Document 00910

ADDENDUM NO. 1

Date of Addendum: 4/24/14

PROJECT NAME: *Rehabilitation of Pumps, Motors, Valves, Piping and Buildings at Various Facilities*

PROJECT NO: WBS No. S-001000-0036-4

BID DATE: May 1st, 2014

FROM: James T. Lincoln, P.E., City Engineer
City of Houston, Public Works and Engineering
611 Walker St, 15th Floor
Houston, Texas 77002
Attn: Rajinder Singh, P.E., Project Manager

TO: Prospective Bidders

This Addendum forms a part of the Bidding Documents and will be incorporated into the Contract documents, as applicable. Insofar as the original Project Manual and Drawings are inconsistent, this Addendum governs.

This Addendum uses the change page method: remove and replace or add pages, or Drawing sheets, as directed in the change instructions below. Change bars (|) are provided in the outside margins of pages from the Project Manual to indicate where changes have been made; no change bars are provided in added Sections. Reissued Drawing Sheets show the Addendum number below the title block and changes in the Drawing are noted by a revision mark and enclosed in a revision cloud.

CHANGE IN BID DATE

The Bid Date for this Project has been changed from April 24th, 2014 to May 1st 2014

CHANGES TO PROJECT MANUAL

BIDDING REQUIREMENTS

1. Document 00410 - Bid Form. Replace Bid Form Part B in its entirety.

SPECIFICATIONS

2. Section 00015 - List of Drawings. Replace page 00015-2.
3. Section 00821 – Wage Scale for Building Construction. Delete entire section.
4. Section 01110 – Summary of Work. Replace entire section.
5. Section 11133 – Horizontal Split Case Centrifugal Pumps. Replace page 11133-3.
6. Section 11134 – End Suction Pumps. Replace page 11134-3.
7. Section 11800 – Chemical Metering Systems. Replace pages 11800-4 and 11800-5.
8. Section 13300 – Process Instrumentation and Controls – General Provisions. Replace page 13300-18.
9. Section 15138 – Electric Valve Actuators. Replace page 15138-7, Appendix A – Actuator Schedule.
10. Section 16211- Sound Attenuating Enclosure. Replace page 16211-1.
11. Section 16402 – Underground Duct Banks. Replace page 16402-3.

CHANGES TO DRAWINGS

12. Drawing G-2, revise Drawing Name of Sheet 40 to read as follows: "Electrical Enlarged Modification Plan."
13. Drawing G-2 revise Drawing Name of Sheet 41 to read as follows: "Electrical Control Schematics."
14. Delete Sheet STD-C-3, Site Work Details, and replace with revised Sheet STD-C-3R.
15. Delete Sheet SB-C-3, Detention Pond Layout, and replace with revised Sheet SB-C-3R.
16. Section A of Sheet SB-M-2, the proposed eccentric reducer on the discharge side of the pump shall be 16"x10" to match the existing ball valve size.
17. Sheet SB-M-3, revise callout pertinent to reinstallation of the existing 30-inch flow meter on the temporary by-pass line to read as follows: "Remove existing 30-inch flow meter."
18. Plan and Section views of Sheet SB-M-4, revise callout pertinent to the 30-inch sleeve valve to read as follows: "Proposed 30-inch sleeve valve assembly with 24-inch sleeve and electrical motor actuator."
19. Plan and Section views of Sheet SB-M-5, revise callout pertinent to the 30-inch sleeve valve to read as follows: "Proposed 30-inch sleeve valve assembly with

24-inch sleeve and electrical motor actuator."

20. Delete Sheet SB-E-1, Electrical Overall Site Plan Modification, and replace with revised Sheet SB-E-1R.
21. Delete Sheet SB-E-3, Electrical Proposed Overall One Line Diagram, and replace with revised Sheet SB-E-3R.
22. Delete Sheet SB-E-4, Proposed PS Switchgear One Line Diagram, and replace with revised Sheet SB-E-4R.
23. Sheet SB-E-5, In Switchgear "SWE" line up, change callout "BP NO.4" to read "BP NO.2", and change callout "T-MCC-LB" to read "T-MCC-CB".
24. Sheet SB-E-5, In Switchgear "SWW" line up, change callout "BP NO.2" to read "BP NO.4"
25. Delete Sheet SB-E-7, Electrical Building Power Plan, and replace with revised Sheet SB-E-7R.
26. Sheet SB-E-8, Change Note 4 " Relocate All Signals to Remote PLC in a 2"conduit" to read " Verify and field route all signals from existing PLC cabinet to Remote I/O PLC in Remote I/O cabinet. Provide minimum 2 inch conduit."
27. Delete Sheet SB-E-9, Existing Pump Building Modification Plan, and replace with revised Sheet SB-E-9R.
28. Delete Sheet SB-E-12, Electrical Control Schematics Sheet 1 of 2, and replace with revised Sheet SB-E-12R, Electrical Enlarged Modifications Plan.
29. Delete Sheet SB-E-15, Panelboard Schedules and Light Fixture Schedule, and replace with revised Sheet SB-E-15R.
30. Sheet SB-E-16, In Switchgear "SWW" line up, change callout "BP NO.4" to read "BP NO.1"
31. Sheet SB-E-16, In Switchgear "SWW" line up, change callout "BP NO.3" to read "BP NO.2"
32. Sheet SB-E-16, Change callout "PS East Switchgear "East Portion" " to read "Pump Station Switchgear "SWE" ".
33. Sheet SB-E-16, In Switchgear "SWE" line up, change callout "BP NO.2" to read "BP NO.3"
34. Sheet SB-E-16, In Switchgear "SWE" line up, change callout "BP NO.1" to read "BP NO.4"
35. Sheet SB-E-20, Change callout "Equipment to be Relocated to Proposed Electrical Building" to read "Equipment to be remain in existing PLC cabinet".
36. Delete Sheet SB-E-21, Proposed Control System Architecture Diagram, and replace with revised Sheet SB-E-21R.
37. Delete Sheet SH2-C-2, Proposed Overall Site Plan, and replace with revised Sheet SH2-C-2R.
38. Delete Sheet SH2-C-3, Yard Piping Plan, and replace with revised Sheet SH2-C-3R.
39. Delete Sheet SH2-C-4, Detention Pond Layout, and replace with revised Sheet SH2-C-4R.
40. Delete Sheet SH2-M-1, Booster Pumps and Piping proposed plan, and replace with revised Sheet SH2-M-1R.

41. Delete Sheet SH2-M-2, Booster Pumps and Piping proposed section, and replace with revised Sheet SH2-M-2R.
42. Delete Sheet SH2-M-3, Booster Pumps and Piping proposed section, and replace with revised Sheet SH2-M-3R.
43. Sheet SH2-E-2, Change note 3 from "Provide all required hardware" to read" Provide and field route 1" conduit with 2 -#10 and 1 #12 GND from Mini-Power Center "LA" ".
44. Sheet SH2-E-3, Change callout "Circuit Breaker" to read "1200A/3P, LSIG, 65KAIC, and 316 S.S Nema 4X enclosure".
45. Sheet SH2-E-4, Disconnect switches for A/C no1 and A/C no.2 shall be 30A, 3P, 316 S.S. Nema 4X enclosure.
46. Sheet SH2-E-8, Change all type "D" light fixtures in Pump room to type "B" light fixtures.
47. Sheet SH2-E-14, Change MCC designation callout "Motor Control Center "ST" Elevation" to read "Motor Control Center "SH2" Elevation".
48. Sheet SH2-E-20, "FM-1" Flowmeter is an existing flowmeter at the existing water well.
49. Delete Sheet R-C-2, Proposed Overall Site Plan, and replace with revised Sheet R-C-2R.
50. Delete Sheet R-C-4, Detention Pond Layout, and replace with revised Sheet R-C-4R.
51. Plan and Section views of Sheet R-M-5, revise callout pertinent to the 2" air release valve to read as follows: "2-inch Combination Air Valve."
52. Delete Sheet R-E-2, Electrical Proposed Site Plan, and replace with revised Sheet R-E-2R.
53. Delete Sheet R-E-3, Electrical Overall One Line Diagram Sheet 1 of 2, and replace with revised Sheet R-E-3R.
54. Delete Sheet R-E-5, Electrical Building Equipment Plan, and replace with revised Sheet R-E-5R.
55. Sheet R-E-6, Provide Lighting Control panel and locate it next to lighting panel "LPA (see detail on Sheet R-E-17)".
56. Delete Sheet R-E-9, Existing Pump Building Modification Plan, and replace with revised Sheet R-E-9R.
57. Delete Sheet R-E-12, Panelboard Schedules and Light Fixture Schedule, and replace with revised Sheet R-E-12R.
58. Delete Sheet R-E-14, Electrical Details Sheet 1 of 4, and replace with revised Sheet R-E-14R.
59. Delete Sheet R-E-19, Proposed Control System Architecture, and replace with revised Sheet R-E-19R.
60. Delete Sheet KWB-C-2, Proposed Overall Site Plan, and replace with revised Sheet KWB-C-2R.
61. Delete Sheet KWB-C-4, Detention Pond Layout, and replace with revised Sheet KWB-C-4R.
62. Sheet KWB-E-4, replace the 20A circuit breaker feeding the Scrubber Control

Panel with 100A circuit Breaker. Replace conduit and conductors feeding the Scrubber Control Panel from "1"C., 3 #8, 1 #10 GND" to read "1 ½" C., 3 #3, 1 #8GND".

63. Sheet KWB-E-7, Provide Lighting Control panel and locate it next to lighting panel "LPA (see detail on Sheet KWB-E-18".
64. Delete Sheet KWB-E-11, Chlorine Storage Building Lighting and Power Plans, and replace with revised Sheet KWB-E-11R.
65. Sheet 73#1-E-2, Change callout "MCC-1" to read "Existing Square D Model 6 Motor Control Center".
66. Sheet 73#1-E-2, Change callout "Proposed 800A Circuit Breaker in Nema S.S. 4X Enclosure" to read "Proposed 65KAIC 800A Circuit Breaker in a 316 S.S. Nema 4X enclosure".

END OF ADDENDUM NO. 1

Ravi Kaleyatodi

DATED: 4/24/14

Ravi Kaleyatodi, P.E.,CPM
Senior Assistant Director
Engineering Branch
Engineering and Construction Division

END OF DOCUMENT

STATE OF TEXAS
ALEXANDER V. KUZOVKOV
108422
LICENSED
PROFESSIONAL ENGINEER
04/21/14

Document 00410B

BID FORM – PART B

1.0 TOTAL BID PRICE HAS BEEN CALCULATED BY BIDDER, USING THE FOLLOWING COMPONENT PRICES AND PROCESS (PRINT OR TYPE NUMERICAL AMOUNTS):

A. STIPULATED PRICE: **$**N/A
(Total Bid Price; minus Base Unit Prices, Extra Unit Prices, Cash Allowances and All Alternates, if any)

B. BASE UNIT PRICE TABLE:

Item No.	Spec. Ref	Base Unit Short Title	Units	Est. Quantity	Unit Price	Total in Figures
Spring Branch						
1	01502	Mobilization	LS	1	$105,000(1)	$105,000(1)
2	01270S	Storm Water Pollution Prevention Control measures including but not limited to filter fabric fence, inlet protection barriers, and stabilized construction exit	LS	1		
3	02086	Adjusting Manholes, Inlets and Valve Boxes to Grade	EA	1		
4	01270S	Bollards	EA	2		
5	01270S	Stormwater Items including but not limited to ditches, swales, connection to existing storm structures, piping, Inlets, and detention pond	LS	1		

Item No.	Spec. Ref	Base Unit Short Title	Units	Est. Quantity	Unit Price	Total in Figures
6	01270S	Paving Items including but not limited to new pavement including subbase	LS	1		
7	01270S	Demolition Items including but not limited to removal and disposal of existing pavement, Mechanical and Electrical Equipment, and Piping	LS	1		
8	01270S	Concrete items including but not limited to reinforced concrete foundations for Electrical Building and Metering Station including vapor barrier and select fill, and all other required materials	LS	1		
9	15201	16" Slanting/Tilting Disc Check Valve	EA	4		
10	02521	18" Butterfly Valve	EA	4		
11	15138	Reinstallation of the existing ball valves and installation new electrical actuators	EA	4		
12	01270S	Modifications to pump suction and discharge piping including pipe fittings, accessories, pipe supports, disinfection, and testing.	LS	1		

Item No.	Spec. Ref	Base Unit Short Title	Units	Est. Quantity	Unit Price	Total in Figures
13	01270S	30" metering station including piping, pipe fittings, pipe connections, chemical diffusers with associated chemical feed lines, appurtenances, and disinfection	LS	1		
14	02519	24" Electronic Control Valve	EA	1		
15	02522 15138	30" Butterfly Valve w/Electrical Actuator (open-stop-close)	EA	3		
16	02522 15138	30" Butterfly Valve w/Electrical Actuator (modulating)	EA	2		
17	02522	24" Butterfly Valve w/ Manual Actuator	EA	1		
18	01270S	Remove and Replace 36" Buried Butterfly Valve MJxMJ, including fittings and disinfection	EA	1		
19	02524	Air Release Valve - 1"	EA	4		
20	02524	Combination Air Valve - 8"	EA	1		
21	01270S	Coating for exposed piping and pumps as noted	LS	1		
22	11133	Horizontal Split Case Pump and Motor assembly including concrete support base	EA	4		
23	13120	Precast Concrete Electrical Building including all doors, hardware, HVAC, accessories complete in place	LS	1		
24	01270S	Instrumentation	LS	1		

Item No.	Spec. Ref	Base Unit Short Title	Units	Est. Quantity	Unit Price	Total in Figures
25	01270S	Electrical Modifications	LS	1		
26	13325	Control Panel	LS	1		
27	01270S	Process Control System Integrator	LS	1		
28	01270S	Programming	LS	1		
29	13430	HMI Node License	EA	1	$8,000(2)	
Total Spring Branch					**$**_____	
Sharpstown No. 2						
30	01502	Mobilization	LS	1	$60,000(1)	$60,000(1)
31	01270S	Storm Water Pollution Prevention Control measures including but not limited to filter fabric fence, inlet protection barriers, and stabilized construction exit	LS	1		
32	01270S	Stormwater Items including but not limited to ditches, swales, connection to existing storm structures, piping, Inlets, and detention pond	LS	1		
33	15430	2" RPZ Backflow Preventer	EA	1		
34	01270S	Paving Items including but not limited to new pavement including subbase and sidewalk	LS	1		

Item No.	Spec. Ref	Base Unit Short Title	Units	Est. Quantity	Unit Price	Total in Figures
35	01270S	Demolition Items including but not limited to removal of the existing masonry building including foundation, removal and disposal of existing pavement, structures, Mechanical and Electrical Equipment and Piping	LS	1		
36	01270S	Reinforced concrete foundation for Pump Building including, vapor barrier and select fill and all other required materials	LS	1		
37	01270S	Mechanical piping including all buried and exposed suction and discharge piping and headers, yard piping, fittings, accessories including pipe supports, testing and disinfection	LS	1		
38	15201	12" Globe Style Silent Check Valve	EA	3		
39	01270S	12" Gate Valve, FLxFL	EA	3		
40	01270S	14” Gate Valve, FLxFL	EA	3		
41	02522	24” Butterfly Valve, FLxFL	EA	6		
42	02522	24” Butterfly Valve, MJxMJ	EA	1		
43	02524	Air Release Valve – ¾”	EA	3		
44	02524	Combination Air Valve - 3"	EA	1		

Item No.	Spec. Ref	Base Unit Short Title	Units	Est. Quantity	Unit Price	Total in Figures
45	01270S	Coating for exposed piping and pumps as noted	LS	1		
46	01270S	Connection to existing Ground Storage Tank	EA	1		
47	01270S	Disinfection of existing Ground Storage Tank	EA	1		
48	11133	Horizontal Split Case Pump assembly, including concrete support base	EA	3		
49	11260	Chlorination System including all water and chlorine solution piping, valves and fittings, chlorine leak detector, chlorine residual analyzer, and SCBA 30 minute supply	LS	1		
50	15430	Safety Shower	EA	1		
51	13120	Precast Concrete Pump Building including all doors, hardware, HVAC, crane rails, and accessories complete in place	EA	1		
52	14622	Electric Crane, Hoist and Motorized Trolley	EA	1		
53	01270S	Galvanized steel fabricated pipe support for 24-inch pipe inside of Pump Building, including design	EA	1		
54	01270S	Instrumentation	LS	1		
55	01270S	Electrical modifications	LS	1		
56	13325	Control Panel	LS	1		

Item No.	Spec. Ref	Base Unit Short Title	Units	Est. Quantity	Unit Price	Total in Figures
57	01270S	Process Control System Integrator	LS	1		
58	01270S	Programming	LS	1		
59	13430	HMI Node License	EA	1	$8,000[2]	
		Total Sharpstown No. 2			**$**_____	
Ridgemont						
60	01502	Mobilization	LS	1	$80,000[1]	$80,000[1]
61	01270S	Storm Water Pollution Prevention Control measures including but not limited to filter fabric fence, inlet protection barriers, and stabilized construction exit	LS	1		
62	01270S	Tree Removal	EA	3		
63	01270S	Stormwater Items including but not limited to ditches, swales, connection to existing storm structures, piping, Inlets, and detention pond	LS	1		
64	01270S	Paving Items including but not limited to new pavement including subbase and sidewalk	LS	1		
65	01270S	Removal and Disposal of existing pavement, building, structures, Mechanical and Electrical Equipment and Piping	LS	1		

Item No.	Spec. Ref	Base Unit Short Title	Units	Est. Quantity	Unit Price	Total in Figures
66	01270S	Reinforced concrete foundations for electrical building, generator, and fuel storage tank including vapor barrier and select fill and all other required materials	LS	1		
67	01270S	Mechanical piping including all buried and exposed suction and discharge piping and headers, yard piping, fittings, accessories, pipe supports, testing and disinfection	LS	1		
68	01270S	14" Gate Valve, FLxFL	EA	3		
69	15201	14" Globe Style Silent Check Valve	EA	3		
70	01270S	16" Gate Valve, FLxFL	EA	3		
71	01270S	18" Gate Valve, FLxFL	EA	2		
72	02522	18" Butterfly Valve w/Handwheel	EA	2		
73	02521	12" Gate Valve, MJxMJ	EA	2		
74	02521	18" Gate Valve, MJxMJ	EA	1		
75	02522	24" Butterfly Valve, FLxFL w/ Manual Actuator	EA	1		
76	02524	Air Release Valve – ¾"	EA	3		
77	02524	Combination Air Valve – 2"	EA	4		
78	01270S	Coating for exposed piping and pumps as noted	LS	1		

Item No.	Spec. Ref	Base Unit Short Title	Units	Est. Quantity	Unit Price	Total in Figures
79	11133	Horizontal Split Case Pump assembly, including concrete support base	EA	3		
80	13120	Precast Concrete Electrical Building including all doors, hardware, HVAC, accessories complete in place	LS	1		
81	01270S	Aluminum Catwalk and Stairs inside of Pump Building, including design	LS	1		
82	01270S	Instrumentation	LS	1		
83	01270S	Electrical modifications	LS	1		
84	01270S	Stand-by Generator including but not limited to Diesel Fuel Management system, and Fuel Storage Tank with aluminum stairs and platform to the tank	LS	1		
85	13325	Control Panel	LS	1		
86	01270S	Process Control System Integrator	LS	1		
87	01270S	Programming	LS	1		
88	13430	HMI Node License	EA	1	$8,000(2)	
		Total Ridgemont			**$**_____	

Kingwood B						
Item No.	**Spec. Ref**	**Base Unit Short Title**	**Units**	**Est. Quantity**	**Unit Price**	**Total in Figures**
89	01502	Mobilization	LS	1	$70,000(1)	$70,000(1)
90	01270S	Storm Water Pollution Prevention Control measures including but not limited to filter fabric fence, inlet protection barriers, and stabilized construction exit	LS	1		
91	01270S	Removable Bollards	EA	6		
92	01270S	Stormwater Items including but not limited to ditches, swales, connection to existing storm structures, piping, inlets, and detention pond	LS	1		
93	01270S	Paving Items including but not limited to new pavement including subbase and sidewalk	LS	1		
94	01270S	Concrete Permeable Pavers with sub base and perforated pipe, complete in place	SY	145		
95	01270S	Removal and disposal of existing buildings and structures, pavement, Mechanical and Electrical Equipment, and Piping	LS	1		

Item No.	Spec. Ref	Base Unit Short Title	Units	Est. Quantity	Unit Price	Total in Figures
96	01270S	Reinforced concrete foundations for electrical building, chemical feed building, chemical storage and scrubber including vapor barrier, select fill and all other required materials	LS	1		
97	01270S	Modifications to pump suction and discharge piping including pipe fittings, accessories, including floor drains, pipe supports, testing and disinfection	LS	1		
98	15201	12" Globe Style Silent Check Valve	EA	3		
99	01270S	12" Gate Valve, FLxFL	EA	8		
100	01270S	6" Gate Valve, MJxMJ	EA	1		
101	02524	Air Release Valve – ¾"	EA	4		
102	15870	24" FRP Ductwork including duct, fittings, supports and appurtenances	LS	1		
103	01270S	Coating for Chemical Containment Area	LS	1		
104	01270S	Coating for exposed Piping and pumps as noted	LS	1		
105	11133	Horizontal Split Case Pump assembly, including concrete support base	EA	3		
106	01270S	Premium Efficiency Motor for BP #3	EA	1		

Item No.	Spec. Ref	Base Unit Short Title	Units	Est. Quantity	Unit Price	Total in Figures
107	11800	Polyphosphate Metering System including chemical feed piping, valves, and accessories	LS	1		
108	11800	Fluoride Metering System including chemical feed piping, valves and accessories	LS	1		
109	01270S	Chemical storage tank including piping, valves, and accessories	LS	1		
110	15430	Safety Shower	EA	1		
111	11280	Dry Scrubber	EA	1		
112	01270S	Chemical Feed Building including all masonry and concrete work excluding foundation, door, hardware, HVAC, roofing, accessories complete in place, and interior/exterior painting	LS	1		
113	01270S	Chlorine Storage Building including all masonry and concrete work excluding foundation, doors, hardware, HVAC, roofing, accessories complete in place, and interior/exterior painting	LS	1		
114	13120	Precast Concrete Electrical Building including all doors, hardware, HVAC, accessories complete in place	LS	1		

Item No.	Spec. Ref	Base Unit Short Title	Units	Est. Quantity	Unit Price	Total in Figures
115	01270S	Instrumentation, including chlorine leak detectors	LS	1		
116	01270S	Electrical modifications	LS	1		
117	13325	Control Panel	LS	1		
118	01270S	Process Control System Integrator	LS	1		
119	01270S	Programming	LS	1		
120	13430	HMI Node License	EA	1	$8,000(2)	
		Total Kingwood B			**$**_____	
District 73 #1						
121	01502	Mobilization	LS	1	$14,000(1)	$14,000(1)
122	01270S	Storm Water Pollution Prevention Control measures including but not limited to filter fabric fence, inlet protection barriers, and stabilized construction exit	LS	1		
123	01270S	Removal and disposal of the existing Scrubber, concrete, pavement, Mechanical and Electrical Equipment, and Piping	LS	1		
124	01270S	Modifications to pump suction and discharge piping including fittings, accessories and pipe supports, testing and disinfection	LS	1		
125	15201	6" Globe Style Check Valve	EA	1		

Item No.	Spec. Ref	Base Unit Short Title	Units	Est. Quantity	Unit Price	Total in Figures
126	01270S	6" Gate Valve, FLxFL	EA	1		
127	01270S	Coating for exposed Piping and pumps as noted	LS	1		
128	11134	Horizontal End Suction Pump assembly, including concrete support base	EA	1		
129	01270S	Instrumentation, including chlorine leak detector	LS	1		
130	01270S	Electrical modifications	LS	1		
131	13325	Control Panel	LS	1		
132	01270S	Process Control System Integrator	LS	1		
133	01270S	Programming	LS	1		
134	13430	HMI Node License	EA	1	$8,000(2)	
Total District 73 #1					**$**	

BASE UNIT PRICE TOTAL _____

C. EXTRA UNIT PRICE TABLE:

Item No.	Spec. Ref	Extra Unit Short Title	Units	Est. Quantity	Unit Price	Total in Figures
135	02318	Extra Hand Excavation	CY	20	$15.00(2)	$300(2)
136	02318	Extra Machine Excavation	CY	50	$20.00(2)	$1,000.00(2)

Item No.	Spec. Ref	Extra Unit Short Title	Units	Est. Quantity	Unit Price	Total in Figures
137	02318	Extra Placement Backfill Material	CY	50	$6.00(2)	$300.00(2)
138	01270S	Abatement and disposal of 1 mercury pressure switches. Includes abatement plan and regulatory reporting.	LS	1	$2,500.00(2)	$2,500.00(2)
139	16111	1" Rigid Aluminum Conduit installed above ground	LF	500	$10.50(2)	$5,250.00(2)
140	16111	1 1/2" Rigid Aluminum Conduit installed above ground	LF	200	$16.50(2)	$3,300.00(2)
141	16111	2 1/2" Rigid Aluminum Conduit installed above ground	LF	100	$21.50(2)	$2,150.00(2)
142	16120	Copper No. 14 AWG conductor with XHHW-2 insulation, installed	LF	5,000	$0.75(2)	$3,750.00(2)
143	16120	Copper No. 12 AWG conductor with XHHW-2 insulation, installed	LF	4,000	$0.92(2)	$3,680.00(2)
144	16120	Copper No. 10 AWG conductor with XHHW-2 insulation, installed	LF	2,000	$1.14(2)	$2,280.00(2)
145	16120	Copper No. 6 AWG conductor with XHHW-2 insulation, installed	LF	2,000	$1.70(2)	$3,400.00(2)
146	16120	Copper No. 4 AWG conductor with XHHW-2 insulation, installed	LF	1,000	$2.75(2)	$2,750.00(2)

Item No.	Spec. Ref	Extra Unit Short Title	Units	Est. Quantity	Unit Price	Total in Figures
147	16120	Copper No. 1 AWG conductor with XHHW-2 insulation, installed	LF	500	$3.70(2)	$1,850.00(2)
148	16120	Copper No. 1/0 AWG conductor with XHHW-2 insulation, installed	LF	500	$4.60(2)	$2,300.00(2)
149	16120	Copper No. 3/0 AWG conductor with XHHW-2 insulation, installed	LF	500	$6.10(2)	$3,050.00(2)
150	16126	2/C or 3/C, #16 AWG twisted shielded instrument cable, installed	LF	2,000	$2.10(2)	$4,200.00(2)
151	16402	1” PVC Schedule 40 Conduit Installed in Underground Duct Bank	LF	1,000	$2.60(2)	$2,600.00(2)
152	16402	1 1/2” PVC Schedule 40 Conduit Installed in Underground Duct Bank	LF	1,000	$3.10(2)	$3,100.00(2)
153	16402	2 1/2” PVC Schedule 40 Conduit Installed in Underground Duct Bank	LF	500	$3.90(2)	$1,950.00(2)
154	16402	Duct bank trenching, rebar, concrete encasement and backfill for duct banks where the top of the ducts is maximum 48” below grade	LF	200	$35.00(2)	$7,000.00(2)

EXTRA UNIT PRICE TOTAL _____

D. CASH ALLOWANCE TABLE:

Item No.	Spec. Ref	Cash Allowance Short Title	Cash Allowance in Figures
155	01110	Building Permit Fees	$50,000(1)
156	01110	CenterPoint Energy Electrical Service	$50,000(1)
TOTAL CASH ALLOWANCES			$100,000(1)

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E. TOTAL BID PRICE: **$**_____
(Add Totals for Items A., B., C., and D. above)

2.0 SIGNATURES: By signing this Document, I agree that I have received and reviewed all Addenda and considered all costs associated with the Addenda in calculating the Total Bid Price.

Bidder: _____
(Print or type full name of your proprietorship, partnership, corporation, or joint venture.*)

**By: _____
Signature Date

Name: _____
(Print or type name) Title

Address: _____
(Mailing)

_____
(Street, if different)

Telephone and Fax Number: _____
(Print or type numbers)

* If Bid is a joint venture, add additional Bid Form signature sheets for each member of the joint venture.

** Bidder certifies that the only person or parties interested in this offer as principals are those named above. Bidder has not directly or indirectly entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free competitive bidding.

Note: This document constitutes a government record, as defined by § 37.01 of the Texas Penal Code. Submission of a false government record is punishable as provided in § 37.10 of the Texas Penal Code.

Footnotes for Tables B through E:
(1) Fixed Unit Price determined prior to Bid. Cannot be adjusted by the Bidder.
(2) Minimum Bid Price determined prior to Bid. Can be increased by the Bidder by crossing out the Minimum and noting revised price on the line above.
(3) Maximum Bid Price determined prior to Bid. Can be decreased but not increased by Bidder by crossing out the Maximum and noting revised price on the line above. A Bid that increases the Maximum Bid Price may be found non-conforming and non-responsive.
(4) Fixed Range Bid Price determined prior to Bid. Unit Price can be adjusted by Bidder to any amount within the range defined by crossing out prices noted and noting revised price on the line above.

26	SB-S-2	Metering Station Plan, Sections and Details Phase 1
27	SB-S-3	Metering Station Plan, Sections and Details Phase 2
	HVAC	
28	SB-H-1	Electrical Building HVAC Plan
	Electrical/Instrumentation/Control	
29	SB-E-1	Electrical Overall Site Plan Modification
30	SB-E-2	Electrical Existing Overall One line Diagram
31	SB-E-3	Electrical Proposed Overall One line Diagram
32	SB-E-4	Proposed PS Switchgear One line Diagram
33	SB-E-5	Electrical Building Equipment Plan
34	SB-E-6	Electrical Building Lighting Plan
35	SB-E-7	Electrical Building Power Plan
36	SB-E-8	Existing Pump Building Demolition Plan
37	SB-E-9	Existing Pump Building Modification Plan
38	SB-E-10	Existing Metering Station Demolition Plan
39	SB-E-11	Proposed Metering Station Electrical Plan
40	SB-E-12	Electrical Enlarged Modifications Plan
41	SB-E-13	Electrical Control Schematics
42	SB-E-14	Control Block Diagram
43	SB-E-15	Panelboard Schedules and Light Fixture Schedule
44	SB-E-16	Electrical PS Switchgear Elevation
45	SB-E-17	Electrical Details Sheet 1 of 3
46	SB-E-18	Electrical Details Sheet 2 of 3
47	SB-E-19	Electrical Details Sheet 3 of 3
48	SB-E-20	Existing Control System Architecture Diagram
49	SB-E-21	Proposed Control System Architecture Diagram
50	SB-E-22	Existing PLC Input/Output Table Sheet 1 of 7
51	SB-E-23	Existing PLC Input/Output Table Sheet 2 of 7
52	SB-E-24	Existing PLC Input/Output Table Sheet 3 of 7
53	SB-E-25	Existing PLC Input/Output Table Sheet 4 of 7
54	SB-E-26	Existing PLC Input/Output Table Sheet 5 of 7
55	SB-E-27	Existing PLC Input/Output Table Sheet 6 of 7
56	SB-E-28	Existing PLC Input/Output Table Sheet 7 of 7
57	SB-E-29	Proposed PLC Input/Output Table Sheet 1 of 2
58	SB-E-30	Proposed PLC Input/Output Table Sheet 2 of 2
	Sharpstown Water Plant #2	
	Civil	
59	SH2-C-1	Demolition Plan
60	SH2-C-2	Proposed Overall Site Plan

SECTION 01110

SUMMARY OF WORK

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Summary of the Work including but not limited to work by the City, work sequence, future work, Contractor use of Premises, special conditions for substantial completion and City occupancy.

1.02 WORK COVERED BY CONTRACT DOCUMENTS

A. Work of the Contract is for the construction of various improvements including replacement of pumps, motors, valves, buildings, electrical and SCADA modifications and replacement at the following water plant facilities:

Spring Branch	9400 Kempwood Drive, Houston, TX
Sharpstown #2	8619 Bellaire Boulevard, Houston, TX
Ridgemont	15908 Ridgeroe Lane, Houston, TX
Kingwood B	3822 Rustic Woods Drive, Houston, TX
District 73 #1	24120 East Lake Houston Parkway, Houston, TX

B. The project is a combination of various improvements inside existing pump buildings and within the site limits at five existing groundwater treatment plants and pumping facilities located in Houston, Texas.

C. The work of this Contract consists of, but not limited to, the construction of the items listed below, shown on the drawings, and described in the Project Specifications:

1. One temporary field office shall be provided for the project for use by representatives of the City. Location to be determined.

2. Spring Branch
   a. Replacement of the existing horizontal split case booster pumps and motors;
   b. Replacement of existing booster pump suction isolation valves, suction and discharge piping, and air release valves on the pump discharge lines;
   c. Installation of new tilting disc check valves on pumps discharge;
   d. Installation of electric actuators on the existing ball valves;
   e. Installation of a new precast concrete building with cast-in place

concrete foundation to house electrical and control equipment;

f. Replacement of the existing booster pump electrical switchgear including electrical feeders;
g. Replacement of the outdoor 1200A, 2.4 kV Service Entrance Fusible Switch and associated conductors.
h. Removal of the existing TI-505 PLC and provide a new Siemens S7-1513 PLC for Pump Station Control;
i. Removal of the existing control panel and provide new SCADA control panel with all accessories.
j. Provide programming services for new PLC for control and monitor plant new modification.
k. Replacement of the existing 30-inch surface water metering station with associated valves, piping, cast-in place concrete foundation and pipe supports, electrical actuators, instrumentation and controls;
l. Associated site work and SWPP control work;
m. Replacement of the existing 30-inch buried butterfly valve.
n. When the 1200A, 2.4 kV Service Entrance Fusible Switch and associated conductors are replaced, provide diesel fuel to operate the City's on-site diesel engine standby generator to power the water pumping station. Also provide a qualified operator to continuously monitor the generator when in operation.
o. When the feeder cable to Transformer "T-MCC-CB" is replaced, provide a portable diesel engine standby generator, fuel and temporary cabling to power "MCC-CB" at the Chlorine Building. Also provide a qualified operator to continuously monitor the generator when in operation.

3. Sharpstown #2
   a. Demolition and disposal of the existing pump station building with associated pumps, valves, piping and fittings, and electrical and control equipment;
   b. Installation of a new precast concrete pump building with cast-in place concrete foundation to house new pumps, valves, piping and fittings, electrical and control equipment, and chlorine feed equipment;
   c. Replacement of the existing electrical equipment including switchgear and electrical feeders;
   d. Removal of the existing TI-505 PLC and provide a new Siemens S7-1513 PLC for Pump Station Control;
   e. Removal of the existing control panel and provide new SCADA control panel with all accessories.
   f. Provide programming services for new PLC for control and monitor plant new modification.
   g. Installation of a temporary electrical service for the construction

period for the WiMAX Building and the elevated storage tank;
h. Removal of existing service entrance and provide a new electrical service entrance.
i. Associated piping work
j. Associated site work and SWPP control work.

4. Ridgemont
   a. Replacement of the existing horizontal split case booster pumps and motors;
   b. Replacement of the existing booster pump suction and discharge isolation valves, suction and discharge piping, and air release valves on the pump discharge lines;
   c. Demolition of the existing discharge headers and flow meters;
   d. Installation of new discharge flow meters with associated piping, pipe supports, and associated electrical and control work;
   e. Installation of a new precast concrete building with cast-in place concrete foundation to house electrical equipment;
   f. Replacement of the existing electrical equipment including switchgear and electrical feeders;
   g. The existing CenterPoint Energy 750 kVA overhead transformer bank will be reused for the new electrical service;
   h. Replacement of the existing TI-505 PLC with a Siemens S7-1513 PLC for Pump Station Control;
   i. Remove existing control panel and provide new SCADA control panel with all accessories.
   j. Provide programming services for new PLC for control and monitor plant new modification
   k. Installation of a new standby diesel engine generator with associated electrical, structural, and control work;
   l. Installation of a new diesel fuel storage tank with associated electrical, structural, and control work;
   m. Associated pipe work;
   n. Associated site work.

5. Kingwood B
   a. Replacement of the existing horizontal split case booster pumps and motors;
   b. Replacement of existing booster pump suction and discharge isolation valves, suction and discharge piping, and air release valves on the pump discharge lines;
   c. Replacement of the existing flow meters on the existing discharge lines;
   d. Installation of a new precast concrete building with cast-in place concrete foundation to house electrical equipment;
   e. Replacement of the existing electrical equipment including

switchgear and electrical feeders;
f. The existing overhead transformer bank will be removed by CenterPoint Energy;
g. Removal of the existing TI-505 PLC and provide with a Siemens S7-1513 PLC for Pump Station Control;
h. Remove existing control panel and provide new SCADA control panel with all accessories.
i. Provide programming services for new PLC for control and monitor plant new modification.
j. Installation of a new chemical feed and storage system consisting of a new chemical storage tank, chemical containment area, and chemical feed building, skid mounted chemical feed pumps, and associated piping, structural, electrical and control work;
k. Installation of a new CenterPoint Energy pad mounted transformer and transformer access road to replace the existing overhead transformer bank;
l. Installation of a new dry scrubber;
m. Replacement of the existing chlorine storage canopy building with a totally enclosed masonry building on the existing concrete foundation;
n. Demolition of the existing chemical feed building and electrical equipment;
o. Associated site work.

6. District 73# 1
   a. Removal of existing dry scrubber;
   b. Replace of the existing 1,000 gpm horizontal split case booster pump and motor with 250 gpm pump and motor;
   c. Replacement of the existing booster pump suction and discharge isolation valves, and suction and discharge piping on the pump discharge line;
   d. Replacement of the existing electrical service entrance fused switch;
   e. Replacement of the existing automatic transfer switch;
   f. Removal of the existing Siemens S7-200 Series PLC and provide a new Siemens S7-1513 PLC for Pump Station Control.
   g. Remove existing control panel and provide new SCADA control panel with all accessories.
   h. Provide programming services for new PLC for control and monitor plant new modification

1.03 DEFINITIONS

A. Large Diameter Water Lines: Water lines 24-inches in diameter and larger. References to large diameter water lines shall apply to pipe, valves and

appurtenances 24-inch and larger.

B. Small Diameter Water Lines: Water lines 20-inches in diameter and smaller. References to small diameter water lines shall apply to pipe, valves and appurtenances 20-inch and smaller.

1.04 WORK SEQUENCE AND LIMITATIONS

A. Spring Branch
1. The facility shall remain fully operational during construction without interruptions for more than two hours at a time;
2. Contractor shall provide written notice to the Project Manager and the City DWO seven (7) calendar days prior to requested day and time of each interruption;
3. Electrical building with associated electrical equipment and electrical feeders to the new pumps shall be fully completed prior to taking pumps out of service for replacement;
4. All booster pumps work with associated piping, structural, electrical and control work shall be completed sequentially. No more than pump at a time can be taken out of service;
5. Contractor shall provide written notice to the Project Manager and the City DWO forty eight (48) hours, not including holidays and weekends, prior to requested day and time of taking each pump out of service;
6. Surface water Metering Station replacement shall be scheduled during the low demand period in January thru February;
7. Surface water Metering Station can be taken out of service for no more than 10 calendar days at a time with a maximum of two times during the low demand period;
8. Contractor shall provide written notice to the Project Manager and the City DWO seven (7) calendar days prior to requested day and time of each interruption;
9. Surface water Metering Station construction shall be completed in two phases as shown on the Drawings.
10. In the event that the electronic control valve (sleeve valve) is not delivered prior to completion of the rest of the surface water Metering Station, a 30” spool piece shall be provided in its place until the valve is delivered.
11. Replacement of the 1200A, 2.4 kV Service Entrance Fusible Switch and associated conductors shall be scheduled in the low demand period in January thru February. Delivery of the Service Entrance Fusible Switch is on the critical path for this location.

B. Sharpstown #2
1. The facility can be taken out of service for completion of all work.

2. Contractor shall provide written notice to the Project Manager and the City DWO fourteen (14) calendar days prior to requested day of taking facility out of service;
3. Contractor shall install temporary electrical service to the Wi Max building and elevated storage tank lighting system prior to taking facility out service;
4. Contractor shall coordinate with the Project Manager and the City DWO for closing all required distribution system isolation valves.

C. Ridgemont
1. The facility shall remain fully operational during construction without interruptions for more than four hours at a time;
2. Contractor shall provide written notice to the Project Manager and the City DWO seven (7) calendar days prior to requested day and time of each interruption;
3. Electrical building with associated electrical equipment and electrical feeders to the new pumps shall be fully completed prior to taking pumps out of service for replacement;
4. All booster pumps work with associated piping, structural, electrical and control work shall be completed sequentially. No more than pump at a time can be taken out of service;
5. Contractor shall provide written notice to the Project Manager and the City DWO forty eight (48) hours, not including holidays and weekends, prior to requested day and time of taking each pump out of service;
6. New discharge header and yard piping shall be installed, tested, and disinfected prior to taking the existing piping discharge piping out of service.

D. Kingwood B
1. The facility shall remain fully operational during construction without interruptions for more than four hours at a time;
2. Contractor shall provide written notice to the Project Manager and the City DWO seven (7) calendar days prior to requested day and time of each interruption;
3. Electrical building with associated electrical equipment and electrical feeders to the new pumps shall be fully completed prior to taking pumps out of service for replacement;
4. All booster pumps work with associated piping, structural, electrical and control work shall be completed sequentially. No more than pump at a time can be taken out of service;
5. Contractor shall provide written notice to the Project Manager and the City DWO forty eight (48) hours, not including holidays and weekends, prior to requested day and time of taking each pump out of service;
6. New chemical feed and storage buildings with all associated equipment and accessories shall be installed, tested, and fully operational prior to

taking the existing chemical feed building out of service for demolition.

7. Contractor shall provide temporary covers and protection for the 1-ton chlorine cylinders located under canopy during demolition of the existing canopy and construction of the new chlorine storage building on the existing concrete slab.

E. District 73-1

1. The facility can be taken out of service for completion of all work
2. Contractor shall provide written notice to the Project Manager and the City DWO fourteen (14) calendar days prior to requested day of taking facility out of service;

1.05 COORDINATION OF WORK

A. Schedule construction operations with City Project Manager and Drinking Water Operations (DWO) Infrastructure Group. Coordinate DWO's Infrastructure Group a minimum of 48 hours prior to beginning construction.

B. Refer to Section 01312 - Coordination and Meetings for general coordination.

C. Refer to Paragraph 1.04 for site specific coordination and work sequence requirements.

D. City may occupy sites and existing and adjacent buildings during entire construction period. Cooperate with City during construction operations to minimize interference with City's daily operations. Maintain existing exits unless otherwise indicated.

1.06 CASH ALLOWANCES

A. Include the following specific Cash Allowances in Contract Price under provision of General Conditions Paragraph 3.11:

1. CenterPoint Energy Electrical Service.
2. Building Permits. Allowance to obtain building permits from City of Houston and Harris County for work at all water plant facilities identified in Paragraph 1.02 A.

1.07 INCENTIVE ALLOWANCES – Not Used

1.08 CITY-FURNISHED PRODUCTS – Not Used

1.09 CONTRACTOR USE OF PREMISES

A. Comply with procedures for access to the site and Contractor's use of rights-of-

way as specified in Section 01145 - Use of Premises.

B. Construction Operations: Limited to the City's rights-of-way provided by the City and areas shown or described in the Contract documents.

C. Utility Outages and Shutdown: Provide a minimum of 48 hours notice to the City and private utility companies (when applicable), excluding weekends and holidays, in advance of required utility shutdown. Coordinate all work as required.

1.10 STREET CUT ORDINANCE

A. Excavations on or under pavement in the City's right-of-way must have a permit. Comply with City of Houston, Texas Ordinance No. 2000-1115, an ordinance amending Chapter 40 of the Code of Ordinances, Houston, Texas, relating to excavating in the Public right-of-way.

B. Comply with the latest edition of street cut New Pavement Repair and Pavement Replacement details.

C. Quantities are included for street cut pavement repair and replacement in applicable Specification sections for Unit Price contracts.

D. Include payment for street cut pavement repair and replacement in lump sum bid for Stipulated Price contracts.

1.11 WARRANTY

A. Comply with warranty requirements in accordance with Document 00700 - General Conditions.

1.12 INTERPRETATION OF CONFLICTS

A. Should conflict occur in Contact Documents, request interpretation before proceeding with Work. Such requests shall first be preceded by diligent investigation into Contact Documents. Contain evidence of such investigation in requests for interpretation.

1.13 GENERAL CONSTRUCTION NOTES

A. Notify the Utility Coordinating Committee at 1-800-669-8344 or (713) 223-4567, and the City of Houston Department of Public Works and Engineering, Civil Construction at 832-395-2090 at least 72 hours prior to commencement of work.

B. Field verify existing facilities shown on the drawings by whatever means necessary (metal detection. probes, excavation, survey, others) prior to excavation for proposed utilities. Field verification work shall be completed prior excavation for proposed utilities. No separate pay item.

C. These plans and the surveys upon which they are based are tied into the official City of Houston survey system in compliance with ordinance No. 69-1978. City of Houston survey markers and monuments referenced have been included in this plan set.

D. Comply with OSHA Regulations and State of Texas laws concerning excavation, trenching and shoring as specified in City of Houston Ordinance No. 87-1457.

E. Conduct construction operations under this contact in conformance with the erosion control practices described in Document 01410 "TPDES Requirements" and Document 01570 "Storm Water Pollution Control" and Storm Water Pollution Prevention Plans included in the construction drawings. Work identified in this project falls under Large Construction Activity with area disturbed to be on or more acres but less than five acres. TPDES requirements applicable to Large Construction Activity will apply.

F. Any pavement (such as wheel chair ramps, pavement curbs, sidewalks, driveways, bikeways, etc.), fences, gates, lawns, irrigation utilities, landscapes, culverts, inlets, manholes, signs or mail boxes and other improvements that have been disturbed due to utility construction shall be replaced with same quality material and condition, according to City of Houston standard specifications. Contractors are required to bid accordingly.

1.14 EXISTING UTILITIES

A. Underground utilities existing in the vicinity of this project. While every effort has been made to show locations for existing utilities, they are approximate and other utilities may exist in the vicinity of this project, which are not shown on these plans. The location and grades of existing utilities are based on as-built information.

B. Public and private utility lines may exist that are not shown on the construction drawings. Locate, maintain and protect the integrity of these lines. Hand excavation may be required.

C. Coordinate with the proper utility company to relocate or divert any utility in conflict with proposed construction so as not to disrupt service of same. Restore relocated or diverted utility to its original condition and location upon completion of construction.

1.15 WATER LINES

A. Water lines shall be constructed in accordance with current City of Houston specifications for large and small diameter water lines.

B. All utilities present on these drawings are shown at approximate locations based on the best available information. The contractor shall field determine the exact locations prior to commencing construction. The contractor shall be fully responsible for any and all damages caused by failure to exactly locate and maintain these underground utilities, at no additional cost to the City of Houston.

1.16 STORM SEWERS

A. Adequate drainage shall be maintained at all times during construction. Any drainage ditch or structure disturbed during construction shall be restores to the satisfaction of the owning authority. All construction storm runoff shall comply with the final draft of the Storm Water Management Handbook for construction activities, as prepared by Harris County, HCFCD and the City of Houston in compliance with NPDES requirements.

B. Contractor shall be responsible for removal of siltation in existing and proposed storm sewer systems (if necessary) that result from construction activities associated with this project.

1.17 SANITARY SEWERS

A. The contractor is fully responsible for damages to existing sanitary sewer facilities as a result of this project. Sanitary sewers shall be constructed in compliance with the latest city specifications for sewer construction, and tested as specified in the city test procedure for either liquid or air, including all amendments and revisions thereto. Embedment and backfill for sanitary sewers shall be placed in accordance with City of Houston standard drawing unless otherwise noted.

B. Maintain service to all sewers during construction. Contractor is responsible for locating all sanitary sewer service laterals affected by construction.

1.18 STORM WATER POLLUTION PREVENTION PLAN

A. The Storm Water Pollution Prevention Plan for this project is governed by Specification Sections 01410, 01570 and 01575 and the layouts provided in the construction drawings. Contractor shall comply with Storm Water Pollution Prevention Plan requirements as detailed in the construction documents. There is no separate cost or cash allowance for Storm Water Pollution Prevention Plan

implementation and maintenance/clean-up. Cost shall be incidental to unit price for filter fabric fence, inlet protection barrier, reinforced filter fabric barrier and stabilized construction exist bid items.

1.19 ADDITIONAL CONDITIONS FOR SUBSTANTIAL COMPLETION

A. In addition to requirements outlined in Document 00700 – General Conditions, for Contractor to be substantially complete with the Work and call for inspection by Project Manager to confirm, the following conditions must be met or completed:

1. Demonstrate the ability to receive and monitor video and Supervisory Control and Data Acquisition (SCADA) data from all remote sites (ground water plants, pressure points, fire stations, etc).

2. All SCADA and security equipment shall be installed, accepted by manufacturer's representative, and witnessed and approved by the City's SCADA Electrical and Instrumentation and Drinking Water Operations prior to approval by Project Manager.

3. All testing shall be completed and accepted by Project Manager.

4. Draft O&M manuals shall be delivered to Project Manager.

5. Training shall be conducted, utilizing draft O&M manuals.

6. *All Safety related work including pavement stripping, signing and signalization*

   a. All safety-related systems and equipment shall be installed, accepted by manufacturer's representative and approved for use.

7. *All pay items complete report.*

8. *Contractor shall contact Construction Project Manager to complete Texas Department of Licensing and Regulation Post Construction Inspection of pedestrian elements for Texas Accessibility Standards. All permit and fees associated with TDLR inspection shall be paid by the contractor."*

B. No additional conditions described in Paragraph 1.10 may be included in Contractor's punch list.

1.20 SOIL CONDITIONS & ENVIRONMENTAL SITE ASSESSMENTS (ESA)

A. A soils report was prepared for Spring Branch, Sharpstown #2, Ridgemont and Kingwood B water plants. Bidder(s) must consider the soil conditions provided in the Geotechnical Report. This report is been provided on a CD, which is attached to the Project Manual.

B. Environmental site assessments were not conducted for the project sites.

C. Limited Asbestos and Lead Surveys were prepared for the Kingwood B. Bidder(s) must consider the findings of these reports, which are being provided on a CD that is attached to the Project Manual.

1.21 SAFETY SYSTEMS

A. The plans and any attendant drawings (including shop drawings, as built drawings or record drawings), addenda, change orders and specifications, prepared by Klotz Associates and its subconsultants do not extend to or include designs or systems pertaining to the safety of the construction contractor or its employees, agents, or representatives in their performance of the work. The seals of registered professional engineer(s) and architect(s) from Klotz Associates, Kalluri Group, Inc., KIT Professionals, Inc., ESPA Corp. depicted hereon do not extend to any such safety systems that may now or hereafter be incorporated in these plans. The construction contractor shall prepare or obtain the appropriate safety systems, including the plans and specifications required by House Bill 662 and 665 enacted by the Texas Legislature.

1.22 CENTERPOINT ENERGY ELECTRICAL FACILITIES

A. Overhead lines may exist on property. All lines should be located prior to construction. Texas law, section 752, health & safety code, forbids all activities in which personas or equipment may come within six (6) feet of live overhead high voltage lines. Parties responsible for work, including contractors, are legally responsible for safety of construction workers under this law. This law carries both criminal and civil liability. To arrange for lines to be turned off or removed call CenterPoint Energy at (713) 207-2222.

B. Location of CenterPoint Energy electrical facilities, are approximate and have not been verified by actual field check.

C. Hand dig within one (1) foot of CenterPoint Energy underground electrical facilities.

D. Overhead lines exist on and adjacent to the project sites, which may be live during the construction period. Facilitate work so as not to interrupt services unless permitted by CenterPoint Energy.

E. Exercise caution when working in the vicinity of CenterPoint Energy electrical cable, underground wiring and overhead lines.

F. When excavation within 5 feet and beneath a depth of 3 feet below existing grade of a utility pole or anchor to which CenterPoint Energy facilities are attached, CenterPoint Energy will secure or brace these poles and anchor prior to excavation. The cost of CenterPoint Energy's efforts is incidental. "No separate pay item".

1.23 CENTERPOINT ENERGY UNDERGROUND GAS FACILITIES

A. Locations of CenterPoint Energy main lines (to include Unit Gas Transmission and/or Industrial Gas Supply Corporation where applicable) are shown in an approximate location only. Service lines are not usually shown. The contractor shall contact the Utility Coordinating Committee at (713) 223-4567 or 1-800-669-8344 a minimum of 48 hours prior to construction to have main and service lines field located.

B. When CenterPoint Energy pipeline markings are not visible, call (713) 967-8037 (7:00 am to 4:30 pm) for status of line location request before excavation begins.

C. When excavating within eighteen inches (18") of the indicated location of CenterPoint Energy facilities, all excavation must be accomplished using non-mechanical excavation procedures.

D. When CenterPoint Energy facilities are exposed, sufficient support must be provided to the facilities to prevent excessive stress on the piping.

E. The contractor is fully responsible for any damages caused by his failure to exactly locate and preserve these underground facilities.

F. All gas facilities are the property of CenterPoint Energy, unless otherwise noted.

1.24 AT&T TEXAS (TELEPHONE FACILITIES)

A. The locations of AT&T Texas utilities are shown in an approximate way only. The contractor shall determine the exact location before commencing work. He agrees to be fully responsible for any damages and all damages, which might be occasioned by his failure to exactly locate and preserve these underground utilities.

B. Call 1-800-344-8377 a minimum of 48 hours prior to construction to have underground lines field located.

C. When excavation within eighteen inches (18") of an indicated location of AT&T facilities, all excavations must be accomplished by using non-mechanized excavation procedures. When boring, the contractor shall expose AT&T facilities.

D. When AT&T facilities are exposed, the contractor will provide support to prevent damage to the conduit ducts or cables. When excavating near telephone poles, the contractor shall brace the pole for support.

1.25 TREE PROTECTION

A. Notify City of Houston Parks and Recreation Department representative Mr. Victor Cordova, City Forester, at 832-395-8454, at least two (2) weeks in advance of clearing cutting or pruning any tree.

B. Adhere to the requirements of Specification Section 01562 – Tree and Plant Protection. Protect any existing trees, landscaping, and sprinkler systems. Repair damaged sprinkler systems and replace damaged landscaping to original condition or better. No separate payment.

C. Live trees removed must be replaced with equivalent size in inches or with multiple trees whose cumulative size equates to the size of the tree being replaced. Tree replacement includes cost of new tree, installation, watering and warranty per Specification Section 02915, at no additional cost.

1.26 SALVAGED EQUIPMENT

A. Contractor shall carefully remove and salvage the following items during construction:

1. Actuators;
2. Blind flanges;
3. Electrical equipment; and
4. SCADA equipment

B. The City of Houston reserves First Right of Salvage.

C. Salvaged items must be delivered to Drinking Water Operations. Contractor shall coordinate with DWO to determine delivery location, which should be with the requirements of the individual specification sections:

1.27 EQUIPMENT TRAINING

A. Contractor shall provide training for the following equipment in accordance with the requirements of the individual specification sections:

1. Electric Valve Actuators;
2. Horizontal Centrifugal Pump; and
3. SCADA and Controls equipment per Instrumentation and Control General Provisions.

B. Training shall include classroom instruction and field operation and maintenance instruction with the O&M manual(s) and other materials, slides, videos and handouts.

C. Training shall be performed at each site upon completion of the installation and testing of the equipment per specification section requirements.

1.28 PROJECT RECORD DOCUMENTS

A. Prepare as-built horizontal and vertical locations of proposed yard piping and utilities. In addition, include any existing utilities encountered during construction in the as-built drawings. Data is to be provided to Project Manager. See Document 01785 for additional requirements.

1.29 PROJECT SIGN

A. Project sign detail included in Contract Drawings is the latest City of Houston standard but does not reference the latest Council Members. Contractor shall ensure latest names and Council Districts are represented on the signs.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Delivery

1. Deliver all components to site in manufacturer's shipping crates or boxes.

2. Provide flange covers.

3. Ship with bearings lubricated.

B. Storage

1. Store all components off ground.

2. Protect from the weather.

C. Handling

1. Handle all components in accordance with manufacturer's instructions to prevent damage.

1.06 OPERATION AND MAINTENANCE MANUALS

A. Provide Operation and Maintenance manuals in accordance with Section 01782.

PART 2 PRODUCTS

2.01 APPROVED MANUFACTURERS

A. Fairbanks Morse.
B. ITT Goulds.
C. Approved Equal

2.02 PUMP CONSTRUCTION

A. Design

1. Rotation

a. The pump will be clockwise rotation when viewed from the driver end looking at the pump.

2. Impeller

points including shut-off, design point, and minimum head for which pump is designed to operate. Conform to calculation methods as described in the latest Hydraulic Institute Standards.

3. Results of the performance tests shall be certified by a Registered Professional Engineer and submitted for approval before final shipment

PART 2 PRODUCTS

2.01 APPROVED MANUFACTURERS

A. ITT Goulds.
B. Fairbanks Morse.
C. Approved Equal.

2.02 PUMP CONSTRUCTION

A. Provide end suction pumps that are compliant with ANSI B73.1 standards.

B. Casing shall have top centerline discharge, allow for back-pull out of rotating assembly and have register fit between the pullout assembly and the casing and for ease of maintenance. Casing shall have integral cast feet. Flanges shall be serrated for positive sealing against leakage. Casing shall meet ANSI B16.5 requirements and have Class 150 FF flanges

C. Impeller shall be of the fully open type made 316 stainless steel, statically and hydraulically balanced. Impeller shall be suited for corrosives, abrasives, small solids, and stringy fibers. Impeller shall have back pump-out vanes to reduce pressure on the shaft seal and reduce axial thrust on the bearings. Impeller shall be balanced to ISO Specification 1940 Figure 2 Level G6.3. Enclosed impellers are not acceptable.

D. Shaft shall be made of 4140 steel and designed for minimum deflection at seal faces. Shaft deflection at seal shall be less than .002 in at the seal.

E. Shaft sleeve shall be made of 316 stainless. Sleeve shall protect the shaft from wear and from contact with the pumped liquid. Shaft sleeves shall be locked in place by threaded, bronze shaft sleeve nuts. An "O" ring shall be furnished under sleeve to prevent leakage. Sleeve shall be of the “hook” type to expand with operating temperature.

F. Seal chamber shall be made of cast iron separate from the casing and mounted in cylindrical fits in the casing. Seal chamber shall have TaperBore construction and

PART 2 PRODUCTS

2.01 POLYPHOSPHATE METERING SYSTEM

A. Manufacturers

1. Prominent, Gamma/L

2. Wallace & Tiernan

3. Pulsafeeder

B. Performance Requirements

1. Polyphosphate design feed rate: 8.4 gal/hr

2. Pressure: 29 psi

C. The chemical metering pump(s) shall be microprocessor-controlled, simplex, solenoid-driven, reciprocating, mechanically-actuated diaphragm type. All pumping functions shall be set by membrane-switch keypad and status shall be displayed on an illuminated LCD, readable at an offset angle of 45 degrees. The housing shall be rated NEMA 4X.

D. Power supply shall be 120 VAC, 60 Hz, single phase

E. Programming and Control

1. Stroke length control shall be manually and automatically adjusted between 100% and 0% with a stroke adjustment knob on the pump face control. Provide external control by 4-20mA input. The LCD shall digitally display stroke length setting in 1% increments in the full range between 100%

2. The pump shall be equipped with the programmable function of pressure levels to allow pump to operate at reduced pressures from the maximum rated pressure of the pump.

F. Accessories:

1. Liquid end materials: acrylic/PVC

2. Seal: Viton seals with PTFE diaphragm

3. Diaphragm type: Safety diaphragm with visual indicator

4. Calibration column: 500 mL, PVC

5. Pressure gage: 2-½ inch 316 SS with CPVC isolator, 0-160 psig

6. Back pressure valve: ½ inch, adjustable 0-150 psig

7. Wye strainer

2.02 FLUORIDE METERING SYSTEM

A. Manufacturers

1. Prominent, Gamma/L
2. Wallace & Tiernan

3. Pulsafeeder

B. Performance Requirements

4. Fluoride (hydrofluorosilicic acid) design feed rate: 4.5 gal/hr

5. Pressure: 58 psi

C. The chemical metering pump(s) shall be microprocessor-controlled, simplex, solenoid-driven, reciprocating, mechanically-actuated diaphragm type. All pumping functions shall be set by membrane-switch keypad and status shall be displayed on an illuminated LCD, readable at an offset angle of 45 degrees. The housing shall be rated NEMA 4X.

D. Power supply shall be 120 VAC, 60 Hz, single phase

E. Programming and Control

1. Stroke length control shall be manually and automatically adjusted between 100% and 0% with a stroke adjustment knob on the pump face control. Provide external control by 4-20mA input. The LCD shall digitally display stroke length setting in 1% increments in the full range between 100%

2. The pump shall be equipped with the programmable function of pressure levels to allow pump to operate at reduced pressures from the maximum rated pressure of the pump.

F. Accessories:

BL Technology, Inc.
13171 Misty Willow Drive
Houston, TX, 77070
Attn: Robert Lee
Phone: 281-970-8191

Boyer Inc.
8904 Fairbanks N. Houston
Houston, TX 77064
Attn: Stacy Jordan
Phone: 713-466-5395

MCC Weimar
Weimar Manufacturing
505 South Eagle Street
Weimar, TX 78962
Attn: Frank Macaulay
Phone: 979-725-8527

Prime Controls, LP
10400 Westoffice
Suite 105
Houston, TX 77042
Attn: Mike Whitman
Phone: 713-244-9747

G. Being listed in this specification section does not relieve any potential PCSI from meeting the qualifications specified in this section.

H. Listed PCSI companies are not required to submit a qualification proposal. Companies interested in being pre-approved as a PCSI, shall submit three (3) copies of a qualification proposal to the Engineer no later than two weeks before the bid opening date. Additional pre-approved PCSI companies will be listed by Addendum no later than seven (7) days before the bid opening date.

1. The qualification proposal shall provide details and a description of how the supplier proposes to fulfill the requirements set forth in this Specification. The supplier shall present the proposal in sufficient detail so that proper evaluation regarding the experience and capabilities of the supplier can be performed.

   a. The proposal shall contain evidence that the supplier has sufficient financial resources to meet the obligations incidental to the performance of the work including available bonding. (This requirement may be provided in the form of a verifiable or certified financial report for the company's latest fiscal year).

APPENDIX A – ACTUATOR SCHEDULE

SITE	LOCATION	VALVE TYPE	NEW / EXISTING	VALVE MODEL	VALVE SIZE (in.)	QTY
Spring Branch Water Plant	BP-1	Ball, Rubber Seated	Existing	Pratt, 150 lb., AWWA C507	10	1
Spring Branch Water Plant	BP-2	Ball, Rubber Seated	Existing	Pratt, 150 lb., AWWA C507	10	1
Spring Branch Water Plant	BP-3	Ball, Rubber Seated	Existing	Pratt, 150 lb., AWWA C507	10	1
Spring Branch Water Plant	BP-4	Ball, Rubber Seated	Existing	Pratt, 150 lb., AWWA C507	10	1
Spring Branch Water Plant	Metering Station	Butterfly	New	Pratt, 150 lb., AWWA C509	30	5
Spring Branch Water Plant	Metering Station	Sleeve Valve	New	Pratt, 150 lb., AWWA C507	24*	1

*Sleeve Diameter

Section 16211

SOUND ATTENUATING ENCLOSURE

PART 1: GENERAL

1.01 SCOPE OF WORK

A. This section specifies a weatherproof sound attenuating enclosure for a standby diesel engine generator.

B. Standby Diesel Engine Generator supplier shall furnish the Sound Attenuating Enclosure.

1.02 MEASUREMENT AND PAYMENT

A. No separate payment will be made for work performed under this Section.

1.03 RELATED SECTIONS

A. Section 01330 - Submittal Procedures

B. Section 01735 - Vendor Training

C. Section 01782 - Operations and Maintenance Data

D. Section 16195 – Electrical Identification

E. Section 16210 – Standby Diesel Engine Generators

1.04 REFERENCE STANDARDS

A. Furnish and install a weatherproof sound attenuating enclosure designed to reduce the noise level of the standby diesel engine generator set to the level identified for "residential property" at the property line in Chapter 30, Noise and Sound Level Regulation, in the City of Houston Building Code.

B. Wall construction and cooling baffle or silence construction shall be independently tested in conformance with ASTM procedures C423 for sound absorption, E90 transmission loss, E413 for sound transmission class and E477 for silencer acoustical performance (Dynamic Insertion Loss).

C. Generator enclosure design shall be adequate to withstand the following load: 110 mph wind speed in 3 second gusts in accordance with Section 1609.3 and Table 1609.3.1 of the City of Houston Building Code; enclosure roof load to be 200PSF. Design of the enclosure shall be by a Professional Structural Engineer licensed in Texas.

A. Provide a 3-inch minimum concrete covering on both sides, top and bottom of concrete envelopes around conduits. Add red dye at the rate of 10 pounds per cubic yard to concrete used for envelopes for easy identification during subsequent excavation.

B. Firmly fix ducts in place during pouring of concrete. Carefully spade and vibrate the concrete to ensure filling of spaces between ducts.

C. Make bends with sweeps of radius not less than 6 times the smallest diameter of the raceway.

D. Make a transition from Schedule 40 PVC conduit to epoxy fiberglass conduit where duct banks enter building structures or stub-up for continuation above grade.

E. Make bends of 30 degrees or more using epoxy fiberglass large radius elbows.

F. Reinforce all duct banks.

1. Reinforce duct banks with No. 5 longitudinal steel bars placed at each corner and along each face at a maximum parallel spacing of 6 inches on centers, and No. 4 stirrups transversely placed at 36-inch maximum longitudinal intervals.

2. Maintain a maximum clearance of 2 inches from bars to the edge of the concrete encasement.

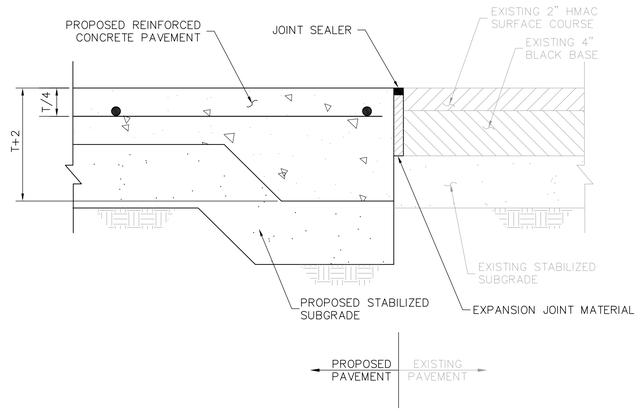
G. Where ducts enter structures such as handholes, manholes, pullboxes, or buildings, terminate the ducts in suitable end bells, insulated L-bushings, Meyers hubs or couplings on steel conduits. Tag cables entering pull boxes with stamped, stainless steel tags. Identify as designated in cable and conduit schedule.

H. Do not backfill with material containing large rock, paving materials, cinders, large or sharply angular substances, corrosive material, or other materials which can damage or contribute to corrosion of ducts or prevent adequate compaction of fill.

I. Install a bare stranded 4/0 copper duct bank ground in each duct bank envelope where duct banks terminate in switchgear or MCCs. Make ground electrically continuous throughout the entire duct bank system. Connect ground to switchgear and MCC ground buses and to above ground conduit extensions of the underground duct system.

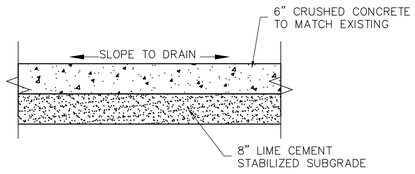
J. After completion of the duct bank and prior to pulling cable, pull a mandrel, not less than 12 inches long and with a cross section approximately one-fourth inch less than the inside cross section of the duct, through each duct. Then pull a rag swab or sponge through to remove any particles of earth, sand or gravel that may have been left in the duct. Repull the rag or sponge swab until the swab emerges clean.

REV	DESCRIPTION	BY	DATE
1	ADDENDUM No.1	AVK	APR 2014



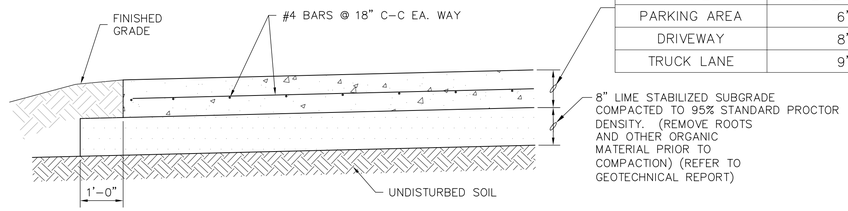
CONCRETE PAVEMENT REPLACEMENT DETAIL

DETAIL 1 / N.T.S.



CRUSHED CONCRETE PAVEMENT SECTION

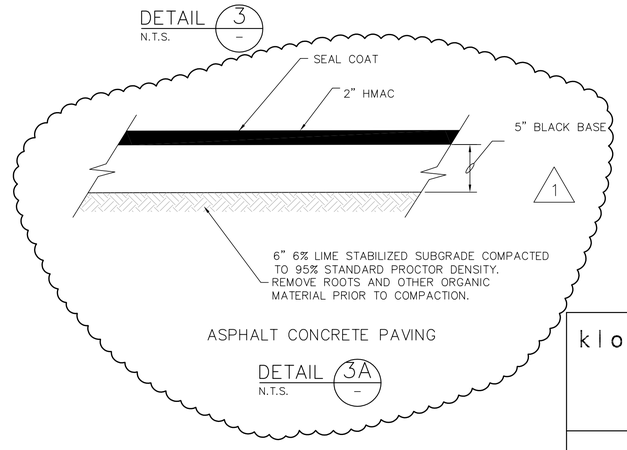
DETAIL 2 / N.T.S.



PAVEMENT THICKNESS	
TYPE	PAVEMENT INFO
PARKING AREA	6"
DRIVEWAY	8"
TRUCK LANE	9"

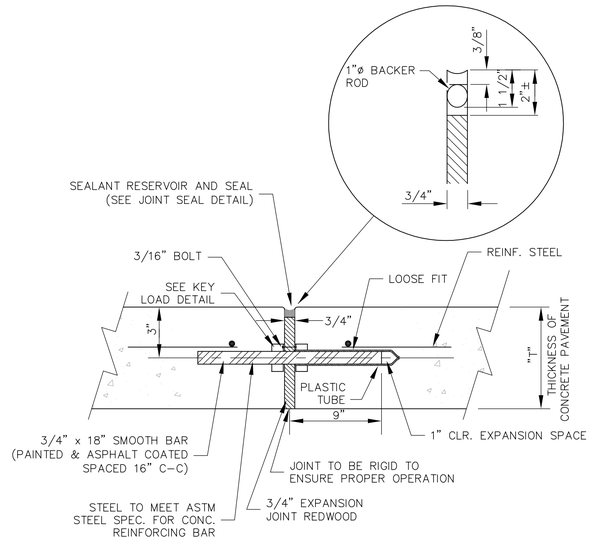
CONCRETE PAVING

DETAIL 3 / N.T.S.



ASPHALT CONCRETE PAVING

DETAIL 3A / N.T.S.

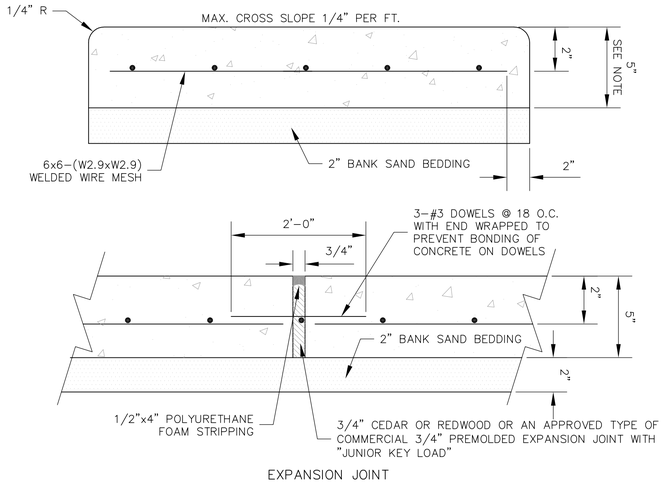


EXPANSION JOINT DETAIL

DETAIL 4 / N.T.S.

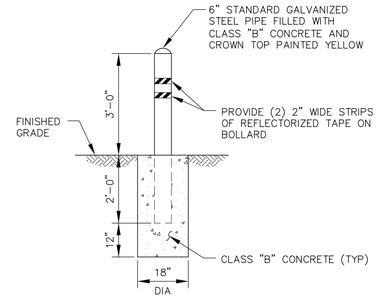
SIDEWALK NOTES:

1. ALL CONCRETE SIDEWALKS SHALL BE REINFORCED AS SHOWN.
2. CONTRACTION JOINTS SHALL BE SPACED AT 4' INTERVALS.
3. CONTRACTION JOINTS SHALL BE 1/8" DEEP AND EDGED WITH A JOINTER OR GROOVING TOOL.
4. 1/2" EXPANSION MATERIAL REQUIRED WHERE SIDEWALKS ABUT BUILDINGS, CURBS, DRIVEWAYS, OR EXIST. SIDEWALKS.
5. EXPANSION JOINTS SHALL BE SPACED AT A MAXIMUM OF 20' INTERVALS.
6. EXISTING SIDEWALKS SHALL BE SAWCUT TO FORM A SQUARE SURFACE AT LOCATIONS WHERE PROPOSED SIDEWALKS CONNECT TO EXISTING SIDEWALKS.
7. MAXIMUM AGGREGATE SIZE FOR CONCRETE SIDEWALKS IS 1".



EXPANSION JOINT
CONCRETE SIDEWALK

DETAIL 5 / N.T.S.



BOLLARD

DETAIL 6 / N.T.S.

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houston.office@klotz.com
Texas PE Firm Reg. # F-929

STATE OF TEXAS
ALEXANDER V. KUZOVKOV
108422
LICENSED
PROFESSIONAL ENGINEER
4/15/2014

SURVEYED BY: TSC FB No. –

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

REHABILITATION OF PUMPS, MOTORS, VALVES, PIPING & BUILDINGS AT VARIOUS FACILITIES PACKAGE A

SITE WORK DETAILS
SHEET 3 OF 4

CIVIL

WBS NUMBER	
S-001000-0036-4	
DRAWING SCALE	
NTS	
CITY OF HOUSTON PM	
RAJINDER SINGH	

STD-C-3R | SHEET No. 7 OF 191

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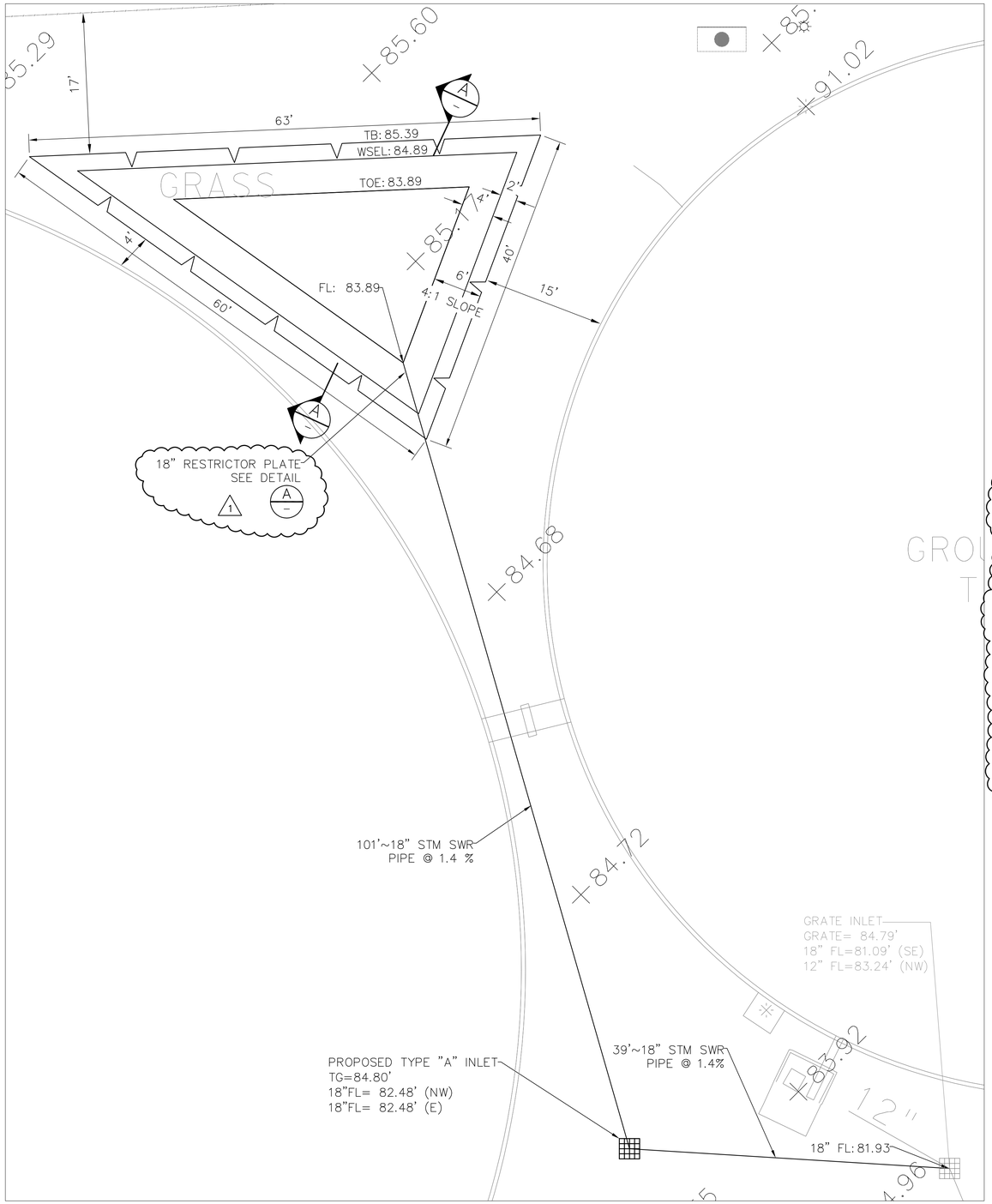
REV	DESCRIPTION	BY	DATE
1	ADDENDUM No.1	AVK	APR 2014



IMPERVIOUS AREA CALCULATIONS	
EXISTING	13799 SY
PROPOSED	13919 SY
INCREASED IMPERVIOUS AREA	120 SY

WARNING

OVERHEAD AND UNDERGROUND UTILITIES MAY EXIST IN THE VICINITY OF THIS PROJECT. LOCATIONS SHOWN FOR EXISTING UTILITIES ARE APPROXIMATE AND OTHER UTILITIES MAY EXIST IN THE VICINITY OF THE PROJECT WHICH ARE NOT SHOWN ON THE PLANS.

IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE ALL EXISTING UTILITIES, IN THE VICINITY OF THE PROJECT, PRIOR TO BEGINNING CONSTRUCTION.

DETENTION ANALYSIS

INCREASED IMPERVIOUS AREA= 120 SY X 9 SF/1 SY X 1 ACRE/43,560 SF = 0.025 ACRES
STORAGE REQUIRED =0.55 ACRE-FT PER ACRE INCREASED IMPERVIOUS AREA
STORAGE REQUIRED =0.025 ACRES X 0.55 ACRE-FT X 43,560 SQ.FT/ACRE = 599 CF

DETENTION FACILITY TO BE MAINTAINED BY OWNER

DETENTION POND

TOP BANK ELEVATION =85.39
WATER SURFACE ELEVATION =84.89 (6" FREEBOARD)
AVERAGE DEPTH = 1 FT (FROM BOTTOM OF FREEBOARD)

AREA FROM BOTTOM OF FREEBOARD =856 SF
TOE BANK AREA =388 SF
SIDE SLOPE AREA = 856 SF - 388 SF =468 SF

VOLUME

TOE BANK VOLUME =388 SF X 1 FT =388 CF
SIDE SLOPE VOLUME =(468 SF X 1 FT) / 2 =234 CF
TOTAL VOLUME =388 CF + 234 CF = 622 CF

POND STORAGE PROVIDED = 622 CF
POND STORAGE REQUIRED = 599 CF

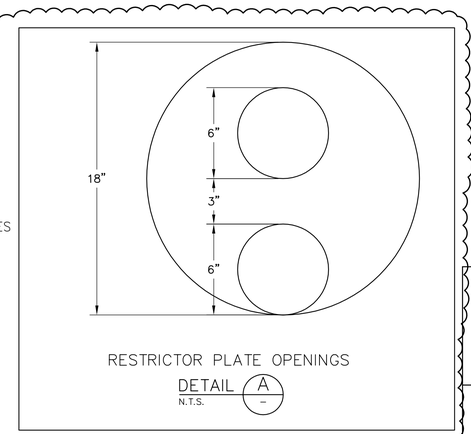
RESTRICTOR DESIGN CALCULATIONS

ALLOWABLE DISCHARGE RATE FOR LOW LEVEL RESTRICTOR
= 0.5 CFS/ACRE * 4.96 ACRES = 2.48 CFS
ALLOWABLE DISCHARGE RATE FOR COMBINED RESTRICTOR
= 2.0 CFS/ACRE * 4.96 ACRES = 9.92 CFS

DESIGN DISCHARGE = $Q=CA(2g)^{1/2}(H)^{1/4}$

Q = DESIGN DISCHARGE IN CFS
C = COEFFICIENT OF DISCHARGE - 0.6 FOR OPENINGS IN PLATES
A = AREA OF OPENING IN SQUARE FEET
g = ACCELERATION DUE TO GRAVITY (32.2 FT/S*S)
H = HEAD DIFFERENCE BETWEEN ENTRANCE AND EXIT IN FEET WHEN ORIFICE IS FULLY SUBMERGED OR THE DIFFERENCE BETWEEN WATER SURFACE ELEVATION AT THE ENTRANCE AND THE CENTROID OF THE ORIFICE WHEN PARTIALLY SUBMERGED

LOW LEVEL RESTRICTOR SIZE = 6"
HIGH LEVEL RESTRICTOR SIZE = 6"

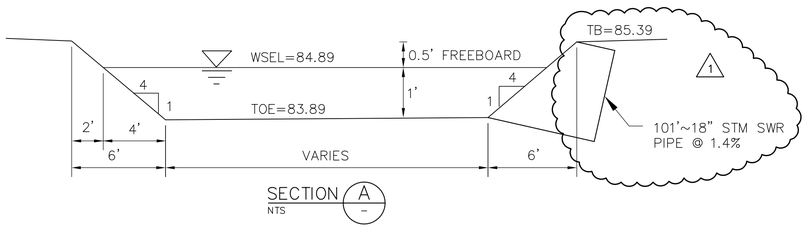


RESTRICTOR PLATE OPENINGS
DETAIL A
N.T.S.

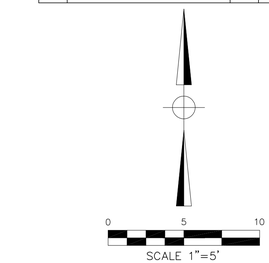
GEOTECHNICAL INFORMATION

REFER TO GEOTECHNICAL REPORT ENTITLED: GEOTECHNICAL INVESTIGATION PROPOSED WATER PLANT IMPROVEMENTS PACKAGE A PREPARED BY ASSOCIATED TESTING LABORATORIES, INC.

REPORT NUMBER G13-163, DATED: OCT 7, 2013



SECTION A
NTS



SCALE 1"=5'

LEGEND

100.00	EXISTING ELEVATIONS
TG	TOP OF GRATE ELEVATION
TB	TOP OF BANK ELEVATION
FL	FLOW LINE ELEVATION
WSEL	WATER SURFACE ELEVATION
TOE	BOTTOM OF POND ELEVATION

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ALEXANDER V. KUZOVKOV
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4 / 15 / 2014

SURVEYED BY: TSC FB No. -

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

REHABILITATION OF PUMPS, MOTORS, VALVES, PIPING & BUILDINGS AT VARIOUS FACILITIES PACKAGE A

SPRING BRANCH WATER PLANT

DETENTION POND LAYOUT

9400 KEMPWOOD DRIVE, HOUSTON, TEXAS
CIVIL

WBS NUMBER	
S-001000-0036-4	
DRAWING SCALE	
1"=5'	
CITY OF HOUSTON PM	
RAJINDER SINGH	

SB-C-3R | SHEET No. 17 OF 191

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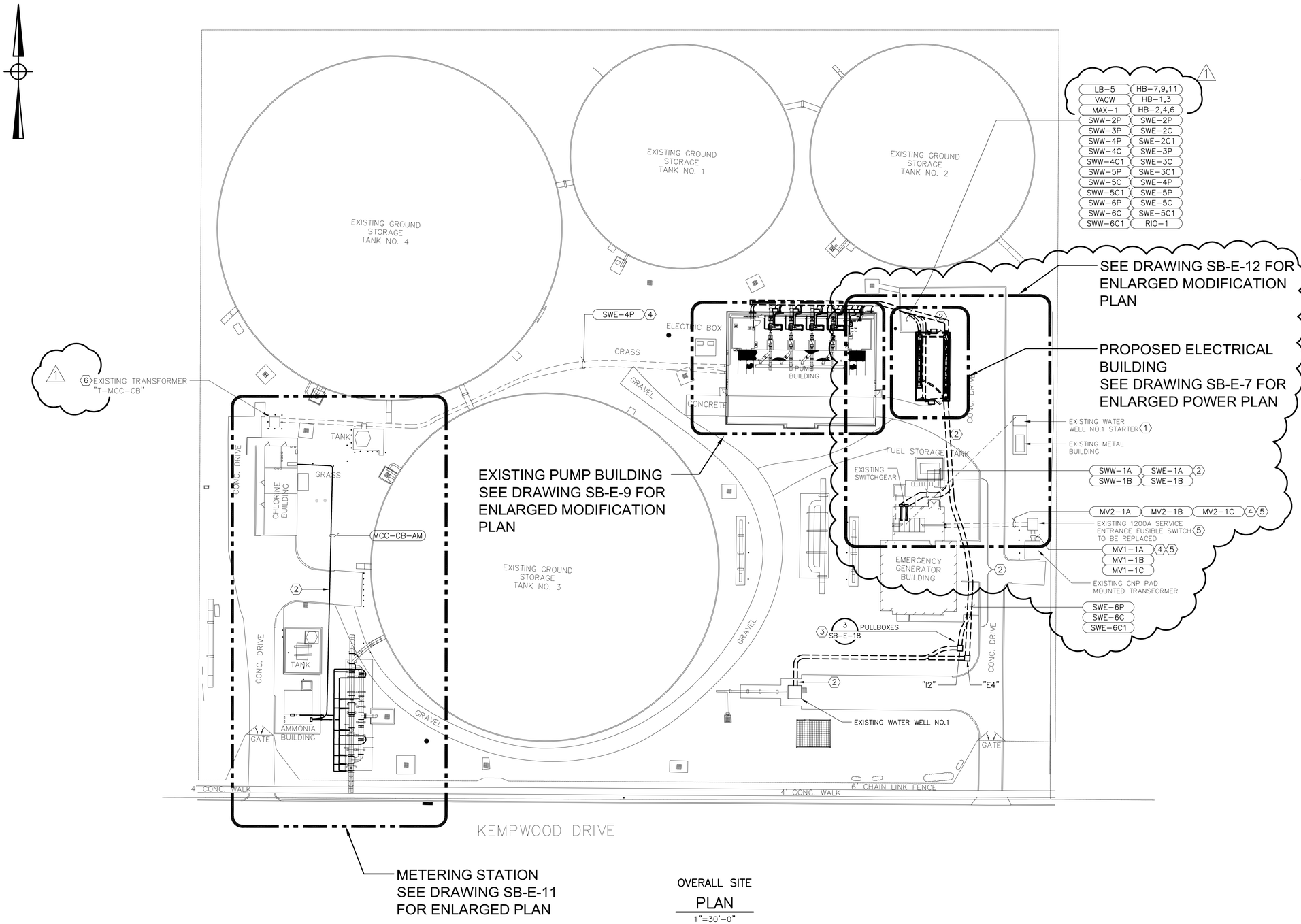
REV	DESCRIPTION	BY	DATE
1	ADDENDUM 1	BC	4/16/2014

NOTES:

1. REMOVE WELL STARTER SWITCHGEAR, CONDUCTORS AND RADIO ANTENNA. SAW CUT AND REMOVE CONCRETE FOUNDATION UNDER SWITCHGEAR. CAP ALL EXISTING CONDUITS AT 12" BELOW GROUND LEVEL. FOUNDATION FOR EXISTING METAL BUILDING TO REMAIN.
2. INSTALL NEW DUCT BANK PER DETAIL 2/SB-E-18. SAW CUT AND REPLACE PAVEMENT TO MATCH EXISTING.
3. PROVIDE ONE "E4" PULL BOX AND ONE "I2" PULL BOX.
4. REPLACE CONDUCTORS. SEE DWG. SB-E-3.
5. WHEN SWITCH AND CONDUCTORS ARE REPLACED, THE CITY'S EXISTING ON-SITE DIESEL GENERATOR SHALL BE OPERATED TO POWER THE PUMP STATION. CONTRACTOR SHALL PROVIDE ALL FUEL FOR GENERATOR. CONTRACTOR TO ALSO PROVIDE A QUALIFIED OPERATOR TO MONITOR GENERATOR PERFORMANCE.
6. CONTRACTOR SHALL PROVIDE PORTABLE GENERATOR, A QUALIFIED OPERATOR, FUEL AND TEMPORARY CABLING TO POWER THE MCC IN THE CHLORINE BUILDING WHEN THE 2.4 kV FEEDER CABLE TO THIS TRANSFORMER IS REPLACED.



OVERALL SITE PLAN
1"=30'-0"

1" = 30'
15 0 30

SB-E-1R

KGL Kalluri Group, Inc.
Consulting Engineers & Project Managers
TBPE Registration No. F-665
10497 Town & Country Way, Suite 220
Houston, Texas 77024
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STATE OF TEXAS
BRIAN S. CHONG
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4-16-14

SURVEYED BY: TSC FB No. -

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

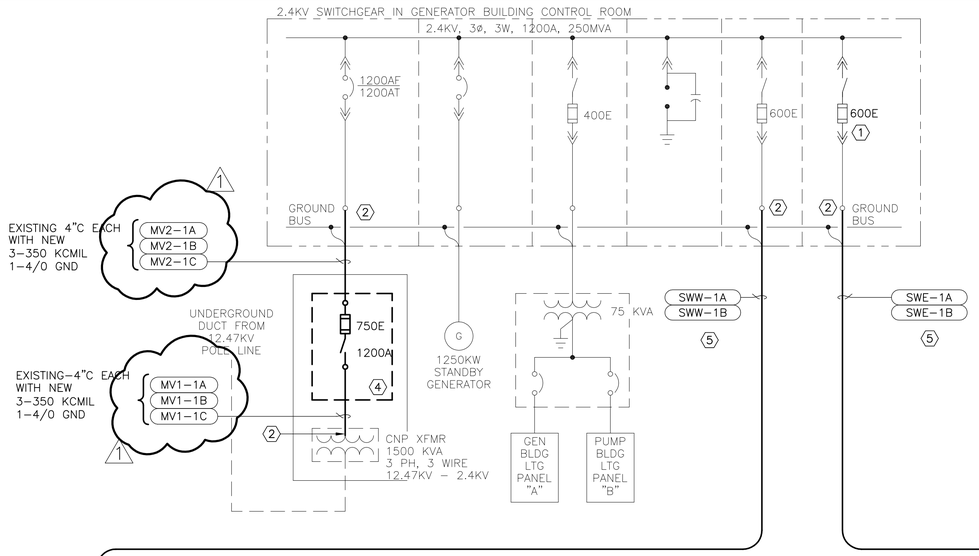
REHABILITATION OF PUMPS, MOTORS, VALVES, PIPING & BUILDINGS AT VARIOUS FACILITIES PACKAGE A SPRING BRANCH ELECTRICAL OVERALL SITE PLAN MODIFICATION

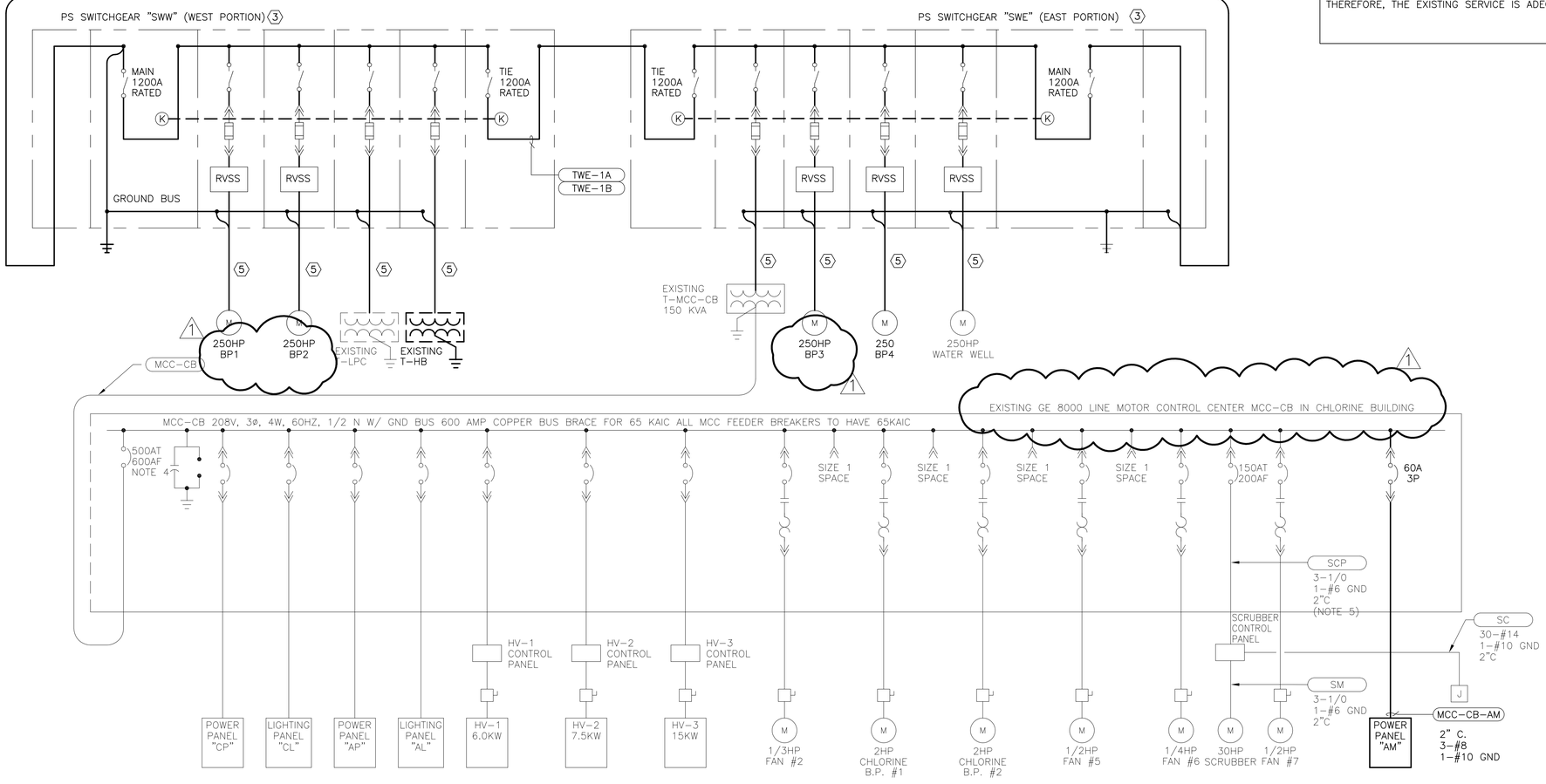
ELECTRICAL

WBS NUMBER	S-001000-00036-4
DRAWING SCALE	AS NOTED
CITY OF HOUSTON PM	RAJINDER SINGH
SHEET No. 29 OF 191	

L:\Active projects\4069-AM (Water Plants Elect)\Drawings\Addendum\Spring Branch\SB-E-1 Site Plan.dwg Apr 16, 2014

REV	DESCRIPTION	BY	DATE
1	ADDENDUM 1	BC	4/16/2014





ONE LINE DIAGRAM

NOTES:

1. PROVIDE THREE NEW 5.5kV, 600E CURRENT LIMITING FUSES AND NEW BOLT-IN FUSE MOUNTING HARDWARE. FUSES TO BE MERSEN (GOULD SHAWMUT) NO. 225-007-955 OR CURRENTLY AVAILABLE EQUIVALENT FUSES. PROVIDE TWO SETS OF THREE SPARE FUSES.
2. FIELD CONNECT PROPOSED CONDUIT AND CONDUCTOR TO EXISTING EQUIPMENT.
3. NOT ALL EQUIPMENT IS SHOWN. REFER TO DWG SB-E-4 FOR MORE DETAIL.
4. PROPOSED 1200A, 3POLE, FUSIBLE, 5.5kV SWITCH. SWITCH CONFIGURATION SHALL MATCH EXISTING CONDUIT STUB-UPS. PROVIDE AN INCOMING COMPARTMENT, A FUSIBLE SWITCH COMPARTMENT AND MAIN HORIZONTAL BUS BETWEEN COMPARTMENTS. SEE SPECIFICATION 16361 FOR ADDITIONAL REQUIREMENTS.
5. REFER TO DWG SB-E-4 FOR CONDUITS AND CONDUCTORS DETAIL.

SERVICE LOAD ANALYSIS

EXISTING MAXIMUM KVA DEMAND BASED ON POWER COMPANY RECORDS FOR THE PAST YEAR	841 KVA
PLUS 25% OF MAXIMUM DEMAND PER NEC 220.87	210 KVA
PLUS NEW LOAD (300-250=50HPX4)	200 KVA
TOTAL LOAD	1251 KVA

AT 2400V, 3PH 1251 KVA = 300.95 A
THE EXISTING TWO SETS OF 350 KCMIL CAPACITY IS 630 A
THEREFORE, THE EXISTING SERVICE IS ADEQUATE

KGI Kalluri Group, Inc.
Consulting Engineers & Project Managers
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Phone: (713)-365-9288

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BRIAN S. CHONG
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4-16-14

SURVEYED BY: TSC FB No. -

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

REHABILITATION OF PUMPS, MOTORS, VALVES, PIPING & BUILDINGS AT VARIOUS FACILITIES PACKAGE A SPRING BRANCH ELECTRICAL PROPOSED OVERALL ONE LINE DIAGRAM

ELECTRICAL

WBS NUMBER	S-001000-00036-4
DRAWING SCALE	AS NOTED
CITY OF HOUSTON PM	RAJINDER SINGH
SHEET No. 31 OF 191	

SB-E-3R

REV	DESCRIPTION	BY	DATE
1	ADDENDUM 1	BC	4/16/2014

PUMP STATION SWITCHGEAR "SWW" (WEST PORTION)

2.4kV, 3 PH, 3 WIRE, 60 Hz, 1200A CU BUS, 200 MVA RATED (50 KA RMS SYM.)

1W 2W 3W 3W 4W 4W 5W 6W 7W 8W 9W

MAIN 1200A 3P

600A 3P 30E — SPARE — SPARE

400A 4R CPT RVSS VT ML 369 100/5 CONTROLS

TIE 1200A 3P

PB

SWW-5P SWW-6P

PLC-2 TO SWITCHGEAR "SWE"

SPARE

SWW-1A SWW-1B 2-4"C., EACH WITH 3-350 KCMIL (5KV CABLE), 1-#4/0 GND. (600V)

2"C, 1-#4/0 GND

TO 2.4KW SWITCHGEAR IN GENERATOR BUILDING (SEE DWG SB-E-3 FOR CONTINUATION)

EXOTHERMIC CONNECTION OR EQUAL (TYP)

EXISTING XFMR "T-LPC" IN EXISTING PUMP BUILDING (75KVA) TO GROUND GRID SYSTEM

3/4" DIAMETER X 20'-0" GROUND ROD

SWW-2P 1 1/2"C., 3-#8, (MV) 1-#10 GND.

SWW-3P 1 1/2"C., 3-#8, 1-#10 GND. (MV)

XFMR "HB" 75kVA

3/4" DIAMETER X 20'-0" GROUND ROD

XHB-01 1 1/2"C., 3-#2, 1-#8 GND.

PANEL "HB"

HB-1,3,5

MINI PWR CNTR "LB" 1 1"C., 3-#2, 1-#8 GND.

SWW-4P 3"C., EMPTY WITH PULL LINE

SWW-4C 2"C., EMPTY WITH PULL LINE

2"C., EMPTY WITH PULL LINE SWW-4C1

SWW-5C SWW-5C1 SWW-6C SWW-6C1

VA VALVE ACTUATOR 250 BP-1 BP-2

E STOP SWITCH RTDS

SWW-5C2 SWW-6C2

HB-13,15,17 HB-19,21,23

TWE-1A TWE-1B 2-4"C., EACH WITH 3-350 KCMIL (MV CABLE), 1-#4/0 GND. (600V)

PUMP STATION SWITCHGEAR "SWE" (EAST PORTION)

2.4kV, 3 PH, 3 WIRE, 60 Hz, 1200A CU BUS, 200 MVA RATED (50 KA RMS SYM.)

1E 2E 3E 4E 5E 5E 7E 8E 9E

TIE 1200A 3P

TO SWITCHGEAR "SWW"

400A 4R CPT RVSS VT ML 369 100/5 CONTROLS

600A 3P 50E — SPARE

MAIN 1200A 3P

PB

SWE-2P SWE-3P

SPARE

INCOMING

SWE-2C SWE-2C1 SWE-3C SWE-3C1 SWE-4P

PROPOSED J-BOX "JB2"

EXISTING J-BOX "JB1"

EXISTING XFMR "T-MCC-CB" 150 KVA

SWE-5P 3"C., EMPTY WITH PULL LINE

SWE-5C 2"C., EMPTY WITH PULL LINE

2"C., EMPTY WITH PULL LINE SWE-5C1

3/4" 1 PAIR #18 T/S

TO PLC

SWE-6P SWE-6C

EXISTING ON SITE WATER WELL

SV OIL HEATER OIL LEVEL PS E STOP SWITCH FM

1 1/2"C, 1-#4/0 GND

SWE-1A SWE-1B 2-4"C., EACH WITH 3-350 KCMIL (5KV CABLE), 1-#4/0 GND.

TO GROUND GRID SYSTEM

EXOTHERMIC CONNECTION OR EQUAL (TYP)

3/4" DIAMETER X 20'-0" GROUND ROD

TO 2.4KV SWITCHGEAR IN GENERATOR BUILDING (SEE DWG SB-E-3 FOR CONTINUATION)

ONE LINE DIAGRAM

NOTES:

1. 3"C., 3-#2 (5KV), 1-#6 GND.
2. 1"C., 2-#12 (SP. HTR.), 2-#14 (E STOP), 4-#14 (SPARE) 1-#12 GND
3. 2"C., 8-3/C #16 TSP (RTDS), 2-3/C #16 TSP (SPARES).
4. 1"C., 12-#14.
5. 2"C., 3-#6 (5KV), 1 -#10 GND.
6. PROFIBUS CABLE TO PLC CABINET B VIA WIREWAY.
7. PROFIBUS CABLE TO PLC CABINET A VIA WIREWAY.
8. 1"C., 3-#10, 1-#10 GND.
9. 2"C,. 4-#10, 10-#14, AND 1-#12 GND.
10. REUSE EXISTING CONDUIT WITH PROPOSED 3-#6(5KV) AND 1 -#10 GND.

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STATE OF TEXAS BRIAN S. CHONG 106528 LICENSED PROFESSIONAL ENGINEER 4-16-14

SURVEYED BY: TSC FB No. –

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

REHABILITATION OF PUMPS, MOTORS, VALVES, PIPING & BUILDINGS AT VARIOUS FACILITIES PACKAGE A SPRING BRANCH PROPOSED PS SWITCHGEAR ONE LINE DIAGRAM

ELECTRICAL

WBS NUMBER	S-001000-00036-4
DRAWING SCALE	AS NOTED
CITY OF HOUSTON PM	RAJINDER SINGH
SHEET No.	32 OF 191

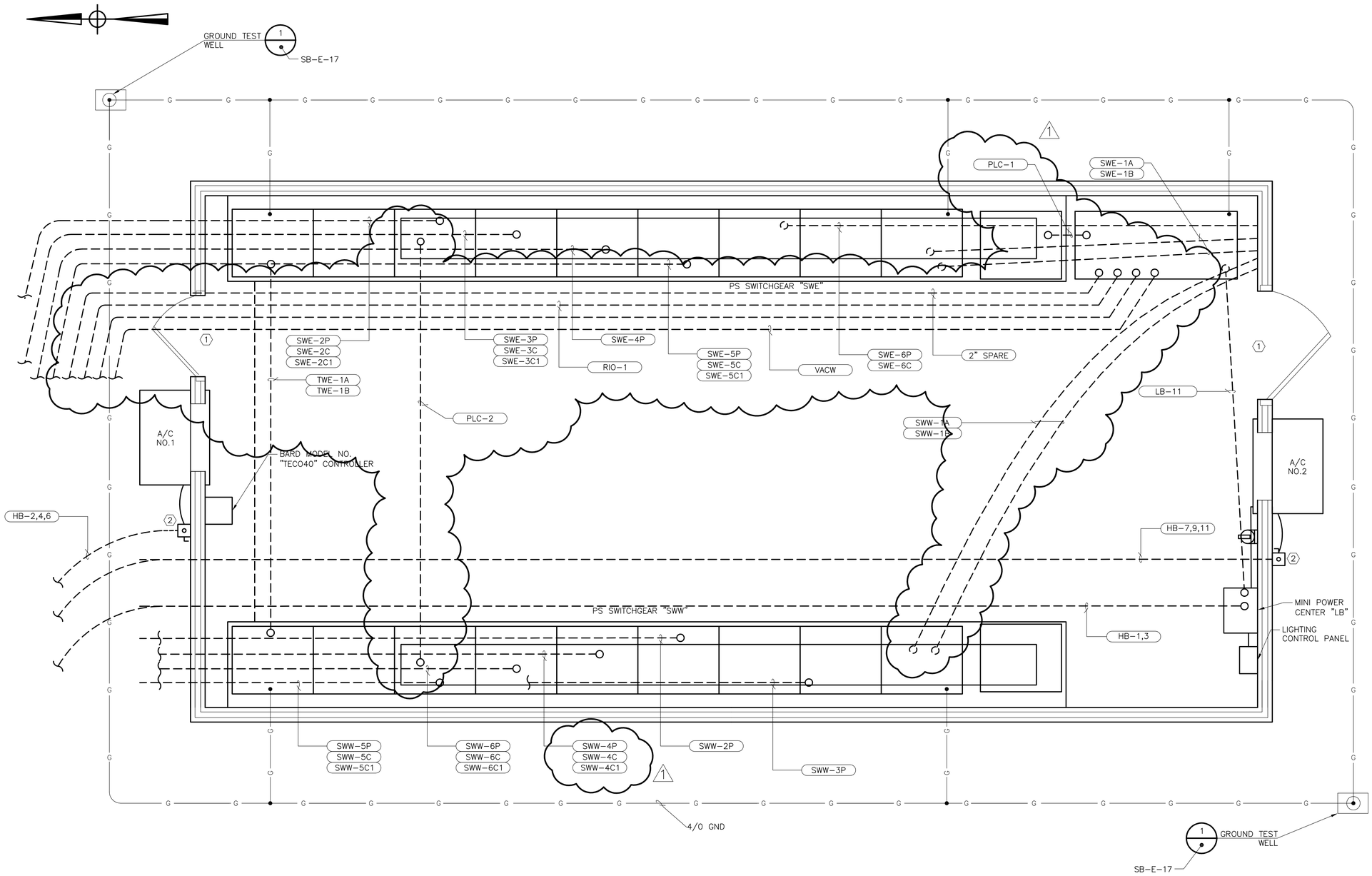
SB-E-4R

L:\Active projects\1069 AM (Water Plants Elect)\Drawings\Addendum\Spring Branch\SB-E-4 Proposed PS Switchgear Onelines Diagram.dwg Apr 16, 2014

REV	DESCRIPTION	BY	DATE
1	ADDENDUM 1	BC	4/16/2014

1 NOTES:

1. PROVIDE PANIC HARDWARE FOR EACH DOOR. SEE SPECIFICATION FOR MORE DETAILS.
2. 30A, 3 PHASE, 316 S.S NEMA 4X ENCLOSURE.



ELECTRICAL BUILDING POWER

PLAN

1/2"=1'-0"

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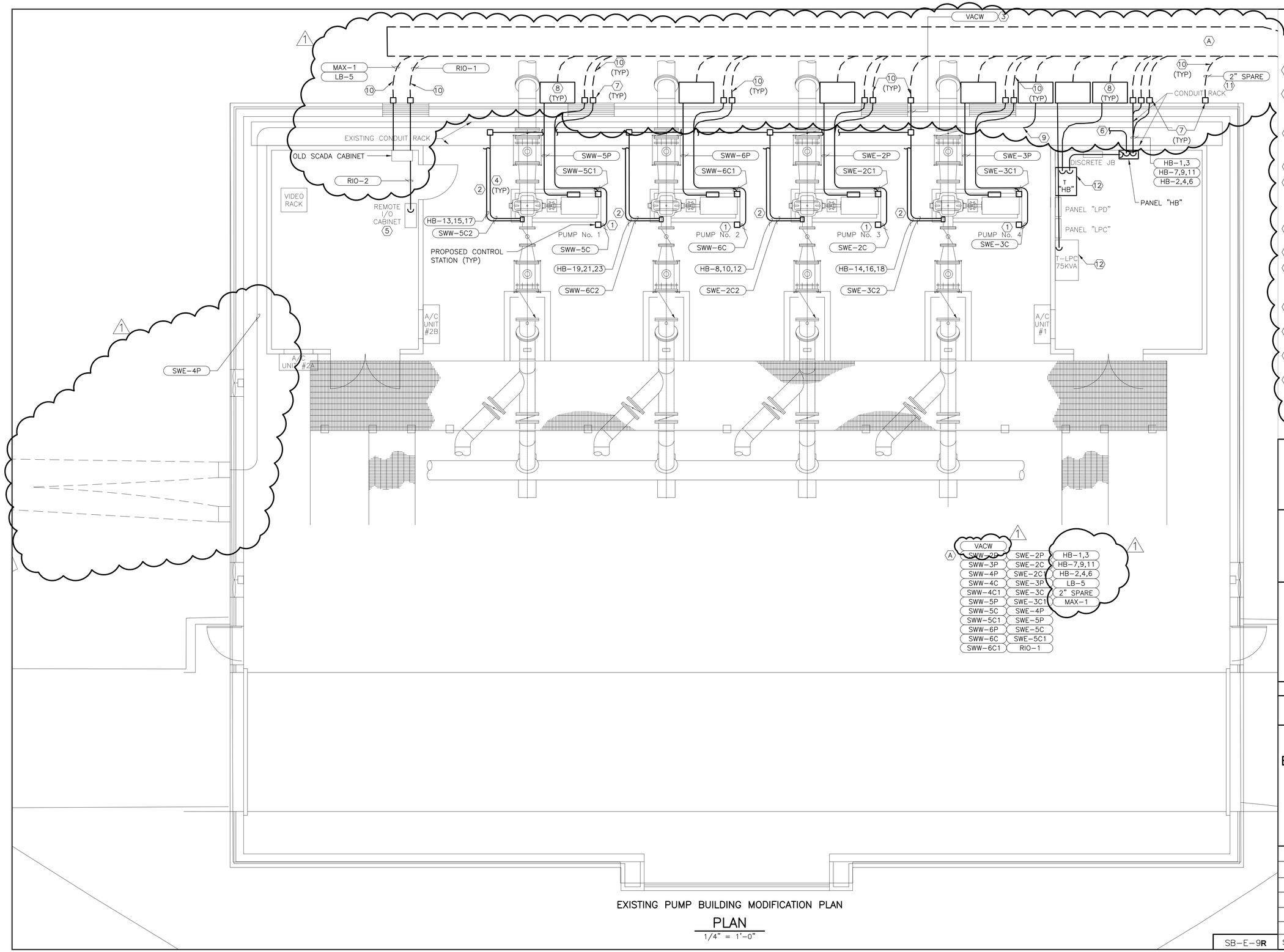
REHABILITATION OF PUMPS, MOTORS, VALVES, PIPING & BUILDINGS AT VARIOUS FACILITIES PACKAGE A SPRING BRANCH ELECTRICAL BUILDING POWER PLAN

ELECTRICAL

WBS NUMBER	
S-001000-00036-4	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON PM	
RAJINDER SINGH	

SB-E-7R | SHEET No. 35 OF 191

L:\Active projects\4069-KAI (Water Plants Elect)\Drawings\Addendum\Spring Branch\SB-E-7 Electrical Building Power Plan.dwg Apr 17 2014



EXISTING PUMP BUILDING MODIFICATION PLAN

PLAN

1/4" = 1'-0"

REV	DESCRIPTION	BY	DATE
1	ADDENDUM 1	BC	4/16/2014

NOTES:

1. E-STOP PROPOSED MOTOR CONTROL STATION.
2. 480V CIRCUIT TO PANELBOARD "HB". SEE NOTE 8 ON DWG. SB-E-4 FOR CONDUIT AND CONDUCTORS REQUIREMENT FOR EACH ACTUATOR.
3. ACTUATOR CONTROL WIRING TO PLC IN BOOSTER PUMP PLC CABINET. 2"C., 48 #14, #12GND.
4. 1"C.,12 #14 (4 #14 SPARE), #12 GND
5. VERIFY REMOTE PLC PROFIBUS COMMUNICATION. IF IT NOT WORKING, PROVIDE NEW PROFIBUS COMMUNICATION MODULE. CONNECT ALL LEVEL TRANSMITTERS AND OTHER SIGNALS TO REMOTE PLC.
6. 480V CIRCUIT IN 1"C. TO EACH VALVE ACTUATOR.
7. LBD FITTING AT WALL PENETRATION.
8. CUSTOM MADE 30"X30"X18" DEEP NEMA 4X, TYPE 316 S.S. PULL BOX WITH HINGED DOOR. SEAL WALL PENETRATION WATERTIGHT. CONNECT TO BOX WITH MYERS HUBS.
9. CONNECT TO EXISTING CONDUIT "T-MCC-CB" (NEW CIRCUIT "SWE-4P").
10. ROUTE SIGNAL CONDUITS A MINIMUM OF 18" FROM POWER CONDUITS IN DUCT BANKS.
11. ROUTE 2" SPARE SIGNAL CONDUIT TO SCADA CABINET IN NEW ELECTRICAL BUILDING.
12. PROVIDE AND INSTALL A 30" HIGH STEEL HOT-DIP GALVANIZED PLATFORM TO SUPPORT TRANSFORMER. BOLT PLATFORM TO FLOOR WITH TYPE 316 S.S. EXPANSION BOLTS. PLATFORM TO BE DESIGNED BY A LICENSED STRUCTURAL ENGINEER IN TEXAS.

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4-16-14

SURVEYED BY: TSC FB No. –

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

REHABILITATION OF PUMPS, MOTORS, VALVES, PIPING & BUILDINGS AT VARIOUS FACILITIES PACKAGE A SPRING BRANCH EXISTING PUMP BUILDING MODIFICATION PLAN

ELECTRICAL

WBS NUMBER	
S-001000-00036-4	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON PM	
RAJINDER SINGH	
SHEET No. 37 OF 191	

SB-E-9R

L:\Active projects\4069-KAI (Water Plants Elect)\Drawings\Addendum\Spring Branch\SB-E-9 Existing Pump Building Modification Plan.dwg Apr 16, 2014

REV	DESCRIPTION	BY	DATE
1	ADDENDUM 1	BC	4/16/2014

NOTES:

1. REMOVE WELL STARTER SWITCHGEAR, CONDUCTORS AND RADIO ANTENNA. SAW CUT AND REMOVE CONCRETE FOUNDATION UNDER SWITCHGEAR. CAP ALL EXISTING CONDUITS AT 12" BELOW GROUND LEVEL. FOUNDATION FOR EXISTING METAL BUILDING TO REMAIN.
2. INSTALL NEW DUCT BANK PER DETAIL 2/SB-E-18. SAW CUT AND REPLACE PAVEMENT TO MATCH EXISTING. ROUTE SIGNAL CONDUITS A MINIMUM OF 18" FROM POWER CONDUITS IN DUCT BANKS.
3. EXISTING CNP PAD MOUNTED TRANSFORMER.
4. REPLACE CONDUCTORS. SEE DWG. SB-E-3.
5. 1200A SERVICE ENTRANCE FUSIBLE SWITCH TO BE REPLACED.
6. REMOVE LBD FITTINGS.
7. SEE DWG. SB-E-1 FOR CONDUIT TAG IDENTIFICATION.
8. REMOVE CONDUITS AND CONDUCTORS.
9. INSTALL KNOCKOUT CLOSURES IN TOP OF SWITCHGEAR TO CLOSE CONDUIT OPENINGS.
10. REMOVE LBD FITTINGS AND ABOVE GROUND CONDUITS. SEAL CONDUIT OPENINGS IN WALL WATERTIGHT WITH NON-SHRINK GROUT TO MATCH MASONRY MORTAR COLOR. CAP CONDUITS 12" BELOW GRADE.
11. ABANDON DUCT BANK IN PLACE. EXACT DUCT BANK ROUTING IS NOT KNOWN.
12. DIESEL FUEL LINE TO REMAIN IN SERVICE. EXCAVATE CAUTIOUSLY AROUND DIESEL FUEL LINE.
13. CUSTOM MADE 42"HX36"WX24"D NEMA 4X, TYPE 316 S.S. PULL BOX WITH HINGED DOOR. SEAL CONDUIT WALL PENETRATIONS WATERTIGHT. CONNECT TO BOX WITH MYERS HUBS.

METAL BUILDING

NEW ELECTRICAL BUILDING

SWW-1A
SWW-1B

SEE DWG. SB-E-9 FOR CONTINUATION

DIESEL FUEL TANK

75kVA PAD MOUNTED XFMR

SWW-1A
SWW-1B

SWE-1A
SWE-1B

(TYP)

CONDUIT RACK

BUS TRANSITION | T-BP2 & T-BP3 | T-LP2 & T-MCC2B | BP-1 | BP-4

ELECTRICAL ENLARGED MODIFICATION PLAN

1:5

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4-16-14

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CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

REHABILITATION OF PUMPS, MOTORS, VALVES, PIPING & BUILDINGS AT VARIOUS FACILITIES PACKAGE A SPRING BRANCH ELECTRICAL ENLARGED MODIFICATION PLAN

ELECTRICAL

WBS NUMBER	
S-001000-00036-4	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON PM	
RAJINDER SINGH	
SB-E-12R	SHEET No. 40 OF 191

REV	DESCRIPTION	BY	DATE
1	ADDENDUM 1	BC	4/16/2014

PANEL "HB"

BUS AMPS 400 MLO ____
MAIN BRKR. AMPS 225 WIRE SIZE ____
VOLTS 480 AIC 18 KA
PHASE 3 WIRE 3 SN ✓

NOTES
1. ADJ. CKTS. TO BAL. PNL.
2. SURFACE MOUNT, NEMA 1.

GND	CKT. DESCRIPTION	WIRE	LOAD	BKR.	A	B	C		BKR.	LOAD	WIRE	CKT. DESCRIPTION	GND
1-1/2"C., #6	PANEL LB	2	12500	100	1			2	30	3300	10	A/C NO. 1	1"C., #10
			12500		3			4		3300			
	SPACE		0		5			6		3300			
1"C., #10	A/C NO. 2	10	3300	30	7			8	15	0	12	BP-3 ACTUATOR	1"C., #12
			3300		9			10		0			
			3300		11			12		0			
1"C., #12	BP-1 ACTUATOR	12	0	15	13			14	15	0	12	BP-4 ACTUATOR	1"C., #12
			0		15			16		0			
			0		17			18		0			
1"C., #12	BP-2 ACTUATOR	12	0	15	19			20	20			SPARE	
			0		21			22					
			0		23			24					
					N								

TOTAL LOAD = 45.0 KVA

LIGHT FIXTURE SCHEDULE

TYPE	CATALOG NUMBER	DESCRIPTION	LAMPS	REMARKS
A	LITHONIA No. DMW-2-32-MVOLT-GEB10PS-WLF-A268 WITH STAINLESS STEEL LATCHES	WET LOCATION FIXTURE WITH IMPACT RESISTANT, REINFORCED FIBERGLASS HOUSING AND HIGH IMPACT RESISTANT ACRYLIC DIFFUSER.PROVIDE ZERO DEGREE COLD WEATHER PROGRAMMED RAPID START BALLAST.	2-32W,41K, RAPID START	MOUNT WITH TYPE 316 S.S. STRUT AND TYPE 316 S.S. HARDWARE.
B	LITHONIA No. TWH-LED-20C-40K-MVOLT-DDBXD	DIE-CAST ALUMINUM WALL PACK FIXTURE WITH GLASS REFRACTOR, SPECULAR ANODIZED ALUMINUM REFLECTOR, AND DARK BRONZE POWDER COAT PAINT FINISH.	LED	MOUNT WITH TYPE 316 S.S. HARDWARE. MOUNT ON OUTSIDE WALL WITH BOTTOM OF FIXTURE AT 10'-0" ABOVE ELECTRICAL ROOM FLOOR ELEVATION.
C	LITHONIA No. ELT50-H1212 WITH 3' CORD & GROUNDED PLUG	EMERGENCY LIGHT UNIT WITH 90 MINUTE, 12 VOLT, LEAD CALCIUM BATTERY.	TWO 12 WATT HALOGEN	PROVIDE A RECEPTACLE NEXT TO UNIT FOR UNIT TO PLUG-IN. MOUNT WITH TYPE 316 S.S. HARDWARE. MOUNT BOTTOM OF FIXTURE AT 8'-0" ABOVE ELECTRICAL ROOM FLOOR.
X	LITHONIA No. LE-S-1-R-120-ELNSD	EMERGENCY EXIT LIGHT WITH 90 MINUTE BACK UP BATTERY AND POLYCARBONITE HOUSING.	LED ILLUMINATED	MOUNT BOTTOM OF FIXTURE AT 9'-6" ABOVE ELECTRICAL ROOM FLOOR.
D	COOPER CROUSE-HINDS MODEL: EVLGDJ4201	LED LUMINAIRE WET LOCATION FIXTURE.	LED 36WATT	1-1/4" STANCHION MOUNT (MATCH EXISTING LIGHT FIXTURE HEIGHT)

PANEL "LB"

MAIN BRKR. AMPS 100
TRANSFORMER 25KVA
VOLTS 120/240 AIC 10 KA
PHASE 1 WIRE 3 SN ✓

NOTES
1. BREAKERS 1P/20A UNLESS MARKED OTHERWISE.
2. ADJ. CKTS. TO BAL. PNL.
3. SURFACE MOUNT, NEMA 1
4. MOUNT MINI POWER CENTER WITH PANEL COVER HINGE AT 72" AFF.

CKT. DESCRIPTION	WIRE	LOAD	BKR.			BKR.	LOAD	WIRE	CKT. DESCRIPTION
EXIT LIGHTS	12	500	20	1	2	20	500	12	BUILDING LIGHTS
EMERGENCY LIGHTS	12	800	20	3	4	20	1800	12	BUILDING RECEPTACLES
WIMAX RADIO	12	1000	30	5	6	20	3000	10	SPARE
SERIAL RADIO	12	600	30	7	8	20	–	10	–
LIGHT CONTROL PANEL	12	600	20	9	10	20	1200	12	BUILDING EXTERIOR LIGHTS
SCADA PANEL (PLC)	12	800	20	11	12	20	–	–	SPARE
SPARE	–	–	20	13	14	20	–	–	SPARE
SPARE	–	–	20	15	16	20	–	–	SPARE
SPARE	–	–	20	17	18	20	–	–	SPARE
SPARE	–	–	20	19	20	20	–	–	SPARE
				21	22				
				23	24				
				25	26				
				N					

TOTAL LOAD = 10.8 KVA

* USE 1"C. UNLESS STATED OTHERWISE.

PANEL "AM"

MAIN BRKR. AMPS 60
TRANSFORMER ____
VOLTS 208/120 AIC 22 KA
PHASE 3 WIRE 3 SN ✓

NOTES
1. BREAKERS 1P/20A UNLESS MARKED OTHERWISE.
2. ADJ. CKTS. TO BAL. PNL.
3. SURFACE MOUNT, NEMA 1

CKT. DESCRIPTION	WIRE	LOAD	BKR.			BKR.	LOAD	WIRE	CKT. DESCRIPTION
MOV NO.1	12	500	20	1	2	20	500	12	MOV NO.2
		800		3	4		500		
		500		5	6		500		
MOV NO.3	12	500	20	7	8	20	500	12	MOV NO.4
		500		9	10		500		
		500		11	12		500		
MOV NO.5	12	500	20	13	14	20	500	12	MAGMETER NO.1
		500		15	16	20	500	12	MAGMETER NO.2
		500		17	18				
SLEEVE ACT	12		20	19	20				
				21	22				
				23	24				
				N					

TOTAL LOAD = 8.8 KVA

* USE 1"C. UNLESS STATED OTHERWISE.

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4-16-14

SURVEYED BY: TSC FB No. –

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

REHABILITATION OF PUMPS, MOTORS, VALVES, PIPING & BUILDINGS AT VARIOUS FACILITIES PACKAGE A SPRING BRANCH PANELBOARD SCHEDULES AND LIGHT FIXTURE SCHEDULE

ELECTRICAL

WBS NUMBER	
S-001000-00036-4	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON PM	
RAJINDER SINGH	

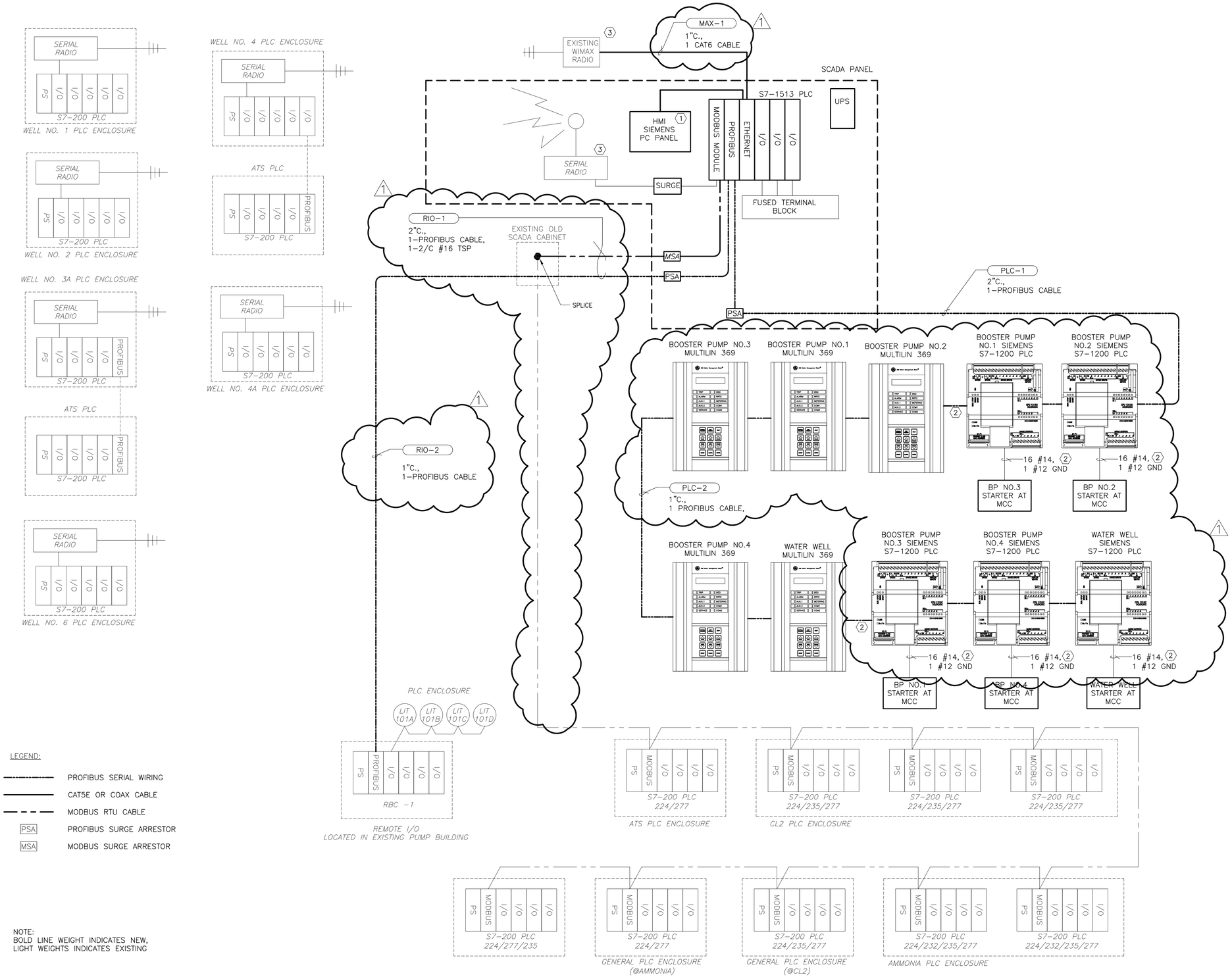
SB-E-15R SHEET No. 43 OF 191

L:\Active projects\4068-WA (Water Plants Elect)\Drawings\Addendum\Spring Branch\SB-E-15 Panelboard and Light Fixture Schedules.dwg Apr 16, 2014

REV	DESCRIPTION	BY	DATE
1	ADDENDUM 1	BC	4/16/2014

NOTES:

1. SIEMENS PANEL 6AV7885-5AK21-7EA3-IPC577D
2. VIA WIREWAY.
3. EQUIPMENT LOCATED IN EXISTING PLC PANEL IN EXISTING PUMP BUILDING.



LEGEND:

- PROFIBUS SERIAL WIRING
- CAT5E OR COAX CABLE
- MODBUS RTU CABLE
- PSA — PROFIBUS SURGE ARRESTOR
- MSA — MODBUS SURGE ARRESTOR

NOTE:
BOLD LINE WEIGHT INDICATES NEW,
LIGHT WEIGHTS INDICATES EXISTING

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CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

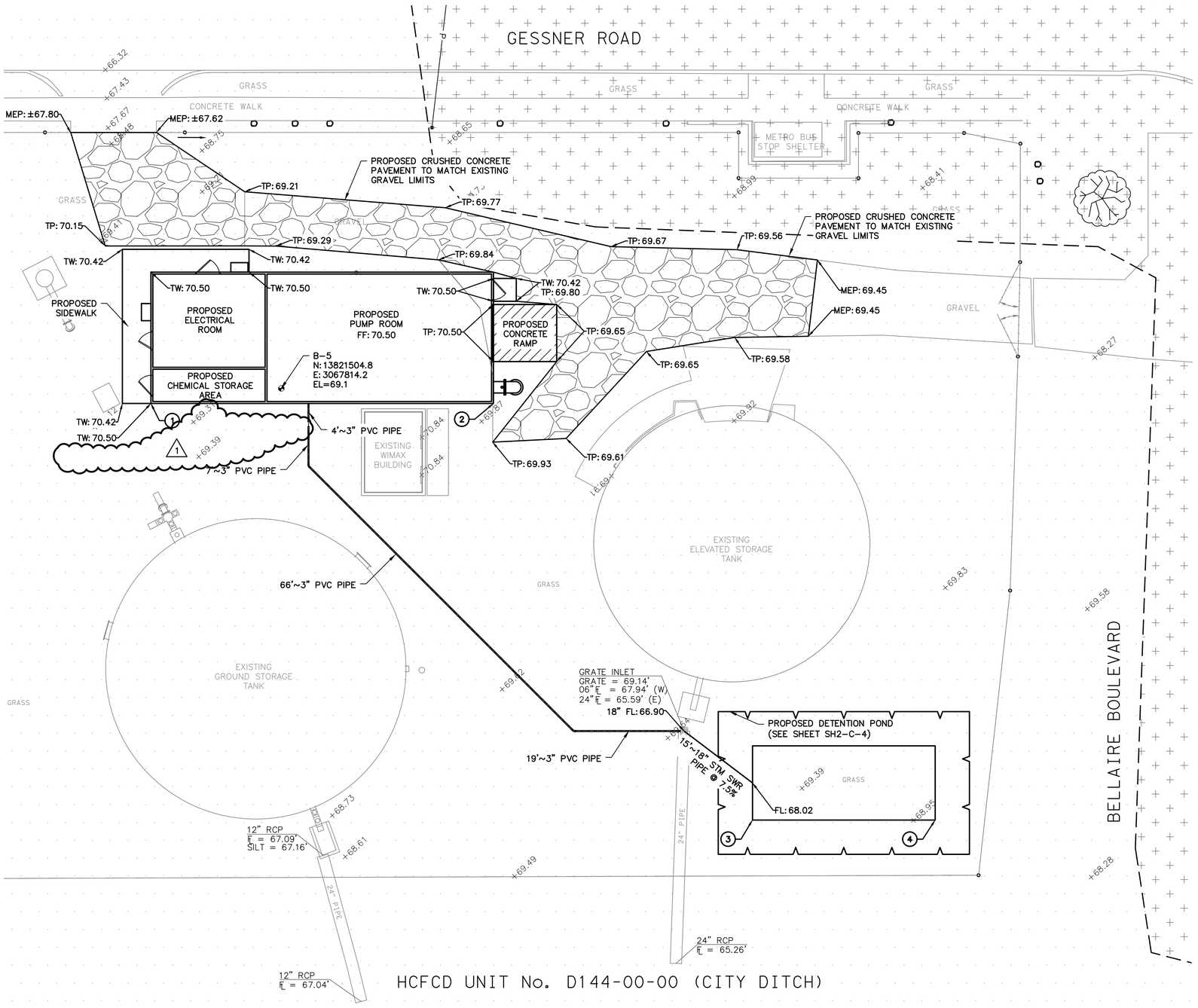
REHABILITATION OF PUMPS, MOTORS, VALVES, PIPING & BUILDINGS AT VARIOUS FACILITIES PACKAGE A SPRING BRANCH PROPOSED CONTROL SYSTEM ARCHITECTURE DIAGRAM

ELECTRICAL

WBS NUMBER	S-001000-00036-4
DRAWING SCALE	AS NOTED
CITY OF HOUSTON PM	RAJINDER SINGH
SHEET No. 49 OF 191	

SB-E-21R

L:\Active projects\4069-AA (Water Plants Elect)\Drawings\Addendum\Spring Branch\SB-E-21 Proposed Control System Architecture Diagram.dwg Apr 16, 2014



FLOODPLAIN NOTES

ACCORDING TO MAP 48201C0835L OF THE FEDERAL EMERGENCY MANAGEMENT AGENCY'S FLOOD INSURANCE RATE MAPS FOR HARRIS COUNTY, TEXAS DATED JUNE 18, 2007, THE SUBJECT PROJECT AREA IS PARTIALLY SITUATED WITHIN THE FOLLOWING ZONES:

ZONE AE DESCRIBED AS A SPECIAL FLOOD HAZARD AREA SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD EVENT (100-YEAR FLOOD) WITH BASE FLOOD ELEVATIONS DETERMINED. THE BASE FLOOD ELEVATION IS DETERMINED TO BE 69 FEET.

ZONE X DESCRIBED AS AREAS OF 0.2% ANNUAL CHANCE FLOOD; AREAS OF 1% ANNUAL CHANCE FLOOD WITH AVERAGE DEPTHS OF LESS THAN 1 FOOT OR WITH DRAINAGE AREAS LESS THAN 1 SQUARE MILE; AND AREAS PROTECTED BY LEVEES FROM 1% ANNUAL CHANCE FLOOD. THE 500 YEAR FLOOD ELEVATION IS DETERMINED TO BE 69.5 FEET.

CITY OF HOUSTON FLOODPLAIN MANAGEMENT OFFICE NOTES

1. THIS PROJECT WILL NOT RESULT IN THE ADDITION OF ANY FILL MATERIAL WITHIN ZONE AE AN AREA DESCRIBED AS A FLOODPLAIN ZONE AREA HAVING A 1% CHANCE FLOOD.

2. DURING ALL CONSTRUCTION ACTIVITY, THE CONTRACTOR MUST NOT STORE ANY CONSTRUCTION EXCAVATED MATERIALS WITHIN THE PROJECT SITE THAT IS IN THE DELINEATED FLOOD ZONE AND BELOW THE BASE FLOOD ELEVATION. THE CONTRACTOR'S CONSTRUCTION "MEANS AND METHODS" MUST INCLUDE THE REMOVAL AND/OR HAULING OFF OF ANY EXCAVATED MATERIALS FROM THE SITE.

NOTES

1. STABILIZE ALL DISTURBED AREAS WITH HYDROMULCH. ALL DISTURBED AREAS TO BE RESTORED TO ORIGINAL CONDITION OR BETTER.
2. ACTUAL LOCATION OF EXISTING UTILITIES MAY VARY FROM COORDINATES AND ELEVATION PROVIDED. CONTRACTOR TO VERIFY BEFORE CONSTRUCTION AND NOTIFY THE ENGINEER IF DISCREPANCIES ARE IDENTIFIED.
3. GRADE AREAS AROUND FOUNDATION PADS TO DRAIN AWAY FROM THE STRUCTURE.
4. CONTRACTOR SHALL ENSURE THAT SLOPE ON FINISHED SURFACE OF THE CONCRETE IN FIRST FIVE FEET OUTSIDE DOORS DOES NOT EXCEED 2%.
5. CONTRACTOR SHALL ENSURE THAT SLOPE OF SIDEWALKS DO NOT EXCEED 5% IN THE DIRECTION OF TRAVEL AND 2% CROSS-SLOPE.
6. ADJUST WATER VAULT TO MATCH PROPOSED PAVEMENT GRADE.
7. REFER TO FOUNDATION PLANS FOR PROPOSED BUILDING

IMPERVIOUS AREA CALCULATIONS	
EXISTING	584 SY
PROPOSED	703 SY
INCREASED IMPERVIOUS AREA	119 SY

GEOTECHNICAL INFORMATION

REFER TO GEOTECHNICAL REPORT ENTITLED: GEOTECHNICAL INVESTIGATION PROPOSED WATER PLANT IMPROVEMENTS PACKAGE A PREPARED BY ASSOCIATED TESTING LABORATORIES, INC.

REPORT NUMBER G13-163, DATED: SEP 19, 2013

POINT TABLE		
POINT #	NORTHING	EASTING
1	13821481.5926	3067818.0115
2	13821541.5392	3067815.4204
3	13821590.0261	3067886.3670
4	13821621.9963	3067884.9851

REV	DESCRIPTION	BY	DATE
1	ADDENDUM No.1	AVK	APR 2014

0 10 20
SCALE 1"=10'

LEGEND

- ZONE AE (100 YEAR FLOODPLAIN)
- SHADED ZONE X (500 YEAR FLOODPLAIN)
- CONCRETE PAVEMENT SEE DETAIL ON SHEET STD-C-3
- CRUSHED CONCRETE PAVEMENT, SEE DETAIL ON SHEET STD-C-3
- FF: XX.XX — FINISH FLOOR ELEVATION
- MEP: XX.XX — MATCH EXISTING PAVEMENT ELEVATION
- FG: XX.XX — FINISHED GRADE ELEVATION
- TG: XX.XX — TOP OF AREA INLET ELEVATION
- TP: XX.XX — TOP OF PAVEMENT ELEVATION (GRAVEL)
- TW: XX.XX — TOP OF WALKWAY ELEVATION (CONCRETE)
- GRADE SLOPE ARROWS
- PROPOSED
- 100.00 — EXISTING ELEVATIONS

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4/15/2014

SURVEYED BY: TSC FB No. –

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

REHABILITATION OF PUMPS, MOTORS, VALVES, PIPING & BUILDINGS AT VARIOUS FACILITIES PACKAGE A
SHARPSTOWN No.2 WATER PLANT
PROPOSED OVERALL SITE PLAN
8619 BELLAIRE BOULEVARD, HOUSTON, TEXAS
CIVIL

WBS NUMBER	
S-001000-0036-4	
DRAWING SCALE	
1"=10'	
CITY OF HOUSTON PM	
RAJINDER SINGH	

SH2-C-2R SHEET No. 60 OF 191

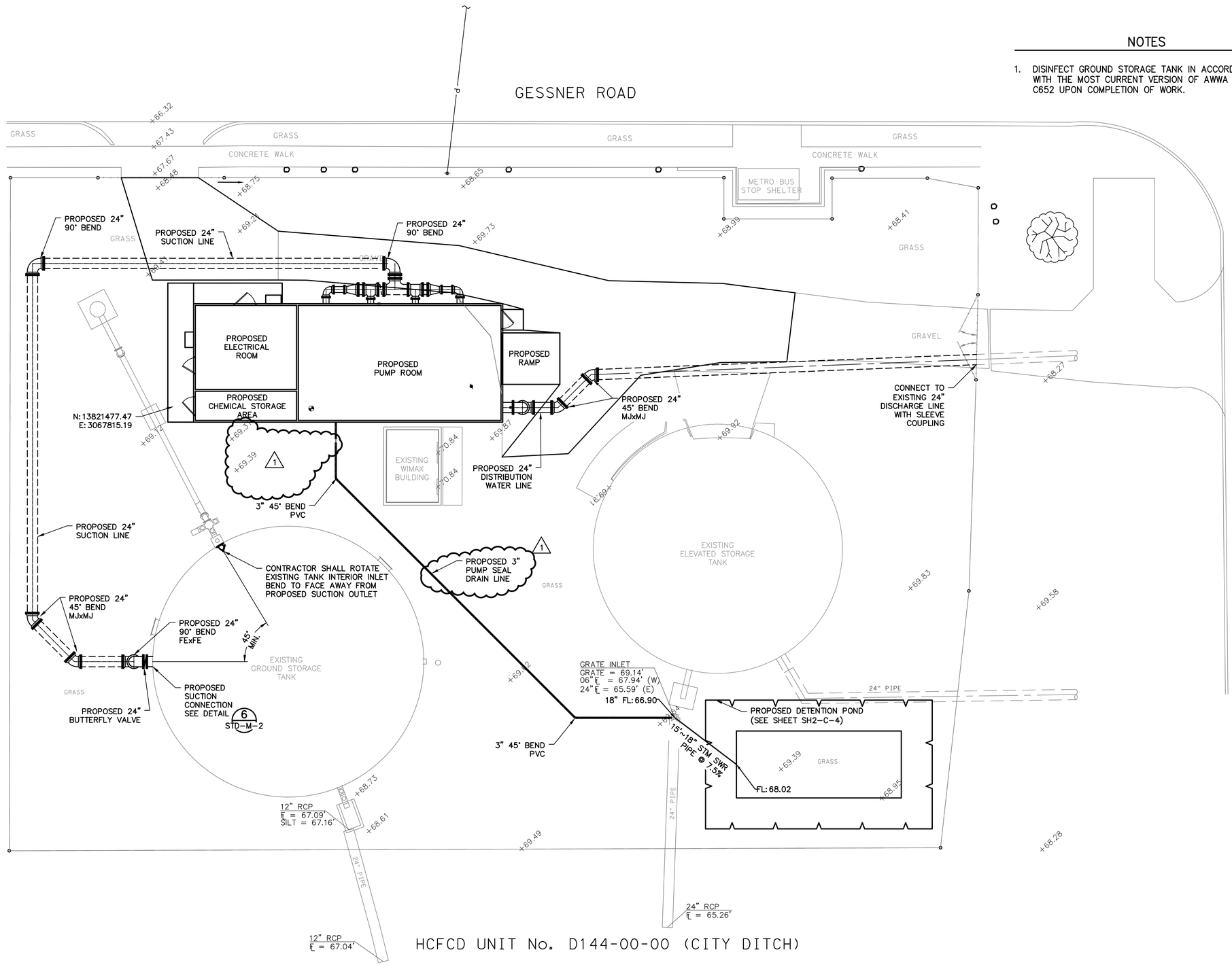
J:\0101.065.002\07.00 CADD\COH\02-Construction Drawings\SHARPSTOWN #2\SH2.C2.Prop.Over.Site.Plan.dwg Apr 15 2014

REV	DESCRIPTION	BY	DATE
1	ADDENDUM No.1	AVK	APR 2014

NOTES

1. DISINFECT GROUND STORAGE TANK IN ACCORDANCE WITH THE MOST CURRENT VERSION OF AWWA STANDARD C652 UPON COMPLETION OF WORK.

0 10 20
SCALE 1"=10'



BELLAIRE BOULEVARD

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4/15/2014

SURVEYED BY: TSC FB No. –

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

REHABILITATION OF PUMPS, MOTORS, VALVES, PIPING & BUILDINGS AT VARIOUS FACILITIES PACKAGE A
SHARPSTOWN No.2 WATER PLANT
YARD PIPING PLAN

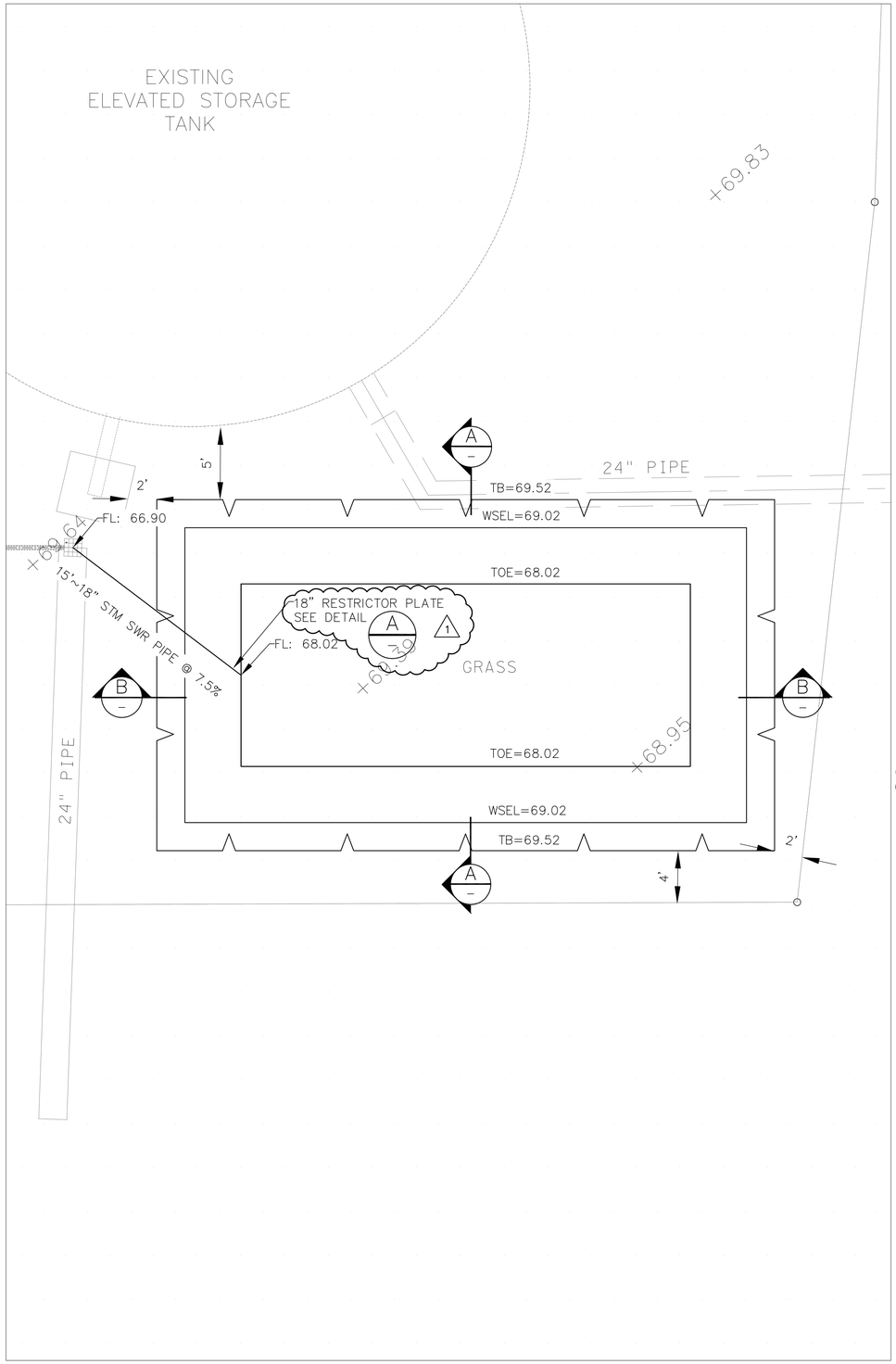
8619 BELLAIRE BOULEVARD, HOUSTON, TEXAS
CIVIL

WBS NUMBER	S-001000-0036-4
DRAWING SCALE	1"=10'
CITY OF HOUSTON PM	RAJINDER SINGH

SH2-C-3R SHEET No. 61 OF 191

J:\0101.065.002\07.00 CADD\COH\02-Construction Drawings\SHARPSTOWN #2\SH2.C3.Yard.Piping.dwg Apr 15 2014

REV	DESCRIPTION	BY	DATE
1	ADDENDUM No.1	AVK	APR 2014



IMPERVIOUS AREA CALCULATIONS	
EXISTING	584 SY
PROPOSED	703 SY
INCREASED IMPERVIOUS AREA	119 SY

WARNING

OVERHEAD AND UNDERGROUND UTILITIES MAY EXIST IN THE VICINITY OF THIS PROJECT. LOCATIONS SHOWN FOR EXISTING UTILITIES ARE APPROXIMATE AND OTHER UTILITIES MAY EXIST IN THE VICINITY OF THE PROJECT WHICH ARE NOT SHOWN ON THE PLANS.

IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE ALL EXISTING UTILITIES, IN THE VICINITY OF THE PROJECT, PRIOR TO BEGINNING CONSTRUCTION.

DETENTION ANALYSIS

INCREASED IMPERVIOUS AREA= 119 SY SY X 9 SF/1 SY X 1 ACRE/43,560 SF = 0.025 ACRES
STORAGE REQUIRED =0.55 ACRE-FT PER ACRE INCREASED IMPERVIOUS AREA
STORAGE REQUIRED =0.025 ACRES X 0.55 ACRE-FT X 43,560 SQ.FT/ACRE = 599 CF

DETENTION POND

TOP BANK ELEVATION =69.52
WATER SURFACE ELEVATION =69.02 (6" FREEBOARD)
AVERAGE DEPTH = 1 FT (FROM BOTTOM OF FREEBOARD)

AREA FROM BOTTOM OF FREEBOARD =840 SF
TOE BANK AREA =416 SF
SIDE SLOPE AREA = 840 SF - 416 SF =424 SF

VOLUME

TOE BANK VOLUME =416 SF X 1 FT =416 CF
SIDE SLOPE VOLUME =(424 SF X 1 FT) / 2 =212 CF
TOTAL VOLUME =416 CF + 212 CF = 628 CF

POND STORAGE PROVIDED = 628 CF
POND STORAGE REQUIRED = 599 CF

DETENTION FACILITY TO BE MAINTAINED BY OWNER

GEOTECHNICAL INFORMATION

REFER TO GEOTECHNICAL REPORT ENTITLED: GEOTECHNICAL INVESTIGATION PROPOSED WATER PLANT IMPROVEMENTS PACKAGE A PREPARED BY ASSOCIATED TESTING LABORATORIES, INC.

REPORT NUMBER G13-163, DATED: OCT 7, 2013

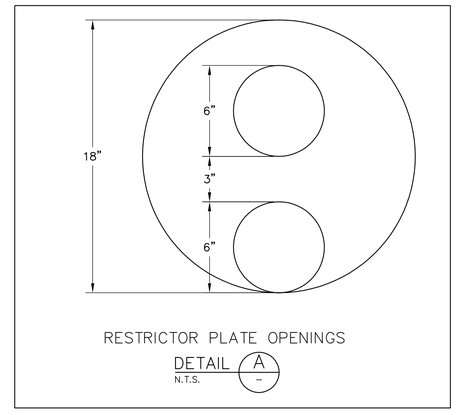
RESTRICTOR DESIGN CALCULATIONS

ALLOWABLE DISCHARGE RATE FOR LOW LEVEL RESTRICTOR
= 0.5 CFS/ACRE * 0.55 ACRES = 0.3 CFS
ALLOWABLE DISCHARGE RATE FOR COMBINED RESTRICTOR
= 2.0 CFS/ACRE * 0.55 ACRES = 1.1 CFS

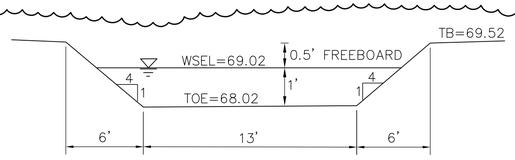
DESIGN DISCHARGE = $Q=CA(2g)^{1/2}(H)^{1/4}$

Q = DESIGN DISCHARGE IN CFS
C = COEFFICIENT OF DISCHARGE - 0.6 FOR OPENINGS IN PLATES
A = AREA OF OPENING IN SQUARE FEET
g = ACCELERATION DUE TO GRAVITY (32.2 FT/S*S)
H = HEAD DIFFERENCE BETWEEN ENTRANCE AND EXIT IN FEET WHEN ORIFICE IS FULLY SUBMERGED OR THE DIFFERENCE BETWEEN WATER SURFACE ELEVATION AT THE ENTRANCE AND THE CENTROID OF THE ORIFICE WHEN PARTIALLY SUBMERGED

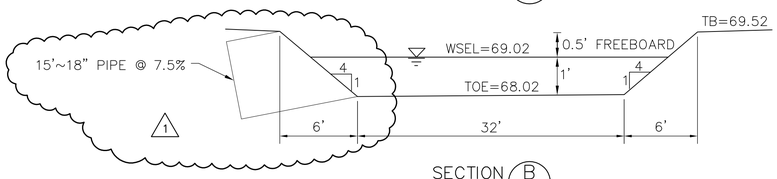
LOW LEVEL RESTRICTOR SIZE = 6"
HIGH LEVEL RESTRICTOR SIZE = 6"



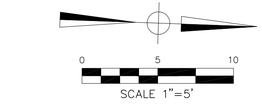
RESTRICTOR PLATE OPENINGS
DETAIL A
N.T.S.



SECTION A
NTS



SECTION B
NTS



LEGEND

SHADED ZONE X (500 YEAR FLOODPLAIN)

100.00 EXISTING ELEVATIONS

TG	TOP OF GRATE ELEVATION
TB	TOP OF BANK ELEVATION
FL	FLOW LINE ELEVATION
WSEL	WATER SURFACE ELEVATION
TOE	BOTTOM OF POND ELEVATION

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DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

REHABILITATION OF PUMPS, MOTORS, VALVES, PIPING & BUILDINGS AT VARIOUS FACILITIES PACKAGE A

SHARPSTOWN No.2 WATER PLANT

DETENTION POND LAYOUT

8619 BELLAIRE BOULEVARD, HOUSTON, TEXAS

CIVIL

WBS NUMBER	
S-001000-0036-4	
DRAWING SCALE	
1"=5'	
CITY OF HOUSTON PM	
RAJINDER SINGH	
SH2-C-4R	SHEET No. 62 OF 191

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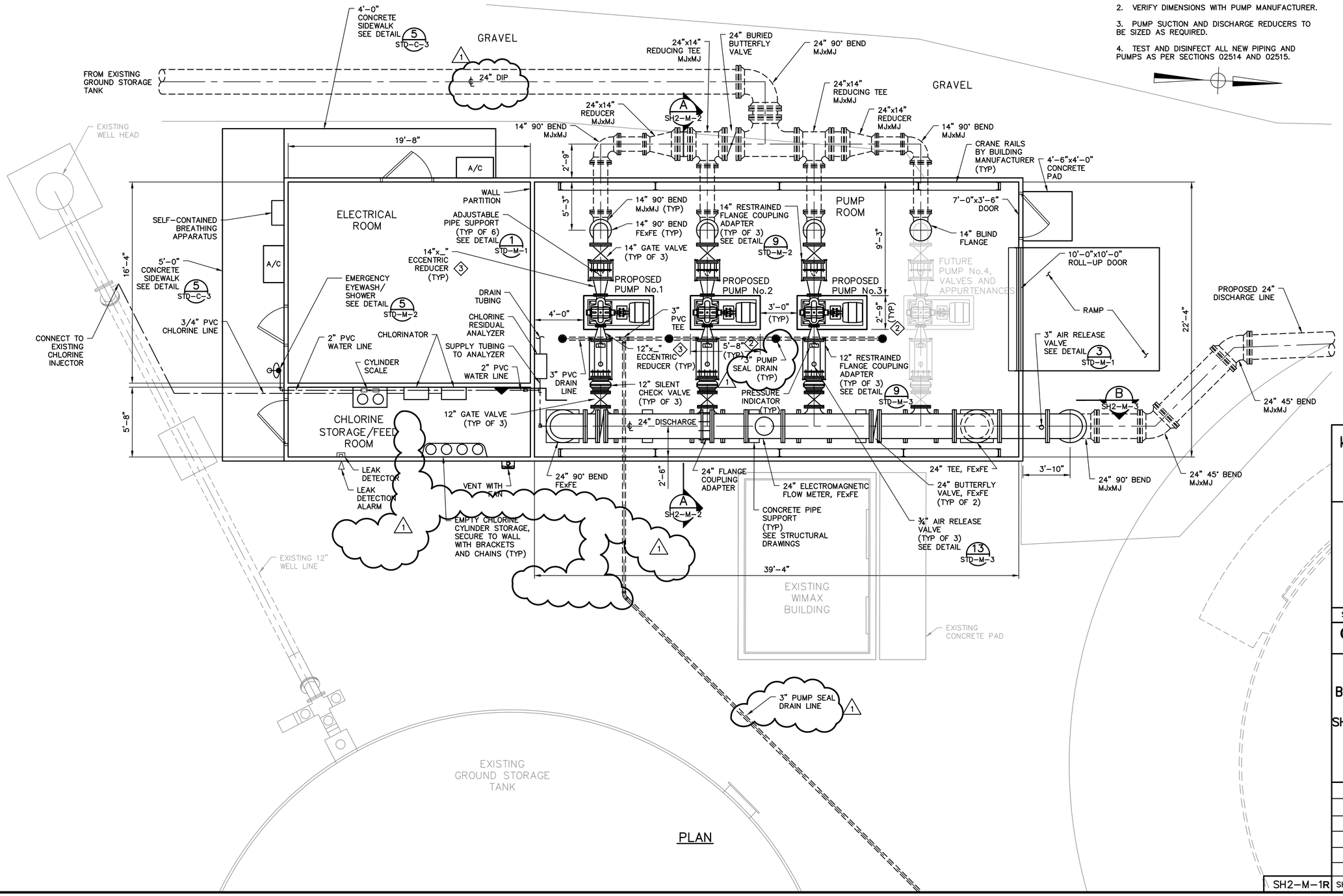
REV	DESCRIPTION	BY	DATE
1	ADDENDUM No.1	AVK	APR 2014

NOTES:

1. PAINT ALL NEW AND EXISTING EXPOSED PIPING, FITTINGS, AND VALVES UPON COMPLETION OF WORK. FINISH COAT AMERON 450 AND INTERMEDIATE COATS AMERON 385. COLOR BARR BLUE (STANDARD CITY OF HOUSTON POTABLE WATER PIPING AND TANK COLOR).
2. VERIFY DIMENSIONS WITH PUMP MANUFACTURER.
3. PUMP SUCTION AND DISCHARGE REDUCERS TO BE SIZED AS REQUIRED.
4. TEST AND DISINFECT ALL NEW PIPING AND PUMPS AS PER SECTIONS 02514 AND 02515.



PLAN

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REHABILITATION OF PUMPS, MOTORS, VALVES, PIPING & BUILDINGS AT VARIOUS FACILITIES PACKAGE A

SHARPSTOWN No.2 WATER PLANT

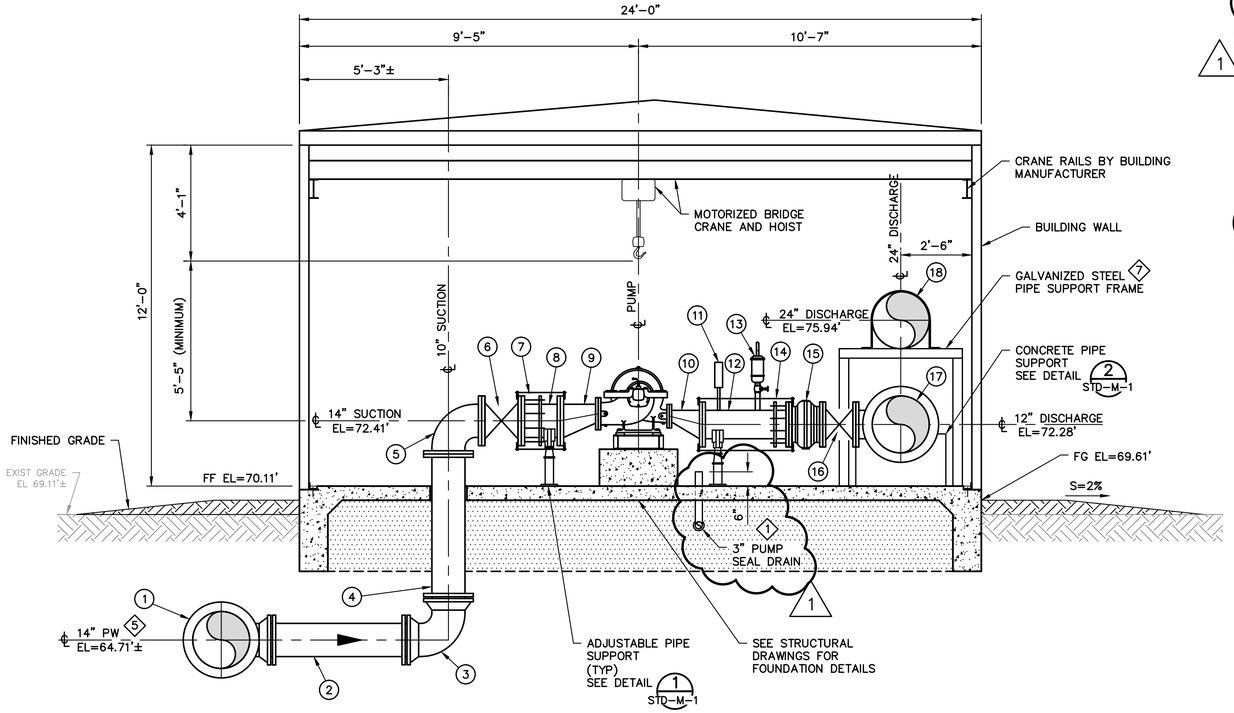
BOOSTER PUMPS AND PIPING
PROPOSED
PLAN
MECHANICAL

WBS NUMBER
S-001000-0036-4
DRAWING SCALE
3/8"=1'-0"
CITY OF HOUSTON PM
RAJINDER SINGH

SH2-M-1R | SHEET No. 65 OF 191

J:\0101.065.002\07.00 CADD\COH\02-Construction Drawings\SHARPSTOWN #2\SH2.M1-M3.Pump Station.dwg Apr 17 2014

REV	DESCRIPTION	BY	DATE
1	ADDENDUM No.1	AVK	APR 2014



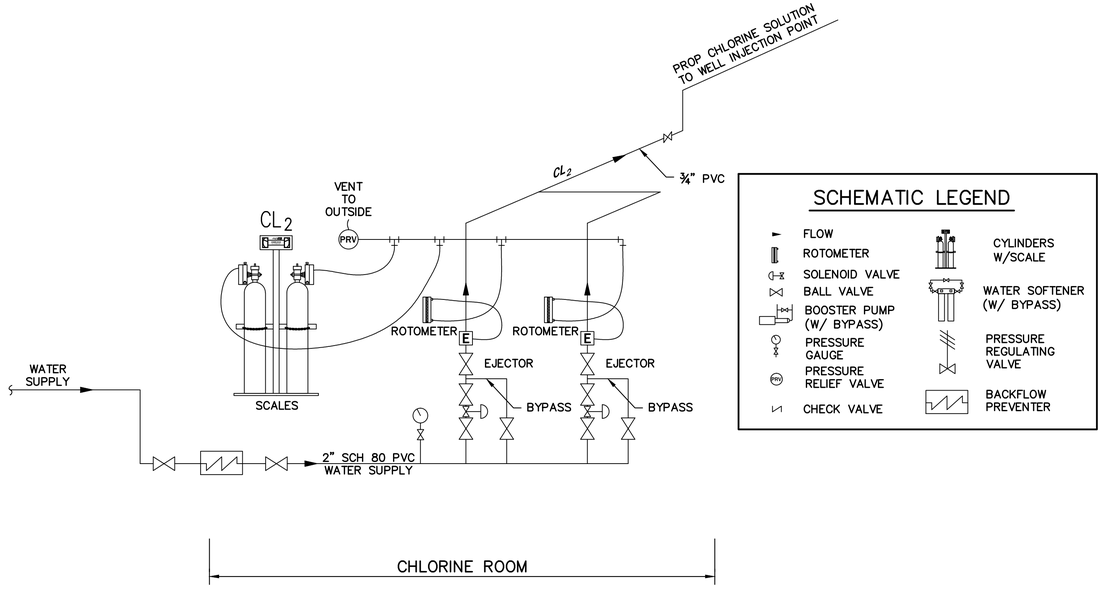
SECTION A
3/8"=1'-0" SH2-M-1

SECTION A
VALVE AND PIPE FITTINGS INDEX

TAG No.	DESCRIPTION
1	24"x14" TEE, MJxMJ
2	14" DUCTILE IRON PIPE, PExPE
3	14" 90° BEND, MJxMJ
4	14" DUCTILE IRON PIPE, FExPE
5	14" 90° BEND, FExFE
6	14" GATE VALVE WITH HANDWHEEL, FExFE
7	14" RESTRAINED FLANGE COUPLING ADAPTER
8	14" DUCTILE IRON PIPE, FExPE
9	12"x_" ECCENTRIC REDUCER, FExFE
10	12"x_" ECCENTRIC REDUCER, FExFE
11	PRESSURE INDICATOR
12	12" DUCTILE IRON PIPE, FExPE
13	3/4" AIR RELEASE VALVE
14	12" RESTRAINED FLANGE COUPLING ADAPTER
15	12" GLOBE STYLE CHECK VALVE, FExFE
16	12" GATE VALVE WITH HANDWHEEL, FExFE
17	24"x12" TEE, FExFE
18	24" DUCTILE IRON PIPE, FExFE

NOTES:

1. RUN 3" DRAIN THROUGH VERTICAL CENTER OF BEAM. WRAP WITH 30 LB TAR PAPER. CAST IN PLACE OR HOLE SAW.
2. VERIFY ACTUAL DIMENSION WITH PUMP MANUFACTURER.
3. USE STEEL PIPE WITH 1/2" WALL THICKNESS. COAT INTERIOR AND EXTERIOR OF PIPE PER SPECIFICATIONS.
4. SECURE ALL BURIED PIPING WITH MEGALUGS.
5. CONTRACTOR TO FIELD VERIFY EXISTING CONNECTING PIPE FOR PROPER ELEVATION.
6. PUMP SUCTION AND DISCHARGE REDUCERS TO BE SIZED AS REQUIRED.
7. SUBMIT SHOP DRAWINGS AND DESIGN ANALYSIS SEALED BY A PROFESSIONAL STRUCTURAL ENGINEER REGISTERED TO PRACTICE IN THE STATE OF TEXAS ILLUSTRATING AND DETAILING THE DESIGN AND INSTALLATION OF PIPE SUPPORT FRAME.



SCHEMATIC LEGEND

- FLOW
- ROTOMETER
- SOLENOID VALVE
- BALL VALVE
- BOOSTER PUMP (W/ BYPASS)
- PRESSURE GAUGE
- PRESSURE RELIEF VALVE
- CHECK VALVE
- CYLINDERS W/SCALE
- WATER SOFTENER (W/ BYPASS)
- PRESSURE REGULATING VALVE
- BACKFLOW PREVENTER

CHLORINE SCHEMATIC
NTS

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SURVEYED BY: TSC FB No. –

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

REHABILITATION OF PUMPS, MOTORS, VALVES, PIPING & BUILDINGS AT VARIOUS FACILITIES PACKAGE A
SHARPSTOWN No.2 WATER PLANT
BOOSTER PUMPS AND PIPING
PROPOSED
SECTION
MECHANICAL

WBS NUMBER
S-001000-0036-4
DRAWING SCALE
3/8"=1'-0"
CITY OF HOUSTON PM
RAJINDER SINGH

SH2-M-2R SHEET No. 66 OF 191

J:\0101.065.002\07.00 CADD\COH\02-Construction Drawings\SHARPSTOWN #2\SH2-M1-M3.Pump Station.dwg Apr 17 2014

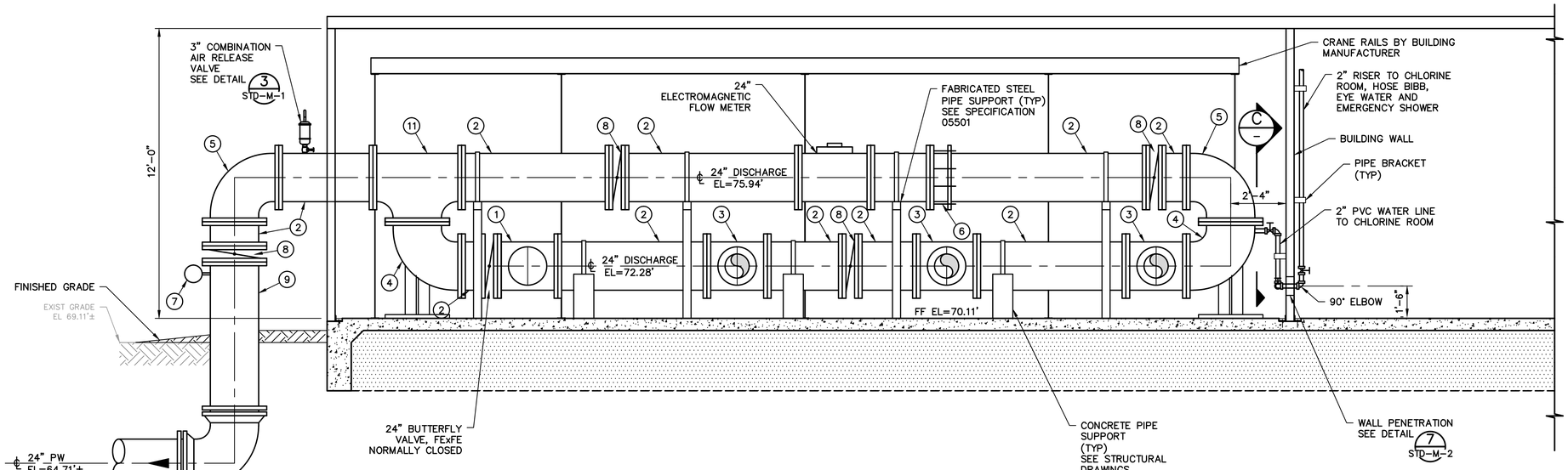
REV	DESCRIPTION	BY	DATE
1	ADDENDUM No.1	AVK	APR 2014

SECTION B
VALVE AND PIPE FITTINGS INDEX

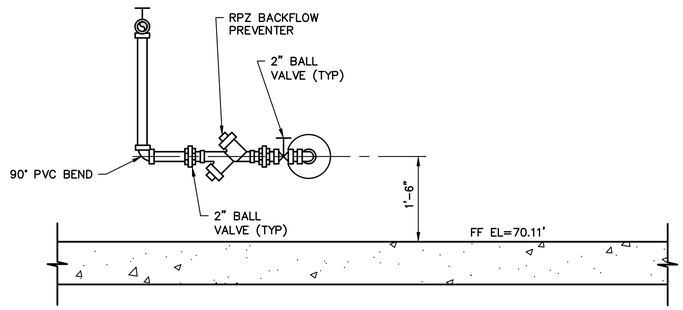
TAG No.	DESCRIPTION
1	24"x12" TEE WITH BLIND FLANGE, FExFE
2	24" DUCTILE IRON PIPE, FExFE
3	24"x12" TEE, FExFE
4	24" 90° BASE BEND, FExFE
5	24" 90° BEND, FExFE
6	24" FLANGE COUPLING ADAPTER
7	PRESSURE INDICATOR
8	24" BUTTERFLY VALVE, FExFE
9	24" DUCTILE IRON PIPE, FExPE
10	24" 90° BEND, MJxMJ
11	24"x24" TEE, FExFE

NOTES: ◇

1. SECURE ALL BURIED PIPING WITH MEGALUGS.
2. CONTRACTOR TO FIELD VERIFY EXISTING CONNECTING PIPE FOR PROPER ELEVATION.



SECTION B
3/8"=1'-0" SH2-M-1



SECTION C
3/16"=1'-0"

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SURVEYED BY: TSC FB No. –

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

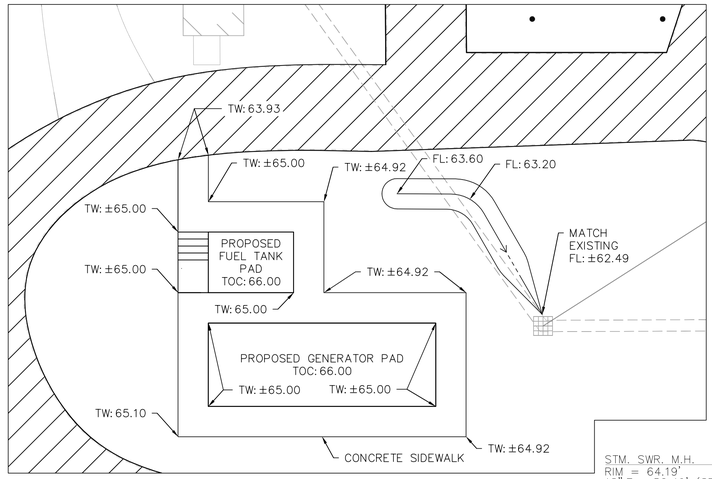
REHABILITATION OF PUMPS, MOTORS, VALVES, PIPING & BUILDINGS AT VARIOUS FACILITIES PACKAGE A
SHARPSTOWN No.2 WATER PLANT
BOOSTER PUMPS AND PIPING
PROPOSED
SECTION
MECHANICAL

WBS NUMBER	
S-001000-0036-4	
DRAWING SCALE	
3/8"=1'-0"	
CITY OF HOUSTON PM	
RAJINDER SINGH	

SH2-M-3R | SHEET No. 67 OF 191

J:\0101.065.002\07.00 CADD\COH\02-Construction Drawings\SHARPSTOWN #2\SH2.M1-M3.Pump Station.dwg Apr 17 2014

REV	DESCRIPTION	BY	DATE
1	ADDENDUM No.1	AVK	APR 2014



GRADING DETAIL

1"=10'

FLOODPLAIN NOTES

ACCORDING TO MAP 48201C1005L OF THE FEDERAL EMERGENCY MANAGEMENT AGENCY'S FLOOD INSURANCE RATE MAPS FOR HARRIS COUNTY, TEXAS DATED JUNE 18, 2007, THE SUBJECT PROJECT AREA IS SITUATED ENTIRELY WITHIN: SHADED ZONE X DESCRIBED AS AREAS OF 0.2% ANNUAL CHANCE FLOOD; AREAS OF 1% ANNUAL CHANCE FLOOD WITH AVERAGE DEPTHS OF LESS THAN 1 FOOT OR WITH DRAINAGE AREAS LESS THAN 1 SQUARE MILE; AND AREAS PROTECTED BY LEVEES FROM 1% ANNUAL CHANCE FLOOD. THE 500 YEAR FLOOD ELEVATION IS DETERMINED TO BE 65 FEET.

NOTES

1. STABILIZE ALL DISTURBED AREAS WITH HYDROMULCH. ALL DISTURBED AREAS TO BE RESTORED TO ORIGINAL CONDITION OR BETTER.
2. ACTUAL LOCATION OF EXISTING UTILITIES MAY VARY FROM COORDINATES AND ELEVATION PROVIDED. CONTRACTOR TO VERIFY BEFORE CONSTRUCTION AND NOTIFY THE ENGINEER IF DISCREPANCIES ARE IDENTIFIED.
3. GRADE AREAS AROUND FOUNDATION PADS TO DRAIN AWAY FROM THE STRUCTURE.
4. CONTRACTOR SHALL ENSURE THAT SLOPE ON FINISHED SURFACE OF THE CONCRETE IN FIRST FIVE FEET OUTSIDE DOORS DOES NOT EXCEED 2%.
5. CONTRACTOR SHALL ENSURE THAT SLOPE OF SIDEWALKS DO NOT EXCEED 5% IN THE DIRECTION OF TRAVEL AND 2% CROSS-SLOPE.
6. REFER TO FOUNDATION PLANS FOR PROPOSED BUILDING.

IMPERVIOUS AREA CALCULATIONS	
EXISTING	2456 SY
PROPOSED	2638 SY
INCREASED IMPERVIOUS AREA	182 SY

GEOTECHNICAL INFORMATION

REFER TO GEOTECHNICAL REPORT ENTITLED: GEOTECHNICAL INVESTIGATION PROPOSED WATER PLANT IMPROVEMENTS PACKAGE A PREPARED BY ASSOCIATED TESTING LABORATORIES, INC.

REPORT NUMBER G13-163, DATED: OCT 7, 2013

POINT TABLE		
POINT #	NORTHING	EASTING
1	13781358.9103	3095257.1329
2	13781371.8082	3095224.7750
3	13781448.7942	3095259.7973
4	13781452.0717	3095249.5987
5	13781683.3912	3095068.8160
6	13781711.6690	3095080.2447

0 20 40

SCALE 1"=20'

LEGEND

- CRUSHED CONCRETE PAVEMENT, SEE DETAIL ON SHEET STD-C-3
- 1 ASPHALT CONCRETE PAVEMENT, SEE DETAIL ON SHEET STD-C-3
- FF: XX.XX — FINISH FLOOR ELEVATION
- MEP: XX.XX — MATCH EXISTING PAVEMENT ELEVATION
- FG: XX.XX — FINISHED GRADE ELEVATION
- TG: XX.XX — TOP OF AREA INLET ELEVATION
- TP: XX.XX — TOP OF PAVEMENT ELEVATION
- TW: XX.XX — TOP OF WALKWAY ELEVATION
- TOC: XX.XX — TOP OF CONCRETE PAD ELEVATION
- GRADE SLOPE ARROWS
- PROPOSED
- 100.00 — EXISTING ELEVATIONS

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4/15/2014

SURVEYED BY: TSC FB No. –

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

REHABILITATION OF PUMPS, MOTORS, VALVES, PIPING & BUILDINGS AT VARIOUS FACILITIES PACKAGE A
RIDGEMONT WATER PLANT
PROPOSED OVERALL SITE PLAN

15908 RIDGEROE LANE, HOUSTON TEXAS

CIVIL

WBS NUMBER	S-001000-0036-4
DRAWING SCALE	1"=20'
CITY OF HOUSTON PM	RAJINDER SINGH

R-C-2R | SHEET No. 94 OF 191

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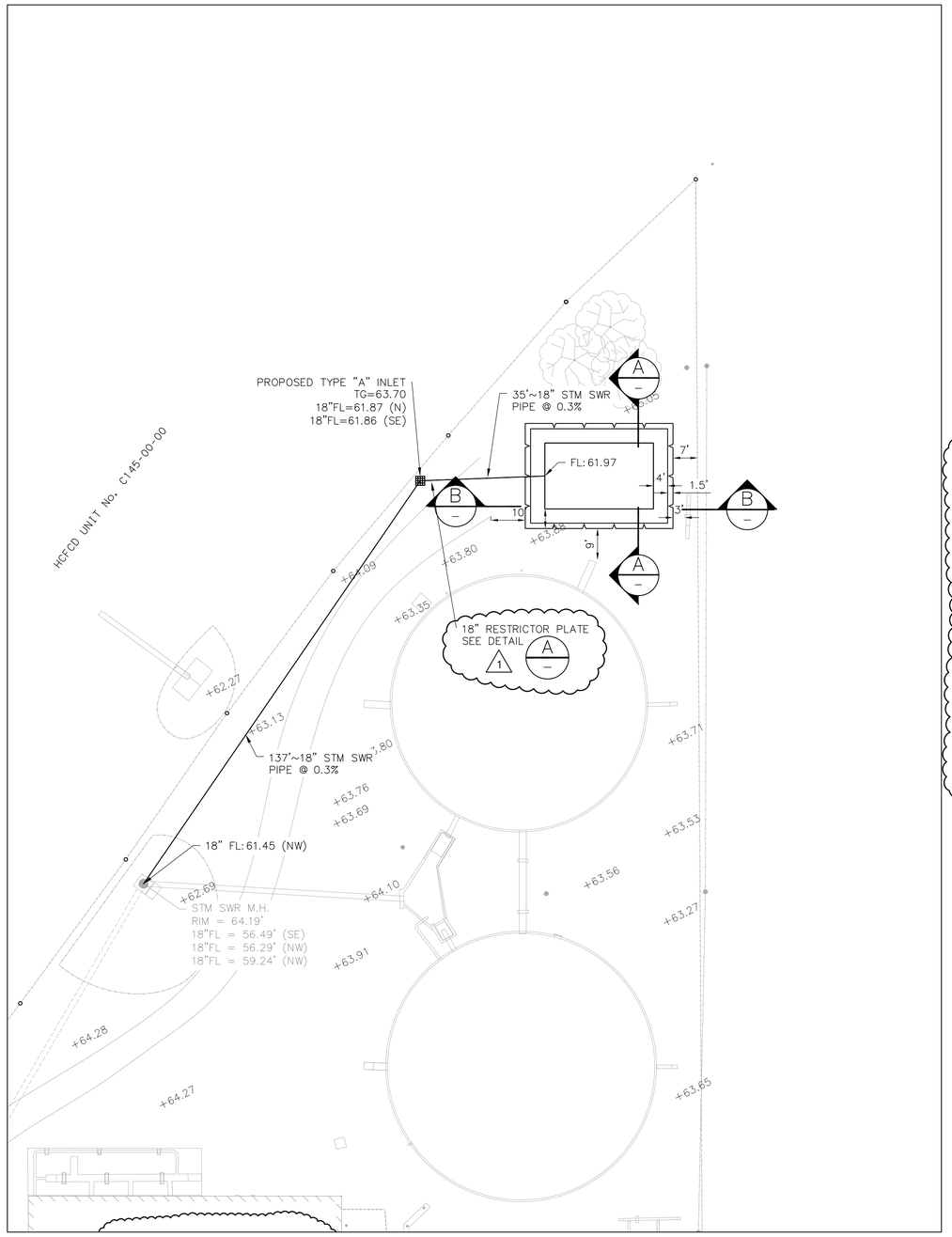
REV	DESCRIPTION	BY	DATE
1	ADDENDUM No.1	AVK	APR 2014



IMPERVIOUS AREA CALCULATIONS	
EXISTING	2456 SY
PROPOSED	2638 SY
INCREASED IMPERVIOUS AREA	182 SY

DETENTION ANALYSIS

INCREASED IMPERVIOUS AREA= 182 SY SY X 9 SF/1 SY X 1 ACRE/43,560 SF = 0.038 ACRES
STORAGE REQUIRED =0.55 ACRE-FT PER ACRE INCREASED IMPERVIOUS AREA
STORAGE REQUIRED =0.038 ACRES X 0.55 ACRE-FT X 43,560 SQ.FT/ACRE = 911 CF

DETENTION POND

TOP BANK ELEVATION =63.80
WATER SURFACE ELEVATION =63.50 (6" FREEBOARD)
AVERAGE DEPTH = 1.33 FT (FROM BOTTOM OF FREEBOARD)

AREA FROM BOTTOM OF FREEBOARD =1,021 SF
TOE BANK AREA =564 SF
SIDE SLOPE AREA =1,021 SF - 564 SF =457 SF

VOLUME

TOE BANK VOLUME =564 SF X 1.33 FT =750.12 CF
SIDE SLOPE VOLUME =(457 SF X 1.33 FT) / 2 =303.91 CF
TOTAL VOLUME =750.12 CF + 303.91 CF = 1,054.03 CF

POND STORAGE PROVIDED = 1,054 CF
POND STORAGE REQUIRED = 911 CF

RESTRICTOR DESIGN CALCULATIONS

ALLOWABLE DISCHARGE RATE FOR LOW LEVEL RESTRICTOR
= 0.5 CFS/ACRE * 1.58 ACRES = 0.79 CFS
ALLOWABLE DISCHARGE RATE FOR COMBINED RESTRICTOR
= 2.0 CFS/ACRE * 1.58 ACRES = 3.16 CFS

DESIGN DISCHARGE =

Q = DESIGN DISCHARGE IN CFS
C = COEFFICIENT OF DISCHARGE - 0.6 FOR OPENINGS IN PLATES
A = AREA OF OPENING IN SQUARE FEET
g = ACCELERATION DUE TO GRAVITY (32.2 FT/S*S)
H = HEAD DIFFERENCE BETWEEN ENTRANCE AND EXIT IN FEET WHEN ORIFICE IS FULLY SUBMERGED OR THE DIFFERENCE BETWEEN WATER SURFACE ELEVATION AT THE ENTRANCE AND THE CENTROID OF THE ORIFICE WHEN PARTIALLY SUBMERGED

LOW LEVEL RESTRICTOR SIZE = 6"
HIGH LEVEL RESTRICTOR SIZE = 6"

RESTRICTOR PLATE OPENINGS
DETAIL A N.T.S.

WARNING

OVERHEAD AND UNDERGROUND UTILITIES MAY EXIST IN THE VICINITY OF THIS PROJECT. LOCATIONS SHOWN FOR EXISTING UTILITIES ARE APPROXIMATE AND OTHER UTILITIES MAY EXIST IN THE VICINITY OF THE PROJECT WHICH ARE NOT SHOWN ON THE PLANS.

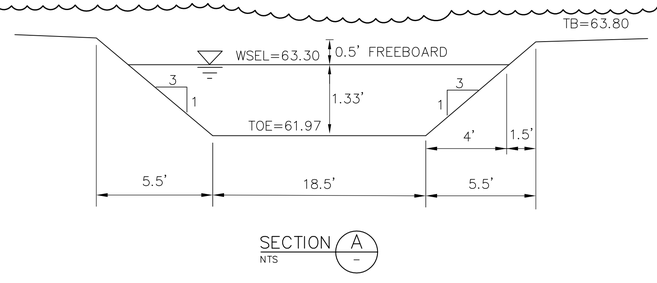
IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE ALL EXISTING UTILITIES, IN THE VICINITY OF THE PROJECT, PRIOR TO BEGINNING CONSTRUCTION.

DETENTION FACILITY TO BE MAINTAINED BY OWNER

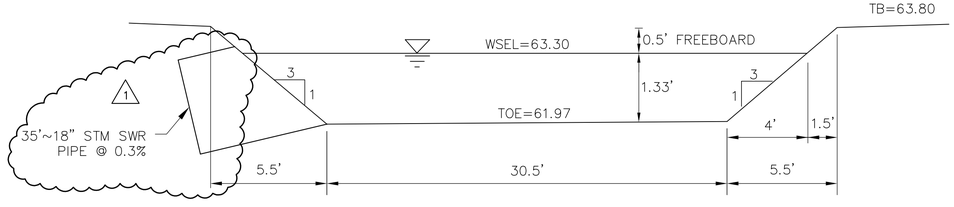
GEOTECHNICAL INFORMATION

REFER TO GEOTECHNICAL REPORT ENTITLED: GEOTECHNICAL INVESTIGATION PROPOSED WATER PLANT IMPROVEMENTS PACKAGE A PREPARED BY ASSOCIATED TESTING LABORATORIES, INC.

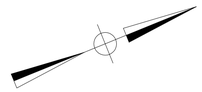
REPORT NUMBER G13-163, DATED: OCT 7, 2013



SECTION A NTS



SECTION B NTS



LEGEND

100.00	EXISTING ELEVATIONS
TG	TOP OF GRATE ELEVATION
TB	TOP OF BANK ELEVATION
FL	FLOW LINE ELEVATION
WSEL	WATER SURFACE ELEVATION
TOE	BOTTOM OF POND ELEVATION

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108422
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4/15/2014

SURVEYED BY: TSC FB No. -

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

REHABILITATION OF PUMPS, MOTORS, VALVES, PIPING & BUILDINGS AT VARIOUS FACILITIES PACKAGE A
RIDGEMONT WATER PLANT
DETENTION POND LAYOUT

15908 RIDGEROE LANE, HOUSTON, TEXAS
CIVIL

WBS NUMBER	
S-001000-0036-4	
DRAWING SCALE	
1"=20'	
CITY OF HOUSTON PM	
RAJINDER SINGH	
R-C-4R	SHEET No. 96 OF 191

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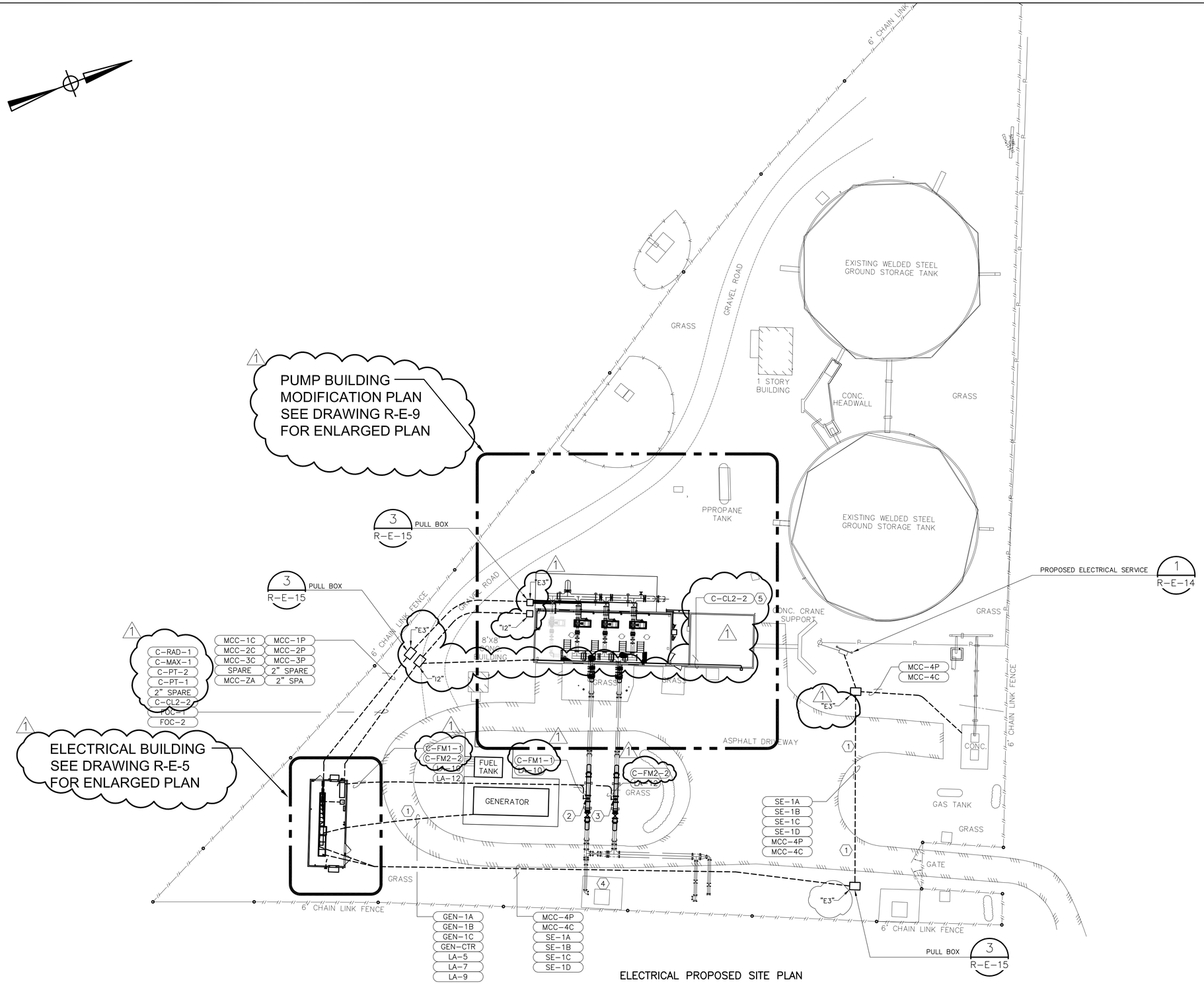
REV	DESCRIPTION	BY	DATE
1	ADDENDUM 1	BC	4/16/2014

NOTES:

1. REPLACE PAVEMENT AFTER INSTALLATION. SEE CIVIL DRAWING DETAIL FOR MORE INFORMATION.
2. FM-1 PROPELLER METER WITH ANALOG DISPLAY.
3. FM-2 PROPELLER METER WITH ANALOG DISPLAY.
4. REPLACE CONCRETE AFTER INSTALLATION.
5. FIELD ROUTE CONDUIT AND CONDUCTORS BACK TO SCADA PANEL. PROVIDE ALL REQUIRED HARDWARE FOR MOUNTING.



ELECTRICAL PROPOSED SITE PLAN

PLAN

1"=20'-0"

KGI Kalluri Group, Inc.
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4-16-14

SURVEYED BY: TSC FB No. –

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

REHABILITATION OF PUMPS, MOTORS, VALVES, PIPING & BUILDINGS AT VARIOUS FACILITIES PACKAGE A RIDGEMONT ELECTRICAL PROPOSED SITE PLAN

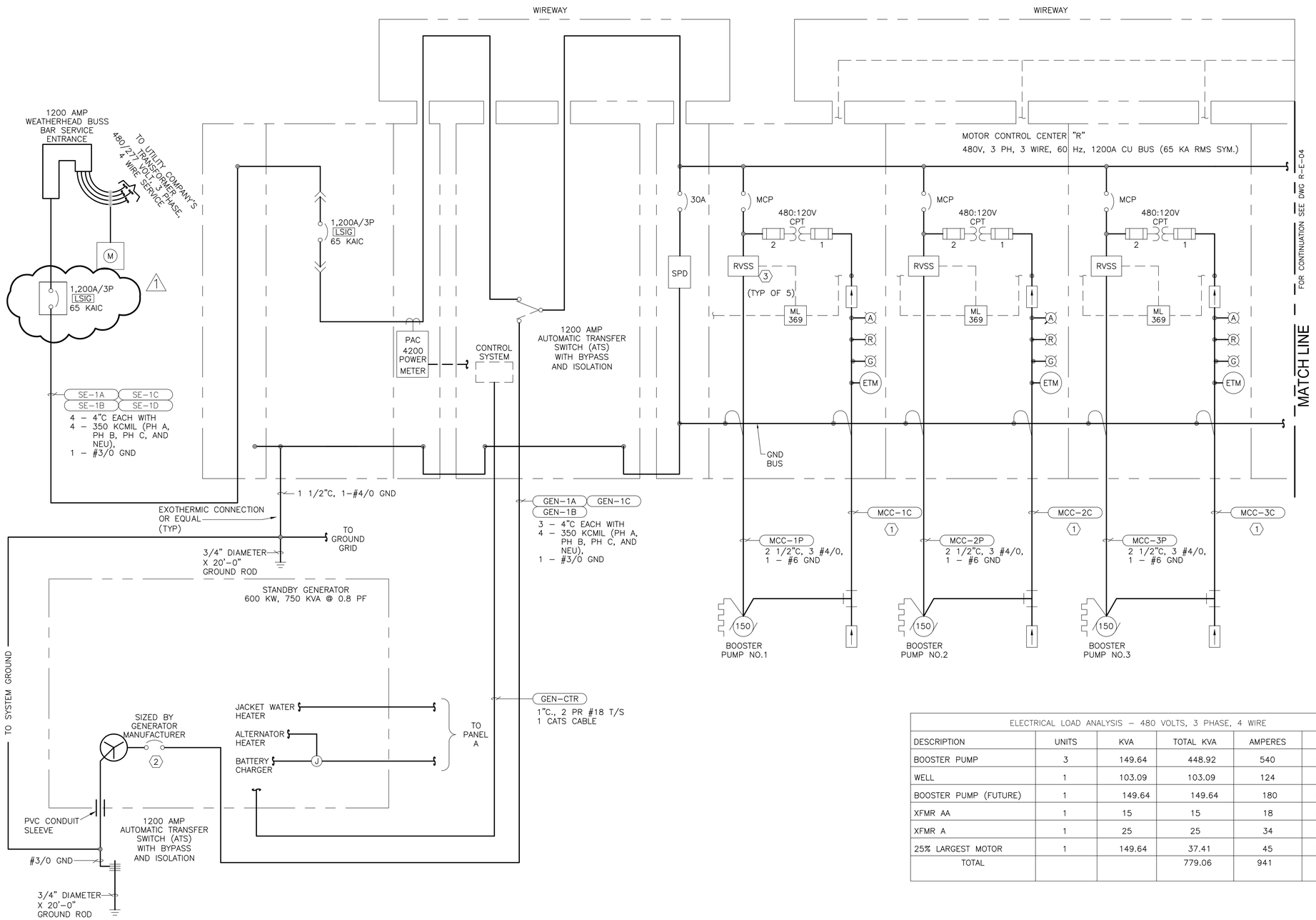
ELECTRICAL

WBS NUMBER	
S-001000-00036-4	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON PM	
RAJINDER SINGH	
SHEET No. 109 OF 191	

R-E-2R

L:\Active projects\1069-AM (Water Plants Elect)\Drawings\Addendum\Ridgemont\R-E-02 Site Plan.dwg Apr 16 2014

REV	DESCRIPTION	BY	DATE
1	ADDENDUM 1	BC	4/16/2014



NOTES:

1. CONTROL TO BE 2–INCH CONDUIT WITH 2 #12 (SP. HTR), 6 #14, 1 #12GND, AND 4 #14 ARE SPARE.
2. GENERATOR MANUFACTURER TO PROVIDE GENERATOR CIRCUIT BREAKER.
3. SERVERE DUTY RATED SOLID STATE SOFT STARTER.

ELECTRICAL LOAD ANALYSIS – 480 VOLTS, 3 PHASE, 4 WIRE

DESCRIPTION	UNITS	KVA	TOTAL KVA	AMPERES	REMARK
BOOSTER PUMP	3	149.64	448.92	540	PROPOSED
WELL	1	103.09	103.09	124	EXISTING
BOOSTER PUMP (FUTURE)	1	149.64	149.64	180	PROPOSED
XFMR AA	1	15	15	18	PROPOSED
XFMR A	1	25	25	34	PROPOSED
25% LARGEST MOTOR	1	149.64	37.41	45	PROPOSED
TOTAL			779.06	941	

ONE LINE DIAGRAM

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CITY OF HOUSTON
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REHABILITATION OF PUMPS, MOTORS, VALVES, PIPING & BUILDINGS AT VARIOUS FACILITIES PACKAGE A RIDGEMONT ELECTRICAL OVERALL ONE LINE DIAGRAM SHEET 1 OF 2

ELECTRICAL

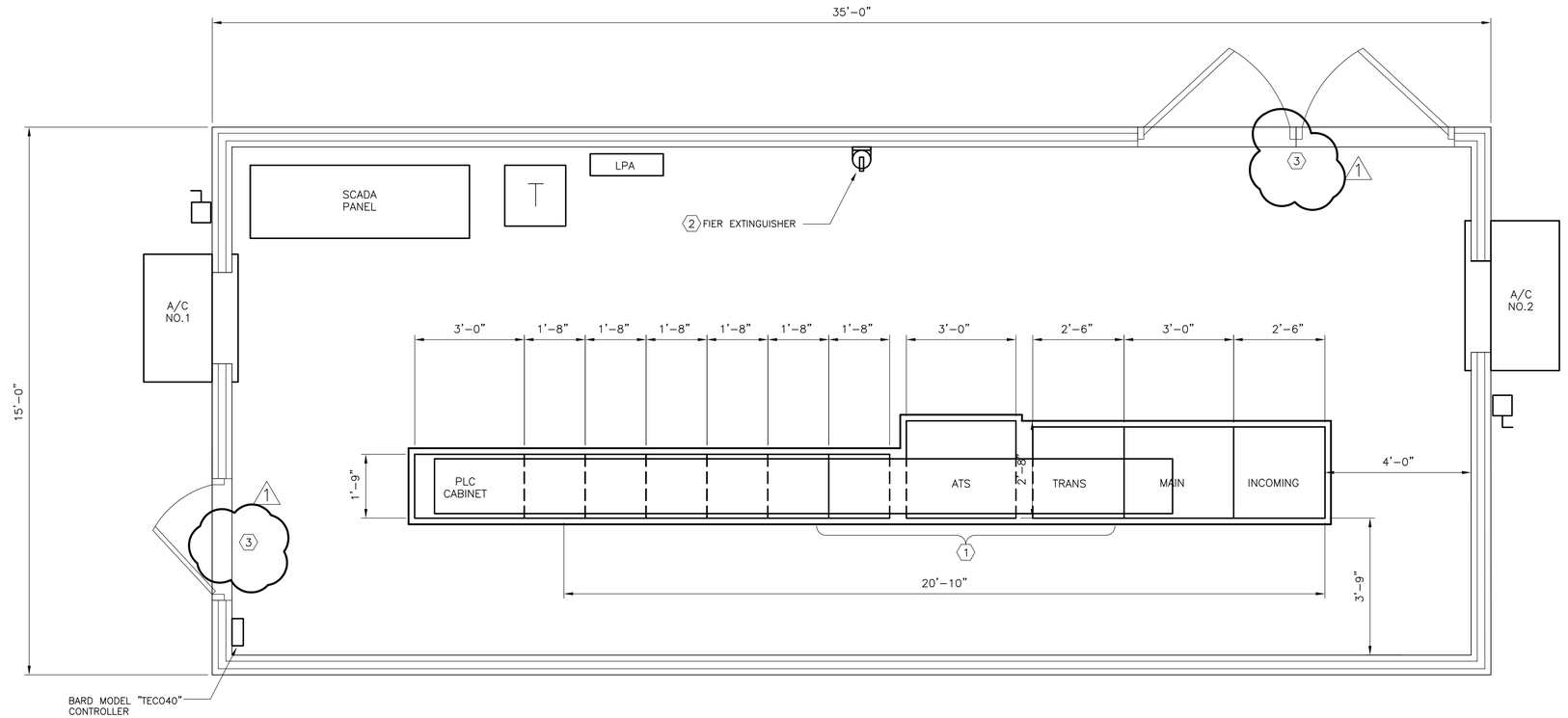
WBS NUMBER	
S–001000–00036–4	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON PM	
RAJINDER SINGH	
SHEET No. 110 OF 191	

R–E–3R

REV	DESCRIPTION	BY	DATE
1	ADDENDUM 1	BC	4/16/2014

NOTES:

1. CUSTOM WIREWAY IS LOCATED ABOVE SWITCHGEAR.
2. PROVIDE AND FIELD INSTALL KIDDIE MODEL NO. 10–TAS OR EQUAL WITH WALL MOUNT BRACKET AND ALL REQUIRED HARDWARE.
3. PROVIDE PANIC HARDWARE FOR EACH DOOR. SEE SPECIFICATION FOR MORE DETAILS.



ELECTRICAL BUILDING EQUIPMENT PLAN

PLAN

1/2"=1'–0"

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CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

REHABILITATION OF PUMPS, MOTORS, VALVES, PIPING & BUILDINGS AT VARIOUS FACILITIES PACKAGE A RIDGEMONT ELECTRICAL BUILDING EQUIPMENT PLAN

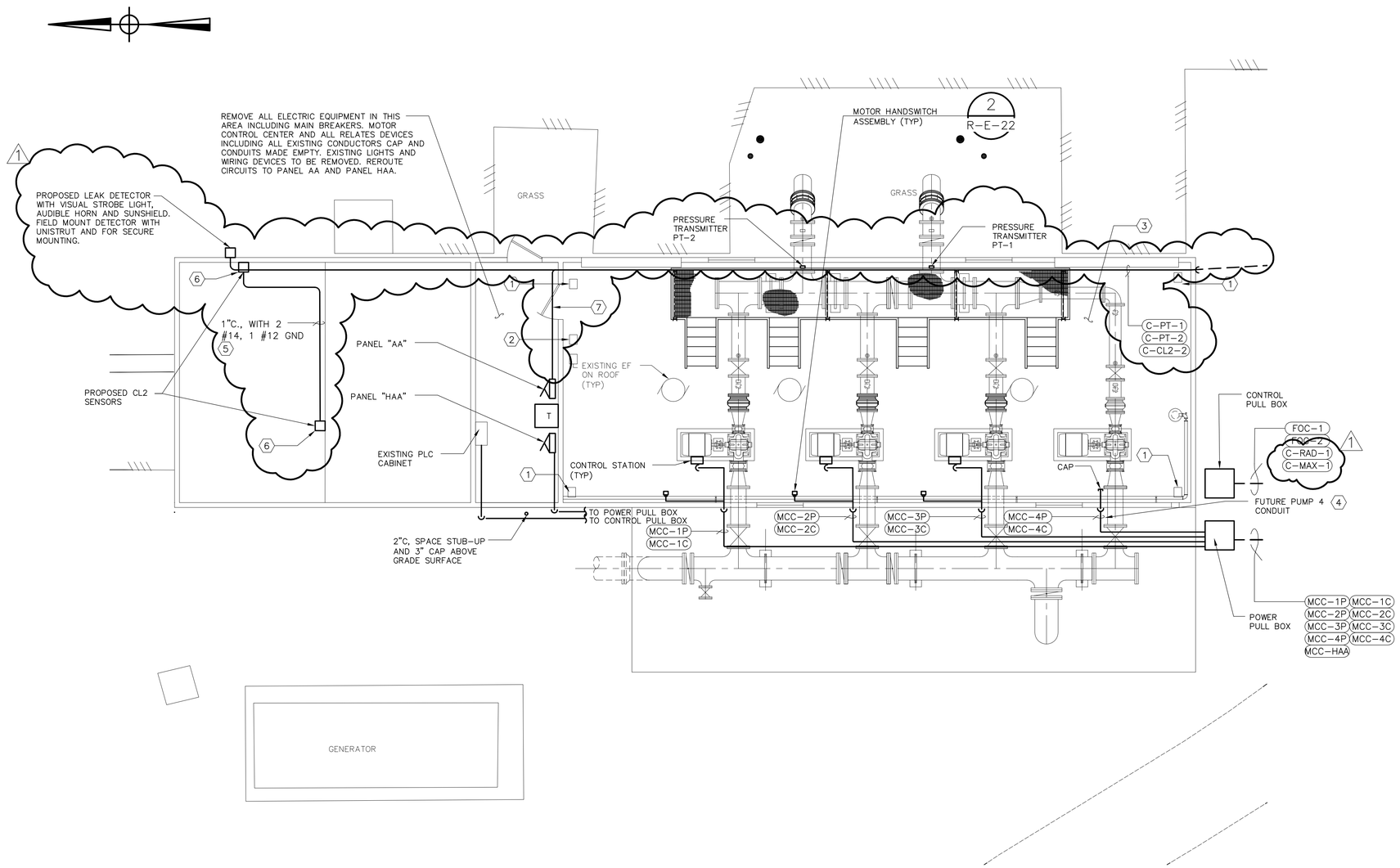
ELECTRICAL

WBS NUMBER	
S-001000-00036-4	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON PM	
RAJINDER SINGH	
SHEET No. 112 OF 191	

R-E-5R

C:\Active projects\4069-AA (Water Plants Elect)\Drawings\Addendum\Ridgemont\R-E-05 Electrical Building Equipment Plan.dwg Apr 16 2014

REV	DESCRIPTION	BY	DATE
1	ADDENDUM 1	BC	4/16/2014



EXISTING PUMP BUILDING MODIFICATION PLAN

PLAN

3/16"=1'-0"

NOTES:

1. EXISTING PUMP ROOM HEATER CIRCUIT ROUTED TO PANEL HAA
2. EXISTING HOIST DISCONNECT TO PANEL HAA
3. REROUTE LIGHT CIRCUITS AND WIRING DEVICE CIRCUITS TO PANEL AA.
4. CAP CONDUIT THROUGH WALL FOR FUTURE PUMP.
5. PROVIDE AND FIELD ROUTE CONDUIT AND CONDUCTOR TO CL2 SENSOR.
6. FIELD MOUNT CL2 SENSOR AT THE SAME LOCATION OF EXISTING SENSOR.
7. PROVIDE AND FIELD ROUTE 3/4"C., WITH 2 #12, 1 #12 GND TO EACH PRESSURE TRANSMITTER AND CHLORINE LEAK DETECTOR.

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DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

REHABILITATION OF PUMPS, MOTORS, VALVES, PIPING & BUILDINGS AT VARIOUS FACILITIES PACKAGE A RIDGEMONT EXISTING PUMP BUILDING MODIFICATION PLAN

ELECTRICAL

WBS NUMBER	
S-001000-00036-4	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON PM	
RAJINDER SINGH	
SHEET No. 116 OF 191	

R-E-9R

L:\Active projects\1069 HAI (Water Plants Elect)\Drawings\Addendum\Ridgemont\R-E-09 Existing Pump Building Modification Plan.DWG Apr 16, 2014

REV	DESCRIPTION	BY	DATE
1	ADDENDUM 1	BC	4/16/2014

PANEL "HAA"

BUS AMPS 400 MLO ____
MAIN BRKR. AMPS 100 WIRE SIZE ____
VOLTS 277/480 AIC 18 KA
PHASE 3 WIRE 2 SN ✓

NOTES
1. ADJ. CKTS. TO BAL. PNL.
2. SURFACE MOUNT, NEMA 1.

GND	CKT. DESCRIPTION	WIRE	LOAD	BKR.	A	B	C		BKR.	LOAD	WIRE	BUILDING LIGHTS	GND
12	HEATER NO.1	10	2000	30	1			2	30	2000	10	HEATER NO.2	12
12			2000		3			4		2000			12
12			2000		5			6		2000			12
12	BUILDING EXTERIOR LIGHTS	10	2000	30	7			8	30	2000	10	HEATER NO.4	12
12			2000		9			10		2000			12
12			2000		11			12		2000			12
12	PANEL AA	10	4330	30	13			14					12
12			4330		15			16					12
12					17			18					12
12					19			20					12
12					21			22					12
12					23			24					12
12					25			26					12
12					27			28					12
12					29			30					12
12					31			32					12
12					33			34					12
12					35			36					12
12					37			38					12
12					39			40					12
12					41			42					12
					N								

TOTAL LOAD = X.X KVA

LIGHT FIXTURE SCHEDULE

TYPE	CATALOG NUMBER	DESCRIPTION	LAMPS	REMARKS
A	LITHONIA No. DMW-2-32-MVOLT-GEB10PS-WLF-A268 WITH STAINLESS STEEL LATCHES	WET LOCATION FIXTURE WITH IMPACT RESISTANT, REINFORCED FIBERGLASS HOUSING AND HIGH IMPACT RESISTANT ACRYLIC DIFFUSER.PROVIDE ZERO DEGREE COLD WEATHER PROGRAMMED RAPID START BALLAST.	2-32W,41K, RAPID START	MOUNT WITH TYPE 316 S.S. STRUT AND TYPE 316 S.S. HARDWARE.
B	LITHONIA No. TWH-LED-20C-40K-MVOLT-DDBXD	DIE-CAST ALUMINUM WALL PACK FIXTURE WITH GLASS REFRACTOR, SPECULAR ANODIZED ALUMINUM REFLECTOR, AND DARK BRONZE POWDER COAT PAINT FINISH.	LED	MOUNT WITH TYPE 316 S.S. HARDWARE. MOUNT ON OUTSIDE WALL WITH BOTTOM OF FIXTURE AT 10'-0" ABOVE ELECTRICAL ROOM FLOOR ELEVATION.
C	LITHONIA No. ELT50-H1212 WITH 3' CORD & GROUNDED PLUG	EMERGENCY LIGHT UNIT WITH 90 MINUTE, 12 VOLT, LEAD CALCIUM BATTERY.	TWO 12 WATT HALOGEN	PROVIDE A RECEPTACLE NEXT TO UNIT FOR UNIT TO PLUG-IN. MOUNT WITH TYPE 316 S.S. HARDWARE. MOUNT BOTTOM OF FIXTURE AT 8'-0" ABOVE ELECTRICAL ROOM FLOOR.
X	LITHONIA No. LE-S-1-R-120-ELNSD	EMERGENCY EXIT LIGHT WITH 90 MINUTE BACK UP BATTERY AND POLYCARBONITE HOUSING.	LED ILLUMINATED	MOUNT BOTTOM OF FIXTURE AT 9'-6" ABOVE ELECTRICAL ROOM FLOOR.
D	COOPER CROUSE-HINDS MODEL: EVLGDJ4201	LED LUMINAIRE WET LOCATION FIXTURE.	LED 36WATT	1-1/4" STANCHION MOUNT (MATCH EXISTING LIGHT FIXTURE HEIGHT)

PANEL "AA"

MAIN BRKR. AMPS 100 WIRE SIZE ____
VOLTS 120/240 AIC 18 KA
PHASE 1 WIRE 2 SN ✓

NOTES
1. ADJ. CKTS. TO BAL. PNL.
2. SURFACE MOUNT, NEMA 1.

GND	CKT. DESCRIPTION	WIRE	LOAD	BKR.	A	B		BKR.	LOAD	WIRE	BUILDING LIGHTS	GND
12	EXISTING BLDG EXIT LIGHTS	12	1400	20	1		2	20	1600	12	EXISTING BLDG EXTERIOR LIGHTS	12
12	EXISTING BLDG EMERGENCY LIGHTS	12	600	20	3		4	20	800	12	EXISTING BLDG RECEPTACLES	12
12	EXISTING BLDG LIGHTS	12	1400	20	5		6	20	800	12	EXISTING SCADA PANEL	12
12	CL2 LEAK DETECTOR	12	400	20	7		8	20	400	12	PT NO. 1	12
12	SPARE			20	9		10	20	400	12	PT NO. 2	12
12	SPARE			20	11		12	20		12	SPARE	12
12	SPARE			20	13		14	20			SPARE	12
12					15		16	20			SPARE	12
12					17		18					12
12					19		20					12
12					21		22					12
12					23		24					12
					N							

TOTAL LOAD = X.X KVA

PANEL "A"

MAIN BRKR. AMPS 100 WIRE SIZE ____
VOLTS 120/240 AIC 18 KA
PHASE 1 WIRE 2 SN ✓

NOTES
1. ADJ. CKTS. TO BAL. PNL.
2. SURFACE MOUNT, NEMA 1.

GND	CKT. DESCRIPTION	WIRE	LOAD	BKR.	A	B		BKR.	LOAD	WIRE	BUILDING LIGHTS	GND
12	EXIT LIGHTS	12		20	1		2	20		12	BUILDING EXTERIOR LIGHTS	12
12	EMERGENCY LIGHTS	12		20	3		4	20		12	BUILDING RECEPTACLES	12
12	GEN JACKET HEATER	12		20	5		6	20		12	SCADA PANEL	12
12	GEN BATTERY CHARGER	12		20	7		8	20		12	PLC CABINET	12
12	GEN ALTERNATOR HEATER	12		20	9		10	20		12	FM-1	12
12	SPARE			20	11		12	20		12	FM-2	12
12	SPARE			20	13		14	20			SPARE	12
12	SPARE			20	15		16	20			SPARE	12
12	SPARE			20	17		18	20			SPARE	12
12	SPARE			20	19		20	20			SPARE	12
12	SPARE			20	21		22	20			SPARE	12
12	SPACE				23		24					12
12	SPACE				25		26					12
12	SPACE				27		28					12
12	SPACE				29		30					12
12	SPACE				31		32					12
12	SPACE				33		34					12
12	SPACE				35		36					12
12	SPACE				37		38					12
12					39		40					12
12					41		42					12
					N							

TOTAL LOAD = X.X KVA

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SURVEYED BY: TSC FB No. -

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

REHABILITATION OF PUMPS, MOTORS, VALVES, PIPING & BUILDINGS AT VARIOUS FACILITIES PACKAGE A RIDGEMONT

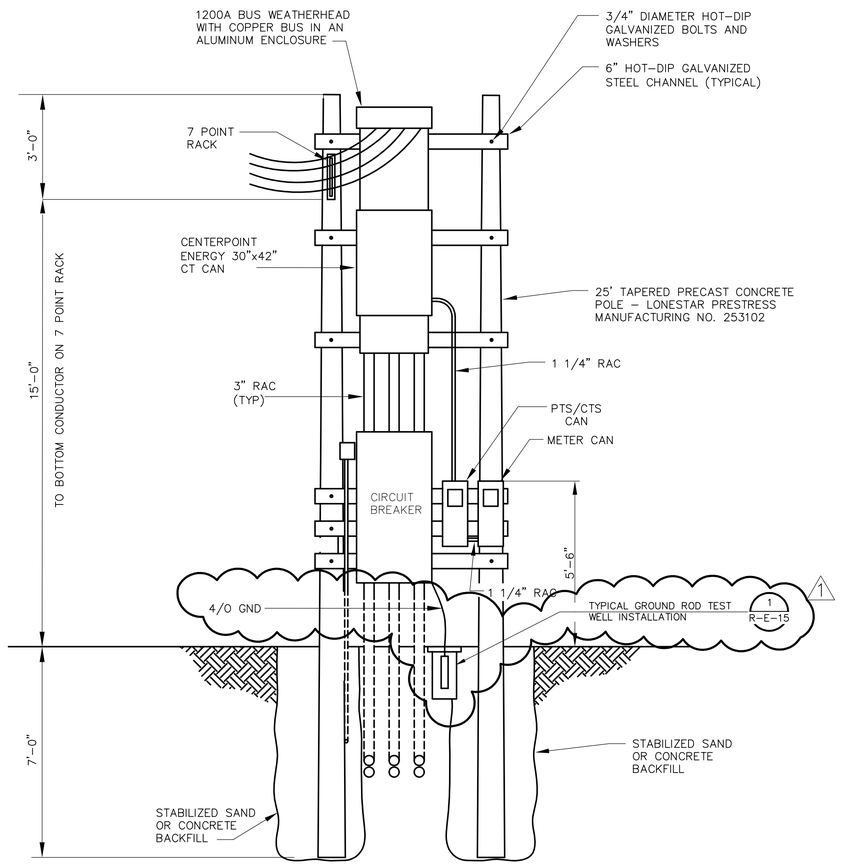
PANELBOARD SCHEDULES AND LIGHT FIXTURE SCHEDULE

ELECTRICAL

WBS NUMBER	
S-001000-00036-4	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON PM	
RAJINDER SINGH	
SHEET No. 119 OF 191	

R-E-12R

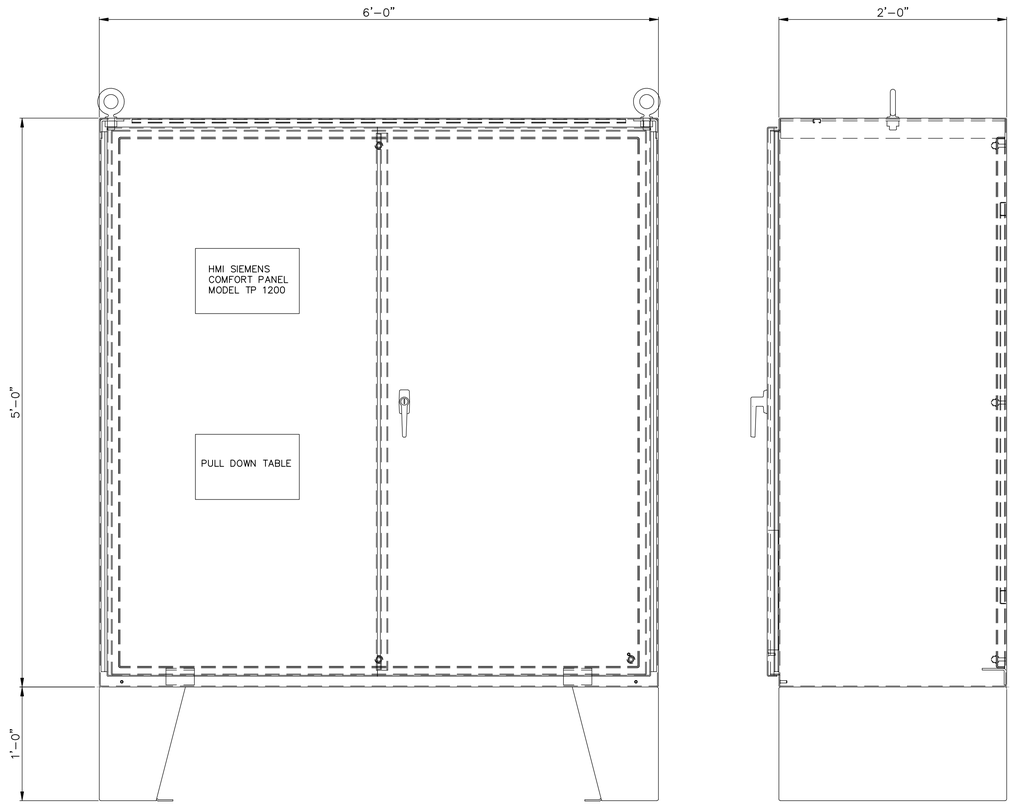
REV	DESCRIPTION	BY	DATE
1	ADDENDUM 1	BC	4/16/2014



PROPOSED ELECTRICAL SERVICE ENTRANCE

DETAIL 1

N.T.S.



CONTROL PANEL ELEVATION

DETAIL 2

N.T.S.

R-E-14R

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DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

REHABILITATION OF PUMPS, MOTORS, VALVES, PIPING & BUILDINGS AT VARIOUS FACILITIES PACKAGE A RIDGEMONT ELECTRICAL DETAILS SHEET 1 OF 4

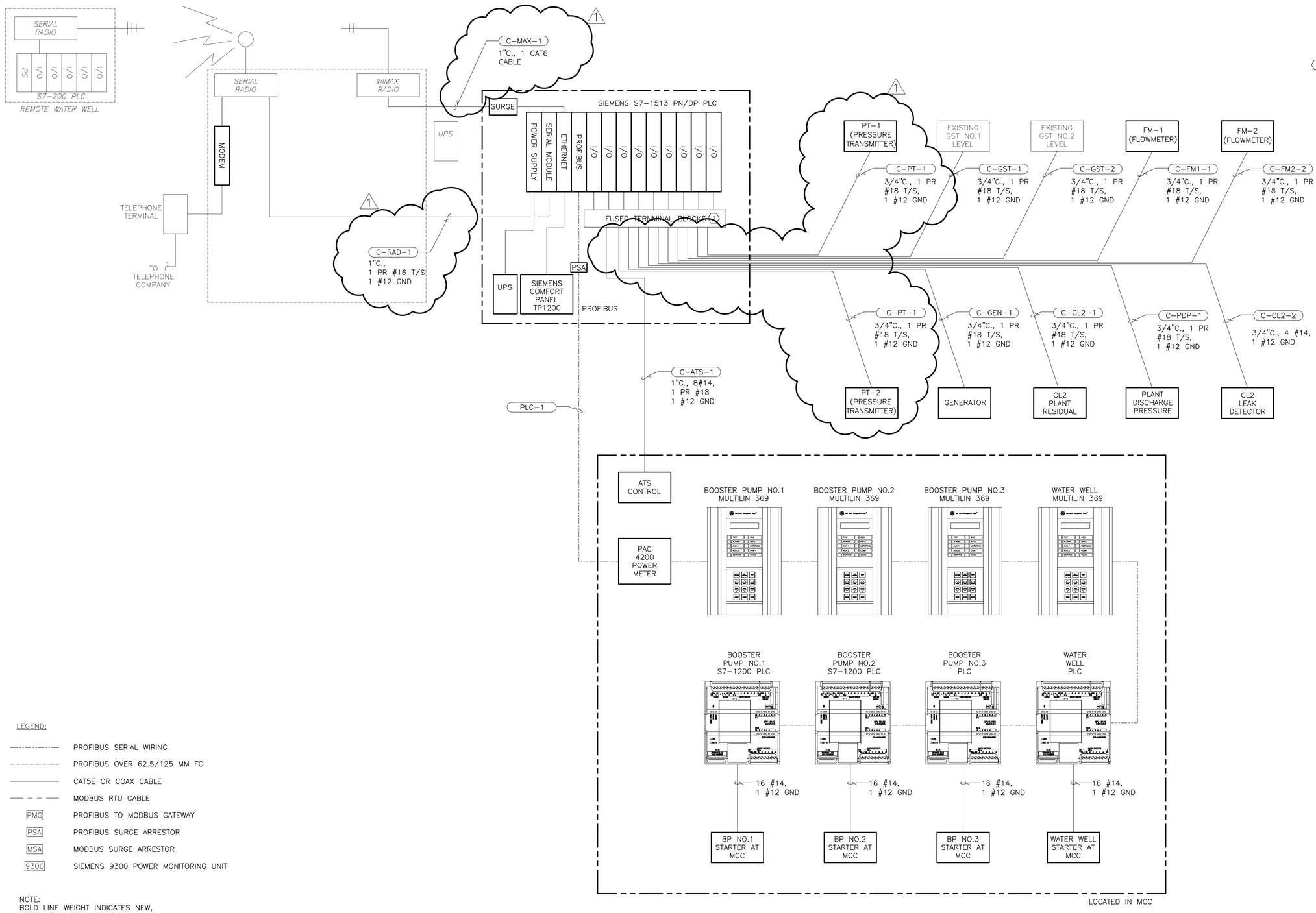
ELECTRICAL

WBS NUMBER	
S-001000-00036-4	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON PM	
RAJINDER SINGH	
SHEET No. 121 OF 191	

REV	DESCRIPTION	BY	DATE
1	ADDENDUM 1	BC	4/16/2014

NOTES:

1. PROVIDE SURGE PROTECTED TERMINAL BLOCK FOR ALL ANALOG SIGNAL.



LEGEND:

- PROFIBUS SERIAL WIRING
- PROFIBUS OVER 62.5/125 MM FO
- CAT5E OR COAX CABLE
- MODBUS RTU CABLE
- PMG — PROFIBUS TO MODBUS GATEWAY
- PSA — PROFIBUS SURGE ARRESTOR
- MSA — MODBUS SURGE ARRESTOR
- 9300 — SIEMENS 9300 POWER MONITORING UNIT

NOTE:
BOLD LINE WEIGHT INDICATES NEW,
LIGHT WEIGHTS INDICATES EXISTING

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4-16-14

SURVEYED BY: TSC FB No. –

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

REHABILITATION OF PUMPS, MOTORS, VALVES, PIPING & BUILDINGS AT VARIOUS FACILITIES PACKAGE A RIDGEMONT PROPOSED CONTROL SYSTEM ARCHITECTURE DIAGRAM

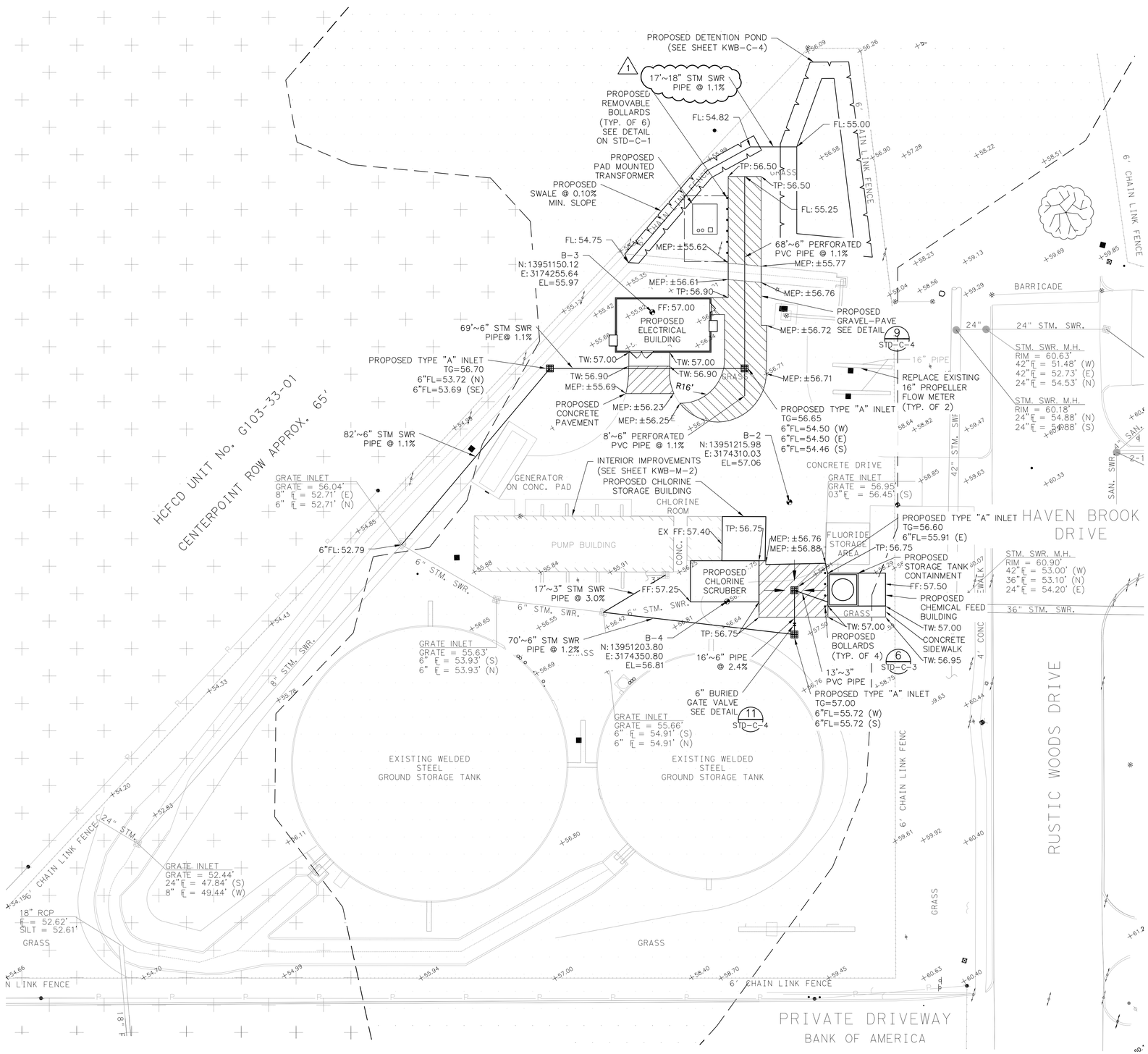
ELECTRICAL

WBS NUMBER	
S-001000-00036-4	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON PM	
RAJINDER SINGH	
SHEET No. 126 OF 191	

R-E-19R

L:\Active projects\4065-A4 (Water Plants Elect)\Drawings\Addendum\Ridgemont\R-E-19 PROPOSED Control System Architecture Diagram.dwg Apr 16, 2014

REV	DESCRIPTION	BY	DATE
1	ADDENDUM No.1	AVK	APR 2014



FLOODPLAIN NOTES

ACCORDING TO MAP 48201C0315L OF THE FEDERAL EMERGENCY MANAGEMENT AGENCY'S FLOOD INSURANCE RATE MAPS FOR HARRIS COUNTY, TEXAS DATED JUNE 18, 2007, THE SUBJECT PROJECT AREA IS PARTIALLY SITUATED WITHIN THE FOLLOWING ZONES:

ZONE AE DESCRIBED AS A SPECIAL FLOOD HAZARD AREA SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD EVENT (100-YEAR FLOOD) WITH BASE FLOOD ELEVATIONS DETERMINED. THE BASE FLOOD ELEVATION IS DETERMINED TO BE 55 FEET.

ZONE X DESCRIBED AS AREAS OF 0.2% ANNUAL CHANCE FLOOD; AREAS OF 1% ANNUAL CHANCE FLOOD WITH AVERAGE DEPTHS OF LESS THAN 1 FOOT OR WITH DRAINAGE AREAS LESS THAN 1 SQUARE MILE; AND AREAS PROTECTED BY LEVEES FROM 1% ANNUAL CHANCE FLOOD. THE 500 YEAR FLOOD ELEVATION IS DETERMINED TO BE 56 FEET.

CITY OF HOUSTON FLOODPLAIN MANAGEMENT OFFICE NOTES

1. THIS PROJECT WILL NOT RESULT IN THE ADDITION OF ANY FILL MATERIAL WITHIN ZONE AE AN AREA DESCRIBED AS A FLOODPLAIN ZONE AREA HAVING A 1% CHANCE FLOOD.

2. DURING ALL CONSTRUCTION ACTIVITY, THE CONTRACTOR MUST NOT STORE ANY CONSTRUCTION EXCAVATED MATERIALS WITHIN THE PROJECT SITE THAT IS IN THE DELINEATED FLOOD ZONE AND BELOW THE BASE FLOOD ELEVATION. THE CONTRACTOR'S CONSTRUCTION "MEANS AND METHODS" MUST INCLUDE THE REMOVAL AND/OR HAULING OFF OF ANY EXCAVATED MATERIALS FROM THE SITE.

NOTES

1. STABILIZE ALL DISTURBED AREAS WITH HYDROMULCH. ALL DISTURBED AREAS TO BE RESTORED TO ORIGINAL CONDITION OR BETTER.
2. ACTUAL LOCATION OF EXISTING UTILITIES MAY VARY FROM COORDINATES AND ELEVATION PROVIDED. CONTRACTOR TO VERIFY BEFORE CONSTRUCTION AND NOTIFY THE ENGINEER IF DISCREPANCIES ARE IDENTIFIED.
3. GRADE AREAS AROUND FOUNDATION PADS TO DRAIN AWAY FROM THE STRUCTURE.
4. CONTRACTOR SHALL ENSURE THAT SLOPE ON FINISHED SURFACE OF THE CONCRETE IN FIRST FIVE FEET OUTSIDE DOORS DOES NOT EXCEED 2%.
5. CONTRACTOR SHALL ENSURE THAT SLOPE OF SIDEWALKS DO NOT EXCEED 5% IN THE DIRECTION OF TRAVEL AND 2% CROSS-SLOPE.
6. REFER TO FOUNDATION PLANS FOR PROPOSED BUILDING.

IMPERVIOUS AREA CALCULATIONS	
EXISTING	2978 SY
PROPOSED	3187 SY
INCREASED IMPERVIOUS AREA	209 SY

GEOTECHNICAL INFORMATION

REFER TO GEOTECHNICAL REPORT ENTITLED: GEOTECHNICAL INVESTIGATION PROPOSED WATER PLANT IMPROVEMENTS PACKAGE A PREPARED BY ASSOCIATED TESTING LABORATORIES, INC.

REPORT NUMBER G13-163, DATED: OCT 7, 2013

0 20 40
SCALE 1"=20'

LEGEND

	ZONE AE (100 YEAR FLOODPLAIN)
	SHADED ZONE X (500 YEAR FLOODPLAIN)
	GRAVEL-PAVE SEE DETAIL ON SHEET STD-C-4
	CONCRETE PAVEMENT SEE DETAIL ON SHEET STD-C-3
FF: XX.XX	FINISH FLOOR ELEVATION
MEP: XX.XX	MATCH EXISTING PAVEMENT ELEVATION
FG: XX.XX	FINISHED GRADE ELEVATION
TG: XX.XX	TOP OF AREA INLET ELEVATION
TP: XX.XX	TOP OF PAVEMENT ELEVATION (CONCRETE)
TW: XX.XX	TOP OF WALKWAY ELEVATION (CONCRETE)
	GRADE SLOPE ARROWS
	PROPOSED
100.00	EXISTING ELEVATIONS

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SURVEYED BY: TSC FB No. –

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

REHABILITATION OF PUMPS, MOTORS, VALVES, PIPING & BUILDINGS AT VARIOUS FACILITIES PACKAGE A

KINGWOOD B WATER PLANT

PROPOSED OVERALL SITE PLAN

3822 RUSTIC WOODS DRIVE, HOUSTON, TEXAS

CIVIL

WBS NUMBER	S-001000-0036-4
DRAWING SCALE	1"=20'
CITY OF HOUSTON PM	RAJINDER SINGH

KWB-C-2R SHEET No. 133 OF 191

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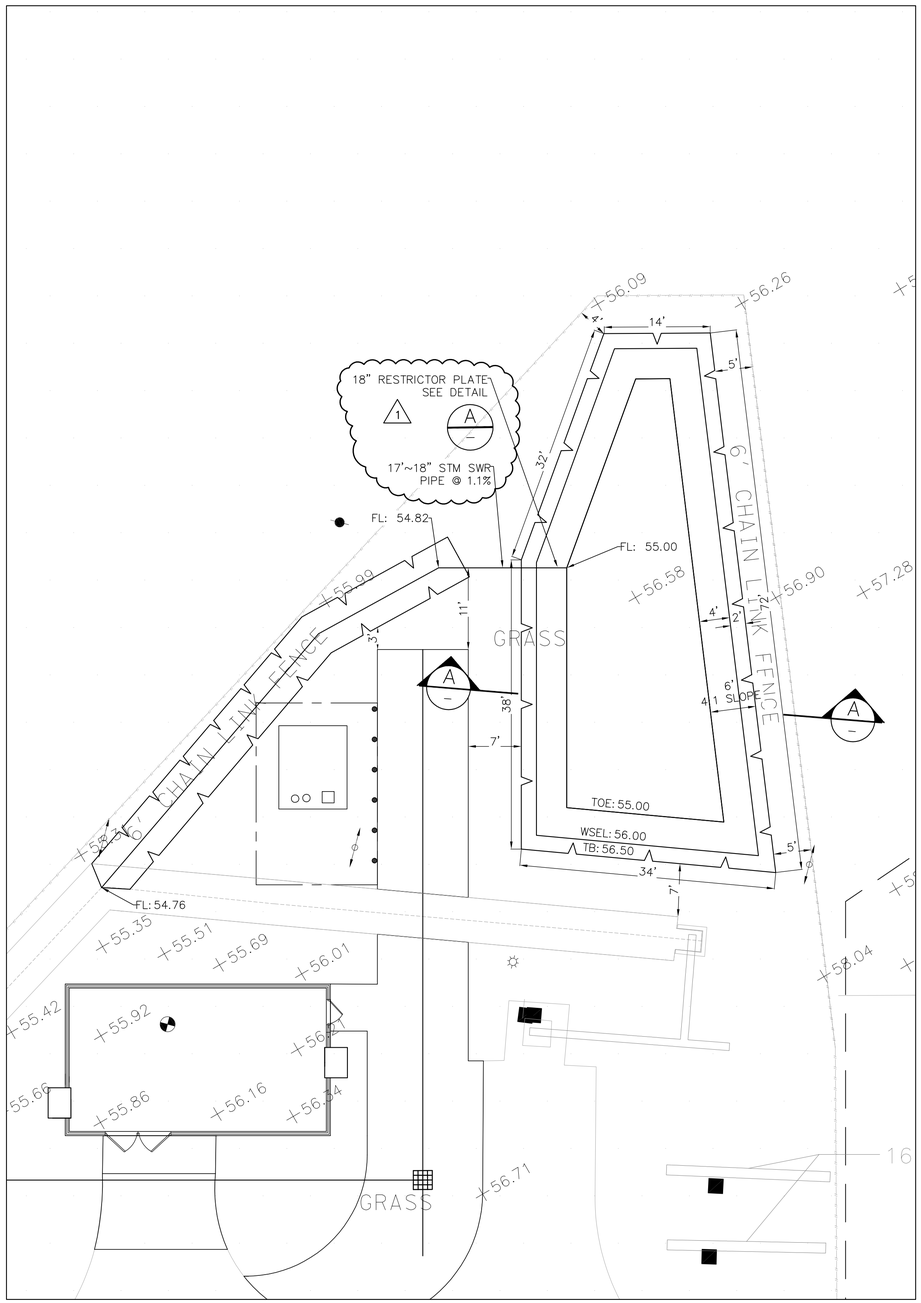
REV	DESCRIPTION	BY	DATE
1	ADDENDUM No.1	AVK	APR 2014



IMPERVIOUS AREA CALCULATIONS	
EXISTING	2978 SY
PROPOSED	3187 SY
INCREASED IMPERVIOUS AREA	209 SY

WARNING

OVERHEAD AND UNDERGROUND UTILITIES MAY EXIST IN THE VICINITY OF THIS PROJECT. LOCATIONS SHOWN FOR EXISTING UTILITIES ARE APPROXIMATE AND OTHER UTILITIES MAY EXIST IN THE VICINITY OF THE PROJECT WHICH ARE NOT SHOWN ON THE PLANS.

IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE ALL EXISTING UTILITIES, IN THE VICINITY OF THE PROJECT, PRIOR TO BEGINNING CONSTRUCTION.

0 10 20
SCALE 1"=10'

DETENTION ANALYSIS

INCREASED IMPERVIOUS AREA= 209 SY SY X 9 SF/1 SY X 1 ACRE/43,560 SF =0.043 ACRES
STORAGE REQUIRED =0.55 ACRE-FT PER ACRE INCREASED IMPERVIOUS AREA
STORAGE REQUIRED =0.043 ACRES X 0.55 ACRE-FT X 43,560 SQ.FT/ACRE = 1,031 CF

DETENTION POND

TOP BANK ELEVATION =56.50
WATER SURFACE ELEVATION =56.00 (0.5' FREEBOARD)
AVERAGE DEPTH =1.00 FT (FROM BOTTOM OF FREEBOARD)

AREA FROM BOTTOM OF FREEBOARD =1,503 SF
TOE BANK AREA =871 SF
SIDE SLOPE AREA = 1,503 SF - 871 SF =632 SF

VOLUME

TOE BANK VOLUME = 871 SF X 1 FT =871 CF
SIDE SLOPE VOLUME = (632 SF X 1 FT) / 2 =316 CF
TOTAL VOLUME = 871 CF + 316 CF =1,187 CF

POND STORAGE PROVIDED = 1,187 CF
POND STORAGE REQUIRED = 1,031 CF

DETENTION FACILITY TO BE MAINTAINED BY OWNER

GEOTECHNICAL INFORMATION

REFER TO GEOTECHNICAL REPORT ENTITLED: GEOTECHNICAL INVESTIGATION PROPOSED WATER PLANT IMPROVEMENTS PACKAGE A PREPARED BY ASSOCIATED TESTING LABORATORIES, INC.

REPORT NUMBER G13-163, DATED: OCT 7, 2013

LEGEND

	SHADED ZONE X (500 YEAR FLOODPLAIN)
100.00	EXISTING ELEVATIONS
TG	TOP OF GRATE ELEVATION
TB	TOP OF BANK ELEVATION
FL	FLOW LINE ELEVATION
WSEL	WATER SURFACE ELEVATION
TOE	BOTTOM OF POND ELEVATION

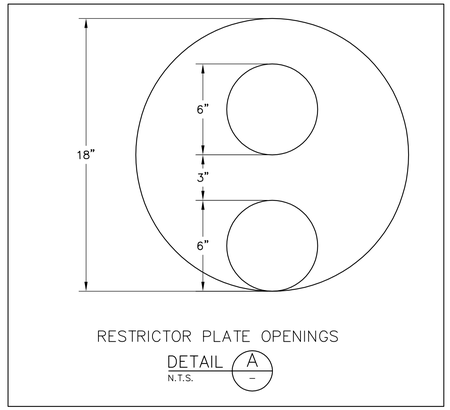
RESTRICTOR DESIGN CALCULATIONS

ALLOWABLE DISCHARGE RATE FOR LOW LEVEL RESTRICTOR
= 0.5 CFS/ACRE * 1.46 ACRES = 0.73 CFS
ALLOWABLE DISCHARGE RATE FOR COMBINED RESTRICTOR
= 2.0 CFS/ACRE * 1.46 ACRES = 2.92 CFS

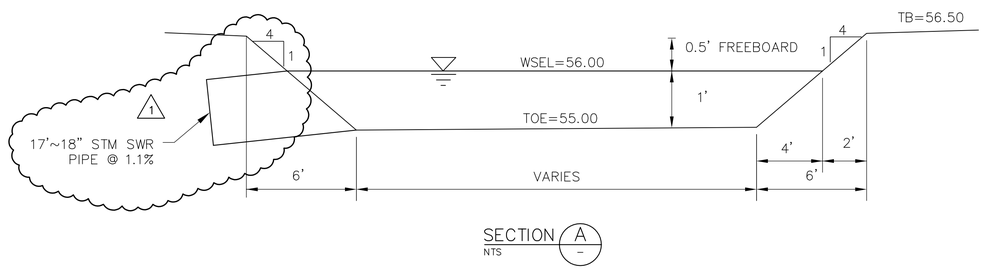
DESIGN DISCHARGE = $\mathbf{Q=CA(2g)^{1/2}(H)^{1/4}}$

Q = DESIGN DISCHARGE IN CFS
C = COEFFICIENT OF DISCHARGE - 0.6 FOR OPENINGS IN PLATES
A = AREA OF OPENING IN SQUARE FEET
g = ACCELERATION DUE TO GRAVITY (32.2 FT/S*S)
H = HEAD DIFFERENCE BETWEEN ENTRANCE AND EXIT IN FEET WHEN ORIFICE IS FULLY SUBMERGED OR THE DIFFERENCE BETWEEN WATER SURFACE ELEVATION AT THE ENTRANCE AND THE CENTROID OF THE ORIFICE WHEN PARTIALLY SUBMERGED

LOW LEVEL RESTRICTOR SIZE = 6"
HIGH LEVEL RESTRICTOR SIZE = 6"



RESTRICTOR PLATE OPENINGS
DETAIL A
N.T.S.



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REHABILITATION OF PUMPS, MOTORS, VALVES, PIPING & BUILDINGS AT VARIOUS FACILITIES PACKAGE A

KINGWOOD B WATER PLANT

DETENTION POND LAYOUT

3822 RUSTIC WOODS DRIVE, HOUSTON, TEXAS
CIVIL

WBS NUMBER	
S-001000-0036-4	
DRAWING SCALE	
1"=10'	
CITY OF HOUSTON PM	
RAJINDER SINGH	

KWB-C-4R SHEET No. 135 OF 191

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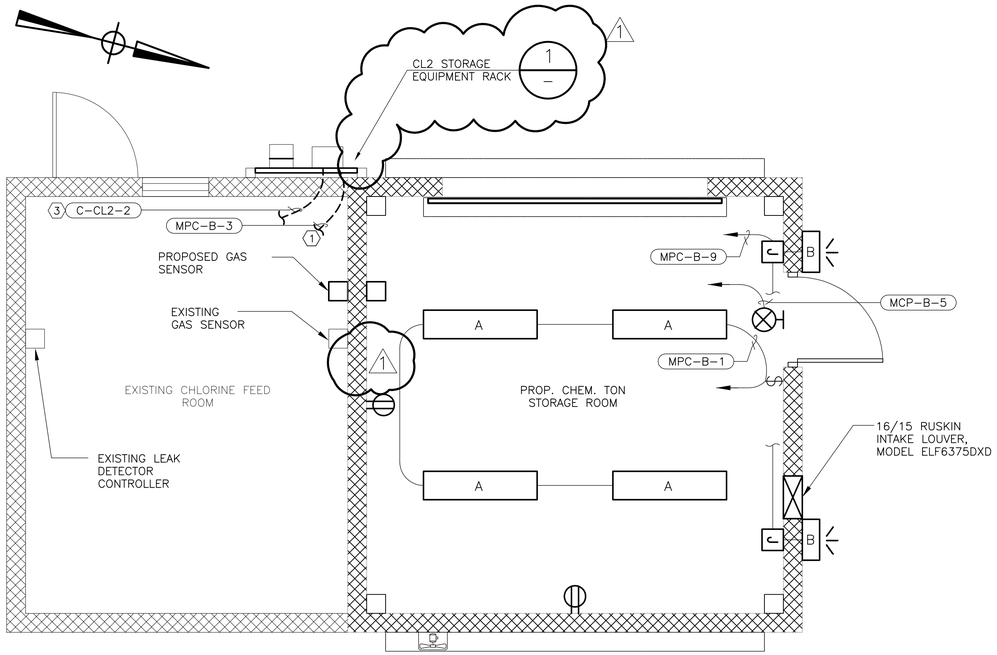
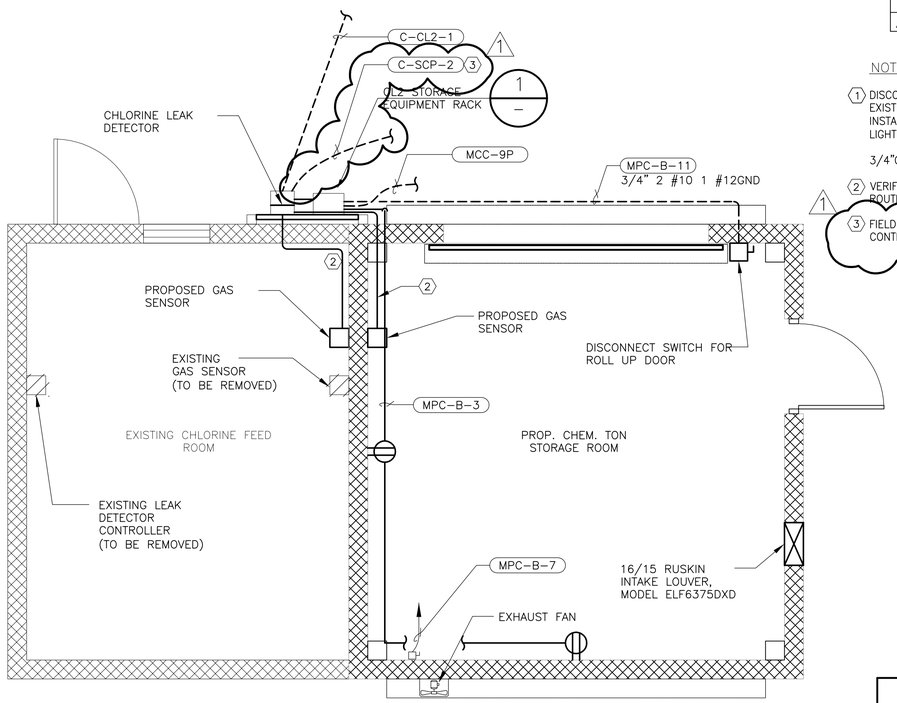
REV	DESCRIPTION	BY	DATE
1	ADDENDUM 1	BC	4/16/2014



CHLORINE STORAGE BUILDING LIGHTING PLAN

PLAN

3/8"=1'-0"



CHLORINE STORAGE BUILDING POWER PLAN

PLAN

3/8"=1'-0"

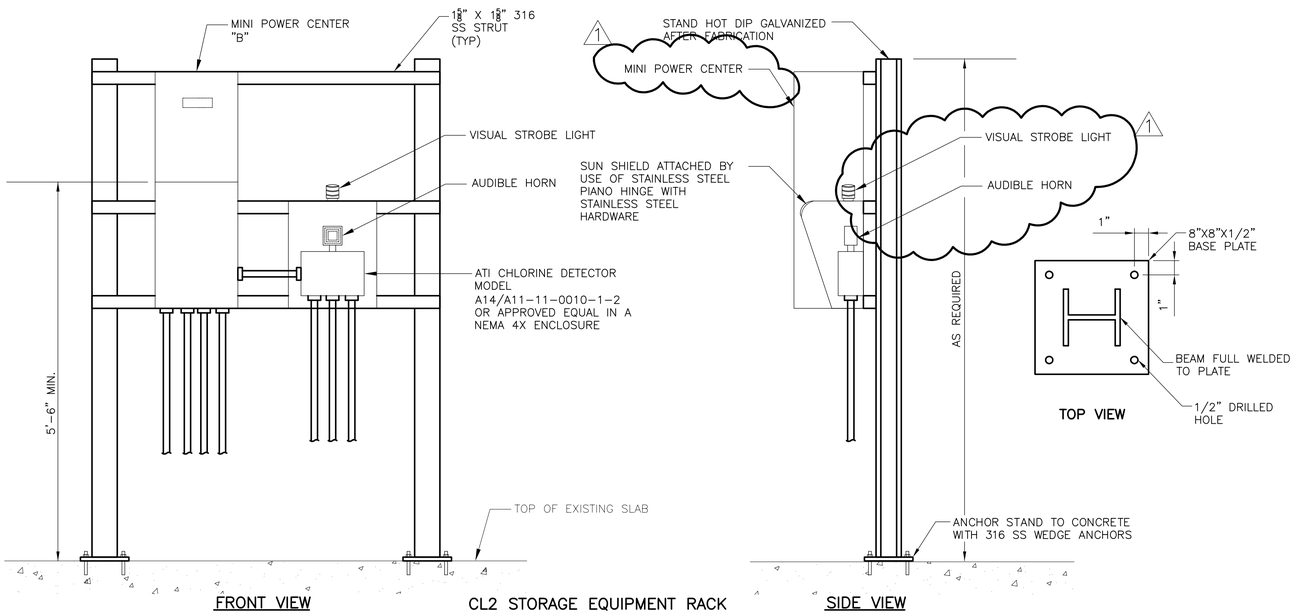
NOTES:

1. DISCONNECT EXISTING CONDUITS AND CONDUCTORS FROM EXISTING LIGHT FIXTURES AND RECEPTACLES AND FIELD INSTALL 3/4" CONDUITS AND CONDUCTORS TO EXISTING LIGHT FIXTURES AND RECEPTACLES.

   3/4"C,. WITH MANUFACTURE CABLE.

2. VERIFY CHLORINE AUTO VALVE LOCATION AND FIELD ROUTE CONDUIT AND CONDUCTORS TO DEVICE.

3. FIELD ROUTE CONDUIT AND CONDUCTORS TO SCRUBBER CONTROL PANEL.



CL2 STORAGE EQUIPMENT RACK

DETAIL 1

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REHABILITATION OF PUMPS, MOTORS, VALVES, PIPING & BUILDINGS AT VARIOUS FACILITIES PACKAGE A

KINGWOOD B
CHLORINE STORAGE BUILDING LIGHTING AND POWER PLANS

ELECTRICAL

WBS NUMBER	
S-001000-00036-4	
DRAWING SCALE	
AS NOTED	
CITY OF HOUSTON PM	
RAJINDER SINGH	

KWB-E-11R | SHEET No. 162 OF 191

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