintegrated rock that can be removed with a hand pick or power operated excavator or shovel, no loose, shaken, or previously blasted rock or broken stone in rock fillings or elsewhere, and no rock exterior to the minimum limits of measurement allowed, which may fall into the excavation, will be considered as rock.

3.05 STRUCTURE EXCAVATION AND COMPACTION PROCEDURES - GENERAL

A. Excavation shall be made to such widths as will give suitable room for construction of the structures, for bracing and supporting, pumping and drainage; and the bottom of the excavations shall be rendered firm and dry and in all respects acceptable to the Engineer.

B. Excavation and dewatering shall be accomplished by methods which preserve the undisturbed state of subgrade soils. Subgrade soil which becomes soft, loose, "quick," or otherwise unsatisfactory for support of structures as a result of inadequate excavation, dewatering or other construction methods shall be removed and replaced by structural fill as required by the Engineer at the Contractor's expense.

C. Dewatering shall be such as to prevent boiling or detrimental underseepage at the base of the excavation as specified herein. The Contractor shall install such means as required to preserve the stability of the base of the operation.

D. Excavating equipment shall be satisfactory for carrying out the work in accordance with the Specifications. In no case shall the earth be ploughed, scraped or dug with machinery so near to the finished subgrade as to result in excavation of, or disturbance of material below grade, the last of the excavated material being removed with pick and shovel just before placing of concrete or working mat thereon.

E. During final excavation to subgrade level, take whatever precautions are required to prevent disturbance and remolding of the subgrade. Material which has become softened and mixed with water shall be removed. Hand excavation of the final three to six inches will be required as necessary to obtain a satisfactory undisturbed bottom. The Engineer will be the sole judge as to whether the work has been accomplished satisfactorily.

F. All structure areas shall be stripped, cleared and grubbed of all surface vegetation and root laden top soils.

G. After stripping, the structure areas should be leveled sufficiently to permit equipment traffic and then proof-rolled with a vibratory roller with at least a twenty (20) ton static weight. Careful observations should be made during proof-rolling of the stripped subgrade area to identify any areas of soft yielding soils that may require over excavation and replacement.

H. Compaction should continue until the minimum density specified in the Special Provisions or on the Plans is achieved.

3.06 BACKFILLING AND COMPACTION

A. Structural fill shall be placed in loose lifts not exceeding twelve (12) inches and should be compacted to the minimum density specified in the Special Provisions or on the plans.

B. Common fill may be used as backfill against the exterior walls of the structures, including manholes, wet wells and storm structures, or in other areas as designated by the Engineer. Common fill shall be placed in loose lifts not exceeding twelve (12) inches and should be compacted to the minimum density specified in the Special Provisions or on the plans.

C. Materials placed in fill areas shall be deposited to the lines and grades shown on the Drawings making due allowance for settlement of the material and for the placing of topsoil thereon.

D. The surfaces of filled areas shall be grades to smooth true lines, strictly conforming to grades indicated on the paving and grading Drawings, and no soft spots or uncompacted areas will be allowed in the work.

E. No compacting shall be done when the material is too wet either from rain or from excess application of water. At such times, work shall be suspended until the previously placed and new materials have dried sufficiently to permit proper compaction.

F. Density tests shall be performed by an engineering testing laboratory as specified or as directed by the Engineer.

G. When a density test is scheduled and a time agreed upon by the Engineer and Contractor, it shall be the Contractor's responsibility to properly prepare the area in advance.

H. Where unsatisfactory compaction is revealed by the test, the Contractor shall re-excavate, backfill, re-compact and/or rework the backfill as required, to obtain the required degree of compaction.

3.07 SHEETING LEFT IN PLACE

A. Where damage is likely to result from withdrawing sheeting, upon direction of the Engineer, the sheeting shall be left in place.

3.08 DISPOSAL OF SURPLUS MATERIAL

A. All excavated material not required or not suitable for fill, or backfill, shall be disposed of by the Contractor, as directed by the Engineer.

B. Material suitable for backfill is to be stockpiled on, or near site, until released by the Engineer for disposal.

3.09 GRADING

A. Grading in preparation for placing of topsoil, planting areas, paved walks and drives, and appurtenances shall be performed at all places that are indicated on the Drawings, to the lines, grades, and elevations shown and

otherwise as directed by the Engineer. Such work shall be performed in a manner that the requirements for formation of slopes, lines, and grades can be followed. All material encountered, of whatever nature, within the limits indicated, shall be removed and disposed of as directed. During the process of grading, the subgrade shall be maintained in such condition that it will be well drained at all times. When directed, temporary drains and drainage ditches shall be installed to intercept or divert surface water which may affect the progress or condition of the work.

B. If, at the time of grading, it is not possible to place any material in its proper section of the permanent structure, it shall be stockpiled for later use. No extra payment will be made for the stockpiling or double handling of excavated material.

C. The right is reserved to make minor adjustments or revisions in lines or grades, if found necessary as the work progresses, due to discrepancies on the Drawings or in order to obtain satisfactory construction.

D. Stones or rock fragments larger than four inches in their greatest dimensions will not be permitted in the top six inches of the finished subgrade of all fills or embankments.

E. In cuts, all loose or protruding rocks on the back slopes shall be barred loose or otherwise removed to line or finished grade of slope. All cut and fill slopes shall be uniformly dressed to the slope, cross section, and alignment shown on the Drawings or as directed by the Engineer.

F. No grading is to be done in areas where there are existing pipe lines that may be uncovered or damaged until such lines have been located and it has been determined if such lines must be maintained are relocated, or where lines are to be abandoned, all required valves are closed and remaining pipes are plugged.

END OF SECTION

SECTION 32 12 01

STABILIZED AND ASPHALT ROADWAY RESTORATION

PART 1 – GENERAL

1.01 SCOPE OF WORK

A. Contractor shall furnish all labor and materials required to restore stabilized roadways and asphalt paving as specified herein.

B. Workmanship and materials shall be in accordance with Department of Transportation requirements for new pavement for roads under their jurisdiction. Any local or County Road shall be restored in accordance with permits or ordinances of the municipality having jurisdiction over such road or street. Restoration of flexible pavement shall conform to the approved permit or utility license for each road crossing.

C. Where applicable, all work shall conform to the Technical Specifications of Florida Department of Transportation "Standard Specifications for Road and Bridge Construction", latest edition (Divisions II and III) and "Roadway and Traffic Design Standards", latest edition, including any amendments thereto. The Contractor shall acquire his own copies of the Department of Transportation Standards. In the event of conflict between the Department of Transportation Standards and the Specifications listed in these documents, the Engineer shall determine which shall govern.

1.02 SUBMITTALS

A. Shop drawings for the proposed materials of construction, including an asphalt job mix formula, shall be submitted to the Engineer for approval at least two weeks prior to the application of stabilized or paved surfaces.

PART 2 – PRODUCTS

2.01 SUBBASE

A. Materials used should be high bearing value soil, sand-clay, ground limestone, crushed limerock, coquina, or any other material suitable for stabilization. Muck shall not be used.

2.02 BASE

A. Limerock for use as base material shall meet the requirements of Florida Department of Transportation Standard Specifications for Road and Bridge Construction, Section 911. The limerock producer shall address

each truck receipt to the Contractor and the job site. Each receipt will show the source of the material by D.O.T. pit number. One copy of each receipt will be submitted daily to the County for his records.

B. Coquina shell used in the base course shall have an organic material of not greater than 0.5 percent nor contain significant quantities of sand or other impurities, which would prevent bonding. At least ninety-seven (97) percent of the coquina used shall pass through a 3 1/ 2-inch ring.

C. Crushed concrete base material shall conform to the following gradation:

Sieve Size	Percent by Weight Passing
2"	100
1 1/2"	95-100
3/4"	65-90
3/8"	45-75
No. 4	35-60
No. 10	24-45
No. 50	5-25
No. 200	0-10

1. Material for Crushed Concrete Base shall consist only of crushed concrete and such additive materials as may be approved by the Engineer for the purpose of facilitating construction and achieving the desired characteristics of the finished in-place product. Material which shows a significant tendency toward adverse chemical or physical change on exposure to moisture will not be acceptable. The material shall be free of any ferrous metals.

2. The material shall not contain lumps, balls, or pockets of sand or clay material in size or quantity sufficient to be detrimental to the proper bonding, finishing or strength of the crushed concrete base.

3. The specific mechanical and physical properties of crushed concrete aggregate and any additive materials permitted in the construction of crushed concrete base shall be determined on the basis of test results as the work progresses.

D. Reclaimed Asphalt Pavement Base

1. Reclaimed asphalt base material may be used on paved shoulders, bike paths and other non-traffic applications. Materials shall be in accordance with Section 283 of the FDOT Standard Specifications for Road and Bridge Construction.

2.03 PRIME AND TACK COATS

A. Bituminous prime coats shall be applied to previously prepared bases. Bituminous tack coats shall be placed on existing paved surfaces and between successive lifts of asphalt material.

B. The prime coat shall be cut-back asphalt Grade RC-70 or RC-250, emulsified asphalt Grades SS-I or CSS-I, or other types and grades of bituminous material specified or approved by the Engineer.

C. The tack coat shall be emulsified asphalt, Grades RS-2, SSI-I, CSS-I, SS-IH, CSS-IH, AS-60, AE-90, AE-150, or asphalt emulsion prime.

D. A cover material must be placed on the prime coat to insure that the prime coat remains intact until the surface course is placed.

2.04 ASPHALT WEARING SURFACE

A. The bituminous wearing surface applied shall be that specified in the Plans or contract documents.

B. Asphalt mixes for FDOT roadways shall be as required by the FDOT permit or as specified.

C. If no asphalt mix is specified on Pinellas County roads, Type PC-III asphaltic concrete shall be used as the paving material, unless otherwise indicated. Design mix properties shall be in accordance with Pinellas County's Specifications.

PART 3 - EXECUTION

3.01 PAVEMENT AND BASE REMOVAL

A. Pavement removal shall be held to the minimum width consistent with good construction practice. The pavement material shall be carefully separated from other excavated materials and will not be permitted to be included in the backfill, but shall be satisfactorily disposed of by the Contractor. Base materials may be salvaged and stockpiled for reuse as stabilizer, subject to the approval of the Engineer. Reuse of salvaged base material as new base material is not permitted.

3.02 ASPHALT REMOVAL

A. All asphalt street pavement removed shall be replaced with base and surface materials which are of a quality and thickness equal to or more than the materials removed. The edges of the paving shall be cut to neat lines beyond any settled or broken areas. Pavement shall be replaced as soon as practicable after compaction of backfill.

3.03 SURFACE TREATED STREETS

A. All surface treated streets removed shall be replaced with at least six inches of compacted shell or limerock as directed by the Engineer. This base shall be primed and sanded and maintained until overlayed.

3.04 REPLACING STABILIZED ROADWAY

A. The Contractor shall restore cuts in all stabilized roadway surfaces using the same type and grade of material used on the existing street surface. After the pipelines and/or appurtenances have been installed and properly backfilled as herein specified, the Contractor shall bring the roadway surface to grade and ready the surface to receive the stabilization material. The stabilizing materials shall be of high-bearing value such as sand, clay, oyster shell, coquina shell, rock screening, crushed concrete or any other material which, as allowed by the agency with jurisdiction over such road and that, in the opinion of the Engineer, is suitable for stabilization.

B. The stabilizing material shall be applied in such quantities as may be necessary to bring the top six inches of the roadway surface to a bearing value as hereinafter specified and to the proper line and grade. The material shall be incorporated with the roadbed material by plowing, disking, harrowing, blading, and mixing with a rotary tiller, or any other equipment approved by the Engineer. The mixed materials shall be of uniform density throughout the width and depth of the layer being

processed. After thoroughly mixing to a uniform texture, the surface shall be compacted by rolling with any type of equipment that will produce the density required. Compaction shall continue until the entire depth to be stabilized has a value determined from tests made on the 6-inch compacted thickness, of not less than the requirements set forth by the agency having jurisdiction over the road.

3.05 RESURFACING

A. When pavement replacement is complete, certain streets as directed by the County, shall be resurfaced for the full width of the existing paved section. Resurfacing shall be consistent with the requirements set forth by the governmental agency that has jurisdiction over the road.

B. Materials for resurfacing shall be as specified on the Drawings.

3.06 SUBBASE PREPARATION

A. Prior to installation of base material, the area shall be graded to within 0.2± feet, and soft, spongy or mucky material removed. Sufficient stabilizing material shall be cut in to achieve a Florida Bearing Value (FBV) in excess of 75 psi or limerock bearing ratio (LBR) greater than forty (40) pounds at a minimum density of ninety-eight (98) percent of a maximum density as defined and measured in ASSTHO T-180 (Modified Proctor), to a six inch minimum depth.

B. Density tests for subbase materials shall be taken at three hundred (300) foot intervals in a staggered pattern and around structures as required. If compaction procedures allow, testing requirements may be reduced or increased at the Engineer's discretion.

3.07 BASE COURSE CONSTRUCTION

A. General

1. The base course shall be constructed on the prepared subgrade, in accordance with the Specifications and Plans. All base material shall be placed in accordance with the lines, grades, notes, and typical cross sections shown on the Plans. Any deviation from the Plans is subject to the approval of the Engineer. Any deviations not approved by the Engineer shall be repaired to the satisfaction of the Engineer at no expense to the County.

B. Limerock, Reclaimed Asphalt or Crushed Concrete Base Course

1. Base shall be spread by mechanical spreaders, equipped to produce an even distribution with a uniform thickness. When the specified compacted thickness of the base is greater than six inches, the base shall be constructed in two courses. The thickness of the first course shall be one-half the total thickness of the finished base. After spreading is completed, the entire surface shall be scarified and shaped so as to produce the required grade and cross section after compaction. If two courses are required, each lift shall be prepared as previously described. Prior to spreading of the upper course, density tests will have been taken for the lower and determined to be satisfactory.

2. When the material does not have the proper moisture content to ensure the required density, it shall be wet or dried as required. When adding water, it shall be uniformly mixed in by disking to the full depth of the course that is being compacted.

3. All materials shall be compacted to a density of not less than ninety-eight (98) percent of maximum density as determined by AASHTO T 180. Density tests shall be taken at three hundred (300) foot intervals in a staggered pattern and around structures as required. Density determinations shall be made at more frequent intervals, at no extra cost, if deemed necessary by the Engineer.

4. The finished surface of the base course shall be checked with a template cut to the required crown and a fifteen foot straight edge laid parallel to the center line of the road. All irregularities greater than one-quarter inch shall be corrected to the satisfaction of the Engineer.

5. The base material shall extend at least twelve (12) inches outside the edge of the finished paved surface, unless otherwise indicated. Thickness of the base shall be measured at two hundred (200) foot intervals at various points in the cross section. Measurements shall be taken at various points on the cross section through holes not less than three inches in diameter and at locations, as specified by the Engineer. Where the compacted thickness is deficient by one-half inches or more, the Contractor shall correct the deficiency by scarifying and adding material for a distance of one hundred (100) feet in each direction from the edge of the deficient area. The required thickness, compaction and cross section will then be achieved.

6. Prime coat shall be applied only when the base meets the specified density and the moisture content in the top half of the base does not exceed ninety (90) percent of the optimum moisture of the base material.

C. Asphalt Base Course.

1. Asphalt base courses shall be applied in accordance with DOT Standards and Specifications, Section 234. The job mix formula approved for the Project shall be used. Any deviation from the approved mix must be submitted to the Engineer and approved before being implemented.

2. The base course material shall be placed with an approved paving machine. A motor grader may be required if a leveling course is needed. The base mix may be placed when the air temperature is at least forty (40) degrees F and rising, provided that the sub-grade is not frozen or affected by frost.

3. A paver, equipped with automatic screed control, shall be used for all machine-laid courses. The automatic joint matcher shall be used on the top course of the base after the first pass with a paving machine. All mixtures shall be laid by the stringline method, with the exception of areas adjacent to curb and gutter or other true edges. The temperature of the mix shall be between three hundred (300) degrees F and three hundred fifty (350) degrees F. Any mixture caught by rain in transit may be laid at the Contractor's own risk; if removal and replacement is required, it shall be at the expense of the Contractor. In no case shall the mixture be spread when rain is falling or when there is water on the surface to be covered. The layer thickness for asphalt concrete structure courses shall be as shown on the Drawings.

4. Compaction

a. After the asphalt mixture has been spread to the proper lines, grades, and cross sections, compaction operations may begin. The Contractor shall establish rolling procedures and submit his sequence of compaction operations to the Engineer for approval. The equipment used may include, but is not committed to steel-wheeled rollers, pneumatic tired rollers, and vibratory rollers. Areas which are inaccessible to a roller shall be compacted by the use of hand tamps or other satisfactory means. An entire sequence of compaction operations shall be performed for each layer of applied material, density determinations shall also be made.

b. The in-place density of each course shall be determined through core samples and the nuclear backscatter method. A core sample of a representative paving section shall be taken every two hundred fifty (250) feet. Additional testing around manholes or other structures may be required. In addition to density tests via core samples, Marshall stability tests are also required. Marshall stability tests will be taken for every day of asphalt pavement production.

E. Shell Base Course

1. Shell base material shall be constructed on the prepared subgrade in accordance with these Specifications and in conformity with the lines, grades and cross sections shown on the Plans. The shell base shall be spread uniformly and evenly; during spreading operations the shell shall be thoroughly saturated with water.

2. After spreading the shell shall be compacted, with water being added as required, until the required density is obtained. Compaction and density shall be as required for limerock base, except that the testing methods shall be modified in the laboratory and in the field. At least three density determinations shall be made on each day's final compaction operations.

3. Upon completion of initial compaction, the entire surface shall be scarified and shaped to exact crown and cross section. The base shall then be rewatered and compacted to the required density. The finished surface shall be tested with a template and fifteen (15) foot straight edge. All irregularities greater than one-quarter inch shall be corrected to the satisfaction of the Engineer. The prime coat shall be applied after the base meets all density and finish requirements.

3.08 ASPHALT WEARING SURFACE

A. The asphalt wearing surface shall be constructed on the prepared base in accordance with the Plans and Specifications and in conformity with the indicated lines, grades, and cross sections.

B. The mixture shall be spread only when the base is clean, dry, properly cured, and approved by the Engineer. The temperature shall be at least forty (40) degrees F and rising. No paving operations will be permitted if it is raining or rain is imminent. The mix shall be between three hundred (300) F and three hundred fifty (350) degrees F.

C. The asphalt mixture shall be spread with an approved paving machine to the required width and depth. All mixes, except those adjacent to curb and gutter, shall be laid according to the stringline method. The depth of each layer shall be checked every fifty (50) feet.

D. The mixture shall be compacted to its final depth, no less than one and one half inch and thicker for new roads and one inch for overlays. Compaction and layering procedures specified for asphalt base courses shall apply to surface courses. All testing and density requirements will also apply.

E. When laying operations are interrupted, a transverse joint shall be constructed by cutting back on the previous run to expose the full depth of material. Longitudinal joints are to be sloped or rolled over and sealed. When the adjacent strip is constructed, the edge shall be trimmed back to expose the unsealed face. All longitudinal construction joints shall be offset six inches to twelve (12) inches laterally between layers.

F. When fresh mixture is laid against transverse or longitudinal joints, it shall be placed in contact to produce an even, well compacted joint after rolling.

G. The finished surface shall be tested with a template and fifteen (15) foot straight edge. Any irregularities shall be repaired to the satisfaction of the Engineer. The surface shall be of uniform texture and compaction. No sand spots, ripples, or loosened portions shall be evident. No traffic shall be allowed onto the finished surface until it is deemed acceptable by the Engineer.

Pinellas County
Public Works Roadway Pavement Guidelines

In accordance with County Ordinance 92-62, Article III, Section 154 (Ordinance Needs to be updated to show Superpave Surface Course)

	Arterial	**Collector (Major/Minor) Commercial / Industrial**	**Residential Medium Traffic**	**Residential Light Traffic**
Structural Coefficient	**4.17**	**3.28**	**3.06**	**2.46**
Asphalt Superpave Surface	Type SP-12.5 Fine, Traffic Level "C" 3" min. thick (2 lifts) (0.44) (1.32 Total)	Type SP-12.5 Fine, Traffic Level "C" 2" min. thick (0.44) (0.88 Total)	Type SP-9.5 Fine, Traffic Level "C" 1-1/2" min. thick (0.44) (0.66 Total)	Type SP-9.5 Fine, Traffic Level "C" 1-1/2" min. thick (0.44) (0.66 Total)
Base (Compacted 98% of AASHTO T-180)	Limerock 10 ½" Min. Thickness (Min. 100 LBR) (0.18) (1.89 Total)	Limerock 8" Min. Thickness (Min. 100 LBR) (0.18) (1.44 Total)	Limerock 8" Min. Thickness (Min. 100 LBR) (0.18) (1.44 Total)	Limerock 6" Min. Thickness (Min. 100 LBR) (0.18) (1.08 Total)
Sub-Base (Compacted 98% of AASHTO T-180)	12" min. thickness (Stab. w/min. 40 LBR) (0.08) (0.96 Total)	12" min. thickness (Stab. w/min. 40 LBR) (0.08) (0.96 Total)	12" min. thickness (Stab. w/min. 40 LBR) (0.08) (0.96 Total)	9" min. thickness (Stab. w/min. 40 LBR) (0.08) (0.72 Total)
Two Lane Roadway Pavement Width	28' Total (with or without curbs)	28' Total (with or without curbs)	24' Total (with or without curbs) (28' for type F curb)	24' Total (with or without curbs) (28' for type F curb)
				4-10-08

Structural Layer Coefficients for Optional Base: Superpave Type B-12.5 Base= 0.30, Crushed Concrete Base= 0.15

END OF SECTION

SECTION 32 13 01

CONCRETE SIDEWALKS, DRIVEWAYS AND GUTTERS

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. Contractor shall furnish all labor and materials required to restore and construct concrete sidewalks, driveways and gutters as specified herein.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Sidewalk shall be 3000 psi concrete, at least four feet wide, five feet wide on arterial and collector streets, and four inches thick, except at driveways. Driveway sidewalks shall be six inches thick with six inches by six inches #10 wire mesh reinforcing.

B. Replacement of concrete driveways shall be in accordance with County Standards (six inches, 3000 psi/28 day with 6 x 6 # 10 mesh from back of curb to property line).

C. Curb and curb and gutter shall consist of 3000 psi/28 day concrete.

D. Expansion joints shall be installed between the back-of-curb and concrete driveways, and between concrete driveways and sidewalks, where new concrete abuts old concrete.

PART 3 – EXECUTION

3.01 CURB AND GUTTER

A. Curb or curb and gutter removal, where required in the construction of this work, shall be held to a minimum. Curb and gutter material to be removed shall be carefully separated from the trench excavation material and shall be disposed of as directed. The Contractor shall replace all curb or curb and gutter which has been removed. Curb and gutter shall be removed up to the nearest regular joint on each side of the trench.

B. Curb or curb and gutter shall be replaced as soon as possible after the backfill is placed and compacted and shall duplicate in all respects the original construction. Workmanship shall be in accordance with the best standard practices for this type of work. Curb and curb and gutter shall

consist of 3,000 psi/28 day concrete reinforced with bars or mesh of the same size, spacing and number as the section of curb or curb and gutter it replaces.

3.02 SIDEWALKS

A. Sidewalk removal, where required in the construction of this work, shall be held to a minimum. Sidewalk material removed shall be carefully separated from the trench excavation material and shall be disposed of as directed. Sidewalk shall be cut at the nearest regular joint on each side of the trench.

B. The Contractor shall replace all sidewalks which are removed. Sidewalks shall be replaced as soon as practicable after the backfill is placed and compacted and shall duplicate, in all respects, the original sidewalk.

C. The Contractor shall replace all sidewalks which are damaged by the construction operation or by the heavy equipment traveling over them and shall replace them at their own expense.

D. The top surface of all sidewalks shall be given a light broom finish.

3.03 DRIVEWAYS

A. Concrete driveways that are crossed or traversed by the trenches shall be restored to the conditions existing prior to the excavation.

B. Removal shall be held to a minimum, but when necessary removal shall be made in neat sawcut lines or to the nearest joint if approved by the Engineer.

3.04 TESTS

A. The quality of the concrete as to conformance to the specifications is the entire responsibility of the Contractor until it is accepted in place. When required by the County or the Engineer, the Contractor shall arrange for field testing. Field testing shall include, but may not be limited to, the following:

1. Compressive Strength Test: Compressive strength tests shall be made by breaking standard six inch diameter by twelve (12) inch high test specimens prepared, cured and broken in accordance with the American Society for Testing Materials Standard Methods C 31 and C 39, Latest Revision. Four specimen test cylinders shall be taken from each concrete pour of five cubic yards or more. One additional test shall be taken from each fifty (50) cubic yards or

fraction thereof in each pour in excess of thirty (30) cubic yards. One cylinder from each pour shall be broken at seven days, the remainder at twenty-eight (28) days. Additional test cylinders may be ordered for determining the characteristics of a new design mix or changes in equipment or methods, and under adverse weather or curing conditions.

2. Slump Test: Slump test shall be made in accordance with ASTM C 143, and shall be made on each load of concrete unless directed differently by the County or Engineer.

3. Reports: Proper reports of all tests performed by the laboratory shall be prepared by the laboratory and submitted promptly to the County and Engineer. Such reports shall be properly labeled so as to identify the portions of the Project into which the materials are being placed, and the results of the test indicating whether or not the test met the requirements of these specifications.

3.05 CAUSE FOR REJECTION

A. Should the concrete fail to conform to all the requirements of this Section, the Engineer may require the Contractor to remove the defective concrete and reconstruct the work as directed.

END OF SECTION

SECTION 32 92 01

SEEDING AND SODDING

PART 1 – GENERAL

1.01 SCOPE OF WORK

A. Where required by the Engineer, areas along the work shall be grassed and mulched in accordance with Section 570, of the latest edition of the State of Florida Department of Transportation "Standard Specifications for Road and Bridge Construction".

B. The area to be grassed and mulched along the work shall include all damaged cover over the backfilled trench and area adjacent thereto irrespective of the cause of damage, whether it be from handling of pipe, trenching or driving equipment.

1.02 QUALITY ASSURANCE

A. Requirements

1. It is the intent of this Specification that the Contractor is obliged to deliver a satisfactory stand of grass as specified. If necessary, the Contractor shall repeat any or all of the work, including grading, fertilizing, watering, and seeding or sodding at no additional cost to the County until a satisfactory stand is obtained.

B. Satisfactory Stand

1. For purposes of grassing, a satisfactory stand of grass is herein defined as a full lawn cover over areas to be seeded or sodded, with grass free of weeds, alive and growing, leaving no bare spots larger than 3/4 square yard within a radius of ten (10) feet.

1.03 SUBMITTALS

A. Provide technical data as required for shop drawings on all materials or installation procedures required under this Section.

B. When required by the Engineer, submit representative topsoil samples for analysis by a private laboratory to determine nutrient deficiencies and outline a proper fertilization program.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Fertilizer

1. Fertilizer shall be a complete fertilizer, the elements of which are derived from organic sources. Fertilizer shall be a standard product complying with State and Federal fertilizer laws.

2. Percentages of nitrogen, phosphorus and potash shall be based on laboratory tests on the actual soils. For purpose of bidding, assume four percent nitrogen, eight percent phosphorus and four percent potash by weight. At least fifty (50) percent of the total nitrogen shall contain no less than three percent water-insoluble nitrogen.

3. Fertilizer shall be delivered to the site, mixed as specified, in the original unopened standard size bags showing weight, analysis and name of manufacturer. Containers shall bear the manufacturer's guaranteed statement of analysis, or a manufacturer's certificate of compliance covering analysis shall be furnished to the Engineer. Store fertilizer in a weatherproof place and in such a manner that it will be kept dry and its effectiveness will not be impaired.

4. Superphosphate shall be composed of finely ground phosphate rock as commonly used for agricultural purposes containing not less than twenty (20) percent available phosphoric acid.

B. Seed

1. Grass seed shall be the same as existed prior to construction or as approved by the Engineer and shall be ninety-nine (99) percent minimum purity, eighty (80) percent minimum germination and one percent maximum weed seed, labeled in accordance with U.S. Department of Agriculture Rules and Regulations under Federal Seed Act in effect. Seed which has become wet, moldy, or otherwise damaged in transit or storage shall not be acceptable.

2. Hydroseed may be utilized if approved for use by the Engineer.

C. Sod

1. Sod shall be St. Augustine or Argentine Bahia, or the same as existed prior to construction, of firm texture having a compacted growth and good root development as approved.

2. Sod shall be certified to meet Florida State Plant Board Specifications, absolutely true to varietal type, and free from weeds or other objectionable vegetation, fungus, insects and disease of any kind.

3. Before being cut and lifted the sod shall have been mowed three times with the final mowing not more than a week before cutting into uniform dimensions.

D. Mulch

1. Mulch for use with seeding shall be fresh hay. Rate of application specified herein shall correspond to depth not less than one inch or more than three inches according to texture and moisture content of mulch material.

E. Water

1. It is the Contractor's responsibility to water the site, as required during seeding and sodding operations and through the maintenance period and until the work is accepted. The Contractor shall make whatever arrangements may be necessary to ensure an adequate supply of water to meet the needs for his work. The Contractor shall also furnish all necessary hose, equipment, attachments and accessories for the adequate irrigation of lawns and planted areas as may be required.

PART 3 - EXECUTION

3.01 SHOULDER STABILIZATION, SEEDING, MULCHING AND SODDING

A. The Contractor shall protect and restore road shoulders, ditch banks and other natural or artificial slopes as directed by the Engineer. Except where soil-cement rip-rap is shown and/or directed, protection shall be provided by stabilizing to a minimum LBR as set forth by the agency with jurisdiction over such road, and/or seeding and mulching the shoulders of the road.

B. The Contractor shall apply 4-8-4 fertilizer at a rate of six hundred (600) pounds per acre on all seeded areas. All seed or seed mixture used is subject to the approval of the Engineer.

3.02 GRASS AND SHRUBBERY PLOTS

A. Grass plots and graded areas shall be restored to the condition existing prior to making the excavation. All shrubbery, ornamental trees and other planting shall be fully protected. If it is necessary to remove any shrubbery or planting to accomplish the work, it shall be satisfactorily replaced before the work will be accepted. A 4-8-4 fertilizer shall be applied to all replaced sod at

a rate of six hundred pounds per acre.

B. The areas in which the grass plots and shrubbery are to be replaced shall contain sufficient moisture, as determined by the Engineer, for optimum results after being placed. The areas shall be kept in a moist condition for no less than three weeks. The moistened condition shall extend at least to the full depth of the rooting zone.

3.03 NEW SOD PLACEMENT

A. Whenever a suitable area has been graded and requires sodding, the Contractor shall, when directed by the Engineer, proceed at once with the sodding of the available areas. Sodding shall be incorporated into the Project at the earliest practical time in the life of the contract. No sod which has been cut for more than seventy-two (72) hours shall be used unless specifically authorized by the Engineer after his careful inspection thereof. Any sod which is not placed within twenty-four (24) hours after cutting shall be stacked in an approved manner and properly maintained,.

B. The sod shall be placed on the prepared surface, with edges in close contact, and shall be firmly and smoothly embedded by light tamping or rolling with appropriate tools or equipment.

C. Where sodding is used in drainage ditches, the setting of the pieces shall be staggered, such as to avoid a continuous seam along the line of flow. Along the edges of such staggered areas the offsets of individual strips shall not exceed six inches. In order to prevent erosion caused by vertical edges at the outer limits, the outer pieces of sod shall be tamped so as to produce a feather-edge effect.

D. On areas where the sod may slide, due to height and slope, the Engineer may direct that the sod be pegged with pegs driven through the sod blocks into firm earth, at suitable intervals.

E. Any pieces of sod which, after placing, show an appearance of extreme dryness shall be removed and replaced with new sod.

F. Ditch banks disturbed during the construction of ditch and creek crossings shall be sodded when directed by the Engineer or when called for in the permit requirements.

G. Watering and fertilizing requirements shall conform in all respects to those specified above.

END OF SECTION

SECTION 33 01 32

SANITARY SEWER CLEANING AND TELEVISING

PART 1 – GENERAL

1.01 SCOPE

A. The Contractor shall provide for routine maintenance cleaning and closed circuit television inspection (CCTV) of assigned pipes and inspection of manholes within the Pinellas County sanitary sewer collection system including removal and disposal of debris removed during the cleaning process, which is preventing the design flow of the pipe, prevent blockages and restore the sewer to near full capacity and self-scouring velocity. The contractor shall be aware that this specification requires work in active sewers.

B. The Work includes furnishing all plant, labor, tools, equipment and materials including various forms of specialized pipe cleaning, and televising of sanitary sewage mains and related manholes, and all operations to support the primary maintenance cleaning and inspection activities are also to be provided.

C. This specification section also applies to new installation, replacement and repair inspection for compliance documentation of construction specifications.

1.02 SAFETY CODE REQUIREMENTS

A. The Contractor shall conduct his operations in strict accordance with all applicable Federal, State, and Local safety codes and statutes and shall be fully responsible and obligated to maintain procedures for safety of the public as well as work, personnel and equipment involved in the project.

B. The Contractor shall at all times during the course of the cleaning and televising conform to Occupational Safety and Health Administration (OSHA) and all other applicable safety codes or standards. No additional compensation will be allowed for OSHA or other safety code standards or requirements.

C. The Contractors shall conform to traffic control requirements of the State of Florida Department of Transportation at all sites within roadway right-of-ways.

1.03 SUBMITTALS

A. The Contractor shall submit the following information:

1. Information on all types of processes that will be used for cleaning.
2. Copies of PACP/ MACP certifications for personnel performing television and manhole inspections.
3. Manufacturer's certification that the equipment to be used meets the referenced standards and these specifications.
4. Proposed equipment and procedures for accomplishing the work.
5. Proposed personnel assigned to the cleaning work.

PART 2 – EQUIPMENT

2.01 CLEANING EQUIPMENT

A. All sanitary sewer pipes shall be cleaned with truck-mounted high velocity hydraulic cleaning (hydra-cleaning) equipment and equipped vacuum debris removal system. Sufficient high pressure hose length should be available on the vehicle described to perform cleaning on manhole runs up to 900 linear feet in length. High pressure hose should be at least 1 inch in diameter with the ability to deliver at least 80 gallons per minute at 3,000 PSI. Water tanks on the vehicle should be at least 1,200 gallons in capacity. All controls for cleaning equipment shall be located so that the equipment can be operated above ground.

B. The nozzle and skids used for cleaning should be designed for use in a manner consistent with the diameter of the pipe being cleaned. Specialty heads and nozzles may be required for hardened debris, grease, and scale removal.

C. Cutting heads to remove intruding roots or projecting obstructions will also be required and shall be designed specifically for the diameter of the pipe in which they are used.

D. Vacuum debris removal system shall be used to remove sand, silt, grease, rocks, bricks, and all other debris from manholes during the cleaning process. It is essential that the debris be removed from the wastewater system and not allowed to move into adjacent pipes or manholes. Wastewater removed from the collection system during the vacuuming process can be decanted back into the system only after being allowed to settle sufficiently to prevent solid materials from also re-entering the system.

E. Contractor shall provide equipment capable of removing all sand, dirt, rocks and other debris from the sewer reach to allow unobstructed remote television internal inspection of all internal surfaces.

F. Cleaning system shall utilize a device capable of dislodging sediments found in sewer lines without damaging the structural integrity of the pipe. Cleaning devices shall have sufficient power to force and move the debris commonly found in large diameter sewers to a manhole for extraction. Cleaning method may maintain normal sewer flows during the cleaning process.

G. Contractor shall certify that backup cleaning equipment, including machines, devices, tools, etc, is available and can be delivered to the site with in 24 hours.

H. Contractor shall provide all equipment required for specialty cleaning including removing roots and de-scaling sewer pipes.

2.02 CLOSED CIRCUIT TELEVISION EQUIPMENT

A. Video inspection shall be performed using National Association of Sewer Companies (NASSCO) Pipeline Assessment and Certification Program (PACP) certified software.

B. Closed Circuit Television Inspection Equipment shall produce a color video.

C. Pipe inspection camera shall be a pan-and-tilt and radial viewing pipe inspection camera that pans a minimum of ± 275 degrees and rotates 360 degrees.

D. A slope indicator shall be included on the camera and accurately calibrated per manufacture's instructions for measurement of pipe slope.

E. A camera with an accurate footage counter shall be used, which displays on the monitor the exact distance of the camera from the centerline of the starting manhole.

F. The camera will be capable of height adjustment so that the camera lens is always centered at one-half the inside diameter, or higher, in the pipe being televised.

G. Lighting for the camera shall be suitable to allow a clean picture of the entire periphery of the pipe. A reflector in front of the camera may be required to enhance lighting in dark or large diameter pipe.

H. The camera, television monitor and other components of the video system shall be capable of producing a minimum 500-line resolution colored video picture.

I. Video data shall be provided to the County in a digital format such as a external removable drive, or other device or media, as required by the County to be uploaded to the CCTV inspection database.

J. Video data shall be PACP database compliant and compatible with the County's existing Granite XP software database system.

PART 3 – EXECUTION

3.01 NEIGHBORHOOD NOTIFICATION

A. Not less than 48 hours prior to the commencement of work in a right-of-way, the Contractor shall notify all residents and businesses affected by the work with an approved printed door hanger notice indicating the schedule date of work, the type of work, and Contractor's and superintendent's name, address and telephone number. The notice shall contain wording indicating any disruption of sanitary service or access to property that may be required to perform the work. Disruption in sanitary sewer service shall not exceed four hours. Access to private property shall be maintained at all times.

3.02 DEWATERING

A. All gravity sanitary sewer pipes (lines) less than 48" in diameter shall be dewatered for cleaning and inspection purposes. Lines 48" and larger may be cleaned and inspected without dewatering only when the County agrees that dewatering in not feasible. Each exception to the dewatering requirement shall be considered on a case by case basis. Contractor will assume that dewatering is required for bidding purposes.

B. Dewatering may be accomplished by pumping water around the work area or by plugging off pipes to isolate the portion of the system being worked on while cleaning and performing inspection. If plugging the line is used for dewatering purposes, the system must be properly monitored so that no overflows occur. If a pipe that has been rehabilitated by the installation of a liner is plugged, the liner must be braced at the manhole to prevent movement of the liner pipe.

3.03 CLEANING

A. The sewers shall be cleaned by removing dirt, rock, sand, roots and other deleterious materials from the pipe and manholes. The cleaning

equipment shall remove grease or roots and restore ninety-five (95) percent of original pipe inside diameter.

B. All necessary precautions are to be taken to protect the sewer lines from damage resulting from the cleaning and inspection process. Reimbursement for damage to the sewer infrastructure or damage or flooding of private or public property, as a direct or indirect result of the cleaning and inspection operation shall be the responsibility of the Contractor.

C. Contractor shall be responsible for all permits required to perform assigned Work.

D. Contractor shall obtain permission from the property owner whenever access to manholes in easements and right-of-way is required for equipment.

E. Cleaning and inspection work required includes, but not limited to the following:

a. Field locating all manholes along the sewer pipes to be cleaned.
b. Maintaining and protecting both vehicular and pedestrian traffic, and meeting all requirements of the County and all other government agencies having jurisdiction.
c. Cleaning and inspecting existing sanitary sewer pipes and manholes, as herein specified, and to record the inspection information in the format identified by the County.
d. Disposal of waste, sediment and debris as specified herein.
e. Removal of roots, scale, and protrusions as specified herein.
f. Cleaning and restoring the work area as the work progresses and after the completion of all work activities.
g. All other work required for the complete and satisfactory cleaning and inspection of the pipeline and adjacent manholes.

3.04 CLEANING PROCEDURE

A. After determining and performing all preliminary requirements, Contractor shall thoroughly clean assigned pipelines sufficiently to permit an unrestricted inspection by closed circuit television. The Contractor shall remove accumulated grease, roots, sand, rock, bricks, sludge and all other debris that obstructs video inspection such that all portions of the pipe being inspected will be clearly visible.

B. Contractor shall remove all brick, rocks, debris, sludge, dirt, sand, grease, roots and other materials from the sewers shown in the work order, and collect and remove the resulting debris from the manholes of the sewer section being cleaned. Equipment shall decant or separate the water from the solids before it is transported to the designated disposal site. Liquid decanted from the solids shall be returned to the sewer. Debris remaining in the sewer after cleaning shall not exceed 5% of the pipe diameter. Passing waste material between manholes, causing line stoppages, accumulations of sand, or damage to the pumping equipment, shall not be permitted.

C. Contractor shall complete a NASSCO Manhole Assessment and Certification Program (MACP) manhole inspection form for both upstream and downstream terminal manholes during cleaning and inspection operation.

D. Normal cleaning consists of removing all debris and requires a minimum of two passes. The first pass shall be restricted to 800 psi at the nozzle head. The second and subsequent passes shall be at 1200 psi.

E. Specialty cleaning consists of removing all heavy grease, roots and tuberculation by use of special equipment such as a high pressure de-scaling head, root cutter, or other mechanical means approved by the County.

F. Contractor is responsible for damage to the sewer as a direct result of the cleaning method.

G. Contractor shall use all cleaning equipment in accordance with manufacturer's recommendations to prevent damage to sewer lines.

H. Contractor shall immediately notify the County if fresh soil, pieces of pipe, or other visible signs of potential problems occur during cleaning operations.

I. Contractor shall ensure that water pressure created does not cause damage due to flooding of property being served by sewer section(s) involved.

J. Contractor shall conform to the following requirements:

a. Cleaning of upstream reached of sewers shall be completed before the downstream reached are cleaned.

b. Hydraulic cleaning equipment shall be inserted in the downstream manhole of the reach and the work shall proceed upstream unless otherwise approved by the County.

K. Any blockages of lateral building connections resulting from the cleaning or other items of work shall be removed by cleaning of the building connection by Contractor, at its own expense. Any damage caused by flooding of lateral building connections shall be corrected by Contractor, at its own expense.

3.05 WASTE DISPOSAL

A. Waste materials and debris resulting from sanitary sewer cleaning operations shall be removed and conveyed by the Contractor to an approved waste site. The disposal site shall be accessible during the Contractor's working hours. All permits required shall be the responsibility of the Contractor. Waste material and debris resulting from the cleaning operation shall be drained in the collection system and disposed of at Pinellas County Solid Waste Operations, located at 3095 114th Avenue North. The material deposited at Solid Waste Operations, shall not exhibit any liquid when deposited at the location as specified by Pinellas County Solid Waste Operations. Disposal manifest records shall be supplied to Pinellas County Utilities. Under no circumstances shall sewage or solids removed from sewer lines be dumped onto the streets or into ditches, catch basins or storm drains. It shall not be necessary to stop the cleaning operation while the debris is transported to the disposal site.

3.06 CLOSE CURICUIT TELEVISION INSPECTION PROCEDURE

A. The Contractor shall provide Pinellas County with digital media that includes video and data base file that is compatible with Granite XP in NASSCO PACP format. Compatibility issues with software other than Granite XP latest version are the Contractor's responsibility.

B. CCTV inspection shall be performed by NASSCO PACP certified operators who use NASSCO certified software that is compatible with Granite XP latest version using PACP defect coding methodology.

C. Perform CCTV inspection immediately after line cleaning. Before insertion of the camera into the sewer, the camera shall record on video the upstream and downstream manhole, pipe size, specific location of the sewer, and the direction in which the camera will travel. The camera shall be moved through the line in either direction at a moderate rate, stopping when necessary to permit proper documentation of the sewer's condition in audio and documented on the television inspection log.

D. The camera height shall be adjustment so that the camera lens is always centered at one-half the inside diameter, or higher, in the pipe being televised.

E. The camera shall not travel at a speed greater than thirty (30) feet per minute. To better understand the flow from each individual lateral the camera shall be positioned at each lateral for a sufficient duration to determine the nature of flow and condition of the lateral (minimum of 30-seconds).

F. Videos shall pan beginning and ending manholes to demonstrate that all debris has been removed. A manhole inspection shall be performed for all manholes.

G. Manual winches, power winches, TV cable powered rewinds, or self-propelled cameras may be used to move the camera through the sewer line.

H. When manually operated winches are used to pull the television camera through the line, telephones or other suitable means of communication should be set up between the two manholes of the section being inspected to insure good communication between members of the crew.

I. If during CCTV inspection of a pipeline, the television camera is unable to pass through the entire manhole section, the Contractor shall set up his equipment so that the inspection can be performed from the opposite direction (reverse setup) in order to obtain a complete video of the line. If, again, the camera fails to pass through the manhole section, the inspection of the entire manhole section will be considered complete for purposes of payment. Whenever such a condition arises, notify the County to determine if an obstruction removal or point repair is necessary.

J. In the event that the TV camera encounters broken pipe and there is a possibility that continuation of the inspection could cause the TV Camera to become stuck or result in additional pipe damage or collapse, the Engineer may elect to discontinue the inspection.

K. Distance Measurements: The accuracy of the measurements for location of defects, service connections, changes in pipe materials, and all other PACP recognized conditions is paramount, particularly when it may require later corrective action or a dig-up. The accuracy of the footage meter shall be checked by taking a reading at the entrance to the away manhole and comparing with a surface measurement made with a steel tape or walking meter (Roll-A-Tape). These measurements shall be performed by the Contractor in the presents of the Pinellas County inspector. Measurement meters shall be accurate to one-tenth of a foot over the entire length of the sewer line section being inspected. Otherwise, the Contractor shall take corrective action.

L. The video inspection shall be clear and visible with adequate lighting to enable the viewer to discern even small defects in the pipe being inspected. Camera distortions, inadequate lighting, dirty lens, or blurred/hazy picture will be cause for rejection of a video and rejection of the associated line segment. Any pipeline reach television inspection video that does not meet this requirement or fails to meet PACP specifications shall be cause for Contractor to re-inspect the pipe at no additional cost to the County. Payment for television inspection and sewer rehabilitation will not be made until the County approves the quality of the video and logs.

M. CCTV inspection video shall be continuous for pipe segments between manholes. Do not leave gaps in the video of a segment between manholes and do not show a single segment on more than one video, unless specifically allowed by the County.

N. Documentation of television inspection by the Contractor shall be performed in accordance with the Specifications. TV reports can be assembled elsewhere, but documentation must be done in the field. A video inspection report shall be prepared by the Contractor for every segment and manhole that is CCTV-inspected. The Contractor shall provide written records that show the location in relation to an identified manhole of each infiltration point observed during inspection. In addition, other points of significance such as locations of building sewers, unusual conditions, roots, sewer connections, broken pipe, presence of scale and corrosion, and other discernible features shall be recorded on the PACP television inspection report. The video, PACP television inspection report and the NASSCO Manhole Inspection Form version 4.3 or higher, with all applicable fields accurately completed per PACP format, shall be supplied to the County with each Pay Request.

3.07 REMOVAL OF DEBRIS

A. Materials generated by the cleaning operation shall be removed by vacuuming at the upstream or downstream manhole of the section being cleaned. Suitable traps or weirs shall be used to prevent the movement of solids to adjacent sections of pipe.

3.08 WATER

A. The use of potable water from the municipal, private, or reclaimed water systems for filling the water tanks on cleaning vehicles shall be permitted however, Contractor shall be required to acquire and use a meter approved by the County to monitor the use of this water and will be charged for water use in accordance with the current rate as described in PCU Policy Manual and the schedule of rates and fees. Contractor shall be responsible for obtaining and hooking up the potable water meter at his own expense. A reduce pressure type backflow preventer approved by the County shall be used to prevent contamination of the potable water system. Contractor is responsible for any damage resulting from improper operation of hydrants. Contractor shall not use or obstruct a fire hydrant when there is a fire in the area.

B. Contractor shall not waste water from the public water supply because of improper connections or from hydrants left open.

3.09 FINAL ACCEPTANCE OF SEWER LINE CLEANING

A. Acceptance of sewer line cleaning work is contingent upon the completion of the CCTV inspection and successful review of the television inspection video by the County. If the inspection shows the cleaning to by unsatisfactory, Contractor shall be required to re-clean and re-inspect the sewer line until the cleaning is shown to be satisfactory. Such re-cleaning and re-inspection shall be made at Contractor's expense.

3.10 TRAFFIC CONTROL AND MAINTENANCE OF TRAFFIC

A. Refer to Section 01 55 26, Traffic Regulation

B. If required, the Contractor shall employ a uniformed off-duty police officer to maintain and regulate traffic through the work area.

END OF SECTION

SECTION 33 01 33

MANHOLE REHABILITATION

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. The intent of manhole repair is to provide a structurally sound and watertight manhole in place of an existing deteriorated manhole.

B. Several types of manhole repair may be ordered: rebuilding, lining and replacement. The Engineer may change the type of repair for a particular manhole after visually inspecting the manhole.

C. Costs for traffic control shall be included in the work item in right-of-ways with a County Functional Classification of Collector or less and locations not requiring more than Standard Index 612.

D. Minor infiltration shall be considered as a part of manhole work effort. Very active infiltration as determined by the Engineer shall be paid in a separate Pay Item, if it is specifically included as a pay item in the Contract.

1.02 SUBMITTALS

A: All materials and procedures required to establish compliance with the Specifications shall be submitted to the County/Engineer for review/approval.

B. Submittals shall include at least the following:

1. Descriptive literature, bulletins and/or catalogs of materials.

2. Work procedures including flow diversion plan, method of repair, etc.

3. Materials and method for repair of leaks or cracks in concrete structure.

4. Final installation report on completed structures.

1.03 WARRANTY

A. Manufacturer shall warrant all products against failure for a period of ten (10) years, performing repairs to the damage and restore the coating at no cost to the County within sixty (60) days after written notification of the failure. For

warranty requirements for other lining material refer to specific liner system specification sections.

1.04 SUBSTITUTIONS

A. Only after execution of the contract will Engineer consider requests from Contractor for substitutions. Substitutions will be considered only when a product becomes unavailable due to no fault of Contractor.

B. Items identified as “equal” shall be accompanied by product literature and a written itemized comparison of the published specifications (feature by feature from the manufacturer’s literature) for the item specified and for the item proposed. The burden of proof of “equality” shall be on the supplier.

C. Request constitutes a representation that Contractor:
   1. Has investigated proposed product and determined that it meets or exceeds, in all respects, specified product.
   2. Will provide the same warranty for substitution as for specified product.
   3. Will coordinate installation and make other changes which may be required for Work to be complete in all respects.
   4. Waives claims for additional costs which may subsequently become apparent.

D. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals without separate written request, or when acceptance will require substantial revision of Contract Documents.

E. Engineer will determine acceptability of proposed substitution, and will notify Contractor of acceptance or rejection in writing within a reasonable time.

PART 2 – PRODUCTS

2.01 PATCHING MATERIAL FOR MANHOLES

A. Manhole patching material shall be. as specified in the Materials Specification Manual.

B. Active leaks shall be stopped using a rapid setting cementitious grout. Some leaks may require weep holes to localize the infiltration during the application after which the weep holes shall be plugged with rapid setting mix prior to the final liner application. When severe infiltration is present, drilling may be required in order to pressure grout.

2.02 PRESSURE GROUTING

A. Severe infiltration shall be repaired by pressure grouting using material specified in the Material Specification Manual. equal.

2.03 CALCIUM ALUMINATE MANHOLE LINER

The coating to be applied shall be pure fused calcium aluminate mortar with pure fused calcium aluminate as specified in Materials Specification Manual.

2.04 FIBERGLASS MANHOLE LINER

A. Fiberglass Liners shall be specifically manufactured for sewer use as specified in Material Specification Manual.. These products shall meet all requirements of latest ASTM designation C-582 (plastic laminates) and ASTM designation C-581 (chemical resistance). The properly installed liners shall not fail under H-20 dynamic wheel load applied vertically. Liner shall be installed in accordance with manufacturer's requirements.

2.05 MULTI-COMPONENT STRESS PANEL MANHOLE LINER SYSTEM

A. Multi-component stress panel liner system shall be. as specified in Material Specification Manual.

2.06 URETHANE/ EPOXY, POLYUREA MANHOLE LINER SYSTEM

A. Urethane/epoxy, polyurea liner system shall be as specified in Material Specifications Manual.

2.07 POLYURETHANE MANHOLE LINER SYSTEM

Polyurethane liner system shall be as specified in Material Specification Manual

2.08 POLYMORPHIC RESIN MANHOLE LINER SYSTEM

A. Polymorphic Resin liner system shall be as specified in Materials Specifications Manual.

PART 3 – EXECUTION

f

3.01 FIELD LAYOUT

A. The County supplied Atlas sheet, street address and other pertinent information will identify the general location of the manhole. If there is any question as to the general location described by the County, the Contractor

shall approach the Engineer and address the questions before beginning with the excavation.

3.02 MANHOLE ADJUSTMENT

A. Manhole ring and covers found to be above or below grade shall be adjusted by adding or removing rows of brick and mortar to meet the following specifications:

1. The top of the cone shall be set between two and one-half inches and fourteen and one-half (14 1/2) inches below the bottom of the manhole cover frame. It is the intent of the specifications to provide a minimum of two and one-half inches to accommodate future grade changes without disturbing the manhole.

2. Where the distance between the bottom of the manhole cover frame and the top of the cone is greater than fourteen and one-half (14 1/2) inches, 12-inch riser units shall be used to bring the top of the cone to within the limits specified.

3.03 MANHOLE REBUILDING

A. Manholes that have cracked rings, leaky risers or covers below grade may be designated to be rebuilt. The rebuilding shall include all labor, equipment, materials, including excavation and dewatering to accomplish the following:

1. Removing existing manhole down to required elevation and rebuild using brick or precast sections as directed by the Engineer.

2. The Contractor shall then install a new manhole ring and cover as directed by the Engineer.

3. The contractor shall install new stainless steel manhole insert to prevent surface water inflow into the collection system through the manhole lid, as directed by the engineer.

3.04 MANHOLE LINING

A. Manholes may be designated to receive a new fiberglass liner and reducer cone. This lining will only be specified for forty-eight (48) inches in diameter or larger manholes. Installation of fiberglass liners and reducer cones shall include:

1. Excavation of an area sufficiently wide and deep for removal of the old castings, mortar and brick riser and the existing manhole top section.

2. The bottom of the manhole liner shall be cut to fit the existing manhole base as closely as possible. Cutouts in manhole liner shall be made to accommodate existing inlets, drops, and clean-outs. Cuts should be precisely made with a power saw fitted with masonry-type blade or with a special jigsaw. Fresh cut fiberglass shall receive two coats of polyester resin to resist wicking.

3. The manhole liner shall be lowered into the existing brick or concrete manhole and set into a quick-setting grout mixture. Good bottom seal shall be obtained in order to prevent loss of grout from the annular space between the outside of the manhole liner and the interior of the old manhole. A six inch height of a quick-setting grout shall be placed above the initial bottom seal in the annular space between the manhole liner and the existing brick or concrete manhole to insure adequacy of the bottom seal. The gap from drops, clean-outs materials, and existing piping between the existing manhole wall and the new manhole liner wall shall be bridged with short lengths of PVC or other corrosion-resistant pipe approved by the County. Quick-setting mortar shall be used to seal around all pipes.

4. The annular space between the manhole liner and existing brick or concrete manhole shall be filled with a Portland cement and sand grout. The grout shall be made with six bags of cement per cubic yard of grout.

5. As directed by the Engineer, the new ring and cover shall be replaced and finished to grade by constructing a chimney on the flat shoulder of the manhole liner using brick and mortar or precast concrete rings. In no case, shall the cast iron ring be placed directly on the manhole liner. All new rings and covers will be furnished by the Contractor.

3.05 MANHOLE PATCHING AND LINING

A. This Section shall govern all work, materials and equipment required for manhole rehabilitation for the purpose of eliminating infiltration, providing corrosion protection, repair of voids and restoration of structural integrity of the manhole, as a result of spray applying a monolithic fiber-reinforced cementitious liner to the wall and bench surfaces of brick, concrete or any other construction material.

B. The Applicator must be approved, trained and certified as having successfully completed factory training. The Applicator/Contractor shall

furnish all labor, equipment and materials for applying the coating directly to the contour of the manhole to form a structural cementitious liner of a minimum of one-half inch thickness using a machine specially designed for the application. All aspects of the installation shall be in accordance with manufacturer's recommendations and shall include the elimination of active infiltration prior to applying lining, the repair and sealing of inverts and benches, the removal of any loose or unsound material and patching.

C. The manhole shall be prepared for coating by placing boards over inverts to prevent extraneous material from entering the sewer lines and to prevent up stream line from flooding the manhole. All foreign material shall be removed from the manhole wall and bench using a high pressure water spray (minimum 1,200 psi). Loose and protruding brick, mortar and concrete shall be removed using a mason's hammer and chisel or scraper.

D. Active leaks shall be stopped using a rapid setting cementitious grout according to the manufacturer's recommendations. Some leaks may require weep holes to localize the infiltration during the application after which the weep holes shall be plugged with rapid setting mix prior to the final liner application. When severe infiltration is present, drilling may be required in order to pressure grout. Manufacturer's recommendations shall be followed when pressure grouting is required.

E. Any bench, invert or service line repairs shall be made at this time using a quick-setting mix and following the manufacturer's recommendations.

F. The surface, prior to spraying on the lining system, shall be damp without noticeable free water droplets, or running water. Materials shall be sprayed, applied to a minimum uniform thickness to insure that all cracks, crevices and voids are filled and a somewhat smooth surface remains after light troweling. The light troweling is performed to compact the material into voids and to set the bond.

G. Not before the first application has begun to take an initial set (disappearance of surface sheen which could be fifteen (15) minutes to one hour depending upon ambient conditions) the second application should be made to assure a minimum total finished thickness of one-half inch. The surface shall then be troweled to a smooth finish being careful not to over trowel, so as to bring additional water to the surface to weaken it. A brush finish may be applied to the finished coat to remove trowel marks. Manufacturer's recommendation shall be followed whenever more than twenty-four (24) hours have elapsed between applications.

H. The wooden bench covers shall be removed and when the bench is sprayed such that a gradual slope is produced from the walls to the invert

with the thickness at the edge of the invert being no less than one-half inch. The wall-bench intersection shall be rounded to a uniform radius, the circumference of the intersection.

I. For calcium aluminate mortar systems, curing should be implemented as soon as the surface begins to harden and dry (as early as one hour after application). Several layers of ASTM C-309 liquid membrane curing compound or a 100%-humid moisture cure may be used.

3.06 TESTS

A. Procedure

1. Compressive strength tests shall be made by breaking 2-inch cube test specimens prepared, cured and broken in accordance with the American Society for Testing Materials Standard Method C-109, latest version. Four specimen test cubes shall be taken from every fifty (50) bags of product used or eight (8) manholes. One cube shall be broken at seven days, the remainder at twenty-eight (28) days. Additional test cubes may be ordered for changes in equipment or method, and under adverse weather, or curing conditions.

B. Responsibility for Tests and Reports

1. The Contractor shall supply all cube molds, tools and labor for preparing specimens.

2. The test cubes shall be tested in a recognized commercial testing laboratory.

3.07 FINAL ACCEPTANCE

A. All completed manhole work will be inspected by the County. Any leaks or cracks or defective workmanship shall be repaired to the satisfaction of the Engineer at no cost to the County. Final acceptance will be granted after surface restoration, if required, is complete.

END OF SECTION

SECTION 33 01 34

SANITARY SEWER PIPE REPAIRS

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall furnish all labor and materials to repair sanitary sewer pipelines as specified herein.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 GENERAL

A. The Contractor shall excavate and expose suspected damaged pipeline at general locations described by the County. The pipeline shall be exposed for visual inspection four feet on each side of the damaged area or as directed by the County. The County may authorize replacing bad joint materials (vitrified clay or concrete pipe) or removing and replacing the pipe.

B. Crushed stone shall be used in pipe bedding and to help stabilize trench bottoms. Special attention shall be given to compacting the bedding underneath the pipeline and its haunches.

C. Backfilling of repaired pipe shall proceed only in the presence of the Inspector.

3.02 VITRIFIED CLAY PIPE REPAIRS

A. Repairs to VCP including cracked or crushed pipe, cracked bells, offset joints, holes, etc. shall be accomplished by replacing a section of damaged pipe with a piece of new C-900 PVC pipe. Such replacement shall be performed in accordance with the clay pipe manufacturer's recommendations. PVC repair sleeves shall be supplied by Contractor.

3.03 IRON PIPE REPAIRS

A. Repairs to iron pipe shall be accomplished using one of two methods

1. One method will consist of the application of an appropriate repair sleeve. Refer to Material Specification Manual.

2. The second method will be used when the damaged area of pipe is larger than recommended for the repair sleeves. This method consists of cutting out the damaged section of pipe and replacing it with a section of new ductile iron pipe.

B. The connections of new and old pipe shall be accomplished with two new ductile iron solid sleeves. All iron pipe repair work shall be performed in accordance with the manufacturer's recommendations. All repairs, including sleeves, shall be wrapped in polyethylene encasement.

3.04 REINFORCED CONCRETE PIPE REPAIR

A. Reinforced concrete pipe repair shall be accomplished by the use of a reinforced concrete collar. Reinforcing shall be circumferential with a minimum cross-section area as specified in ASTM Des: C76 for Class V, R.C.P. of the same diameter as the damaged pipe. For damaged areas less than two feet in diameter, the collar may be the sole element of repair. A cutout of corrugated metal pipe shall be placed over the damaged area only to aid in the formation of the collar. The collar shall extend three hundred sixty (360) degrees around the pipe and two feet past the damaged area and corrugated metal in the longitudinal axis.

B. For larger repairs, the collar shall be used as a closure. The damaged pipe length shall be removed and become the property of the Contractor. The replacement length may be jointed with the existing pipe on one end only. The existing portion of the joint shall be thoroughly cleaned and the rubber gasket replaced. After fully seating the joint, the other end shall receive a concrete collar closure extending two feet past the joint in the longitudinal direction. If the new and existing joints are not identical, the closure shall be used at both ends.

3.05 POLYVINYL CHLORIDE PIPE REPAIR

A. For non-pressure applications, existing and new pipe shall be jointed with flexible couplings with stainless steel straps as approved in the County's Material Specification Manual. Only the flexible coupling recommended by the manufacturer for the particular pipes to be jointed shall be used.

B. For pressure pipe applications, repairs shall be made by one of the two methods as specified for iron pipe, except replacement pipe shall be PVC pressure pipe.

3.06 FINAL ACCEPTANCE

A. In the case of pressure pipe applications, after the pipe repair is complete and still exposed, the pipeline will be placed in service. Visual inspection, by

the Engineer, of the repair while the pipeline is pressurized will provide tentative acceptance of the repair, provided no leaks are present. Repair of leaks or unsatisfactory work shall be performed at no cost to the County. Final acceptance will be granted after proper backfilling and surface restoration is accomplished.

B. In the case of non-pressure service, the Contractor shall backfill and have the line inspected by a County Inspector. The line shall be inspected by one of two methods: (1) inspection by mirrors and sunlight and/or (2) television inspection as directed by the Engineer.

1. Upon submission of CD/DVD the County will review and verbally respond within one working day. If the repair is not satisfactory to the Engineer, the Contractor will, at no cost to the County, re-excavate, make repairs, television inspect and backfill.

2. When the repair is satisfactory to the Engineer, the Contractor will be directed to complete surface restoration. Upon satisfactory completion of surface restoration, final acceptance will be granted.

3.07 PUMPING AND BYPASSING

A. When pumping and bypassing is required or ordered by the Engineer, the Contractor shall supply the pumps, conduits, and other equipment to divert the flow of sewage around the pipeline on which work is to be performed. The bypass system shall be of sufficient capacity to handle existing peak flow plus additional flow that may occur during a rainstorm. The Contractor will be responsible for furnishing the necessary labor and supervision to set up and operate the pumping and bypassing system.

B. When flow in a sewer line is plugged, blocked, or bypassed, sufficient precautions must be taken to protect the sewer lines from damage that might result from sewer surcharging. Further, precautions must be taken to insure that sewer flow control operations do not cause flooding or damage to public or private property being served by the sewers involved. Under no circumstances shall sewage be discharged into/onto any place other than another sewer manhole or a piece of equipment designed to carry sewage. Any damage caused from the Contractor's neglect of these precautions is solely the responsibility of the Contractor.

END OF SECTION

SECTION 33 05 21

HORIZONTAL DIRECTIONAL DRILLING

STANDARD SMALL DIAMETER INSTALLATIONS

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. The Work specified in this section consists of furnishing and installing underground utilities using the horizontal directional drilling (HDD) method of installation, also commonly referred to as directional boring or guided horizontal boring. This Work shall include all services, equipment, materials, and labor for the complete and proper installation, testing, restoration of underground utilities and environmental protection and restoration.

B. Small Diameter Installation shall be defined as a HDD that the nominal outside diameter of the product pipe is twelve (12) inches or less.

1.02 SUBMITTALS

A. Prior to beginning work, the Contractor must submit to the Engineer a Work plan detailing the procedure and schedule to be used to execute the Project. The Work plan should include a description of all equipment to be used, down-hole tools, a list of personnel and their qualifications and experience (including back-up personnel in the event that an individual is unavailable), list of subcontractors, a schedule of work activity, a safety plan (including MSDS of any potentially hazardous substances to be used), traffic control plan (if applicable), an environmental protection plan and contingency plans for possible problems. Work plan should be comprehensive, realistic and based on actual working conditions for this particular Project. Plan should document the thoughtful planning required to successfully complete the Project.

B. The Contractor shall submit documentation that the proposed electrofusion personnel have been certified by the pipe or electrofusion accessory manufacturer.

C. All drilling fluids and loose cuttings shall be contained. No fluids shall be allowed to enter any unapproved areas or natural waterways. Upon completion of the directional drill project, all excess drilling fluid and material shall be removed by the Contractor.

D. The Contractor shall submit a Bentonite Management Plan that includes the following as a minimum.

1. Rapid response procedures - directional drilling shall be performed by a Contractor who has the expertise required to perform the related work. The Contractor shall designate qualified personnel and equipment on the site during directional drilling operations responsible for monitoring drilling fluid pressure, and watching surface conditions for visual signs of frac-out. Contractor shall provide immediate response and initiate containment procedures in the event of an occurrence of a bentonite spill. In the event of a bentonite spill or frac-out all drilling activities shall be stopped. Drill stem shall be removed from the bore hole and the hole abandoned.

2. Containment procedures - sediment control systems such as: silt fence or earth berms on uplands, and floating silt barriers or other aquatic barriers in water, and other means necessary to prevent the spread of the bentonite spill shall be installed immediately.

3. Timely cleanup capability - remediation of the lost bentonite shall begin immediately. Cleanup shall include removal of the material from the site by an approved method, and disposal of the material by an approved method in an appropriate location as directed by the County representative.

E. Contractor shall submit Specifications on directional drilling equipment to be used to ensure that the equipment will be adequate to complete the Project. Equipment shall include but not be limited to: drilling rig, mud system, mud motors (if applicable), down-hole tools, guidance system and rig safety systems. Calibration records for guidance equipment shall be included. Specifications for any drilling fluid additives that Contractor intends to use or might use will be submitted.

F. Specifications on material to be used shall be submitted to Engineer and material shall include the pipe, fittings, drilling mud, drilling additives and any other item which is to be an installed component of the Project or used during construction.

1.03 QUALITY ASSURANCE

A. The requirements set forth in this Specification include a wide range of procedural precautions necessary to insure that the very basic, essential aspects of a proper directional bore installation are adequately controlled. Strict adherence shall be required under specifically covered conditions

outlined in this Specification. Adherence to the Specifications contained herein, or the Engineer's approval of any aspect of any directional bore operation covered by this Specification, shall in no way relieve the Contractor of their ultimate responsibility for the satisfactory completion of the Work authorized under the Contract.

B. Drilling Notes: The pipe shall be installed to the exact lines and grades shown on the plans by a State of Florida licensed and bonded undergournd utility Contractor, with minimum two years experience in Directional Drilling.

PART 2 - PRODUCTS

2.01 GENERAL

A. Directional drilling equipment shall consist of a directional drilling rig of sufficient capacity to perform the bore and pullback the pipe, a drilling fluid mixing, delivery system of sufficient capacity to successfully complete the crossing, a guidance system to accurately guide boring operations and trained and competent personnel to operate the system. All equipment shall be in good, safe operating condition with sufficient supplies, materials and spare parts on hand to maintain the system in good working order for the duration of this Project.

2.02 PRODUCT PIPE, JOINTS AND FITTINGS

A. PIPE

1. All product pipe to be installed by the HDD operation will be High Density Polyethylene (HDPE), Restrained Joint PVC or Restrained Joint Ductile Iron pipe.
2. Refer to material specifications for material requirements.
3. Refer to piping sections of this specification for pipe handling requirements.

B. FITTINGS

1. Refer to material specifications for material requirements.

C. DRILLING FLUID (MUD) SYSTEM

1. Drilling fluid shall be composed of a carrier fluid (water) and drilling fluid additives (bentonite and/or polymers). Bentonite is a naturally occurring clay mineral (montmorillinite) that forms a mud when mixed with water.

2. The composition of the drill fluid is determined by the results of geological investigation executed in line with the framework of the project planned before construction.

3. The principal functions of drilling fluids used in HDD are:

a. Transporting drill cuttings to the surface by suspending and carrying them in the fluid stream flowing in the annulus between the borehole wall and the drill pipe/product.

b. Cleaning build-up on drill bits or reamer cutters by directing fluid streams at the cutters.

c. Cooling the downhole tools and electronic equipment.

d. Lubricating to reduce the friction between the drill pipe/product pipe and the borehole wall.

e. Stabilizing the borehole, especially in loose or soft soils by building a low permeability filter cake, and exerting a positive hydrostatic pressure against the borehole wall. The filter cake along with positive hydrostatic pressure reduces collapse of the borehole and prevents formation fluids (i.e. groundwater) from flowing into the borehole or drilling fluids from exiting the borehole into the formation (loss of circulation).

f. The Contractor shall provide hydraulic power to the borehole with a downhole mud motor.

g. The following fluid properties are to be tested and considered to assure compatibility between the drilling fluid mixture and the native soil after proper identification and characterization. These fluid properties are density, viscosity, pH – value, circulation, volume and solid content.

h. The drilling fluid pressures and flow rates shall be continuously monitored and recorded by the Contractor at the pump and within the annular space within thirty (30) feet of the drilling head.

2.03 DRILLING SYSTEM

A. The directional drilling machine shall consist of a hydraulically powered system to rotate, push and pull hollow drill pipe into the ground at a variable

angle while delivering a pressurized fluid mixture to a guidable drill (bore) head. The machine shall be anchored to the ground to withstand the pulling, pushing and rotating pressure required to complete the crossing. The hydraulic power system shall be self-contained with sufficient pressure and volume to power drilling operations. Hydraulic system shall be free of leaks. Rig shall have a system to monitor and record maximum pull-back pressure during pull-back operations. The rig shall be grounded during drilling and pull-back operations. There shall be a system to detect electrical current from the drill string and an audible alarm which automatically sounds when an electrical current is detected.

B. The drill head shall be steerable by changing its rotation and shall provide the necessary cutting surfaces and drilling fluid jets.

C. Mud motors (if required) shall be of adequate power to turn the required drilling tools.

D. The drill pipe shall be constructed of high quality 4130 seamless tubing, grade D or better with thread.

2.04 GUIDANCE SYSTEM

A. The method of guidance utilized in locating and steering the pilot string from entry to exit shall be state of the art. Readings shall be recorded after the advancement of each successive drill pipe and the readings plotted. Access to all recorded readings and plan and profile information shall be made available to the Engineer, or his representative at all times.

2.05 DRILLING FLUID (MUD) SYSTEM

A. A self-contained, closed, drilling fluid mixing system shall be of sufficient size to mix and deliver drilling fluid composed of bentonite clay, potable water and appropriate additives. Mixing system shall be able to molecularly shear individual bentonite particles from the dry powder to avoid clumping and ensure thorough mixing. The drilling fluid reservoir tank shall be a minimum of five hundred (500) gallons. Mixing system shall continually agitate the drilling fluid during drilling operations.

B. Drilling fluid shall be composed of clean water and bentonite clay. Water shall be from an authorized source with a pH of 8.5 - 10. Water of a lower pH or with excessive calcium shall be treated with the appropriate amount of sodium carbonate or equal. The water and bentonite clay shall be mixed thoroughly and be free of any clumps or clods. No additional material may be used in drilling fluid without prior approval from Engineer. Contractor is responsible for provisions to obtain clean water for the fluid.

The Bentonite mixture used shall have the minimum viscosities as measured by a March Funnel:

Rock, Clay - 60 sec.
Hard Clay - 40 sec.
Soft Clay - 45 sec.
Sandy Clay - 90 sec.

Stable Sand - 80 sec.
Loose Sand - 110 sec.
Wet Sand - 110 sec.

These viscosities may be varied to best fit the soil conditions encountered, as approved by the Engineer.

C. Additives to drilling fluid such as drill soap, polymers, etc. shall be "environmentally safe" and be approved for such usage. No diesel fuel will be used.

D. The mud pumping system shall have a minimum capacity of 50 GPM and be capable of delivering the drilling fluid at a constant minimum pressure of 1000 psi. The delivery system shall have filters in-line to prevent solids from being pumped into the drill pipe. Connections between the pump and drill pipe shall be leak-free. Used drilling fluid and drilling fluid spilled during drilling operations shall be contained and properly disposed of. A berm, or equivalent, shall be maintained around drill rigs, drilling fluid mixing system, entry and exit pits and drilling fluid recycling system to prevent spills into the surrounding environment. Pumps and or vacuum truck(s) of sufficient size shall be in place to convey excess drilling fluid from containment areas to storage and facilities.

2.06 OTHER EQUIPMENT

A. Pipe rollers shall be of sufficient size to fully support the weight of the pipe while being hydro-tested and during pull-back operations. Sufficient number of rollers shall be used to prevent excess sagging of pipe. Rollers shall be used as necessary to assist in pull back operations and in layout/fusing of material.

B. Hydraulic or pneumatic pipe rammers may only be used if necessary and with the authorization of Engineer.

C. Other devices or utility placement systems for providing horizontal thrust other than those previously defined in the preceding sections shall not be used unless approved by the Engineer prior to commencement of the Work.

Consideration for approval will be made on an individual basis for each specified location. The proposed device or system will be evaluated prior to approval or rejection on its potential ability to complete the utility placement satisfactorily without undue stoppage and to maintain line and grade within the tolerances prescribed by the particular conditions of the Project.

PART 3 – EXECUTION

3.01 GENERAL

A. Contractor to contact Pinellas County Utilities at least forty-eight (48) hours before each of the following activities: 1) the set up of a drilling pit, 2) the start of drilling operation, 3) the installation of service pipe. Upon completion of the pilot hole phase of the operation, a complete set of as-built records shall be submitted in duplicate to the Engineer. These records shall include copies of the plan and profile drawing, as well as directional readings recorded during the drilling operation.

B. The drawings show existing utilities that are believed to be near the directional drill alignment. There is no guarantee that these utilities are located as shown or that other utilities may not be present. The Contractor is to field locate existing utilities in advance of the work so as not to delay work and avoid conflict or disruption of utility services.

C.

3.02 PERSONNEL REQUIREMENTS

A. All personnel shall be fully trained in their respective duties as part of the directional drilling crew and in safety. Each person must have at least two years directional drilling experience. A competent and experienced supervisor representing the Contractor and Drilling Subcontractor shall be present at all times during the actual drilling operations. A responsible representative who is thoroughly familiar with the equipment and type work to be performed, must be in direct charge and control of the operation at all times. In all cases the supervisor must be continually present at the job site during the actual directional bore operation. The Contractor and Subcontractor shall have a sufficient number of competent workers on the job at all times to insure the directional bore is made in a timely and satisfactory manner.

Personnel who are unqualified, incompetent or otherwise not suitable for the performance of this Project shall be removed from the jobsite and replaced with a suitable person.

3.03 DRILLING PROCEDURE

A. Work site as indicated on drawings, within right-of-way, shall be graded or filled to provide a level working area. No alterations beyond what is required for operations are to be made. Contractor shall confine all activities to designated work areas.

B. Entire drill path shall be accurately surveyed with entry and exit stakes placed in the appropriate locations within the areas indicated on Drawings. If Contractor is using a magnetic guidance system, drill path will be surveyed for any surface geo-magnetic variations or anomalies.

C. Contractor shall place silt fence between all drilling operations and any drainage, wetland, waterway or other area designated for such protection by contract documents, state, federal and local regulations. Additional environmental protection necessary to contain any hydraulic or drilling fluid spills shall be put in place, including berms, liners, turbidity curtains and other measures. Contractor shall adhere to all applicable environmental regulations. Fuel or oil may not be stored in bulk containers within two hundred (200) feet of any water-body or wetland.

D. Contractor shall adhere to all applicable state, federal and local safety regulations and all operations shall be conducted in a safe manner. Safety meetings shall be conducted at least weekly with a written record of attendance and topic submitted to Engineer.

E. Pipe shall be welded/fused together in one length, if space permits. Pipe will be placed on pipe rollers before pulling into bore hole with rollers spaced close enough to prevent excessive sagging of pipe.

F. Pilot hole shall be drilled on bore path with no deviations greater than five percent of depth over a length of one hundred (100) feet. In the event that pilot does deviate from bore path more than five percent of depth in one hundred (100) feet, Contractor shall notify Engineer and Engineer may require Contractor to pull-back and re-drill from the location along bore path before the deviation.

G. In the event that a drilling fluid fracture, inadvertent returns or returns loss occurs during pilot hole drilling operations, Contractor shall cease operations and shall discuss corrective options with the Engineer, work shall then proceed accordingly.

H. Upon approval of the pilot hole location by the Engineer, the hole enlargening or back reaming phase of the installation shall begin. The borehole diameter shall be increased to accommodate the pullback operation of the required size of PE pipe. The type of back reamer to be

utilized in this phase shall be determined by the types of subsurface soil conditions that have been encountered during the pilot hole drilling operation. The reamer type shall be at the Contractor's discretion with the final hole diameter being a maximum of twenty (20) percent larger than the outside diameter of the product pipe being installed in the borehole.

I. The open borehole may be stabilized by means of bentonite drilling slurry pumped through the inside diameter of the drill pipe and through openings in the reamer. The slurry will also serve as an agent to carry the loose cuttings to the surface through the annulus of the borehole. These cuttings and bentonite slurry are to be contained at the exit hole or entry side of the directional bore in pits or holding tanks. The slurry may be recycled at this time for reuse in the hole opening operation or it shall be hauled by the Contractor to an approved dump site and properly disposed. A complete list of all drilling fluid additives and mixtures to be used in the directional operation will be submitted to the Engineer along with their respective material safety data sheets.

J. In the event that pipe becomes stuck, Contractor shall notify Engineer. Engineer, Contractor, and/or the maintaining agency shall discuss options and then work will proceed accordingly.

K. Excess pipe shall be removed and the bore hole associated with this excess pipe shall be filled with flowable fill or grout, unless the area of the excess pipe is excavated and backfilled as part of the tie-in operations.

3.04 PIPE TESTING

A. Following successful pull-back of pipe, Contractor shall test pipe as required in Section 01 45 17, Pipeline Testing Requirements.

3.05 SITE RESTORATION

A. Following drilling operations, Contractor will demobilize equipment and restore the work-site to original condition. Any noticeable surface defects due to the drilling operation shall be repaired by Contractor.

3.06 RECORD KEEPING

A. Contractor shall maintain a daily project log of drilling operations and a guidance system log with a copy given to Engineer at completion of boring. As-built drawings shall be certified as to accuracy by Contractor as required in Section 01 78 39.

END OF SECTION

SECTION 33 05 22

HORIZONTAL DIRECTIONAL DRILLING

SUBAQUEOUS CROSSINGS AND LARGE DIAMETER INSTALLATIONS

PART 1-GENERAL

1.01 DESCRIPTION OF REQUIREMENTS

A. This specification covers the installation of pipe by horizontal directional drilling (HDD). HDD is a trenchless excavation method that is accomplished in three phases. The first phase consists of drilling a small diameter pilot hole along a designed directional path. The second phase consists of enlarging the pilot hole to a diameter suitable for installation of the pipe. The third phase consists of pulling the product pipe into the enlarged hole. HDD is accomplished using a specialized horizontal drilling rig with ancillary tools, equipment and borehole stabilizing drilling fluids.

B. The Contractor shall provide all necessary labor, tools, materials and equipment to successfully complete the installation of directionally drilled piping as specified herein and to the lines and grades shown on the Contract Drawings. The Contractor shall be responsible for the final constructed product, and for furnishing the qualified labor and superintendence necessary for this method of construction.

C. The drilling operations shall use techniques of creating or directing a borehole along a predetermined path to a specified target location. Use of down-hole steering tools to change the boring course and monitoring instrumentation to locate and orient the boring along a predetermined course is required.

D. The mobile drilling system shall utilize a jetting drill bit and/or drill bit with mud motor to drill and circulate cuttings and spoil from the borehole.

E. Steering shall be accomplished through the use of an articulated section of drill collar that causes an angular offset resulting in the drill bit being off-center. When steering adjustments are required, as dictated by down hole guidance monitoring equipment, the bit is rotated toward the desired direction of travel and the drill pipe and bit are advanced forward without rotation.

1.02 DEFINITIONS

A. Contractor’s Construction Drawings. Shall be defined as drawings by which the Contractor proposes to construct, operate, build, etc., the

referenced item. The submission of these drawings shall be required for the sole purpose of providing sufficient details to verify that the Contractor's work progress is in accordance with the intent of the design. When required, such drawings will have been previously reviewed and sealed by a qualified professional engineer registered in the State of Florida.

B. Subaqueous Crossings shall be defined as a HDD that crosses under a body of water greater than 50 feet across.

C. Large Diameter Installation shall be defined as a HDD that the nominal outside diameter of the product pipe is greater than twelve (12) inches.

1.03 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. American Association of State Highway and Transportation Officials (AASHTO).

B. Occupational Safety and Health Administration (OSHA).

C. API Specifications 13A, 1993. Specification for Drilling Fluid Materials, Fifteenth Edition, Dallas, Texas. American Petroleum Institute.

D. API Recommended Practice 13B-1, 1990. Standard Procedures for Field Testing Water-Based Drilling Fluids, First Edition, Dallas, Texas, American Petroleum Institute.

E. API Bulletin 13D, 1985. Bulletin on the Rheology of Oil-Well Drilling Fluids, Second Edition, Dallas, Texas, American Petroleum Institute.

F. Horizontal Directional Drilling Good Practices Guidelines, HDD Industry Consortium, 300pp, 2nd ed., 2004.

G. IADC Drilling Manual, 1992. Eleventh Edition, Houston, Texas, International Association of Drilling Contractors.

H. Installation of Pipelines by Horizontal Directional Drilling, Pipeline Research Committee, American Gas Association, PR-227-9424, April 1995.

I. Installation of Pipelines Beneath Levees Using Horizontal Directional Drilling, US Army Corps of Engineers, Waterways Experiment Station, Final Report, CPAR-GL-98-1, April 1998.

J. Pressure Pipeline Design for Water and Wastewater, American Society for Civil Engineers, 2nd ed., 1992

K. Tables for Hydraulic Design of Pipes and Sewers, American Society for Civil Engineers, 5th ed., 1990.

1.04 SUBMITTALS

A. Prior to beginning the Work, the contractor must submit to the Engineer the following items:

1. The Contractor shall provide a completed HDD Work plan with drawings and written description identifying details of the proposed method of construction and sequence of operations to be performed during construction. The Work plan shall address the following requirements:

a. Pre-construction walkover and site inspection.

1) Call- One Call for utilities location within the limits of the HDD project (Ground Penetrating Radar (GPR) Electronic Locate, Subsurface Location as required).

2) The Contractor shall video tape and take photographs of near by structures which may be affected by inadvertent fluid returns.

3) The Contractor shall review as-built drawing and prior soil reports of past projects in the area, if available.

4) The Contractor shall make an effort to discuss the scope of the proposed project with City, County and State Agencies that may have previous project construction knowledge in the vicinity.

b. The Contractor shall establish a drill profile between the entry and exit point by observing various framework conditions mentioned below in order to ensure, that the intended theoretical drilling profile line can also be realized in practice.

1) Entry and exit angle

2) Slant tangential sections

3) Radii of curvature

4) Cover

5) Borehole diameter

If the Contractor is planning on deviating from bid document HDD Profile, then the Contractor is required to submit additional drawings with the new HDD Profile for the engineer's approval.

The deviation drawings shall include a HDD Profile, plan view and cross-section. The Contractor is also recommended to submit deviation drawings for larger bores for site layout plans (Rig and Product Pipe Layout site) and pipeline stringing area (rollers).

c. The Contractor shall provide anticipated drilling rates for pilot bore, reaming and pullback procedures. These drilling rates shall be used to calculate drilling fluid volumes required for pilot hole, each reaming pass and pullback. The contractor shall guarantee pump capacity and that the drilling fluid cleaning system is capable of sustaining the anticipated drilling rates during the pilot bore, reaming and pullback.

d. The Contractor shall submit qualification documents for the HDD superintendent and key personnel experience in accordance with Section 1.06A and 1.06B. Also, the contractor shall have personnel with a Florida/OSHA Certification for the site Safety Representative.

e. The Contractor shall submit a detailed schedule for the HDD installation at least fifteen (15) days prior to mobilization. The detail schedule shall identify all major construction activities and durations, with beginning and completion dates shown. The detail schedule shall be updated at least every two weeks or more frequently, as directed by the Engineer, and shall include but not limited to the following items:

1) Pre-construction walk over and inspection.

2) Regular Mobilization and set-up.

3) Pilot bore

4) Pre-reaming and reaming.

5) Layout and thermal butt fusing of pipe.

6) Pressure Testing of pipe prior to pullback when practical or as directed by the Engineer.

7) Final reaming and pullback of product pipe.

8) Annulus grouting after installation (optional).

9) Mandrel/pig test to confirm deformations of product pipe are within allowable tolerances.

10) Cleanup, surface restoration, and demobilization.

B. The Contractor shall make available complete, legible, written daily logs and records as called for in Section 1.06C of this specification and as directed by the Engineer as it is being created or no later than by noon of the following day to which the records correspond.

C. The Contractor shall document any deviations from the actual plan and profile of the bore path and the location shown on the plans. The Contractor shall notify the Engineer immediately upon discovery of any deviations from the design plans.

D. The Contractor shall submit measured mud and/or drilling fluid weights used during pilot boring and reaming of the bore measured at a minimum of twice per shift or at least once per two hundred (200) feet of drilled or reamed length, whichever is more frequent.

E. The Contractor shall submit an as-built profile of the pilot bore within twenty-four (24) hours of completion of the pilot bore.

F. The Contractor shall submit records of equipment calibrations and certifications for all equipment used for downhole wireline survey and tracking of the drill head. Procedures for operating the downhole wireline survey tools shall be described, including measures to verify the accuracy of the equipment readings. The Contractor shall submit a drawing with the surveyed location of the surface wire grid system for the “TruTracker” or equipment tracking system. The Contractor shall submit methods for surveying the coordinates of the surface wire grid system both on shore and across or under the waterway. During pilot bore, reaming passes, and pipe pullback the Contractor shall electronically record the following information once per drill pipe or every thirty (30) feet, whichever is most frequent. The information shall be provided to the Engineer, as it is being

created or no later than noon of the day following the shift for which the records were taken.

1. Rate of Penetration
2. Rotation
3. Thrust
4. Pump Rates
5. Measured Depth
6. Annular Pressure
7. Flow Meter (Returns Suction Line)

G. The Contractor shall submit an as-built profile of the pilot bore within 24 hours of completion of the pilot bore.

H. The Contractor shall submit methods and procedures for filling the pipe with fluid during pull back and testing.

I. A Frac-out and Surface Spill Contingency Plan shall be prepared for the installation of pipelines using HDD. This plan shall be submitted to the Engineer prior to construction. The Contractor shall submit a letter of intent signed by an authorized representative of Contractor, confirming that the plan will be followed. The contingency plan for inadvertent returns/hydrofracture shall address all potential pathways for release of drilling fluid, and shall address containment, cleanup, and mitigation measures as well as reporting procedures and points of contact for regulatory and permitting agencies. The Plan shall address releases to the ground surface and to waterways. Stand-by equipment shall be provided by the Contractor to recover fluids from the waterway via truck and via boat. Floating turbidity barriers shall be part of the stand-by equipment to minimize dispersion in the event that drilling fluids reach the waterway.

J. Soil Separation Plant and Plans for Disposal:

1. The Contractor shall submit details on the pump and cleaning plant. Include dimensions, manufacturer's specifications, pump capacity, noise rating, and soundproofing details on the system.

2. Pump capacity should be specified for water at sea level elevation, and adjusted for actual elevation and fluid viscosity.

3. Provide details on the generator, including dimensions, noise ratings at twenty-five (25) feet, and soundproofing. Confirm that the generator and other on-site equipment can be operated without exceeding the maximum allowable noise tolerances specified in permit, or "by Pinellas County Noise Ordinance."

4. The Contractor shall submit plans for disposal of waste materials resulting from the pipeline construction, including drilling fluids, cuttings, waste oil, fuel, discharge water, etc. The Contractor shall identify the disposal site and submit a letter indicating willingness and legal authority to accept the described and anticipated waste products.

K. The Contractor shall provide details on measures to be taken to monitor and protect adjacent utilities, structures, and roadways, and provide details on monitoring equipment and provisions, including the layout of all settlement points, and other monitoring points. Provide two copies of pre-construction survey of adjacent structures and photographs with captions to document conditions prior to beginning HDD construction.

L. The Contractor shall submit a Safety Plan, including the name of the Contractor's Site Safety Representative, emergency telephone numbers for medical facilities, and precautions for handling and disposal of any hazardous or flammable materials. The Safety Plan shall include a code of safe practices and an emergency plan in accordance with OSHA and Florida/OSHA requirements.

M. The Contractor shall submit detailed descriptions of all equipment and materials to be used for the pipeline installation. Equipment and material submittals shall include directional drill rig, drill rig anchoring system, the mud system, drill bits, mud motors, reamers or hole openers, pipe rollers for pullback, drilling fluid and additives, pipe pull head, and pipe pulling swivel. Descriptions of equipment shall include manufacturers' specifications, calibrations, appropriate drawings, photographs, and descriptions of any modifications since manufacture. Descriptions of drilling fluid additives shall be accompanied by Materials Safety Data Sheets (MSDS) and manufacturers' descriptions and warranties.

1.05 PERFORMANCE REQUIREMENTS

A. The Contractor shall provide all equipment, materials, and personnel necessary for completing the installation as shown on the plans and specified herein. The equipment and materials shall include, but are not limited to:

1. Directional drilling rig with all ancillary equipment, including drill pipe, drilling fluid, cutting tools, reaming bits, swivels, expanders, motors, pumps, hoses, mixing equipment, drilling fluid processing equipment (cuttings separation equipment), downhole survey equipment, energized surface grid tracking system, fluid pressure and flow rate monitoring equipment, pull back monitoring equipment, spare parts, pipe handling equipment, crane, backhoe,

roller, side boom tractors, control cabin, control equipment, and office equipment.

2. Drilling fluids, water, fuel, lubricant, polymers, or other additives.

3. Any other expendable or reusable materials, supplies, and equipment needed for the installation.

B. The drilling equipment shall be capable of advancing through the geologic conditions to be encountered at the site, as described in the geotechnical reports, and as anticipated by the Contractor.

C. The drilling fluid shall be designed for the geologic conditions to be encountered at the site, as described in the geotechnical reports and as anticipated by the Contractor.

D. The drilling system shall include a fluid pump and separation plant that can achieve the rates of drilling fluid pumping, spoil separation, and slurry cleaning required by the Contractor to achieve planned production rates for the soils described in the geotechnical reports, and as anticipated by the Contractor. Shaker screens and hydrocyclones may be required for efficient separation of spoils. The Contractor is advised that the separation plant must fit within the allowable work areas.

E. All spoil and slurry must be contained in trucks, tanks, approved recirculation pits, or other containers at all times. Dumping of spoil or slurry on the ground, discharge into sewer, or discharge into the water bodies will not be permitted. All spoils will be transported and disposed of off site at an approved disposal facility that meets all State of Florida and local requirements.

F. Perform all work within areas shown on the plans.

G. The pipeline shall be installed using the radii of curvatures and entry and exit angles shown on the drawings, unless deviations are approved in writing by the Engineer.

H. Pipe rollers and lifters will be required to help the transition of the product pipe into the borehole. The number of pipe rollers and lifters shall be determined by the Contractor and submitted as part of the work plan.

I. Surface settlement or heave of utilities and other features above the HDD centerlines and within the zone influenced by the HDD construction shall be limited in values that avoid damage. The Contractor shall repair any damage resulting from settlement or heave caused by HDD activities at no additional cost to the Owner.

J. It shall be the Contractor's sole responsibility that all work is done in conformance with all applicable federal, state, and local safety requirements. Required safety equipment and procedures shall be employed by the Contractor at all times. All materials and methods of construction shall meet the applicable requirements of Pinellas County and the applicable requirements of the State of Florida Administrative Code.

K. The pipe will be certified by the Contractor as meeting all requirements of the specifications. The product pipe will be pressure-tested by the Contractor prior to pull back when practical or as directed by the Engineer, and after installation is completed, in accordance with requirements specified by the Manufacturer.

L. The Contractor shall allow the Engineer access to and shall furnish necessary assistance and cooperation to aid the Engineer in observations and data and sample collection, including, but not limited to the following:

1. The Owner and Engineer shall have full access to the operator control container prior to, during, and following all HDD operations. This shall include, but not be limited to, providing visual access to real-time operator control screens, gauges, and indicators.

2. The Owner and Engineer shall have full access to the slurry separation plant prior to, during and following all HDD operations. This shall include, but not be limited to, full access to shaker screens, hydrocyclones, conveyor belts, and slurry and spoil holding tanks. The Engineer shall be allowed to collect soil samples from the shaker screens and/or spoil holding tanks on the slurry separation plant a minimum of once per drill pipe section, and whenever changes in conditions are observed or suspected.

3. Sound levels measured by the Engineer or Engineer's consultant shall not exceed 55 dBA 6 PM to 7 AM, or 60 dBA 7 AM to 6 PM, within five feet of the nearest occupied building. Contractor shall comply with all local noise ordinances if the local requirements are more stringent. Sound levels in excess of these values are sufficient cause to have the work halted until equipment can be quieted to these levels. Work stoppage by the County for excessive noise shall **not** relieve the Contractor of the other portions of this specification including, but not limited to, completion of all Work within specified contract time and contract price. The Contractor shall submit a plan prior to construction identifying all noise reduction/abatement procedures. The plan will be approved by the Engineer prior to construction.

4. If mufflers cannot achieve the necessary noise reduction, noise abatement shall be accomplished by the Contractor's installation of baffles (or other acceptable means) positioned to break line-of-sight from the noise source to affected residences and/or commercial structures. Minimum noise abatement measures shall consist of equipping all engines with hospital grade mufflers or silencers.

1.06 QUALITY ASSURANCE

A. The Contractor shall have at least three years of demonstrated successful experience installing pipelines using the horizontal directional drilling process on at least three projects with similar diameters, installation lengths, and ground and ground water conditions. The Contractor shall furnish evidence of successful use of wireline and "Tru-Tracker" guidance and tracking system on at least two projects. The Contractor shall furnish evidence of successful experience with downhole pressure and load monitoring devices on at least one project. The Contractor shall furnish evidence of successful experience by including project owner, project name, location, diameter, length, depth, ground conditions, any problems encountered and how resolved, and any claims and how resolved. Owner's representative with address and telephone number shall be provided.

B. Qualifications and Experience of Contractor Personnel: The Contractor shall employ skilled, experienced superintendent(s), drill rig operators, and key personnel. The superintendent(s) and drill rig operators shall have at least three years of successful experience using the HDD process, on at least five projects with similar diameters, pull back length and ground conditions. The superintendent(s), drill rig operator, and key personnel shall demonstrate successful completion of at least three projects where pipe was installed with horizontal directional drilling techniques. The Contractor shall furnish resumes of the superintendent(s) and operators. Personnel experience records should include project names, locations, pull back lengths, ground conditions, pipe materials, project description, project owner, Engineer, and references with names, addresses and telephone numbers. The superintendent and operators listed in the submittal shall be on site during all construction related activities required for HDD installation.

C. Daily logs and records shall be maintained by the Contractor and shall include drilling lengths, location of drill head, drilling fluid pressures and flow rates, drilling fluid losses, inadvertent returns, drilling times required for each pipe joint, any instances of retraction and re-drilling of the pilot bore or segments thereof, and any other relevant observations, including any observed settlement, heave, frac-outs or surface spills. The drilling

fluid pressures shall be measured at the entry point and at the drill head and recorded at least twice per drill pipe length. These records shall be maintained and provided daily to the Engineer. The position of the drill head shall be continuously tracked and recorded by a downhole wireline tracking locator system, and shall be supplemented by a “Tru-Tracker” or equivalent tracking system installed that completely encompasses the area between the entry point and the exit point. The coordinates of the surface wire grid system shall be surveyed and recorded. A plot of actual locations of the bore path shall be maintained and updated daily, or more frequently, as directed by the Engineer.

D. Contractor shall provide at least seventy-two (72) hours advance written notice to the Engineer of the planned inception of major drilling activities, including pilot bore launch, pre-reaming, reaming, and product pipe pullback. The Contractor shall immediately notify the Engineer, in writing, when any significant problems are encountered or if ground conditions are considered by the Contractor to be materially and significantly different than those represented within the Contract Documents. The Contractor shall perform the pilot bore in the presence of the Engineer, unless Engineer grants prior written approval to perform such work in Engineer’s absence.

E. All surveying equipment used for downhole wireline surveying and tracking of the bore path and drill head and layout of the surface wire grid system for the “Tru-Tracker” or equivalent tracking system shall be inspected and calibrated by the equipment manufacturer prior to use. Proof of this inspection and calibration shall be provided to the Engineer prior to the commencement of drilling operations.

PART 2 – PRODUCTS

2.01 GENERAL

A. Directional drilling equipment shall consist of a directional drilling rig of sufficient capacity, drilling rods, appropriate drill bit, reamer, product pipe, drilling fluid, and additives, an adequate guidance system to accurately guide the boring operations and trained and competent personnel to operate the drilling system. All equipment shall be properly inspected to assure good and safe operating condition with sufficient back-up equipment in case of a failure.

2.02 PRODUCT PIPE, JOINTS AND FITTINGS

A. PIPE

1. All product pipe to be installed by the HDD operation will be High Density Polyethylene (HDPE), Restrained Joint PVC or Restrained Joint Ductile Iron pipe.

2. Refer to material specifications for material requirements.

3. Refer to piping sections of this specification for pipe handling requirements.

B. FITTINGS

1. Refer to material specifications for material requirements.

C. DRILLING FLUID (MUD) SYSTEM

1. Drilling fluid shall be composed of a carrier fluid (water) and drilling fluid additives (bentonite and/or polymers). Bentonite is a naturally occurring clay mineral (montmorillinite) that forms a mud when mixed with water.

2. The composition of the drill fluid is determined by the results of geological investigation executed in line with the framework of the project planned before construction.

3. The principal functions of drilling fluids used in HDD are:

a. Transporting drill cuttings to the surface by suspending and carrying them in the fluid stream flowing in the annulus between the borehole wall and the drill pipe/product.

b. Cleaning build-up on drill bits or reamer cutters by directing fluid streams at the cutters.

c. Cooling the downhole tools and electronic equipment.

d. Lubricating to reduce the friction between the drill pipe/product pipe and the borehole wall.

e. Stabilizing the borehole, especially in loose or soft soils by building a low permeability filter cake, and exerting a positive hydrostatic pressure against the borehole wall. The filter cake along with positive hydrostatic pressure reduces

collapse of the borehole and prevents formation fluids (i.e. groundwater) from flowing into the borehole or drilling fluids from exiting the borehole into the formation (loss of circulation).

f. The Contractor shall provide hydraulic power to the borehole with a downhole mud motor.

g. The following fluid properties are to be tested and considered to assure compatibility between the drilling fluid mixture and the native soil after proper identification and characterization. These fluid properties are density, viscosity, pH – value, circulation, volume and solid content.

h. The drilling fluid pressures and flow rates shall be continuously monitored and recorded by the Contractor at the pump and within the annular space within thirty (30) feet of the drilling head.

D. DRILL PIPE

The Contractor shall use high quality drill pipes. The drill pipe shall be inspected periodically and properly maintained within the manufacturer's prescribed limits.

The Contractor shall adhere to the manufacturer's guidelines for using their pipe, and sound practices must be followed to ensure reduced risk of downhole failure, i.e. the Contractor shall not bend the drill pipe sharper than the minimum bend radius stated by the manufacturer, especially on HDD enter and exit locations.

PART 3 - EXECUTION

3.01 GENERAL

A. Contractor shall contact Pinellas County Utilities at least forty-eight (48) hours before each of the following activities: 1) the set up of a drill rig pit, 2) the start of the pilot bore, 3) the pull back of the product pipe. Upon completion of the pilot hole phase of the operation, a complete set of as-built records shall be submitted in duplicate to the Engineer. These records shall include copies of the plan and profile drawing, as well as directional readings recorded during the drilling operation.

B. The drawings show existing utilities that are believed to be near the directional drill alignment. There is no guarantee that these utilities are located as shown or that other utilities may not be present. The

Contractor is to field locate existing utilities in advance of the work so as not to delay work and avoid conflict or disruption of utility services.

C. The Contractor shall provide adequate control of surface water and drilling fluids drainage and runoff, and provide silt fences and hay bales to prevent surface water or drilling fluids from entering the adjacent environmentally sensitive area.

D. The Contractor shall not initiate HDD until all submittals are received, reviewed, and accepted by the Engineer.

E. The Contractor shall not initiate HDD until all required permits are obtained.

3.02 PERSONNEL QUALIFICATIONS

A. Horizontal Directional Drilling is a complex operation and requires a high standard of qualified personnel to execute the Work. The personnel engaged in the execution of the work shall be carefully trained both in the project management and the operation of HDD equipment.

B. The Contractor shall employ skilled, experienced superintendent(s), drilling operators, safety specialist and competent support personnel.

C. The Contractor superintendent and drilling operators shall have at least three years of demonstrated successful experience installing pipelines using HDD process on at least three projects with similar diameters, installation lengths and groundwater conditions.

D. The Contractor shall furnish evidence of successful use of wire line and “Tru-Tracker” guidance and tracking systems on at least two similar projects.

3.03 WORK STAGING AREA

A. The Contractor shall limit staging and work operations to the areas shown on the Drawings, or as otherwise accepted in writing by the Engineer, for storage of equipment and materials, parking, product pipe layout, drilling, and other work.

B. The Contractor shall maintain the work area in a manner that shall minimize adverse impacts on other public use activities. The Contractor shall proceed with work in a safe, orderly manner, while maintaining the work site free of debris and unnecessary equipment and materials.

C. The Contractor shall follow all requirements of the Frac-Out and Surface Spill Contingency Plan as submitted and approved and shall control operational pressures, drilling mud weights, drilling speeds, and any other operational factors required to avoid hydro-fracture, fluid losses to formations, and drilling fluid spillage. This includes any spillages or returns at entry and exit locations or at any intermediate point. All inadvertent returns or spills shall be promptly contained and cleaned up. The Contractor shall maintain on-site mobile spoil removal equipment during all drilling, pre-reaming, reaming, and pull back operations and shall be capable of quickly removing spoils. The Contractor shall immediately notify Engineer of any inadvertent returns or spills and immediately contain and clean up the return or spill.

D. Combustible materials (fuel, oil, lubricants, etc.) shall be stored off-site or in a well-ventilated storage facility removed from the immediate vicinity of the drilling area by at least twenty (20) feet.

E. The Contractor shall provide maintenance of traffic plans, in accordance with approved Traffic and Safety Requirements, erect appropriate barriers, warning lights, and signs, painted with approved colors, warnings, and graphics to ensure adequate warning to motorist and the public.

F. The Contractor shall install an enclosure fence and/or barrier walls around the work area. The enclosure fence shall include a lockable gate and should be adequate to prevent entry of unauthorized persons, when practical or as directed by Engineer.

G. At the completion of construction, the Contractor shall remove all temporary facilities installed by the Contractor. Unused soil, aggregate, and other materials shall be removed and disposed of at approved sites in accordance with all Federal, State, and Local regulations. Any damage to streets, lawns, common areas, and sidewalks shall be restored to original or better conditions. All disturbed areas shall be re-vegetated.

3.04 MOBILIZATION

A. The Contractor shall mobilize all equipment, materials, and personnel necessary to install pipeline using the HDD process at the locations shown in the Drawings.

1. The Contractor shall set up temporary workspace within the areas shown on the Drawings. Appropriate precautions and measures shall be employed by the Contractor to prevent erosion, surface drainage, and spillage of drilling fluids or other materials that could adversely impact the environmental quality of the site. Silt fences, hay wattles, and hay bales shall be used to line the work area to

minimize erosion and contain any spillages or runoff. A vacuum truck, shovels, brooms, buckets, and barrels shall be kept on-site to facilitate containment and cleanup. A vacuum truck or trailer unit shall be on standby and capable of responding within one hour to any spill or inadvertent return incident.

2. The exit area shall have a drilling fluid pit for containing drilling fluids and cuttings. Appropriate precautions and measures shall be employed by the Contractor to prevent erosion, surface drainage, and spillage of drilling fluids or other materials that could adversely impact the environmental quality of the site. Hay bales or wattles shall be used to line the exit area to minimize erosion and runoff. Containment and cleanup equipment shall be available to contain and clean up any surface spills and frac-outs.

3. Layout area shall be free of stones, wood, debris and obstructions. A crane to lift pipe over driveways and entrances, etc. and pipe rollers shall be provided by the Contractor to facilitate pipe pull back.

3.05 HORIZONTAL DIRECTIONAL DRILLING

A. The capacity of the directional drilling system used by the Contractor shall be adequate to install the specified pipeline.

B. The pump used by the Contractor shall be adequate to supply the required flow rate and pressures at the anticipated drilling fluid viscosity at all times. Drilling speeds shall not exceed pump capacity.

C. At all times during the pilot bore the Contractor shall provide and maintain a bore tracking system that is capable of accurately locating the position of the drill head in the x, y, and z axes. The Contractor shall record these data at least twice per drill pipe length or every fifteen (15) feet, whichever is more frequent.

1. Contractor shall monitor and record x, y, and z coordinates relative to an established surface survey benchmark, from downhole survey data using downhole wireline system. “Tru-Tracker” energized surface grid, or equivalent, shall be installed and used to supplement the wireline system. The “Tru-Tracker” grid shall encompass the entire area of the bore including underwater across the water. Alternatively, the Contractor may propose fixed “Tru-Tracker” grids on land outside the waterway, supplemented by moveable grids on floating templates that can be temporarily anchored and surveyed while drilling the pilot hole. The moveable template should be sufficiently large to encompass the active drilling area for a two hour drilling period, and should be at least as

wide as the maximum depth of the bore. The grids shall be surveyed to establish horizontal and vertical position to 0.1 feet accuracy. The data shall be continuously monitored and recorded at least twice per drill pipe length or every fifteen (15) feet, whichever is most frequent.

2. Deviations between the recorded and design bore path shall be calculated and reported on the daily log. If the deviations exceed tolerances specified elsewhere, such occurrences shall be reported immediately to the Engineer. The Contractor shall undertake all necessary measures to correct deviations and return to design line and grade.

3. Drilling fluid pressures and flow rates shall be continuously monitored and recorded by the Contractor. The pressures shall be monitored at the pump and within the annular space with a downhole pressure-sensing tool located within thirty (30) feet of the drilling head.

4. Maximum allowable drilling speeds shall be calculated by the Contractor for pilot boring and each reaming pass and shall not be exceeded for pilot boring or reaming passes. Measurements shall be taken every fifteen (15) feet.

5. The Contractor shall measure and record drilling fluid viscosity and density at least three times per shift with at least two hours between readings, using calibrated Marsh funnel and mud balance. These measurements shall be included in daily logs submitted to the Engineer. The Contractor shall document modifications to the drilling fluids, by noting the types and quantities of drilling fluid additives and the dates and times when introduced. The reason for the addition of drilling fluid additives or other modifications shall be documented and reported.

   The Contractor shall measure and record the pH on a regular basis (three times per shift with at least two hours between readings) with pH strips, paper or a pH meter.

   The Contractor shall constantly monitor and record the circulating volume, particularly for the early detection of drilling fluid losses, or thinning, or the danger of borehole collapse. Ground upheavals can also be detected early from such differences, and necessary action can be implemented to prevent further damage.

The Contractor shall constantly monitor and record the solid (sand) content to assure there is no significant increase, which can diversely impact efficiency of the circulations system.

D. Entry and exit points shall be as shown on the drawings, unless otherwise approved in writing by the Engineer. The Contractor shall employ licensed, professional land surveyors to locate the entry and exit points, and to establish horizontal and vertical datum for the bore and the pipe layout and fabrication areas.

E. Drill entrance and exit angles shall be as shown on the Contract Plans and Drawings, unless otherwise approved in writing by the Engineer.

F. The pilot bore shall follow the design path of the bore shown on the Drawings.

1. Horizontal and vertical deviations shall be less than plus or minus three feet from the design path centerline. The Contractor shall continuously monitor horizontal and vertical position and record the position at least twice per drill pipe length, or at fifteen (15) feet intervals, whichever is most frequent.

2. The radius of curvature shall not be less than that shown on the Drawings. The radius of curvature shall be calculated over the distance of three drill pipe sections.

3. The location of the entry and exit points shall be as shown on the Drawings. The Contractor shall be solely responsible for all work necessary to correct excessive deviations from line and grade, including re-drilling, redesigning connections, and acquiring additional easement, at no additional cost to the Owner and without schedule extension.

G. The pilot bore shall be pre-reamed and reamed using equipment and methods submitted by the Contractor. The Contractor shall completely ream the borehole to the final diameter prior to pull back, when practical or as directed by the Engineer.

H. The Contractor shall perform hydrostatic water pressure test in accordance with the manufacturer's guidelines prior to product pipe pullback.

I. Pipe Pullback:

1. The pipe shall be installed by pulling it into the reamed bore path in a continuous operation when practical, behind a final reaming tool selected by the Contractor.

2. The pipe shall be isolated from excessive torsional and axial stresses by a swivel device with a pre-established breakaway tensile capacity that is lower than the allowable tensile strength of the product pipe.

3. All measurements shall be made, recorded, and submitted on the daily logs during final reaming and pipe pull back.

4. The maximum pull (axial tension force) exerted on the pipelines shall be measured continuously and limited to the maximum allowed by the pipe manufacturer with an appropriate actor of safety ($\geq$ 2) so that the pipe or joints are not overstressed.

5. The pipelines shall be adequately supported during installation so as to prevent overstressing or buckling. The Contractor shall provide adequate support/rollers along the pipe layout area to support the required length of the pipe for each bore. Such support/rollers shall be spaced at a maximum of sixty (60) feet on centers, and the rollers shall be comprised of a non-abrasive material arranged in a manner to provide support to the bottom and bottom quarter points of the pipeline allowing for free movement of the pipeline during pullback. The pipe layout area shall be cleared of all large stones, construction debris, or other foreign objects that could damage the pipe during pull back.

6. The end of the pipe shall be closed during the pull back operation.

7. Each length of pipe shall be inspected and cleaned as necessary to be free of debris immediately before joining.

8. Tracer wire will be attached to the leading end of the pipe pulling head and shall extend the full length of the installed pipe.

9. The Contractor shall at all times handle the pipe in a manner that does not overstress or otherwise damage the pipe. Vertical and horizontal curves shall be limited so that wall stresses do not exceed fifty (50) of yield stress for flexural bending of the pipe or joint. If the pipe is buckled or otherwise damaged, the damaged section shall be removed and replaced by the Contractor at his expense. The Contractor shall take appropriate steps during pull

back to ensure that the pipe and tracer wires (if required) will be installed without damage.

10. The pipe shall be **filled with water** as it enters the borehole to reduce pull back loads and to ensure that adequate internal pressure is maintained at all points to counter balance collapse pressures.

11. The Contractor shall monitor and inspect pipe rollers and method for suspending product pipe at exit pit during the pull back operation to avoid damage to the pipe.

12. The Contractor shall cease pull back operations if the pipe is damaged and shall remove the product pipe from the bore and repair the pipe using the manufacturer's recommended procedure or replace the damaged pipe before resuming installation.

13. Damage to the product pipe resulting from manufacturer defects, installation, contact grouting, or grouting of the annulus is the responsibility of the Contractor, including costs for replacement and labor and materials. To confirm no damage to the pipe, upon completion of pull back and grouting, the Contractor shall perform the following test on the completed pipeline:

    a. A sphere or pig, one inch less in diameter than the internal diameter of the product pipe, which is capable of allowing water to pass through it, complete with a pulling cable on either side of sphere or pig, shall be pulled through the entire length of the pipeline. If the pig or sphere cannot pass through the pipe, it shall be considered collapsed and damaged.

14. After the product pipe is completely pulled through the borehole, a sufficient relaxation period, if recommended by the pipe manufacturer, shall be provided before the final pipe tie-in.

15. The Contractor shall conduct a final hydrostatic test of the installed pipeline. Final test shall be in accordance with the pipe manufacturer's guidelines. The Contractor will repair any defects discovered during this test, and repeat until the pipe passes the test.

J. The Contractor shall notify the Engineer immediately in the event that any obstruction is encountered that prevents further advancement of the drill pipe, or pull back of the pre-reamer, reamer, and/or pipe. The Contractor shall make all diligent and reasonable efforts to advance past the object by drilling slowly through the object, pulling back, and drilling along a new

bore path that avoids the object, or excavating and exposing and removing the object, and all other reasonable attempts to continue the bore. The Contractor shall notify the Engineer of proposed measures to attempt to advance past the object, prior to initiating the attempt. If the Contractor attempts to pull back and re-drill, the Contractor shall adhere to line and grade tolerances established in this specification section, unless the Engineer approves variance, in writing, prior to the Contractor's attempt to re-drill. The Contractor and Engineer shall investigate the cause and together determine an appropriate response. Appropriate response may include revisions to equipment or methods, retraction and re-drilling of a portion of the borehole, or abandonment of the borehole. If abandonment is deemed necessary, the Contractor shall recover, to the extent practicable, any drill pipe, product pipe, and tools in the borehole, and properly abandon the borehole by contact grouting, unless otherwise directed in writing by the Engineer. If the borehole is abandoned, the Contractor shall be allowed to begin a second attempt to install the pipeline at an alternate location subject to approval, in writing, by the Engineer. The Contractor shall take all reasonable actions to complete the installation with minimal delays.

K. The Contractor shall remove all equipment, materials, drilling fluids, muck, waste, and debris from the site and restore the site to its original condition upon completion of the installation. Restoration and demobilization shall be completed by the Contractor within seven days of the completion of the pipeline installation.

L. The Contractor shall monitor for settlement or heave before and during drilling and grouting operations.

END OF SECTION

SECTION 33 33 01

GRAVITY SEWERS

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. The Work includes furnishing all plant, labor, tools, equipment, materials, and performing all operations in connection with construction of sanitary sewers and appurtenant structures, including excavation, trenching, backfilling and appurtenant work as required, or as directed.

1.02 Material Depth Limitations

A. Pipe materials used for gravity sewers shall be subject to the depth limitations indicated in accordance with the Standard Details.

PART 2 - PRODUCTS

2.01 MATERIALS

A. All gravity sewer pipe and appurtenant materials used in the Pinellas County Sewer System shall be as specified in the latest version of the Pinellas County Utilities Material Specification Manual at the time of plan approval.

PART 3 - EXECUTION

3.01 CONSTRUCTION

A. Order of Work

1. The Engineer reserves the right to specify which sewer lines will receive priority in construction. In general, however, the work will be from the lower end of the sewer towards the upper end of the sewer.

B. Maintenance of Existing Sewerage Facilities

1. It is the responsibility of the Contractor to maintain operation of the existing sewerage facilities during construction and repair work. The Contractor shall be responsible for providing any equipment required to maintain operation of service during construction. Any damage done to any existing sewer pipe or structure is to be immediately repaired to a condition equal to, or better than, its original condition.

C. Location and Grade of Sewers

1. The line and the grade of the sewer, as well as the location of manholes, and all other appurtenances, shall be as shown on the Plans or, as directed by the Engineer. The grade line as given on the Plans indicates the grade of the invert of the sewer pipe.

D. Cutting Gravity Sewer Pipe

1. Cutting ductile iron pipe shall be field cut with a power saw. No impact cutting is permitted. The spigot end of pipe thus cut shall be filed or ground to form a bevel.

2. Cutting PVC sewer pipe may be field cut using hand or power saws in accordance with the manufacturer's recommendations. The raw spigot end thus formed shall be filed to remove gasket damaging burrs and to form a standard bevel.

E. Laying Gravity Sewers

1. Cut sheets for complete sections of the gravity sewers, as designated by the Engineer, shall be submitted by the Contractor to the Engineer for approval at least two days prior to construction. Each run of gravity sewer shall be represented on a separated cut sheet.

2. Installation of ductile iron pipe shall conform to the procedures outlined in "A Guide for the Installation of Ductile Iron Pipe" which is available from the Ductile Iron Pipe Research Association. All ductile iron pipe is to be encased in green polyethylene material, conforming to the requirements of the County’s Materials Specification Manual. Polyethylene film shall be supplied in tube form suitable for use in Installation Method 'A' per AWWA C105.

3. Installation of PVC pipe shall be per ASTM D-2321 and UNI-B-5.

4. Trench excavation shall be as specified in Section 31 23 33, Excavation and Backfill for Pipes.

5. Each pipe shall be laid true to line and grade so as to form a close concentric joint with the adjoining pipe, preventing offsets in the flow line. The trench bottom shall form a solid base for the entire length of pipe and shall be capable of supporting the full weight of the pipe and backfill material. The pipe bells shall not bear against the solid bottom of the ditch. Sewers will be inspected with mirrors at intervals during construction and corrected, if necessary, before backfill.

6. All wye units, stubs, or other fittings placed in lines for future connections, or services, shall have the open bell tightly plugged using pipe manufacturer=s recommended watertight plug. All plugs shall be capable of withstanding 4 psi internal air test pressure, yet permit easy removal for future use.

7. The open ends of all pipelines shall be kept securely plugged at the end of each day's work and at any other time when any operation is being carried out which might permit foreign materials, rock, dirt, etc. to enter the pipe. Pipelines shall be thoroughly flushed out upon their completion and when directed by the Engineer.

F. Joining Gravity Sewer Pipe

1. Gravity sewer pipe having factory fabricated joints shall be joined together in strict accordance with the manufacturer's specifications. The surface shall be wiped free of dust, dirt, gravel, or other foreign materials before joining. The spigot end shall be centered on grade into the bell end of the last downstream length of pipe, and properly seated.

2. When seating pipe with a pry, lever, or other approved device, care shall be taken to protect the pipe end from damage. Ends damaged in any manner shall be cause for rejection of the pipe.

G. Repair and Replacement Construction

1. All repair and replacement work shall conform to standards specified for new construction wherever applicable, or as specified in the Repair Specifications.

H. Removal of Existing Pipe

1. Existing pipe no longer in service that is removed from the system shall be disposed of properly by the Contractor. Openings in manholes, sewer lines, or wye branches remaining in place shall be properly plugged and sealed so as to eliminate any possibility of infiltration at the point of separation. All pieces of broken pipe shall be removed from the trench before backfill operations commence. Backfill of the trench shall be as specified in Section 31 23 33 - Excavation and Backfill for Pipes. Inspection of structures remaining in place shall be made before backfill.

3.02 INSPECTIONS OF LINES AND MANHOLES

A. Inspection of completed lines and manholes shall be scheduled within a reasonable time after construction or when required by the Engineer. Before

scheduling an inspection, the Contractor shall prepare the lines by cleaning and flushing. Manholes shall be clean, finished and free of leaks.

B. Manholes shall be on a true and uniform grade. The inverts shall have a smooth steel troweled finish. All benches shall be uniformly sloping. The frames shall be tight and properly set in mortar on solid masonry. The invert, benches and adjacent pipe shall be free of splattered mortar. All required interior lining or paint shall be kept intact. Manhole frames shall be adjusted to grade with the covers and frames cleaned and free of mortar and asphaltic mixtures. All precast manhole seams shall be filled with an approved asphaltic compound.

C. Pipe between manholes shall be true to line and grade. Dips and sags with one inch or more of trapped water shall be cause for rejection. Inspection shall be by mirror and sunlight and shall be followed by television inspection at the Contractor's/Developer's expense. Air testing may be required also at the Contractor's/Developer's expense. Contractor shall provide personnel to assist with inspections.

D. The Contractor shall provide Pinellas County Utilities with a Television Inspection of the completed gravity sewers in accordance with the following:

1. Shall be performed by a NASSCO PACP Certified Operator who will use software that is compatible with Granite XP latest version software to NASSCO PACP Standards.

2. Shall be submitted as digital media that includes video and data base file in PACP format and include a printed copy of the PACP television inspection log.

3. Shall perform a manhole inspection and provide a completed NASSCO Manhole Inspection form latest version for each manhole that is connected to the sewer being inspected.

4. All pertinent data recorded in audio on the media to include:

   a. Subdividion name and phase number.
   b. Manhole numbers (these numbers must match manhole numbers on “as built” drawings).
   c. Date
   d. Size and material of pipe
   e. Service connection locations, right or left
   f. All distances between manholes
   g. Locations of suspected and obvious pipe deficiencies (i.e., bad joints, breaks or leaks etc)

5. PVC pipe shall have a deflection test using a seven and one-half percent (go-no-go) test mandrel of appropriate size, which shall be visible on video at all times.

6. The printed NASSCO PACP television report (indicating manhole numbers) which will accompany the media. This written report must include:

   a. Manhole numbers (these numbers must match manhole numbers on "as-built" drawings).
   b. Service connection locations, right or left.
   c. Reference to service connection locations out of manholes.
   d. Locations of suspected and obvious pipe deficiencies (i.e., bad joints, breaks or leaks, etc.).
   e. Depth of each manhole.
   f. Actual measured distance (on ground) between manholes.

7. All visual and television inspections shall be completed and approved by Pinellas County Utilities after the road base has been constructed but prior to the placing of any asphalt.

8. Television Inspection Media must clearly show details of structural defects, misalignments and infiltration.

9. For detailed requirements for Television Inspection see Section 33 01 32 Sanitary Sewer Cleaning and Televising.

E. All known or indicated breaks shall be repaired by the Contractor regardless of the test allowances. Faulty sections of sewer lines or manholes rejected by the Engineer shall be removed and re-laid by the Contractor. Sunken manholes will not be accepted.

3.03 SERVICE CONNECTIONS - WYE UNITS AND SERVICE PIPE

A. In new sewer construction, D.I.P. and PVC service connections shall be made by means of a wye or tee. All joints connected to the wye unit shall remain flexible. Service connections on existing mains shall be made using a sewer saddle approved in the County's Materials Specification Manual.

B. All new sewer service connections shall have a continuous looped trace wire consisting of one (1) 14-gauge minimum solid copper or one (1) 12- gauge copper clad steel tracer wires taped to the top center of the pipe from the cleanout to the main line and back to the cleanout in accordance with the Pinellas County Standard Details. Tracer wire shall be in accordance with the County's Materials Specifications Manual.

C. Service pipe for all properties shall be laid to the property line and plugged, as shown on the Standard Details. All ends of service lines shall be marked by a permanent stake and where sidewalks or curbs are located nearby, by a chiseled mark cut in the sidewalk or curb. Service pipe shall have a protective cover of not less forty-two (42) inches under all roads and thirty-six (36) inches at all property lines. Inspection of service pipe shall be made before backfill. Service pipe shall have a visibly good line and grade. Shallow service shall be laid by using a four foot hand level with proper shim attached to one end.

D. In cases of extra depth where service pipe cannot be laid on a continuous grade to the property line, the Contractor shall then furnish all materials and construct risers as shown on the Plans. When pipe cannot be adequately supported on undisturbed earth, it shall be supported on a concrete cradle. No payment will be made for concrete required to correct conditions resulting from faulty construction methods or negligence.

3.04 SERVICE RECONNECTIONS

A. Service reconnections require adapters for all joints that will not connect properly with ordinary factory joints. Approved pipe cutting methods shall be used to cut any pipe required for the connection. All cut pipe will be ground and smoothed to remove snags and sharp edges. No mortar or collars shall be used on reconnections unless specifically approved by the Engineer.

3.05 JOINING NEW PIPE TO OLD PIPE

A. Joining polyvinyl chloride pipe to existing vitrified clay pipe requires an adapter approved in the County's Materials Specification Manual for all joints that will not connect properly with ordinary factory joints. Approved pipe cutting methods must be used to cut any pipe required for the connection. All cut pipe shall be ground and smoothed to remove snags and sharp edges. No mortar or collars shall be used for such connections unless approved by the Engineer.

3.06 CLEAN-OUTS

A. Clean-outs shall be constructed in accordance with the Standard Details at locations as shown on the Plans.

3.07 JOINING PIPE TO MANHOLES OR OTHER STRUCTURES

A. All manhole connection holes shall be core drilled with a maximum hole diameter not to exceed one and a half times the pipe diameter.

B. Approved standard groutable PVC-to-manhole fitting approved in the County's Materials Specification Manual, or a flexible rubber boot may also be used at the manhole connection. The boot shall be manufactured of neoprene or isoprene compounds formulated and tested to resist deterioration due to sewage, hydrogen sulfide, oils, fats, greases, petroleum products and by-products. The connection at the manhole wall shall be flexible and water-tight. Any annular space inside the manhole at the connection shall be filled with approved caulking material or joint filler.

C. Stubouts for future mains shall be constructed at the locations and to the elevations shown on the Plans. The manhole benches shall be constructed to direct flows from all shown manhole inlets smoothly to the outlet. Stubouts shall be plugged with bricks and mortar per the detail shown on the Plans.

D. Pipe connections to existing manholes shall be made so that finished work will conform, as nearly as possible, to the essential requirements for new manhole construction, as specified above. Drop connections on existing manholes shall be strengthened by use of eight #6 pins, placed around the drop elbow and tee, or inside PVC drops may be used.

3.08 WATER MAIN STORM DRAIN CROSSINGS

A. In all cases where sanitary sewer mains cross water mains, or storm sewers with a minimum clear distance between the sanitary sewer and the water main or storm sewer of less than twelve (12) inches, the sanitary sewer shall be ductile iron pipe for a distance of ten feet on either side of the point of crossing. No pipe joint shall occur within ten (10) feet of the crossed water main.

END OF SECTION

SECTION 33 34 00

SANITARY SEWAGE FORCE MAINS AND APPURTENANCES

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall furnish all plant, labor, materials, equipment and tools and perform all operations in connection with the construction of the sanitary sewage mains and appurtenances, including excavation, trenching, backfilling, testing, clearing and clean-up.

1.02 MAINTAINING SERVICE AND SHUT DOWNS

A. The Contractor's attention is called to the fact that the existing system must be kept in operation at all times. Where connections are made to existing mains or other shutdowns are necessary, permission must be obtained and arrangements must be made with the Utilities Department for removing from service those mains that will be affected. Shutdowns must be held to a minimum in both number and duration. Bypass pumping and hauling operations may be required to interrupt service.

B. No valve or other control device on the existing system shall be operated by the Contractor without first obtaining approval from the Utilities Department. The Contractor shall, at least forty-eight (48) hours in advance, notify citizens subject to interruption of service by means of door hangers or any other approved method of the starting time and duration of such interruption.

1.03 SUBMITTALS

A. Unless waived by the Engineer, cut sheets for the entire force main shall be submitted by the Contractor to the Engineer for approval at least two days prior to construction. This requirement will not relieve the Contractor of the responsibility to accurately record the "as-built" locations (horizontal and vertical) of piping, valving and appurtenances. Contractor shall submit to the County the Continuity Testing Results per Section 3.04 Item 6.g.

1.04 LAYING PIPE

A. All roads and curbs shall be installed prior to force main installation. On a road where there is no curb, the paving must be done prior to installing the force main. Any deviation from this must be approved in writing by the

Pinellas County Engineer or his designated representative. In any case, force mains will not be accepted or tested until curb and/or roads are compete, thus preventing possible relocation or adjusting and retesting of newly installed pipes.

B. All joints, fittings and other appurtenances shall not be covered until inspected by the Pinellas County Inspector. Non-compliance will require excavation of all joints and fittings.

C. The pipe and fittings shall be constructed as shown on the approved Plans. All pipe four inches and larger in diameter may be deflected, but not bent. PVC pipe two inches in diameter may be bent around cul-de-sacs that have a radius of thirty-seven (37) feet or larger if the trench is left open until the Pinellas County Inspector is onsite to document that this guideline is fully complied with. The use of fittings not shown on the "Contractor Copy" construction Plan must have the prior concurrence of the Pinellas County Inspector.

1.05 ABANDONMENT OF EXISTING MAINS BEING TAKEN OUT OF SERVICE

A. In general, pipe six inches and smaller abandoned within Pinellas County rights-of-way shall be capped at both ends and abandoned in place. Grouting is not required unless specifically required by the Engineer or the County.

B. Abandoned pipes eight inches and larger shall be filled with grout or flowable fill unless otherwise directed by the County or the Engineer.

C. Pipe abandoned in rights-of-way owned by municipalities other than Pinellas County shall be subject to the requirements of the agency having jurisdiction.

D. All pipes shall be abandoned in a manner which results in the abandoned pipeline not being pressurized.

PART 2 – PRODUCTS

2.01 GENERAL

A. Materials, equipment and supplies furnished and permanently incorporated into the Project shall be of first quality in every respect, shall be constructed and finished to high standards of workmanship, and shall be the product of an approved reputable manufacturer. Material shall be suitable for the service intended, shall reflect modern design and engineering and shall be fabricated in a first-class workmanlike manner. All materials, equipment and supplies shall be new and shall have not

been in service at any time previous to installation, except as required in tests or incident to installation.

B. Materials and construction pertaining to restoration and construction of roads and structures shall be in accordance with the latest edition of Florida Department of Transportation (DOT) Standard Specifications for Road and Bridge Construction or as called for on the Plans.

C. All ductile iron or cast iron pipe, fittings and valves are to be encased in green polyethylene material, conforming to ASTM specification D-1248, with a minimum 8 mil thickness, taped and free of dirt in accordance with the latest edition of AWWA C105. Polyethylene film shall be supplied in tube form suitable for use in Installation Method 'A' as defined in AWWA C105.

D. All piping and appurtenances shall be color coded green with the exception of ductile iron pipe. That shall be encased in green polyethylene wrap, or if not available, encased in clear polywrap and shall be marked by means of three four-inch wide painted green lines along the length of the pipe at opposite locations around the pipe.

E. All PVC piping and ductile iron mains partially constructed of PVC or HDPE between valves shall be installed with locator wires, as specified below.

F. Force mains shall be buried with green metallic locator tape. All locater tape shall be placed twelve (12) inches above buried pipe.

G. No glued joints will be allowed. Mechanical restrainers are the only acceptable method of restraint.

2.02 MATERIALS

A. All pipe and appurtenant materials used in the Pinellas County Sewer System shall be as specified in the latest version of the Pinellas County Utilities, Material Specification Manual at the time of plan approval.

PART 3 - EXECUTION

3.01 HANDLING

A. All materials, unless otherwise directed, shall be unloaded as nearby as possible to the location of installation by the Contractor. Materials shall be handled with care to avoid damage.

B. Materials shall be lifted by hoists or slid or rolled on skidways in such manner as to avoid shock. Under no circumstances shall materials be dropped. Pipe handled on skidways must not be allowed to roll against pipe already on the ground. The Contractor shall be responsible for the safe handling of all materials. Damaged materials shall not be installed.

C. All materials found during the progress of work to have flaws, cracks, or other defects will be rejected by the Engineer regardless of whether or not it has been installed and shall be replaced by and at the expense of the Contractor.

D. All PVC pressure pipe, upon delivery to the site and until such time as it is placed in the trench, shall be shielded from the weather and direct sunlight to prevent pipe deterioration.

E. Materials shall not be stacked or placed under materials in such a manner that damage could result.

F. Slings, hooks, or tongs used for lifting shall be padded in such a manner as to prevent damage to exterior surfaces, interior linings and components. If any part of the coating, lining or components is damaged, the repairs or replacement shall be made by the Contractor at his expense and in a manner satisfactory to the Engineer prior to attempting installation.

G. In the event that materials supplied by the County are defective, the Contractor shall notify the Engineer immediately so arrangements can be made for replacing such devices.

3.02 FIELD LAYOUT AND MODIFICATIONS

A. The Contractor, unless directed otherwise, shall be responsible for setting construction layout stakes and/or offsets required to complete the designated work. The Contractor shall insure that those stakes and/or offsets are protected and any re-staking due to work stoppage shall be included and no additional compensation to the Contractor will be made.

B. The Engineer has the right to make any modifications as he deems necessary due to field conditions, conflicts with other utilities or to protect other properties.

3.03 EXCAVATION, ALIGNMENT AND GRADE

A. Trench excavation and backfill shall be in accordance with Specification 31 23 33, Excavation and Backfill for Pipes.

B. All mains shall be laid and maintained at the required lines and grades with fittings, valves and appurtenances at the described locations. All pipe shall be laid to the depth as shown on the Plans, or when a depth is not indicated, with a minimum cover of thirty (30) inches outside of the roadway, and thirty-six (36) inches under the roadway. Grade lines shall be set by the Contractor. The tolerance of such grades shall not be more than that specified on the drawings. When no tolerance is indicated a tolerance of 0.5 foot shall be used. All other realignments must be approved by the Engineer. The Contractor shall have suitable survey equipment on the site at all times.

C. The Work shall at all times progress with caution so as to prevent damage to underground obstructions both known and unknown. Should an obstruction not shown on the Plans be encountered, the Engineer shall be immediately notified and he shall be responsible for alteration to the plan should realignment be necessary. The Contractor shall notify the Engineer far enough in advance to allow the realignment to be accomplished by deflection in the pipe joints.

3.04 LAYING AND JOINING BURIED FORCE MAINS

A. General

1. Prior to installation, all pipe shall be inspected for defects and all lump or excess coatings shall be removed. The inside of the bell and outside of the spigot shall be cleaned prior to joining of all pipe. Caution shall be taken to prevent damage to the pipe during lowering into the trench. Caution shall be taken to prevent foreign matter from entering the pipe during installation. The Engineer may require covering of the end of the pipe to prevent debris from entering. No debris, tools, clothing or other material shall be placed in the pipe.

2. After placement in the trench the spigot end of the pipe shall be centered in the bell and the pipe shall be driven home and then brought to the proper line and grade by tamping approved backfill material under it, except for the bell. Joint deflection shall not exceed manufacturer's limit.

3. During the time that the pipe is in the trench but no work is in progress, the end shall be closed by a water-tight plug. This shall include the noon hour, as well as overnight. If there is water in the trench upon beginning work, this plug shall remain in place until the trench has been pumped dry, unless otherwise approved by the Engineer.

4. Standard plugs shall be inserted into all dead end pipes, tees or crosses; spigot ends shall be capped; flanged ends shall have blind flanges, or sheet metal or plywood caps. Plugs installed for pressure testing shall be fully secured and restrained to withstand the test pressure.

5. Where plugging is required because of Contract division or phasing for later connection, the ends of such lines shall be equipped with a permanent type cast iron or ductile iron plug/cap or blind flange with or without a blowoff cock, as shown on the Drawings. Installation or removal of such plugging shall be considered incidental to the work and no payment shall be expected for this work by the Contractor.

6. Tracer Wire For PVC, HDPE and Non-Continuous Ductile Iron Force Mains.

   a. Tracer wire shall be installed on all mainline pipe. Mainline pipe installed by open cut method shall have two (2) 14-gauge minimum solid copper or two (2) 12-gauge copper-clad steel tracer wires taped to the top center of the pipe. Mainline pipe installed by horizontal directional drill shall have two (2) 12-gauge copper-clad steel tracer wires installed with the pipe. All tracer wire shall be as specified in the material specification manual.

   b. The locator wires shall have colored insulation matching the type of service provided in the main and be acceptable for direct burial.

   c. All splices of the wires shall be made with watertight connections per material specification manual.

   d. The wires shall each be continuous throughout the project.

   e. The wire is to be tied to all valves, tees and elbows

   f. The locator wires shall be brought up into all valve boxes with enough slack provided to extend 10 to 12-inches out of each box and installed as shown in the Standard Details.

   g. Contractor shall perform a 12-volt DC electrical continuity test on each of the wires. No more than one volt of loss per 1000 feet of mainline pipe will be acceptable. The locator wire system shall pass the 12-volt DC electrical continuity test for at least one wire prior to final acceptance of the

pipeline. Any cuts or breaks in the wire shall be repaired by the Contractor at his expense.

h. The locator wire shall be tested by the Contractor at the time of pressure testing. If this test fails, the Contractor is responsible for repairing the locator wire and the pressure test will be reschedule when the wire will pass.

B. Pigging, Flushing and Cleaning

1. All mains shall be pigged, cleaned and flushed to remove all sand and other foreign matter. The Contractor shall be responsible for developing a pigging and flushing plan to be submitted to the Project Representative for approval prior to pigging and flushing. The Contractor shall dispose of all water used pigging and for flushing without causing a nuisance or property damage, in accordance with state and local requirements. Any permits or fees required for the disposal of flushing water shall be the responsibility of the Contractor.

2. Flushing water used by the Contractor shall be taken from an approved metered source. The water utility will provide the meter and designate the source. Potable and reclaimed flushing water shall be at the Contractor's expense.

a. Reclaimed water should be used for sanitary force mains.

b. Potable water can be used for all service types.

3. The cleaning of the new piping system shall be accomplished by the controlled and pressurized passage of a series of hydraulic or pneumatic polyurethane plugs of varying dimensions coatings, and densities; which shall be selected by the pipe cleaning Contractor. The Contractor shall provide a means to enter the pig into the system, control and regulate flow, monitor flows and pressures, and to remove the pig from the system. The Contractor shall maintain a constant surveillance of the system and immediately report to the proper authority any in-line problems encountered or any malfunctions discovered in the piping system. A record of pig models, sizes, styles, and other pertinent information shall be kept by the Contractor and turned over to the County.

4. The Contractor shall furnish pig launching and retrieval equipment to minimize additional valving, fittings and auxiliary water supplies. Valves and blowoff assemblies, which are installed as part of the project, shall be used as much as possible to minimize the number of temporary ports required for proper flushing and cleaning.

5. All materials used shall be specifically manufactured for flushing and cleaning pressure pipes, bends and valves. The pigs shall be able to go through bends, open valves and fittings, and provide adequate cleaning of the pipe.

6. Cost of Pigging Services- The cost to complete the requirements under this section shall be included in the contract items provided in the proposal sheet. There is no separate pay item for this work.

C. Jointing HDPE Pipe and Fittings

1. HDPE pipe shall be jointed by the butt-fusion process in accordance with pipe manufacturer's directions. Contractor shall provide butt-fusion technicians who are trained and certified by the P.E. pipe manufacturer to complete the project. The date of technician certification shall not exceed 12 months before commencing construction.

2. Butt-fusion means the butt-joining of the pipe by softening the aligned faces of the pipe ends in a suitable apparatus and pressing them together under controlled pressure.

3. The internal and external beads resulting from the butt-fusion process shall be visible and examined for penetration 360 degrees around the pipe diameter.

4. All fittings for HDPE pipe (4" and larger), except for D.I/HDPE Mechanical Joint Adaptors, shall be ductile iron mechanical joint fittings per material specification manual and shall be joined to the pipe using a butt fused restrained mechanical joint adapter.

5. The D.I./HDPE mechanical joint adapter shall be connected to the HDPE pipe by a heat-fused joint on one end, and connected to a ductile iron pipe valve, or fitting with a mechanical joint on the other end.

6. Solvent epoxy cementing, electro-fusion couplings and mechanical joining with bolt on wrap around clamps or mechanical joints with out an adapter shall not be used for connections.

7. The D.I./HDPE mechanical joint adaptor shall be connected to the HDPE pipe by a heat-fused joint on one end, and connected to a ductile iron pipe valve, or fitting with a mechanical joint on the other end.

8. Short pieces of pipe between valves and fittings shall be DIP with all joints restrained for sizes 3-inches and larger. For 2-inch, the

short pieces shall be brass or Sch. 80 with IP threads and DI, HDPE or brass fittings and all joints restrained.

D. Jointing Push-On Ductile Iron and PVC Pipe and Fittings

1. The inside of the bell and the outside of the spigot end shall be thoroughly cleaned to remove dirt, grit, oil or excess coatings and other foreign matter. The rubber gasket shall be flexed inward and inserted in the gasket recess of the bell socket. A thin film of gasket lubricant shall be applied to either the inside surface of the gasket or the spigot ends, care will be taken to avoid contact with the ground. The joint shall be completed by forcing the plain end to the bottom of the socket with a forked tool or jacking device or other approved method. All pipe shall have depth mark prior to insertion. Pipe cut in the field shall be filed to resemble the spigot end of manufactured pipe.

2. When deflection is required the joint shall be completed prior to setting the deflection. The deflection shall conform to applicable AWWA Standards or manufacturer's recommendation with prior Engineer's approval.

E. Jointing Mechanical Joint Pipe and Fittings

1. The inside of the socket, the outside of the spigot end and the gland shall be thoroughly cleaned and or washed with an approved solution to remove dirt, grit, oil or excess coatings and foreign matter to improve gasket seating. The gland shall then be placed on the plain end of the pipe with the lip extension toward the plain end, followed by the gasket with the narrow edge of the gasket toward the plain end of the pipe. The pipe shall be inserted into the socket and the gasket pressed firmly and evenly into the gasket recess. The joint shall be kept straight during the assembly and any deflection required shall be done after the joint has been assembled but prior to tightening the bolts.

F. Jointing Special Joint Ductile Iron Pipe and Fittings

1. Other special joint pipe shall be assembled or installed, per manufacturer's recommendations, or directed by the Engineer. The Contractor shall insure that the joint is thoroughly cleaned by removing all dirt, oil, grit, excess coatings and foreign matter to insure a tight joint.

3.05 TEMPORARY AND PERMANENT PLUGGING

A. Temporary plugging of pipes shall be performed at the time of construction when the work is interrupted due to lunch breaks, end of shift or any other reason that require work to stop for more than half an hour.

B. Permanent plugs shall be inserted into the bells of all dead-ends of pipe, tees, or crosses and plain ends shall be capped. All plugs and caps shall be properly restrained as called for on the Plans or Standard Details.

3.06 REMOVAL OF OUT OF SERVICE PIPE

A. Due to certain permit requirements, pipe that is to be removed from service will have to be physically taken out of the ground. The limits of pipe to be removed shall be specifically called for in the Plans or shall be approved in writing by the Engineer. Any other removal not specifically called for, shall be considered incidental to construction of other items in the Contract and the Contractor will not receive compensation for such work.

B. When removing pipe, the Contractor shall excavate a trench wide enough to dislodge the pipe from the surrounding soil, and long enough to be able to handle the pipe without causing any damage to nearby utilities, structures or adjacent property.

C. The removed pipe, fitting and appurtenances will become the Contractor's property and he shall be responsible for proper disposal and any required permits thereof.

D. Refer to Specification 01 35 00, Special Project Procedures for removal of asbestos cement (AC) pipe.

3.07 INSTALLATION OF PIPE UNDER DRIVEWAYS

A. At the Engineer's discretion, the Contractor will be required to auger pipes under driveways, structures or trees to avoid removal or expensive restoration of those structures. The Contractor will be allowed to utilize an auger machine and to push or pull the carrier pipe into the bore without the need of a casing.

B. The Contractor shall install the sewer water pipe within the bore hole on a line and grade to allow connection to open cut piping adjacent to the bore hole within pipe jointing alignment limits defined for the pipe in question. The completed installation shall not result in settlement of soil under the driveway.

3.08 INSTALLATION OF PIPE UNDER HIGHWAYS AND RAILROADS

A. The Contractor shall furnish and install protective steel pipe casings and/or carrier pipe under highways/railroads in the pipe size, thickness, length, location and details as shown on the Drawings and specified herein. The Contractor's attention is particularly directed to the requirements of the particular municipal or private owner or Department of Public Works having jurisdiction over the highways/railroads whether through permit, verbal or other directions.

B. The construction shall not be started until the necessary permits have been obtained, a copy is at the job site, and proper notice and approval for construction has been obtained from the owner of the highway/railroad and the Engineer.

C. All necessary materials, equipment, labor and traffic protection devices shall be on the job site before requesting permission to start the Work.

D. Steel casings and the installation thereof required for highway/railroad crossings shall be in accordance with the standards and requirements of the Florida Department of Transportation (FDOT) or railroads or AASHTO Standards and the Specifications outlined herein. All work of this nature shall be performed by qualified Subcontractors regularly engaged in that type or work and shall be subject to approval by the Engineer.

E. All work shall be in accordance with Specification 33 05 20, Jacking and Boring.

3.09 FITTINGS

A. All fittings shall be restrained by means of restraining devices such as restrainer glands, restraining gaskets, etc.

B. Fittings shall be set and joined to the pipe and each type of joint as specified for pipe.

C. Trenching and backfilling for all fittings shall also be in accordance with Section 31 23 33, Excavation and Backfill for Pipes.

D. The use of thrust blocks in new lines is prohibited and shall only be limited to areas in which a new fitting has been installed in an existing line and is not feasible to restrain joints or when directed by the Engineer.

E. The use of "reverse dead-man" shall be as described under Standard Details for dead-end valves or in circumstances that the Engineer deems it necessary and shall be performed under his direction.

3.10 VALVES

A. Valves shall be set and joined to the pipe and each type of joint as specified for pipe.

B. Trenching and backfilling for all valves shall also be in accordance with 31 23 33, Excavation and Backfill for Pipes.

C. Cast iron valve boxes shall be firmly supported, maintained centered and plumb over the operating nut of the valve. Outside of paved areas, valve boxes shall be set in a 2' x 2' x 6" thick concrete collar, along with a brass ID tag, as shown on Standard Details. The box cover shall be flush with the surface of the finished pavement. All force main valve box lids shall be painted green and shall have the word “SEWER” cast in the lid.

D. All reasonable effort must be made to locate valves/valve boxes, back of curb, in grass areas and at street corners, whenever possible.

E. Valve boxes in areas that will require sod at a later date must be left one to two inches above existing grade (to allow for sod thickness).

F. All valves/boxes shall be located by means of a perpendicular 6" x 2' green stripe across the curb. The distance from the back of the curb to the valve will be stenciled on the curb with numbers four inches high, painted green, by the Contractor. This information will be referenced on the pavement, if no curbs are to be installed. All valve box tops shall be painted green. All valves must be centered over the operating nut/wheel and all valves, after being fully opened, will be backed off one-quarter turn to prevent them from being jammed open. This procedure should take place only after the main has passed pressure testing and has been accepted by the County.

G. All dead end valves shall be restrained with a reverse deadman, per the Standard Details.

H. Should the operating nut be more than three feet below the final grade, an extension shall be supplied and installed by the Contractor. The extension shall bring the nut to within twelve (12) inches of final grade.

I. Installation of Valves on Existing Force Mains

1. When installing valves in existing mains (cutting-in), the Contractor shall insure that the pipe is kept clean at all times and no debris, ground water, mud, oil, etc., will make their way into the pipe.

2. The lid shall fit flush in the top of the box without forcing and shall not rock, tip or rattle. Valve box lids shall be painted green and referenced to the closest curb by stenciling the distance, and by painting a six inches wide by two feet long stripe perpendicular to the curb of the roadway.

J. Removal and Disposal of Existing Valves

1. Any valve, unless otherwise specified, that is removed from the system shall become the property of the Contractor and he shall insure proper disposal.

3.11 TAPPING OF MAINS

A. The Contractor, after installing the sleeve and prior to making the tap, shall ensure that the sleeve is providing a watertight joint by means of pressure testing with pressures in accordance with 01 45 17, Pipeline Testing Requirements. If leaks are present, the Contractor will be required to repair them to the satisfaction of the Engineer.

3.12 INSTALLATION OF BOLTS ON MECHANICAL JOINTS

A. Align bolt holes and insert bolts, with bolt heads behind the bell flange, and tighten opposite nuts to keep the gland square with the socket. Tighten the nuts in accordance with following table:

Bolt Diameter (inches)	Torque (ft-lb)
5/8	45-60
3/4	75-90
1	85-100
1 1/4	105-120

3.13 PAINTING

A. All above ground installations shall be painted OSHA safety precaution green. Paint application shall be in accordance with the paint manufacturer's recommendation.

B. Paint shall be as specified in the County Materials Specification Manual.

C. Guard post shall be painted OSHA safety yellow.

D. All painting shall be in accordance with Section 09 91 00, Painting.

3.14 PRESSURE TESTING

A. All sewage force mains shall be tested in accordance with Specification 01 45 17, Pipeline Pressure and Leakage Testing Requirements.

END OF SECTION

SECTION 33 39 00

SANITARY SEWER STRUCTURES

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. The Work includes furnishing all plant, labor, tools, equipment, materials, end performing all operations in connection with construction of sanitary sewers and appurtenant structures, including excavation, trenching, backfilling and appurtenant work as required, or as directed.

1.02 RELATED DOCUMENTS

A. Specification 33 33 01, Gravity Sewers

B. Specification 31 23 34, Excavation and Backfill for Structures

PART 2 – PRODUCTS

2.01 MATERIALS

A. General

1. All manholes shall be precast concrete unless prior approval for an alterative material is given by the County.

B. Concrete

1. Concrete for cradles shall conform to Specification 03 10 01, Concrete and Concrete Materials of these Specifications and shall develop a minimum 2,500 psi compressive strength at twenty-eight (28) days.

C. Brick

1. Where brick manholes are specifically called for, brick shall be hard, solid common clay brick meeting the requirements for latest ASTM C-32 (sewer brick), Grade MA.

D. Mortar

1. Mortar for manholes shall consist of one part Portland Type II cement, two to three parts fine sand mixed with water for proper

consistency. Lime shall not be used in mortar for manholes. Commercially prepared mortar mixes, or expanding grout, shall not be used. Admixtures to mortar or commercial fast-setting cements shall not be used without approval of the Engineer.

2.02 MANHOLES

A. Slabs for Brick Manholes

1. Slabs shall be 3,750 psi/28 day concrete with a wood float finish. Reinforcement shall consist of #4 bars on eight inch centers, both ways, with one and one-half-inches of cover over the bar mat and three inches between earth and re-bar.

2. Brick manholes less than twelve (12) feet deep shall have a slab depth of eight inches. Manholes twelve (12) feet or deeper shall have a slab depth of twelve (12) inches. Slabs for standard manholes, shall be no less than six feet square. Slabs for Type A manholes, shall be a minimum of five feet square. Slabs for drop manholes shall be of sufficient size to support the manhole and the entire drop structure.

3. Slabs shall be located accurately so that manhole or manhole and drop assembly will be centered on slab. All slabs shall be installed at a grade that will allow clearance under the bells of the pipe. All slabs shall be solidly installed on 3/4-inch bedding stone which has been compacted against firm undisturbed ditch bottom. Depth of bedding stone shall be a minimum of six inches, or as directed by the Engineer.

4. The Contractor shall request an inspection of reinforcing steel for all slabs poured on the job.

5. The Contractor shall submit a copy of all concrete truck delivery receipts to the Engineer.

6. If slabs for manholes are to be supplied by a commercial precast firm, the Contractor shall advise the Engineer sufficiently in advance so that inspection may be initiated at the precast yard.

B. Precast Manholes

1. Precast, reinforced concrete manholes shall have tongue and groove interlocking joints. Inverts shall be formed as specified herein. Shop drawings shall be submitted and approved by the Engineer prior to placing order with supplier.

a. Precast reinforced concrete manhole risers, grade rings and tops shall conform as to materials, design, and fabrication with the requirements of ASTM, C-478. The concrete shall consist of 4,000 psi/28 day, Type II Portland Cement. The walls for standard manholes shall be no less than six inches thick. All precast manhole parts are to be free of fractures, honeycomb, and other defects of concrete. Cones shall be concentric.

b. Precast manholes shall consist of a base unit with openings for the sewer pipe, riser units of various lengths to build the manhole up to the required depth and concentric cones. The minimum height of the shortest riser shall be twelve (12) inches.

C. Fiberglass Manholes

1. Fiberglass manholes shall be as specified in the County's Materials Specification Manual.

D. Manhole Frames and Covers

1. All frames and covers are to be U.S. Foundry and Manufacturing Corporation #195W, with a one hundred sixty-five (165) pound cover, or approved equal. All mating surfaces shall be machined for proper fit. All covers are to be stamped "Pinellas County Sanitary Sewer" with the year of construction. All manhole covers shall have two watertight pick holes.

PART 3 - EXECUTION

3.01 EXCAVATION AND BACKFILL

A. Excavation and backfill for manholes shall be per Specification 31 23 34, Excavation and Backfilling for Structures.

3.02 MANHOLE CONSTRUCTION

A. Brick Manholes

1. Where required, manholes shall be constructed of brick masonry with cast iron frames and covers. Mortar shall be properly proportioned, thoroughly mixed, and used immediately. Any mortar entering the initial set, requiring additional water or heating, shall be discarded. Bricks will be laid radially and pressed into the mortar spread on the previous course. Each brick will be pressed against the adjoining brick so that inside vertical corners touch. The mortar shall totally fill

all space between bricks. The inside wall of the manhole shall be kept wiped clean of excess mortar. Excess mortar on the outside of the manhole wall shall be kept troweled smooth or cut off. Corbels are to be concentric, and built in twelve (12) courses, unless otherwise specified. The exterior of the manhole shall be plastered to a 5/8-inch thickness, and shrinkage cracks shall be sealed by brushing before the final set. Risers between corbels and cast iron frames shall be limited to twelve (12) inches. The exterior plastered surface of the manholes shall be coated with an approved asphaltic waterproofing material. When outside drops are constructed on manholes, the drop shall be entirely supported by the slab. The drop stack may be formed by brick and poured with concrete, or built up with brick and mortar. Memphis Tees shall be used in the drop structures. All drop manholes shall have the inside surfaces coated as specified for precast manholes.

B. Precast Manholes

1. Any modifications necessary to adapt the units to conform to the locations and grades shown, or required, shall be made without additional compensation. It shall be the responsibility of the Contractor to assure that all manhole inlets are provided at the proper locations and elevations to accommodate the actual field requirements without additional compensation.

2. All requirements for manhole and drop manhole construction as previously specified which are applicable to precast manhole construction shall be considered as being contained herein.

3. Slabs for precast manholes shall extend a minimum of six inches beyond the outside face of the manhole wall.

4. All slabs for precast drop manholes shall be of sufficient size to entirely support the drop structure. Slabs shall have the minimum thickness shown in the Standard Details.

5. Manhole Units

a. All exposed interior surfaces and the tongue and groove ends of each unit shall be sand blasted and brushed clean, and immediately thereafter, completely coated with a protective coating of not less than 15 mils of manhole coating per Material Specification Manual. The coating shall be applied in strict accordance with the manufacturer's recommendations.

b. All exterior surfaces shall be brushed clean and, immediately thereafter, completely coated with a protective coating of not less than 15 mils of approved coating. The coating shall be applied in strict accordance with manufacturer's recommendations.

c. The interior and exterior paint shall be intact and continuous. Any chips or holidays shall be patched using two coats of approved coatings and used according to manufacturer instructions.

d. Top and bottom ends of riser or sections shall be perfectly formed so that continuous and uniform contact is possible around the entire joint. Malformed joints shall be rejected.

6. Installation

a. All slabs or bottom sections shall be installed at a grade that will allow clearance under the bells of the pipe. All slabs or bottom sections shall be solidly installed on 3/4-inch bedding stone which has been compacted against firm undisturbed ditch bottom. Depth of bedding stone will be as directed by the Engineer.

b. The tongue and groove ends of each unit shall be primed with Ram-nek primer and allowed to dry. Immediately before placing the next unit, the joints shall receive a coating of Ram-nek. Enough plastic material shall be placed in the joint to squeeze a bead of excess material out of the joint insuring a completely sealed joint.

c. The top of the cone shall be set between two and one-half inches and fourteen and one-half (14 1/2) inches below the bottom of the manhole cover frame. It is the intent of the Specifications to provide a minimum of two and one-half inches to accommodate future grade changes without disturbing the manhole. Where the distance between the bottom of the manhole cover frame and the top of the cone is greater than fourteen and one-half (14 1/2) inches, 12-inch riser units shall be used to bring the top of the cone to within the limits specified.

d. The annular space between the sewer pipe and the opening in the manhole shall be grouted with Portland cement mortar and wiped or collared to insure a watertight joint. Invert channels shall be formed after the manhole is set by one of the following

methods: Build up with brick and mortar, or lay a full section of sewer pipe through manhole and cut out the top half. The manhole floor outside of the channels shall be made smooth and sloped toward the channels on a slope of two inches, per foot.

C. Inverts

1. Invert channels shall be constructed smooth and semicircular, conforming to the inside of adjacent sewer section. The mortared invert channel shall have a steel trowel finish. Changes in direction of flow shall be made in a smooth curve of as large a radius as possible. Changes in size and grade shall be made gradually and smoothly. Whenever possible, inverts shall be formed with a full section of pipe laid through the manhole with the top half of the pipe cut out. Benches shall be built up solidly with concrete or brick and mortar and shall be sloping to the invert. All inside drops shall have a flume constructed to channel flow into the invert. Standard drop manholes shall be built whenever the inside drop exceeds twenty-four (24) inches. All pipe entering the manhole must be trimmed flush with the walls. All exposed sharp edges of pipe shall be wiped smooth with mortar.

D. Type A Manholes

1. Manholes four feet or less in depth shall be constructed in accordance with the details shown on the Plans.

E. Standard Manholes

1. Standard manholes shall be constructed in accordance with the details shown on the Plans.

F. Drop Manholes

1. Drop manholes shall be constructed in accordance with details shown on the Plans.
2. Special drop manholes may be required at points where force mains connect to gravity sewers above the flow line of the manhole. The special bowl drop shall be constructed in accordance with the Standard Details.

G. Concrete Cradles

1. Concrete cradles shall be constructed at the location shown on the Plans or as directed. They shall conform to the details shown on the

Plans, or may, under special conditions, be modified as directed by the Engineer.

H. Fiberglass Lined Manholes

1. The properly installed liners shall not fail under H-20 dynamic wheel load applied vertically. All fiberglass products shall be subject to OCFC Visual Inspection Standards, prior to installation. Fiberglass manhole liners shall be constructed on the base slab, as specified, and shall be encased by brick masonry, or pre-cast as previously specified.

2. Any pipe entering through the manhole walls with an invert equal to, or higher than the benches will be sealed all around to the interior walls by use of fiberglass patching kit. There shall be no mortar exposed above bench level, except the stack.

I. Epoxy Impregnated Membrane Lined Manhole

1. Where specifically required by the Plans, manhole lining shall be installed using an epoxy impregnated membrane. Specific membrane thickness and epoxy density, and attributes, shall be as shown on the Plans or Standard Details, or as specified by the Engineer.

J. Removal of Existing Manholes

1. The Contractor shall remove, as indicated on the Plans, the entire manhole structure including all walls, base slab, frame and cover. The Contractor shall install a new manhole immediately after removal of the existing manhole or immediately backfill and compact the excavation with sand to a one hundred (100) percent maximum density, as determined by the methods contained in the State of Florida Department of Transportation Standard Specifications for Road and Bridge Construction, latest edition.

2. Should the Contractor elect to backfill the excavation prior to the installation of the new manhole, the road surface shall be patched with asphalt in accordance with Section 32 12 01 – Stabilized Roadway and Asphalt Paving, and shall be maintained in satisfactory condition until such time as the new manhole is installed.

K. Adjustment of Manhole Frames and Covers

1. Manhole frames and covers shall be adjusted to pavement grade during road resurfacing by addition or removal of successive courses of brick

masonry. Where required by the Engineer, height adjustment inserts of continuous rings of a type, as directed by the Engineer, shall be installed in the frame/cover assembly.

2. Manhole frame and covers shall be adjusted to finished ground elevation in non-pavement areas by addition or removal of successive courses of brick masonry. Where required by the Engineer, height adjustment inserts of continuous rings of a type, as directed by Engineer, shall be installed in the frame/cover assembly.

3.03 INSPECTION OF MANHOLES

A. Inspection of completed lines and manholes shall be as specified in Section 33 33 01, Gravity Sewers.

END OF SECTION