

Document 00910
ADDENDUM NO. 1

Date of Addendum: 3/2/16
Enter date by hand when signed for release

PROJECT NAME: Renovation of the 4200 Leeland Annex & Improvements at the
NEWPP Administration Building.

PROJECT NO: WBS No. S-001000-0052-4

BID DATE: March 10, 2016 (Bid date has changed.)

FROM: Ravi Kaleyatodi, P.E., Senior Assistant Director
City of Houston, Department of Public Works and Engineering
611 Walker, 15th Floor
Houston, Texas 77002
Attn: John Msigwa, PE, Project Manager

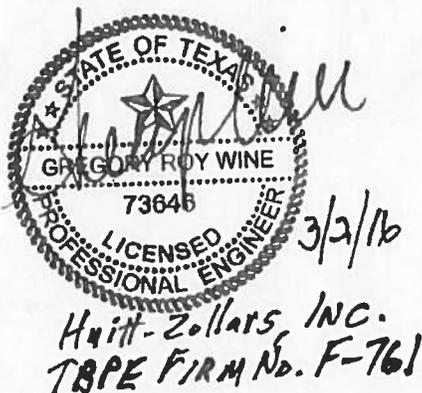
TO: Prospective Bidders

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.

CHANGE IN BID DATE

The Bid Date for this Project has been changed from February 25, 2016 to March 10, 2016. Time of day and place for submittal of bid remains the same.

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.



00910-1
02-01-2004

ADDENDUM NO. 1

CHANGES TO PROJECT MANUAL
SPECIFICATIONS

1. Section 00010 – Table of Contents.
 - a. Remove and Replace Section 00010 in its entirety.
2. Section 00015 – List of Drawings.
 - a. Remove and replace page 1 and page 2.
3. Section 00410B – Bid Form Part B.
 - a. Remove and Replace Section 00410B in its entirety.
4. Section 01110 – Summary of Work.
 - a. Remove and Replace Section 01110 in its entirety.
5. Section 02411 – Selective Demolition
 - a. Delete paragraph 1 in section 3.2.A.- and replace with
 1. Comply with requirements for existing service/systems interruptions specified in Section 01110 – Summary of Work.
 - b. In paragraph 3.3.A.1 - Delete 015000 and replace with 01504.
 - c. In paragraph 3.3.B.4 - Delete 015000 and replace with 01504.
 - d. In paragraph 3.4.A.9 - Delete 017419 and replace with 01576.
6. Section 02519 – Sample Lines and Fittings
 - e. Add Specification Section 02519 – Sample Lines and Fittings in its entirety.
7. Section 03100 – Concrete Formwork
 - a. In paragraph 1.03.A. - Delete (01 3000) (01300) and replace with 01330 - Submittal Procedures.
8. Section 03250 – Concrete Joints and Joint Accessories
 - a. In paragraph 1.02.H. - Delete 07900 and replace with 07920 – Joint Sealants.
 - b. In paragraph 1.03.A. – Delete 01300 and replace with 01340 – Shop Drawings, Product Data, and Samples.

9. Section 03350 – Concrete Finishes
 - a. In paragraph 1.03.A. - Delete 01300 and replace with 01340 – Shop Drawings, Product Data, and Samples
10. Section 03600 – Grout
 - a. In paragraph 1.02.E. - Delete paragraph 1.02.E. in its entirety.
 - b. In paragraph 1.03.A. – Delete 01300 and replace with 01340 – Shop Drawings, Product Data, and Samples
11. Section 03740 – Modifications to Existing Concrete
 - a. Delete 01300 and replace with 01340 – Shop Drawings, Product Data, and Samples
 - b. Delete paragraph 2.01.F.1 in its entirety
12. Section 05120 – Structural Steel
 - a. Delete paragraph 1.3.D in its entirety
13. Section 05210 – Steel Joists and Girders
 - a. Delete paragraph 1.4.D in its entirety
14. Section 05311 – Steel Floor Deck
 - a. Delete paragraph 1.3.C in its entirety
 - b. In paragraph 1.4.A. – Delete 01300 and replace with 01340 – Shop Drawings, Product Data, and Samples
15. Section 05400 – Cold-Formed Metal Framing
 - a. Delete paragraph 1.2.B.1. in its entirety
 - b. In paragraph 1.2.B.2+3 – Delete 09255 and replace with 09260 – Gypsum Board Assemblies
16. Section 05500 – Miscellaneous Metal
 - a. Delete paragraph 1.03.G in its entirety.
 - b. Delete paragraph 1.03.K in its entirety.
 - c. Delete paragraph 1.03.M in its entirety.
 - d. In paragraph 1.04.A – Delete 01300 and replace with 01340 – Shop

Drawings, Product Data, and Samples

17. Section 05530 – Metal Gratings and Cover Plates
 - a. In paragraph 1.02.A – Delete reference to 05511 and replace with 05500 – Miscellaneous Metals
 - b. In paragraph 1.03.A – Delete 01300 and replace with 01340 – Shop Drawings, Product Data, and Samples
18. Section 07115 – Bituminous Dampproofing
 - a. Delete paragraph 1.2.B.1 in its entirety
19. Section 07555 – Modified Bituminous Protected Membrane Roofing
 - a. In paragraph 1.2.B.1 – Delete 06100 Rough Carpentry and replace with 06105 - Miscellaneous Carpentry
 - b. In paragraph 1.2.B.4 – Delete reference to 15165 and replace with 15093 – Sleeves and Seals for HVAC Piping
 - c. In paragraph 2.5.G – Delete reference to 07620 and replace with 07720 – Roof Accessories
20. Section 09310 – Revise title from “Ceramic Tile” to “Porcelain Tile”.
 - a. Delete paragraph 1.2.B.1 in its entirety
 - b. Delete paragraph 1.5.E in its entirety
21. Section 09705 – Epoxy Resin Composition Flooring
 - a. Delete paragraph 1.4.C in its entirety
22. Section 09911 – Exterior Painting
 - a. Delete paragraph 1.3.A in its entirety
23. Section 09912 – Interior Painting
 - a. Delete paragraph 1.2.B.1 in its entirety
24. Section 09960 – High-Performance Coatings
 - a. In top and bottom footer, delete 099600 and replace with 09960
25. Section 11315 – Packaged Pump Station

- a. In paragraph 1.04.G – Delete 13410, Instrumentation Control Systems and Field Devices and replace with 01782 – Operations and Maintenance Data
- 26. Section 11420 – Peristaltic Sampling Pumps
 - a. Delete Section 11420 in its entirety
- 27. Section 11600 – Lab Equipment
 - a. Remove and Replace Section 11600 in its entirety.
- 28. Section 12500 – Furniture Systems. Add to Paragraph 2.01. A. 1 the following:
 - b. Systems:
 - “Volterra” for private enclosed offices.
 - “Leverage” for open plan work stations.
- 29. Section 16711 – Pathways for Communications Systems
 - a. In paragraph 3.3.A – Delete 16092 and replace with 16091 – Sleeves and Sleeve Seals for Electrical Raceways and Cabling
- 30. Section 16712 – Grounding and Bonding for Communications Systems
 - a. In paragraph 1.6.A.1 – Delete 017823 and replace with 01782 – Operations and Maintenance Data

CHANGES TO DRAWINGS

1. Drawing No. G-001

Replace Drawing No. G-001 in its entirety with the attached Drawing No. G-001.

2. Drawing No. 01-C-110

Replace Drawing No. 01-C-110 in its entirety with the attached Drawing No. 01-C-110.

3. Drawing No. 01-C-111

Delete Drawing No. 01-C-111 in its entirety.

4. Drawing No. 01-C-112

Delete Drawing No. 01-C-112 in its entirety.

5. Drawing No. 01-C-211

Delete Drawing No. 01-C-211 in its entirety.

6. Drawing No. 01-C-212

Delete Drawing No. 01-C-212 in its entirety.

7. Drawing No. 01-A-603

Replace Drawing No. 01-A-603 in its entirety with the attached Drawing No. 01-A-603.

8. Drawing No. 01-E-103

Replace Drawing No. 01-E-103 in its entirety with the attached Drawing No. 01-E-103.

9. Drawing No. 09-A-130

Replace Drawing No. 09-A-130 in its entirety with the attached Drawing No. 09-A-130.

10. Drawing No. 09-A-131

Replace Drawing No. 09-A-131 in its entirety with the attached Drawing No. 09-A-131.

11. Drawing No. 09- A-132

Replace Drawing No. 09-A-132 in its entirety with the attached Drawing No. 09-A-132.

12. Drawing No. 09-A-201

Replace Drawing No. 09- A-201 in its entirety with the attached Drawing No. 09- A-201

13. Drawing No. 09-A-403

Replace Drawing No. 09-A-403 in its entirety with the attached Drawing No. 09-A- 403

14. Drawing No. 09-A-501

Replace Drawing No. 09-A-501 in its entirety with the attached Drawing No. 09-A-501.

15. Drawing No. 09-A-504

Replace Drawing No. 09-A-504 in its entirety with the attached Drawing No. 09-A-504.

16. Add Drawing No. 01-A-801. Sheet 33A of 149

17. Drawing No. 09-E-204

Replace Drawing No. 09-E-204 in its entirety with the attached Drawing No. 09-E-204.

RFI RESPONSES

1. The proposed sample lines at the NEWPP show to be run in an existing concrete pipe trench. It was mentioned during the walk through that the trenches are going to be modified in another project and that we will not be able to do the work required in this contract until the work in the other project has been completed. Please confirm whether or not this is the case. If it is I believe the other project has a contract time of 3 years and has not bid yet. It does not seem like a good idea to tie the completion of work in this contract to a much larger project with a much longer contract time.

Response: The future work associated with the sample lines (SP01, SP02, SP03 and SP04) has been deleted from the project work. These four sample lines are now installed, terminate in an existing concrete trench and are capped. See revised Drawing 01-C-110.

2. The notes on sheet 7 state that the buried and below grade portion of the sample lines is to be HDPE DR 11. Is it acceptable to use schedule 80 PVC as a substitute for the HDPE?

Response: Schedule 80 PVC is acceptable as a substitute for HDPE pipe for the material of the proposed buried and below grade sample lines.

3. How is access at the Leeland Annex Building going to be handled? There will be a lot of truck traffic as well as regular traffic from our workers. Will we be able to open the gates? Will the City keep a security guard at the gates during working hours? Please confirm.

Response: As discussed at the pre-bid meeting with City of Houston property representative: the construction access will be through the existing vehicle entry gates on the south side of the property, general contractor will provide their own lock at the gates for delivery/access to the construction site.

4. The plans and specs call for the laboratory tops to be Corian, but they also say chemical resistance. We are not sure if Corian is considered chemical resistant. Laboratory tops are typically epoxy. Please confirm whether epoxy laboratory tops are acceptable.

Response: Provide "Corian" as specified.

5. We have asked by subcontractors if the site would be open again for inspection; please advise if this is possible.

Response: City of Houston will provide access to sites. Contact: John Msigwa, P.E., Project Manager, 832-395-2318.

6. Sheet 01-C-101; identifies proposed site storm work, parking and sidewalks by others. Will this work be done in parallel with the improvement work at the NEWPP Administration Building?

Response: Other contractors may be working on site as well.

7. The specifications provided for the project include several sections which would appear to be non-applicable to this project including sections applicable

specifically to Question 1 above. Additionally, there are specifications for irrigation and landscaping; however, there are no landscaping drawings. Can you clarify by addenda the sections which are non-applicable to this project?

Response: These particular sections are City of Houston standard specifications; however, the following sections are not in the scope of work: Section 02811 Landscape Irrigation and Section 02915 Tree Planting.

8. For temporary power and water, will be able to tie-into existing City services? Has the City of Houston identified a lay-down and storage area for the NEWPP project?

Response: Yes. Lay-down areas are near/adjacent to work areas.

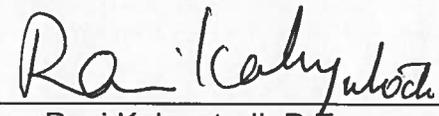
9. Specs show 1/2" Solids Passage, Plan Sheet shows 2" Solids Passage and our pump passes a 1-1/2" Solid. Great fit with our pump but we have to know for sure if a 1-1/2" solids passage will be acceptable. This is critical because if not, we are not going to be able to bid and I do not want to waste anymore time.

Response: The minimum sphere diameter required to pass through the pump is 0.5-inch as indicated in the Specification 11315.

10. Is Schedule 80 PVC for discharge piping acceptable? Plans shows Galvanized Piping.

Response: Schedule 80 PVC is an acceptable material for the discharge piping associated with the proposed lift station.

END OF ADDENDUM NO. 1

DATED: 

 Ravi Kaleyatodi, P.E.
Senior Assistant Director
Department of Public Works
and Engineering

END OF DOCUMENT

Document 00010

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NOTE: Bold capitalized Specification Sections are included in the City of Houston Department of Public Works and Engineering Standard Construction Specifications for Wastewater Collection Systems, Water Lines, Storm Drainage, Street Paving, and Traffic located here:
http://documents.publicworks.houstontx.gov/document-center/cat_view/88-engineering-and-construction/92-specifications/208-division-02-16-standard-specifications.html; and are incorporated in Project Manuals by reference as if copied verbatim. Documents listed "for filing" are to be provided by Bidder and are not included in this Project Manual unless indicated for example only. The Document numbers and titles hold places for actual documents to be submitted by Contractor during Bid, post-bid, or construction phase of the Project. Specification Sections marked with an asterisk (*) are amended by a supplemental specification, printed on blue paper and placed in front of the Specification it amends. Documents in the 200, 300 and 400 series of Division 00, except for Document 00410B – Bid Form, Part B, are not part of the Contract.

<u>Doc. No.</u>	<u>Document Title</u>	<u>Doc. Date</u>
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00041	List of Pre-qualified Asbestos & Lead Abatement Contractors	03-21-2012

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00210	Supplementary Instructions to Bidders	08-01-2015
00220	Request for Bid Information	06-11-2004

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00430	Bidder's Bond (For filing; Example Form)	02-01-2004
00450	Bidder's Statement of MWBE/PDBE/DBE/SBE Status	07-01-2013
00452	Contractor Submission List - Fair Campaign Ordinance	04-30-2004
00453	Bidder's Statement of Residency	02-01-2004
00454	Affidavit of Non-interest	02-01-2004
00455	Affidavit of Ownership or Control	09-04-2007
00457	Conflict of Interest Questionnaire	02-28-2006

RENOVATION OF THE 4200 LEELAND ANNEX &
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00471	Pre-bid Good Faith Efforts.....	08-01-2015
00472	Bidder's Goal Deviation Request.....	08-01-2015
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00600	List of Proposed Subcontractors and Suppliers.....	07-01-2013
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00602	Contractor's Drug Free Workplace Policy (For filing)	
00604	History of OSHA Actions and List of On-the-job Injuries.....	02-01-2004
00605	List of Safety Impact Positions	02-01-2004
00606	Contractor's Certification of No Safety Impact Positions	02-01-2004
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00611	Statutory Payment Bond.....	05-17-2005
00612	One-year Maintenance Bond.....	05-17-2005
00620	Affidavit of Insurance (with attached Certificates of Insurance)	02-01-2004
00622	Name and Qualifications of Proposed Superintendent (For filing)	
00624	Affidavit of Compliance with Affirmative Action Program	02-01-2004
00630	(POP-2) Certification of Compliance with Pay or Play Program.....	07-03-2012
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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):

THIS IS A CONSOLIDATED BID FORM FOR THE FOLLOWING TWO LOCAL SITES:

- Renovation of the 4200 Leeland Annex
- Improvements at the NEWPP Administration Building

Renovation of the 4200 Leeland Annex:

A1. STIPULATED PRICE:

\$N/A

(Total Bid Price; minus Base Unit Prices, Extra Unit Prices, Cash Allowances and All Alternates, if any)

B1. BASE UNIT PRICE TABLE:

B1. BASE UNIT PRICES - Renovation of the 4200 Leeland Annex:						
Item No.	Spec Ref.	Base Unit Short Title	Unit of Measure	Estimated Quantity	Unit Price (this column controls)	Total in figures
1.	01502	Mobilization	LS	1	\$150,000.00 ⁽¹⁾	\$150,000.00 ⁽¹⁾
2.	01555	Traffic Control and Regulation	LS	1	[\$1,000.00] ⁽²⁾	[\$1,000.00] ⁽²⁾
3.	02411	Selective Demolition	LS	1		
4.	ALL	Water Quality Laboratory	LS	1		
5.	11600, 11440, 12566	Laboratory Equipment and Appliances	LS	1		
6.	12500	Furniture	LS	1		
7.	02317, 15400	Acid Neutralization Sump	EA	1		
8.	02317, 15400	Sample Well	EA	1		

RENOVATION OF THE 4200 LEELAND ANNEX &
IMPROVEMENTS AT THE NEWPP ADMINISTRATION BUILDING
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**BID FORM
PART B**

B1. BASE UNIT PRICES - Renovation of the 4200 Leeland Annex:						
Item No.	Spec Ref.	Base Unit Short Title	Unit of Measure	Estimated Quantity	Unit Price (this column controls)	Total in figures
9.	02317, 02506, 02531, 02533, 02260	4" PVC Pipe	LF	60		
10.	02506, 02531, 02533, 02260	4" PVC Clean Out	EA	2		
11.	02317, 02506, 02531, 02533, 02534, 02260	Sanitary Sewer Connection to existing sewer line	LS	1		
12.	02317, 02502, 02511, 02260	8" Water Line for Fire Pump	LF	30		
13.	02502, 02512, 02260	8" x 8" Tap & Sleeve and Valve	EA	1		
14.	02526, 02260	6" Fire Service Turbine Meter, Vault and Post Indicator Valve	EA	1		
15.	02502, 02513, 02260	Wet Connection to 8" Water Line	EA	1		
16.	07555, 07620, 07710, 07720	Remove and Replace Roofing	LS	1		
17.	13730, 13740, 13760	Security Equipment, Controls and Conductors	LS	1		
18.	16711, 16712, 16714, 16717	IT/Communications	LS	1		
19.	01650	Provide electronically completed Technical Asset Data forms in accordance with Specification 01650 using electronic Microsoft Excel format template provided by CM. Submit hard copies of all electronic files.	LS	1		
TOTAL BASE UNIT PRICES FOR B1.: Renovation of the 4200 Leeland Annex						

RENOVATION OF THE 4200 LEELAND ANNEX &
IMPROVEMENTS AT THE NEWPP ADMINISTRATION BUILDING
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BID FORM
PART B

C1. EXTRA UNIT PRICE TABLE:

C1. EXTRA UNIT PRICES - Renovation of the 4200 Leeland Annex:						
Item No.	Spec Ref.	Extra Unit Short Title	Unit of Measure	Estimated Quantity	Unit Price (this column controls)	Total in figures
20.	02318	Extra hand excavation	CY	50	[\$40.00] ⁽²⁾	[\$2,000.00] ⁽²⁾
21.	02318	Extra machine excavation and backfill	CY	50	[\$18.00] ⁽²⁾	[\$900.00] ⁽²⁾
22.	02321	Furnish, place and compact extra backfill material	CY	50	[\$14.00] ⁽²⁾	[\$700.00] ⁽²⁾
23.	02321	Extra Cement stabilized sand backfill	CY	50	[\$15.00] ⁽²⁾	[\$750.00] ⁽²⁾
24.	01270	Extra Material Hauling	CY	50	[\$5.00] ⁽²⁾	[\$250.00] ⁽²⁾
25.	02318	Extra Bank Sand	CY	50	[\$5.00] ⁽²⁾	[\$250.00] ⁽²⁾
26.	02502	Extra 8" Water Line for Fire Pump	LF	100	[\$150.00] ⁽²⁾	[\$15,000.00] ⁽²⁾
27.	02531	Extra 4" PVC Pipe for Sanitary Sewer	LF	50	[\$55.00] ⁽²⁾	[\$2,750.00] ⁽²⁾
TOTAL EXTRA UNIT PRICES FOR C1.: Renovation of the 4200 Leeland Annex						[\$22,600.00]⁽²⁾

D1. CASH ALLOWANCE TABLE:

D1. CASH ALLOWANCES - Renovation of the 4200 Leeland Annex:			
Item No.	Primary Spec Ref.	Cash Allowance Short Title	Cash Allowance in figures (1)
28.	N/A	City of Houston Building Permit Fee	\$9,000.00
29.	15400	Relocation and Installation of the equipment for two De-ionized Water Systems and components by Mueller Water Conditioning, Inc.	\$10,000.00
TOTAL CASH ALLOWANCES FOR D1.: Renovation of the 4200 Leeland Annex			\$19,000.00

E1. ALTERNATES TABLE - N/A

F1. TOTAL BID PRICE FOR

Renovation of the 4200 Leeland Annex:

(Add Totals for Items A1., B1., C1., D1., and E1. above)

\$ _____

RENOVATION OF THE 4200 LEELAND ANNEX &
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**BID FORM
PART B**

Improvements at the NEWPP Administration Building:

A2. STIPULATED PRICE:

\$N/A

(Total Bid Price; minus Base Unit Prices, Extra Unit Prices, Cash Allowances and All Alternates, if any)

B2. BASE UNIT PRICE TABLE:

B2. BASE UNIT PRICES: Improvements at the NEWPP Administration Building:						
Item No.	Spec Ref.	Base Unit Short Title	Unit of Measure	Estimated Quantity	Unit Price (this column controls)	Total in figures
30.	01502	Mobilization	LS	1	\$50,000.00 ⁽¹⁾	\$50,000.00 ⁽¹⁾
31.	02411	Selective Demolition	LS	1		
32.	01410	Storm Water Pollution Prevention Plan	LS	1		
33.	ALL	Water Quality Laboratory	LS	1		
34.	11600, 12566	Laboratory Equipment and Appliances	LS	1		
35.	12500	Furniture	LS	1		
36.	ALL	Storage Building to include lighting and HVAC	LS	1		
37.	ALL	Interior Renovations	LS	1		
38.	09521	Acoustical Insulation/(Panel Installation in Conference Room	LS	1		
39.	02775	Reinforced Concrete Sidewalk, 4-1/2" thick	SF	1,200		
40.	10730	Aluminum Canopy	LF	180		
41.	02317, 02506, 02531, 02533, 02260	4" Influent Line	LF	20		

RENOVATION OF THE 4200 LEELAND ANNEX &
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**BID FORM
 PART B**

B2. BASE UNIT PRICES: Improvements at the NEWPP Administration Building:						
42.	02519	¾" diameter HDPE DR 11 sample lines installed by direct bury	LF	3,000		
43.	11420	Core Saw Existing Concrete Trench Wall	LS	1		
44.	02519, 02513	Connection of ¾" diameter Sample Lines to Sample Points	EA	3		
45.	11315	Sample Water Recycle Lift Station to include discharge sump pump with wet well, 3" discharge pipes, valves and valve vault and electrical service connection	EA	1		
46.	02532, 02317, 02260	3" Force Main, underground installation and connection to basin	LF	1,100		
47.	03300	Bollard	EA	2		
48.	01650	Provide electronically completed Technical Asset Data forms in accordance with specification 01650 using electronic Microsoft Excel format template provided by CM. Submit hard copies of all electronic files.	LS	1		
TOTAL BASE UNIT PRICES FOR B2.: Improvements at the NEWPP Administration Building						\$ _____

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C2. EXTRA UNIT PRICE TABLE:

C2. EXTRA UNIT PRICES - Improvements at the NEWPP Administration Building:						
Item No.	Spec Ref.	Extra Unit Short Title	Unit of Measure	Estimated Quantity	Unit Price (this column controls)	Total in figures
49.	02318	Extra hand excavation	CY	50	[\$40.00] ⁽²⁾	[\$2,000.00] ⁽²⁾
50.	02318	Extra machine excavation and backfill	CY	50	[\$18.00] ⁽²⁾	[\$900.00] ⁽²⁾
51.	02321	Furnish, place and compact extra backfill material	CY	50	[\$14.00] ⁽²⁾	[\$700.00] ⁽²⁾
52.	02321	Extra Cement stabilized sand backfill	CY	50	[\$15.00] ⁽²⁾	[\$750.00] ⁽²⁾
53.	01270	Extra Material Hauling	CY	50	[\$5.00] ⁽²⁾	[\$250.00] ⁽²⁾
54.	02318	Extra Bank Sand	CY	50	[\$5.00] ⁽²⁾	[\$250.00] ⁽²⁾
55.	02519	¾" diameter HDPE DR 11 sample lines installed by direct bury	LF	100	[\$25.00] ⁽²⁾	[\$2,500.00] ⁽²⁾
56.	02775	Extra Reinforced Concrete Sidewalk, 4-1/2" thick	SF	100	[\$6.00] ⁽²⁾	[\$600.00] ⁽²⁾
57.	02531	Extra 4" PVC Pipe for Sanitary Sewer	LF	50	[\$55.00] ⁽²⁾	[\$2,750.00] ⁽²⁾
TOTAL EXTRA UNIT PRICES FOR C2.: Improvements at the NEWPP Administration Building						[\$10,700.00]⁽²⁾

D2. CASH ALLOWANCE TABLE:

D2. CASH ALLOWANCES - Improvements at the NEWPP Administration Building:			
Item No.	Primary Spec Ref.	Cash Allowance Short Title	Cash Allowance in figures (1)
58.	N/A	City of Houston Building Permit Fee	\$6,000.00
TOTAL CASH ALLOWANCES FOR D2.: Improvements at the NEWPP Administration Building			\$6,000.00

E2. ALTERNATES TABLE: N/A

F2. TOTAL BID PRICE FOR

Improvements at the NEWPP Administration Building: \$ _____

(Add Totals for Items A2, B2, C2, D2., and F2 above)

RENOVATION OF THE 4200 LEELAND ANNEX &
IMPROVEMENTS AT THE NEWPP ADMINISTRATION BUILDING
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BID FORM
PART B

SUMMARY OF BID PRICES FOR RENOVATION OF THE 4200 LEELAND
ANNEX & IMPROVEMENTS AT THE NEWPP ADMINISTRATION BUILDING

F1. TOTAL BID PRICE FOR THE 4200 LEELAND ANNEX: \$ _____
(Add Totals for Items A1., B1., C1., D1., and E1. above)

F2. TOTAL BID PRICE FOR IMPROVEMENTS AT THE NEWPP ADMINISTRATION
BUILDING: \$ _____
(Add Totals for Items A2., B2., C2., D2., and E2. above)

GRAND TOTAL BID PRICE FOR
RENOVATION OF THE 4200 LEELAND ANNEX &
IMPROVEMENTS AT THE NEWPP ADMINISTRATION BUILDING: \$ _____
(Add Totals for Items F1. and F2. 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 B1 through E2:

- (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, but not decreased, by crossing out the Minimum and inserting revised price on the line above. Cannot be decreased by the Bidder.

END OF DOCUMENT

00410B-7 Addendum No. 1 Bidder's Initials []
08-01-2015

SECTION 01110
SUMMARY OF WORK

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Summary of the Work including Work Covered by the Contract Documents, Cash Allowances, City-Furnished Products, Work Sequence, Contract Use of Premises, Warranty, Minimum Conditions for Substantial Completion, General Construction Notes and Confidentiality of Contract Documents
- B. Work related to this Section is found in:
 - 1. Section 01110 – Construction Phasing
 - 2. Section 01325 – Construction Schedule

1.02 PROJECT INFORMATION

Project Locations: Northeast Water Production Plant
12121 N. Sam Houston Parkway East
Humble, Texas 77396

4200 Leeland Annex
4200 Leeland
Houston, Texas 77023

- A. Owner: City of Houston.
 - 1. Owner's Representative at NEWPP: Drew Molly, Operations Manager.
 - 2. Owner's Representative at 4200 Leeland Annex: Fabian Heaney, Lab Operations Manager.
- B. Architect: Huitt-Zollars, Inc.
 - 1500 Dairy Ashford, Suite 200
 - Houston, Texas 77077-3858
 - Attn: Will Krasner, P.E., Project Manager
- C. Texas Department of Licensing and Regulation (TDLR) ADA project numbers are as follows:
 - 1. Renovation of the 4200 Leeland Annex – EABPRJ #B6800268.

2. Improvements at the NEWPP Administration Building – EABPRJ #B6800271.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

- A. The Work of Project is defined by the Contract Documents and consists of the following:

Renovation of 4200 Leeland Annex

BASE UNIT PRICE

1. Mobilization - The work shall include, but not be limited to, mobilization, demobilization, clean up, site restoration, bonds, insurance, closeout procedures, training, commissioning and requirements in Division 1 – General Requirements.
2. Traffic Control and Regulation - The work shall include, but not be limited to, requirements in Sections 01554 – Traffic Control and Street Signs and Section 01562 – Traffic Control and Regulation.
3. Selective Demolition - The work shall include, but not be limited to, demolition and repair of existing building infrastructure to complete project work identified in the drawings and the requirements of Section 01731 – Cutting and Patching, Section 01576 – Waste Material Disposal and Section 2411 – Selective Demolition.
4. Water Quality Laboratory - The work shall include, but not be limited to, all interior and exterior renovations to building, restrooms and exterior walls; floorings, ceilings, windows, partitions, finishes, millwork, casework, doors and hardware; electrical service and lighting; HVAC equipment, ductwork, exhausts, fans and roof penetrations; structural work; fire pump, piping and room; fire alarms and fire suppression; and plumbing, fixtures, sinks, gas piping and eyewashes as required in the drawings and specifications.
5. Laboratory Equipment and Appliances – The work shall include, but not be limited to, providing, and relocating Owner-provided, laboratory equipment and appliances to include installation as required in the drawings and Section 11600 – Lab Equipment and Section 12566 – Appliances.
6. Furniture - The work shall include, but not be limited to, requirements in Section 12360 – Laboratory Casework and Section 12500 Furniture Systems.
7. Acid Neutralization Sump - The work shall include, but not be limited to, excavation, acid neutralization sump, PVC connections, bedding, backfill and turf establishment as required in drawings and Division 2 – Site Work.
8. Sample Well - The work shall include, but not be limited to, excavation, sample well, PVC connections, bedding, backfill and turf establishment as required in drawings and Division 2 – Site Work.

9. 4" PVC Pipe - The work shall include, but not be limited to, excavation, PVC pipe and connections, bedding, backfill, turf establishment and testing as required in the drawings, Section 02531 – Gravity Sanitary Sewers and Section 02533 – Acceptance Testing for Sanitary Sewers.
10. 4" PVC Clean Out - The work shall include, but not be limited to, excavation, PVC Clean Out and connections, bedding, backfill and turf establishment as required in drawings and Division 2 – Site Work.
11. Sanitary Sewer Connection to existing sewer line – The work shall include, but not be limited to, excavation, PVC pipe and connections, bedding, backfill and turf establishment as required in drawings and Division 2 – Site Work.
12. 8" Water Line for Fire Pump - The work shall include, but not be limited to, excavation, ductile iron pipe and connections, wall penetration, bedding, backfill, turf establishment, disinfection and testing as required in drawings and Division 2 – Site Work.
13. 8" x 8" Tapping Sleeve and Valve - The work shall include, but not be limited to, providing and installing 8" x 8" tapping sleeve and valve as required in the drawings and in Section 02525 – Tapping Sleeves and Valves.
14. 6" Fire Service Turbine Meter, Vault and Post Indicator Valve - The work shall include, but not be limited to, excavation; 6" fire service turbine meter, vault and post indicator valve; connections to ductile iron pipe; and bedding, backfill and turf establishment as required in the drawings and Division 2 – Site Work.
15. Wet Connection to 8" Water Line - The work shall include, but not be limited to, wet connection to existing 8" water line as required in the drawings and in Section 02513 – Wet Connections.
16. Remove and Replace Roofing – The work shall include, but not be limited to, demolition of existing roofing to complete project work identified in Section 01731 – Cutting and Patching, Section 01576 – Waste Material Disposal and Section 024119 – Selective Demolition and installation of plywood, insulation panels, mechanical fasteners, penetrations, roofing and flashing as required in the drawings and specifications.
17. Security Equipment, Controls and Conductors – The work shall include, but not be limited to, providing and installing security cameras (interior and exterior), security system control equipment, conduit and conductors as required in the drawings and specifications.
18. IT/Communications - The work shall include, but not be limited to, providing and installing conduit, cabling, receptacles, twenty eight (28) Office/VOIP phones, one (1) conference phone and two (2) wall mounted phones with wall-mount adapter as required in the drawings, specifications and the City of Houston's Houston Information Technology Systems "Telecommunications Cabling Systems Standards", Revision 2.0 dated June 25, 2015.

19. Provide electronically completed Technical Asset Data forms in accordance with specification 01650 using electronic Microsoft Excel format template provided by CM. Submit hard copies of all electronic files.

EXTRA UNIT PRICE WORK

Includes Unit Price Work bid items numbered 20-27 as shown in Section 00410B.

CASH ALLOWANCE

28. City of Houston Building Permit Fee for Renovation of 4200 Leeland Annex
29. Contractor to use Mueller Water Conditioning, Inc. for relocation and installation of the equipment for two De-ionized Water Systems and components.

Improvements at the Northeast Water Purification Plant Administration Building

BASE UNIT PRICE

30. Mobilization - The work shall include, but not be limited to, mobilization, demobilization, clean up, site restoration, bonds, insurance, closeout procedures, training, commissioning and requirements in Division 1 – General Requirements.
31. Selective Demolition - The work shall include, but not be limited to, demolition and repair of existing building infrastructure to complete project work identified in the drawings and the requirements of Section 01731 – Cutting and Patching, Section 01576 – Waste Material Disposal and Section 02411 – Selective Demolition.
32. Storm Water Pollution Prevention Plan – The work shall include, but not limited to, installation of inlet protection barriers and best management practices as required in the drawings and Section 01410 – TPDES Requirements.
33. Water Quality Laboratory - The work shall include, but not be limited to, all interior and exterior renovations to new laboratory area in the building; floorings, ceilings, windows, finishes, millwork, casework, doors and hardware; specialty items; electrical service and lighting; HVAC equipment, ductwork, exhausts, fans and wall penetrations; fire alarms and fire suppression; plumbing, fixtures, sinks, piping and eyewashes as required in the drawings and specifications.
34. Laboratory Equipment and Appliances – The work shall include, but not be limited to, providing laboratory equipment and appliances to include installation as required in the drawings and Section 11600 – Lab Equipment and Section 12566 – Appliances.
35. Furniture - The work shall include, but not be limited to, requirements in Section 12360 – Laboratory Casework and Section 12500 Furniture Systems.
36. Storage Building to include lighting and HVAC - The work shall include, but not limited to, excavation, fill, reinforced concrete foundation and slab, walls, masonry,

- reinforcement, roof and roofing, electrical service, lighting, doors and hardware as required in the drawings and specifications.
37. Interior Renovations - The work shall include, but not be limited to, all interior renovations in the building; floorings, ceilings, windows, finishes, doors and hardware; electrical service and lighting; HVAC equipment, ductwork, exhausts, fans and wall penetrations; plumbing, fixtures, sinks, piping and eyewashes as required in the drawings and specifications.
 38. Acoustical Insulation/Panel Installation in Conference Room - The work shall include, but not limited to, providing and installing acoustical insulation and panels in conference room as required in the drawings and in Section 09511 – Acoustical Panel Ceilings and Section 09521 – Acoustical Wall Panes.
 39. Reinforced Concrete Sidewalk, 4-1/2" thick - The work shall include, but not limited to, excavation, fill, placement of 4-1/2" reinforced concrete sidewalk as required in the drawings and Section 02775 – Concrete Sidewalks.
 40. Aluminum Canopy - The work shall include, but not limited to, providing and installing a manufacturer's aluminum canopy over new and existing sidewalk and pavement to include connection to building as required in the drawings and Section 10730 – Walkway Covers.
 41. 4" Influent Line - The work shall include, but not be limited to, excavation, pipe and connections, bedding, backfill, turf establishment and testing as required in the drawings, Section 02531 – Gravity Sanitary Sewers and Section 02533 – Acceptance Testing for Sanitary Sewers.
 42. 3/4" Diameter HDPE DR 11 Sample Lines installed by direct bury – The work shall include, but not limited to, excavation, providing and installing 3/4" Diameter HDPE DR 11 Sample Lines by direct bury and compacted backfill as required in the drawings and specifications.
 43. Core Saw Existing Concrete Trench Wall – The work shall include, but not limited to, core sawing the existing concrete trench wall, providing and installing four (4) sample lines and capping lines as required in the drawings and specifications.
 44. Connection of 3/4" diameter Sample Lines to Sample Points - The work shall include, but not limited to, excavation, installation and connection of 3/4" diameter sample lines to sample points to include valves, tees, reducers and fittings as required in the drawings and specifications.
 45. Sample Water Recycle Lift Station to include discharge sump pump with wet well, 3" discharge pipes, valves and valve vault and electrical service connection - The work shall include, but not limited to, sample water recycle lift station to include discharge sump pump with wet well, 3" discharge pipes, valves and valve vault and electrical service connection as required in the drawings, Section 11315 – Package Pump Station and other specifications.

46. 3" Force Main, underground installation and connection to basin - The work shall include, but not limited to, excavation, 3" force main, connections, bedding, backfill, turf establishment and testing as required in drawings and Section 02532 – Sanitary Sewer Force Mains and Section 02533 – Acceptance Testing for Sanitary Sewers.
47. Bollard - The work shall include, but not limited to, installation of reinforced concrete, painted pipe bollard with foundation as required in the drawings and specifications.
48. Provide electronically completed Technical Asset Data forms in accordance with specification 01650 using electronic Microsoft Excel format template provided by CM. Submit hard copies of all electronic files.

EXTRA UNIT PRICE WORK

Includes Unit Price Work bid items numbered 49 – 57 as shown in Section 00410B.

CASH ALLOWANCE

58. City of Houston Building Permit Fee

Contractor shall submit cost proposals to the City Project Manager for approval prior to beginning work on any work item covered by Cash Allowances. Contractor shall be entitled to payment for costs approved by the City Project Manager only. The Cash Allowances provide an upper limit for payment for the work covered, and do not guarantee payment to the Contractor of any portion, or all, of the stated Cash Allowances.

1.3 CONSTRUCTION PHASING

1. Work associated with the "Renovation of the 4200 Leeland Annex" shall start first and be substantially complete within 270 calendar days after Date of Commencement of the Work. Work for "Improvements at the NEWPP Administration Building" cannot start before November 2016. The contractor shall submit the submittals and obtain the approval for ordering materials for both locations. The contractor shall order and obtain the equipment which has a long time delivery schedule and store the material as stated in the contract documents.

1.4 ALTERNATES

There are no alternates included in this project

1.5 CITY-FURNISHED PRODUCTS

Owner will furnish products indicated. The work includes relocation, handling, storing, protecting, and installing owner-furnished products.

1. Refer to: "Lab Equipment Schedules" in drawings.

1.6 CONTRACTOR'S USE OF PREMISES

2. Comply with procedures for access to the site and Contractor's use of rights-of-way as specified in section 01145—use of Premises with security requirement specified in section 01560
3. Space within the existing plant site is limited. Contractor shall have use of Project site for construction operations as indicated on Drawings by the Contract limits and as indicated by requirements of this Section
4. The contractor may determine that additional work area, storage sites, access to plant sites or temporary right-of-way, are required for proper completion of the work. If the above mentioned items are necessary, the Contractor shall be solely responsible for obtaining such items and shall pay all costs in connection with such items.
5. It shall be understood that the responsibility for protection and safekeeping of equipment and materials on or near the site will be entirely that of the Contractor and that no claim shall be made against the Owner by reason of any act of any employee or trespasser. It shall be further understood that should any occasion arise necessitating access to the sites occupied by these stored materials and equipment, Contractor owning or responsible for the stored materials and/or equipment shall immediately move same. No materials or equipment may be placed upon the property of the owner unless the Owner has agreed to the location contemplated by the Contractor to be used for storage.
6. Any and all grass or earth disturbed as a result of the construction shall be re-graded, with new sod placed and maintained by the Contractor until healthy growth is established. Grass areas of the plant inside the agreed construction areas shall be mowed regularly and watered sufficiently by the contractor to maintain the vegetation.
7. In no case shall the contractor affect the existing treatment process in any manner and shall not degrade the existing stream quality. Any fine levied against the Owner, by TCEQ or other regulatory agency having jurisdiction resulting from an action and/or inaction or the Contractor shall be paid by the Contractor.
8. Full Owner Occupancy: Owner will occupy both sites, Leeland and the NEWPP Administration Building during entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's day-to-day operations. Maintain existing exits unless otherwise indicated.
9. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and approval of authorities having jurisdiction.

10. City of Houston Project Manager will prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied prior to Owner acceptance of the completed Work.

1.7 WARRANTY

Comply with warranty requirements in accordance with Document 00700 – General Conditions and Document 00800 – Supplementary Conditions.

1.8 ADDITIONAL CONDITIONS FOR SUBSTANTIAL COMPLETION

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 special conditions must be met or completed:

- A. Hydrostatic testing and disinfection shall be completed and accepted by the Project Manager.
- B. Complete report of all pay items.
- C. "As-built mark-ups" of the construction drawings of all work performed shall be provided to the Project Manager as part of the project close-out procedures.

1.9 GENERAL CONSTRUCTION NOTES

- A. Contractor shall keep the plans confidential as provided in this agreement and shall not make copies of the plans. Contractor understands that the plans are confidential information under the Texas Homeland Security Act, Chapter 421 of the Texas Government Code.
- B. Contractor shall keep the Plans in a locked secure location. The company shall keep this location confidential and share this information only with its personnel, subcontractors and designated City Staff for the purpose of performing the work.
- C. The contractor shall require all sub-contractors who use the plans to sign a confidentiality agreement acceptable to the owner

2.0 PROJECT NOTICE/JUSTIFICATION

- A. This project is part of the City's Capital Improvement Program to increase the safety, reliability and the efficiency of operations at the Northeast Water Purification Plant and consolidate DWO water testing laboratories at one location and to provide additional storage.

3.0 PRODUCTS (Not Used)

4.0 EXECUTION (Not Used)

END OF SECTION

SECTION 02519

SAMPLE LINES AND FITTINGS

PART 1 – GENERAL

1.1 SECTION INCLUDES:

All labor, materials, equipment, and incidentals as shown, specified, and required to furnish and install thermoplastic piping, fittings and insulation.

1.2 MEASUREMENT AND PAYMENT:

A. Unit Prices.

1. Payment for installation of sample lines is on a linear foot basis. Measurement will be taken along the center line of the pipe from end to end. Payment will be made for each foot of sample line installed, complete in place including pipe, excavation, bedding, backfill and special backfill, shoring, earthwork, hydrostatic testing, insulation for exposed piping and accessories.
2. Refer to Section 01270 - Measurement and Payment for unit price procedures.

B. Stipulated Price (Lump Sum). If the Contract is a Stipulated Price Contract, payment for work in this Section is included in the total Stipulated Price.

1.3 REFERENCES

A. Standards referenced in this Section are:

1. ASTM D1784, Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.
2. ASTM D1785, Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80 and 120.
3. ASTM D2464, Specification for Threaded Poly (Vinyl Chlorinated) (PVC) Plastic Pipe Fittings, Schedule 80.
4. ASTM D2467, Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.
5. ASTM D2564, Specification for Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Piping Systems.
6. ASTM D3139, Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals.
7. ASTM D3261, Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing
8. ASTM D3350, Standard Specification for Polyethylene Plastics Pipe and Fittings Materials
9. ASTM F477, Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.
10. ASTM F656, Specification for Primers for Use in Solvent Cement Joints of Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings.
11. ASTM F679, Specification for Poly (Vinyl Chloride) (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings.
12. ASTM F714, Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Outside Diameter
13. ASTM F1055, Standard Specification for Electrofusion Type Polyethylene Fittings for Outside Diameter Controlled Polyethylene and Crosslinked Polyethylene (PEX) Pipe and Tubing

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14. ASTM F1674, Standard Test Method for Joint Restraint Products for Use with PVC Pipe.
15. ASTM F1760, Specification for Coextruded Poly (Vinyl Chloride) (PVC) Non-Pressure Plastic Pipe Having Reprocessed-Recycled Content.
16. NSF 14, Plastic Piping Systems Components and Related Material.
17. ANSI/NSF 61, Drinking Water System Components - Health Effects.
18. Standards of U.S. Food and Drug Administration.

1.4 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer: Shall have a minimum of five years of experience producing thermoplastic pipe and fittings substantively similar to the materials specified, and shall be able to submit documentation of satisfactory service in at least five completed installations in operation for at least five years each.
2. Installer:
 - a. Engage a single pipe installer who shall be responsible for all thermoplastic pipe Work, and who shall employ only tradesmen with specific skills and experience in the type of Work required.
 - b. Installer shall have a minimum of five years experience installing thermoplastic pipe and fittings substantively similar to the materials specified and substantively similar to or larger than the scope of thermoplastic piping Work on the Project, and shall be able to submit documentation of satisfactory experience in at least five completed installations in operation for at least five years each.

B. Component Supply and Compatibility:

1. Obtain all materials included in this Section, regardless of component Supplier, from a single thermoplastic pipe Supplier. All pipe of each material type shall be furnished by the same manufacturer.
2. Thermoplastic pipe Supplier shall review and approve to prepare all Shop Drawings and other submittals for all materials furnished under this Section.
3. Materials shall be suitable for specified service conditions and shall be integrated into overall assembly by thermoplastic pipe Supplier.

1.5 SUBMITTALS

A. Action Submittals: Submit the following:

1. Product Data:
 - a. Submit product data on pipe, fittings, gaskets, hardware, and appurtenances sufficient to demonstrate compliance with the Contract Documents.

B. Informational Submittals: Submit the following:

1. Certificates:
 - a. Submit manufacturer's certificate of compliance standards referenced in this Section.
2. Source Quality Control Submittals:
 - a. When requested by ENGINEER, submit results of source quality control tests.
3. Qualifications Statements:
 - a. Submit qualifications of manufacturer when requested by ENGINEER.
 - b. Submit qualifications of installer when requested by ENGINEER.

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1.6 DELIVERY, STORAGE AND HANDLING

- A. Delivery:
1. Deliver materials to the Site to ensure uninterrupted progress of the Work.
 2. Upon delivery inspect pipe and appurtenances for cracking, gouging, chipping, denting, and other damage and immediately remove from Site and replace with acceptable material.
- B. Storage:
1. Store materials to allow convenient access for inspection and identification. Store material off ground using pallets, platforms, or other supports. Protect packaged materials from corrosion and deterioration.
 2. Cover pipe and fittings stored outdoors.
- C. Handling:
1. Handle pipe, fittings, specials, and accessories carefully in accordance with pipe manufacturer's recommendations. Do not drop or roll material off trucks. Do not drop, roll or skid piping.
 2. Avoid unnecessary handling of pipe.
 3. Keep pipe interiors free from dirt and foreign matter.
 4. Protect interior linings and exterior coatings of pipe and fittings from damage. Replace pipe and fittings with damaged lining regardless of cause of damage.

PART 2 – PRODUCTS

2.1 SERVICE CONDITIONS

- A. General:
1. Pipe materials shall be suitable for services intended. Refer to Drawings and piping installation section.
 2. Pipe shall be homogeneous throughout and free of visible cracks, holes, foreign inclusions, and other defects. Unless otherwise shown or indicated, pipe shall be uniform in color, opacity, density, and other physical properties.
 3. Comply with NSF 14.
 4. Buried pipe shall be capable of withstanding external live load, including impact, equal to AASHTO H-20 loading, with cover shown or indicated on the Drawings.
 5. Pipe, fittings, and appurtenances in contact with potable water or water that will be treated to become potable shall be listed in ANSI/NSF 61 as being suitable for contact with potable water, and shall comply with requirements of the authorities having jurisdiction at the Site.

2.2 POLYVINYL CHLORIDE (PVC) PIPING

- A. PVC Pipe – General Applications: Unless otherwise shown or indicated, PVC pipe shall comply with the following:
1. Manufacturers: Provide products of one of the following
 - a. Ipex, Inc.
 - b. Spears Manufacturing Company.
 - c. North American Pipe.
 - d. Or equal.
 2. Material: Unless otherwise specified, comply with the following:
 - a. Type and Grade: Type 1, Grade 1.
 - b. Wall Thickness: Schedule 80 complying with ASTM D1784 and ASTM D1785, and US Product Service PS 21-70 as having same outside diameter dimension as cast-iron pipe.

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- c. Temperature Rating: Rated for temperature to 140 degrees F.
- d. Color: Gray, unless otherwise specified.
- 3. Fittings: Type, grade, schedule, and color of fitting shall match the associated pipe.
 - a. Solvent Weld: Comply with ASTM D2467.
 - b. Threaded: Threaded fittings shall comply with ASTM D2464.
 - c. Flanged: Provide flanged fittings with EPDM gaskets.
- 4. Joints:
 - a. Solvent Weld: Use primer and solvent cement recommended by PVC pipe manufacturer for the application. Primer shall be in accordance with ASTM F656, and solvent cement shall be in accordance with ASTM D2564.
 - b. Threaded: Use 100 percent virgin polytetrafluoroethylene (Teflon or PTFE) tape for threaded fittings. Pipe shall not be threaded.
 - c. Flanged: Provide with backup flange minimum 1/8-inch thick. Backup flanges and connecting bolts shall be Type 304 stainless steel.

2.3 HIGH DENSITY POLYETHYLENE (HDPE) PIPING

- A. General Applications: Unless otherwise shown or indicated, HDPE pipe shall comply with the following:
 - 1. Manufacturers: Provide products of one of the following:
 - a. JM Eagle
 - b. Georg Fischer (GF)
 - c. ISCO Industries LLC
 - d. Or equal.
 - 2. Material: Pipe and fitting material shall have a Plastic Pipe Institute (PPI) recommended designation of PE 4710. Material shall have a cell classification of 445574C as defined by ASTM D3350. Unless otherwise specified, comply with the following:
 - a. Type and Grade: Type 1, Grade 1.
 - b. Dimension Ratio: DR 11
 - c. Minimum Pressure Rating: 200 psi
 - d. Temperature Rating: Rated for temperature to 140 degrees F.
 - e. HDPE Pipe shall conform to ASTM F714, IPS pipe size.
 - f. Color: Natural
 - 3. Fittings:
 - a. Butt Fusion Fittings - Fittings shall be made from HDPE pipe resin meeting ASTM D 3350 with a minimum cell classification of 445574C. Molded butt fusion fittings shall have a manufacturing standard of ASTM D 3261. Fabricated fittings must have the same pressure rating as the pipe; a DR less than the pipe shall be used. Fabricated fittings are to be manufactured using a Data Logger to record temperature, fusion pressure, and a graphic representation of the fusion cycle shall be part of the Quality Control records.
 - b. Electrofusion Fittings - Fittings shall be made from resin or pipe meeting ASTM D 3350 with a minimum cell classification of 445574C. Electrofusion Fittings shall meet the manufacturing standard of ASTM F 1055. Fittings shall have the same pressure rating as the pipe or higher unless otherwise specified on the plans.
 - c. Flanged and Mechanical Joint Adapters - Flanged and Mechanical Joint Adapters shall be made from materials containing resin that meets ASTM D 3350 with a minimum cell classification of 445574C.
 - 4. Transition between Unlike Materials: Unlike materials shall not be joined together by heat fusion. Accomplish transition between unlike materials by mechanical or flanged couplings capable of identical pressure ratings.

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SAMPLE LINES AND FITTINGS

2.4 PIPE INSULATION

A. Acceptable Manufacturers

1. Subject to compliance with the Contract Documents, the following manufacturers are acceptable for fiberglass insulation:
 - a. Certainteed Corporation.
 - b. Schuller (Manville).
 - c. Owens Corning.
 - d. Knauf.

B. Piping Insulation – Fiberglass

1. Preformed fiberglass pipe insulation:
 - a. Density: 4 LBS/CF.
 - b. Temperature rated: 650 DegF.
 - c. Average thermal conductivity not to exceed 0.22 (Btu-IN)/(HR-FT²-DegF) at mean temperature of 75 DegF.
 - d. Fire hazard rating:
 - 1) UL 723, ASTM E84, NFPA 255.
 - 2) Flame spread not exceeding 25 and smoke developed not exceeding 100.
2. Moisture adsorption:
 - a. ASTM C553.
 - b. Not greater than 0.5 percent moisture by volume when exposed to moisture laden air at 120 DegF and 96 percent RH.
3. Fungi and bacteria resistance:
 - a. ASTM C665.
 - b. Does not breed or promote growth.
 - c. Flame attenuated glass fibers bonded with thermosetting resin.
4. Piping jackets (general applications):
 - a. Aluminum: 16 mil embossed aluminum.
5. Provide minimum insulation thickness conforming to schedules or as shown on the Drawings.

2.5 IDENTIFICATION

A. Detectable Underground Warning Tape for Non-Metallic Pipelines:

1. Tape shall be of inert, acid- and alkali-resistant, polyethylene, five mils thick, six inches wide, with aluminum backing, and have 15,000 psi tensile strength and 80 percent elongation capability. Tape shall be suitable for direct burial.
2. Message shall read, "CAUTION [insert customized name of pipe service, i.e., "NON-POTABLE WATER", "SANITARY SEWER", "CHLORINE SOLUTION", or other appropriate service] PIPE BURIED BELOW" with bold letters approximately two inches high. Messages shall be printed at maximum intervals of two feet. Tape shall be custom colored the same as the pipeline colors as specified for the associated pipe service in Section 09901, Protective Coatings.
3. Manufacturer: Provide products of one of the following:
 - a. Brady Corporation
 - b. Seton Identification Products
 - c. Marking Services, Inc.
 - d. Or equal.

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2.6 PIPE MARKERS

- A. Description:
1. Provide pipe markers for the exposed sample lines.
- B. Products and Manufacturers: Provide one of the following:
1. Custom High Performance Pipe Markers (B-689), and SnapOn and StrapOn Pipe Markers (B-915), by Brady Worldwide, Inc., Signmark Division.
 2. Custom Ultra-Mark High Performance Pipe Markers, by Seton Identification Products, a Tricor Direct Company.
 3. Or approved equal.
- C. Pipe Markers:
1. Lettering of Titles/Legend and Color Field Size:
 - a. Letter size and color field length shall be as indicated in Table 2.5C of this Section:

TABLE 2.5C, PIPE MARKERS:
SIZE OF TEXT AND COLOR FIELD

Outside Diameter of Pipeline or Covering* (inches)	Size of Text (Legend Characters)	Minimum Length of Color Field**
3/4 to 1.25	1/2-inch	8 inches
1.5 to 1-7/8	3/4-inch	8 inches
2 to 5-7/8	1.25-inch	12 inches
6 to 9-7/8	2.5-inch	24 inches
10 and Larger	3.5-inch	32 inches
*Outside diameter includes pipe diameter plus insulation and jacketing.		
**Length of sign and color field shall be as required to accommodate required legend, and shall not be less than minimum length indicated unless required otherwise by space constraints.		

- b. Text and symbols shall be Standard Helvetica Medium, all upper case. Pipe markers shall include text with separate arrow signs indicating direction of flow of pipeline contents. Pipe markers with arrows shall be located as specified in Part 3 of this Section.
- c. Pipe markers indicating pipeline contents shall identify pipeline contents by complete name, as indicated in Table 10 14 00-B of this Section. Obtain from ENGINEER interpretation of required pipe marker text for pipelines provided under the Project that are not listed in Table 10 14 00-B of this Section.

PART 3: EXECUTION

3.1 GENERAL:

- A. Pipe and Fittings: Size as indicated on the plans. Install as shown in accordance with manufacturer's recommendations.

3.2 EXCAVATION AND TRENCHING: Section 02317 – Excavation and Backfill for Utilities and Section 02320 – Utility Backfill Materials.

3.3 HAULING, UNLOADING and DISTRIBUTING PIPE:

- A. During loading, transportation and unloading, every precaution shall be taken to prevent injury to the pipe. No pipe shall be dropped from cars or trucks, or allowed to roll down slides without proper retaining ropes. During transportation each pipe shall rest on suitable pads, strips, skids or blocks securely wedged or tied in place. Any pipe damaged shall be replaced.

3.4 BURIED PIPING INSTALLATION:

- A. Conform to manufacturer's instructions and requirements of standards and manuals listed below, as applicable:
1. ASTM D2321, ASTM D2774, ANSI/AWWA C605, AWWA M23, AWWA M45, AWWA, M55.
 2. Install pipe accurately to line and grade shown and indicated in the Contract Documents, unless otherwise approved by ENGINEER. Remove and reinstall pipes that are not installed correctly.
 3. Slope piping uniformly between elevations shown.
 4. Keep groundwater level in trench at least 24 inches below bottom of pipe before laying pipe. Do not lay pipe in water. Maintain dry trench conditions until jointing and backfilling are complete. Keep clean and protect interiors of pipe, fittings, valves, and appurtenances.
 5. For PVC piping with solvent welded joints, 2.5-inch diameter and smaller, snake piping in trench to compensate for thermal expansion and contraction.
 6. Carefully examine pipe, fittings, valves, and specials for cracks, damage, and other defects while suspended above trench before installation. Immediately remove defective materials from the Site and replace with acceptable products.
 7. Inspect interior of all pipe, fittings, valves, and specials and completely remove all dirt, gravel, sand, debris, and other foreign material from pipe interior and joint recesses before pipe and appurtenances are moved into excavation. Bell and spigot-type mating surfaces shall be thoroughly wire brushed, and wiped clean and dry immediately before pipe is laid.
 8. Field cut pipe, where required, with machine specially designed for cutting the type of pipe being installed. Make cuts carefully, without damage to pipe, coating or lining, and with smooth end at right angles to axis of pipe. Cut ends on push-on joint type pipe shall be tapered and sharp edges filed off smooth. Do not flame-cut pipe.
 9. Do not place blocking under pipe, unless specifically approved by ENGINEER for special conditions.
 10. Touch up protective coatings in manner satisfactory to ENGINEER prior to backfilling.
 11. Notify ENGINEER in advance of backfilling operations.
 12. On steep slopes, take measures acceptable to ENGINEER to prevent movement of pipe during installation.
 13. Thrust Restraint: Where required, provide thrust restraint.
 14. Exercise care to avoid flotation when installing pipe in cast-in-place concrete, and in locations with high groundwater.

3.5 EXPOSED PIPING INSTALLATION:

- A. Conform to manufacturer's instructions and requirements of standards and manuals listed in this Section and per Thermoplastic Pipe, AWWA M23
- B. Install straight runs true to line and elevation.
- C. Install vertical pipe truly plumb in all directions.
- D. Install piping parallel or perpendicular to walls of structures. Piping at angles and 45 degree runs across corners of structures will not be accepted unless specifically shown on the Contract Documents or approved by the ENGINEER.

SAMPLE LINES AND FITTINGS

- E. Install small diameter piping generally as shown when specific locations and elevations are not indicated. Locate such piping as required to avoid ducts, equipment, beams, and other obstructions.
- F. Install piping to leave all corridors, walkways, work areas, and similar spaces unobstructed. Unless otherwise approved by ENGINEER provide a minimum headroom clearance under piping and pipe supports of 7.5 feet. Clearances beneath piping shall be measured from the outermost edge of piping, flanges or other type of joint that extends beyond the nominal outside diameter of piping.
- G. Protect and keep clean interiors, fittings, and valves of pipe that will convey potable water, chemicals, and other pipe designated by ENGINEER.
- H. Cutting: Cut pipe from measurements verified at Site. Field cut pipe, where required, with a machine specially designed for cutting type of pipe being installed. Make cuts carefully without damage to pipe, coating, or lining, and with a smooth end at right angles to axis of pipe. Cut ends of push-on joint type pipe shall be tapered and sharp edges filed off smooth. Do not flame-cut pipe.
- I. Deflections at joints shall not exceed 75 percent of amount allowed by pipe manufacturer, unless otherwise approved by the Engineer.
- J. Utilize wide band supports as recommended by pipe manufacturer and approved by ENGINEER to minimize localized stresses.
- K. Provide piping passing through walls with a sleeve of wearing material to prevent abrasion damage to piping.
- L. Provide anchored supports at elbows, valves, bends in piping, and at connections to equipment and tanks.
- M. Spacing of supports shall be in accordance with the manufacturer's published recommendations at maximum design operating temperature of pipe.
- N. Provide U-clamps with wide band circumferential contact.
- O. Provide guides on long runs of piping to maintain alignment and reduce chance of elastic failure of pipe. Space guides as recommended by pipe manufacturer.
- P. Provide anchored supports to restrain joints that allow expansion. Minimize use of bellows style joints. Where required and approved by the ENGINEER provide bellows style joints with low axial force to take up pipe expansion. Flexible connectors may be used to absorb thermal movement when approved in writing by ENGINEER.
- Q. Provide devices that will reduce hydraulic pulsation in piping, together with shut-off and drain valve on all discharge lines of positive displacement pumps to reduce hydraulic hammer, and provide flexible connectors to absorb vibration. Submit details for ENGINEER to review.

3.6 SOLVENT CEMENT WELDED JOINTS:

- A. Bevel pipe ends and remove all burrs before making joint. Clean pipe and fittings thoroughly. Do not make solvent cement joints if temperature is below 40 degrees F. Do not make solvent cement welded joints in wet conditions.
- B. Use solvent cement supplied or recommended by pipe manufacturer.
- C. Apply joint primer and solvent cement and assemble joints in accordance with recommendations and instructions of manufacturer of joint materials and pipe manufacturer.
- D. Implement appropriate safety precautions when using joint primers and solvent cements. Allow air to circulate freely through pipelines to allow solvent vapors to escape. Slowly admit fluid when flushing or filling pipelines to prevent compression of gases within pipes.

3.7 FUSION JOINTS:

- A. Sections of polyethylene pipe should be joined into continuous lengths on the jobsite above ground. The joining method shall be the butt fusion method and shall be performed in strict accordance with the pipe supplier's recommendations. The butt fusion equipment used in the joining

SAMPLE LINES AND FITTINGS

procedures should be capable of meeting all conditions recommended by the pipe supplier. The butt fusion joining will produce a joint with weld strength equal to or greater than the tensile strength of the pipe itself. All field welds shall be made with fusion equipment equipped with a Data Logger. Temperature, fusion pressure and a graphic representation of the fusion cycle shall be part of the Quality Control records.

- B. Mechanical joining will be used where the butt fusion method cannot be used. Mechanical joining will be accomplished by either using a HDPE flange adapter with a ductile iron back-up ring.
- C. Hot gas fusion, threading, solvents, and epoxies will not be used to join HDPE pipe.

3.8 TRACER TAPE INSTALLATION

- A. Detectable Underground Warning Tape for Non-Metallic Pipelines:
 - 1. Provide polyethylene tracer tape with aluminum backing for buried, non-metallic piping, which includes pipe that is PVC, CPVC, polyethylene, HDPE, FRP, ABS, and vitrified clay.
 - 2. Provide magnetic tracer tape 12 to 18 inches below finished grade, above and parallel to buried pipe.
 - 3. For pipelines buried eight feet or greater below finished grade, provide second line of magnetic tracer tape 2.5 feet above crown of buried pipe, aligned along the pipe centerline.
 - 4. Tape shall be spread flat with message side up before backfilling.

3.9 INSULATION INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. General:
 - 1. Piping below ground covered with earth will not be insulated except as noted on plans.
 - 2. Consider ductwork, piping and equipment as exposed, except as otherwise indicated.
 - 3. Consider ductwork, piping and equipment in walls, partitions, floors, pipe chases, pipe shafts and duct shafts as concealed.
 - 4. Consider ductwork, piping and equipment above ceilings as concealed.
 - 5. Provide release for insulation application after installation and testing is complete.
 - 6. Apply insulation on clean, dry surfaces after inspection.
 - 7. Provide insulation continuous through wall, roof and ceiling openings, pipe hangers, supports and sleeves.
 - 8. Provide insulation with vapor barrier for piping, ductwork and equipment where surfaces may be cooler than surrounding air temperatures.
 - a. Provide vapor barrier (0.17 perm-IN; ASTM C553) continuous and unbroken.
 - b. Hangers, supports, anchors, and related items that are secured directly to cold surfaces must be adequately insulated and vapor-sealed to prevent condensation.
 - 9. Apply specified adhesives, mastics and coatings at the manufacturer's recommended coverage per unit volume.
- C. Piping Insulation - Fiberglass:
 - 1. Apply over clean dry pipe
 - a. Butt all joints together firmly.
 - 2. Seal joints, slits, miter-cuts and other exposed edges of insulation as recommended by the insulation manufacturer.
 - 3. Insulate fittings, valves, and flanges with insulation thickness equal to adjacent pipe.
 - 4. Aluminum pipe jacket:
 - a. Field-applied aluminum jacket with vapor-sealed longitudinal and butt joints.

SAMPLE LINES AND FITTINGS

- b. Provide smooth and straight joint with a minimum 2 IN overlap.
- c. Secure joints with corrosion-resistant screws spaced 0.25 to 0.50 IN back from edge.
- d. Center spacing of screws 5 IN maximum or as required to provide smooth tight-fitted joints.
- e. Place joints on least exposed side of piping to obtain neat appearance.

D. REPAIR

- 1. Whenever any factory applied insulation or job-applied insulation is removed or damaged, replace with the same quality of material and workmanship.

3.10 INSPECTION

- A. Inspect the pipe for defects before installation and fusion. Defective, damaged or unsound pipe will be rejected.

3.11 TESTING

- A. Pressure testing shall be conducted in accordance with Section 02515 – Hydrostatic Testing of Pipelines and ASTM F 2164, Field Leak Testing of Polyethylene Pressure Piping Systems Using Hydrostatic Pressure.

3.12 PAINTING

- A. Painting of exposed piping shall be conducted in accordance with Section 09901 – Protective Coating.

++ END OF SECTION ++

SECTION 11600

LABORATORY EQUIPMENT

PART 1 - GENERAL

The General Provisions of the Contract, including General and Special Conditions and the requirements of Division 1, apply to the Work in this Section.

1.1 WORK INCLUDED

- A. Equipment items as listed below by Equipment Mark Number:

LOCATION - NORTHEAST WPP ADMINISTRATION BUILDING

1. SPECTROPHOMETER
Equipment Mark Number: 012
2. COAGULANT CHARGE ANALYZER
Equipment Mark Number: 013
3. TURBIDIMETER
Equipment Mark Number: 014
4. JAR TESTER
Equipment Mark Number: 015
5. STIRRER PROBE AND PADDLE
Equipment Mark Number: 016
6. MULTI-PARAMETER METER
Equipment Mark Number: 017
7. VACUUM PUMP
Equipment Mark Number: 018
8. MAGNETIC STIRRER
Equipment Mark Number: 019
9. STIR PLATE AND STAND
Equipment Mark Number: 020
10. MOISTURE ANALYZER
Equipment Mark Number: 021
11. MOISTURE AND SOLIDS ANALYZER
Equipment Mark Number: 022

LOCATION - 4200 LEELAND ANNEX

- 12. WATER SYSTEM
Equipment Mark Number: 102
- 13. GAS CYLINDER RACK, 8 CYL, 12" Diameter
Equipment Mark Number: 106
- 14. GAS CYLINDER RACK, 2 CYL, 18" Diameter
Equipment Mark Number: 110
- 15. FUME HOOD, 72"
Equipment Mark Number: 127
- 16. FUME HOOD, 48"
Equipment Mark Number: 128
- 17. INCUBATOR
Equipment Mark Number: 141
- 18. WASHER
Equipment Mark Number: 145
- 19. COMPACT REFRIGERATOR
Equipment Mark Number: 146
- 20. REFRIGERATOR/FREEZER
Equipment Mark Number: 150
- 21. DI LAB WATER SYSTEM
Equipment Mark Number: 192
- 22. BALANCE TABLE
Equipment Mark Number: 194

- B. Installation of equipment with labor, services, and incidentals necessary for complete and operational equipment installation.
- C. Utilities to be roughed in at location recommended by manufacturer.

1.2 ALTERNATIVE BIDS

- A. Refer to Division 1 – General Requirements for possible effect on Work of this Section.

1.3 QUALITY ASSURANCE

- A. Equipment shall be produced by a manufacturer of established reputation with a minimum of five years of experience supplying specified equipment.

1.4 STANDARD AND REGULATORY REQUIREMENTS

- A. Equipment indicated within this specification section shall comply with all applicable national, state and local codes and regulations, including seismic, fire, and racking codes and regulations. Additional, more specific compliance requirements may be listed under individual equipment headings.
- B. All materials shall be made in the United States.

1.5 SUBMITTALS

- A. Refer to the Equipment Schedules on the Drawings for submittal requirements listed in the "Submittals" column of the equipment list.
- B. Product Data (PD):
 - 1. Submit Product Data in accordance with Division 1 - General Requirements of these specifications.
 - a. All Product Data submittals shall identify proposed project specific items marked by arrow, circle, underline, reproducible highlight, or other markings clearly discernable by the reviewer, to show which specific items, parts and accessories are being submitted for the project product data review. Non-marked or generic product data submittals with no marks indicating specific items, parts and accessories will be a cause for rejection.
 - 2. Restrict submitted material to pertinent data. For instance, do not include manufacturer's complete catalog when pertinent information is contained on a single page.
- C. Operation and Maintenance Manual (OM):
 - 1. Provide a complete parts list, operating instructions, and maintenance manual covering equipment at time of installation including, but not limited to:
 - a. Description of system and components.
 - b. Manufacturer's printed operating instructions.
 - c. Printed listing of periodic preventive maintenance items and recommended frequency required to validate warranties. Failure to provide maintenance information will indicate that preventive maintenance is not a condition for validation of warranties.
 - d. List of original manufacturer's parts, including suppliers' part numbers and cuts, recommended spare parts stockage quantity and local parts and service source.
 - e. Assemble and provide copies of manual in 8-1/2 by 11 inch format. Foldout diagrams and illustrations are acceptable. Manual to be reproducible by dry copy method. Provide copies per provisions of Division 1 - General Requirements.
- D. Shop Drawings (SD). Submit shop drawings in accordance with Division 1 -General

Requirements of these specifications. Refer to the Equipment Schedule for the equipment mark numbers requiring shop drawings.

1. Submitted shop drawings shall be project specific and shall include a minimum 1/8 inch to 1 foot scaled (or larger standard architectural imperial scale), dimensioned, graphical representation of the size, orientation, and location for the submitted equipment. The drawings shall further include dimensions from structural elements or architectural grid lines, operational clearances, locations of any utility service connection points, mounting requirements, and structural supports required for the submitted equipment.

E. Required Documents for Permit and Local Jurisdictional Approval:

1. Where required by local jurisdiction and/or code officials, the contractor shall be responsible for producing and submitting all documentation required for obtaining any and all applicable approvals related to the specified equipment. This documentation may include, but may not be limited to, engineered signed and stamped plans, details, anchorage layouts for storage equipment, as well as racks to show compliance with locally adopted building, fire, and other codes. A copy of these required documents shall be included with the product submittal to the architect for their review.

1.6 PRODUCT SUBSTITUTIONS

- A. Follow requirements specified in Division 1 - General Requirements.
- B. Additional costs resulting from substitution of products other than those specified, including drawing changes and construction, will be at the sole expense of the Contractor.
- C. Substitution Approval: Manufacturers listed for each equipment item may bid without submittal for that item. Manufacturers not listed shall submit for approval in accordance with "Instructions to Bidders". Prior to procurement, submittals for each equipment item by Mark Number shall be provided in accordance with Division 1 - General Requirements.

1.7 WARRANTY

- A. Warrant work specified herein for one year from substantial completion against defects in materials, function and workmanship.
- B. Warranty shall include materials and labor necessary to correct defects.
- C. Defects shall include, but not be limited to loose, damaged and missing parts and abnormal deterioration of finish.
- D. Submit warranties in accordance with Division 1 - General Requirements of these specifications.
- E. All parts shall be readily available locally in the United States.

1.8 SPECIAL WARRANTY

- A. Three years manufacturer's special extended warranty for materials and installation.

1.9 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver equipment in manufacturer's containers, appropriately packaged and/or crated for protection during shipment and storage in humid, dusty conditions. Equipment shall be stored per manufacturer's recommendation.
- B. Indelibly label all containers, including those contained in others, on outside with item description(s) per title and Mark Number of this specification.
- C. Provide equipment and materials specified complete in one shipment for each equipment item. Split or partial shipments are not permissible.

1.10 LABELING

- A. Manufacturer shall securely attach in a prominent location on each major item of equipment a non-corrosive nameplate showing manufacturer's name, address, model number, serial number, and pertinent utility or operating data.
- B. All electrical equipment and materials shall be new and shall be listed by Underwriter's Laboratories, Inc. (U.L.), or other National Recognized Testing Laboratory (NRTL), in categories for which standards have been set by that agency and labeled as such in the manufacturer's plant.

PART 2 - PRODUCTS

2.1 SPECTROPHOTOMETER
Equipment Mark Number: 012

A. Capacities and Dimensions

1. Operating Mode: Transmittance (%), absorbance and concentration (wavelength and time)
2. Wavelength Range: 190 - 1100 nm
3. Wavelength Accuracy: plus or minus 1 nm
4. Wavelength Reproducibility: < 0.1 nm nm
5. Wavelength Resolution: 0.1 nm
6. Wavelength Selection: Automatic, based on method selection
7. Spectral Bandwidth: 2 nm
8. Scanning Speed: 900 nm/min (in 1 nm steps)
9. Photometric Measuring Range: plus or minus 3 Abs
10. Photometric Accuracy: 5 mAbs at 0.0-0.5 Abs, <1% at 0.5-2.0 Abs at 546 nm
11. Data Logger: 5000 data points (result, date, time, sample-ID, user-ID)
12. Dimensions: 8.5" H x 19.7" W x 18.1" D
13. Weight: 24.25 lbs

B. Features

1. Source Lamp: Tungsten (visible range), deuterium (UV range)
2. Display: TFT 7 inch WVGA color touch
3. Preprogrammed Methods: > 250
4. User Programs: 200
5. Interfaces: USB type A (2), USB type B, Ethernet, RFID module
6. Enclosure Rating: IP20 with closed lid
7. Warranty: one year

C. Accessories

D. Manufacturer's Reference:

1. Prime manufacturer: Specifications are based on equipment identified herein by manufacturer's name and model to establish acceptable standards of quality, performance, features, and construction.
 - a. Basis of Design: HACH, Model # DR 6000 UV VIS Benchtop Spectrophotometer with RFID Technology, 1-800-227-4224, orders@hach.com
2. Other manufacturers: Contingent upon compliance with these specifications and documentation requirements set forth in SUBMITTALS, equipment produced by other manufacturers, may be considered as equivalent.

2.2 COAGULANT CHARGE ANALZER
Equipment Mark Number: 013

A. Capacities and Dimensions

1. Adjustable height stand
2. Dimensions: 8.5" W x 17.8" H x 9.2" D; Unit fully extended: 8.5"x26"x9.2"
3. Sample Volume: 250 mL to 2000 mL
4. Weight: 18 lbs
5. Power requirements: 110 VAC 60 hz, 1A

B. Features

1. Low/High conductivity gain adjustment
2. Display: -10.00 to +10.00
3. Probe Type: Immersion, quick replacement cartridge
4. Piston Type: Quick replacement
5. Signal gain: Low/High gain switch
6. Materials Contacting Sample: Delrin, stainless steel
7. Self Diagnostics: Flashing LED, motor, optoswitch
8. Warranty – one year

C. Accessories

D. Manufacturer's Reference:

1. Prime manufacturer: Specifications are based on equipment identified herein by manufacturer's name and model to establish acceptable standards of quality, performance, features, and construction.
 - a. Basis of Design: CHEMTRAC, Coagulant Charge Analyzer, Model # CCA3100, 1-800-442-8722, www.chemtrac.com
2. Other manufacturers: Contingent upon compliance with these specifications and documentation requirements set forth in SUBMITTALS, equipment produced by other manufacturers, may be considered as equivalent.

2.3 TURBIDIMETER
Equipment Mark Number: 014

A. Capacities and Dimensions

1. Accuracy: $\pm 2\%$ of reading plus 0.01 NTU from 0 to 1000 NTU; $\pm 5\%$ of reading from 1000 to 4000 NTU
2. Dimensions (H x W x D): 156 mm x 400 mm x 305 mm
3. Warranty: 2 years
4. Weight: 7.56 lbs.
5. Power Requirements: 115 to 230 VAC; 50 to 60 Hz; 60 VA maximum

B. Features

1. Air Purge: 0.1 scfm at 69 kPa, hose barb connection for 1/8 in tubing, maximum 138 kPa. Dry nitrogen or instrument-grade air.
2. Compliance Certifications: UL/CSA
3. Display Type: 8-digit LED display
4. Interface: RS232 serial (bi-directional)
5. Max. operating humidity: 90
6. Measurement Modes: NTU, EBC, Nephelo
7. Operating Temperature Range: 0 to 40 °C
8. Range: 0 to 0.999 EBC units EBC mode, ratio on: manual; 0 to 26800 Nephelos Nephelo mode, ratio on: auto, auto-decimal; 0 to 26800 Nephelos Nephelo mode, ratio on: manual
9. Regulatory: USEPA method 180.1
10. Repeatability: $\pm 1\%$ of reading or ± 0.01 NTU, whichever is greater
11. Resolution: 0.001 on lowest range
12. Response Time: 6.8 s with signal averaging off; 14 s with signal averaging on
13. Sample Cell Compatibility: 25 mm round; 12, 13, 16, and 19 mm round with optional adapter kit
14. Sample Volume: 30 mL with 25 mm sample cells
15. Serial input interface: RS232 serial interface (bidirectional)
16. Source Lamp: Tungsten lamp
17. Storage Conditions: -40 °C to 60 °C
18. User Interface: Button
19. User Interface Languages: English

C. Accessories

D. Manufacturer's Reference:

1. Prime manufacturer: Specifications are based on equipment identified herein by manufacturer's name and model to establish acceptable standards of quality, performance, features, and construction.
 - a. Basis of Design: HACH, Model # 2100N Laboratory Turbidimeter, EPA, 115 Vac, 1-800-227-4224, orders@hach.com
2. Other manufacturers: Contingent upon compliance with these specifications and documentation requirements set forth in SUBMITTALS, equipment produced by other manufacturers, may be considered as equivalent.

2.4 JAR TESTER
Equipment Mark Number: 015

A. Capacities and Dimensions

1. Four operator-programmable memory banks
2. Paddle speeds from 5 to 300 rpm in 1-rpm increments
3. Stirrers that run sequentially, independently or continuously
4. Six (6) stainless steel 1" x 3" paddles with adjustable depth to up to 9 inches
5. Six (6) standard, round, glass, 1-liter laboratory beakers

B. Features

1. Programmable Audio Signals
2. Powder-coated steel uniframe chassis
3. LED floc illuminator built into the base
4. Warranty – two year

C. Accessories

1. 120V AC adapter

D. Manufacturer's Reference:

1. Prime manufacturer: Specifications are based on equipment identified herein by manufacturer's name and model to establish acceptable standards of quality, performance, features, and construction.
 - a. Basis of Design: PHIPPS & BIRD, Programmable Jar Tester, Model # CPB900, 1-800-955-7621, www.phippsbird.com
2. Other manufacturers: Contingent upon compliance with these specifications and documentation requirements set forth in SUBMITTALS, equipment produced by other manufacturers, may be considered as equivalent.

2.5 STIRRER PROBE AND PADDLE
Equipment Mark Number: 016

A. Capacities and Dimensions

1. Description: Stirrer probe (for benchtop meters)
 - a. Diameter: 0.6 inch round (stirring paddle)
 - b. Weight: 0.8 lb.
 - c. Dimensions (L x W x H): 8.3 in. x 0.8 in. x 0.8 in.
2. Description: Stirrer paddle
 - a. Diameter: 0.6 inch round (stirring paddle)
 - b. Weight: 0.8 lb.
 - c. Dimensions (L x W x H): 0.5 in. x 0.6 in. x 0.6 in.

B. Manufacturer's Reference:

1. Prime manufacturer: Specifications are based on equipment identified herein by manufacturer's name and model to establish acceptable standards of quality, performance, features, and construction.
 - a. Basis of Design: ORION, Star Series Automatic Stirrer Probe, Model # 096019 and Replacement Paddles, Model # 096021, 1-800-225-1480, www.thermoscientific.com
2. Other manufacturers: Contingent upon compliance with these specifications and documentation requirements set forth in SUBMITTALS, equipment produced by other manufacturers, may be considered as equivalent.

2.6 MULTI-PARAMETER METER
Equipment Mark Number: 017

A. Capacities and Dimensions

1. Benchtop Multi-parameter meter that combines a pH meter, an ion meter, and a conductivity meter.
2. Two measuring channels: Channel 1, pH and Conductivity with temperature °C; Channel 2, pH, ORP/Redox or I.S.E. + °C
3. Equipped with a connection for a second stirrer which allows for a second measuring stand.
4. Equipped with a data logger with storage of up to 330 measurements per channel
5. Includes RS 232 C connectivity for printer or PC as well as a connection for external PC keyboard or barcode reader.

B. Testing Specifications

Specifications				
	Measurement Ranges	Resolution	Input Accuracy (± 1 digit)	Reproducibility (± 1 digit)
pH	-2 to 16	0.1/0.01/0.001	≤0.002	±0.001
mV	±2000	0.1/1	≤0.2	±0.1
Temp.	-20 to 150°C (-4 to 302°F)	0.1 °C (0.1°F)	≤0.2 °C (0.4°F)	±0.1°C (0.1°F)
ISE	10 ⁻⁶ M to 10 ⁻¹ M	programmable	--	--
Conductivity	0.001* μS/cm to 1000* mS/cm * With 5070 cell 0.2 μS/cm to 200 mS/cm	variable	≤0.5 %	±0.1 %
Resistivity	0 Ohm to 500 MOhm	--	≤0.5%	±0.1 %
Salinity	5.85 mg/L to 311.1 g/L NaCl	--	--	--
NaCl	--	variable	≤0.5 %	±0.1 %
TDS	0 mg/L to 500 g/L	variable	≤0.5 %	±0.1 %

C. Accessories

1. pH Electrode, Model # LZW5014.97.0002:5014
2. Conductivity Cell, Model # LZW5070.97.002:5070
3. Thermal Printer: Model # LZW8201

D. Manufacturer's Reference:

1. Prime manufacturer. Specifications are based on equipment identified herein by manufacturer's name and model to establish acceptable standards of quality, performance, features, and construction.
 - a. Basis of Design: HACH, sensION + MM374 Benchtop Multi-Parameter Meter with Accessories, Model # LPV4140T.97.002, 1-800-227-4224, orders@hach.com
2. Other manufacturers: Contingent upon compliance with these specifications and documentation requirements set forth in SUBMITTALS, equipment produced by other manufacturers, may be considered as equivalent.

2.7 VACUUM PUMP
Equipment Mark Number. 018

A. Capacities and Dimensions

1. Power rating: 1/8 Horsepower
2. Free Air flow capacity @ 0 psi: 1.9 cfm
3. Max Pressure: 60 psi
4. Max Vacuum: 25.50 in-Hg
5. < 70 dBA

6. Inlet and Outlet Size: 3/8" hose barb
7. Dimensions: 5-1/8" W x 10-15/16" H x 7-5/8" L
8. Weight: 14.4 lbs
9. Power requirements: 115 V, 60 Hz, Single Phase
10. Warranty: one year

B. Manufacturer's Reference:

1. Prime manufacturer: Specifications are based on equipment identified herein by manufacturer's name and model to establish acceptable standards of quality, performance, features, and construction.
 - a. Basis of Design: GAST, Compressor/Vacuum Pump, Model # DOA-P704-AA, 1-269-926-6171, www.gastmfg.com
2. Other manufacturers: Contingent upon compliance with these specifications and documentation requirements set forth in SUBMITTALS, equipment produced by other manufacturers, may be considered as equivalent.

2.8 MAGNETIC STIRRER
Equipment Mark Number: 019

A. Capacities and Dimensions

1. Max stirring capacity: 2.5 liters
2. Speed range: 100 rpm to 1000 rpm
3. Dimensions: 7.1" x 7.1" x 2.8"
4. Power: 110/115 V
5. Cover Material: AISI 316 Stainless Steel
6. Weight: 3.1 lbs
7. Warranty: one year

B. Accessories

1. Stir Bars – ten (10) each, Model # HI 731320

C. Manufacturer's Reference:

1. Prime manufacturer: Specifications are based on equipment identified herein by manufacturer's name and model to establish acceptable standards of quality, performance, features, and construction.
 - a. Basis of Design: HANNA INSTRUMENTS, Magnetic Stirrer, Model # HI 300N-1, 1-214-414-2214, <http://hannainst.com>
2. Other manufacturers: Contingent upon compliance with these specifications and documentation requirements set forth in SUBMITTALS, equipment produced by other manufacturers, may be considered as equivalent.

2.9 STIR PLATE AND STAND
Equipment Mark Number: 020

A. Capacities and Dimensions

1. Stirring Speed: Approximately 300 rpm at 60 Hz
2. Dimensions (H x W x D): 229 mm x 152 mm x 64 mm
3. Power Requirements (Hz): 60 Hz
4. Power Requirements (Voltage): 115 V
5. Weight: 5.73 lbs.

B. Accessories

1. Digital Titrator, Product # 1690001
2. Delivery Tubes for Digital Titrator, 90 degree bend, Project # 4157800
3. Stir Bar, Magnetic, Octagonal, Project # 2095355 – six (6) each

C. Manufacturer's Reference:

1. Prime manufacturer: Specifications are based on equipment identified herein by manufacturer's name and model to establish acceptable standards of quality, performance, features, and construction.
 - a. Basis of Design: HACH, Stir Plate, TitraStir, Product # 19400-00, 1-800-227-4224, orders@hach.com
2. Other manufacturers: Contingent upon compliance with these specifications and documentation requirements set forth in SUBMITTALS, equipment produced by other manufacturers, may be considered as equivalent.

2.10 MOISTURE ANALZER
Equipment Mark Number: 021

A. Capacities and Dimensions

1. Applications: Percent Moisture Determination, Percent Solid Determination, Percent Moisture Regain Determination and Weighing
2. Six (6) shut off criteria (manual, timed, 3 pre-defined auto settings, or user-set auto)
3. Four (4) heating profiles (standard, ramp, step, fast),
4. Heating Range: 50° to 200° C (1° C increments)
5. Power requirements: 115 V, 60 Hz

B. Features

1. Backlit dot matrix display to include % moisture, % solids, % regain, time, temperature, weight, test ID, drying curve & statistics
2. RS232 with GLP/GMP data output
3. Warranty. one year

C. Manufacturer's Reference.

1. Prime manufacturer: Specifications are based on equipment identified herein by manufacturer's name and model to establish acceptable standards of quality, performance, features, and construction.
 - a. Basis of Design: OHAUS CORPORATION, Moisture Analyzer, Model # MB45, 1-800-672-7722, <http://us.ohaus.com>
2. Other manufacturers: Contingent upon compliance with these specifications and documentation requirements set forth in SUBMITTALS, equipment produced by other manufacturers, may be considered as equivalent.

2.11 MOISTURE AND SOLIDS ANALYZER
Equipment Mark Number: 022

A. Capacities and Dimensions

1. Moisture | Solids Range: 0.005 to 100%
2. Moisture Resolution: 0.001% (Default) or programmable from 0.0 to 0.00000
3. Repeatability: 0.002% standard deviation depending on test program
4. Balance Resolution: 0.0001 g
5. Temperature Range: 25°C to 275°C controlled to $\pm 1^\circ\text{C}$, nickel chromium heating element
6. Sample Size: 100 mg to 40 g (0.2 ± 0.1 g – 39.9 ± 0.1 g)
7. Ending Criteria: Prediction, Rate, Time, Time or Rate, Temp \rightarrow Predict, Temp \rightarrow Rate, Temp \rightarrow Time or Rate; Rate can be set as low as 0.0010% per minute; Test Parameter Memory: Storage of up to 250 Programs (246 User, 4 Factory); 1000 Test Results with last 100 test graphs
8. Statistical Analysis: Mean, Standard Deviation, Relative Standard Deviation
9. Results Display: Moisture, Solids, Dry Weight, Purity
10. Linked Test Program: Programmable temperatures for free & bound moisture
11. Balance Calibration: Menu driven calibration and verification in the field
Programmable calibration reminder
12. Heater Calibration: Menu driven
13. NIST traceable using Temperature Calibration Kit
14. Self Diagnostics: Built in hardware and software diagnostics
15. Access Code: Master Code, Calibration Code
16. Power Requirements: 100-120 VAC, 50/60 Hz @ 8 A, 0.2 A heat off
17. Dimensions: 9.5" H x 11.5" W x 19.5" D
18. Weight: 32 lbs
19. Warranty: Two years, factory parts and labor (one year international)

B. Features

1. Accuracy, Durability, Reliability, Consistency and Speed
2. Fan-Assisted Cool-Down Provides 25% Faster Throughput
3. Four Decimal Place Balance
4. Menu Driven User Programmable Interface Through Keypad | Color LCD Display
5. Nitrogen Purge Capabilities
6. Parameter Expert (Develop parameters to match reference method)
7. Pass/Fail Criteria
8. Programmable Temperature Ramp Control
9. Ethernet and Serial Ports, USB

C. Accessories

D. Manufacturer's Reference:

1. Prime manufacturer: Specifications are based on equipment identified herein by manufacturer's name and model to establish acceptable standards of quality, performance, features, and construction.
 - a. Basis of Design: ARIZONA INSTRUMENTS, Moisture and Solids Analyzer, Model Computrac Max 4000XL, 1-800-528-7411, www.azlc.com
2. Other manufacturers: Contingent upon compliance with these specifications and documentation requirements set forth in SUBMITTALS, equipment produced by other manufacturers, may be considered as equivalent.

2.12 WATER SYSTEM
Equipment Mark Number: 102

A. Capacities and Dimensions

1. Dimensions: 17.5" x 13.5" x 19.5"
2. Flow Rate: Up to 2 L/hr
3. Power requirements: 110 V, 60 Hz, 1 phase

B. Features

1. With TOC Monitor
2. Nanopure Analytical UV
3. Warranty: one year

C. Accessories

D. Manufacturer's Reference:

1. Prime manufacturer: Specifications are based on equipment identified herein by manufacturer's name and model to establish acceptable standards of quality, performance, features, and construction.
 - a. Basis of Design: BARNSTEAD THERMO SCIENTIFIC, Deionizer Nanopure Diamond UV TOC Water System, Model # D11951, 1-800-442-8722, www.chemtrac.com
2. Other manufacturers: Contingent upon compliance with these specifications and documentation requirements set forth in SUBMITTALS, equipment produced by other manufacturers, may be considered as equivalent.

2.13 GAS CYLINDER RACK, 8 CYL, 12" DIAMETER
Equipment Mark Number: 106

A. Capacities and Dimensions

1. Outdoor bulk cylinder storage rack
2. Eight (8) cylinder capacity
3. Supports cylinder diameters up to 12"
4. Dimensions: 58" x 26" x 30"

B. Features

1. UFC, NFPA, CGA & OSHA compliant
2. 2" square steel tube continuously seam welded
3. Two levels of welded steel chains
4. Snaps for each cylinder
5. Pre-drilled 0.406" diameter floor mounting holes
6. Secure to existing concrete with Hilti Anchor Bolts
7. Sealed with exterior grade powder paint

C. Manufacturer's Reference:

1. Prime manufacturer: Specifications are based on equipment identified herein by manufacturer's name and model to establish acceptable standards of quality, performance, features, and construction.
 - a. Basis of Design: USA SAFETY SOLUTIONS, INC., 4 Cylinders (4x1) – Barricade – Gas Cylinder Rack, USA Safety Model # BR4X2FS, 1-877-805-8650, www.usasafety.com
2. Other manufacturers: Contingent upon compliance with these specifications and documentation requirements set forth in SUBMITTALS, equipment produced by other manufacturers, may be considered as equivalent.

2.14 GAS CYLINDER RACK, 2 CYL, 18" DIAMETER
Equipment Mark Number: 110

A. Capacities and Dimensions

1. Outdoor bulk cylinder storage rack
2. Two (2) cylinder capacity
3. Supports cylinder diameters up to 18" – 22"
4. Dimensions: 38" x 36" x 40"

B. Features

1. UFC, NFPA, CGA & OSHA compliant
2. 2" square steel tube continuously seam welded
3. Two levels of welded steel chains
4. Snaps for each cylinder
5. Pre-drilled 0.406" diameter floor mounting holes
6. Secure to existing concrete with Hilti Anchor Bolts
7. Sealed with exterior grade powder paint

C. Manufacturer's Reference:

1. Prime manufacturer: Specifications are based on equipment identified herein by manufacturer's name and model to establish acceptable standards of quality, performance, features, and construction.

- a. Basis of Design: USA SAFETY SOLUTIONS, INC., 2 Cylinders (2x1) – Barricade – Gas Cylinder Rack, USA Safety Model # BR2x1CRY022, 1-877-805-8650, www.usasafety.com
2. Other manufacturers: Contingent upon compliance with these specifications and documentation requirements set forth in SUBMITTALS, equipment produced by other manufacturers, may be considered as equivalent.

2.15 FUME HOOD, 72"
Equipment Mark Number: 127

A. Capacities and Dimensions

1. General Purpose Bench Fume Hood with Vertical Rising Sash
2. Open By-Pass Hood
3. Overall Hood Length: 72"
4. Hood Depth: 36"
5. Sash Opening Length: 64"
6. Sash Opening Height: 28" above airfoil
7. Sash Opening: 12.9 square feet
8. Total CFM and Static Pressure: 80 FPM – CFM = 1040 & S.P = 0.25"; 100 FPM - CFM = 1290 & S.P = 0.40"; 120 FPM – CFM = 1550 & S.P = 0.60"
9. Complies with ASHRAE 110-1995, BS-7258 and DIN 12 924 standards

B. Features

1. 4" thick endwalls
2. Interior baffles
3. Frameless sash with full-length formed steel handle
4. Low profile PVC sash tracks and sash leveling and alignment feature
5. Friction-fit interior access panels
6. Heavy gauge cold rolled steel exterior panels with independent rigid structural frame with powder coated chemical resistant finish.
7. Interior: Epoxy Resin coated liner
8. Warranty – one year

C. Accessories

1. Worktop: Kewaunee Model # 019243-72RBK, black in color with sink located on left end.
2. Base Cabinets: 36" L, Steel, Kewaunee Model # G08C352236 - 0104 (two each)
3. Service Fittings
4. Sink: Kewaunee Model # 1006-00, 18"x8"x15"
5. Fan/Blower

D. Manufacturer's Reference:

1. Prime manufacturer: Specifications are based on equipment identified herein by manufacturer's name and model to establish acceptable standards of quality, performance, features, and construction.

- a. Basis of Design: KEWAUNEE SUPREME AIR FUME HOOD, Model # H05K5472-00, 704-873-7202, www.kewaunee.com
2. Other manufacturers: Contingent upon compliance with these specifications and documentation requirements set forth in SUBMITTALS, equipment produced by other manufacturers, may be considered as equivalent.

2.16 FUME HOOD, 48"
Equipment Mark Number: 128

A. Capacities and Dimensions

1. General Purpose Bench Fume Hood with Vertical Rising Sash
2. Open By-Pass Hood
3. Overall Hood Length: 48"
4. Hood Depth: 36"
5. Sash Opening Length: 40"
6. Sash Opening Height: 28" above airfoil
7. Sash Opening: 8.1 square feet
8. Total CFM and Static Pressure: 80 FPM – CFM = 650 & S.P = 0.15"; 100 FPM - CFM = 810 & S.P = 0.25"; 120 FPM – CFM = 980 & S.P = 0.35"
9. Complies with ASHRAE 110-1995, BS-7258 and DIN 12 924 standards

B. Features

1. 4" thick endwalls
2. Interior baffles
3. Frameless vertical rising sash with full-length formed steel handle
4. Low profile PVC sash tracks and sash leveling and alignment feature
5. Friction-fit interior access panels
6. Heavy gauge cold rolled steel exterior panels with independent rigid structural frame
7. Interior: Epoxy Resin coated liner
8. Warranty – one year

C. Accessories

1. Worktop: Kewaunee Model # 019243-48RBK, black in color with sink located on left end.
2. Base Cabinet: 48" L, Steel, Kewaunee Model # G08C352248-0104
3. Service Fittings
4. Sink: Kewaunee Model # 1006-00, 18"x8"x15"
5. Fan/Blower

D. Manufacturer's Reference:

1. Prime manufacturer: Specifications are based on equipment identified herein by manufacturer's name and model to establish acceptable standards of quality, performance, features, and construction.
 - a. Basis of Design: KEWAUNEE SUPREME AIR FUME HOOD, Model # H05K5448-00, 704-873-7202, www.kewaunee.com

2. Other manufacturers: Contingent upon compliance with these specifications and documentation requirements set forth in SUBMITTALS, equipment produced by other manufacturers, may be considered as equivalent.

2.17 INCUBATOR
Equipment Mark Number: 141

A. Capacities and Dimensions

1. Large laboratory Incubator
2. Exterior Dimensions: 41.5" x 34.8" x 87.5"
3. Interior Dimensions: 35" x 26" x 73.2"
4. Number of Shelves: Six (6)
5. Temperature Range: 8 degrees above ambient to 70 degrees C
6. Temperature Uniformity: plus or minus 8 degrees @ 37 degrees C
7. Volume: 38.6 cubic feet
8. Power requirements: 220 V, 60 Hz, 1650 W

B. Features

1. Microprocessor Temperature Control
2. Over-Temperature Safety Protection
3. Gentle Air Flow
4. Temperature Uniformity to 0.8°C
5. 4 Interior Electrical Outlets
6. Prewired Access Panel for Chart Recorder
7. Two Year Warranty

C. Accessories

- 1.

D. Manufacturer's Reference:

1. Prime manufacturer: Specifications are based on equipment identified herein by manufacturer's name and model to establish acceptable standards of quality, performance, features, and construction.
 - a. Basis of Design: VWR INTERNATIONAL, Incubator, Model # 35962-096, 1-800-932-5000, <https://us.vwr.com>
2. Other manufacturers: Contingent upon compliance with these specifications and documentation requirements set forth in SUBMITTALS, equipment produced by other manufacturers, may be considered as equivalent.

2.18 WASHER
Equipment Mark Number: 145

A. Capacities and Dimensions

1. Water Recirculation Rate: 112 gal./min., 230V, 60Hz
2. Dimensions: 32.25" x 27.5" x 34.25 to 36.25"
3. Shipping Weight: 260 lbs

B. Features

1. Freestanding washer
2. Door, sides, and interior are to be constructed of Type 304 stainless steel
3. Liquid detergent and rinse aid store in door and dispense automatically.
4. Adjustable cycle programs
5. Ten (10) factory-set cycle programs
6. Microprocessor control with liquid crystal display
7. Memory storage
8. RS-232 port
9. Viewing window with light
10. Temperatures up to 199°F may be programmed for wash and rinse cycles
11. Up to six purified water rinses may be programmed
12. Water rinses can use pressurized or non-pressurized water
13. Separate water pumps for washing and draining
14. Steam generator
15. Forced air drying system
16. HEPA filter to remove airborne particulates
17. Programmable drying from 100 to 158°F for up to 250 minutes.

C. Accessories

1. Base Stand, 17" High with Two (2) storage compartments, Labconco No. 4595500
2. Lower Test Tube Spindle Rack (3) 4546000 Labconco
3. Lower Standard Rack (3) 4588500 Labconco
4. Accessory Rack 32 Pin (4) 4401801 Labconco
5. Accessory Rack 10 Pin (4) 4401501 Labconco
6. Accessory Box Bulk Tube (3) 4542100 Labconco
7. Utensil Basket (3) 4402201 Labconco

D. Manufacturer's Reference:

1. Prime manufacturer: Specifications are based on equipment identified herein by manufacturer's name and model to establish acceptable standards of quality, performance, features, and construction.
 - a. Basis of Design: LABCONCO, FlaskScrubber Vantage Glassware Washer, Model # 4540031, 1-800-821-5525, <http://www.labconco.com>
2. Other manufacturers: Contingent upon compliance with these specifications and documentation requirements set forth in SUBMITTALS, equipment produced by other manufacturers, may be considered as equivalent.

2.19 COMPACT REFRIGERATOR
Equipment Mark Number: 146

A. Capacities and Dimensions

1. 5 cubic feet
2. Dimensions: 33-3/4" x 21-3/8" x 22-3/4"
3. Weight: 76 lbs
4. Temperature Range: -2 to 10 degrees C
5. Power requirements: 120 V, 60 Hz

B. Features

1. Can be placed under a bench or used freestanding
2. Adjustable mechanical thermostat control
3. Interior liner fabricated from seamless high-impact polystyrene
4. R134A refrigerant
5. Manual defrost
6. Three adjustable wire shelves and flat inner door liner
7. Freezer has two fixed shelves
8. Complies with UL Standards for safety and performance
9. UL and C-UL listed
10. Warranty: two (2) years

C. Manufacturer's Reference:

1. Prime manufacturer: Specifications are based on equipment identified herein by manufacturer's name and model to establish acceptable standards of quality, performance, features, and construction.
 - a. Basis of Design: VWR INTERNATIONAL, VWR® General-Purpose Laboratory Refrigerator and Freezer, Model # 14236-524, 1-800-932-5000, <https://us.vwr.com>
2. Other manufacturers: Contingent upon compliance with these specifications and documentation requirements set forth in SUBMITTALS, equipment produced by other manufacturers, may be considered as equivalent.

2.20 REFRIGERATOR/FREEZER
Equipment Mark Number: 150

A. Capacities and Dimensions

1. Upright combination refrigerator/freezer
2. 10 cubic feet
3. Power requirements: 120 V, 60 Hz

B. Features

1. Manual defrost
2. Single door model with internal freezer compartment
3. Three adjustable wire shelves
4. Warranty: 13 months

C. Manufacturer's Reference:

1. Prime manufacturer: Specifications are based on equipment identified herein by manufacturer's name and model to establish acceptable standards of quality, performance, features, and construction.
 - a. Basis of Design: LAB-LINE INSTRUMENTS, Refrigerator/Freezer Combo, Model # 3764A, 1-800-522-5463, <http://www.labline.com>

2. Other manufacturers: Contingent upon compliance with these specifications and documentation requirements set forth in SUBMITTALS, equipment produced by other manufacturers, may be considered as equivalent.

2.21 DI LAB WATER SYSTEM
Equipment Mark Number: 192

A. Capacities and Dimensions

1. Flow rate: up to 2-Liters per minute
2. Ion exchange capacity: up to 2,000 grains
3. Cabinet Dimensions: Width - 20 in, Depth - 12 in, Height - 20 in
4. Operating Weight: 45 lbs
5. Inlet Pressure: 30 psi (min), 100 psi (max)
6. System Power Source: Switching power supply - 12 VDC at 2.5 Amps
7. Power requirements: Two (2) 100-240 AC, 50/60Hz, 1.0A grounded receptacles within 5 feet of the right side of the system cabinet

B. Features

1. Biological Grade Ultra-Low TOC Type I DI System
2. Built-in combination ultraviolet (UV) Oxidizer/Sterilizer
3. Built-in Ultrafilter (UF) to remove pyrogen, endotoxin, RNase, & DNase
4. Continuous recirculation
5. Built-in activated carbon prefilter
6. Digital, temp-compensated resistivity monitor with red/green LED alarm set point
7. Teflon recirculating remote dispenser with 0.22- μ m final filter capsule
8. Bench, shelf or wall-mounted
9. Two (2) year system warranty

C. Accessories

D. Manufacturer's Reference:

1. Prime manufacturer: Specifications are based on equipment identified herein by manufacturer's name and model to establish acceptable standards of quality, performance, features, and construction.
 - a. Basis of Design: AQUA SOLUTIONS, Biological Grade Ultra-Low TOC Type I DI System, Model # 2121BL, 1-800-458-2021, <http://www.AquaA.com>
2. Other manufacturers: Contingent upon compliance with these specifications and documentation requirements set forth in SUBMITTALS, equipment produced by other manufacturers, may be considered as equivalent

2.22 BALANCE TABLE
Equipment Mark Number: 194

A. Capacities and Dimensions

1. Marble
2. Dimensions: 35" x 24" x 31"
3. Weight: 650 lbs

B. Features

1. Three inch (3") thick marble slab construction
2. Marble slab legs are reinforced with an iron cross-beam coated for corrosion resistance.
3. All edges are rounded and precisely cut to ensure a smooth, level working surface.
4. Color: white with brown, green, and gray mark

C. Manufacturer's Reference:

1. Prime manufacturer: Specifications are based on equipment identified herein by manufacturer's name and model to establish acceptable standards of quality, performance, features, and construction.
 - a. Basis of Design: GAWET MARBLE AND GRANITE, Marble Balance Table, Model # A4-1602, 1-802-773-8868, <http://gawetmarble.com>
2. Other manufacturers: Contingent upon compliance with these specifications and documentation requirements set forth in SUBMITTALS, equipment produced by other manufacturers, may be considered as equivalent.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Coordinate location of rough-in work and utility stub-outs to assure match and/or non-interference with equipment to be installed.
- B. Inspect delivered equipment for damage from shipping and exposure to weather. Compare delivered equipment with packing lists and specifications to assure receipt of all items.

3.2 INSTALLATION

- A. Perform work under direct supervision of Foreman or Construction Superintendent with authority to coordinate installation of scheduled equipment with Architect.
- B. Install equipment in accordance with plans, shop drawings, and manufacturer's instructions:
 1. Positioning: Place equipment in accordance with any noted special positioning requirements generally level, plumb, and at right angles to adjacent work.
 2. Fitting: Where field cutting or trimming is necessary, perform in a neat, accurate, professional manner without damaging equipment or adjacent work.

3. Anchorage: Attach equipment securely to floor, per manufacturer's instructions and as directed by Architect, to prevent damage resulting from inadequate fastening. Installation fasteners shall be installed to avoid scratching or damaging adjacent surfaces.
4. Upon completion of work, finish surfaces shall be free of tool marks, scratches, blemishes, and stains.

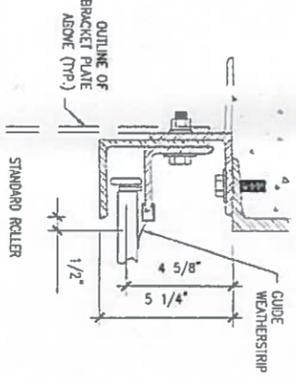
3.3 TESTING

- A. After final installation is complete and prior to authorizing payment, specified equipment shall be checked for compliance with specifications in the presence of the Architect using acceptance procedures provided by the manufacturer.

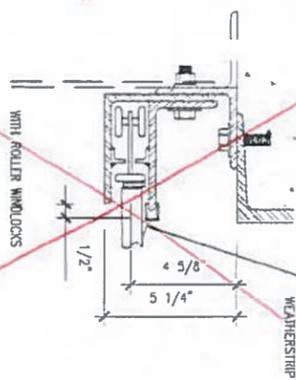
3.4 CLEANUP

- A. Touch-up damage to painted finishes.
- B. Wipe and clean equipment of any oil, grease, and solvents, and make ready for use.
- C. Clean area around equipment installation and remove packing or installation debris from job site.
- D. Notify Architect for acceptance inspection.

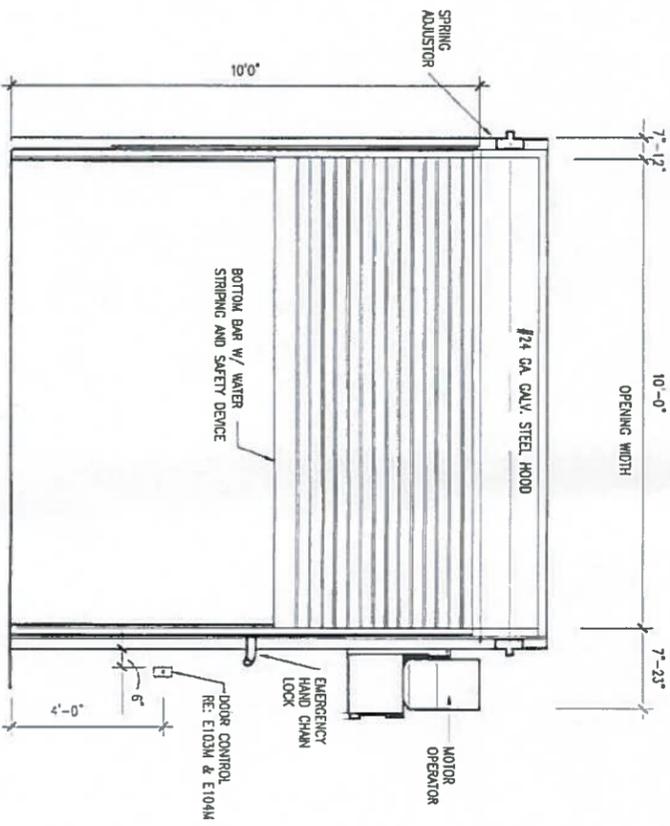
END OF SECTION 11600



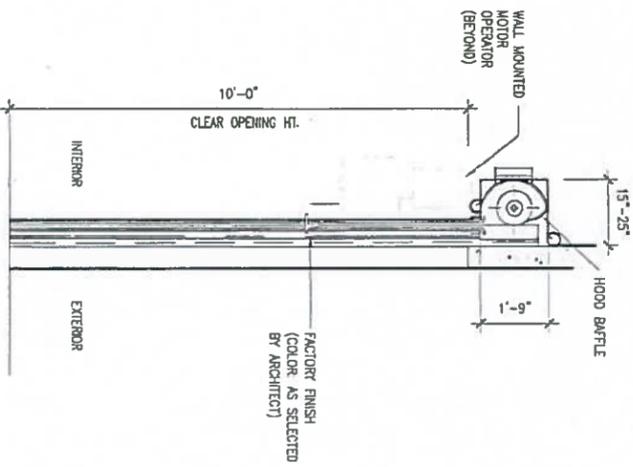
4 GUIDE DETAIL / INTERIOR
 01-A-603 N.T.S.



3 GUIDE DETAIL / EXTERIOR
 01-A-603 N.T.S.



2 OVERHEAD DOOR ELEVATION
 01-A-603 N.T.S.

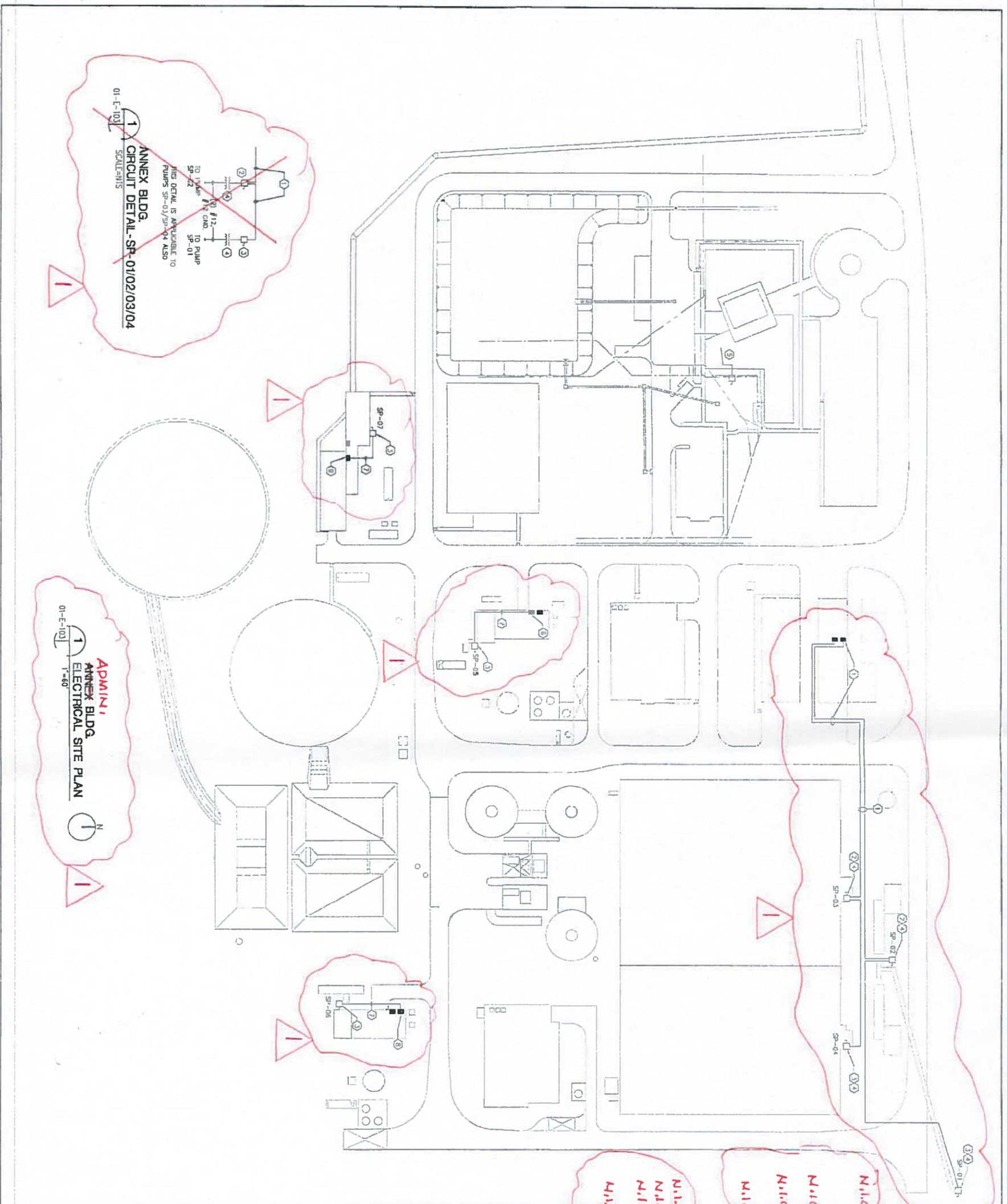


1 OVERHEAD DOOR SECTION
 01-A-603 N.T.S.

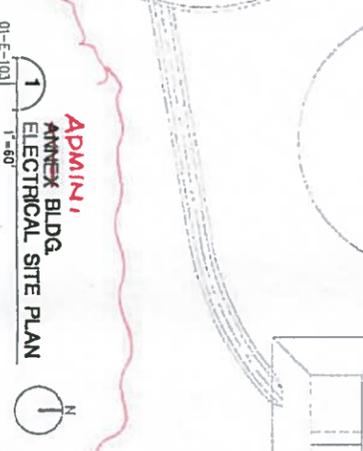
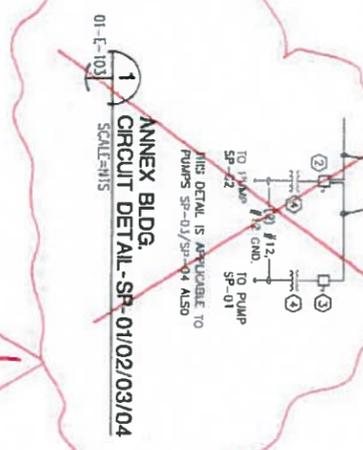
WARNING
 IF HIS BAR DOES NOT MEASURE 1\"/>

ISSUE LOG	
No.	DESCRIPTION
1	12/01/15 ISSUE FOR BID AND CONSTRUCTION
2316 ADPENDING N.A.I	

COMPANY:	HUNT-ZOLLARS
SUPPLIED BY:	Hunt-Zollars Inc. 2.04.15 1000 West Loop South, Suite 1000 Houston, Texas 77027 Phone: (713) 782-0000 Fax: (713) 782-0000
CITY OF HOUSTON DEPARTMENT OF PUBLIC WORKS AND ENGINEERING DRAWING WATER OPERATIONS BUILDING IMPROVEMENTS FOR WATER FACILITIES AT NEWPP, NEWPP, 4500 LIZELAND AND ARBORORE ADMINISTRATION BUILDING NEWPP OVERHEAD DOOR DETAILS	
DESIGNED BY:	AS SHOWN
CHECKED BY:	JOHN W. JOHNSON, P.E.
DATE:	5 4 1 4
SHEET NO.	5 4 1 4
DWG. NO.	01-A-603



NOTE	NOTES BY SYMBOL
1	480V 1PH CIRCUITS FROM PANEL 11-STR01-1P01-3C01S 35C/25.1L EACH CIRCUIT SHALL BE (3)1/2\"/>
2	PROVIDE 30V/2P SWITCH-RETRY-4P LINE SIZE DOUBLE LUG-BIT PROVIDE 6A FUSES FOR PUMPS SP-02/03 SP-05/06/07
3	PROVIDE 30V/2P SWITCH-RETRY-4P PROVIDE 6A FUSES FOR PUMPS SP-01/04. ADD FUSED SWITCH FOR PUMPS SP-05/06/07
4	2.0 KVA, 480-240/120V SCALED TRANSFORMER, NEMA 4X
5	LET STATION POWER, EXTEND CIRCUIT FROM PANEL 13P-01, SLOTS 31,33,35 PROVIDE 20V/3P BREAKER CIRCUIT SHALL BE (3)1/2\"/>
6	PROVIDE 20V/1P BREAKER IN PANEL 06-STR01-1P01A. CIRCUITS TO PUMPS SHALL BE (3)1/2\"/>
7	PROVIDE 20V/1P BREAKER IN PANEL 206-STR01-1P01A SLOTS 36 PROVIDE 20V/1P BREAKER IN PANEL 06-STR01-1P01A SLOTS 36

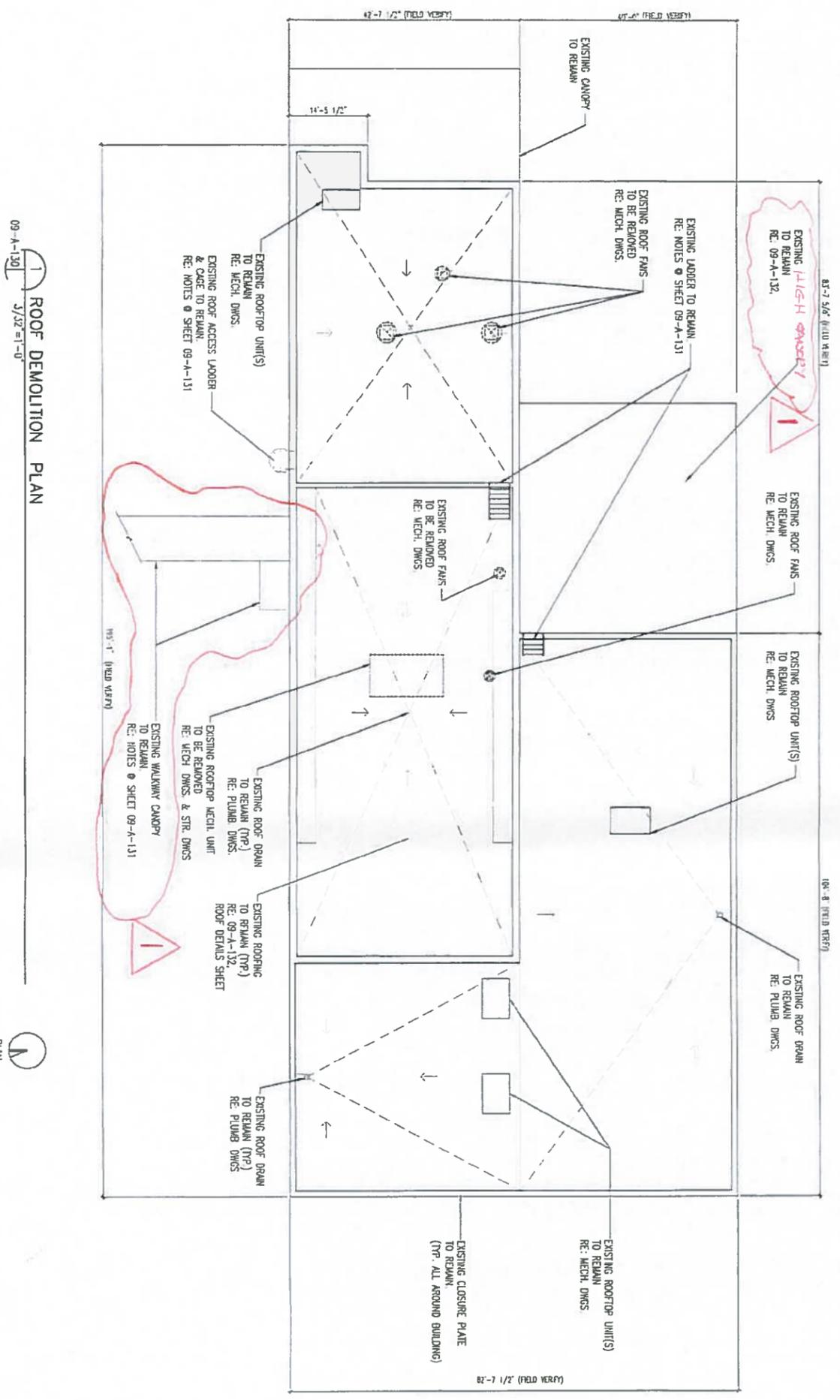


WARNING
 IF THIS TAG DOES NOT MEASURE 1\"/>

ISSUE LOG

No	DATE	DESCRIPTION
1	12/01/15	ISSUE FOR 80 AND CONSTRUCTION
2	12/01/15	ADD BREAKER IN PANEL

COMPANY: HUNT-ZOLLARS
 PROJECT: CITY OF HOUSTON
 SURVEYED BY: Hunt-Zollars Inc.
 CITY OF HOUSTON
 DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
 DIVISION OF PUBLIC OPERATIONS AND ENGINEERING
 BUILDING APPROVALS SECTION FOR PERMITS AND INSPECTIONS
 AT 5700, NEWPP, 4500 LEBLANC AND ADDONS
 NEWPP
 ADMINISTRATION BUILDING
 ELECTRICAL SITE PLAN



09-A-130
 3/32" = 1'-0"
ROOF DEMOLITION PLAN



NOTE	DESCRIPTION
1.	REMOVE ALL EXISTING FLASHINGS, COUNTER FLASHINGS, TERMINATION BARS AND FASTENERS
2.	COORDINATE WITH MECHANICAL, PLUMBING AND ELECTRICAL DRAWINGS FOR MEP DEMOLITION WORK AND WORK TO REMAIN.
3.	RE: DWG. 09-M-102 FOR MECH. DEMO ROOF PLAN

ISSUE LOG

NO.	DATE	DESCRIPTION
1	12/04/15	ISSUE FOR BID AND CONSTRUCTION
2	12/15/15	ADDENDUM MAIL

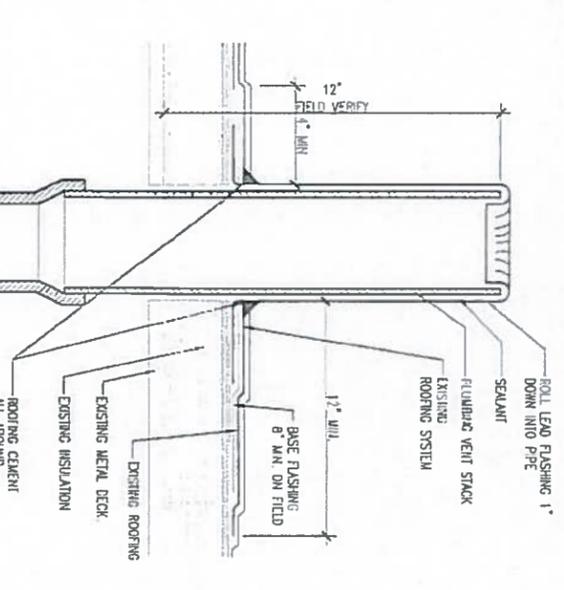
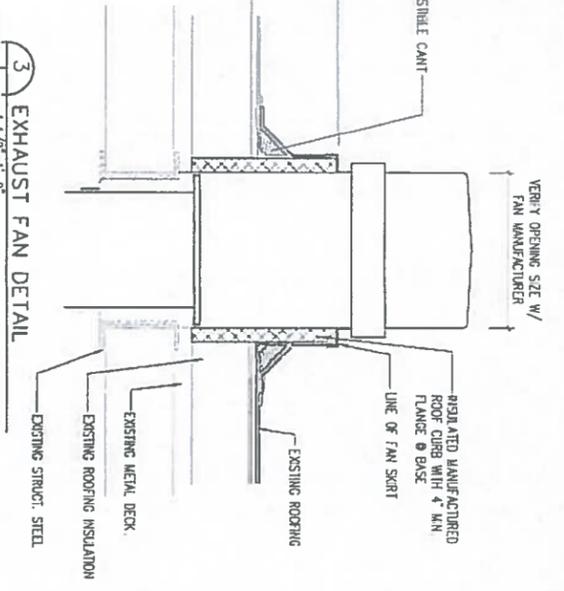
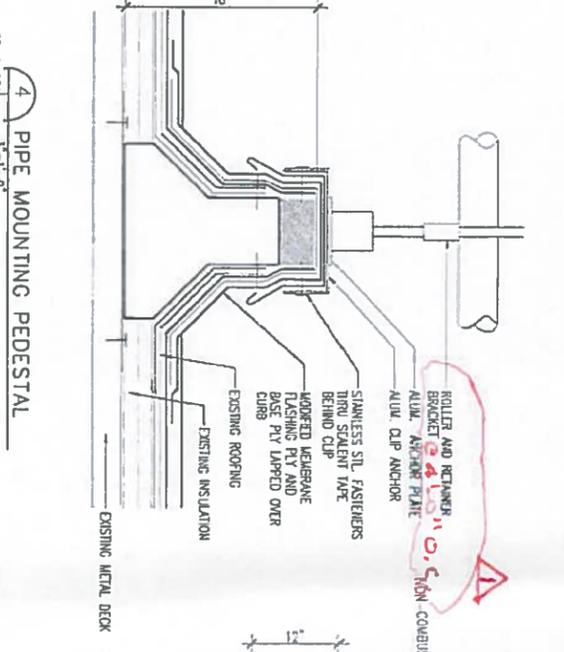
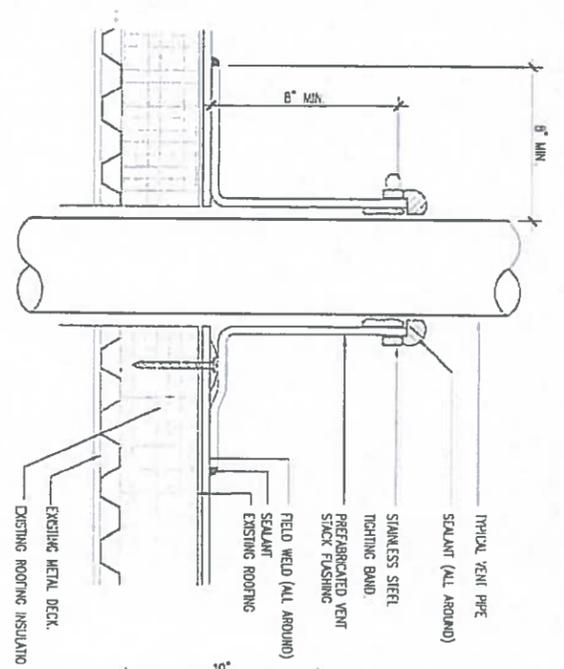
HUTZCOWERS
 REGISTERED PROFESSIONAL ENGINEER
 No. 170415
 State of Texas
 Mechanical
 170415
 Fm Registration No. F-781

SUBMITTED BY:
CITY OF HOUSTON
 DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
 DRINKING WATER OPERATIONS
 BUILDING IMPROVEMENTS FOR WATER FACILITIES
 AT ERFP, NRPFP, 4200 LEE LAND AND ADDRESS
 ANNEX BUILDING
4200 LEE LAND
ANNEX BUILDING
ROOF DEMOLITION PLAN



WARNING
 IF THIS DRAWING IS NOT MEASURED IN THE FIELD, IT IS NOT TO SCALE.

DATE: DEC. 2015
 SHEET NO. 1 OF 149
 DWG. NO. 09-A-130

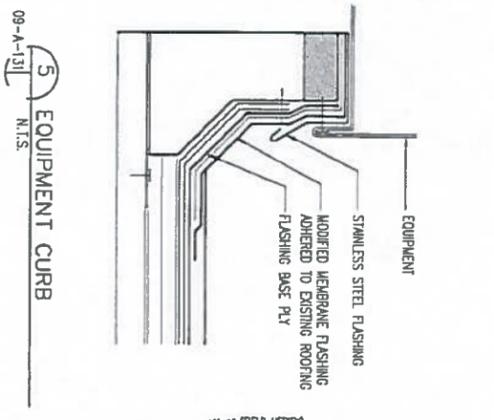


09-A-131 3'-1'-0" 6 PIPE PENETRATION DETAIL

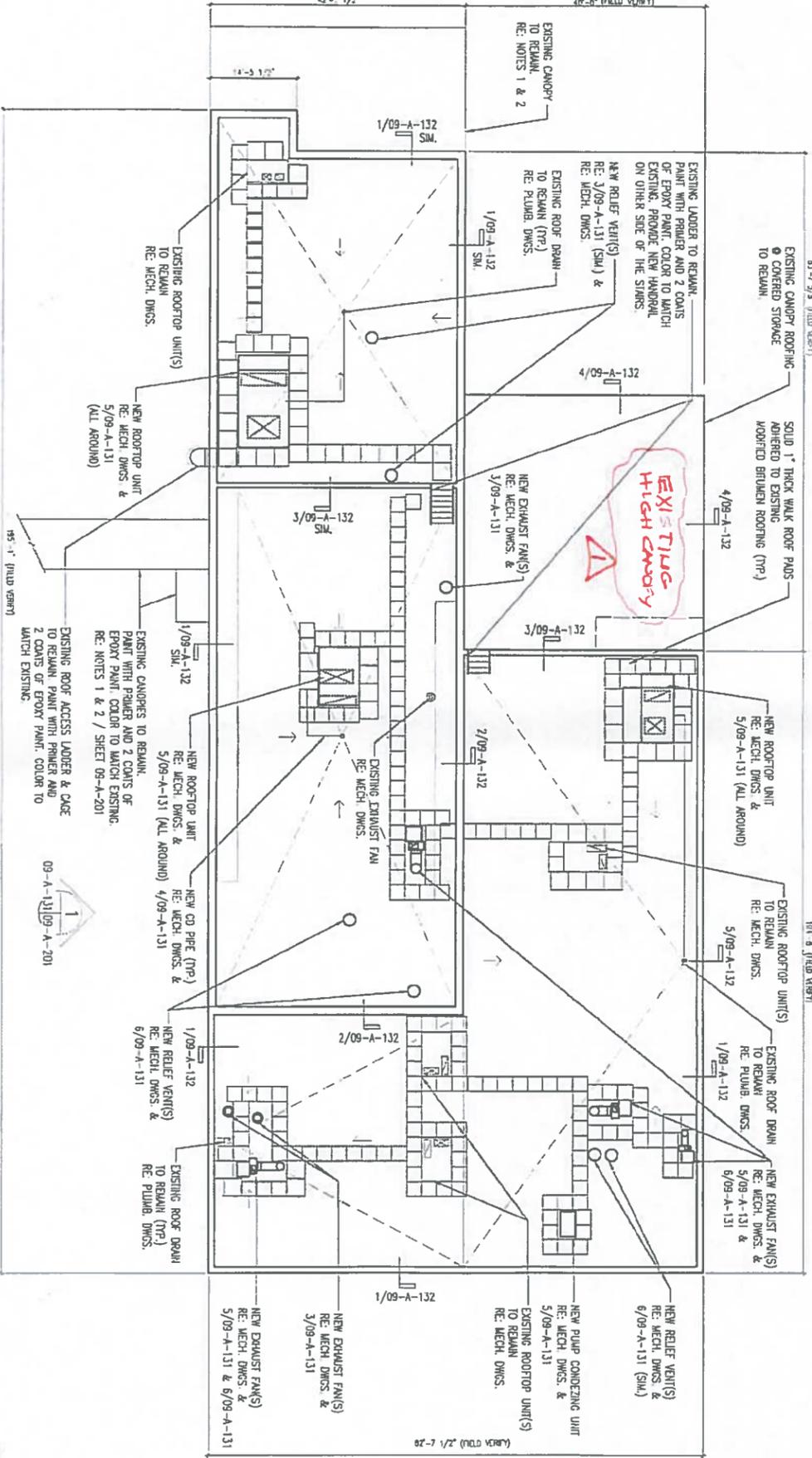
09-A-131 3'-1'-0" 4 PIPE MOUNTING PEDESTAL

08-A-131 (09-A-201) 1'-7/2"=1'-0" 3 EXHAUST FAN DETAIL

09-A-131 1'-7/2"=1'-0" 2 TYPICAL SANITARY VENT DETAIL



09-A-131 N.I.S. 5 EQUIPMENT CURB



09-A-131 3'-2"=1'-0" 1 ROOF PLAN

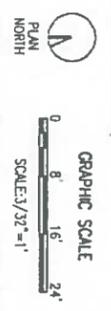
NOTES:

1. PAINT EXISTING CANOPY OVER RAMP & CANOPY TO GARAGE STRUCTURE AS WELL AS ALL COLUMNS & UNDERSIDE OF CANOPIES. CLEAN, PRIMER & PAINT w/ 2 COATS OF EPOXY PAINT. COLOR TO MATCH EXISTING.
2. AFTER CLEANING & PRIMING EXISTING EXPOSED STEEL, PAINT w/ 2 COATS OF EPOXY PAINT. COLOR TO MATCH EXISTING.
3. RE. DMC. 09-A-202 FOR MECH. MOUNTED EQUIPMENT.
4. **INSTALL NEW COM. 1" THICK WALK ROOF PADS OVER EXISTING ROOF.**

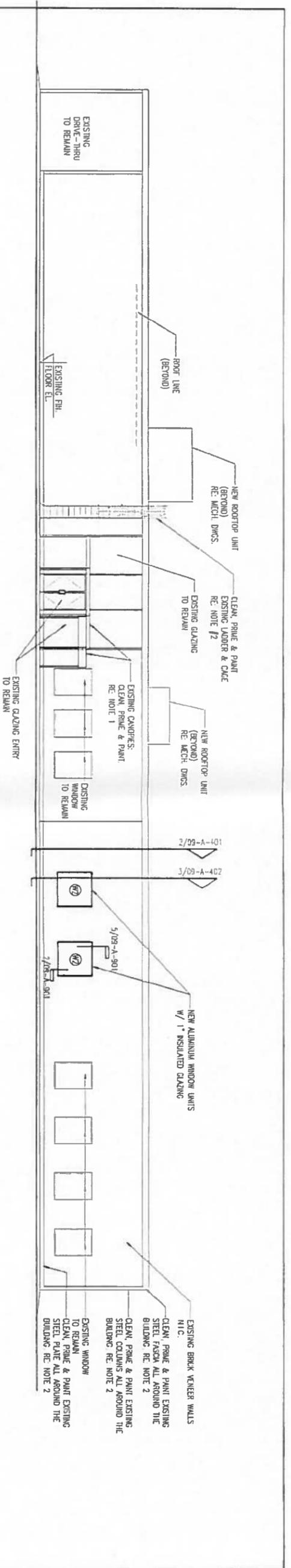
ISSUE LOG

No.	DATE	DESCRIPTION
1	12/04/15	ISSUE FOR BO AND CONSTRUCTION
2	12/04/15	ISSUE FOR BO AND CONSTRUCTION

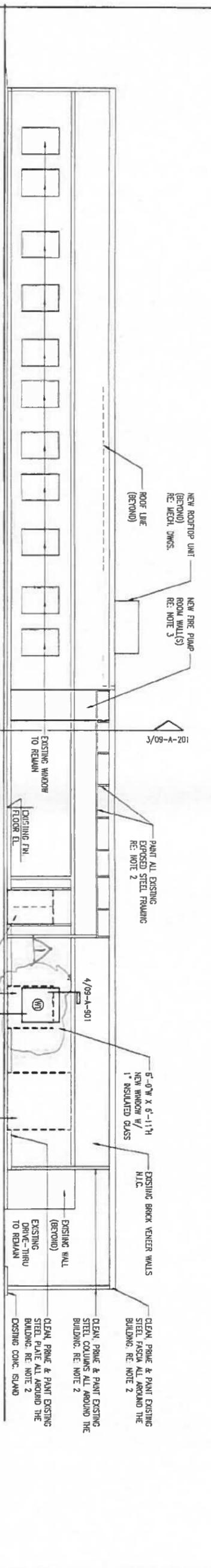
COMPANY: HUNTZIGERS
 CITY OF HOUSTON
 DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
 BUILDING IMPROVEMENTS FOR WATER FACILITIES AT EMPF, NEMFP, 4200 LEELAND AND ANNEX
 4200 LEELAND ANNEX BUILDING
 ROOF PLAN AND DETAILS



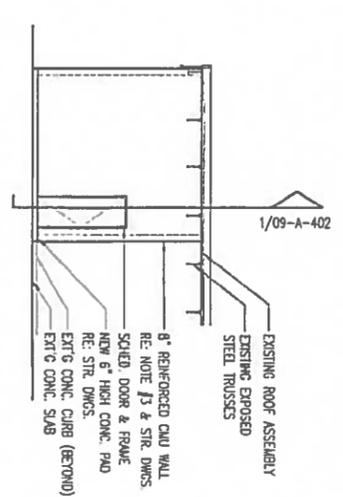
WARNING: IF THIS BAR DOES NOT MEASURE 1" LONG, DO NOT USE THIS SHEET TO SCALE.
 DATE: DEC. 2015
 SHEET NO.: 11 OF 149
 DWG. NO.: 09-A-131



09-A-201
 1/8"=1'-0"
1 NORTH ELEVATION



09-A-201
 1/8"=1'-0"
2 SOUTH ELEVATION



09-A-201
 1/8"=1'-0"
3 FIRE ROOM EXTERIOR ELEVATION / SECTION @ EXISTING CANOPY

- NOTES:**
1. PAINT EXISTING CANOPY OVER RAUP & CANOPY TO DAMAGE STRUCTURE AS WELL AS ALL COLUMNS & UNDERSIDE OF CANOPES CLEAN, PRIMER & PAINT w/ 2-COATS OF EPOXY PAINT. COLOR TO MATCH EXISTING.
 2. AFTER CLEANING & PRIMING EXISTING EXPOSED STEEL PAINT w/ 2-COATS OF EPOXY PAINT. COLOR TO MATCH EXISTING.
 3. NEW CHU WALLS SHALL HAVE FLUSH/FLAT HORIZONTAL & VERTICAL JOINTS ON THE EXTERIOR FACES. CLEAN, PRIME & APPLY JOINTS & FINISH ELASTOMERIC FINISH w/ 2-COATS. COLOR TO MATCH BRICK VENEER.

REMOVE O.H. DOOR & SWING DOORS
 FILL IN OPENING w/ BACK UP CHU
 WALL & VENEER BRICK TO MATCH
 EXISTING IN SIZE & COLOR.
 RE: STR. DWGS.

ISSUE LOG

No.	DATE	DESCRIPTION
1	12/04/15	ISSUE FOR BID AND CONSTRUCTION

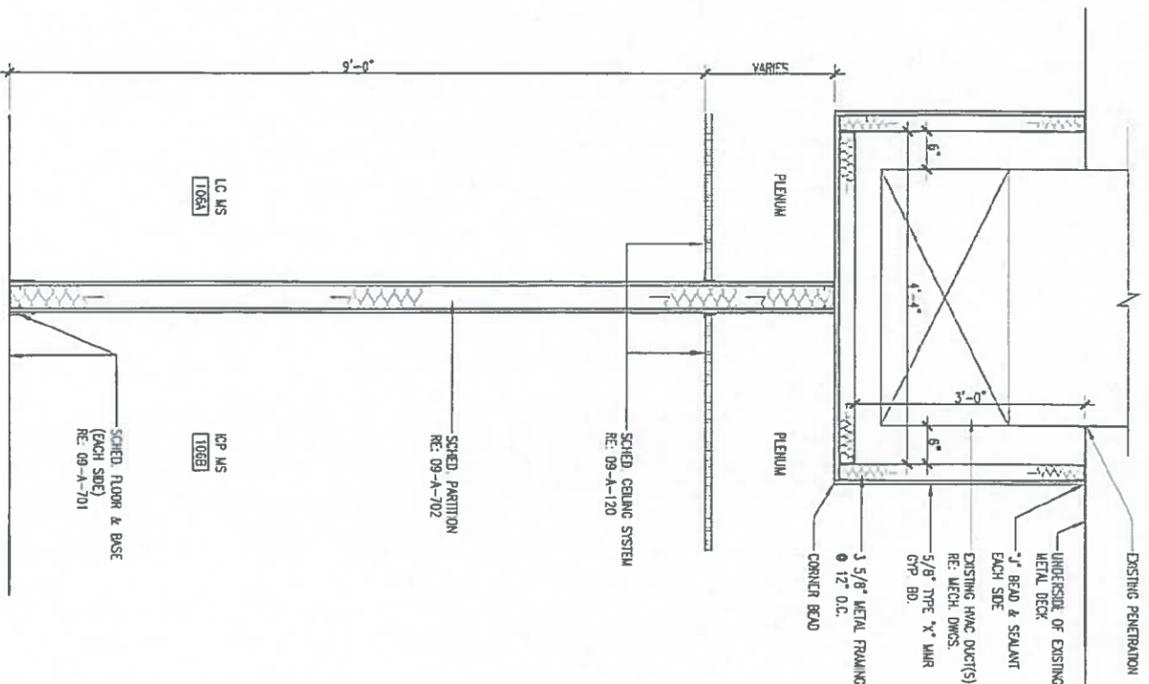
HUNT-ZOLARS
 1204, 15
 SUPERSEDED BY:

CITY OF HOUSTON
 DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
 DRINKING WATER OPERATIONS
 BUILDING IMPROVEMENTS FOR WATER FACILITIES
 AT EMPF, NEWFP, 4200 LEELEND AND ARDORKER
 ANNEX BUILDING
 4200 LEELEND

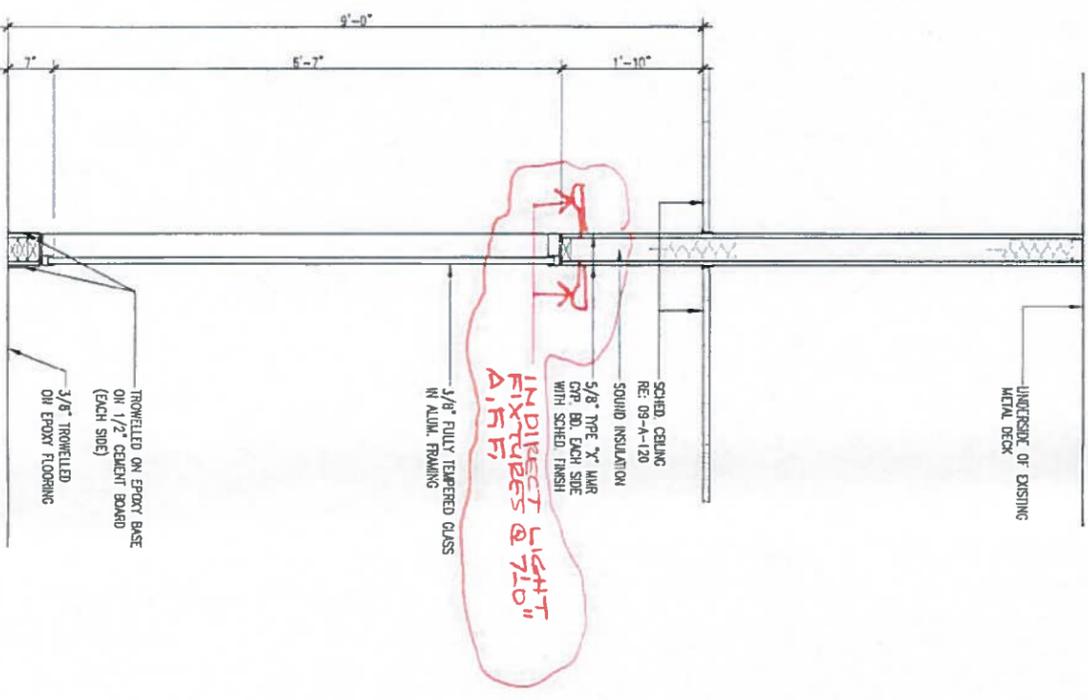
GRAPHIC SCALE
 0 4' 8' 16'
 SCALE: 1/8"=1'

WARRANTY
 0 IF THIS BAR DOES NOT MEASURE 1' NOT TO SCALE.

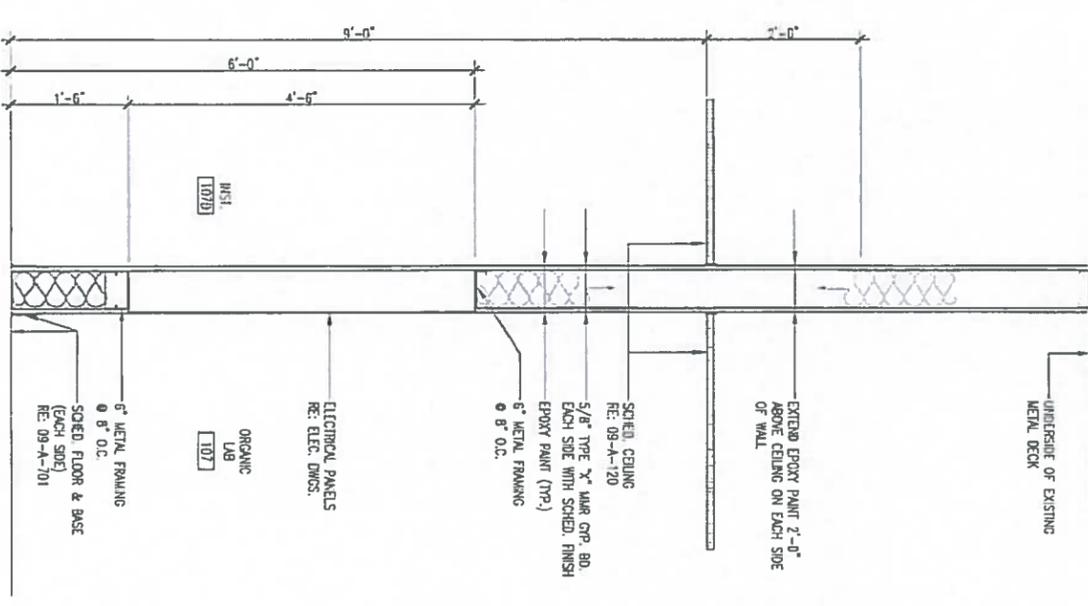
DEC 2015 1307149 DWG. NO. 09-A-201



09-A-403 3 WALL BI-PASS @ EXISTING HVAC DUCT(S)
 1"=1'-0"



09-A-403 2 WALL SECTION THRU GLASS PANEL
 1"=1'-0"



09-A-403 1 WALL SECTION THRU ELECTRICAL PANEL
 1"=1'-0"

INDIRECT LIGHT FIXTURES @ 7'10" A.F.F.

SPECIAL NOTES:
 INSTALL NEW 5" THERMAL BATT INSULATION TO THE UNDERSIDE OF THE EXISTING ROOF DECK.

ISSUE LOG

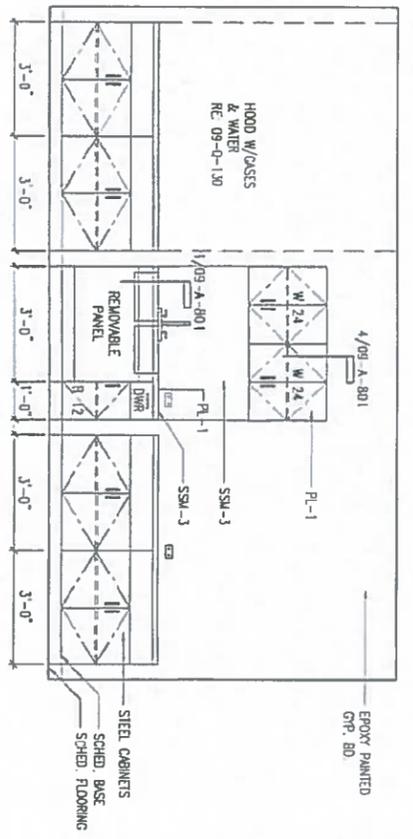
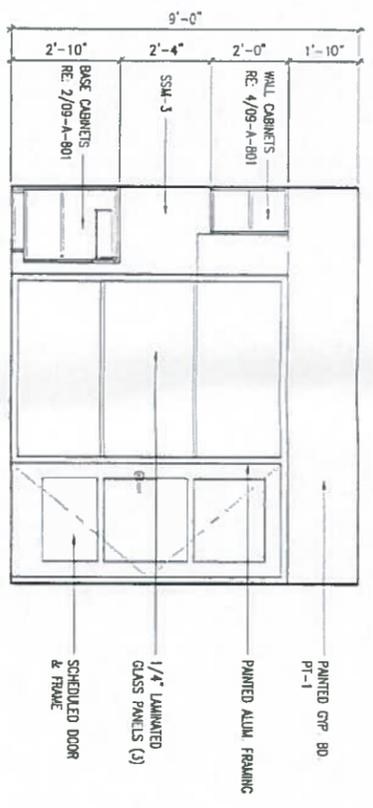
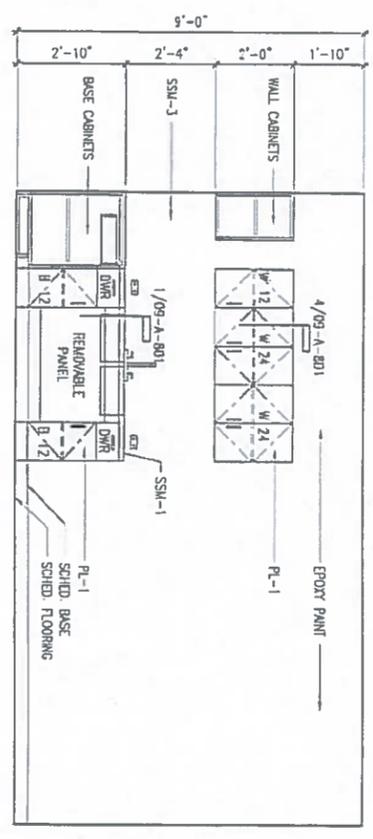
NO.	DATE	DESCRIPTION
1	12/24/15	REVISION FOR BID AND CONSTRUCTION
2	1/14/16	REVISION FOR BID AND CONSTRUCTION

HUNT-ZOLARS
 REGISTERED ARCHITECTS & ENGINEERS
 120415
 SURVEYED BY: Hunt-Zolars Inc. 120415
 Form Registration No. F-791

CITY OF HOUSTON
 DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
 DRINKING WATER OPERATIONS
 BUILDING IMPROVEMENTS FOR WATER FACILITIES
 AT WPP, WETPP, 4200 LEELAND AND ADDMORE
 ANNEX BUILDING
 WALL SECTIONS

DRWG NO. S-01000-0051-4
 DRAWING SCALE: AS SHOWN
 CITY OF HOUSTON P.E.
 DATE: DEC. 2015
 SHEET NO. 76 OF 149
 DWG. NO. 09-A-403

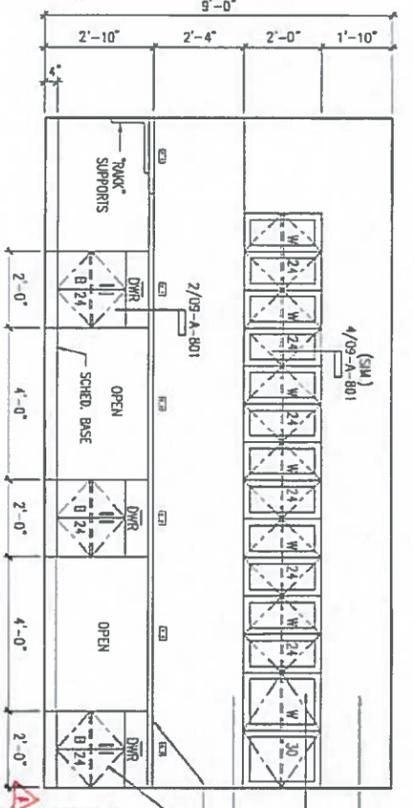
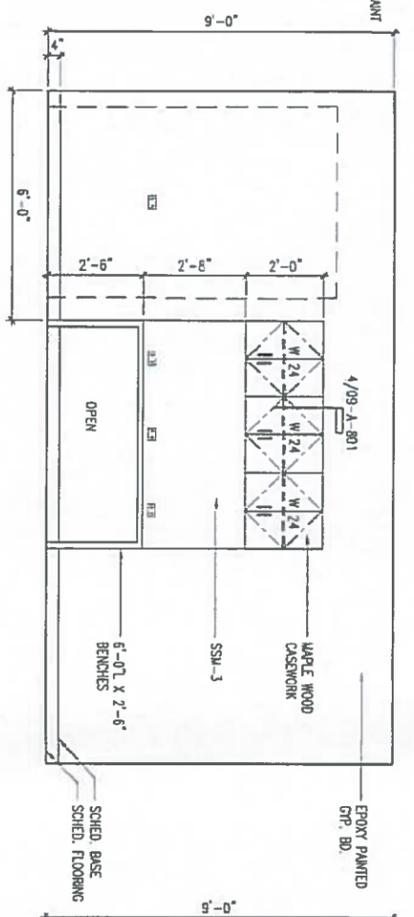
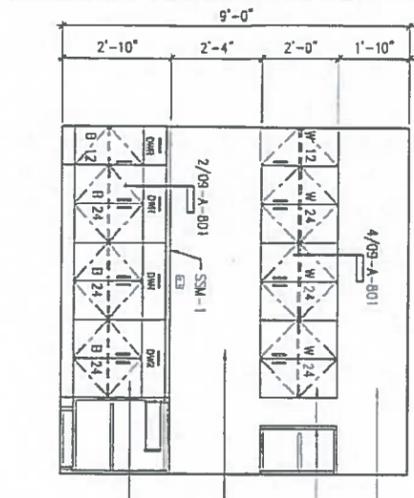
WARNING
 THIS BAR DOES NOT MEASURE TO THE CENTER OF SCALE.



7 AUTOCLAVE (SOUTH WALL)
 09-A-504 1/2"=1'-0"

6 INTERIOR ELEVATION
 09-A-504 1/2"=1'-0"

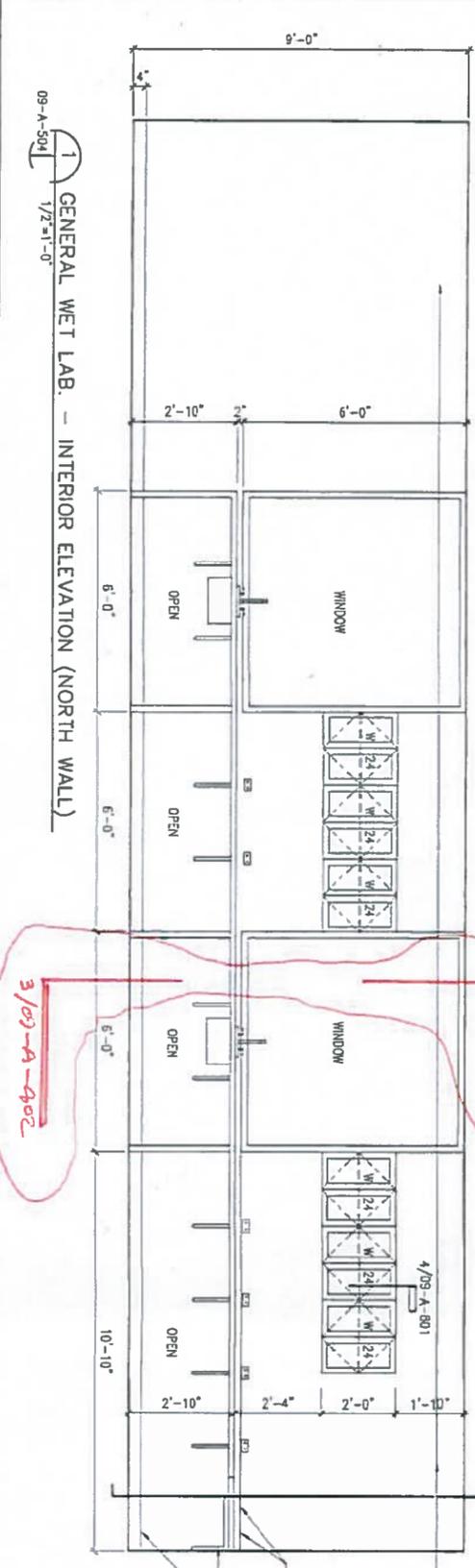
5 ORGANIC EXTRACTION - INTERIOR ELEVATION
 09-A-504 1/2"=1'-0"



4 AUTOCLAVE (EAST WALL)
 09-A-504 1/2"=1'-0"

3 ORGANIC EXTRACTION - INTERIOR ELEVATION
 09-A-504 1/2"=1'-0"

2 GENERAL WET LAB - INTERIOR ELEVATION
 09-A-504 1/2"=1'-0"



1 GENERAL WET LAB - INTERIOR ELEVATION (NORTH WALL)
 09-A-504 1/2"=1'-0"



WARNING
 1 THIS BAR DOES NOT MEASURE TO THE FACE OF THE WALL

DATE	12/01/15
BY	JOHN MORGAN P.E.
CHECKED BY	JOHN MORGAN P.E.
DATE	12/01/15
SHEET NO.	1
DWG. NO.	09-A-504

COMPANY: HUNTZOLARS
 6.33.16
 REGISTERED PROFESSIONAL ENGINEER
 STATE OF TEXAS
 No. 11531
 Exp. 12/31/18
 12/01/15
 City of Houston, Texas
 4200 LEELEND ANNEX BUILDING
 INTERIOR ELEVATIONS

No.	DATE	DESCRIPTION
1	12/01/15	ISSUE FOR RFP AND CONSTRUCTION

