**TOWN OF BLACKSTONE, MASSACHUSETTS**
**WATER TREATMENT PLANT**
**CONTRACT 2020-1, DWSRF 6686**

# ADDENDUM NO. 1

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To be considered as part of the contract drawings and specifications and all other contract documents for the project referenced above; superseding previously issued Drawings, Specifications, Bidding Requirements, Contract Documents and Addenda, to the extent modified by this Addendum. Bidders are advised that this Addendum must be acknowledged in the appropriate space provided on the Form of General Bid and the Form for Sub-Bid.

## GENERAL

1. Blackstone Water Treatment Plant – PRECONSTRUCTION CONFERENCE ATTENDEES LIST

Onsite Preconstruction Conference occurred on June 16, 2021 at 10:00am. The Preconstruction Conference Attendees List is attached to this Addendum.

## SPECIFICATIONS

### TABLE OF CONTENTS

Revise the name of the following section in the Table of Contents under Division 02, Existing Conditions as follows;

| | |
|---|---|
| Delete the Section Title; | |
| "Removal of Non-Friable AC Pipe | 02 61 26.16" |
| And replace with; | |
| "Removal of Underground Non-Friable AC Pipe | 02 61 26.16" |

Revise the name of the following section in the Table of Contents under Division 07, Thermal and Moisture Protection as follows;

| | |
|---|---|
| Delete the Section Title; | |
| "Elastomeric Sheet Waterproofing | 07 13 53" |
| And replace with; | |
| "Membrane Water Proofing | 07 13 53" |

Add the following section title to the Table of Contents under Division 09, Finishes;

| | |
|---|---|
| "Resilient Base and Accessories | 09 65 13" |

Delete the following section in the Table of Contents under Division 26, Electrical;

"Packaged Engine Generators 26 32 13"

Revise the name of the following section in the Table of Contents under Division 26, Electrical as follows;

Delete the Section Title;
"Lighting System 26 51 00"
And replace with;
"Interior Lighting 26 51 00"

Add the following section title to the Table of Contents under Division 33, Utilities;

"High Density Polyethylene Pipe 33 11 13.28"

Revise number of the following section in the Table of Contents under Division 46, Water and Wastewater Equipment as follows;

Delete the Section Title;
"Process Chemicals 46 33 00.13"
And replace with;
"Process Chemicals 46 30 00.13"

**SECTION 00 41 13 – FORM FOR GENERAL BID**

Delete "Section 00 41 13 – Form of General Bid" in its entirety and replace with the attached, "Section 00 41 13 – Form of General Bid".

**SECTION 00 41 13.13e – FORM FOR SUB-BID ITEM 2E ELECTRICAL WORK**

Delete "Section 00 41 13.13e – Form for Sub-Bid Item 2e, Electrical Work" in its entirety and add the attached, "Section 00 41 13.13 - Form for Sub-Bid Item 2e, Electrical Work".

**SECTION 00 45 13 – ATTACHMENT A – DCAM UPDATE STATEMENT**

Add the attached title page to Section 00 45 13, "SECTION 00 45 13 ATTACHMENT A DCAM GENERAL CONTRACTOR UPDATE STATEMENT"

**SECTION 00 73 73 – ATTACHMENT C – MBE/WBE BID SPECIFICATIONS**

Add the attached "Section 00 73 73.50 – Attachment C – MBE/WBE Bid Specifications" after the specification section title page.

## SECTION 01 22 00 – MEASUREMENT AND PAYMENT

Remove the following from Paragraph 1.02.A under Alternate No. 1 (Remote Well Building Improvements);

"The lump sum price for Alternate No. 1 shall constitute full compensation for furnishing all labor, materials, tools, and equipment related to improvements to the remote well buildings as shown on the drawings and called for in the specifications."

And replace with;

"The lump sum price for Alternate No. 1 shall constitute full compensation for furnishing all labor, materials, tools, and equipment related to improvements to the remote well buildings including Well 2, Well 4, Well 6, and Well 7 as shown on the drawings and called for in the specifications."

In Paragraph 1.02.A, under Alternate No. 2 (Corrosion Control Facility HVAC Improvements), add the following paragraph;

"Electrical. Alternate No. 2 includes work by the Electrical Filed Sub-Bidder. The value of this work is included as a separate item in the Electrical Filed Sub-Bid and is to be included in the total price for Alternate No. 2. This work includes electrical work related to the Corrosion Control Facility HVAC improvements identified within the contract documents."

## SECTION 05 50 50 – METAL FABRICATIONS

Add the following;

**"**2.016 FLOOR HATCHES / LADDER UP / SAFETY POSTING / NETTING:

1. Frames and covers:

    a. Interior floor doors, frames and covers shall be fabricated from aluminum materials.

    b. Aluminum floor hatches/floor doors, covers and frames shall be extruded aluminum with built-in neoprene cushion and connectors bolted or welded to the exterior.

    c. Door leaf shall be aluminum checkered plate reinforced with aluminum stiffeners as required.

    d. Hinges shall be heavy bronze or stainless steel pintle hinges, compression spring operators enclosed in telescopic tubes, with positive snap latch with turn handles.

    e. The doors shall open to 90 degrees and lock automatically in that position.

f. A vinyl grip handle shall be provided to release and close the cover with one hand. A removable key wrench shall be provided.

g. Doors shall be built to withstand a minimum live load of 300 pounds per square foot and be equipped with a snap lock and removable wrench lift handle.

h. Hardware shall be cadmium plated or stainless steel and factory finish shall be a prime coat of red oxide applied to steel doors and frames, or aluminum mill finish with bituminous coating shall be applied to the exterior of the aluminum frames or stainless steel for corrosive or explosive atmosphere areas.

i. Hatches shall be fabricated in accordance with the details shown on the drawings. Hatch covers and frames shall be manufactured by Bilco Co., New Haven, Connecticut; Inryco/Milnor, Lima, Ohio; U.S.F. Fabrication, Hialeah, Florida; or an approved equal.

j. Hatches shall be gasketed where called for on the plans. Hatches shall not have drains within the frame channels.

k. The manufacturers shall guarantee against defects in material or workmanship for a period of five years from date of Owner's acceptance.

l. Fall through prevention system consisting of hinged aluminum safety grate provided for all access hatches. Hinged grating shall be secured and seat to access hatches as per manufacturer's specifications. Grating shall be factory painted in accordance with Section 099000 with an OSHA safety orange or safety yellow finish.

m. Provide Roof Hatch Safety Railing system equal to "Bil-Guard® 2.0 Roof Hatch Safety Railing System" as manufactured by Bilco or approved equal.

n. Provide stainless steel safety post on ladder assembly equal to "LADDER UP SAFETY POST, LU-3" as manufactured by Bilco or approved equal."

**SECTION 07 00 01 – WATERPROOFING, DAMPPROOFING & CAULKING REQUIREMENTS (FILED SUB-BID REQUIRED)**

Remove the following wording from Paragraph 1.01.C.3;

"Section 07 13 53 – ELASTOMERIC SHEET WATERPROOFING"

And replace with;

"Section 07 13 53 – MEMBRANE WATER PROOFING"

**SECTION 07 13 53 – MEMBRANE WATER PROOFING**

Delete "Section 07 13 53 – Elastomeric Sheet Waterproofing" in its entirety and replace with the attached "Section 07 13 53 – Membrane Water Proofing".

**SECTION 08 11 00 – METAL DOORS AND FRAMES**

Delete "Section 08 11 00 – Metal Doors and Frames" in its entirety and replace with the attached, "Section 08 11 00 – Metal Doors and Frames".

**SECTION 22 11 19 – DOMESTIC WATER PIPING SPECIALTIES**

Delete paragraphs "2.12 TRAP-SEAL PRIMER DEVICE" and "2.13 TRAP-SEAL PRIMER SYSTEMS" in their entirety.

**SECTION 22 13 19 – SANITARY WASTE PIPING SPECIALTIES**

Delete "Section 22 13 19 – Sanitary Waste Piping Specialties" in its entirety and replace with the attached, "Section 22 13 19 – Sanitary Waste Piping Specialties".

**SECTION 26 32 13 – PACKAGED PROPANE ENGINE GENERATOR 80KW**

Delete "Section 26 32 13 – Packaged Propane Engine Generator 80KW" in its entirety.

**SECTION 26 00 01 – ELECTRICAL FILED SUB-BID REQUIREMENTS**

Delete reference to Section "26 23 13" in paragraph 1.1.B.

Add "Drawing E604 – Wiring Diagram" to the list of included filed sub-bid drawings in paragraph 1.1.F.

**SECTION 33 11 13.28 – HIGH DENSITY POLYETHYLENE PIPE**

Add the attached "Section 33 11 13.28 – High Density Polyethylene Pipe".

**SECTION 40 93 00 – INSTRUMENTATION AND CONTROL – GENERAL**

Delete the reference to specification "Section 40 95 63 – Wireless Telemetry" in paragraph 1.02.D.7 in its entirety. There is no specification Section 40 95 63 in this contract.

**SECTION 40 94 43.1 – 40 94 43 ATTACHMENT 1 I/O LISTS**

Add the attached "Blackstone WTP IO List - CFCP" to the end of Section 40 94 43.1 40 94 43 Attachment 1 I/O Lists.

# DRAWINGS

## DRAWING H100A

1. Delete "Sheet H100A" in its entirety and replace with attached "Sheet H100A – HVAC New Building Basin Plan".

## DRAWING H101A

1. Delete "Sheet H101A" in its entirety and replace with attached "Sheet H101A – HVAC New Building First Floor Plan".

## DRAWING H101C

1. Delete "Sheet H101C" in its entirety and replace with attached "Sheet H101C – Well No. 2 and 6 HVAC Floor Plans".

## DRAWING H601

1. Delete "Sheet H601" in its entirety and replace with attached "Sheet H601 – HVAC Schedules".

## DRAWING H701

1. Delete "Sheet H701" in its entirety and replace with attached "Sheet H701 – Mechanical Automatic Temperature Controls".

## DRAWING D603

1. In the Well 8 Flow Diagram delete "160 GPM" and replace with "500 GPM".

## DRAWING E003

1. Delete "Sheet E003" in its entirety and replace with attached "Sheet E003 – Electrical Site Plans".

## DRAWING E201

1. Delete "Sheet E201" in its entirety and replace with attached "Sheet E201 – Electrical Power Plans".

## DRAWING E202

1. Delete "Sheet E202" in its entirety and replace with attached "Sheet E202 – Existing Corrosion Control Facility Electrical Plans".

**DRAWING E401**

1. Delete "Sheet E401" in its entirety and replace with attached "Sheet E401 – Electrical Well Plans Sheet I – Alternate No. 1".

**DRAWING E402**

1. Delete "Sheet E402" in its entirety and replace with attached "Sheet E402 – Electrical Well Plans Sheet II – Alternate No. 1".

**DRAWING E601**

1. Delete "Sheet E601" in its entirety and replace with attached "Sheet E601 – Electrical One Line Diagrams".

**DRAWING E603**

1. Delete "Sheet E603" in its entirety and replace with attached "Sheet E603 – Electrical Schedules Sheet II".

**DRAWING E604**

1. Add the attached "Sheet E604 – Wiring Diagram".

## QUESTIONS

Question: Should any of the electrical equipment at Well 4 be maintained?

Answer: Contractor shall maintain the Honeywell Flow Totalizer as this is currently providing the well station's flow and will continue to do such in the future.

Question: On sheet D602, the Chemical Feed Schematics two ball valves are shown on the bulk tank drain line. Are both needed?

Answer: Only one ball valve is needed on the drain line.

Question: Are the electrical permit fees waived for this project?

Answer: All town based permit fees will be waived by the town. See measurement and payment for fees to the electric utility.

Question: Are all the work sites located within the jurisdiction of Blackstone (for permits)?

Answer: Yes, all work sites are in the town of Blackstone.

Question: Is the GC responsible for utility back charges by allowance?

Answer: Back charges are covered in the allowance listed in Section 01 22 00 – Measurement and Payment.

Question: Does the utility allowance include any possible costs associated with the temporary overhead electrical service drop routing or removal shown on E003?

Answer: The utility allowance includes any and all costs billed by the utility company. Any costs incurred by the electrical contractor will be covered by the base bid.

Question: The electrical filed sub-bid form shows only one alternate. However, note 6 on E202 shows an alternate 2 or is this the GC's responsibility?

Answer: New electrical filed sub-bid form included in this addendum.

Question: Section 26 32 13 does not say that it is the responsibility of the electrical filed sub-bidder in paragraph 1.0. Is that an oversight?

Answer: Section 26 32 13 is removed from the contract via this addendum. See revised drawings.

Question: Is panelboard "HPL1" a 400A MLO (shown on Drawing E603) or a 200A MCB (shown on Drawing E601)?

Answer: HPL1 shall be a 400A MLO panel.

Question: What voltage characteristics are needed out of the new dry type transformer "T1A" for back feeding the CCF structure's existing 150A main breaker? Would it be 120/240V 1PH 3W? Drawing E602 transformer schedule and drawing E602 one line diagram do not appear to make it clear.

Answer: Per drawings E601 and E602 the output of the T1A transformer is 120/240V, 1-phase, 3-wire.

Question: Are the HPL1-14,16,18, & 19,21,23 circuited sump pump SP-1, & -2 disconnect switches shown on drawing E201 associated with the PPL1-2 circuited SP-1, & -2 sump pump control panel?

Answer: Yes, these are the disconnects for the sump pumps. Disconnects shall be wired to sump pump controller. Refer to revised Drawings.

Question: Are the Finish Water Pump FWP-110, & -120 related emergency shut/off switches shown on drawing E201 intended as stop lock-outs? If these are Finish Water Pump equipment stop lock-outs, will the 400AS/250AF fusible disconnects shown on the drawing E01 Electrical One-Line Diagram still be required? If the Finish Water Pump 400AS/250AF fusible disconnects are required, where should they be physically located?

Answer: Yes, the disconnects shall be removed. Refer to revised drawing E601.

Question: Are there any VFD related logic control diagrams available (more than the E502 instrument wiring diagram)?

Answer: Refer to new drawing E604.

Question: What is the location for new panelboard PPL1 in Well Building No. 2?

Answer: Refer to revised drawing.

Question: What are the panel schedules for new panelboards PPL1 (Well Bldg. No. 2), PPL1 (Well Bldg. No. 7), and unnamed new 200A panelboard (Well Bldg. No. 4)?

Answer: Refer to revised drawing.

Question: The existing VFDs located in Well Buildings No. 2 & 7, are they existing to remain or be replaced with new? Drawing E401, Detail 5 indicates existing to remain; Details 2 & 4 indicate new.

Answer: VFDs in Well Buildings No. 2 & 7 are existing and will not be replaced. Refer to revised drawings.

Question: What is the extent of the Utility Company's scope of work? Drawing E003 indicates overhead work to be done by electrical contractor; Drawing E601 indicates this work to be done by Utility.

Answer: Refer to revised note 3 on drawing E003. Electrical contractor is responsible for the coordination of the temporary and new electrical services with the utility company.

Question: What is the extent of the instrumentation scope of work as it pertains to the Division 26 FSB?

Answer: Electrical FSB is responsible for conduit, wire and final terminations per drawings.

Question: Need a specification or a manufacturer for the watertight access manways going into the backwash waste tanks.

Answer: Manway shall meet all required components as seen on sheet A401 - Wall Sections.

Question: Note 4.03 on drawing S001 calls for rebar to be galvanized. Specification calls for rebar to be black. Which one?

Answer: The rebar is to be galvanized.

Question: Are aluminum hatches by Miscellaneous Metals or by GC?

Answer: The aluminum hatches are by the Miscellaneous Metals sub-bidder.

Question: Drawing S-100 calls out sheeting to protect the existing building foundation during the excavation of the new 10-foot deeper foundation. In addition, it appears sheeting will be needed to protect the existing utility pole located to the southwest corner of the new foundation area. Will sheeting be required to be left in place?

Answer: The sheeting will be left in place, cut down either to 4 feet minimum below grade or 2 feet minimum below bottom of new foundations, whichever is lower.

Question: Drawing C202 calls for a 2-inch HDPE pipe (sump discharge from building to existing SMH) and a 4-inch HDPE pipe (sludge discharge from building to existing SMH). What spec. Section is this piping covered under?

Answer: See specification Section 33 11 13.28 – High Density Polyethylene Pipe added via this addendum.

Question: Drawing C202 calls out a 12” steel casing pipe to be provided under the new connection annex. What spec. is the casing pipe to be supplied under? Is the intent to snake the 2” and 4” lines referenced in the question above through this casing pipe and if so: Are spacers required within the casing pipe? How are the ends of the casing pipe to be left (sealed, filled with sand, ect)?

Answer: The minimum thickness is to be 0.429 inches as shown on C202. Yes, the intent is to pass the 2” and 4” lines through the casing pipe. Spacers are not required. The

contractor shall brick and mortar the ends to seal the ends of the casing pipe. Annular space is not required to be filled with sand.

Question: Section 13 42 00, 1.01.A.2 States the insulated standing seam metal roof system shall be installed by Massachusetts Licensed Sheet Metal Workers. Typically, this work is performed by the prefabricated metal building erector as part of the building system as a whole. Can this requirement be removed from the bid documents?

Answer: The Contractor shall adhere to prevailing laws and regulations, including 271 CMR regarding the use of licensed sheet metal workers.

Question: Clarify the intent of paving.

Answer: The hatch shown on sheet C201 denotes the outer limit of paving limits. The total proposed paving area is approximately 2,800 square feet.

Question: Finish Hardware specification Section 08 71 00, paragraph 2.02.K.1.a calls for kickplates to be 10" high. Hardware sets call for them to be 8" high. Please clarify.

Answer: Kickplates to be 10" high.

Question: Hollow Metal specification Section 08 11 00, paragraph 2.01.A calls for Bullet Resistant exterior doors. Are any doors required to be Bullet Resistant? If yes, please advise opening numbers.

Answer: No doors are required to be bullet resistant. See attached revised Specification 08 11 00 – Hollow Metal Doors and Frames.

Question: Hollow Metal specification Section 08 11 00 calls for all doors and frames to be cold-rolled steel. WTP doors and frames are typically furnished A60 galvanneal steel, factory primed. Please advise.

Answer: See attached revised Specification 08 11 00 – Hollow Metal Doors and Frames.

Question: Hollow Metal Details 1 and 2/A801 indicate Thermal-Break frames for exterior openings #100A and 100B, is this correct? The same details indicate a Thermal-Break frame for interior opening #101B, is this correct?

Answer: Yes, thermally broken doors are required for the exterior doors.

Question: There is reference to a Fiber Patch Panel in each of the MCP and CFPCP control panels on Q-100. Are the specifications for the type of connectors and the patch panel itself?

Answer: Contractor can choose. To be coordinated with other fiber optic equipment. (See paragraph 2.05.A.2 of specification Section 40 93 00 – Instrumentation and Control – General)

Question: Is there an I/O list for the CFCP?

Answer: See I/O list for the CFCP attached to this addendum.

Question: Are PDIT-110, 120, & 130 provided by the Filter System Manufacturer? If they are not and are meant to be part of Division 40 could you provide the specifications for those instruments?

Answer: These instruments are to be provided by the filter system vendor.

Question: The remote station that is referred to on the bid form, is that well 4 or all 3 wells?

Answer: See modified language included via this addendum in specification Section 01 22 00 – Measurement and Payment.

Question: Which section owns the Foundation Insulation?

Answer: Below grade rigid insulation is specified in Section 07 21 00 – Thermal Insulation, paragraph 2.01.A. The rigid insulation is the responsibility of the General Contractor.

Question: What are the limits of the dampproofing & Sheet Waterproofing? It's quite conflicting between the Architectural & Structural Drawings.

Answer: Refer to Sheet S101 for dampproofing and waterproofing limits.

Question: Section 07 13 53 calls for EPDM Rubber Sheet Waterproofing below grade. The rep said the product in the spec should not be installed below grade. Please Advise.

Answer: Please see specification Section 07 13 53 – Membrane Water Proofing attached to this addendum.

## ATTACHMENTS

- Preconstruction Conference Attendees List (1 page)

- Contract Specification Section 00 41 13 – Form of General Bid (6 page)
- Contract Specification Section 00 41 13.13, Form for Sub-Bid Item 2e, Electrical Work (4 pages)
- Contract Specification Section 00 45 13 - Attachment A – DCAM Update Statement Cover Sheet (1 page)
- Contract Specification Section 00 73 73.50, Attachment C – MBE/WBE Bid Specifications (16 pages)
- Contract Specification Section 07 13 53 – Membrane Water Proofing (3 pages)
- Contract Specification Section 08 11 00 – Hollow Metal Doors and Frames (7 pages)
- Contract Specification Section 22 13 19 – Sanitary Water Piping Specialties (8 pages)
- Contract Specification Section 33 11 13.28 - High Density Polyethylene Pipe (6 pages)
- Contract Specification Section 40 94 43.1 – Blackstone WTP IO List - CFCP (1 page)
- Sheet H100A – HVAC New Building Basin Plan (1 page)
- Sheet H101A – HVAC New Building First Floor Plan (1 page)
- Sheet H101C – Well No. 2 and 6 HVAC Floor Plans (1 page)
- Sheet H601 – HVAC Schedules (1 page)
- Sheet H701 – Mechanical Automatic Temperature Controls (1 page)
- Sheet E003 – Electrical Site Plans (1 page)
- Sheet E201 – Electrical Power Plans (1 page)
- Sheet E202 – Existing Corrosion Control Facility Electrical Plans (1 page)
- Sheet E401 – Electrical Well Plans Sheet I – Alternate No. 1 (1 page)
- Sheet E402 – Electrical Well Plans Sheet II – Alternate No. 1 (1 page)
- Sheet E601 – Electrical One Line Diagrams (1 page)
- Sheet E603 – Electrical Schedules Sheet II (1 page)
- Sheet E604 – Wiring Diagram (1 page)

**END OF ADDENDUM NO. 1**

TOWN OF BLACKSTONE, MASSACHUSETTS
BY ITS TOWN ADMINISTRATOR

WESTON & SAMPSON ENGINEERS, INC.
READING, MASSACHUSETTS

Blackstone MA, Water Treatment Plant – Preconstruction Conference Attendees List 6/16/2021

## SIGN IN SHEET

| Name | Company/Organization | Phone Number | Email |
|---|---|---|---|
| Sam Kenney | Weston & Sampson | 978-532-1900 | KenneyS@wseinc.com |
| Hayden Brown | R.H. White Construction | 508-832-3295 | HBrown@rhwhite.com |
| Keith Karge | Ostrow Electric | 774-267-9398 | bostrow@ostrowelectric.com |
| Ken DeVries | LaFluer Electric | 508-864-0474 | kdevries@lafluerelectric.com |
| Jim Ramos | Hart Engineering | 401-658-4600 | Jramos@hartcompanies.com |
| Mike Field | Wayne I Griffin Electric | 508-306-5330 | mfield@wjgei.com |
| Dustin Crus | R.H. White Construction | 508-723-4880 | Dcrus@rhwhite.com |
| Jordan Thomas | R.H. White Construction | 774-772-0761 | Jthomas@rhwhite.com |
| Allen Coffey | WES Construction | 781-201-0715 | Acoffey@wesconstruction.com |
| Alfred D. Myette | Fall River Electrical Associates Co. Inc. | 508-674-2820 | almyette@frea.biz |
| Mike Deso | Lockwood Remediation - (Dewatering Water Treatment) | 774-239-5855 | mdeso@lrt-llc.net |

SECTION 00 41 13

FORM OF GENERAL BID

To the Awarding Authority:

A. The Undersigned proposes to furnish all labor and materials required for the **Water Treatment Plant, DWSRF 6686** in Blackstone, Massachusetts, in accordance with the accompanying plans and specifications prepared by Weston & Sampson Engineers, Inc. for the contract price specified below, subject to additions and deductions according to the terms of the specifications.

B. This bid includes addenda numbered _____.

C. The proposed contract price is

_____dollars

and _____ cents ($_____).

For Alternate No. 1 (Remote Well Building Improvements)

Add $_____dollars and

_____ cents ($_____).

For Alternate No. 2 (Corrosion Control Facility HVAC Improvements)

Add $_____dollars and

_____ cents ($_____).

D. The subdivision of the proposed contract price is as follows:
Item 1. The work of the general contractor, being all work other than that covered by Item 2,

$ _____ (Base Bid)

$ _____(Alternate No. 1).

$ _____(Base Bid plus Alternate No. 1).

$ _____(Alternate No. 2).

$ _____(Base Bid plus Alternate No. 1 plus Alternate No. 2).

Item 2. Sub-bids as follows:

| Sub Trade | Name of Sub-Bidder | Amount | Bond Required "Y" or "N" |
|---|---|---|---|
| 2a. Waterproofing, Dampproofing, and Caulking | | | |
| 2b. Painting (for Base Bid) | | | |
| Painting (For Alt. No. 1) | | | |
| 2c. Plumbing | | | |
| 2d. Heating, Ventilating, and Air Conditioning (HVAC) (for Base Bid) | | | |
| HVAC (for Alt. No. 1) | | | |
| HVAC (for Alt. No. 2) | | | |
| 2e. Electrical Work (for Base Bid) | | | |
| Electrical (for Alt. No. 1) | | | |
| Electrical (for Alt. No. 2) | | | |
| 2f. Miscellaneous Metals and Ornamental Iron | | | |

**Total of Item 2:**

| | |
|---|---|
| **$** | **Base Bid** |
| **$** | (Alt. No 1) |
| **$** | **Base Bid + Alt No. 1** |
| **$** | (Alt. No. 2) |
| **$** | **Base Bid + Alt. No. 2** |

The undersigned agrees that each of the above-named sub-bidders will be used for the work indicated at the amount stated, unless a substitution is made. The undersigned further agrees to pay the premiums for the performance and payment bonds furnished by sub-bidders as requested herein and that all of the cost of all such premiums is included in the amount set forth in Item 1 of this bid.

The undersigned agrees that if it is selected as general contractor, it will promptly confer with the awarding authority on the question of sub-bidders; and that the awarding authority may substitute for any sub-bid listed above a sub-bid filed with the awarding authority by another

sub-bidder for the sub-trade against whose standing and ability the undersigned makes no objection; and that the undersigned will use all such finally selected sub-bidders at the amounts named in their respective sub-bids and be in every way as responsible for them and their work as if they had been originally named in this general bid, the total contract price being adjusted to conform thereto.

The undersigned agrees that, if it is selected as general contractor, it will within five days, Saturdays, Sundays and legal holidays excluded, after presentation thereof by the awarding authority, execute a contract in accordance with the terms of this bid and furnish a performance bond and also a labor and materials or payment bond, each of a surety company qualified to do business under the laws of the commonwealth and satisfactory to the awarding authority and each in the sum of the contract price, the premiums for which are to be paid by the general contractor and are included in the contract price.

The undersigned hereby certifies that it is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the work; that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee**;** and that it will comply fully with all laws and regulations applicable to awards made subject to section 44A.

The undersigned further certifies under the penalties of perjury that this bid is in all respects bona fide, fair and made without collusion or fraud with any other person. The word "person" shall mean any natural person, joint venture, partnership, corporation or other business or legal entity which sells materials, equipment or supplies used in or for, or engages in the performance of, the same or similar construction, reconstruction, installation, demolition, maintenance or repair work or any part thereof.

The undersigned further certifies under penalty of perjury that the said undersigned is not presently debarred from doing public construction work in the Commonwealth of Massachusetts under the provisions of Section Twenty-Nine F of Chapter Twenty-Nine, Section 25C (10) of Chapter 152 (workers' compensation) or any other applicable debarment provisions of any other Chapter of the General Laws or any rule or regulations promulgated thereunder; and is not

presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency.

Bidders must fully comply with Subpart C of 2 CFR Part 180 and 2 CFR Part1532, entitled Responsibilities of Participants Regarding Transactions (Doing Business with Other Persons). Contractors, subcontractors, or suppliers that appear on the Excluded Parties List System at sam.gov are not eligible for award of any contracts funded by the Massachusetts State Revolving Fund.

The Bidder hereby agrees that if selected as the Contractor it will commence work under this contract on or before a date to be fixed in the written "Notice to Proceed" given by the Owner to the Contractor, to achieve substantial completion by December 31, 2022 and to fully complete the project by April 30, 2023. The Bidder further agrees to pay as liquidated damages the sum of $1,500 for each consecutive calendar day thereafter during which the work has not achieved substantial completion, as defined in the "Substantial Completion" provisions of Section 00 72 00 GENERAL CONDITIONS and as provided in the "Liquidated Damages" provisions of Section 00 73 00 SUPPLEMENTARY CONDITIONS.

The undersigned understands that all bids for this project are subject to the applicable bidding laws of the Commonwealth of Massachusetts, including General Laws Chapter 149, Sections 44A to 44J, as amended. Every bidder (including sub-bidders) must furnish the DCAM Update Statement with the bid.

The contract will be awarded to the lowest responsible and eligible bidder based on the Base Bid and applicable sub-bids, OR the Base Bid and Alternate 1 and applicable sub-bids, OR the Base Bid and Alternates 1 and 2 and applicable sub-bids.

The undersigned understands that the Owner reserves the right to reject any or all bids and to waive any informalities in the bidding.

The time period for holding bids, where Federal approval is not required is 30 days, Saturdays, Sundays and legal holidays excluded, after the opening of the bids and where Federal

approval is required, the time period for holding bids is 30 days, Saturdays, Sundays and holidays excluded after Federal approval.

The undersigned agrees that this bid shall be good and may not be withdrawn for a period of 60 days, Saturdays, Sundays and legal holidays excluded, after the opening of bids.

Bid security in the form of a bid bond, cash, certified check, treasurer's or cashier's check, payable to the Owner, in a dollar amount of 5 percent of the total bid, in accordance with the conditions in the INSTRUCTION TO BIDDERS, has been attached to this bid.

Pursuant to M.G.L. CH. 62C, Sec 49A, I certify under the penalties of perjury that I have complied with all laws of the Commonwealth relating to taxes, reporting of employees and contractors, and withholding and remitting child support.

Disadvantaged Business Enterprise (DBE) goals are applicable to the total dollars paid to the construction contract. The goals for this project are a minimum of 4.2 percent D/MBE participation and 4.5 percent D/WBE participation by certified DBEs. The two low Bidders shall submit completed DBE forms (EEO-DEP-190, EEO-DEP-191and the DBE Certification of United States Citizenship form) by the close of business on the third business day after bid opening. Failure to comply with the requirements of this paragraph may be deemed to render a proposal nonresponsive. No waiver of any provision of this section will be granted unless approved by the Department of Environmental Protection (MassDEP).

The undersigned Bidder hereby certifies it will comply with the specific affirmative action steps contained in the EEO/AA provisions of this Contract, including compliance with the Disadvantaged Business Enterprise provisions as required under these contract provisions. The contractor receiving the award of the contract shall incorporate the EEO/AA provisions of this contract into all subcontracts and purchase orders so that such provisions will be binding upon each subcontractor or vendor.

The undersigned certifies under penalties of perjury that there have been no substantial changes in its financial position or business organization other than those changes noted within the application since the applicant's most recent pre-qualification statement.

Respectfully submitted:

Date _____ By _____

(Signature)

_____

(Name - Typed or Printed)

_____

(Title)

(SEAL - if bid is by a corporation) _____

(Business Name)

_____

(Federal ID Number)

_____

(Business Address)

_____

(City and State)

_____

(Telephone Number)

_____

(Fax Number)

P:\MA\Blackstone MA\2200740 WTP Design\Specifications\Div-00 Procurement and Contracting Requirements\00 41 13-Form of Gen. Bid.docx

SECTION 00 41 13.13

FORM FOR SUB-BID ITEM 2e

**Electrical Work**

To All General Bidders Except Those Excluded:

The undersigned proposes to furnish all labor and materials required for completing, in accordance with the hereinafter described plans, specifications and addenda, all the work specified in ***Division 26*** of the specifications and in any plans specified in such section, prepared by Weston & Sampson Engineers, Inc. for construction of Town of Blackstone WTP in Blackstone, Massachusetts, for the contract sum of

_____ Dollars*

($_____).

*** All entries must be made clearly and in ink.**

For Alternate No. 1 (Remote Well Building Improvements),

Add $_____dollars

For Alternate No. 2 (Electrical Work Associated with HVAC Equipment),

Add $_____dollars

B. This sub-bid includes addenda numbered _____.

C. This sub-bid

(___) may be used by any general bidder except:

_____

_____

_____

_____

(__) may only be used by the following general bidders:

_____

_____

**(To exclude general bidders, insert "X" in one box only and fill in blank following that box. Do not answer C if no general bidders are excluded.)**

D. The undersigned agrees that, if it is selected as a sub-bidder it will, within five (5) days, Saturdays, Sundays, and legal holidays excluded, after presentation of a subcontract by the general bidder selected as the general contractor, execute with such general bidder a subcontract in accordance with the terms of this sub-bid, and contingent upon the execution of the general contract, and, if requested so to do in the general bid by the general bidder, who shall pay the premiums therefor, or if prequalification is required pursuant to section 44D 3/4, furnish a performance and payment bond of a surety company qualified to do business under the laws of the Commonwealth and satisfactory to the awarding authority, in the full sum of the subcontract price.

E. The names of all persons, firms and corporations furnishing to the undersigned labor or labor and materials for the class or classes or part thereof of work for which the provisions of the section of the specifications for this sub-trade require a listing in this paragraph, including the undersigned if customarily furnished by persons on his own payroll and in the absence of a contrary provision in the specifications, the name of each such class of work or part thereto and the bid price for each such class of work or part thereof are:

| Name | Class of Work | Bid Price |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

**(Do not give bid price for any class or part thereof furnished by undersigned.)**

F. The undersigned agrees that the above list of bids to the undersigned represents bona fide bids based on the hereinbefore described plans, specifications and addenda and that, if the undersigned is awarded the contract, they will be used for the work indicated at the amounts stated, if satisfactory to the awarding authority.

G. The undersigned further agrees to be bound to the General Contractor by the terms of the hereinbefore described plans, specifications, including all general and supplemental general conditions stated therein, and addenda, and to assume toward it all the obligations and responsibilities that it, by those documents, assumes toward the Owner.

H. The undersigned offers the following information as evidence of its qualifications to perform the work as bid upon according to all the requirements of the plans and specifications:

1. Have been in business under present business name _____ years.

2. Ever failed to complete any work awarded? _____

3. List one or more recent buildings with names of General Contractor and architect on which you served as a subcontractor for work of similar character as required for the above-named building.

| | Building | Architect | General Contractor | Amount of Contract |
|---|---|---|---|---|
| a. | | | | |
| b. | | | | |
| c. | | | | |

4. Bank reference _____

I. The undersigned hereby certifies it is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the work; that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee: and that it will comply fully with all laws and regulations applicable to awards of subcontracts subject to section 44F.

J. The undersigned understands that all bids for this project are subject to the applicable bidding laws of the Commonwealth of Massachusetts, including General Laws Chapter 149, Sections 44A to 44J, as amended. Every sub-bidder must furnish the DCAM Sub-bidder Update Statement with the bid.

K. The undersigned agrees to comply with the applicable portions of Division 00 and 01 of the project specifications, and other sections of the specification as referenced. The undersigned also agrees to coordinate all work with that of other trades to avoid conflict of equipment, so that the work of the entire project, including all trades, shall not be delayed or interfered with.

L. Bid security in the form of a bid bond, cash, certified check, treasurer's or cashier's check, payable to the Owner, in a dollar amount of 5 percent of the total bid, in accordance with the conditions in the INSTRUCTIONS TO BIDDERS, has been attached to this bid.

M. The successful sub-bidder shall be required to submit to the General Contractor a signed certification showing compliance with the minority manpower ratios and specific action steps contained in The Commonwealth of Massachusetts Equal Employment Opportunity Anti-Discrimination and Affirmative Action Program reprinted in Section 00 73 73.16 of this specification.

N. The undersigned further certifies under the penalties of perjury that this sub-bid is in all respects bona fide, fair and made without collusion or fraud with any other person. As used in this subsection the word "person" shall mean any natural person, joint venture, partnership, corporation or other business or legal entity. The undersigned further certifies under penalty of perjury that the said undersigned is not presently debarred from doing public construction work in the Commonwealth under the provisions of section twenty-nine F of chapter twenty-nine, or any other applicable debarment provisions of any other chapter of the General Laws or any rule or regulation promulgated thereunder.

Date: _____

_____
(Name of Sub-bidder)

By: _____
(Title and Name of Person Signing Bid)

(SEAL - if bid is by a corporation)

_____
(Business Address)

_____
(City and State)

_____
(Telephone Number)

_____
(Fax Number)

END OF SECTION

SECTION 00 45 13

ATTACHMENT A

DCAM GENERAL CONTRACTOR UPDATE STATEMENT

# APPENDIX E
# CONSTRUCTION BID SPECIFICATIONS
# SPECIAL PROVISIONS FOR DISADVANTAGED BUSINESS ENTERPRISES
# MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
## DIVISION OF MUNICIPAL SERVICES

## DISADVANTAGED BUSINESS ENTERPRISE PROGRAM BACKGROUND

In May 2008 a United States Environmental Protection Agency (EPA) rule became effective that changed the Minority Business Enterprise (MBE) and Women Business Enterprise (WBE) Program to a Disadvantaged Business Enterprise (DBE) Program.

For firms to qualify under the old MBE/WBE program they needed to be socially disadvantaged and had to be certified by the Supplier Diversity Office (SDO). Under the new DBE rule, the firms must be both **socially** and **economically** disadvantaged, **citizens of the United States**, and certified as a DBE. Women and certain minorities are presumed to be socially disadvantaged. The economic disadvantage is measured by the owner's initial and continuing personal net worth of less than $1,320,000.

Because the Clean Water Act requires the use of MBEs and WBEs, these firms will still be utilized in the State Revolving Fund (SRF) Loan Program, but they must also be certified as DBEs.

SDO will continue to be the certifying agency for the SRF program. SDO certifies firms under the federal Department of Transportation program, which is acceptable for use in the SRF program. An additional form has been added to the DBE package to verify that DBEs are owned or controlled by United States citizens.

## BID SPECIFICATIONS

**I.** In this contract, the percentage of business activity to be performed by disadvantaged business enterprise(s) (DBE) shall not be less than the following percentages of the total contract price or the percentage submitted by the contractor in the Schedule of Participation, whichever is greater:

Disadvantaged MBE (D/MBE) 4.2% Disadvantaged WBE (D/WBE) 4.5%

## II. DEFINITIONS

For the purpose of these provisions, the following terms are defined as follows:

A. Awarding Authority – Entity that awards a prime contract under a State Revolving Fund loan.

B. Bidder - Any individual, partnership, joint venture, corporation, or firm submitting a price, directly or through an authorized representative, for the purpose of performing construction or construction related activities under a Contract.

C. Certified DBE – A DBE certified by the United States Small Business Administration, under its 8(a) Business Development Program (13 CFR part 124, subpart A) or its Small Disadvantaged Business Program (13 CFR part 124, subpart B); The United States Department of Transportation (DOT), under its regulations for Participation by DBSs in DOT programs (49 CFR parts 23 and 26); or SDO in accordance with 40 CFR part 33; provided that the certification meets the U.S. citizenship requirement under 40 CFR §33.202 or §33.203.

D. Compliance Unit - A subdivision of MassDEP's Affirmative Action Office designated to ensure compliance under these provisions.

E. Contractor - Any business that contracts or subcontracts for construction, demolition, renovation, survey, or maintenance work in the various classifications customarily used in work and that is acting in this capacity under the subject contract.

F. Construction Related Services - Those services performed at the work site ancillary to, and/or in support of, the construction work, such as hauling, trucking, equipment operation, surveying or other technical services, etc. For the purposes hereof, supply and delivery of materials (e.g. pre-cast concrete elements) to the site by a supplier who has manufactured those goods, or substantially altered them before re-sales shall be considered as "construction related services

G. Construction Work - The activities at the work site, or labor and use of materials in the performance of constructing, reconstructing, erecting, demolishing, altering, installing, disassembling, excavating, etc, all or part of the work required by the Contract Documents.

H. Disadvantaged Business Enterprise (DBE) - An entity owned or controlled by a socially and economically disadvantaged individual as described by Public Law 102-389 (42 U.S.C. 4370d) or an entity owned and controlled by a socially and economically disadvantaged individual as described by Title X of the Clean Air Act Amendments of 1990 (42 U.S.C. 7601 note); a Small Business Enterprise (SBE); a Small Business in a Rural Area (SBRA); or a Labor Surplus Area Firm (LAF), a Historically Underutilized Business (HUB) Zone Small Business Concern, or a concern under a successor program.

I. Equipment Rental Firm - A firm that owns equipment and assumes actual and contractual responsibility for renting said equipment to perform a useful function of the work of the contract consistent with normal industry practice

J. Good Faith Efforts – The race and/or gender neutral measures described in 40 CFR 33, subpart C.

K. HUBZone - A historically underutilized business zone, which is an area located within one or more qualified census tracts, qualified metropolitan counties, or lands within the external boundaries of an Indian reservation.

L. HUBZone small business concern - A small business concern that appears on the List of Qualified HUBZone Small Business Concerns maintained by the Small Business Administration.

M. Joint Venture - An agreement between SDO certified DBE and a non-DBE or non-DBE controlled enterprise.

1. A pairing of companies will be considered a DBE joint venture if the SDO certified DBE which is part of the relationship has more than 51% of the profits that are derived from that project.

2. A joint venture between a certified DBE subcontractor and a non DBE subcontractor, in which the DBE for that proportion of the joint venture's contract equal to the DBE participation in the joint venture.

3. Whenever a general bid is filed by a joint venture with a certified DBE participant in the joint venture that does not exercise more than 51% control over management and profits, that joint venture shall be entitled to credit as a DBE for that portion of the joint venture's contract equal to the DBE participation in the joint venture. Minority As deemed by SDO.

N. Labor surplus area firm (LSAF) - A concern that together with its first-tier subcontractors will perform substantially in labor surplus areas (as identified by the Department of Labor in accordance with 20 CFR part 654). Performance is substantially in labor surplus areas if the costs incurred under the contract on account of manufacturing, production or performance of appropriate services in labor surplus areas exceed 50 percent of the contract price.

O. Letter of Intent – Certified document signed by the principal(s) of the DBE with respect to the work to be performed under contract.

P. Local Government Unit (LGU) – A city, town, or municipal district which applies for a loan under the Clean Water Trust Program.

Q. Material Supplier – A vendor certified by SDO as a DBE in sales to supply industry from an established place of business or source of supply, and that vendor.

1. Manufactures goods from raw materials, or substantially utilizes them in the work, or substantially alters them before resale, entitling the general contractor to DBE credit for 100% of the purchase order.

2. Provides and maintains a storage facility for materials utilized in the work, entitling the general contractor to DBE credit for 10% of the purchase order

R. Minority and Women Business Enterprise (M/WBE) – Any business concern certified by the SDO as a bona-fide M/WBE. A bona-fide M/WBE is a business whose minority group/women ownership interests are real, which have at least 51% ownership and control over management and operation.

S. Percent of Total Price – Is the percentage to be paid to the DBE, work they perform, as compared to the total bid price

T. Recipient - An agency, person or political subdivision which has been awarded or received financial assistance by the Trust or MassDEP.

U. Small business, small business concern or small business enterprise (SBE) - A concern, including its affiliates, that is independently owned and operated, not dominant in the field of operation in which it is bidding, and qualified as a small business under the criteria and size standards in 13 CFR part 121.

V. Small business in a rural area (SBRA) - A small business operating in an area identified as a rural county with a code 6-9 in the Rural-Urban continuum Classification Code developed by the United States Department of Agriculture in 1980.

W. SDO – The Supplier Diversity Office.

X. Subcontractor – A company, firm, joint venture, or individual who enters into an agreement with a contractor to provide services pursuant to an award of financial assistance.

Y. Total Contract Price – The total amount of compensation to be paid for all materials, work or services rendered in the performance of the contract

Z. Trust – The Massachusetts Clean Water Trust established by M.G.L. c.29.

## III. REQUIREMENTS FOR CONTRACT AWARD

DBE packages must be submitted by the two lowest bidders on the project. Following bid opening, the LGU shall notify the two lowest bidders to submit DBE packages to the LGU or the LGUs consultant, as directed. By the close of business on the third business day after notification, the two lowest bidders, including a bidder who is a MBE, WBE or DBE, shall submit the following information:

A. A Schedule of Participation (Form EEO-DEP-190). The Schedule of Participation shall list those certified DBEs the bidder intends to use in fulfilling the contract obligations, the nature of the work to be performed by each certified DBE subcontractor and the total price they are to be paid.

1. A listing of bona-fide services such as a professional, technical, consultant or managerial services, assistance in the procurement of essential personnel, facilities, equipment, materials, or supplies required for performance of the contract, and reasonable fees or commissions charged.

2. A listing of haulers, truckers, or delivery services, not the contractors, including reasonable fees for delivery of said materials or supplies to be included on the project.

B. A Letter of Intent (Form EEO-DEP-191) for each DBE the bidder intends to use on the project. The Letter of Intent shall include, among other things, a reasonable description of the work the certified DBE is proposing to perform and the prices the certified DBE proposes to charge for the work. A Letter of Intent shall be jointly signed by the certified DBE and the General Contractor who proposes to use them in the performance of the Contract.

C. Each DBE must also sign and return the DBE Certification of United States Citizenship form to verify that the firm is owned or controlled by a United States citizen.

D. The SDO "DBE Certification" as prepared by each certified DBE.

E. A completed Request for Waiver form and backup documentation should the goals not be achieved (See IV below).

## IV. REQUIREMENTS FOR MODIFICATION OR WAIVERS.

The bidder shall make every possible effort to meet the minimum requirements of certified DBE participation. If the percentage of DBE participation submitted by the bidder on its Schedule of Participation (EEO-DEP-190) does not meet the minimum requirements, the bid may be rejected by the Awarding Authority and found not to be eligible for award of the contract.

In the event that the bidder is unable to meet the minimum requirements of DBE participation, the bidder shall submit with his/her submittal required in Section III. Requirement of Contract Award a Request for Waiver form (EEO-DEP-490). The Awarding Authority shall review the waiver request to determine if the request should proceed. If approved by the Awarding Authority, the Awarding Authority shall submit the waiver request and supporting documentation, with a recommendation to MassDEP within five days of receipt of the Request for Waiver. MassDEP in conjunction with the project manager, Compliance Unit, will determine whether the waiver will be granted.

The waiver request shall include detailed information as specified below to establish that the bidder has made a good faith effort to comply with the minimum requirements of DBE participation specified in Part I. In addition, the bidder must show that such efforts were undertaken well in advance of the time set for opening of bids to allow adequate response. A waiver request shall include the following:

A. A detailed record of the effort made to contact and negotiate with the certified DBE, including, but not limited to:

   1. names, addresses and telephone numbers of all such companies contacted;

   2. copies of written notices(s) which were sent to certified DBE potential subcontractors, prior to bid opening;

   3. a detailed statement as to why each subcontractor contacted (i) was not willing to do the job or (ii) was not qualified to perform the work as solicited; and

   4. in the case(s) where a negotiated price could not be reached the bidder should detail what efforts were made to reach an agreement on a competitive price;

   5. copies of advertisements, dated not less than ten (10) days prior to bid opening, as appearing in general publications, trade-oriented publications, and applicable minority/ women-focused media detailing the opportunities for participation.

B. MassDEP may require the bidder to produce such additional information as it deems appropriate.

C. No later than fifteen (15) days after MassDEP receives all required information and documentation, it shall make a decision in writing, whether the waiver is granted and shall provide that determination to the bidder and Awarding Authority. If the waiver request is denied, the facts upon which a denial is based will be set forth in writing. If the waiver request is denied, the bid shall be rejected by the Awarding Authority, or the contract will be determined ineligible for SRF funding.

   If a Request for Waiver is denied by MassDEP and the bid is rejected by the Awarding Authority, the Awarding Authority may then move to the second bidder on the project. At the Awarding Authority's discretion, it may collect a DBE package from the third bidder on the project.

## V. DISADVANTAGED BUSINESS ENTERPRISES PARTICIPATION

A. Reporting Requirements

1. The Contractor's utilization of certified DBEs will be documented based upon submittal of the LGU's monthly Payment Requisitions as reported on Form-2000. The Form-2000 form will show all certified DBEs performing work on the project regardless of any billing activity for that month. For auditing and accounting purposes, the Contractor periodically may be required to submit copies of canceled checks verifying that payments have been made to the certified DBE as listed on the schedule. The Contractor may also be required to submit current schedules on utilization of all DBEs to indicate when their services will commence and be billed for.

2. During the life of the Contract, the Contractor's fulfillment of the percentage requirements in Part I shall be determined with reference to the Contract price as follows:

   A. If the price in the Contract executed exceeds the base bid price (e.g., because an alternate was selected or because unit prices were used in awarding the Contract), the Contractor shall submit for approval by MassDEP a revised Schedule of Participation by certified DBEs satisfying the percentage requirements and such other information concerning additional DBE participation as may be requested by MassDEP.

   B. If the Contract price increases after execution due to change orders or other adjustments, MassDEP may require the Contractor to subcontract additional work or to purchase additional goods and services from certified DBEs up to the percentages stated in Part I.

## VI. COMPLIANCE

A. If the Schedule or any of the Letters of Intent are materially incomplete or not submitted in a timely manner, the LGU may rescind its vote of award; treat the bid informal as to substance and reject the bid. If the bid is incomplete in any other respect than the Schedule the LGU with the approval of MassDEP may waive the informalities upon satisfactory completion of the required information by the Contractor and the certified DBE as applicable.

B. If the LGU finds that the percentage of certified DBE participation submitted by the contractor on its Schedule does not meet the percentage requirement in Part I, it shall rescind its vote of award and find such contractor not to be eligible for award of the contract.

C. The Contractor shall not perform with its own organization, or subcontract to any other primary or subcontractor any work designated for the named certified DBEs on the schedule submitted by the Contractor under Part III without the approval of MassDEP.

D. A Contractor's compliance with the percentage requirement in Part I shall continue to be determined by reference to the required percentage of the total contract price as stated in Section I even though the total of actual contract payments may be greater or less than the bid price.

E. If the Contractor for reasons beyond its control cannot comply with Part III in accordance with the Schedule submitted under Part III, Section B, the contractor must submit to MassDEP as soon as they are aware of the deficiency, the reason for its inability to comply. Proposed revisions to the Schedule stating how the contractor intends to meet its obligations under these conditions must be submitted within ten (10) working days of notification.

F. If the Contractor is becomes aware by any means that that DBE is no longer certified, the Contractor shall immediately notify MassDEP. The Contractor shall use good faith efforts to retain a substitute certified DBE.

G. If a certified DBE listed by the bidder in its Schedule of M/WBE contractors fails to obtain a performance or payment bond requested by the bidder, said failure shall not entitle the bidder to avoid the requirements of Part III (A). After a bidder has been awarded the contract, he shall not change the certified DBE listed in its Schedule at the time of the award or make any other such substitutions without the written approval of MassDEP.

## VII. SANCTIONS

A. If the Contractor does not comply with the terms of these Special Provisions, the Awarding Authority may (1) suspend any payment for the work that should have been performed by a certified DBE pursuant to the schedule, or (2) require specific performance of the Contractor's obligation by requiring the Contractor to subcontract with a DBE for any contract or specialty item at the contract price established for that item in the proposal submitted by the Contractor.

B. To the extent that the Contractor has not complied with the terms of these Special Provisions, the Awarding Authority may retain in connection with Estimates and Payments an amount determined by multiplying the bid price of this contract by the percentage in Section I, less the amount paid to DBE's for work performed under the contract and any payments already suspended under VII A.

C. The Awarding Authority may suspend, terminate or cancel this contract, in whole or in part, or may call upon the Contractor's surety to perform all terms and conditions in the contract, unless the contractor is able to demonstrate his compliance with the terms

of these Special Provisions, and further deny to the Contractor, the right to participate in any future contracts awarded by the Awarding Authority for a period of up to three years.

D. In any proceeding involving the imposition of sanctions by the Awarding Authority, no sanctions shall be imposed if the Awarding Authority finds that the contractor has taken every possible measure to comply with these Special Provisions or that some other justifiable reason exists for waiving these Special Provisions in whole or in part.

E. The contract shall provide such information as is necessary in the judgment of the Awarding Authority to ascertain its compliance with the terms of these Special Provisions.

F. A contractor shall have the right to request suspension of any sanctions imposed under this section upon demonstrating that he is in compliance with these Special Provisions.

DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION
MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF MUNICIPAL SERVICES

# SCHEDULE OF PARTICIPATION FOR SRF CONSTRUCTION

**Project Title:** _____ **Project Location:** _____

**Disadvantaged Minority Business Enterprise Participation in the SRF Loan Work**

| Name & Address of D/MBE | Nature of Participation | Dollar Value of Participation |
|---|---|---|
| 1. | | |
| 2. | | |
| 3. | | |
| | **Total D/MBE Commitment:** | **$** |
| **Percentage D/MBE Participation** = (Total D/MBE Commitment) / (Bid Price) = | | **%** |

**Disadvantaged Women Business Enterprise Participation in the SRF Loan Work**

| Name & Address of D/WBE | Nature of Participation | Dollar Value of Participation |
|---|---|---|
| 1. | | |
| 2. | | |
| 3. | | |
| | **Total D/WBE Commitment:** | **$** |
| **Percentage D/WBE Participation** = (Total D/WBE Commitment) / ( Bid Price) = | | **%** |

The Bidder agrees to furnish implementation reports as required by MassDEP to indicate the D/MBEs and D/WBE(s) which it has used or intends to use. Breach of this commitment constitutes a breach of the contract.

Name of Bidder: _____

Date: _____ By: _____
Signature

NOTE: Participation of a DBE may be counted in only their certified category; the same dollar participation cannot be used in computing the percentage of D/MBE participation and again of D/WBE participation.

# LETTER OF INTENT FOR SRF CONSTRUCTION

This form is to be completed by the D/MBE and D/WBE and must be submitted by the Bidder no later than close of business on the third business day after notification by the LGU. A separate form must be completed for each D/MBE and D/WBE involved in the project.

Project Title: _____ Project Location: _____

**TO:** _____
(Name of Bidder)

**FROM:** _____
(Please Indicate Status [ ] D/MBE or [ ] D/WBE)

° I/we intend to perform work in connection with the above project as (check one):

[ ] An individual
[ ] A corporation
[ ] Other (explain): _____
[ ] A partnership
[ ] A joint venture with: _____

° It is understood that if you are awarded the contract, you intend to enter into an agreement to perform the activity described below for the prices indicated.

**DBE PARTICIPATION**

| Description of Activity | Date of Project Commencement | $ Amount | % Bid Price |
|---|---|---|---|
| | | $ | % |

° The undersigned certify that they will enter into a formal agreement upon execution of the contract for the above referenced project.

| **BIDDER** | **DBE** |
|---|---|
| (Authorized Original Signature) Date<br>ADDRESS: | (Authorized Original Signature) Date<br>ADDRESS: |
| TELEPHONE #: | TELEPHONE #: |
| FEIN: | FEIN: |

**ORIGINALS:**

- **° Compliance Mgr. City/Town Project Location**
- **° DEP Program Manager for DEP's AAO Director**

*** Attach a copy of current (within 2 years) DBE Certification**

# DBE CERTIFICATION OF UNITED STATES CITIZENSHIP

For the SRF program, under the EPA Disadvantage Business Enterprise (DBE) Rule, a DBE must be owned or controlled by a socially and economically disadvantaged person that is also a **citizen of the United States** (*See* 40 CFR 33.202). "Ownership" is defined at 13 CFR 124.105 and "control" is defined at 13 CFR 124.106.

DBEs are certified for the SRF program through the Supplier Diversity Office using the federal Department of Transportation (DOT) DBE rules. EPA allows the use of DBEs certified under the DOT rules as long as they are also United States citizens. To ensure compliance with the EPA rule, MassDEP must verify United States citizenship through the completion of the following form for each DBE used on the project.

SRF Project Number _____

Contract Number _____

Contract Title _____

DBE Subcontractor _____

The undersigned, on behalf of the above named DBE subcontractor, hereby certifies that the DBE firm is either owned or controlled by a person or persons that are citizens of the United States.

_____
Printed Name and Title of DBE Signatory

_____
DBE Signature

_____
Date

# DISADVANTABED BUSINESS ENTERPRISE PROGRAM
# DBE SUBCONTRACTOR PARTICIPATION FORM

The United States Environmental Protection Agency (EPA) requires that this form be provided to all subcontractors on the project. At the option of the subcontractor, this form may be filled out and submitted directly to the EPA DBE Coordinator.

| | |
|---|---|
| NAME OF SUBCONTRACTOR | PROJECT NAME |
| ADDRESS | CONTRACT NO. |
| TELEPHONE NO. | E-MAIL ADDRESS |
| PRIME CONTRACTOR NAME: | |

Please use the space below to report any concerns regarding the above EPA-funded project (e.g., reason for termination by prime contractor, late payment, etc.).

_____

_____

_____

_____

_____

| CONTRACT ITEM NO. | ITEM OF WORK OR DESCRIPTION OF SERVICES RECEIVED FROM THE PRIME CONTRACTOR | AMOUNT SUBCONTRACTOR WAS PAID BY PRIME CONTRACTOR |
|---|---|---|
| | | |

_____ _____

Subcontractor Signature Title/Date

Equivalent to EPA form 6100-2

## REQUEST FOR WAIVER FOR SRF CONSTRUCTION

Upon exhausting all known sources and making every possible effort to meet the minimum requirements for DBE participation, the Bidder may seek relief either partially or entirely from these requirements by submitting a completed waiver package by the close of business on the third business day after notification by the LGU. Failure to comply with this process shall be cause to reject the bid thereby rendering the Bidder not eligible for award of the contract.

### General Information

Project Title: _____ Project Location: _____

Bid Opening (time/date) _____

Bidder: _____

Mailing Address: _____

Contact Person: _____ Telephone No. (  ) _____ Ext. _____

### Minimum Requirements

The bidder must demonstrate that good faith efforts were undertaken to comply with the percentage goals as specified. The firm seeking relief must show that such efforts were taken appropriately in advance of the time set for opening bid proposals to allow adequate time for response(s) by submitting the following:

A. A detailed record of the effort made to contact and negotiate with disadvantaged minority and/or woman owned businesses, including:

1. names, addresses, telephone numbers and contact dates of all such companies contacted;

2. copies of written notice(s) which were sent to DBE potential subcontractors prior to bid opening;

3. a detailed statement as to why each subcontractor contacted (i) was not willing to do the job or (ii) was not qualified to perform the work as solicited; and

4. in the case(s) where a negotiated price could not be reached the bidder should detail what efforts were made to reach an agreement on a competitive price.

5. copies of advertisements, dated not less than ten (10) days prior to bid opening, as appearing in general publications, trade-oriented publications, and applicable minority/women-focused media detailing the opportunities for participation;

B. MassDEP may require the bidder to produce such additional information as it deems appropriate.

C. No later than fifteen (15) days after submission of all required information and documentation, MassDEP shall make a determination, in writing, whether the waiver request is granted and shall provide that determination to the bidder and Awarding Authority. If the waiver request is denied, the facts upon which a denial is based will be set forth in writing.

CERTIFICATION

The undersigned herewith certifies that the above information and appropriate attachments are true and accurate to the best of my knowledge and that I have been authorized to act on behalf of the bidder in this matter.

_____ _____

(authorized original signature) DATE

DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION
MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF MUNICIPAL SERVICES

# STATE REVOLVING FUND LOAN PROGRAM – SCHEDULE OF SUBCONTRACTOR PARTICIPATION

Local Governmental Unit _____

Project Name _____

SRF Identification Number _____

General Contractor _____

Contract Value _____

The United States Environmental Protection Agency (EPA) requires that all SRF borrowers develop and maintain a list of all MBE/WBE and non MBE/WBE subcontractors on the project.

This form must be completed and returned to MassDEP within 90 days of award of the contract.

| Subcontractor | Point of Contact | Mailing Address | Telephone Number | E-Mail Address | MBE | WBE | DBE | Subcontract Value |
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SECTION 07 13 53

MEMBRANE WATERPROOFING
(FILED SUB-BID REQUIRED AS PART OF 07 00 01)

PART 1 - GENERAL

1.01 WORK INCLUDED:

This section covers the furnishing of labor, materials, equipment and incidentals for the application of the membrane waterproofing system complete as shown in the Drawings and specified herein. The waterproofing system shall be applied to the outside of the concrete foundation walls from 6 inches below grade down to the top of the building foundation mat.

1.02 RELATED WORK:

A. Section 03 30 00, CAST-IN-PLACE CONCRETE

1.03 REFERENCES

A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

American Society for Testing and Materials (ASTM)

ASTM D412 Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers - Tension

ASTM D624 Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers

ASTM D2581 Polybutylene (PB) Plastics Molding and Extrusion Materials

B. Where reference is made to one of the above standards, the revisions in effect at the time of bid opening shall apply.

1.04 QUALITY ASSURANCE:

A. All materials required for the installation shall be furnished by a single manufacturer who has been actively marketing a self-adhesive modified bituminous sheet waterproofing system in the United States for a minimum of 10 years.

B. A full-time employee of the membrane manufacturer who is trained in the application of the specified system shall be available for consultation and periodic job visits.

C. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

D. Use a subcontractor currently approved in writing by the manufacturer of the approved waterproofing.

A. Provide five year manufacturer warranty for waterproofing failing to resist penetration of water, except where such failures are the result of structural failures of building. Hairline cracking of concrete due to temperature change is not considered a structural failure.

1.05 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

A. Materials list of items proposed to be provided under this Section;

B. Manufacturer's specifications and other data needed to prove compliance with the specified requirements;

C. Manufacturer's recommended installation procedures which, when approved by the Engineer, will become the basis for accepting or rejecting actual installation procedures used on the Work.

1.06 DELIVERY, STORAGE AND HANDLING:

A. Deliver products to the job site in their manufacturer's original container, with labels intact and legible.

1. Maintain packaged materials with seals unbroken and labels intact until time of use.

2. Promptly remove damaged material and unsuitable items from the job site, and promptly replace with material meeting the specified requirements, at no additional cost to the Owner.

B. Except as otherwise approved by the Engineer, determine and comply with manufacturer's recommendations on product handling, storage, and protection.

PART 2 - PRODUCTS

2.01 MEMBRANE WATERPROOFING:

A. Where indicated on the Drawings, and described herein provide Bituthene 4000" manufactured by W.R. Grace Co., or provide an equal system approved by the Engineer.

B. For protection of the installed membrane waterproofing, provide Bituthene Protection System consisting of Bituthene protection board PB-3000 adhered with Bituthene protection board adhesive PBA-000 applied at a rate of 250 to 350 sq. ft. per gal., or an approved equal.

2.02 OTHER MATERIALS:

Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Engineer.

PART 3 - EXECUTION

3.01 SUBSTRATE INSPECTION AND PREPARATIONS:

A. All concrete shall be properly cured and dried (minimum 7 days for normal structural concrete and 14 days for lightweight structural concrete).

B. All surfaces to receive waterproofing shall be structurally sound and free of voids, spalled areas, loose aggregate, sharp protrusions, coarse aggregate, grease, oil, wax, dust, dirt, and debris, as described by the manufacturer.

3.02 MEMBRANE INSTALLATION:

A. Apply surface conditioner recommended for the membrane to the concrete surface in accordance with manufacturer's directions and let it dry thoroughly, as specified.

B. Apply the membrane to the prepared surfaces in accordance with manufacturer's directions, with special attention to corners, laps and edges. Do not apply when ambient or surface temperatures are below 25ºF.

C. Apply manufacturer recommended hardboard over the membrane with recommended adhesive, per manufacturer's instructions.

D. Backfill around foundation walls, exercising care to avoid damage to the protective board on the membrane. See Section 31 00 00, EARTHWORK, for backfill materials and procedures.

END OF SECTION

SECTION 08 11 00

METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes:

1. Interior standard steel doors and frames.
2. Exterior standard steel doors and frames.

B. Related Requirements:

1. Section 08 71 00 "Door Hardware" for door hardware for hollow-metal doors.

1.3 DEFINITIONS

A. Minimum Thickness: Minimum thickness of base metal without coatings according to NAAMM-HMMA 803 or ANSI/SDI A250.8.

1.4 COORDINATION

A. Coordinate anchorage installation for hollow-metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

B. Coordinate requirements for installation of door hardware, electrified door hardware, and access control and security systems.

1.5 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.6 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Include the following:

1. Elevations of each door type.
2. Details of doors, including vertical- and horizontal-edge details and metal thicknesses.
3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
4. Locations of reinforcement and preparations for hardware.
5. Details of each different wall opening condition.
6. Details of anchorages, joints, field splices, and connections.
7. Details of accessories.
8. Details of moldings, removable stops, and glazing.

C. Samples for Initial Selection: For hollow-metal doors and frames with factory-applied color finishes.

D. Product Schedule: For hollow-metal doors and frames, prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with final door hardware schedule.

## 1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver hollow-metal doors and frames palletized, packaged, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.

1. Provide additional protection to prevent damage to factory-finished units.

B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.

C. Store hollow-metal doors and frames vertically under cover at Project site with head up. Place on minimum 4-inch-high wood blocking. Provide minimum 1/4-inch space between each stacked door to permit air circulation.

# PART 2 - PRODUCTS

## 2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Ceco Door; ASSA ABLOY.
2. Concept Frames, Inc.
3. DE LA FONTAINE.
4. Steelcraft; an Allegion brand.

## 2.2 PERFORMANCE REQUIREMENTS

A. Thermally Rated Door Assemblies: Provide door assemblies with U-factor of not more than 0.40 deg Btu/F x h x sq. ft. when tested according to ASTM C518.

## 2.3 INTERIOR STANDARD STEEL DOORS AND FRAMES

A. Construct hollow-metal doors and frames to comply with standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.

B. Heavy-Duty Doors and Frames: ANSI/SDI A250.8, Level 2; ANSI/SDI A250.4, Level B.

1. Doors:

   a. Type: As indicated in the Door and Frame Schedule.
   b. Thickness: 1-3/4 inches.
   c. Face: Uncoated steel sheet, minimum thickness of 0.042 inch.
   d. Edge Construction: Model 1, Full Flush
   e. Edge Bevel: Provide manufacturer's standard beveled or square edges
   f. Core: Polystyrene

2. Frames:

   a. Materials: Uncoated steel sheet, minimum thickness of 0.053 inch.
   b. Construction: Full profile welded
   c. Thermally Broken Frame at Door #101B

3. Exposed Finish: Prime

## 2.4 EXTERIOR STANDARD STEEL DOORS AND FRAMES

A. Construct hollow-metal doors and frames to comply with standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.

B. Heavy-Duty Doors and Frames: ANSI/SDI A250.8, Level 2; ANSI/SDI A250.4, Level B.

1. Doors:

   a. Type: As indicated in the Door and Frame Schedule.
   b. Thickness: 1-3/4 inches.
   c. Face: Metallic-coated steel sheet, minimum thickness of 0.042 inch, with minimum A60 coating.
   d. Edge Construction: Model 1, Full Flush
   e. Edge Bevel: Provide manufacturer's standard beveled or square edges.
   f. Top Edge Closures: Close top edges of doors with flush closures of same material as face sheets. Seal joints against water penetration.
   g. Bottom Edges: Close bottom edges of doors with end closures or channels of same material as face sheets. Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape.
   h. Core: Polystyrene

2. Frames:

a. Materials: Metallic-coated steel sheet, minimum thickness of 0.053 inch, with minimum A60 coating.
b. Construction: Full profile welded
c. Thermally broken frames.

3. Exposed Finish: Prime

## 2.5 FRAME ANCHORS

A. Jamb Anchors:

1. Type: Anchors of minimum size and type required by applicable door and frame standard, and suitable for performance level indicated.
2. Quantity: Minimum of three anchors per jamb, with one additional anchor for frames with no floor anchor. Provide one additional anchor for each 24 inches of frame height above 7 feet.
3. Postinstalled Expansion Anchor: Minimum 3/8-inch-diameter bolts with expansion shields or inserts, with manufacturer's standard pipe spacer.

B. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor.

C. Floor Anchors for Concrete Slabs with Underlayment: Adjustable-type anchors with extension clips, allowing not less than 2-inch height adjustment. Terminate bottom of frames at top of underlayment.

D. Material: ASTM A879/A879M, Commercial Steel (CS), 04Z coating designation; mill phosphatized.

1. For anchors built into exterior walls, steel sheet complying with ASTM A1008/A1008M or ASTM A1011/A1011M; hot-dip galvanized according to ASTM A153/A153M, Class B.

## 2.6 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A1008/A1008M, Commercial Steel (CS), Type B; suitable for exposed applications.

B. Hot-Rolled Steel Sheet: ASTM A1011/A1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.

C. Metallic-Coated Steel Sheet: ASTM A653/A653M, Commercial Steel (CS), Type B.

D. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A153/A153M.

E. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow-metal frames of type indicated.

F. Mineral-Fiber Insulation: ASTM C665, Type I (blankets without membrane facing); consisting of fibers manufactured from slag or rock wool; with maximum flame-spread and smoke-

developed indexes of 25 and 50, respectively; passing ASTM E136 for combustion characteristics.

G. Glazing: Comply with requirements in Section 08 80 00 "Glazing."

## 2.7 FABRICATION

A. Door Astragals: Provide overlapping astragal on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated. Extend minimum 3/4 inch beyond edge of door on which astragal is mounted or as required to comply with published listing of qualified testing agency.

B. Hollow-Metal Frames: Fabricate in one piece except where handling and shipping limitations require multiple sections. Where frames are fabricated in sections, provide alignment plates or angles at each joint, fabricated of metal of same or greater thickness as frames.

1. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
2. Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers as follows. Keep holes clear during construction.

    a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.

C. Hardware Preparation: Factory prepare hollow-metal doors and frames to receive templated mortised hardware, and electrical wiring; include cutouts, reinforcement, mortising, drilling, and tapping according to ANSI/SDI A250.6, the Door Hardware Schedule, and templates.

1. Reinforce doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.
2. Comply with BHMA A156.115 for preparing hollow-metal doors and frames for hardware.

## 2.8 STEEL FINISHES

A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.

1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with ANSI/SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

# PART 3 - EXECUTION

## 3.1 PREPARATION

A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces. Touch up factory-applied finishes where spreaders are removed.

B. Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

## 3.2 INSTALLATION

A. Install hollow-metal doors and frames plumb, rigid, properly aligned, and securely fastened in place. Comply with approved Shop Drawings and with manufacturer's written instructions.

B. Hollow-Metal Frames: Comply with ANSI/SDI A250.11

1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces without damage to completed Work.

    a. Where frames are fabricated in sections, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces. Touch-up finishes.
    b. Install frames with removable stops located on secure side of opening.

2. Floor Anchors: Secure with postinstalled expansion anchors.

    a. Floor anchors may be set with power-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.

3. Solidly pack mineral-fiber insulation inside frames.
4. In-Place Concrete or Masonry Construction: Secure frames in place with postinstalled expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
5. Installation Tolerances: Adjust hollow-metal frames to the following tolerances:

    a. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
    b. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
    c. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
    d. Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.

C. Hollow-Metal Doors: Fit and adjust hollow-metal doors accurately in frames, within clearances specified below.

1. Non-Fire-Rated Steel Doors: Comply with ANSI/SDI A250.8

## 3.3 REPAIR

A. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.

B. Touchup Painting: Cleaning and touchup painting of abraded areas of paint are specified in painting Sections.

END OF SECTION 08 11 00

SECTION 22 13 19

SANITARY WASTE PIPING SPECIALTIES
(FILED SUB-BID REQUIRED AS PART OF SECTION 22 00 01)

PART 1 - GENERAL

1.1 GENERAL PROVISIONS:

A. Sub-Bid Requirements: As provided under Section 22 00 01 - PLUMBING SUB-BID REQUIREMENTS, and supplemented under the Bidding Requirements, Contract Forms, and Conditions of the Contract, and applicable parts of Division 1 – GENERAL REQUIREMENTS.

B. Work of this Filed Sub-Bid includes all individual specification sections listed in Section 22 00 01.

1.2 RELATED DOCUMENTS:

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Related Sections:

Section 22 05 13 – COMMON MOTOR REQUIREMENTS FOR PLUMBING EQUIPMENT

Section 22 05 48 – VIBRATION AND SEISMIC CONTROLS FOR PLUMBING

Section 26 05 19 – LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

Section 26 05 26 – GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

SUMMARY:

C. Section Includes:

1. Cleanouts.
2. Air-admittance valves.
3. Roof flashing assemblies.
4. Through-penetration firestop assemblies.
5. Miscellaneous sanitary drainage piping specialties.

1.3 ACTION SUBMITTALS:

A. Product Data: For each type of product. Include rated capacities, operating characteristics, and accessories for the following:

B. Shop Drawings:

1. Show fabrication and installation details for frost-resistant vent terminals.
2. Wiring Diagrams: Power, signal, and control wiring.

1.4 INFORMATIONAL SUBMITTALS:

A. Field quality-control reports.

1.5 CLOSEOUT SUBMITTALS:

A. Operation and Maintenance Data: For sanitary waste piping specialties to include in emergency, operation, and maintenance manuals.

1.6 MAINTENANCE MATERIAL SUBMITTALS:

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

PART 2 - PRODUCTS

2.1 ASSEMBLY DESCRIPTIONS:

A. Sanitary waste piping specialties shall bear label, stamp, or other markings of specified testing agency.

B. Comply with NSF 14 for plastic sanitary waste piping specialty components.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing, and marked for intended location and application.

2.2 CLEANOUTS:

A. Cast-Iron Exposed Cleanouts:

1. Standard: ASME A112.36.2M.
2. Size: Same as connected drainage piping

3. Body Material: as required to match connected piping.
4. Closure: Countersunk, brass plug.
5. Closure Plug Size: Same as or not more than one size smaller than cleanout size.

B. Cast-Iron Exposed Floor Cleanouts:

1. Standard: ASME A112.36.2M for adjustable housing cast-iron soil pipe with cast-iron ferrule cleanout.
2. Size: Same as connected branch.
3. Type: Heavy-duty, adjustable housing.
4. Body or Ferrule: Cast iron.
5. Clamping Device: Required.
6. Closure: Brass plug with tapered threads.
7. Adjustable Housing Material: Cast iron with setscrews or other device.
8. Frame and Cover Material and Finish: Polished bronze.
9. Frame and Cover Shape: Round.
10. Top Loading Classification: Heavy Duty.
11. Riser: ASTM A 74, Extra-Heavy or Service class, cast-iron drainage pipe fitting and riser to cleanout.

## 2.3 ROOF FLASHING ASSEMBLIES:

A. Roof Flashing Assemblies:

1. Description: Manufactured assembly made of 6.0-lb/sq. ft., 0.0938-inch- thick, lead flashing collar and skirt extending at least 8 inches from pipe, with galvanized-steel boot reinforcement and counterflashing fitting.

a. Open-Top Vent Cap: Without cap.
b. Low-Silhouette Vent Cap: With vandal-proof vent cap.
c. Extended Vent Cap: With field-installed, vandal-proof vent cap.

## 2.4 THROUGH-PENETRATION FIRESTOP ASSEMBLIES:

A. Through-Penetration Firestop Assemblies:

1. Standard: UL 1479 assembly of sleeve-and-stack fitting with firestopping plug.
2. Size: Same as connected soil, waste, or vent stack.
3. Sleeve: Molded-PVC plastic, of length to match slab thickness and with integral nailing flange on one end for installation in cast-in-place concrete slabs.
4. Stack Fitting: ASTM A 48/A 48M, gray-iron, hubless-pattern wye branch with neoprene O-ring at base and gray-iron plug in thermal-release harness. Include PVC protective cap for plug.
5. Special Coating: Corrosion resistant on interior of fittings.

2.5 MISCELLANEOUS SANITARY DRAINAGE PIPING SPECIALTIES:

A. Open Drains:

1. Description: Shop or field fabricate from ASTM A 74, Service class, hub-and-spigot, cast-iron soil-pipe fittings. Include P-trap, hub-and-spigot riser section; and where required, increaser fitting joined with ASTM C 564 rubber gaskets.
2. Size: Same as connected waste piping.

B. Deep-Seal Traps:

1. Description: Cast-iron or bronze casting, with inlet and outlet matching connected piping.
2. Size: Same as connected waste piping.

a. NPS 2: 4-inch-minimum water seal.
b. NPS 2-1/2 and Larger: 5-inch-minimum water seal.

C. Air-Gap Fittings:

1. Standard: ASME A112.1.2, for fitting designed to ensure fixed, positive air gap between installed inlet and outlet piping.
2. Body: Bronze or cast iron.
3. Inlet: Opening in top of body.
4. Outlet: Larger than inlet.
5. Size: Same as connected waste piping and with inlet large enough for associated indirect waste piping.

2.6 MOTORS:

A. General requirements for motors are specified in Section 22 05 13 – COMMON MOTOR REQUIREMENTS FOR PLUMBING EQUIPMENT.

1. Motor Sizes: Minimum size as indicated. If not indicated, motor shall be large enough, so driven load will not require motor to operate in service factor range above 1.0.

PART 3 - EXECUTION

3.1 INSTALLATION:

A. Equipment Mounting:

1. Comply with requirements for vibration-isolation and seismic-control devices specified in Section 22 05 48 – VIBRATION AND SEISMIC CONTROLS FOR PLUMBING PIPING AND EQUIPMENT.

B. Install backwater valves in building drain piping.

1. For interior installation, provide cleanout deck plate flush with floor and centered over backwater valve cover, and of adequate size to remove valve cover for servicing.

C. Install cleanouts in aboveground piping and building drain piping according to the following, unless otherwise indicated:

1. Size same as drainage piping up to NPS 4. Use NPS 4 for larger drainage piping unless larger cleanout is indicated.
2. Locate at each change in direction of piping greater than 45 degrees.
3. Locate at minimum intervals of 50 feet for piping NPS 4 and smaller and 100 feet for larger piping.
4. Locate at base of each vertical soil and waste stack.

D. For floor cleanouts for piping below floors, install cleanout deck plates with top flush with finished floor.

E. For cleanouts located in concealed piping, install cleanout wall access covers, of types indicated, with frame and cover flush with finished wall.

F. Install fixture air-admittance valves on fixture drain piping.

G. Install stack air-admittance valves at top of stack vent and vent stack piping.

H. Install air-admittance-valve wall boxes recessed in wall.

I. Install roof flashing assemblies on sanitary stack vents and vent stacks that extend through roof. Comply with requirements in Section 07 62 00 – SHEET METAL FLASHING AND TRIM.

J. Install flashing fittings on sanitary stack vents and vent stacks that extend through roof. Comply with requirements in Section 07 62 00 – SHEET METAL FLASHING AND TRIM.

K. Install through-penetration firestop assemblies in plastic stacks at floor penetrations.

L. Assemble open drain fittings and install with top of hub 2 inches above floor.

M. Install deep-seal traps on floor drains and other waste outlets, if indicated.

N. Install air-gap fittings on draining-type backflow preventers and on indirect-waste piping discharge into sanitary drainage system.

O. Install sleeve and sleeve seals with each riser and stack passing through floors with waterproof membrane.

P. Install vent caps on each vent pipe passing through roof.

Q. Install frost-resistant vent terminals on each vent pipe passing through roof. Maintain 1-inch clearance between vent pipe and roof substrate.

R. Install expansion joints on vertical stacks and conductors. Position expansion joints for easy access and maintenance.

S. Install frost-proof vent caps on each vent pipe passing through roof. Maintain 1-inch clearance between vent pipe and roof substrate.

T. Install wood-blocking reinforcement for wall-mounting-type specialties.

U. Install traps on plumbing specialty drain outlets. Omit traps on indirect wastes unless trap is indicated.

3.2 CONNECTIONS:

A. Comply with requirements in Section 22 13 16 – SANITARY WASTE AND VENT PIPING for piping installation requirements. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Install piping adjacent to equipment to allow service and maintenance.

C. Ground equipment according to Section 26 05 26 – GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS.

D. Connect wiring according to Section 26 05 19 – LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES.

3.3 FLASHING INSTALLATION:

A. Comply with requirements in Section 07 62 00 – SHEET METAL FLASHING AND TRIM.

B. Fabricate flashing from single piece unless large pans, sumps, or other drainage shapes are required.

C. Install sheet flashing on pipes, sleeves, and specialties passing through or embedded in floors and roofs with waterproof membrane.

1. Pipe Flashing: Sleeve type, matching pipe size, with minimum length of 10 inches, and skirt or flange extending at least 8 inches around pipe.
2. Sleeve Flashing: Flat sheet, with skirt or flange extending at least 8 inches around sleeve.
3. Embedded Specialty Flashing: Flat sheet, with skirt or flange extending at least 8 inches around specialty.

D. Set flashing on floors and roofs in solid coating of bituminous cement.

E. Secure flashing into sleeve and specialty clamping ring or device.

F. Install flashing for piping passing through roofs with counterflashing or commercially made flashing fittings, according to Section 07 62 00 – SHEET METAL FLASHING AND TRIM.

G. Extend flashing up vent pipe passing through roofs and turn down into pipe, or secure flashing into cast-iron sleeve having calking recess.

3.4 LABELING AND IDENTIFYING:

A. Equipment Nameplates and Signs: Install engraved plastic-laminate equipment nameplate or sign on or near each of the following:

1. Pumps.

B. Distinguish among multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations, in addition to identifying unit.

1. Nameplates and signs are specified in Section 22 05 53 – IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT.

3.5 FIELD QUALITY CONTROL:

A. Perform tests and inspections and prepare test reports.

1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect field-assembled FOG disposal systems and their installation, including piping and electrical connections, and to assist in testing.

B. Tests and Inspections:

1. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.6 PROTECTION:

A. Protect drains during remainder of construction period to avoid clogging with dirt or debris and to prevent damage from traffic or construction work.

B. Place plugs in ends of uncompleted piping at end of each day or when work stops.

3.7 DEMONSTRATION:

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain FOG disposal systems.

END OF SECTION

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# SECTION 33 11 13.28

# HIGH DENSITY POLYETHYLENE PIPE

## PART 1 - GENERAL

1.01 WORK INCLUDED:

A. This Section covers furnishing, handling, laying, joining and installation of HDPE piping, fittings and appurtenances.

B. The Contractor shall furnish and install the various pipelines and appurtenant work as indicated on the Contract Drawings and as specified herein, or as reasonably required to produce a complete, proper, and functional installation in accordance with the intent of these Contract Documents.

1.02 RELATED WORK:

A. Section 31 00 00, EARTHWORK

1.03 REFERENCES:

A. The following standards form a part of this specification as referenced:

American Water Works Association (AWWA)

AWWA C906-90 Polyethylene PE Pressure Pipe and fittings, 4 in. through 63 in., for Water Distribution

American Society for Testing and Materials (ASTM)

ASTM D1248 Specifications for Polyethylene Plastics Molding and Extrusion Materials.

ASTM D2837 Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials.

ASTM F714 Specification for Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter.

Plastic Pipe Institute (PPI)

PPI TR-3 Policies and Procedures for Developing Hydrostatic Design Stresses for Thermoplastic Pipe Materials.

1.04 QUALITY ASSURANCE:

A. All pipe and fittings shall be inspected and tested at the factory as required by the standard specifications to which the material is manufactured. The Contractor shall furnish in duplicate to the Engineer sworn certificates providing evidence of such tests.

B. The Owner reserves the right to have any or all pipe, fittings, and special castings inspected and/or tested by an independent service at either the manufacturer's plant or elsewhere. Such inspection and/or tests shall be at the Owner's expense.

C. Deflections in horizontal alignment will not be permitted at joints without written consent of the Engineer. If approved, deflections shall not exceed one-half the manufacturer's recommendation.

D. When requested by the Engineer, the Contractor shall ensure that a qualified representative of the manufacturer shall be present at the jobsite for the first day of pipe laying, to assure that proper procedures are followed.

E. The Engineer shall be notified in advance when the location of an existing pipeline conflicts with the proposed location of the Work.

F. Pipe and fittings of the same type shall be products of a single manufacturer.

G. All piping shall be of the type and size shown on the drawings and described in this section of the Specifications.

1.05 DELIVERY, STORAGE, AND HANDLING:

A. Pipes and fittings shall be carefully handled when loading and unloading. Pipes shall be lifted by hoists or lowered on skidways in such a manner as to avoid shock.

B. HDPE pipe shall be protected from exposure to sunlight (unless restrained in racks) to prevent bowing of the pipe due to expansion and contraction. Such protection shall consist of canvas covering, or other material, as recommended by the manufacturer. Plastic sheets, which may allow excessive temperatures to develop where the pipe is stored, shall not be used.

1.06 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

A. Shop drawings shall consist of manufacturer's scale drawings or catalog cuts including descriptive literature and complete characteristics, specifications, and code requirements. Shop drawings shall be submitted for the HDPE pressure pipe, type of joints, fittings, and couplings, in accordance with the specifications.

PART 2 - PRODUCTS

2.01 HIGH-DENSITY POLYETHYLENE (HDPE) PIPE AND FITTINGS:

A. All HDPE pipe and fittings shall be manufactured from virgin polyethylene resin, PE 4710, and shall conform to ASTM D3350.

B. All polyethylene fittings shall have a pressure rating equal to or higher than the pressure rating of the pipe.

C. All HDPE fittings at the manholes shall have ANSI Class 150 316 stainless steel backing rings.

D. Unless noted otherwise, all pipe and fittings shall be SDR 17 rated at 125 psi.

E. All piping and valves shall be supported by the size and style supports shown in the drawings, or an approved equal.

F. Pipe shall be homogeneous throughout; free from voids, cracks, and other defects; as uniform as commercially practicable in color, density, and other physical properties.

G. Pipe surfaces shall be free from nicks, scratches, and other blemishes. The joining surfaces of pipe shall be free from gouges and other imperfections that could cause leakage at joints.

H. Fittings for transition from the HDPE main to the PVC building service shall be one of the following, or an approved equal, as recommended by the pipe manufacturer:

1. Electrofusion saddles as manufactured by Central Plastics.
2. Conventional fusion saddles as manufactured by Central Plastics, Philips Driscopipe, or Plexco.
3. INSERTA TEE as manufactured by Fowler Manufacturing Co.

For fused saddles, transition couplings for HDPE to PVC shall be submitted for approval.

PART 3 - EXECUTION

3.01 INSPECTION BEFORE INSTALLATION:

A. Each length of pipe and each fitting shall be carefully inspected prior to being lowered into the trench. All materials not meeting the requirements of these specifications, or otherwise found defective or unsatisfactory by the Engineer, shall be rejected and immediately marked and removed from the jobsite by the Contractor.

B. Bedding, sub-bedding, and other trench conditions shall be carefully inspected prior to laying pipe. All conditions shall be made available to the Engineer for inspection.

3.02 PIPE INSTALLATION:

A. Pipe interiors, fitting interiors, and joint surfaces shall be thoroughly cleaned prior to installation. Pipes and fittings shall be maintained clean. For HDPE pipe, a clean cotton cloth shall be employed for cleaning; polyester-type materials shall not be used as they may melt during fusion procedures.

B. Pipes shall be installed in the locations and to the required lines and grades shown on the drawings and provided in these Specifications, using an approved method of control.

C. Excavations shall be maintained free of water during the progress of the Work. No pipes shall be laid in water, nor shall there by any joints made up in water.

D. If any defective pipe is discovered after being placed, removal and replacement with sound pipe will be required at no additional cost to the Owner.

3.03 HDPE PIPE JOINING:

A. HDPE pipe should be joined by butt-fusion methods, having a completely uniform and monolithic pipe interior according to the fusion joining procedures as instructed by the manufacturer.

B. Each individual performing fusion joining shall have had at least one year of experience in the use of the fusion procedure.

C. Inspection of joints shall be performed by a person qualified by training or experience to evaluate the acceptability of HDPE joints made under the applicable joining procedures.

D. The pipe sections shall be joined at ground level to a length recommended by the manufacturer, such that when pulling the pipe into position alongside the trench, maximum allowable stress is not exceeded. Use appropriate materials and equipment, as recommended by the HDPE pipe manufacturer, when pulling butt-fused pipe sections alongside the trench, to prevent pipe damage.

E. HDPE pipe boots shall be provided on all entrance piping in manholes.

3.04 TESTING:

A. Prior to the pressure and leakage tests, the piping shall be thoroughly flushed clean of all dirt, dust, oil, grease and other foreign material. This work shall be done with care to avoid damage to linings and coatings.

B. The installed pipe shall be pressure tested and leakage tested in accordance with AWWA Standard C600.

C. PRESSURE AND LEAKAGE TESTS:

1. Unless otherwise approved, all pipelines shall be given a combined pressure and leakage tests between line valves. The Contractor shall furnish and install suitable temporary testing plugs or caps; all necessary pressure pumps, pipe connections, meters, gates, and other necessary equipment; and all labor required. The Owner or Engineer shall have the privilege of using his or her own gages.

2. Subject to approval and provided that the tests are made within a reasonable time considering the progress of the project as a whole, and the need to put the section into service, the Contractor may make the tests when he desires.

3. Unless it has already been done, the section of pipe to be tested shall be filled with water of approved quality, and all air shall be expelled from the pipe. The Contractor shall follow established procedures for filling the pipe and expelling trapped air to avoid exposing the piping system to water-hammer. If blowoffs are not available at high points for releasing air, the Contractor shall excavate as required and install the necessary taps. If the Contractor changes the grade of pipe installation, he will be responsible for locating the taps at the correct location in the system for testing. Taps shall be installed at the beginning and end of each disinfection run. After completion of the test, if so required by the Engineer, he shall remove corporations used for testing; plug the holes and backfill as necessary.

4. The section under test shall be maintained full of water for a period of 24 hours prior to the combined pressure and leakage test being applied.

5. The pressure shall consist of first raising the water pressure (based on the elevation of the lowest point of the section under test corrected to the gage location) to a pressure in pounds per square inch numerically equal to the pressure rating of the pipe (150 psi, unless otherwise noted). If the Contractor cannot achieve the specified pressure and maintain it for a period of one hour, the section shall be considered as having failed to pass the pressure test.

6. If the pressure test fails, the Contractor shall make a leakage test by metering the flow of water into the pipe while maintaining in the section being tested a pressure equal to the pressure rating of the pipe. If the average leakage during a two-hour period exceeds a rate of 11.6 gallons per inch of diameter per 24 hours per mile of pipeline, the section shall be considered as having failed the leakage test. For

example, if 1,000 feet of 12-inch pipe is to be tested, the allowable leakage is 2.2 gallons over a 2-hour period, calculated as follows:

$$L = \frac{(11.6\ \text{gal}) \times (12'') \times (2\ \text{hr.}) \times (1000')}{(1'') \times (24\ \text{hr.}) \times (5280')} = 2.2\ \text{gal}$$

7. If the section fails to pass the pressure and leakage test, the Contractor shall do everything necessary to locate, uncover, and repair or replace the defective pipe, fitting, or joint, all at his own expense and without extension of time for completion of the work. Additional tests and repairs shall be made until the section passes the specified test.

END OF SECTION

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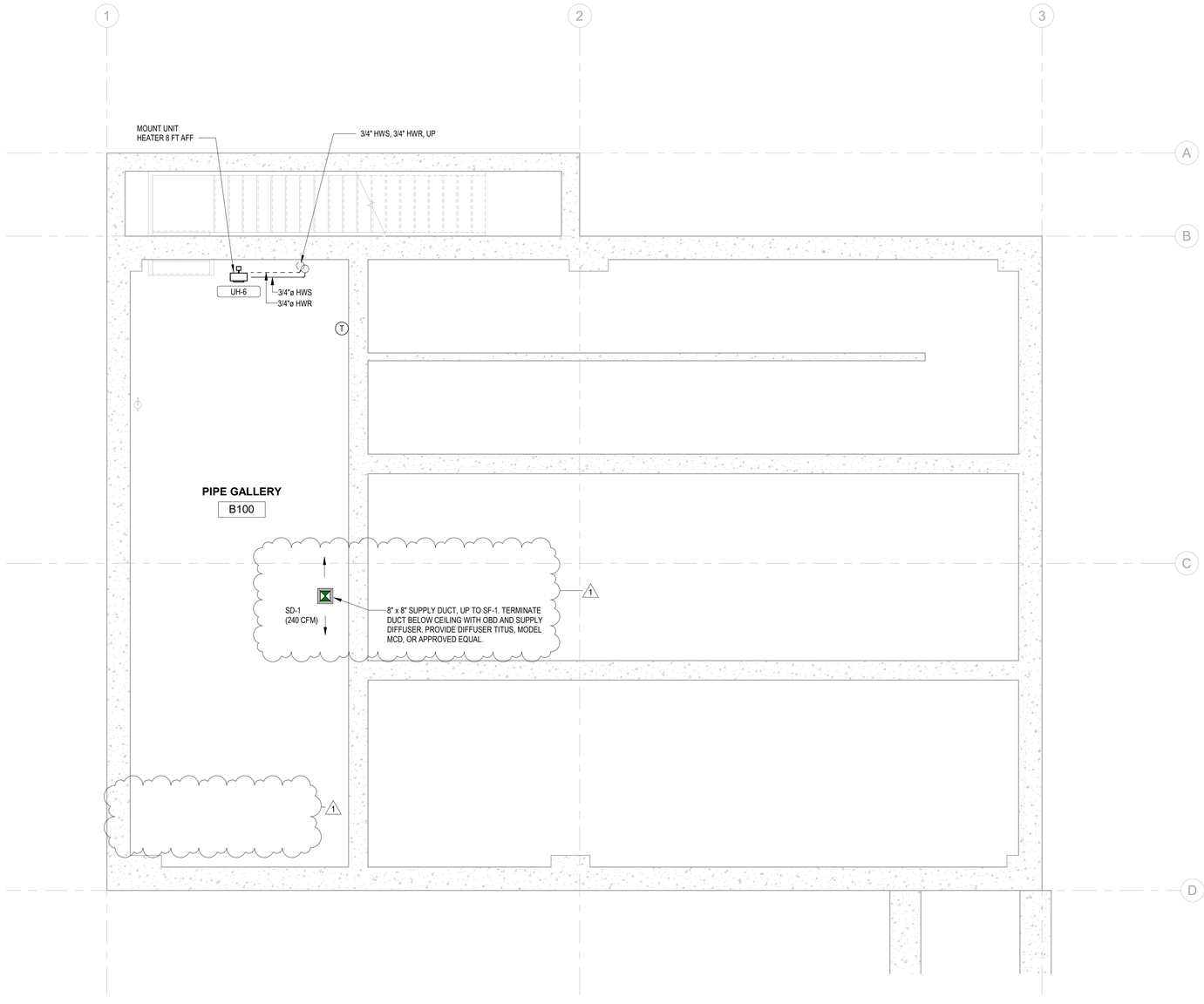
## Blackstone WTP IO List - CFCP

| TAG NO | SIGNAL DESCRIPTION | DI | DO | AI | AO | COMMENTS |
|---|---|---|---|---|---|---|
| ESL-020 | Utility Power Failure | 1 | | | | |
| ESH-020 | Surge Suppressor Fault | 1 | | | | |
| XS-020A | UPS Fault/Battery Low | 1 | | | | |
| XS-020B | 24 VDC Power Supply Failure | 1 | | | | |
| HS-020 | Alarm Reset PB | | | | | |
| YL-020A | PLC Fault | | 1 | | | |
| FIT-100 | CCF Flow Rate | | | 1 | | |
| LSH-105 | CCF Pipe Pit High Level Alarm | 1 | | | | |
| FS-105 | CCF Flow Switch | 1 | | | | |
| LSH-120 | Sodium Hypochlorite Day Tank High Level | 1 | | | | |
| LSH-130 | Sodium Hydroxide Day Tank High Level | 1 | | | | |
| LSH-140 | Poly/Orthophosphate Day Tank High Level | 1 | | | | FUTURE |
| LSH-150 | Sodium Hydroxide Containment High Level | 1 | | | | |
| LSH-160 | Sodium Hypochlorite Containment High Level | 1 | | | | |
| LIT-130 | Sodium Hypochlorite Storage Tank Level | | | 1 | | |
| LIT-140 | Sodium Hydroxide Storage Tank Level | | | 1 | | |
| FS-100 | Eyewash/Shower In Use Alarm | 1 | | | | |
| FS-200 | Eyewash/Shower In Use Alarm | 1 | | | | |
| TP-101 | Sodium Hydroxide Transfer Pump Run Status | 1 | | | | |
| TP-101 | Sodium Hydroxide Transfer Pump Run S/S Interlock | 1 | 1 | | | |
| TP-201 | Sodium Hypochlorite Transfer Pump Run Status | | | | | |
| TP-201 | Sodium Hypochlorite Transfer Pump Run S/S Interlock | | 1 | | | |
| TP-301 | Poly/Orthophosphate Transfer Pump Run Status | 1 | | | | FUTURE |
| TP-301 | Poly/Orthophosphate Transfer Pump Run S/S Interlock | | 1 | | | FUTURE |
| FP-101 | Sodium Hydroxide Feed Pump Run Status | 1 | | | | |
| FP-101 | Sodium Hydroxide Feed Pump Fault | 1 | | | | |
| FP-101 | Sodium Hydroxide Feed Pump Start/Stop | 1 | | | | |
| FP-101 | Sodium Hydroxide Feed Pump Speed Control | | | | 1 | |
| FP-101 | Sodium Hydroxide Feed Pump Speed Feedback | | | 1 | | |
| FP-102 | Sodium Hydroxide Feed Pump Run Status | 1 | | | | |
| FP-102 | Sodium Hydroxide Feed Pump Fault | 1 | | | | |
| FP-102 | Sodium Hydroxide Feed Pump Start/Stop | 1 | | | | |
| FP-102 | Sodium Hydroxide Feed Pump Speed Control | | | | 1 | |
| FP-102 | Sodium Hydroxide Feed Pump Speed Feedback | | | 1 | | |
| FP-201 | Sodium Hypochlorite Feed Pump Run Status | 1 | | | | |
| FP-201 | Sodium Hypochlorite Feed Pump Fault | 1 | | | | |
| FP-201 | Sodium Hypochlorite Feed Pump Start/Stop | 1 | | | | |
| FP-201 | Sodium Hypochlorite Feed Pump Speed Control | | | | 1 | |
| FP-201 | Sodium Hypochlorite Feed Pump Speed Feedback | | | 1 | | |
| FP-202 | Sodium Hypochlorite Feed Pump Run Status | 1 | | | | |
| FP-202 | Sodium Hypochlorite Feed Pump Fault | 1 | | | | |
| FP-202 | Sodium Hypochlorite Feed Pump Start/Stop | 1 | | | | |
| FP-202 | Sodium Hypochlorite Feed Pump Speed Control | | | | 1 | |
| FP-202 | Sodium Hypochlorite Feed Pump Speed Feedback | | | 1 | | |
| FP-301 | Poly/Orthophosphate Feed Pump Run Status | 1 | | | | FUTURE |
| FP-301 | Poly/Orthophosphate Feed Pump Fault | 1 | | | | FUTURE |
| FP-301 | Poly/Orthophosphate Feed Pump In Remote | 1 | | | | FUTURE |
| FP-301 | Poly/Orthophosphate Feed Pump Start/Stop | 1 | | | | FUTURE |
| FP-301 | Poly/Orthophosphate Feed Pump Speed Control | | | | 1 | FUTURE |
| FP-301 | Poly/Orthophosphate Feed Pump Speed Feedback | | | 1 | | FUTURE |
| FP-302 | Poly/Orthophosphate Feed Pump Run Status | 1 | | | | FUTURE |
| FP-302 | Poly/Orthophosphate Feed Pump Fault | 1 | | | | FUTURE |
| FP-302 | Poly/Orthophosphate Feed Pump In Remote | 1 | | | | FUTURE |
| FP-302 | Poly/Orthophosphate Feed Pump Start/Stop | 1 | | | | FUTURE |
| FP-302 | Poly/Orthophosphate Feed Pump Speed Control | | | | 1 | FUTURE |
| FP-302 | Poly/Orthophosphate Feed Pump Speed Feedback | | | 1 | | FUTURE |
| | | | | | | |
| | **TOTALS** | **36** | **4** | **9** | **6** | |




1 / H100A BASIN PLAN

1/4" = 1'-0"

0 2' 4' 8'

Project:
TOWN OF BLACKSTONE,
MASSACHUSETTS DEPARTMENT OF
PUBLIC WORKS

WATER TREATMENT PLANT

53 ELM STREET, BLACKSTONE,
MASSACHUSETS,01504

Weston & Sampson
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978.532.1900 800.SAMPSON

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| No. | Date | Description |
|---|---|---|
| 1 | 06/24/2021 | ADDENDUM 1 |



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Scale:

Key Plan:

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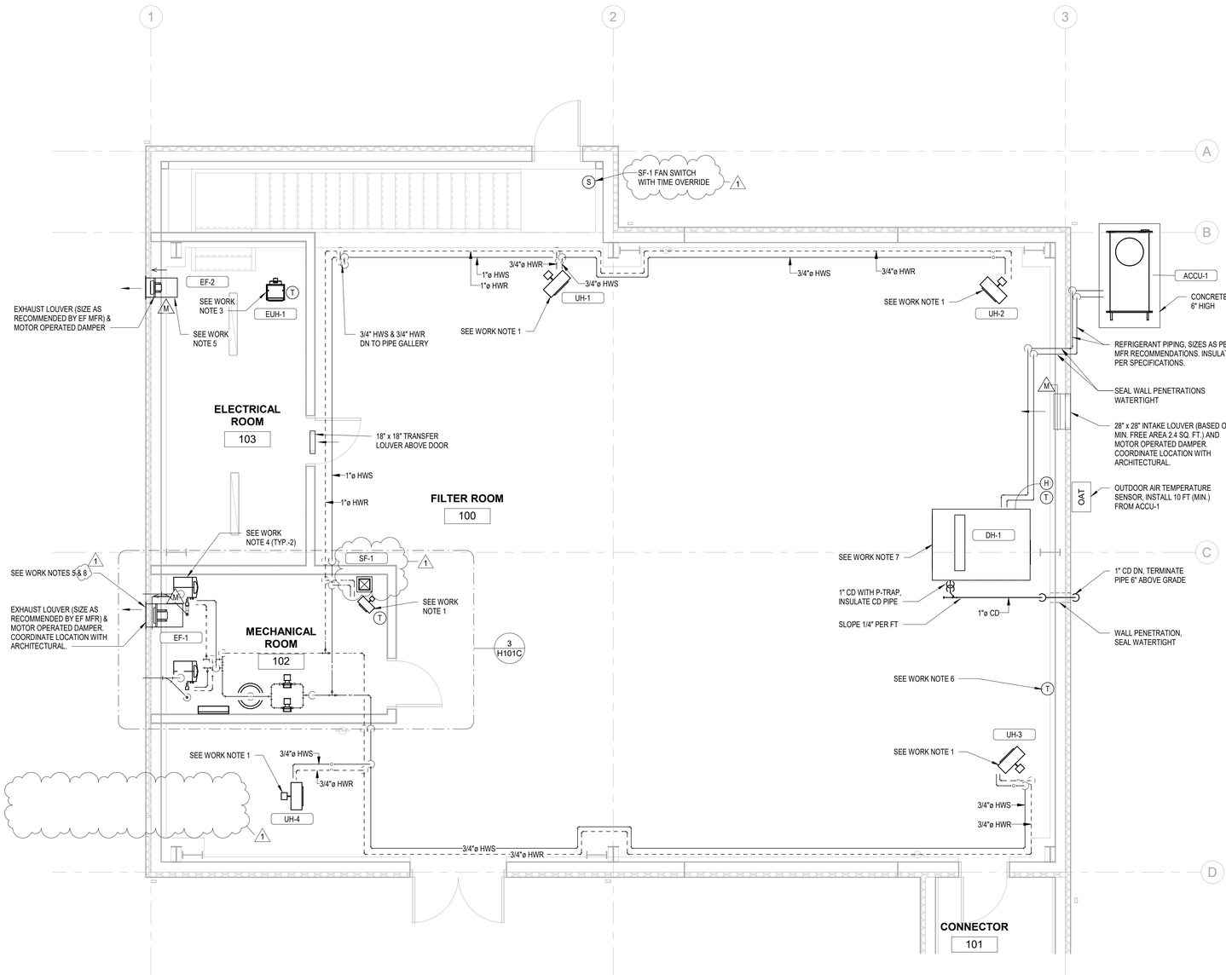
| Date: | 05/21/2021 |
| Drawn By: | YK |
| Reviewed By: | SEH |
| Approved By: | SEH |
| W&S Project No.: | 2200740 |
| W&S File No.: | TBD |

Drawing Title:
HVAC NEW BUILDING
BASIN PLAN

Sheet Number:
H100A

Addendum No. 1




1 / H101A HVAC NEW BUILDING FIRST FLOOR PLAN

1/4" = 1'-0"

0 2' 4' 8'

WORK NOTES:

1. HOT WATER UNIT HEATER, PROVIDE SUPPORTS BRACKETS. INSTALL 10 FT AFF.
2. HOT WATER UNIT HEATER, PROVIDE SUPPORT BRACKETS. INSTALL UNDER CEILING.
3. ELECTRIC UNIT HEATER, PROVIDE SUPPORTS. COORDINATE WITH ELECTRICAL.
4. GAS-FIRED BOILER, INSTALL ON 6" CONCRETE PAD. COORDINATE BOILER LOCATION AND REQUIRED CLEARANCES WITH PROCESS PIPE IN THE MECHANICAL ROOM.
5. WALL EXHAUST FAN. PROVIDE WITH LOUVER AND MOTOR OPERATED DAMPER (BY THE FAN MFR). COORDINATE WALL OPENING SIZE WITH FAN'S MFR. RECOMMENDATIONS.
6. COMMERCIAL PROGRAMMABLE THERMOSTAT, WALL MOUNTED, SHALL CONTROL (4) HW UNIT HEATERS IN FILTER ROOM, EXHAUST FAN EF-1 AND ASSOCIATED INTAKE LOUVER IN FILTER ROOM. THERMOSTAT SHALL HAVE MANUAL OVERRIDE CAPABILITY. REFER TO FAN CONTROLS ON DRAWING H701. INSTALL THERMOSTAT 4'-0" AFF.
7. MOUNT DEHUMIDIFIER UP HIGH, COORDINATE LOCATION WITH PROCESS PIPING AND EQUIPMENT. SUPPORT UNIT FROM STRUCTURAL ELEMENTS ABOVE.
8. EXHAUST FAN SHALL BE 18 FT AFF. FOR LOCATION OF FAN WALL OPENING REFER TO ARCHITECTURAL DRAWINGS. (1)

Project:

TOWN OF BLACKSTONE, MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

WATER TREATMENT PLANT

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| 1 | 06/24/2021 | ADDENDUM 1 |



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Scale:

Key Plan:

NORTH

| | |
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| Date: | 05/21/2021 |
| Drawn By: | YK |
| Reviewed By: | SEH |
| Approved By: | SEH |
| W&S Project No.: | 2200740 |
| W&S File No.: | TBD |

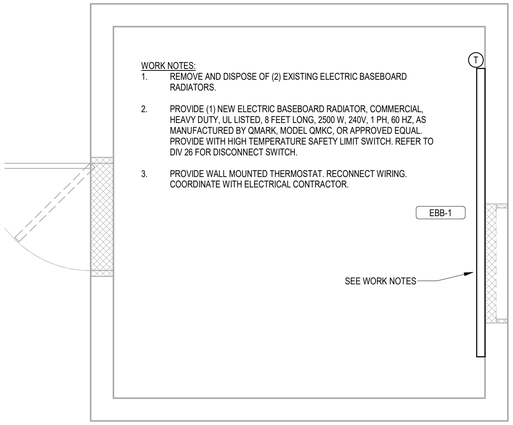
Drawing Title:

HVAC NEW BUILDING FIRST FLOOR PLAN

Sheet Number:

H101A

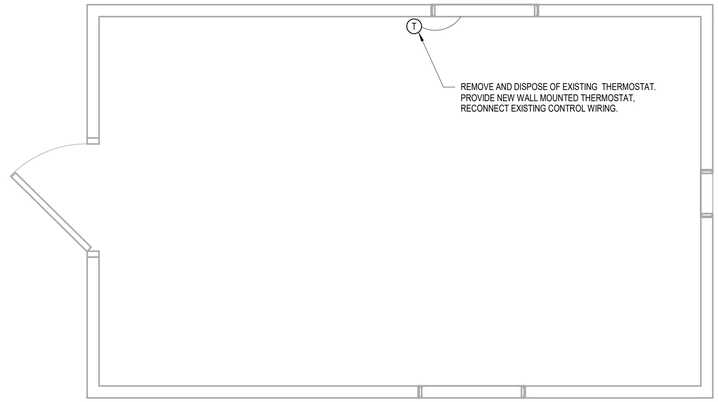
Addendum No. 1




1 H101C ALTERNATE No. 1 - WELL No. 2

1/2" = 1'-0"

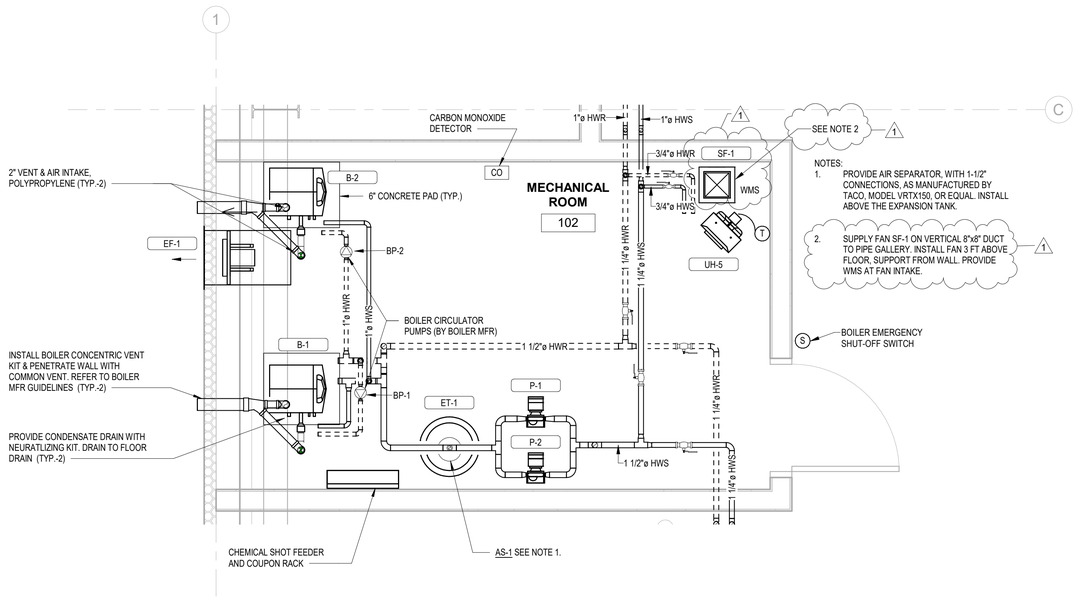
0 1' 2' 4'




2 H101C ALTERNATE No. 1 - WELL No. 6

1/2" = 1'-0"

0 1' 2' 4'




3 H101C NEW BUILDING MECHANICAL ROOM PLAN

1/2" = 1'-0"

0 1' 2' 4'



Project:

TOWN OF BLACKSTONE, MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

WATER TREATMENT PLANT

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| Date: | 05/21/2021 |
| Drawn By: | YK |
| Reviewed By: | SEH |
| Approved By: | SEH |
| W&S Project No.: | 2200740 |
| W&S File No.: | TBD |

Drawing Title:

WELL NO. 2 AND 6 HVAC FLOOR PLANS

Sheet Number:

H101C

## DEHUMIDIFIER SCHEDULE

| ID | SERIVCE/LOCATION | MANUFACTURER | MODEL | AIRFLOW (CFM) | ESP (in wc) | TSP (in wc) | OUTSIDE AIRFLOW (CFM) | DEHUMIDIFIER CAP. (LBS/HR) | REFRIGERANT | VOLTAGE | PHASE | HZ | FILTER | WEIGHT | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DH-1 | FILTER ROOM 100 | DESERT AIRE | LW-15 | 6.900 | 0.05 | 1.22 | 0 | 44 | R-407C | 460 | 3 | 60 | MERV 8 | 2050 | 1 THROUGH 7 |

NOTES:
1. REFER TO SPECIFICATIONS, DETAILS, AND CONTROL DIAGRAMS FOR ADDITIONAL INFORMATION.
2. PROVIDE AIR COOLING, UNIT SHALL HAVE REFRIGERANT CONNECTIONS AND BE REMOTE CONDENSER READY.
3. PERFORMANCE IS RATED AT 70° F AND 50% RH.
4. PROVIDE UNIT-MOUNTED POWER DISCONNECT, EIC STARTER, OVERLOAD PROTECTION, REFRIGERANT SWITCH.
5. DEHUMIDIFIER SHALL BE COMPATIBLE WITH OUTDOOR CONDENSING UNIT ACCU-1.
6. PROVIDE STAINLESS STEEL SLOPED DRAIN PAN.
7. PROVIDE MICROPROCESSOR CONTROLLER.

## REMOTE AIR COOLED CONDENSING UNIT SCHEDULE

| ID | MANUFACTURER | MODEL NO. | COOLING ACTUAL CAP (MBH) | COMPRESSOR REFRIGERANT TYPE | WEIGHT (lb) | ELECTRICAL DATA FLA | MCA | V | PH | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| ACCU-1 | DESERT AIRE | CM3540 | 154.0 | R-407C | 390 | 6 | 6 | 460 | 3 | 1 THROUGH 6 |

NOTES:
1. REFER TO SPECIFICATIONS, DETAILS, AND CONTROL DIAGRAMS FOR ADDITIONAL INFORMATION.
2. PROVIDE FACTORY STAND OR CONCRETE PAD.
3. COMPRESSOR SHALL HAVE DC DRIVEN INVERTER TECHNOLOGY, CRANKCASE HEATERS, INTERNAL THERMAL OVERLOAD, AND COMPRESSOR ISOLATION.
4. PROVIDE WITH 1 YEAR COMPLETE UNIT WARRANTY (PARTS AND LABOR) AND 5 YEAR EXTENDED PARTS WARRANTY.
5. CONDENSING UNIT SHALL BE COMPATIBLE WITH DEHUMIDIFIER.
6. PROVIDE POWER DISCONNECT SWITCH.

## GAS-FIRED BOILER SCHEDULE

| ID | MANUFACTURER | MODEL | GAS-FIRED HEAT EXCHANGER: GAS BURNER INPUT (BTU/H) | CAP (BTU/H) | STAGES | FUEL TYPE | FUEL MIN PRESS (PSI) | WATERSIDE FLOW DESIGN (GPM) | EWT(°F) | LWT(°F) | PD (ftH2O) | VOL (GAL) | THERMAL EFF (%) | UNIT WEIGHT (lb) | FLA | MCA | MOCP | VOLT | PH | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B-1 | Lochinvar | KHB085N | 85000 | 80750 | 15 | NAT.GAS | 4.0 | 5.4 | 130 | 160 | 0.4 | 2.2 | 95 | 165 | 3.1 | 2.7 | 150.0 | 120 | 1 | 1 THROUGH 11 |
| B-2 | Lochinvar | KHB085N | 85000 | 80750 | 15 | NAT.GAS | 4.0 | 5.4 | 130 | 160 | 0.4 | 2.2 | 95 | 165 | 3.1 | 2.7 | 150.0 | 120 | 1 | 1 THROUGH 11 |

NOTES:
1. REFER TO SPECIFICATIONS, DETAILS, AND CONTROL DIAGRAMS FOR ADDITIONAL INFORMATION.
2. PROVIDE WITH STAINLESS STEEL CONSTRUCTION. PROVIDE BOILER WITH A 10 YEAR WARRANTY ON THE STAINLESS STEEL HEAT EXCHANGER AND 1 YEAR WARRANTY ON REMAINDER OF THE BOILER PARTS.
3. PROVIDE WITH PROBE TYPE LOW WATER CUT-OFF WITH MANUAL RESET, PRESSURE RELIEF VALVE SET AT 75 PSI, HIGH AND LOW GAS PRESSURE SWITCHES WITH MANUAL RESET TEMPERATURE AND PRESSURE GAUGES.
4. PROVIDE WITH FACTORY CONDENSATE TRAP AND CONDENSATE NUETRALIZER KIT.
5. PROVIDE WITH FACTORY OUTDOOR RESET CONTROL AND OUTDOOR AIR TEMPERATURE SENSOR.
6. PROVIDE WITH MANUFACTURER'S CONTROLLER AND ALARM BELL. PROVIDE FACTORY CONTROLLER.
7. PROVIDE WITH FACTORY HIGH TEMPERATURE LIMIT WITH MANUAL RESET, FLOW SWITCH, FLUE TEMPERATURE SENSOR, AND LOW AIR PRESSURE SWITCH.
8. BOILER AND INSTALLTION SHALL COMPLY WITH CSD-1 CODE REQUIREMENTS.
9. PROVIDE AL29-4C OR POLYPROPYLENE FLUE DESIGNED FOR AND APPROVED BY THE SUBMITTED CONDENSING BOILER MANUFACTURER WITH WALL VENT AND COMBUSTION AIR TERMINATIONS.
10. PROVIDE WITH MASSACHUSETTS APPROVED VENTLESS GAS TRAIN. IF NOT MA APPROVED, THE MECHANICAL CONTRACTOR SHALL PROVIDE PAINTED STEEL GAS VENTS AS REQUIRED TO PROPERLY VENT THE GAS TRAIN AT NO ADDITIONAL COST THE OWNER.
11. PROVIDE SINGLE POINT POWER. DISCONNECT BY DIV 26.

## UNIT HEATER SCHEDULE

| ID | LOCATION | MANUFACTURER | MODEL NO. | TYPE | FAN AIRFLOW (CFM) | MOTOR QTY | MOTOR POWER (HP) | MOTOR RPM | MOTOR ECM | HEATING COIL CAP (BTU/H) | AIRSIDE EAT(db)(°F) | AIRSIDE LAT(db)(°F) | WATERSIDE FLOW (GPM) | WATERSIDE EWT(°F) | WATERSIDE LWT(°F) | WATERSIDE PD (ftH2O) | VOLT | PH | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UH-1 | FILTER ROOM 100 | Modine | HC 63S | HORIZONTAL | 680 | 1 | 0.10 | 1550 | Yes | 29320 | 60.0 | 97.0 | 2.90 | 160 | 130 | 0.30 | 120 | 1 | 1 THROUGH 5 |
| UH-2 | FILTER ROOM 100 | Modine | HC 63S | HORIZONTAL | 680 | 1 | 0.10 | 1550 | Yes | 29320 | 60.0 | 97.0 | 2.90 | 160 | 130 | 0.30 | 120 | 1 | 1 THROUGH 5 |
| UH-3 | FILTER ROOM 100 | Modine | HC 63S | HORIZONTAL | 680 | 1 | 0.10 | 1550 | Yes | 29320 | 60.0 | 97.0 | 2.90 | 160 | 130 | 0.30 | 120 | 1 | 1 THROUGH 5 |
| UH-4 | FILTER ROOM 100 | Modine | HC 63S | HORIZONTAL | 680 | 1 | 0.10 | 1550 | Yes | 29320 | 60.0 | 97.0 | 2.90 | 160 | 130 | 0.30 | 120 | 1 | 1 THROUGH 5 |
| UH-5 | MECH RM 102 | Modine | HC 18L | HORIZONTAL | 370 | 1 | 0.04 | 1550 | Yes | 10420 | 60.0 | 100.0 | 1.00 | 160 | 130 | 0.40 | 120 | 1 | 1 THROUGH 5 |
| UH-6 | PIPE GALLERY | Modine | HC 18L | HORIZONTAL | 340 | 1 | 0.02 | 1550 | Yes | 7260 | 60.0 | 93.0 | 0.80 | 160 | 130 | 0.30 | 120 | 1 | 1 THROUGH 5 |
| UH-7 | EXISTING BLDG | Modine | HC 33S | HORIZONTAL | 630 | 1 | 0.04 | 1550 | Yes | 18600 | 60.0 | 91.0 | 2.30 | 180 | 160 | 0.20 | 120 | 1 | 1 THROUGH 5 |

NOTES:
1. REFER TO SPECIFICATIONS, DETAILS, AND CONTROL DIAGRAMS FOR ADDITIONAL INFORMATION.
2. PROVIDE ALL FRACTIONAL HP MOTORS WITH INTEGRAL DISCONNECT PREWIRED TO THE UNIT. DISCONNECTING MEANS SHALL BE NEMA RATED AND SUITABLE FOR LOCKING IN THE OFF POSITION.
3. PROVIDE ALL FRACTIONAL HP MOTORS WITH INTEGRAL RESETTABLE THERMAL OVERLOAD.
4. PROVIDE WIRE CAGE FAN GUARD.
5. PROVIDE WITH SPRING HANGING TYP VIBRATION ISOLATION.

## ELECTRIC UNIT HEATER SCHEDULE

| ID | LOCATION | MANUFACTURER | MODEL NO. | TYPE | FAN AIRFLOW DESIGN | MOTOR QTY | MOTOR POWER (HP) | MOTOR RPM | MOTOR ECM | HEATING COIL AIRSIDE EAT(db) | HEATING COIL AIRSIDE LAT(db) | HEATING ELEMENT QTY | HEATING ELEMENT POWER (KW) | WEIGHT (lb) | FLA | V | PH | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EUH-1 | ELECTRIC ROOM 103 | Modine | HER30 | CABINET | 380 | 1 | 0.03 | 1600 | No | 60.0 | 87.1 | 1 | 3 | 27 | 14.4 | 208 | 1 | 1 THROUGH 6 |

NOTES:
1. REFER TO SPECIFICATIONS, DETAILS, AND CONTROL DIAGRAMS FOR ADDITIONAL INFORMATION.
2. PROVIDE WITH INTEGRAL DISCONNECT PREWIRED TO THE UNIT. DISCONNECTING MEANS SHALL BE NEMA RATED AND SUITABLE FOR LOCKING IN THE OFF POSITION.
3. PROVIDE WITH INTEGRAL CONTINUOUS DUTY, AUTOMATIC RESETTING THERMAL OVERLOAD.
4. PROVIDE WIRE CAGE FAN GUARD.
5. PROVIDE LOW-VOLTAGE UNIT MOUNTED THERMOSTAT.
6. PROVIDE WITH SPRING HANGING TYP VIBRATION ISOLATION.

## FAN SCHEDULE

| ID | LOCATION | MANUFACTURER | MODEL NO. | TYPE | FAN AIRFLOW DESIGN (CFM) | FAN PRESS ESP (IN-WG) | FAN RPM | FAN DRIVE TYPE | MOTOR BHP | MOTOR QTY | MOTOR HP | MOTOR ECM | WEIGHT (lb) | V | PH | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EF-1 | FILTER ROOM 100 | Greenheck | SE-1-12-432-VG | SIDEWALL | 315 | 0.25 | 991 | DIRECT | 0.25 | 1 | 0.05 | Yes | 27 | 120 | 1 | 1 THROUGH 4 |
| EF-2 | ELECTRICAL ROOM | Greenheck | SE-1-10-428-P | SIDEWALL | 275 | 0.25 | 1650 | DIRECT | 0.20 | 1 | 0.04 | Yes | 20 | 120 | 1 | 1 THROUGH 4 |
| SF-1 | MECH ROOM 102 | Greenheck | SQ-70 | IN-LINE | 240 | 0.25 | 1750 | DIRECT | 0.17 | 1 | 0.04 | No | 26 | 120 | 1 | 5 THROUGH 8 |

NOTES:
1. REFER TO SPECIFICATIONS, DETAILS, AND CONTROL DIAGRAMS FOR ADDITIONAL INFORMATION.

SIDEWALL
1. PROVIDE WALL HOUSING WITH BIRD SCREEN.
2. PROVIDE ULTRA LOW LEAKAGE MOTORIZED DAMPER WITH LOW VOLTAGE DAMPER ACTUATOR.
3. PROVIDE WITH ECM TYPE MOTOR WITH MOTOR MOUNTED SPEED CONTROL DIAL.
4. PROVIDE WITH SINGLE POINT POWER AND FACTORY TOGGLE TYPE DISCONNECT SWITCH.

INLINE
5. PROVIDE GALVANIZED STEEL HOUSING WITH BOLTED ACCESS PANELS.
6. PROVIDE FLEXIBLE CONNECTOR BETWEEN FAN AND DUCT CONNECTION.
7. PROVIDE WITH SINGLE POINT POWER AND FACTORY TOGGLE TYPE DISCONNECT SWITCH.
8. PROVIDE SUPPORTS FROM THE WALL.

## PUMP SCHEDULE

| ID | MANUFACTURER | MODEL NO. | TYPE | DESIGN TEMP. (°F) | PUMP FLOW DESIGN (GPM) | PUMP HEAD (FT) | MOTOR WATT | MOTOR ECM | UNIT WEIGHT (lb) | V | PH | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P-1 | Grundfos | MAGNA3 32-100 F | IN-LINE CIRCULATOR | 200 | 15.0 | 20.0 | 178.00 | Yes | 17 | 115 | 1 | 1 THROUGH 3 |
| P-2 | Grundfos | MAGNA3 32-100 F | IN-LINE CIRCULATOR | 200 | 15.0 | 20.0 | 178.00 | Yes | 17 | 115 | 1 | 1 THROUGH 3 |

NOTES:
1. REFER TO SPECIFICATIONS, DETAILS, AND CONTROL DIAGRAMS FOR ADDITIONAL INFORMATION.
2. PROVIDE PREMIUM EFFICIENCY ECM TYPE MOTOR WITH INTEGRAL CONTROLS AND THERMAL AND OVERCURRENT PROTECTION. PROVIDE WITH STAINLESS STEEL IMPELLOR AND SHAFT.
3. REFER TO DIV 26 FOR DISCONNECT SWITCH.

## EXPANSION TANK SCHEDULE

| ID | LOCATION | MANUFACTURER | MODEL NO. | TYPE | VOLUME TANK | UNIT DIMENSIONS HEIGHT | UNIT DIMENSIONS DIAMETER | MAX WORKING PRESURE (PSIG) | WEIGHT (lb) | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| ET-1 | MECH ROOM 102 | TACO | CA-90 | BLADDER | 23.0 | 30" | 16" | 125 | 120 | 1, 2 |

NOTES:
1. REFER TO SPECIFICATIONS, DETAILS, AND CONTROL DIAGRAMS FOR ADDITIONAL INFORMATION.
2. TANK SHALL BE ASME RATED

## PIPE INSULATION (2015 IECC AND ASHRAE 90.1 2013 COMPLIANCE)

| PIPING SYSTEM TYPES | FLUID TEMPERATURE RANGE (°F) | MINIMUM INSULATION THICKNESS IN INCHES FOR INDOOR PIPE SIZES (SEE NOTES BELOW) <1" | 1" & 1-1/4" | 1-1/2" - 3" | K-FACTOR (BTU-INCH/°F-HR-SF) AT AVG TEMPERATURE (°F) |
|---|---|---|---|---|---|
| LOW TEMPERATURE HEATING | 141-200 | 1.5 | 1.5 | 2 | 0.25-0.29 @ 125°F |
| FULLY CONDENSING BOILERS | 105-140 | 1 | 1 | 1.5 | 0.22-0.28 @ 100°F |
| REFRIGERANT OR COOLING COIL CONDENSATE DRAIN | <60 | 0.5 | 1 | 1 | 0.20-0.27 @ 75°F |

NOTES:
1. REFER TO SPECIFICATIONS AND DETAILS FOR ADDITIONAL INFORMATION.
2. FOR MINIMUM THICKNESS OF ALTERNATIVE INSULATION TYPES OUTSIDE THE STATED CONDUCTIVITY RANGE, SEE TEST METHOD FOR STEADY STATE HEAT TRANSFER PROPERTIES OF HORIZONTAL PIPE INSULATIONS, ASTM C 335-95, AND THE STATE ENERGY CODE.
3. FOR DUAL TEMPERATURE SYSTEMS (HEATING AND COOLING) USE THE THICKER INSULATION VALUE REQUIRED FOR EITHER HEATING OR COOLING AND PROVIDE VAPOR BARRIER JACKET.
4. ALL OUTDOOR REFRIGERANT PIPING SHALL BE PROVIDED WITH 3/4" THICK INSULATION WITH PVC JACKETING.

Project:
TOWN OF BLACKSTONE, MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

WATER TREATMENT PLANT

53 ELM STREET, BLACKSTONE, MASSACHUSETS,01504

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Consultants:

Revisions:

| No. | Date | Description |
|---|---|---|
| 1 | 06/24/2021 | ADDENDUM 1 |



Seal:

Issued For:
BID DOCUMENTS

Scale:

Key Plan:

Date: 05/21/2021
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W&S Project No.: 2200740
W&S File No.: TBD

Drawing Title:
HVAC SCHEDULES

Sheet Number:
H601

## CONTROL POINT DESCRIPTOR LEGEND

| | |
|---|---|
| TAG | ATC CONTRACTOR PROVIDED DDC POINT AND HARDWARE |
| TAG | CONTROL DEVICE FURNISHED BY ELECTRICAL OR PLUMBING CONTRACTOR BUT INTERFACED TO DDC SYSTEM BY ATC CONTRACTOR (ELEC SHOWN) |
| TAG | ATC CONTRACTOR INTERFACE TO EQUIPMENT MANUFACTURER'S HARDWARE |
| TAG | ATC CONTRACTOR PROVIDED LOCAL CONTROL POINT |

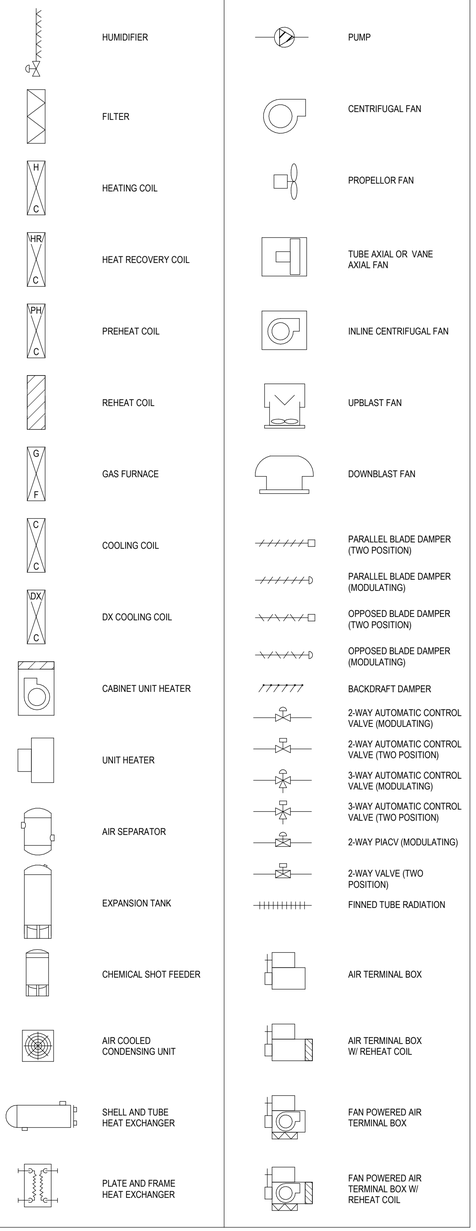
## CONTROL ABBREVIATIONS

| | |
|---|---|
| ACD | AUTOMATIC CONTROL DAMPER |
| ACV | AUTOMATIC CONTROL VALVE |
| AFMS | AIR FLOW MEASURING STATION |
| ALM | ALARM |
| ATC | AUTOMATIC TEMPERATURE CONTROL |
| AQS | AQUASTAT |
| BCV | BASEBOARD CONTROL VALVE |
| BDD | BACKDRAFT DAMPER W/ ADJ COUNTERWEIGHT |
| BV | BYPASS VALVE |
| C | CARBON DIOXIDE SENSOR |
| CAP | CAPACITY CONTROL |
| CCLT | COOLING COIL LEAVING AIR TEMP SENSOR |
| CLT | COIL LAT SENSOR |
| CHRT | CHILLED WATER RETURN TEMP SENSOR |
| CHST | CHILLED WATER SUPPLY TEMP SENSOR |
| CHWRT | CHILLED WATER RESET TEMPERATURE |
| CO | CARBON MONOXIDE SENSOR |
| CRT | CONDENSER WATER RET TEMP SENSOR |
| CST | CONDENSER WATER SUP TEMP SENSOR |
| CT | CURRENT TRANSFORMER (STATUS FEEDBACK) |
| CV | COOLING COIL CONTROL VALVE |
| DAT | DISCHARGE AIR TEMPERATURE SENSOR |
| DDC | DIRECT DIGITAL CONTROL |
| DDCFP | DIFFERENTIAL PRESSURE SWITCH |
| DL | DEMAND LIMIT |
| DPS | DEIFFERENTIAL PRESSURE SWITCH |
| DPT | DIFFERENTIAL PRESSURE SENSOR/TRANSMITTER |
| DPV | DIFFERENTIAL PRESSURE BYPASS VALVE |
| DSP | DISCHARGE STATIC PRESSURE SENSOR |
| EAD | EXHAUST AIR DAMPER |
| EAT | ENTERING AIR TEMPERATURE |
| ECM | ELECTRONICALLY COMMUTATED MOTOR |
| ERW | ENERGY RECOVERY WHEEL |
| ES | END SWITCH |
| FA | FAULT ALARM |
| FDPS | FILTER DIFFERENTIAL PRESSURE SWITCH |
| FMT | FLOW METER/TRANSMITTER |
| FS | FLOW SWITCH |
| FZ | FREEZESTAT |
| H | RELATIVE HUMIDITY SENSOR |
| HCV | HEATING COIL CONTROL VALVE |
| HCLT | HEATING COIL LEAVING AIR TEMP SENSOR |
| HE | HIGH EFFICIENCY |
| HEGA | HE GAS ABSORBER FILTER |
| HEPA | HE PARTICULATE AIR FILTER |
| HGB | HOT GAS BYPASS |
| HHL | HIGH HUMIDITY LIMIT SENSOR |
| HLH | HIGH/LOW HUMIDITY LIMIT SENSOR |
| HOA | HANDS-OFF AUTOMATIC SWITCH |
| HS | HAND SWITCH |
| HPS | HIGH LIMIT PRESSURE SENSOR |
| HSPS | HIGH STATIC PRESSURE SWITCH |
| HV | HEATING CONTROL VALVE |
| HWRT | HOT WATER RETURN TEMP SENSOR |
| HWST | HOT WATER SUPPLY TEMP SENSOR |
| IFBD | INEGRAL FACE AND BYPASS |
| IGV | INLET GUIDE VANES |
| LAT | LEAVING AIR TEMP SENSOR |
| LEL | LOW EXPLOSIVE LIMIT |
| LLSV | LIQUID LINE SOLENOID VALVE |
| LSPS | LOW STATIC PRESSURE SWITCH |
| LS | LEVEL SENSOR |
| LSI | LIGHT SWICH INTERFACE |
| LSHA | LEVEL SENSOR HIGH ALARM |
| LSHS | LEVEL SENSOR HIGH SWITCH |
| LSLA | LEVEL SENSOR LOW ALARM |
| LSLS | LEVEL SENSOR LOW SWITCH |
| MAT | MIXED AIR TEMP SENSOR |
| MUWW | MAKE-UP WATER VALVE |
| MD | MOTION DETECTOR |
| NC | NORMALLY CLOSED (ON LOSS OF POWER) |
| NO | NORMALLY OPEN (ON LOSS OF POWER) |
| NO2 | NITROGEN DIOXIDE SENSOR |
| OAD | OUTSIDE AIR DAMPER |
| OAH | OUTSIDE AIR HUMIDITY SENSOR (WB) |
| OAT | OUTSIDE AIR TEMPERATURE SENSOR (DB) |
| PAD | PRIMARY AIR DAMPER |
| PIACV | PRESSURE INDEPENDANT ACV |
| PPM | PARTS PER MILLION |
| PR | PRESSURE SENSOR |
| PROP | PROPANE SENSOR |
| RAD | RETURN AIR DAMPER |
| RAH | RETURN AIR HUMIDITY SENSOR |
| RAT | RETURN AIR TEMPERATURE SENSOR |
| RV | REHEAT CONTROL VALVE |
| RH | RELATIVE HUMIDITY |
| RI | RUN INDICATOR |
| RSID | RETURN SMOKE ISOLATION DAMPER |
| S | SWITCH |
| SAD | SUPPLY AIR DAMPER |
| SD | SMOKE DAMPER |
| SDET | SMOKE DETECTOR |
| SFT | SMOKE/FIRE DETECTOR |
| SP | STATIC PRESSURE SENSOR |
| SPD | SPEED CONTROL |
| S/S | START/STOP |
| S/SH | START/STOP HIGH SPEED/CAPACITY |
| S/SL | START/STOP LOW SPEED/CAPACITY |
| SSID | SUPPLY SMOKE ISOLATION DAMPER |
| SSP | SUCTION STATIC PRESSURE SENSOR |
| T | THERMOSTAT |
| TAD | TRANSFER AIR DAMPER |
| TS | TEMPERATURE SENSOR |
| VFD | VARIABLE FREQUENCY DRIVE |
| VFDS | VFD SPEED |
| VFDO | VFD OUTPUT (FEEDBACK) |
| VS | VIBRATION SWITCH |

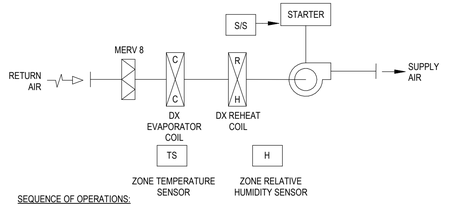
## GENERAL ATC NOTES

1. ON-SITE TRAINING SHALL ALSO INCLUDE A MINIMUM OF 8 HOURS OF HANDS ON INSTRUCTION GEARED TOWARD OPERATION AND MAINTENANCE OF THE SYSTEMS, PRIOR TO TRAINING, THE NECESSARY LESSON PLANS, TRAINING DOCUMENTS, HANDOUTS, ETC. SHALL BE PROVIDED WITH THE CURRICULUM OUTLINED.
2. ALL TRAINING SHALL BE RECORDED AND COPIED TO DVD BY THE ATC CONTRACTOR. THREE COPIES OF THE RECORDED SESSIONS SHALL BE SUBMITTED TO THE OWNER FOR THEIR USE.
3. PROVIDE WIRING FROM ELECTRICAL SOURCE TO MISCELLANEOUS ATC DEVICES. REFER TO HVAC PLANS, HVAC MECHANICAL ROOM PLANS, AND ELECTRICAL PLANS FOR LOCATION OF POWER SOURCES FOR ATC SYSTEM.
4. PROVIDE DEMOLITION OF EXISTING CONTROL COMPONENTS WHICH ARE BEING REPLACED BY THE NEW ATC CONTROL SYSTEM.
5. LOCATION OF ALL NEW DDC CONTROL PANELS SHALL BE FIELD VERIFIED WITH THE EXISTING CONDITIONS BY THE CONTRACTOR.
6. ALL ATC CONTROLS SHALL BE HARDWIRED. NO WIRELESS TECHNOLOGY SHALL BE ALLOWED. ALL EXPOSED WIRING IN THE SHOPS, MAINTENANCE OR STORAGE AREAS SHALL BE INSTALLED IN MINIMUM 1/2 INCH GALVANIZED EMT CONDUIT.
7. INSTALL ALL NEW CONTROL WIRING FOR OFFICES AND OTHER SIMILAR OCCUPIED SPACES IN THE WALLS. WHERE WIRING WOULD BE EXPOSED IN THESE AREAS, THE WIRING SHALL BE INSTALLED IN WIRE MOLD.

## DIAGRAM EQUIPMENT SYMBOLS




NOTE: SOME OR ALL SYMBOLS MAY BE USED ON THIS PROJECT

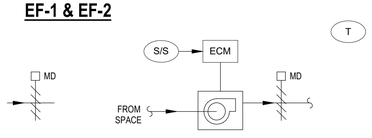



SEQUENCE OF OPERATIONS:

1. THE DEHUMIDIFIER SHALL OPERATE UPON A RISE IN THE SPACE DEWPOINT TEMPERATURE ABOVE 42°F (ADJ). THE DEHUMIDIFIER SHALL RUN CONTINUOUSLY UNTIL THE SPACE DEWPOINT TEMPERATURE SETPOINT IS SATISFIED.
2. THE DEHUMIDIFIER SHALL OPERATE IN COOLING MODE WHEN THE SPACE DRY BULB TEMPERATURE RISES ABOVE 80°F (ADJ). IN THIS MODE THE CONTROLLER WILL SHIFT THE DEHUMIDIFIER FROM THE REHEAT MODE AND REJECT ALL ENERGY TO THE REMOTE CONDENSER TO PROVIDE SENSIBLE COOLING TO THE SPACE.

## DEHUMIDIFIER

## EF-1 & EF-2




EXHAUST FAN CONTROLS:

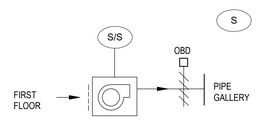
GENERAL
1. THE EXHAUST FAN SHALL BE STARTED AND STOPPED VIA TEMPERATURE SENSOR.
2. ALL TEMPERATURES LISTED ARE FAHRENHEIT. ALL SETPOINTS ARE ADJUSTABLE.

FAN CONTROL
1. THE FAN SHALL BE DE-ENERGIZED. INTAKE AND EXHAUST DAMPERS SHALL BE CLOSED. UPON A RISE IN SPACE TEMPERATURE ABOVE THE SETPOINT OF 80°F (ADJ), DAMPERS SHALL OPEN, AND THE FAN SHALL BE ENERGIZED.
2. THE OPPOSITE SHALL OCCUR ON A DROP IN SPACE TEMPERATURE BELOW 75°F (ADJ).
3. TEMPERATURE SENSOR SHALL HAVE ON-OFF MANUAL OVERRIDE, AND MAINTAIN THIS SETTING FOR 30 MINUTES (ADJ.). AFTER SET TIME, REGULAR SCHEDULE SHALL RESUME.

ALARMS
1. IF THE ROOM TEMPERATURE FALLS BELOW 40°F (ADJ) OR ABOVE 95°F (ADJ) FOR 10 MINUTES (ADJ) OR LONGER, SEND A DETAILED ALARM TO THE SCADA.

## EXHAUST FANS

## SF-1

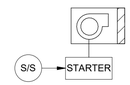



EXHAUST FAN CONTROLS:

1. THE SUPPLY FAN SHALL BE STARTED AND STOPPED FROM WALL MOUNTED MANUAL ON-OFF SWITCH WITH TIME OVERRIDE.
2. WHEN SWITCH IS OFF FAN SHALL BE DE-ENERGIZED. WHEN SWITCH IS ON, FAN SHALL START AND RUN FOR 30 MINUTES (ADJ.). WHEN SET TIME IS EXPIRED, THE FAN SHALL TURN OFF.

1

## SUPPLY FAN - PIPE GALLERY



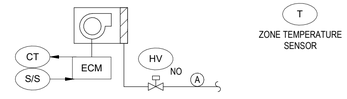

UNIT HEATER CONTROLS:

GENERAL
1. UNIT HEATER SHALL BE STARTED AND STOPPED VIA LINE VOLTAGE ELECTRONIC THERMOSTAT.
2. ALL SETPOINTS SHALL BE ADJUSTABLE.
3. ALL TEMPERATURES LISTED ARE IN FAHRENHEIT.

CONTROL SEQUENCE
1. THE UNIT HEATER FAN SHALL BE DE-ENERGIZED. UPON A DROP IN SPACE TEMPERATURE BELOW THE SETPOINT OF 60°F (ADJ), THE HEATER SHALL BE ENERGIZED.
2. THE OPPOSITE SHALL OCCUR ON A RISE IN SPACE TEMPERATURE ABOVE 62°F (ADJ).

## ELECTRIC UNIT HEATER (EUH-1)

## UH-1




UNIT HEATER CONTROLS:

GENERAL
1. UNIT HEATER SHALL BE STARTED AND STOPPED VIA DDC CONTROLLER.
2. ALL SETPOINTS SHALL BE ADJUSTABLE.
3. MOTOR RATED RELAYS SHALL BE PROVIDED TO INTERFACE MANUAL MOTOR STARTER WITH CONTROL WIRING TO SATISFY CONTROL SEQUENCE.
4. ALL TEMPERATURES LISTED ARE IN FAHRENHEIT.

CONTROL SEQUENCE
1. THE UNIT HEATER FAN SHALL BE DE-ENERGIZED. UPON A DROP IN SPACE TEMPERATURE BELOW THE SETPOINT OF 60°F (ADJ), THE CONTROL VALVE (HV) SHALL OPEN AND FLOW SHALL BE PROVEN BY THE AQUASTAT PRIOR TO THE FAN BEING ENERGIZED.
2. THE OPPOSITE SHALL OCCUR ON A RISE IN SPACE TEMPERATURE ABOVE 62°F (ADJ).

ALARMS
1. IF THE ROOM TEMPERATURE FALLS BELOW 50°F (ADJ) FOR 10 MINUTES (ADJ) OR LONGER, THE DDC CONTROLLER SHALL GIVE A DETAILED ALARM SIGNAL TO THE OPERATOR WORKSTATION.

## UNIT HEATER CONTROL SEQUENCE

Project:
TOWN OF BLACKSTONE, MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS
WATER TREATMENT PLANT
53 ELM STREET, BLACKSTONE, MASSACHUSETS,01504

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Consultants:

Revisions:

| No. | Date | Description |
|---|---|---|
| 1 | 06/24/2021 | ADDENDUM 1 |



Seal:

Issued For:
BID DOCUMENTS

Scale:

Key Plan:

| | |
|---|---|
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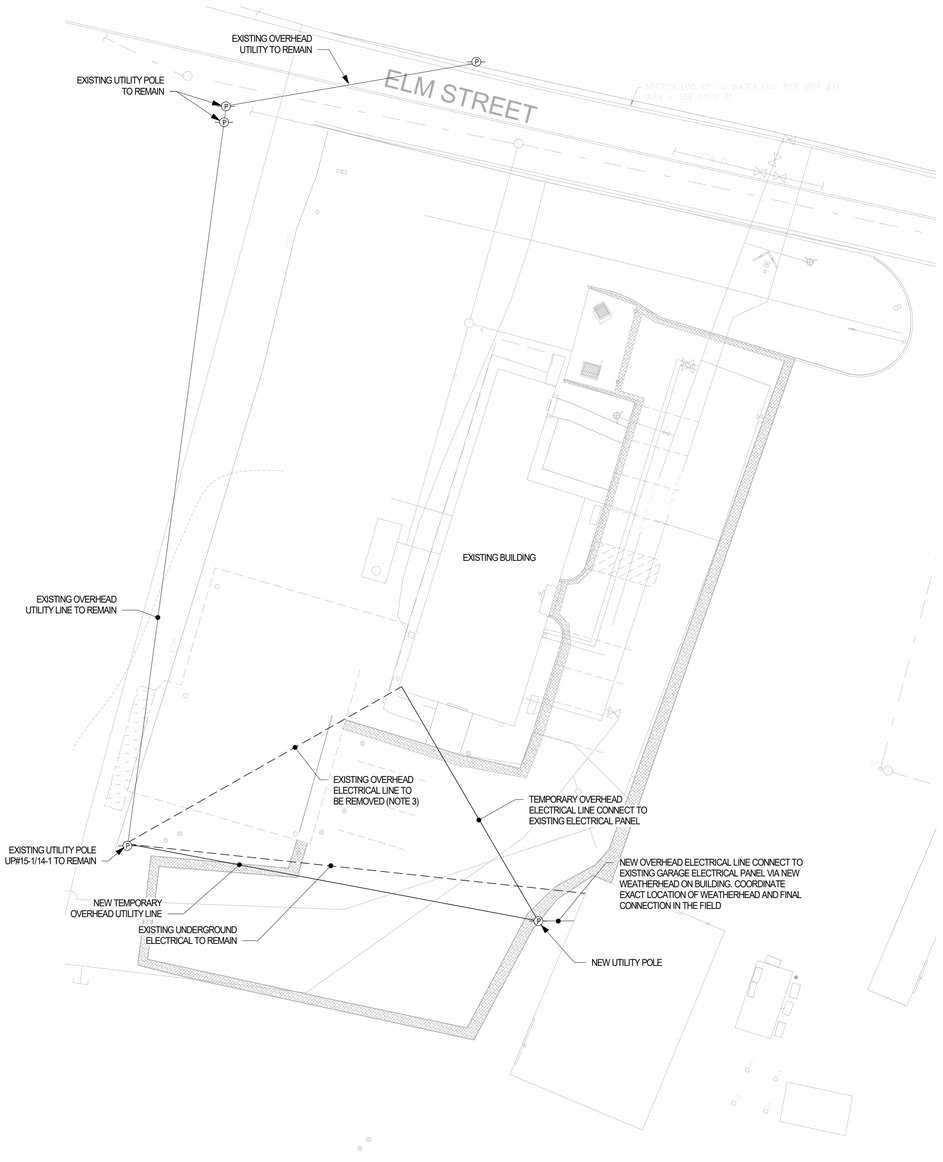
| Drawn By: | YK |
| Reviewed By: | SEH |
| Approved By: | SEH |
| W&S Project No.: | 2200740 |
| W&S File No.: | TBD |

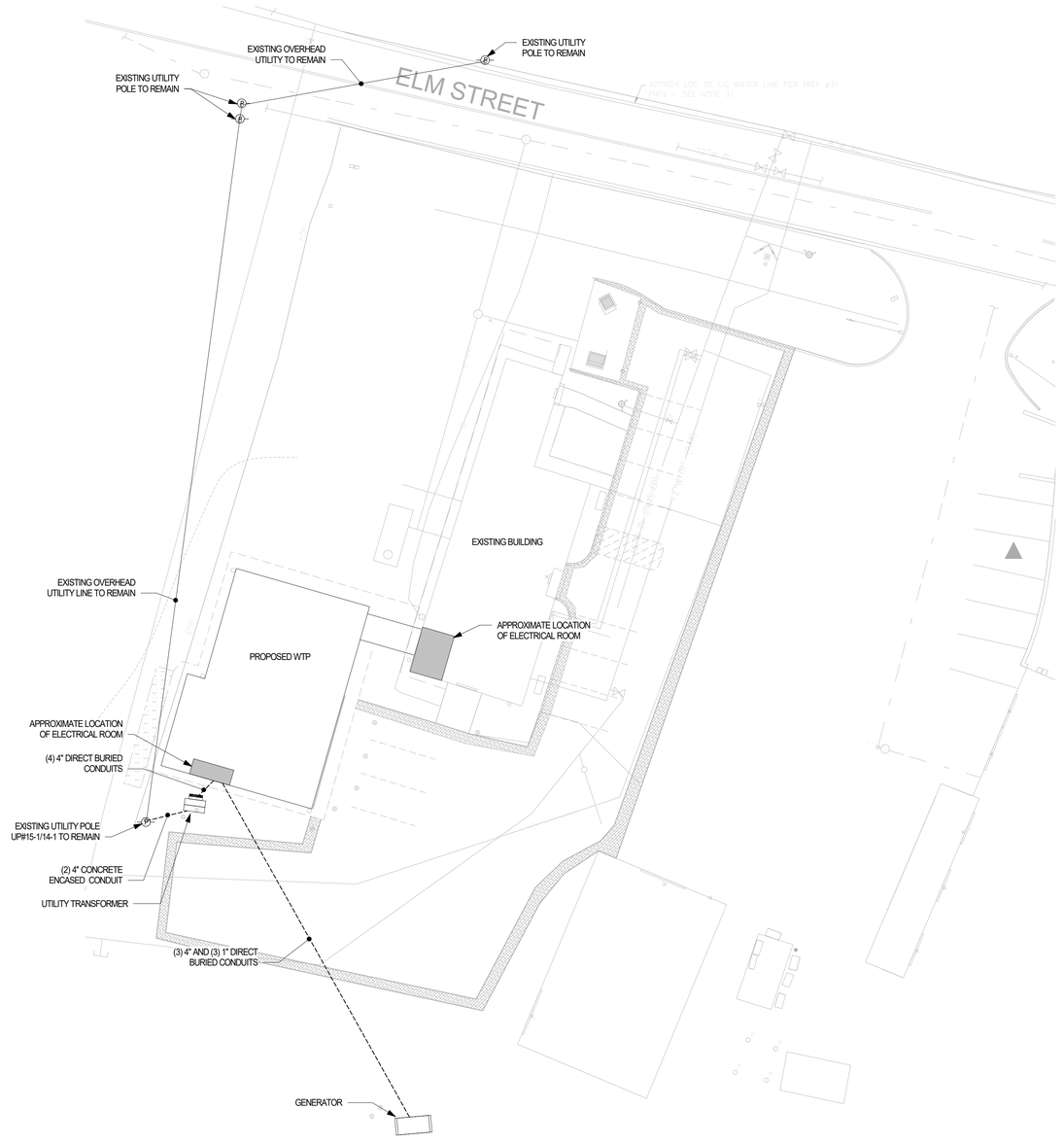
Drawing Title:
MECHANICAL AUTOMATIC TEMPERATURE CONTROLS

Sheet Number:
H701

Addendum No. 1




1 Site-Electrical Demo/Temp Plan
1" = 20'-0"




2 Site-Electrical New Work Plan
1" = 20'-0"

DRAWING NOTES:

1. REFER TO DRAWING E001 FOR LEGEND AND ABBREVIATIONS.
2. REFER TO DRAWING E002 FOR GENERAL NOTES.
3. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE UTILITY COMPANY TO RELOCATE THE EXISTING OVERHEAD UTILITY LINES FEEDING THE EXISTING CORROSION CONTROL FACILITY. UTILITY SHALL BE RESPONSIBLE FOR ALL OVERHEAD PRIMARY WIRE. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SECONDARY WIRING. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE UTILITY COMPANY TO PROVIDE A TEMPORARY SERVICE WHILE THE NEW WATER TREATMENT PLANT IS BEING INSTALLED. ONCE THE NEW SERVICE TO THE WATER TREATMENT FACILITY HAS BEEN INSTALLED, TESTED AND OPERATIONAL ELECTRICAL CONTRACTOR SHALL REFEED THE EXISTING CORROSION CONTROL FACILITY FROM THE NEW WATER TREATMENT PLANT. ONCE THE NEW PERMANENT POWER IS INSTALLED, TESTED AND OPERATION ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE UTILITY FOR THE DISCONNECTION AND REMOVAL OF THE TEMPORARY ELECTRICAL SERVICE. ELECTRICAL CONTRACTOR SHALL COORDINATE ALL SHUTDOWNS WITH THE OWNER. 1

20 10 0 20 40
SCALE: 1"=20'

Project:
TOWN OF BLACKSTONE, MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

BLCKSTONE WATER TREAMENT PLAN

53 ELM STREET, BLACKSTONE, MASSACHUSETTS, 01504

Weston & Sampson
Weston & Sampson Engineers, Inc.
55 Walkers Brook Drive, Suite 100
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978.532.1900 800.SAMPSON
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Consultants:

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Key Plan:

NORTH

| | |
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| Date: | 05/21/2021 |
| Drawn By: | DNM |
| Reviewed By: | RFM |
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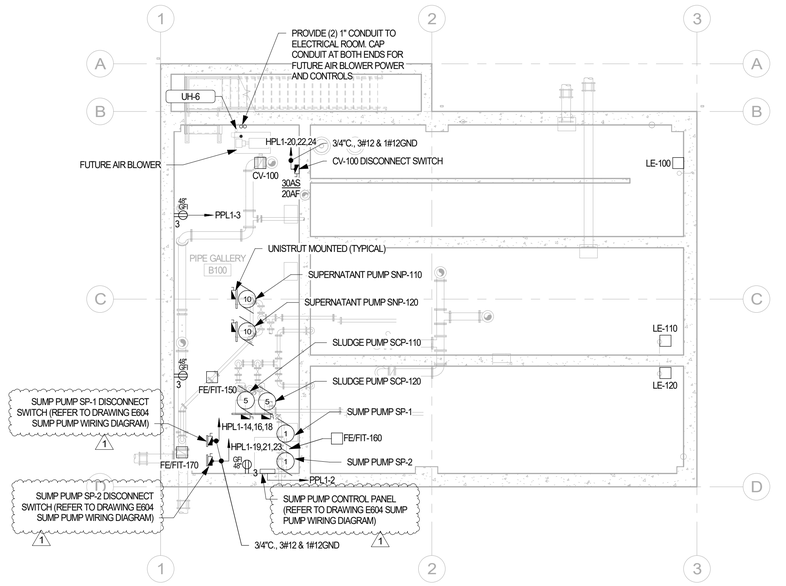
Drawing Title:
ELECTRICAL SITE PLANS

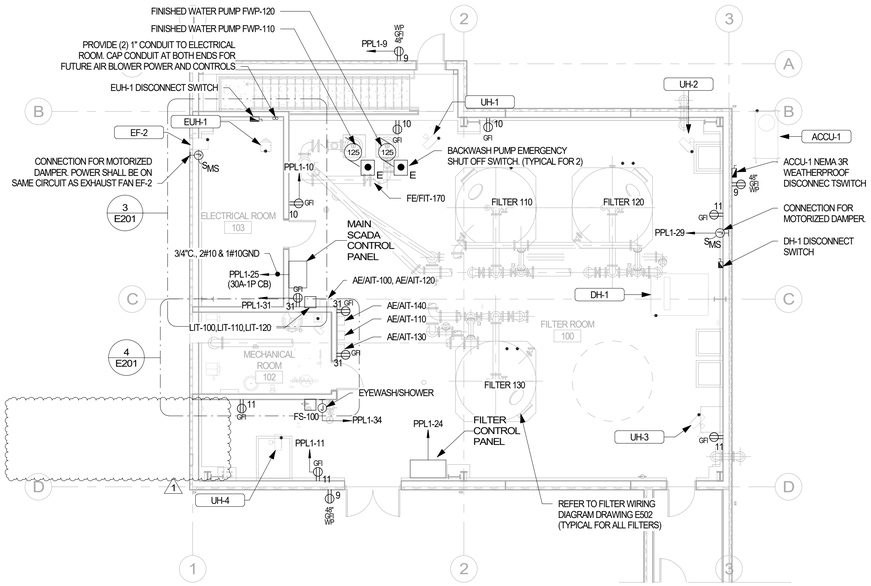
Sheet Number:
E003

Addendum No. 1



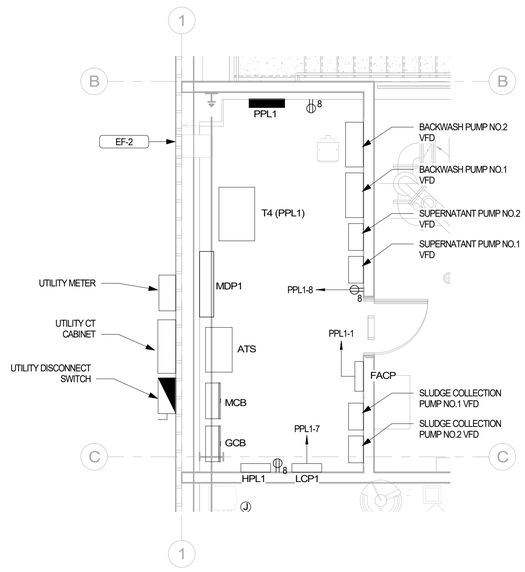

1 Water Treatment Basin Level Power Plan
1/8" = 1'-0"

0 4' 8' 16'



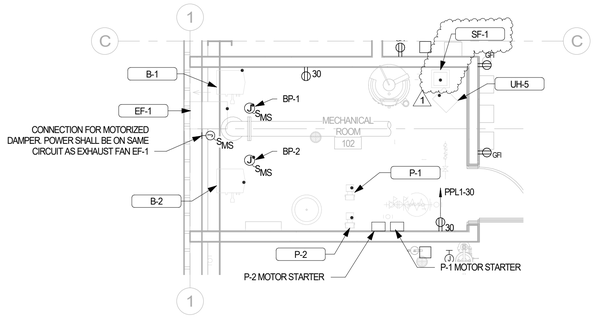

2 Water Treatment Plant First Floor Power Plan
1/8" = 1'-0"

0 4' 8' 16'




3 ELECTRICAL ROOM ENLARGED PLAN
1/4" = 1'-0"

0 2' 4' 8'




4 MECHANICAL ROOM ENLARGED PLAN
1/4" = 1'-0"

0 2' 4' 8'

DRAWING NOTES:

1. REFER TO DRAWING E001 FOR LEGEND AND ABBREVIATIONS.
2. REFER TO DRAWING E002 FOR GENERAL NOTES.
3. REFER TO DRAWING E602 AND E603 FOR EQUIPMENT SCHEDULES.
4. REFER TO DRAWINGS E603 FOR PANELBOARD SCHEDULES.

Project:

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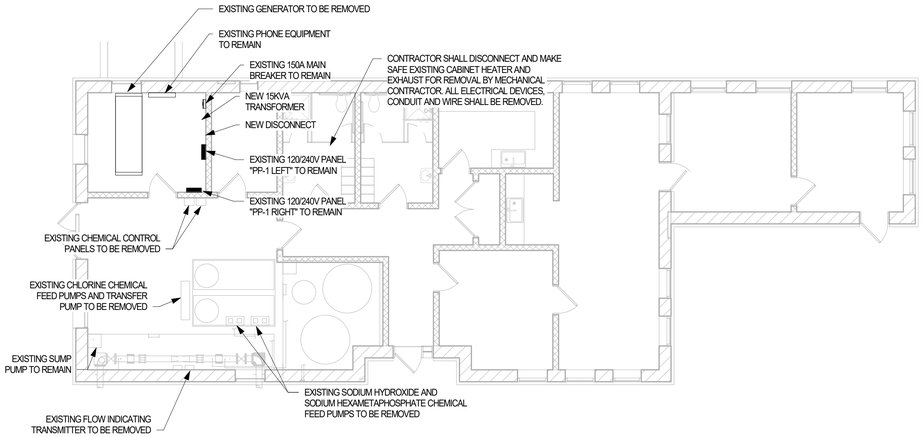
Drawing Title:

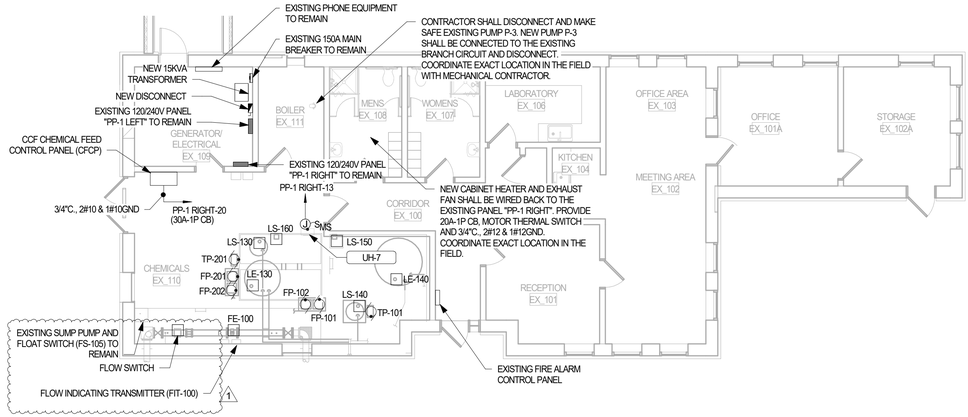
ELECTRICAL POWER PLANS

Sheet Number:

E201




3 Existing Bldg Power Demo Plan
1/8" = 1'-0"




1 Existing Bldg Power New Work Plan
1/8" = 1'-0"




EXISTING CORROSION CONTROL FACILITY ELECTRICAL ROOM PHOTO 1



EXISTING CORROSION CONTROL FACILITY ELECTRICAL PANEL




EXISTING CORROSION CONTROL FACILITY FIRE ALARM PANEL

EXISTING CORROSION CONTROL FACILITY ELECTRICAL ROOM PHOT 2

DRAWING NOTES:

1. REFER TO DRAWING E001 FOR LEGEND AND ABBREVIATIONS.
2. REFER TO DRAWING E002 FOR GENERAL NOTES.
3. REFER TO DRAWING E602 AND E603 FOR EQUIPMENT SCHEDULES.
4. REFER TO DRAWINGS E603 FOR PANELBOARD SCHEDULES.
5. REFER TO DRAWING E502 CHEMICAL FEED PUMP INSTALLATION DETAIL 6 AND CHEMICAL TRANSFER PUMP INSTALLATION DETAIL 7 FOR ADDITIONAL REQUIREMENTS.
6. ALL ELECTRICAL WORK ASSOCIATED WITH THE HVAC EQUIPMENT SHALL BE PART OF ALTERNATE NO.2

0 4' 8' 16'

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

Key Plan:

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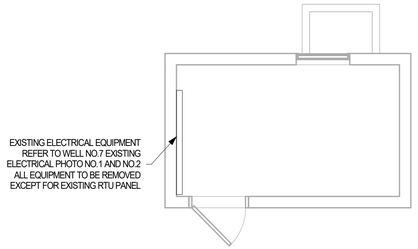
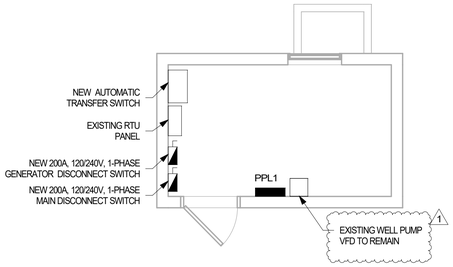
Drawing Title:
EXISTING CORROSION CONTROL FACILITY ELECTRICAL PLANS

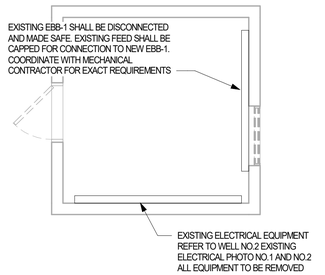
Sheet Number:
E202



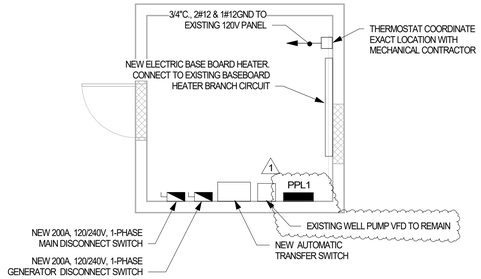

1 WELL NO.7- DEMO PLAN
1/4" = 1'-0"




2 WELL NO.7 - NEW WORK PLAN
1/4" = 1'-0"




3 WELL NO.2 - DEMO PLAN
1/4" = 1'-0"




4 WELL NO.2 - NEW WORK
1/4" = 1'-0"

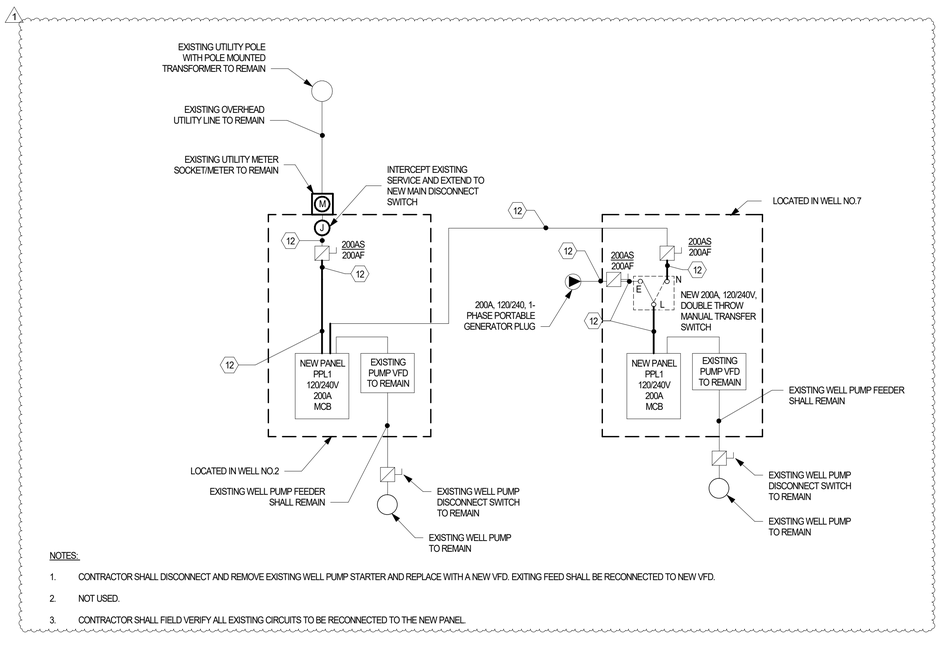
WELL NO.7 EXISTING ELECTRICAL EQUIPMENT PHOTO NO.1

WELL NO.7 EXISTING ELECTRICAL EQUIPMENT PHOTO NO.2

WELL NO.2 EXISTING ELECTRICAL EQUIPMENT PHOTO NO.1

WELL NO.2 EXISTING ELECTRICAL PANEL

WELL NO.2 EXISTING ELECTRICAL EQUIPMENT PHOTO NO.2




5 ELECTRICAL WELL NO.2 AND NO.7 ONE-LINE RISER DIAGRAM
NOT TO SCALE

DRAWING NOTES:

1. REFER TO DRAWING E001 FOR LEGEND AND ABBREVIATIONS.
2. REFER TO DRAWING E002 FOR GENERAL NOTES.

0 2' 4' 8'



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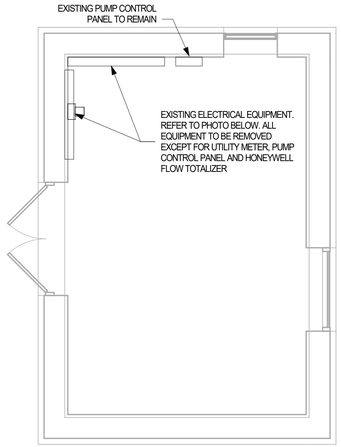
| Approved By: | RFM |
| W&S Project No.: | ENG20-0740 |
| W&S File No.: | TBD |

Drawing Title:

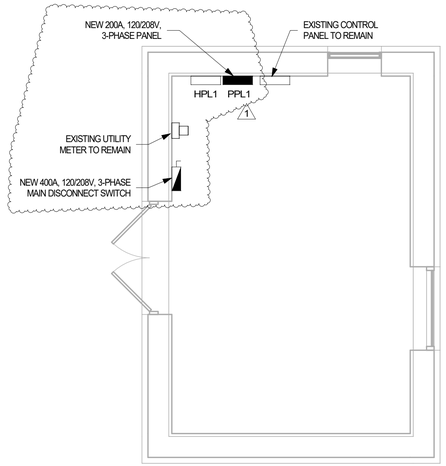
ELECTRICAL WELL PLANS SHEET I - ALTERNATE NO.1

Sheet Number:

E401




1 WELL NO.4 - DEMO PLAN
1/4" = 1'-0"




2 WELL NO.4 - NEW WORK
1/4" = 1'-0"

WELL NO.4 EXISTING ELECTRICAL EQUIPMENT PHOTO NO.1


WELL NO.4 EXISTING ELECTRICAL PANEL PHOTO NO.2


PANEL IS EQUIPED WITH THE FOLLOWING EXISTING CIRCUIT BREAKERS:
(1) 225-3P, (1) 50A-3P, (1) 30A-3P, (2) 20A-3P

WELL NO.4 EXISTING ELECTRICAL PANEL PHOTO NO.1

DRAWING NOTES:

1. REFER TO DRAWING E001 FOR LEGEND AND ABBREVIATIONS.
2. REFER TO DRAWING E002 FOR GENERAL NOTES.
3. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CIRCUITS TO REMAIN AND BE RECONNECTED TO NEW PANEL. REFER TO PHOTOS FOR ALL EXISTING BREAKERS.

0 2' 4' 8'

Project:
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Scale: 1/4" = 1'-0"

Key Plan:

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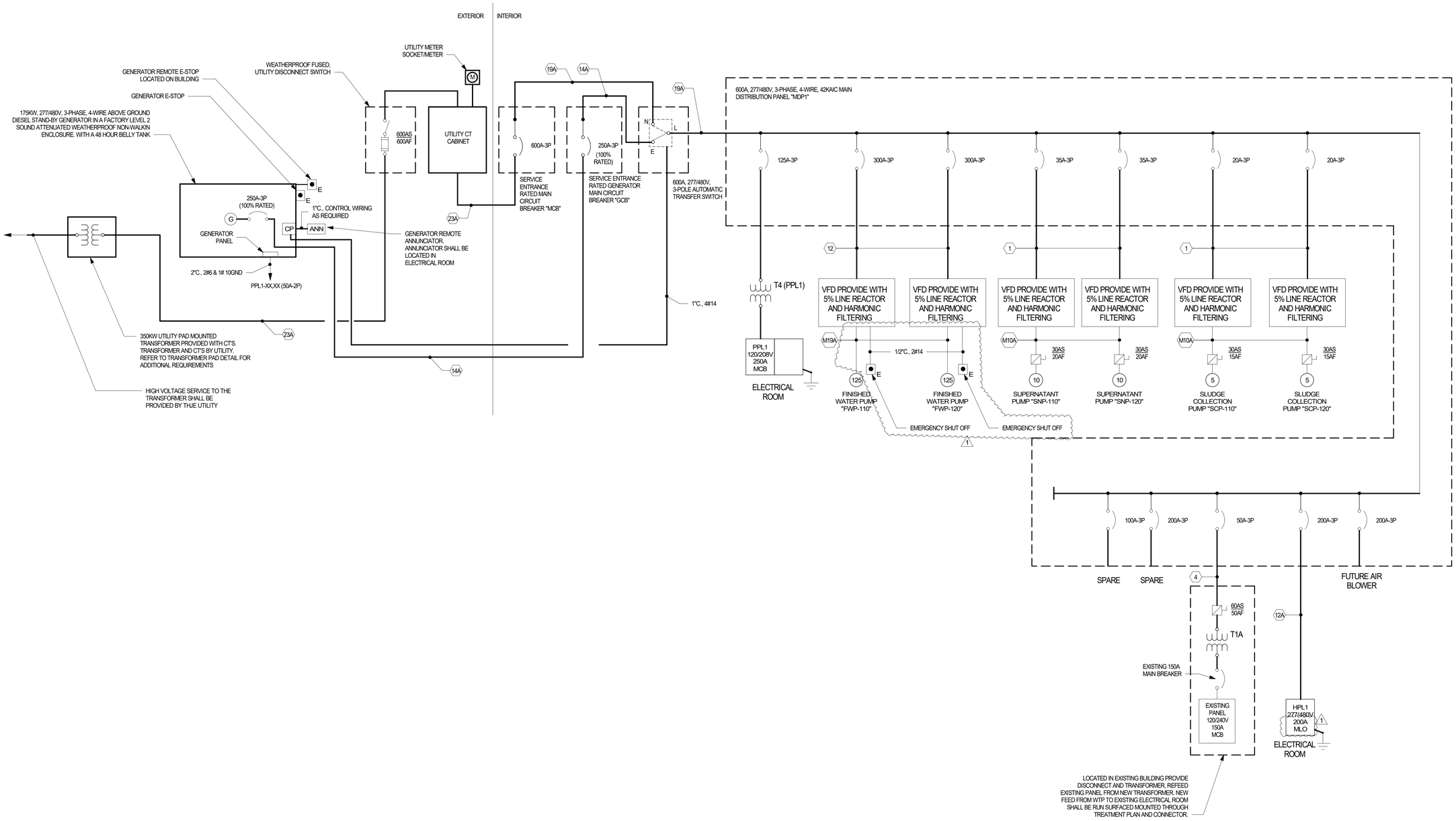
| Reviewed By: | RFM |
| Approved By: | RFM |
| W&S Project No.: | ENG20-0740 |
| W&S File No.: | TBD |

Drawing Title:
ELECTRICAL WELL PLANS SHEET II - ALTERNATE NO.1

Sheet Number:
E402

Addendum No. 1




DRAWING NOTES:

1. REFER TO DRAWING E001 FOR LEGEND AND ABBREVIATIONS.
2. REFER TO DRAWING E002 FOR GENERAL NOTES.
3. REFER TO DRAWINGS E603 FOR PANELBOARD SCHEDULES.
4. REFER TO DRAWING E602 FOR FEEDER SCHEDULES.
5. REFER TO SITE PLAN DRAWING E003 FOR ADDITIONAL CONDUITS NOT SHOWN ON THE ONE LINE DIAGRAM.

Project:

TOWN OF BLACKSTONE, MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

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Scale: N.T.S.

Key Plan:

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| Date: | 05/21/2021 |
| Drawn By: | DNM |
| Reviewed By: | RFM |
| Approved By: | RFM |
| W&S Project No.: | ENG20-0740 |
| W&S File No.: | TBD |

Drawing Title:

ELECTRICAL ONE LINE DIAGRAMS

Sheet Number:

E601

**Panel ID:** HPL1
**Voltage:** 480Y/277
**Phase/Wire:** 3/4
**Fed From:** MDP1
**Location:** ELECTRICAL ROOM 103

**MLO Rating:** 400 A
**A.I.C. Rating:** 22,000 AMPS SYMMETRICAL
**Manufacturer:**

| CKT | DESCRIPTION | CB Size | Poles | A | | B | | C | | Poles | CB Size | DESCRIPTION | CKT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | 11.6 | 1.8 | | | | | | | | 2 |
| 3 | DEHUMIDIFIER DH-1 | 60 A | 3 | | | 11.6 | 1.8 | | | 3 | 20 A | ACCU-1 | 4 |
| 5 | | | | | | | | 11.6 | 1.8 | | | | 6 |
| 7 | | | | 1.1 | 1.1 | | | | | | | | 8 |
| 9 | FILTER 110 | 20 A | 3 | | | 1.1 | 1.1 | | | 3 | 20 A | FILTER 120 | 10 |
| 11 | | | | | | | | 1.1 | 1.1 | | | | 12 |
| 13 | | | | 1.1 | 1.5 | | | | | | | | 14 |
| 15 | FILTER 130 | 20 A | 3 | | | 1.1 | 1.5 | | | 3 | 20 A | SUMP PUMP SP-1 | 16 |
| 17 | | | | | | | | 1.1 | 1.5 | | | | 18 |
| 19 | | | | 1.5 | 0.2 | | | | | | | | 20 |
| 21 | SUMP PUMP SP-2 | 20 A | 3 | | | 1.5 | 0.2 | | | 3 | 20 A | CV-100 | 22 |
| 23 | | | | | | | | 1.5 | 0.2 | | | | 24 |
| 25 | | | | | | | | | | | | | 26 |
| 27 | | | | | | | | | | | | | 28 |
| 29 | | | | | | | | | | | | | 30 |
| 31 | | | | | | | | | | | | | 32 |
| 33 | | | | | | | | | | | | | 34 |
| 35 | | | | | | | | | | | | | 36 |
| 37 | | | | | | | | | | | | | 38 |
| 39 | | | | | | | | | | | | | 40 |
| 41 | | | | | | | | | | | | | 42 |
| | **Total kVA** | | | 19.9 kVA | | 19.9 kVA | | 19.9 kVA | | | | | |

**Total Connected Load (kVA)** 59.7 kVA
**Total Connected Current (Amps)** 72 A

**Panel ID:** PPL1
**Voltage:** 208Y/120
**Phase/Wire:** 3/4
**Fed From:**
**Location:** ELECTRICAL ROOM 103

**MCB Rating:** 250 A
**A.I.C. Rating:** 10,000 AMPS SYMMETRICAL
**Manufacturer:**

| CKT | DESCRIPTION | CB Size | Poles | A | | B | | C | | Poles | CB Size | DESCRIPTION | CKT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | FACP | 20 A | 1 | 0.5 | 1.5 | | | | | 1 | 20 A | SUMP PUMP CONTROL PANEL | 2 |
| 3 | RCPT PIPE GALLERY B100 | 20 A | 1 | | | 0.5 | 1.4 | | | 1 | 20 A | UPPER LEVEL LIGHTING | 4 |
| 5 | PIPE GALLERY LIGHTING | 20 A | 1 | | | | | 0.2 | 0.0 | 1 | 20 A | EXTERIOR IIGHTING | 6 |
| 7 | LCP1 | 20 A | 1 | 0.5 | 0.5 | | | | | 1 | 20 A | RCPT ELECTRICAL ROOM 103 | 8 |
| 9 | EXTERIOR RECEPTACLES | 20 A | 1 | | | 0.0 | 0.0 | | | 1 | 20 A | RCPT FILTER ROOM 100 | 10 |
| 11 | RCPT FILTER ROOM 100 | 20 A | 1 | | | | | 0.0 | 1.5 | 2 | 20 A | EUH-1 ELECTRICAL ROOM | 12 |
| 13 | UNIT HEATERS | 20 A | 1 | 0.0 | 1.5 | | | | | | | | 14 |
| 15 | SPEC MECHANICAL ROOM 102 | 15 A | 1 | | | 0.6 | 0.6 | | | 1 | 15 A | BOILER B-2 | 16 |
| 17 | | | | | | | | 0.3 | 0.3 | | | | 18 |
| 19 | HOT WATER PUMP P-1 | 20 A | 3 | 0.3 | 0.3 | | | | | 3 | 20 A | HOT WATER PUMP P-2 | 20 |
| 21 | | | | | | 0.3 | 0.3 | | | | | | 22 |
| 23 | EF-1 AND EF-2 | 15 A | 1 | | | | | 0.0 | 1.5 | 1 | 20 A | FILTER CONTROL PANEL | 24 |
| 25 | MAIN SCADA CONTROL PANEL | 30 A | 1 | 0.0 | 3.3 | | | | | 1 | 20 A | FILTER 110 FE/FIT | 26 |
| 27 | FILTER 120 FE/FIT | 20 A | 1 | | | 3.3 | 3.3 | | | 1 | 20 A | FILTER 130 FE/FIT | 28 |
| 29 | MOTORIZED DAMMPER FILTER ROOM | 20 A | 1 | | | | | 0.1 | 0.4 | 1 | 20 A | RCPT MECHANICAL ROOM 102 | 30 |
| 31 | RCPT FILTER ROOM 100 | 20 A | 1 | 0.0 | 1.3 | | | | | 1 | 20 A | BP-1 | 32 |
| 33 | BP-2 | 20 A | 1 | | | 0.6 | 0.1 | | | 1 | 20 A | EYEWASH/SHOWER | 34 |
| 35 | SUPPLY FAN SF-1 | 20 A | 1 | | | | | 1.3 | | | | | 36 |
| 37 | | | | | | | | | | | | | 38 |
| 39 | | | | | | | | | | | | | 40 |
| 41 | | | | | | | | | | | | | 42 |
| 43 | | | | | | | | | | | | | 44 |
| 45 | | | | | | | | | | | | | 46 |
| 47 | | | | | | | | | | | | | 48 |
| 49 | | | | | | | | | | | | | 50 |
| 51 | | | | | | | | | | | | | 52 |
| 53 | | | | | | | | | | | | | 54 |
| 55 | | | | | | | | | | | | | 56 |
| 57 | | | | | | | | | | | | | 58 |
| 59 | | | | | | | | | | | | | 60 |
| | **Total kVA:** | | | 9.7 kVA | | 11.1 kVA | | 5.6 kVA | | | | | |

**Total Connected Load (kVA)** 22.6 kVA
**Total Connected Current (Amps)** 63 A

## HVAC EQUIPMENT SCHEDULE

| NO. | DESCRIPTION | LOCATION NAME | LOCATION NUMBER | LOAD HP | LOAD A | LOAD W | VOLT | PHASE | Panel | Circuit Number | CONDUIT & WIRE SIZE | THERMAL MOTOR SWITCH | MOTOR STARTER | VFD | RECEPTACLE | JUNCTION BOX | NON-FUSED DISCONNECT | FUSED DISCONNECT | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ACCU-1 | CONDENSING UNIT | | | 0.00 hp | 6 A | 0.00 W | 480 V | 3 | HPL1 | 2,4,6 | 3/4" 2#12 & 1#12GND | | | | | | | | NOTE 3 |
| B-1 | BOILER | MECHANICAL ROOM | 102 | 0.00 hp | 0 A | 500.00 W | 120 V | 1 | PPL1 | 15 | 3/4" 2#12 & 1#12GND | X | | | | X | | | NOTE 3 |
| B-2 | BOILER | MECHANICAL ROOM | 102 | 0.00 hp | 0 A | 500.00 W | 120 V | 1 | PPL1 | 16 | 3/4" 2#12 & 1#12GND | X | | | | X | | | NOTE 3 |
| BP-1 | BOILER PUMP | MECHANICAL ROOM | 102 | 0.00 hp | 0 A | 1200.00 W | 120 V | 1 | PPL1 | 32 | 3/4" 2#12 & 1#12GND | X | | | | X | | | NOTE 3 |
| BP-2 | BOILER PUMP | MECHANICAL ROOM | 102 | 0.00 hp | 0 A | 500.00 W | 120 V | 1 | PPL1 | 33 | 3/4" 2#12 & 1#12GND | | X | | | X | | | NOTE 3 |
| DH-1 | DEHUMIDIFIER | FILTER ROOM | 100 | 0.00 hp | 42 A | 0.00 W | 480 V | 3 | HPL1 | 1,3,5 | 1"C., 3#6 & 1#10GND | | | | | | | 60AS/60AF | NOTE 3 |
| EF-1 | EXHAUST FAN | MECHANICAL ROOM | 102 | 0.00 hp | 0 A | 0.10 W | 120 V | 1 | PPL1 | 23 | 3/4" 2#12 & 1#12GND | X | | | | X | | | NOTE 3 |
| EF-2 | EXHUAST FAN | | | 0.00 hp | 0 A | 0.01 W | 120 V | 1 | PPL1 | 23 | 3/4" 2#12 & 1#12GND | X | | | | X | | | NOTE 3 |
| EUH-1 | ELECTRIC UNIT HEATER | ELECTRICAL ROOM | 103 | 0.00 hp | 0 A | 3000.00 W | 208 V | 1 | PPL1 | 12,14 | 3/4" 2#12 & 1#12GND | | | | | | 20A-1PH | | NOTE 3 |
| P-1 | HOT WATER PUMP | MECHANICAL ROOM | 102 | 0.00 hp | 0 A | 900.00 W | 208 V | 1 | PPL1 | 17,19,21 | 3/4" 3#12 & 1#12GND | | X | | | | | | NOTE 1 |
| P-2 | HOT WATER PUMP | MECHANICAL ROOM | 102 | 0.00 hp | 0 A | 900.00 W | 208 V | 1 | PPL1 | 18,20,22 | 3/4" 3#12 & 1#12GND | | X | | | | | | NOTE 1 |
| SF-1 | SUPPLY FAN | MECHANICAL ROOM | 102 | 0.00 hp | 0 A | 1200.00 W | 120 V | 1 | PPL1 | 35 | 3/4" 2#12 & 1#12GND | X | | | | X | | | NOTE 3 |
| ~~UH-1~~ | ~~UNIT HEATER~~ | ~~FILTER ROOM~~ | ~~100~~ | ~~0.00 hp~~ | ~~0 A~~ | ~~0.10 W~~ | ~~120 V~~ | ~~1~~ | ~~PPL1~~ | ~~13~~ | ~~3/4" 2#12 & 1#12GND~~ | ~~X~~ | | | | ~~X~~ | | | ~~NOTE 3~~ |
| UH-2 | UNIT HEATER | FILTER ROOM | 100 | 0.00 hp | 0 A | 0.10 W | 120 V | 1 | PPL1 | 13 | 3/4" 2#12 & 1#12GND | X | | | | X | | | NOTE 3 |
| UH-3 | UNIT HEATER | FILTER ROOM | 100 | 0.00 hp | 0 A | 0.10 W | 120 V | 1 | PPL1 | 13 | 3/4" 2#12 & 1#12GND | X | | | | X | | | NOTE 3 |
| UH-4 | UNIT HEATER | FILTER ROOM | 100 | 0.00 hp | 0 A | 0.10 W | 120 V | 1 | PPL1 | 13 | 3/4" 2#12 & 1#12GND | X | | | | X | | | NOTE 3 |
| UH-5 | UNIT HEATER | MECHANICAL ROOM | 102 | 0.00 hp | 0 A | 0.01 W | 120 V | 1 | PPL1 | 13 | 3/4" 2#12 & 1#12GND | X | | | | X | | | NOTE 3 |
| UH-6 | UNIT HEATER | PIPE GALLERY | B100 | 0.00 hp | 0 A | 0.10 W | 120 V | 1 | PPL1 | 13 | 3/4" 2#12 & 1#12GND | X | | | | X | | | NOTE 3 |
| UH-7 | UNIT HEATER | CHEMICALS | EX_110 | 0.00 hp | 0 A | 0.00 W | 120 V | 1 | PP-1 RIGHT | 13 | 3/4" 2#12 & 1#12GND | | | | | | | | |

MECHANICAL EQUIPMENT SCHEDULE NOTES:

1. STARTERS, VFD'S AND DISCONNECT SWITCHES SHALL BE FURNISHED BY THE MECHANICAL CONTRACTOR, INSTALLED AND WIRED BY THE ELECTRICAL CONTRACTOR
2. STARTERS, VFD'S AND DISCONNECT SWITCHES SHALL BE FURNISHED AS PART OF THE MECHANICAL EQUIPMENT FURNISHED AND INSTALLED BY THE MECHANICAL CONTRACTOR, WIRED BY THE ELECTRICAL CONTRACTOR.
3. STARTERS, VFD'S AND DISCONNECTS SHALL BE FURNISHED, INSTALLED AND WIRED BY THE ELECTRICAL CONTRACTOR.
4. ELECTRICAL CONTRACTOR SHALL COORDINATE EXACT FUSE SIZE AND OVERCURRENT PROTECTION FOR ALL MECHANICAL EQUIPMENT WITH MANUFACTURERS RECOMMENDATIONS.

## CHEMICAL FEED AND TRANSFER PUMP EQUIPMENT SCHEDULE

| NO. | DESCRIPTION | LOCATION NAME | LOCATION NUMBER | LOAD HP | LOAD A | LOAD W | VOLT | PHASE | Panel | Circuit Number | CONDUIT & WIRE SIZE | THERMAL MOTOR SWITCH | MOTOR STARTER | VFD | RECEPTACLE | JUNCTION BOX | NON-FUSED DISCONNECT | FUSED DISCONNECT | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FP-101 | CHEMICAL FEED PUMP | CHEMICALS | EX_110 | 0.00 hp | 0 A | 1500.00 W | 120 V | 1 | PP-1 RIGHT | 15 | 3/4" 2#12 & 1#12GND | | | | X | | | | |
| FP-102 | CHEMICAL FEED PUMP | CHEMICALS | EX_110 | 0.00 hp | 0 A | 1500.00 W | 120 V | 1 | PP-1 RIGHT | 16 | 3/4" 2#12 & 1#12GND | | | | X | | | | |
| FP-201 | CHEMICAL FEED PUMP | CHEMICALS | EX_110 | 0.00 hp | 0 A | 1500.00 W | 120 V | 1 | PP-1 RIGHT | 18 | 3/4" 2#12 & 1#12GND | | | | X | | | | |
| FP-202 | CHEMICAL FEED PUMP | CHEMICALS | EX_110 | 0.00 hp | 0 A | 1500.00 W | 120 V | 1 | PP-1 RIGHT | 17 | 3/4" 2#12 & 1#12GND | | | | X | | | | |
| TP-101 | CHEMICAL TRANSFER PUMP | CHEMICALS | EX_110 | 0.00 hp | 0 A | 1500.00 W | 120 V | 1 | PP-1 RIGHT | 14 | 3/4"C., 2#12 & 1#12GND | | | | X | | | | |
| TP-201 | CHEMICAL TRANSFER PUMP TP-201 | CHEMICALS | EX_110 | 0.00 hp | 0 A | 1500.00 W | 120 V | 1 | PP-1 RIGHT | 19 | 3/4" 2#12 & 1#12GND | | | | X | | | | |

CHEMICAL FEED EQUIPMENT SCHEDULE NOTES:

1. ALL CHEMICAL FEED EQUIPMENT IS LOCATED IN THE EXISTING BUILDING.
2. CONTACTOR TO PROVIDE ALL NEW CIRCUIT BREAKERS WITHIN EXISTING PANEL. NEW BREAKERS SHALL MATCH EXISTING IN STYLE AND AIC RATING

**Panel ID:** PP-1 RIGHT
**Voltage:** 208Y/120
**Phase/Wire:** 3/4
**Fed From:**
**Location:** GENERATOR/ ELECTRICAL EX_109

**MCB Rating:** 200 A
**A.I.C. Rating:** 10,000 AMPS SYMMETRICAL
**Manufacturer:**

| CKT | DESCRIPTION | CB Size | Poles | A | | B | | C | | Poles | CB Size | DESCRIPTION | CKT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | EXISTING | 20 A | 1 | 0.0 | 0.0 | | | | | 1 | 20 A | EXISTING | 2 |
| 3 | EXISTING | 20 A | 1 | | | 0.0 | 0.0 | | | 1 | 20 A | EXISTING | 4 |
| 5 | EXISTING | 20 A | 1 | | | | | 0.0 | 0.0 | 1 | 20 A | EXISTING | 6 |
| 7 | EXISTING | 20 A | 1 | 0.0 | 0.0 | | | | | 1 | 20 A | EXISTING | 8 |
| 9 | EXISTING | 20 A | 1 | | | 0.0 | 0.0 | | | 1 | 20 A | EXISTING | 10 |
| 11 | EXISTING | 20 A | 1 | | | | | 0.0 | 0.0 | 1 | 20 A | EXISTING | 12 |
| 13 | UNIT HEATER UH-7 | 20 A | 1 | 0.6 | 1.5 | | | | | 1 | 20 A | TP-101 | 14 |
| 15 | FP-101 | 20 A | 1 | | | 1.5 | 1.5 | | | 1 | 20 A | FP-102 | 16 |
| 17 | FP-202 | 20 A | 1 | | | | | 1.5 | 1.5 | 1 | 20 A | FP-201 | 18 |
| 19 | TP-201 | 20 A | 1 | 1.5 | 0.0 | | | | | 1 | 20 A | SCADA PANEL | 20 |
| 21 | | | | | | | | | | | | | 22 |
| 23 | | | | | | | | | | | | | 24 |
| 25 | | | | | | | | | | | | | 26 |
| 27 | | | | | | | | | | | | | 28 |
| 29 | | | | | | | | | | | | | 30 |
| 31 | | | | | | | | | | | | | 32 |
| 33 | | | | | | | | | | | | | 34 |
| 35 | | | | | | | | | | | | | 36 |
| 37 | | | | | | | | | | | | | 38 |
| 39 | | | | | | | | | | | | | 40 |
| 41 | | | | | | | | | | | | | 42 |
| | **Total kVA:** | | | 3.6 kVA | | 3.0 kVA | | 3.0 kVA | | | | | |

**Total Connected Load (kVA)** 9.6 kVA
**Total Connected Current (Amps)** 27 A

EXISTING PANEL LOCATED IN EXISTING BUILDING ELECTRICAL ROOM

Project:
TOWN OF BLACKSTONE, MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

BLCKSTONE WATER TREAMENT PLAN

53 ELM STREET, BLACKSTONE, MASSACHUSETTS, 01504

Weston & Sampson
Weston & Sampson Engineers, Inc.
55 Walkers Brook Drive, Suite 100
Reading, MA 01867
978.532.1900 800.SAMPSON
www.westonandsampson.com

Consultants:

Revisions:

| No. | Date | Description |
|---|---|---|
| 1 | 06/24/21 | Addendum No.1 |

COA:



Seal:

Issued For:
BID DOCUMENTS

Scale: 12" = 1'-0"

Key Plan:

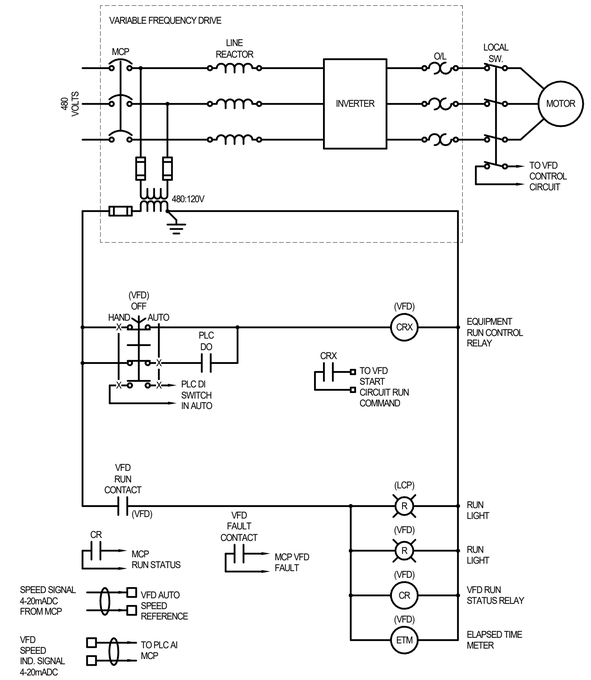
NORTH

Date: 05/19/2021
Drawn By: DNM
Reviewed By: RFM
Approved By: RFM

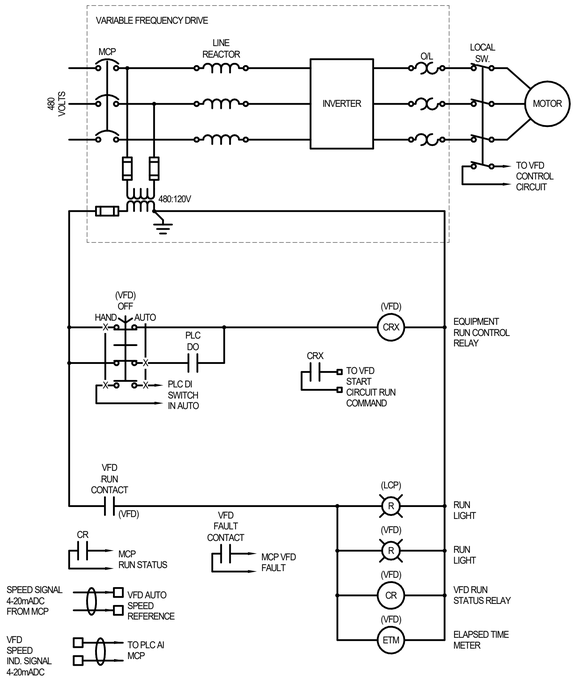
W&S Project No.: ENG20-0740
W&S File No.: TBD

Drawing Title:
ELECTRICAL SCHEDULES SHEET II

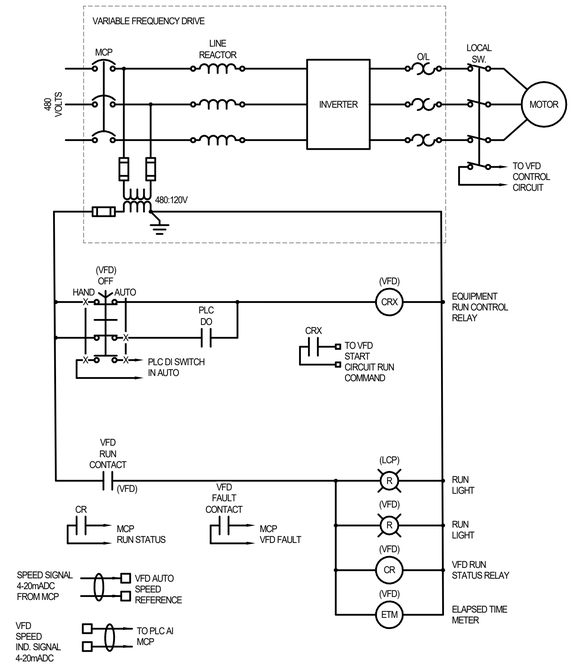
Sheet Number:
E603



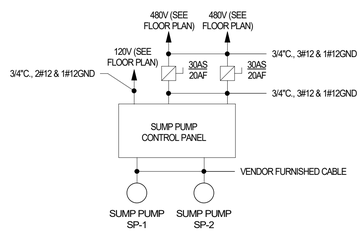

1 TYPICAL SCHEMATIC DIAGRAM - FINISHED WATER PUMPS FWP-110 AND FWP-120
NOT TO SCALE




2 TYPICAL SCHEMATIC DIAGRAM - SLUDGE COLLECTION PUMPS SCP-110 AND SCP-120
NOT TO SCALE




3 TYPICAL SCHEMATIC DIAGRAM - SUPERNTANT PUMPS SNP-110 AND SNP-120
NOT TO SCALE




4 SUMP PUMP WIRING DIAGRAM
NOT TO SCALE


Project:
TOWN OF BLACKSTONE, MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS
BLCKSTONE WATER TREAMENT PLAN
53 ELM STREET, BLACKSTONE, MASSACHUSETTS, 01504

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Consultants:


Revisions:

| No. | Date | Description |
|---|---|---|
| 1 | 06/24/21 | Addendum No.1 |



Seal:

Issued For:
BID DOCUMENTS

Scale: As indicated

Key Plan:

NORTH

| | |
|---|---|
| Date: | 06/23/21 |
| Drawn By: | DNM |
| Reviewed By: | RFM |
| Approved By: | RFM |
| W&S Project No.: | ENG20-0740 |
| W&S File No.: | TBD |

Drawing Title:
WIRING DIAGRAM

1

Sheet Number:
E604