SECTION 01380 (Addendum #2)

CONSTRUCTION PHOTOGRAPHS

PART 1 - GENERAL

1.01 DESCRIPTION

The Owner or Owner's representative will take construction photographs prior to start of the Work and periodically during the course of the Work. No one else will be allowed to take any photographs.

Upon receiving APG's security staff approval, an electronic copy of these photos will be provided to the Contractor for printing purpose.

1.02 PHOTOGRAPHY REQUIRED

A. Photographs will be taken at each of the major stages of construction listed below. Expect weekly progress photographs (up to 20).

1. Site before any contract work begins.

2. Completion of site clearing.

3. Completion of excavations.

4. Completion of foundations of each structure.

5. Completion of enclosure of each structure.

6. Completion of pipe laying prior to backfilling.

7. Completion of site restoration and landscaping.

8. Installation of equipment and facilities as deemed necessary by Owner's Representative.

9. Trenchless Pipe Installation Operations

10. Final completed facility (expect up to 40 photos)

PART 2 - PRODUCTS

2.01 PRINTS

A. Color:

1. Paper: Single weight, color print paper.

2. Finish: Smooth surface, glossy.

3. Size: 8 ½ x 11.

B. Identify each print on back, listing:

1. Name of project

2. Orientation of view

3. Date and time of exposure

4. Location with a unique photo identifier

PART 3 - EXECUTION

3.01 TECHNIQUE

A. Factual Presentation.

B. Correct exposure and focus.

1. High resolution and sharpness

2. Maximum depth-of-field

3. Minimum distortion

3.02 VIEWS REQUIRED

Photograph from locations to adequately illustrate condition of construction and state of progress.

A. At successive periods of photography, take at least one photograph from the same overall view as taken previously.

B. The Owner or Owner's Representative will decide the location and/or views required.

3.03 DELIVERY OF PRINTS

A. Deliver prints to the Owner's Representative to accompany each Application for Payment.

B. Distribution of prints as soon as processed is anticipated to be as follows:

1. Owner's Representative (one set)

2. Owner (two sets)

3.04 USE OF PHOTOGRAPHS

A. Photograph may not be used for any marketing or publicity purpose.

B. Upon completion of the project, submit all paper copy of photos to Owner's representative and all electronic version of these photographs must be destroyed.

END OF SECTION 01380

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SECTION 01400

QUALITY CONTROL

PART 1 - GENERAL

1.01 CODES, RULES, PERMITS AND FEES

A. General:

1. The Contractor shall comply with the City of Aberdeen and Aberdeen Proving Ground Building Codes as well as the requirements of all permits obtained by the Owner.

2. The Contractor shall give all necessary notices, obtain all permits (except as otherwise noted herein) and pay all governmental taxes, fees, and other costs in connection with the work, file all necessary plans, prepare all documents and obtain all necessary approvals of all government departments having jurisdiction, obtain all required Certificates of Inspection and Approval for the work and deliver same to the Construction Manager, except as otherwise noted herein.

B. Included Items:

1. The Contractor shall include in his work, all labor, materials, services, apparatus, and drawings required to comply with all applicable laws, ordinances, rules and regulations, whether or not shown on the Drawings or specified.

C. Compliance:

1. All materials furnished and all work installed shall comply with the rules and regulations of the National Fire Protection Association with all requirements of local utility companies, with the recommendations of the fire insurance rating organization having jurisdiction, and with the requirements of all governmental departments having jurisdiction.

2. The Contractor shall arrange for inspection and approval by the Electrical Inspectors and shall pay all costs of these services.

D. Permits to be obtained by Owner

1. Maryland Department of the Environment (MDE) Construction Permit

2. Water Appropriation and User Permit
3. Erosion and Sediment Control Plan
4. Stormwater Management Plan
5. Notice of Intent (NOI) to comply with the General Permit for construction activities in accordance with EPA's National Pollution Discharge Elimination System (NPDES) stormwater management program. Upon the issuance of the Notice to Proceed to the Contractor, a Transfer of Authority form will be prepared by the COE project designer and routed through the Contracting Officer to the Contractor. The Contractor shall return the signed Transfer of Authority form to the COE designer through the Contracting Officer who shall forward it to MDE. At completion of the construction contract the Contractor shall complete a Notice of Termination (NOT) form and furnish it to MDE through the Contracting Officer notifying that agency of the end of construction.
6. Joint Permit Application (JPA) for Construction in any Floodplain Waterway or Wetland: Maryland Department of the Environment the Corps of Engineers.
7. Forest Conservation Plan (FCP): Due to the location of the project within the Critical Area no FCP is required. All forest conservation aspects have been reviewed by the Critical Area.
8. Critical Area Plan (CAP):
9. Environmental Assessment
10. APG EIO Digging/Excavation Permit
11. Unexploded Ordnance (UXO) Clearing
12. Water Appropriation Permit(for temporary construction dewatering)
13. Air Quality Permit to Construct & Registration Application for Emergency Generator

1.02 MATERIALS AND WORKMANSHIP

A. All materials and equipment required for the work shall be new, unless otherwise specified, and of the best quality and especially adapted to the services required.

B. The Contractor shall furnish a superintendent who shall be constantly in charge of the installation of the work, together with all skilled workmen and labor required to unload, transfer, erect, connect up, adjust, start, operate, and test each system.

C. The Contractor shall locate and install all equipment which must be serviced, operated, or maintained in fully accessible positions. Such equipment shall include, but not be limited to, valves, pumps, unions, cleanouts, drain points, pressure gages, and controls. Minor deviations from the Drawings may be made to allow for better accessibility, but changes of significant magnitude or

changes involving extra cost shall not be made without approval of the Construction Manager.

1.03 STANDARDS

A. Any reference to standards in the Contract Documents shall always imply the latest issue in effect including all amendments and errata at the time bids are taken, of said standards unless otherwise stated.

B. Abbreviations for various organizations and terms which may be used in these Specifications are as follows:

Abbreviation		Organization or Term
AASHTO	-	American Assoc. of State Hwy. and Transportation Officials
ACI	-	American Concrete Institute
AASHO	-	The American Association of State Highway Officials
AI	-	The Asphalt Institute
AISI	-	American Iron and Steel Institute
ANSI	-	American National Standards Institute
APWA	-	American Public Works Association
ASA	-	American Standards Association (Now ANSI)
ASCE	-	American Society of Civil Engineering
ASSCBC	-	American Standard Safety Code for Building Construction

Abbreviation		Organization or Term
ASTM	-	American Society of Testing and Materials
AWWA	-	American Water Works Association
CIPRA	-	Cast Iron Pipe Research Association
DIPRA	-	Ductile Iron Pipe Research Association
DOT Spec	-	Road and Bridge Specifications Md. Dept. of Transportation
E/A	-	Engineer and/or Architect
EPA	-	U.S. Environmental Protection Agency
FS	-	Federal Specifications
GPM	-	Gallons Per Minute
ID	-	Inside Diameter
MBE	-	Minority Business Enterprise
MSS	-	Manufacturers Standardization Soc. of Valve and Fittings Ind.
NBS	-	National Bureau of Standards
NCPI	-	National Clay Pipe Institute
NFPA	-	National Fire Protection Association
NPT	-	National Pipe Threads

NSF	-	National Science Foundation
OD	-	Outside Diameter
OFCCP	-	Office of Federal Contracts Compliance Programs
OSHA	-	U. S. Dept. of Labor, Occupational Safety and Health Admin.
PCA	-	Portland Cement Association
PS	-	United States Products Standards
PSIG	-	Pounds Per Square Inch Gauge
SAE	-	Society of Automotive Engineers
STA	-	Station (100 feet)
UL	-	Underwriter's Laboratories
USASI or	-	United States of America Standards Institute
USAS	-	(Now ANSI)
USGS	-	United States Geological Survey
USC&GS	-	United States Coast and Geodetic Survey

C. The Contractor shall be responsible to obtain and pay for a copy, if required, of each standard identified and maintain a copy of each for reference in the field office throughout the duration of the Work.

1.04 VERIFICATION OF DIMENSIONS

The Contractor shall be responsible for field verification of all dimensions of existing facilities and other items which are shown on the Contract Drawings.

1.05 TESTS OF MATERIALS AND EQUIPMENT

All material before being incorporated in the work shall be subject to inspection, testing and approval of the Construction Manager and any work in which such materials are used without prior test and approval shall be considered defective and unauthorized and will not be paid for. The Contractor shall perform such tests as required by the Specifications in a timely fashion taking into account when the items will be incorporated in the work.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF SECTION 01400

SECTION 02520

WELL CONSTRUCTION

THIS SECTION IS ISSUED FOR REFERENCE ONLY. THIS WORK WILL BE PERFORMED BY A. C. SCHULTES (DRILLER).

PART 1 - GENERAL

1.01 SCOPE OF WORK

The work to be done under this section consists of the construction of three production wells with 16-inch outer casing and 10-inch screens; and three monitoring wells with 4-inch PVC casing at Aberdeen Proving Ground.

1.02 PERMITS, LICENSES AND LAWS

A. General: All work, details, materials and procedures shall comply with the effective Well Construction Regulations of the Code of Maryland Regulations 26.04.04.

B. Personnel: Each driller working on this project shall be licensed in Maryland.

C. Well Construction Permit: The Contractor shall apply for and obtain well construction permits from Harford County, Maryland before the pre-construction meeting.

D. Utilities: The Contractor is responsible for having the appropriate authorities locate all utilities in the working areas. The Contractor shall contact Miss Utility at least 48 hours prior to starting any work on site.

E. Digging Permit: The Contractor will be responsible for obtaining a Digging Permit prior to initiating any ground-disturbing activities on the property of Aberdeen Proving Ground.

1.03 UNEXPLODED ORDNANCE

The Contractor is required to coordinate his work schedule with an unexploded ordnance (UXO) contractor, whose services will be paid for by the Owner.

1.04 HAZARDOUS MATERIALS

The Contractor is required to hire a subcontractor to address potential hazardous materials in coordination with, and with the approval of Aberdeen Proving Ground. Should any hazardous materials be encountered, the associated drilling cuttings shall be disposed of properly. The Contractor is responsible for containing and removing cuttings and fluids generated during drilling and sampling, in accordance with procedures required by Aberdeen Proving Ground.

1.05 ACCESS TO DRILLING SITES

The Contractor is required to provide labor, equipment and materials for stabilizing ground conditions at the drilling sites, including putting down crushed stone as needed.

1.06 SEQUENCE OF WELL CONSTRUCTION

The contractor shall construct the production wells first.

1.07 WELL LOCATIONS

Production Well Site Plans and Coordinates are indicated on a map provided by WRA. Monitoring well locations must be approved by MDE.

PART 2 – PRODUCTS

2.01 DRILLING WATER

All water used for drilling must be potable. Potable water is available for the Contractor's use at APG at no cost.

2.02 MATERIALS

A. Monitoring Well Casing: new 4-inch diameter, PVC, Schedule 40, with thread and coupling

B. Monitoring Well Screen: new 4-inch diameter, machine-slotted PVC, with thread and coupling, and 0.020-inch slots

C. Monitoring Well Filter Sand: Unimin, or equivalent approved by the Engineer, and #2 size

D. Production Well Outer Casing: new 16-inch diameter, black steel, with beveled ends for welding, and minimum wall thickness of 0.375 inch

E. Production Well Inner Casing: new, 10-inch diameter, type 316 stainless steel, with beveled ends for welding

F. Production Well Screen: new, 10-inch diameter, wire-wrapped, V-shaped, type 316 stainless steel

G. Production Well Water Level Pipe: 1-inch diameter, type 304 stainless steel with thread and coupling

H. Production Well Filter Sand: Unimin, or equivalent, with the size approved by the Engineer

PART 3 - EXECUTION

3.01 PRE-CONSTRUCTION MEETING

A pre-construction meeting between the Contractor and the Engineer at the drilling site is required.

3.02 EQUIPMENT

The wells shall be drilled by the direct rotary method. Equipment shall be in good operating condition. Proper lighting is required for night work.

3.03 MUD CONTAINERS

For the circulation of the drilling fluid and cuttings, above-ground mud containers are required. Dug mud pits are not allowed.

3.04 CUTTINGS

The Contractor shall haul the cuttings offsite to an on-site location to be designated by the Owner.

3.05 POWER

The Contractor must provide his own power at the site using portable generators.

3.06 MANUFACTURER CERTIFICATES

The Contractor shall provide copies of the manufacturer certificates for the well materials to the Engineer.

3.07 WORKING HOURS

Work is generally allowed at the site seven days a week. The contractor is required to coordinate with Aberdeen Proving Ground regarding allowed working days at the site.

3.08 RECORDS

The driller shall record an accurate log of the materials penetrated, including descriptions, colors, depths and thicknesses of the strata encountered.

3.09 PILOT HOLE

A 10-inch diameter pilot hole shall be drilled in each well. The purposes of the pilot hole are to obtain representative samples of geologic formations, and to perform borehole geophysical logging. The Engineer may require deeper or shallower pilot holes depending on the geologic materials encountered during drilling. The Engineer will select the depth of the pilot hole during construction.

3.10 FORMATION SAMPLING

The sampling interval shall be 10 feet. The bit shall be allowed to penetrate the formation for the sample interval, and all cuttings from the sample interval shall be caught as circulation continues without drilling. The cuttings from each sample interval shall be stored by filling a plastic, 1-quart container with cuttings, which is labeled with the name of the well and the depth sampled, in feet. The Contractor is responsible for safe storage of the formation samples. The Engineer will select cuttings samples for grain size analyses. The Contractor shall perform the grain size analyses or hire a laboratory to perform the grain size analyses. All of the formation samples from aquifers potentially suitable for groundwater supply development shall be sieved.

3.11 BOREHOLE GEOPHYSICS

The Contractor, or the Contractor's geophysical subcontractor, shall perform the following geophysical logs of the full depth of each pilot hole:

A. Single-point resistance, electric

B. Spontaneous Potential

C. Natural gamma

An original paper copy of the geophysical logs shall be provided to the Engineer at a vertical sale of 1 inch = 20 feet. If the geophysical logs have unsatisfactory definition of formations, inaccurate depths, or the pilot hole has obstructions, the Contractor shall perform additional geophysical logging at no additional cost to the Owner.

3.12 SELECTION OF WELL DIMENSIONS

The Contractor shall submit a written recommendation to the Engineer regarding the final dimensions of each well. The Engineer will review the geophysical logs, the cuttings, and the grain size analyses of the formation samples. Based on review of the aforementioned data the Engineer will approve the casing depths, screen slot size, filter sand size, well depth, and the elevations and length of the screened interval in each test well and in each well.

3.13 MONITORING WELL ASSEMBLY

A. Reaming for casing and screen: The hole shall be reamed to a diameter of 10 to 16 inches.

B. All well materials (i.e. casing, screen, and pipe) shall be carefully measured to the nearest hundredth of a foot during assembly.

C. Joining pipe: Joints shall be thread and couple PVC, not glued.

D. Construction of 4-inch casing/screen assembly: Screen may be installed in sections separated by pieces of casing. As pieces are joined together, the casing/screen assembly shall be lowered into the hole using a temporary string of pipe.

E. Gravel Packing: The filter sand shall be hydraulically placed into the annular space between the casing / screen assembly and the geologic formation with conductor piping. The filter sand shall fill to 3 feet above the top of the uppermost well screen.

F. Top of Well: The top of the 4-inch PVC well casing shall extend 3 feet above the land surface. The PVC shall be protected with a steel well cover with a hinged steel lid and a padlock. The steel cover shall be grouted into the land surface.

3.14 MONITORING WELL DEVELOPMENT

The development shall remove the native silts and clays and drilling fluid residues deposited on the borehole face and in adjacent parts of the aquifer during the drilling process.

A. Methods: Approved development methods include pumping, air lifting, and air surging.

B. Equipment: The contractor shall provide the following equipment for development of the test well:

1. Standard circular orifice weir and piezometer tube
2. Gate valve
3. Water level meter accurate to 0.01 foot
4. Temporary test pump
5. Discharge piping
6. Sample tap at the well head

C. Completion: Well development shall be considered complete when the test well has been developed for at least 8 hours, and the well produces clear water.

3.15 PRODUCTION WELL ASSEMBLY

A. Reaming for outer casing: For the 16-inch outer casing, the hole shall be reamed to no less than 19 inches in diameter, in accordance with Maryland well regulations. If 1.5-inch tremie pipe is used for grouting, the hole shall be reamed to no less than 21 inches in diameter.

B. Measurements: All well materials (i.e., screen, casing, pipe and conductor pipe) shall be carefully measured to the nearest hundredth of a foot during assembly.

C. Welding: All welding for casing, screen, water level pipe, centralizers, or other items in the well shall be performed according to the pipe manufacturer's requirements.

D. Centralizers: To center the outer casing inside the borehole, four bowed steel centralizers shall be installed every 50 feet or at shorter intervals as needed, with staves every 90 degrees, and a width of at least 2 inches. To center the inner casing/screen assembly inside the outer casing, four bowed type 316 stainless steel centralizers shall be attached to the top, and on the sump piece of the casing/screen assembly, with staves every 90 degrees, and a width of at least 2 inches.

E. Water Level Pipe: A 1-inch inside diameter, type 304 stainless steel water level pipe, with thread and coupling, shall be welded to the outside of the outer casing. The inside ends of each piece of water level pipe shall be reamed of any burrs to maintain the diameter. A steel, 90 degree ell shall be installed at the depth indicated on the water well drawing. The water level pipe shall be tack welded to the casing 10 inches above the 90 degree ell, and every 50 feet from the ell to the top of the well. The water level pipe shall have a threaded steel cap.

F. Plumbness and Alignment: Before the outer casing is grouted, the Contractor shall test the outer casing for plumbness and alignment. The plumbness and alignment test to be used is described in the American Water Works Association *Standard for Water Wells* (AWWA document A100-97, Appendix D). The maximum allowable horizontal deviation (drift) of the well from the vertical shall not exceed 2/3 the well's inside diameter, for any 100-foot section of the well.

G. Grouting of outer casing: The annular space between the outer casing and the formation shall be grouted. The Contractor shall notify the appropriate State and County regulators at least 24 hours in advance of grouting. A neat cement grout consisting of a maximum of 6 gallons of water per 94-pound bag of Type II Portland cement shall be mixed. The grout shall be pumped into the bottom of the annular space using a grout pipe or tremie pipe until the grout flows out at ground level. The grout shall be screened with 1/4-inch mesh screen to withhold lumpy cement. The grout shall not be disturbed for at least 12 hours.

H. Replacing Drilling Fluid Before Reaming for Screen/Riser Assembly: Before reaming begins for the screen, the used drilling fluid inside the well casing and in the pits or pans shall be replaced with a new thin mix.

I. Reaming for Screen/Riser Assembly: A 16- to 22-inch diameter hole shall be reamed out below the bottom of the outer casing. The driller shall adequately chlorinate the fluid.

J. Construction of Screen/Riser Assembly: Screen may be installed in sections and separated by pieces of inner casing. As pieces are welded together, the inner casing/screen assembly shall be lowered into the hole using a temporary string of pipe. The Contractor shall replace any collapsed or damaged screen at his expense.

K. Relief Screen: A 5-foot section of 10-inch diameter relief screen shall be included. The bottom of the relief screen shall be 5 feet above the bottom of the 16-inch casing.

L. Sump Assembly: The lowermost part of the riser/screen assembly shall be a sump, consisting of a 5-foot piece of Type 316 inner well casing, with a Type 316 stainless steel plate welded on the bottom.

M. Left-Hand Setting Joint: At the top of the riser pipe, a threaded-and-coupled pipe connected to a left-hand back-off setting joint with a guide shoe shall be used for placement.

N. Flushing Out Drilling Fluid Before Gravel Packing: The drilling fluid inside the reamed hole shall be pumped out with conductor pipe, while potable, chlorinated water is simultaneously pumped in, until the water discharged from the conductor pipe is satisfactorily clean. The used drilling fluid shall be properly disposed of in a prearranged manner, e.g., with a septic contractor.

O. Gravel Packing: The filter sand shall be hydraulically placed into the annular space between the screen/riser assembly and the formation with conductor piping, while chlorinating. The filter sand shall fill to 3 feet below the top of the riser pipe.

P. Top of Well: The top of the well shall be 3 feet above the land surface, with a flanged joint, and a bolted blind flange.

3.16 PRODUCTION WELL DEVELOPMENT

The development of the production well shall remove the native silts and clays and drilling fluid residues deposited on the borehole face and in adjacent parts of the aquifer during the drilling process.

A. Methods: Approved development methods include the following: overpumping above the design rate; surging with a surge block; air lifting (forcing compressed air into the well and thereby forcing water out); and air surging (forcing compressed air into the well and pumping water out).

B. Equipment: The Contractor shall provide the following equipment for production well development:

1. Standard circular orifice weir and piezometer tube.

2. Gate valve

3. Totalizer (i.e., a meter which counts the total number of gallons pumped)

4. temporary submersible test pump capable of pumping 733 gpm.

5. Water level meter accurate to 0.01 foot

6. Discharge piping sufficient to prevent leaks, erosion, nuisance, discoloration of pavements, flooding, or endangerment of adjacent property. The Contractor shall be responsible for damage caused by inadequate discharge piping.

7. Sample tap at the well head

8. Pressure gauge

C. Completion: Well development shall be considered complete when all the following criteria are met:

1. The discharged water shall be clear.

2. After 20 minutes of pumping in the upper range of the well's capacity, the sand content of the water shall not exceed 0.5 parts per million (ppm) over 10 minutes of pumping, as measured with a Rossum Sand Tester.

3. The Specific Capacity (gpm/foot of drawdown) shall become constant, over at least four 20-minute pumping periods, tested in an 8-hour period.

4. The Well Efficiency shall be 80% or higher, based on the data from the 24-hour well pumping test, as calculated by the Engineer.

The Engineer may require that well development be continued in an attempt to achieve acceptable well development, at the Contractor's expense. If development does not stop producing sand, then the Contractor shall pull

the screen and replace it with another screen and filter sand that will not produce sand, at the Contractor's expense.

3.17 PUMPING TEST IN 10-INCH PRODUCTION WELL

The Contractor shall perform a 24-hour pumping test, with a 12-hour recovery period. The purpose is to provide data on well efficiency, aquifer characteristics and groundwater quality. The pump used for the test shall be provided by the Contractor for the required testing and shall not be the permanent production well pump.

A. Equipment: The Contractor shall provide the same equipment for the production well pumping test that is required for production well development.

B. Pre-test: The new well shall remain idle and shall not be pumped for a period of at least 24 hours before the beginning of the 24-hour test.

C. Pumping Rate: At the start of the 24-hour test, the pumping rate shall be immediately adjusted to 733 gallons per minute (gpm) or as directed by the Engineer and maintained at a constant rate. The actual rate to be used during the test will be established by the Engineer based upon the initial results of the production well testing. Flow measurements shall be as frequent as needed to stabilize the discharge in the beginning and every half hour thereafter. The Contractor shall check the orifice and adjust the pumping rate to the desired constant amount at least every half hour.

D. Water Level Measurements: The Contractor shall measure water levels in the production well and in other wells existing at Plumb Point at the time of the test, according to the same elapsed time schedule.

E. Schedule: During the hour immediately preceding the start of the pumping period, water levels in the wells shall be measured every 15 minutes, and one minute before the pump is started. After pumping begins, water level measurements shall be measured and recorded by the Contractor according to the following schedule: measurements on the minute at one-minute intervals during the first 10 minutes of the test (1 minute to 10 minutes elapsed time since pump start); at 2-minute intervals for the next 20 minutes (12 minutes to 30 minutes since start); at 5-minute intervals for the next 30 minutes (35 minutes to 60 minutes since start); at 10-minute intervals for the next 2 hours (1 hour 10 minutes to 3 hours since start); and every hour thereafter for the remainder of the pumping period.

F. Recovery: Immediately after the 24-hour pumping period, the Contractor shall measure the water levels in the wells for a 12-hour recovery period, according to the same schedule that is required for the first 12 hours of the pumping period. The test pump shall not be removed during the 12-hour recovery period.

G. Interruptions: The Engineer may declare a test a false start if equipment failure, data gaps, or a non-constant pumping rate occur. If a false start occurs, the Contractor shall perform a new test at his expense, after a period in which the water level recovers to a constant static level. The wait for the return to static shall be at least 24 hours after the end of the false start test.

H. Records: The Contractor shall record the following data in the test: actual time, elapsed time, depth to water, pumping rate, piezometer tube data, and times when flow was adjusted.

I. Groundwater Quality Tests: The contractor shall hire a subcontractor laboratory to collect samples of the pumped water in the final hour of the 24-hour pumping test. The laboratory shall analyze the samples for the chemical parameters required by MDE for new public water supply wells in Maryland. The parameter list shall also include Total Ammonia, and Total Organic Carbon.

J. In addition to the 24-hour aquifer tests described above, the contractor shall perform a 72-hour aquifer test in which three production wells will be pumped simultaneously at the estimated rate of 733 gpm per production well. A 12-hour period of recovery monitoring is required. Monitoring of water levels in the production wells and all wells at Plumb Point is required. The 72-hour test equipment, procedures, and water level time intervals required are similar to what is required for the previously described 24-hour tests (except for the duration and number of wells pumped). The purpose of the 72-hour test is to provide data to assess how the well field impacts the aquifer.

3.18 PRODUCTION WELL DISINFECTION AND BACTERIOLOGICAL SAMPLING

The new production wells shall be disinfected in accordance with the State well regulations. The Contractor shall have an independent laboratory perform bacteriological sampling of the wells. A satisfactory bacteriological test result per well is required for completion of the project by the Contractor.

3.19 PREVENTION OF CONTAMINATION

The Contractor shall maintain the premises in a sanitary condition and prevent the entrance of surface water or any other matter into wells, and keep wells safe from contamination. The Contractor shall be responsible for any objectionable material that may fall into wells and any effect it may have on water quality or water quantity.

3.20 ABANDONMENT OF WELL

If the Contractor fails to complete construction of a well or should he abandon a well because of loss of tools or for any other cause, if ordered by the Owner, he shall fill the abandoned hole(s) as required by State regulations. Salvaged material furnished by the

Contractor shall remain his property. No payment will be made for any items under the contract.

3.21 MONITORING WELL SAMPLING

A. The Contractor shall collect samples of groundwater from the four-inch diameter wells at Plumb Point, in one rounds of sampling. There are five wells.

B. The groundwater samples shall be analyzed by a laboratory certified by the State of Maryland for the list of parameters indicated in the appendix of the specifications.

C. The Contractor shall provide a written summary of the planned groundwater sampling at least one week before sampling, including the following information: the company collecting the samples; the laboratory that will perform the analyses; the chemical parameters; the volume of sample to be collected for each parameter; the laboratory method number for each parameter; the material of which each sampling container is made; preservatives; and maximum holding times for samples.

D. The round of sampling shall be collected after the last monitoring well has been constructed and developed.

E. The Contractor shall decontaminate the drilling and sampling equipment before each monitoring well is constructed to minimize the potential for contamination between wells.

F. The Contractor shall measure and record the static depth to water in each monitoring well, to the nearest 0.01 foot, before any well pumping or purging starts.

G. The Contractor shall purge three well volumes from each monitoring well before collecting the groundwater samples.

H. The Contractor shall measure and record, using field chemical instruments, the pH, temperature, and specific conductivity at the start of the purging and after each one volume of well is purged.

I. The Contractor shall measure and record the number of gallons purged from each monitoring well.

J. The Contractor shall deliver the groundwater samples to the laboratory.

3.22 SITE RESTORATION

The well construction sites shall be left in an orderly and clean condition as when work began.

3.23 FINAL REPORT

The Contractor shall provide a final report to the Engineer within 2 weeks after the last pumping test is completed. Each report shall include the following:

A. Well Permits

B. Typed copies of the State Well Completion Reports

C. Grain Size Analyses

D. Geophysical Logs at 1 inch = 20 feet scale.

E. Plumbness and alignment test data

F. As-Built Well Drawings

G. Pumping test data

H. Manufacturer Certificates for well materials

I. Laboratory test data

J. Monitoring Well Purge Data

End of Section.

SECTION 13281

ASBESTOS CONTAINING MATERIALS (ACM)

THIS SECTION IS ISSUED FOR REFERENCE ONLY.
THIS WORK WILL BE PERFORMED BY NEUBER ENVIRONMENTAL SERVICES.

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK:

A. This section includes the requirements for the removal and disposal of asbestos-containing materials (ACM). The Asbestos Abatement Contractor is responsible for all work associated with the set-up, removal, and disposal of the ACM associated with this project. All Federal (EPA, OSHA) and State of Maryland (MDE, MOSH) regulations, as well as the requirements established in this specification must be adhered to at all times during this project. The Asbestos Abatement Contractor shall additionally comply with the EPA Asbestos Hazard Emergency Response Act (AHERA) regulations (40 CFR 763 Subpart E), including but not limited to: an accredited labor force and an on-site accredited supervisor available at all times abatement work is occurring. In the event a discrepancy exists between the regulations/specifications, the most stringent condition shall apply. **The Asbestos Abatement Contractor shall review this asbestos abatement specification and the hazardous material report in conjunction with the demolition specifications and drawings to determine the exact scope of work and quantities for asbestos abatement. ACM exists throughout the renovation areas and any disturbance of these materials must be conducted in accordance with these specifications.**

The following table presents the overall approximate gross quantities of ACM, which may require abatement as part of this project. All ACMs were identified within building 250. No ACMs were found within Buildings 251, 252, and 253.

Material	Approximate quantity
Pipe and pipe fitting insulation	200 linear feet
Door caulk	5 doors
Window caulk	43 windows
Pipe gaskets	70 gaskets
Interior boiler components	1 boiler

If additional suspect ACM is identified within inaccessible areas within the scope of the work of this project, the Asbestos Abatement Contractor shall notify the Engineer in writing. The Engineer will direct the Asbestos Abatement Contractor as to how to proceed in regards to the suspect ACM.

If during renovation/demolition activities additional unidentified suspect ACM are encountered, bulk samples must be collected in accordance with the National Emissions Standard for Hazardous Air Pollutants (NESHAP) 40 CFR Part 61 Subpart M to determine if the material contains asbestos. An allowance for the collection of up to thirty (30) asbestos bulk samples by an accredited and Sate of Maryland licensed third party asbestos inspection shall be included under the proposal.

B. This section includes all work necessary to reduce air concentrations of asbestos to the specified level and maintain the specified asbestos control limits. It also includes requirements for the removal, containment, and disposal of ACM. It is the responsibility of the Contractor to identify asbestos-containing materials that will be disturbed by the demolition activities. All sampling and analyses must be conducted by accredited personnel and laboratories.

1.02 QUALITY ASSURANCE:

A. Asbestos Abatement Contractor Qualifications: The Asbestos Abatement Contractor shall be a firm of established reputation (or if newly organized, whose personnel have previously established a reputation in the same field), which is regularly engaged in, and which maintains a regular force of employees skilled in asbestos abatement, and shall have performed this work on previous projects.

1. Asbestos Abatement Contractors performing work in the State of Maryland are required to be licensed to perform asbestos work in Maryland. The Asbestos Abatement Contractor shall comply with the licensing regulations of:

Maryland Air Management Administration
Division of Engineering and Enforcement
Attn: Asbestos Licensing
1800 Washington Boulevard
Baltimore, MD 21230

2. Pursuant to NESHAP requirements, the Asbestos Abatement Contractor must provide appropriate written notification at least 10 working days prior to the start of asbestos abatement work to:

Asbestos Program Coordinator, Code 3AM 22
U. S. Environmental Protection Agency Region III
841 Chestnut Street Building
Philadelphia, PA 19107

And to the appropriate local jurisdiction listed here:

Maryland Air Management Administration
Division of Engineering and Enforcement
1800 Washington Boulevard
Baltimore, MD 21230

B. Laboratory Qualifications: Laboratory shall be regularly engaged in asbestos testing, and personnel used for monitoring airborne concentrations of asbestos fibers shall be proficient in this field. See "Submittals" paragraph for the specific information, which must be submitted for approval of the laboratory.

C. Asbestos Control Limits: The enclosed work areas shall be defined as a regulated area in accordance with 29 CFR 1926.1101.

1. Inside Asbestos Work Area: For personnel wearing negative-pressure respirators, air concentrations of asbestos shall not exceed an 8-hour time weighted average of 0.1 fibers (longer than 5 microns) per cubic centimeter of air. Regardless of respiratory protection worn, air concentrations inside the work area will not exceed an 8-hour time weighted average of 0.2 fibers per cubic centimeter. It is the responsibility of the Contractor to provide an independent industrial hygiene consultant to provide the required personal air monitoring and to assure that all safety, health, and regulatory procedures are followed.

2. Outside Asbestos Work Area: Air concentrations of asbestos shall be maintained at the lowest attainable level and shall not exceed an 8-hour time weighted average of 0.01 fibers (longer than 5 microns) per cubic centimeter of air. This applies to all areas of the building, outside of the regulated area, while work is in progress. The Asbestos Abatement Contractor's industrial hygienist will have unrestricted access to the Asbestos Abatement Contractor's work site and shall have final authority over any and all matters of interpretation regarding regulatory and specification issues. The Asbestos Abatement Contractor may perform any air sampling he wishes to assure compliance and for comparison with this standard.

1.03 REFERENCES:

A. American National Standards Institute (ANSI) Publication:

Z9.2-79 Fundamentals Governing Design and Operation of Local Exhaust Systems

B. American Society for Testing and Materials (ASTM) Publication:

E 849-82 Safety & Health Requirements; Occupational Exposure to Asbestos

C. Code of Federal Regulations (CFR):

29 CFR 1910.1001, Occupational Safety and Health Act (OSHA) Appendix A - I.

29 CFR 1926.1101, Asbestos in Construction, including Appendices.

29 CFR 1910.20, Subpart C, General Safety and Health Provisions.

29 CFR 1926.450-454, Subpart L, Scaffolds

29 CFR 1926.500-503, Subpart M, Fall Protection

29 CFR 1926.1050-1060, Subpart X, Stairways and Ladders

34 CFR, Part 231, Appendix C, Procedures for Containing and Removing Building Materials Containing Asbestos.

40 CFR Part 61, Subpart M: U.S. Environmental Protection Agency, National Emission Standards for Hazardous Air Pollutants (NESHAP) Asbestos.

40 CFR 763: EPA Asbestos in Schools Rule

29 CFR 1910.134: OSHA General Industry Respirator Requirements.

D. State and Local Regulations:

COMAR 26.11.21: Control of Asbestos

COMAR 26.11.23: School Asbestos Accreditation of Individuals

1.04 SUBMITTALS:

A. Asbestos Abatement Contractor or Subcontractor Qualification Information: Items 1.4.A.1 through 1.4.A.5 below shall be submitted and approved by the Engineer, prior to the start of abatement activities. Please note the term abatement activities refer to all aspects of the abatement process including but not limited to: 1) erecting of regulated areas (containments), 2) remediation (abatement), and dismantling of the regulated area.

1. Five Projects: Name and location of the last five asbestos abatement projects of similar size and nature, performed by the Asbestos Abatement Contractor. The names and telephone numbers of contract representatives for these projects must be included.

2. Five Air Tests: Copies of daily log and air monitoring reports including final decontamination levels of last five abatement projects.

3. Experience and Qualifications of Supervision: Name of and experience record of superintendent and foreman. Include evidence of knowledge of applicable regulations; evidence of participation and successful completion of EPA approved training course in asbestos removal and/or supervision of asbestos related work; and experience with asbestos related work in a supervisory position as evidenced through supervision of at least two asbestos abatement contracts.

4. Experience and Qualifications of Workers: Name and experience record of workmen who will be assigned to this project. Include for each person evidence of successful completion of EPA approved training given by qualified personnel. Provide certification that employees meet the medical surveillance requirements of the state for which they are licensed.

5. License Information: Provide a copy of the Maryland License for Asbestos Removal or Encapsulation as a minimum for all projects.

B. Asbestos Abatement Submittals: Items 1.4.B.1. through 1.4.B.7 below shall be and approved by the Engineer prior to starting work.

1. Plan of Action: Submit a detailed plan of the procedures proposed for asbestos abatement. The plan shall include 1) drawings depicting the location and layout of decontamination areas, 2) a detailed description of the sequence of asbestos work areas and abatement activities, 3) a detailed description of the methods and procedures proposed for the removal of ACM, 4) a plan of action for electrical and water usage,

including a plan for providing back-up emergency power, 5) the interface of trades involved in the performance of work, 6) methods to be used to assure the safety of building occupants and visitors to the site, 7) the coordination of the HVAC system shutdowns and the physical isolation of the system, and 8) estimated duration of work and proposed work schedule with dates and times. All plans must be approved by the Engineer prior to the commencement of work.

2. Disposal Plan: A disposal plan including location of approved disposal site and the Asbestos Abatement Contractors method for documenting proper asbestos disposal to the Engineer.

3. Environmental Protection Agency (EPA) Notification: Provide a copy of the NESHAPS Notification of Demolition/Renovation Form sent to the Regional EPA Asbestos Regulation Office. (Paragraph 1.02)

4. Local Government Notification: Provide a copy of the notification sent to the Maryland Department of the Environment.

5. Certificates of Compliance: Submit certification that vacuums, ventilation equipment, and other equipment required to contain airborne asbestos fibers conform to ANSI Z9.2.

6. Information on Encapsulating Material: Submit written evidence that material meets the latest requirements of the EPA and possesses the specified characteristics.

C. During-Work Asbestos Abatement Submittals: Items 1.4.C.1. through 1.4.C.2. below shall be submitted to Engineer as work progresses at the time specified.

1. Air Monitoring and Work Area Information:

a. Air Monitoring Results: Results of all air monitoring conducted by the Asbestos Abatement Contractor shall be posted within 24 hours of collection for all workers to see. A copy of the results shall be given to the Engineer.

b. Differential Air Pressure Readings: Starting when a negative pressure containment is erected and approved by the Engineer, a copy of the strip chart record of the work area relative pressure shall be submitted within 24 hours after the recording was made.

c. Work Area Inspections: The IH will perform visual inspections of the work area for the pre-removal, daily, final, and re-occupancy stages of the work.

2. Transporting and Disposing of Asbestos Containing Materials (ACM):

a. Disposal Receipts: Receipts from the transporter, which acknowledge the Asbestos Abatement Contractor's shipment of ACM from the site (NESHAPS Waste Shipment Records) shall be submitted three (3) days following removal of ACM from the premises. Each receipt shall provide date, quantity of material removed, and signature of an authorized representative of the transporter. A signed and dated copy to the Waste Shipment Record showing receipt at an authorized landfill must

be received by the Engineer within 30 calendar days of the date of the shipping receipt.

b. Transportation Vehicles: Transportation shall be in closed vehicles dedicated to asbestos transportation. Vehicles shall be marked in accordance with Department of Transportation (DOT) and NESHAPS regulations.

c. Shipping Manifest Forms: Signed and completed Shipping Manifest Forms (NESHAPS Waste Shipment Records) shall be used for the transportation of ACM. This form shall be signed by each party who has control over the asbestos waste, and a copy retained by each party as responsibility for the waste is transferred to the next party.

D. Final Submittals: Items 1.04.D.1. and 1.4.D.2. below are to be submitted to the Engineer a maximum of five (5) days after the completion of work for each containment.

1. Daily Log: Copies of a daily log showing the date(s) and time(s) of entrance to and exit from the work area(s) for all persons.

2. Reestablish Systems: Submit written certification:

a. Describing the type, application, and quantity of asbestos-containing materials removed by the abatement contractor.

b. That final inspection items were completed.

c. That mechanical and electrical systems disturbed by the Asbestos Abatement Contractor during work under the contract have been reinstalled and are in working order.

1.05 ASBESTOS ABATEMENT CONTRACTOR RESPONSIBILITY: The Asbestos Abatement Contractor shall assume full responsibility and liability for compliance with all applicable Federal and State of Maryland regulations pertaining to the protection of workers, visitors to the site, and persons occupying areas adjacent to the site. The Asbestos Abatement Contractor is responsible for providing medical examinations and maintaining medical records of personnel as required by the applicable Federal and State of Maryland regulations, and shall hold the government harmless for failure to comply with any applicable safety or health regulation on the part of himself, his employees, or his subcontractors.

1.06 PROJECT/SITE CONDITIONS:

A. Means of Egress: Establish and maintain emergency and fire exits from the work area.

B. Use of Existing Facilities: Use of existing toilets, showers, and/or other similar facilities as decontamination areas is prohibited.

C. Maintenance of Existing Equipment: The Asbestos Abatement Contractor shall be responsible for maintaining the remaining portion building's operational and aesthetic conditions during the project. All areas of the building in which the Asbestos Abatement

Contractor's workers and equipment pass through, use, and/or work in proximity to must be returned to the Owner in the same operating and aesthetic conditions as prior to the start of work. The Asbestos Abatement Contractor shall be responsible for all costs associated with replacing/repairing damaged building materials/equipment.

D. Environmental Conditions to be Maintained: Normal environmental conditions such as, but not limited to heat, light, and air conditioning, must be maintained throughout all occupied areas of the building. The Asbestos Abatement Contractor shall be responsible for any and all costs associated with the loss and re-establishment of environmental conditions.

E. Decontamination Facility: Throughout the time that asbestos removal is taking place, the abatement contractor will maintain a working three-stage decontamination facility at the point of access to the containment. As a minimum, the decontamination facility will consist of a clean changing area, a shower, and a contaminated changing area. The size and location of this facility shall be approved by the Engineer; however the size of the clean room and equipment room shall not be less than thirty-five (35) square feet (7'x5') each.

F. Containment: All asbestos-containing abatement must be performed in a negative pressure enclosure (i.e. full containment) with attached decontamination facility for work within the building.

G. Access to Work Area: Access to work areas shall be through personnel decontamination areas. The following shall have access to work area:

1) Engineer
2) Contract Monitoring Personnel
3) OSHA, EPA & MDE Inspectors
4) Local Building or Health Officials

H. If there are any proposed changes to the abatement procedure outlined in the Asbestos Abatement Contractor's work plan, a new work plan must be submitted in writing to the Engineer for approval, prior to the implementation of the new procedures.

I. All matters of interpretation regarding regulatory issues or project site conditions must be submitted to the CO in writing prior to impacting the area in question. The Engineer shall issue a written response in a reasonable time frame.

J. The Engineer is the only entity, which can alter the contract documents. The Engineer shall not dictate the means and methods by which the abatement contractor performs the work, unless the abatement contractor is in violation of applicable regulations and the project specification. Any action the Asbestos Abatement Contractor takes at the advice of the Engineer, shall be done at the abatement contractor's expense.

1.07 SEQUENCING/SCHEDULING: Asbestos abatement work shifts must be coordinated with and approved by the Engineer. Any proposed change to the established schedule must be submitted in writing to the Engineer for approval at least 72 hours prior to the desired date of schedule change.

PART 2 - PRODUCTS

2.01 EQUIPMENT: Equipment, including protective clothing and respirators, used in the execution of this contract and provided to visitors to the site, shall comply with ASTM E 849 and with the applicable Federal and State of Maryland regulations. Respirators shall conform to the OSHA requirements in 29 CFR 1910.134 and 29 CFR 1926.1101, except that single use and disposable respirators shall not be used. Type of respirators required shall be as specified in 29 CFR 1926.1101. If any area or personal air sampling indicates levels above 0.1 fibers per cubic centimeter or "too dirty to count" inside the asbestos work area, powered air (PAPR) or supplied air (type "C") respirators will be required during actual removal operations.

2.02 ENCAPSULATING MATERIALS:

A. Encapsulating Materials (sealants) shall meet the latest requirements of the Environmental Protection Agency (EPA) and shall possess the following characteristics:

1. Adherence. The sealant eliminates fiber dispersal by adhering to the fibrous substrate with sufficient penetration to prevent separation of the sealant from the sprayed asbestos material.

2. Impact Penetration. It withstands impact and penetration, protects the enclosed, sprayed asbestos material, and it must not cause separation of sprayed asbestos material from its original substrate.

3. Flexibility. It possesses enough flexibility to accommodate atmospheric changes and settling of the structure over time.

4. Resistance to Smoke and Flame. It shall have high flame retardant characteristics and a low toxic fume and smoke emission rating.

5. Ease of Application. It must be easily applied with relative insensitivity to errors in preparation or application. Ease of repair by routine maintenance personnel is desirable.

6. Toxicity. The sealant must be neither noxious nor toxic to application workers and structure users thereafter.

7. Permeability. It should have some permeability to water vapor to prevent condensation accumulation and must be resistant to common cleaning agents.

8. Stability. It should have suitable stability to weathering and aging.

C. Guarantee. Guarantee encapsulating materials to perform for a period of 1 year, in accordance with "Guarantee" clause of the General Conditions.

PART 3 – EXECUTION

Any variations in the execution of work as identified herein must be submitted in writing and approved by the Engineer prior to the implementation of the alternate procedures.

3.01 PREPARATION:

A. Isolate the work area for the duration of the work by completely sealing off all openings and fixtures in the work area, including but not limited to, heating and ventilation ducts, doorways, elevator shafts, corridors, windows, and lighting. The isolation shall be obtained by installing a minimum of two (2) layers of 6-mil flame retardant polyethylene sheeting taped securely in place with duct tape.

B. The Air Handling Unit (AHU) must be shutoff or otherwise physically isolated (cut and capped) prior to the beginning of asbestos abatement activities. The Asbestos Abatement Contractor is responsible for the coordination of the AHU shutoff and/or physically isolating the AHU from the work area. All work must be approved by the Engineer prior to the start of work.

C. Seal all critical barriers in the work area with two layers of 6-mil plastic sheeting taped securely in place with duct tape to protect from damage.

D. Seal all walls with a minimum of two layers of 6-mil flame retardant polyethylene sheeting. Walls shall be sealed from the floor to the ceiling deck or to a flame retardant polyethylene ceiling if applicable. Walls shall consist of all vertical surfaces associated with the wall systems including but not limited to, support beams, spandrel beams, concrete masonry units (CMU) walls, cinderblock, brick walls, etc. If porous, or otherwise non-cleanable ceiling tiles are to remain in the work area, a 6-mil flame retardant polyethylene ceiling must be installed to seal the ceiling tiles from the regulated area.

E. Before the work is begun, clean all removable items and equipment. Remove them from the work area and store as directed.

F. Seal all non-removable items and equipment in the work area with plastic sheeting taped securely in place with duct tape.

G. Post warning signs on all asbestos containments as required by 29 CFR 1926.1101 and ASTM E 849, and as directed by the Engineer.

3.02 WORK PROCEDURE:

A. General Procedures: The enclosed work areas shall be defined as an asbestos regulated area and all asbestos worker protection and work practices not addressed in this specification shall be performed in conformance with the general safety and health provisions of 29 CFR 1926.1101 and 29 CFR 1910.20, respectively. For asbestos abatement work, use general work practices, work practices for removal, and work practices for encapsulation as specified in 29 CFR 1926.1101, ASTM E 849, and other appropriate work procedures approved by the OSHA and the State of Maryland. If a conflict arises, the more stringent shall apply until a determination is made by the Engineer.

B Local Exhaust System: Provide a HEPA filtered local exhaust system in the asbestos control area as required to meet the asbestos control limit and ceiling concentration. The local exhaust system shall be vented to the outside of the building. Local exhaust equipment must be sufficient to maintain a negative air pressure of -0.02 inches of water in the asbestos control area. In no case shall the building ventilation system be used as the local exhaust system for

asbestos control. Filtering in vacuums and exhaust equipment shall conform to ANSI Z9.2; HEPA filters shall be used in all vacuums and exhaust equipment. The Asbestos Abatement Contractor shall supply emergency power to the HEPA equipped local exhaust equipment sufficient to maintain the required negative pressure differential (-0.02 inches of water) in the event the primary power source fails. The emergency power source shall be activated within five (5) minutes of the primary power failing.

C. Coordination of Work of all Trades: Coordinate the work of all trades to assure that their work is performed in accordance with the applicable regulations and that the asbestos control limits are maintained at all times both inside and outside the asbestos work area.

3.03 QUALITY CONTROL:

A. Monitoring: Monitoring of airborne concentrations of asbestos shall be in accordance with 29 CFR 1926.1101 and ASTM E 849. Airborne concentration of asbestos before starting work to obtain a baseline fiber concentration in the affected areas shall occur. Daily monitoring outside the entrance to the asbestos work area, and at the exhaust opening of the local exhaust system shall be performed. If monitoring shows airborne concentrations greater than the asbestos control limits, stop all work, correct the conditions causing the excessive levels, and notify the Engineer immediately. The Asbestos Abatement Contractor's industrial hygienist will perform asbestos monitoring to determine the airborne asbestos levels.

B. Site Inspection and Stop Work Orders: While performing asbestos abatement work, the Asbestos Abatement Contractor shall be subject to on site inspection by the Engineer. Work shall also be subject to inspection by MDE, OSHA and EPA inspectors and/or local building or health officials. If found to be in violation by one of these officials, the Asbestos Abatement Contractor shall cease all asbestos abatement work immediately, and not resume asbestos abatement operations until all violations are resolved. Standby time required to resolve any violation shall be at the Asbestos Abatement Contractor's expense. One complete set of equipment (such as respirators and disposable clothing) required for entry to the asbestos control area shall be made available immediately upon request of the Engineer, for inspection of the asbestos control area. Such requests will only be made during the Asbestos Abatement Contractor's working hours.

3.04 CLEANUP AND DISPOSAL:

A. Permits and Notifications: Secure necessary permits in conjunction with asbestos removal, hauling and disposition and provide timely notification of such actions, as may be required by Federal, State, and local authorities. Notify the Regional Office of the United States Environmental Protection Agency and provide copies of the notification to the Engineer 20 working days prior to the commencement of the work. Provide notification in accordance with 40 CFR 61.22(d)(1). (See Paragraph 1.2.A.2)

B. Housekeeping: Essential parts of asbestos dust control are housekeeping and cleanup procedures. Maintain surfaces of the asbestos control area free of accumulations of asbestos fibers. Give meticulous attention to restricting the spread of dust and debris, keep waste from being distributed over the general area or to lower floors. Use approved industrial vacuum cleaners with a HEPA filter to collect dust and small scrapEquip personnel engaged in the clean up of asbestos scrap and waste with necessary respiratory equipment and protective

clothing.

C. Disposal of Asbestos: Collect and dispose of asbestos waste, scrap, debris, bags, containers, equipment, and asbestos contaminated clothing which may produce airborne concentrations of asbestos fibers in sealed impermeable bags. Prior to placing in bags, or containers, wet down asbestos wastes with amended water to reduce airborne concentrations. Waste asbestos material shall be disposed of in accordance with all Federal regulations at a sanitary landfill that meets EPA requirements. The Contractor will provide the Engineer with a copy of all hazardous waste manifests, hauler receipts or landfill receiving tickets resulting from the disposal of the asbestos waste. The Engineer must approve the establishment of any on-site temporary holding area for properly packaged asbestos waste.

D. Final Cleanup and Removal of Enclosure: The Asbestos Abatement Contractor must notify the Engineer that the work area is ready for final inspection. The Asbestos Abatement Contractor's industrial hygienist will inspect the work area prior to decontamination and removal of the enclosure. Visual observation of asbestos materials, dust, or debris is not permitted on any surface in or around the work area. The Asbestos Abatement Contractor shall clean the work area in accordance with EPA approved methods. The Asbestos Abatement Contractor's shall perform air sampling for clearance purposes. The Asbestos Abatement Contractor's industrial hygienist will perform sampling in accordance with the procedures established by the EPA in 40 CFR Part 763 Subpart E, the Asbestos Hazard Emergency Response Act (AHERA) regulation. Repeat the decontamination and testing process until fiber concentration levels for all inside the work area final clearance samples reach airborne asbestos concentrations of less than (<) 1 fiber per cubic centimeter (f/cc). If the air samples are above the established clearance levels, the Asbestos Abatement Contractor shall continue to re-clean the containment until the clearance levels are achieved. Phase contrast microscopy (PCM) final clearance sampling shall be utilized. All PCM final clearance samples must have fiber concentrations of <0.01 f/cc.

Any additional cleaning shall be performed at the Asbestos Abatement Contractor's expense. In addition the Asbestos Abatement Contractor shall reimburse Owner for all costs associated with the additional industrial hygienist fees. These costs include, but are not limited to final visual re-inspection time, sampling time, travel time, sample analysis, and mileage. Once the airborne asbestos concentration is below the final clearance criteria the Asbestos Abatement Contractor will be informed by the Engineer to remove the asbestos enclosure.

End of Section 13821

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SECTION 13282

LEAD IN CONSTRUCTION

THIS SECTION IS ISSUED FOR REFERENCE ONLY. THIS WORK WILL BE PERFORMED BY NEUBER ENVIRONMENTAL SERVICES.

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK:

The following types of components have been identified as being finished with Lead Based Paint (LBP) within Buildings 250, 251, 252, and exterior tanks:

- o Interior/exterior doors (wood and metal)
- o Interior/exterior door frames (wood and metal)
- o Windows(wood and metal)
- o Window frames and sills(wood and metal)
- o Structural steel
- o Conduit
- o Piping
- o Wood moldings
- o Tanks (interior and exterior)
- o Stair systems
- o Concrete walls and ceilings
- o Ceramic tile
- o Porcelain toilet
- o Wood wall
- o Wood soffit
- o Window and door lintels
- o Exterior tank handrails

NOTES: Other painted surfaces at the site contain measurable amounts of lead and must be handled accordingly for OSHA compliance. Abatement may be required for locations of torch cutting and/or welding on any metal components that are lead based paint or have measurable lead content. Please refer to applicable architectural and mechanical drawings for these locations.

The purpose of the project is to renovate the building; not to perform LBP/LCP abatement. The removal of LBP/LCP is not required for this project. There are no regulatory requirements to abate LBP/LCP prior to performing renovation/demolition projects. The Contractor shall assume all responsibility (in regards to LBP/LCP) for the protection of the subcontractors and the subcontractor's employees performing work in the building. The Contractor shall address LCP/LBP in accordance with the procedures established in 29 CFR 1926.62 (with Maryland amendments). The Owner shall not reimburse the Contractor for the removal of LCP/LBP, which is performed by the Contractor for the purposes of complying with 29 CFR 1926.62 or for the purposes protecting the Contractor's employees and/or subcontractors. The Contractor shall bear the cost of any LBP/LCP abatement, which is performed to satisfy the Contractor's or the subcontractor's health and safety requirements.

If the Contractor chooses to perform LBP/LCP abatement, the procedures outlined in this specification, along with the appropriate Federal and State of Maryland regulations, must be followed. These procedures are only applicable if the Contractor elects to perform LBP/LCP abatement. The Owner is not responsible for the cost associated with these procedures.

1.02 REFERENCES

A. AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI Z9.2-1979	(1979; R 1991) Fundamentals Governing the Design and Operation of Local Exhaust Systems
ANSI Z88.2	(1992) Respiratory Protection

B. CODE OF FEDERAL REGULATIONS (CFR)

29 CFR 1926.21	Safety Training and Education
29 CFR 1926.55	Gases, Vapors, Fumes, Dusts, and Mists
29 CFR 1926.59	Hazard Communication
29 CFR 1926.62	Lead Exposure in Construction
29 CFR 1926.65	Hazardous Waste Operations and Emergency Response
29 CFR 1910.134	Respiratory Protection
40 CFR 260	Hazardous Waste Management Systems: General
40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 262	Generators of Hazardous Waste
40 CFR 263	Transporters of Hazardous Waste
40 CFR 264	Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 265	Interim Status Standard for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 268	Land Disposal Restrictions
40 CFR 745	Lead; Requirements for Lead-Based Paint Activities
49 CFR 172	Hazardous Materials, Tables, and Hazardous Materials Communications Regulations
49 CFR 178	Shipping Container Specification

C. UNDERWRITERS LABORATORIES INC. (UL)

UL 586	(1990) High-Efficiency, Particulate, Air Filter Units

D. STATE OF MARYLAND

COMAR 26.02.07 Procedures for Abating Lead-Containing Substances From Buildings

COMAR 26.16.01 Accreditation and Training for Lead Paint Abatement Services

1.03 DEFINITIONS

A. Action Level - Employee exposure, without regard to use of respirators, to an airborne a concentration of lead of 30 micrograms per cubic meter of air averaged over an 8 hour period in an occupational/industrial environment.

B. Area Sampling - Sampling of lead concentrations within the lead control area and inside the physical boundaries, which is representative of the airborne, lead concentrations but is not collected in the breathing zone of personnel.

C. Competent Person (CP) - As used in this section, refers to a person employed by the Contractor who is trained in the recognition and control of lead hazards in accordance with current State of Maryland regulations as a Lead-Based Paint Risk Assessor. An industrial hygienist or safety professional certified for comprehensive practice by the American Board of Industrial Hygiene or by the Board of Certified Safety Professionals, with this certification is the best choice.

D. Contaminated Room - Room for removal of contaminated personal protective equipment (PPE).

E. Decontamination Shower Facility - That facility that encompasses a clean clothing storage room, and a contaminated clothing storage and disposal rooms, with a shower facility in between.

F. Eight-Hour Time Weighted Average (TWA) - Airborne concentration of lead to which an employee is exposed, averaged over an 8 hour workday as indicated in 29 CFR 1926.62.

G. High Efficiency Particulate Air (HEPA) Filter Equipment - HEPA filtered vacuuming and ventilation equipment with a UL 586 filter system capable of collecting and retaining lead-contaminated paint dust. A high efficiency particulate filter means 99.97 percent efficient against 0.3 micron or larger size particles.

H. Lead - Metallic lead, inorganic lead compounds, and organic lead soaps.

I. Lead Based Paint (LBP) - Protective or decorative coating which contains more than 0.5% lead by weight calculated as a dried solid, or more than 0.7 milligrams of lead per square centimeter of surface area when measured with an x-ray fluorescence analyzer.

J. Lead Control Area - An enclosed area or structure, constructed as a temporary containment equipped with HEPA filtered local exhaust, which prevents the spread of lead dust, paint chips, or debris existing as a condition of lead based paint removal operations. The lead control area is also isolated by physical boundaries to prevent

unauthorized entry of personnel. It is intended to perform the lead-based paint abatement utilizing the same containment, which was established for the asbestos abatement.

K. Lead Permissible Exposure Limit (PEL) - Fifty micrograms per cubic meter of air as an 8 hour time weighted average as determined by 29 CFR 1926.62. If an employee is exposed for more than eight hours in a workday, the PEL shall be determined by the following formula

PEL (micrograms/cubic meter of air) = 400/No. hrs worked per day

L. Personal Sampling - Sampling of airborne lead concentrations within the breathing zone of an employee to determine the 8 hour time weighted average concentration in accordance with 29 CFR 1926.62. Samples shall be representative of the employees' work tasks. The breathing zone shall be considered an area within a hemisphere, forward of the shoulders, with a radius of six to nine inches and centered at the nose or mouth of an employee.

M. Physical Boundary - Area physically roped or partitioned off around an enclosed lead control area to limit unauthorized entry of personnel. As used in this section, "inside boundary" shall mean the same as "outside lead control area but inside boundary."

1.04 QUALITY ASSURANCE

A. Medical Examinations - Before exposure to lead-contaminated dust, provide workers with a comprehensive medical examination as required by 29 CFR 1926.62 and 29 CFR 1910.134. The examination will not be required if adequate records show that employees have been examined as required by 29 CFR 1926.62 within the last year.

B. Medical Records - Maintain complete and accurate medical records of employees for the duration of employment plus 30 years.

C. Medical Surveillance - Provide medical surveillance to all personnel exposed to lead as indicated in 29 CFR 1926.62.

D. Competent Person (CP) Responsibilities

1. Certify training as meeting all State of Maryland requirements as a Lead-Based Paint Risk Assessor.
2. Review and approve lead based paint removal plan for conformance to the applicable referenced standards.
3. Continuously inspect lead based paint removal work for conformance with the approved plan.
4. Perform air and wipe sampling.
5. Ensure work is performed in strict accordance with specifications at all times.
6. Control work to prevent hazardous exposure to human beings and to the environment at all times.
7. Certify the conditions of the work as called for elsewhere in this specification.

E. Training - Train each employee performing paint removal and disposal operations prior to the time of initial job assignment and once every two (2) years thereafter, in accordance with COMAR 26.16.01 and 26.16.02.

F. Training Certification - Submit a certificate for each employee, signed and dated by the approved training source, stating that the employee has received the required Lead Paint Abatement Worker Training.

G. Respiratory Protection Program - Furnish each employee required to wear a negative pressure respirator or other appropriate type with a respirator fit test at the time of initial fitting and at least annually thereafter as required by 29 CFR 1926.62. Establish and implement a respiratory protection program as required by ANSI Z88.2, 29 CFR 1910.134, 29 CFR 1926.62, and 29 CFR 1926.55.

H. Hazard Communication Program - Establish and implement a Hazard Communication Program as required by 29 CFR 1926.59.

I. Hazardous Waste Management - The Hazardous Waste Management Plan shall comply with applicable requirements of federal, State of Maryland, and local hazardous waste regulations and address:

1. Identification and classification of hazardous wastes associated with the work.
2. Estimated quantities of wastes to be generated and disposed of.
3. Names and qualifications of each contractor that will be transporting, storing, treating, and disposing of the wastes. Include the facility location [and operator] and a 24-hour point of contact. Furnish two copies of EPA, State, and local hazardous waste permit applications, permits, manifests, and EPA Identification numbers.
4. Names and qualifications (experience and training) of personnel who will be working on-site with hazardous wastes.
5. List of waste handling equipment to be used in performing the work, to include cleaning, volume reduction, and transport equipment.
6. Spill prevention, containment, and cleanup contingency measures including a health and safety plan to be implemented in accordance with 29 CFR 1926.65.
7. Work plan and schedule for waste containment, removal and disposal. Wastes shall be cleaned up and containerized daily.
8. Cost for hazardous waste disposal according to this plan.

J. Safety and Health Compliance - In addition to the detailed requirements of this specification, comply with laws, ordinances, rules, and regulations of Federal and State of Maryland authorities regarding removing, handling, storing, transporting, and disposing of lead waste materials. Comply with the applicable requirements of the current issue of 29 CFR 1926.62. Submit matters regarding interpretation of standards to the Engineer for resolution before starting work. Where specification requirements and the referenced documents vary, the most stringent requirement shall apply. The following State of Maryland laws, ordinances, criteria, rules and regulations regarding removing, handling, storing, transporting, and disposing of lead-contaminated materials apply:

COMAR 26.02.07	Procedures for Abating Lead-Containing Substances From Buildings
COMAR 26.16.01	Accreditation and Training for Lead Paint Abatement Services
COMAR 26.16.02	Reduction of Lead Risk Housing

K. Pre-Construction Conference - Along with the CP, meet with the Engineer to discuss in detail the hazardous waste management plan and the lead based paint removal plan, including work procedures and precautions for the removal plan.

1.05 SUBMITTALS

A. Manufacturer's Catalog Data

1. Vacuum filters
2. Respirators

B. Instructions

1. Chemicals and equipment
2. Materials
3. Material safety data sheets for all chemicals

C. Statements

1. Qualifications of CP
2. Testing laboratory and consultant qualifications
3. Lead based paint removal plan including CIH approval (signature, date, and certification number)
4. Rental equipment notification
5. Respiratory protection program
6. Hazard communication program
7. EPA approved hazardous waste treatment or disposal facility for lead disposal
8. Hazardous waste management plan

D. Qualifications of CP - Submit name, address, and telephone number of the CP selected to perform responsibilities specified in paragraph entitled "Competent Person (CP) Responsibilities." Provide previous experience of the CP. Submit proper documentation that the CP is trained and licensed in accordance with State of Maryland laws.

E. Testing Laboratory and Consultant - Submit the name, address, and telephone number of the testing laboratory and consultant selected to perform the sampling, testing, and reporting of airborne concentrations of lead. Use a laboratory accredited under the EPA National Lead Laboratory Accreditation Program (NLLAP) by either the American Association for Laboratory Accreditation (AALA) or the American Industrial Hygiene Association (AIHA) and that is successfully participating in the Environmental Lead Proficiency Analytical Testing (ELPAT) program to perform sample analysis.

F. Lead Based Paint Removal Plan (LBPRP) - Submit a detailed job-specific plan of the work procedures to be used in the removal of LBP. The plan shall include a sketch showing the location, size, and details of lead control areas, location and details of decontamination facilities, viewing ports, and mechanical ventilation system. Include in the plan, eating, drinking, smoking and sanitary procedures, interface of trades, sequencing of lead related work, collected waste water and paint debris disposal plan, air sampling plan, respirators, personal protective equipment, and a detailed description of the method of containment of the operation to ensure that airborne lead concentrations of

30 micrograms per cubic meter of air and baseline lead dust concentrations are not reached or exceeded outside of the lead control area.
Include occupational and environmental sampling, training and strategy, sampling methodology, frequency, duration of sampling, and qualifications of sampling personnel in the air sampling portion of the plan.

G. Occupational and Environmental Sampling Results - Submit occupational and environmental sampling results to the Engineer within three working days of collection, signed by the testing laboratory employee performing the analysis, the employee that performed the sampling, and the CP.

H. Certificates

1. Vacuum filters

I. Records

1. Completed and signed hazardous waste manifest from treatment or disposal facility
2. Certification of medical examinations
3. Employee training certification

1.06 REMOVAL

A. Title to Material - Materials resulting from abatement work, except as specified otherwise shall become the property of the Contractor and shall be disposed of properly.

1.07 EQUIPMENT

A. Respirators - Furnish appropriate respirators approved by the National Institute for Occupational Safety and Health (NIOSH) for use in atmospheres containing lead dust. Respirators shall comply with the requirements of 29 CFR 1926.62.

B. Special Protective Clothing - Furnish personnel who will be exposed to lead-contaminated dust with proper disposable uncontaminated protective whole body clothing, head covering, gloves, and foot coverings as required by 29 CFR 1926.62. Furnish proper disposable plastic or rubber gloves to protect hands.

C. Rental Equipment Notification - If rental equipment is to be used during lead based paint handling and disposal, notify the rental agency in writing concerning the intended use of the equipment. Furnish a copy of the written notification to the Engineer.

D. Vacuum Filters - UL 586 labeled HEPA filters.

E. Equipment for Inspection Personnel - Furnish the Engineer with two complete sets of personal protective equipment (PPE) daily, as required herein, for entry into and inspection of the paint removal work within the lead controlled area. Personal protective equipment shall include disposable whole body covering, including appropriate foot,

head, and hand protection. PPE shall remain the property of the Contractor

PART 2 PRODUCTS

2.01 CHEMICALS - Submit applicable Material Safety Data Sheets for all chemicals used in paint removal work. Use the least toxic product approved by the Engineer.

2.02 MATERIALS - The soluble metal content and the total metal content shall not exceed values, which would cause a material to be classified as a hazardous waste.

PART 3 EXECUTION

If the Contractor elects to perform LBP/LCP abatement, then the following procedures must be implemented. All LBP/LCP abatement shall be performed at the Contractor's expense.

3.01 LEAD CONTROL AREA REQUIREMENTS - Establish a lead control area by completely enclosing the area or structure where lead based paint removal operations will be performed, with 6-mil polyethylene sheeting. Contain removal operations by the use of a negative pressure enclosure system with decontamination facilities and HEPA filtered exhaust ventilation units.

3.02 PROTECTION OF EXISTING WORK TO REMAIN - Perform paint removal work without damage or contamination of adjacent areas. Where existing work is damaged or contaminated, restore work to its original condition or better.

3.03 BOUNDARY REQUIREMENTS - Provide physical boundaries around the lead control area by roping off the area designated in the work plan and providing curtains, portable partitions or other enclosures to ensure that airborne concentrations of lead will not reach 30 micrograms per cubic meter of air outside of the lead control area.

3.04 DECONTAMINATION SHOWER FACILITY - Provide clean and uncontaminated change rooms and shower facilities in accordance with this specification and 29 CFR 1926.62.

3.05 MECHANICAL VENTILATION SYSTEM

A. Use adequate ventilation to control personnel exposure to lead in accordance with 29 CFR 1926.62.
B. To the extent feasible, use fixed local exhaust ventilation connected to HEPA filters or other collection systems, approved by the CP. Local exhaust ventilation systems shall be designed, constructed, installed, and maintained in accordance with ANSI Z9.
C. Vent local exhaust outside the building only and away from building ventilation intakes.
D. Use locally exhausted, power actuated, paint removal tools.

3.06 PERSONNEL PROTECTION - Personnel shall wear and use protective clothing and equipment as specified herein. Eating, smoking, or drinking or application of cosmetics is not permitted in the lead control area. No one will be permitted in the lead control area unless they have been appropriately trained and provided with protective equipment.

3.07 WARNING SIGNS - Provide warning signs at approaches to lead control areas. Locate signs at such a distance that personnel may read the sign and take the necessary precautions before

entering the area. Signs shall comply with the requirements of 29 CFR 1926.62.

3.08 WORK PROCEDURES - Perform removal of lead based paint in accordance with approved lead based paint removal plan. Use procedures and equipment required to limit occupational and environmental exposure to lead when lead based paint is removed in accordance with 29 CFR 1926.62, except as specified herein. Dispose of removed paint chips and associated waste in compliance with Federal and State of Maryland requirements.

A. Personnel Exiting Procedures - Whenever personnel exit the lead-controlled area, they shall perform the following procedures and shall not leave the work place wearing any clothing or equipment worn during the work day:

1. Vacuum themselves off.
2. Remove protective clothing in the contaminated change room, and place them in an approved impermeable disposal bag.
3. Shower.
4. Change to clean clothes prior to leaving the physical boundary designated around the lead control area.

B. Air and Wipe Sampling - Air sample for lead in accordance with 29 CFR 1926.62 and as specified herein. Air and wipe sampling shall be directed or performed by the CP.

1. The CP shall be on the job site directing the air and wipe sampling and inspecting the lead based paint removal work to ensure that the requirements of the contract have been satisfied during the entire lead based paint removal operation.

2. Collect personal air samples on employees who are anticipated to have the greatest risk of exposure as determined by the CP. In addition, collect air samples on at least ten percent of the work crew or a minimum of two employees, whichever is greater, during each work shift.

3. Submit results of air samples, signed by the CP, within 72 hours after the air samples are taken. Notify the Engineer immediately of exposure to lead at or in excess of the action level of 30 micrograms per cubic meter of air outside of the lead control area.

4. Before any work begins, collect and analyze baseline wipe samples in accordance with methods defined in HUD protocol and State of Maryland regulations, whichever is more stringent, inside and outside of the physical boundary to assess the degree of dust contamination in the building prior to lead based paint removal.

C. Air Sampling During Paint Removal Work - Conduct area air sampling daily, on each shift in which lead based paint removal operations are performed, in areas immediately adjacent to the lead control area. Such areas as outside the clean room, entrance to the containment, and at the exhaust opening of the local exhaust system are examples of locations where sampling should be performed. Sufficient area monitoring shall be conducted to ensure unprotected personnel are not exposed at or above 30 micrograms per cubic meter of air. If 30 micrograms per cubic meter of air is reached or exceeded, stop work, correct the conditions(s) causing the increased levels. Notify the Engineer

immediately. Determine if condition(s) require any further change in work methods. Removal work shall resume only after approval is given by the Engineer.

D. Lead Based Paint Removal - Provide methodology for removing LBP in work plan. Take whatever precautions necessary to minimize damage to the underlying substrate.

E. Wipe Sampling After Paint Removal - After the removal of the LBP is complete, the CP shall perform a visual inspection of the area to ensure the area is free from all dust and debris. After the visual inspection the Engineer shall collect dust wipes samples according to the HUD protocol and State of Maryland regulations, whichever is more stringent, to determine the lead content of settled dust and dirt in micrograms per square foot of surface area.

F. Cleanup and Disposal - Maintain surfaces of the lead control area free of accumulations of paint chips and dust. Restrict the spread of dust and debris; keep waste from being distributed over the work area. Do not dry sweep or use compressed air to clean up the area. At the end of each shift and when the paint removal operation has been completed, clean the area of visible lead paint contamination by vacuuming with a HEPA filtered vacuum cleaner, wet mopping the area and wet wiping the area as indicated by the CP. Re-clean areas showing dust or residual paint chips or debris. After visible dust, chips and debris are removed, wet wipe and HEPA vacuum all surfaces in the work area. If adjacent areas become contaminated at any time during the work, clean, visually inspect, and then wipe sample all contaminated areas. The CP shall then certify, in writing, that the area has been cleaned of lead contamination before restarting work.

G. Certification - The CP shall certify in writing that the final surface wipe sample results collected inside and outside the work area are less than 40 micrograms per square foot on floors. The respiratory protection used for the employees was adequate; the work procedures were performed in accordance with 29 CFR 1926.62 and 40 CFR 745; and that there were no visible accumulations of lead based paint and dust left in the work site. Do not remove the lead control area or roped off boundary and warning signs prior to receiving the CP's notification.

H. Testing of Lead Based Paint Residue - Test lead containing paint residue in accordance with 40 CFR 261 for lead hazardous waste. The suspect lead waste must be sampled prior to disposal and tested by the TCLP for lead. If the TCLP test reveals a result of less than 5 parts per million (ppm) the waste can be categorized as non-hazardous. If the result is greater than 5 ppm, then the waste must be disposed of properly as a lead hazardous waste. Since LBP/LCP is not required for this project, if lead hazardous waste is generated by the Contractor, then the Contractor shall assume all costs for the disposal of the waste.

I. Disposal – All metal substrates with LCP/LBP shall be disposed of by means of recycling. If recycling is not a feasible option the Contractor shall collect lead-contaminated waste, scrap, debris, bags, containers, equipment, and lead-contaminated clothing, which may produce airborne concentrations of lead particles. Label the containers in accordance with 29 CFR 1926.62 and 40 CFR 261. Dispose of lead-contaminated waste material at an EPA or State approved hazardous waste treatment, storage, or disposal. The Building Owner must obtain an EPA hazardous waste generator identification number.

Store waste materials in U.S. Department of Transportation (49 CFR 178) approved containers. Properly label each container to identify the type of waste (49 CFR 172) and the date the container was filled.

Handle, store, transport, and dispose lead or lead-contaminated waste in accordance with 40 CFR 260, 40 CFR 261, 40 CFR 262, 40 CFR 263, 40 CFR 264, and 40 CFR 265. Comply with land disposal restriction notification requirements as required by 40 CFR 268.

J. Disposal Documentation - Submit written evidence that the hazardous waste treatment, storage, or disposal facility (TSD) is approved for lead disposal by the EPA and State of Maryland or local regulatory agencies. Submit one copy of the completed manifest, signed and dated by the initial transporter in accordance with 40 CFR 262.

End of Section 13282

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WORK ACTIVITIES AND ASSOCIATED AHA'S
GENERAL CONTRACTOR PHASE WORK

AHA Name	Work Activity Description
Office Work	Sitting, walking, writing, typing, use of computer, monitor, keyboard, copier use, lifting, bending and stooping
Surveying	Walking on uneven terrain around construction activities in process
Mobilization	Mobilization and Temporary Trailer Installation, Sanitation; (toilets and hand-wash), waste and debris
Temporary Utility Installation	Temporary installation of electrical for Site Trailer, Potable Water for Trailer
Construction Site Entry	Install and Maintain construction site entry per MDE permit requirements
Stormwater Management and Wetland Protections	Stormwater Sediment and Erosion Control Measures per MDE permit. Wetland Protections per MDE Wetland Permit.
Dig Permit/Utility Locate/UXO Clearance Process	Surveying, Dig Permit, Marking Utilities, UXO Clearances
Demolition Work	Building 250 concrete floor, doors, windows, temporary opening in the wall and outside site and utility related work
Excavation and Trenching	Use of heavy equipment installation of utilities
Directional Drilling	Construction of two pits and directional drilling
Civil	Grading, compaction w/ Heavy Earth Moving Equipment
Civil/Mechanical Utilities	Installation of various utilities. Isolation and control of hazardous energy; including Lock Out/Tag Out (LOTO) as applicable.
Electrical	Electrical Power and Distribution Set Up
Concrete, Formwork, Reinforcing Steel, Spread Footings	Concrete Footings, Slab and Mat Foundation Construction, construct elevated mezzanine, stairs, platform and railings and steel support structure
Micro Piles	Installation of Micro Piles inside Building 250

WORK ACTIVITIES AND ASSOCIATED AHA'S
GENERAL CONTRACTOR PHASE WORK

AHA Name	Work Activity Description
Rigid Inclusion	Installation of rigid inclusion and load transfer platform for Finished Water Tank and pumping station
Electrical Systems	Electrical Systems, TXFMR and Switchgears Installation, Installation of Assured Grounding
Plumbing	Plumbing and Fixtures Installation
Pressure Filters Installation	Unloading, Lifting, storage, placement and installation of vessels inside Building 250 WTP
GAC Filters Installation	Unloading, Lifting, storage, placement and installation of vessels inside Building 250 WTP
Lighting Plan	Exterior and Interior Lighting Installation
HVAC	HVAC System Installation
Fire Alarm System	Fire Alarm System Installation
Fire Protection System	Fire Hydrant Flow Test
Interior Construction	Interior Carpentry, rough in, framing
Interior Finishes	Interior Finishes, prime, paint, caulk
Demobilization	Demobilization and Temporary Trailers Removal
Temporary Fence Installation (if required)	Public Protections/Site Security/ Protection of assets

FOR EXAMPLE ONLY

Activity Hazard Analysis (AHA) #1

Job/Task: Mobilization and Temporary Trailer Installation	**Overall Risk Assessment Code (RAC) (Use highest code)**	**L**
Project Location: Aberdeen Proving Ground (APG), Maryland	**Risk Assessment Code (RAC) Matrix**	
Contract Number: PM18-0020	**Severity** / **Probability**	
Date Prepared: December 2017		
Prepared by: Ryan Morba (PM) Neuber Environmental Services, Inc.	
Reviewed by: Chris Henderson (SSHO) Tetra Tech Charles Johnson (RSM) City of Aberdeen Bill Alcarese, (SHO) USACE	

Severity	**Frequent**	**Likely**	**Occasional**	**Seldom**	**Unlikely**
Catastrophic	**E**	**E**	**H**	**H**	**M**
Critical	**E**	**H**	**H**	**M**	**L**
Marginal	**H**	**M**	**M**	**L**	**L**
Negligible	**M**	**L**	**L**	**L**	**L**

Notes: (Field Notes, Review Comments, etc.)

In addition to the information listed in this AHA, all affected workers will review all provisions of the approved APP and associated Safe Work Practices (SWP's).

A review of applicable sections: OSHA 29 CFR 1926 Construction Industry Regulations, USACE EM385-1-1 (Nov. 2014) applicable sections were used in the development of the safe work practices and controls used to prevent worker exposure to known hazards of the job steps outlined in this Activity Hazard Analysis (AHA).

Step 1: Review each **"Hazard"** with identified safety **"Controls"** and determine RAC (see above).

"Probability" is the likelihood to cause an incident, near miss, or accident and is identified as Frequent, Likely, Occasional, Seldom, or Unlikely.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and is identified as Catastrophic, Critical, Marginal, or Negligible.

Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on the AHA. Annotate the overall highest RAC at the top of the AHA.

RAC Chart

E = Extremely High Risk

H = High Risk

M = Moderate Risk

L = Low Risk

Job/Task: Mobilization and Temporary Trailer Installation AHA #1

Job Steps	Hazards	Controls	RAC
1. Mobilization: Travel to the Project Site	1. Equipment movement during travel.	1. Tie down and secure all materials, equipment and loads. 2. **Inspect** load prior to leaving shop.	**L**
	2. Contact with pedestrians or other workers while parking.	1. Park only where permitted. 2. Keep heavy equipment from pedestrian traffic until site is setup. 3. Attempt to park in an area of low traffic, vehicles, and buildings. 4. Driver should survey the area prior to parking.	**L**

Job/Task: Mobilization and Temporary Trailer Installation AHA #1			
Job Steps	**Hazards**	**Controls**	**RAC**
		5. If load blocks the drivers vision during parking/backing, a spotter will be used to ensure safe parking.	
1. Mobilization: Travel to the Project Site - continued	3. Hazards traveling to the project site, road hazards such as wet pavement, traffic construction, and speed limits.	1. **Be Aware** of all conditions while driving. 2. Keep safe distances from vehicles in front. 3. Adhere to all traffic laws.	**L**
	4. Not knowing project conditions or safety hazards.	1. Meet with Project SSHO to review project scope, hazards, and procedures. 2. Read, know and sign APP/ AHA's. **3. Do not** start any work activity before reviewing the AHA for that specific activity.	**L**
2. Trailer Set-Up Onsite	1. Use of hand tools.	1. Use all hand tools in accordance with the manufacturer's instructions. 2. Workers will be familiar with the proper use of the tool being used. 3. Tools will be maintained according to manufacturer's recommendations. 4. Tools will be inspected before each use. 5. Damaged or defective tools will be placed out of operation until repaired or replaced. 6. Secure work with clamps or a vise, freeing both hands to operate the tool. 7. Be sure to keep good footing and maintain good balance. 8. The proper apparel should be worn. Loose clothing, ties, or jewelry can become caught in moving parts. 9. Work areas should be well lighted. 10. Tools should never be pointed at other workers. 11. Use the right tool for the job.	**L**
	2. Struck by moving equipment.	1. Use spotter (or flagger if needed) or other means to control traffic. 2. Provide high visibility outer garments for workers exposed to vehicle traffic. 3. Erect barricades, stop logs, and/or warning signals where mobile equipment/truck operators have obstructed view.	**L**

Job/Task: Mobilization and Temporary Trailer Installation AHA #1			
Job Steps	**Hazards**	**Controls**	**RAC**
		4. Ensure that all heavy trucks and heavy equipment are equipped with working back up alarms.	
2. Trailer Set-Up Onsite - continued	3. Electrical shock hazards (power tools and extension cords.)	1. Use all hand tools in accordance with the manufacturer's instructions. 2. Workers will be familiar with the proper use of the tool being used. 3. Tools will be inspected before each use. 4. Damaged or defective tools will be placed out of operation until repaired or replaced. 5. Use GFCI for all electrical tools. 6. Never carry a tool by the cord or hose. 7. Never yank the cord or the hose to disconnect it from the receptacle. 8. Keep cords and hoses away from heat, oil, and sharp edges. 9. Disconnect tools when not in use, before servicing, and when changing accessories such as blades, bits and cutters.	**L**
	4. Eye hazards of flying debris.	1. Suitable eye protectors will be provided where there is a potential for eye injury from machines, flying objects, liquids, or a combination of these. 2. Protectors must meet the following minimum requirements: ▪ Adequately protect against the particular hazards for which they are designed; ▪ Be reasonably comfortable when worn under the designated conditions; ▪ Be durable; ▪ Be easily cleanable; and ▪ Be kept clean and in good repair. 3. Emergency eyewash equipment will be provided where there is the potential for a worker's eyes to be exposed to corrosives, strong irritants, or toxic chemicals. 4. Emergency eyewash equipment will be provided in accordance with the requirements of EM 385-1-1 06.B.02.a.3.	**L**
	5. Injury while manual material handling.	1. Workers must ensure that they observe proper lifting techniques and minimize movements such as over-reaching, bending and twisting. 2. Workers should not lift more than 51 lbs. without help from a co-worker(s) or mechanical assistance. 3. Use a dolly or other mechanical method when practical.	**L**

Job/Task: Mobilization and Temporary Trailer Installation AHA #1			
Job Steps	**Hazards**	**Controls**	**RAC**
3. General Safety Requirements	1. Smoking in construction zone.	1. Smoking is **prohibited** near building entrances and fuel storage areas. 2. Smoking is only permitted in designated smoke areas.	**L**
3. General Safety Requirements - continued	2. Unauthorized personnel in the construction zone.	1. Establish perimeters by barricading work areas and erecting warning signs on a security fence. 2. Access to the construction zone will be restricted using tape and barriers. 3. **All visitors and workers** must be briefed by the SSHO, review and sign the project APP prior to entering the construction work zone. 4. **All workers** on site must be familiar with applicable Health & Safety Policies. 5. **All workers** on site will review site specific AHA's.	**L**
	3. Fires	1. Fire extinguishers to be maintained of appropriate size and type (Minimum 10A:60BC required). 2. Debris will be maintained in appropriate trash containers. 3. Housekeeping will be a continued process throughout the project. 4. Workers potentially utilizing fire extinguishers must be adequately trained. 5. If the fire is small enough to be extinguished using one extinguisher a competent worker may choose to combat the fire. 6. The fire will be fought with a fire extinguisher will be fought using the P.A.S.S. System (Pull, Aim, Squeeze, & Sweep)	**L**
	4. Exposure to poison ivy or sumac if present in vegetated areas.	1. As area is inspected, identify any "suspicious" vegetation that may be poison ivy or sumac. 2. Mark these areas with warning tape or spray paint in preparation for vegetation clearance and inform workers about the hazard. 3. Avoid contact with these plants. 4. Wear long sleeve shirts and pants. 5. Wear disposable gloves 6. Wear an "ivy blocker" and have Technu® or Zanfel post-exposure washing agent available. 7. When removing these plants, they need to be removed carefully to avoid spreading vegetation throughout the site or spraying plant debris on personnel or equipment. Also cutting tools that cut this vegetation need to be cleaned and handled carefully as the oils can remain on cutting surfaces.	**L**
	5. Biological hazards such as snakes,	1. Do not reach under objects with bare hands.	**L**

Job/Task: Mobilization and Temporary Trailer Installation AHA #1			
Job Steps	**Hazards**	**Controls**	**RAC**
	insects, scorpions, or spiders could cause poisoning or disease.	2. Wear leather gloves. 3. Wear sturdy steel-toed work boots.	
3. General Safety Requirements - continued	6. Cuts from sharp objects.	1. Use all hand tools in accordance with the manufacturer's instructions. 2. Moving parts of a power tool need to be safeguarded. 3. Work areas should be well lighted. 4. An adequate level of hand protection will be used. 5. Hand protection should be decided based off recognized potential hazards. 6. Workers will be familiar with the proper use of the tool being used. 7. Tools will be maintained according to manufacturer's recommendations. 8. Wear hearing protection during the use of any hand tool. 9. Tool should never be pointed at other workers.	**L**
	7. Hazards due to improper sanitation.	**Housekeeping:** 1. Work site should be kept as clean as possible. 2. Regular cleaning of the site shall be conducted to maintain safe and sanitary conditions in the workplace. 3. Walking and working surfaces shall be kept as dry as possible to reduce slip hazards. 4. Every floor, working place, and passageways shall be kept free from protruding nails, splinters, loose boards, clutter, and unnecessary holes and openings. **Drinking Water:** 1. Adequate supply of potable water will be available to workers for drinking and cleaning. 2. Water must be cool drinking water especially in hot environments. 3. Drinking water shall be dispensed by means that prevent contamination between the consumer and the water source. 4. All drinking water shall be clearly marked "**Drinking Water".** **Toilets:** 1. Toilets shall be provided according to **EM 385 1-1 02 E.** 2. Where hand washing stations are not feasible, portable toilets on site shall be equipped with at least hand sanitizer. 3. Adequate lighting must be provided in portable toilets 4. Adequate ventilation must be provided in portable toilets	**L**

Job/Task: Mobilization and Temporary Trailer Installation AHA #1			
Job Steps	**Hazards**	**Controls**	**RAC**
		5. Portable toilets must be serviced on a regular basis. 6. Toilet facilities shall be inspected daily as part of the regular inspection.	
3. General Safety Requirements - continued	8. Exposure to general construction hazards.	1. The specific type of PPE to be used on this project will vary in accordance with specific tasks. At a minimum, Level D PPE will be utilized continuously. Level D PPE includes: ▪ Work clothes; ▪ Safety toe work boots; ▪ Hard hats; ▪ Safety glasses; ▪ Hearing protection (as needed); ▪ Cut resistant gloves (as needed); and ▪ At a Minimum Class II Reflective Vest (during heavy equipment operations and all traffic control operations) and Class III Reflective High Visibility Vest for night operations.	**L**

Job/Task: Mobilization and Temporary Trailer Installation AHA #1		
Equipment to be Used	**Training Requirements/Competent or Qualified Personnel Name(s)**	**Inspection Requirements**
Vehicles	Drivers must have current state-issued driver's license.	Receipt inspection by user/operator. Perform and document daily prior to use by operator. Weekly maintenance checks. Use of equipment safety checklist.
Mobile construction equipment (grader, front loader, excavator, skip loader, skid steer, bobcat, dozer, water truck)	Only trained equipment operators may operate mobile construction equipment.	Inspect all equipment upon arrival at site and on each day of use. Use equipment checklist. Have operations manual onsite and be familiar with proper use of equipment and attachments.
Hand and power tools.	Specific training for power and hand tools will be provided. Review operators' manual for each tool and ensure that directions are followed.	Operator to perform and document inspections daily prior to use. Maintain as per manufacturer's recommendation. Use additional PPE as needed; face shield, heavy cut resistant gloves, etc.
First aid kit, fire extinguisher, eyewash station	Use of emergency equipment including first aid kits, fire extinguishers and eyewash must be done by personnel familiar with this plan; use and inspection criteria of the equipment, and what the equipment is used for	Fire Extinguisher • Initially and at least monthly thereafter First Aid Kits • Weekly and after use for restocking Eye Wash Station • Weekly • Potable water changed weekly unless a preservative solution is used
Personal Protective Equipment	Users must be trained in the proper use of, limitations of, inspection of, donning and doffing of, and replacement of PPE used	Daily inspection by user before use.

Abbreviations and Acronyms:

§ – Section
AHA – Activity Hazard Analysis
APP – Accident Prevention Plan
CIH – Certified Industrial Hygienist
EHS – environmental health and safety
EM – Engineer Manual
Mph – Miles per hour
OSHA – Occupational Safety and Health Administration
PPE – personal protective equipment
RAC – Risk Assessment Code
SPF – sun protection factor
SS – Site Superintendent
SSHO – Site Safety and Health Officer

Signature Sheet - Job/Task: Mobilization and Temporary Trailer Installation AHA #1

I have reviewed the above **AHA #1** and acknowledge the hazards involved with this work task and the controls that will help to minimize illness or injury during the tasks.

NAME	SIGNATURE	TITLE	DATE
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

ABERDEEN PROVING GROUND, MARYLAND
RENOVATE BUILDING 250 WATER TREATMENT PLANT
CONTRACT NO. 18-10

APPENDIX E Hazardous Material Report

INCLUDED FOR REFERENCE ONLY

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HAZARDOUS MATERIAL REPORT
FOR BUILDINGS 250, 251, 252, 253, 254
AT ABERDEEN PROVING GROUNDS
IN ABERDEEN, MARYLAND

Prepared for:
Whitman, Requardt & Associates, LLP
801 South Caroline Street
Baltimore, Maryland 21230

Aerosol Monitoring & Analysis, Inc. (AMA)
1331 Ashton Road, P.O. Box 646
Hanover, Maryland 21076
Phone: 410-684-3327
Fax: 410-684-3384

AMA Job No. 11265

February 22, 2013

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1.0 EXECUTIVE SUMMARY

1.1 GENERAL

Aerosol Monitoring & Analysis, Inc. (AMA) was contracted by Whitman, Requardt & Associates, LLP to perform an asbestos-containing material (ACM), lead-based paint (LBP), polychlorinated biphenyl (PCB), and light ballasts/mercury vapor lamps (MVL) within Buildings 250, 251, 252, 253, and 254 at Aberdeen Proving Ground located in Aberdeen, Maryland.

AMA's scope of work included the visual evaluation, sampling, testing, and laboratory analysis of accessible suspect ACM, LBP, and visual assessment of fluorescent light fixtures for MVL's and PCB containing light ballasts. The bulk samples of suspect ACM were collected, by Mr. Keith Dempsey And Mr. Patrick Dincher in accordance with the sampling protocol described in the EPA's Asbestos Hazard Emergency Response Act (AHERA). The AHERA sampling protocol establishes that at least one sample of all suspect miscellaneous materials are collected.

Mr. Keith Dempsey, who has attended the EPA Inspector Technician for LBP, and is accredited by the State of Maryland, performed the LBP investigation using the RMD/LPA-1 XRF.

1.2 ASBESTOS-CONTAINING MATERIALS

AMA collected thirty nine (39) bulk samples of suspect ACM, which were identified throughout accessible areas of the buildings. Of the 39 bulk samples collected, nine (9) were identified as containing asbestos by polarized light microscopy (PLM) analysis.

Please refer to the bulk sample Table I attached to this report for the bulk sample results.

1.3 LEAD BASED PAINT

Seventy one (71) surfaces finished with suspect lead-based paint (LBP) were tested during the investigation with the use of a Radiation Monitoring Devices (RMD) model LPA-1 x-ray fluorescence spectrum analyzer (XRF). Forty one (41) of the tests/surfaces/building components were determined to contain greater than (>) 0.7 milligrams of lead per square centimeter (mg/cm^2) of surface area tested, the amount defined as a lead-containing substance according to the State of Maryland. Also attached at the end of the report is AMA's radiation permit to use the XRF at APG.

1.4 MVL/PCB CONTAINING LIGHT BALLASTS

Small capacitors and fluorescent light ballasts manufactured after 1978 have been labeled "NO PCB's" by the manufacturers. Prior to 1978, small capacitors and fluorescent light ballasts were not labeled as to whether they contained PCBs; therefore, all unlabeled capacitors and ballasts were assumed to contain PCBs. AMA performed a visual evaluation of light fixture ballasts in all areas utilizing a random selection method. Any ballast absent of the "No PCB's" label was assumed to contain PCBs. Based on this assessment, AMA identified approximately 17 PCB containing light ballasts within the buildings.

As part of the investigation AMA evaluated the building for mercury in the fluorescent light tubes. The fluorescent light tubes were not sampled for mercury vapor content, but are assumed to contain trace amounts of mercury vapor. These mercury vapor containing fluorescent light

tubes are regulated and must be disposed of properly. Based on this assessment, AMA identified approximately 9 mercury containing light tubes within the

2.0 METHODOLOGY

2.1 ASBESTOS-CONTANING MATERIALS

2.1.1 SAMPLE COLLECTION

Samples were collected with a core bore or utility knife which was driven through the suspect material to the substrate so as to obtain a sample containing each discrete layer. The samples were then placed in sterilized “whirl-pak” bags and assigned unique identifiers, which were recorded on the bags and the bulk survey sampling sheets.

2.1.2 BULK SAMPLE ANALYSIS

Bulk samples were submitted to AMA Analytical Services, Inc. in Lanham, Maryland. AMA Analytical Services, Inc. is accredited by the National Institute of Standards and Technology (NIST) through the National Voluntary Laboratory Accreditation Program (NVLAP #101143) for bulk sample analysis and by the American Industrial Hygiene Association (AIHA #8863.)

Samples of bulk material were analyzed using PLM following the EPA, “Method for the Determination of Asbestos in Bulk Building Materials" (EPA/600/R-93-116). PLM is an optical microscopic technique used to distinguish the different types of asbestos fibers by their shape and unique optical properties. The technique is based on the refraction of light from the various crystalline asbestos structures and observing the corresponding color changes through the microscope. Sample results can be found in Table I, which is attached to this report.

2.1.3 CHAIN OF CUSTODY

A chain of custody form was completed for the bulk samples. The samples were logged in and assigned unique laboratory numbers. Upon completion of analytical services, AMA Analytical Services, Inc. retained the remaining sample materials.

2.2 LEAD BASED PAINT

2.2.1 TESTING STRATEGY

The initial phase of the evaluation for LBP involved a visual evaluation of painted surfaces. After reviewing and compiling documentation pertaining to the materials in the building, a strategy to test suspect surfaces was formulated.

2.2.2 XRF TESTING

The investigation was performed using a RMD model LPA-1 XRF. The LPA-1 XRF contains a small radioactive source (Cobalt 57), which produces x-rays. The instrument emits radiation only when placed against a surface and the trigger is depressed. If the painted surface contains lead, the radiation will stimulate the lead atoms to emit a fluorescent field, which is sensed by a detector inside the unit. The XRF then converts

these signals to a direct reading mg/cm^2 of surface area. The LPA-1 can detect the presence of lead to a depth of approximately 3/8-inch with a 95 % confidence interval.

The LPA-1 features two modes of operation when in use: Quick mode and Standard mode. When the Quick Mode is engaged on the LPA-1, the unit seeks the shortest period of time to assure a positive, negative, or inconclusive measurement with 95% confidence. As stated in the XRF Performance Characteristics Sheet (PCS) developed jointly by EPA and the United States Department of Housing and Urban Development (HUD), no correction is needed for substrate interference using the Quick mode.

The XRF was calibrated in accordance with the manufacturer's instructions. Prior to obtaining readings from suspect surfaces, three calibration readings were performed on a National Institute for Science and Technology (NIST) Calibration Test Block and recorded. The NIST Calibration Block contains a known concentration of lead (1.02 mg/cm^2) and the LPA-1 must indicate 1.02 mg/cm^2 with a tolerance of + or - 0.3 mg/cm^2 for the average of the three readings. If the average of the three calibration readings is within the established tolerance, the unit is working properly. Calibration checks were performed prior to and at the end of the investigation.

Surfaces with lead levels > 0.7 mg/cm^2 are defined as lead containing substances, in the State of Maryland.

3.0 RESULTS

3.1 ASBESTOS-CONTAINING MATERIALS

A total of 39 asbestos bulk samples were collected from accessible areas of the building. **Of the 39 samples collected, 9 samples were determined to contain >1% asbestos by PLM laboratory analysis or assumption.** These materials include calmag pipe and fitting insulation, window caulk, door caulk, assumed interior boiler components, and assumed pipe gaskets. All of these materials were identified within Building 250 only. Please refer to the Table I and APPENDIX B at the end of this report for a complete list of the materials sampled and the laboratory results for the ACM.

3.2 LEAD BASED PAINT

Forty one of the 72 surfaces tested were >0.7 mg/cm^2 of lead with the XRF. The positive components were:

- Interior/exterior doors
- Interior/exterior door frames
- Windows
- Window frames and sills
- Structural steel
- Conduit
- Piping
- Wood moldings
- Tanks (interior and exterior)
- Stair systems
- Concrete walls and ceilings
- Ceramic tile
- Porcelain toilet

- Wood wall
- Wood soffit
- Window and door lintels
- Exterior tank handrails

Please refer to the AMA XRF field forms at the end of this report in APPENDIX A for a complete list of the painted surfaces tested.

3.3 MVL/PCB CONTAINING LIGHT BALLASTS

AMA performed a visual evaluation of the light fixtures throughout the building. All fluorescent light fixtures were included in the count. AMA's personnel identified approximately 9 lamps which are considered to be mercury containing.

AMA performed a visual evaluation of the light fixture ballasts utilizing a random selection method. Any ballast absent of the "No PCB's" label and ballasts located within the building were assumed to contain PCBs. AMA's personnel identified 17 PCB containing light ballasts.

4.0 CONCLUSIONS

4.1 ASBESTOS CONTAINING MATERIALS

The ACMs located within buildings are regulated and categorized in different ways. The EPA defines a "friable asbestos material" as "any material containing greater than one percent asbestos as determined using the method specified in appendix A, subpart F, 40 CFR Part 763, Section 1, PLM, that, when dry, can be crumbled, pulverized, or reduced to powder by hand pressure." At the time of the investigation, the calmag pipe and pipe fitting insulation was found to be friable.

The following materials were categorized as non-friable materials at the time of the survey:

- Door caulking
- Window caulking
- Interior boiler components
- Pipe gaskets

OSHA 29 CFR 1926.1101 defines work involving the disturbance of the non-friable ACM listed within this report as Class II work, while the disturbance of the pipe and fitting insulation is Class I work. If those miscellaneous materials which were determined to be asbestos-containing will be disturbed, it must be done while meeting the requirements set forth in 29 CFR 1926.1101 for Class I and Class II work.

4.2 LEAD BASED PAINT

For projects, which will disturb LBP, the paint must be handled in accordance with the requirements established by the EPA and OSHA. There is no requirement to remove LBP prior to renovation activities, only that painted components be tested to determine the disposal requirements and that contractors be made aware of the existence of LBP, or any paint containing lead in detectable amounts (lead containing paint, LCP), so their workers can be adequately protected.

Regulations established in OSHA's "Lead in Construction Standard" (29 CFR 1926.62) must be

adhered to during demolition and renovation of the surfaces finished with paint containing lead in detectable amounts. This standard established the permissible exposure level (PEL) for lead at 50 micrograms per cubic meter ($\mu g/m^3$) as an eight hour time weighted average (TWA); the action level has been established at 30 $\mu g/m^3$ as an eight hour TWA. This regulation also requires employers to use engineering controls and special work practices to reduce worker lead exposure to, at, or below the PEL. It also triggers several requirements regarding exposure monitoring, biological monitoring, and employee training when a worker is exposed to airborne lead levels at or above the action level.

Whenever renovation or demolition is performed on painted components, an attempt should be made to control dust. Non-regulated paint, or lead containing paint, also has the ability to produce lead dust when it is disturbed. Additionally, room N-4 was used to shoot guns, and has lead dust throughout it. Caution should be utilized within this room until cleaning has taken place.

4.3 MVL/PCB CONTAINING LIGHT BALLASTS

Approximately 17 PCB containing light ballasts were identified during the survey. The PCB-containing light ballasts must be disposed of in accordance with current EPA regulations.

There are two primary Federal laws that affect the disposal of PCB ballasts, which are as follows:

1) Toxic Substances Control Act (TSCA)

2) Superfund Law (Comprehensive Environmental Response, Compensation and Liability Act of "CERCLA")

These two laws may be conflicting and confusing. TSCA states that it is permissible to dispose of non-leaking ballasts in a sanitary landfill, while Superfund prohibits the disposal of more than one pound of PCBs (approximately 16 ballasts) in a sanitary landfill. Prudent policy would follow the more stringent of the two regulations.

Each of these laws is discussed in more detail below. The other Federal regulations that refer to PCBs are discussed toward the end of this section.

TSCA does not regulate the disposal of non-leaking, intact "Small Capacitors", defined as containing less than one kilogram (approximately 3 pounds) of PCB dielectric fluid. Lighting ballasts contain a Small PCB Capacitor and as a result are unregulated for disposal.

The exceptions to this rule are as follows:

1) If the Small Capacitor or ballast is leaking PCBs;

2) If the ballast is owned by a company which, at any time in the past, manufactured equipment which contained PCBs;

3) If the asphalt potting material inside the ballast contains PCBs in excess of 50 ppm.

If a ballast meets any of these criteria, then it must be disposed of by incineration in a TSCA-approved facility or in a chemical waste landfill (after the PCB liquids are drained). The latter is usually impractical for a light ballast. All ballast manufacturers are required to incinerate their ballasts.

Even though it is legal to dispose of ballasts in a sanitary landfill, the EPA encourages disposers of large quantities of PCB ballasts to treat them as if they were a regulated waste. The preamble to the May 31, 1979 PCB Final Rule in the Code of Federal Regulations (40 CFR Part 761), makes it clear that the intent of the Small Capacitor disposal rule was intended for "random disposal" in landfills by "householders and other infrequent disposers". In the case of large quantities (greater than 42 ballasts) of small PCB capacitors by commercial and industrial activities, which "pose a somewhat larger environmental risk"; the EPA strongly encourages the voluntary collection and disposal of small PCB capacitors in chemical waste landfills or high temperature incinerators.

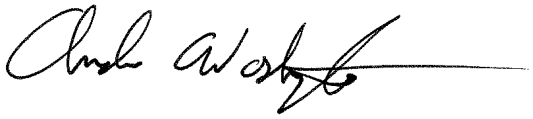
Under the Superfund laws, PCBs are specifically listed as a hazardous substance. The "release" or "threat of release" of more than one pound of PCBs into the environment triggers a Superfund notification and cleanup requirement.

The regulatory level for mercury established by the EPA in 40 CFR Part 261 is 0.20 milligrams per liter (mg/l). The fluorescent lamps found in the building should be considered a hazardous waste for mercury under the Resource Conservation and Recovery Act (RCRA); 40 CFR 261. When this type of fluorescent tube is removed, they should be handled, stored, labeled, and disposed of as a hazardous waste. It is possible to reuse the light tubes within the fixtures at other buildings, but this would still require removal and packaging.

There are no specific training requirements for MVL removal and packaging; however, all workers should be trained in the hazards of mercury, as well as handling procedures.

Enclosed, please find copies of the laboratory certificates of analysis, XRF field forms, the chain of custody, and the bulk sample survey sheets. If you should have any questions regarding this report, please contact our office.

Sincerely,



Andrew Washington
Project Manager

TABLE I
PLM BULK SAMPLE TABLE RESULTS

TABLE I - ASBESTOS BULK SAMPLING TABLE
ABERDEEN PROVING GROUNDS WATER TREATMENT PLANT
FEBRUARY 2013

Sample Number	Material Sampled	Sample Location	Sample Result
Building 250			
11265021401	**Window caulk**	**Ground level south wall, 3rd window**	**2% Chrysotile**
11265021402	**Window caulk**	**2nd floor 2nd window east of west**	**5% Chrysotile**
11265021403	Window glazing	Ground level south wall, 3rd window	No asbestos detected
11265021404	Window glazing	2nd floor 2nd window east of west	No asbestos detected
11265021405	Boiler Gasket	Ground level south wall	No asbestos detected
11265021406	Boiler Gasket	Ground level south wall	No asbestos detected
11265021407	**Calmag pipe insulation**	**2nd floor northeast corner 10' high**	**15% Chrysotile, 5% Crocidolite**
11265021408	**Calmag pipe insulation**	**2nd floor northeast corner upper level, 25' east, 12' high**	**15% Chrysotile, 5% Crocidolite**
11265021409	**Calmag pipe insulation**	**2nd floor south wall, 4' high**	**15% Chrysotile, 5% Crocidolite**
11265021410	**Mudded pipe fitting**	**2nd floor south wall, 4' high**	**60% Chrysotile, <1% Amosite**
11265021411	**Mudded pipe fitting**	**2nd floor south wall, 4' high**	**60% Chrysotile, <1% Amosite**
11265021412	**Mudded pipe fitting**	**2nd floor south wall, 4' high**	**50% Chrysotile, <1% Amosite**
11265021413	Plaster	2nd floor upper office, at east wall, 5' north, 4' high	No asbestos detected
11265021414	Plaster	2nd floor upper office, at east wall, 4' north, 3' high	No asbestos detected
11265021415	Plaster	2nd floor upper office rest room, at east wall, 2' north, 4' high	No asbestos detected
11265021416	Plaster	2nd floor upper office rest room ceiling, 2' from north, 3' from east, 4' high	No asbestos detected
11265021417	Plaster	2nd floor upper office rest room, at north wall, 3' from west, 5' high	No asbestos detected
11265021418	Drywall	2nd floor upper office, northeast corner, 5' high	No asbestos detected
11265021419	Drywall joint compound	2nd floor upper office, northeast corner, 5' high	No asbestos detected
11265021420	Drywall	2nd floor upper office, at east wall, 2' from north	No asbestos detected
11265021421	Drywall joint compound	2nd floor upper office, at east wall, 2' from north	No asbestos detected

TABLE I - ASBESTOS BULK SAMPLING TABLE
ABERDEEN PROVING GROUNDS WATER TREATMENT PLANT
FEBRUARY 2013

Sample Number	Material Sampled	Sample Location	Sample Result
11265021422	Yellow carpet mastic	2nd floor southeast corner	No asbestos detected
11265021423	Yellow carpet mastic	2nd floor, northwest corner under carpet	No asbestos detected
11265021424	Slate roof tar	Exterior from slate shingle on the upper walkway	No asbestos detected
11265021425	Slate roof tar	Exterior from slate shingle on the upper walkway	No asbestos detected
11265021426	Door caulk	Exterior south wall, upper walkway main entrance, 6' high	No asbestos detected
11265021427	**Door caulk**	**Exterior south wall ground level main entrance, 3' high**	**2% Chrysotile**
11265021428	Mudded flue	Ground level south wall, 10' high	No asbestos detected
Building 251			
11265021429	Roof shingle	Exterior south wall, 6' high	No asbestos detected
Building 252			
11265021430	Roof shingle	Exterior northwest corner, 3' high	No asbestos detected
11265021431	Roof tar paper	Exterior northwest corner, 3' high	No asbestos detected
11265021432	Roof shingle	Exterior northwest corner, 3' high	No asbestos detected
11265021433	Roof tar paper	Exterior northwest corner, 3' high	No asbestos detected
Building 253			
11265021434	Roofing tar	30' from north at west side	No asbestos detected
11265021435	Roofing paper	30' from north at west side	No asbestos detected
11265021436	Roof tar	Northwest corner	No asbestos detected
11265021437	Roof tar paper	Northwest corner	No asbestos detected
11265021438	Door caulk	Exterior east wall 3rd door from south wall	No asbestos detected
11265021439	Door caulk	Exterior west wall, 3rd door from south	No asbestos detected

TABLE II
POSITIVE XRF READING TABLE

TABLE II – POSITIVE XRF TABLE
ABERDEEN PROVING GROUNDS WATER TREATMENT PLANT
FEBRUARY 2013

Sample #	Location	Color	Component	Substrate	Condition	Result
005	Building 250 Electrical Room	Gray	Door casing	Wood	Intact	5.4
006	Building 250 Electrical Room	White	Door	Wood	Not Intact	4.9
007	Building 250 Electrical Room	Gray	Window casing	Wood	Not Intact	7.8
008	Building 250 Electrical Room	White	Window sill	Wood	Not Intact	4.0
009	Building 250 Electrical Room	White	Molding	Wood	Not Intact	4.3
010	Building 250 Electrical Room	White	Window	Wood	Intact	4.1
014	Building 250 Lobby	Blue	Conduit	Metal	Intact	.8
015	Building 250 Lobby	Gray	Door Frame	Metal	Intact	2.5
016	Building 250 Lobby	Gray	Door	Metal	Intact	4.4
017	Building 250	White	Window	Wood	Not Intact	>9.9
020	Building 250 Main warehouse	Gray	I beam	Metal	Intact	>9.9
023	Building 250 Main warehouse	Gray	Tank	Metal	Intact	>9.9
025	Building 250 Main warehouse	Gray	Tank base	Metal	Not intact	7.5
026	Building 250 Main warehouse	Gray	Window casing	Wood	Not intact	>9.9
027	Building 250 Main warehouse	Gray	Window sill	Wood	Not intact	>9.9
028	Building 250 Main warehouse	Green	Stair System	Metal	Intact	7.7
029	Building 250 Main warehouse	Green	Hand Rail	Metal	Intact	2.5
030	Building 250 Main warehouse	Yellow	Stair stripe	Metal	Intact	>9.9
031	Building 250	Silver	Stair	Metal	Intact	9.4
033	Building 250	Off white	Door	Wood	Intact	>9.9
034	Building 250	Black	Door Casing	Wood	Not intact	>9.9
035	Building 250	Black	Wall	Concrete	Not intact	>9.9
036	Building 250	White	Ceiling	Concrete	Not intact	>9.9
037	Building 250	White	Tile	Ceramic	Intact	>9.9
039	Building 250	White	Toilet	Ceramic	Intact	4.3
042	Building 250 Main Warehouse Office	White	Wall	Wood	Intact	1.8

TABLE II – POSITIVE XRF TABLE
ABERDEEN PROVING GROUNDS WATER TREATMENT PLANT
FEBRUARY 2013

Sample #	Location	Color	Component	Substrate	Condition	Result
043	Building 250 Exterior	White	Door case	Wood	Not Intact	8.5
044	Building 250 Exterior	White	Door	Wood	Not Intact	>9.9
045	Building 250 Exterior	White	Fascia	Wood	Not Intact	>9.9
046	Building 250 Exterior	White	Window Lintel	Metal	Not Intact	>9.9
047	Building 250 Exterior	White	Window Casing	Wood	Not Intact	>9.9
049	Building 250 Exterior	Gray	Window frame	Metal	Intact	>9.9
051	Building 251 Exterior	Gray	Window	Wood	Not Intact	2.3
052	Building 251 Exterior	Gray	Door	Wood	Not Intact	2.2
053	Building 251 Exterior	Gray	Tank Supply	Metal	Not Intact	>9.9
055	Building 252 Exterior	White	Soffit	Wood	Not Intact	>9.9
056	Building 252 Exterior	Gray	Tank	Metal	Not Intact	5.1
062	Exterior Tanks	Gray metal	Pipe	Metal	Not Intact	2.3
063	Exterior Tanks	Gray Metal	Tank	Metal	Not Intact	0.8
065	Exterior Tanks	Gray Metal	Hand Rail	Metal	Not Intact	0.8
066	Exterior Tanks	Gray Metal	Pipe	Metal	Not Intact	7.0

TABLE III
TOTAL SUSPECT ACM ROOM INVENTORY

ACM Inventory Table
Buildings 250, 251, 252, 253, 254
Aberdeen Proving Ground Water Treatment Plant
February 2013

Material Description	Location	Analysis Result	Estimated Quantity	Units	Condition / Comments
Building 250					
Area 1	**Electrical room**				
Door caulk	**South wall**	**2% Chrysotile**	**1 @ 3' x 7'**	**Door**	
Window caulk	**West wall**	**5% Chrysotile**	**1 @ 6' x 3'**	**Window**	
Window glazing	West wall	No asbestos detected	1 @ 6' x 3'	Window	
Area 2	**Lobby**				
Window caulk	**South wall**	**5% Chrysotile**	**3 @ 1' x 5'**	**Window**	
Window glazing	South wall	No asbestos detected	3 @ 1' x 5'	Window	
Door Caulk	**South wall**	**2% Chrysotile**	**1 @ 3' x 9'**	**Door**	
PCB			6		
MVL			4		
Area 3	**Boiler Room**				
Window caulk	**South and east walls**	**5% Chrysotile**	**1 @ 4' x 5' 1 @ 1' x 4' 1 @ 1' x 2' 2 @ 1' x 1'**	**Window**	**2 @ 1' x 1' on east wall**
Assumed boiler components	**Boiler**	**Assumed ACM**	**1**	**Boiler**	
Window glazing	South and east walls	No asbestos detected	1 @ 4' x 5' 1 @ 1' x 4' 1 @ 1' x 2' 2 @ 1' x 1'	Window	2 @ 1' x 1' on east wall
Boiler Gaskets	Boiler door	No asbestos detected	30	LF	
Mudded Flue	South wall Penetration	No asbestos detected	1	SF	
Area 4	**Main Warehouse**				
Window caulk	**Throughout**	**5% Chrysotile**	**27 @ 8' x 6'**	**Window**	
Window glazing	Throughout	No asbestos detected	27 @ 8' x 6'	Window	
Door caulk	**East and west walls**	**2% Chrysotile**	**2 @ 8' x 10'**	**Door**	
Pipe Gaskets	**Throughout**	**Assumed ACM**	**60**	**Gaskets**	
Calmag pipe insulation	**Throughout**	**15% Chrysotile, 5% Crocidolite**	**160**	**LF**	
Mudded pipe fittings	**Throughout**	**60% Chrysotile, <1% Amosite**	**4**	**Fittings**	

Table III - 1

ACM Inventory Table
Buildings 250, 251, 252, 253, 254
Aberdeen Proving Ground Water Treatment Plant
February 2013

Material Description	Location	Analysis Result	Estimated Quantity	Units	Condition / Comments
Drywall	South wall	No asbestos detected	400	SF	
Drywall joint compound	South wall	No asbestos detected	400	SF	
PCB			6		
MVL			3		
Area 5	**Upper Office Closet**				
Plaster	Walls and ceiling	No asbestos detected	250	SF	
Yellow Carpet Mastic	Throughout	No asbestos detected	30	SF	
Area 6	**Restroom**				
Plaster	All walls and ceiling	No asbestos detected	300	SF	
Window caulk	**South wall**	**5% Chrysotile**	**1 @ 1' x 3'**	**Window**	
Window glazing	South wall	No asbestos detected	1 @ 1' x 3'	Window	
Assumed pipe and fitting	**East wall**	**Assumed ACM**	**20**	**LF**	
Area 7	**East Office**				
Plaster	Throughout	No asbestos detected	500	SF	
Yellow Carpet Mastic	Throughout	No asbestos detected	100	SF	
Window caulk	**North, south and west walls**	**5% Chrysotile**	**3 @ 6' x 6'**	**Window**	
Window glazing	North, south and west walls	No asbestos detected	3 @ 6' x 6'	Window	
PCB			2		
MVL			1		
Area 8					
Drywall	North and west walls and ceiling	No asbestos detected	250	SF	
Drywall joint compound	North and west walls and ceiling	No asbestos detected	250	SF	
Plaster	East wall	No asbestos detected	100	SF	
Door caulk	**South wall**	**2% Chrysotile**	**1 @ 3' x 7'**	**Door**	
Yellow Carpet Mastic	Throughout	No asbestos detected	60	SF	
Window caulk	**South wall**	**5% Chrysotile**	**1 @ 1' x 7'**	**Window**	
Window glazing	South wall	No asbestos detected	1 @ 1' x 7'	Window	
Area 9	**West Office**				
Drywall	North and east walls and ceiling	No asbestos detected	400	SF	
Drywall joint compound	North and east walls and ceiling	No asbestos detected	400	SF	
Window caulk	**North, south and west walls**	**5% Chrysotile**	**2 @ 5' x 5'**	**Window**	
Window glazing	North, south and west walls	No asbestos detected	2 @ 5' x 5'	Window	

ACM Inventory Table
Buildings 250, 251, 252, 253, 254
Aberdeen Proving Ground Water Treatment Plant
February 2013

Material Description	Location	Analysis Result	Estimated Quantity	Units	Condition / Comments
Calmag pipe insulation	**South wall**	**15% Chrysotile, 5% Crocidolite**	**8**	**LF**	
PCB			3		
MVL			1		
Mudded pipe fittings	**South wall**	**60% Chrysotile, <1% Amosite**	**1**	**Fitting**	
Roof					
Slate Roof	Throughout	No asbestos detected	3000	SF	Tar under Slate
Building 251					
Area 1					
Roof Shingle	Throughout	No asbestos detected	40	SF	
Building 252					
Area 1					
Roof Shingle	Throughout	No asbestos detected	2000	SF	
Tar paper	Throughout	No asbestos detected	2000	SF	
Building 254					
Area 1					
No Suspect					
Building 253					
Area 1					
Build up Roof	Throughout	No asbestos detected	7500	SF	Tar on paper on concrete
Door /louver caulk	Throughout	No asbestos detected	20 @ 4' x 2'	Door	

APPENDIX A
XRF FIELD FORMS

JOB NAME: APC

ADDRESS: 250/252/253

1136

RMD LPA-1
FIELD FORM

TEST	ROOM	LOCATION	COLOR	COMPONENT	SUBSTRATE	CONDITION	COMMENTS	TEST NO./RESULT(mg/cm2)	
001	Pre Cal							001	0.9
002								002	0.8
003								003	1.0
004	Electrical Room	W1	W	Wall	Brick	1		004	-0.2
005			Gray	DC	W	NI	+	005	5.4
006			W	D	W		+	006	4.9
007		W2	Gray	WC	W		+	007	7.8
008			W	WS	W		+	008	4.0
009				Mullion	W		+	009	4.3
010		W4	W	Wood	W		+	010	4.1
011				Wall	Concrete			011	-0.1
012		W1	Green	Elec Box	M			012	0.0
013	Lobby	W3	Gray	Shelf	W			013	0.0
014			Blue	conduit	M		+	014	0.8
015		W2	Gray	DF			+	015	2.5
016				D			+	016	4.4
017	Bake Room	W1	W	Window	W	NI	+	017	>9.9
018	Main Warehouse	W1	Tan	Pipe	M			018	-0.2
019								019	-0.1
020			Gray	I-Beam	M		+	020	>9.9

JOB# 1126

DATE: 2/14/13

PAGE 1 OF

JOB NAME: AP6

ADDRESS: 250/251/252/257

RMD LPA-1
FIELD FORM

TEST	ROOM	LOCATION	COLOR	COMPONENT	SUBSTRATE	CONDITION	COMMENTS	TEST NO./RESULT(mg/cm2)	
021	Main Wardrobe	W1	Grn	Trim	M	1		021	-0.1
022	↓	↓	↓	Stm	W	1		022	0.0
023	↓	Grey	Trim	W	1	+		023	>9.9
024	W2	Tan	Pipe	M	M1			024	0.1
025	↓	Grn	Trim Base	M	M1	+		025	7.5
026	W3	↓	WC	W	↓	+		026	>9.9
027	↓	↓	W S	↓	↓	+		027	>9.9
028	W3	Cream	Stor Stm	M	1	+		028	7.7
029	↓	↓	HR	M	1	+		029	2.5
030	W3	Upper	Stor Stripe	M	1	+		030	>9.9
031	↓	Silv	SS	M	1	+		031	9.4
032	W1	OW	W	DW	1			032	-0.3
033	W3	Blk	D	W	M1	+		033	>9.9
034	↓	↓	DC	W	M1	+		034	>9.9
035	W4	W	W	Cork	M1	+		035	>9.9
036	Ceiling	W	Ceil	↓	M1	+		036	>9.9
037	W4	W	Tile	Ceramic	1	+		037	>9.9
038	↓	↓	Sink	↓	1			038	-0.2
039	↓	↓	Toilet	↓	1	+		039	4.3
040	Floor	↓	Flr	↓	1			040	-0.2

Back

JOB# 11265

DATE: 2/14/13

JOB NAME: APG

ADDRESS: 251 - 257

RMD LPA-1
FIELD FORM

TEST	ROOM	LOCATION	COLOR	COMPONENT	SUBSTRATE	CONDITION	COMMENTS	TEST NO./RESULT(mg/cm2)	
041	Main Warehouse office	W2	Silver	Trad	M	I		041	-0.1
042	↓	W4	W	Wall	W	I	+	042	1.8
043	Exterior	W1	W	DC	W	NI	+	043	8.5
044		↓	↓	D	↓	NI	+	044	>9.9
045		↓	↓	Fascia	↓	NI	+	045	>9.9
046		↓	W	Wood Casing	M	NI	+	046	>9.9
047		↓	↓	Wood Casing	W	NI	+	047	>9.9
048			Grey	HR	M	NI	+	048	-0.1
049			↓	Trim Exterior Trim	M	I	+	049	>9.9
050	↓	↓	↓	↓	M	I		050	-0.2
051	Bldg B 251 Exterior	W1	Grey	W	W	NI	+	051	2.3
052	↓	↓	↓	D	↓	NI	+	052	2.2
053	↓	↓	↓	Trim Super	M	NI	+	053	>9.9
054	Bldg 252 Exterior	W3	W	Fascia	W	NI		054	0.0
055	↓	↓	↓	Soffit	W	NI	+	055	>9.9
056		W3	Grey	Trim	M	NI	+ Exterior of Trim	056	5.1
057	Bldg T 254	W1	↓	D	M	NI		057	-0.1
058	↓	W4	↓	Wall	M	NI		058	0.0
059	Bldg 254 Exterior	W1	W	Wall	CB	NI		059	-0.4
060	↓	W4	W	↓	CB	NI		060	-0.1

JOB# 11265

DATE: 2/14/13

JOB NAME: APle

ADDRESS: 250-253

RMD LPA-1
FIELD FORM

TEST	ROOM	LOCATION	COLOR	COMPONENT	SUBSTRATE	CONDITION	COMMENTS	TEST NO./RESULT(mg/cm2)	
061	T254	k/	W	W	M	/		061	0.3
062	Exter Tank	k/	GM	Pipe	M	N/	+	062	***2.3***
063	↓	↓	↓	Tank	M	N/	+	063	***0.8***
064	↓	↓	↓	Str Stry	M	N/	[illegible]	064	-0.2
065	↓	↓	↓	HR	M	N/	+	065	***0.8***
066	↓	↓	↓	Pipe	M	NI	+	066	***7.0***
067	Bldg 250 Ext	W2	Red	↓	M	NI		067	-0.1
068	Post Cal							068	***0.9***
069								069	***0.9***
070								070	***0.9***
071									
072									
073									
074									
075									
076									
077									
078									
079									
080									

JOB# 11265

DATE: 2/14/13

DEPARTMENT OF THE ARMY
U.S. ARMY ABERDEEN PROVING GROUND
ABERDEEN PROVING GROUND, MARYLAND 21005-5001

August 3, 2012

REPLY TO
ATTENTION OF

Office of the Deputy
Installation Commander

Mr. Andrew Washington
1331 Ashton Road
Hanover, MD 21076

Dear Mr. Washington,

This letter responds to your application, dated June 25, 2012, for an Army radiation permit APG-12-001 to use a radioactive source; Co-57, 15 millicuries to perform lead based paint analysis on the Aberdeen and Edgewood Areas of Aberdeen Proving Ground. Your application meets the requirements of Army Pamphlet 385-24, The Army Radiation Safety program, and of title 32, Code of Federal Regulations, part 655, section 655.10.

I hereby permit you to use the Source on this installation during the period August 1, 2012, to July 31, 2013, in accordance with the terms specified in your application and the following conditions:

a. Mr. Patrick A. Eures, Aberdeen Proving Ground's Radiation Safety Officer, must be notified (410-306-2268) at least 24 hours prior to the sources arriving at Aberdeen Proving Ground, and 24 hours prior to project completion.

b. The Aberdeen Proving Ground Radiation Safety Officer must be informed of the location the source will be used and stored.

c. Provide the Aberdeen Proving Ground Radiation Safety Officer copies of shipping documents and leak test records.

d. In the event of source leakage, Aerosol Monitoring & Analysis, Inc., is responsible for restoring the property to Nuclear Regulatory Commission's unrestricted use criteria.

e. The Aberdeen Proving Ground Radiation Safety Officer will be immediately notified of any accident/incident, equipment damage, equipment malfunction, or any other occurrence that could result in contamination or excess radiation exposure.

f. Reapply if you wish to use the sources on this installation after July 31, 2013.

Our point of contact for further information or any questions is Mr. Patrick A. Eures, Directorate of Public Works, Environmental Compliance Division, 410-306-2268.

Sincerely,

Gregory R. McClinton
Colonel, US Army
Deputy Installation Commander

Enclosure

APPENDIX B
LABORATORY RESULTS

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0

Client:	Aerosol Monitoring & Analysis, Inc	**Job Name:**	APG	**Chain Of Custody:**	232373
Address:	PO Box 646, 1331 Ashton Road	**Job Location:**	Buildings 250, 251, 253, T254	**Date Analyzed:**	2/18/2013
	Hanover, Maryland 21076	**Job Number:**	11265	**Person Submitting:**	Kinte Thompson
		P.O. Number:	Not Provided		

Attention: Andrew Washington

Summary of Polarized Light Microscopy

AMA Sample Number	Client Sample #	Total Asbestos	Chrysotile Percent	Amosite Percent	Crocidolite Percent	Other Asbestos Percent	Mineral Wool Percent	Fiberglass Percent	Organic Percent	Synthetic Percent	Other Percent	Particulate Percent	Sample Type	Sample Color	Homogeneity	Analyst ID	Comments
13037813	11265-0214-01	2	2	--	--	--	--	--	--	--	--	98	CK	Off-White	Homogeneous	LBP	
13037814	11265-0214-02	5	5	--	--	--	--	--	--	--	--	95	CK	Off-White	Homogeneous	LBP	
13037815	11265-0214-03	NAD	--	--	--	--	--	--	--	--	--	100	GZ	Off-White	Homogeneous	LBP	
13037816	11265-0214-04	NAD	--	--	--	--	--	--	--	--	--	100	GZ	Off-White	Homogeneous	LBP	
13037817	11265-0214-05	NAD	--	--	--	--	50	--	--	--	--	50	GK	Beige	Homogeneous	LBP	
13037818	11265-0214-06	NAD	--	--	--	--	50	--	--	--	--	50	GK	Beige	Homogeneous	LBP	
13037819	11265-0214-07	20	15	--	5	--	--	--	--	--	--	80	PI	Off-White	Homogeneous	LBP	
13037820	11265-0214-08	20	15	--	5	--	--	--	TR	--	--	80	PI	Off-White	Homogeneous	LBP	
13037821	11265-0214-09	20	15	--	5	--	--	--	--	--	--	80	PI	Off-White	Homogeneous	LBP	
13037822	11265-0214-10	60	60	TR	--	--	--	--	--	--	--	40	Fitting	White	Homogeneous	LBP	
13037823	11265-0214-11	60	60	TR	--	--	--	--	--	--	--	40	Fitting	White	Homogeneous	LBP	
13037824	11265-0214-12	50	50	TR	--	--	--	--	--	--	--	50	Fitting	White	Homogeneous	LBP	
13037825	11265-0214-13	NAD	--	--	--	--	--	--	--	--	--	100	PL	Gray	Homogeneous	LBP	
13037826	11265-0214-14	NAD	--	--	--	--	--	--	--	--	--	100	PL	Gray	Homogeneous	LBP	
13037827	11265-0214-15	NAD	--	--	--	--	--	--	--	--	--	100	PL	Gray	Homogeneous	LBP	

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0

Client:	Aerosol Monitoring & Analysis, Inc	**Job Name:**	APG	**Chain Of Custody:**	232373
Address:	PO Box 646, 1331 Ashton Road	**Job Location:**	Buildings 250, 251, 253, T254	**Date Analyzed:**	2/18/2013
	Hanover, Maryland 21076	**Job Number:**	11265	**Person Submitting:**	Kinte Thompson
		P.O. Number:	Not Provided		

Attention: Andrew Washington

Summary of Polarized Light Microscopy

AMA Sample Number	Client Sample #	Total Asbestos	Chrysotile Percent	Amosite Percent	Crocidolite Percent	Other Asbestos Percent	Mineral Wool Percent	Fiberglass Percent	Organic Percent	Synthetic Percent	Other Percent	Particulate Percent	Sample Type	Sample Color	Homogeneity	Analyst ID	Comments
13037828	11265-0214-16	NAD	--	--	--	--	--	--	--	--	--	100	PL	Gray	Homogeneous	LBP	
13037829	11265-0214-17	NAD	--	--	--	--	--	--	--	--	--	100	PL	Gray	Homogeneous	LBP	
13037830	11265-0214-18	NAD	--	--	--	--	--	--	2	--	--	98	DW	Gray	Homogeneous	LBP	
13037831	11265-0214-19	NAD	--	--	--	--	--	--	--	--	--	100	JC	White	Homogeneous	LBP	
13037832	11265-0214-20	NAD	--	--	--	--	--	--	2	--	--	98	DW	Multi	Layered	LBP	
13037833	11265-0214-21	NAD	--	--	--	--	--	--	--	--	--	100	JC	White	Homogeneous	LBP	
13037834	11265-0214-22	NAD	--	--	--	--	--	--	--	--	--	100	CM	Yellow	Homogeneous	LBP	
13037835	11265-0214-23	NAD	--	--	--	--	--	--	--	--	--	100	CM	Yellow	Homogeneous	LBP	
13037836	11265-0214-24	NAD	--	--	--	--	--	--	15	--	--	85	RT	Black	Homogeneous	LBP	
13037837	11265-0214-25	NAD	--	--	--	--	--	--	10	--	--	90	RT	Black	Homogeneous	LBP	
13037838	11265-0214-26	NAD	--	--	--	--	--	--	--	--	--	100	CK	White	Homogeneous	LBP	
13037839	11265-0214-27	2	2	--	--	--	--	--	--	--	--	98	CK	Off-White	Homogeneous	LBP	
13037840	11265-0214-28	NAD	--	--	--	--	--	--	--	--	--	100	MUD	Beige	Homogeneous	LBP	
13037841	11265-0214-29	NAD	--	--	--	--	--	--	20	--	--	80	RS	Black	Homogeneous	LBP	
13037842	11265-0214-30	NAD	--	--	--	--	--	--	10	--	--	90	RS	Black	Homogeneous	LBP	

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0

Client:	Aerosol Monitoring & Analysis, Inc	**Job Name:**	APG	**Chain Of Custody:**	232373
Address:	PO Box 646, 1331 Ashton Road	**Job Location:**	Buildings 250, 251, 253, T254	**Date Analyzed:**	2/18/2013
	Hanover, Maryland 21076	**Job Number:**	11265	**Person Submitting:**	Kinte Thompson
		P.O. Number:	Not Provided		

Attention: Andrew Washington

Summary of Polarized Light Microscopy

AMA Sample Number	Client Sample #	Total Asbestos	Chrysotile Percent	Amosite Percent	Crocidolite Percent	Other Asbestos Percent	Mineral Wool Percent	Fiberglass Percent	Organic Percent	Synthetic Percent	Other Percent	Particulate Percent	Sample Type	Sample Color	Homogeneity	Analyst ID	Comments
13037843	11265-0214-31	NAD	--	--	--	--	--	--	20	--	--	80	RT	Black	Homogeneous	LBP	
13037844	11265-0214-32	NAD	--	--	--	--	--	--	TR	--	--	100	RS	Black	Homogeneous	LBP	
13037845	11265-0214-33	NAD	--	--	--	--	--	--	20	--	--	80	Tar P.	Black	Homogeneous	LBP	
13037846	11265-0214-34	NAD	--	--	--	--	--	--	--	--	--	100	RT	Black	Homogeneous	LBP	
13037847	11265-0214-35	NAD	--	--	--	--	--	--	TR	--	--	100	RP	Black	Homogeneous	LBP	
13037848	11265-0214-36	NAD	--	--	--	--	--	--	--	--	--	100	RT	Black	Homogeneous	LBP	
13037849	11265-0214-37	NAD	--	--	--	--	--	--	TR	--	--	100	Tar P.	Black	Homogeneous	LBP	
13037850	11265-0214-38	NAD	--	--	--	--	--	--	--	--	--	100	CK	White	Homogeneous	LBP	
13037851	11265-0214-39	NAD	--	--	--	--	--	--	--	--	--	100	CK	White	Homogeneous	LBP	

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0

Client:	Aerosol Monitoring & Analysis, Inc	**Job Name:**	APG	**Chain Of Custody:**	232373
Address:	PO Box 646, 1331 Ashton Road	**Job Location:**	Buildings 250, 251, 253, T254	**Date Analyzed:**	2/18/2013
	Hanover, Maryland 21076	**Job Number:**	11265	**Person Submitting:**	Kinte Thompson
		P.O. Number:	Not Provided		

Attention: Andrew Washington

Summary of Polarized Light Microscopy

AMA Sample Number	Client Sample #	Total Asbestos	Chrysotile Percent	Amosite Percent	Crocidolite Percent	Other Asbestos Percent	Mineral Wool Percent	Fiberglass Percent	Organic Percent	Synthetic Percent	Other Percent	Particulate Percent	Sample Type	Sample Color	Homogeneity	Analyst ID	Comments

The following footnotes only apply to those samples which the total asbestos result is flagged with a note number.

1 TEM RECOMMENDATION - Please note, due to resolution limitations with optical microscopy and/or interference from matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos. It is recommended that the additional analytical technique of TEM be used to check for asbestos fibers below the resolution limits of optical microscopy.

2 MATRIX REDUCTION RECOMMENDATION - Please note, due to interference from the matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos which is obscured from view. It is recommended that the additional preparation technique of gravimetric reduction be performed on this sample to minimize the obscuring effects of matrix components, followed by reanalysis by PLM and/or TEM.

Analysis Method - EPA/600/R-93/116 dated July 1993

NAD = "No Asbestos Detected" TR = "Trace equals less than 1% of this component"

Uncertainty: For samples containing asbestos in range of 1-10% the CV is 0.43, 11-35% CV=0.55, >35 CV=0.23

All results are to be considered preliminary and subject to change unless signed by the Technical Director or Deputy.

Technical Director Peerawut Chaikeenee **Analyst(s)** Lom Butruk

Bulk Sampling Survey Sheet

Date Collected 2/14/13 **Address:** Bldg 250, 251, 253, T254 **Company:** AMA

Job Number: 11265 **Telephone Number:** 410-684-3307

Job Site APG **Contact Person:** A washington **Samples Taken By:** Pat Dunch

Chain of Custody #:

Sample Number	Type of Material Sampled	Sample Location Bldg 250	Friable	Condition of the Material	Accessibility	Photo	Comments
11265 0214 01	Window Caulk	Ground level, 3rd window south wall East or west ~ 4 lf	No	Poor	High	No #	
02	↓	2nd Floor Bldg 250 2nd window East or west ~ 5 lf	No	Poor	High	No #	
03	Window Glazing	Same as # 01	No	Poor	High	No #	
04	↓	Same as # 02	No	Poor	High	No #	
05	Boiler Gasket	Bldg 250 AMA Area #03 @ Boiler ~ 3 sf	Yes	Poor	High	No #	

(Revised 8/98)

Bulk Sampling Survey Sheet

Date Collected 2/14/13 Address: Bldg 250, 251, 253, T 254 Company: AMA

Job Number: 11265 Telephone Number: 410-684-3327

Job Site APG Contact Person: A Walsh Samples Taken By: Pat Dinch

Chain of Custody #:

Sample Number	Type of Material Sampled	Sample Location	Friable	Condition of the Material	Accessibility	Photo	Comments
11265 0014 06	Boiler Gasket	Same as #05	☐ Yes ☑ No ☐ Potentially	☐ Good ☐ Fair ☑ Poor	☐ Low ☐ Medium ☑ High	☐ Yes ☑ No #	
07	Cal-Mag Pipe Insulat	Bldg 250 AMA Area #04 NE corner ~ 10' up	☑ Yes ☐ No ☐ Potentially	☐ Good ☑ Fair ☐ Poor	☐ Low ☑ Medium ☐ High	☐ Yes ☑ No #	
08	↓	Bldg 250 AMA Area #04 Upper Level ~ 25 East ~ 12' up	☑ Yes ☐ No ☐ Potentially	☐ Good ☑ Fair ☐ Poor	☐ Low ☑ Medium ☐ High	☐ Yes ☑ No #	
09	↓	Bldg 250, AMA Area #09 @ South wall ~ 4' W	☑ Yes ☐ No ☐ Potentially	☐ Good ☑ Fair ☐ Poor	☐ Low ☐ Medium ☑ High	☐ Yes ☑ No #	
10	Mudded Fittings	Same as #09	☑ Yes ☐ No ☐ Potentially	☐ Good ☑ Fair ☐ Poor	☐ Low ☑ Medium ☐ High	☐ Yes ☑ No #	

(Revised 8/98)

Bulk Sampling Survey Sheet

Date Collected 2/14/13 **Address:** Bldg 250, 251, 253, 7254 **Company:** AMA

Job Number: 11265 **Telephone Number:** 410-684-3727

Job Site APG **Contact Person:** A Walsh **Samples Taken By:** Pat Dinch

Chain of Custody #:

Sample Number	Type of Material Sampled	Sample Location	Friable	Condition of the Material	Accessibility	Photo	Comments
11265 0214 11	Mudded Fitter	Same as #09	☑ Yes ☐ No ☐ Potentially	☐ Good ☑ Fair ☐ Poor	☐ Low ☑ Medium ☐ High	☐ Yes ☐ No #	
12	↓	Same as #09	☑ Yes ☐ No ☐ Potentially	☐ Good ☑ Fair ☐ Poor	☐ Low ☑ Medium ☐ High	☐ Yes ☐ No #	
13	Plaster	Bldg 250 upper office AMA Am #08 @ East wall ~ 5 ft North ~4' L	☐ Yes ☑ No ☐ Potentially	☐ Good ☑ Fair ☐ Poor	☐ Low ☐ Medium ☑ High	☐ Yes ☑ No #	
14		Bldg 250 upper Office AMA Am #07 @ East wall ~ 4 from North ~3'	☐ Yes ☑ No ☐ Potentially	☐ Good ☑ Fair ☐ Poor	☐ Low ☐ Medium ☑ High	☐ Yes ☑ No #	
15	↓	Bldg 250 upper office Rest Rm @ East wall ~ 2 fm N ~4' h	☐ Yes ☑ No ☐ Potentially	☐ Good ☑ Fair ☐ Poor	☐ Low ☐ Medium ☑ High	☐ Yes ☑ No #	

(Revised 8/98)

Bulk Sampling Survey Sheet

Date Collected: 2/14/13 Address: Bldg 250, 251, 253, T254 Company: AMA

Job Number: 11265 Telephone Number: 410-684-3272

Job Site: APG Contact Person: A Walsh Samples Taken By: Pat Dach

Chain of Custody #:

Sample Number	Type of Material Sampled	Sample Location	Friable	Condition of the Material	Accessibility	Photo	Comments
11265 0214 16	Plaster	Bldg 250 upper attic Restroom Ceiling ~ 2 from North ~ 3 from East ~ 8' up	☐ Yes ☒ No ☐ Potentially	☐ Good ☒ Fair ☐ Poor	☐ Low ☐ Medium ☒ High	☐ Yes ☒ No # ____	
17	↓	Bldg 250 upper office AMA Area #07 @ North wall ~ 3 from west ~ 5' up	☐ Yes ☒ No ☐ Potentially	☐ Good ☒ Fair ☐ Poor	☐ Low ☐ Medium ☒ High	☐ Yes ☒ No # ____	
18	Drywall	Bldg 250 upper office AMA Area #09 NE Corner ~ 5 up	☒ Yes ☐ No ☐ Potentially	☐ Good ☒ Fair ☐ Poor	☐ Low ☐ Medium ☒ High	☐ Yes ☒ No # ____	
19	Drywall Joint Compound	Same as # 18	☒ Yes ☐ No ☐ Potentially	☐ Good ☒ Fair ☐ Poor	☐ Low ☐ Medium ☒ High	☐ Yes ☒ No # ____	
20	Drywall	Bldg 250 upper office AMA Area #09 @ East wall ~ 2 from N	☒ Yes ☐ No ☐ Potentially	☐ Good ☒ Fair ☐ Poor	☐ Low ☐ Medium ☒ High	☐ Yes ☒ No # ____	

(Revised 8/98)

Bulk Sampling Survey Sheet

Date Collected 2/14/17 Address: Bldg 250, 251, 257, 725Y Company: AMA

Job Number: 11265 Telephone Number: 410-684-5327

Job Site APG Contact Person: A Worley Samples Taken By: Pat Dinkey

Chain of Custody #:

Sample Number	Type of Material Sampled	Sample Location	Friable	Condition of the Material	Accessibility	Photo	Comments
11265 0021 21	DM wall Joint Compd	Same #20	☑ Yes ☐ No ☐ Potentially	☐ Good ☑ Fair ☐ Poor	☐ Low ☐ Medium ☑ High	☐ Yes ☑ No #	
22	Yellow Carpet Mastic	Bldg 250 AMA Area #07 @ SE corner under cpt	☐ Yes ☑ No ☐ Potentially	☐ Good ☑ Fair ☐ Poor	☑ Low ☐ Medium ☐ High	☐ Yes ☑ No #	
23	↓	Bldg 250 AMA Area #08 NW corner under cpt	☐ Yes ☑ No ☐ Potentially	☐ Good ☑ Fair ☐ Poor	☑ Low ☐ Medium ☐ High	☐ Yes ☑ No #	
24	Slate Roof Tar	Bldg 250 Exhaust from slate style on upper wall/roof	☐ Yes ☑ No ☐ Potentially	☐ Good ☑ Fair ☐ Poor	☑ Low ☐ Medium ☐ High	☐ Yes ☑ No #	
25	↓	Same as #24	☐ Yes ☑ No ☐ Potentially	☐ Good ☑ Fair ☐ Poor	☑ Low ☐ Medium ☐ High	☐ Yes ☑ No #	

(Revised 8/98)

Bulk Sampling Survey Sheet

Date Collected 2/14/13 **Address:** _____ **Company:** AMA

Job Number: 11365 _____ **Telephone Number:** 410-684-3327

Job Site APG **Contact Person:** A Wasley **Samples Taken By:** Pat Dmel

Chain of Custody #: _____

Sample Number	Type of Material Sampled	Sample Location	Friable	Condition of the Material	Accessibility	Photo	Comments
11365 0014 26	Door Caulk	Bldg 250 Exterior South wall upper walk way Main entrance ~6' up	☐ Yes ☒ No ☐ Potentially	☐ Good ☒ Fair ☐ Poor	☐ Low ☐ Medium ☒ High	☐ Yes ☒ No # ____	
27	↓	Bldg 250 Exterior South wall Ground level main entrance ~3' up	☐ Yes ☒ No ☐ Potentially	☐ Good ☒ Fair ☐ Poor	☐ Low ☐ Medium ☒ High	☐ Yes ☒ No # ____	
28	Mudda Flue	Bldg 250 AMA Ave #03 @ South wall ~10 up	☒ Yes ☐ No ☐ Potentially	☐ Good ☒ Fair ☐ Poor	☐ Low ☒ Medium ☐ High	☐ Yes ☒ No # ____	
29	Roof Shyle	Bldg 251 Exterior South wall ~6' up	☐ Yes ☐ No ☐ Potentially	☐ Good ☐ Fair ☐ Poor	☐ Low ☐ Medium ☐ High	☐ Yes ☐ No # ____	
30	↓	Bldg 252 Exterior North west Corner ~3 up	☐ Yes ☐ No ☐ Potentially	☐ Good ☐ Fair ☐ Poor	☐ Low ☐ Medium ☐ High	☐ Yes ☐ No # ____	

(Revised 8/98)

Bulk Sampling Survey Sheet

Date Collected: 2/14/13 Address: Bldg 250, 251, 252, 253, 254 Company: AMA

Job Number: 11265 Telephone Number: 410-684-3700

Job Site: APG Contact Person: A Walsh Samples Taken By: D Ross

Chain of Custody #:

Sample Number	Type of Material Sampled	Sample Location	Friable	Condition of the Material	Accessibility	Photo	Comments
11265 0214 31	Roof TW Paper	Same as #30	☐ Yes ☒ No ☐ Potentially	☐ Good ☒ Fair ☐ Poor	☐ Low ☐ Medium ☒ High	☐ Yes ☒ No # ____	
32	Roof Shingle	Bldg 252 NW Corn ~3 ft	☐ Yes ☒ No ☐ Potentially	☐ Good ☒ Fair ☐ Poor	☐ Low ☐ Medium ☒ High	☐ Yes ☒ No # ____	
33	Roof TW Paper	Same as #32	☐ Yes ☒ No ☐ Potentially	☐ Good ☒ Fair ☐ Poor	☐ Low ☐ Medium ☒ High	☐ Yes ☒ No # ____	
34	Roofn TW	Bldg 253, ~30 ft from N @ West side	☐ Yes ☐ No ☐ Potentially	☐ Good ☐ Fair ☐ Poor	☐ Low ☐ Medium ☐ High	☐ Yes ☐ No # ____	on concrete
35	Roofn Paper	Same as #34	☐ Yes ☐ No ☐ Potentially	☐ Good ☐ Fair ☐ Poor	☐ Low ☐ Medium ☐ High	☐ Yes ☐ No # ____	↓

(Revised 8/98)

Bulk Sampling Survey Sheet

Date Collected 2/14/13 Address: _____ Company: AMA

Job Number: 11265 _____ Telephone Number: 410-684-7725

Job Site APG Contact Person: A Walk Samples Taken By: Pat Dean

Chain of Custody #: _____

Sample Number	Type of Material Sampled	Sample Location	Friable	Condition of the Material	Accessibility	Photo	Comments
11265 0214 36	Roof Tar	Bldg 253 NW Corner	☐ Yes ☑ No ☐ Potentially	☐ Good ☑ Fair ☐ Poor	☐ Low ☐ Medium ☑ High	☐ Yes ☑ No # ____	
37	Roof Tar Paper	Same as #36	☐ Yes ☑ No ☐ Potentially	☐ Good ☑ Fair ☐ Poor	☐ Low ☐ Medium ☑ High	☐ Yes ☑ No # ____	
38	Door Caulk	Bldg 253 Exter East wall 3rd Door from ~~West~~ South end	☐ Yes ☑ No ☐ Potentially	☐ Good ☑ Fair ☐ Poor	☐ Low ☐ Medium ☑ High	☐ Yes ☑ No # ____	
39	Louv Caulk	Bldg 253 Exter West wall, 3rd louv from South	☐ Yes ☑ No ☐ Potentially	☐ Good ☑ Fair ☐ Poor	☐ Low ☐ Medium ☑ High	☐ Yes ☑ No # ____	
40			☐ Yes ☐ No ☐ Potentially	☐ Good ☐ Fair ☐ Poor	☐ Low ☐ Medium ☐ High	☐ Yes ☐ No # ____	

(Revised 8/98)

AMA Analytical Services, Inc.
Focused on Results www.amalab.com
AIHA (#100470) NVLAP (#101143-0) NY ELAP (10920)
4475 Forbes Blvd. • Lanham, MD 20706
(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643

CHAIN OF CUSTODY

(Please Refer To This Number For Inquires) 232373

Mailing/Billing Information:

1. Client Name: Andrew Washington
2. Address 1: 1331 Ashton Rd , Hanover , MD
3. Address 2:
4. Address 3:
5. Phone #: 410 684 3327 Fax #:

Submittal Information:

1. Job Name: APG
2. Job Location: Bldgs 250, 251, 253, T254
3. Job #: 11265 P.O. #:
4. Contact Person: Andrew Washington @ phone # 410 684 3327
5. Submitted by: Kirte Thompson Signature:

Reporting Info (Results provided as soon as technically feasible). If no TAT/Reporting Info is provided, AMA will assign defaults of 5-Day and email/fax to contacts on file.

AFTER HOURS (must be pre-scheduled)	NORMAL BUSINESS HOURS	REPORT TO:
❑ Immediate Date Due:	❑ Immediate ❑ 3 Day	☒ Include COC/Field Data Sheets with Report
❑ 24 Hours Time Due:	☒ Next Day ❑ 5 Day +	❑ Email: Awashington @ Ama consulting .com
Comments:	❑ 2 Day Date Due: Feb 18	❑ Fax:
	❑ Results Required By Noon	❑ Verbals:

Asbestos Analysis

*PCM Air -- Please Indicate Filter Type:
- ❑ NIOSH 7400 (QTY)
- ❑ Fiberglass (QTY)

TEM Air* -- Please Indicate Filter Type:
- ❑ AHERA (QTY)
- ❑ NIOSH 7402 (QTY)
- ❑ Other (specify) (QTY)

PLM Bulk
- ☒ EPA 600 -- Visual Estimate 39 (QTY)
- ❑ EPA Point Count (QTY)
- ❑ NY State Friable 198.1 (QTY)
- ❑ Grav. Reduction ELAP 198.6 (QTY)
- ❑ Other (specify) (QTY)

MISC
- ❑ Vermiculite
- ❑ Asbestos Soil PLM__(Qual) PLM__(Quan) PLM/TEM__(Qual) PLM/TEM__(Quan)

*It is recommended that blank samples be submitted with all air and surface samples

TEM Bulk
- ❑ ELAP 198.4/Chatfield (QTY)
- ❑ NY State PLM/TEM (QTY)
- ❑ Residual Ash (QTY)

TEM Dust*
- ❑ Qual. (pres/abs) Vacuum/Dust (QTY)
- ❑ Quan. (s/area) Vacuum D5755-95 (QTY)
- ❑ Quan. (s/area)Dust D6480-99 (QTY)

TEM Water
- ❑ Qual. (pres/abs) (QTY)
- ❑ ELAP 198.2/EPA 100.2 (QTY)
- ❑ EPA 100.1 (QTY)

☒ All samples received in good condition unless otherwise noted.
(TEM Water samples ℃)

If field data sheets are submitted, there is no need to complete bottom section.

Metals Analysis
- ❑ Pb Paint Chip (QTY)
- ❑ *Pb Dust Wipe (wipe type) (QTY)
- ❑ *Pb Air (QTY)
- ❑ Pb Soil/Solid (QTY)
- ❑ Pb TCLP (QTY)
- ❑ Drinking Water ❑ Pb (QTY) ❑ Cu (QTY) ❑ As (QTY)
- ❑ Waste Water ❑ Pb (QTY) ❑ Cu (QTY) ❑ As (QTY)
- ❑ Pb Furnace (Media) (QTY)

Fungal Analysis

Collection Apparatus for Spore Traps/Air Samples:
Collection Media

- ❑ *Spore-Trap (QTY)
- ❑ *Surface Swab (QTY)
- ❑ *Surface Tape (QTY)
- ❑ Other (Specify) (QTY)
- ❑ Surface Vacuum Dust (QTY)
- ❑ Culturable ID Genus (Media) (QTY)
- ❑ Culturable ID Species (Media) (QTY)

CLIENT ID #	SAMPLE INFORMATION: SAMPLE LOCATION/ ID	DATE/ TIME	VOL (L)/ Wipe Area	ANALYSIS: TEM	PCM	PLM	LEAD	MOLD	AIR	MATRIX: BULK	DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB	CLIENT CONTACT (LABORATORY STAFF ONLY)
11265 0214 - 01		2/1/13								X						Date/Time: Contact: By:
11265 0214 - 39																
																Date/Time: Contact: By:
																Date/Time: Contact: By:

LABORATORY STAFF ONLY: (CUSTODY)

1. Date/Time RCVD: 2 / 15 / 13 @ 1000 Via: By (Print): David Hudson Sign:
2. Date/Time Analyzed: 2 / 18 / 13 @ 16:30 By (Print): LOM BUTRUK Sign: Lom Butruk
3. Results Reported To: Andrew Washington Via: Email Date: 2 / 18 / 13 Time: Initials: LBP
4. Comments:

END OF APPENDIX E

ABERDEEN PROVING GROUND, MARYLAND
RENOVATE BUILDING 250 WATER TREATMENT PLANT
CONTRACT NO. 18-10

Revised ATTACHMENT A-1 (Addendum #2)

Westech's Scope of work and preliminary drawings for Pressure Iron & Manganese Removal Filters as per Section 11950

INCLUDING RECOMMENDED INSTALLATION STEPS

Aberdeen WTP

Maryland

Engineer
Tetra Tech

Furnished by
Matt Williams
mwilliams@westech-inc.com

Represented by
Irene Pais
Geiger Pump & Equipment Co.
Baltimore, Maryland
(410) 682-2660
ipais@geigerinc.com

WesTech Opportunity Number: 1530246
Thursday, December 28, 2017

Item A – Horizontal MULTICELL® Pressure Filter System

Design Criteria	
Application	Iron and Manganese Removal
Model	FPH23C
Design Flow	2,100 gpm
Number of Filters	2
Size of Each Filter	10 ft 0 in diameter x 26 ft 0 in straight-shell-length
Number of Cells/Filter	2
Filter Loading Rate	3.65 gpm/ft^2
Backwash Method	Air and Water
Design Backwash Rate	12 gpm/ft^2 @ 55° F

Features and Benefits

Horizontal Pressure Filters are an effective, inexpensive, and low-maintenance method of reducing many raw water constituents including iron, manganese, turbidity, color, arsenic (as co-precipitant), etc. Water is introduced to each cell, where it passes through a bed of filter media to remove unwanted particulate. The water then passes a common underdrain plate with distribution nozzles for effluent discharge. Once the media fouls each cell to a predetermined set-point, a backwash cycle is required to dislodge residual particulate for waste discharge. Only one cell is backwashed at a time. The design of the filter with a common underdrain allows backwash water to be supplied from the in service cells to the cell in backwash.

Horizontal Pressure Filter systems with automatic valves and controls reduce operator attention. Backwashing from in-service filter cells reduces the scope of supply by eliminating the need for backwash supply pumps, tanks, and valves.

Tankage

Tankage Scope of Supply

Item	Details
Tank Dimensions	10 ft 0 in diameter x 26 ft 0 in straight-shell-length
Number of cells/filter	2 Cell End Piped
Construction standard	ASME Code with stamp
Construction material	Type 304 Stainless Steel
Working Pressure	100 PSI
Test Pressure	130 PSI
Influent/Backwash waste	8 in flanged
Effluent/Backwash supply	8 in flanged
Air Scour connection	4 in flanged
Air/Vacuum relief	4 in flanged
Overdrain	Header and Lateral Overdrain 316L Pipe and Orifice style, factory installed into the tank
Underdrain	PVC Header and Lateral with ABS Plastic gravel support nozzles, factory installed into the tank
Tank Support	Structural saddle
Manways	24 in diameter (1/cell) T-Bolt (As Specified)

Surface Preparation and Painting

Surface Preparation and Painting Scope of Supply

Location	Notes
Tank Interior and Exterior	None
Piping	One coat of Tnemec Series H90-97 Zinc primer on the exterior only. Field finish to be applied by others.

Fabrications

Fabrications Scope of Supply

Feature	Quantity	Notes
Filter Front Piping	1 Lot	Cement lined Ductile iron pipe and fittings shipped to the limits shown on shaded on the engineer's plans. Items that protrude above the top of the tank will be shipped loose for field attachment by the installing contractor. Items that do not protrude above the top of the tank will be factory installed on the tank.
Freeboard Drain*	1/tank	Includes strainers, shipped loosed for field installation by the installing contractor inside the filter tank.
Air Release Piping	1 lot	Brass ball valves and galvanized steel piping shipped loose for field installation by the installing contractor on the exterior of the tank
Air Scour Grid*	1/cell	Type 304 stainless steel header with slotted laterals, shipped loosed for field installation by the installing contractor inside the filter tank.
Header Lateral Underdrain*	1/cell	Sch 80 PVC header and laterals with NSF 61 listed ABS plastic gravel support nozzles. Header and lateral underdrain components and supports will be factory installed. Grout fill is by others for field installation.
Anchor Bolts	1 Lot	For anchoring the tanks to the floor. Shipped loose for field installation.

*Items are shipped loose for field installation into the filter tank by the installing contractor. PVC solvent and cement are not by WesTech.

Walkway

Walkway Scope of Supply

Feature	Quantity	Notes
Walkway	1	25 ft long walkway, placed between the tanks, tank supported, constructed of prime painted carbon steel structural members with aluminum I-bar grating and Aluminum two-rail handrailing with fittings, for manway access
Walkway access	1	Aluminum ladder with walkthrough.

Media

Media Scope of Supply

Type	Quantity	Depth	Effective Size	U.C.	Packaging
Anthracite	809 ft^3	18 in	0.6–0.8 mm	≤1.6	1-ft^3 bags
GreensandPlus	841 ft^3	18 in	0.30–0.35 mm	≤1.6	½-ft^3 bags
Gravel	712 ft^3	16 in	1/8" x 1/16" (4" layer) ¼" x 1/8" (4" layer) ½" x ¼" (2" layer) ¾" x ½" (2" layer) 1½" x ¾" (4" layer)	-	100 pound bags

Media quantities include sufficient volume for skimming, typically 5% extra. Media is field installed.

Valves

Valves Scope of Supply[1]

Item	Description	Size	Quantity	Type	Operator Type
4	Tank Inlet Isolation	6 in	4	Open/Close	Manual
5	Tank inlet	6 in	4	Open/Close	Electric
6	Tank Backwash Outlet	8 in	4	Open/Close	Electric
7	Tank Draindown	4 in	2	Open/Close	Electric
8	Tank Rinse	6 in	2	Open/Close	Electric
10	Effluent Modulation	6 in	2	Modulating	Electric
11[2]	Effluent Isolation	6 in	2	Open/Close	Manual
15[2]	Backwash Modulation	10 in	1	Modulating	Electric
16[2]	Backwash Inlet Isolation	8 in	2	Open/Close	Manual
17	Backwash Supply	8 in	2	Open/Close	Electric
18[2]	Air Header Isolation	4 in	2	Open/Close	Manual
19[2]	Tank Pressurization	4 in	2	Open/Close	Electric
20	Air Wash	4 in	4	Open/Close	Electric
22	Drain	3 in	2	Open/Close	Ball
No Tag[2]	Air Release	1 in	2	Automatic	Float Actuated

1 - Item numbers correspond to those on the Parts List table on sheet 128 (Drawing 00-D-605).
All butterfly valves are Bray series 30 wafer style with cast iron body, nylon coated disc, metal reinforced EPDM seat and shaft seal. Manually controlled butterfly valves have lever or gear operated handwheel actuators. Automatic butterfly valves have Bray series 70 electric motor actuators with NEMA 4 enclosures, manual overrides, torque switches, and handwheels with auxiliary heaters and limit switches. Automatic air release valves shall be APCO Model 200A. Drain valves shall be Flow-Tek stainless steel ball valves with manual lever operators.
2 – These valves will be shipped loose for field installation by the installing contractor. Those that are powered valves will require wiring and conduit which will be supplied and installed by the installing contractor.

Filter System Control Panel

Filter System Control Panel Scope of Supply

Feature	Description
Number of Panels	1 – shipped loose for field installation by others
Housing	NEMA 4X, type 304 stainless steel, free standing
PLC	Allen Bradley CompactLogix L3 Ethernet programmable controller
OIT	Automation Direct 12” diagonal color touchscreen interface
Gateway	ProSoft Modbus TCP/IP to Ethernet I/P
Ethernet Switch	Ntron #708FX-A
Patch Panel	Belden Modular Industrial Patch Panel
Components	Terminal blocks, wire, surge suppressor, relays, duct, etc. as specified.
Label	UL-508

- Includes factory testing for proper connection of components in the panel. PLC program will be installed in the field and optimized for location specific needs.

Remote I/O Panel

Remote I/O Panel Scope of Supply

Feature	Description
Number of Panels	2 – shipped loose for field installation by others.
Housing	NEMA 4X, type stainless steel, wall mounted
I/O Modules	Allen Bradley FlexLogix Ethernet I/O
Ethernet Switch	NTron #708FX-A
Components	Terminal blocks, wire, surge suppressor, relays, duct, etc. as specified.
Label	UL-508

- Includes factory testing for proper connection of components in the panel.
- WesTech field techs will land and test all wires in the control panel. Wiring and conduit to be provided by others.

Instrumentation

Instrumentation Scope of Supply

Description	Quantity	Type	Output	Manufacturer
Loss of Head Gauge Assembly[1]	2	General Filter #4879 with 4 ½ in gauges and differential pressure switch, includes smooth nose sample taps	Switch, 120 V	WesTech Assembly with Ashcroft gauges and switch
Pressure Transmitter[1]	2	Series 3051 electronic D/P cell transmitter	4-20 mA	Rosemount
Filter Effluent Flow[1]	2	Size 6 in model 8750WA magnetic flow meter with polyurethane liner, 316 SS electrodes, integral mounted aluminum NEMA 4X housing with local display and grounding rings	4-20 mA	Rosemount
Backwash Supply Flow	1	Size 10 in, model 8750WA magnetic flow meter with polyurethane liner, 316 SS electrodes, integral mounted aluminum NEMA 4X housing with local display and grounding rings	4-20 mA	Rosemount

1 – Item is factory installed.

Air Scour Blower

Air Scour Blower Scope of Supply

Quantity	Volume	Pressure	Type	Motor
1	260 scfm	5 PSI	Roots Positive Displacement blower with V-belt drive with guard, inlet/filter silencer, weight type pressure relief valve, motor slide rails, common steel base plate, discharge Rite-Pro check valve, sound enclosure with cooling fan	15 hp, 460 V, 60 Hz, 3 ph, TEFC with thermal switches. Includes NEMA 4X control panel with fusible disconnect, motor starter, electronic overload relay, indicator light, and H-O-A selector switch.

This item is shipped loose for field installation by others

Field Service

WesTech Trips to the Site

Total Trips	Total Days	Includes
3	8	Installation inspection, startup, instruction of plant personnel, and training

Comments:

1. In Section 11950, Item 2.04 requests the inclusion of gravel retaining screens. These gravel retaining screens are not required for WesTech's design. WesTech takes exception and these gravel retaining screens are not included in this proposal. Gravel screens are something that is specified only by Hungerford and Terry as they feel it gives them a competitive advantage. They claim that it is required on installations where there is air scour, due to potential gravel bed disruption. However, the air grid is installed at the media/gravel interface so air is not passing through the gravel bed. Also, the water rate to fluidize the gravel is much higher than the backwash rates used in pressure filters thus the gravel bed will not upset during normal operation. Of the nearly 1000 horizontal pressure filters that WesTech/General Filter has supplied over the last 6 decades, only a handful have gravel retaining screens and those only have them when the project specifications were based on a Hungerford and Terry design.
2. In Section 11950, Item 2.05 specifies a proprietary gravel support nozzle. WesTech takes exception and is quoting our standard gravel support nozzle which is constructed of ABS plastic. The sand valve that is specified is simply a threaded shank with stainless steel plates, spacers, and a spline. The entire purpose of the design is to pass water in either direction while preventing the intrusion of gravel into and through the nozzle. WesTech's underdrain nozzle is an NSF 61 certified, injection molded ABS plastic design, which also passes water in either direction while preventing the intrusion of gravel into or through the nozzle. The gravel layer in contact with the nozzle is large 1 ½" x ¾" sized gravel which cannot penetrate the nozzle opening and due to the high fluidization rate of gravel of that size will not wear against the nozzles. Please see drawing 1530246-0000 which has a detail of the nozzle itself as well as details of the underdrain system. These nozzles are standard on General Filter pressure filters and have been used for the last 15 years without issue.
3. In Section 11950, Item 2.08.A.2 and B have lists of valves. This list is different from that provided on the plans, specifically sheet 128. WesTech is quoting valves that match those noted as supplied by the filter manufacturer on sheet 128.
4. On plan sheet 130, the piping from the air blower to the pressure filters shows isolation valves in a location where if you closed the isolation valve on the first tank, it would cut off air to both tanks. WesTech is quoting a piping system which will alleviate this issue.
5. Due to the height of the roll up door, any piping that is above the top of the tank will be shipped loose for field install to allow for clearance. Please see the attached marked drawing for reference.
6. For the chemical feeds, the chlorine demand is estimated using the formula of:

   $$mg/L\ Cl2 = (1 \times mg/L\ Fe) + (3 \times mg/L\ Mn) + (6 \times mg/L\ H2S) + (8 \times mg/L\ NH3).$$

   Based on the water data, there is 4.7 mg/L of Iron and 0.12 mg/L manganese. The estimated chlorine demand would be approximately 5.06 mg/L Cl2.

   With respect to the effectiveness of the filters, when combined iron and manganese levels reach levels in the range of 6-8 mg/L, the solids load becomes significant with reduced efficiency of the filtration process due to frequent backwash. For waters in this range or above, WesTech recommends the addition of a clarification step to reduce solids being sent to the filter. Please consult WesTech if clarification equipment is desired.

Spare Parts

These spare parts are not included in the pricing above. This information is in response to the request for proposals.

Spare Parts Scope of Supply

Feature	Quantity	Notes	Price
Manway Gaskets	1	24” diameter	$163
Blower filter	1		$200
Butterfly Valve	1	Size: 4 inch	$1,218
Butterfly Valve	1	Size: 6 inch	$2,200
Butterfly Valve	1	Size: 8 inch	$2,315

Miscellaneous bulbs and fuses for the control panel may be procured locally.

NOTE: ANY ITEM NOT LISTED ABOVE TO BE FURNISHED BY OTHERS.

Items Not Furnished by WesTech:

- Unloading of equipment from delivering carrier, protected storage of equipment, installation, supervision of installation
- All items crosshatched on photocopies of engineer's design
- All underground and interconnecting piping, pipe supports, wall inserts or sleeves, Dresser or flexible couplings, hangers, air release piping and valves, sampling lines and sinks, small pressure water supply piping, field work of piping (i.e., drilling and tapping for instrumentation)
- Steel treating basin shells, walkways, handrails, stairways and ladders, air ducts and roof flashing
- Finish paint and intermediate field coats
- All chemical feeders, feed lines, start-up chemicals, chemicals, labor and procedures for the disinfection of equipment, laboratory test equipment
- Structural design, supply and installation of concrete basin, foundations, rebar, concrete, grout, sealant, sumps
- Motor control center, motor starters, disconnects, electrical wiring and conduit, telemetering equipment, level controls, turbidity monitoring equipment, supports for controls
- All pumps, air compressors, dryers, operating and start-up lubricants

This proposal has been reviewed and is approved for issue by Pete Levorson on December 28, 2017.

Firm Pricing

Proposal Name: Aberdeen WTP
Proposal Number: 1530246
Thursday, December 28, 2017

1. Bidder's Contact Information

Company Name	WesTech Engineering, Inc.
Contact Name	Matt Williams
Phone	801.265.1000
Email	mwilliams@westech-inc.com
Address: Number/Street	3665 S West Temple
Address: City, State, Zip	Salt Lake City, UT 84115

2. Pricing

Currency: US Dollars

Scope of Supply

A	Horizontal MULTICELL® Pressure Filter System	[redacted]
	Taxes (sales, use, VAT, IVA, IGV, duties, import fees, etc.)	Not Included

Prices are for a period not to exceed February 28, 2018.

Field Service

Daily Rate	$960

Prices do not include field service unless noted, but it is available at the daily rate plus expenses. The customer will be charged for a minimum of three days for time at the jobsite. Travel will be billed at the daily rate. Any canceled charges due to the customer's request will be added to the invoice. The greater of visa procurement time or a two week notice is required prior to trip departure date.

3. Payment Terms

Submittals Approved	[redacted]
Release for Fabrication	[redacted]
Net 30 days from Shipment	[redacted]

All payments are net 30 days. Partial shipments are allowed. Other terms per WesTech proforma invoice.

4. Schedule

Submittals, after PO receipt	6 to 8 Weeks
Customer Review Period	2 weeks
Ready to Ship, after Submittal Approval	14 to 16 weeks
Total Weeks from PO to Shipment	**22 to 26 weeks**

Terms & Conditions: This proposal, including all terms and conditions contained herein, shall become part of any resulting contract or purchase order. Changes to any terms and conditions, including but not limited to submittal and shipment days, payment terms, and escalation clause shall be negotiated at order placement, otherwise the proposal terms and conditions contained herein shall apply.

Freight: Prices quoted are **F.O.B. shipping point** with freight allowed to a readily accessible location nearest to jobsite. All claims for damage or loss in shipment shall be initiated by purchaser.

Paint: If your equipment has paint included in the price, please take note to the following. Primer paints are designed to provide only a minimal protection from the time of application (usually for a period not to exceed 30 days). Therefore, it is imperative that the finish coat be applied within 30 days of shipment on all shop primed surfaces. Without the protection of the final coatings, primer degradation may occur after this period, which in turn may require renewed surface preparation and coating. If it is impractical or impossible to coat primed surfaces within the suggested time frame, WesTech strongly recommends the supply of bare metal, with surface preparation and coating performed in the field. All field surface preparation, field paint, touch-up, and repair to shop painted surfaces are not by WesTech.

One-Year Warranty

WesTech equipment is backed by WesTech's reputation as a quality manufacturer, and by many years of experience in the design of reliable equipment.

Equipment manufactured or sold by WesTech Engineering, Inc., once paid for in full, is backed by the following warranty:

For the benefit of the original user, WesTech warrants all new equipment manufactured by WesTech Engineering, Inc. to be free from defects in material and workmanship, and will replace or repair, F.O.B. its factories or other location designated by it, any part or parts returned to it which WesTech's examination shall show to have failed under normal use and service by the original user within one (1) year following initial start-up, or eighteen (18) months from shipment to the purchaser, whichever occurs first.

Such repair or replacement shall be free of charge for all items except for those items such as resin, filter media and the like that are consumable and normally replaced during maintenance, with respect to which, repair or replacement shall be subject to a pro-rata charge based upon WesTech's estimate of the percentage of normal service life realized from the part. WesTech's obligation under this warranty is conditioned upon its receiving prompt notice of claimed defects, which shall in no event be later than thirty (30) days following expiration of the warranty period, and is limited to repair or replacement as aforesaid.

This warranty is expressly made by WesTech and accepted by purchaser in lieu of all other warranties, including warranties of merchantability and fitness for particular purpose, whether written, oral, express, implied, or statutory. WesTech neither assumes nor authorizes any other person to assume for it any other liability with respect to its equipment. WesTech shall not be liable for normal wear and tear, corrosion, or any contingent, incidental, or consequential damage or expense due to partial or complete inoperability of its equipment for any reason whatsoever.

This warranty shall not apply to equipment or parts thereof which have been altered or repaired outside of a WesTech factory, or damaged by improper installation, application, or maintenance, or subjected to misuse, abuse, neglect, accident, or incomplete adherence to all manufacturer’s requirements, including, but not limited to, Operations & Maintenance Manual guidelines & procedures.

This warranty applies only to equipment made or sold by WesTech Engineering, Inc.

WesTech Engineering, Inc. makes no warranty with respect to parts, accessories, or components purchased by the customer from others. The warranties which apply to such items are those offered by their respective manufacturers.

Terms & Conditions

Terms and Conditions appearing in any order based on this proposal which are inconsistent herewith shall not be binding on WesTech Engineering Inc. The sale and purchase of equipment described herein shall be governed exclusively by the foregoing proposal and the following provisions:

1. SPECIFICATIONS: WesTech Engineering Inc. is furnishing its standard equipment as outlined in the proposal and as will be covered by final approved drawings. The equipment may not be in strict compliance with the Engineer's/Owner's plans, specifications, or addenda as there may be deviations. The equipment will, however, meet the general intention of the mechanical specifications of these documents.

2. ITEMS INCLUDED: This proposal includes only the equipment specified herein and does not include erection, installation, accessories, nor associated materials such as controls, piping, etc., unless specifically listed.

3. PARTIES TO CONTRACT: WesTech Engineering Inc. is not a party to or bound by the terms of any contract between WesTech Engineering Inc.'s customer and any other party. WesTech Engineering Inc.'s undertakings are limited to those defined in the contract between WesTech Engineering Inc. and its direct customers.

4. PRICE AND DELIVERY: All selling prices quoted are subject to change without notice after 30 days from the date of this proposal unless specified otherwise. Unless otherwise stated, all prices are F.O.B. WesTech Engineering Inc. or its supplier's shipping points. All claims for damage, delay or shortage arising from such equipment shall be made by Purchaser directly against the carrier. When shipments are quoted F.O.B. job site or other designation, Purchaser shall inspect the equipment shipped, notifying WesTech Engineering Inc. of any damage or shortage within forty-eight hours of receipt, and failure to so notify WesTech Engineering Inc. shall constitute acceptance by Purchaser, relieving WesTech Engineering Inc. of any liability for shipping damages or shortages.

5. PAYMENTS: All invoices are net 30 days. Delinquencies are subject to a 1.5 percent service charge per month or the maximum permitted by law, whichever is less on all past due accounts. Pro rata payments are due as shipments are made. If shipments are delayed by the Purchaser, invoices shall be sent on the date when WesTech Engineering Inc. is prepared to make shipment and payment shall become due under standard invoicing terms. If the work to be performed hereunder is delayed by the Purchaser, payments shall be based on the purchase price and percentage of completion. Products held for the Purchaser shall be at the risk and expense of the Purchaser. Unless specifically stated otherwise, prices quoted are for equipment only. These terms are independent of and not contingent upon the time and manner in which the Purchaser receives payment from the owner.

6. PAYMENT TERMS: Credit is subject to acceptance by WesTech Engineering Inc.'s Credit Department. If the financial condition of the Purchaser at any time is such as to give WesTech Engineering Inc., in its judgment, doubt concerning the Purchaser's ability to pay, WesTech Engineering Inc. may require full or partial payment in advance or may suspend any further deliveries or continuance of the work to be performed by the WesTech Engineering Inc. until such payment has been received.

7. ESCALATION: If shipment is, for any reason, deferred by the Purchaser beyond the normal shipment date, or if material price increases are greater than 5% from proposal date to material procurement date, stated prices set forth herein are subject to escalation. The escalation shall be based upon increases in labor and material and other costs to WesTech Engineering Inc. that occur in the time period between quotation and shipment by WesTech Engineering Inc. Purchaser agrees to this potential escalation regardless of contradicting terms in the contract, except when an agreed upon escalation adder is included in the price.

(a) The total quoted revised price is based upon changes in the indices published by the United States Department of Labor, Bureau of Labor Statistics. Labor will be related to the Average Hourly Earnings indices found in the Employment and Earnings publication. Material will be related to the Metal and Metal Products Indices published in Wholesale Prices and Prices Indices.

(b) Price revision for items furnished to, and not manufactured by WesTech Engineering Inc., which exceed the above escalation calculation, will be passed along by WesTech Engineering Inc. to Purchaser based upon the actual increase in price to WesTech Engineering Inc. for the period from the date of quotation to the date of shipment by WesTech Engineering Inc. Any item that is so revised will be excluded from the index escalation calculations set forth in subparagraph (a) above.

8. APPROVAL: If approval of equipment submittals by Purchaser or others is required, a condition precedent to WesTech Engineering Inc. supplying any equipment shall be such complete approval.

9. INSTALLATION SUPERVISION: Prices quoted for equipment do not include installation supervision. WesTech Engineering Inc. recommends and will, upon request, make available, at WesTech Engineering Inc.'s then current rate, an experienced installation supervisor to act as the Purchaser's employee and agent to supervise installation of the equipment. Purchaser shall at its sole expense furnish all necessary labor equipment, and materials needed for installation.

Responsibility for proper operation of equipment, if not installed by WesTech Engineering Inc. or installed in accordance with WesTech Engineering Inc.'s instructions, and inspected and accepted in writing by WesTech Engineering Inc., rests entirely with Purchaser; and any work performed by WesTech Engineering Inc. personnel in making adjustment or changes must be paid for at WesTech Engineering Inc.'s then current per diem rates plus living and traveling expenses.

WesTech Engineering Inc. will supply the safety devices described in this proposal or shown in WesTech Engineering Inc.'s drawings furnished as part of this order but excepting these, WesTech Engineering Inc. shall not be required to supply or install any safety devices whether required by law or otherwise. The Purchaser hereby agrees to indemnify and hold harmless WesTech Engineering Inc. from any claims or losses arising due to alleged or actual insufficiency or inadequacy of the safety devices offered or supplied hereunder, whether specified by WesTech Engineering Inc. or Purchaser, and from any damage resulting from the use of the equipment supplied hereunder.

10. ACCEPTANCE OF PRODUCTS: Products will be deemed accepted without any claim by Purchaser unless written notice of non-acceptance is received by WesTech Engineering Inc. within 30 days of delivery if shipped F.O.B. point of shipment, or 48 hours of delivery if shipped F.O.B. point of destination. Such written notice shall not be considered received by WesTech Engineering Inc. unless it is accompanied by all freight bills for said shipment, with Purchaser's notations as to damages, shortages and conditions of equipment, containers, and seals. Non-accepted products are subject to the return policy stated below.

11. TAXES: Any federal, state, or local sales, use or other taxes applicable to this transaction, unless specifically included in the price, shall be for Purchaser's account.

12. TITLE: The equipment specified herein, and any replacements or substitutes therefore shall, regardless of the manner in which affixed to or used in connection with realty, remain the sole and personal property of WesTech Engineering Inc. until the full purchase price has been paid. Purchaser agrees to do all things necessary to protect and maintain WesTech Engineering Inc.'s title and interest in and to such equipment; and upon Purchaser's default, WesTech Engineering Inc. may retain as liquidated damages any and all partial payments made and shall be free to enter the premises where such equipment is located and remove the same as its property without prejudice to any further claims on account of damages or loss which WesTech Engineering Inc. may suffer from any cause.

13. INSURANCE: From date of shipment until the invoice is paid in full, Purchaser agrees to provide and maintain at its expense, but for WesTech Engineering Inc.'s benefit, adequate insurance including, but not limited to, builders risk insurance on the equipment against any loss of any nature whatsoever.

14. SHIPMENTS: Any shipment of delivery dates recited represent WesTech Engineering Inc.'s best estimate but no liability, direct or indirect, is assumed by WesTech Engineering Inc. for failure to ship or deliver on such dates.

WesTech Engineering Inc. shall have the right to make partial shipments; and invoices covering the same shall be due and payable by Purchaser in accordance with the payment terms thereof. If Purchaser defaults in any payment when due hereunder, WesTech Engineering Inc. may, without incurring any liability therefore to Purchaser or Purchaser's customers, declare all payments immediately due and payable with maximum legal interest thereon from due date of said payment, and at its option, stop all further work and shipments until all past due payments have been made, and/or require that any further deliveries be paid for prior to shipment.

If Purchaser requests postponements of shipments, the purchase price shall be due and payable upon notice from WesTech Engineering Inc. that the equipment is ready for shipment; and thereafter any storage or other charge WesTech Engineering Inc. incurs on account of the equipment shall be for the Purchaser's account.

If delivery is specified at a point other than WesTech Engineering Inc. or its supplier's shipping points, and delivery is postponed or prevented by strike, accident, embargo, or other cause beyond WesTech Engineering Inc.'s reasonable control and occurring at a location other than WesTech Engineering Inc. or its supplier's shipping points, WesTech Engineering Inc. assumes no liability in delivery delay. If Purchaser refuses such delivery, WesTech Engineering Inc. may store the equipment at Purchaser's expense. For all purposes of this agreement such tender of delivery or storage shall constitute delivery.

15. WARRANTY: WESTECH ENGINEERING INC. WARRANTS EQUIPMENT IT SUPPLIES ONLY IN ACCORDANCE WITH THE WARRANTY EXPRESSED IN THE ATTACHED COPY OF "WESTECH WARRANTY" AGAINST DEFECTS IN WORKMANSHIP AND MATERIALS WHICH IS MADE A PART HEREOF. SUCH WARRANTY IN LIEU OF ALL OTHER WARRANTIES, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PARTICULAR PURPOSE, WHETHER WRITTEN, ORAL, EXPRESSED, IMPLIED OR STATUTORY, WESTECH ENGINEERING INC. SHALL NOT BE LIABLE ANY CONTINGENT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES FOR ANY REASON WHATSOEVER.

16. PATENTS: WesTech Engineering Inc. agrees that it will, at its own expense, defend all suits or proceedings instituted against Purchaser and pay any award of damages assessed against it in such suits or proceedings, so far as the same are based on any claim that the said equipment or any part thereof constitutes an infringement of any apparatus patent of the United States issued at the date of this Agreement, provided WesTech Engineering Inc. is given prompt notice in writing of the institution or threatened institution of any suit or proceeding and is given full control of the defense, settlement, or compromise of any such action; and Purchaser agrees to give WesTech Engineering Inc. needed information, assistance, and authority to enable WesTech Engineering Inc. so to do. In the event said equipment is held or conceded to infringe such a patent, WesTech Engineering Inc. shall have the right at its sole option and expense to a) modify the equipment to be non-infringing, b) obtain for Purchaser the license to continue using said equipment, or c) accept return of the equipment and refund to the Purchaser the purchase price thereof less a reasonable charge for the use thereof. WesTech Engineering Inc. will reimburse Purchaser for actual out-of-pocket expenses, exclusive of legal fees, incurred in preparing such information and rendering such assistance at WesTech Engineering Inc.'s request. The foregoing states the entire liability of WesTech Engineering Inc., with respect to patent infringement; and except as otherwise agreed to in writing, WesTech Engineering Inc. assumes no responsibility for process patent infringement.

17. SURFACE PREPARATION AND PAINTING: If furnished, shop primer paint is intended to serve only as minimal protective finish. WesTech Engineering Inc. will not be responsible for the condition of primed or finish painted surfaces after equipment leaves its shops. Purchasers are invited to inspect paint in shops for proper preparation and application prior to shipment. WesTech Engineering Inc. assumes no responsibility for field surface preparation or touch-up of shipping damage to paint. Painting of fasteners and other touch-up to painted surfaces will be by Purchaser's painting contractor after mechanism installation.

Motors, gear motors, and other components not manufactured by WesTech Engineering Inc. will be painted with that manufacturer's standard paint system. It is WesTech Engineering Inc.'s intention to ship major steel components as soon as fabricated, often before drive, motors, and other manufactured components. Unless Purchaser can ensure that shop primed steel shall be field painted within thirty (30) days after arrival at the job site, WesTech Engineering Inc. encourages the Purchaser to order these components without primer.

WesTech Engineering Inc.'s prices are based on paints and surface preparations as outlined in the main body of this proposal. In the event that an alternate paint system is selected, WesTech Engineering Inc. requests that Purchaser's order advise of the paint

selection. WesTech Engineering Inc. will then either adjust the price as may be necessary to comply or ship the material unpainted if compliance is not possible due to application problems or environmental controls.

18. CANCELLATION, SUSPENSION, OR DELAY: After acceptance by WesTech Engineering Inc., this proposal, or Purchaser's order based on this proposal, shall be a firm agreement and is not subject to cancellation, suspension, or delay except upon payment by Purchaser of appropriate charges which shall include all costs incurred by WesTech Engineering Inc. to date of cancellation, suspension, or delay plus a reasonable profit. Additionally, all charges related to storage and/or resumption of work, at WesTech Engineering Inc.'s plant or elsewhere, shall be for Purchaser's sole account; and all risks incidental to storage shall be assumed by Purchaser.

19. RETURN OF PRODUCTS: No products may be returned to WesTech Engineering Inc. without WesTech Engineering Inc.'s prior written permission. Said permission may be withheld by WesTech Engineering Inc. at its sole discretion.

20. BACKCHARGES: WesTech Engineering Inc. will not approve or accept backcharges for labor, materials, or other costs incurred by Purchaser or others in modification, adjustment, service, or repair of WesTech Engineering Inc.-furnished materials unless such back charge has been authorized in advance in writing by a WesTech Engineering Inc. employee, by a WesTech Engineering Inc. purchase order, or work requisition signed by WesTech Engineering Inc.

21. INDEMNIFICATION: Purchaser agrees to indemnify WesTech Engineering Inc. from all costs incurred, including but not limited to court costs and reasonable attorney fees, from enforcing any provisions of this contract, including but not limited to breach of contract or costs incurred in collecting monies owed on this contract.

22. ENTIRE AGREEMENT: This proposal expresses the entire agreement between the parties hereto superseding any prior understandings, and is not subject to modification except by a writing signed by an authorized officer of each party.

23. MOTORS AND MOTOR DRIVES: In order to avoid shipment delays of WesTech Engineering Inc. equipment, the motor drives may be sent directly to the job site for installation by the equipment installer. Minor fit-up may be required.

24. EXTENDED STORAGE: Extended storage instructions will be part of information provided to shipment. If equipment installation and start-up is delayed more than 30 days, the provisions of the storage instructions must be followed to keep WARRANTY in force.

25. LIABILITY: Professional liability insurance, including but not limited to, errors and omissions insurance, is not included. In any event, liability for errors and omissions shall be limited to the lesser of $100,000USD or the value of the particular piece of equipment (not the value of the entire order) supplied by WesTech Engineering Inc. against which a claim is sought.

26. ARBITRATION NEGOTIATION: Any controversy or claim arising out of or relating to the performance of any contract resulting from this proposal or contract issued, or the breach thereof, shall be settled by arbitration in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association, and judgment upon the award rendered by the arbitrator(s) may be entered to any court having jurisdiction.

ACCEPTED BY PURCHASER

Customer Name: _____

Customer Address: _____

_____

_____

Contact Name: _____

Contact Phone: _____

Contact Email: _____

Signature: _____

Printed Name: _____

Title: _____

Date: _____

Preliminary instructions for installation of the horizontal pressure filter. References to drawings are preliminary and do not exist at this point in time.

1.1 TENTATIVE PLAN FOR HOW THINGS WILL SHIP.

1.) Each tank will be shipped on a separate truck.

2.) Most of the Filter Front Piping will be attached to the tank. There will be some piping that extends beyond the height and width of the tank that will ship loose.

3.) The Air Scour Grids will be shipped in crates and will arrive about the same time that the tanks arrive.

4.) The Underdrain ABS Nozzles will be shipped in boxes and will arrive about the same time that the tanks arrive.

5.) The walkways, Handrail, and Ladders will come in separate shipments.

6.) The media will come in five truckloads.

7.) The valves will be shipped in separate crates.

8.) The control panels will come separate.

9.) The LOH assemblies, Pressure transmitters, and magmeters will all come in separate shipments.

10.) The AW Blower will come separate.

1.2 INSTALLATION – HORIZONTAL PRESSURE FILTER

1.) Set filter tanks in position as shown on drawings and Contract plans.

2.) Adjust tanks for level and height. Grout under support saddle if necessary.

3.) Remove manhole covers for installation of components, support gravel and filter media.

4.) Install the header lateral underdrain. Refer to instruction sheet FI-3.

5.) Install the gravel as detailed by the media installation section of this manual. Refer to instruction sheet FM-4.

6.) Install the airwash grid at the interface between the top layer of graded gravel and the filter media. Install the airwash grid prior to the media. Refer to instruction sheet AWG-1.

7.) Install the media as detailed by the media installation section of this manual. Refer to instruction sheet FM-4.

Preliminary instructions for installation of the horizontal pressure filter. References to drawings are preliminary and do not exist at this point in time.

8.) Install manhole covers.

9.) Install filter front piping, fittings, instruments, and valves. Refer to reference drawings, Contract plans, and valve manufacturer's manuals.

NOTE: *Pressure vessels supplied by WesTech are occasionally shipped with the pipe nozzles capped with steel plate. These cap plates will require field cutting for removal. Flanges provided will require field welding after alignment with connecting piping.*

10.) Install sample taps into plant piping in locations as directed by the engineer. The sample taps will require line taps for installation.

11.) Install loss of head gauge on filter front piping. Refer to instruction sheet IN-12.

12.) Install air release components per reference drawing and Contract plans. Piping from tank should not turn or slope down before connecting to the automatic air release valve.

13.) Field touch-up all damaged areas in the shop primed surfaces before application of finish paint. Any damage to the finish paint during shipment or installation should be properly primed and refinished.

14.) Disinfect all pipes, tanks and equipment in accordance with current AWWA procedures and as directed by the project engineer.

1.3 FI-3: INSTALLATION – HEADER LATERAL UNDERDRAIN SYSTEM

1.) Check connections of the header and laterals and their supports as some items may loosed during shipment. Do not walk on system during installation.

2.) Fill bottom of filter tank with 1:3:7 concrete to 3" below centerline on laterals.

3.) Fill with grout level with top of risers. Trowel to a smooth surface.

4.) A recommended grout mixture is 1 part Portland cement to 2 1/2 parts of sand. Use a rather coarse sand of about the following size:

99% passing a No. 8 sieve.
26% passing a No. 50 sieve.
2% passing a No. 100 sieve.

Mix the grout as dry as practical and use retarders only as local experience would permit.

5.) Remove plastic inserts. Secure the nozzles onto the laterals.

6.) Header lateral system is ready for service.

Preliminary instructions for installation of the horizontal pressure filter. References to drawings are preliminary and do not exist at this point in time.

1.4 FM-4: INSTALLATION – FILTER MEDIA

1.) Before commencing media placement, refer to engineer's specifications for special requirements concerning media installation.

2.) See reference drawing and packing list for media specifications, gradations, and depths. Be sure to set aside and store any spare media prior to placing media in filter cells.

3.) Media shall be installed in accordance with ANSI/AWWA B100-01.

4.) Vacuum clean all surfaces in contact with backwash water supply as directed by engineer's specifications and manufacturer's instructions. Be sure underdrain construction has been installed and tested per operation & maintenance manual prior to placing media.

5.) Care must be taken to protect distribution baffles or strainers from damage when cleaning cells or placing media.

6.) Clean each filter thoroughly before any filter media is placed within the filter.

7.) Before any media is placed, mark a continuous level line on the inside of the filter to represent the top elevation of each layer of the filter media.

8.) There are several grades of gravel supplied with one filter as shown on the packing list. All grades are marked as to size. The gravel is to be placed in the filter in layers as shown on the reference drawing.

9.) Divide gravel equally between the number of filters to be installed.

10.) Each size of gravel must be carefully leveled before the next size is added.

11.) It is very important that the fine gravel be level.

12.) Divide filter media equally between the number of filters to be installed.

13.) Place filter media within the filter cell. Workmen should not stand or walk directly on the filter media. Place boards or plywood on the media that will sustain their weight without displacing the material.

14.) Bulk media may be placed dry by using a chute or conveyor to discharge the materials onto a platform from where they may be scattered with a hand trowel.

15.) Bulk media may be placed hydraulically by pump or ejector. If the wet method is used, the media will be added through the water and then backwashed for leveling.

16.) The top elevation of the media layers can be checked by filling the filter with water to previously marked line. Screed each layer to a true level plane.

Preliminary instructions for installation of the horizontal pressure filter. References to drawings are preliminary and do not exist at this point in time.

17.) The top elevation of each layer should be equal to the finished elevation plus the depth of media required for skimming.

18.) After each layer of media has been placed into the filter cell, slowly fill the filter by adding water up through the underdrain.

19.) After the media is submerged, slowly backwash the filter.

20.) After initial backwash, scrape the filter media as directed by the engineer.

21.) The filter should be backwashed three times between additional scrapings if so required.

22.) After final scraping add filter media as required to bring the top surface of the media to the correct elevation.

23.) Before filter is put into service, disinfect filter as required by engineer.

NOTE: *Greensand Plus filter media requires preconditioning by the contractor before units are put into service. Please see information from Inversand on this process.*

1.5 AWG-1: INSTALLATION – PVC PIPE TYPE AIR WASH GRID

1.) Refer to the installation drawing included in this manual.

2.) Air wash grid should be installed after the graded gravel has been placed in the tank and leveled.

3.) Lay planking over the gravel to walk on during installation.

4.) Install the header pipe with the lateral holes in the horizontal plane and the weep hole facing down. A gasket, bolts, nuts and u-bolts are provided.

5.) Install the laterals per reference drawings, using the adapters provided.

NOTE: *The laterals are to be installed with the slots down.*

The bottom of the laterals should be flush with the top of the gravel.

PVC solvent primer and cement, if required, is not provided by WesTech. Follow cement manufacturer's written instructions accurately when making field solvent welded joints.

6.) Install the u-bolts or cable ties over the ends of the laterals to secure them. See reference drawing and packing list for method of securing laterals and installation requirements.

7.) After air wash grid has been completely installed, the rest of the media may be installed, taking care not to crack the header or dislodge the laterals.

Preliminary instructions for installation of the horizontal pressure filter. References to drawings are preliminary and do not exist at this point in time.

1.6 IN-12: INSTALLATION – 4879 LOSS OF HEAD GAUGE

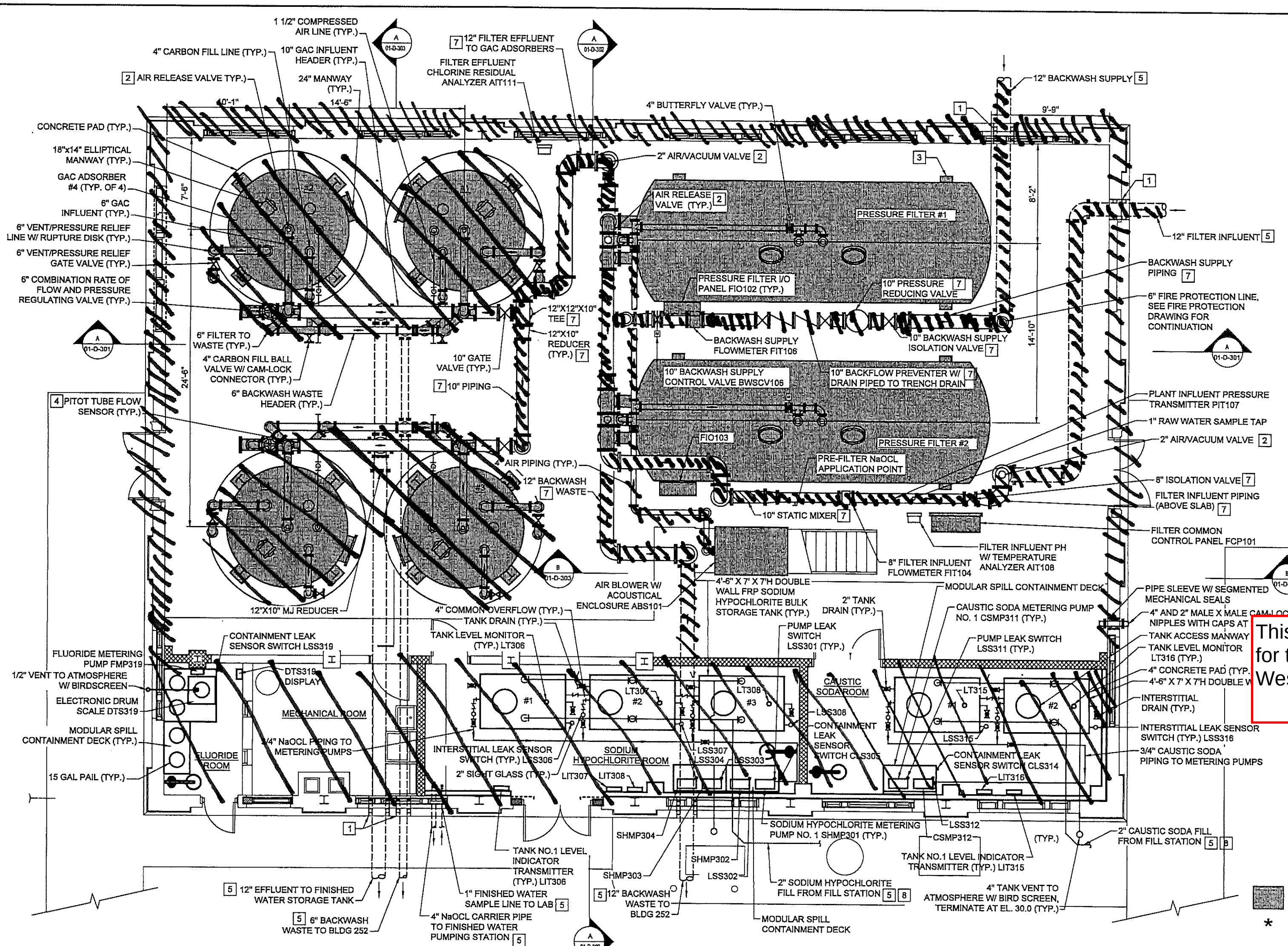
1.) Refer to the installation drawing included in this manual.

2.) Mount Loss of Head Gauge on the unit face piping with the clamp provided.

3.) Connect pressure gauge(s) to indicate filter inlet and outley pressure using 1/4" OD copper tubing and tubing needle valve furnished.

4.) The tubing needle valves furnished will require 1/8" IPS line taps for installation.

5.) All connections to horizontal pipe lines should be made in the side of the pipe line and not on the top or bottom to reduce air entrapment or sediment collection.



1 BUILDING 250 GROUND FLOOR PLAN
01-D-101 SCALE: 1/4"=1'-0"

GENERAL NOTES

1. DEMOLITION NOTE: ALL EXISTING PROCESS EQUIPMENT INSIDE BUILDING 250 INCLUDING BUT NOT LIMITED TO THE SAND FILTERS AND ASSOCIATED PIPE, VALVES AND FITTINGS, CHEMICAL FEED SYSTEMS, RAW WATER PUMPS, FINISHED WATER PUMPS AND RESPECTIVE PIPE, VALVES AND FITTINGS SHALL BE COMPLETELY REMOVED. PLEASE REFER TO THE EXISTING CONTRACT DRAWINGS ON COMPACT DISC.
2. ALL INTERIOR PIPING SHALL BE PROPERLY SUPPORTED IN ACCORDANCE WITH THE SPECIFICATIONS. CONTRACTOR SHALL SUBMIT THE MEANS AND METHODS FOR VARIOUS PIPING FOR APPROVAL.
3. UNLESS OTHERWISE INDICATED, ALL PIPE, VALVE AND FITTINGS SHALL BE PAINTED IN ACCORDANCE WITH THE SPECIFICATIONS.
4. PROVIDE FLOOR CASTING WITH THRUST COLLAR POSITIONED IN CENTER OF FLOOR FOR ALL FLOOR PENETRATIONS.
5. USE ADJUSTABLE PIPE STANCHION SADDLE SUPPORT (WITH STAINLESS STEEL U-BOLT) AT EVERY 8 FEET SPACING.
6. SEE RESPECTIVE CHEMICAL SYSTEM SCHEMATICS FOR DETAILS AND PIPING SIZES.
7. REFER TO SPECIFICATION SECTION 11950 FOR PRESSURE FILTER EQUIPMENT PACKAGE SPECIFICATION, AND THE APPROVED BID PROPOSAL FOR WORK TO BE FURNISHED AND INSTALLED BY THE CONTRACTOR.
8. REFER TO SPECIFICATION SECTION 11960 FOR GAC ADSORBER EQUIPMENT PACKAGE SPECIFICATION AND THE APPROVED BID PROPOSAL FOR WORK TO BE FURNISHED AND INSTALLED BY THE CONTRACTOR.

[X] SHEET KEYNOTES

1. CORE DRILL OPENING, USE SEGMENTED RUBBER COMPRESSION SEALS ON EACH FACE OF WALL TO MAKE WATERTIGHT.
2. RUN PVC VALVE DRAIN TO TRENCH DRAIN.
3. FILL SUPPORT SADDLE WITH CONCRETE.
4. INSERTION TYPE PITOT TUBE FLOW SENSOR W/ DIFFERENTIAL PRESSURE TRANSMITTER.
5. SEE CIVIL DRAWINGS FOR CONTINUATION.
6. STACK THE 2" NIPPLES OVER THE 4" WITH 12" SEPARATION.
7. PIPE, VALVE, OR FITTING SHALL BE INSULATED.
8. SEE STRUCTURAL SECTION 5/S-01-505 FOR SUPPORT DETAILS.

This Drawing depicts the scope of supply for the pressure filter systems by WesTech.

CROSS-HATCHED PARTS NOT BY WESTECH

LEGEND

- PART OF PRESSURE FILTER OR GAC ADSORBER EQUIPMENT PACKAGE
- * PRESSURE FILTER AND GAC ADSORBER INTERCONNECTING PIPING AND EQUIPMENT INSTALLATION BY INSTALLING CONTRACTOR, SEE GENERAL NOTES 7 AND 8.

GRAPHIC SCALE
0 2' 4' 8'
SCALE: 1/4" = 1'-0"

PROFESSIONAL CERTIFICATION:
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 29228
EXPIRATION DATE: 08/17/2017

WRA Whitman, Requardt & Associates, LLP 801 South Caroline Street, Baltimore, Maryland 21231	CITY OF ABERDEEN 60 N. PARKE ST. ABERDEEN, MD 21001 CITY ENGINEER DATE		ABERDEEN PROVING GROUND RENOVATE BUILDING 250 WATER TREATMENT PLANT	BUILDING 250 GROUND FLOOR PLAN	DRAWING 01-D-101 SHEET 130 OF 212

REV	DATE	DESCRIPTION

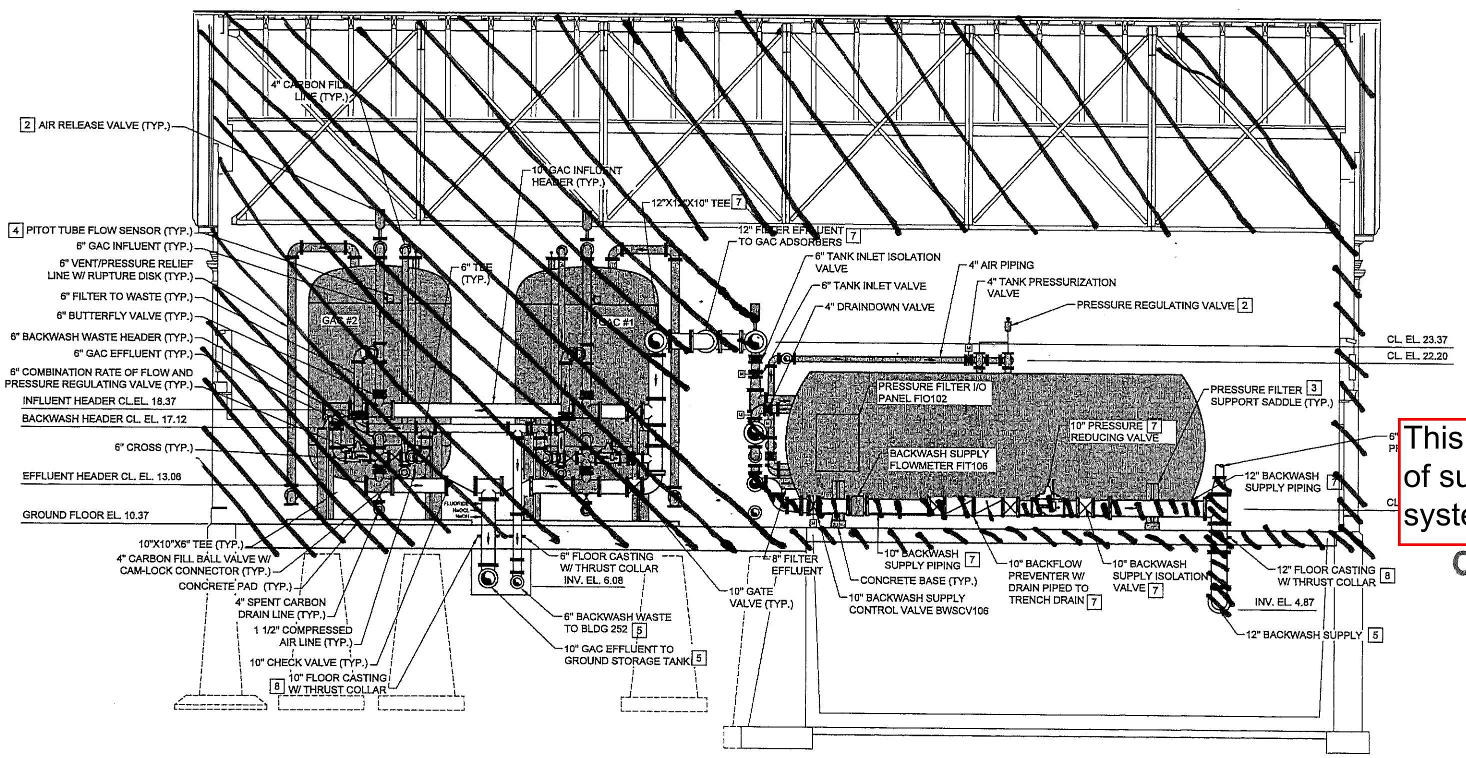
PERMIT SUBMITTAL - NOT FOR CONSTRUCTION

GENERAL NOTES

1. ALL INTERIOR PIPING SHALL BE PROPERLY SUPPORTED IN ACCORDANCE WITH SPECIFICATION. CONTRACTORS SHALL SUBMIT THE MEANS AND METHODS FOR VARIOUS PIPING FOR APPROVAL.
2. UNLESS OTHERWISE INDICATED, ALL PIPE, VALVE AND FITTINGS SHALL BE PAINTED IN ACCORDANCE WITH SPECIFICATION.
3. PROVIDE FLOOR CASTING WITH THRUST COLLAR POSITIONED IN CENTER OF FLOOR FOR ALL FLOOR PENETRATIONS.
4. REFER TO SPECIFICATION SECTION 11950 FOR PRESSURE FILTER EQUIPMENT PACKAGE SPECIFICATION, AND THE APPROVED BID PROPOSAL FOR WORK TO BE FURNISHED AND INSTALLED BY THE CONTRACTOR.
5. REFER TO SPECIFICATION 11960 FOR GAC ADSORBER EQUIPMENT PACKAGE SPECIFICATION AND THE APPROVED BID PROPOSAL FOR WORK TO BE FURNISHED AND INSTALLED BY THE CONTRACTOR.

[X] SHEET KEYNOTES

1. CORE DRILL OPENING, USE SEGMENTED RUBBER COMPRESSION SEALS ON EACH FACE OF WALL TO MAKE WATERTIGHT.
2. RUN PVC VALVE DRAIN TO TRENCH DRAIN.
3. FILL SUPPORT SADDLE WITH CONCRETE.
4. INSERTION TYPE PITOT TUBE FLOW SENSOR W/ DIFFERENTIAL PRESSURE TRANSMITTER.
5. SEE CIVIL DRAWINGS FOR CONTINUATION.
7. PIPE, VALVE, OR FITTING SHALL BE INSULATED.
8. FLOOR CASTING SHALL BE SIZED TO SUIT FLANGED CONNECTIONS ABOVE AND BELOW SLAB WITH THRUST COLLAR LOCATED IN THE CENTER OF THE SLAB.



This Drawing depicts the scope of supply for the pressure filter systems by WesTech.

CROSS-HATCHED PARTS NOT BY WESTECH

(A / 01-D-301) BUILDING 250 SECTION

SCALE: 1/4"=1'-0"
REF: 01-D-101

LEGEND

- [shaded] PART OF PRESSURE FILTER OR GAC ADSORBER EQUIPMENT PACKAGE
- * PRESSURE FILTER AND GAC ADSORBER INTERCONNECTING PIPING AND EQUIPMENT INSTALLATION BY INSTALLING CONTRACTOR, SEE GENERAL NOTES 4 AND 5.

GRAPHIC SCALE
0 2' 4' 8'
SCALE: 1/4" = 1'-0"

PROFESSIONAL CERTIFICATION:
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 29228
EXPIRATION DATE: 06/17/2017

STATE OF MARYLAND PROFESSIONAL ENGINEER (seal)

WRA
Whitman, Requardt & Associates, LLP
801 South Caroline Street, Baltimore, Maryland 21231

CITY OF ABERDEEN
60 N. PARKE ST.
ABERDEEN, MD 21001
CITY ENGINEER   DATE

ABERDEEN PROVING GROUND
RENOVATE BUILDING 250 WATER TREATMENT PLANT

BUILDING 250
SECTION

REV	DATE	DESCRIPTION

DRAWING: 01-D-301
SHEET: 131 OF 212

PERMIT SUBMITTAL - NOT FOR CONSTRUCTION

GENERAL NOTES

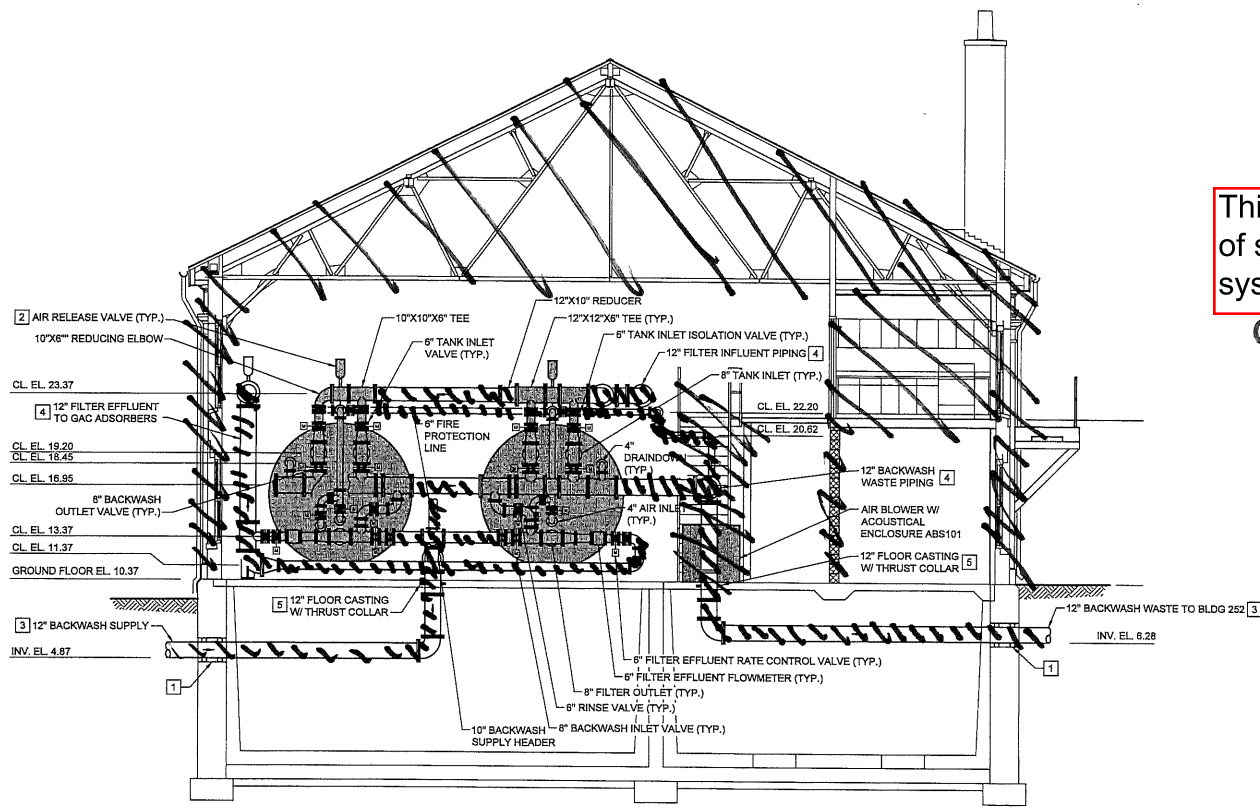
1. ALL INTERIOR PIPING SHALL BE PROPERLY SUPPORTED IN ACCORDANCE WITH SPECIFICATION. CONTRACTORS SHALL SUBMIT THE MEANS AND METHODS FOR VARIOUS PIPING FOR APPROVAL.
2. UNLESS OTHERWISE INDICATED, ALL PIPE, VALVE AND FITTINGS SHALL BE PAINTED IN ACCORDANCE WITH SPECIFICATION.
3. PROVIDE FLOOR CASTING WITH THRUST COLLAR POSITIONED IN CENTER OF FLOOR FOR ALL FLOOR PENETRATIONS.
4. REFER TO SPECIFICATION SECTION 11950 FOR PRESSURE FILTER EQUIPMENT PACKAGE SPECIFICATION, AND THE APPROVED BID PROPOSAL FOR WORK TO BE FURNISHED AND INSTALLED BY THE CONTRACTOR.

[X] SHEET KEYNOTES

1. CORE DRILL OPENING, USE SEGMENTED RUBBER COMPRESSION SEALS ON EACH FACE OF WALL TO MAKE WATERTIGHT.
2. RUN PVC VALVE DRAIN TO TRENCH DRAIN.
3. SEE CIVIL DRAWINGS FOR CONTINUATION.

This Drawing depicts the scope of supply for the pressure filter systems by WesTech.

CROSS-HATCHED PARTS NOT BY WESTECH



A 01-D-302 **BUILDING 250 SECTION**
SCALE: 1/4"=1'-0"
REF: 01-D-101

LEGEND

PART OF PRESSURE FILTER EQUIPMENT PACKAGE

* PRESSURE FILTER INTERCONNECTING PIPING AND EQUIPMENT INSTALLATION BY INSTALLING CONTRACTOR, SEE GENERAL NOTE 4.

GRAPHIC SCALE
0 2' 4' 8'
SCALE: 1/4" = 1'-0"

PROFESSIONAL CERTIFICATION:
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 29228
EXPIRATION DATE: 08/17/2017

STATE OF MARYLAND — PROFESSIONAL ENGINEER — No. 29228

WRA
Whitman, Requardt & Associates, LLP
801 South Caroline Street, Baltimore, Maryland 21231

CITY OF ABERDEEN
60 N. PARKE ST.
ABERDEEN, MD 21001
CITY ENGINEER | DATE

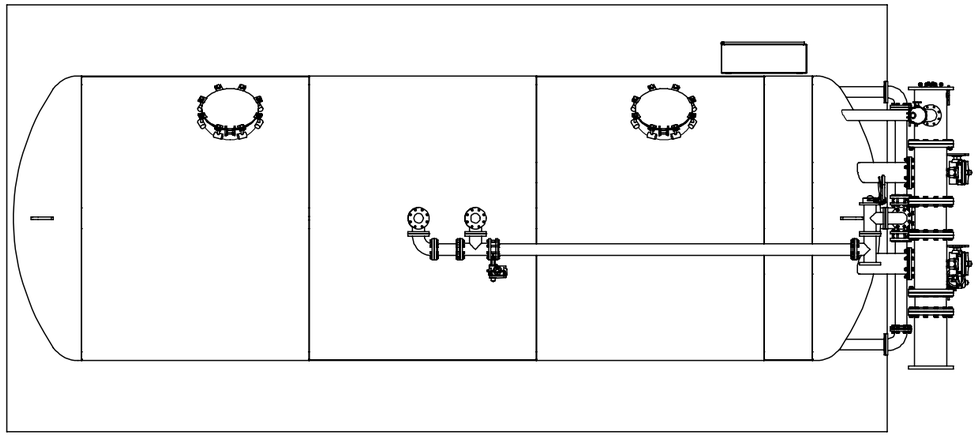
ABERDEEN PROVING GROUND
RENOVATE BUILDING 250 WATER TREATMENT PLANT

BUILDING 250 SECTION

REV	DATE	DESCRIPTION

DRAWING: 01-D-302
SHEET: 132 OF 212

PERMIT SUBMITTAL - NOT FOR CONSTRUCTION



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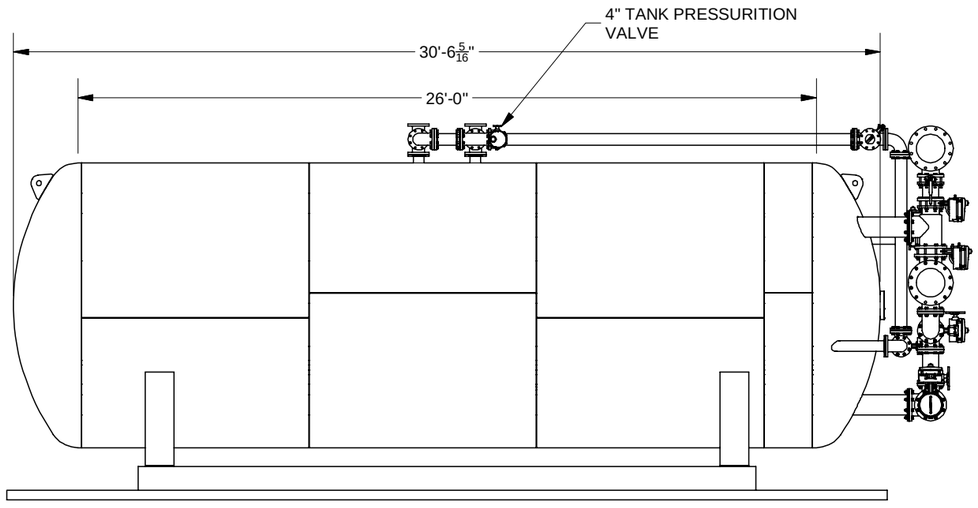
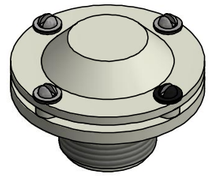
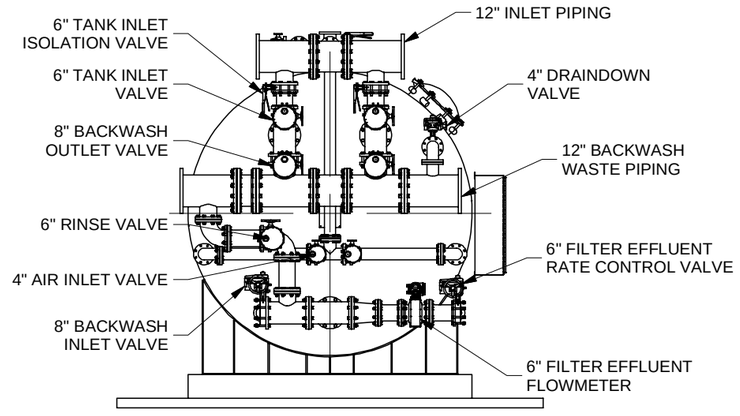


SIDE

NOT ALL PIPING DETAILED



UNDERDRAIN STRAINER DETAIL



END

WESTECH

PRELIMINARY
FOR INFORMATION ONLY

2017-11-10

NOTES:

1. FOLLOW THE LISTED WESTECH REFERENCE DOCUMENTS EXCEPT AS NOTED ON THIS DRAWING.

2. MANUFACTURER'S QUALITY ASSURANCE PROGRAM MUST MINIMALLY MEASURE AND DOCUMENT ALL CRITICAL DIMENSIONS (SHOWN ENCLOSED WITH A NUMBERED PREFIX).

REV	REVISION DESCRIPTION	ECN	DESIGNER	APPROVER	DATE

QR-00-063
REFERENCE DOCUMENTS

WESTECH

TITLE **GENERAL ARRANGEMENT**

HPF 120 X 26 SS 2 CELL END PIPED

DESIGNER	CHECKER	APPROVER	DATE
BA91			2017-11-10

DOCUMENT NUMBER	SHEET	REV
1530246-0000	1 OF 2	-

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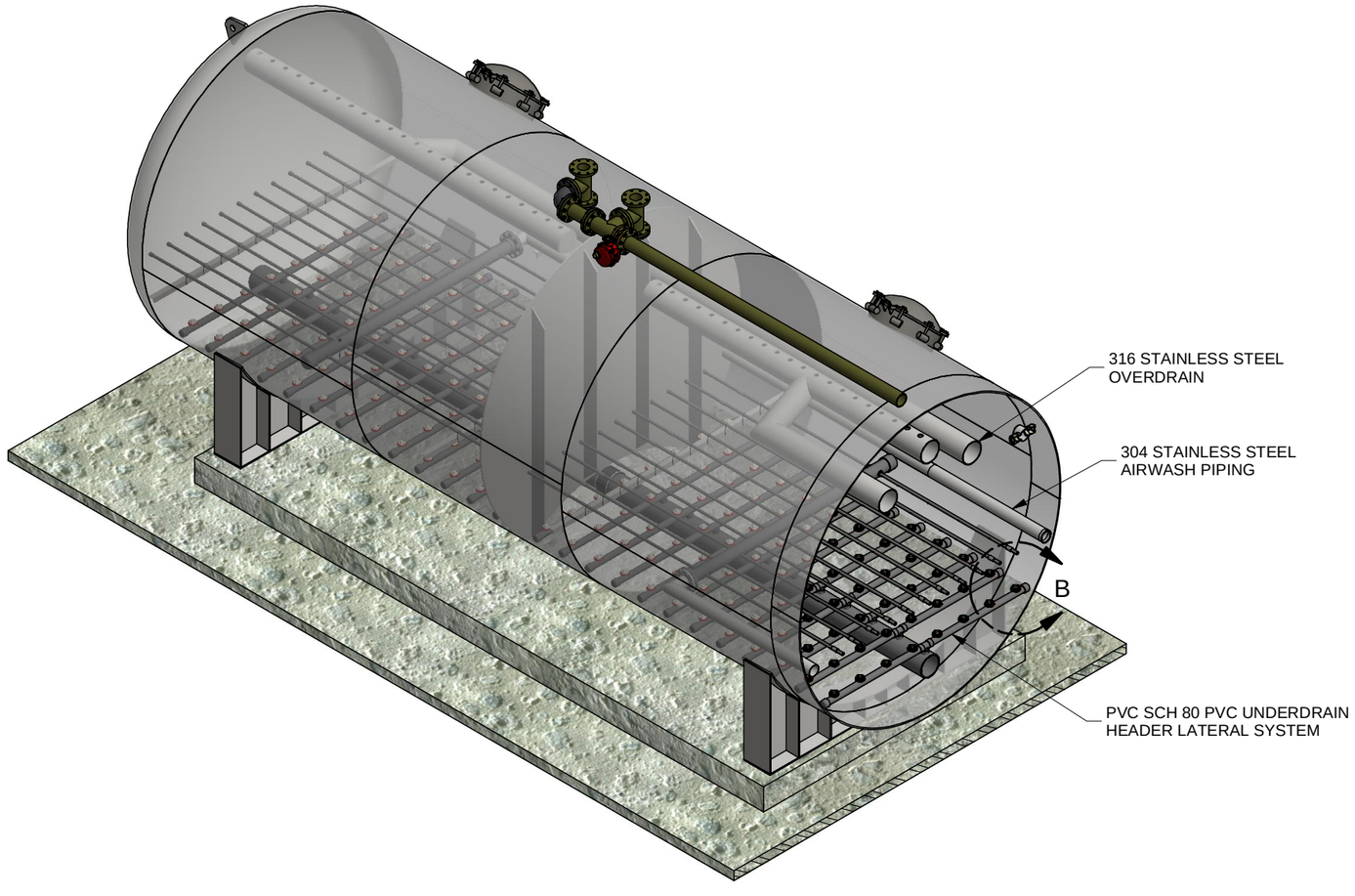
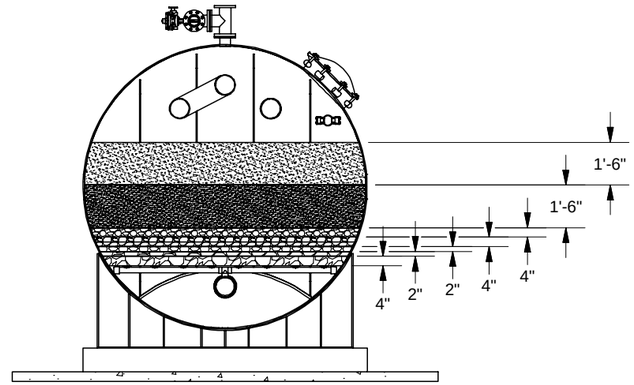
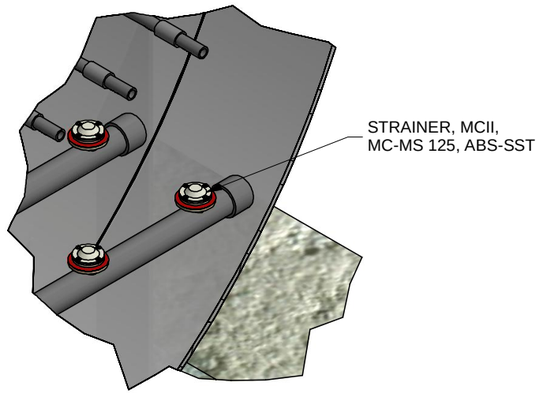


ISOMETRIC CUTAWAY
MEDIA LAYERS AND CONCRETE NOT SHOWN



SECTIONED END VIEW
MEDIA LAYERS



DETAIL B
LATERALS WITH STRAINERS

WESTECH

TITLE **GENERAL ARRANGEMENT**

HPF 120 X 26 SS 2 CELL END PIPED

DESIGNER	CHECKER	APPROVER	DATE
BA91			2017-11-10
DOCUMENT NUMBER		SHEET	REV
1530246-0000		2 OF 2	-

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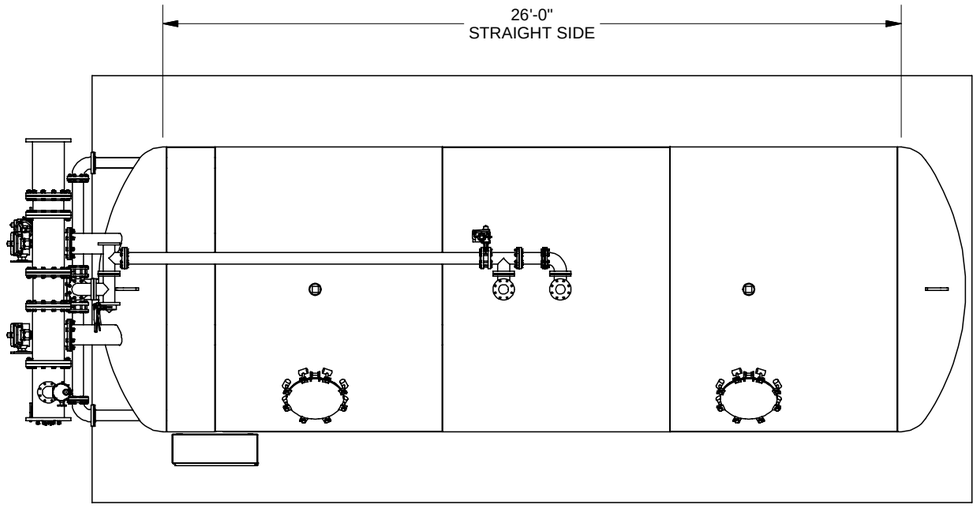

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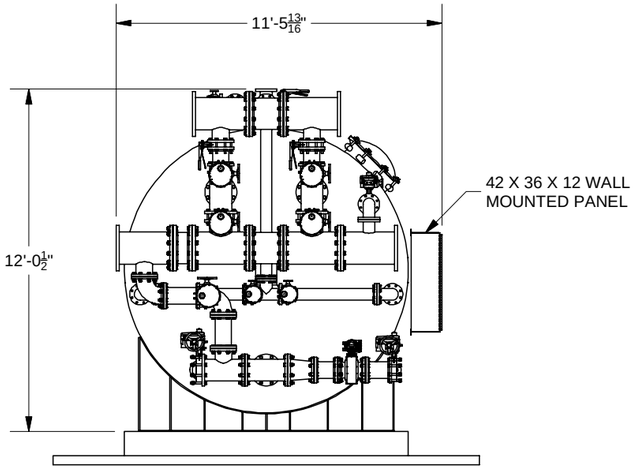

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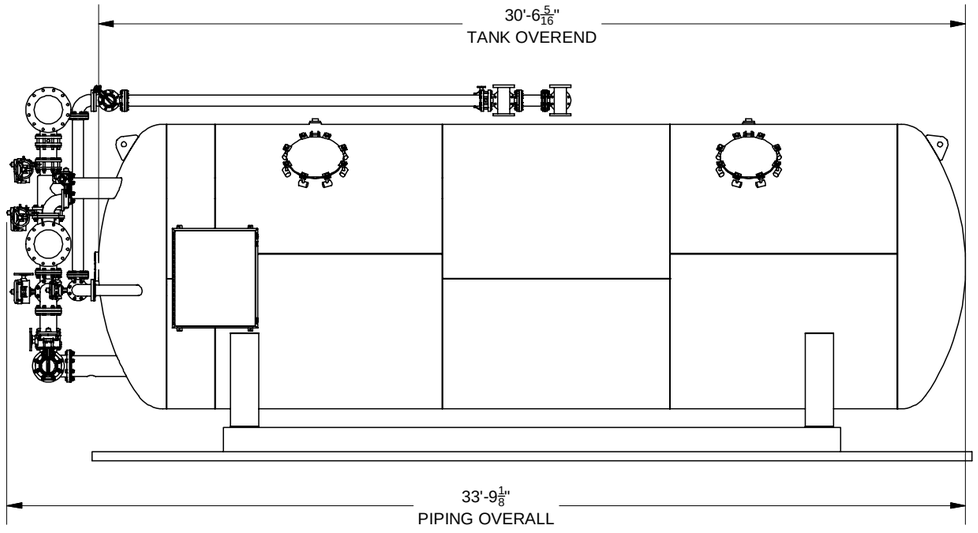


SIDE

PRELIMINARY
FINAL DESIGN MAY VARY
FROM WHAT IS SHOWN
2017-06-22

NOTES:

1. FOLLOW THE LISTED WESTECH REFERENCE DOCUMENTS EXCEPT AS NOTED ON THIS DRAWING.

2. MANUFACTURER'S QUALITY ASSURANCE PROGRAM MUST MINIMALLY MEASURE AND DOCUMENT ALL CRITICAL DIMENSIONS (SHOWN ENCLOSED WITH A NUMBERED PREFIX).

3. SOME OF THE DETAILS OF THE TANK FABRICATION HAVE NOT BEEN UPDATED.

REV	REVISION DESCRIPTION	ECN	DESIGNER	APPROVER	DATE
	QR-00-063				
	REFERENCE DOCUMENTS				

WESTECH

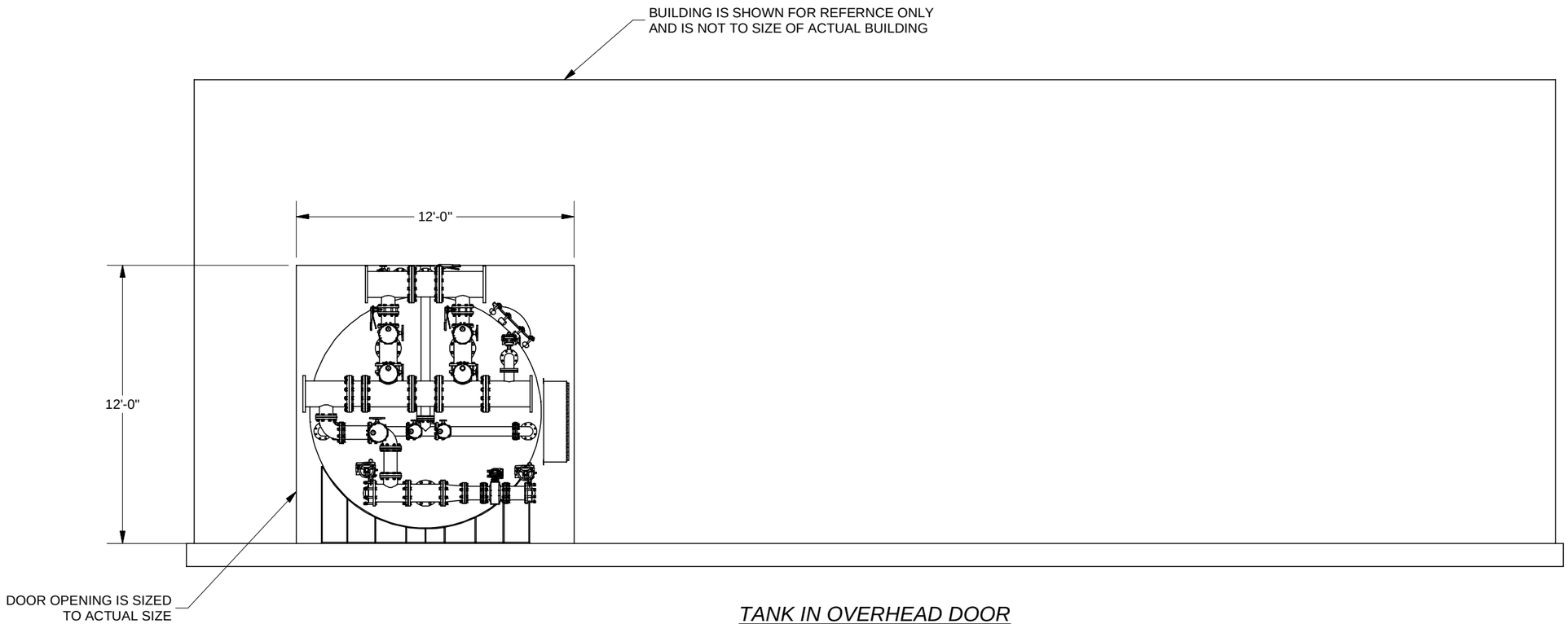
TITLE **TANK AND FACE PIPING REFERENCE DETAILS**

10-0 X 26-0 STRAIGHT SIDE HPF TANK

DESIGNER	CHECKER	APPROVER	DATE
BA91			

DOCUMENT NUMBER	SHEET	REV
1530246-0008	1 OF 2	-

C:\vault\Design\Proposals\153\1530246 Aberdeen, MD\HPF 120 X 24 SS 2 Cell EP WW HL UD HL OD\Workgroup\IDW Files\TANK AND BUILDING REFERENCE.idw



TANK IN OVERHEAD DOOR

WESTECH

TITLE **TANK AND FACE PIPING REFERENCE DETAILS**

10-0 X 26-0 STRAIGHT SIDE HPF TANK

DESIGNER	CHECKER	APPROVER	DATE
BA91			

DOCUMENT NUMBER	SHEET	REV
1530246-0008	2 OF 2	-

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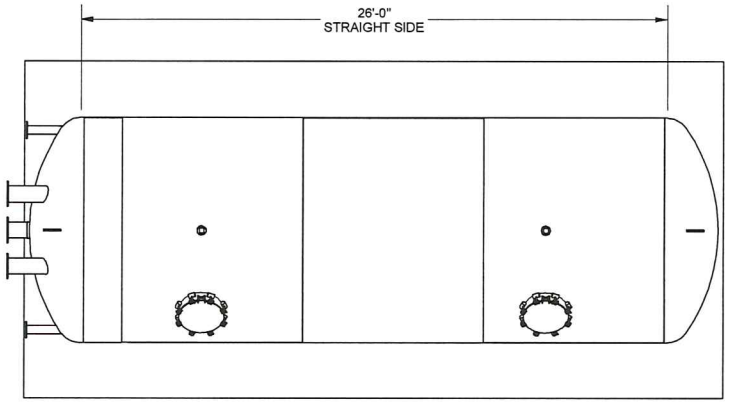

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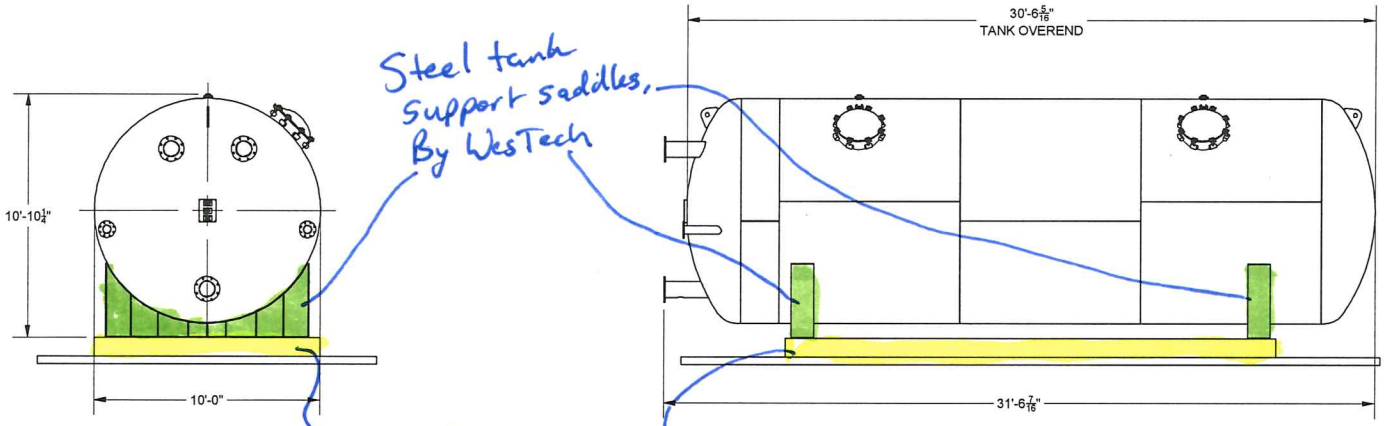

END

SIDE

Steel tank support saddles, By WesTech

Concrete Housekeeping pad, if required, by others

WESTECH
PRELIMINARY
FINAL DESIGN MAY VARY FROM WHAT IS SHOWN
2017-06-22

NOTES:

1. FOLLOW THE LISTED WESTECH REFERENCE DOCUMENTS EXCEPT AS NOTED ON THIS DRAWING.
2. MANUFACTURER'S QUALITY ASSURANCE PROGRAM MUST MINIMALLY MEASURE AND DOCUMENT ALL CRITICAL DIMENSIONS (SHOWN ENCLOSED WITH A NUMBERED PREFIX).
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REV	REVISION DESCRIPTION	ECN	DESIGNER	APPROVER	DATE

QR-00-063
REFERENCE DOCUMENTS

WESTECH

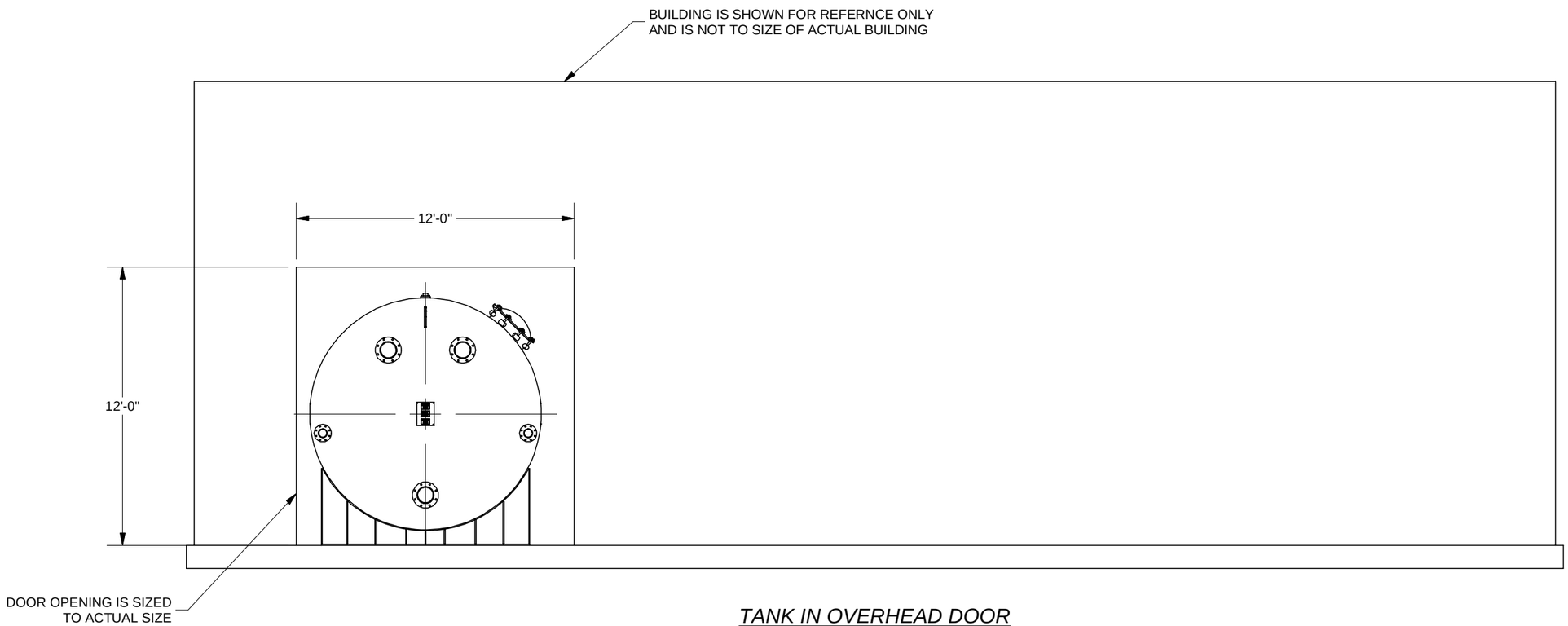
TITLE: TANK WITHOUT FACE PIPING REFERENCE DETAILS

10-0 X 26-0 STRAIGHT SIDE HPF TANK

DESIGNER	CHECKER	APPROVER	DATE
BA91			

DOCUMENT NUMBER	SHEET	REV
1530246-0009	1 OF 2	-

C:\vault\Design\Proposals\153\1530246 Aberdeen, MD\HPF 120 X 24 SS 2 Cell EP WW HL UD HL OD\Workgroup\DW Files\1530246-0009 TANK AND BUILDING REFERENCE wo PIPING.idw



TANK IN OVERHEAD DOOR

WESTECH

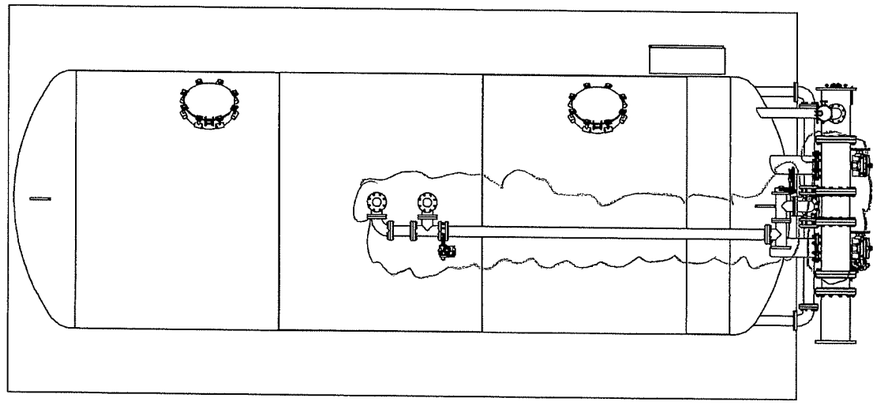
TITLE **TANK WITHOUT FACE PIPING REFERENCE DETAILS**

10-0 X 26-0 STRAIGHT SIDE HPF TANK

DESIGNER	CHECKER	APPROVER	DATE
BA91			

DOCUMENT NUMBER	SHEET	REV
1530246-0009	2 OF 2	-

C:\vault\Design\Proposals\153\1530246 Aberdeen, MD\HPF 120 X 24 SS 2 Cell EP WW HL UD HL OD\Workgroup\IDW Files\1530246-0009 TANK AND BUILDING REFERENCE wo PIPING.idw



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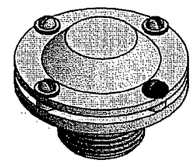
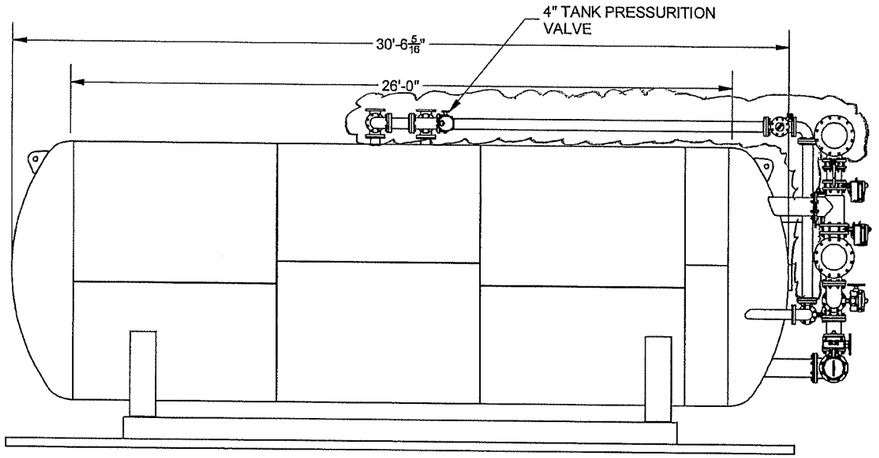
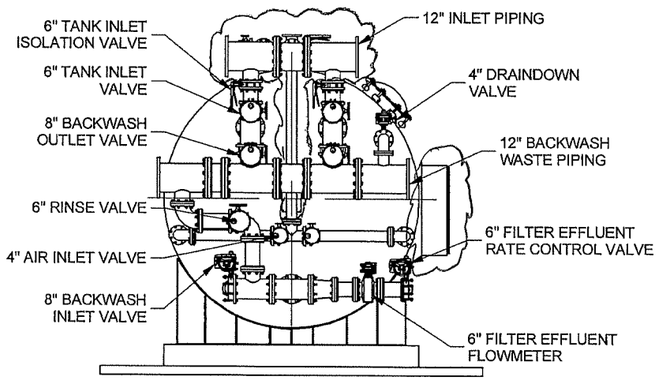


UNDERDRAIN STRAINER DETAIL



SIDE

NOT ALL PIPING DETAILED



END

BUBBLED ITEMS SHIPPED LOOSE
DUE TO BUILDING OPENING HEIGHT

WESTECH
PRELIMINARY
FOR INFORMATION ONLY
2017-11-10

NOTES:

1. FOLLOW THE LISTED WESTECH REFERENCE DOCUMENTS EXCEPT AS NOTED ON THIS DRAWING.

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REV	REVISION DESCRIPTION	ECN	DESIGNER	APPROVER	DATE

QR-00-063
REFERENCE DOCUMENTS

WESTECH

TITLE **GENERAL ARRANGEMENT**

HPF 120 X 26 SS 2 CELL END PIPED

DESIGNER	CHECKER	APPROVER	DATE
BA91			2017-11-10

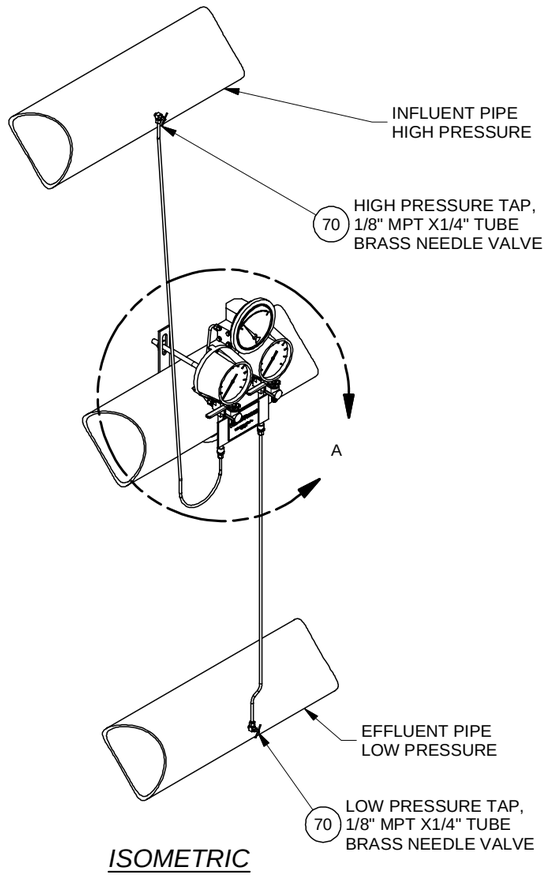
DOCUMENT NUMBER	SHEET	REV
1530246-0000	1 OF 2	-

C:\vault\Design\Proposals\153\1530246 Aberdeen, MD\HPF 120 X 24 SS 2 Cell EP WW HL UD HL OD\Workgroup\IDW Files\1530246 GENERAL ARRANGEMENT.idw

BILL OF MATERIAL							
PIECE	UNIT QTY	PART NO	DESCRIPTION	MATERIAL	LENGTH	WIDTH	TOTAL WT, LB
10	1	1-19377	4879 LOH ASSY DUAL GAUGE WITH DP				13.5
20	1	1-17570	MOUNTING BRACKET, 4879, 0.5 DIA U-BOLT	STN STL, 304			0.4
30	1	1-17567	BACKER BAR, 4879, 8-10 PIPE, 0.5 DIA U-BOLT				1.0
40	1	2-7783	U-BOLT, RND BEND, 0.5-13UNC x 8 PIPE SIZE x 10.375, PLAIN	304			1.2
50	2	2-5405	WSHR, FLAT, LARGE OD, 0.5	304			0.1
60	2	2-5890	NUT, HEX, 0.5-13UNC	304			0.0
70	2	2-10659	VALVE, NEEDLE, 0.25 CPRSN INLET	BRASS			0.2
80	1	2-19534	TUBE, CD SMLS, 0.25 OD x 0.030 WALL x 300	CU			0.4

△2

APPROX. TOTAL WEIGHT (LB)
15.7



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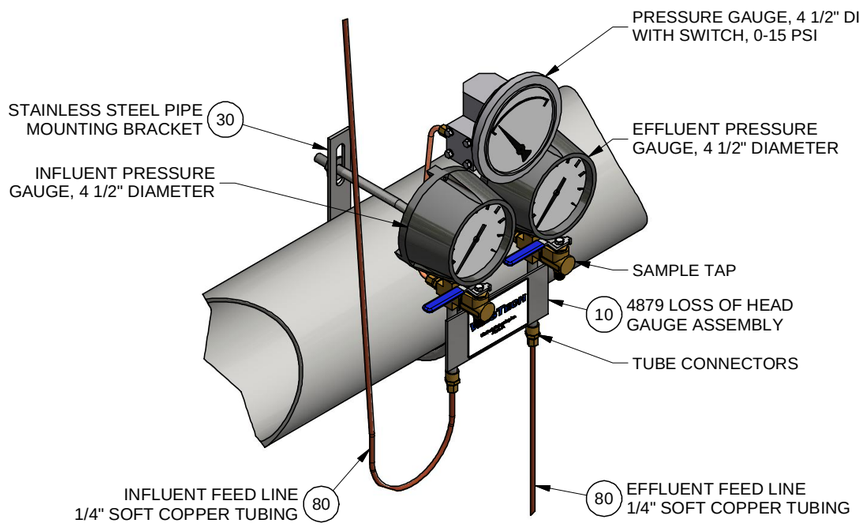
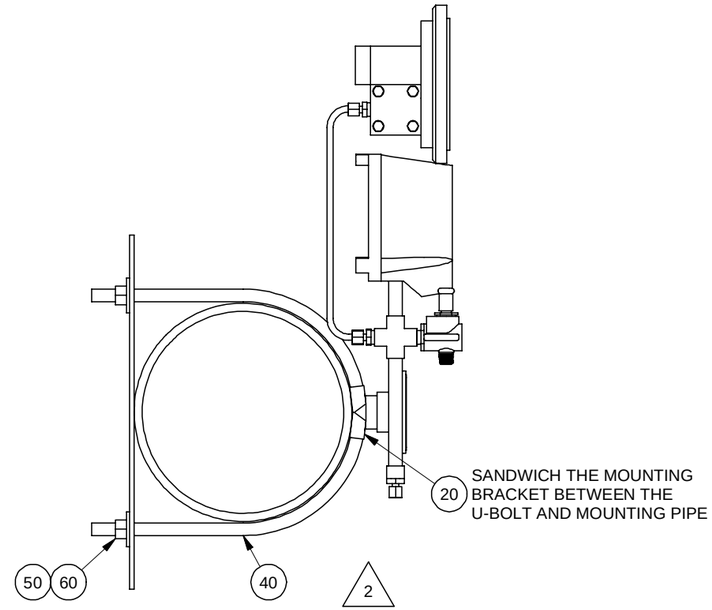


DETAIL A



SIDE
TUBING REMOVED

NOTES:

1.) INSTALLER MUST PROVIDE 1/8" NPT TAP IN INFLUENT AND EFFLUENT PIPE OR HEADER FOR NEEDLE VALVE INSTALLATION.

2.) GAUGE SHOWN MOUNTED AND TAPPED ON HORIZONTAL PIPE RUNS BUT CAN BE MOUNTED AND TAPPED ON VERTICAL PIPE RUNS AS REQUIRED.

3.) FOR APPLICATIONS WHERE TAPPING CONNECTIONS ARE INSTALLED ON HORIZONTAL PIPES, LOCATE TAPS ON PIPE HORIZONTAL CENTERLINE TO PREVENT AIR OR SEDIMENT ENTRAPMENT.

REV	REVISION DESCRIPTION	ECN	DESIGNER	APPROVER	DATE
0	RELEASE FOR FABRICATION		MO96	JA20	2010/03/17
1	UPDATED TITLEBLOCK, CHANGED DRAWING NUMBER, THIS DRAWING SUPERCEDES 9000974016-MD		PR63		2013/06/27
2	CHANGED THE MOUNTING BRACKET AND STRAP TO A U-BOLT	199	BA91	BR63	2016/07/14

REFERENCE DOCUMENTS

WESTECH

TITLE **KIT, 4879 LOH GAUGE, DUAL GAUGE, DP INCLUDED**
8 IN U-BOLT, 25FT COPPER TUBING, 2 VALVES

DESIGNER	CHECKER	APPROVER	DATE
MO96	SH40	JA20	2010-03-17

DOCUMENT NUMBER	SHEET	REV
2-6500	1 OF 1	**2**

C:\Vault\Design\Standard Products\General Filter\Filter Parts\4879 Loss of Head Gauge\Operations and Engineering Manual\Drawings\Fabrication\2-6500.idw

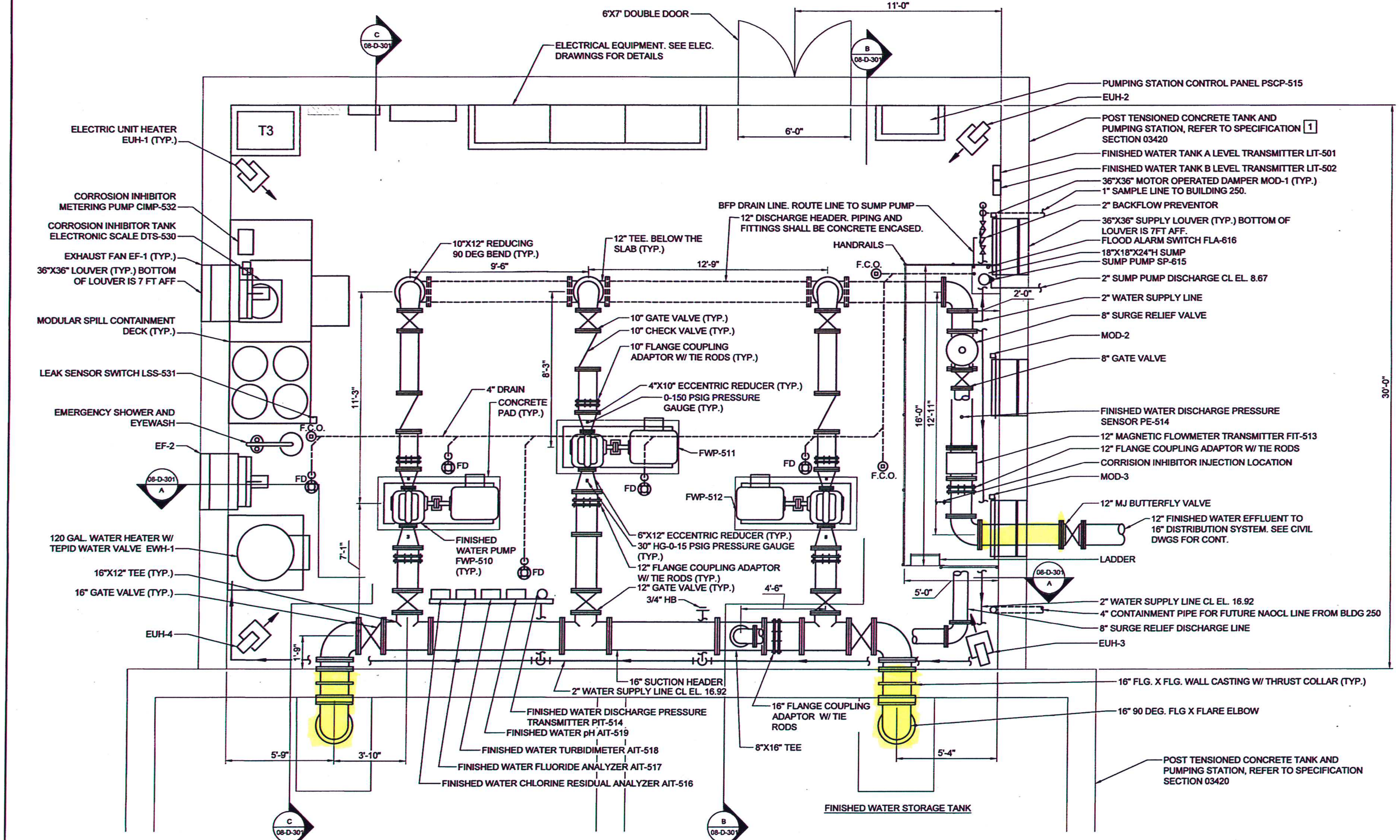
ABERDEEN PROVING GROUND, MARYLAND
RENOVATE BUILDING 250 WATER TREATMENT PLANT
CONTRACT NO. 18-10

Additional Details to be inserted under Attachment A-3 (Addendum #2)

Dutchland's Scope of work and preliminary drawings for Post Tensioned Concrete Finished Water Tank and Pumping Station as per Section 03420

☒ SPECIFIC NOTES

1. PROVIDE A 1% DRAINAGE SLOPE TO THE ROOF OF THE FINISHED WATER PUMPING STATION. ROOF SHALL SLOPE TOWARD THE NORTHWEST CORNER OF THE FACILITY.



1 08-D-101 FINISHED WATER PUMPING STATION PLAN
SCALE: 3/8"=1'-0"

All Highlighted pipes are provided and installed by Dutchland, Inc.

PROFESSIONAL CERTIFICATION:
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 29228
EXPIRATION DATE: 06/17/2019

REV	DATE	DESCRIPTION

WRA
Whitman, Requardt & Associates, LLP
801 South Caroline Street, Baltimore, Maryland 21231

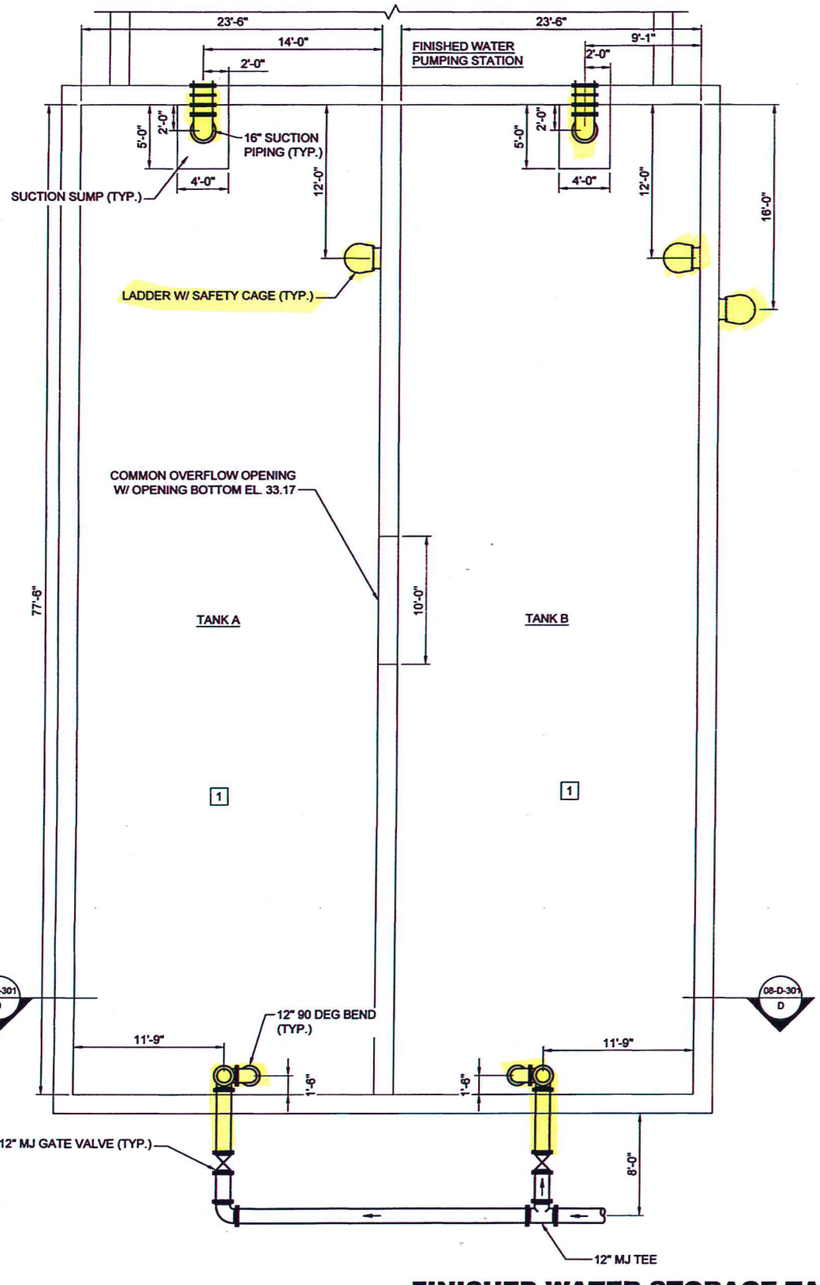
CITY OF ABERDEEN
60 N. PARKE ST.
ABERDEEN, MD 21001

CITY ENGINEER | DATE

ABERDEEN PROVING GROUND
RENOVATE BUILDING 250 WATER TREATMENT PLANT

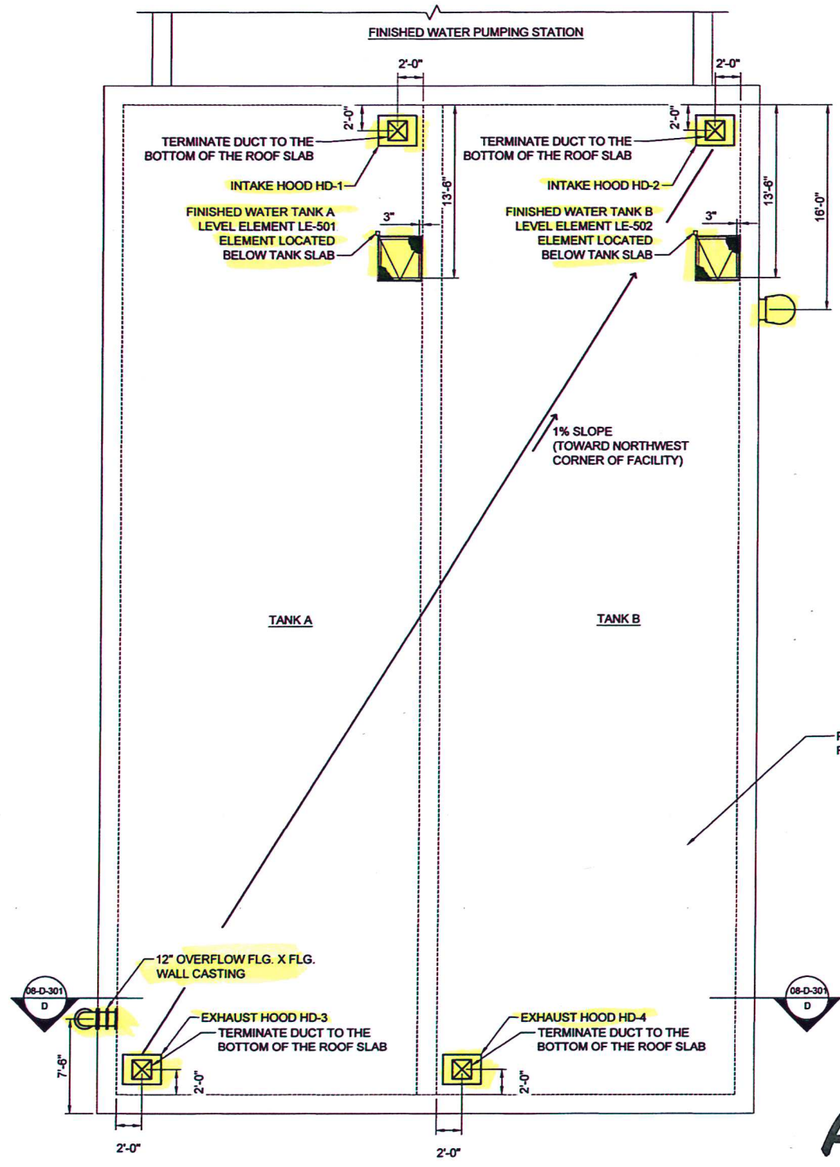
FINISHED WATER PUMPING STATION PLAN

DRAWING 08-D-101



FINISHED WATER STORAGE TANK LOWER LEVEL PLAN

1 / 08-D-102 SCALE: 3/16"=1'-0"



FINISHED WATER STORAGE TANK UPPER LEVEL PLAN

2 / 08-D-102 SCALE: 3/16"=1'-0"

SPECIFIC NOTES

1. PRESSURE RELIEF VALVES ARE NOT ALLOWED FOR THE FOUNDATION SLAB DESIGN.

All Highlighted pipes, and appurtenances supplied and installed by Dutchland, Inc.

PROFESSIONAL CERTIFICATION:
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EXPIRATION DATE: 06/17/2019

STATE OF MARYLAND · WEI-KEUNG WU · NO. 29228 · PROFESSIONAL ENGINEER

WRA
Whitman, Requardt & Associates, LLP
801 South Caroline Street, Baltimore, Maryland 21231

CITY OF ABERDEEN
60 N. PARKE ST.
ABERDEEN, MD 21001
CITY ENGINEER DATE

ABERDEEN PROVING GROUND
RENOVATE BUILDING 250 WATER TREATMENT PLANT

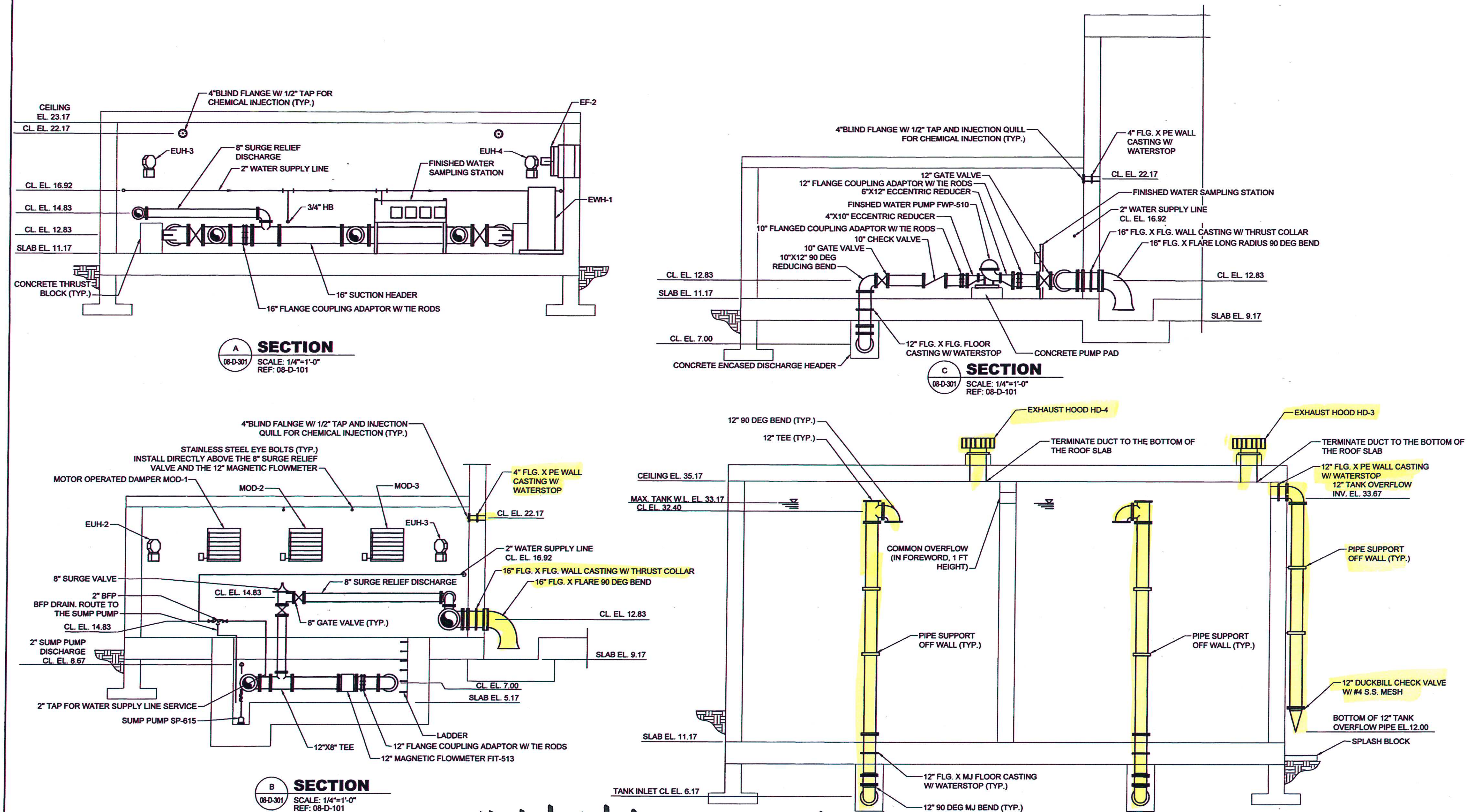
FINISHED WATER STORAGE TANK PLANS

REV	DATE	DESCRIPTION

DRAWING 08-D-102

SHEET 137 OF 212

FILENAME: W:\14233-000\CADD\14233000-08-D-102.DWG



A SECTION
08-D-301
SCALE: 1/4"=1'-0"
REF: 08-D-101

C SECTION
08-D-301
SCALE: 1/4"=1'-0"
REF: 08-D-101

B SECTION
08-D-301
SCALE: 1/4"=1'-0"
REF: 08-D-101

D SECTION
08-D-301
SCALE: 1/4"=1'-0"
REF: 08-D-101

All Highlighted pipes and appurtenances supplied and installed by Dutchland, Inc.

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EXPIRATION DATE: 06/17/2019

STATE OF MARYLAND — PROFESSIONAL ENGINEER — No. 29228

Whitman, Requardt & Associates, LLP
801 South Caroline Street, Baltimore, Maryland 21231

CITY OF ABERDEEN
60 N. PARKE ST.
ABERDEEN, MD 21001
CITY ENGINEER — DATE

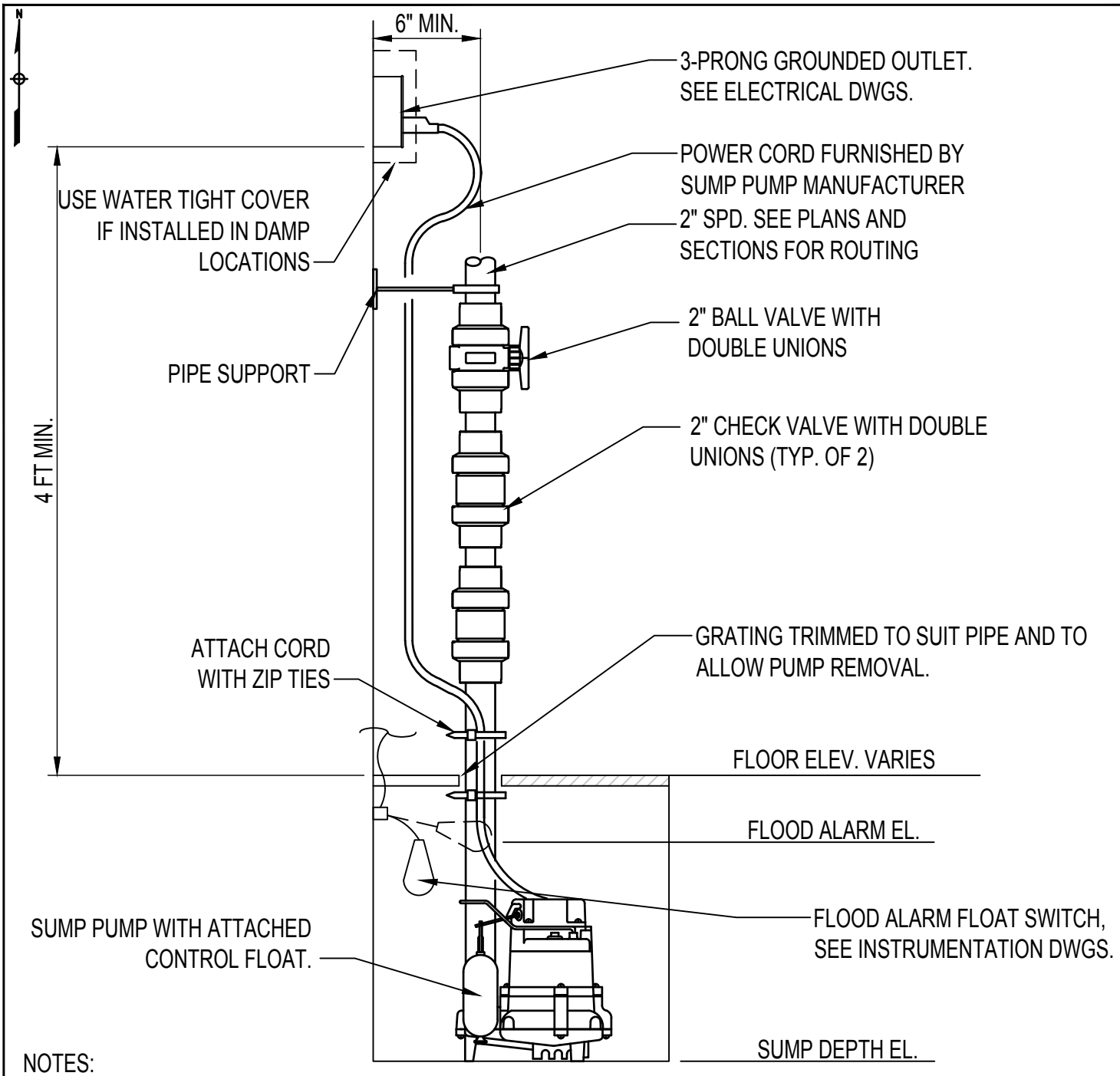
ABERDEEN PROVING GROUND
RENOVATE BUILDING 250 WATER TREATMENT PLANT

FINISHED WATER PUMPING STATION AND STORAGE TANK SECTIONS

REV	DATE	DESCRIPTION

DRAWING 08-D-301
SHEET 138 OF 212

ATTACHMENT TO DRAWING #00-D-501 (SHEET 123 OF 212)



NOTES:

1. PIPE SUPPORTS SHALL NOT BE USED BETWEEN BALL VALVE AND PUMP TO ALLOW FOR COMPONENT REMOVAL.
2. PROVIDE BUSHING AS NECESSARY TO CONNECT PUMP TO 2" PIPING.

SUMP PUMP SCHEDULE

UNIT I.D.	FLOW (GPM)	TDH (FT)	HP	RPM	ELECTRICAL VOLT/PH/HZ	REMARKS (LOCATION,ETC.)
SP-417	30	14	3/10	1550	120/1/60	BLDG. 252
SP-615	30	14	3/10	1550	120/1/60	FINISHED WATER PS

WRA
Whitman, Requardt & Associates, LLP
801 South Caroline Street, Baltimore, Maryland 21231

Project Name
City of Aberdeen
Aberdeen Proving Ground
Renovate Building 250 Water Treatment Plant

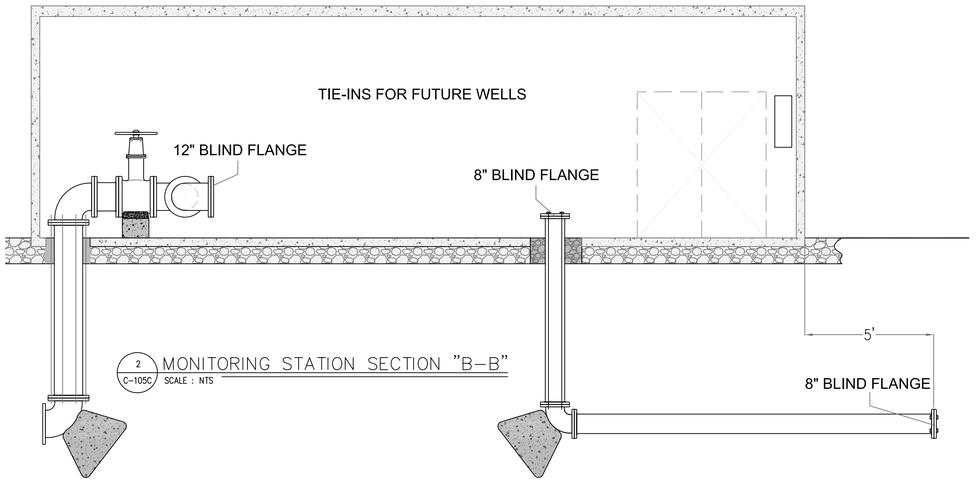
Date
JAN. 2018

Scale
NONE

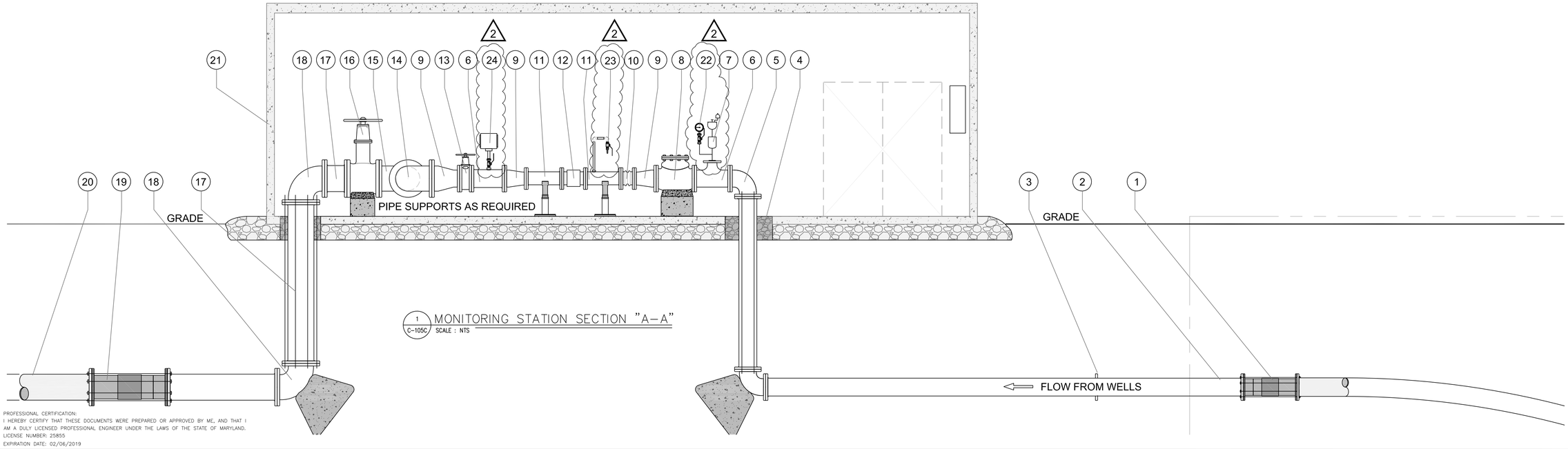
Sheet
1 of 1

WELL MONITORING STATION LAYOUT, EQUIPMENT AND PIPING SCHEDULE

ITEM NO.	ITEM	DESCRIPTION
1	8" DIP TO HDPE TRANSITION	SEE SPECIFICATION SECTION 15060 FOR DETAILS.
2	8" DIP PIPE	ANSI A21.15 DUCTILE IRON WITH FLANGED ENDS AND DOUBLE CEMENT LINED
3	FUTURE PIPE STUB EXTENTS	ANSI A21.15 DUCTILE IRON WITH FLANGED ENDS AND DOUBLE CEMENT LINED
4	OPENING IN CONCRETE	SEE DRAWING C-105B FOR DIMENSIONS
5	8" 90	ANSI A21.15 DUCTILE IRON WITH FLANGED ENDS AND DOUBLE CEMENT LINED
6	8x4 TEE W/2" W/TAPPED BLIIND FLANGE	ANSI A21.15 DUCTILE IRON WITH FLANGED ENDS AND DOUBLE CEMENT LINED
7	2" AIR / VACUUM VALVE	APCO WD RATED FOR 150 PSI, WITH 1/2" NO. 55 AIR RELEASE/THROTTLING VALVE OR EQUAL
8	8' CHECK VALVE	SWING CHECK TYPE STYLE 159-02 M & H CO. OR EQUAL WITH FLANGED ENDS.
9	8" TO 6" REDUCER	ANSI A21.15 DUCTILE IRON WITH FLANGED ENDS AND DOUBLE CEMENT LINED
10	ELASTOMERIC EXPANSION JOINT	EXPANSION JOINT SHALL BE MERCER SERIES 450 WITH CONTROL RODS AND PLATES RATED FOR 150 PSIG, AND ANSI CLASS 125 FLANGES.
11	6"x18"L SPOOL PIECE W/SAMPLE COCK	ANSI A21.15 DUCTILE IRON WITH FLANGED ENDS AND DOUBLE CEMENT LINED
12	6" MAGNETIC FLOW METER	FLOW TUBE SHALL BE STAINLESS STEEL, RANGE 0-2 MGD, 120 VOLT NEMA 4 ENCLOSURE WITH INTEGRAL TRANSMITTER, ABB MODEL 10DX4311, OR EQUAL.
13	BUTTERFLY VALVE W/ HANDWHEEL	AWWA C504 RUBBER SEATED, CLASS 150, FLANGED W/WORM GEAR OPERATOR PER AWWA C504 & C509A.
14	12" DI 90	ANSI A21.15 DUCTILE IRON WITH FLANGED ENDS AND DOUBLE CEMENT LINED
15	12" TEE	ANSI A21.15 DUCTILE IRON WITH FLANGED ENDS AND DOUBLE CEMENT LINED
16	12" GATE VALVE	ANSI A21.15 DUCTILE IRON WITH FLANGED ENDS
17	SPOOL PIECE FIELD FIT	ANSI A21.15 DUCTILE IRON WITH FLANGED ENDS AND DOUBLE CEMENT LINED
18	12" 90	ANSI A21.15 DUCTILE IRON WITH FLANGED ENDS AND DOUBLE CEMENT LINED
19	12" DI TO HDPE TRANSITION	SEE SPECIFICATION SECTION 15060 FOR DETAILS.
20	(2) 12" HDPE	SEE SPECIFICATION SECTION 15060 FOR DETAILS.
21	24' x 30' CONCRETE WELL MONITORING STATION	PRE-CAST CONCRETE BUILDING AS PER SPECIFICATION SECTION 13120. EXTERIOR TO MATCH EXISTING BUILDINGS IN THIS AREA.
22	PRESSURE GAUGE WITH SHUTOFF COCK	4-1/2" DIA. ASHCROFT TYPE 1379 RANGE 0-100 PSI WITH ASHCROFT TYPE 1092 SHUT-OFF COCK OR EQUAL
23	1/2" SAMPLE COCK	STOCKHAM NO. B-13T WITH SCREWED ENDS.
24	DISCHARGE PRESSURE TRANSMITTER	SEE SPECIFICATION SECTION 17410



2 / C-105C MONITORING STATION SECTION "B-B"
SCALE : NTS



1 / C-105C MONITORING STATION SECTION "A-A"
SCALE : NTS

PROFESSIONAL CERTIFICATION:
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.
LICENSE NUMBER: 25855
EXPIRATION DATE: 02/06/2019

STATE OF MARYLAND · SHIVA KUMAR · 25855 · PROFESSIONAL ENGINEER

TETRA TECH, INC.
240 Continental Drive, Suite 200
Newark, Delaware 19713
ph: 302 736-7551 fax: 302 454-5988
WWW.TETRATECH.COM

CITY OF ABERDEEN
60 NORTH PARKE STREET
ABERDEEN, MD. 21001
CITY ENGINEER DATE

ABERDEEN PROVING GROUND
RENOVATE BUILDING 250
WATER TREATMENT PLANT

WELL MONITORING STATION
SECTION VIEW

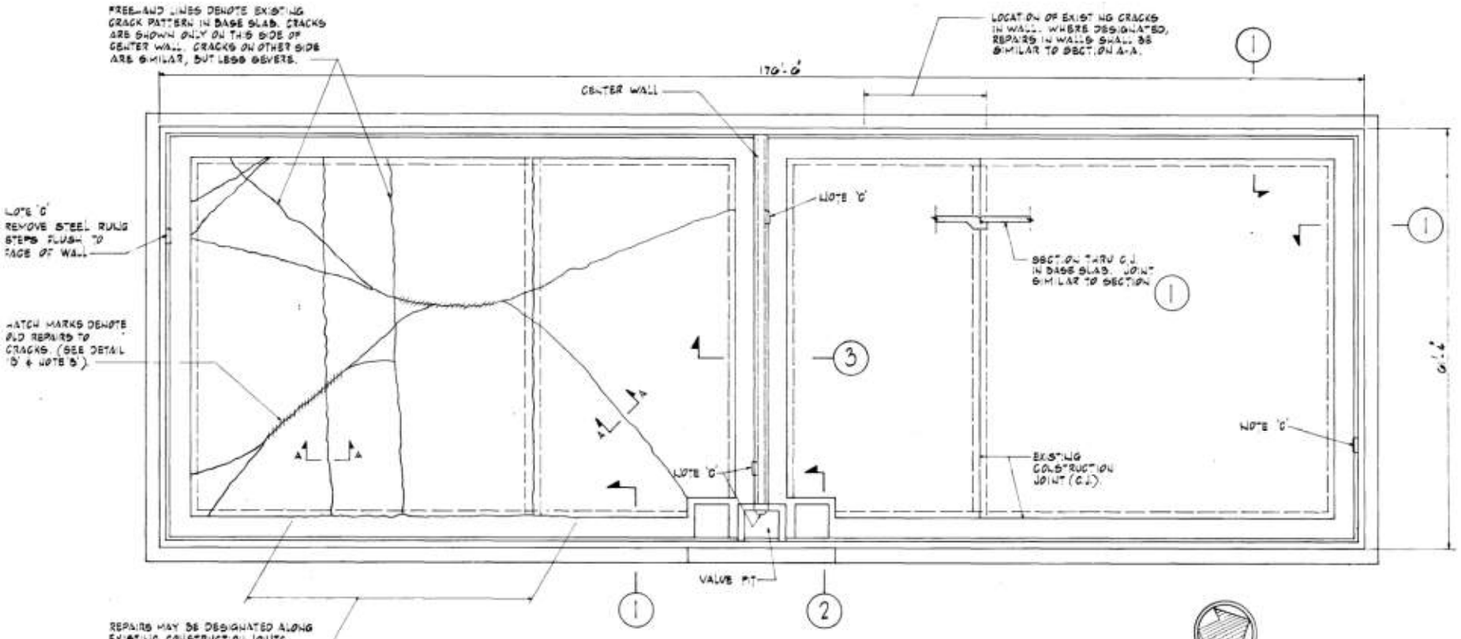
RCN:	103S5128
DRAWN BY:	snl
CHECKED BY:	HKM
SCALE:	AS NOTED
APPROVED BY:	HKM
DATE:	10.20.2017
CAD FILE:	SEE STAMP

ADDENDUM 2
DRAWING: C-105C
SHEET NUMBER: 5 of 35

S:\03-Projects\State & Local\City of Aberdeen\103S5128_CM services during APG Building 250 Construction\3. Working Files\APG_final_APG11Sheet.dwg 01/23/2018 15:02

Existing Building 253 (tank) related drawings (3 sheets)

CORPS OF ENGINEERS — U. S. ARMY



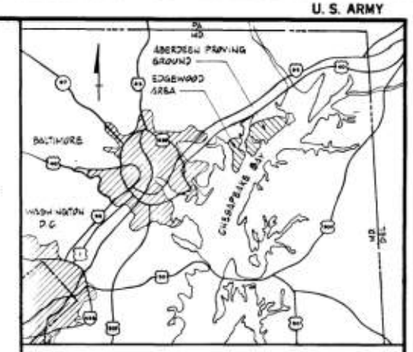
PLAN OF EXISTING POTABLE WATER STORAGE TANK

SCALE: 1/8" = 1'-0"

ABBREVIATIONS

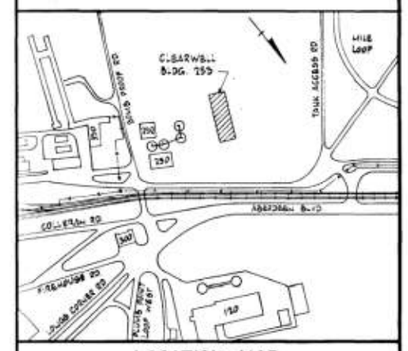
CMU	CONCRETE MASONRY UNIT
CONC	CONCRETE
CONT	CONTINUOUS
CONST	CONSTRUCTION
DIAM	DIAMETER
EA.	EACH
EXIST	EXISTING
MAX.	MAXIMUM
REINF	REINFORCING
SQ FT	SQUARE FEET
TYP	TYPICAL
S.S.	STAINLESS STEEL

NOTE 5:
GROOVE WIDTH SHALL EXCEED 1" AS NECESSARY TO SQUARE OFF OLD REPAIRS TO CRACKS.



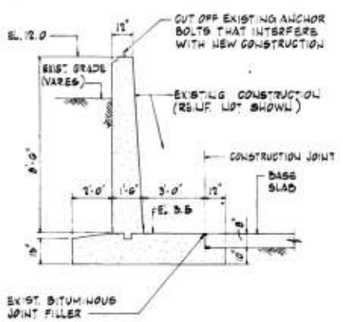
VICINITY MAP

SCALE 1" = 12.5 MILES

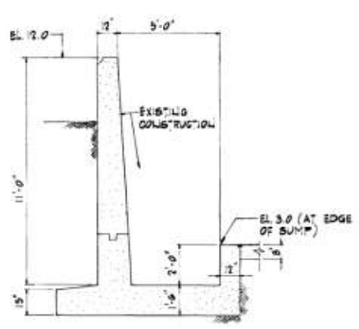


LOCATION MAP

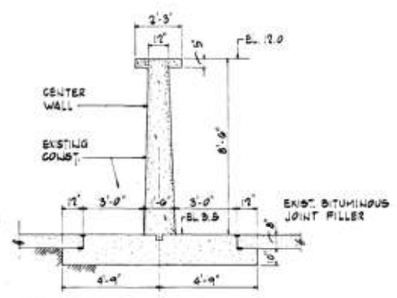
SCALE 1" = 200'



SECTION (1)
SCALE: 3/8" = 1'-0"



SECTION (2)
SCALE: 3/8" = 1'-0"

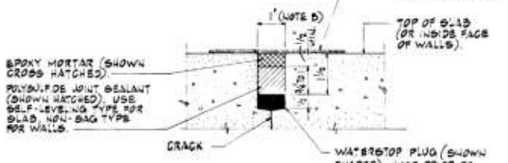


SECTION (3)
SCALE: 3/8" = 1'-0"

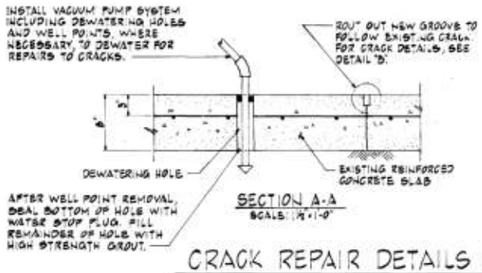
TABLE OF REPAIR ITEMS *

DESCRIPTION	QUANTITY	DESCRIPTION	QUANTITY
REPAIR CRACKS IN BASE SLAB AND WALLS	SEE BID DOCUMENTS	GRATING	20 SQ. FT.
REMOVE STEEL RUNG STEPS	5 LOCATIONS	REPAIR EXISTING VALVE EXTENSIONS	2 EA.
CONCRETE MASONRY WALLS (IN PLACE) 8" CMU 6" CMU	 820 SQ. FT. 435 SQ. FT.	PAINTING CMU WALLS EXISTING STEEL BRACKETS	1255 SQ. FT./COAT 2 EA.
ACCESS DOORS	3 EA.	DOUBLE TEES	22 EA.
LADDERS	3 EA.	ROOFING AND INSULATION (IN PLACE)	11,410 SQ. FT.
LOUVERS	20 EA.	TANK WASHDOWN AND CLEAN-UP	1 ITEM

* THE TABLES OF REPAIR ITEMS IS GIVEN TO ASSIST IN THE DESCRIPTION OF THE WORK TO BE ACCOMPLISHED. THE DESCRIPTIVE ITEMS AND QUANTITIES ARE APPROXIMATE AND ARE GIVEN FOR ESTIMATING PURPOSES ONLY.



DETAIL 'B'
HALF SCALE



SECTION A-A
SCALE: 1/4" = 1'-0"

CRACK REPAIR DETAILS (BASE SLAB AND WALLS)

NOTES:

STEPS FOR CRACK REPAIRS ARE OUTLINED AS FOLLOWS:

1. WASH DOWN SLAB AND WALLS.
2. ROUT OUT DESIGNATED CRACKS.
3. APPLY WATERSTOP PLUG.
4. SANDBLAST
5. MASK TOP EDGES OF CRACK.
6. APPLY PRIMER AND POLYSULFIDE SEALANT.
7. REMOVE MASKING. APPLY PRIMER AND EPOXY MORTAR.
8. APPLY EPOXY GLAZE
9. REMOVE BLAST GRIT AND DEBRIS.

REFER TO SPECIFICATIONS FOR FURTHER DESCRIPTION OF PROCEDURE AND MATERIALS. THE CONTRACTING OFFICER WILL DESIGNATE THOSE CRACKS TO BE REPAIRED.

SHT.	INDEX OF DRAWINGS	DWG. NO.
1	CONCRETE REPAIR DETAILS	40-01-385
2	ROOF PLAN & DETAILS	" "
3	GENERAL NOTES & DETAILS	" "

REDUCTION SCALE

0 1" 2" 3" 4"
1/8 1/4 1/2 1/10

REVIEWED & COORDINATED
SUBMITTED
RECOMMENDED
APPROVED
APPROVED FOR

McGAUGHY, MARSHALL & McMILLAN
ARCHITECTURE ENGINEERING & PLANNING

JACK H. STEWART No. 3100 4/24/79

REV	DATE	DESCRIPTION	BY

DEPARTMENT OF THE ARMY
BALTIMORE DISTRICT, CORPS OF ENGINEERS
BALTIMORE, MARYLAND

ABERDEEN PROVING GROUND, MARYLAND

REPAIRS & ROOF REPLACEMENT TO BUILDING NO. 253
PROJECT No. 268X ABERDEEN AREA

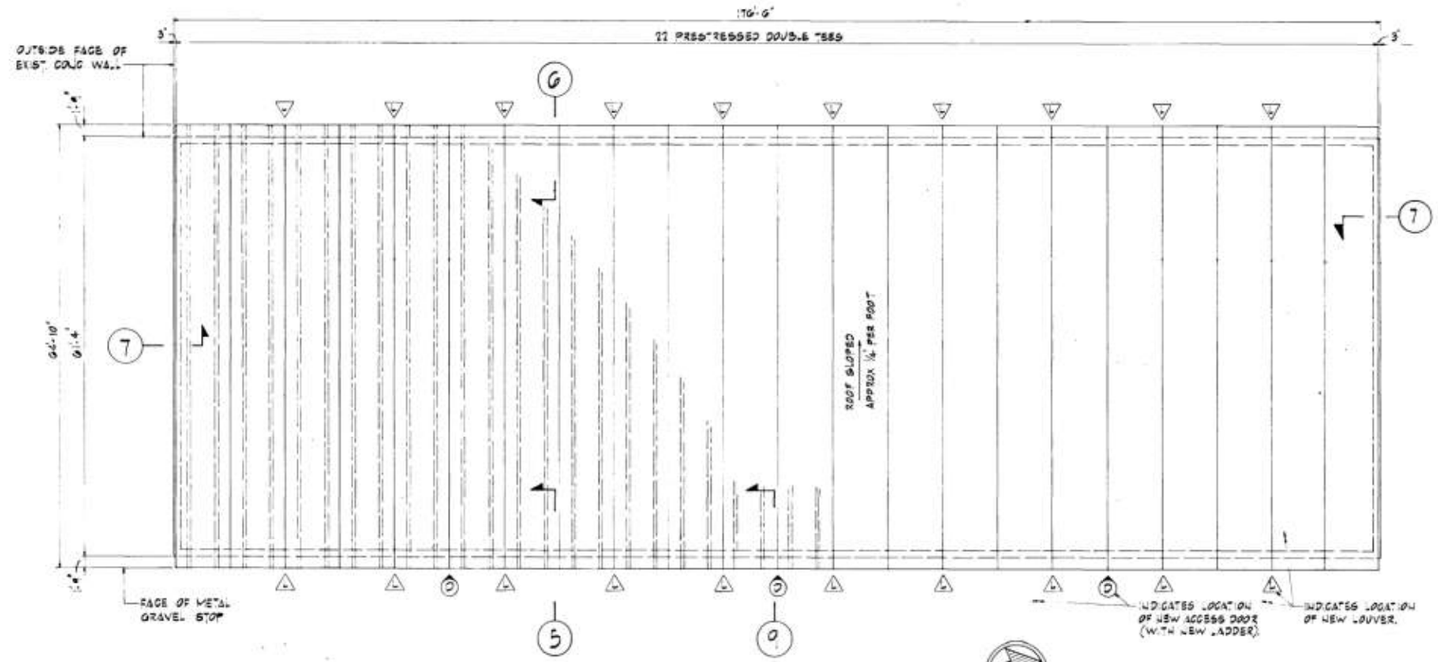
CONCRETE REPAIR DETAILS

SPEC. NO.	PROJ. REG. NO.	DRAWING NUMBER	PLATE
A.P.G. DWG. NO.		40-01-385	1
SCALE AS SHOWN	DATE APRIL, 1979	SHEET 1 OF	

MF. NO. 030398

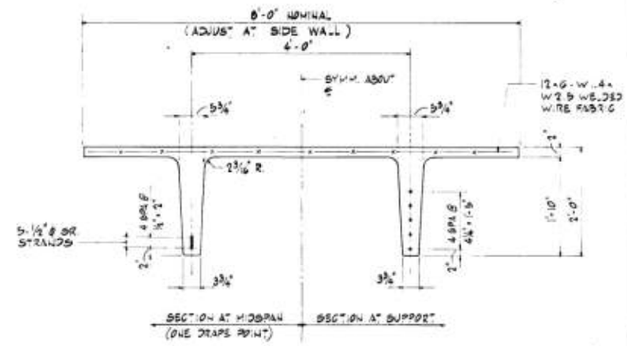
CORPS OF ENGINEERS

U. S. ARMY



ROOF PLAN

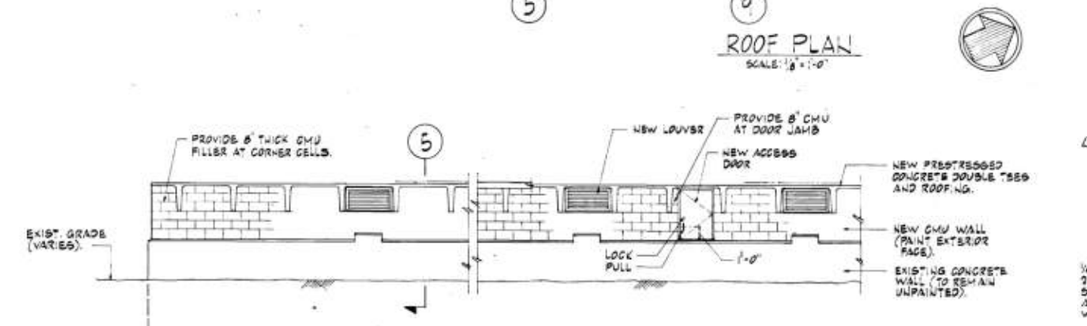
SCALE: 1/8" = 1'-0"



TYPICAL SECTION THRU PRESTRESSED DOUBLE TEE

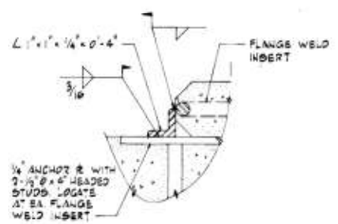
NOTES FOR PRESTRESSED DOUBLE TEES

1. FOR GENERAL NOTES SEE SHEET 3.
2. INITIAL TENSION IN EACH ½"ϕ G.R STRAND SHALL BE 28,900#
3. THE EXPECTED NET CAMBER AT DETENSIONING IS 1".
4. ELASTOMERIC BEARING PADS 3⅛" x 3¾" x ¾" SHALL BE PROVIDED AT EACH BEARING POINT. SEE SPECS FOR DESCRIPTION AND SPECIAL EPOXY GRIT COATING REQUIREMENTS FOR CONTACT SURFACES. PLACE THE 3¾" PAD DIMENSION TO MATCH THE 5¾" STEM WIDTH.
5. DOUBLE TEES ARE DESIGNED FOR A LIVE LOAD OF 80 PSF



PART SOUTH ELEVATION

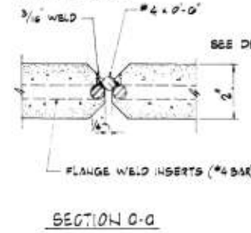
SCALE: 1/8" = 1'-0"



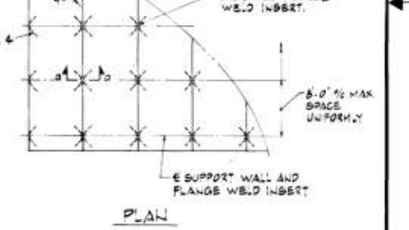
DETAIL 4

HALF SCALE

NOTE:
APPLY 2 COATS OF EPOXY GLAZE TO EACH COLLECTOR AFTER WELDING.

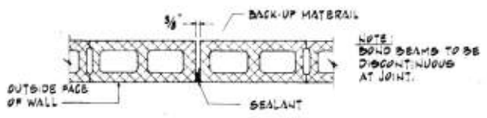


SECTION C-C

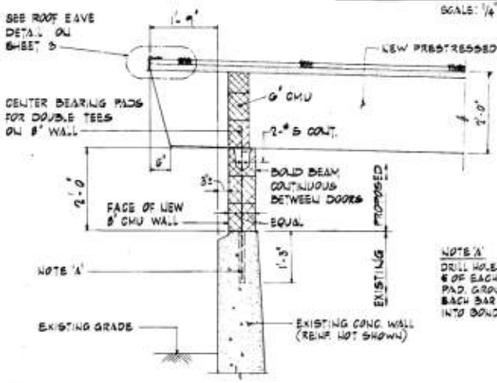


PLAN

TYPICAL JOINT & FLANGE WELDING DETAILS FOR PRESTRESSED MEMBERS

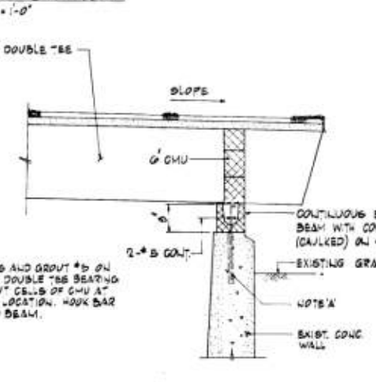


TYPICAL VERTICAL CRACK CONTROL JOINT



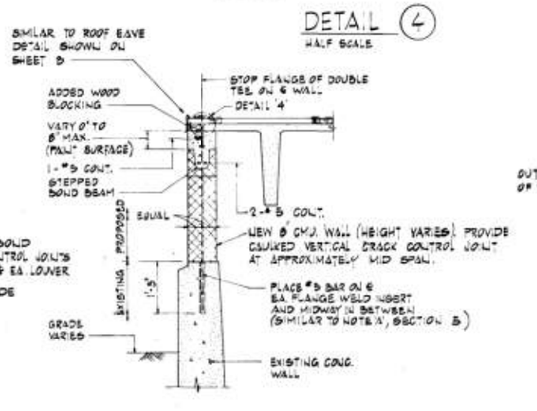
SECTION 5

SCALE: 3/16" = 1'-0"



SECTION 6

SCALE: 3/16" = 1'-0"



SECTION 7

SCALE: 3/16" = 1'-0"

REDUCTION SCALE

0 1" 2" 3" 4"

1/8 GRAPHIC 1/4 1/2 SCALE 1/10

McGAUGHY, MARSHALL & McMILLAN

ARCHITECTURE ENGINEERING & PLANNING

JACK H. STEWART No. 2601 4/25/79

REV	DATE	DESCRIPTION	BY

DEPARTMENT OF THE ARMY
BALTIMORE DISTRICT, CORPS OF ENGINEERS
BALTIMORE, MARYLAND

ABERDEEN PROVING GROUND, MARYLAND

REPAIRS & ROOF REPLACEMENT TO BUILDING NO. 253

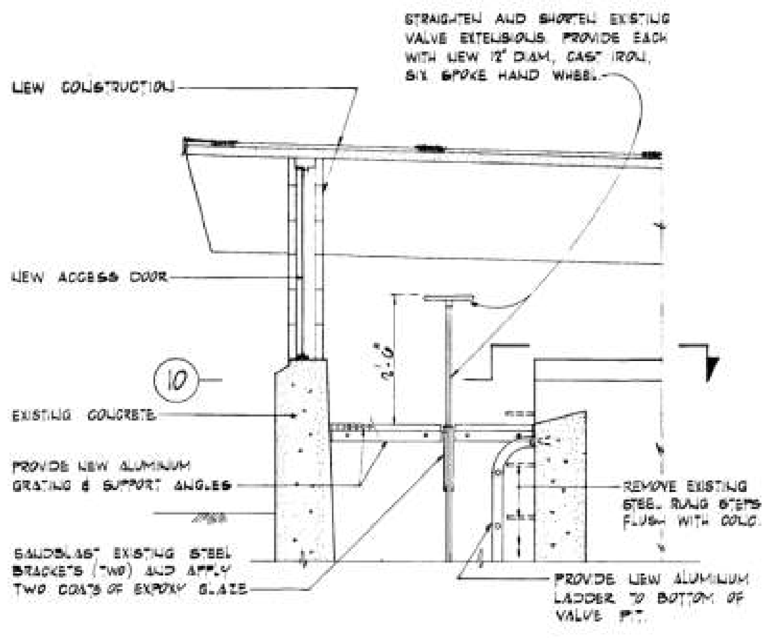
PROJECT No. 268X ABERDEEN AREA

ROOF PLAN & DETAILS

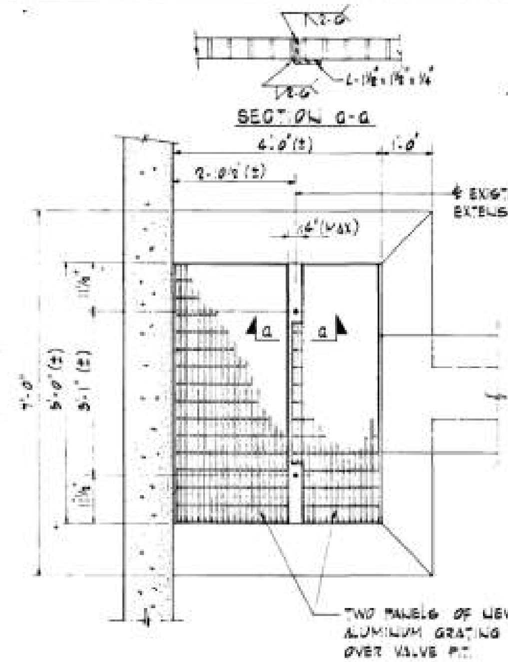
SPEC. NO.	PROJ. REQ. NO.	DRAWING NUMBER	PLATE
A/E DWG. NO.		40-01-385	2
SCALE AS SHOWN	DATE APRIL, 1979	SHEET: 2 OF	

MF. NO: 030394

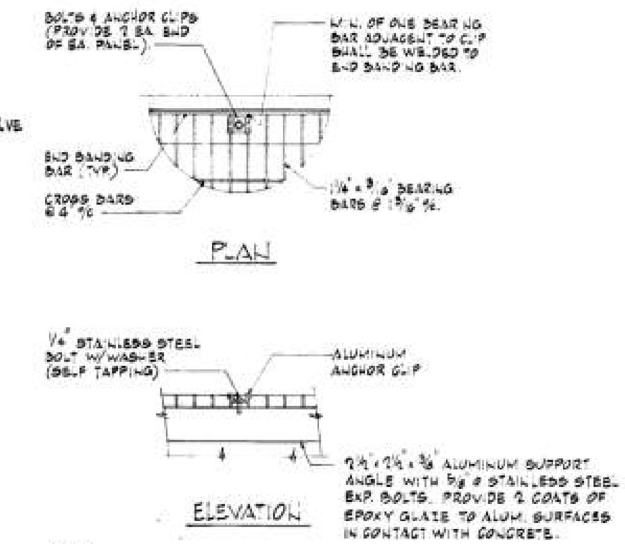
Bal Stck 80 copies 9619



SECTION (9)
SCALE: 3/8" = 1'-0"



SECTION (10)
SCALE: 3/8" = 1'-0"



NOTE:
GRATING SHALL BE ALUMINUM TYPE I, WITH PLAIN SURFACE, (SEE SPEC).

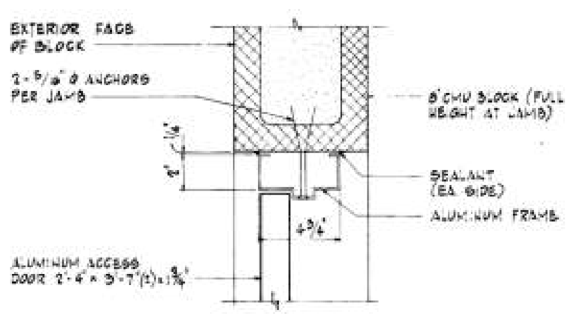
GRATING FASTENER DETAIL
SCALE: 3" = 1'-0"

GENERAL NOTES:

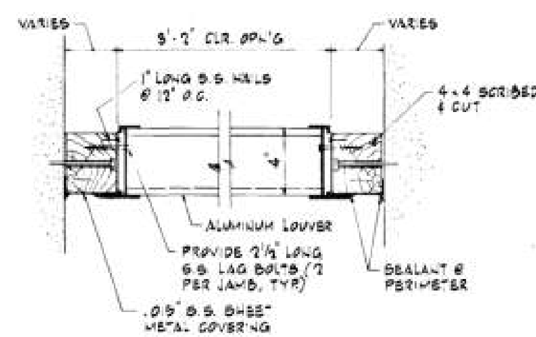
1. UNLESS OTHERWISE NOTED, CONCRETE FOR THE STRUCTURE SHALL BE STANDARD WEIGHT AND SHALL HAVE THE FOLLOWING MINIMUM COMPRESSIVE STRENGTHS AT AN AGE OF 28 DAYS.

   CAST IN PLACE CONCRETE .... f'_c = 3,000 PSI.
   PRESTRESSED CONCRETE AT DETENSIONING f'_{ci} = 4,000 PSI.
   PRESTRESSED CONCRETE .... f'_c = 5,000 PSI.

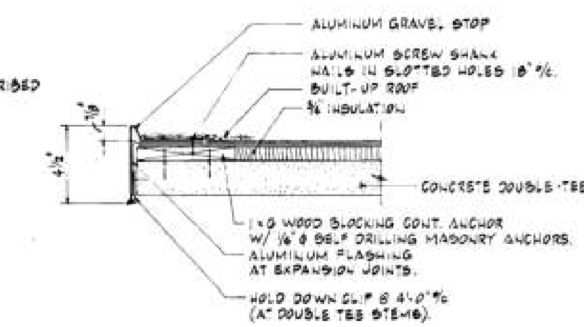
2. REINFORCING STEEL SHALL BE DEFORMED NEW BILLET STEEL BARS CONFORMING TO ASTM GRADES A 615-60 FOR MAIN BARS AND ASTM A 615-40 FOR STIRRUPS AND TIES.
3. REINFORCING STEEL MARKED CONTINUOUS (CONT) SHALL BE LAPPED 36 x BAR DIAMETER AT SPLICES AND CORNERS.
4. WELDED WIRE FABRIC (W.W.F.) SHALL CONFORM TO ASTM A 185.
5. CONTRACTOR SHALL THOROUGHLY FAMILIARIZE HIMSELF WITH THE PLANS, SPECIFICATIONS AND THE EXISTING STRUCTURE BEFORE ATTEMPTING ANY MODIFICATIONS THERETO.
6. BEFORE PROCEEDING WITH THE WORK, ANY DISCREPANCY BETWEEN THESE PLANS AND THE EXISTING STRUCTURE SHALL BE REPORTED TO THE CONTRACTING OFFICER. CONTRACTING OFFICER WILL FURNISH ADDITIONAL DETAILS IF REQUIRED.
7. THE DIMENSIONS AND ELEVATIONS GIVEN FOR THE EXISTING STRUCTURE AND FOR MEMBERS CONNECTED THERETO ARE APPROXIMATE AND ARE GIVEN FOR ESTIMATING PURPOSES ONLY. DETAIL WORK SHALL BE BASED ON FIELD MEASUREMENTS.
8. PAINT FOR CMU WALLS SHALL MATCH COLOR # 26593 (LIGHT GREY) FROM FEDERAL STANDARD 595.



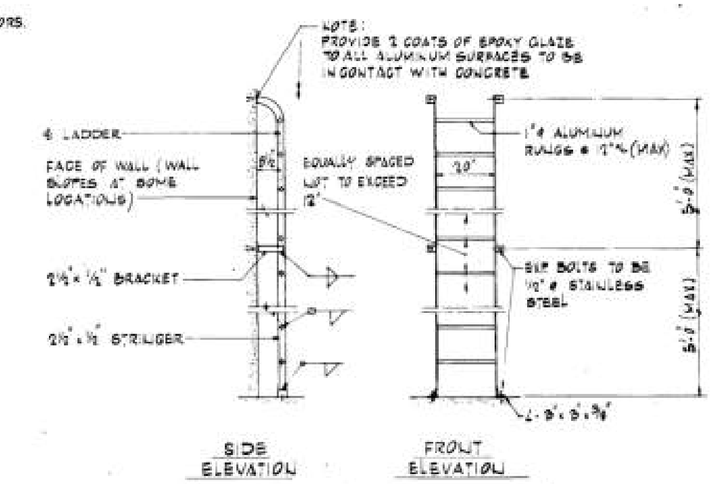
TYPICAL ACCESS DOOR JAMB
SCALE: 3" = 1'-0" (HEAD SIMILAR)



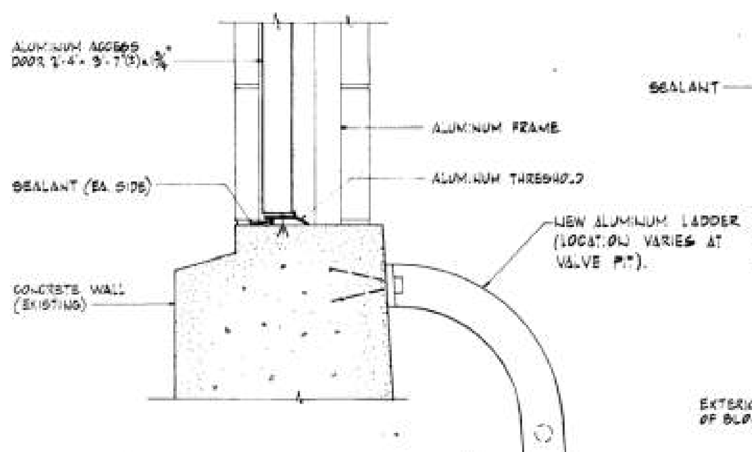
SECTION (11)
SCALE: 3" = 1'-0"



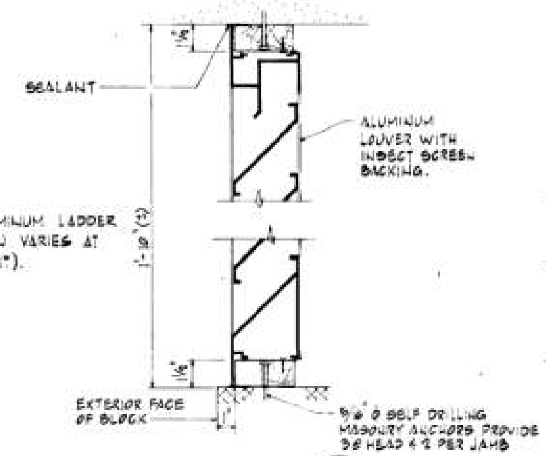
ROOF EAVE DETAIL
SCALE: 3" = 1'-0"



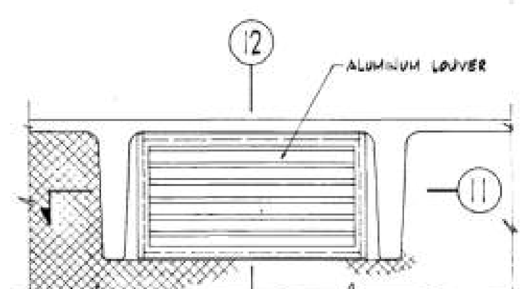
ALUMINUM LADDER DETAILS



TYPICAL ACCESS DOOR SILL
SCALE: 3" = 1'-0"



SECTION (12)
SCALE: 3" = 1'-0"



TYPICAL LOUVER ELEVATION
SCALE: 1" = 1'-0"

REDUCTION SCALE
0 1" 2" 3" 4"
1/8 1/4 1/2 1/10
GRAPHIC SCALE

REV	DATE	DESCRIPTION	BY

DEPARTMENT OF THE ARMY
BALTIMORE DISTRICT, CORPS OF ENGINEERS
BALTIMORE, MARYLAND

ABERDEEN PROVING GROUND, MARYLAND

REPAIRS & ROOF REPLACEMENT
TO BUILDING NO. 253
PROJECT No. 268X ABERDEEN AREA

GENERAL NOTES & DETAILS

McGAUGHY, MARSHALL & McMILLAN
A PROFESSIONAL CORPORATION
ARCHITECTURE ENGINEERING & PLANNING

COMMONWEALTH OF VIRGINIA
JACK H. STEWART
No. 3801
4/25/79
CERTIFIED PROFESSIONAL ENGINEER

SPEC. NO.	PROJ. REG. NO.	DRAWING NUMBER	PLATE
		40-01-385	3
A.P.G. DWG. NO.			

SCALE: AS SHOWN | DATE: APRIL, 1979 | SHEET 3 OF

MF. NO. 030400
Bal Dist 50 copies 9619