

THE SCHOOL DISTRICT OF PHILADELPHIA
SCHOOL REFORM COMMISSION
Office of Capital Programs
440 North Broad Street, 3rd Floor – Suite 371
Philadelphia, PA 19130

TELEPHONE: (215) 400-4730

Addendum No. 001 (CORRECTED)

Subject: Boiler Plant Replacement Bid Package
General, Mechanical, & Electrical
SDP Contract No. B-108c/109c/110c of 2017/18

Location: Mastbaum High School
3116 Frankford Avenue
Philadelphia, Pennsylvania 19134

This Addendum, dated May 09, 2019, shall modify and become part of the Contract Documents for the work of this project. Any items not mentioned herein, or affected by, shall be performed strictly in accordance with the original documents.

Revise as indicated below or by attachment

1.1 Specifications

- 1.1.1 List of Drawings
ADD Drawing P-102 Plumbing Fuel Oil Tank Demolition and New Work.
- 1.1.2 Table of Contents
ADD Section 02 6500 Underground Storage Tank Removal.
- 1.1.3 Section 01000 Summary of Work
ADD section 1.03.A.3.j:
"j. Remove 15,000 gallon underground fuel oil storage tank and associated piping.
Provide new 15,000 gallon underground fuel oil storage tank and fuel oil piping."
- 1.1.4 Section 01 9113 General Commissioning Requirements, 1.01.A
CHANGE the section to read: "The **MECHANICAL** Contractor will procure a Commissioning Authority (CA). The CA must be:
1. An employee or subcontractor of the **MECHANICAL** Contractor
2. Independent and a disinterested party from the Electrical Contractor, the **General Contractor....**"
- 1.1.5 ADD section 02 6500 Underground Storage Tank Removal. [See Attached]
- 1.1.6 REPLACE section 23 1113 Facility Fuel-Oil Piping with Addendum 001 Version. [See Attached]

2.1 Drawings

- 2.1.1 Drawing G-001: ADD Sheet P-102, Plumbing Fuel Oil Tank Demolition and New Work to the Drawing Index as Sheet 19A.

- 2.1.2** Drawing A-101, Architectural Demolition Plan: DELETE keynote 4 from equipment pad currently supporting the natural gas booster pump. This pad will be reused. Refer to P-101.
- 2.1.3** Drawing A-101, Architectural New work Plan: ADD an equipment pad for NGBP-2. Tag with new work keynote #3. ADD the existing to remain equipment pad for NGBP-1. Refer to P-101.
- 2.1.4** Drawing M-101: ADD General Note #6: "Coordinate the phasing of all demolition with the SDP Construction Manager. Certain aspects of the existing boiler plant must remain in operation to support the temporary boilers until the new boilers are functional. This includes- but is not limited to – the condensate pumps, boiler feed tank, and boiler feed pumps."
- 2.1.5** Drawing M-403: DELETE "EX" from the pipe tags of the plan south 10" LPS connections to the boilers.
- 2.1.6** Drawing M-403: ADD 6" Combustion air intake and 6" vent from GUH-1 and GUH-2 to plan north wall and concentric vent kit at plan north wall. ADD the following to keynote #3: "Core drill exterior wall. Provide combustion air intake and vent ductwork from gas fired unit heater to exterior wall penetration. Provide concentric vent kit and seal annular space around penetration."
- 2.1.7** Drawing M-601: REVISE Gravity Intake Hood Schedule MODEL column for GIH-1 and GIH-2:

From "WIH-48x60" to "WIH-60x60"
- 2.1.8** Drawing M-601: ADD Note #2 to Motor Operated Damper Schedule and indicate that this note applies to MOD-3 and MOD-4 in the REMARKS column.

"Mount the actuator for the motor operated damper vertically upward from the damper. Maintenance access to actuator will be through the louvered penthouse from above."
- 2.1.9** Drawing M-701: Delete "Wiring By" columns of "Steam and Condensate Control Diagram", "Hot Water Heat Exchanger and Pumps Control Diagram", and "Natural Gas Booster Pump Control Diagram". Control and low-voltage (less than 120V) wiring and conduit is to be provided by the mechanical contractor. Power wiring (120V and greater) and conduit is to be provided by the electrical contractor.
- 2.1.10** REPLACE P-101 with Addendum 001 Version. [See attached]
- 2.1.11** ADD Drawing P-102, Plumbing Fuel Oil Tank demolition and New Work [See attached]
- 2.1.12** Drawing E-401: ADD 120V wiring and conduit circuit from the remote overflow alarm panel to Panel PPBA. Refer to P-102.
- 2.1.13** Drawing E-401: ADD 120V wiring and conduit circuit from the level control system and secondary containment leak detection panel to PPBA. Refer to P-101.
- 2.1.14** Drawing E-501: ADD the remote overflow alarm panel and the level control system and secondary containment leak detection panel to PPBA panel schedule.

3.1 Contractor questions:

3.1.1 What contractor is hiring the commissioning agent?

RESPONSE: The mechanical contractor will hire the commissioning agent.

3.1.2 Is the Mechanical Contractor to hire the water treatment contractor? Normally the School Districts hires the Water Treatment Contractor and the Mechanical purchases the equipment. Please advise.

RESPONSE: SDP will hire the Water Treatment Contract

3.1.3 Who is responsible for the Asbestos Abatement? The specifications read as below:

The Asbestos Abatement Contractor (AAC) shall be employed as a sub-contractor to the Prime Mechanical Contractor (GC) awarded this project.

RESPONSE: The mechanical contractor will hire the asbestos abatement contractor.

3.1.4 How many new louvers are required?

RESPONSE: Refer to Sheet A-101, New Work Keynote #8 and Architectural Roof Plan – New Work #4. Two rectangular louvers are indicated.

3.1.5 Does new chimney access door need a fire rating?

RESPONSE: Provide a tight-sealing, non-combustible masonry chimney cleanout cover per 2018 International Building Code Chapter 21.

3.1.6 What is required at roof area where skylight is to be removed?

RESPONSE: Two louvered penthouses (GIH-1 and GIH-2) are to be installed. Refer to M-403 and A-501 details 2 and 3.

3.1.7 Spec. Section 01 1000, "Summary of Work", Page 3, Section 1.06, #2, B-109 Mechanical Contract states mechanical contractor to install "controls, and low voltage conduit and wire." Drawing M-702 contradicts this and states "Control wiring by electrical contractor. Is the mechanical contractor (B-109c) or the electrical contractor (B-110c) responsible for the conduit and wiring required for controls?"

RESPONSE: Drawing M-702 has been corrected per this addendum. Control and low-voltage (less than 120V) wiring and conduit is to be provided by the mechanical contractor. Power wiring (120V and greater) and conduit is to be provided by the electrical contractor.

3.1.8 Drawing M101 note #15 states to remove all piping in their entirety but Drawing M402 shows to connect 8" steam piping to the existing 14" LPS main. It also shows new connections from the new boilers to the existing 12" LPS main. Which is correct?

RESPONSE: Two louvered penthouses (GIH-1 and GIH-2) are to be installed. Refer to M-403 and A-501 details 2 and 3.

- 3.1.9** Drawing M101 note #15 states to remove all piping in their entirety but Drawing M402 shows to connect 8" steam piping to existing 14" LPS main. It also shows new connections from the new boilers to the existing 12" LPS main. Which is correct?

RESPONSE: The referenced clerical errors of Sheet M-402 have been corrected. See attached.

- 3.1.10** New work key note 7 on drawing A101 calls for a new louvered penthouse – see mechanical drawings. We cannot find any louvered penthouse details on the mechanical drawings. Please clarify.

RESPONSE: See Sheet M-601 Gravity Intake Hood Schedule for GIH-1 and GIH-2. Note amendment to this schedule per Addendum 001.

END OF ADDENDUM #001

SECTION 02 6500
UNDERGROUND STORAGE TANK REMOVAL

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Removal and disposal of underground storage tanks and connected piping.
- B. Cleaning and vapor freeing of tanks.
- C. Fuel removal.
- D. Temporary containment of excavated soil.
- E. Water disposal.
- F. Providing reports required by regulatory agencies.
- G. Backfilling.

1.02 REFERENCE STANDARDS

- A. API RP 1604 - Closure of Underground Petroleum Storage Tanks; 1996 (R2010).
- B. API PUBL 1628 - Guide to the Assessment and Remediation of Underground Petroleum Releases; 1996.
- C. ASTM D4397 - Standard Specification for Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications; 2016.
- D. 29 CFR 1910 - Occupational Safety and Health Standards; current edition.
- E. 29 CFR 1910.38 - Emergency action plans; current edition.
- F. COE EM-385-1-1 - Safety and Health Requirements Manual; 2008.

1.03 SUBMITTALS

- A. Site Safety and Health Plan: Describe safety and health plan and procedures as related to underground tank removal and pipe removal, and as related to operations associated with petroleum contaminated soils and water.
- B. Excavation and Material Handling Plan: Describe methods, means, equipment, sequence of operations and schedule to be employed in excavation, transport, handling, and stockpiling of soil during underground tank removal.
 - 1. Submit to Engineer of Record fifteen days before beginning tank removal work.
 - 2. Include a material handling plan that describes phases of dealing with the contaminated soil and water as it relates to the proposed tank and piping removal.
 - 3. Include methods of excavating, a material handling plan for the contaminated material, soil testing requirements, safety precautions and requirements, and water pumping and collection requirements.
- C. Field Sampling and Laboratory Testing Plan: Describe field sampling methods and quality control procedures.
 - 1. Identify laboratory and laboratory methods to be used for contamination testing.
 - 2. Sample reports shall show sample identification for location, date, time, sample method, contamination level, name of individual sampler, identification of laboratory, and quality control procedures.
- D. Tank and Piping Removal and Disposal Plan: Describe methods, means, sequence of operations, and schedule to be employed in the testing, pumping, cleaning, de-vaporizing, inspecting, removal, and disposal of underground storage tanks and piping.
- E. Spill and Discharge Control Plan: Describe procedures and plan related to potential spills and discharge of contaminated soils and water.
- F. Reports:

1. Identification of tanks removed and disposed of, including site map showing location of tank and piping.
 2. Starting and ending dates of reporting period.
 3. Closure report. Incorporate reports, records, and data into a single binder with the title "SITE ASSESSMENT REPORT" on the cover of the binder.
 4. Laboratory testing reports, including location of soil excavated and associated OVA/FID (organic vapor analyzer/flame ionization device) readings, and sampling and test results for:
 - a. TPH (total petroleum hydrocarbons).
 - b. BTEX (benzene, toluene, ethylbenzene, and xylene).
 - c. TCLP (toxicity characteristic leaching procedure); if BTEX indicates gasoline, then provide TCLP.
 5. Cumulative quantities of soil excavated, beginning with start date for each tank and associated piping.
- G. Record Documents:
1. Building permit, inspection permits, and other permits required for underground tank removal.
 2. Results of excavation, including sketch showing location of underground storage tank, sampling locations, and extent of excavation.
 3. Contaminated soil disposal paperwork, such as laboratory testing reports.
 4. Contaminated water disposal paperwork, such as laboratory testing results.

1.04 QUALITY ASSURANCE

- A. Perform work in accordance with local, state, and federal regulations and 40 CFR 280.
- B. Qualifications: Prior to start of work, submit documentation of recent experience and resumes of personnel working on the project.
 1. Data shall indicate that tank removal contractor, subcontractors, and personnel employed on the project have been engaged in removal, transportation, and disposal of underground tanks and associated piping, are familiar with and shall abide with the following:
 - a. Provide documentation that tank removers are certified if locality of project has this requirement.
 2. Furnish the name and qualifications of the proposed Site Safety and Health Officer, based on education, training, and work experience.
- C. References: Furnish data proving experience on at least three prior projects that included types of activities similar to those in this project. Provide project titles, dates of projects, owners of projects, point of contact for each project, and phone numbers of each point of contact.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Plastic Sheeting: ASTM D4397.

PART 3 EXECUTION

3.01 PREPARATION FOR TANK REMOVAL AND DISPOSAL

- A. Site Safety And Health Plan (SSHP): Furnish safety, health, and accident prevention provisions and develop a Site Safety and Health Plan (SSHP).
 1. The SSHP shall incorporate the requirements of 29 CFR 1910 and COE EM-385-1-1.
 2. Site work shall not start until the SSHP is approved by the Engineer of Record and Owner.
- B. Site Safety And Health Officer: Identify an individual to serve as the Site Safety and Health Officer (SSHO) .
 1. The SSHO shall report problems and concerns regarding health and safety to the Engineer of Record.

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2. The SSHO shall have a working knowledge of local and Federal occupational safety and health regulations, and shall provide training to Contractor employees in air monitoring practices and techniques.
 3. The SSHO shall also provide day to day industrial hygiene support, including air monitoring, training, and daily site safety inspections.
 4. The SSHO shall be trained in the use of the monitoring and sampling equipment, interpretation of data required to implement the SSHP, and to administer the elements of the SSHP.
 5. The SSHO shall remain on site during project operations and may be assigned other duties, such as project foreman or quality control manager.
- C. Spill And Discharge Control Plan: Develop, implement, and maintain a comprehensive spill and discharge control plan.
1. The plan shall provide contingency measures for potential spills and discharges from handling and transportation of contaminated soils and water.
 2. A possible source of guidance for assessment and remediation is API PUBL 1628.
- D. Exclusion Zone (EZ) And Contamination Reduction Zone (CRZ): Do not permit personnel not directly involved with the project to enter work zones, called the EZ and CRZ.
1. The EZ shall be an area around the tank a minimum of 10 feet from the limits of the tank excavation.
 2. At the perimeter of the EZ, establish a CRZ.
 3. Within the CRZ, equipment and personnel shall be cleaned as stated in the paragraph entitled "Personnel and Equipment Decontamination."
 4. The Contractor's site office, parking area, and other support facilities shall be located outside the EZ and CRZ.
 5. Clearly mark and post the boundaries of the EZ and CRZ.
 6. Include a site map, outlining the extent of work zones and location of support facilities, in the SSHP.
- E. Training: Provide health and safety training in accordance with 29 CFR 1910 prior to starting work.
1. Furnish copies of current training certification statements for personnel prior to initial entry into the work site.
 2. On-Site Training: Prior to starting on-site work, a health and safety training class shall be held by the SSHO to discuss the implementation of the SSHP.
 3. Notify the Engineer of Record and owner 24 hours prior to beginning the training class.
- F. Personnel Protection: Furnish appropriate personal safety equipment and protective clothing to personnel.
1. Ensure that safety equipment and protective clothing is kept clean and well maintained.
- G. Decontamination: Decontaminate or properly dispose of personal protective equipment and clothing worn in contaminated areas at the end of the work day.
1. The SSHO shall be responsible for ensuring that personal protective clothing and equipment are decontaminated before being reissued.
- H. First Aid And Emergency Response Equipment And Procedures: Provide appropriate emergency first aid equipment for treatment of exposure to site physical and chemical hazards.
1. Provide and post a list of emergency phone numbers and points of contact for fire, hospital, police, ambulance, and other necessary contacts.
 2. Provide and post a route map detailing the directions to the nearest medical facility.
- I. Ignition Sources: Do not permit ignition sources in the EZ and CRZ.
- J. Personnel And Equipment Decontamination: Decontaminate personnel and equipment before exiting the work zones.

- K. Waste Disposal: The SSHP shall detail the practices and procedures to be utilized to dispose of wastes. Upon completion of the project, certify that equipment and materials were properly decontaminated prior to being removed from the site.
- L. Emergency Response Requirements: Furnish emergency response and contingency plan in accordance with 29 CFR 1910.38.
 - 1. In an emergency, take action to remove or minimize the cause of the emergency, alert the Engineer of Record and owner, and institute necessary measures to prevent repetition of the emergency.
 - 2. Equip site-support vehicles with route maps providing directions to the medical treatment facility.
- M. Unforeseen Hazards: Notify the Engineer of Record and owner of any unforeseen hazard or condition that becomes evident during work.

3.02 TANK CLEANING

- A. Fuel Removal:
 - 1. Consider remaining fuel contaminated or waste fuel; pump into 55 gallon drums or other suitable containers for disposal in accordance with approved procedures meeting local, state, and federal regulations.
 - a. Drums or tanks used for containerizing waste fuel shall be furnished by Contractor.
 - 2. Dispose of remaining fuel emulsions in accordance with applicable local, state, and federal regulations.

3.03 TEMPORARY CONTAINMENT OF EXCAVATED SOIL

- A. Provide temporary containment area near the excavated area.
- B. Cover containment area with 30 mil polyethylene sheeting.
 - 1. Place excavated soil on the impervious barrier and cover with 6 mil polyethylene sheeting.
 - 2. Provide straw bale berm around the outer limits of the containment area and cover with polyethylene sheets.
 - 3. Secure edges of sheets to keep the polyethylene sheeting in place.

3.04 EXCAVATION

- A. Provide Engineer of Record with written documentation, no later than 30 days before work begins, that proper state or local authorities have been notified.
- B. Notify Engineer of Record at least 48 hours prior to start of tank removal work.
 - 1. Stage operations to minimize the time that tank excavation is open and the time that contaminated soil is exposed to the weather.
 - 2. Provide protection measures around the excavation area to prevent water runoff and to contain the soil within the excavation area.
- C. Excavation: Excavate as required to remove tanks and piping.
 - 1. Place soil removed from the excavation in a temporary containment area.
 - 2. Collect and temporarily store water runoff from stockpiled soils.
- D. Excavation Methods: Select methods and equipment to remove soil to minimize disturbance to areas beyond the limits of the excavation area.
 - 1. Material that becomes contaminated as a result of Contractor's operations shall be removed and disposed of at no additional cost to Owner.

3.05 WATER DISPOSAL

- A. Dewatering will be permitted only with approval of Engineer of Record.
- B. Store and test water generated during removal of tanks and piping.
 - 1. If contaminated, transport and dispose of water in an EPA approved disposal site in accordance with federal, state, and local requirements.
 - 2. Non-contaminated water may be disposed of on-site.

3.06 DISPOSAL OF UNDERGROUND TANKS, ANCHORS, SLABS, AND ASSOCIATED PIPING

- A. Preparation: API RP 1604. Remove the fill pipe, gage pipe, vapor recovery truck connection, submersible pumps, and drop tube.
 - 1. Cap or remove non-product piping, except vent piping.
 - 2. Plug tank openings so that vapors will exit through vent piping during the vapor-freeing process.
- B. Purging: Remove flammable vapors in accordance with API RP 1604. Tanks shall be certified as "vapor free" prior to further work.
- C. Cleaning and Testing: Clean tank and perform atmosphere testing in accordance with API RP 1604.
 - 1. Distribution (product delivery) piping shall be cleaned and removed or the piping shall be cleaned, filled with concrete, and abandoned in place.
 - 2. Test the tank atmosphere and the excavation area for flammable or combustible vapor concentrations, with a combustible gas indicator until the tank is removed from the excavation and from the site.
- D. Tank Removal and Disposal:
 - 1. Plug or cap accessible holes. One plug shall have a minimum 1/8 inch vent hole.
 - 2. Remove tank from the excavation, place it on a level surface and render it useless in accordance with API RP 1604.
 - 3. Transport and dispose of tank at an EPA approved disposal site in accordance with federal, state, and local regulations.

3.07 CLOSURE REPORT (SITE ASSESSMENT REPORT)

- A. Provide Engineer of Record a Site Assessment Report in a single binder notebook that contains the full collection of reports relating to this work, including but not limited to, records, starting and ending dates of reporting period, inspections, documentation, and data as follows:
 - 1. Complete UST Notification Form (within 30 days of closure).
 - 2. Description of work, including removal procedures, number of tanks removed, identification of tanks removed and disposed of, cubic yards of excavated soil, location of disposal sites, and dates of excavation.
 - 3. Site plan, including location of tanks and piping, limits of excavation, sampling points, results of excavation, and depths.
 - 4. Laboratory testing reports, copies of data and test results from testing laboratory.
 - 5. Tank disposal paperwork, contaminated soil disposal paperwork, and contaminated water disposal paperwork.
 - 6. Certifications required by implementing agency.
 - 7. Building permit, inspection permits, and other permits required for underground tank removal, notifications, and inspection reports.
 - 8. Cumulative quantities of soil excavated, beginning with start date for each tank and associated piping.

3.08 SPILLS OF CONTAMINATED SOILS

- A. Use appropriate vehicles and operating practices to prevent spillage or leakage of contaminated materials from occurring during operations. Inspect vehicles leaving the area of contamination to ensure that no contaminated materials adhere to the wheels or undercarriage.

3.09 BACKFILLING

- A. Backfill, compact, grade, and pave the work area to return to existing conditions per OSHA standards.

END OF SECTION

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SECTION 23 1113
FACILITY FUEL-OIL PIPING

PART 1 GENERAL

1.01 RELATED REQUIREMENTS

- A. Section 09 9600 - High-Performance Coatings.
- B. Section 22 0553 - Identification for Plumbing Piping and Equipment.

1.02 REFERENCE STANDARDS

- A. API Spec 5L - Line Pipe; 2018.
- B. API RP 1615 - Installation of Underground Petroleum Storage Systems; 2011.
- C. API Std 2000 - Venting Atmospheric and Low-Pressure Storage Tanks; 2014.
- D. ASME BPVC - Boiler and Pressure Vessel Code; 2017.
- E. ASME BPVC-IX - Boiler and Pressure Vessel Code, Section IX - Welding, Brazing, and Fusing Procedures; Welders; Brazers; and Welding, Brazing and Fusing Operators; 2017.
- F. ASME B1.1 - Unified Inch Screw Threads; 2003 (Reaffirmed 2008).
- G. ASME B16.3 - Malleable Iron Threaded Fittings: Classes 150 and 300; 2016.
- H. ASME B16.5 - Pipe Flanges and Flanged Fittings NPS 1/2 Through NPS 24 Metric/Inch Standard; 2017.
- I. ASME B16.9 - Factory-Made Wrought Buttwelding Fittings; 2012.
- J. ASME B16.11 - Forged Fittings, Socket-welding and Threaded; 2016 (Errata 2017).
- K. ASME B16.12 - Cast Iron Threaded Drainage Fittings; 2009.
- L. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings; 2012.
- M. ASME B16.22 - Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings; 2013.
- N. ASME B16.26 - Cast Copper Alloy Fittings for Flared Copper Tubes; 2013.
- O. ASME B16.39 - Malleable Iron Threaded Pipe Unions Classes 150, 250, and 300; 2014.
- P. ASME B18.2.1 - Square, Hex, Heavy Hex, and Askew Head Bolts and Hex, Hex Flange, Lobed Head, and Lag Screws (Inch Series); 2012, Including July 2013 Errata.
- Q. ASME B18.2.2 - Nuts for General Applications: Machine Screw Nuts, Hex, Square, Hex Flange, and Coupling Nuts (Inch Series); 2015.
- R. ASME B31.1 - Power Piping; 2016.
- S. ASME B31.3 - Process Piping; 2016.
- T. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2012.
- U. ASTM A182/A182M - Standard Specification for Forged or Rolled Alloy and Stainless Steel Pipe Flanges, Forged Fittings, and Valves and Parts for High-Temperature Service; 2017.
- V. ASTM A234/A234M - Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service; 2017.
- W. ASTM A312/A312M - Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes; 2017.
- X. ASTM B32 - Standard Specification for Solder Metal; 2008 (Reapproved 2014).
- Y. ASTM B62 - Standard Specification for Composition Bronze or Ounce Metal Castings; 2017.
- Z. ASTM B75/B75M - Standard Specification for Seamless Copper Tube; 2011.
- AA. ASTM B88 - Standard Specification for Seamless Copper Water Tube; 2016.
- AB. ASTM B88M - Standard Specification for Seamless Copper Water Tube (Metric); 2016.

- AC. ASTM B813 - Standard Specification for Liquid and Paste Fluxes for Soldering of Copper and Copper Alloy Tube; 2016.
- AD. ASTM D229 - Standard Test Methods for Rigid Sheet and Plate Materials Used for Electrical Insulation; 2013.
- AE. ASTM D5677 - Standard Specification for Fiberglass (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe and Pipe Fittings, Adhesive Bonded Joint Type, for Aviation Jet Turbine Fuel Lines; 2017.
- AF. AWS A5.8M/A5.8 - Specification for Filler Metals for Brazing and Braze Welding; 2011 (Amended 2012).
- AG. MSS SP-80 - Bronze Gate, Globe, Angle and Check Valves; 2013.
- AH. MSS SP-110 - Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends; 2010.
- AI. NACE SP0285 - External Corrosion Control of Underground Storage Tank Systems by Cathodic Protection; 2011.
- AJ. NACE SP0286 - Electric Isolation of Cathodically Protected Pipelines; 1997 (Reaffirmed 2007).
- AK. NFPA 30 - Flammable and Combustible Liquids Code; 2018.
- AL. NFPA 31 - Standard for the Installation of Oil Burning Equipment; 2016.
- AM. UL 567 - Emergency Breakaway Fittings, Swivel Connectors and Pipe Connection Fittings for Petroleum Products and LP-Gas; Current Edition, Including All Revisions.

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Conduct a preinstallation meeting one week prior to the start of the work of this section; require attendance by all affected installers.
- B. Sequencing: Ensure that utility connections are achieved in an orderly and expeditious manner.

1.04 SUBMITTALS

- A. Product Data: Provide data on pipe materials, pipe fittings, valves and accessories. Provide manufacturers catalog information. Indicate valve data and ratings.
- B. Shop Drawings: Indicate tanks, system layout, pipe sizes, location, and elevations. For fuel oil tanks, indicate dimensions and accessories including manholes and hold down straps.
- C. Certificates: Certify that products meet or exceed specified requirements.
- D. Project Record Documents: Record actual locations of piping system, storage tanks, and system components.
- E. Maintenance Data: Include installation instructions, spare parts lists, exploded assembly views.
- F. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.
- G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 01 6000 - Product Requirements, for additional provisions.
 - 2. Valve Repacking Kits: One for each type and size of valve.

1.05 QUALITY ASSURANCE

- A. Welding Materials and Procedures: Comply with ASME BPVC.
- B. Welders Certification: In accordance with ASME BPVC-IX.
- C. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.
- D. Installer Qualifications: Company specializing in performing the type of work specified in this section with minimum three years of experience and approved by manufacturer.
- E. Valves: Manufacturer's name and pressure rating marked on valve body.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Protect piping and fittings from soil and debris with temporary end caps and closures. Maintain in place until installation.

1.07 WARRANTY

- A. Provide five year manufacturer warranty for fuel oil transfer pumpset and accessories.

PART 2 PRODUCTS

2.01 PIPING AND FITTINGS

- A. Regulatory Requirements:
 - 1. Comply with the material, fabrication, and operating requirements of ASME B31.3, except as modified herein.
 - 2. Comply with ASME B31.1 for installation of fuel oil piping.
 - 3. Comply with applicable regulations for installation of fuel oil system.
 - 4. Provide certificate of compliance from Authority Having Jurisdiction indicating approval of installation of fuel oil system.
 - 5. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc., as suitable for the purpose specified and indicated.
- B. Comply with the material, fabrication, and operating requirements of ASME B31.3, except as modified herein.
- C. Carbon Steel Pipe:
 - 1. Comply with One of the Following:
 - a. ASTM A53/A53M, Type E or S, Grade B, seamless or electric welded, Schedule 80 for pipe less than 2-1/2 inch in diameter or Schedule 40 for pipe 2-1/2 inch in diameter and larger.
 - b. API Spec 5L, Product Specification Level (PSL) 1, Grade B, submerged-arc welded or gas metal-arc welded.
 - 2. End Connections:
 - a. Forged, socket weld type, complying with ASTM A182/A182M and ASME B16.11 for pipe or fittings less than 2-1/2 inch.
 - b. Buttweld type complying with ASTM A234/A234M, Grade WPB and ASME B16.9 for pipe or fittings 2-1/2 inch and larger of the same wall thickness as the adjoining pipe.
 - c. Threaded type complying with ASME B16.3, Class 150 or ASME B16.11.
- D. Exterior Containment Piping System: Factory fabricated, double-wall complying with ASME B31.3 and NFPA 30.
 - 1. Manufacturers:
 - a. Insul-Tek Piping Systems, Inc.; Fiberclad: www.insul-tek.com/#sle
 - b. Rovanco: www.rovanco.com/#sle
 - c. Tricon Piping Systems, Inc.: www.triconpiping.com/#sle
 - 2. Physical Characteristics:
 - a. Fiberglass reinforced plastic (FRP) complying with ASTM D5677.
 - b. Chemically compatible with type of fuel handled.
 - c. Non-corrosive.
 - d. Dielectric.
 - e. Non-biodegradable.
 - f. Microbial resistant.
 - g. Pressure Limitation: Capable of withstanding 5 psig minimum air pressure.
 - 3. Design Characteristics:
 - a. Piping and support allow for drainage.
 - b. Allows for complete inspection of the product piping prior to sealing of containment piping.
 - c. Pipe Supports:

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- 1) Design based on pipe size, pipe weight, fuel weight, and operating condition to evenly separate containment piping from product piping.
 - 2) Construct of same material as product piping.
 - 3) Design supports so no point loading occurs on the primary or exterior pipe.
 - 4) Permanently attach supports to product pipe by tack welding or adhesive.
 - 5) Design to allow for pipe movement of both product piping and exterior containment piping without causing damage to either.
- E. Copper Pipe: Type K.
1. Comply with ASTM B88 and ASTM B88M.
 2. Fittings and End Connections:
 - a. Wrought Copper and Bronze Solder-Joint Pressure Fittings: Comply with ASME B16.22 and ASTM B75/B75M.
 - b. Cast Copper Alloy Solder-Joint Pressure Fittings: Comply with ASME B16.18.
 - c. Cast Copper Alloy Fittings for Flared Copper Tube: Comply with ASME B16.26 and ASTM B62.
 - d. Brass or bronze adapters for brazed tubing acceptable for connecting tubing to flanges and threaded ends of valves and equipment.
 - e. Extracted brazed tee joints acceptable if produced with acceptable tool and installed in accordance with manufacturer's recommendations.
 3. Solder:
 - a. Comply with ASTM B32, grade Sb5, tin-antimony alloy for service pressures up to 150 psig.
 - b. Comply with ASTM B813 for solder flux in non-corrosive, liquid, or paste form.
 4. Brazing Filler Metal:
 - a. Filler metal to comply with AWS A5.8M/A5.8, Type Bag-5 with AWS Type 3 flux.
 - b. Type BCuP-5 or BCuP-6 acceptable for brazing copper-to-copper joints.

2.02 FLANGES, COUPLINGS, AND PIPING COMPONENTS

- A. Flanges:
1. Provide flanged end connections on equipment, fittings, piping, piping components, adapters, couplings, and valves complying with ASME B16.5, Class 150.
 2. Gaskets, Non-Isolating:
 - a. 1/8 inch thick.
 - b. Comply with ASME B16.12, raised-faced type.
 - c. Material: Buna-N.
 3. Gaskets, Electrically Isolating:
 - a. Comply with ASTM D229.
 - b. Electrical Insulating Material: 1000 ohms resistance.
 - c. Chemically compatible with fuel handled.
 - d. Full face type.
 - e. Provide full surface, spiral-wound, mylar, insulating sleeves between bolts and holes of flanges.
 - f. Furnish bolt shank diameter not less than diameter at root of threads.
 - g. Provide high-strength 1/8 inch thick, phenolic, insulating washers next to flanges with flat, circular, stainless steel washers over the insulating and under bolt heads and nuts.
 - h. Supply adequate bolt length to accommodate insulating gaskets and stainless steel washers.
 4. Bolts, Nuts, and Washers:
 - a. Comply with ASME B18.2.1 and ASME B18.2.2.
 - b. Bolts:
 - 1) Regular hexagonal type.

- 2) Threaded in accordance with ASME B1.1, Class 2A fit, Coarse Thread Series, for sizes 1 inch and smaller and Eight-Pitch Thread Series for sizes larger than 1 inch.
 - 3) Provide sufficient length to obtain full bearing on nuts, projecting no more than two full threads beyond nuts with bolts tightened to required torque.
- c. Nuts:
- 1) Hexagonal, heavy series type.
 - 2) Threaded in accordance with ASME B1.1, Class 2B fit, Coarse Thread Series for sizes 1 inch and smaller and Eight-Pitch Thread Series for sizes larger than 1 inch.
- B. Piping Components:
1. Provide components that meet the material, fabrication, and operating requirements of ASME B31.3, except as modified herein.
 2. Pressure Design Class: Class 150 as defined in ASME B16.5.
 3. Threaded Unions:
 - a. Comply with ASME B16.39, Class 150.
 - b. Materials: Comply with ASTM A312/A312M, Grade 304 or 316.
 - c. Dielectric Unions: Comply with dimensional, strength, and pressure requirements of ASME B16.39, Class 150.
 - d. Provide galvanized or plated steel parts.
 - e. Furnish water-impervious insulation barrier capable of limiting galvanic current to one percent of the short-circuit current in a corresponding bimetallic joint and withstand a 600 volt breakdown test when dry.

2.03 GATE VALVES

- A. Manufacturers:
1. Conbraco Industries: www.apollovalves.com/#sle.
 2. Nibco, Inc: www.nibco.com/#sle.
 3. Milwaukee Valve Company: www.milwaukeevalve.com/#sle.
- B. MSS SP-80, Class 125, bronze body, bronze trim, rising stem, handwheel, inside screw, solid wedge disc, solder ends.

2.04 GLOBE VALVES

- A. Manufacturers:
1. Conbraco Industries: www.apollovalves.com/#sle.
 2. Nibco, Inc: www.nibco.com/#sle.
 3. Milwaukee Valve Company: www.milwaukeevalve.com/#sle.
- B. MSS SP-80, Class 125, bronze body, bronze trim, handwheel, bronze disc, solder ends.

2.05 BALL VALVES

- A. Manufacturers:
1. Conbraco Industries: www.apollovalves.com/#sle.
 2. Nibco, Inc: www.nibco.com/#sle.
 3. Milwaukee Valve Company: www.milwaukeevalve.com/#sle.
- B. MSS SP-110, Class 150, 400 psi CWP, bronze, two piece body, chrome plated brass ball, regular port, teflon seats and stuffing box ring, blow-out proof stem, lever handle with balancing stops, solder.

2.06 SWING CHECK VALVES

- A. Manufacturers:
1. Apollo Valves: www.apollovalves.com/#sle.
 2. Hammond Valve: www.hammondvalve.com/#sle.
 3. Nibco, Inc: www.nibco.com/#sle.
 4. Milwaukee Valve Company: www.milwaukeevalve.com/#sle.

- B. MSS SP-80, Class 125, bronze body and cap, bronze swing disc, solder ends.

2.07 RELIEF VALVES

- A. Manufacturers:
 - 1. Armstrong International, Inc: www.armstronginternational.com/#sle.
 - 2. ITT McDonnell & Miller: www.mcdonnellmiller.com/#sle.
 - 3. Spirax-Sarco: www.spiraxsarco.com/us/#sle.
- B. Bronze body, teflon seat, steel stem and springs, automatic, direct pressure actuated at maximum 60 psi, UL listed for fuel oil, capacities ASME certified and labelled.

2.08 STRAINERS

- A. Manufacturers:
 - 1. Armstrong International, Inc: www.armstronginternational.com/#sle.
 - 2. Green Country Filter Manufacturing: www.greencountryfilter.com/#sle.
 - 3. WEAMCO: www.weamco.com/#sle.
- B. Threaded brass body for 175 psi CWP, Y pattern with 1/32 inch stainless steel perforated screen.

2.09 FLEXIBLE CONNECTORS

- A. Manufacturers:
 - 1. Circuit Hydraulics, Ltd: www.circuit-hydraulics.co.uk.
 - 2. Flexicraft Industries: www.flexicraft.com/#sle.
 - 3. Penflex: www.penflex.com/#sle.
- B. Bronze inner hose and braided exterior sleeve, suitable for minimum 200 psi CWP and 250 degrees F.

2.10 UNDERGROUND FUEL STORAGE TANKS

- A. Manufacturers:
 - 1. Highland Tank; www.https://www.highlandtank.com/#sle
 - 2. Ace Tank & Equipment Co: www.acetank.com/#sle.
 - 3. Containment Solutions, Inc.: www.containmentsolutions.com/#sle.
 - 4. Xerxes Corporation: www.xerxescorp.com/#sle.
- B. Tank: Double Wall mild carbon steel, ACT-100-U compliant, UL-58 Type I listed and labeled, UL-1746 listed and labeled, and API Std 650 compliant.
 - 1. Operating Pressure: Atmospheric.
 - 2. Exterior Finish: SP6 Blast, 70 mils of urethane per ACT-100U. Factory spark tested.
 - 3. Provide with anchor straps with neoprene liner and turnbuckles (2 per strap), attachments, fittings, lifting lugs, and tappings for accessories.
- C. Filler Cap: 3 inch watertight brass with lock, recessed box and cover.
- D. Gauge: Remote reading, electronic, for two wire, 24 volt power, with wall mounted direct reading gauge.
- E. Cathodic Protection: Galvanic type with sacrificial magnesium anodes welded to tank, to NACE SP0285.
- F. Capacity:
 - 1. Volume: 15,000 gallons.
 - 2. Diameter: 120 inches.
 - 3. Overall Length: 306 inches.
- G. Tank Fittings with 150# flanges:
 - 1. Fill: 4 inch.
 - 2. Vent: 4 inch, galvanized, including "T" and elbow assembly with 1/4 inch square mesh screen over inlet.
 - 3. Suction: 4 inch anti-siphon connection to tank bottom with foot valve.

4. Return: 4 inch.
 5. Gauge Fitting: 4 inch.
 6. Internal Monitor Pipe: 2 inch.
 7. Connections: UL 567, dielectric bushings.
 8. Provide striker plates at each opening.
- H. Manways: 42 inch diameter, with nuts, bolts, cover, gasket, and extension sleeve; located at top of tank.
1. AASHTO Standard for "H-20" truck loadings.
- I. Internal Ladder: 2"x 1/4" bar sides and 3/4" diameter rungs on 12" center.
- J. Air Test: Bubble test interior and interstitial space prior to installation with a charge of 5 PSI.
- K. Warranty: Provide a 30-year warrant against failure due to exterior corrosion and internal corrosion when used with petroleum products.
- L. Level Control System and Secondary Containment Leak Detection System:
1. Manufacturers:
 - a. Pneumecator; TMS3000, MP 450 S, and ES825-200F:
<http://www.pneumecator.com/#sle>
 - b. Preferred Utilities: <https://www.preferred-mfg.com/#sle>
 - c. Kenco Engineering: <http://kenco-eng.com/#sle>
 2. Microprocessor-based controller with non-volatile memory in a NEMA 12 Enclosure.
 - a. Nine digit, seven segment display; LED alarm indicators; and 85 dB alarm
 3. Rigid 316 Stainless Steel Magnetostrictive Probe
 4. Solid state, electronic, product distinguishing leak sensor utilizing both electro-optical and conductivity technology to differential between hydrocarbon-based liquid and water.
 - a. UL Class I, Div1, Groups C and D.
 5. UL Approved.
- M. Outdoor Overfill Alarm Panel
1. Outdoor overfill alarm panel, 85dB audible alarm with auto-silence after 20 seconds, and persistent red indicator light in NEMA 4x enclosure.

2.11 FUEL OIL PUMPS

- A. Manufacturers:
1. Preferred Utilities: www.preferred-mfg.com/#sle
 2. Smith-Koch: www.geigerinc.com/#sle
 3. Simplex, Inc: www.simplexdirect.com/#sle.
 4. Suntec: www.suntecpumps.com/#sle.
 5. Viking Pump, Inc: www.vikingpump.com/#sle.
- B. Listed and Labeled in accordance with UL 343.
- C. Furnish and install one (1) transfer pump set, as required, to deliver fuel oil from storage tank to burner supply loop. Unit shall be a complete factory packaged assembly, consisting of duplex fuel oil pump set; piped, wired and fitted out with required components, mounted onto a steel containment base. Mounting base shall be fabricated of steel plating of not less than 1/8" thick with a 1" high spill proof containment wall surrounding entire base. One 1/4" plugged drain connection shall be included in containment wall. Provide at each corner, external to mounting base, welded steel tie downs for purpose of securing pump set assembly to housekeeping pad. Pumps, motors and related components shall be attached to mounting brackets by means of bolting. Mounting brackets shall be secured to base by continuous weld. Steel brackets for mounting and/or supporting of electrical control panel shall be welded to mounting base. Penetration through containment base for purpose of mounting equipment and/or anchoring same to housekeeping pad shall not be acceptable. All piping shall be schedule 80 carbon steel ASTM-A-53. Fittings shall be 150# minimum malleable iron. Unions shall be installed at the inlet and discharge of each pump, to enable removal of pump without disassembly of piping.

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Capacity and sizing shall be based on 40 SSU oil supplied to pump suction. The following components shall be included with the pump set:

1. Two (2) fuel oil pumps; pumps shall be positive displacement, rotary internal gear type with mechanical seal. Motor and pump shall be the close-coupled design. Each pump shall have a minimum capacity and discharge head as scheduled. Pumps shall be capable of developing 25 inches mercury vacuum at 0 PSI factory tested. Pump motors shall have a horsepower as scheduled, 208 Volts, 60 Cycle, 3 Phase, 1800 RPM.
2. Two (2) U.L. listed duplex strainer with brass mesh strainer baskets. Strainer shall be one piece body casting of 150 PSI cast iron with screwed connections. Strainer shall be capable of being cleaned without disruption to oil flow.
3. Two (2) external fuel oil relief valves. Each relief valve shall be a cast bronze body with brass and bronze internals. Valve to have 150 lb. body rating with adjustable range of 0 to 50 lbs. Set relief valve at 10 PSI.
4. Gate valves shall be installed on suction and discharge of each fuel oil pump and prior to all gauges. Valves to be threaded bronze bodied, with bonnet, discs and stem of bronze. Packing to be fuel oil resistant. Provide check valves in the discharge line of each pump. Check valves shall be thread cast bronze body with bronze internals.
5. Pressure gauge, 0-60 PSIG shall be provided on discharge of fuel pumps after throttling valve. Compound gauges shall be installed prior to and after the fuel oil duplex strainer. Gauges shall be 2-1/2 inches diameter and shall have a dial range from 30 inches of vacuum to 15 PSI. Case shall be black finished steel, with steel dial. Movement to be brass with phosphor bronze bourdon tube. Isolation valve to be installed in line before each gauge.
6. Throttling valve. A plug valve or gate valve with a needle type position indicator shall be provided on the discharge of each pump to permit throttling the discharge of each pump to 5 PSIG.
7. One (1) Back Pressure Regulating Valve shall be supplied loose for field mounting by contractor as shown on drawing. Valve shall be set to maintain 5 PSI pressure on fuel oil supply loop.
8. Control panel shall be provided as part of the transfer pump system. Control Cabinet shall be manufactured and labeled in accordance with UL508A. Simply supplying UL recognized individual components is not sufficient. The assembled control cabinet, as a whole, must be inspected for proper wiring methods, fusing, etc. and must be labeled as conforming to UL508A. Inspection and labeling shall be supervised by UL. The system must be manufactured by a nationally recognized Trade Union (I.B.E.W. or similar trade union). Lack of an NRTL certified UL508A wiring methods inspection and label or lack of a Trade Union label will be grounds for rejection. Panel shall be NEMA type with full piano hinge, factory pre-wired and tested. Panel shall house the necessary overload devices, switches, lights, circuit breakers, control circuit transformer, starters, relays and controls. Panel shall be suitable for one electrical power field connection. The following switches and indicators shall be provided:
 - a. Auto/Manual/Off selector switch for each pump.
 - b. Fused control circuit transformer for each circuit, when motor exceeds 120 volts.
 - c. Motor starters, each having three overload relays, with circuit breaker.
 - d. PUMP ON indicating light for each pump.
 - e. Separate indicating lights for flow failure and oil detection.
 - f. Annunciation to sound and indicate flow failure or oil detected in the sump. An additional remote audio and visual alarm signals shall be incorporated in remote Equipment Alarm Panel located in Custodian's room which will have alarm-silencing push button.

- g. Necessary transformers, relays, contactors, power supplies, fuses and devices to accommodate intent of specifications.
 - h. Numbered terminal block or strip.
 - i. Identification nameplates for all switches, indicating lamps and components.
 - j. Electric alternator.
9. Sequence of operation shall allow manual selection of active pump. Should active pump fail, the stand-by pump, after a field adjustable time delay period, shall be brought on line and the alarm horn will sound. System must incorporate an adjustable time delay on failure to eliminate nuisance shut downs.
10. Control Circuits: Independent of each pump with electrical alternator to operate pumps in sequence.
11. Manual Lead-Lag Control: Overrides electrical alternator when active pump is manually selected.
12. Leak detection. Unit shall have an oil detector in the containment base, arranged to shut down both pumps and sound the alarm horn when the detector detects oil in the sump.
- D. Factory Testing: Pump Sets must be fully tested prior to shipment. Testing shall include both a pressure and vacuum testing period. First, the complete pump set shall be pressure tested to rated pressure using an air pressure source. The test shall confirm that the pump set piping system can maintain rated pressure for 4 hours. Next, the complete pump set shall be brought to a vacuum greater than 25" Hg. The test shall confirm that the pump set piping system can maintain vacuum for 4 hours. Following a pressure and vacuum test the pump set shall be given a full operational test. The pump set shall be connected to a fuel oil supply and return. The pump set shall be operated normally. Motor amps shall be noted at no load and full load for each motor. The motor amps shall be within 10% of rated motor amps. During the test, the relief valve shall be set and tested. Operation of pump set instrumentation shall be tested. A copy of the test procedures shall be sent to the consulting engineer and owner. The owners and or the consulting engineer at their discretion shall observe this and all other tests. A certificate of factory testing, together with a copy of- the wiring diagram and arrangement diagrams shall be placed in the control cabinet prior to shipment.
- E. After testing, the entire unit shall be painted with temperature, water and chemical resistant enamel. All nameplates, gauges, brass valves, shafts and other moving parts shall be masked and left unpainted. Provide touch-up paint to marred surfaces after installation and start-up.
- F. Install fuel oil transfer pumps on concrete base. Anchor the unit to the base.

2.12 ANTI-SIPHON VALVE

- A. Manufacturers:
 - 1. Preferred Utilities, Model A
 - 2. Morrison Bros. Co.
 - 3. OPW
- B. UL listed for fuel oil service.
- C. Body: Bronze with oil-proof gasketing
- D. Spring loaded poppet
- E. Composition seat and dashpot

2.13 OIL SAFETY VALVES

- A. Manufacturers:
 - 1. Suntec Industries, Inc.
 - 2. Webster Fuel Pumps & Valves; a division of Capital City Tool, Inc.
 - 3. OPW
- B. UL listed for fuel oil service. Include metal body; broken-line, oil shutoff feature; and 40-psig minimum pressure rating.

2.14 FUSOMATIC GATE VALVE

- A. Acceptable Manufacturers
 - 1. Preferred Utilities
- B. Class 125, bronze body, valves suitable for fuel oil service
- C. UL Listed and meets NFPA 31 Standard
- D. Quick-closing, spring-loaded and thermally actuated fusible element that melts at 165 deg. F causing the valve to close tightly.

2.15 TRANSITION SUMP

- A. Manufacturers:
 - 1. Franklin Fueling Systems, APT; AST: <http://www.franklinfueling.com/americas/en/#sle>
 - 2. OPW: <https://www.opwglobal.com/opw-retail-fueling/#sle>
 - 3. Bravo: <http://sbravo.com/category/transition-sumps/#sle>
- B. H-20 Load rating composite material with fueltight and watertight seals at the lid and around piping entries.
- C. 30" burial depth.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that excavations are to required grade, are dry, and have not been over-excavated.

3.02 PREPARATION

- A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
- B. Remove scale and dirt, on inside and outside, before assembly.
- C. Prepare piping connections to equipment with flanges or unions.

3.03 PIPING INSTALLATION

- A. Provide only rigid, metal piping inside the facility. If plastic piping is utilized outside, provide a transition sump just outside the building penetration to transition between materials.
- B. Install in accordance with manufacturer's instructions and API RP 1615.
- C. Provide non-conducting dielectric connections wherever jointing dissimilar metals. Install to NACE SP0286.
- D. Route piping in orderly manner and maintain gradient.
- E. Group piping whenever practical at common elevations.
- F. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- G. Provide clearance for installation of insulation and access to valves and fittings.
- H. Where pipe support members are welded to structural building framing, scrape, brush clean, weld, and apply one coat of zinc rich primer. Refer to Section 09 9600.
- I. Identify piping systems including underground piping. Refer to Section 22 0553.
- J. Install valves with stems upright or horizontal, not inverted.
- K. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

3.04 FUEL TANK INSTALLATION

- A. Install tanks in accordance with manufacturer's instructions and API RP 1615.
- B. Clean and flush underground tanks prior to delivery to site. Seal until pipe connections are made.

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- C. Install underground tanks on concrete ballast pad with mass equal to tank capacity, and secure with hold-down straps and turnbuckles.
- D. Install underground tanks with minimum 24 inches cover.
- E. Install single wall underground tanks in concrete vault or provide impermeable liner in excavation around tank.
- F. Backfill steel tanks in accordance with NFPA 30 and 31.
- G. Provide piping connections to tanks with unions and swing joints. Provide venting to API Std 2000.
- H. Extend fill line and cover to grade and provide minimum 24 by 24 by 6 inch concrete pad.
- I. Clean and flush day tank prior to delivery to site. Seal until pipe connections are made.
- J. Fill tanks at project turn-over with appropriate fuel.

END OF SECTION

JULES E. MASTBAUM HIGH SCHOOL - BOILER PLANT REPLACEMENT
SDP CONTRACT NO. B-108(c), B-109(c) and B-110(c) of 2017/2018

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**ADDENDUM 002
03 MAY 2019**

NO.	DATE	REVISION
A	03 MAY 2019	ADDENDUM 002

MASTBAUM HIGH SCHOOL
3116 FRANKFORD AVENUE
PHILADELPHIA, PA 19134

PROJECT TITLE
BOILER PLANT REPLACEMENT

SHEET TITLE
PLUMBING NEW WORK PLAN

DRAWING SCALE AS INDICATED	FILE NO. 019
LOCATION NO. 5060	
DRAWN BY CJW	CHECKED BY BMW
8108(c) of 2017/2018 8109(c) of 2017/2018 8110(c) of 2017/2018	

DRAWING NO.
P-101
SHEET 19 OF 26

GENERAL SHEET NOTES

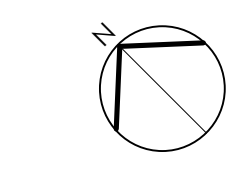
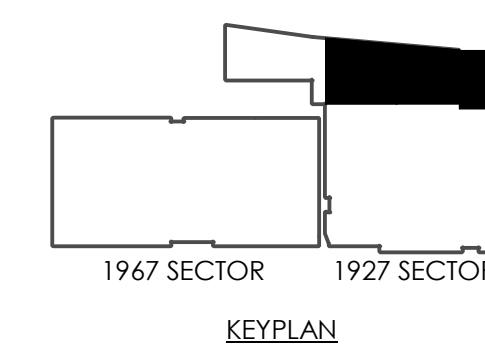
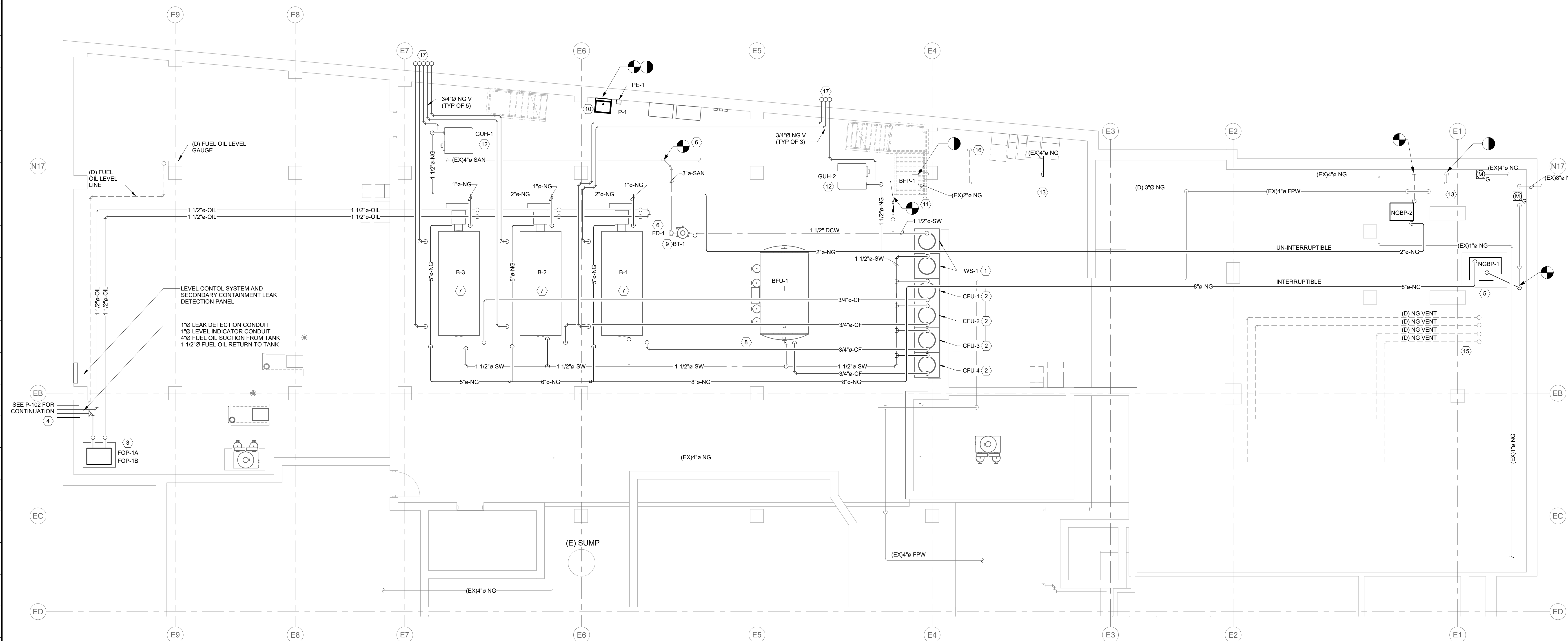
- INSULATE ALL NEW AND EXISTING DOMESTIC WATER, SOFTENED WATER, AND CHEMICAL FEED PIPING. ASSUME 600'-0" OF 2" EXISTING PIPE. VERIFY IN FIELD.
- LABEL ALL NEW PIPING, EQUIPMENT, AND ACCESSORIES.
- PRIME AND FINISH COAT PAINT ALL NEW AND EXISTING NATURAL GAS AND FUEL OIL PIPING IN WORK AREA.
- PATCH PENETRATIONS VACATED BY REMOVAL OF PIPING TO MATCH EXISTING.
- PROVIDE 20 HOURS OF 247 DRAIN CLEANING TO BE SCHEDULED AS NEEDED BY THE SCHOOL DISTRICT OF PHILADELPHIA CONSTRUCTION MANAGER.
- SLEEVE AND SEAL ALL NEW WALL AND FLOOR PENETRATIONS.
- CLEAN ALL EXISTING FLOOR DRAIN IN PROJECT SCOPE.
- PROVIDE A PVC JACKET ON ALL INSULATED PIPING WITHIN 8'-0" OF FINISHED FLOOR.
- FURNISH DISCONNECT SWITCHES FOR ALL NEW MECHANICAL PLUMBING EQUIPMENT TO THE ELECTRICAL CONTRACTOR.

SHEET KEYNOTES

- PROVIDE WATER SOFTENER, CONTROLS, AND ACCESSORIES.
- PROVIDE CHEMICAL FEED UNIT, CONTROLS, AND ACCESSORIES.
- PROVIDE FUEL OIL PUMPSET, CONTROLS, AND ACCESSORIES.
- REFER TO P-102 FOR CONTINUATION.
- PROVIDE NEW NATURAL GAS BOOSTER PUMP, CONTROLS, ACCESSORIES, AND NATURAL GAS PIPING TO BOILERS (INTERRUPTIBLE GAS SERVICE).
- PROVIDE NEW FLOOR DRAIN, SANITARY PIPING, AND TRAP PRIMER. SLOPE SANITARY PIPING AT 1/4" PER LINEAR FOOT.
- PROVIDE SOFTENED WATER AND CHEMICAL FEED PIPING CONNECTIONS TO BOILER. REFER TO BOILER PIPING SCHEMATIC.
- PROVIDE SOFTENED WATER AND CHEMICAL FEED PIPING CONNECTIONS TO BOILER FEED UNIT. REFER TO BOILER FEED UNIT PIPING SCHEMATIC.
- PROVIDE DOMESTIC COLD WATER TO BLOWDOWN QUENCH AFTER-COOLER.
- DISCONNECT AND REMOVE WALL HUNG SINK. PROVIDE NEW WALL-HUNG SINK AND TRAP PRIMER VALVE. RECONNECT DOMESTIC HOT AND COLD WATER, SANITARY PIPING, AND PROVIDE NEW TRAP PRIMER TO NEW FLOOR DRAIN. PROVIDE NEW ISOLATION VALVES AND DOMESTIC HOT AND COLD WATER CONNECTIONS WITH NEW TRAP.
- PROVIDE NEW BACKFLOW PREVENTER AND ACCESSORIES WITH SANITARY DRAIN PIPING DOWN TO FLOOR DRAIN.
- PROVIDE DRAIN PIPING AND CONDENSATE NEUTRALIZATION TANK FROM UNIT HEATER VENT TRAP TO FLOOR DRAIN.
- PROVIDE NEW NATURAL GAS PIPING FROM EXISTING GAS MAIN TO NATURAL GAS UNIT HEATERS AND BOILER PILOTS (NON-INTERRUPTIBLE GAS SERVICE). PROVIDE CONDENSATE DRAIN PIPING FROM VENT TRAP DOWN TO AN INDIRECT CONNECTION AT SINK P-1.
- REMOVE ABANDONED NATURAL GAS PIPING BACK TO MAIN.
- REMOVE NATURAL GAS VENTS, HANGERS, AND ACCESSORIES. SEAL EXTERIOR PENETRATION VACATED BY REMOVED VENTS.
- REMOVE ABANDONED NATURAL GAS PIPING BRANCH AND CAP AT NATURAL GAS MAIN.
- CORE EXTERIOR WALL. PROVIDE NATURAL GAS VENTS FROM EQUIPMENT PRESSURE REGULATORS TO OUTDOORS AND ALONG EXTERIOR WALL UP TO LOW ROOF OF LINE PER PGW STANDARDS. SEAL ANNULAR SPACE AROUND PIPING.

1 PLUMBING NEW WORK PLAN

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



Local File: BM\360\063894-001-SDP - Mastbaum HS Boiler Plant Replacement\063894_M_Central_R18_A360.rvt
Central File: BM\360\063894-001-SDP - Mastbaum HS Boiler Plant Replacement\063894_M_Central_R18_A360.rvt
Project Number: 2
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SEAL:

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**ADDENDUM 002
03 MAY 2017**

NO.	DATE	REVISION
A	03 MAY 2017	ADDENDUM 002

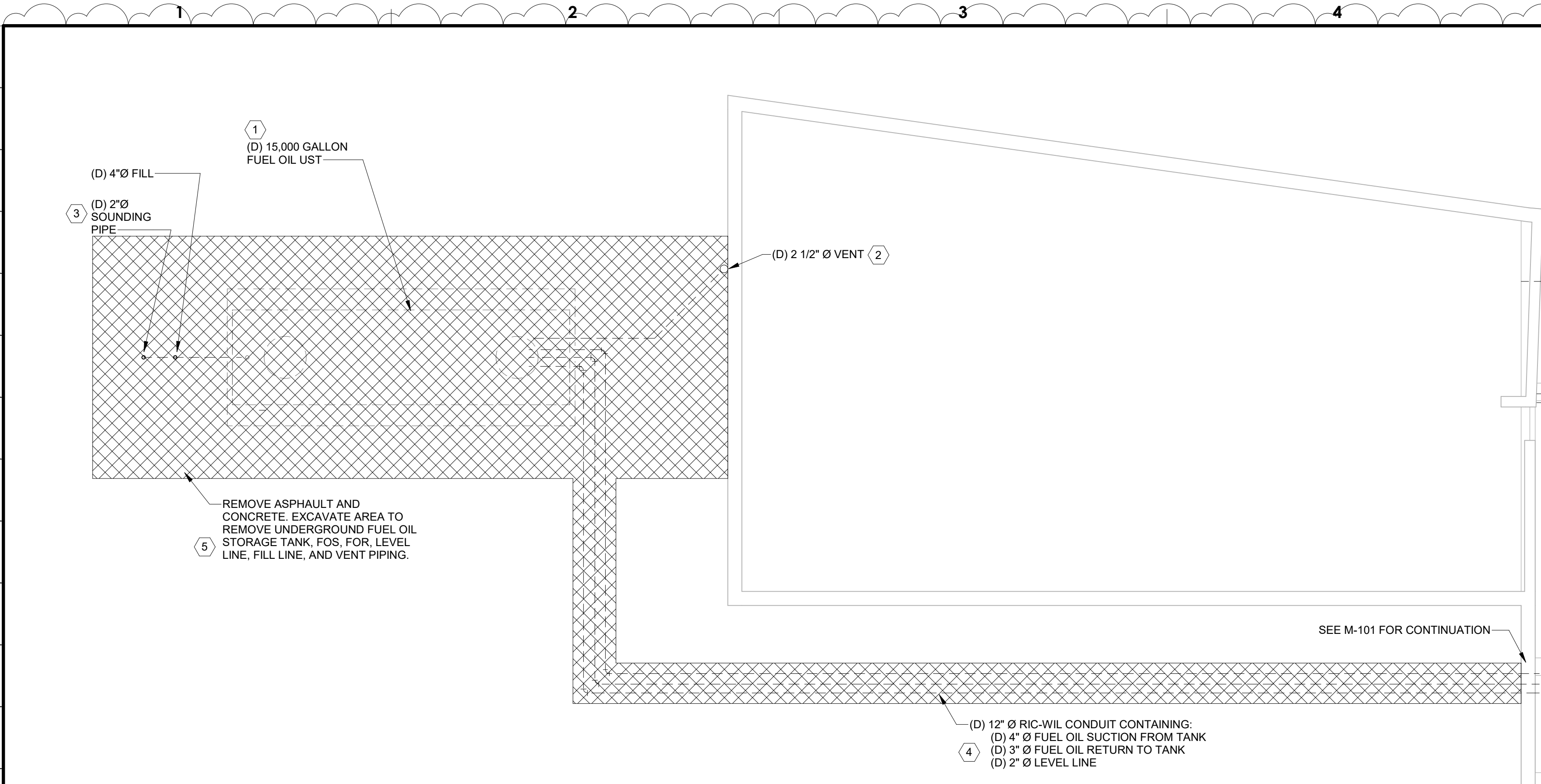
MASTBAUM HIGH SCHOOL
3116 FRANKFORD AVENUE
PHILADELPHIA, PA 19134

PROJECT TITLE
BOILER PLANT REPLACEMENT

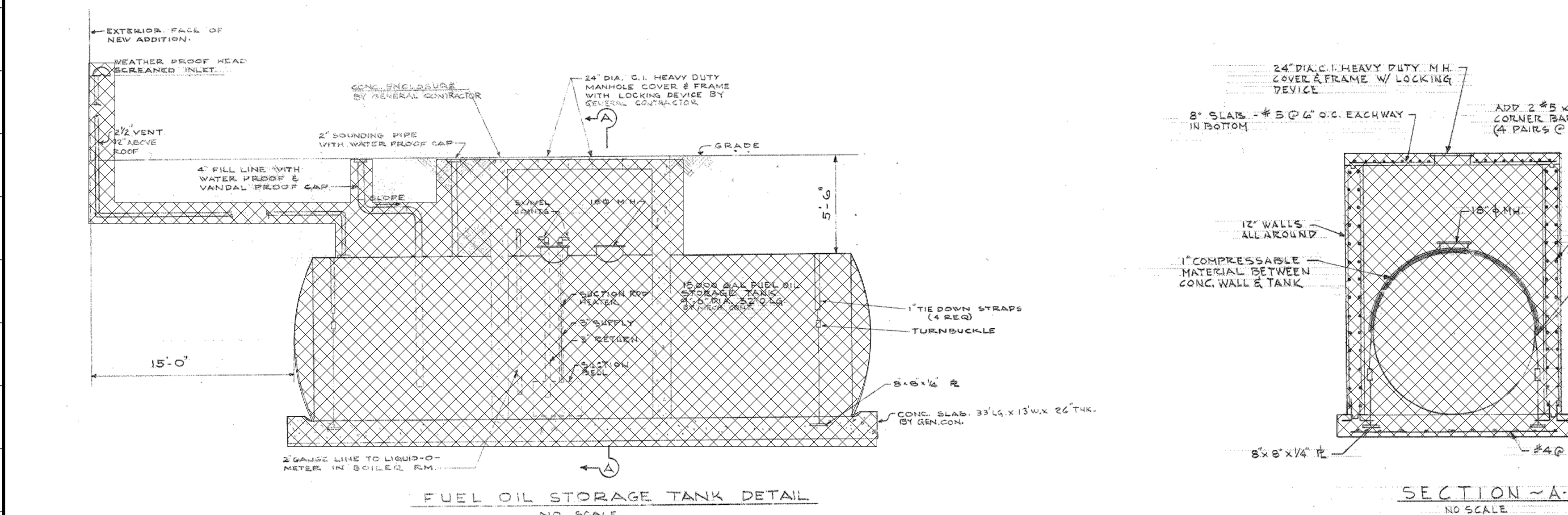
SHEET TITLE
**PLUMBING FUEL OIL TANK
DEMOLITION AND NEW WORK**

DRAWING SCALE	AS INDICATED	FILE NO.
LOCATION NO.	5060	
DRAWN BY	CJW	CHECKED BY BMW
		8108(c) of 2017/2018 8109(c) of 2017/2018 8110(c) of 2017/2018

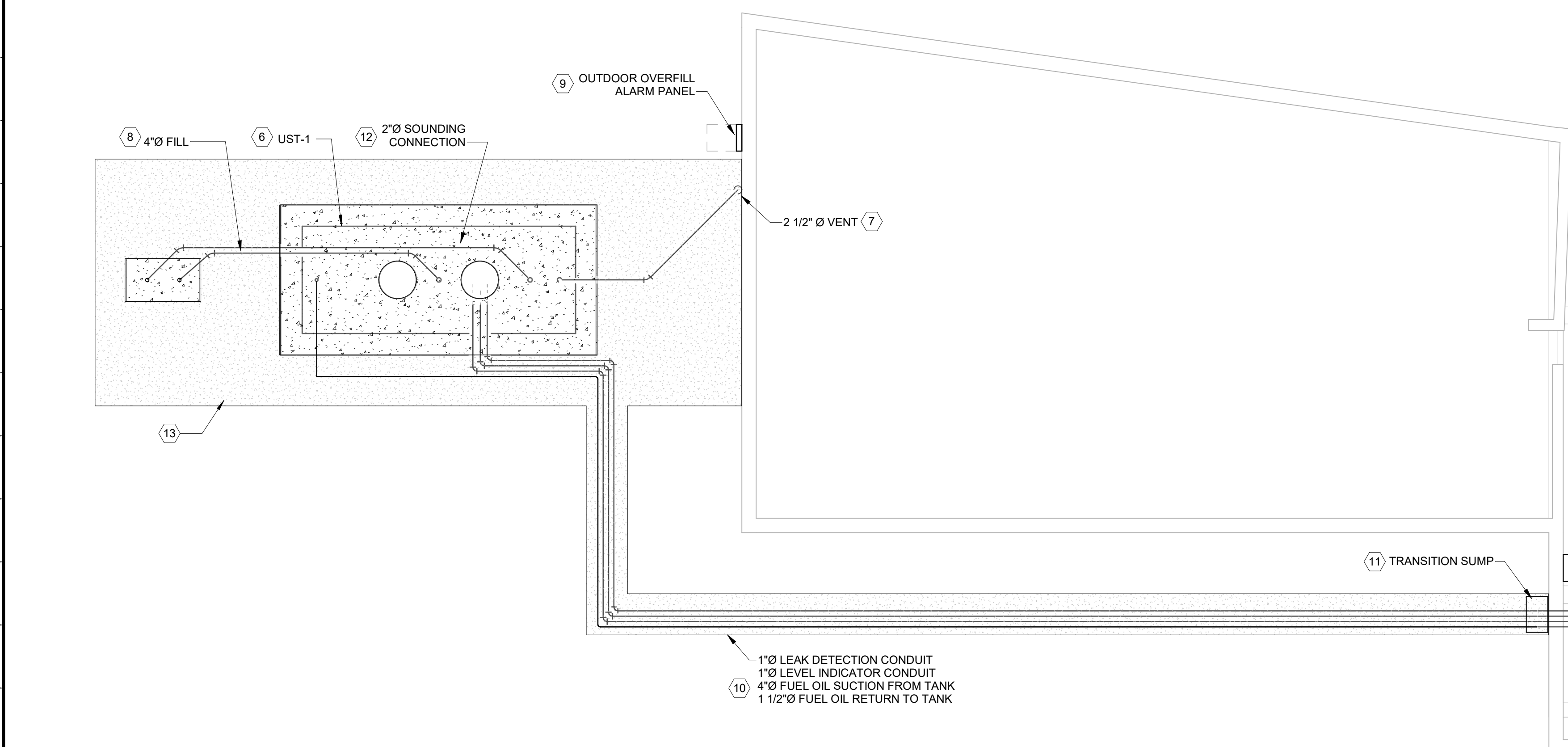
DRAWING NO.
P-102
SHEET 19A OF 26



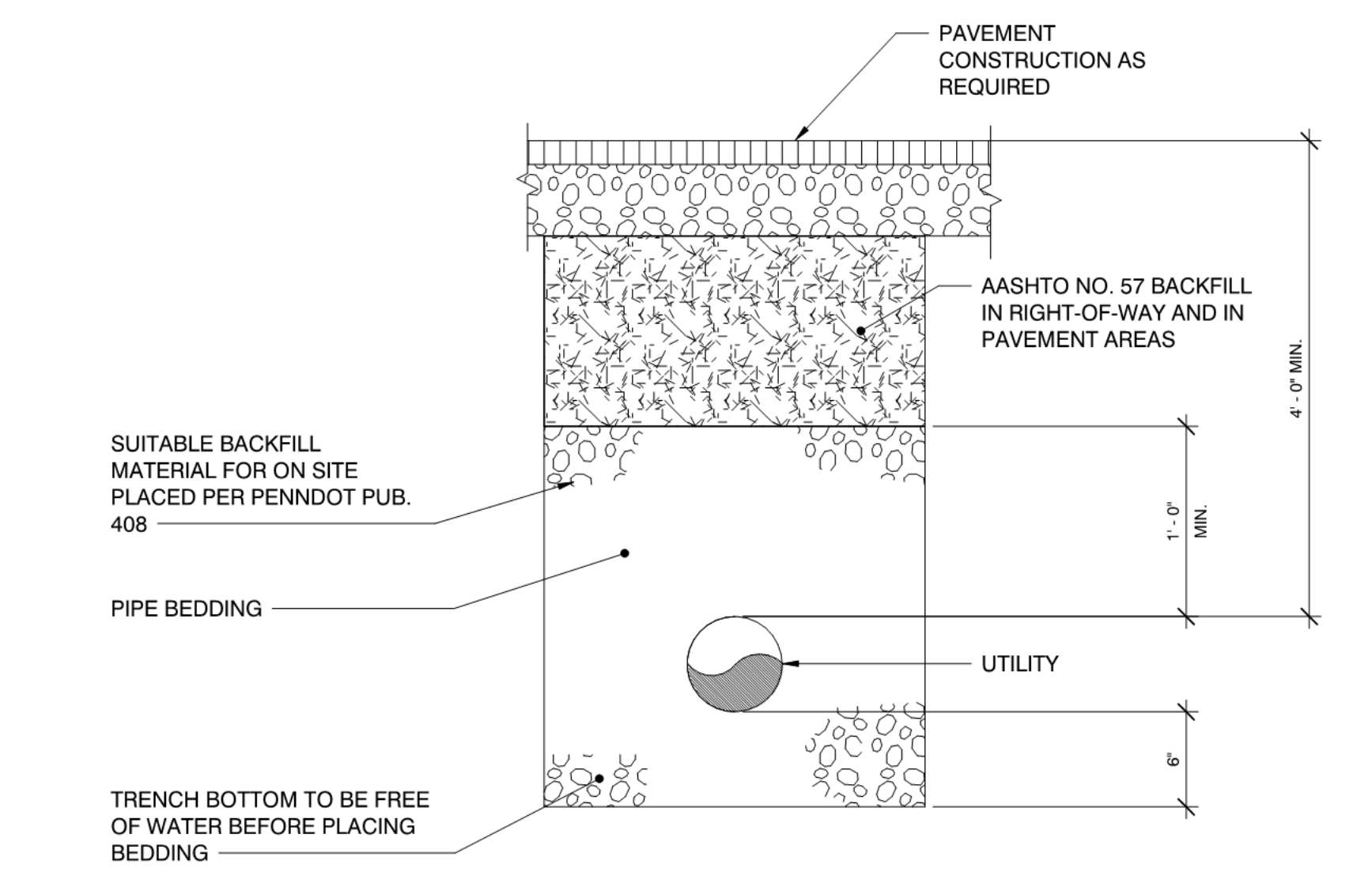
1 UNDERGROUND STORAGE TANK AND FUEL OIL PIPING DEMOLITION PLAN
SCALE: 1/8" = 1'-0"



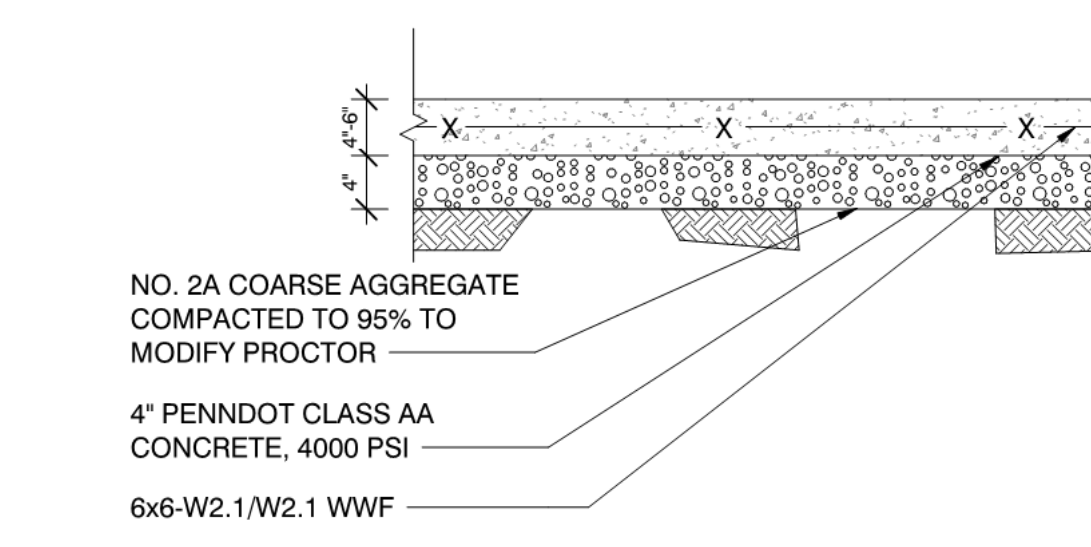
2 UNDERGROUND STORAGE TANK DEMOLITION REFERENCE



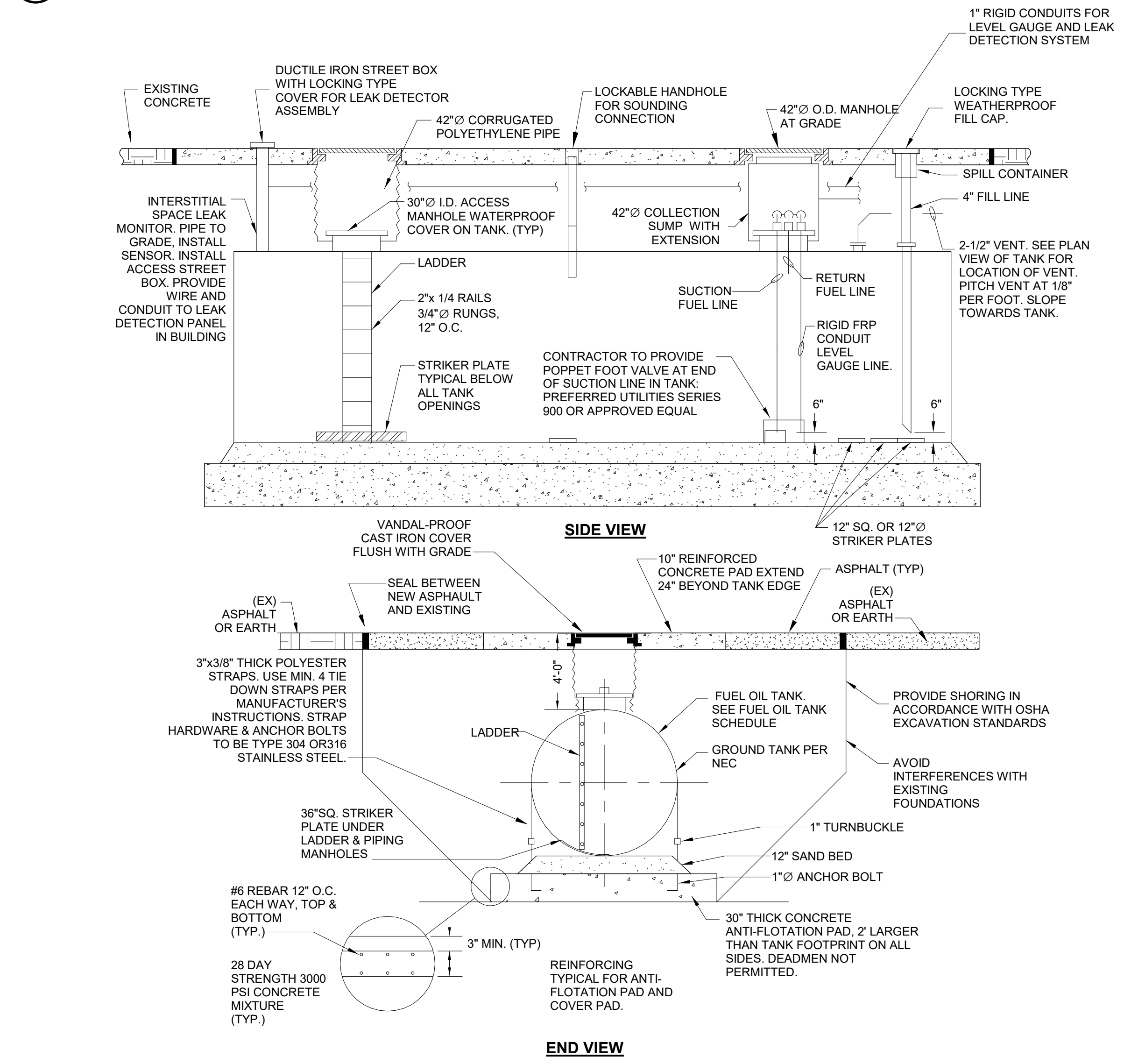
3 UNDERGROUND STORAGE TANK AND FUEL OIL PIPING NEW WORK PLAN
SCALE: 1/8" = 1'-0"



4 TRENCH BACKFILL PAVING DETAIL



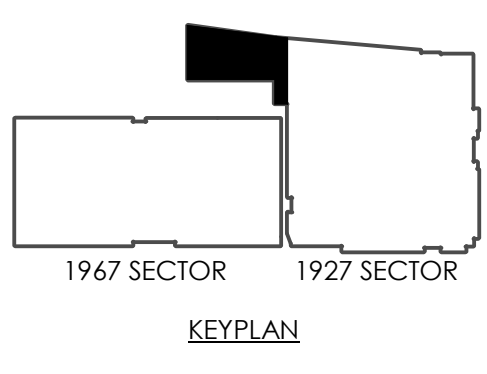
5 CONCRETE PAVING DETAIL



6 UNDERGROUND STORAGE TANK DETAIL

UNDERGROUND STORAGE TANK SCHEDULE									
TAG	FLUID	CAPACITY (GAL)	DIAMETER (FT-IN)	LENGTH (FT-IN)	MANWAY (FT-IN)	CONSTRUCTION	BASIS OF DESIGN		REMARKS
							MANUFACTURER	MODEL	
UST-1	#2 FUEL OIL	15,000	10'-0"	25'-6"	(2) 2'-6"	DOUBLE WALL STEEL	HIGHLAND TANK	ACT-100-U	1,2,3

- PROVIDE UL LABEL.
- PROVIDE WITH INTERNAL LADDER, SUCTION LINE POPPET FOOT, STRIKE PLATES, AND INTERNAL STEEL DIPSTICK PIPE.
- PROVIDE WITH LEVEL MONITORING AND LEAK DETECTION SYSTEM WITH HIGH AND LOW ALARM LIGHTS, AND AUDIBLE ALARMS. PROVIDE REMOTE OVERFILL ALARM WITH AUDIBLE AND VISUAL ALERTS.



Project Number: 2
 5/3/2019 4:16:07 AM
 Local File: BM\360\63894-001-SDP - Mastbaum HS Boiler Plant Replacement\63894_M_Central_R18_A360.rvt
 Central File: BM\360\63894-001-SDP - Mastbaum HS Boiler Plant Replacement\63894_M_Central_R18_A360.rvt

SEAL:

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**ADDENDUM 002
03 MAY 2019**

NO.	DATE	REVISION
A	03 MAY 2019	ADDENDUM 002

MASTBAUM HIGH SCHOOL
3116 FRANKFORD AVENUE
PHILADELPHIA, PA 19134

PROJECT TITLE

BOILER PLANT REPLACEMENT

SHEET TITLE
**MECHANICAL NEW WORK
CENTRAL MECHANICAL
ROOM ENLARGED PLANS**

DRAWING SCALE	FILE NO.
AS INDICATED	5060
LOCATION NO.	009
DRAWN BY	CHECKED BY
ACS	BMW
8108(c) of 2017/2018	
8109(c) of 2017/2018	
8110(c) of 2017/2018	

DRAWING NO.

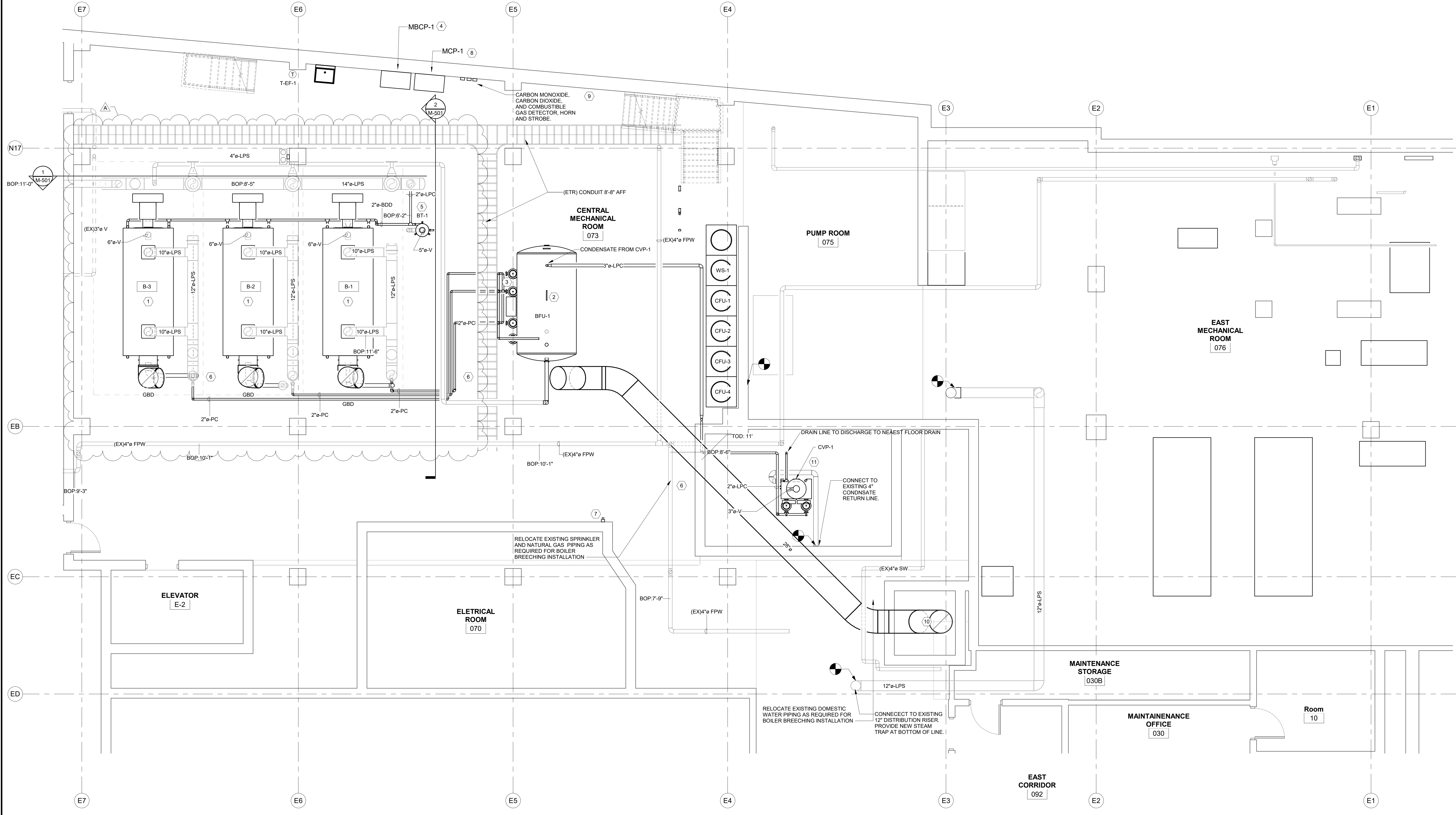
M-402

SHEET 9 OF 26

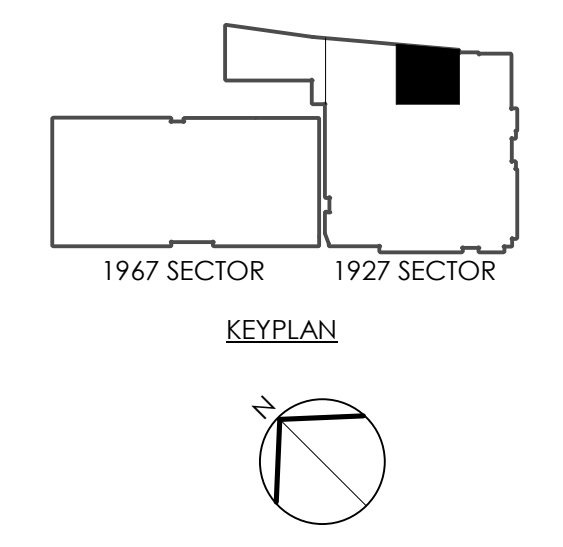
COMBUSTION AIR SCHEDULE							
BOILER	INPUT (BTUH)	2009 IFGC REQUIREMENT FOR SINGLE OPENING (SQ IN / 3000 BTUH)	REQUIRED OPENING (SQ IN)	ASSOCIATED MODS	EACH MOD DIMENSIONS (INxIN)	FREE AREA (%)	TOTAL FREE AREA (SQ IN)
B-1	8660000	1	2886.6	MOD-1, MOD-2	50 x 50	58	1450
B-2	8660000		2886.6	MOD-3	60 x 60	81	2916
B-3	8660000		2886.6	MOD-4	60 x 60	81	2916

- GENERAL SHEET NOTES**
- INSULATE ALL STEAM, STEAM CONDENSATE, STEAM VENT, BLOWDOWN, HEATING HOT WATER, AND BOILER FEED PIPING.
 - PROVIDE A PVC JACKET ON ALL INSULATED PIPING WITHIN 8'-0" OF FINISHED FLOOR.
 - LABEL ALL PIPING BREECHING, EQUIPMENT, AND CONTROLS.
 - FURNISH DISCONNECT SWITCHES FOR ALL NEW MECHANICAL EQUIPMENT TO THE ELECTRICAL CONTRACTOR.
 - PRIME COAT ALL PIPING PRIOR TO INSULATION. FINISH COAT PAINT ALL UN-INSULATED, VALVES, AND ACCESSORIES.
 - PATCH PENETRATIONS VACATED BY REMOVAL OF PIPING TO MATCH EXISTING.
 - SLEEVE AND SEAL ALL NEW WALL AND FLOOR PENETRATORS.

- SHEET KEYNOTES**
- PROVIDE BOILER, BURNER, FUEL OIL PUMP, PIPING, CONTROLS AND ACCESSORIES. MAINTAIN NO LESS THEN THE PENNSYLVANIA LABOR AND INDUSTRY STANDARD 30 INCHES HORIZONTAL CLEARANCE FROM BOILER, BURNER, PIPING, AND BREECHING SURFACES. DO NOT MOUNT AND PIPING OR ACCESSORIES IN A MANNER THAT WOULD PREVENT SERVICING OR REMOVING THE BOILER JACKET. FURNISH DISCONNECT SWITCHES TO ELECTRICAL CONTRACTOR.
 - PROVIDE BOILER FEED UNIT TANK, SUPPORTS, PIPING, CONTROLS, AND ACCESSORIES.
 - PROVIDE BOILER FEED PUMP, PIPING, CONTROLS, AND ACCESSORIES.
 - PROVIDE MAIN BOILER CONTROL PANEL. MBCP-1
 - PROVIDE BLOWDOWN TANK, PIPING, AND ACCESSORIES.
 - PROVIDE DOUBLE WALL, INSULATED BREECHING WITH BACKDRAFT DAMPERS TO EXISTING CHIMNEY. RELOCATE PIPING AS NEEDED TO MAKE CONNECTION.
 - PROVIDE EMERGENCY BOILER SHUT DOWN PUSH BUTTON, WIRING, AND COORDINATE CONDUIT WITH ELECTRICAL CONTRACTOR.
 - PROVIDE MECHANICAL CONTROL PANEL. MCP-1
 - PROVIDE CARBON MONOXIDE, CARBON DIOXIDE, AND COMBUSTIBLE GAS DETECTORS. PROVIDE AUDIBLE HORN AND VISUAL STROBE FOR ALARM CONDITIONS. INTERLOCK WITH MAIN BOILER CONTROL PANEL.
 - PROVIDE SINGLE-WALL CHIMNEY LINER UP THROUGH CHIMNEY, SUPPORT FROM CHIMNEY BASE. PROVIDE STAINLESS STEEL CHIMNEY CAP. COORDINATE WITH GENERAL CONTRACTOR.
 - PROVIDE CONDENSATE VACUUM PUMP, PIPING, AND ALL ASSOCIATED ACCESSORIES. FURNISH DISCONNECT SWITCH TO ELECTRICAL CONTRACTOR.



**MECHANICAL NEW WORK CENTRAL AND EAST MECHANICAL ROOMS ENLARGED
PLAN BELOW 11'6"**
SCALE: 1/4" = 1'-0"



Local File: BMW_360/1036894_001-SDP - Mastbaum HS Boiler Plant Replacement/36894_M_Central_R18_A360.rvt
Central File: BMW_360/1036894_001-SDP - Mastbaum HS Boiler Plant Replacement/36894_M_Central_R18_A360.rvt
Project Number: 2
5/30/2019 6:19:14 AM