A. Install switchboard and accessory items in accordance with manufacturers' written installation instructions and the following specifications.

B. Anchor each switchboard assembly to two 4-inch minimum channel iron sills arranged in accordance with manufacturer's recommendations. Attach by tack welding or bolting. Level and grout sills flush with switchboard mounting surface.

C. Housekeeping Pads
1. General Contractor shall furnish and install housekeeping pads for all switchboard.

D. Temporary Lifting Provisions. Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from switchboard units and components.

E. Operating Instructions. Frame and mount printed, basic operating instructions for switchboard, including control and key interlocking sequences, and emergency procedures. Fabricate frame of finished wood or metal and cover instructions with clear acrylic plastic. Mount on the front of the switchboard. Provide wiring diagram for each section.

3.02 IDENTIFICATION

A. Identify field installed wiring and components and provide warning signs as specified in Division 16 section "Electrical Identification."

3.03 GROUNDING

A. Ground equipment to main electrical ground bus indicated. Provide minimum ground resistance at switchboard location as specified in Section 16450, "Grounding".

3.04 CONNECTIONS

A. Tighten switchboard bus joint bolts and electrical connector and terminal bolts in accordance with manufacturer's published torque tightening values. Where manufacturer's torque values are not stated, use those specified in UL Standards 486A and 486B. Provide permanent interior labels listing torque requirements.

3.05 FIELD TESTS & CHECKS

A. Comply with applicable standards of the National Electrical Testing Association (NETA) including Standard ATS, "Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems."

B. Arrange and pay for the services of a factory authorized service representative to supervise the testing and adjustment of switchboard components for a total of one working day.

C. Visual and Mechanical Inspections. Include the following inspections and related work:

1. Inspect for defects and physical damage, testing laboratory, labels, and nameplate compliance with up-to-date circuit connections.
2. Verify that potential transformers, including their overcurrent protection and current transformers, meet specified requirements.
3. Perform operational test and exercise of mechanical components and other operable devices in accordance with manufacturer's instruction manual.
4. Check switchboard anchorage, area clearances, and alignment and fit of components.
5. Check tightness of bolted electrical connections with calibrated torque wrench. Refer to manufacturer's instructions for proper torque values.
6. Clean switchboard interior and exterior using manufacturer's approved methods and materials.
7. Perform visual and mechanical inspection and related work for OCPDs as specified in section "Overcurrent Protective Devices."

D. Electrical Tests. Include the following items performed in accordance with manufacturer's instruction:

1. Insulation resistance test of buses and portions of control wiring that disconnect from solid state devices through normal disconnecting features. Insulation resistance less than 100 megohms is not acceptable.
2. Ratio and polarity tests on current and voltage transformers according to ANSI standards.
3. Ground resistance test on system and equipment ground connections according to ANSI standards.
4. Calibrate ammeters and voltmeters at midscale. Use check instruments with documented up to date calibration traceable to National Institute of Standards and Technology (NIST) standards.
5. Verify appropriate capacity, overcurrent protection, and operating voltage of control power elements including control power transformer and control power wiring.
6. Calibrate watt-hour and demand meters to 0.5 percent, and verify meter multipliers. Use check instruments with documented up-to-date calibration traceable to NIST standards.
7. Check phasing of alternate supply sources to the same bus.
8. Protective Device Ratings and Settings. Verify indicated ratings and settings and make the final system adjustments of OCPDs in accordance with Division 16 section "Overcurrent Protection Devices."
9. Coordination and Selectivity. Verify the coordination and selectivity settings between switchboard’s main disconnect device and distribution section circuit breakers in accordance with Section 16010.

E. Retesting. Correct deficiencies identified by tests and observations and retest switchboard. Verify by the retests that switchboard meet specified requirements.

F. Adjust relay and protective device settings according to the recommended settings table provided by the coordination study. Field adjustments to be completed by the electrical equipment manufacturer's field service as required.

G. Make minor modifications to equipment as required to accomplish conformance with arc flash study.

H. Notify Engineer in writing of any required major equipment modifications.

3.06 ARC FLASH WARNING LABELS

A. Provide a 3.5 in. x 5 in. thermal transfer type label of high adhesion polyester for each work location analyzed.

B. All labels will be based on recommended overcurrent device settings and will be provided after the results of the analysis have been presented to the owner and after any system changes, upgrades or modifications have been incorporated in the system (two separate sets of color coded labels shall be provided, one for normal condition and one when the maintenance switch at main and feeder breakers is activated).

C. The label shall include the following information, at a minimum:
1. Location designation
2. Nominal voltage
3. Flash protection boundary
4. Incident energy or energy range corresponding to reported Hazard risk category.
5. Working distance
6. Engineering report number, revision number and issue date.

D. Labels shall be machine printed, with no field markings.

E. Labels shall be field installed by the contractor.

3.07 CLEANING

A. Upon completion of installation, inspect interior and exterior of switchboard. Prior to substantial completion remove paint splatters and other spots, dirt, and debris. Touch up scratches and mars of finish to match original finish.

3.08 PROTECTION

A. Apply temporary heat in accordance with manufacturer's recommendation within each section of switchboard throughout periods during which the switchboard is not in a space that is continuously under normal control of temperature and humidity.

END OF SECTION

SECTION 16430

SHORT-CIRCUIT/COORDINATION STUDY/ARC FLASH HAZARD ANALYSIS

PART 1 GENERAL

1.01 RELATED DOCUMENTS. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 specification sections, apply to this section.

1.02 DESCRIPTION OF WORK

A. General. Provide short-circuit, protective device coordination and arc flash hazard studies as prepared by the electrical equipment manufacturer or an approved engineering firm, in accordance with the plans and specifications for the facility's electrical distribution systems as required.

B. This study shall include all new distribution equipment supplied by the equipment manufacturer under this Contract, as well as all directly affected existing distribution equipment at the Owner's facility.

1.03 QUALITY ASSURANCE

A. The Contractor shall prepare an Arc Flash Hazard Analysis Study per the requirements set forth in NFPA 70E – Standard for Electrical Safety in the Workplace. The arc flash hazard analysis shall be performed in accordance to the IEEE Std. 1584-2002 equations that are presented in NFPA 70E-latest edition, Annex D.

B. Qualifications

1. The short-circuit, protective device coordination and arc flash analysis studies shall be conducted under the supervision and approval of a Registered Professional Electrical Engineer skilled in performing and interpreting the power system studies.
2. The Registered Professional Electrical Engineer shall be a full-time employee of the equipment manufacturer or an approved engineering firm.
3. The Registered Professional Electrical Engineer shall have a minimum of five (5) years of experience in performing power system studies.
4. The equipment manufacturer or approved engineering firm shall demonstrate experience with Arc Flash Hazard Analysis by submitting names of at least ten actual arc flash hazard analysis it has performed in the past year.

C. Computer Analysis Software. The studies shall be performed using the latest revision of the SKM Systems Analysis Power*Tools for Windows (PTW) software program or prior approved equal.

D. References. The Contractor shall use the following references:

1. Institute of Electrical and Electronics Engineers, Inc. (IEEE):
   a. IEEE 141 – Recommended Practice for Electric Power Distribution and Coordination of Industrial and Commercial Power Systems
   b. IEEE 242 – Recommended Practice for Protection and Coordination of Industrial and Commercial Power Systems
   c. IEEE 399 – Recommended Practice for Industrial and Commercial Power System Analysis
   d. IEEE 241 – Recommended Practice for Electric Power Systems in Commercial Buildings
   e. IEEE 1015 – Recommended Practice for Applying Low-Voltage Circuit Breakers Used in Industrial and Commercial Power Systems.
   f. IEEE 1584 - Guide for Performing Arc-Flash Hazard Calculations
2. American National Standards Institute (ANSI):
   a. ANSI C57.12.00 – Standard General Requirements for Liquid-Immersed Distribution, Power, and Regulating Transformers
   b. ANSI C37.13 – Standard for Low Voltage AC Power Circuit Breakers Used in Enclosures
   c. ANSI C37.010 – Standard Application Guide for AC High Voltage Circuit Breakers Rated on a Symmetrical Current Basis
   d. ANSI C 37.41 – Standard Design Tests for High Voltage Fuses, Distribution Enclosed Single-Pole Air Switches, Fuse Disconnecting Switches and Accessories.
3. The National Fire Protection Association (NFPA):
   a. NFPA 70 - National Electrical Code, latest edition
   b. NFPA 70E – Standard for Electrical Safety in the Workplace

1.04 SUBMITTALS

A. Submit the following package in accordance with Division 1 and this specification section.

B. The results of the short-circuit, protective device coordination and arc flash hazard analysis studies shall be summarized in a final report and submitted along with the equipment shop drawings. Additional copies of the short-circuit input and output data, where required, shall be provided on CD in PDF format.

C. The report shall include:

1. Executive Summary.
2. Descriptions, purpose, basis and scope of the study.
3. Tabulations of circuit breaker, fuse and other protective device ratings versus calculated short circuit duties.
4. Protective device time versus current coordination curves, tabulations of relay and circuit breaker trip unit settings, fuse selection.
5. Fault current calculations including a definition of terms and guide for interpretation of the computer printout.
6. Details of the incident energy and flash protection boundary calculations.
7. Recommendations for system improvements, where needed.

8. One-line diagram.

D. Arc flash labels shall be provided in hard copy only.

PART 2 PRODUCTS

2.01 STUDIES

A. Contractor to furnish short-circuit and protective device coordination studies as prepared by equipment manufacturer or an approved engineering firm.

B. The contractor shall furnish an Arc Flash Hazard Analysis Study per NFPA 70E - Standard for Electrical Safety in the Workplace, reference Article 130.3 and Annex D.

2.02 DATA COLLECTION

A. Contractor shall furnish all data as required by the power system studies. The Engineer performing the short-circuit, protective device coordination and arc flash hazard analysis studies shall furnish the Contractor with a listing of required data after award of the contract. The Contractor shall expedite collection of the data to assure completion of the studies as required for final approval of the distribution equipment shop drawings and/or prior to the release of the equipment for manufacturing.

B. Source combination may include present and future motors and generators.

C. Load data utilized shall include existing and proposed loads as shown on the Contract Documents.

D. If applicable, include fault contribution of existing motors in the study. The Contractor shall obtain required existing equipment data, if necessary, to satisfy the study requirements.

2.03 SHORT-CIRCUIT AND PROTECTIVE DEVICE EVALUATION STUDY

A. Use actual conductor impedances if known. If unknown, use typical conductor impedances based on IEEE Standard 141-1993.

B. Minimum transformer design impedances shall be used when test impedances are not available.

C. Provide the following:
1. Calculation methods and assumptions.
2. Selected base per unit quantities.
3. One-line diagram of the system being evaluated.
4. Source impedance data, including electric utility system and motor fault contribution characteristics.
5. Tabulations of calculated quantities.
6. Results, conclusions, and recommendations.

D. Calculate short-circuit momentary and interrupting duties for a three-phase bolted fault at each:
   1. Electric utility's supply termination point.
   2. Incoming switchgear.
   3. Unit substation primary and secondary terminals.
   4. Low voltage switchgear.
   5. Motor control centers.
   6. Standby generators and automatic transfer switches.
   7. Branch circuit panelboards.
   8. Other significant locations throughout the system.

E. For grounded systems, provide a bolted line-to-ground fault current study for areas as defined for the three-phase bolted fault short-circuit study.

F. Protective Device Evaluation:
   1. Evaluate equipment and protective devices and compare to short circuit ratings.
   2. Adequacy of switchgear, motor control centers, and panelboard bus bars to withstand short-circuit stresses.

2.04 PROTECTIVE DEVICE COORDINATION STUDY

A. Proposed protective device coordination time-current curves (TCC) shall be displayed on log-log scale graphs.

B. Include on each TCC graph, a complete title and one-line diagram with legend identifying the specific portion of the system covered.

C. Terminate device characteristic curves at a point reflecting maximum symmetrical or asymmetrical fault current to which the device is exposed.

D. Identify the device associated with each curve by manufacturer type, function, and, if applicable, tap, time delay, and instantaneous settings recommended.

E. Plot the following characteristics on the TCC graphs, where applicable:
   1. Electric utility's overcurrent protective device.
   2. Medium voltage equipment overcurrent relays.
   3. Medium and low voltage fuses including manufacturer's minimum melt, total clearing, tolerance, and damage bands.
   4. Low voltage equipment circuit breaker trip devices, including manufacturer's tolerance bands.
   5. Transformer full-load current, magnetizing inrush current, and ANSI through-fault protection curves.
   6. Conductor damage curves.
   7. Ground fault protective devices, as applicable.
   8. Pertinent motor starting characteristics and motor damage points, where applicable.
   9. Pertinent generator short-circuit decrement curve and generator damage point.
   10. The largest feeder circuit breaker in each motor control center and applicable panelboard.

F. Provide adequate time margins between device characteristics such that selective operation is provided, while providing proper protection.

2.05 ARC FLASH HAZARD ANALYSIS

A. The arc flash hazard analysis shall be performed according to the IEEE Std. 1584-2002 equations that are presented in NFPA 70E-latest edition, Annex D.

B. The flash protection boundary and the incident energy shall be calculated at all significant locations in the electrical distribution system (switchboards, switchgear, motor-control centers, panelboards, busway and splitters, motor disconnects) where work could be performed on energized parts.

C. The arc flash hazard analysis shall include all significant locations in 240 volt and 208 volt systems fed from transformers equal to or greater than 125 kVA where work could be performed on energized parts.

D. Safe working distances shall be based upon the calculated arc flash boundary considering an incident energy of 1.2 cal/cm^2.

E. When appropriate, the short circuit calculations and the clearing times of the phase overcurrent devices will be retrieved from the short-circuit and coordination study model. Ground overcurrent relays should not be taken into consideration when determining the clearing time when performing incident energy calculations

F. The short-circuit calculations and the corresponding incident energy calculations for multiple system scenarios must be compared and the greatest incident energy must be uniquely reported for each equipment location. Calculations must be performed to represent the maximum and minimum contributions of fault current magnitude for all normal and emergency operating conditions. The minimum calculation will assume that the utility contribution is at a minimum and will assume a minimum motor contribution (all motors off). Conversely, the maximum calculation will assume a maximum contribution from the utility and will assume the maximum amount of motors to be operating. Calculations shall take into consideration the parallel operation of synchronous generators with the electric utility, where applicable.

G. The incident energy calculations must consider the accumulation of energy over time when performing arc flash calculations on buses with multiple sources. Iterative calculations must take into account the changing current contributions, as the sources are interrupted or decremented with time. Fault contribution from motors and generators should be decremented as follows:
   1. Fault contribution from induction motors should not be considered beyond 3-5 cycles.
   2. Fault contribution from synchronous motors and generators should be decayed to match the actual decrement of each as closely as possible (e.g. contributions from permanent magnet generators will typically decay from 10 per unit to 3 per unit after 10 cycles).

H. For each equipment location with a separately enclosed main device (where there is adequate separation between the line side terminals of the main protective

device and the work location), calculations for incident energy and flash protection boundary shall include both the line and load side of the main breaker.

I. When performing incident energy calculations on the line side of a main breaker (as required per above), the line side and load side contributions must be included in the fault calculation.

J. Mis-coordination should be checked amongst all devices within the branch containing the immediate protective device upstream of the calculation location and the calculation should utilize the fastest device to compute the incident energy for the corresponding location.

K. Arc flash calculations shall be based on actual overcurrent protective device clearing time. Maximum clearing time will be capped at 2 seconds based on IEEE Std. 1584-2002 section B.1.2. Where it is not physically possible to move outside of the flash protection boundary in less than 2 seconds during an arc flash event, a maximum clearing time based on the specific location shall be utilized.

2.06 REPORT SECTIONS

A. Input data shall include, but not be limited to the following:
   1. Feeder input data including feeder type (cable or bus), size, length, number per phase, conduit type (magnetic or non-magnetic) and conductor material (copper or aluminum).
   2. Transformer input data, including winding connections, secondary neutral-ground connection, primary and secondary voltage ratings, kVA rating, impedance, % taps and phase shift.
   3. Reactor data, including voltage rating, and impedance.
   4. Generation contribution data, (synchronous generators and Utility), including short-circuit reactance (X"d), rated MVA, rated voltage, three-phase and single line-ground contribution (for Utility sources) and X/R ratio.
   5. Motor contribution data (induction motors and synchronous motors), including short-circuit reactance, rated horsepower or kVA, rated voltage, and X/R ratio.

B. Short-Circuit Output Data shall include, but not be limited to the following reports:
   1. Low Voltage Fault Report shall include a section for three-phase and unbalanced fault calculations and shall show the following information for each applicable location:
      a. Voltage
      b. Calculated fault current magnitude and angle
      c. Fault point X/R ratio
      d. Equivalent impedance
   2. Momentary Duty Report shall include a section for three-phase and unbalanced fault calculations and shall show the following information for each applicable location:
      a. Voltage
      b. Calculated symmetrical fault current magnitude and angle

c. Fault point X/R ratio
d. Calculated asymmetrical fault currents
i. Based on fault point X/R ratio
ii. Based on calculated symmetrical value multiplied by 1.6
iii. Based on calculated symmetrical value multiplied by 2.7
e. Equivalent impedance

3. Interrupting Duty Report shall include a section for three-phase and unbalanced fault calculations and shall show the following information for each applicable location:
a. Voltage
b. Calculated symmetrical fault current magnitude and angle
c. Fault point X/R ratio
d. No AC Decrement (NACD) Ratio
e. Equivalent impedance
f. Multiplying factors for 2, 3, 5 and 8 cycle circuit breakers rated on a symmetrical basis
g. Multiplying factors for 2, 3, 5 and 8 cycle circuit breakers rated on a total basis

C. Recommended Protective Device Settings:
1. Phase and Ground Relays:
a. Current transformer ratio
b. Current setting
c. Time setting
d. Instantaneous setting
e. Recommendations on improved relaying systems, if applicable.
2. Circuit Breakers:
a. Adjustable pickups and time delays (long time, short time, ground)
b. Adjustable time-current characteristic
c. Adjustable instantaneous pickup
d. Recommendations on improved trip systems, if applicable

D. Incident energy and flash protection boundary calculations
1. Arcing fault magnitude
2. Protective device clearing time
3. Duration of arc
4. Arc flash boundary
5. Working distance
6. Incident energy
7. Hazard Risk Category
8. Recommendations for arc flash energy reduction

PART 3 EXECUTION

3.01 FIELD ADJUSTMENT

A. Adjust relay and protective device settings according to the recommended settings table provided by the coordination study. Field adjustments to be

completed by the electrical equipment manufacturer's field service engineer as required.

B. Make minor modifications to equipment as required to accomplish conformance with short circuit and protective device coordination studies.

C. Notify Engineer in writing of any required major equipment modifications.

3.02 ARC FLASH WARNING LABELS

A. The Contractor of the arc flash hazard analysis shall provide a 3.5 in. x 5 in. thermal transfer type label of high adhesion polyester for each work location analyzed.

B. All labels will be based on recommended overcurrent device settings and will be provided after the results of the analysis have been presented to the Owner and after any system changes, upgrades or modifications have been incorporated in the system.

C. Warning labels shall be provided for both under normal operation and when the system is under maintenance switch mode.

D. The label shall include the following information, at a minimum:
1. Location designation
2. Nominal voltage
3. Flash protection boundary
4. Hazard risk category
5. Incident energy or energy range corresponding to reported Hazard risk category.
6. Working distance
7. Engineering report number, revision number and issue date.

E. Labels shall be machine printed, with no field markings.

F. Arc flash labels shall be provided in the following manner and all labels shall be based on recommended overcurrent device settings.
1. For each 600, 480 and applicable 208 volt panelboard, one arc flash label shall be provided.
2. For each motor control center, one arc flash label shall be provided.
3. For each low voltage switchboard, one arc flash label shall be provided.
4. For each switchgear, one flash label shall be provided.
5. For medium voltage switches one arc flash label shall be provided

G. Labels shall be field installed by the contractor and field verified by the vendor's field engineer.

3.03 ARC FLASH TRAINING

A. The Contractor of the arc flash hazard analysis shall train the Owner's qualified staff (eight persons) of the potential arc flash hazards associated with working on energized equipment (minimum of 8 hours). The training shall be certified for continuing education units (CEUs) by the International Association for

Continuing Education Training (IACET) or equivalent. Provide hard copies of training material for the class attendees as required.

END OF SECTION

SECTION 16440

DISCONNECT SWITCHES

(Part of Work of Section 16101 – ELECTRICAL WORK FILED SUB-BIDS, Filed Sub-Bid Required)

PART 1 - GENERAL

1.01 SCOPE

A. The Contractor shall provide the labor, tools, equipment, and material necessary to install circuit and motor disconnects in accordance with the plans and as specified herein.

B. Extent of circuit and motor disconnect switch work is indicated by drawings and schedules.

C. Types of circuit and motor disconnect switches in this section include the following:
1. Equipment disconnects.
2. Motor circuit disconnects.
3. Service switch.

1.02 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions, Supplementary Conditions, and Division 1 specification sections, apply to this section.

B. Related Sections.
1. Section 16050 Basic Electrical
2. Section 16110 Raceways
3. Section 16120 Wires and Cables
4. Section 16130 Cabinets, Boxes, and Fittings

1.03 QUALITY ASSURANCE

A. Reference Standards.
1. Massachusetts Electrical Code (MEC) Compliance.
2. Underwriters' Laboratories, Inc. (UL) Compliance. Comply with requirements of UL 98 "Enclosed and Dead Front Switches."
3. National Electrical Manufacturers Association (NEMA) Compliance. Comply with applicable requirements of NEMA Standards. KS-1 "Enclosed Switches".

1.04 SUBMITTALS

A. General. Submit manufacturer's product data, test reports, and material certifications.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Heavy Duty Safety Switches. Provide surface mounted, heavy duty type, steel enclosed safety switches, of types, sizes, and electrical characteristics as indicated on the drawings. Provide switches incorporating quick make, quick break type switches, so that switch blades are visible in OFF position with door open. Interlocked cover to prevent opening in "ON" positions except by means of special interlock release mechanism. Equip with operating handle which is integral part of enclosure base and whose operating position is easily recognizable and is padlockable in OFF position. Construct current carrying parts of high conductivity copper with silver tungsten type switch contacts; and positive pressure type reinforced fuse clips where fusible switches are specified or required by code. Provide NEMA Type enclosures as shown on plans and as required by the specifications for room environmental conditions.

B. Fuses. Provide fuses for safety switches, confirming to UL 198E as noted on plan, fuses shall be Class RK 1 unless otherwise noted.

2.02 ACCEPTABLE MANUFACTURERS

A. Siemens.
B. Cutler-Hammer, Inc.
C. General Electric Co.
D. Square D Company.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install circuit and motor disconnect switches as indicated, complying with manufacturer's written instructions, applicable requirements of MEC, and NEMA.

B. Install disconnect switches for use with motor driven equipment, motors, and controllers within sight of the motor position unless otherwise indicated.

C. Provide a suitable means for mounting all disconnect switches.

3.02 GROUNDING

A. Provide equipment grounding connections, tightened to ensure a permanent and effective ground, for all electrical disconnect switches.

END OF SECTION

SECTION 16450

GROUNDING

(Part of Work of Section 16101 – ELECTRICAL WORK FILED SUB-BIDS, Filed Sub-Bid Required)

PART 1 - GENERAL

1.01 SCOPE

A. The Contractor shall provide the labor, tools, equipment, and materials necessary to furnish and install grounding materials in accordance with the plans and as specified herein.

B. Grounding. This section includes solid grounding of electrical systems and equipment.

1.02 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions, Supplementary Conditions, and Division 1 specification sections, apply to this section.

B. Related Sections
1. Section 16050 Basic Electrical
2. Section 16120 Wires and Cables
3. Section 16670 Lightning Protection Systems

1.03 QUALITY ASSURANCE

A. Reference Standards.
1. "Massachusetts Electrical Code" (MEC), as applicable to electrical grounding and bonding, Art. 250. Use of conduit system for ground conductor shall not be allowed.
2. Underwriters' Laboratories, Inc. (UL). UL 467 "Electrical Grounding and Bonding Equipment.
3. Institute of Electrical and Electronic Engineers (IEEE) IEEE 81 and 142.
a) 80-1986, "IEEE Guide for Safety in AC Substation Grounding."
b) 81-1983, "IEEE Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Grounded System (Part 1)."
c) 141-1993, "IEEE Recommended Practice for Electric Power Distribution for Industrial Plants."
d) 142-1991, "IEEE Recommended Practice for Grounding of Industrial and Commercial Power Systems."

1.04 SUBMITTALS

A. Submit the following in accordance with Conditions of Contract and Division 1 specification sections:
1. Product data for each type of product specified.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Provide each electrical grounding system with assembly of materials required for complete installation including wires/cables, connectors, lugs, clamps, ground rods, bonding jumpers and accessories.

B. Provide electrical grounding conductors for grounding connections matched to power supply wiring materials and sized according to N.E.C.

C. Provide electrical connectors, lugs, clamps, boding jumpers and accessories as recommended by the respective manufacturer for the particular application, unless otherwise indicated.

D. Ground rods; Solid copper, 5/8-inch diameter by 10 feet long.

E. Insulated conductors: Green in color.

F. Ground Bus. Bare annealed copper bars of rectangular cross section, 1/4" x 3" x length as required, with 98 percent conductivity, rigidly attached to structure.

G. Bonding Strap Conductor/Connectors. Soft copper, 0.05 inch thick and 2 inches wide, except as indicated.

H. Pressure Connectors. High conductivity plated units.

I. Bolted Clamps. Heavy duty units listed for the application.

J. Exothermic Welded Connections. Provided in kit form and selected for the specific types, sizes, and combinations of conductors and other items to be connected.

2.02 ACCEPTABLE MANUFACTURERS

A. Burndy Corporation.
B. A.B. Chance Co.
C. Dossert Corp.
D. Erico Products, Inc.
E. GB Electrical, Inc.
F. Joslyn Manufacturing Co.
G. Kearney-National.
H. O-Z/Gedney Co.
I. Quazite Corporation.
J. Raco, Inc.
K. Thomas and Betts.

PART 3 - EXECUTION

3.01 GROUNDING AND BONDING

A. Ground main service entrance distribution panel ground bus or lug to neutral of incoming service, to enclosure, to building steel and to main cold water pipe. Install grounding bushings or service conduits.

B. Provide equipment grounding conductors in all conduits containing power, control, or instrumentation conductors on the load side of the service equipment or on the load side of a separately derived system.

C. Comply with MEC Article 250 for sizes and quantities of equipment grounding conductors, except that larger sizes indicated or shown on the Contract Documents shall take precedence. Use of metallic conduit systems for equipment grounding as recognized by the MEC shall not be permitted under this specification.

D. Separately derived systems required by MEC to be grounded shall be grounded in accordance with MEC 250-26.

E. In addition, bond the grounded conductor of the separately derived system to the nearest available point on the interior metal water piping system, per MEC 250-80(a), or if no water piping extend to main service disconnect ground.

F. Install grounding bushings on conduits at both primary and secondary entrances to transformers. Ground transformer enclosures to bushings.

G. Install bonding jumper for flexible metal conduit unless fittings are approved for grounding or otherwise comply with N.E.C.
   1. Size jumper to match over-current device.
   2. Green insulation.
   3. Connect to grounding bushing at each end.

H. Ground each metal lighting pole or standard with a common bare copper equipment grounding conductor run with the circuit conductors.

I. Ensure that entire electrical system is electrically continuous and permanently and effectively grounded, including all electrical equipment and motors.

J. Locate ground rods with a minimum of one rod length from each other and at least the same distance from any other grounding electrode. Connect ground conductors to ground rods by means of exothermic welds except at test wells and as otherwise indicated. Drive rods until tops are 24 inches below finished floor or final grade except as otherwise indicated.

K. Route grounding electrode conductors along the shortest and straightest paths possible without obstructing access or placing conductors where they may be subjected to strain, impact, or damage, except as indicated.

L. Ensure that grounding electrode conductor connections to interior piping, structural members, and the like are accessible for periodic inspection during the life of the structure.

3.02 BONDING FOR OTHER TRADES

A. Signal raceways, water piping, heating piping and metallic air ducts shall be bonded together and to the grounding conductor with No. 8 soft drawn bare solid conductors. Connections to pipes shall be made with cast clamps of like material as the pipes to which attached, to ducting terminated in a secure manner by best practical means, bonding across any flexible or insulated connections.

B. All bonding conductors shall be installed in a neat and workmanlike manner, properly shaped for contour of surface involved and properly supported. At locations remote from the switch gear, bond to the largest raceway nearby.

3.03 FIELD QUALITY CONTROL

A. Independent Testing Organization. Arrange and pay for the services of a qualified independent electrical testing organization to perform tests described below.

B. Measure ground resistance without the soil being moistened by any means other than natural precipitation or natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance. Perform tests by the three point fall of potential method in accordance with Section 9.03 of IEEE 81. Simple moisture addition is not acceptable.

C. Ground/resistance maximum values shall be as follows:
Equipment rated 500 kVA and less. 10 ohms.
Equipment rated 500 kVA to 1000 kVA. 5 ohms.
Equipment rated over 1000 kVA. 3 ohms.
Unfenced substations and pad mounted equipment. 5 ohms.
Fence Grounds. 10 ohms.

D. Where ground resistances exceed specified values, and if directed, modify the grounding system to reduce resistance values. Where measures are directed that exceed those indicated under the provisions of the Contract, changes to Contract Price shall be evaluated.

END OF SECTION

SECTION 16460

TRANSFORMERS

(Part of Work of Section 16101 – ELECTRICAL WORK FILED SUB-BIDS, Filed Sub-Bid Required)

PART 1 - GENERAL

1.01 SCOPE

A. The Contractor shall provide the labor, tools, equipment, and materials necessary to furnish and install transformers in accordance with the plans and as specified herein.

1.02 RELATED DOCUMENTS

B. Drawings and general provisions of Contract, including General Conditions and Division 1 specification sections, apply to this section.

C. Related Sections:
1. Section 16050 Basic Electrical
2. Section 16195 Electrical Identification

1.03 QUALITY ASSURANCE

A. Reference Standards.
1. National Fire Protection Association (NFPA) 70 "Massachusetts Electrical Code (MEC).
2. American National Standards Institute/Institute of Electrical and Electronic Engineers (ANSI/IEEE) Compliance.
3. Underwriters' Laboratories, Inc. (UL) Compliance, UL 506 Standard.
4. State and local energy codes.

1.04 SUBMITTALS

A. Furnish manufacturer's product data, test reports, and materials certifications as required.

B. Product Test Reports. Certified copies of manufacturer's design and routine factory tests required by the referenced standards.

PART 2 - PRODUCTS

2.01 TRANSFORMERS, GENERAL

A. Factory assembled and tested, air cooled, dry type units of size specified, having characteristics and ratings as indicated. Units shall be designed for 60 Hertz (Hz) service.

B. Comply with NEMA Standard ST 20 "Dry Type Transformers for General Applications."

C. Windings. Two winding type, copper. Three phase transformers shall use one coil per phase in primary and secondary.

D. Sound Level. Minimum of 3 decibels (dB) less than NEMA ST 20 standard sound levels for transformer type and size indicated when factory tested in accordance with that standard.

E. Enclosures. Unless otherwise noted on the drawings enclosures shall be indoor, ventilated.

F. Insulation Class. 185 degrees Celsius (°C) or 220°C class for transformers 15 kilovolt amperes (kVA) or smaller; 220°C class for transformers larger than 15 kVA.

G. Insulation Temperature Rise. 80°C maximum rise above 40°C.

H. Taps. For transformers 3 kVA and larger, full capacity taps in high voltage winding as follows:
1. 3 kVA through 25 kVA. Two 5 percent taps below rated high voltage.
2. 3 kVA through 10 kVA. Two 5 percent taps below rated high voltage.
3. 15 kVA through 500 kVA. Six 2 1/2 percent taps, two above and four below rated high voltage.

I. Accessories. The following accessory items are required where indicated:
1. Wall Mounting Brackets. Manufacturers standard brackets for transformers sized up to 75 kVA where wall mounting is indicated.

2.02 ACCEPTABLE MANUFACTURERS

A. Acme Electric Corp.
B. General Electric Co.
C. Siemens Energy & Automation, Inc.
D. Square D Co.
E. Westinghouse Electric Corp.
F. Cutler-Hammer.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Arrange equipment to provide adequate spacing for cooling air circulation.

B. Install units on vibration mounts as shown; comply with manufacturer's indicated installation method, if any. Outdoor installations shall be on a housekeeping pad unless pole mounted. Indoor installations over 30 kVA shall be set on a welded steel channel box on top of a housekeeping pad. Indoor installations 30 kVA and under shall be wall mounted using steel angle frame unless otherwise noted.

3.02 GROUNDING

A. Ground transformers per MEC Art. 250.

END OF SECTION

SECTION 16470

PANELBOARDS

(Part of Work of Section 16101 – ELECTRICAL WORK FILED SUB-BIDS, Filed Sub-Bid Required)

PART 1 - GENERAL

1.01 SCOPE

A. The Contractor shall provide the labor, tools, equipment, and materials necessary to install panelboards and enclosures in accordance with the plans and as specified herein.

B. This section includes lighting and power panelboards and associated auxiliary equipment rated 600 volts or less.

1.02 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Division 1 specification sections, apply to this section.

B. Related Sections:
1. Section 16050 Basic Electrical

1.03 QUALITY ASSURANCE

A. Reference Standards.

B. National Fire Protection Association (NFPA) 70, MEC, compliance.

C. National Electrical Manufacturers Association (NEMA) Standard. NEMA PB1, "Panelboards."

D. Underwriters' Laboratories, Inc. (UL) Standards. Comply with UL 61 "Panelboards", UL 50 "Cabinets and Boxes" and ULB69 "service entrance equipment".

1.04 SUBMITTALS

A. Furnish manufacturer's product data, test reports, and materials certifications as required.

B. Submit the following in accordance with Conditions of Contract and Division 1 specification sections.
1. Product data for each type panelboard, accessory item, and component specified.
2. Shop drawings from manufacturers of panelboards including dimensioned plans, sections, and elevations. Show tabulations of installed devices, major features, voltage rating and AIC ratings.
3. Panel schedules for installation in panelboards. Submit final versions after load balancing.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Panelboards shall be of a dead-front safety type, equipped with thermal-magnetic molded case circuit breakers as indicated on the Drawings. All panels shall be of same manufacture, complying with UL61.

B. Circuit breakers shall be thermal-magnetic type with quick-make, quick-break, trip-free mechanism, per Fed. Spec. W-C-375B.

C. Furnish molded case circuit breakers in panel boards as indicated on Drawing.

D. Panelboards shall have copper bus with fully capacity neutral bus, ground bus and bolt-on circuit breakers.

E. Panelboards for use as service disconnecting means shall additionally conform to UL 869.

F. Accessories. Provide a transient voltage surge suppression device for panelboards as indicated on the drawings. The units shall be 3 phase and shall be mounted in a metal enclosure suitable for attachment to the panelboard enclosure. The units shall meet UL standard 1449 and have a UL label. Provide Leviton TVSS devices or equal.

2.02 ACCEPTABLE MANUFACTURERS

A. Available Manufacturers. Subject to compliance with requirements, manufacturers offering products that may be incorporated in the work include, but are not limited to, the following:
   1. Square D. Co.
   2. Cutler-Hammer Products
   3. Siemens Energy and Automation, Inc.
   4. General Electric Co.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install panelboards and accessory items in accordance with NEMA PB 1.1,"General Instructions for Proper Installation, Operation, and Maintenance of Panelboards Rated 600 Volts or Less" and manufacturers' written installation instructions.

B. Mounting Heights. Top of trim 6'-2" above finished floor, except as indicated.

C. Circuit Directory. Typed and reflective of final circuit changes required to balance panel loads. Obtain approval before installing. Number branch circuit devices accordingly to correspond to circuit directory.

3.02 GROUNDING

A. Make equipment grounding connections for panelboards as indicated.

B. Provide ground continuity to main electrical ground bus indicated.

C. Electrical Tests. Include the following items performed in accordance with manufacturer's instructions:
   1. Ground resistance test on system and equipment ground connections.
   2. Test main and subfeed overcurrent protective devices.

3.03 CLEANING

A. Upon completion of installation, inspect interior and exterior of panelboards. Remove paint splatters and other spots, dirt, and debris. Touch up scratches and marred surfaces of finish to match original finish.

3.04 COMMISSIONING

A. Balancing Loads. After Substantial Completion, conduct load balancing measurements and circuit changes as follows:
   1. Perform measurements during period of normal working load as advised by the Owner.
   2. Tolerance. Difference between phase loads exceeding 20 percent at any one panelboard is not acceptable. Rebalance and recheck as required to meet this minimum requirement.

END OF SECTION

SECTION 16480

MOTOR CONTROL CENTERS

(Part of Work of Section 16101 – ELECTRICAL WORK FILED SUB-BIDS, Filed Sub-Bid Required)

PART 1 - GENERAL

1.01 SCOPE

A. General. The Contractor shall provide the labor, tools, equipment, and materials necessary to furnish and install MCCs in accordance with the plans and as specified herein.

1. Types of MCCs components specified in this section include the following:
   a) MCC supporting structures.
   b) Bus systems.
   c) Unit compartments.
   d) Motor starters.
   e) Variable frequency drives.
   f) Feeder units.
   g) Overload protection.
   h) Over current protection.
   i) Control components.
   j) Surge protection.

1.02 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract apply to this section.

B. Related Sections:
   1. Section 16050 Basic Electrical
   2. Section 16481 Motor Starters

1.03 QUALITY ASSURANCE

A. Reference Standards.
   1. National Fire Protection Association (NFPA) 70, "MEC".
   2. National Electrical Manufacturers Association (NEMA) Standard. NEMA ICS 2.
   3. Underwriters' Laboratories, Inc. (UL) Standard. UL 845.

1.04 SUBMITTALS

A. Furnish manufacturer's product data, test reports, and material certifications as required.

B. Submit the following in accordance with Conditions of Contract and Division 1 specification sections:

1. Voltage, phase, frequency.
2. Horizontal and vertical bus capacity.
3. Short circuit ratings.
4. Main and feeder circuit breakers ratings
5. Types of motor controllers.
6. Types of wiring (NEMA type wiring).
7. Enclosures.
8. Sections.
9. Motor size and overload heaters.
10. Panels and transformers.
11. Control components.
12. Over current protective devices
13. Metering components.
14. Surge protection.
15. Time-current curves for all circuit breakers in the MCC.

C. Submit layout drawings of MCCs showing accurate scaled basic equipment sections including, but not limited to, motor controllers, device panels, and circuit breakers. Submit unit wiring diagrams. Clearly differentiate on wiring diagrams those conductors which are factory installed and those which are field installed.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Acceptable Manufacturers
1. Allen-Bradley.
2. Square D.
3. GE.
4. Eaton.

B. Construction
1. The motor control centers shall be the product of a single manufacturer who shall also be the manufacturer of all the circuit breakers, variable frequency drives, and the motor starters included in the motor control center.
2. The MCCs shall consist of one or more vertical sections, each with groupings of unit compartments containing motor controllers, feeder, and auxiliary devices as indicated. Design MCCs for connection to available faults of not less than 42,000 RMS symmetrical amperes. Provide MCCs with NEMA Class 1, Type B wiring. All wiring shall be identified by permanent plastic heat shrink label at each termination.
3. The MCCs shall be factory assembled, deadfront with enclosed vertical sections, as indicated, fastened together to form rigid free standing assembly. Construct each section 90 inches high with 9 inch horizontal wireways at top and bottom, 20 inches wide, and a minimum of 14 inch section depth. Provide NEMA Type 1 gasketed enclosure. Provide removable lifting angle full length of MCC.

Design lifting angle to support entire weight of MCC section. Design bottom channels to be removable, provide holes for bolting MCC units to floor.

4. Provide shipping splits in MCC lineup to allow for shipment of maximum 60 inch long units. Design MCCs so matching vertical sections of same current rating and manufacturer can be added later at either end of lineup without use of transition sections. Provide removable end and top plates to close off openings.
5. Bus bars shall be of tin plated copper or aluminum, braced to withstand faults of 42,000 RMS symmetrical amperes minimum. Provide main horizontal bus with rating of 1,000 amperes, and vertical bus rating of 300 amperes unless otherwise noted. The ground bus running full width of MCC at bottom of lineup. Drill ground bus and furnish lugs as indicated.
6. The MCCs shall be provided with draw out type unit compartments with doors, unit support pans, and disconnect operators. Enclose and isolate each unit from adjacent units. Design units so that faults will be contained within compartments and with a minimum 42,000 amperes RMS symmetrical fault withstandability. Provide draw out units with a de-energized position where the unit is still supported by the structure, but no electrical connection is made. Provide a method of locking the unit in the de-energized position.
7. Provide external operator handles for starters, VFD's, switches, and circuit breakers. Design handle with up-down motion and with down position indicating OFF. Construct handles which permit locking handle in OFF position with three padlocks. Provide interlock for each unit door with associated disconnect mechanism to prevent door from opening when unit is energized.
8. Provide factory assembled, thermal magnetic molded case circuit breakers with permanent instantaneous magnetic and thermal trips in each pole, ampere ratings as indicated. Construct with quick break action and positive handle indication. Circuit breakers shall be coordinated to maximum extended possible.
9. Provide combination type motor starters, and VFDs, types as specified in Section 16481 with thermal magnetic circuit breaker and ambient compensated, manual reset, inverse time, thermal overload relay. Overload protection shall be provided in each phase conductor. Provide overload heaters sized based upon motor nameplate current. Provide a 120 volt control power transformer for each motor starter unit with two primary fuses and one secondary fuse. The transformer secondary shall be grounded. Provide a minimum of two normally open and one normally closed auxiliary contacts. Units shall be NEMA rated.
10. All push buttons, selector switches, and pilot lights mounted in unit doors shall be heavy duty NEMA Type 12. Pilot lights shall be push to test type. Control relays shall be 600 volt industrial control relays with 120 volt coils and convertible contacts. Timers shall consist of a control relay, as described above, with a solid state timer attachment. Each motor starter shall have a power monitor relay to trip the starter on loss of phase low voltage and phase reversal protection. The unit shall be provided with delay on trip and auto restart.
11. Furnish surge protector equipment for the protection of all AC electrical circuits from the effects of lighting induced currents, substation switching transients and internally generated transients. Suppressors shall be listed in accordance with UL 1449 and IEEE C62.41 Standards. Coordinate impulse sparkover voltage with system circuit voltage, and provide factory mounting and connection. Refer to plans for the specified type.

12. Paste the as-built wiring diagrams for each starter and VFD on the respective unit door inside the bucket.

C. Spare Parts
1. Furnish six spares of each type and rating of fuse and fusible devices required. Include spares for:
   a) Control power fuses.
   b) Fuses for fusible switches.
2. Furnish one starter coil for every two starters of each NEMA size installed.
3. Furnish one set of overload heaters for every starter used in MCC.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install MCC as indicated, in accordance with equipment manufacturer's written instructions, and complying with applicable requirements of MEC, NEMA's Standard.

B. Housekeeping pads for all motor control centers shall be provided by the General Contractor. Coordinate size of all pads with the General Contractor.

C. Provide factory representative to inspect completed installation and provide start-up services.

D. Adjust operating mechanisms for free mechanical movement.

E. Touch up scratched or marred surfaces to match original finishes.

F. Provide equipment grounding connections for MCC's as indicated.

3.02 FIELD QUALITY CONTROL

A. Prior to tenderization of MCCs, check with insulation resistance tester for proper values of phase-to-phase and phase-to-ground insulation resistances. Log that data and submit to Engineer.

B. Prior to tenderization of circuitry, check control center electrical circuits for continuity and for short circuits.

END OF SECTION

SECTION 16481

MOTOR STARTERS

(Part of Work of Section 16101 – ELECTRICAL WORK FILED SUB-BIDS, Filed Sub-Bid Required)

PART 1 - GENERAL

1.01 SCOPE

A. The Contractor shall provide the labor, tools, equipment, and materials necessary to furnish and install motor starters in accordance with the plans and as specified herein.

B. Types of motor starters specified in this section include the following:
   1. Manual.
   2. Combination.
   3. Variable frequency drive.
   4. Solid-state starters.

1.02 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General Conditions, Supplementary Conditions, and Division 1 specification sections, apply to work of this section.

B. Related Sections.
   1. Section 16480 Motor Control Center
   2. Section 16050 Basic Electrical

1.03 QUALITY ASSURANCE

A. Reference Standards.
   1. Massachusetts Electrical Code (MEC) Articles 220, 250, and 430.
   2. Underwriters' Laboratories, Inc. (UL) Compliance. UL 486A and B, and UL 508. Provide starters and components, which are UL listed and labeled.
   3. Institute of Electrical and Electronic Engineers (IEEE) Compliance.
   4. National Electrical Manufacturers Association (NEMA) Compliance. NEMA Standard ICS 2.

B. Qualifications
   1. Firms regularly engaged in manufacture of motor starters and drives of types and sizes required, whose products have been in satisfactory use in similar service for not less than 5 years.

C. Factory Test
   1. Variable Frequency Drives

a) All control printed circuit boards shall be dynamically tested for a minimum of 22 hours while heat cycled 1 hour at each temperature setting from 32 degrees Fahrenheit (°F) to 140°F.

b) All controllers shall be subjected to Run-In Test with a properly sized motor and operated under cycling load conditions on a dynamometer.

1.04 SUBMITTALS

A. Furnish manufacturer's product data, test reports, and materials certifications as required.

B. Submit the following in accordance with conditions of contract and Division 1 specification sections:

1. Product Data. Submit manufacturer's data and installation instructions on motor starters and drives.
2. Wiring Diagrams. Submit power and control wiring diagrams for motor controllers showing connections to electrical power panels, feeders, and equipment. Differentiate between portions of wiring which are manufacturer installed and portions, which are field installed.
3. Motor Overloads. Submit for approval motor overload sizes for each new motor starter furnished or existing motor starter modified. Overload size shall be based on actual motor nameplate data and power factor correction size; where applicable. Include thermal overload compensation sizing information where motor(s) are operated at temperatures different than the motor starters.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Except as otherwise indicated, provide motor starters, drives and auxiliary components which comply with manufacturer's standard materials, design and construction in accordance with published product information, and as required for a complete installation.

B. Fractional HP Manual Starters. Provide single-phase fractional HP manual motor controllers, of sizes and ratings indicated. Equip with manually operated quick make, quick break toggle mechanisms; and with one piece melting alloy type thermal units. Provide starters with double break silver alloy contacts, visible from both sides of controller; green pilot lights, and switch capable of being padlocked OFF.

C. Variable Frequency Drives:

1. Variable frequency controllers shall be listed by Underwriters Laboratories (UL).
2. Construct the drives with three major sections: a full wave, 3 phase diode rectifier section to convert from alternating current (ac) to direct current (dc), a dc filter section to smooth the dc voltage, and a pulse width modulated 3 phase inverter section to provide a variable voltage, variable frequency output at a constant voltage to frequency ration. The output frequency range shall be a minimum of 6 to 120 hertz (Hz).

3. VFDs of 100 hp or less shall be 6 pulse or 12 pulse design with input line reactor as required to meet the input voltage and current harmonic distortion limits at PCC. The PCC will be the secondary side of the utility pad mounted transformer. VFDs over 100 hp and larger shall be 18 pulse design as indicated on the electrical-one line drawings.
4. General:
   a) Pump applications, constant torque.
   b) Motor type – standard NEMA design B.
   c) The controller shall not require an isolation transformer, even if motors are located in a damp area.
   d) All components shall include original manufacturer's identification and part number.
   e) High power factor input with minimal line distortion, notching or harmonics.
   f) Basic drive design shall be pulse width modulated with carrier frequency adjustable to 10 kHz.
   g) The controller shall comply with Federal Communications Commission requirements under Part 15 Rules for Radio Frequency Interference and IEEE 519 for 5% maximum harmonics.
   h) All controllers shall be subjected to a 22-hour burn-in test.
5. Environmental:
   a) Ambient operating temperature range – 10 to 40° C.
   b) Humidity: 5 to 95%, noncondensing.
   c) Altitude: 0 to 3300 feet above sea level.
6. Electrical:
   a) Input line voltage: 480 volts, 3-phase, 60 Hz, +/- 10% voltage fluctuation.
   b) Motor nameplate voltage: 460 volts, 3-phase, 60 Hz.
   c) Output frequency range: 0 to 120 Hz.
   d) Minimum drive efficiency: 95% at 100% speed.
   e) Current rating: 110% of connected motor full load ampere (output rated current) continuous at full speed, 150% for one minute.
   f) Power loss ride through: 16 mx.
   g) Input line fuses.
   h) External control circuit voltage: 120 V AC, maximum.
7. The controller shall include the following protective features with status indictors:
   a) Overvoltage.
   b) Undervoltage.
   c) Overcurrent.
   d) Ground fault.
   e) Overtemperature.
   f) Phase loss/blown fuse.
   g) Running overload protection.
   h) Common alarm contact for external user.
   i) Line circuit breaker.
   j) 5% in-line reactor or harmonic filter (6-pulse drives) as shown on the one- line diagrams.

k) Load side harmonic filters for the selected loads harmonic as shown on the one- line diagrams.

8. The power circuit design shall be such that the following conditions will not damage the drive:
   a) Single or three-phase fault from line-to-line or line-to-ground.
   b) Opening of all three phases during operation by disconnect switch at motor location.
9. Indicator light safety feature shall indicate when DC bus is energized and capacitors are charged.
10. Internal calibration adjustments:
   a) Minimum speed.
   b) Maximum speed.
   c) DC boost.
   d) Acceleration/deceleration rates.
   e) Stop mode (ramp or coast).
   f) Automatic restart after fault trip with lockout after five attempts to restart.
   g) Anti-windmilling adjustable brake time.
   h) Adjustable volts/Hertz.
11. Unit mounted operator controls:
   a) Hand-Off-Auto switch.
   b) Speed adjust potentiometer.
   c) Indicating speed meter.
   d) Power ON light.
   g) Local – Remote speed selector switch.
   h) Other control devices and interlocks as shown on the drawings.
   i) Note: each process alarm condition shown on the wiring diagram shall be provided with time delay function and shall be manually reset prior to restart.
12. Provision for remote external controls:
   a) Two wire ON-OFF control.
   b) Speed adjust, analog input (4-20 mADC).
   c) Remote speed pot in a NEMA 12 enclosure furnished by the VFD vendor.
13. Bypass starters: Provide heavy duty type soft-start bypass starter for motors 60Hp and greater as shown on the drawings. The soft-start starters shall be provided with field adjustable ramp-up and ramp-down functions as required. All contactors used in VFD/bypass configuration shall be NEMA rated.
14. Harmonic Requirements:
   a) General: Under normal operating conditions when minimum of one VFD of each set of pumps are operating, the line harmonics introduced into the power system form the AC VFD controller shall be within the distortion limits as defined in IEEE 519-(1992).
   b) Total Harmonic Distortion (THD) voltage shall not exceed 5 percent and THD current shall not exceed 5 percent, when measured at the point of common coupling (PCC).

D. Combination Starters. Provide combination starters consisting of a starter as described above with thermal magnetic molded case circuit breaker mounted in a common enclosure. Provide external operator handles for the switches or breakers. Design of the handle with an up-down motion and with the down position indicating OFF. Construct the handles to permit locking in the OFF position with up to three padlocks. The starters shall be NEMA rated but in no case less than NEMA 1. The starters shall include HOA selector switches, ON/OFF pilot lights, control power transformer, electronic overload relays, three phase power monitor to protect against low voltage, loss of phase and phase reversal with auto reset, two sets of auxiliary contacts, alarm lights, timers, relays, etc. as shown on the drawings.

E. Enclosures. Starters and drives shall be mounted in the motor control center unless otherwise shown. Units shown as weatherproof (WP) shall be mounted in NEMA Type 4 enclosures. NEMA 1 enclosures shall be provided for stand-alone starters and drives in dry area. Coat the enclosures with the manufacturer's standard color finish.

2.02 EXTRA MATERIALS

A. Maintenance Stock, Fuses. For types and ratings required, furnish additional fuses, amounting to one unit for every installed unit.

2.03 ACCEPTABLE MANUFACTURERS

A. Allen-Bradley.
B. Square D.
C. G.E.
D. Eaton

Note: The VFD manufacturer shall be the same as the manufacturer of the specified MCC's.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Examine areas and conditions under which motor starters and drives are to be installed, and notify the Engineer in writing of conditions detrimental to proper completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Engineer.

B. Install motor starters and drives where indicated, in accordance with equipment manufacturer's written instructions and with recognized industry practices; complying with applicable requirements of MEC, UL and NEMA standards, to ensure that products fulfill requirements.

C. Tighten connectors and terminals, including screws and bolts, in accordance with equipment manufacturer's published torque tightening values for equipment connectors. Where manufacturer's torquing requirements are not indicated, tighten connectors and

terminals to comply with tightening torques specified in UL Standards 486A and B, and the MEC.

D. Install fuses, of sizes indicated, in each fusible disconnect switch.

E. Wall mount the enclosures using spacers or standoffs (1/4 inch minimum).

3.02 FIELD QUALITY CONTROL

A. Prior to energization of motor controller equipment, check with ground resistance tester, phase-to-phase and phase-to-ground insulation resistance levels to ensure requirements are fulfilled.

B. Prior to energization, check circuitry for electrical continuity, and for short circuits.

C. Provide two eight (8)-hour day operator training on the VFDs. The training shall be conducted by the vendor's qualified representatives.

END OF SECTION

SECTION 16490

AUTOMATIC TRANSFER SWITCH

(Part of Work of Section 16101 – ELECTRICAL WORK FILED SUB-BIDS, Filed Sub-Bid Required)

PART 1 - GENERAL

1.01 SCOPE

A. The Contractor shall provide the labor, tools, equipment, and materials necessary to furnish and install transfer switches in accordance with the plans and as specified herein.

B. Extent of transfer switch work, including to furnish and install control devices, is as indicated on the drawings and as specified herein.

1.02 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract apply to this section.

B. Related Sections.
1. Section 16050 Basic electrical
2. Section 16210 Standby Generator
3. Section 16480 Motor Control Center

1.03 QUALITY ASSURANCE

A. Reference Standards
1. Massachusetts Electrical Code (MEC).
2. Underwriters' Laboratories, Inc. (UL) Compliance UL 1008. Provide transfer switches and components which are UL listed and labeled and rated for short circuit interrupt and withstand ratings indicated.
3. National Electrical Manufacturers Association (NEMA) Compliance. NEMA Standard Pub/Nos. ICS.
4. NFPA 110 Compliance.

B. Qualifications
1. Firms regularly engaged in manufacture of electrical power transfer switches, of types, ratings, and capacities required, whose products have been in satisfactory use in similar service for not less than 5 years.

1.04 SUBMITTALS

A. Furnish manufacturer's product data, test reports, and materials certifications as required.

B. Submit the following in accordance with conditions of Contract and Division 1 specification sections:
1. Product Data. Submit manufacturer's data and installation instructions for electrical power transfer switches.

2. Shop Drawings. Submit layout drawings of transfer switches showing accurately scaled equipment locations and spatial relationships to associated electrical equipment in proximity.
3. Wiring Diagrams. Submit elementary control or ladder wiring diagrams for transfer switches, and associated control devices showing connections to prime and alternate power sources, electrical load, and equipment components. Differentiate between portions of wiring that are manufacturer installed and portions that are field installed.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Provide factory fabricated, automatic transfer switch, delayed transition type and auxiliary equipment of types, sizes, ratings, and electrical characteristic for services as indicated on the drawings. Transfer switch mechanism shall be electrically-operated by a single solenoid and mechanically held. Locking shall be accomplished without the use of latching solenoids, toggle mechanisms or gear arrangements. Operation shall be inherently doubled-thow with normal and emergency contacts moving simultaneously. Operating transfer time shall not exceed one-half of a second. The automatic transfer switches over 1,000 amps shall be 4 pole, delayed transition type. The automatic transfer switches under 1,000 amps shall be 3 pole.

B. Main switch contacts shall be segmented and the configuration shall be designed such that fault currents provide increased main contact pressure. Separate arcing contacts are required and visual inspection and replacement of a main and separate arcing contacts, both stationary and movable, shall be possible from the front of the switch without any disassembly of operating linkages or power conductors. Main contacts consisting of adapted devices, such as subassemblies or contractors, not originally designed for transfer switch application are not acceptable.

C. ATS shall be provided in the switchboard lineup as shown on the drawings. All power cables, lugs, and contacts shall be covered to protect the operator should the switch be closed into a dead fault. Minimum interrupting rating shall be 42,000 amps RMS, SYM.

D. The transfer switch shall be equipped with the following accessories:
1. Adjustable time delay to override momentary dips in normal source, 0-10 seconds.
2. Full phase voltage relay supervision of the normal source (656-70% dropout and 92-95% pickup) with at least one close differential relay (83-85% dropout and 92-95% pickup) to detect “brownout” conditions.
3. Voltage/frequency lockout relay (90% pickup, nominal) to prevent premature transfer to emergency source.
4. System test switch, momentary type.
5. Gold plated engine starting control contacts for 2-wire control.
6. Auxiliary pilot contacts rated 10 amperes at 120 VAC, two closed on normal and two closed on emergency.
7. Adjustable (2-25 minutes norminal) time delay on retransfer to normal.
8. Adjustable time delay (5 to 15 minutes, nominal) on shutdown of engine-generator after retransfer of the load to normal.
9. Automatic engine exercisers with load/no load selector switch and 7-day clock with adjustments for time, day and duration of generator exercise period.

10. Pilot lights mounted on exterior of enclosure doors: Green (normal) and red (emergency).
11. Two N.O. load shed contacts on emergency position. Contacts shall open 3 seconds prior to transfer to emergency side and shall close 3 seconds after switch has been transferred.

2.02 ACCEPTABLE MANUFACTURERS

A. ASCO, 7000 series.
B. Russelectric Inc.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install transfer switch, including associated control devices as indicated, in accordance with equipment manufacturer's written instructions, and with recognized industry practices, to ensure that transfer switch comply with requirements. Comply with applicable requirements of NEC and NFPA pertaining to wiring practices and installation of transfer switch.

B. General Contractor shall provide housekeeping pads for all floor mounted transfer switches.

C. Tighten electrical connectors and terminals, including screws and bolts, in accordance with equipment manufacturer's published torque tightening values for equipment connectors. Where manufacturer's torquing requirements are not indicated, tighten connectors and terminals to comply with tightening torques specified in UL Standards 486A and 486B.

3.02 GROUNDING

A. Provide equipment grounding connections for transfer switch units as indicated. Tighten connectors to comply with tightening torques specified in UL Standard 486A to assure permanent and effective grounding.

3.03 FIELD QUALITY CONTROL

A. Test transfer switch, by means of simulated power outage; automatic start-up by remote automatic starting, transfer of load and automatic shutdown. Prior to these tests, adjust transfer switch timers for proper system coordination.

3.04 TRAINING

A. Train Owner's personnel in procedures for starting up, testing, and operating transfer switches and auxiliary equipment.

END OF SECTION

SECTION 16500

LIGHTING FIXTURES

(Part of Work of Section 16101 – ELECTRICAL WORK FILED SUB-BIDS, Filed Sub-Bid Required)

PART 1 – GENERAL

1.01 SCOPE

A. The Contractor shall provide the labor, tools, equipment, and materials necessary to furnish and install lighting fixtures in accordance with the plans and schedules as specified herein.

B. Types of lighting fixtures in this section include the following:
1. LED.

1.02 RELATED DOCUMENTS

A. General. Drawings and general provisions of Contract, including General Conditions, Supplementary Conditions, and Division 1 specification sections, apply to work of this section.

B. Division 16, Section 16050, "Basic Electrical Materials and Methods," sections apply to work specified in this section.

C. Related Sections. The following Division 16 sections contain requirements that relate to this section:
1. Section 16050 - Basic Electrical
2. Section 16120 - Wires and Cables, for wiring used in tandem wired fixtures.

1.03 QUALITY ASSURANCE

A. Reference Standards.
1. National Electrical Code (NEC) compliance.
2. National Electrical Manufacturers Association (NEMA) Compliance. NEMA Standard LE 1 and LE 2.
3. Underwriters' Laboratories, Inc. (UL) Compliance. UL 486A and B, standards.
4. National Fire Protection Association (NFPA) Compliance. NFPA 78, NFPA 101.

1.04 SUBMITTALS

A. Furnish manufacturer's product data, test reports, and materials certifications as required.

B. Submit the following in accordance with Conditions of Contract and Division 1 specification sections:

1. Submit manufacturer's product data and installation instructions on each type lighting fixture and component including lamp data.
2. Provide isofootcandle (isolux) plot diagram of footcandles on horizontal pavement surface which shows composite values of illuminance projected from the arrangement of light sources from indicated fixture locations and heights in outdoor applications.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Provide lighting fixtures, of sizes, types and ratings as indicated on the drawings, complete with, but not limited to, housings, energy efficient lamps, lamp holders, reflectors, and wiring. Ship fixtures factory assembled, with those components required for a complete installation.

2.02 SPARE PARTS

A. Provide a quantity equal to 10 percent of installed units of the following component type:
1. Lamps. Ten lamps for each 100 of each type and rating installed. Furnish at least one of each type.
2. Diffusers and Lenses. One for each 100 of each type and rating installed. Furnish at least one of each type.
3. Globes and Guards. One for each 20 of each type and rating installed. Furnish at least one of each type.
4. Photocell. One for each type and rating integral to lighting fixtures. Furnish at least one of each type.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Examine areas and conditions under which lighting fixtures are to be installed. Examine substrate/substrata for supporting lighting fixtures. Notify the Engineer in writing of conditions detrimental to proper completion of the work. Do not proceed with work until satisfactory conditions have been corrected in a manner acceptable to the Engineer.

B. Install lighting fixtures at locations and heights as indicated, in accordance with fixture manufacturer's written instructions, applicable requirements of MEC, Massachusetts Electrical Contractors Association's (NECA) "Standard of Installation," NEMA standards.

C. Provide fixtures and/or fixture outlet boxes with hangers to properly support fixture weight. Submit design of hangers, method of fastening, other than indicated or specified herein, for review by the Engineer.

D. Support fixtures in lay-in type grid ceilings by hangers or wire anchors from the structural ceiling, not from the lay-in grid.

1. Exception. For recessed cans, the cans shall be equipped with bar hangers with integral slots for mounting directly to the T bar grid. In addition, all four corners of the T bar grid shall be supported from the structural ceiling by hangers or wire anchors.

E. Provide plaster frames for recessed fixtures installed in other than suspended grid type acoustical ceiling systems. Brace frames temporarily to prevent distortion during handling.

F. Fasten fixtures securely to indicated structural supports. Ensure that pendant fixtures are plumb and level. Provide individually mounted pendant fixtures longer than 2 feet with twin stem hangers. Provide stem hanger with ball aligners and provisions for minimum one inch vertical adjustment. Mount continuous rows of fixtures with an additional stem hanger greater than number of fixtures in the row.

3.02 GROUNDING

A. Provide ground to all lighting fixtures. Provide equipment grounding connections for exterior lighting fixtures as indicated. Tighten connections to comply with tightening torques specified in UL Standard 486A to assure permanent and effective grounds.

3.03 FIELD QUALITY CONTROL

A. At Date of Substantial Completion, clean luminaries and replace lamps in lighting fixtures which are observed to be noticeably dimmed after Contractor's use and testing, as judged by the Engineer.

END OF SECTION

SECTION 16670

LIGHTNING PROTECTION SYSTEMS

(Part of Work of Section 16101 – ELECTRICAL WORK FILED SUB-BIDS, Filed Sub-Bid Required)

PART 1 - GENERAL

1.01 SCOPE

A. The Contractor shall provide the labor, tools, equipment, and materials necessary to furnish and install lightning protection systems in accordance with the plans and as specified herein.
   1. This section includes lightning protection systems for buildings and associated structures and includes requirements for lightning protection systems components including, but not limited to, the following:
      a. Air terminals.
      b. Bonding plates.
      c. Conductors.
      d. Connectors.
      e. Fasteners.
      f. Grounding plates.
      g. Grounding rods.
      h. Rod clamps.
      i. Splicers.
   2. Raceways used for lightning protection system conductors are specified in Section 16110 "Raceways."

1.02 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General Conditions and Division 1 specification sections, apply to this section.

B. Related sections. The following sections contain requirements that relate to this section:
   1. Section 16050 Basic Electrical
   2. Section 16110 Raceways
   3. Section 16450 Grounding

1.03 QUALITY ASSURANCE

A. Reference Standards:
   1. National Fire Protection Association (NFPA) 70 "National Electrical Code" (NEC).
   2. NFPA Standard 78, and UL Standard 96.
   3. Lightning Protection Institute (LPI) Standards 175, 176, and 177.
   4. UL Standards 96 and 96A.
   5. ANSI Standard C2.

1.04 SUBMITTALS

A. Furnish manufacturer's product data, test reports, and materials certifications as required.

B. Submit the following in accordance with Conditions of Contract and Division 1 specification sections.
   1. Product data for each type of product specified, including roof adhesive where used.
   2. Shop drawings detailing lightning protection system including, but not limited to, air terminal locations, conductor routing, connections and grounding.

1.05 JOB CONDITIONS

A. Coordinate installation of lightning protection system with the installation of other building systems and components, including electrical wiring, supporting structures and building materials, and metal components requiring interface with lightning protection systems.

1.06 DELIVERY, STORAGE, AND HANDLING

Not used.

1.07 SPECIAL WARRANTY

Not used.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Acceptable Manufacturers:
   1. East Coast Lightning Equipment.
   2. Harger Lightning Protection, Inc.
   3. Independent Protection Co., Inc.
   4. Maxwell Lightning Protection Co.
   5. Robbins Lightning Protection Co.
   6. Sewell Manufacturing Co., Inc.
   7. Thompson Lightning Protection, Inc.
   8. Approved equal.

B. Lightning Protection System Components. Provide lightning protection system materials and components, that comply with manufacturer's standard design, in accordance with published product information. Provide air terminals, bonding plates, conductors, connectors, conductor straps, fasteners, grounding plates, grounding rods, rod clamps, splicers, and other components required for a complete system that meets LPI-175, UL 96A and NFPA 78 standards.

C. Air Terminals:
   1. Pint: Solid Aluminum, 12 inches high, 1/2-inch diameter, with tapered points.
   2. Point Coating: Minimum 1/16-inch lead.

D. Fasteners and Attachments:
   1. Same material as air terminals.

E. Main Conductors Down Leads and Roof:
   1. Copper cable, minimum weight not less than 375 lbs/1,000 ft: minimum wire size No. 14 AWG.

F. Secondary Conductors:
   1. Copper cable, minimum 13 strand No. 17 AWG.

G. Fasteners:
   1. All fasteners shall be substantial in construction, not subject to breakage and shall be of the same material as the conductor or of such nature that there will be no serious tendency toward electrolytic corrosion in the presence of moisture.
   2. Galvanized fasteners not acceptable.

H. Connectors and Disconnectors:
   1. Compression type designed to withstand 200 lbs pull.
   2. Exothermic Welding Type. (for below grade only).
   3. Bi-metallic Type.

I. Depth Indicator Tags:
   1. Copper.

J. Ground Rods:
   1. 10 feet copper clad steel rods 3/4-inch diameter. The proportion of copper on copper-clad rods shall be approximately 30 percent of the weight of the rod. Ground rods shall be driven vertically.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install system in accordance with manufacturer's instruction and UL requirements.

B. Install a perimeter cable around the entire roof of each building. Each perimeter shall be connected to down leads not to exceed 100 feet OC around the perimeter of any level to be protected. Down leads shall be in concealed conduit.

C. Install Air Terminals in plumb position securely fastened to withstand overturning. Provide the required number of air terminals around each perimeter

protected and all prominent parts of the building. Air terminals shall be placed at intervals not exceeding 20'-0" around perimeter of building, and shall extend 10" minimum distance above the object they are to protect.

D. All metallic masses above the structure which are a permanent part of the building with the exception of those of comparatively small sizes and not within six feet of the lightning conductor, shall be made a part of the lightning protection system by interconnection with the system, or shall be independently grounded. Plumbing vent stacks, fan housing, fences and other metallic masses high in the building shall be permanently and effectively grounded by bonding to the lightning conductor.

E. Conductors shall be fastened and run as follows:
   1. Fasten conductors to building at 3 feet maximum intervals.
   2. On masonry set fasteners in brick, block, or stone but not in mortar joints.
   3. Bend to radii greater than 8 inches.
   4. Limit angle of turns to 90 degrees.
   5. Route horizontal conductors around obstruction in horizontal plane.
   6. Route conductor in horizontal or vertical planes only.
   7. Do not form obstructions to ice or snow.
   8. Connect main conductor to metal bodies of inductance located within 6 feet by secondary conductor.
   9. Connect conductor to metal bodies of inductance located within 6 feet by secondary conductor.
   10. Place depth indicator tags on each down lead between 3 feet and 6 feet above grade. Stamp each tag to indicate depth of ground and whether connection is to water pipe or common ground.
   11. Install disconnector on all but one down lead, located one (1) foot above grade.
   12. Protect down conductors subject to damage with guards to 6 feet above grade level.
   13. Bond nonferrous metal guards to conductors at top.
   14. Protect down conductors entering acidic soil with pipe leads extending not less than 3 feet above grade and 3 feet below grade.

END OF SECTION

SECTION 16700

FIRE ALARM SYSTEMS

(Part of Work of Section 16101 – ELECTRICAL WORK FILED SUB-BIDS, Filed Sub-Bid Required)

PART 1 - GENERAL

1.01 SCOPE

A. The Contractor shall provide the labor, tools, equipment, and materials necessary to furnish and install fire alarm systems in accordance with the plans and as specified herein.

B. Products Included. This section includes requirements for fire alarm systems and components including the following:
1. Smoke detectors.
2. Duct smoke detectors.
3. Heat detectors.
4. Bells.
5. Horns.
6. Visual alarm signals.
7. Fire alarm control panel (FACP).
8. Device location indicating lights.
9. Addressable interface units.
10. Addressable control units.
11. Annunciator.
12. Emergency power supply.
13. Master box.
14. Communication systems including radio equipment to provide communication between the master box and the fire department as directed by local fire department. This will include, but not be limited to, providing the required radio path study.

1.02 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General Conditions and Division 1 specification sections, apply to this section.

B. Related Sections.
1. Section 15300 Fire Protection (for water flow, pressure, or tamper switches connected to fire alarm system.
2. Section 16050 Basic Electrical

1.03 QUALITY ASSURANCE

A. Referenced Standards. Perform all work associated with the fire alarm system in compliance with applicable requirements of governing agencies having jurisdiction and in accordance with the plans and as specified herein.
1. Comply with all applicable codes, local ordinances, and regulations and the requirements of the authority having jurisdiction. Provide all necessary equipment/devices to comply with the local Fire Department requirements.

2. National Fire Protection Association (NFPA). Components and installation shall comply with the following NFPA Codes:

   a. NFPA 70, "Massachusetts Electrical Code" (MEC).
   b. NFPA 72, "National Fire Alarm Code."

3. Underwriters' Laboratories, Inc. (UL) Listing and Labeling. Provide system and components specified in this section that are listed and labeled by UL.
4. Massachusetts Fire Prevention Regulations (527 CMR).

1.04 SUBMITTALS

A. Manufacturer's product data sheets and installation instructions.

B. Complete system one line and wiring diagrams.

C. Battery calculations.

D. Operation and Maintenance instructions.

E. Floor plans showing wiring, location, address, and zone identification of each device.

F. Submit the proposed fire alarm system submittal to local Fire Department for approval.

1.05 MANUFACTURERS

A. Subject to compliance with the Specification requirements:
   1. Notifier
   2. FCI
   3. Simplex
   4. Approved equal

B. Installer shall be regularly engaged in the installation of fire alarm systems and shall be factory authorized by the manufacturer to provide sales and service.

PART 2 - PRODUCTS

2.01 SYSTEM OPERATION

A. The fire alarm system shall provide a general evacuation signal which shall be manually and automatically initiated, as shown on the Drawings and described herein.

B. Operation of a manual pull station, area smoke detector or heat detector shall initiate a general evacuation alarm, and register an alarm condition at the control panel and master box.

C. General evacuation notification devices shall be provided with separate audio and visual circuits such that alarms may be silenced and visual alarms continue to operate until the system is reset.

D. All initiating, notification and tamper circuits shall be supervised.

2.02 FIRE ALARM CONTROL PANEL

A. Main Control Panel: Modular type panel installed in a steel cabinet with hinged door and cylinder lock. Switches and other controls shall not be accessible without the use of a key. The control panel shall be a neat, compact, factory-wired assembly containing all parts and equipment required to provide specified operating and supervisory functions of the system. Panel cabinet shall be finished on the inside and outside with factory-applied enamel finish. Provide audible trouble signal. Provide indication of: Power on, battery power on, and alarm, trouble and supervisory acknowledge switches. Provide permanent engraved rigid plastic or metal identification plates, or silk-screened labels attached to the rear face of the panel viewing window, for all lamps and switches. System power shall be 120 volts AC services, transformed through a two winding isolation transformer and rectified to 24 volts DC for operation of all system initiating, actuating, signal sounding (indicating appliance), trouble signal and fire alarm tripping circuits. Permanently label all switches. Panel shall be provided with the following features:

1. Trouble silencing switch which transfers audible trouble signals (including remote trouble devices, if provided) to an indicating lamp. For non-self-resetting type switch, upon correction of the trouble condition, audible signals will again sound until the switch is returned to its normal position.
2. Evacuation alarm silencing switch which when activated will silence all alarm notification appliances without resetting the panel, and cause operation of system trouble signals. Subsequent alarm(s) from additional zone(s) not originally in alarm shall cause activation of the evacuation alarms even with the alarm silencing switch in the "silenced" position.
3. Reset switch when activated will restore the system to normal standby status after the cause of the alarm has been corrected, and all activated initiating devices reset. Operation of reset switch shall restore activated smoke detectors to normal standby status.
4. Lamp test switch.
5. Drill switch which will enable test of alarm devices and restoration to normal without tripping the system.
6. Custom zone labeling.
7. Battery charger with volt and ammeters.
8. Maintenance free lead-calcium batteries.
9. Transient voltage surge protection.
10. Initiating circuits shall be Class B.

2.03 DEVICES

A. Manual Pull Stations
   1. Dual action, key reset, addressable suitable for semiflush or surface mounting. The device shall be painted red with the word FIRE in white raised letters.

B. Heat Detectors
   1. Fixed Temperature, or rate of rise as required.

C. Area Smoke Detectors
   1. Spot type photoelectric analog addressable with integral communications and device identification. Flashing LED indicator for normal operation with steady illumination on alarm. The smoke detector shall measure the analog level of smoke and report the

level to the Control Panel.

D. Duct Smoke Detectors
   1. If applicable, duct smoke detectors shall be photoelectric, analog addressable, with integral communications and device identification. Duct smoke detectors are furnished by the Electrical Contractor and installed by the HVAC Contractor. Control wiring of smoke dampers is by the HVAC contractor. Control wiring of motor shutdown is by the Electrical Contractor. Wiring to fire alarm panel is by the Electrical Contractor. All duct detectors shall initiate a supervisory signal to the fire alarm control panel and be provided with 120V rated form C contacts that open/close upon sensing of smoke or detector failure. Contacts will be used to shut down the associated air handler when detectors are installed in the supply ducts of air handlers. An additional set of form C contacts shall be provided for owners use.

E. Notification Appliances
   1. 24 Volt Xenon Flasher and electronic horns per ADA guidelines. Minimum intensity 15/75 cd unless otherwise shown on Drawings. Horns for local alarming shall have a distinct tone, different from general evacuation alarm.

PART 3 - EXECUTION

3.01 INSTALLATION

A. The Contractor shall provide all equipment and materials required for a fully operational system. The Contractor shall prepare layout drawings showing device locations, raceway size, wiring runs, conduit fill and terminations.

B. All wiring shall be installed in galvanized rigid steel conduit.

C. All junction boxes and fittings shall be color coded red. Junction Box Covers shall be labeled Fire Alarm System.

D. Coordinate device locations with other trades to assure proper installation of devices. Coordinate with other trades where work pertains to fire alarm system, i.e. air handling unit control, fire suppression system.

E. The Contractor shall clean all dirt and debris from the inside of the fire alarm control panels, annunciators, devices, etc. and clean the outside of aforementioned equipment after the completion of the installation. During construction, devices and equipment shall have protective coverings to limit amount of dirt and debris.

F. The manufacturer shall provide on-site supervision of the installation to assure system is installed to meet manufacturers installation requirements.

3.02 TESTING

A. System Acceptance:
   1. A pretest shall be held with the installer and the manufacturer's technical representative present. After certification of a complete pretest, the installing

contractor shall provide the authority having jurisdiction with written documentation from the manufacturer's authorized representative of the outcome of the test and then shall re-inspect in the presence of the authority having jurisdiction and the manufacturer's authorized technical representative. A complete test shall be conducted as follows: the installing contractor, in the presence of a representative of the authority having jurisdiction, shall manually operate every manual fire alarm station, activate every rate of rise type thermodetector with heat, manually operate or electrically short out every fixed temperature thermodetector, actuate every smoke detector with smoke in accordance with the manufacturer's recommendations to demonstrate that smoke can enter the chamber and initiate an alarm and activate the required systems.

2. Each manual fire alarm station, thermodetector, smoke detector, extinguishing system switching circuits, flow switch circuit and each alarm horn/strobe circuit shall be opened in at least two locations to test for the correctness of the supervisory circuitry. All communications shall be tested completely.
3. The fire alarm system may be placed in operation prior to acceptance if in the opinion of the authority having jurisdiction, it will enhance public safety or provide property protection during the final phases of construction. In this case all devices will be thoroughly cleaned or replaced prior to the system acceptance test. The system will not be placed in operation without the written permission of the authority having jurisdiction. Under no circumstances will this be considered a final acceptance test.

B. The manufacturer's representative shall provide on-site training for the Owner's representatives upon completion of acceptance testing.

C. Provide the services of a manufacturer's representative to conduct a radio survey inside the constructed water treatment plant building and outside the building to determine signal strength and reliability of the Attleboro and Mansfield fire and police department communication radios at the frequencies used by the City/Town. Radio survey to be conducted by:
   1. Cyber Communications.
   2. Comtronics Corporation.
   3. Or equal.

END OF SECTION

SECTION 16720

SECURITY ALARM SYSTEM

(Part of Work of Section 16101 – ELECTRICAL WORK FILED SUB-BIDS, Filed Sub-Bid Required)

PART 1 - GENERAL

1.01 SCOPE

A. General. The Contractor shall provide the labor, tools, equipment and materials necessary to furnish and install intrusion detection and security camera systems in accordance with the plans and as specified herein.

B. Extent of intrusion detection system work is indicated by the drawings and these specifications and shall include intrusion detection systems and specified sensors, door controllers, signal equipment, system controls, alarm display, software, and security computers.

1.02 RELATED DOCUMENTS

A. General. Drawings and general provisions of the Contract, including General Conditions, Supplementary Conditions, and Division 1 specification sections, apply to this section.

B. Related sections:
1. Section 08100 Hollow Metal Doors and Frames
2. Section 08302 Fiberglass Doors and Frames
3. Section 08710 Finish Hardware
4. Section 16050 Basic Electrical

1.03 QUALITY ASSURANCE

A. Referenced standards.
1. Comply with National Fire Protection Association (NFPA) 70, “National Electrical Code (NEC)”.
2. Underwriters’ Laboratories, Inc. (UL) Standard 609, “Local Burglar Alarm Units and Systems”.
3. Factory Mutual (FM) Compliance. Provide FM approval intrusion detection systems and components.

1.04 SUBMITTALS

A. Submit shop drawings and product data in accordance with this specification.

B. No equipment and material shall be ordered or shop work started unit the Engineer’s acceptance of shop drawings has been given.

C. Where manuals include manufacturer’s catalog pages, clearly indicate the specific items included in this installation and delete or otherwise clearly indicate all extraneous data, which does not apply.

PART 2 - PRODUCTS

2.01 MANUFACTURERS/VENDORS

A. The vendor selected by the Contractor to provide the complete security alarm system, subject to compliance with the specification requirements, shall be:
   1. Citizen Security – Ludlow, MA.
   2. Ademco
   3. ADT Security Systems
   4. Or equal

B. For basis of design, the security system provided shall be based on infinias Access Control Systems as manufactured by 3xLogic.

C. For basis of design, the security cameras provided shall be Avigilon Model: 6.0C-H5A-BO1-IR (Bullet camera) with Avigilon back boxes.

2.02 COMPONENTS

A. General:
   1. Provide a security alarm system complete and ready to use in accordance with the requirements of the Contract Documents. The system shall include all control panels, door and window contacts, remote control switches, conduit, wiring, and all other parts necessary for the proper operation of the security alarm system. The Contractor shall prepare layout drawings showing device locations, conduit sizes and runs, wiring within each conduit, and terminations for review and approval by the Engineer.
   2. Show satisfactory evidence that the supplier is an authorized distributor for the equipment proposed and that he maintains a fully equipped service department for maintenance of its system after guarantee period.
   3. Provide a set of operating instructions, circuit diagrams and other information necessary for proper installation, maintenance and operation of the system.
   4. All equipment including wiring, cabling and back boxes furnished and installed under these specifications shall be guaranteed for a period of one year from the date of Substantial Completion. Included under the guarantee shall be all electrical and mechanical defects or failures except that which can be proven to have been caused by misuse or abuse. All service and parts shall be the responsibility of the Contractor during the period of guarantee.
   5. All wiring for the security system shall be the same as specified for lighting and power circuitry. Raceways containing the security system conductors shall not contain any other conductors and no AC current carrying conductors will be allowed in the same raceway with the security system conductors.
   6. Location of the control panel, alarm initiating devices, alarm indicating devices shall be as shown on the plans.

B. Door Access Control:
   1. The complete door access control system shall include the following:
      a. Door contact (one per leaf)
      b. In close proximity to each door, as identified on the security alarm plan drawing, a digital keypad shall be provided for arming and disarming of the security

system.

C. Security Cameras:
   1. The security cameras system shall include the following:
      a. Avigilon Model: 6.0C-H5A-BO1-IR (Bullet camera) (as shown on drawings, total of five).
      b. Avigilon back box (each camera).

D. General Requirements:
   1. Security System operation:
      a. The system shall be comprised of five zones. Each zone shall be programmable for instant, delay, day supervisory, silent and priority (nonshuntable). Loop response time shall be programmable. System shall detect faulty read only memory (ROM) on power up. System shall be continually supervised by a microprocessor timer.
         i. System shall be arranged to allow each zone to operate independently of the others.
      b. The system shall be armed, disarmed, reset, monitored and altered by the use of digital keypads located as shown on the drawings. The system shall provide "fail safe arming" preventing arming of the system if a zone has been violated or is ajar. System shall indicate which zone is ajar. As an option, the system shall be single zone programmable for key switch arm and disarm function with tamper.
      c. Actuation of the duress zone shall cause the following to occur:
         i. Activate the built-in digital communicator, seize the protected premises telephone line and automatically report the alarm to a remote location. No local signaling shall occur.
         ii. Transfer the contacts on a 5 Amp SPDT relay located in the control panel.
         iii. It shall be possible to field program the system through the keypad to either locally indicate this alarm condition or, at the Owner's option, not to indicate this condition.
      d. Acknowledgement of alarms or troubles, in conjunction with interrogation of other systems activity (i.e., alarm memory, bypassing of zones, etc.) shall require the use of a personal authorization code (PAC) number to be entered in the keypad.
      e. During a daytime "disarmed" condition, all motion detectors, glass break detectors, doors or windows switches or any indicating alarm appliance if in alarm condition shall be indicated through the system status indicators. The system ready lamp will extinguish. If the panel is "armed" these appliances will activate the control, sound the signals and alert the monitoring station through the built-in communicator.
      f. Security cameras will be powered over ethernet (PoE) from the Security Alarm Control Panel. Wiring shall be run from the Security Alarm Control Panel to the Security computer in the Control Room. Security computer shall contain infinias Essentials software or approved equal. Wiring shall be as indicated on the electrical drawings, or as required by the manufacturer.

E. Workstations: Security and General Use Computer Workstations (2 required):
   1. Workstations shall be set-up to run required software and dedicated wide-screen TV/monitor service depending on their use as shown.

2. Tower workstation form factor.
3. One Intel Quad-Core processor, 3.0 GHz or greater, minimum of 10 MB L3 cache on chip die, 2133 MHz front side bus minimum.
4. 16 GB of RAM, 2133 MHz speed minimum, 2 DIMMS maximum.
5. Media Drives:
    a. DVD ± Dual-layer Drive with both Read and Write Capability.
6. Expansion slots:
    a. Two Full Height PCI slots
    b. One Full Height PCI Express slot
7. Internal Disk:
    a. 1 TB of usable storage minimum, SATA, hard drive configured RAID 1 array.
8. Video graphics capable of 1920 x 1200 pixels, 70 Hz refresh rate and 32-bit true color minimum. VGA, DVI, and HDMI or Display Port outputs. 512MB of dedicated video RAM minimum. Card must be dual monitor capable.
9. I/O Ports & devices:
    a. Minimum of four USB 2.0 ports
10. Interface devices:
    a. Generic USB 104 key (Windows) keyboard, no hot keys onboard.
    b. Two button USB optical mouse with scroll wheel.
    c. Monitor:
        1) LCD 24-inch nominal size minimum
        2) Support for 1920 x 1080 resolution at 70 Hz minimum
        3) 16 ms response time maximum
        4) 250 nits (cd/m2) brightness minimum
        5) 400 to 1 contrast ratio minimum
        6) Vertical viewing angle of 85 degrees minimum
        7) Horizontal viewing angle of 85 degrees minimum
        8) Analog GRB, Digital DVI-D, and HDMI or Display Port video input connector types
        9) Adjustable height stand
        10) Soundbar
11. Networking:
    a. All network interfaces shall have the following features:
        1) Support for latest Microsoft operating system
        2) Gigabit Ethernet port, copper connection accepting standard CAT-6 cables for Ethernet communications
        3) IEEE 802.3ab support for gigabit networking standard
        4) IEEE 802.Q VLAN support
        5) Auto sensing 10/100/1000 Mbps
        6) SNMP manageable
12. Operating system
    a. Latest release of 64-bit Windows 10 Professional.
13. Software
    a. Microsoft Office Professional 2016 shall include the following programs at a minimum.
        1) Microsoft Excel
        2) Microsoft Word
        3) Microsoft Access
        4) Microsoft PowerPoint
    b. Adobe Acrobat Reader (Latest Edition)
    c. Virus scan and protection software by Symantec Endpoint Protection (Latest Edition), or approved equal.
    d. Microsoft Internet Explorer (Latest Edition)

e. WinZip Professional (Latest Edition)
f. Infinias Essentials (Latest Edition) - Security computer only

14. Typical Workstations
    a. Dell T5810
    b. HP Z620
    c. Approval equal

PART 3 – INSTALLATION

3.01 INSTALLATION

A. Install the system in accordance with applicable codes and safety precautions. The system shall be designed by acceptable manufacturer as shown in 2.01.A. The installation of all work shall be neat. All boxes, equipment, etc., shall be plumb and square.

B. It shall be the responsibility of the Contractor to cooperate with other trades in order to achieve well-coordinated progress and satisfactory final results. Contractor shall watch for conflicts with work of the contractors on the job and execute, without claim for extra payment, moderate moves or changes as are necessary to accommodate other equipment or preserve symmetry and pleasing appearance.

C. All equipment shall be firmly held in place. All switches, connector jacks, outlets, etc., shall be clearly, logically, and permanently marked during installation.

D. Take such precautions as are necessary to prevent and guard against electromagnetic and electrostatic hum; to supply adequate ventilation and to install the equipment to provide safety for the operator.

END OF SECTION

SECTION 16740

TELEPHONE SYSTEM

(Part of Work of Section 16101 – ELECTRICAL WORK FILED SUB-BIDS, Filed Sub-Bid Required)

PART 1 - GENERAL

1.01 SCOPE

A. The Contractor shall provide the labor, tools, equipment, and materials necessary to provide telephone system in accordance with the plans and as specified herein. This includes the furnishing and installing of complete systems of empty conduits, outlet boxes with plates, terminal cabinets, plywood backboards, pull boxes and underground ducts as shown on the drawings and as specified herein for use by the Telephone Company.

B. The telephone system shall include 5 separate outside lines, distributed throughout the facility as indicated on the drawings and/or as specified herein.

1.02 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions, Supplementary Conditions, and Division 1 specification sections, apply to this section.

B. Related Sections.
1. Section 16050 Basic Electrical

1.03 QUALITY ASSURANCE

A. Reference Standards.
1. Local telephone company codes.
2. National Electrical Code (NEC).
3. Underwriters' Laboratories, Inc. (UL) Compliance.
4. Federal communications commission (FCC) regulations.

1.04 SUBMITTALS

A. Furnish manufacturer's product data, test reports, and materials certification as required.
1. Submit a complete master wiring diagram engineering drawings of the system with specification sheets covering all components of the system and block diagram indicating all components and interwiring (quantity and size) shall be submitted for approval. The system and equipment shown in the engineering drawings and specifications shall meet all requirements of this specification.

PART 2 - PRODUCTS

2.01 MATERIALS

A. General. Provide telephone system equipment and accessories; of types, sizes, ratings and electrical characteristics indicated, which comply with utility and manufacturer's standard materials, design and construction.

B. Terminal Boxes. Terminal cabinets shall be similar in construction to panel board boxes furnished under Section 16130 except that they shall have 5/8-inch plywood backboards, that have two coats of wood sealer. Box sizes shall be as required by the Telephone Company.

C. Raceways. Raceways shall be rigid steel conduit as shown on the drawings. All conduits shall be terminated with insulated bushings.

D. Pull wire shall be 12 gauge galvanized iron.

E. Wall Mounted Outlet Boxes. Wall mounted outlet boxes shall be 4-inch square and be equipped with single gang cover with stainless steel plate having bushed hole.

F. Jack Assemblies. Eight position modular, latching, plug type, in flush mounting wall plate except as otherwise indicated.

1. Wall plates. Designed for telephone service. Match those indicated for power receptacle outlets in same spaces for materials and finish. For wall telephone units, include provision for support of unit.

G. Cable. 12 pair, No. 22 AWG, solid copper, unshielded, twisted pair construction in polyvinyl chloride (PVC) sheath. Conform to Insulated Cable Engineers Association (ICEA) Standard A-80-576, “Communication Wire and Cable for Wiring of Premises.” Cable used in plenums shall be listed for use in plenums.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Provide and install required conduit, wire, pullboxes, and accessory items to accomplish the work involved in providing the telephone service as shown on the Drawings. Telephone utility company shall provide the specific telephone service wiring from the utility pole to the telephone mounting board in the Electrical Room in the conduit furnished and installed by the Contractor as shown on the Drawings.

B. Coordinate service work with the Owner and utility company. Costs incurred by the telephone utility company shall be paid directly by the Owner to the utility company.

C. Obtain all permits, pay all fees and provide all materials and labor necessary for interfacing with utility equipment to install telephone service.

D. Furnish and install all conduit, boxes, outlets and low voltage wire and accessory items necessary to accomplish the work detailed herein or in the Drawings.

E. All work shall be coordinated with the Telephone Company and shall conform to their requirements so as to ensure their approval for a complete installation. All labor and materials required by the Telephone Company to secure their approval shall be provided whether or not such labor and materials are specified or shown.

END OF SECTION

APPENDIX A

GEOTECHNICAL REPORT

LGCI
Lahlaf Geotechnical Consulting, Inc.

December 4, 2023

Mr. Matthew O'Dowd
Project Designer
Tata and Howard
67 Forest Street
Marlborough, MA 01752
Phone: (508) 232-4231
Mobile: (802) 922-6702
E-mail: modowd@tataandhoward.com

Re: **Geotechnical Report**
Proposed Wading River Water Treatment Facility
Mansfield, Massachusetts
LGCI Project No. 2344

Dear Mr. O'Dowd:

Lahlaf Geotechnical Consulting, Inc. (LGCI) has completed a geotechnical study for the proposed Wading River Water Treatment Facility in Mansfield, Massachusetts. We are submitting our geotechnical report electronically.

The soil samples from our explorations are currently stored at LGCI for further analysis, if requested. Unless notified otherwise, we will dispose of the soil samples after three (3) months.

Thank you for choosing LGCI as your geotechnical engineer.

Very truly yours,

Lahlaf Geotechnical Consulting, Inc.

Abdelmadjid M. Lahlaf, Ph.D., P.E.
Principal Engineer

LGCI
Lahlaf Geotechnical Consulting, Inc.

GEOTECHNICAL REPORT
PROPOSED WADING RIVER WATER TREATMENT FACILITY
MANSFIELD, MASSACHUSETTS

LGCI Project No. 2344
December 4, 2023

Prepared for:

Tata and Howard
67 Forest Street
Marlborough, MA 01752
Phone: (508) 232-4231

GEOTECHNICAL REPORT
PROPOSED WADING RIVER WATER TREATMENT FACILITY
MANSFIELD, MASSACHUSETTS
LGCI Project No. 2344
December 4, 2023

Prepared for:

Tata and Howard
67 Forest Street
Marlborough, MA 01752
Phone: (508) 232-4231

Prepared by:

LAHLAF GEOTECHNICAL CONSULTING, INC.
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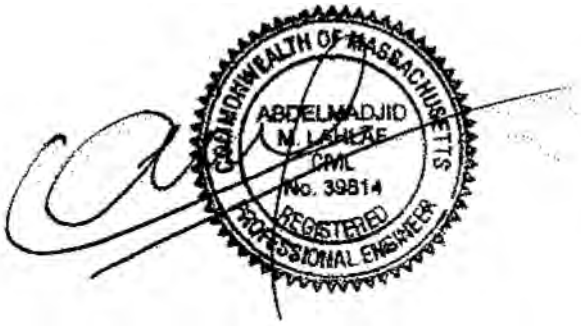

Abdelmadjid M. Lahlaf, Ph.D., P.E.
Principal Engineer

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1. PROJECT INFORMATION

1.1 Project Authorization

This geotechnical report presents the results of the subsurface explorations and a geotechnical evaluation performed by Lahlaf Geotechnical Consulting, Inc. (LGCI) for the proposed Wading River Water Treatment Facility in Mansfield, Massachusetts. We performed our services in general accordance with our proposal No. 23107 dated September 12, 2023, and in general accordance with the Agreement for Geotechnical Engineering Services (Agreement) between Tata and Howard (T&H) and LGCI dated October 3, 2023. Ms. Karen L. Gracey of T&H authorized our services by signing the Agreement on October 25, 2023.

1.2 Purpose and Scope of Services

The purpose of our geotechnical services was to perform subsurface explorations at the site for the proposed Wading River Water Treatment Facility, and to provide foundation design and construction recommendations. LGCI performed the following services:

- Coordinated our exploration locations with T&H.
- Marked the exploration locations at the site and notified Dig Safe Systems Inc. (Dig Safe) and the Town of Mansfield for utility clearance.
- Engaged a drilling subcontractor for two (2) days to advance seven (7) soil borings at the site.
- Provided an LGCI geotechnical field representative at the site to coordinate and observe the borings, describe the soil samples, and prepare field logs.
- Submitted two (2) soil samples collected from the borings for laboratory testing.
- Prepared this geotechnical report containing the results of our subsurface explorations and our recommendations for foundation design and construction.

Our scope included observing three (3) test pits excavated by the Town. The test pits were not excavated. We recommend tha6t the test pits be performed before the start of construction.

Our scope does not include preparing specifications, reviewing contract documents, attending meetings, or providing construction services. LGCI would be pleased to perform these services when needed. Recommendations for unsupported slopes, stormwater management, erosion control, pavement design, slope stability analyses, liquefaction and/or site-specific seismic analysis, pile analysis and design, and cost or quantity estimates are not included in our scope of work.

LGCI's scope of services does not include an environmental assessment for the presence or absence of wetlands or analytical testing for hazardous or toxic materials in the soil, surface water, groundwater, or air, on or below or around this site, or mold in the soil or in any structure at the site. Any statements regarding odors, colors, or unusual or suspicious items or conditions are strictly for the information of the client.

1.3 Site Description

Our understanding of the site is based on our field observations, our discussions with T&H, and on the following document:

- Drawing 5-2 titled: "Conceptual Layou, Wading River WTP, Proposed Location No. 2," (Existing Conditions Plan) prepared by T&H, dated October 2023, and provided to LGCI by T&H via email on November 8, 2023.

The site is located at 250 Balcom Street in Mansfield, Massachusetts, as shown in Figure 1. The site is located in the Town of Mansfield but is owned and operated by the City of Attleboro. The site is bordered by Balcom Street on the southern side, by existing water basins on the eastern side, and by wooded land on the northern and western sides. The site is currently vacant and wooded.

Based on the Existing Conditions Plan, the grades at the site generally range from El. 132 feet near Balcom Street on the southern side of the site and El. 152 feet near the northern side of the site. The existing grades within the proposed water treatment facility building range between El. 138 feet and El. 146 feet. The existing grades within the proposed lined lagoons range between El. 150 feet and El. 152 feet. The existing grades within the proposed stormwater infiltration basin range between El. 132 feet and El. 136 feet.

1.4 Project Description

Our understanding of the proposed construction is based on our discussions with T&H, and the document listed in Section 1.3.

We understand that the proposed construction will consist of a one-story water treatment facility building with a footprint of about 160 feet by 120 feet, i.e., with a total footprint of about 19,200 square feet. We understand that the proposed building will have an interior foundation to support a clarification and filtration treatment system. We understand that the proposed first finished floor elevation (FFE) of the proposed building has not been established at the time of this geotechnical report.

Based on our conversations with T&H, we understand that the FFE of the proposed building will be within the range of El. 140 feet to El. 146 feet; thus, possibly requiring cuts and fills up to about 8 feet to achieve the proposed FFE of the proposed building. We understand that the proposed construction will also consist of a stormwater filtration basin to the east of the proposed building, and three (3) lined lagoons and one (1) unlined lagoon to the west of the proposed building.

1.5 Elevation Datum

We understand that the elevations provided in the Existing Conditions Plan are referenced with respect to the North American Vertical Datum of 1988 (NAVD 88). Elevations are in feet.

2. SITE AND SUBSURFACE CONDITIONS

2.1 Surficial Geology

LGCI reviewed a surficial geologic map titled: "Surficial Materials Map of the Wrentham Quadrangle, Massachusetts," prepared by Stone, B.D., Stone, J.R., and DiGiacomo-Cohen, M.L., Scientific Investigation Map 3402, Quadrangle 107 – Wrentham, 2018.

The surficial geologic map of the site indicates that the soils in the general vicinity of the site consist of coarse deposits and artificial fill.

The coarse deposits consist of sand, sand and gravel, and gravel deposits as described below.

Sand Deposits – The sand deposits are comprised mostly of fine to coarse sand. Coarser layers may contain up to 25 percent gravel. Finer layers may contain very fine sand, silt, and clay.

Sand and Gravel Deposits –The sand and gravel deposits occur as a mixture of gravel and sand within individual layers and as alternating layers of sand and gravel. The sand and gravel layers range between 25 to 50 percent gravel and 50 to 75 percent sand.

Gravel Deposits – The gravel deposits are comprised of at least 50 percent gravel, cobbles, and boulders. Sand occurs within gravel beds and as separate layers within the gravel.

The artificial fill consists of earth materials and manmade materials that have been artificially emplaced.

The Surficial Geologic Map is shown in Figure 2.

2.2 LGCI's Explorations

2.2.1 General

LGCI coordinated our exploration locations with T&H and marked the exploration locations in the field. LGCI notified Dig Safe and the Town of Mansfield for utility clearance prior to starting our explorations at the site.

Unless notified otherwise, we will dispose of the soil samples obtained during our explorations after three (3) months.

2.2.2 LGCI's Soil Borings

LGCI engaged Soil X Corp. (Soil X) of Leominster, Massachusetts to advance seven (7) soil borings (B-1 to B-7) at the site on November 1 and 2, 2023. The borings were advanced with a Diedrich D-70 Turbo ATV Drill Rig using 4-1/4-inch inner-diameter hollow stem augers and drive and wash boring techniques with 3-inch casings. The borings extended to depths

ranging between 20.8 feet and 22 feet beneath the ground surface. Upon completion, the boreholes were backfilled with the soil cuttings.

Soil X performed Standard Penetration Tests (SPT) and obtained split spoon samples with an automatic hammer at typical depth intervals of 2 feet or 5 feet as noted on the boring logs in general accordance with ASTM D-1586.

An LGCI geotechnical field representative observed and logged the borings in the field.

2.2.3 Exploration Logs and Locations

The boring locations are shown in Figure 3. Appendix A contains LGCI's boring logs and Table 1 includes a summary of LGCI's borings.

2.3 Subsurface Conditions

The subsurface description in this report is based on a limited number of explorations and is intended to highlight the major soil strata encountered during our explorations. The subsurface conditions are known only at the actual exploration locations. Variations may occur and should be expected between exploration locations. The boring logs represent conditions that we observed at the time of our explorations and were edited, as appropriate, based on the results of the laboratory test data and inspection of the soil samples in the laboratory. The strata boundaries shown in our boring logs are based on our interpretations and the actual transitions may be gradual. Graphic soil symbols are for illustration only.

The soil strata encountered in LGCI's borings were as follows, starting at the ground surface.

Forest Mat – Forest mat was encountered at the ground surface in all borings. The thickness of the forest mat ranged between 0.3 feet and 2.0 feet.

Subsoil – A layer of subsoil was encountered beneath the forest mat in borings B-1 to B-3, B-5, and B-7. The subsoil extended to depths ranging between 2.0 feet and 2.2 feet beneath the ground surface. The samples within this layer were mostly described as silty sand. One (1) sample was described as poorly graded sand, and one (1) sample was described as well graded sand. The fines content in the subsoil ranged between 5 and 30 percent, and the gravel content ranged between 5 and 25 percent. The subsoil contained traces of organic soil, roots, and pine needles.

The SPT N-values in this layer ranged between 1 blow per foot (bpf) and 9 bpf, indicating very loose to loose material.

Sand and Gravel – A layer of sand and gravel was encountered beneath the layer of forest mat or subsoil in all borings and extended to the termination depths of the borings. The samples in this layer were mostly described as well graded sand and poorly graded sand. Two (2) samples were described as poorly graded gravel, and one (1) sample was described as well graded gravel. The

fines content in this layer ranged between 0 and 15 percent, and the gravel content ranged between 0 and 40 percent. When described as gravel, the sand content in this layer ranged between 20 and 45 percent.

The SPT N-values in this layer ranged between 5 bpf and refusal, with most values ranging between 10 bpf and 40 bpf, indicating mostly medium dense to dense material. Please note that the high SPT N-values in the sand and gravel may be due to obstructions such as cobbles and boulders in the sand and gravel and may not represent the true density of the sand and gravel.

2.4 Groundwater

Groundwater was encountered in all borings at depths ranging between 4.0 feet and 18.0 feet beneath the ground surface, as shown in Table 1 and in the boring logs.

The groundwater information reported herein is based on observations made during or shortly after the completion of drilling. In addition, the drilling procedure introduced water into the boreholes during drilling. Therefore, the reported groundwater levels may not represent the actual groundwater conditions, as additional time may be required for the groundwater levels to stabilize. The groundwater information presented in this report only represents the conditions encountered at the time and location of the explorations. Seasonal fluctuation should be anticipated.

2.5 Laboratory Test Data

LGCI submitted two (2) soil samples collected from the borings for grain-size analysis. The results of the grain-size analyses are provided in the test data sheets included in Appendix B and are summarized in the table below.

Grain-Size Analysis Test Results

Boring No.	Sample No.	Stratum	Sample Depth (ft.)	Percent Gravel	Percent Sand	Percent Fines
B-1	S2	Sand and Gravel	2.0 – 4.0	54.2	40.1	5.7
B-2	S3	Sand and Gravel	4.0 – 6.0	5.2	87.9	6.9

3. EVALUATION AND RECOMMENDATIONS

3.1 General

Based on our understanding of the proposed construction, our observation of our borings, and the results of our laboratory testing, there are a few issues that we would like to highlight for consideration and discussion.

3.1.1 Forest Mat and Subsoil

- Forest Mat and Subsoil were encountered in the borings. These materials are not suitable to support foundations.

- The forest mat should be entirely removed from within the entire construction area, including the proposed building footprint and proposed paved areas.

- The subsoil should be entirely removed from within the proposed building footprint and replaced with Structural Fill. We anticipate that the removal will extend up to depths of about 2.2 feet. The removal may extend to greater depths at locations not explored by LGCI. Laterally, the removal should extend beyond the proposed building footprint a distance equal to the distance between the bottom of the proposed footings and the top of the natural sand and gravel, or 5 feet, whichever is greater.

- The subgrade of footings should be prepared in accordance with the recommendations in Section 4.1.

- Within paved areas, the subsoil should be removed to the top of the natural sand and gravel or to a depth of 18 inches beneath the bottom of the proposed pavement. Where organic soil or other soft material is exposed, the organic soil or soft material should be removed. Subsoil deeper than 18 inches beneath the bottom of the proposed pavement can remain in place provided these materials are firm and unyielding following proofrolling as described in Section 4.1.

3.1.2 Shallow Footings and Slabs-on-Grade

Based on the results of the borings, the subsurface conditions are suitable to support shallow spread and continuous footings bearing on Structural Fill placed directly on top of the sand and gravel layer after entirely removing the topsoil and the subsoil. The proposed slab may be designed as a slab-on-grade. Our recommendation for net allowable bearing capacity in the sand and gravel is presented in Section 3.2.1. Our estimates for settlement are presented in Section 3.2.2. Our concrete slab considerations are presented in Section 3.3. Section 4.1 provides recommendations for preparation of subgrades.

3.2 Foundation Recommendations

3.2.1 Footing Design

- We recommend entirely removing the forest mat and the subsoil from within the proposed building footprint as described in Section 3.1.1.

- We recommend supporting the proposed building on spread footings bearing on Structural Fill placed directly on the natural sand and gravel.

- We recommend designing the proposed footings using a net allowable bearing pressure of 5 kips per square foot (ksf).

- We recommend that the footings bear on a minimum of 12 inches of Structural Fill placed directly on top of the natural sand and gravel. The Structural Fill should extend at least 1 foot laterally beyond the limits of the footings.

- Footing subgrades should be prepared in accordance with the recommendations in Section 4.1.

- Foundations should be designed in accordance with The Commonwealth of Massachusetts State Building Code 780 CMR, Ninth Edition (MSBC 9th Edition).

- Exterior footings and footings in unheated areas should be placed at a minimum depth of 4 feet below the final exterior grade to provide adequate frost protection. Interior footings in heated areas may be designed and constructed at a minimum depth of 2 feet below finished floor grades.

- Wall footings should be designed and constructed with continuous, longitudinal steel reinforcement for greater bending strength to span across small areas of loose or soft soils that may go undetected during construction.

- A representative of LGCI should be engaged to observe that the subgrade has been prepared in accordance with our recommendations.

3.2.2 Settlement Estimates

Based on our experience with similar soils and designs using a net allowable bearing pressure of 5 ksf, we anticipate that the total settlement will be approximately 1 inch, and that the differential settlement of the footings will be 3/4 inch or less over a distance of 25 feet. We believe that total and differential settlements of this magnitude are tolerable for a similar structure. However, the tolerance of the proposed structure to the predicted total and differential settlements should be assessed by the structural engineer.

3.3 Concrete Slab Considerations

3.3.1 Slabs-on-Grade

- The proposed floor slab should be constructed as a slab-on-grade bearing on a minimum of 12 inches of Structural Fill placed directly on top of the natural, undisturbed sand and gravel. The subgrade of the slab should be prepared as described in Section 4.1.

- To reduce the potential for dampness in the proposed floor slab, the project architect may consider placing a vapor barrier beneath the floor slab. The vapor barrier should be protected from puncture during the placement of the proposed slab reinforcement.

- For the design of the floor slab bearing on the materials described above, we recommend using a modulus of subgrade reaction, k_{s1}, of 100 tons per cubic foot (tcf). Please note that the values of k_{s1} are for a 1 x 1 square foot area. These values should be adjusted for larger areas using the following expression:

$$Modulus\ of\ Subgrade\ \mathrm{Re}action\ (k_s) = k_{s1} * \left(\frac{B+1}{2B}\right)^2$$

where:

k_s = Coefficient of vertical subgrade reaction for loaded area;
k_{s1} = Coefficient of vertical subgrade reaction for a 1 x 1 square foot area; and
B = Width of area loaded, in feet.

Please note that cracking of slabs-on-grade can occur as a result of heaving or compression of the underlying soil, but also as a result of concrete curing stresses. To reduce the potential for cracking, the precautions listed below should be closely followed during the construction of all slabs-on-grade:

- Construction joints should be provided between the floor slab and the walls and columns in accordance with the American Concrete Institute (ACI) requirements, or other applicable code.

- The backfill in interior utility trenches should be properly compacted.

- In order for the movement of exterior slabs not to be transmitted to foundations or superstructures, exterior slabs, such as approach slabs and sidewalks, should be isolated from the superstructure.

3.3.2 Under-slab Drains and Waterproofing

Based on the groundwater level observed in the borings, we believe that an under-slab drainage system is not required.

Depending on the FFE of the proposed pipe gallery, it may need to be designed as a waterproof structure. Alternatively, it should be designed with an under-slab drainage system.

If needed, we recommend that the under-slab drainage system (if installed) consist of 1) a minimum of 12 inches of ¾-inch crushed stone placed below the slab, and 2) 6-inch-diameter slotted PVC pipes installed with their inverts at least 15 inches below the bottom of the slab. Because the proposed pipe gallery is only 9 feet wide, we recommend providing two (2) perforated pipes. The trenches should be at least 18 inches wide and should extend 9 inches below the bottom of the 12 inches of the crushed stone layer to allow placing crushed stone around the PVC pipe. The slotted PVC pipes should connect to a 6-inch solid PVC header pipe that collects and channels the collected water out of the building.

A non-woven geotextile fabric should be installed between the crushed stone and the underlying soil for separation. The slots on the PVC pipes should be placed facing downward to allow for entry of water at the bottom of the pipe. Clean-outs should be included at the end of the perforated pipes and at changes in directions.

We recommend channeling the water from the under-slab drainage system to flow by gravity to a low-lying area or to an infiltration/drainage system. If gravity flow is not possible, the groundwater collected from the under-slab drainage system should be collected in a sump-pump pit and pumped out of the building. We recommend that a backup generator and spare pump be provided with the system to use in the event of a power outage or pump failure. The owner should apply for a discharge permit and should perform analytical tests as required by the permits.

3.4 Seismic Design

Based on the SPT N-values from the borings and in accordance with Table 1604.11 of MSBC 9th Edition, we estimate that the seismic criteria for the site are as follows:

- Site Class: D
- Spectral Response Acceleration at short period (Ss): 0.189g
- Spectral Response Acceleration at 1 sec. (S_1): 0.063g
- Site Coefficient Fa (Table 1613.5.3(1)): 1.6
- Site Coefficient Fv (Table 1613.5.3(2): 2.4
- Adjusted spectral response S_{MS}: 0.298g
- Adjusted spectral response S_{M1}: 0.154g

Based on the SPT data from the borings, the site soils are not susceptible to liquefaction.

3.5 Lateral Pressures for Wall Design

3.5.1 Lateral Earth Pressures

Lateral earth pressures for the design of below-grade walls, if any, and site retaining walls are provided below.

Coefficient of Active Earth Pressure, K_A:	0.31
Coefficient of At-Rest Earth Pressure, K_o:	0.47
Coefficient of Passive Earth Pressure, K_p:	3.3
Total Unit Weight γ:	125 pcf

Note: The values in the table are based on a friction angle for the backfill of 32 degrees and neglecting friction between the backfill and the wall. The design active and passive coefficients are based on horizontal surfaces (non-sloping backfill) on both the active and passive sides, and on a vertical wall face.

- We recommend placing free-draining material within the 3 feet immediately behind retaining walls.

- Perimeter drains are not required for the proposed building.

- We recommend providing weep holes at the bottom of site retaining walls, including temporary SOE systems, to promote drainage where possible. Alternatively, a pipe should be placed at the base of the wall to collect the water. Groundwater collected by the wall drains should be discharged into a lower area if gravity flow is possible.

- Passive earth pressures should only be used at the toe of the wall where special measures or provisions are taken to prevent the disturbance or future removal of the soil on the passive side of the wall, or in areas where the wall design includes a key. In any case, the passive pressures should be neglected in the top 4 feet.

- Where a permanent vertical uniform load will be applied to the active side immediately adjacent to the wall, a horizontal surcharge load equal to half of the uniform vertical load should be applied over the height of the wall. At a minimum, a temporary lateral construction surcharge load of 100 pounds per square foot (psf) should be applied uniformly over the height of the wall.

- We recommend using an ultimate friction factor of 0.5 between the sand and gravel or Structural Fill and the bottom of the wall. Below-grade walls should be designed for minimum factors of safety of 1.5 for sliding and 2.0 for overturning.

3.5.2 Seismic Pressures

In accordance with the Massachusetts State Building Code, 9th Edition (MSBC 9th Edition), Section 1610, a lateral earthquake force equal to $0.100*(S_s)*(F_a)*\gamma*H^2$ should be included in the design of the walls (for horizontal backfill), where S_s is the maximum considered earthquake spectral response acceleration (defined in Section 3.4), F_a is the site coefficient (defined in Section 3.4), γ is the total unit weight of the soil backfill, and H is the height of the wall.

The earthquake force should be distributed as an inverted triangle over the height of the wall. In accordance with MSBC 9th Edition, Section 1610.2, a load factor of 1.43 should be applied to the earthquake force for wall strength design.

Temporary surcharges should not be included when designing for earthquake loads. Surcharge loads applied for extended periods of time should be included in the total static lateral soil pressure, and their earthquake lateral force should be computed and added to the force determined above.

3.6 Parking Lots, Driveways, and Sidewalks

3.6.1 General

The subsurface conditions encountered at the site are generally suitable to support the proposed driveways, parking lots, and sidewalks after preparation of the subgrade as described in Section 4.1.

- We recommend entirely removing the topsoil from within the footprint of the proposed driveways and parking lots.

- The existing fill should be improved in accordance with the recommendations in Section 4.1.

- Cobbles and boulders should be removed to at least 18 inches below the bottom of the pavement.

3.6.2 Sidewalks

- Sidewalks should be placed on a minimum of 12 inches of Structural Fill with less than 5 percent fines.

- To reduce the potential for heave caused by surface water penetrating under the sidewalk, the joints between sidewalk concrete sections should be sealed with a waterproof compound. The sidewalks should be sloped away from the building or other vertical

surfaces to promote flow of water. To the extent possible, roof leaders should not discharge onto sidewalk surfaces.

3.6.3 Pavement Sections

A typical, minimum, standard-duty pavement section that could be used for parking areas is as follows:

1.5" Asphalt "Top Course"
2.0" Asphalt "Base Course"
8" Processed Gravel for Sub-Base (MassDOT M1.03.1)

A typical, minimum, heavy-duty pavement section that could be used for areas of heavy truck traffic is as follows:

2.0" Asphalt "Top Course"
2.5" Asphalt "Base Course"
12" Processed Gravel for Sub-Base (MassDOT M1.03.1)

The pavement sections shown above represent minimum thicknesses representative of typical local construction practices for similar use. Periodic maintenance should be anticipated.

Pavement material types and construction procedures should conform to specifications of the "Standard Specifications for Highways and Bridges," prepared by the Commonwealth of Massachusetts Department of Public Works and dated 1988 (with the latest Supplemental Specifications).

Areas to receive relatively highly concentrated, sustained loads such as dumpsters, loading areas, and storage bins are typically installed over a rigid pavement section to distribute concentrated loads and reduce the possibility of high stress concentrations on the subgrade. Typical rigid pavement sections consist of 6 inches of concrete placed over a minimum of 12 inches of subbase material.

3.7 Underground Utilities

Boulders at the bottom of utility trenches should be removed to at least 12 inches below the pipe invert and the resulting excavation should be backfilled with suitable backfill. Utilities should be placed on suitable bedding material in accordance with the manufacturer's recommendations. "Cushion" material should be placed, by hand, above the utility pipe in maximum 6-inch lifts. The lift should be compacted by hand to avoid damage to the utility. Where the bedding/cushion material consists of crushed stone, it should be wrapped in a geotextile fabric.

Compaction of fill in utility trenches should be in accordance with our recommendations in Section 4.3. To reduce the potential for damage to utilities, placement and compaction of fill

immediately above the utilities should be performed in accordance with the manufacturer's recommendations.

4. CONSTRUCTION CONSIDERATIONS

4.1 Subgrade Preparation

- Organic materials, existing fill, if any, subsoil, abandoned utilities, buried foundations, and other below-ground structures should be entirely removed from within the footprint of the proposed building and site structures, including site retaining walls, and exterior stairs, if any, before the start of foundation work.

- Tree stumps, root balls, and roots larger than ½ inch in diameter should be removed and the cavities filled with suitable material and compacted per Section 4.3 of this report.

- Cobbles and boulders should be removed at least 6 inches from beneath footings and 18 inches beneath the bottom of slabs and paved areas. The resulting excavations should be backfilled with compacted Structural Fill under the building and with Ordinary Fill under the subbase of paved areas.

- The bottom of the excavation resulting from the removal of the existing fill or natural soil should be compacted with a dynamic vibratory compactor imparting a minimum of 40 kips of force to the subgrade.

- The base of the footing excavations in granular soil should be compacted with a dynamic vibratory compactor weighing at least 200 pounds and imparting a minimum of 4 kips of force to the subgrade.

- After the surficial materials are removed to a depth of 18 inches within the proposed paved areas in accordance with the recommendations in Section 3.1, the exposed subsoil deeper than 18 inches beneath the bottom of the proposed pavement should be improved by compacting the exposed surface with at least six (6) passes of a vibratory roller compactor imparting a dynamic effort of at least 20 kips. Where soft zones of soil are observed, the soft soil should be removed, and the grade should be restored using Ordinary Fill to the bottom of the proposed subbase layer.

- Soil that pumps due to excessive moisture should be removed and replaced with dry Structural Fill under the proposed building or Ordinary Fill to the bottom of the subbase layer in paved areas.

- Fill placed within the footprint of the proposed building should meet the gradation and compaction requirements of Structural Fill, shown in Section 4.3.1.

- Fill placed under the subbase of paved areas should meet the gradation and compaction requirements of Ordinary Fill, shown in Section 4.3.2.

- Fill placed in the top 12 inches beneath sidewalks should consist of Structural Fill with less than 5 percent fines.

- Loose or soft soils identified during the compaction of the footing or floor slab subgrades should be excavated to a suitable bearing stratum, as determined by the representative of LGCI. Grades should be restored by backfilling with Structural Fill or crushed stone.

- When crushed stone is required in the drawings or is used for the convenience of the contractor, it should be wrapped in a geotextile fabric for separation except where introduction of the geotextile fabric promotes sliding. A geotextile fabric should not be placed between the bottoms of the footings and the crushed stone.

- An LGCI representative should observe the exposed subgrades prior to fill and concrete placement to verify that the exposed bearing materials are suitable for the design soil bearing pressure. If soft or loose pockets are encountered in the footing excavations, the soft or loose materials should be removed and the bottom of the footing should be placed at a lower elevation on firm soil, or the resulting excavation should be backfilled with Structural Fill, or crushed stone wrapped in a filter fabric.

4.2 Subgrade Protection

The soils are frost susceptible. If construction takes place during freezing weather, special measures should be taken to prevent the subgrade from freezing. Such measures should include the use of heat blankets or excavating the final 6 inches of soil just before pouring the concrete. Footings should be backfilled as soon as possible after footing construction. Soil used as backfill should be free of frozen material, as should the ground on which it is placed. Filling operations should be halted during freezing weather.

Materials with high fines contents are typically difficult to handle when wet, as they are sensitive to moisture content variations. Subgrade support capacities may deteriorate when such soils become wet and/or disturbed. The contractor should keep exposed subgrades properly drained and free of ponded water. Subgrades should be protected from machine and foot traffic to reduce disturbance.

4.3 Fill Materials

Structural Fill and Ordinary Fill should consist of inert, hard, durable sand and gravel free from organic matter, clay, surface coatings, and deleterious materials, and should conform to the gradation requirements shown below.

4.3.1 Structural Fill

The Structural Fill should have a plasticity index of less than 6 and should meet the gradation requirements shown below. Structural Fill should be compacted in maximum 9-inch loose lifts to at least 95 percent of the Modified Proctor maximum dry density (ASTM

D1557), with moisture contents within ±2 percentage points of the optimum moisture content.

Sieve Size Percent	Passing by Weight
3 inches	100
1 ½ inch	80-100
½ inch	50-100
No. 4	30-85
No. 20	15-60
No. 60	5-35
No. 200*	0-10

* 0 – 5 for the top 12 inches under sidewalks, exterior slabs, pads, and walkways

4.3.2 Ordinary Fill

Ordinary Fill should have a plasticity index of less than 6 and should meet the gradation requirements shown below. Ordinary Fill should be compacted in maximum 9-inch loose lifts to at least 95 percent of the Modified Proctor maximum dry density (ASTM D1557), with moisture contents within ±2 percentage points of the optimum moisture content.

Sieve Size Percent	Passing by Weight
6 inches	100
1 inch	50-100
No. 4	20-100
No. 20	10-70
No. 60	5-45
No. 200	0-20

4.4 Reuse of Onsite Materials

Based on our field observations and the results of the grain-size analyses, the natural sand and gravel may be used as Ordinary Fill.

The contractor should avoid mixing the reusable soils with fine-grained and/or organic soils. The soils to be reused should be excavated and stockpiled separately for compliance testing. Soils with 20 percent or greater fines contents are generally very sensitive to moisture content variations and are susceptible to frost. Such soils are very difficult to compact at moisture contents that are much higher or much lower than the optimum moisture content determined from the laboratory compaction test. Therefore, strict moisture control should be implemented during the compaction of onsite soils with fines contents of 20 percent or greater. The contractor should be prepared to remove and replace such soils if pumping occurs.

If needed, the onsite material could be blended with imported rock and processed in a crusher to produce fill meeting the gradation requirements of the materials in Section 4.3. Suitable imported

material and amended/improved materials should be stockpiled separately from unimproved onsite soils.

Materials to be used as fill should first be tested for compliance with the applicable gradation specifications.

4.5 Groundwater Control Procedures

Based on the groundwater levels measured in our borings, we do not anticipate that major groundwater control procedures will be needed during construction. We anticipate that filtered sump pumps installed in a series of sump pump pits located at least 3 feet below the bottom of planned excavations may be sufficient to handle groundwater and surface runoff that may enter the excavation during wet weather. The contractor should be prepared to use multiple sump pumps to maintain a dry excavation during excavations for foundations and utilities.

The contractor should be permitted to employ whatever commonly accepted means and practices are necessary to maintain the groundwater level below the bottom of the excavation and to maintain a dry excavation during wet weather. Groundwater levels should be maintained at a minimum of 1 foot below the bottom of the excavations during construction. The placement of reinforcing steel or concrete in standing water should not be permitted.

To reduce the potential for sinkholes developing over sump pump pits after the sump pumps are removed, the crushed stone placed in the sump pump pits should be wrapped in a geotextile fabric. Alternatively, the crushed stone should be entirely removed after the sump pump is no longer in use, and the sump pump pit should be restored with suitable backfill.

4.6 Temporary Excavations

All excavations to receive human traffic should be constructed in accordance with OSHA guidelines.

The site soils should generally be considered Type “C” and should have a maximum allowable slope of 1.5 Horizontal to 1 Vertical (1.5H:1V) for excavations less than 20 feet deep. Deeper excavations, if needed, should have shoring designed by a professional engineer.

The contractor is solely responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench the sides of the excavations as required to maintain the stability of the excavation sides and bottom.

5. RECOMMENDATIONS FOR FUTURE WORK

We recommend engaging LGCI to perform the following services:

- Prepare Earth Moving Specifications and review the geotechnical aspect of contract drawings.

- Review contractor submittals and Request for Information (RFIs).

- Provide a field representative during construction to observe the removal of the unsuitable soil, and to observe the subgrade of footings and slabs.

6. REPORT LIMITATIONS

Our analyses and recommendations are based on project information provided to us at the time of this report. If changes to the type, size, and location of the proposed structures or to the site grading are made, the recommendations contained in this report shall not be considered valid unless the changes are reviewed, and the conclusions and recommendations modified in writing by LGCI. LGCI cannot accept responsibility for designs based on our recommendations unless we are engaged to review the final plans and specifications to determine whether any changes in the project affect the validity of our recommendations, and whether our recommendations have been properly implemented in the design.

It is not part of our scope to perform a more detailed site history; therefore, we have not explored for or researched the locations of buried utilities or other structures in the area of the proposed construction. Our scope did not include environmental services or services related to moisture, mold, or other biological contaminants in or around the site.

The recommendations in this report are based in part on the data obtained from the subsurface explorations. The nature and extent of variations between explorations may not become evident until construction. If variations from anticipated conditions are encountered, it may be necessary to revise the recommendations in this report. We cannot accept responsibility for designs based on recommendations in this report unless we are engaged to 1) make site visits during construction to check that the subsurface conditions exposed during construction are in general conformance with our design assumptions and 2) ascertain that, in general, the work is being performed in compliance with the contract documents.

Our report has been prepared in accordance with generally accepted engineering practices and in accordance with the terms and conditions set forth in our agreement. No other warranty, expressed or implied, is made. This report has been prepared for the exclusive use of Tata and Howard for the Proposed Wading River Water Treatment Facility in Mansfield, Massachusetts as conceived at this time.

7. REFERENCES

In addition to the references included in the text of the report, we used the following references:

American Society of Civil Engineers, "Minimum Design Loads and Associated Criteria for Buildings and Other Structures," ASCE/SEI 7-16, 2017.

The Commonwealth of Massachusetts (2017), "The Massachusetts State Building Code, Ninth (9^{th}) Edition."

The Department of Labor, Occupational Safety and Health Administration (1989), "Occupational Safety and Health Standards - Excavations; Final Rule," 20 CFR Part 1926, Subpart P.

USGS Mansfield, MA topographic map from http://mapserver.mytopo.com.

Table 1 - Summary of LGCI's Borings
Proposed Wading River Water Treatment Facility
Mansfield, Massachusetts
LGCI Project No. 2344

Boring No.	Ground Surface Elevation (ft.)[1]	Groundwater[2] Depth / El. (ft.)	Bottom of Forest Mat Depth / El. (ft.)	Bottom of Subsoil Depth / El. (ft.)	Bottom of Sand and Gravel Depth / El. (ft.)	Bottom of Boring Depth / El. (ft.)
B-1	146.0	8.5 / **137.5**	0.8 / **145.2**	2.0 / **144.0**	21.0 [3]/ **125.0**	21.0 / **125.0**
B-2	138.0	6.0 / **132.0**	0.3 / **137.7**	2.0 / **136.0**	21.0 [3]/ **117.0**	21.0 / **117.0**
B-3	138.0	4.0 / **134.0**	0.3 / **137.7**	2.0 / **136.0**	21.0 [3]/ **117.0**	21.0 / **117.0**
B-4	146.0	14.0 / **132.0**	2.0 / **144.0**	- / -	22.0 [3]/ **124.0**	22.0 / **124.0**
B-5	146.0	9.0 / **137.0**	0.5 / **145.5**	2.2 / **143.8**	21.0 [3]/ **125.0**	21.0 / **125.0**
B-6	150.0	18.0 / **132.0**	0.9 / **149.1**	- / -	22.0 [3]/ **128.0**	22.0 / **128.0**
B-7	136.0	10.0 / **126.0**	0.3 / **135.7**	2.0 / **134.0**	20.8 [3]/ **115.2**	20.8 / **115.2**

1. The ground surface elevation was interpolated to the nearest 2 feet from drawing 5-2 titled: "Conceptual Layout, Wading River WTP, Proposed Location No. 2," prepared by Tata & Howard Incorporated, dated October 2023, and provided to LGCI by Tata & Howard Incorporated via e-mail on November 8, 2023.

2. Groundwater was measured during drilling, at the end of drilling, or based on sample moisture whichever is shallower.

3. Boring terminated in the sand and gravel layer.

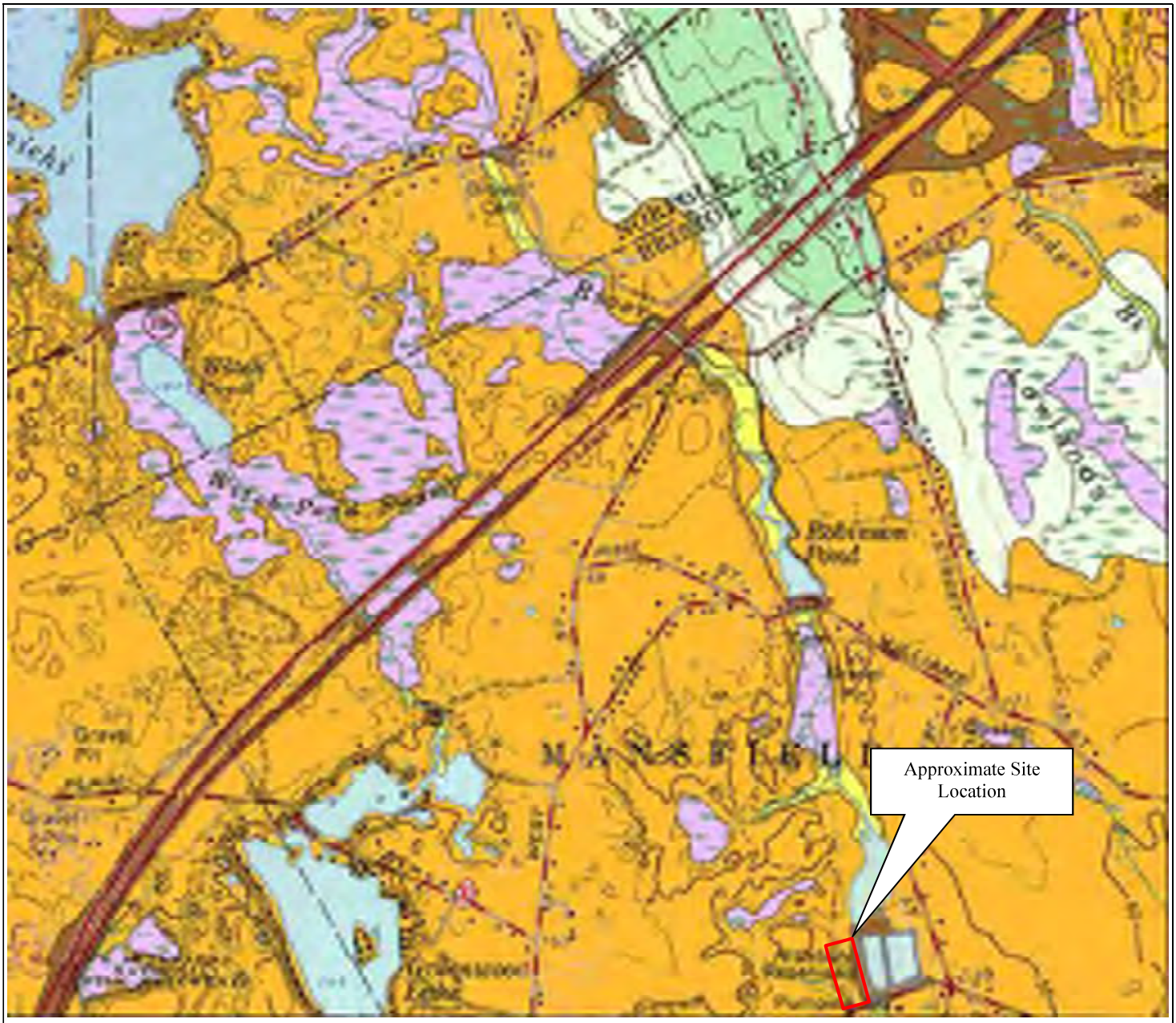
4. "-" means layer was not encountered.

Contour Intervals: 10 feet

[redacted]

Note: Figure based on USA Topo Maps of Mansfield, MA obtained from https://viewer.nationalmap.gov/

Client:	Project:	Figure 1 – Site Location Map	
Tata & Howard Incorporated	Proposed Wading River Water Treatment Facility		
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Mansfield, MA	LGCI Project No.: 2344	Date: Dec. 2023



N

Coarse deposits consist of *gravel deposits*, *sand and gravel deposits*, and *sand deposits*, not differentiated in this report. *Gravel deposits* are composed of at least 50 percent gravel-size clasts; cobbles and boulders predominate; minor amounts of sand occur within gravel beds, and sand comprises a few separate layers. Gravel layers generally are poorly sorted, and bedding commonly is distorted and faulted due to postdepositional collapse related to melting of ice. *Sand and gravel deposits* occur as mixtures of gravel and sand within individual layers and as layers of sand alternating with layers of gravel. Sand and gravel layers generally range between 25 and 50 percent gravel particles and between 50 and 75 percent sand particles. Layers are well sorted to poorly sorted; bedding may be distorted and faulted due to postdepositional collapse. *Sand deposits* are composed mainly of very coarse to fine sand, commonly in well-sorted layers. Coarser layers may contain up to 25 percent gravel particles, generally granules and pebbles; finer layers may contain some very fine sand, silt, and clay

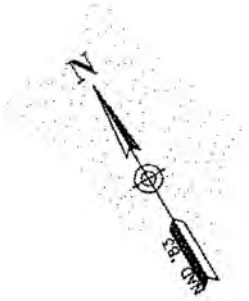
Artificial fill—Earth materials and manmade materials that have been artificially emplaced, primarily in highway and railroad embankments and in dams; unit may also include landfills, urban-development areas, and filled coastal wetlands

Note: Figure based on map titled: "Surficial Materials Map of the Wrentham Quadrangle, Massachusetts," prepared by Stone, B.D., Stone, J.R., and DiGiacomo-Cohen, M.L., for U.S. Geological Survey, Scientific Investigation Map 3402, Quadrangle 107 – Wrentham.

Client:	Project:	Figure 2 – Surficial Geologic Map	
Tata & Howard Incorporated	Proposed Wading River Water Treatment Facility		
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Mansfield, MA	LGCI Project No.: 2344	Date: Dec. 2023

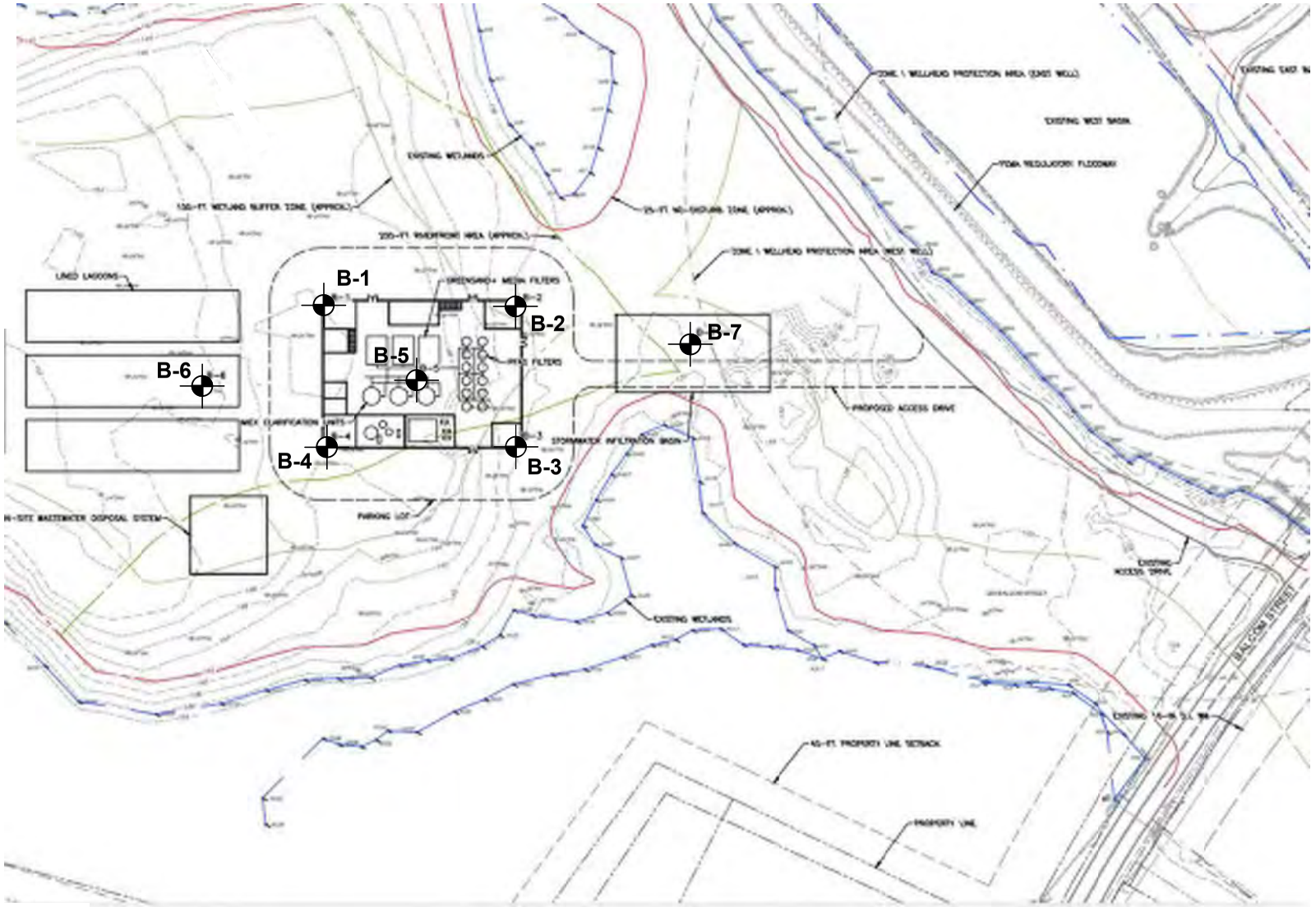
Legend

Approximate location of borings advanced by Soil X Corp. (Soil X) of Leominster, MA on November 1 and 2, 2023 and observed by Lahlaf Geotechnical Consulting, Inc. (LGCI).



Approximate Scale (ft.)

0 40 80



Note

Figure based on drawing 5-2 titled: "Conceptual Layout, Wading River WTP, Proposed Location No. 2," prepared by Tata & Howard Incorporated, dated October 2023, and provided to LGCI by Tata & Howard Incorporated via e-mail on November 8, 2023.

Client:	Project:	Figure 3 – Boring Location Plan	
Tata & Howard Incorporated	Proposed Wading River Waste Treatment Facility		
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Mansfield, MA	LGCI Project No.: 2344	Date: Dec. 2023

Appendix A – LGCI's Boring Logs

LGCI
Lahlaf Geotechnical Consulting, Inc.
100 Chelmsford Rd Suite 2
Billerica, MA 01862
Telephone: 9783305912
Fax: 9783305056

BORING LOG

CLIENT: Tata & Howard Incorporated
PROJECT NAME: Prop. Wading River Water Treatment Facility
LGCI PROJECT NUMBER: 2344
PROJECT LOCATION: Mansfield, MA

DATE STARTED: 11/2/23 **DATE COMPLETED:** 11/2/23
BORING LOCATION: Near northwestern corner of prop. building
COORDINATES: NA
SURFACE El.: 146 ft. (see note 1) **TOTAL DEPTH:** 21 ft.
WEATHER: 30's / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: 9.0 ft. / El. 137.0 ft. Based on sample moisture
AT END OF DRILLING: 8.5 ft. / El. 137.5 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Soil Exploration Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: HSA (4-1/4" I.D.) then 3-inch casing
DRILL RIG TYPE/MODEL: Diedrich D-70 turbo
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: NP / EG **CHECKED BY:** JKW

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
	145.0	0	S1	1-2-3-5 (5)	24/13		Forest Mat	0.8	S1 - Top 9": Forest Mat
							Subsoil	145.2	Bot. 4": Silty SAND (SM), fine to coarse, 25-30% fines, 10-15% fine to coarse angular gravel, trace of roots, orange-brown, moist
		2	S2	9-16-20-22 (36)	24/14			2.0 144.0	S2 - Well Graded GRAVEL with Silt and Sand (GW-GM), fine to coarse, subrounded, 5-10% fines, 40-45% fine to coarse sand, light brown
		4	S3	17-20-22-34 (42)	24/17				S3 - Well Graded SAND with Gravel (SW), fine to coarse, 0-5% fines, 30-35% fine to coarse subangular gravel, light brown, moist
5	140.0	6	S4	38-27-23-22 (50)	24/15				S4 - Well Graded SAND with Gravel (SW), fine to coarse, 0-5% fines, 25-30% fine to coarse subangular gravel, light brown, moist
		8							
		9	S5	11-8-8-9 (16)	24/10				S5 - Poorly Graded SAND (SP), fine to medium, 0-5% fines, light brown, wet
10	135.0	11					Sand and Gravel		
		14	S6	16-9-9-8 (18)	24/7				S6 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 15-20% fine to coarse subrounded gravel, light brown, wet
15	130.0	16							
		19	S7	8-6-7-6 (13)	24/8				S7 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 15-20% fine to coarse subrounded gravel, light brown to gray, wet
20	125.0	21						21.0	Bottom of borehole at 21.0 feet. Backfilled borehole with drill cuttings.
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest 2 feet based on drawing 5-2 titled: "Conceptual Layout, Wading River WTP, Proposed Location No. 2," prepared by Tata & Howard Incorporated, dated October 2023, and provided to LGCI by Tata & Howard Incorporated via e-mail on November 8, 2023.

LGCI
Lahlaf Geotechnical Consulting, Inc.
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BORING LOG

CLIENT: Tata & Howard Incorporated
PROJECT NAME: Prop. Wading River Water Treatment Facility
LGCI PROJECT NUMBER: 2344
PROJECT LOCATION: Mansfield, MA

DATE STARTED: 11/1/23 **DATE COMPLETED:** 11/1/23
BORING LOCATION: Near northeastern corner of prop. building
COORDINATES: NA
SURFACE El.: 138 ft. (see note 1) **TOTAL DEPTH:** 21 ft.
WEATHER: 40's / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: 6.0 ft. / El. 132.0 ft. Based on sample moisture
AT END OF DRILLING: 6.5 ft. / El. 131.5 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Soil Exploration Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: Diedrich D-70 turbo
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TG **CHECKED BY:** JKW

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0	S1	1-0-1-4 (1)	24/17		Forest Mat / Subsoil	0.3 / 137.7	S1 - Top 4": Forest Mat Bot. 13": Silty SAND (SM), fine to medium, 15-20% fines, trace of organic soil, trace of roots, orange-brown, moist
		2	S2	6-8-11-13 (19)	24/0			2.0 / 136.0	S2 - No recovery, trace of coarse sand and gravel in tip of split spoon
	135.0	4	S3	7-9-11-11 (20)	24/15				S3 - Well Graded SAND with Silt (SW-SM), fine to coarse, 5-10% fines, 5-10% fine subrounded gravel, orange to brown, wet
5		6	S4	6-7-7-7 (14)	24/21				S4 - Well Graded SAND with Silt (SW-SM), fine to coarse, 5-10% fines, orange to brown, wet
	130.0	8							
10		10	S5	3-4-5-4 (9)	24/22	1	Sand and Gravel		REMARK 1: Maintained positive head in HSA between depths of 10.0 feet and 21.0 feet. S5 - Poorly Graded SAND with Silt (SP-SM), fine to medium, 5-10% fines, gray to brown, wet
		12							
	125.0								
15		15	S6	2-4-5-4 (9)	24/24				S6 - Poorly Graded SAND with Silt (SP-SM), fine, 10-15% fines, gray, wet
		17							
	120.0								
20		20	S7	5-95	12/12				S7 - Poorly Graded SAND (SP), fine to medium, 0-5% fines, gray, wet
		21						21.0	Bottom of borehole at 21.0 feet. Backfilled borehole with drill cuttings.
	115.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest 2 feet based on drawing 5-2 titled: "Conceptual Layout, Wading River WTP, Proposed Location No. 2," prepared by Tata & Howard Incorporated, dated October 2023, and provided to LGCI by Tata & Howard Incorporated via e-mail on November 8, 2023.

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BORING LOG

B-3

CLIENT: Tata & Howard Incorporated
PROJECT NAME: Prop. Wading River Water Treatment Facility
LGCI PROJECT NUMBER: 2344
PROJECT LOCATION: Mansfield, MA

DATE STARTED: 11/2/23 **DATE COMPLETED:** 11/2/23
BORING LOCATION: Near southeastern corner of prop. building
COORDINATES: NA
SURFACE El.: 138 ft. (see note 1) **TOTAL DEPTH:** 21 ft.
WEATHER: 30's / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: 4.0 ft. / El. 134.0 ft. Based on sample moisture
AT END OF DRILLING: 4.0 ft. / El. 134.0 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Soil Exploration Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: HSA (4-1/4" I.D.) then 3-inch casing
DRILL RIG TYPE/MODEL: Diedrich D-70 turbo
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: EG / NP **CHECKED BY:** JKW

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark
		0	S1	1-1-1-3 (2)	24/13	
		2	S2	5-6-13-14 (19)	24/11	
	135.0	4	S3	16-17-18-16 (35)	24/8	
5		6	S4	7-7-10-9 (17)	24/20	
	130.0	8				
		9	S5	9-8-9-7 (17)	24/11	
10		11				
	125.0					
		14	S6	3-5-8-14 (13)	24/11	
15		16				
	120.0					
		19	S7	18-11-10-12 (21)	24/0	
20		21				
	115.0					
25						

Strata	Depth El.(ft.)	Material Description
Forest Mat / Subsoil	0.3 / 137.7	S1 - Top 4": Forest Mat Bot. 9": Silty SAND (SM), fine to medium, 15-20% fines, 5-10% fine to coarse subrounded gravel, trace of roots, orange-brown, moist
	2.0 / 136.0	S2 - Poorly Graded GRAVEL with Sand (GP), coarse, subrounded, 0-5% fines, 40-45% fine to coarse sand, light brown, moist
		S3 - Well Graded SAND with Silt (SW-SM), fine to coarse, 10-15% fines, 10-15% fine subrounded gravel, trace of organic soil, light brown, wet
		S4 - Top 13": Well Graded SAND with Silt (SW-SM), fine to coarse, 5-10% fines, 10-15% fine subrounded gravel, light brown, wet Bot. 7": Poorly Graded SAND (SP), fine to medium, 0-5% fines, orange, wet
Sand and Gravel		S5 - Top 6": Well Graded SAND with Silt (SW-SM), fine to coarse, 5-10% fines, orange to brown, wet Bot. 5": Poorly Graded SAND with Silt (SP-SM), fine to medium, trace of coarse, 5-10% fines, 0-5% fine subrounded gravel, orange, wet
		S6 - Similar to S5 Bot. 5", light brown to gray
		S7 - No recovery
	21.0	Bottom of borehole at 21.0 feet. Backfilled borehole with drill cuttings.

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest 2 feet based on drawing 5-2 titled: "Conceptual Layout, Wading River WTP, Proposed Location No. 2," prepared by Tata & Howard Incorporated, dated October 2023, and provided to LGCI by Tata & Howard Incorporated via e-mail on November 8, 2023.

LGCI
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BORING LOG

B-4
PAGE 1 OF 1

CLIENT: Tata & Howard Incorporated
PROJECT NAME: Prop. Wading River Water Treatment Facility
LGCI PROJECT NUMBER: 2344
PROJECT LOCATION: Mansfield, MA

DATE STARTED: 11/1/23 **DATE COMPLETED:** 11/1/23
BORING LOCATION: Near southwestern corner of prop. building
COORDINATES: NA
SURFACE El.: 146 ft. (see note 1) **TOTAL DEPTH:** 22 ft.
WEATHER: 40's / Showers
GROUNDWATER LEVELS:
DURING DRILLING: 15.0 ft. / El. 131.0 ft. Based on sample moisture
AT END OF DRILLING: 14.0 ft. / El. 132.0 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Soil Exploration Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: Diedrich D-70 turbo
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TG **CHECKED BY:** JKW

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
	145.0	0					Forest Mat		S1 - Forest Mat
		2	S1	1-1-4-5 (5)	24/11			2.0 144.0	
		4	S2	4-5-8-13 (13)	24/2		Sand and Gravel		S2 - Poorly Graded GRAVEL with Sand (GP), coarse, subangular, 0-5% fines, 20-25% fine to coarse sand, light brown, moist
5			S3	7-12-19-19 (31)	24/16				S3 - Well Graded SAND with Gravel (SW), fine to coarse, 0-5% fines, 15-20% fine to coarse subangular gravel, light brown, moist
	140.0	6	S4	17-16-15-17 (31)	24/19				S4 - Well Graded SAND (SW), fine to coarse, 0-5% fines, 0-5% fine subrounded gravel, light brown, moist
		8							
10		10	S5	5-5-9-15 (14)	24/17				S5 - Poorly Graded SAND (SP), fine to medium, 0-5% fines, 0-5% fine subrounded gravel, light brown, moist
	135.0	12							
									▼
15									▽ S6 - Poorly Graded SAND with Silt (SP-SM), fine to medium, 5-10% fines, light brown to gray, wet
	130.0	15	S6	3-4-5-6 (9)	24/20				
		17							
20									
	125.0	20	S7	2-3-3-5 (6)	24/19	1			REMARK 1: Maintained positive head in HSA for S7. S7 - Poorly Graded SAND with Silt (SP-SM), fine to medium, 10-15% fines, gray, wet
		22						22.0	
25									Bottom of borehole at 22.0 feet. Backfilled borehole with drill cuttings.

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest 2 feet based on drawing 5-2 titled: "Conceptual Layout, Wading River WTP, Proposed Location No. 2," prepared by Tata & Howard Incorporated, dated October 2023, and provided to LGCI by Tata & Howard Incorporated via e-mail on November 8, 2023.

LGCI
Lahlaf Geotechnical Consulting, Inc.
100 Chelmsford Rd Suite 2
Billerica, MA 01862
Telephone: 9783305912
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BORING LOG

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PAGE 1 OF 1

CLIENT: Tata & Howard Incorporated
PROJECT NAME: Prop. Wading River Water Treatment Facility
LGCI PROJECT NUMBER: 2344
PROJECT LOCATION: Mansfield, MA

DATE STARTED: 11/2/23 **DATE COMPLETED:** 11/2/23
BORING LOCATION: Near center of prop. building
COORDINATES: NA
SURFACE El.: 146 ft. (see note 1) **TOTAL DEPTH:** 21 ft.
WEATHER: 30's / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: 9.0 ft. / El. 137.0 ft. Based on sample moisture
AT END OF DRILLING: 9.5 ft. / El. 136.5 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Soil Exploration Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: HSA (4-1/4" I.D.) then 3-inch casing
DRILL RIG TYPE/MODEL: Diedrich D-70 turbo
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: EG / NP **CHECKED BY:** JKW

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
	145.0	0	S1	1-1-3-12 (4)	24/9		Forest Mat	0.5 145.5	S1 - Top 6": Forest Mat
							Subsoil		Bot. 3": Silty SAND with Gravel (SM), fine to medium, 15-20% fines, 20-25% fine to coarse subrounded gravel, trace of roots, brown, moist
		2	S2	18-31-36-37 (67)	24/15			2.2 143.8	S2 - Top 2": Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium, 5-10% fines, 15-20% fine to coarse subrounded gravel, trace of pine needles, light brown, moist
		4							Bot. 13": Well Graded SAND with Gravel (SW), fine to coarse, 0-5% fines, 15-20% fine to coarse subangular gravel, light brown, moist
5			S3	10-22-30-34 (52)	24/13				S3 - Well Graded SAND with Gravel (SW), fine to coarse, 0-5% fines, 30-35% fine to coarse subrounded gravel, light brown, moist
	140.0	6	S4	29-27-26-22 (53)	24/15				S4 - Similar to S3, 20-25% fine to coarse subrounded gravel
		8							
		9	S5	12-10-12-15 (22)	24/10				S5 - Poorly Graded SAND (SP), fine to medium, trace of coarse, 0-5% fines, 5-10% fine subrounded gravel, light brown, wet
10	135.0	11					Sand and Gravel		
		14	S6	11-7-6-8 (13)	24/9				S6 - Poorly Graded SAND with Silt (SP-SM), fine to medium, trace of coarse, 5-10% fines, ~5% fine subrounded gravel, light brown to orange, wet
15	130.0	16							
		19	S7	6-5-6-9 (11)	24/8				S7 - Well Graded SAND with Silt (SW-SM), fine to coarse, 5-10% fines, 0-5% fine subrounded gravel, light brown, wet
20	125.0	21						21.0	Bottom of borehole at 21.0 feet. Backfilled borehole with drill cuttings.
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest 2 feet based on drawing 5-2 titled: "Conceptual Layout, Wading River WTP, Proposed Location No. 2," prepared by Tata & Howard Incorporated, dated October 2023, and provided to LGCI by Tata & Howard Incorporated via e-mail on November 8, 2023.

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BORING LOG

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PAGE 1 OF 1

CLIENT: Tata & Howard Incorporated
PROJECT NAME: Prop. Wading River Water Treatment Facility
LGCI PROJECT NUMBER: 2344
PROJECT LOCATION: Mansfield, MA

DATE STARTED: 11/1/23 **DATE COMPLETED:** 11/1/23
BORING LOCATION: Near prop. lined lagoons
COORDINATES: NA
SURFACE El.: 150 ft. (see note 1) **TOTAL DEPTH:** 22 ft.
WEATHER: 40's / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: 20.0 ft. / El. 130.0 ft. Based on sample moisture
AT END OF DRILLING: 18.0 ft. / El. 132.0 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Soil Exploration Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: Diedrich D-70 turbo
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TG **CHECKED BY:** JKW

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Material Description
		0	S1	2-4-6-9 (10)	24/16		Forest Mat (0.9 / 149.1)	S1 - Top 10": Forest Mat
		2	S2	8-8-13-18 (21)	24/12			Bot. 6": Well Graded SAND with Gravel (SW), fine to coarse, 0-5% fines, 20-25% fine to coarse subangular gravel, light brown, moist S2 - Similar to S1 Bot. 6"
5	145.0	4	S3	13-18-22-22 (40)	24/15			S3 - Well Graded SAND with Gravel (SW), fine to coarse, 0-5% fines, 25-30% fine to coarse subangular gravel, light brown, wet
		6	S4	27-29-30-27 (59)	24/17			S4 - Similar to S3
10	140.0	8						
		10	S5	8-10-14-13 (24)	24/0		Sand and Gravel	S5 - No recovery
15	135.0	12						
		15	S6	4-4-8-8 (12)	24/17			S6 - Poorly Graded SAND (SP), fine to medium, 0-5% fines, 0-5% fine to coarse subrounded gravel, light brown, moist
		17						▼
20	130.0	20	S7	3-5-8-8 (13)	24/18			▽ S7 - Poorly Graded SAND with Silt (SP-SM), fine to medium, 5-10% fines, gray, wet
		22					(22.0)	Bottom of borehole at 22.0 feet. Backfilled borehole with drill cuttings.
25	125.0							

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest 2 feet based on drawing 5-2 titled: "Conceptual Layout, Wading River WTP, Proposed Location No. 2," prepared by Tata & Howard Incorporated, dated October 2023, and provided to LGCI by Tata & Howard Incorporated via e-mail on November 8, 2023.

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BORING LOG

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PAGE 1 OF 1

CLIENT: Tata & Howard Incorporated
PROJECT NAME: Prop. Wading River Water Treatment Facility
LGCI PROJECT NUMBER: 2344
PROJECT LOCATION: Mansfield, MA

DATE STARTED: 11/1/23 **DATE COMPLETED:** 11/1/23
BORING LOCATION: Near prop. stormwater infiltration basin
COORDINATES: NA
SURFACE El.: 136 ft. (see note 1) **TOTAL DEPTH:** 20.8 ft.
WEATHER: 30's / Cloudy
GROUNDWATER LEVELS:
DURING DRILLING: 10.0 ft. / El. 126.0 ft. Based on sample moisture
AT END OF DRILLING: 11.0 ft. / El. 125.0 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Soil Exploration Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: Diedrich D-70 turbo
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TG **CHECKED BY:** JKW

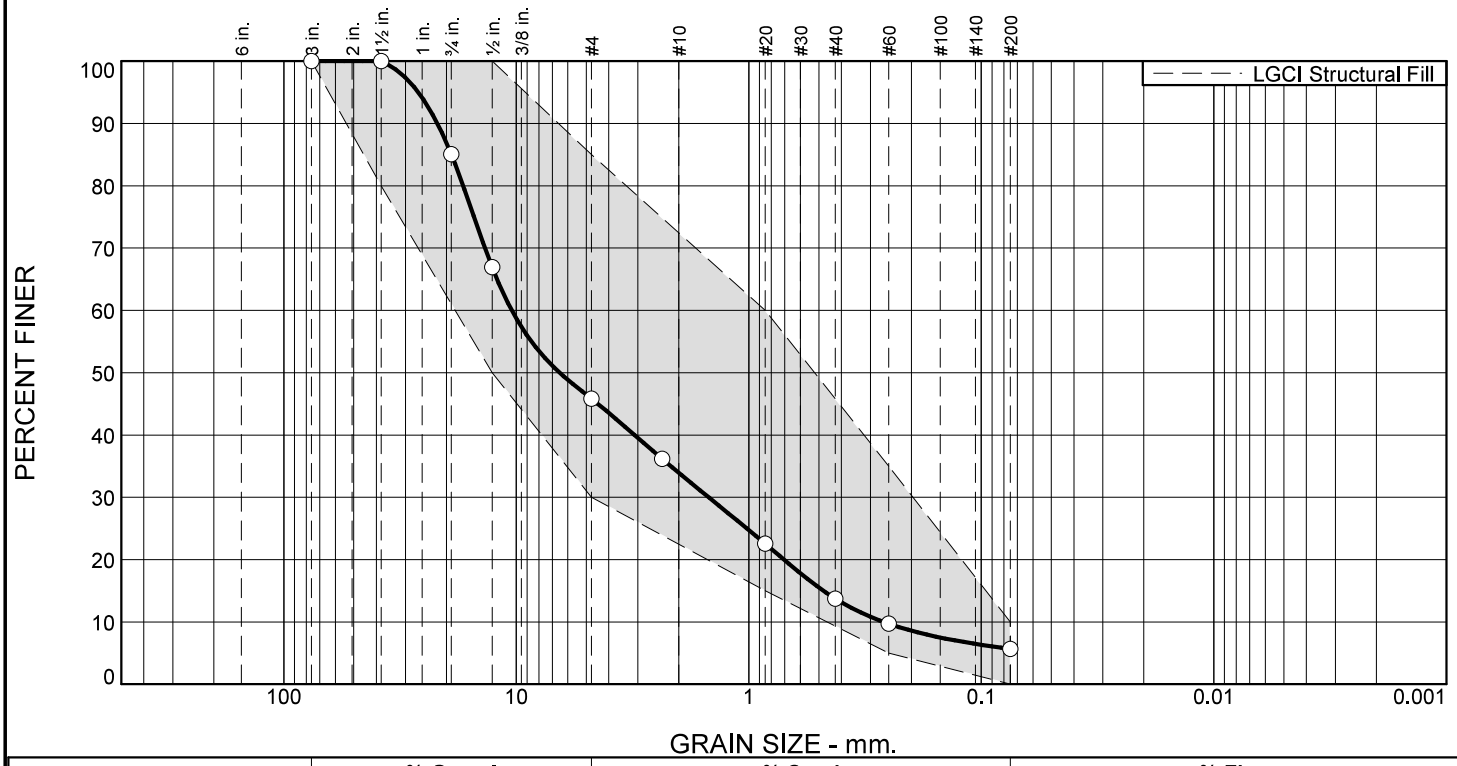
Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0					Forest Mat	0.3 / 135.7	S1 - Top 4": Forest Mat
	135.0		S1	2-4-5-8 (9)	24/11		Subsoil		Bot. 7": Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, ~10% fines, 15-20% fine to coarse subangular gravel, trace of roots, orange-brown, moist
		2	S2	10-13-16-21 (29)	24/9			2.0 / 134.0	S2 - Well Graded SAND with Gravel (SW), fine to coarse, 0-5% fines, 25-30% fine to coarse subangular gravel, light brown, moist
		4	S3	15-18-15-13 (33)	24/10				S3 - Well Graded SAND with Gravel (SW), fine to coarse, 0-5% fines, 35-40% fine to coarse angular gravel, light brown, moist
5	130.0	6	S4	17-13-14-16 (27)	24/2				S4 - Similar to S3, rock in tip of split spoon
		8							
10		10	S5	7-3-2-2 (5)	24/14		Sand and Gravel		S5 - Poorly Graded SAND with Silt (SP-SM), fine to medium, 5-10% fines, light brown, wet
	125.0	12							
15		15	S6	3-5-6-9 (11)	24/16	1			REMARK 1: Maintained positive head in HSA between depths of 15.0 feet and 20.8 feet. S6 - Similar to S5, trace of fine subrounded gravel
	120.0	17							
						2			REMARK 2: HSA grinding encountered on possible cobbles or boulder at depth of 18.5 feet.
20		20	S7	34-66/3" (66/3")	9/9			20.8	S7 - Poorly Graded SAND with Silt and Gravel (SP-SM), fine, 5-10% fines, 35-40% fine to coarse angular gravel, gray to brown, wet
	115.0	20.8							Bottom of borehole at 20.8 feet. Backfilled borehole with drill cuttings.
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest 2 feet based on drawing 5-2 titled: "Conceptual Layout, Wading River WTP, Proposed Location No. 2," prepared by Tata & Howard Incorporated, dated October 2023, and provided to LGCI by Tata & Howard Incorporated via e-mail on November 8, 2023.

Appendix B – Laboratory Test Results

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	14.9	39.3	11.9	20.2	8.0	5.7	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0	100.0	
1.5"	100.0	80.0 - 100.0	
0.75"	85.1		
0.5"	66.9	50.0 - 100.0	
#4	45.8	30.0 - 85.0	
#8	36.2		
#20	22.5	15.0 - 60.0	
#40	13.7		
#60	9.7	5.0 - 35.0	
#200	5.7	0.0 - 10.0	

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Well Graded GRAVEL with Silt and Sand (GW-GM), fine to coarse, subrounded, 5-10% fines, 40-45% fine to coarse sand, light brown

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= AASHTO (M 145)=

Coefficients

D_{90}= 21.8473 D_{85}= 19.0054 D_{60}= 10.4395
D_{50}= 6.5101 D_{30}= 1.4878 D_{15}= 0.4774
D_{10}= 0.2627 C_u= 39.74 C_c= 0.81

Remarks

Natural sand and gravel sample.

Date Received: 11/2/23 **Date Tested:** 11/6/23

Tested By: JKW

Checked By: TG

Location: Boring B-1 **Date Sampled:** 11/2/23

Sample Number: S2 **Depth:** 2.0'-4.0'

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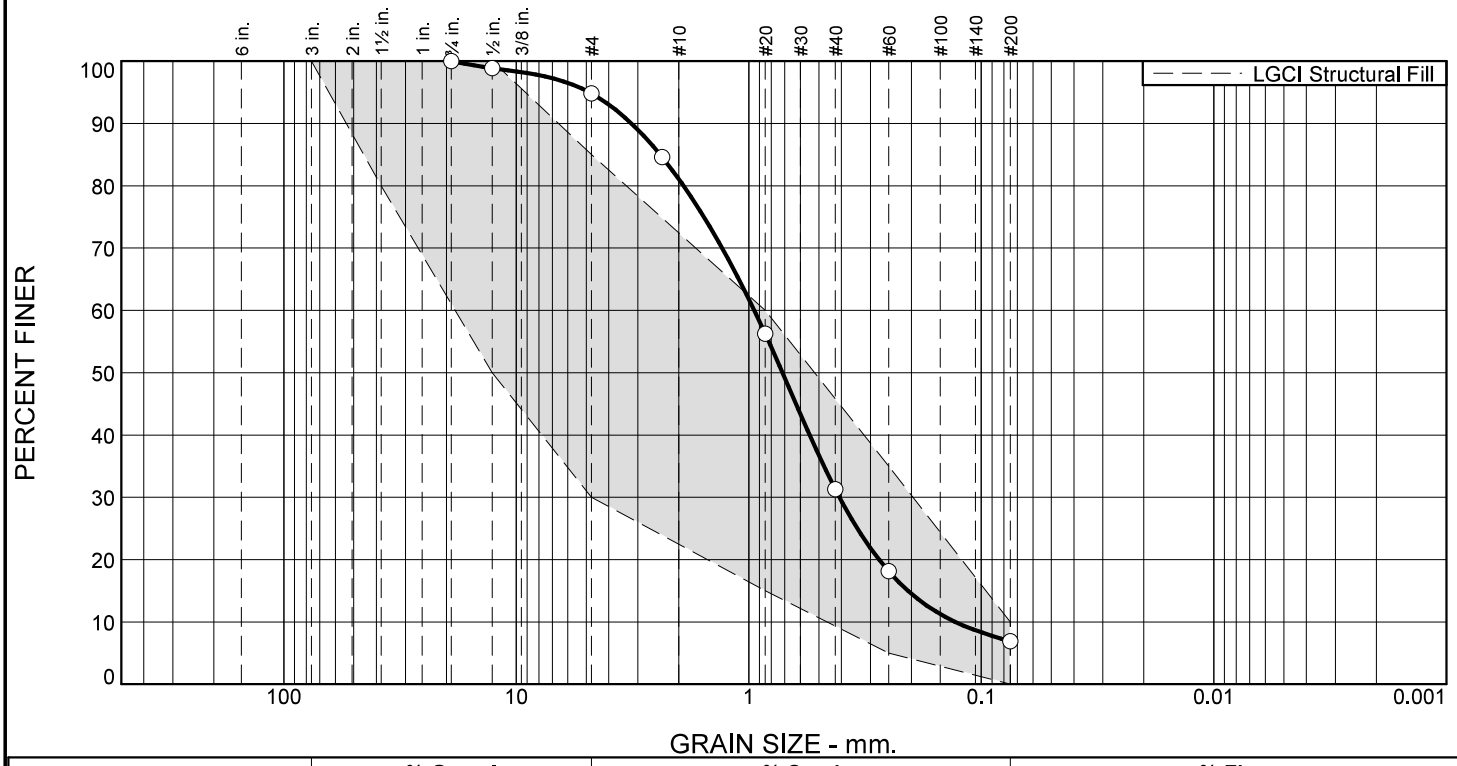
Client: Tata & Howard Incorporated

Project: Proposed Wading River Water Treatment Facility, Mansfield, MA

Project No: 2344 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	5.2	13.7	49.8	24.4	6.9	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
0.75"	100.0		
0.5"	98.9	50.0 - 100.0	
#4	94.8	30.0 - 85.0	X
#8	84.6		
#20	56.2	15.0 - 60.0	
#40	31.3		
#60	18.1	5.0 - 35.0	
#200	6.9	0.0 - 10.0	

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Well Graded SAND with Silt (SW-SM), fine to coarse, 5-10% fines, 5-10% fine subrounded gravel, orange to brown

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= AASHTO (M 145)=

Coefficients

D_{90}= 3.1978 D_{85}= 2.4054 D_{60}= 0.9471
D_{50}= 0.7166 D_{30}= 0.4075 D_{15}= 0.2065
D_{10}= 0.1293 C_u= 7.32 C_c= 1.36

Remarks

Natural sand and gravel sample.

Date Received: 11/1/23 **Date Tested:** 11/2/23

Tested By: JKW

Checked By: TG

Location: Boring B-2
Sample Number: S3 **Depth:** 4.0'-6.0'

Date Sampled: 11/1/23

LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Tata & Howard Incorporated
Project: Proposed Wading River Water Treatment Facility, Mansfield, MA

Project No: 2344 **Figure**

APPENDIX B

DCAMM UPDATE STATEMENTS

DIVISION OF CAPITAL ASSET MANAGEMENT & MAINTENANCE

PRIME UPDATE STATEMENTS ARE NOT PUBLIC RECORDS AND ARE NOT OPEN TO PUBLIC INSPECTION (M.G.L. C.149, §44D)

TO ALL BIDDERS AND AWARDING AUTHORITIES

A COMPLETED AND SIGNED PRIME CONTRACTOR UPDATE STATEMENT MUST BE SUBMITTED WITH EVERY PRIME BID FOR A CONTRACT PURSUANT TO M.G.L. c.149, §44A AND M.G.L. c. 149A. ANY PRIME BID SUBMITTED WITHOUT AN APPROPRIATE UPDATE STATEMENT IS INVALID AND MUST BE REJECTED.

Caution: This form is to be used for submitting Prime Contract bids. It is not to be used for submitting Filed Sub-Bids or Trade Sub-Bids.

AWARDING AUTHORITIES

If the Awarding Authority determines that the bidder does not demonstrably possess the skill, ability and integrity necessary to perform the work on the project, it must reject the bid.

BIDDER'S AFFIDAVIT

I swear under the pains and penalties of perjury that I am duly authorized by the bidder named below to sign and submit this Prime Contractor Update Statement on behalf of the bidder named below, that I have read this Prime Contractor Update Statement, and that all of the information provided by the bidder in this Prime Contractor Update Statement is true, accurate, and complete as of the bid date.

Bid Date	Print Name of Prime Contractor
Project Number (or name if no number)	Business Address
Awarding Authority	Telephone Number

SIGNATURE⇨ _____

Bidder's Authorized Representative

INSTRUCTIONS

INSTRUCTIONS TO BIDDERS

- This form must be completed and submitted by all Prime contractors bidding on projects pursuant to M.G.L. c. 149, §44A and M.G.L. c. 149A.
- You must give complete and accurate answers to all questions and provide all of the information requested. MAKING A MATERIALLY FALSE STATEMENT IN THIS UPDATE STATEMENT IS GROUNDS FOR REJECTING YOUR BID AND FOR DEBARRING YOU FROM ALL PUBLIC CONTRACTING.
- **This Update Statement must include all requested information that was not previously reported on the Application used for your firm's most recently issued (not extended or amended) Prime Contractor Certificate of Eligibility. The Update Statement must cover the entire period since the date of your Application, NOT since the date of your Certification.**
- You must use this official form of Update Statement. Copies of this form may be obtained from the awarding authority and from the Division of Capital Asset Management and Maintenance Web Site: www.mass.gov/DCAMM.
- If additional space is needed, please copy the appropriate page of this Update Statement and attach it as an additional sheet.
- See the section entitled "Bidding Limits" in the *Instructions to Awarding Authorities* for important information concerning your bidding limits.

INSTRUCTIONS TO AWARDING AUTHORITIES

Determination of Bidder Qualifications

- It is the awarding authority's responsibility to determine who is the lowest eligible and responsible bidder. You must consider all of the information in the low bidder's Update Statement in making this determination. Remember: this information was not available to the Division of Capital Asset Management and Maintenance at the time of certification.
- The bidder's performance on the projects listed in Parts 1 and 2 must be part of your review. Contact the project references.
- AWARDING AUTHORITIES ARE STRONGLY ENCOURAGED TO REVIEW THE LOW BIDDER'S ENTIRE CERTIFICATION FILE AT THE DIVISION OF CAPITAL ASSET MANAGEMENT AND MAINTENANCE. Telephone (617) 727-9320 for an appointment.

Bidding Limits

Single Project Limit: The total amount of the bid, including all alternates, may not exceed the bidder's Single Project Limit.

Aggregate Work Limit: The annual value of the work to be performed on the contract for which the bid is submitted, when added to the annual cost to complete the bidder's other currently held contracts, may not exceed the bidder's Aggregate Work Limit. Use the following procedure to determine whether the low bidder is within its Aggregate Work Limit:

Step 1 Review Update Statement Question #2 to make sure that all requested information is provided and that the bidder has accurately calculated and totaled the annualized value of all incomplete work on its currently held contracts (column 9).

Step 2 Determine the annual dollar value of the work to be performed on your project. This is done as follows:

(i) If the project is to be completed in less than 12 months, the annual dollar value of the work is equal to the full amount of the bid.

(ii) If the project will take more than 12 months to complete, calculate the number of years given to complete the project by dividing the total number of months in the project schedule by 12 (calculate to 3 decimal places), then divide the amount of the bid by the calculated number of years to find the annual dollar value of the work.

Step 3 Add the annualized value of all of the bidder's incomplete contract work (the total of column 9 on page 5) to the annual dollar value of the work to be

performed on your project. **The total may not exceed the bidder's Aggregate Work Limit**.

Correction of Errors and Omissions in Update Statements

Matters of Form: An awarding authority shall not reject a contractor's bid because there are mistakes or omissions of form in the Update Statement submitted with the bid, provided the contractor promptly corrects those mistakes or omissions upon request of the awarding authority. [810 CMR 8.05(1)].

Correction of Other Defects: An awarding authority may, in its discretion, give a contractor notice of defects, other than mistakes or omissions of form, in the contractor's Update Statement, and an opportunity to correct such defects, provided the correction of such defects is not prejudicial to fair competition. An awarding authority may reject a corrected Update Statement if it contains unfavorable information about the contractor that was omitted from the Update Statement filed with the contractor's bid. [810 CMR 8.05(2)].

PART 1 - COMPLETED PROJECTS

LIST ALL PUBLIC AND PRIVATE *BUILDING* PROJECTS YOUR FIRM HAS COMPLETED SINCE THE DATE OF APPLICATION FOR YOUR MOST RECENTLY ISSUED (NOT EXTENDED OR AMENDED) DCAMM CERTIFICATE OF ELIGIBILITY. YOU MUST REPORT ALL REQUESTED INFORMATION NOT PREVIOUSLY REPORTED ON THAT DCAMM APPLICATION*.

PROJECT TITLE & LOCATION	WORK CATEGORY	CONTRACT PRICE	START DATE	DATE COMPLETED

Attach additional sheets if necessary

* If your firm has been terminated from a project prior to completion of the work or has failed or refused to complete its work under any contract, full details and an explanation must be provided. See Part 3 of this Update Statement.

PROVIDE THE FOLLOWING REFERENCE INFORMATION FOR EACH COMPLETED PROJECT LISTED ON THE PREVIOUS PAGE.

PROJECT TITLE	COMPANY NAME	CONTACT PERSON	TELEPHONE
	OWNER:		
	DESIGNER:		
	GC:		
	OWNER:		
	DESIGNER:		
	GC:		
	OWNER:		
	DESIGNER:		
	GC:		
	OWNER:		
	DESIGNER:		
	GC:		
	OWNER:		
	DESIGNER:		
	GC:		

Is your company or any individual who owns, manages or controls your company affiliated with any owner, designer or general contractor named above, either through a business or family relationship? ☐ YES ☐ NO

Are any of the contact persons named above affiliated with your company or any individual who owns, manages or control your company, either through a business or family relationship? ☐ YES ☐ NO

If you have answered YES to either question, explain. _____

PART 2 - CURRENTLY HELD CONTRACTS

LIST ALL PUBLIC AND PRIVATE BUILDING AND NON-BUILDING *CONSTRUCTION* PROJECTS YOUR COMPANY HAS UNDER CONTRACT ON THIS DATE REGARDLESS OF WHEN OR WHETHER THE WORK COMMENCED.

1	2	3	4	5	6	7	8	9
PROJECT TITLE & LOCATION	WORK CATEGORY	START AND END DATES	ON SCHEDULE (yes / no)	CONTRACT PRICE	% NOT COMPLETE	$ VALUE OF WORK NOT COMPLETE (col. 5 X col. 6)	NO. OF YEARS REMAINING (see note below)	ANNUALIZED VALUE OF INCOMPLETE WORK (col. 7 ÷ col. 8) (divided by)

ANNUALIZED VALUE OF ALL INCOMPLETE CONTRACT WORK (Total of Column 9) $_____

Column 8
- If less than one year is left in the project schedule, write 1.
- If more than 12 months are left in the project schedule, divide the number of months left in the project schedule by 12 (calculate to three decimal places).

PROVIDE THE FOLLOWING REFERENCE INFORMATION FOR EACH CURRENTLY HELD PROJECT LISTED ON THE PREVIOUS PAGE.

PROJECT TITLE	COMPANY NAME	CONTACT PERSON	TELEPHONE
	OWNER:		
	DESIGNER:		
	GC:		
	OWNER:		
	DESIGNER:		
	GC:		
	OWNER:		
	DESIGNER:		
	GC:		
	OWNER:		
	DESIGNER:		
	GC:		
	OWNER:		
	DESIGNER:		
	GC:		

Is your company or any individual who owns, manages or controls your company affiliated with any owner, designer or general contractor named above either through a business or family relationship? ☐ YES ☐ NO

Are any of the contact persons named above affiliated with your company or any individual who owns, manages or control your company, either through a business or family relationship? ☐ YES ☐ NO

If you have answered YES to either question, explain. _____

For **Parts 3 and 4**, if you answer YES to any question, please provide on a separate page a complete explanation. You must report all requested information not previously reported on your most recent DCAMM Application for Prime Certificate of Eligibility. Information must supplement all judicial and administrative proceedings involving bidder's firm, which were instituted or concluded (adversely or otherwise) since your firm's Application for your most recently issued (not extended or amended) Certificate of Eligibility. Include all details [project name(s) and location(s), names of all parties involved, relevant dates, etc.].

PART 3 – GENERAL PERFORMANCE

Part 3 of the Update Statement corresponds to Section 5 of the Prime Application. The numbering below refers back to the numbered questions in the application for your reference.

Prime Application Section 5 - General Performance

	YES	NO
5.A. Has your Company been terminated prior to completion of a Contract?	☐	☐
5.B. Has your Company failed or refused to perform or complete any of its Scope of Work under any Contract prior to substantial completion?	☐	☐
5.C. Has your Company and/or any principal, officer, or individual with a Financial Interest in your Company filed for bankruptcy?	☐	☐
5.D. Has a surety for your Company taken over or been asked to complete your Scope of Work under any Contract?	☐	☐
5.E. Has a payment or performance bond been invoked against your Company on any Contract?	☐	☐
5.F. Has any surety for your Company made payment under a payment bond to a vendor or supplier or other party on any Contract?	☐	☐
5.G. Has any subcontractor filed a demand for direct payment on any of your Contracts?	☐	☐
5.H. Has a lawsuit been filed by any of your subcontractors or suppliers to enforce a mechanic's lien in connection with any of your Contracts?	☐	☐
5.I. Has there been a death of any Company employee or other person in connection with (or as the result of) performing your Company's Scope of Work on any of your Contracts?	☐	☐
5.J. Has any Company employee or other person suffered an injury while performing any tasks within the Scope of Work on any of your Contracts resulting in his/her inability to return to work for a period in excess of one year?	☐	☐

PART 4 – LEGAL OR ADMINISTRATIVE PROCEEDINGS; COMPLIANCE WITH LAWS

Part 4 of the Update Statement corresponds to section 6 of the Prime Application. The numbering below refers back to the numbered questions in the application for your reference.

Prime Application Section 6 -Legal or Administrative Proceedings; Compliance with Laws

The term "administrative proceeding" as used in this Prime Contractor Update Statement includes (i) any action taken or proceeding brought by a governmental agency, department or officer to enforce any law, regulation, code, legal, or contractual requirement, except for those brought in state or federal courts, or (ii) any action taken by a governmental agency, department or officer imposing penalties, fines or other sanctions for failure to comply with any such legal or contractual requirement.

The term "anyone with a financial interest in your firm" as used in this Section "I", shall mean any person and/or entity with a 5% or greater ownership interest in the applicant's firm.

	YES	NO
6.A. Have any Judicial Actions or Administrative Proceedings involving your Company and/or a principal or officer or individual with a Financial Interest in your Company been brought, concluded, or settled relating to the procurement or performance of any of your Contracts?	☐	☐
6.B. Have any Judicial Actions or Administrative Proceedings involving your Company and/or a principal or officer or individual with a Financial Interest in your Company been brought, concluded, or settled relating to a violation of any state or federal construction procurement laws?	☐	☐
6.C. Have any criminal charges involving your Company and/or a principal or officer or individual with a Financial Interest in your Company been brought, concluded, or settled relating to the procurement or performance of any of your Contracts (e.g., fraud, graft, embezzlement, forgery, bribery, falsification or destruction of records or receipt of stolen property)?	☐	☐
6.D. Have any Judicial Actions or Administrative Proceedings involving your Company and/or a principal or officer or individual with a Financial Interest in your Company been brought, concluded, or settled relating to a violation of state ethics laws (in Massachusetts: M.G.L. Chapter 268A)?	☐	☐

Section 6 - Legal or Administrative Proceedings; Compliance with Laws (continued)

	YES	NO
6.E. Have any Judicial Actions or Administrative Proceedings involving your Company and/or a principal or officer or individual with a Financial Interest in your Company been brought, concluded, or settled relating to a violation of any state or federal law regulating hours of labor, unemployment compensation, minimum wages, prevailing wages, overtime pay, equal pay, child labor or worker's compensation?	☐	☐
6.F. Have any Judicial Actions or Administrative Proceedings involving your Company and/or a principal or officer or individual with a Financial Interest in your Company been brought, concluded, or settled relating to a violation of any state or federal law prohibiting discrimination in hiring and/or employment?	☐	☐
6.G. Have any Judicial Actions or Administrative Proceedings involving your Company and/or a principal or officer or individual with a Financial Interest in your Company been brought, concluded, or settled for violation of any state or federal law regulating labor relations, including collective bargaining agreements, employee welfare benefit plans, employee pension benefit plans, other ERISA and non-ERISA plans?	☐	☐
6.H. Have any proceedings by a local, state, or federal agency been brought, concluded, or settled relating to decertification, debarment or suspension of your Company and/or any principal or officer or individual with a Financial Interest in your Company from construction contracting?	☐	☐
6.I. Have any Judicial Actions or Administrative Proceedings involving your Company and/or a principal or officer or individual with a Financial Interest in your Company been brought, concluded, or settled relating to a violation of state or federal environmental laws?	☐	☐
6.J. Has your Company been fined or sanctioned by OSHA and/or any other state or federal agency for violations of any laws or regulations related to occupational health or safety?	☐	☐
6.K. Has your Company ever (i) failed to meet applicable workforce and/or diversity program goals, benchmarks or other requirements, and/or (ii) been sanctioned, fined and/or penalized for non-compliance with workforce policies and/or diversity programs (e.g., for MBEs, WBEs, SDVOBEs and DBEs) and/or failure to maintain and/or submit required reports, such as certified payrolls.	☐	☐
6.L. Other than previously reported in the above questions, have any Judicial Actions or Administrative Proceedings or investigations involving your Company and/or a principal or officer or individual with a Financial Interest in your Company been brought, concluded, or settled by any local, state or federal agency relating to the procurement or performance of any construction contract?	☐	☐

PART 5 - SUPERVISORY PERSONNEL

List all supervisory personnel, such as project managers and superintendents, who will be assigned to the project if your firm is awarded the contract. **Attach the resume of each person listed below**.

NAME	TITLE OR FUNCTION

PART 6 - CHANGES IN BUSINESS ORGANIZATION OR FINANCIAL CONDITION

Have there been any changes in your company's business organization (**including changes in ownership, mergers, or asset/stock sales)**, financial condition or bonding capacity since the date your current Certificate of Eligibility was issued? ☐ Yes ☐ No

If YES, attach a separate page providing complete details.

PART 7 – LIST OF COMPLETED CONSTRUCTION PROJECTS SUBMITTED TO THE DIVISION OF CAPITAL ASSET MANAGEMENT AND MAINTENANCE.

Attach here a copy of the list of completed construction projects which was submitted with your firm's DCAMM Application for your most recently issued (not extended or amended) DCAMM Certificate of Eligibility. The Attachment must include a complete copy of the entire Projects Table – "Completed Projects" and the final page – "Certification" (Signature Page) containing the signature and date that the Completed Projects list was submitted to the Division of Capital Asset Management and Maintenance.

DIVISION OF CAPITAL ASSET MANAGEMENT & MAINTENANCE

SUB-BIDDERS' UPDATE STATEMENTS ARE NOT PUBLIC RECORDS AND ARE NOT OPEN TO PUBLIC INSPECTION (M.G.L. C.149, §44D)

Sub-Bidder Update Statement

TO ALL SUB-BIDDERS, TRADE CONTRACTORS AND AWARDING AUTHORITIES

A COMPLETED AND SIGNED SUB-BIDDER UPDATE STATEMENT MUST BE SUBMITTED WITH EVERY FILED SUB-BID PURSUANT TO M.G.L. c.149, §44F AND EVERY TRADE SUB-BID PURSUANT TO M.G.L. c. 149A. ANY FILED SUB-BID OR TRADE SUB-BID SUBMITTED WITHOUT AN APPROPRIATE SUB-BIDDER UPDATE STATEMENT IS INVALID AND MUST BE REJECTED.

Caution: This form is to be used for submitting Filed Sub-Bids and Trade Sub-Bids Only

AWARDING AUTHORITIES

If the Awarding Authority determines that the Sub-Bidder is not competent to perform the work as specified on the project, it should reject the bid.

SUB-BIDDER'S AFFIDAVIT

I swear under the pains and penalties of perjury that I am duly authorized by the bidder named below to sign and submit this Sub-Bidder Update Statement on behalf of the bidder named below, that I have read this Sub-Bidder Update Statement, and that all of the information provided by the bidder in this Sub-Bidder Update Statement is true, accurate, and complete as of the bid date.

Bid Date	Print Name of Sub-Bidder or Trade Contractor
Project Number (or name if no number)	Business Address
Awarding Authority	Telephone Number

SIGNATURE⇨ _____

Bidder's Authorized Representative

INSTRUCTIONS

INSTRUCTIONS TO SUB-BIDDERS

- This form must be completed and submitted by all Filed Sub-Bidders bidding on projects pursuant to M.G.L. c. 149, §44F and Trade Contractors bidding on projects pursuant to M.G.L. c. 149A.

- You must give complete and accurate answers to all questions and provide all of the information requested. MAKING A MATERIALLY FALSE STATEMENT IN THIS SUB-BIDDER UPDATE STATEMENT IS GROUNDS FOR REJECTING YOUR BID AND FOR DEBARRING YOU FROM ALL PUBLIC CONTRACTING.

- **This Sub-Bidder Update Statement must include all requested information that was not previously reported on the Application used for your company's most recently issued (not extended or amended) Sub-Bidder Certificate of Eligibility. The Sub-Bidder Update Statement must cover the entire period since the date of that Application, NOT since the date of your Certification.**

- You must use this official form of Sub-Bidder Update Statement. Copies of this form may be obtained from the awarding authority or from the DCAMM Web Site: www.mass.gov/DCAMM/certification.

- If additional space is needed, please copy the appropriate page of this Sub-Bidder Update Statement and attach it as an additional sheet.

INSTRUCTIONS TO AWARDING AUTHORITIES

Determination of Sub-Bidder Qualifications

- It is the awarding authority's responsibility to determine each responsible bidder. You must consider all of the information in the bidder's Sub-Bidder Update Statement in making this determination. Remember: this information was not available to the Division of Capital Asset Management and Maintenance at the time of certification.

- The Sub-Bidder's performance on the projects listed in Parts 1 and 2 must be part of your review. Contact the project references.

- Awarding Authorities are strongly encouraged to review the Sub-Bidder's entire certification file at the Division of Capital Asset Management and Maintenance, telephone (857) 204-1305 or via email at certification.DCAMM@mass.gov for an appointment.

Correction of Errors and Omissions in Sub-Bidder Update Statements

Matters of Form: An awarding authority shall not reject a Sub-Bidder's bid because there are mistakes or omissions of form in the Sub-Bidder Update Statement submitted with the bid pursuant to M.G.L. c.149, §44D, provided the Sub-Bidder promptly corrects those mistakes or omissions upon request of the awarding authority. [810 CMR 8.13(1)]

Correction of Other Defects: An awarding authority may, in its discretion, give a Sub-Bidder notice of minor defects and omissions as to form in the Sub-Bidder's Update Statement and provide an opportunity to correct its Sub-Bidder Update Statement. However, the Sub-Bidder shall not be allowed to make corrections to a Sub-Bidder Update Statement if material information about the Sub-Bidder was omitted from the Sub-Bidder Update Statement filed with the Sub-Bidder's bid. The Awarding Authority shall advise DCAMM of any material omissions in a Sub-Bidder's Update Statement. [810 CMR 8.13(2)]

PART 1 - COMPLETED PROJECTS

List All Public And Private Projects Of $20,000 or more your company has completed since the date of application for your most recently issued (not extended or amended) Sub-Bidder Certificate Of Eligibility*.

PROJECT TITLE & LOCATION	WORK CATEGORY	CONTRACT PRICE	START DATE	DATE COMPLETED

Attach additional sheets if necessary

* If your company has been terminated from a project prior to completion of the work or has failed or refused to complete its work under any contract, full details and an explanation must be provided. See Part 3 of this Sub-Bidder Update Statement.

PROVIDE THE FOLLOWING REFERENCE INFORMATION FOR EACH COMPLETED PROJECT LISTED ON THE PREVIOUS PAGE.

PROJECT TITLE		COMPANY NAME	CONTACT PERSON	TELEPHONE	EMAIL ADDRESS
	OWNER:				
	DESIGNER				
	GC:				
	OWNER:				
	DESIGNER				
	GC:				
	OWNER:				
	DESIGNER				
	GC:				
	OWNER:				
	DESIGNER				
	GC:				
	OWNER:				
	DESIGNER				
	GC:				
	OWNER:				
	DESIGNER				
	GC:				

Is your company or any individual who owns, manages or controls your company affiliated with any owner, designer or general contractor named above, either through a business or family relationship? ☐ YES ☐ NO

Are any of the contact persons named above affiliated with your company or any individual who owns, manages or control your company, either through a business or family relationship? ☐ YES ☐ NO

If you have answered YES to either question, explain. _____

PART 2 – PROJECTS IN PROGRESS CONTRACTS

List all public and private projects of $20,000 or more your company has under contract on this date regardless of when or whether the work commenced.

1	2	3	4	5	6	7
PROJECT TITLE & LOCATION	WORK CATEGORY	START AND END DATES (MM/YYYY)	ON SCHEDULE (yes / no)	CONTRACT PRICE	% NOT COMPLETE	$ VALUE OF WORK NOT COMPLETE (col. 5 X col. 6)

PROVIDE THE FOLLOWING REFERENCE INFORMATION FOR EACH INCOMPLETE PROJECT LISTED ON THE PREVIOUS PAGE.

PROJECT TITLE		COMPANY NAME	CONTACT PERSON	TELEPHONE	EMAIL ADDRESS
	OWNER:				
	DESIGNER				
	GC:				
	OWNER:				
	DESIGNER				
	GC:				
	OWNER:				
	DESIGNER				
	GC:				
	OWNER:				
	DESIGNER				
	GC:				
	OWNER:				
	DESIGNER				
	GC:				
	OWNER:				
	DESIGNER				
	GC:				

Is your company or any individual who owns, manages or controls your company affiliated with any owner, designer or general contractor named above either through a business or family relationship? ☐ YES ☐ NO

Are any of the contact persons named above affiliated with your company or any individual who owns, manages or control your company, either through a business or family relationship? ☐ YES ☐ NO

If you have answered YES to either question, explain. _____

PART 3 - GENERAL PERFORMANCE

For Parts 3 and 4, if you answer YES to any question, please provide on a separate page a complete explanation. Information you provide herein must supplement the application for your most recently issued (not extended or amended) Sub-Bidder Certificate of Eligibility. You must report all requested information not previously reported on that application.

Include all details [project name(s) and location(s), names of all parties involved, relevant dates, etc.].

	YES	NO
5A. Has your Company been terminated prior to completion of a Contract?	☐	☐
5B. Has your Company failed or refused to perform or complete any of its Scope of Work under any Contract prior to substantial completion?	☐	☐
5C. Has your Company and/or any principal, officer, or individual with a Financial Interest in your Company filed for bankruptcy?	☐	☐
5D. Has a surety for your Company taken over or been asked to complete your Scope of Work under any Contract?	☐	☐
5E. Has a payment or performance bond been invoked against your Company on any Contract?	☐	☐
5F. Has any surety for your Company made payment under a payment bond to a vendor or supplier or other party on any Contract?	☐	☐
5G. Has any subcontractor filed a demand for direct payment on any of your Contracts?	☐	☐
5H. Has a lawsuit been filed by any of your subcontractors or suppliers to enforce a mechanic's lien in connection with any of your Contracts?	☐	☐
5I. Has there been a death of any Company employee or other person in connection with (or as the result of) performing your Company's Scope of Work on any of your Contracts?	☐	☐
5J. Has any Company employee or other person suffered an injury while performing any tasks within the Scope of Work on any of your Contracts resulting in his/her inability to return to work for a period in excess of one year?	☐	☐

PART 4 - Legal or Administrative Proceedings; Compliance with Laws

Please answer the following questions. Information must supplement all judicial and administrative proceedings involving bidder's company, which were instituted or concluded (adversely or otherwise) since your company's Application for your most recently issued (not extended or amended) Sub-Bidder Certificate of Eligibility. You must report all requested information not previously reported on that DCAMM Application.

The term "administrative proceeding" as used in this Sub-Bidder Update Statement includes (i) any action taken or proceeding brought by a governmental agency, department or officer to enforce any law, regulation, code, legal, or contractual requirement, except for those brought in state or federal courts, or (ii) any action taken by a governmental agency, department or officer imposing penalties, fines or other sanctions for failure to comply with any such legal or contractual requirement.

The term "anyone with a financial interest in your company" as used in this Section "I", shall mean any person and/or entity with a 5% or greater ownership interest in the applicant's company.

If you answer YES to any question, on a separate page provide a complete explanation of each proceeding or action and any judgment, decision, fine or other sanction or result. Include all details (name of court or administrative agency, title of case or proceeding, case number, date action was commenced, date judgment or decision was entered, fines or penalties imposed, etc.).

	YES	NO
6.A. Have any Judicial Actions or Administrative Proceedings involving your Company and/or a principal or officer or individual with a Financial Interest in your Company been brought, concluded, or settled relating to the procurement or performance of any of your Contracts?	☐	☐
6.B. Have any Judicial Actions or Administrative Proceedings involving your Company and/or a principal or officer or individual with a Financial Interest in your Company been brought, concluded, or settled relating to a violation of any state or federal construction procurement laws?	☐	☐
6.C. Have any criminal charges involving your Company and/or a principal or officer or individual with a Financial Interest in your Company been brought, concluded, or settled relating to the procurement or performance of any of your Contracts (e.g., fraud, graft, embezzlement, forgery, bribery, falsification or destruction of records or receipt of stolen property)?	☐	☐
6.D. Have any Judicial Actions or Administrative Proceedings involving your Company and/or a principal or officer or individual with a Financial Interest in your Company been brought, concluded, or settled relating to a violation of state ethics laws (in Massachusetts: M.G.L. Chapter 268A)?	☐	☐

PART 4 - Legal or Administrative Proceedings; Compliance with Laws (continued)

	YES	NO
6.E. Have any Judicial Actions or Administrative Proceedings involving your Company and/or a principal or officer or individual with a Financial Interest in your Company been brought, concluded, or settled relating to a violation of any state or federal law regulating hours of labor, unemployment compensation, minimum wages, prevailing wages, overtime pay, equal pay, child labor or worker's compensation?	☐	☐
6.F. Have any Judicial Actions or Administrative Proceedings involving your Company and/or a principal or officer or individual with a Financial Interest in your Company been brought, concluded, or settled relating to a violation of any state or federal law prohibiting discrimination in hiring and/or employment?	☐	☐
6.G. Have any Judicial Actions or Administrative Proceedings involving your Company and/or a principal or officer or individual with a Financial Interest in your Company been brought, concluded, or settled for violation of any state or federal law regulating labor relations, including collective bargaining agreements, employee welfare benefit plans, employee pension benefit plans, other ERISA and non-ERISA plans?	☐	☐
6.H. Have any proceedings by a local, state, or federal agency been brought, concluded, or settled relating to decertification, debarment or suspension of your Company and/or any principal or officer or individual with a Financial Interest in your Company from construction contracting?	☐	☐
6.I. Have any Judicial Actions or Administrative Proceedings involving your Company and/or a principal or officer or individual with a Financial Interest in your Company been brought, concluded, or settled relating to a violation of state or federal environmental laws?	☐	☐
6.J. Has your Company been fined or sanctioned by OSHA and/or any other state or federal agency for violations of any laws or regulations related to occupational health or safety?	☐	☐
6.K. Has your Company ever (i) failed to meet applicable workforce and/or diversity program goals, benchmarks or other requirements, and/or (ii) been sanctioned, fined and/or penalized for non-compliance with workforce policies and/or diversity programs (e.g., for MBEs, WBEs, SDVOBEs and DBEs) and/or failure to maintain and/or submit required reports, such as certified payrolls.	☐	☐
6.L. Other than previously reported in the above questions, have any Judicial Actions or Administrative Proceedings or investigations involving your Company and/or a principal or officer or individual with a Financial Interest in your Company been brought, concluded, or settled by any local, state or federal agency relating to the procurement or performance of any construction contract?	☐	☐

PART 5 - SUPERVISORY PERSONNEL

List all supervisory personnel who will be assigned to the project if your company is awarded the contract.

Attach the resume of each person listed below.

NAME	TITLE OR FUNCTION

PART 6 - CHANGES IN BUSINESS ORGANIZATION OR FINANCIAL CONDITION

Have there been any changes in your company's business organization (**including changes in ownership, mergers, or asset/stock sales)**, financial condition or bonding capacity since the date your current Certificate of Eligibility was issued? ☐ Yes ☐ No

If YES, attach a separate page providing complete details.

PART 7 – LIST OF COMPLETED CONSTRUCTION PROJECTS SUBMITTED TO THE DIVISION OF CAPITAL ASSET MANAGEMENT AND MAINTENANCE ALONG WITH CERTIFICATION SIGNATURE PAGE.

Attach here a copy of the list of completed construction projects which was submitted with your company's application for your most recently issued (not extended or amended) Sub-Bidder Certificate of Eligibility. The Attachment must include a complete copy of the entire Completed Projects spreadsheet and the final page Certification (Signature) Page of the online application, containing the signature and date the completed projects list was submitted to the Division of Capital Asset Management and Maintenance.

APPENDIX C

MASSDEP BRP WS 24

APPROVAL TO CONSTRUCT A FACILITY
TO TREAT GREATER THAN ONE MGD

Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

Southeast Regional Office • 20 Riverside Drive, Lakeville MA 02347 • 508-946-2700

Maura T. Healey
Governor

Kimberley Driscoll
Lieutenant Governor

Rebecca L. Tepper
Secretary

Bonnie Heiple
Commissioner

December 6, 2024

Ms. Kourtney Allen, Superintendent
Attleboro Water Department
1296 West Street
Attleboro, MA 02703

RE: ATTLEBORO- Public Water Supply
Attleboro Water Department
PWS ID#: 4016000
BRP WS24, Approval to Construct a Facility to Treat > 1 MGD
Record #24-WS24-0002-APP
DWSRF 16764

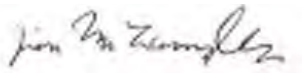
Dear Ms. Allen,

The Southeast Regional Office of the Massachusetts Department of Environmental Protection (MassDEP), Drinking Water Program, is in receipt of plans and specifications for the construction of a 2.0 MGD Water Treatment Plant for the existing Wading River surface water source in the Town of Mansfield, Massachusetts.

Please find attached MassDEP's conditional approval of the new Wading River Water Treatment Plant.

Please note that the signature on this cover letter indicates formal issuance of the attached document. If you have any questions regarding this document, please contact Giliane Tardieu at (508) 946-2789 or Giliane.tardieu@mass.gov.

Sincerely



Jim McLaughlin, Chief
Drinking Water Program
Bureau of Water Resources

DWP Archive/SERO/ATTLEBORO-4016000-System Modifications-2024-12-06 WS24 Wading River

Ec: Water1@cityofattleboro.us
deputyhealthagent@cityofattleboro.us
mtibbetts@tataandhoward.com
modowd@tataandhoward.com
rneyland@tataandhoward.com
Chuyen Nguyen, DEP-SERO-DWP
Scott Sayers, DEP-SERO-DWP
Katie Sousa, DEP-SERO-DWP
Margaret Finn, DEP-Boston-DWP
Lilla Dick, DEP-Boston-SRF

Attleboro Water Department
Attleboro, Massachusetts
PWS ID#4016000
BRP WS24, Approval to Construct Treatment Facility >1MGD
Record #24-WS24-0002-APP

The Southeast Regional Office of the Department of Environmental Protection, Drinking Water Program ("the Department"), is in receipt of plans and specifications for the construction of a Water Treatment Plant at the Wading River Site in the Town of Mansfield, Massachusetts. The plans and specifications, submitted on behalf of the Attleboro Water Department ("the PWS") by Tata and Howard of Marlborough, Massachusetts, were received by the Department on October 10, 2024, and bear the seal and signature of Ryan P. Neyland, a Massachusetts Registered Professional Engineer, P.E. No. 48460 ("the Engineer").

Specific documents relative to this proposal received and reviewed by the Department for conformance with the Department's Water Supply Regulations, 310 CMR 22.00 (Regulations) and "Guidelines and Policies for Public Water Systems" (Guidelines) are as follows:

- WS Certification Form.
- Cover Letter.
- Specifications.
- Fluoride Chemical Feed Checklist.
- NaOH Chemical Feed Checklist.
- NaOCl Chemical Feed Checklist.
- Phosphate Chemical Feed Checklist.
- Hydraulic Loading Rates (HLRs) and Pathogens Calculations.
- Log Removal Credit Summary.
- Permit Summary.
- Design/Engineering Study.
- Pump Design Summary.
- Waste Disposal Plan.
- Water Management Plan.
- 1st half of Drawings Set.
- 2nd half of Drawings Set.

BACKGROUND: A pilot study was conducted to evaluate treatment processes for organics and PFAS removal. Based on the recommendations of that study the PWS is submitting an application for the construction of a new water treatment plant at the Wading River site.

PROPOSED TREATMENT

The new Wading River Water Treatment Plant (WTP) will process up to 2.00 MGD. The WTP will utilize existing exterior raw water sand filtration beds. New construction will include: magnetic ion-exchange (MIEX) treatment, GreensandPlus™ filtration, PFAS removal contactor vessels, disinfection, chemical feed systems, pumps, and appurtenances. PFAS removal media will be Fluoro-sorb® FS-200 Adsorbent media manufactured by CETCO®. Building components including HVAC, plumbing, fire sprinkler system, diesel fueled emergency power generator, and electrical equipment will be incorporated into the new WTP. Additional work will include the demolition of the existing chemical feed facility and existing chlorine contact tank, site work, utilities installation, below-grade concrete tanks and foundation, masonry building,

Attleboro Water Department
Attleboro, Massachusetts
PWS ID#4016000
BRP WS24, Approval to Construct Treatment Facility >1MGD
Record #24-WS24-0002-APP

MAGNETIC ION-EXCHANGE (MIEX) TREATMENT SYSTEM:

Water withdrawn from the Wading River at Blake's Pond in the Town of Mansfield is currently filtered through four open air sand beds. The sand beds with two infiltration wells will remain as part of the proposed treatment process. The discharge lines from the two existing wells will manifold and feed the pre-filtered water standpipe. Water from the standpipe will enter the MIEX system consisting of 3 parallel contactors. Flow through those contactors is continuous providing uninterrupted flow, redundancy, and consistent water quality. Auxiliary equipment to regenerate the resin with sodium chloride salt will also be provided. The MIEX treatment system will consist of the following equipment and appurtenances:

1. One (1) Raw Water standpipe.
2. Three (3) Contactor Tanks.
3. One (1) Loaded Resin Tank.
4. One (1) Fresh Resin Pump Skid.
5. One (1) Salt Saturator Pump Skid.
6. Two (2) Regeneration Skids.
7. One (1) Recycle Brine Tank.
8. One (1) Recycle Brine Pump Skid.
9. One (1) Virgin Resin Skid.
10. Two (2) Air Compressors.
11. One (1) Salt Saturator Tank.
12. One (1) elevated aluminum access platform for the regeneration skids.
13. One (1) elevated aluminum for the contactors and loaded resin tank.
14. Initial MIEX® Resin Supply.
15. Initial Salt Supply.
16. Valves.
17. Piping
18. MIEX System Instrumentation and Electrical Controls.

Each contactor tank will have an inside diameter of 11 feet and an overall height of 19.5 feet. The Contactors shall be provided with a remote input/output (I/O) panel. The system shall operate using automated controls. The following functions shall be fully automatic, requiring no physical labor to execute the following tasks:

1. Regeneration of saturated resin including but not limited to resin transfer, draining of regeneration vessels, flushing of resin, and recirculation.
2. Brine Recycle.
3. Switching of duty-standby status of the three contactors.
4. Monitoring and alarming of MIEX process variables, measured through online instrumentation.
5. Interfacing with SCADA system for start-stop, setpoint adjustment, and alarming.

The MIEX system control logic shall be provided by an Allen-Bradley programmable logic controller (PLC) for compatibility with the Owner's SCADA system. The PLC shall be protected by a surge

suppressor. Operator access to controller registers shall be by touch pad type interface with digital display mounted on a MIEX Main Control Panel (MMCP). The MMCP shall include a UPS sized to power the PLC, OIT, loop power supplies and control devices within the panel for a minimum of 30 minutes.

System Water Quality Requirements:

1. Raw water supplied to the MIEX system shall be slow sand filter effluent.
2. Anticipated MIEX System Influent Water Quality:
    a. Total Organic Carbon (TOC) - 2.0 to 10.0 mg/l
    b. Manganese – less than 1.0 mg/l
    c. Iron – less than 0.5 mg/l
    d. Inlet Sulfate – 5 to 25 mg/L
    e. pH – 5.5 to 8.5
    f. Temperature – 33 °F to 70 °F
3. Plant Effluent Guarantee. Provided that the feed water is within the above ranges, the MIEX system shall produce contactor effluent with the following quality:
    a. TOC – If the Influent TOC is equal to or greater than 5 mg/L, the MIEX process shall remove at least 65% of the TOC from the influent. If the Influent TOC is less than 5 mg/L, the effluent TOC must be reduced to less than 1.8 mg/L with removal percentage defined per the equation below:

$$\text{Removal (\%)} = 1 - \frac{\text{Effluent TOC (mg/L)}}{\text{Influent TOC (mg/L)}}$$

    b. Sodium – The average amount of sodium added by the MIEX process shall be less than 10 mg/l, when comparing effluent to influent concentrations. Up to 14 staged samples may be required to provide adequate averaging.
    c. Chloride - The average amount of sodium added by the MIEX process shall be less than 12 mg/l, when comparing effluent to influent concentrations. Up to 14 staged samples may be required to provide adequate averaging.
4. The MIEX system shall be designed to:
    a. Treat influent flowrates of up to and including of 2.0 million gallons per day (MGD).
    b. Produce no more than 550 gallons per day of brine per MGD treated.
    c. Require less than 490 pounds per day per MGD treated of NSF grade, dry sodium chloride salt crystals.
    d. Require a regeneration frequency of not less than 1000 bed volumes processed to achieve effluent TOC criteria.
    e. Require less than 7,500 gallons per day per MGD treated of water used for all MIEX process ancillary operations such as but not limited to regenerations, resin transfers, and flushing.
    f. Consist of three (3) contactors to provide 3 x 50% design.
    g. Require less than 2.0 gallons of fresh resin per day per million gallons treated.

The Contractor will supply sufficient sodium chloride salt for all installation activities such as start-up and commissioning and placing the MIEX system into initial operation:

a. Salt shall be supplied by pneumatic bulk delivery tanker.
b. Salt shall be NSF 60 certified or listed.
c. Salt shall meet the following MIEX criteria (for max. levels of impurities):

Impurity	Maximum Concentration, Dry Weight Basis
Sulphate, as SO_4^{-2}	5,000 ppm
Calcium, as Ca^{+2}	900 ppm
Magnesium, as Mg^{+2}	600 ppm
Iron, as Fe^{+2}/Fe^{+3}	30 ppm
Total Water Insoluble	0.15% w/w

Waste brine will go to the waste brine holding tank.

GREENSAND FILTER SYSTEM

MIEX treated water will flow to an intermediate wetwell and will be pumped by two intermediate pumps to a pressure filtration system using GreensandPlus™ media. The influent stream to the GreensandPlus™ filter system will be treated with sodium hydroxide, sodium hypochlorite and polyaluminum chloride. The filter system shall include the following elements:

1. Three (3) 10-foot diameter horizontal filter vessels
2. Underdrain
3. Inlet Distributor/Backwash Collector
4. Air Wash Distributor
5. Gravel Retaining Screen
6. Support Gravel
7. Filter Media
8. Control Valves
9. Isolation Valves
10. Accessories
11. Filter Control Panel
12. Filter Face and Connecting Piping
13. Air Backwash Blower
14. Air Backwash System Valves and Piping
15. Instrumentation and Controls
16. Start-up and Training

HORIZONTAL PRESSURE FILTRATION SYSTEM

The horizontal pressure filtration system shall meet the following guidelines:

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1. The filter system shall consist of three (3) 10-foot diameter, 31-foot straight shell length horizontal pressure filters.
2. Based on the following piloted raw water quality:
   Manganese – 0.92 mg/L
   Iron – <0.30 mg/L
   pH – 7.5
   Alkalinity – 31 mg/L as $CaCO_3$
   The filters shall successfully treat a filter loading rate of **2.25 GPM/ft2** when operated at the design water flow rate of 1390 GPM (2 filters in service).
3. The system shall produce filtrate with the following quality:
   Manganese – less than 0.02 mg/L
   Iron – less than 0.03 mg/L
4. The filter run length must be at least 24 hours long between backwashing cycles.
5. The operating weight of each filter, including face piping, shall be approximately 300,000 pounds.

VESSELS

1. Each filter shall be 10’ diameter by 31’ straight shell.
2. The filter tanks shall be of welded steel construction using SA-516 Grade 70 steel, and shall be tested to withstand a hydrostatic pressure 30% in excess of the designed working pressure of 100 psi.
3. The filter tanks shall be of welded steel construction using SA-516 Grade 70 steel, and shall be tested to withstand a hydrostatic pressure 30% in excess of the designed working pressure of 100 psi.
4. The filter tank shall be of the "three cell" design, with steel plate and support beams separating the three compartments. A common underdrain plate shall be welded into the bottom of the vessel, drilled and tapped to receive the sand valve distributors.
5. The heads shall be ASME torispherical and shall not be less than ¼” thick steel and the shell walls shall not be less than ¼” thick steel.
6. Each tank shall be furnished with two (2) structural steel saddles to support the total operating weight of the filter. Each tank shall be furnished with four (4) 14"x 18" manways, one for each cell and a manway in the lower portion of the vessel. Each tank shall be provided with a sufficient number of lifting lugs designed to support the entire weight of the filter assembly.
7. The vessel(s) and face piping shall have surfaces prepared and coated with the surface preparation: All paints, coatings, and sealants in contact with potable water shall be NSF-approved.
8. The filter underdrain system shall be common to all three filter compartments. The underdrain system shall consist of a fully supported bottom plate with 1" drilled and tapped openings spaced to uniformly distribute the backwash water and evenly collect the filtered water.
9. Each filter compartment shall receive its own inlet distributor/backwash collector of the header/lateral design. The distributors shall be fabricated from Sch. 40 steel pipe.

10. Each filter compartment shall receive its own air wash distributor of the header/lateral design. 1. The air wash distributors within the filter tank shall be fabricated from Sch. 40, #316 stainless steel pipe with 150 lb., #316 stainless steel threaded fittings and flanges.
11. Each filter compartment shall be supplied with a gravel retaining screen. 1. The screen shall be installed at the intersection between the top of the graded gravel bed and the start of the Manganese Greensand.

FILTER MEDIA

GreensandPlus™: Each filter compartment shall be provided with enough material for a 24" bed depth of filtration media. Anthracite: Each filter compartment shall be provided with enough material for a 12" bed depth of specially graded anthracite. The total GreensandPlus™ and Anthracite bed depth shall total 36 inches. Gravel Support Bed: A graded gravel support bed shall be incorporated in the bottom of each filter cell, consisting of five (5) layers of graded gravel, with the largest size gravel loaded into the filter first and the succeeding smaller sizes placed on top.

MANWAY ACCESS GRATING

The upper manways in each of the filter compartments shall be made accessible.

AUTOMATIC CONTROL

The filter control panel shall include all hardware and software to monitor and control the pressure filtration system. The filter control panel shall be linked via Ethernet to the computerized SCADA master terminal unit that will monitor and control all other functions within the treatment facility. All control functions accessible from the FCP touch pad interface shall also be accessible via the SCADA workstation computer.

PFAS REMOVAL TREATMENT SYSTEM

The effluent from the Greensand filter system will feed the PFAS treatment system. The equipment is based on the AdEdge Water Technologies, LLC Model MODPFx-12060CS-2-MVT-LL adsorption system. The system shall consist of three (3) pairs of vessels designed and constructed for installation indoors and continuous operation with the following service conditions, and based on the following parameters for each pair of vessels assuming one of the three pairs of vessels is out of service:

1. Design Flow Rate: 695 gallons per minute (gpm)
2. Number of Vessels: Two
3. Vessel Size: 120" O.D. x 60" Side Shell
4. EBCT: 3.0 min per vessel
5. Media Volume: 275 cubic feet (ft3) per vessel
6. Vessel Configuration: Series operation
7. Typical Operating Pressure: 50 psi
8. Maximum Allowable Working Pressure: 100 psi

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FILTER MEDIA

The Media shall be Fluoro-sorb® FS-200 Adsorbent media manufactured by CETCO®, 2870 Forbes Avenue, Hoffman Estates, IL.

The effluent from the PFAS treatment system will feed the backwash supply tank and will be used to backwash both the PFAS vessels and the greensand filters. The effluent from the PFAS treatment system will be treated with phosphate and fluoride before entering a baffled clearwell. Two high lift pumps will convey the finished water from the clearwell to the distribution system.

PUMP DESIGN

Characteristics		East & West Basin Pumps (2) (Existing)	Intermediate Pump Nos. 1 & 2	Supernatant Pump Nos. 1 & 2	Backwash Pump Nos. 1 & 2	High Lift Pump Nos. 1 & 2	Residuals Pump
Design Point 1	Flow (GPM)	900	1,400	300	1,500	1,400	80
	Design Head (feet)	33	125	126	55	325	24
	Pump Efficiency (%)	77	84	81	80	82	67
Shut-off Head (feet) – Max. Speed		52	145	138	93	455	26
Maximum Flow (GPM)		1,050	1,900	500	1,875	2,075	125
Head at Maximum Flow (feet)		27	97	75	39	205	18
Motor	Horsepower	10	60	15	30	150	1
	Volts	460	460	460	460	460	460
	Phase	3	3	3	3	3	3
	Drive	Variable	Variable	Variable	Variable	Variable	Motor Starter

Start/stop operations of the new treatment plant will be interlocked with the start/stop operations of the East and West Basin pumps, which are on/off controlled based on the elevation of the controlling distribution system storage tank. The operator shall set the WTP influent flow rate and select which pumps are to operate at the SCADA (lead/lag). The SCADA will control the speed of the pump/VFD to maintain the preset flow rate. For flows up to 700 gpm, the lead pump will operate alone and above 700 gpm, both pumps will operate. For 2-pump operation, the SCADA shall operate the pumps at the same speed.

CHEMICAL FEED SYSTEMS

Five chemical feed systems will be installed at the treatment plants ("critical chemicals" requiring extra control systems are identified in parentheses):

- Sodium hydroxide. (*critical*)
- Sodium hypochlorite. (*critical*)
- Hydrofluorosilicic acid. (*critical*)
- Polyaluminum chloride.
- Ortho-polyphosphate.

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Each chemical feed system will include bulk tanks, day tank, magnetic drive transfer pump, and two peristaltic metering pumps.

The chemical treatment and control systems have been designed in compliance with the Massachusetts Drinking Water Regulations' 310 CMR 22.04(14) Chemical Safety Control for Critical Chemical Feed Systems, and the *Guidelines for Public Water Systems* ("Guidelines") Chapter 6, Section 6.1.3.

Sodium hydroxide, sodium hypochlorite, liquid phosphate and hydrofluorosilicic acid will be stored in bulk tanks. The hydroxide and hypochlorite systems will have 2 bulk tanks each, while the phosphate and fluoride will have a single bulk tank. Each tank will be equipped with a radar level sensor for monitoring tank levels by the SCADA system, and for indication both locally on the respective transfer pump control panel (TPCP), and at the respective exterior fill stations (6 total). At a preset high level as programmed at the SCADA system, an audible alarm will sound at the respective fill station, and a respective high tank level alarm will be annunciated at the SCADA system. The exterior horn will continue to annunciate until acknowledged either at the SCADA system, or by activation of the acknowledge button on the fill station panel.

The above chemical feed systems are each equipped with a single day tank and transfer pump. The day tanks are refilled by manual operation of a local "ON/OFF" switch which must be manually maintained in the ON position during filling of the tank. The transfer pump may also be stopped automatically by the high-level switch in the day tanks. Radar level sensors on the day tanks provide level indication to the SCADA system and locally on the respective TPCP.

Poly aluminum chloride (PACl) is purchased in carboys and stored on a grated containment area. A carboy is placed on a digital weigh scale that transmits a 4-20mA signal to the SCADA in proportion to weight. Daily day/carboy and bulk tank usage will be recorded at the SCADA. Resetting of the daily totals will be via the operator initiating a manual reset button on the SCADA. Low level/weight setpoints for each day tank/carboy and bulk tank shall annunciate a respective alarm on the SCADA.

Summary Table of Chemical Tanks:

Chemical	Number of Bulk Tanks	Volume of Bulk Tank (Gallon)	Number of Day Tanks	Volume of Day Tank (Gallon)	Number of Transfer Pumps	Number of Metering Pumps	
NaOH	2	2,550	2	275	1	2	
NaOCl	2	2,550	1	330	1	2	
H_2SiF_6	1	545	1	30	1	2	
Phosphate	1	905	1	30	1	2	
PACL	Carboy	-----	1	25	-----	2	Scale

The chlorine and caustic feed systems shall be equipped with a 3-way motorized valve connecting the outlet of the two bulk tanks on each system. Selection of the bulk tank to utilized for day tank refilling will be via a selector switch (Tank A/Tank B) mounted on the respective TPCP. Each feed system is

equipped with two metering pumps (one a standby), that pump chemical to the appropriate water header in proportion to the respective metered water flow. Each metering pump shall be furnished with a local control panel containing a HOA switch. Local operation requires activation of the spring-loaded switch to the ON position, at which point the pump operates for a period time set on the panel's timer. Contacts on the HOA switch provide an "In AUTO" signal to the SCADA.

With all metering pumps in AUTO at the local control stations, the operator via the SCADA selects which of each system's pumps is lead/lag. The SCADA system will provide individual start/stop signals to each lead pump that is interlocked as follows:

- The caustic, PACl, and chlorine pumps will energize to feed chemical to the MIEX effluent main prior to the GreensandPlus filters whenever an IP starts and the water flow signal exceeds a preset setpoint (i.e.: 100 gpm), and deenergize when all IP pumps stop.
- The phosphate and fluoride pumps will energize and feed chemical to the treated water header prior to the clearwell whenever an IP starts and the finished water flow to the clearwell exceeds a preset setpoint (i.e.: 100 gpm), and deenergize when the IP pumps stop.

The SCADA shall also have AUTO and STOP selection for each metering pump that will prevent a respective pump from operating when set to OFF. The SCADA system will provide individual 4-20mA pacing signals to each pump, which shall be capable of being scaled either up or down at the SCADA interface console, by the operator. The SCADA system shall be programmed to prevent both metering pumps from operating at the same time via SCADA, when the local control panels for each pump are in "AUTO". If one local control panel is in "AUTO" and the other local control panel is in "HAND", the SCADA system shall allow both pumps to operate.

Level switches located in all five chemical containment areas will activate respective alarms on the SCADA system to warn of a chemical spill.

Flow switches on the water supply line to each emergency shower/eyewash unit on the main floor and in the basement will activate an emergency alarm on the SCADA system to warn of a potential employee injury.

A temperature transmitter located in the process area of the WTP will provide a 4-20mA signal to the SCADA in proportion to room temperature. Respective "high" and "low" temperature alarms will be annunciated at the SCADA at preset high and low temperature setpoints.

Float switches located in basement sump of the WTP will annunciate an alarm to warn of high level.

CLEARWELL DESIGN

The serpentine, baffled clearwell is designed for an 8-foot depth at 98,000 gallons. Channel width is 5 feet, 4 inches. Travel distance is over 250 feet (Department estimate) through the clearwell. The shutdown depths will be a minimum of 7-feet and a maximum of 9.5 feet. Design conditions are pH of 7.5, chlorine residual of 1.0 mg/l, with a 0.7 baffle factor. Worst-case conditions during winter, with temperature less

than 0.5°C and at maximum flow of 2 MGD (1,389 gpm), show the actual CT (chlorine residual multiplied by contact time) of 49.4 mg·min/l, which exceeds the CT required for 0.5 log Giardia Lamblia inactivation of 42.2 mg·min/l.

A Contact Time Tracer Study for the clearwell will be provided at least 45 days prior to the anticipated startup of the WTP. The hydrofluorosilic acid chemical feed system provided at the WTP by the Contractor will be used as the tracer chemical. The PWS shall apply for a BRP WS21 Pilot Study Proposal tor the CT study, and submit the report under a BRP WS22 Pilot Study Report.

ANALYTICAL INSTRUMENTS AND SAMPLING

A sample line on the treated water header prior to the GreensandPlus filters provides water to a combination pH/chlorine analyzer in the laboratory, which outputs respective pH and chlorine residuals to the SCADA for monitoring. High and low adjustable setpoints for both parameters annunciate respective alarms on the SCADA.

A sample line on the treated water header after chemical injection but before the clearwell provides water to a combination pH/chlorine analyzer in the laboratory, which outputs respective pH and chlorine residuals to the SCADA for monitoring and recording. High and low adjustable setpoints for both parameters annunciate respective alarms on the SCADA.

A sample line from a tap on the finished water main downstream of the high lift pumps provides water to both a fluoride and combination pH/chlorine analyzer in the laboratory, which outputs respective fluoride, pH and chlorine residuals to the SCADA for monitoring and recording. High and low adjustable setpoints for all three parameters which annunciate respective alarms on the SCADA and shutdown the WTP.

Two low-range and one high range turbidimeters shall be provided that monitor the following sampling locations:

a. Prefiltered water prior to MIEX treatment (low range).
b. Post-Greensand filtered water Combined Filter Effluent (low range).
c. Supernatant return line (high range).

The prefiltered and post-Greensand samples are required as part of the Surface Water Treatment Rule and have adjustable high turbidity alarm setpoints. The supernatant turbidimeter shall be an inline insertion probe used to monitor turbidity and suspended solids in the returned water for determining the need to extend spent backwash water settling times or the need to remove the settled residuals in the tank. Two indicator/controllers shall be furnished to provide local display of the turbidimeter readings and transmit the turbidity signals to SCADA for monitoring and recording. The two low-range turbidimeters shall be connected to a single indicator/controller and the high-range will be connected to its own unit.

The three turbidimeters and the prefiltered water pH/temperature analyzer all drain to a self-contained ejector pump basin that pumps the sample waste flow to the spent backwash tank.

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SUPERVISORY CONTROL & DATA ACQUISITION SYSTEM

A new computerized SCADA system, consisting of a programmable logic controller (PLC) based main control panel (MCP) and three personal computer (PC) workstations located at the new water treatment facility, constructed under this contract. The work also involves installation of four new Remote I/O panels. The programmable logic controller(s) (PLC) in the main control panel (MCP) shall be the central point for monitoring and controlling all instruments, signals, alarms and controls in the water treatment facility. All monitoring and control of the new WTP and associated high lift, intermediate, and well pumps shall be via the PLC in the MCP. The central point of the SCADA monitoring and control system shall be the programmable logic controller (PLC) in the existing MTU at the West Street Facility.

Flow switches on the water supply line to each emergency shower/eyewash unit on the main floor and in the basement will activate an emergency alarm on the SCADA system to warn of a potential employee injury.

A temperature transmitter located in the process area of the WTP will provide a 4-20mA signal to the SCADA in proportion to room temperature. Respective “high” and “low” temperature alarms will be annunciated at the SCADA at preset high and low temperature setpoints.

A float switches located in basement sump of the WTP will annunciate an alarm to warn of high level.

A standby power generator system complete with transfer switch will be installed and will include:

1. Engine/generator set.
2. Transfer switch.
3. Batteries.
4. Battery charger.
5. Exhaust system.
6. Weatherproof Enclosure.

The generator will have a diesel fueled engine and be able to provide 500 kilowatts of electrical power at 0.8 power factor for continuous standby operation. A relay in the automatic transfer switch will furnish a “loss of normal power” alarm to the SCADA. Contacts within the emergency generator control panel shall furnish a “running” status signal and common “trouble” alarm to the SCADA for generator alarm annunciation. Note that natural gas is not available in the vicinity of the plant.

A fire alarm system will be installed. The fire alarm system shall provide a general evacuation signal which shall be manually and automatically initiated. Contacts on the fire alarm system shall provide fire notification to the SCADA system.

Intrusion detection and security camera systems will be installed.

A chain link fence system 8-feet high with a cantilever side gate will be installed.

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WASTE DISPOSAL PLAN

The Wading River Water Treatment Plant (WTP) will generate four distinct waste streams. These waste streams are sanitary waste, instrumentation and process waste, residuals from manganese GreensandPlus™ treatment and backwashing, and brine waste from MIEX treatment.

A 2-stage lagoon system is designed to handle and discharge process residuals from the GreensandPlus™ backwash process at the Wading River WTP. GreensandPlus™ filters are used for iron and manganese removal and are periodically backwashed, where the residuals will be discharged to a spent backwash holding tank. The residuals will settle in the tank and the supernatant will be recycled back to the start of the GreensandPlus™ filtration process. The settled residuals will be pumped out to the lagoon system.

Process and instrumentation equipment waste from the sink drain in the WTP laboratory is directed to the onsite septic system. Five online analyzers located in the laboratory are specified in to measure water quality parameters of select process streams. All five analyzers being specified as reagentless and adding no chemicals to the water, all of the water exiting the analyzers can and will be discharged into the Spent Backwash Tank.

The spent brine solution from the regeneration process of the MIEX resin is a waste stream. A below grade storage tank will store this spent brine solution. This solution will accumulate in the tank and be vacuumed into a waste hauling truck for transportation and disposal offsite as a hauled waste.

Sanitary waste from plumbing fixtures such as toilets, lavatories, and showers will be discharged to an onsite septic system located at the Wading River WTP.

Bench-scale testing of the sludge and MIEX brine produced at the Wading River WTP will be conducted during initial startup and testing to confirm or determine the means for proper disposal. A more detailed Waste Disposal Plan will be submitted to the Department during construction of the Wading River WTP, and the Residuals Management Plan portion will be finalized after the appropriate bench-scale testing of the sludge.

SURFACE WATER TREATMENT RULE (SWTR) COMPLIANCE

The SWTR requires 99.99% (4-log) removal and/or inactivation of viruses and 99.9% (3-log) removal and/or inactivation of Giardia lamblia. 2-log minimum removal of Cryptosporidium was added by the Interim Enhanced Surface Water Treatment Rule (IESWTR). Monthly reporting of CT calculations determines compliance with the log inactivation requirements.

The raw water sand beds do not qualify as “slow sand filtration” under the SWTR, thus the proposed treatment plant will continue to be classified as an “alternative” treatment plant for SWTR compliance purposes.

Based upon the historical SWTR compliance provided by the sand beds, and as demonstrated through piloting and documented in the Pilot Study Report the Department approved on May 6, 2024 (Record No. 24-WS22-0007), the Department is approving 2-log Giardia removal by the sand beds.

The Pilot Study Report demonstrated the GreensandPlus™ filters can achieve 2-log Giardia removal when operated with polyaluminum chloride at a filter loading rate of 2.25 gpm/sf. The Department is approving the GreensandPlus™ filters 1-log of Giardia removal provided the filters are operated no higher than 2.25 gpm/sf and a coagulant is continuously added.

The SWTR requires at least 0.5 log Giardia inactivation by disinfection. The proposed clearwell is designed to achieve at least 0.5 log Giardia inactivation by sufficient contact time using sodium hypochlorite.

Based on the approved Pilot Study Report and the submitted design, the Department approves pathogen removal and inactivation credits for the following treatment processes: existing sand filters; proposed GreensandPlus™ vessels (2.25 gpm/sf max loading rate) with polyaluminum chloride coagulant; and sodium hypochlorite disinfection. These treatment processes are granted 3.5-log Giardia lamblia, 4-log virus, and 2 log Cryptosporidium removal and inactivation credits.

APPROVAL CONDITIONS

Pursuant to the Department's authority under 310 CMR 22.04(7) to require that each supplier of water operate and maintain its system in a manner that ensures the delivery of safe drinking water to consumers, this approval is made subject to the following conditions:

1. All submittals required by this approval shall be directed to the Department's Southeast Regional Office Drinking Water Program unless otherwise specified. All submittals required by this approval shall reference the date of this approval letter and Record Number 24-WS24-0002-APP.

2. The PWS shall notify the Department, in writing, thirty (30) days prior to the completion of the facility construction so that a final inspection can be conducted. The PWS shall not place the subject facility into service until such time as the Department conducts its final inspection of the completed treatment works and approves the use of the described facility in writing.

3. Construction shall be completed in strict accordance with the submitted plans. Any changes made to the submitted plans or specifications affecting the capacity, hydraulic conditions, operating units, functioning of water treatment processes or quality of water to be delivered, shall receive prior written approval of the Department's Southeast Regional Office Drinking Water Program.

4. The PWS shall submit for review and approval a Proposal for a Chlorine Contact Time Tracer Study as a BRPWS21 Pilot Study Proposal permit application. The Proposal must be approved by the Department prior to final approval for the use of the water treatment facility. The Proposal shall identify interim contact time values to be used at startup to ensure that the facility will comply with the inactivation requirements of the Surface Water Treatment Rules. The study using approved tracer(s) will commence with startup of the treatment facility. The PWS shall complete the Tracer Study within 60 days following startup and submit a report of the Tracer Study results to the Department for approval within 90 days following startup. The Tracer Study Report shall outline the final methods and values the PWS intends to use to comply with the Surface Water Treatment Rules. The Tracer Study Report shall be submitted as a BRPWS22 Pilot Study Report.

5. In accordance with 310 CMR 22.20A(3)(b)2, The residual disinfectant concentration in the water entering the distribution system cannot be less than 0.2 mg/l for more than four hours.

6. Based on the approved Pilot Study Report and the submitted design, the Department approves pathogen removal and inactivation credits for the following treatment processes: existing sand filters; proposed GreensandPlus™ vessels (2.25 gpm/sf max loading rate) with polyaluminum chloride coagulant; and sodium hypochlorite disinfection. These treatment processes are granted 3.5-log Giardia lamblia, 4-log virus, and 2 log Cryptosporidium removal and inactivation credits.

7. The PWS shall submit a "Continuous Turbidity Meter Questionnaire for Validation Protocol" form to the Department for each turbidimeter to be used for compliance purposes prior to the final inspection.

8. The media used in the PFAS removal vessels shall be Fluoro-Sorb® FS-200 organo-clay absorbent media. The PWS shall adhere to the Manufacturer's requirements and the requirements contained in the Department's New Technology Approval letter dated August 2, 2023.

9. All sample taps within the treatment facility shall be a smooth-nosed style. No threads shall be on any sample tap.

10. The PWS shall update its Emergency Response Plan to incorporate the new facilities.

11. The PWS shall update its asset management plan, inventory, maintenance plan, and budget to include the new facilities.

12. The PWS shall, minimally, complete the EPA's "10 Questions for a Cybersecurity Dialogue with a Utility." The results shall not be submitted to the Department. The engineer shall certify that the work was done and the completed work shall be shown during the final inspection.

13. No later than sixty (60) days following the date of the Department's written approval to activate the modified facility, the PWS shall engage a third party to conduct a cybersecurity assessment. Free cybersecurity assessments are available from EPA. The PWS will receive an assessment report following completion of the assessment. Do not email or share the report with anyone. Contact the Department upon receipt of the assessment report and the Department will arrange to conduct an onsite review of the report.

14. All chemical tanks, carry pipes, and chemical injection locations shall be labeled in accordance with the Department's Guidelines and Policies for Public Water Systems ("*Guidelines*"). The bulk fill station shall be labeled with the chemical name, chemical formula, and 4-digit UN number.

15. Bulk and day chemical storage tank vents shall vent individually to the exterior of the facility. Bulk tanks shall not feed directly to a chemical feed pump, and no connection from a bulk tank shall bypass the day tank.

16. The PWS shall post an emergency contingency planning sheet in a readily visible part of the treatment facility as required and specified at *Guidelines* sections 7.2.9 and 12.1.1.

17. The PWS shall maintain the pH of the finished water (point of distribution system entry) at a level consistent with their corrosion control strategy. The Department will require full rounds of semiannual monitoring under the Lead and Copper Rule (LCR) after granting final approval of the modified treatment facilities to go online. Please submit a new LCR sampling plan for approval.

18. The PWS shall, at a minimum, monitor and record the pH levels and chlorine residual levels of water entering the distribution system from the treatment facilities on a daily basis. The results shall be entered on the required water treatment reporting forms. Daily readings are being required in order to validate the accuracy of the continuous pH and chlorine residual monitoring equipment.

19. The PWS must establish its applicable Optimum Water Quality Parameters (OWQP) to comply with the Lead and Copper Rule (LCR) (310 CMR 22.06B). To accomplish this, the PWS will need to collect water quality samples from the finished water sample line, all other entry points (i.e., sample the source water; post-treatment if treatment is used), and from sites in the distribution system which represent water quality throughout the distribution system (e.g., coliform sampling sites). Water quality data shall be reported to the Department on Form LCR-WQA. Please contact Nicholas Shuler of the Southeast Regional Office at 617-418-0444 to verify the OWQP sampling protocol.

20. Instrumentation, monitoring equipment, and alarm systems must be properly maintained and calibrated at all times. Separate calibration logs for each instrument/monitor must be maintained.

21. Water Treatment Chemicals:

    a) The PWS shall ensure that chemicals which may come in contact with the water or affect the quality of the water, are certified to be in conformance with ANSI/NSF Standard 60 or meet the food grade standards of the United States Pharmacopeia. Each chemical barrel delivered from the manufacturer must bear the NSF seal.
    b) A properly certified operator shall be present when any deliveries of chemicals are made. Handling and storage of any chemical shall conform to the *Guidelines*. Chemical delivery procedures shall be posted at the facility.
    c) The facility shall be equipped with appropriate quantities of personal protection equipment as directed by Safety Data Sheets (SDS) for the chemicals used on site. Such equipment shall include, but not be limited to, safety goggles, face shields, chemical aprons, chemical resistant gloves, hearing protection, fire extinguishers, litmus paper, first aid kit, etc. All staff working at the facility shall be trained in the use and proper application of the safety equipment. A copy of the SDS for each chemical used or stored shall be available at all times at the treatment facility.
    d) The PWS shall have available appropriate laboratory equipment to monitor chlorine and pH. The equipment shall be on hand at the time of the final inspection.
    e) The PWS shall report to the Department the amount of all chemicals introduced to the subject water supply in accordance with 310 CMR 22.15(4) of the Drinking Water Regulations of Massachusetts on a form approved by the Department.

22. The PWS shall implement best management practices regarding sodium hypochlorite to minimize the formation of chlorate.

23. A cross-connection survey of the new treatment plant shall be performed by a Massachusetts certified cross connection control surveyor prior to final inspection. Completed and signed standard cross connection control survey forms shall be provided to the Department at the time of final inspection. The PWS shall maintain copies of all cross-connection control documents.

24. The PWS shall maintain communication with its customers regarding any potential water service disruption during the project.

25. The Operation and Maintenance (O&M) manual for the water treatment plant, shall include a spare parts list and parts order form. This O&M manual shall contain information necessary for the operator of the water supply system to properly operate and maintain said system in accordance with the Department's Regulations, *Guidelines* and Policy 93-02 "Operation and Maintenance Manuals."

26. The following shall be prepared and available on site prior to the Department's final inspection of the completed facility: O&M manual; emergency contact sheet; chemical receiving procedure; alarm testing procedure; quarterly alarm testing logs; and instrumentation calibration sheets. Some of these materials may be kept electronically at the PWS's discretion, contact the Department for guidance.

27. The PWS shall not place the treatment facility in service until such time as satisfactory post-treatment results for the following contaminants are provided to the Department from a Massachusetts-certified testing laboratory: coliform bacteria, inorganics, PFAS, secondary contaminants, VOC. All sample results shall be submitted on standard Department reporting forms with the "SS" (Special Sample) boxes checked.

28. The PWS shall, prior to the construction of the facility, secure any and all approvals necessary for the ultimate disposal of the accumulated water treatment plant residuals in accordance with applicable rules and regulations. In addition, in accordance with the Department's *Guidelines* Chapter 5, Section 10, the PWS shall prepare and provide the Department with a written (electronic pdf document) Waste Disposal Plan including a detailed Residuals Management Plan prior to placing the facility on-line.

29. The PWS shall provide the Department with a facility-staffing plan. The plan should detail staff coverage of the new facilities in accordance with the requirements of 310 CMR 22.11B of the Massachusetts Drinking Water Regulations. For this purpose, please be advised the Department has rated the new Wading River Water Treatment Facility at a Grade IV-T level.

30. The PWS shall submit a certification to the Department's Air Quality Program within 60 days of installing the emergency power generator. Instructions for the certification can be found at: https://www.mass.gov/how-to/submit-a-compliance-certification-stationary-engine-or-turbine.

31. During the final inspection, the applicant shall demonstrate the operation of the treatment processes, interlocking, alarms and the instrumentation and control system.

32. The Department recommends the PWS assess the vulnerability of the treatment plant and equipment and include the results of the assessment in any security planning.

33. Prior to the Department's final inspection, a Massachusetts Registered Professional Engineer shall submit a stamped certification of the completed works. The certification shall be accompanied by the following:
    a. A statement certifying that the facilities have been constructed in accordance with the plans and specifications, and are in compliance with the Department's regulations, guidance, policies, and this approval.
    b. A statement that the facilities are fully operational, tested and ready to be put on-line.
    c. A statement certifying that the piping and facilities have been disinfected in accordance with the applicable ANSI/AWWA standards.
    d. A statement certifying that pressure testing of the water mains has occurred, as applicable. A copy of the test results shall be submitted to this office. If a pressure test has not been performed then this office will require one according to the manufacturer's specifications. (See *Guidelines*, Section 9.7.6).
    e. A form summarizing the critical chemical alarm testing results and other requirements as provided by the Department.

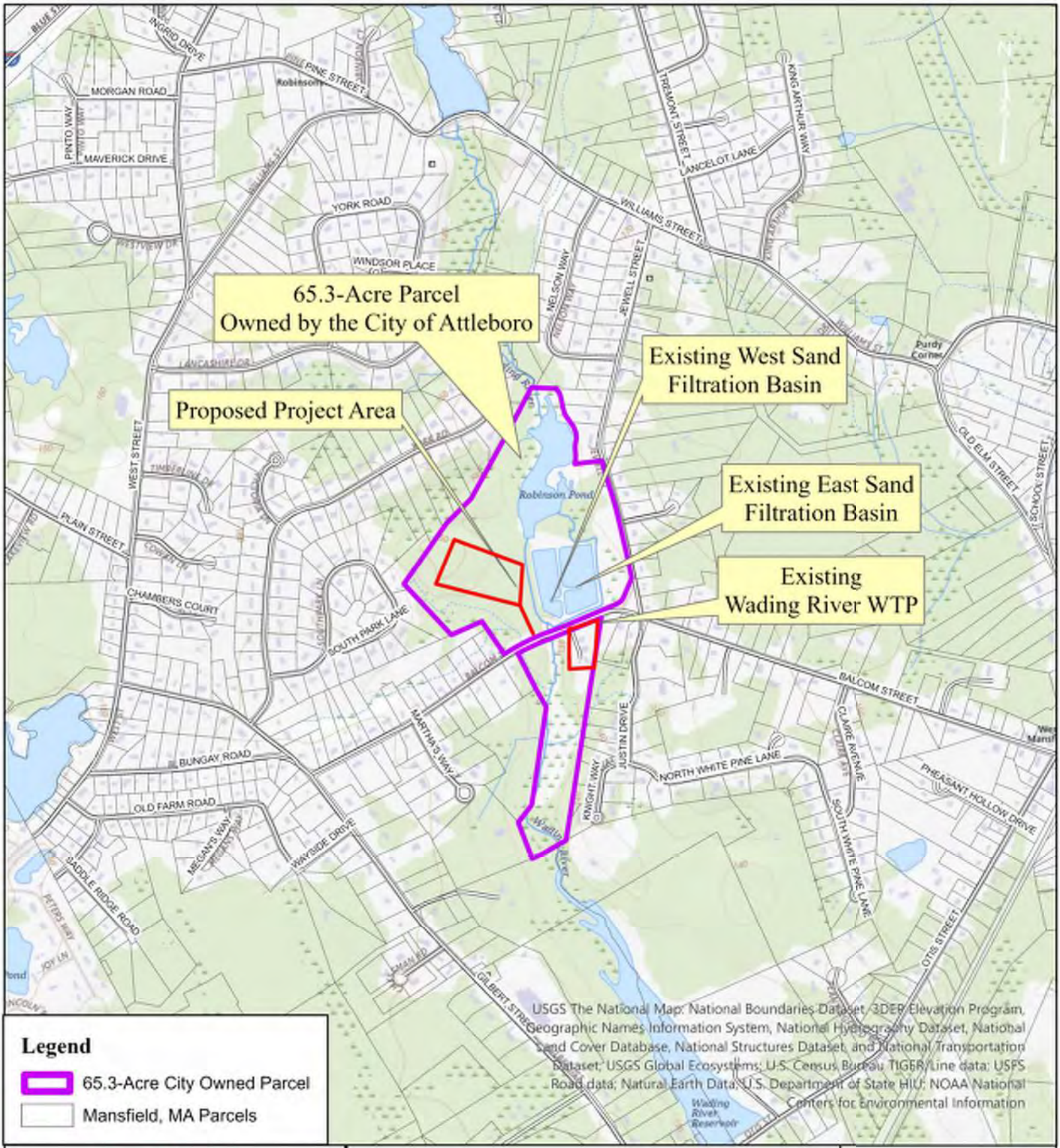
34. This permit approval does not grant water withdrawal to exceed those limits authorized by the PWS's Water Management Act Registration and Permit.

35. All equipment installations, including horizontal and vertical pumps, shall be guarded in accordance with OSHA standard 1910.219 (rotating equipment) and OSHA standard 1910.212 (all moving equipment.) The PWS is responsible for ensuring compliance with all applicable safety regulations in addition to these specific citations. The review of this permit does not constitute a review of safety requirements under the purview of OSHA or the Massachusetts Department of Labor.

Both the Administrative and Technical Reviews of the following application has been completed: BRP WS24, Approval to Construct Treatment Facility Modifications >1 MGD, Record #24-WS24-0002-APP. This approval pertains only to the water supply aspects of the proposal and therefore does not negate the responsibility of the owners or operators to comply with other applicable laws, and/or regulations

APPENDIX D

LOCUS MAP



TATA & HOWARD

Date: February 2025
Approximate Scale: 1"=1,000'

Locus Map

Attleboro Wading River WTP

Mansfield, Massachusetts

Figure No.

1-1

APPENDIX E

MIEX VALVE SCHEDULE

Wading River Water Treatment Plant
Attleboro Water Department
MIEX Valve Identification List

Valve Tag	Factory Mounting	Description	Valve Size (inches)	Connections	Connection Type	Valve Body	Valve Trim	Valve Seat	Actuated or Manual	Fail Mode	Make and Model	Manufacturer Part Number
V2100	Shipped Loose to be Field Installed by General Contractor	Contactor 1 Isolation	8	Butterfly (Lugged)	Lugged (#150)	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 578	161 578 108
POV-2103	Shipped Loose to be Field Installed by General Contractor	Contactor 1 Effluent On/Off	8	Butterfly	Wafer (#150)	PVC	EPDM	EPDM	Actuated	Closed	Georg Fischer: Type 240	199 240 008
V2104	Shipped Loose to be Field Installed by General Contractor	Contactor 1 High Drain	3	Butterfly (Lugged)	Lugged (#150)	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 578	161 578 104
V2106	Shipped Loose to be Field Installed by General Contractor	Contactor 1 Low Drain	3	Butterfly (Lugged)	Lugged (#150)	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 578	161 578 104
V2108	Shipped Loose to be Field Installed by General Contractor	Contactor 1 Influent Drain/Sample	1	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 344
V2110	Shipped Loose to be Field Installed by General Contractor	Contactor 1 Effluent Drain/Sample	1	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 344
V2112	Shipped Loose to be Field Installed by General Contractor	Contactor 1 Circulation Pump Suction Isolation	6	Butterfly (wafer)	Wafer (#150)	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 567	161 567 007
V2113	Shipped Loose to be Field Installed by General Contractor	Contactor 1 Effluent Standpipe Drain	2	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 347
V2114	Shipped Loose to be Field Installed by General Contractor	Contactor 1 Circulation Pump Discharge Isolation	6	Butterfly (wafer)	Wafer (#150)	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 567	161 567 007
V2115	Shipped Loose to be Field Installed by General Contractor	Contactor 1 Effluent Standpipe Pressure/Level Transmitter Block/Bleed	½	Needle (Bar Stock)	NPT (MxF)	SS316	SS316	N/A	Manual	N/A	WIKA: Type 910.11.200	4339836
V2116	Shipped Loose to be Field Installed by General Contractor	Contactor 1 Circulation Pump Discharge Check	6	Butterfly (wafer)	Wafer (#150)	SS	SS	SS	Manual	N/A	RitePro: Model XEZ NSF	V0615XEZNSF
V2117	Shipped Loose to be Field Installed by General Contractor	Contactor 1 Circulation Pump Discharge Pressure Transmitter Block/Bleed	½	Needle (Bar Stock)	NPT (MxF)	SS316	SS316	N/A	Manual	N/A	WIKA: Type 910.11.200	4339836
V2118	Shipped Loose to be Field Installed by General Contractor	Contactor 1 Circulation Pump Discharge Sample / Drain	1	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 344
V2119	Shipped Loose to be Field Installed by General Contractor	Contactor 1 Circulation Pump Air Release Valve	3/4	Air Release	NPT	SS304	Hardened Chrome	N/A	Manual	N/A	Armstrong: Type 11-AV	11AV-3/4"-#38
V2120	Shipped Loose to be Field Installed by General Contractor	Contactor 1 Loaded Resin Airlift Outlet Isolation	2	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 347
V2122	Shipped Loose to be Field Installed by General Contractor	Contactor 1 Loaded Resin Airlift Drain	1	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 344
V2124	Shipped Loose to be Field Installed by General Contractor	Contactor 1 Recycle Airlift Isolation	1/2	3-Piece Ball	NPT	SS316	PTFE	RPTFE	Manual	N/A	FlowTek: 7000 Series	7103-3-R-R-L
V2126	Shipped Loose to be Field Installed by General Contractor	Contactor 1 Recycle Airlift Air Supply Check	1/2	1-Piece Check	Tube x Tube	Al	Al	Al	Manual	N/A	PISCO: Type CVU	CVU1/2-1/2
V2128	Shipped Loose to be Field Installed by General Contractor	Contactor 1 Fresh Resin Inlet Isolation	3	Butterfly (Lugged)	Lugged (#150)	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 578	161 578 104
V2130	Shipped Loose to be Field Installed by General Contractor	Contactor 1 Fresh Resin Inlet Drain/Sample	1	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 344
V2132	Shipped Loose to be Field Installed by General Contractor	Contactor 1 Bottom Sample Isolation	1	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 344

Wading River Water Treatment Plant
Attleboro Water Department
MIEX Valve Identification List

Valve Tag	Factory Mounting	Description	Valve Size (inches)	Connections	Connection Type	Valve Body	Valve Trim	Valve Seat	Actuated or Manual	Fail Mode	Make and Model	Manufacturer Part Number
V2134	Shipped Loose to be Field Installed by General Contractor	Contactor 1 Low Sample Isolation	1	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 344
V2136	Shipped Loose to be Field Installed by General Contractor	Contactor 1 Middle Sample Isolation	1	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 344
V2138	Shipped Loose to be Field Installed by General Contractor	Contactor 1 High Sample Isolation	1	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 344
PR-2140	Skid Mounted by Vendor	Contactor Sample Sink Service Water Pressure Regulator	1	Pressure Regulator	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 582 (w/ Gauge)	161 582 224
V2140	Skid Mounted by Vendor	Contactor 1 Sample Sink Eductor Service Water Valve	1	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 344
V2141	Skid Mounted by Vendor	Contactor Sample Sink Eductor Flow Control Valve	1	3-Piece Diaphragm	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 514	161 514 614
V2143	Skid Mounted by Vendor	Contactor 1 Sample Sink Loaded Resin Flush Water Check	1	3-Piece Check	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 562	161 562 104
V2142	Skid Mounted by Vendor	Contactor 1 Sample Sink Valve (Bottom)	3/4	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 343
V2144	Skid Mounted by Vendor	Contactor 1 Sample Sink Valve (Lower)	3/4	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 343
V2146	Skid Mounted by Vendor	Contactor 1 Sample Sink Valve (Middle)	3/4	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 343
V2148	Skid Mounted by Vendor	Contactor 1 Sample Sink Valve (Top)	3/4	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 343
V2200	Shipped Loose to be Field Installed by General Contractor	Contactor 2 Isolation	8	Butterfly (Lugged)	Lugged (#150)	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 578	161 578 108
POV-2203	Shipped Loose to be Field Installed by General Contractor	Contactor 2 Effluent On/Off	8	Butterfly	Wafer (#150)	PVC	EPDM	EPDM	Actuated	Closed	Georg Fischer: Type 240	199 240 008
V2204	Shipped Loose to be Field Installed by General Contractor	Contactor 2 High Drain	3	Butterfly (Lugged)	Lugged (#150)	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 578	161 578 104
V2206	Shipped Loose to be Field Installed by General Contractor	Contactor 2 Low Drain	3	Butterfly (Lugged)	Lugged (#150)	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 578	161 578 104
V2208	Shipped Loose to be Field Installed by General Contractor	Contactor 2 Influent Drain/Sample	1	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 344
V2210	Shipped Loose to be Field Installed by General Contractor	Contactor 2 Effluent Drain/Sample	1	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 344
V2212	Shipped Loose to be Field Installed by General Contractor	Contactor 2 Circulation Pump Suction Isolation	6	Butterfly (wafer)	Wafer (#150)	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 567	161 567 007
V2213	Shipped Loose to be Field Installed by General Contractor	Contactor 2 Effluent Standpipe Drain	2	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 347
V2214	Shipped Loose to be Field Installed by General Contractor	Contactor 2 Circulation Pump Discharge Isolation	6	Butterfly (wafer)	Wafer (#150)	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 567	161 567 007
V2215	Shipped Loose to be Field Installed by General Contractor	Contactor 2 Effluent Standpipe Pressure/Level Transmitter Block/Bleed	½	Needle (Bar Stock)	NPT (MxF)	SS316	SS316	N/A	Manual	N/A	WIKA: Type 910.11.200	4339836

Wading River Water Treatment Plant
Attleboro Water Department
MIEX Valve Identification List

Valve Tag	Factory Mounting	Description	Valve Size (inches)	Connections	Connection Type	Valve Body	Valve Trim	Valve Seat	Actuated or Manual	Fail Mode	Make and Model	Manufacturer Part Number
V2216	Shipped Loose to be Field Installed by General Contractor	Contactor 2 Circulation Pump Discharge Check	6	Butterfly (wafer)	Wafer (#150)	SS	SS	SS	Manual	N/A	RitePro: Model XEZ NSF	V0615XEZNSF
V2217	Shipped Loose to be Field Installed by General Contractor	Contactor 2 Circulation Pump Discharge Pressure Transmitter Block/Bleed	½	Needle (Bar Stock)	NPT (MxF)	SS316	SS316	N/A	Manual	N/A	WIKA: Type 910.11.200	4339836
V2218	Shipped Loose to be Field Installed by General Contractor	Contactor 2 Circulation Pump Discharge Sample / Drain	1	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 344
V2119	Shipped Loose to be Field Installed by General Contractor	Contactor 2 Circulation Pump Air Release Valve	3/4	Air Release	NPT	SS304	Hardened Chrome	N/A	Manual	N/A	Armstrong: Type 11-AV	11AV-3/4"-#38
V2220	Shipped Loose to be Field Installed by General Contractor	Contactor 2 Loaded Resin Airlift Outlet Isolation	2	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 347
V2222	Shipped Loose to be Field Installed by General Contractor	Contactor 2 Loaded Resin Airlift Drain	1	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 344
V2224	Shipped Loose to be Field Installed by General Contractor	Contactor 2 Recycle Airlift Isolation	1/2	3-Piece Ball	NPT	SS316	PTFE	RPTFE	Manual	N/A	FlowTek: 7000 Series	7103-3-R-R-L
V2226	Shipped Loose to be Field Installed by General Contractor	Contactor 2 Recycle Airlift Air Supply Check	1/2	1-Piece Check	Tube x Tube	Al	Al	Al	Manual	N/A	PISCO: Type CVU	CVU1/2-1/2
V2228	Shipped Loose to be Field Installed by General Contractor	Contactor 2 Fresh Resin Inlet Isolation	3	Butterfly (Lugged)	Lugged (#150)	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 578	161 578 104
V2230	Shipped Loose to be Field Installed by General Contractor	Contactor 2 Fresh Resin Inlet Drain/Sample	1	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 344
V2232	Shipped Loose to be Field Installed by General Contractor	Contactor 2 Bottom Sample Isolation	1	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 344
V2234	Shipped Loose to be Field Installed by General Contractor	Contactor 2 Low Sample Isolation	1	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 344
V2236	Shipped Loose to be Field Installed by General Contractor	Contactor 2 Middle Sample Isolation	1	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 344
V2238	Shipped Loose to be Field Installed by General Contractor	Contactor 2 High Sample Isolation	1	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 344
PR-2140	Skid Mounted by Vendor	Contactor Sample Sink Service Water Pressure Regulator	1	Pressure Regulator	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 582 (w/ Gauge)	161 582 224
V2240	Skid Mounted by Vendor	Contactor 2 Sample Sink Eductor Service Water Valve	1	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 344
V2241	Skid Mounted by Vendor	Contactor Sample Sink Eductor Flow Control Valve	1	3-Piece Diaphragm	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 514	161 514 614
V2243	Skid Mounted by Vendor	Contactor 2 Sample Sink Loaded Resin Flush Water Check	1	3-Piece Check	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 562	161 562 104
V2242	Skid Mounted by Vendor	Contactor 2 Sample Sink Valve (Bottom)	3/4	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 343
V2244	Skid Mounted by Vendor	Contactor 2 Sample Sink Valve (Lower)	3/4	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 343
V2246	Skid Mounted by Vendor	Contactor 2 Sample Sink Valve (Middle)	3/4	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 343

Wading River Water Treatment Plant
Attleboro Water Department
MIEX Valve Identification List

Valve Tag	Factory Mounting	Description	Valve Size (inches)	Connections	Connection Type	Valve Body	Valve Trim	Valve Seat	Actuated or Manual	Fail Mode	Make and Model	Manufacturer Part Number
V2248	Skid Mounted by Vendor	Contactor 2 Sample Sink Valve (Top)	3/4	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 343
V2300	Shipped Loose to be Field Installed by General Contractor	Contactor 3 Isolation	8	Butterfly (Lugged)	Lugged (#150)	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 578	161 578 108
POV-2303	Shipped Loose to be Field Installed by General Contractor	Contactor 3 Effluent On/Off	8	Butterfly	Wafer (#150)	PVC	EPDM	EPDM	Actuated	Closed	Georg Fischer: Type 240	199 240 008
V2304	Shipped Loose to be Field Installed by General Contractor	Contactor 3 High Drain	3	Butterfly (Lugged)	Lugged (#150)	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 578	161 578 104
V2306	Shipped Loose to be Field Installed by General Contractor	Contactor 3 Low Drain	3	Butterfly (Lugged)	Lugged (#150)	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 578	161 578 104
V2308	Shipped Loose to be Field Installed by General Contractor	Contactor 3 Influent Drain/Sample	1	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 344
V2310	Shipped Loose to be Field Installed by General Contractor	Contactor 3 Effluent Drain/Sample	1	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 344
V2312	Shipped Loose to be Field Installed by General Contractor	Contactor 3 Circulation Pump Suction Isolation	6	Butterfly (wafer)	Wafer (#150)	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 567	161 567 007
V2313	Shipped Loose to be Field Installed by General Contractor	Contactor 3 Effluent Standpipe Drain	2	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 347
V2314	Shipped Loose to be Field Installed by General Contractor	Contactor 3 Circulation Pump Discharge Isolation	6	Butterfly (wafer)	Wafer (#150)	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 567	161 567 007
V2315	Shipped Loose to be Field Installed by General Contractor	Contactor 3 Effluent Standpipe Pressure/Level Transmitter Block/Bleed	½	Needle (Bar Stock)	NPT (MxF)	SS316	SS316	N/A	Manual	N/A	WIKA: Type 910.11.200	4339836
V2316	Shipped Loose to be Field Installed by General Contractor	Contactor 3 Circulation Pump Discharge Check	6	Butterfly (wafer)	Wafer (#150)	SS	SS	SS	Manual	N/A	RitePro: Model XEZ NSF	V0615XEZNSF
V2317	Shipped Loose to be Field Installed by General Contractor	Contactor 3 Circulation Pump Discharge Pressure Transmitter Block/Bleed	½	Needle (Bar Stock)	NPT (MxF)	SS316	SS316	N/A	Manual	N/A	WIKA: Type 910.11.200	4339836
V2318	Shipped Loose to be Field Installed by General Contractor	Contactor 3 Circulation Pump Discharge Sample / Drain	1	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 344
V2319	Shipped Loose to be Field Installed by General Contractor	Contactor 1 Circulation Pump Air Release Valve	3/4	Air Release	NPT	SS304	Hardened Chrome	N/A	Manual	N/A	Armstrong: Type 11-AV	11AV-3/4"-#38
V2320	Shipped Loose to be Field Installed by General Contractor	Contactor 3 Loaded Resin Airlift Outlet Isolation	2	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 347
V2322	Shipped Loose to be Field Installed by General Contractor	Contactor 3 Loaded Resin Airlift Drain	1	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 344
V2324	Shipped Loose to be Field Installed by General Contractor	Contactor 3 Recycle Airlift Isolation	1/2	3-Piece Ball	NPT	SS316	PTFE	RPTFE	Manual	N/A	FlowTek: 7000 Series	7103-3-R-R-L
V2326	Shipped Loose to be Field Installed by General Contractor	Contactor 3 Recycle Airlift Air Supply Check	1/2	1-Piece Check	Tube x Tube	Al	Al	Al	Manual	N/A	PISCO: Type CVU	CVU1/2-1/2
V2328	Shipped Loose to be Field Installed by General Contractor	Contactor 3 Fresh Resin Inlet Isolation	3	Butterfly (Lugged)	Lugged (#150)	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 578	161 578 104
V2330	Shipped Loose to be Field Installed by General Contractor	Contactor 3 Fresh Resin Inlet Drain/Sample	1	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 344

Wading River Water Treatment Plant
Attleboro Water Department
MIEX Valve Identification List

Valve Tag	Factory Mounting	Description	Valve Size (inches)	Connections	Connection Type	Valve Body	Valve Trim	Valve Seat	Actuated or Manual	Fail Mode	Make and Model	Manufacturer Part Number
V2332	Shipped Loose to be Field Installed by General Contractor	Contactor 3 Bottom Sample Isolation	1	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 344
V2334	Shipped Loose to be Field Installed by General Contractor	Contactor 3 Low Sample Isolation	1	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 344
V2336	Shipped Loose to be Field Installed by General Contractor	Contactor 3 Middle Sample Isolation	1	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 344
V2338	Shipped Loose to be Field Installed by General Contractor	Contactor 3 High Sample Isolation	1	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 344
PR-2140	Skid Mounted by Vendor	Contactor 3 Sample Sink Service Water Pressure Regulator	1	Pressure Regulator	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 582 (w/ Gauge)	161 582 224
V2340	Skid Mounted by Vendor	Contactor 3 Sample Sink Eductor Service Water Valve	1	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 344
V2341	Skid Mounted by Vendor	Contactor Sample Sink Eductor Flow Control Valve	1	3-Piece Diaphragm	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 514	161 514 614
V2343	Skid Mounted by Vendor	Contactor 3 Sample Sink Loaded Resin Flush Water Check	1	3-Piece Check	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 562	161 562 104
V2342	Skid Mounted by Vendor	Contactor 3 Sample Sink Valve (Bottom)	3/4	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 343
V2344	Skid Mounted by Vendor	Contactor 3 Sample Sink Valve (Lower)	3/4	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 343
V2346	Skid Mounted by Vendor	Contactor 3 Sample Sink Valve (Middle)	3/4	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 343
V2348	Skid Mounted by Vendor	Contactor 3 Sample Sink Valve (Top)	3/4	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 343
POV-6101	Skid Mounted by Vendor	Regen 1 - Loaded Resin Inlet On/Off	3	Butterfly	Wafer (#150)	PVC	EPDM	EPDM	Actuated	Closed	Georg Fischer: Type 240	199 240 004
V6102	Skid Mounted by Vendor	Regen 1 - U/Drain Outlet Isolation	1-1/2	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 346
POV-6103	Skid Mounted by Vendor	Regen 1 - Service Water Top Inlet On/Off	1-1/2	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Actuated	Closed	Georg Fischer: Type 253	199 253 067
V6104	Skid Mounted by Vendor	Regen 1 - U/Drain Drain	1	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 344
POV-6105	Skid Mounted by Vendor	Regen 1 - Brine Top Inlet On/Off	1-1/2	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Actuated	Closed	Georg Fischer: Type 253	199 253 067
V6106	Skid Mounted by Vendor	Regen 1 - U/drain Pump Discharge Isolation	1-1/2	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 346
POV-6107	Skid Mounted by Vendor	Regen 1 - Sat. Brine Top Inlet On/Off	1-1/2	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Actuated	Closed	Georg Fischer: Type 253	199 253 067
V6108	Skid Mounted by Vendor	Regen 1 - U/drain Pump Sample	1/4	3-Piece Ball	NPT	SS316	PTFE	RPTFE	Manual	N/A	FlowTek: 7000 Series	7102-3-R-R-L
POV-6109	Skid Mounted by Vendor	Regen 1 - Virgin Resin Addition	2	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Actuated	Closed	Georg Fischer: Type 253	199 253 068

Wading River Water Treatment Plant
Attleboro Water Department
MIEX Valve Identification List

Valve Tag	Factory Mounting	Description	Valve Size (inches)	Connections	Connection Type	Valve Body	Valve Trim	Valve Seat	Actuated or Manual	Fail Mode	Make and Model	Manufacturer Part Number
POV-6111	Skid Mounted by Vendor	Regen 1 - U/drain Service Water On/Off	1-1/2	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Actuated	Closed	Georg Fischer: Type 253	199 253 067
POV-6113	Skid Mounted by Vendor	Regen 1 - U/drain Waste Brine On/Off	1-1/2	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Actuated	Closed	Georg Fischer: Type 253	199 253 067
POV-6115	Skid Mounted by Vendor	Regen 1 - U/drain Carrier Water On/Off	1-1/2	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Actuated	Closed	Georg Fischer: Type 253	199 253 067
POV-6117	Skid Mounted by Vendor	Regen 1 - U/drain Brine Return On/Off	1-1/2	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Actuated	Closed	Georg Fischer: Type 253	199 253 067
POV-6119	Skid Mounted by Vendor	Regen 1 - Decant Outlet On/Off	3	Butterfly	Wafer (#150)	PVC	EPDM	EPDM	Actuated	Closed	Georg Fischer: Type 240	199 240 004
POV-6121	Skid Mounted by Vendor	Regen 1 - Fresh Resin Outlet On/Off	3	Butterfly	Wafer (#150)	PVC	EPDM	EPDM	Actuated	Closed	Georg Fischer: Type 240	199 240 004
POV-6201	Skid Mounted by Vendor	Regen 2 - Loaded Resin Inlet On/Off	3	Butterfly	Wafer (#150)	PVC	EPDM	EPDM	Actuated	Closed	Georg Fischer: Type 240	199 240 004
V6202	Skid Mounted by Vendor	Regen 2 - U/Drain Outlet Isolation	1-1/2	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 346
POV-6203	Skid Mounted by Vendor	Regen 2 - Service Water Top Inlet On/Off	1-1/2	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Actuated	Closed	Georg Fischer: Type 253	199 253 067
V6204	Skid Mounted by Vendor	Regen 2 - U/Drain Drain	1	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 344
POV-6205	Skid Mounted by Vendor	Regen 2 - Brine Top Inlet On/Off	1-1/2	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Actuated	Closed	Georg Fischer: Type 253	199 253 067
V6206	Skid Mounted by Vendor	Regen 2 - U/drain Pump Discharge Isolation	1-1/2	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 346
POV-6207	Skid Mounted by Vendor	Regen 2 - Sat. Brine Top Inlet On/Off	1-1/2	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Actuated	Closed	Georg Fischer: Type 253	199 253 067
V6208	Skid Mounted by Vendor	Regen 2 - U/drain Pump Sample	1/4	3-Piece Ball	NPT	SS316	PTFE	RPTFE	Manual	N/A	FlowTek: 7000 Series	7102-3-R-R-L
POV-6209	Skid Mounted by Vendor	Regen 2 - Virgin Resin Addition	2	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Actuated	Closed	Georg Fischer: Type 253	199 253 068
POV-6211	Skid Mounted by Vendor	Regen 2 - U/drain Service Water On/Off	1-1/2	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Actuated	Closed	Georg Fischer: Type 253	199 253 067
POV-6213	Skid Mounted by Vendor	Regen 2 - U/drain Waste Brine On/Off	1-1/2	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Actuated	Closed	Georg Fischer: Type 253	199 253 067
POV-6215	Skid Mounted by Vendor	Regen 2 - U/drain Carrier Water On/Off	1-1/2	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Actuated	Closed	Georg Fischer: Type 253	199 253 067
POV-6217	Skid Mounted by Vendor	Regen 2 - U/drain Brine Return On/Off	1-1/2	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Actuated	Closed	Georg Fischer: Type 253	199 253 067
POV-6219	Skid Mounted by Vendor	Regen 2 - Decant Outlet On/Off	3	Butterfly	Wafer (#150)	PVC	EPDM	EPDM	Actuated	Closed	Georg Fischer: Type 240	199 240 004
POV-6221	Skid Mounted by Vendor	Regen 2 - Fresh Resin Outlet On/Off	3	Butterfly	Wafer (#150)	PVC	EPDM	EPDM	Actuated	Closed	Georg Fischer: Type 240	199 240 004

Wading River Water Treatment Plant
Attleboro Water Department
MIEX Valve Identification List

Valve Tag	Factory Mounting	Description	Valve Size (inches)	Connections	Connection Type	Valve Body	Valve Trim	Valve Seat	Actuated or Manual	Fail Mode	Make and Model	Manufacturer Part Number
V6000	Shipped Loose to be Field Installed by General Contractor	Regeneration Service Water Isolation	2	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 347
PR-6000	Skid Mounted by Vendor	Regeneration Service Water Pressure Regulator	2	Pressure Regulator	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 582 (w/ Gauge)	161 582 227
POV-6001	Skid Mounted by Vendor	Loaded Resin Flush Water On/Off	1	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Actuated	Closed	Georg Fischer: Type 253	199 253 065
V6002	Skid Mounted by Vendor	Loaded Resin Flush Water Check	1	3-Piece Check	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 562	161 562 104
POV-6003	Skid Mounted by Vendor	Fresh Resin Flush Water On/Off	1	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Actuated	Closed	Georg Fischer: Type 253	199 253 065
V6910	Skid Mounted by Vendor	Fresh Resin Pump Seal Water Isolation	1/2	3-Piece Ball	NPT	SS316	PTFE	RPTFE	Manual	N/A	FlowTek: 7000 Series	7103-3-R-R-L
PR-6910	Skid Mounted by Vendor	Fresh Resin Pump Seal Water Pressure Regulator	1/2	Pressure Regulator	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 582 (w/ Gauge)	161 582 222
SV6912A	Skid Mounted by Vendor	Fresh Resin Pump A Seal Water On/Off Solenoid	1/2	Solenoid	NPT	SS	PTFE	PTFE	Actuated	Closed	Festo: Type VZXF	VZXF-L-M22C-M-B-N12-130-M1-V4B2T-50-40
SV6912B	Skid Mounted by Vendor	Fresh Resin Pump B Seal Water On/Off Solenoid	1/2	Solenoid	NPT	SS	PTFE	PTFE	Actuated	Closed	Festo: Type VZXF	VZXF-L-M22C-M-B-N12-130-M1-V4B2T-50-40
V6900	Skid Mounted by Vendor	Fresh Resin Pump Skid Suction Isolation	3	Butterfly (Wafer)	Wafer (#150)	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 567	161 567 004
POV-901A	Skid Mounted by Vendor	Fresh Resin Pump A Discharge On/Off	3	Butterfly	Wafer (#150)	PVC	EPDM	EPDM	Actuated	Closed	Georg Fischer: Type 240	199 240 004
POV-901B	Skid Mounted by Vendor	Fresh Resin Pump B Discharge On/Off	3	Butterfly	Wafer (#150)	PVC	EPDM	EPDM	Actuated	Closed	Georg Fischer: Type 240	199 240 004
V6904A	Skid Mounted by Vendor	Fresh Resin Pump A Suction Isolation	3	Butterfly (Wafer)	Wafer (#150)	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 567	161 567 004
V6904B	Skid Mounted by Vendor	Fresh Resin Pump B Suction Isolation	3	Butterfly (Wafer)	Wafer (#150)	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 567	161 567 004
V6906A	Skid Mounted by Vendor	Fresh Resin Pump A Discharge Drain	1	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 344
V6906B	Skid Mounted by Vendor	Fresh Resin Pump B Discharge Drain	1	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 344
V6902A	Skid Mounted by Vendor	Fresh Resin Pump A Discharge Isolation	3	Butterfly (Wafer)	Wafer (#150)	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 567	161 567 004
V6902B	Skid Mounted by Vendor	Fresh Resin Pump B Discharge Isolation	3	Butterfly (Wafer)	Wafer (#150)	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 567	161 567 004
V6020	Shipped Loose to be Field Installed by General Contractor	Waste Brine Filter By-Pass	2	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 347
V6022	Shipped Loose to be Field Installed by General Contractor	Waste Brine Filter Inlet Isolation	2	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 347
V6024	Shipped Loose to be Field Installed by General Contractor	Waste Brine Filter Outlet Isolation	2	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 347

Wading River Water Treatment Plant
Attleboro Water Department
MIEX Valve Identification List

Valve Tag	Factory Mounting	Description	Valve Size (inches)	Connections	Connection Type	Valve Body	Valve Trim	Valve Seat	Actuated or Manual	Fail Mode	Make and Model	Manufacturer Part Number
V6028	Shipped Loose to be Field Installed by General Contractor	Waste Brine Filter Drain	1/2	3-Piece Ball	NPT	SS316	PTFE	RPTFE	Manual	N/A	FlowTek: 7000 Series	7103-3-R-R-L
V6029	Shipped Loose to be Field Installed by General Contractor	Waste Brine Filter Vent	1/4	3-Piece Ball	NPT	SS316	PTFE	RPTFE	Manual	N/A	FlowTek: 7000 Series	7102-3-R-R-L
V8100	Shipped Loose to be Field Installed by General Contractor	Brine Tank Outlet Isolation	3	Butterfly (Lugged)	Lugged (#150)	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 578	161 578 104
V8104A	Skid Mounted by Vendor	Brine Pump A Discharge Check Valve	2	3-Piece Check	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 562	161 562 107
V8104B	Skid Mounted by Vendor	Brine Pump B Discharge Check Valve	2	3-Piece Check	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 562	161 562 107
POV-8105	Shipped Loose to be Field Installed by General Contractor	Brine Tank Recirculation On/Off	2	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Actuated	Closed	Georg Fischer: Type 253	199 253 068
V8106A	Skid Mounted by Vendor	Brine Tank Pump A Discharge Isolation	2	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 347
V8106B	Skid Mounted by Vendor	Brine Tank Pump B Discharge Isolation	2	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 347
POV-8107	Shipped Loose to be Field Installed by General Contractor	Brine Tank Service Water On/Off	2	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Actuated	Closed	Georg Fischer: Type 253	199 253 068
V8108	Skid Mounted by Vendor	Brine Pump Pressure Transmitter Block/Bleed	½	Needle (Bar Stock)	NPT (MxF)	SS316	SS316	N/A	Manual	N/A	WIKA: Type 910.11.200	4339836
V8102A	Skid Mounted by Vendor	Brine Pump A Suction Isolation	2	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 347
V8102B	Skid Mounted by Vendor	Brine Pump B Suction Isolation	2	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 347
V8110	Shipped Loose to be Field Installed by General Contractor	Brine Tank Level (Press.) Transmitter Isolation	1	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 344
PR-8111	Shipped Loose to be Field Installed by General Contractor	Brine Tank Service Water Pressure Regulator	2	Pressure Regulator	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 582 (w/ Gauge)	161 582 227
V8114	Shipped Loose to be Field Installed by General Contractor	Brine Tank Pump Drain	1	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 344
V8112	Skid Mounted by Vendor	Brine Tank Skid Discharge Isolation	2	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 347
V8200	Shipped Loose to be Field Installed by General Contractor	Saturator Tank Outlet Isolation	3	Butterfly (Lugged)	Lugged (#150)	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 578	161 578 104
STR8201	Shipped Loose to be Field Installed by General Contractor	Saturator Tank Outlet Y-Strainer	3	Y Strainer	Glue Spigot	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 306	192 306 650
V8202A	Skid Mounted by Vendor	Saturated Brine Pump A Suction Isolation	2	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 347
V8202A	Skid Mounted by Vendor	Saturated Brine Pump A Suction Isolation	2	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 347
V8203A	Skid Mounted by Vendor	Saturator Pump A Suction Sample / Drain	1	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 344

Wading River Water Treatment Plant
Attleboro Water Department
MIEX Valve Identification List

Valve Tag	Factory Mounting	Description	Valve Size (inches)	Connections	Connection Type	Valve Body	Valve Trim	Valve Seat	Actuated or Manual	Fail Mode	Make and Model	Manufacturer Part Number
V8203B	Skid Mounted by Vendor	Saturator Pump B Suction Sample / Drain	1	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 344
V8204A	Skid Mounted by Vendor	Saturator Pump A Discharge Check Valve	2	3-Piece Check	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 562	161 562 107
V8204B	Skid Mounted by Vendor	Saturator Pump B Discharge Check Valve	2	3-Piece Check	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 562	161 562 107
V8206A	Skid Mounted by Vendor	Saturator Pump A Discharge Isolation	2	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 347
V8206B	Skid Mounted by Vendor	Saturator Pump B Discharge Isolation	2	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 347
V8208	Skid Mounted by Vendor	Saturator Pump Pressure Transmitter Block/Bleed	½	Needle (Bar Stock)	NPT (MxF)	SS316	SS316	N/A	Manual	N/A	WIKA: Type 910.11.200	4339836
V8210	Shipped Loose to be Field Installed by General Contractor	Saturator Level (Press. Isolation)	1	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 344
STR8210	Shipped Loose to be Field Installed by General Contractor	Saturator Tank Level (Press) Y-Strainer	1	Y Strainer	Glue Spigot	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 306	192 306 400
POV-8211	Shipped Loose to be Field Installed by General Contractor	Sat. Salt Brine Tank Fill On/Off	2	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Actuated	Closed	Georg Fischer: Type 253	199 253 068
V8212	Shipped Loose to be Field Installed by General Contractor	Saturator Level (Press) Drain	1	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 344
V8214	Shipped Loose to be Field Installed by General Contractor	Saturator Tank Drain	3	Butterfly (Lugged)	Lugged (#150)	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 578	161 578 104
POV-8201	Shipped Loose to be Field Installed by General Contractor	Saturator Service Water Inlet On/Off	2	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Actuated	Closed	Georg Fischer: Type 253	199 253 068
V8218	Shipped Loose to be Field Installed by General Contractor	Saturator Service Water Check	2	3-Piece Check	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 562	161 562 107
V8220	Shipped Loose to be Field Installed by General Contractor	Saturator Service Water Inlet Isolation	2	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 347
V8222	Shipped Loose to be Field Installed by General Contractor	Saturator Salt Fill Pipe Water Flush	3/4	3-Piece Ball	NPT	SS316	PTFE	RPTFE	Manual	N/A	FlowTek: 7000 Series	7104-3-R-R-L
PR-8224	Shipped Loose to be Field Installed by General Contractor	Salt Saturator Service Water Pressure Regulator	2	Pressure Regulator	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 582 (w/ Gauge)	161 582 227
V6801	Skid Mounted by Vendor	Virgin Resin Service Water Isolation	2	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 347
V6802	Skid Mounted by Vendor	Virgin Resin Skid Water Flow Control	2	3-Piece Diaphragm	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 514	161 514 617
V6804	Skid Mounted by Vendor	Virgin Resin Skid Spray Ball Water Flow Control	1-1/2	3-Piece Diaphragm	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 514	161 514 616
V6806	Skid Mounted by Vendor	Virgin Resin Eductor Suction Isolation	2	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 347
V6808	Skid Mounted by Vendor	Virgin Resin Eductor Discharge Isolation	2	3-Piece Ball	Glue Socket	PVC	EPDM	EPDM	Manual	N/A	Georg Fischer: Type 546 Pro	161 546 347

Wading River Water Treatment Plant
Attleboro Water Department
MIEX Valve Identification List

Valve Tag	Factory Mounting	Description	Valve Size (inches)	Connections	Connection Type	Valve Body	Valve Trim	Valve Seat	Actuated or Manual	Fail Mode	Make and Model	Manufacturer Part Number
V9202	Shipped Loose to be Field Installed by General Contractor	Compressed Air Line Bleed	1/2	3-Piece Ball	NPT	SS316	PTFE	RPTFE	Manual	N/A	FlowTek: 7000 Series	7103-3-R-R-L
V9200	Shipped Loose to be Field Installed by General Contractor	Compressed Air Pressure Transmitter Block/Bleed	½	Needle (Bar Stock)	NPT (MxF)	SS316	SS316	N/A	Manual	N/A	WIKA: Type 910.11.200	4339836
V9210	Skid Mounted by Vendor	RIO-1 Panel Air Isolation	1/2	3-Piece Ball	NPT	SS316	PTFE	RPTFE	Manual	N/A	FlowTek: 7000 Series	7103-3-R-R-L
PR-9212	Skid Mounted by Vendor	RIO-1 Panel Pressure Filter/Regulator	1/2	Filter / Regulator	NPT	Al	NBR	NBR	Manual	N/A	Festo: MSB4-AQP	MSB4-AQP-D4-J84-WPB-UL1
V9220	Skid Mounted by Vendor	RIO-2 Panel Air Isolation	1/2	3-Piece Ball	NPT	SS316	PTFE	RPTFE	Manual	N/A	FlowTek: 7000 Series	7103-3-R-R-L
PR-9222	Skid Mounted by Vendor	RIO-2 Panel Pressure Filter/Regulator	1/2	Filter / Regulator	NPT	Al	NBR	NBR	Manual	N/A	Festo: MSB4-AQP	MSB4-AQP-D4-J84-WPB-UL1
V9230	Shipped Loose to be Field Installed by General Contractor	RIO-3 Panel Air Isolation	1/2	3-Piece Ball	NPT	SS316	PTFE	RPTFE	Manual	N/A	FlowTek: 7000 Series	7103-3-R-R-L
PR-9232	Skid Mounted by Vendor	RIO-3 Panel Pressure Filter/Regulator	1/2	Filter / Regulator	NPT	Al	NBR	NBR	Manual	N/A	Festo: MSB4-AQP	MSB4-AQP-D4-J84-WPB-UL1
V9250	Shipped Loose to be Field Installed by General Contractor	PP-01 Air isolation	1	3-Piece Ball	NPT	SS316	PTFE	RPTFE	Manual	N/A	FlowTek: 7000 Series	7105-3-R-R-L
V9252	Skid Mounted by Vendor	PP-01 Air isolation to Contactor 1 Air Lift Pump	1	3-Piece Ball	NPT	SS316	PTFE	RPTFE	Manual	N/A	FlowTek: 7000 Series	7105-3-R-R-L
PR-9252	Skid Mounted by Vendor	Contactor 1 Air Lift Pump Pressure Regulator	1/2	Pressure Regulator	NPT	Al	NBR	NBR	Manual	N/A	Festo: Type MS6-LR	Part #: MS6-LR-1/2-D6-AS
SV9251	Skid Mounted by Vendor	Contactor 1 Air Lift Pump On / Off Solenoid	1/2	Solenoid	NPT	SS	PTFE	PTFE	Actuated	Closed	Festo: Type VZXF	VZXF-L-M22C-M-B-N12-130-M1-V4B2T-50-40
V9262	Skid Mounted by Vendor	PP-01 Air isolation to Contactor 2 Air Lift Pump	1	3-Piece Ball	NPT	SS316	PTFE	RPTFE	Manual	N/A	FlowTek: 7000 Series	7105-3-R-R-L
PR-9262	Skid Mounted by Vendor	Contactor 2 Air Lift Pump Pressure Regulator	1/2	Pressure Regulator	NPT	Al	NBR	NBR	Manual	N/A	Festo: Type MS6-LR	Part #: MS6-LR-1/2-D6-AS
SV9261	Skid Mounted by Vendor	Contactor 2 Air Lift Pump On / Off Solenoid	1/2	Solenoid	NPT	SS	PTFE	PTFE	Actuated	Closed	Festo: Type VZXF	VZXF-L-M22C-M-B-N12-130-M1-V4B2T-50-40
V9272	Skid Mounted by Vendor	PP-01 Air isolation to Contactor 3 Air Lift Pump	1	3-Piece Ball	NPT	SS316	PTFE	RPTFE	Manual	N/A	FlowTek: 7000 Series	7105-3-R-R-L
PR-9272	Skid Mounted by Vendor	Contactor 3 Air Lift Pump Pressure Regulator	1/2	Pressure Regulator	NPT	Al	NBR	NBR	Manual	N/A	Festo: Type MS6-LR	Part #: MS6-LR-1/2-D6-AS
SV9271	Skid Mounted by Vendor	Contactor 3 Air Lift Pump On / Off Solenoid	1/2	Solenoid	NPT	SS	PTFE	PTFE	Actuated	Closed	Festo: Type VZXF	VZXF-L-M22C-M-B-N12-130-M1-V4B2T-50-40
V9240	Skid Mounted by Vendor	RIO-4 Panel Air Isolation	1	3-Piece Ball	NPT	SS316	PTFE	RPTFE	Manual	N/A	FlowTek: 7000 Series	7105-3-R-R-L
PR-9242	Skid Mounted by Vendor	RIO-4 Panel Pressure Filter/Regulator	1/2	Filter / Regulator	NPT	Al	NBR	NBR	Manual	N/A	Festo: MSB4-AQP	MSB4-AQP-D4-J84-WPB-UL1

APPENDIX F

ORDER OF CONDITIONS FROM THE CONSERVATION COMMISSION

Massachusetts Department of Environmental Protection

eDEP Transaction Copy

Here is the file you requested for your records.

To retain a copy of this file you must save and/or print.

Username:	**SHARVARR**
Transaction ID:	**1849633**
Document:	**WPA Form 5 - OOC**
Size of File:	**159.62K**
Status of Transaction:	**Submitted**
Date and Time Created:	**12/17/2024:2:26:34 PM**

Note: This file only includes forms that were part of your transaction as of the date and time indicated above. If you need a more current copy of your transaction, return to eDEP and select to “Download a Copy” from the Current Submittals page.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
SE 211-1015
MassDEP File #

eDEP Transaction #

City/Town

E. Signatures

This Order is valid for three years, unless otherwise specified as a special condition pursuant to General Conditions #4, from the date of issuance.

1. Date of Issuance

Please indicate the number of members who will sign this form.
This Order must be signed by a majority of the Conservation Commission.

2. Number of Signers

The Order must be mailed by certified mail (return receipt requested) or hand delivered to the applicant. A copy also must be mailed or hand delivered at the same time to the appropriate Department of Environmental Protection Regional Office, if not filing electronically, and the property owner, if different from applicant.

Signature	Printed Name
	Robert Smith MacDonald
	Ryan O'Hara
	Jonathan Hedlund
	Michael Healey
	Aaron Roth
	Aaron Gruneko

Signature

Printed Name

☐ by hand delivery on

Date

☐ by certified mail, return receipt requested, on

Date

Conservation Commission

6 Park Row, Mansfield, Massachusetts 02048

ADDITIONAL SPECIAL CONDITIONS UNDER
THE MANSFIELD WETLAND PROTECTION BY-LAW CHAPTER 220

For SE 211-1015 Cathleen DeSimone, City of Attleboro, 250 Balcom Street, Mansfield, MA, proposed construction of a municipal water treatment plant with access road, site work and all associated utilities and site work. The work also includes partial demolition of structures of the existing water treatment plant within 100-foot buffer of an Inland Bank and within the 200-foot Riverfront Area.

1. RECORD ORDER No work can be started until the Order of Conditions has been recorded with the Bristol County Registry of Deeds and the receipt of the Order is returned to the Commission filled in by the Registry.

2. PLAN OF RECORD All work must conform to the plan dated, referenced as "the plan of record" in this Order.

3. LIMIT OF WORK All limits of work and erosion controls shall be installed prior to any construction, clearing, or excavation. The erosion controls shall consist of a 8" diameter biodegradable mulch-filled silt sock with wooden stakes every 10 feet on each sides of sock or equivalent (do not pierce silt sock with stakes). In addition to the silt sock, trenched-in silt fence may be required depending on the specific site conditions. See the Conservation Agent (Agent) for specific erosion control design standards. The Applicant shall notify the Agent when any such devices or measures are installed so that a site visit can be conducted prior to the commencement of work.

4. ADDITIONAL MITIGATION The Commission reserves the right to require additional mitigation or erosion control devices or measures if mitigation or erosion control devices are not adequately installed or maintained on site.

5. STABILIZATION The Applicant shall ensure that all demarcation (i.e. limits of work) and erosion control devices will remain in place and be maintained throughout the construction process and until all disturbed areas are stabilized. Stabilization shall be achieved once a complete vegetative cover is reached. Seeded areas shall be covered with a suitable protective cover to allow the seed to germinated and become established. All side slopes greater than 3:1 (but less than 2:1) are to be covered with jute mesh and seeded. At no point shall erosion occur resulting in sediment entering the wetland areas. If erosion occurs, the Agent is to be contacted to review the extent of the erosion and determine follow-up actions.

6. ROOF RUNOFF All roof runoff is to be directed in to drywells or equivalent drainage components approved by the Commission. The Commission or its agent shall review the locations of the drywells.

7. CONSTRUCTION SEQUENCE A construction sequence is to be submitted to the Commission prior to the start of work.

8. START WORK NOTIFICATION The Conservation Commission or its agent is to be notified of the starting date of the work prior to its commencement.

9. PRE-CONSTRUCTION MEETING Prior to the commencement of work, a pre-construction meeting shall be held with the Agent, the Engineer and/or Representative, and the General Contractor to review the Order of Conditions, scope of work and construction sequencing.

10. OOC/LDP ON-SITE The Applicant shall be responsible to ensure that all contractors on site during the construction have received and reviewed the Order of Conditions and all plans of record.

11. WETLAND FLAGGING Wetland flagging must remain in place until the project has been completed and the Certificate of Compliance issued.

12. COC WITH AS-BUILT The Certificate of Compliance shall be requested in writing upon completion of the project. At the same time, the applicant or any successor shall, upon completion of the project; submit an as-built plan and letter signed by a professional engineer, certifying that the work has been done in accordance with the approved plan.

13. REVISIONS TO BE REVIEWED Any modifications or revisions to the plan(s) referenced in this Order must be submitted to the Commission for review. For single family lots, this Order is for the structures shown on the plan of record only. Any additional structures including, but not limited to, decks, patios, sheds, pools, walkways and/or any hardscape features must be reviewed by the Commission. If, after their review, the Commission finds that the changes are not significant enough (minor modifications) to warrant an Amended Order or new Notice of Intent, then the revised plans shall be considered the new plan of record. If the changes are significant enough to warrant an Amended Order or new Notice of Intent, then the applicant is required to file accordingly.

15. SIGNAGE FOR COMMERCIAL PROJECT Signage for industrial, commercial or any large scale project:

> Prior to receiving a Certificate of Compliance, the Applicant must install permanent "Environmentally Sensitive Area" signs on the subject lot. The Applicant must install 12" x 18" metal signs on a permanent metal post. The quantity and location of the signs are to be designated by the Commission or the Agent on a case by case basis. Contact the Conservation Department for signage details, sign vendors, and method of installation.

17. NO SYNTHETIC CHEMICALS No synthetic fertilizer, herbicides, pesticides or fungicides can be used; only organic products may be used.

18. WETLAND MONITOR A wetland monitor, pre-approved by the Mansfield Conservation Commission, is to be hired at the applicant's expense. The wetland monitor is to be present during construction and during all work within Conservation Commission jurisdiction.

19. WEEKLY UPDATES Wetland Monitor shall provide weekly updates in writing to the Conservation Commission during construction to update the Commission regarding the status of the construction within the Conservation Commission jurisdiction.

20. THREE (3) GROWING SEASONS Wetland Monitor shall report back to the Commission once the replication areas have been constructed and planted and quarterly for the next three growing seasons.

21. 75% SURVIVAL RATE The replication area plantings shall be 75% successful within the first two growing seasons. If that is not the case then recommendations for additional plantings shall be proposed to the Mansfield Conservation Commission. A Full Certificate of Compliance

cannot be issued until THREE (3) growing seasons have passed AND 75% survival rate has been achieved. Commission to determine monitoring for THREE (3) growing seasons.

23. STORMWATER O&M All the terms and conditions set forth in the Stormwater Management Plan for (project title) prepared by (Engineer), submitted on (date) are to be included with this Order of Conditions. All on-going O&M plan activities are to be recorded as noted. All reports and checklist are to be submitted to the Commission as noted.

24. **DUMPING OF LAWN CLIPPINGS IS PROHIBITED** Dumping of lawn clippings and/or yard debris into a wetland and/or 25-foot No Disturb Zone is prohibited. Storage is prohibited in these areas as well.

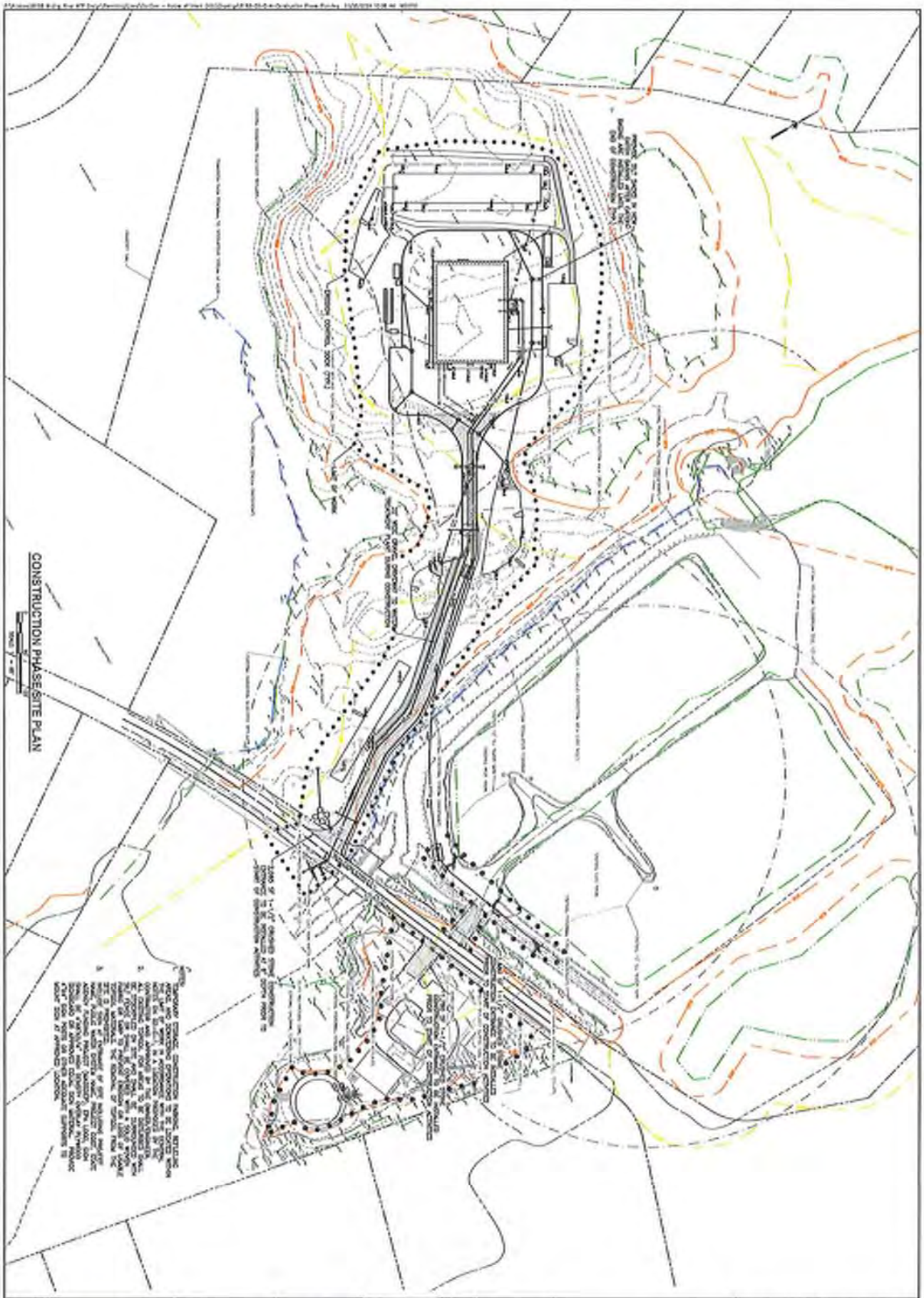
With the following special conditions:
25. Conservation Agent to meet onsite with Wetlands Scientist before the buffer zone enhancement Plantings are installed.
26. Order of Conditions shall not be issued until Town Engineer's SWM comments have been satisfied.

EXISTING CONDITIONS SITE PLAN

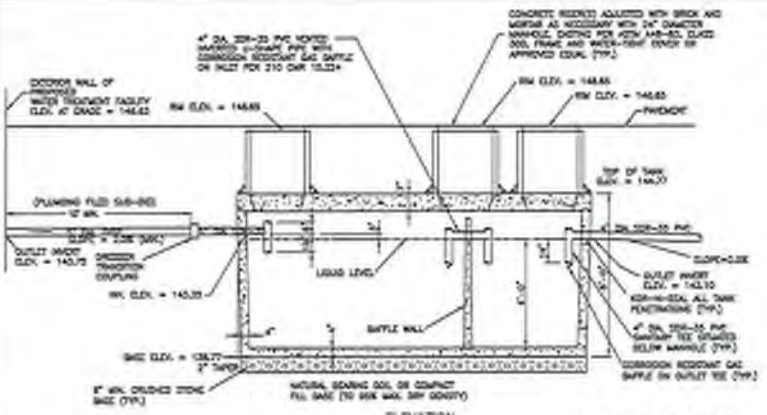
SCALE: 1" = 40'

RECEIVED
DEC 15 2024
BY:

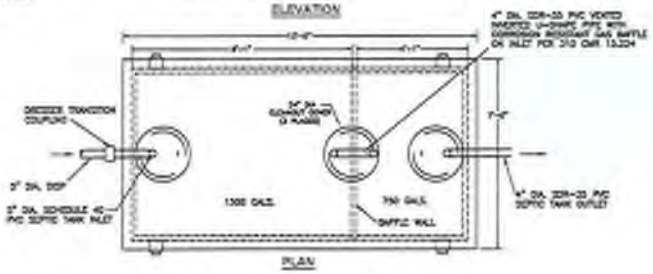
02-C-2	TATA & HOWARD		CONSERVATION SUBMITTAL NOT FOR CONSTRUCTION		CIVIL EXISTING CONDITIONS SITE PLAN	ATTLEBORO WATER DEPT. ATTLEBORO, MA WADING RIVER WATER TREATMENT PLANT



02-C-4	TATA & HOWARD			CONSERVATION SUBMITTAL NOT FOR CONSTRUCTION		CIVIL CONSTRUCTION PHASE SITE PLAN	ATTLEBORO WATER DEPT. ATTLEBORO, MA WADING RIVER WATER TREATMENT PLANT



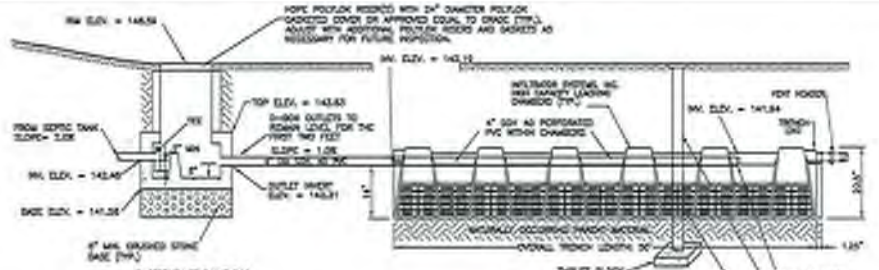
ELEVATION



PLAN

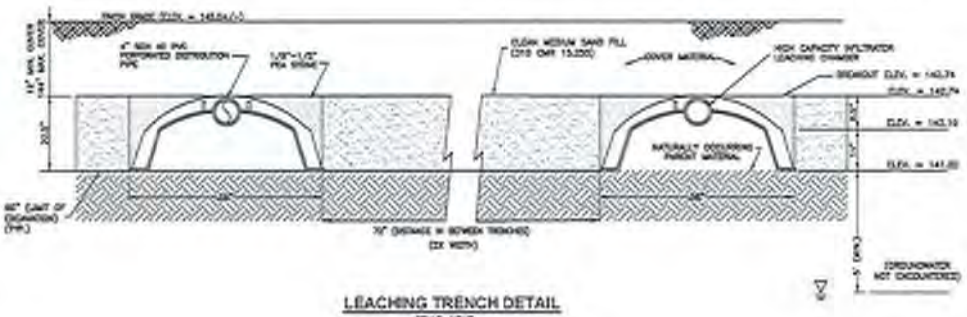
2,000 GALLON NOMINAL MONOLITHIC TWO COMPARTMENT SEPTIC TANK

TANK AND DIVIDING SHALL MEET ASTM—LATEST OR APPROVED EQUAL SEE SPECIFICATIONS FOR DETAIL



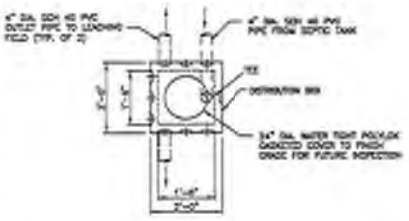
DISTRIBUTION BOX

SEE DETAIL THIS SHEET



LEACHING TRENCH DETAIL

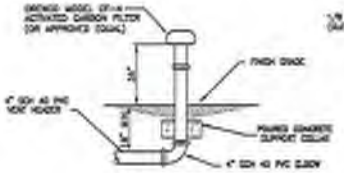
SCALE: NONE



PLAN VIEW

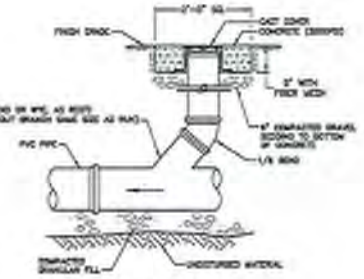
DISTRIBUTION BOX

SCALE: NONE



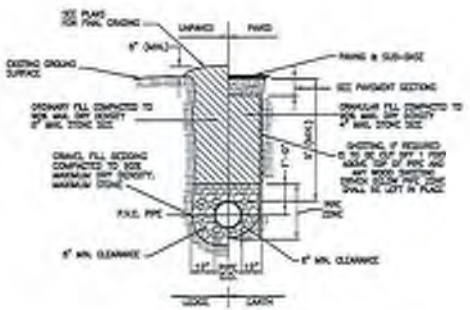
VENT DETAIL

SCALE: NONE



CLEANOUT DETAIL

NOT TO SCALE



PVC PIPE TRENCH DETAIL

SCALE: NONE

ATTLEBORO WATER DEPT.
ATTLEBORO, MA

WADING RIVER
WATER TREATMENT PLANT

CIVIL
SEPTIC SYSTEM DETAILS

CONSERVATION SUBMITTAL
NOT FOR CONSTRUCTION

TATA & HOWARD

99-C-7

TATA & HOWARD

CONSERVATION SUBMITTAL

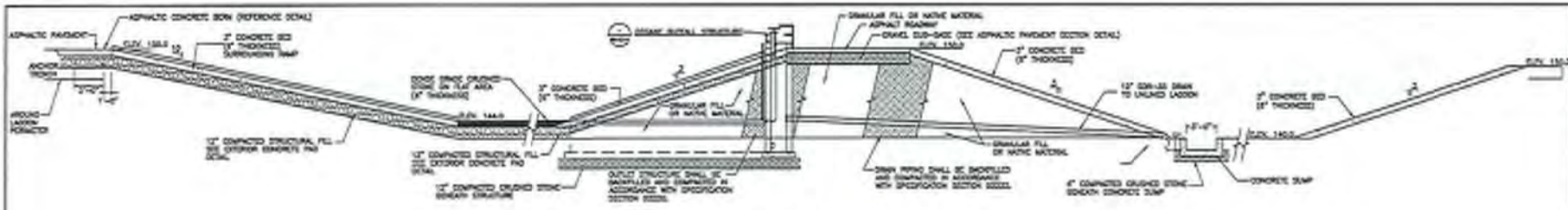
NOT FOR CONSTRUCTION

CIVIL
BRINE WASTE HOLDING UNDERGROUND FRP TANK DETAILS

ATTLEBORO WATER DEPT.
ATTLEBORO, MA

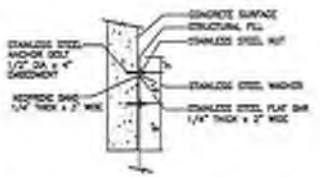
WADING RIVER WATER TREATMENT PLANT

99-C-6



LAGOON PROFILE THROUGH HEADWALL AND WEIR

SCALE: NONE

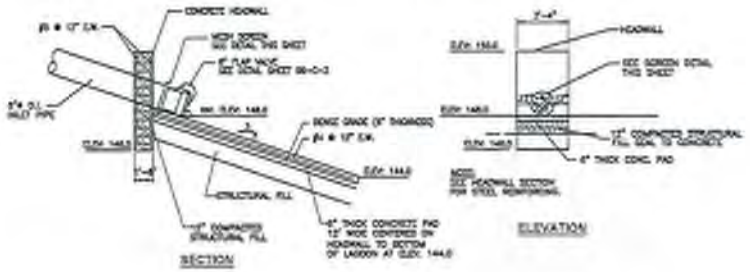


NOTES:

1. THE NEOPRENE BAND AND STAINLESS STEEL FLAT BAR WILL BE CONTINUOUS AROUND THE CONCRETE STRUCTURE.
2. PROVIDE 6" OVERLAP FOR NEOPRENE BAND, NO OVERLAP REQUIRED FOR STAINLESS STEEL FLAT BAR.
3. CONCRETE EDGES AND CORNERS TO BE SMOOTH AND ROUNDED TO PREVENT LACE DAMAGE.
4. BOLTS WILL BE INSTALLED AT A SPACING OF 6" ALONG THE LENGTH OF THE CONCRETE STRUCTURE.
5. BOLTS TO BE INSTALLED 4" BACK FROM CORNERS OF THE CONCRETE.
6. PROVIDE WATERTIGHT CONNECTION OF HDPE WITH CONCRETE.
7. ALL STAINLESS STEEL TO BE TYPE 316.

TYPICAL CONNECTION OF STRUCTURAL FILL WITH CONCRETE

SCALE: NONE

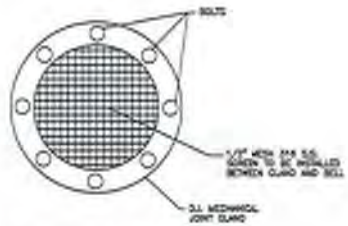


SECTION

ELEVATION

LAGOON INLET HEADWALL

SCALE: NONE



MESH SCREEN DETAIL

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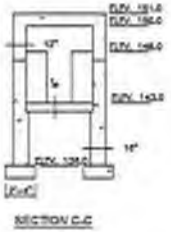
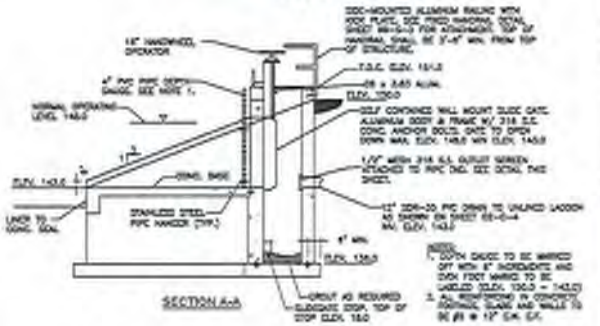
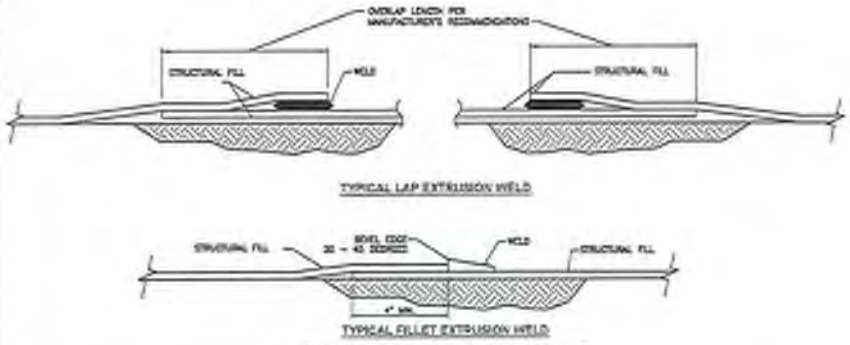


SECTION C-C



SECTION A-A

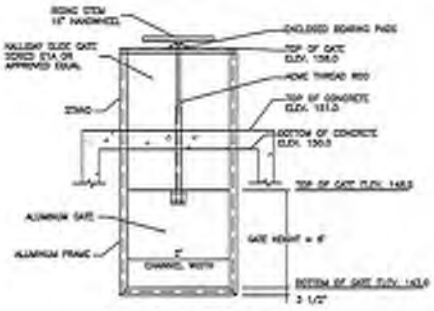


TYPICAL LAP EXTRUSION WELD

TYPICAL FILLET EXTRUSION WELD

TYPICAL EXTRUSION WELD DETAILS

SCALE: NONE



SLIDE GATE DETAIL

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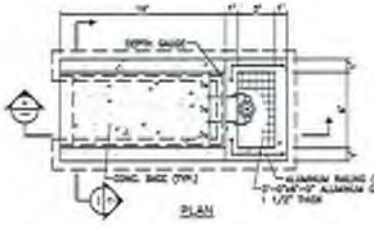


PLAN

LAGOON DECANT OUTFALL STRUCTURE

SCALE: NONE

ATTLEBORO WATER DEPT.
ATTLEBORO, MA

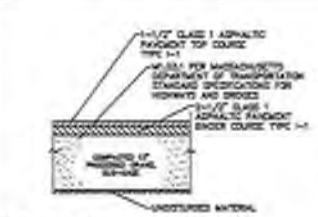
WADING RIVER
WATER TREATMENT PLANT

CIVIL
LAGOON DETAILS

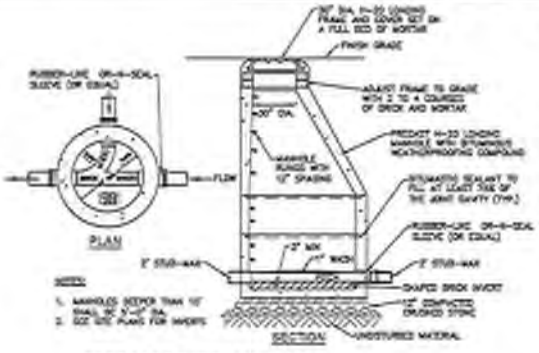
CONSERVATION SUBMITTAL
NOT FOR CONSTRUCTION

TATA & HOWARD

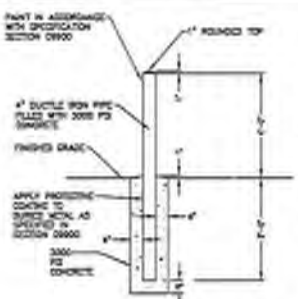
99-C-5



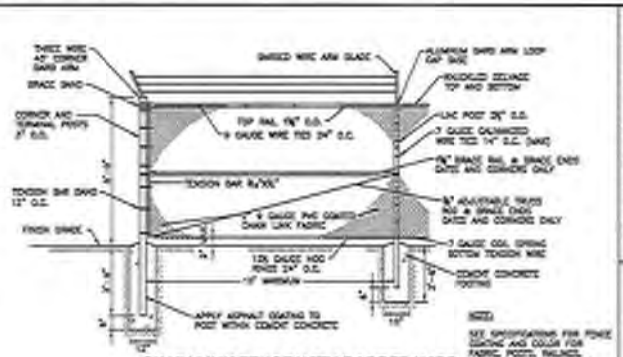
ASPHALTIC PAVEMENT SECTION



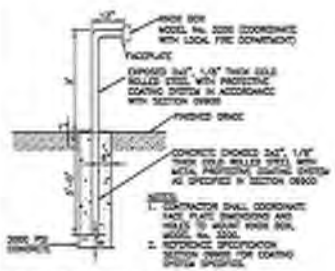
PRECAST SEWER MANHOLE



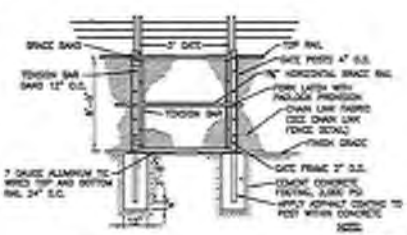
BOLLARD DETAIL



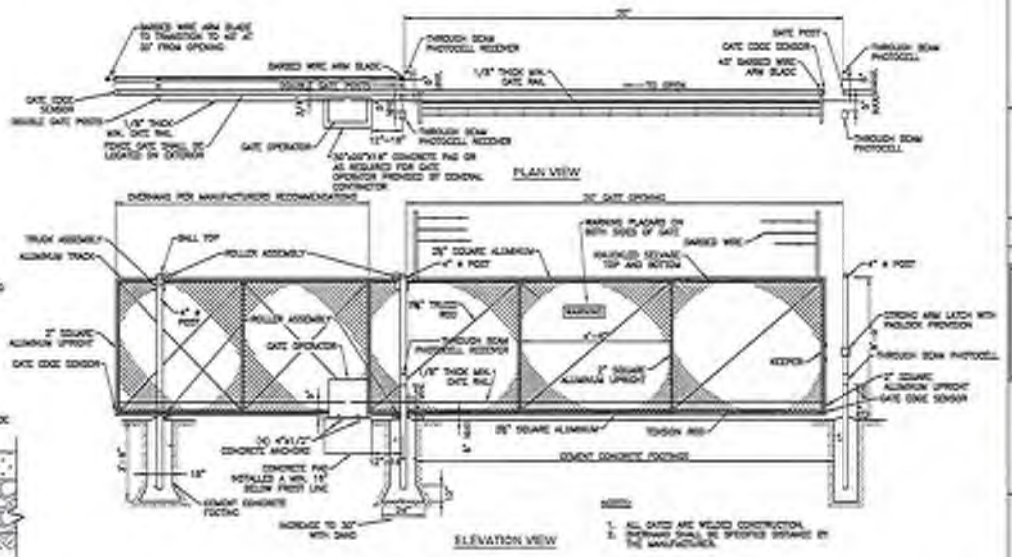
CHAIN LINK FENCE WITH BARBED WIRE



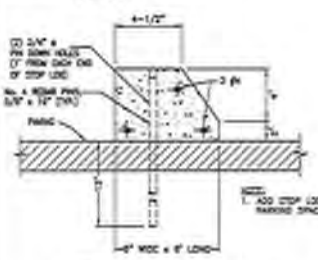
KNOX BOX POLE-MOUNT



SINGLE GATE WITH BARBED WIRE

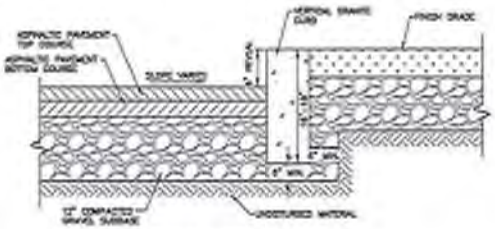


CANTILEVERED SLIDING GATE WITH GATE OPERATOR

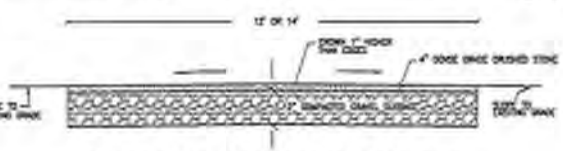


CONCRETE STOP LOG

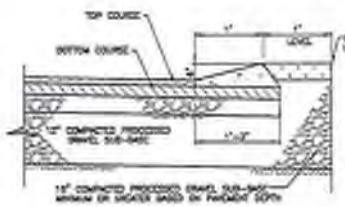
EXTERIOR CONCRETE PAD DETAIL



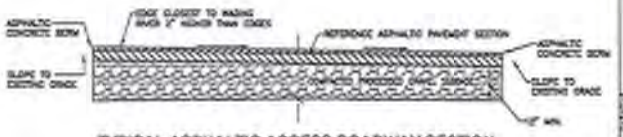
VERTICAL GRANITE CURB



TYPICAL GRAVEL ACCESS ROADWAY SECTION



ASPHALTIC CONCRETE BERM



TYPICAL ASPHALTIC ACCESS ROADWAY SECTION

ATTLEBORO WATER DEPT.
ATTLEBORO, MA

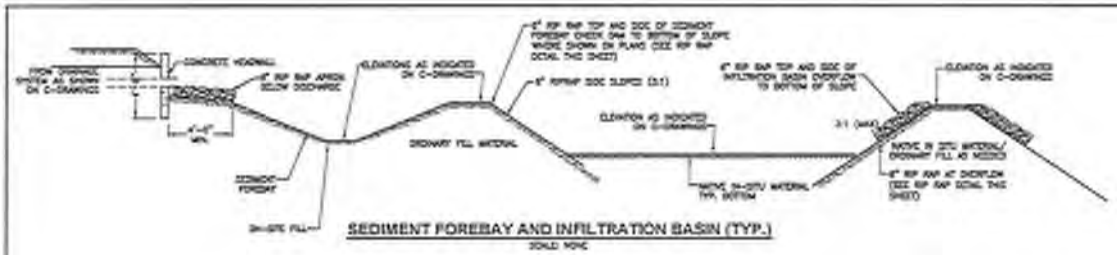
WADING RIVER
WATER TREATMENT PLANT

CIVIL
SITE DETAILS
SHEET 1

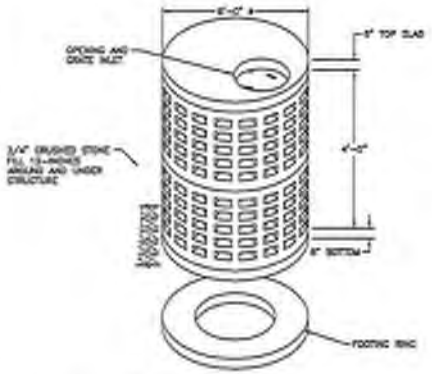
CONSERVATION SUBMITTAL
NOT FOR CONSTRUCTION

TATA & HOWARD

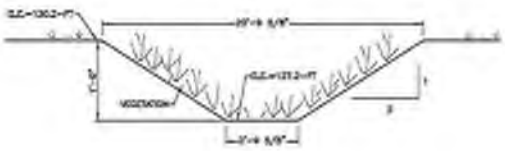
99-C-4



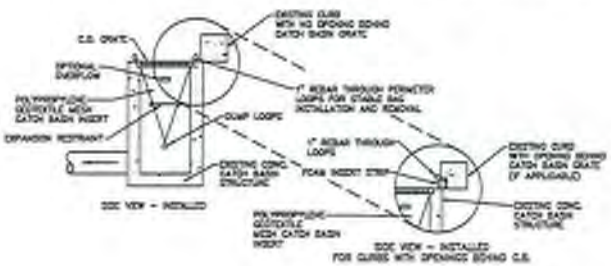
SEDIMENT FOREBAY AND INFILTRATION BASIN (TYP.)
SCALE: NONE



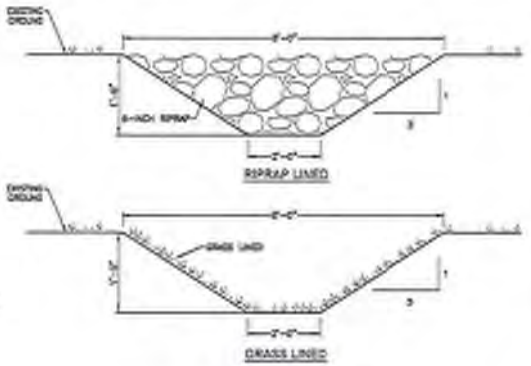
LEACHING CATCH BASIN
SCALE: NONE



WATER QUALITY SWALE (WET)
SCALE: NONE

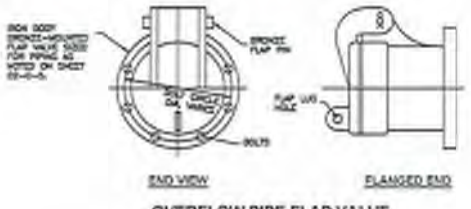


CATCH BASIN SILTATION CONTROL INSERT
SCALE: NONE

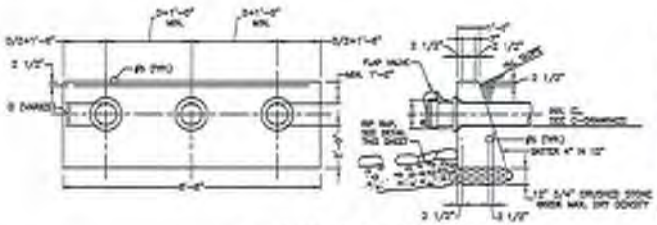


DRAINAGE CHANNEL
SCALE: NONE

RIPRAP DETAIL
NOT TO SCALE



OVERFLOW PIPE FLAP VALVE
NOT TO SCALE



CONCRETE HEADWALL DETAIL
NOT TO SCALE

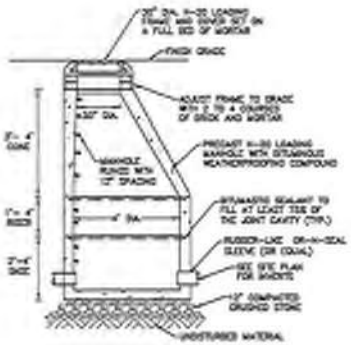
ATTLEBORO WATER DEPT.
ATTLEBORO, MA
WADING RIVER
WATER TREATMENT PLANT

CIVIL
STORMWATER AND ENVIRONMENTAL CONTROLS
DETAILS SHEET 2

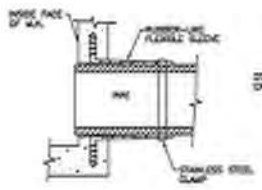
CONSERVATION SUBMITTAL
NOT FOR CONSTRUCTION

TATA & HOWARD

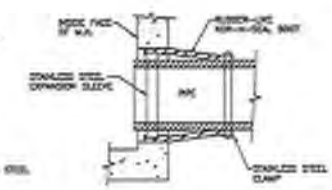
99-C-3



PRECAST DRAIN MANHOLE

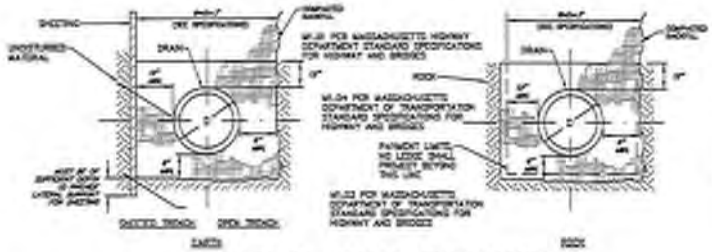


LOCK-JOINT FLEXIBLE MJK SLEEVE (OR EQUAL)

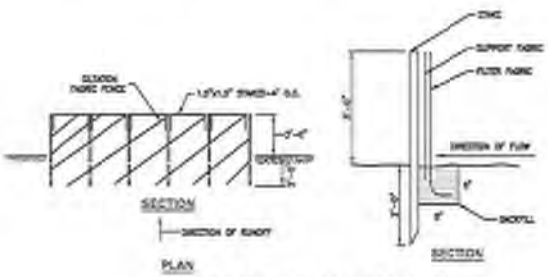


KOR-N-SEAL SLEEVE (OR EQUAL)

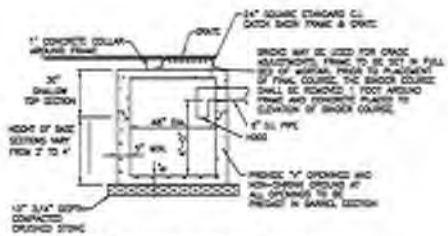
SLEEVE FOR MANHOLE WALL PENETRATION



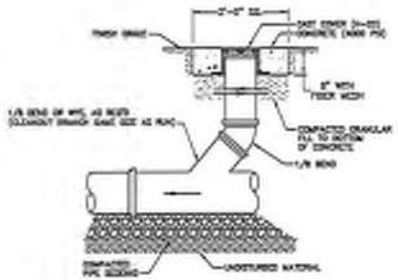
CORR. HDPE DRAINAGE LINE TRENCH SECTIONS



SILT FENCE EROSION CONTROL

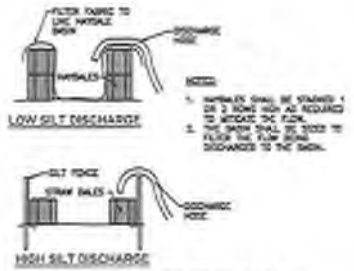


GRATE INLET DEEP SUMP CATCH BASIN



CLEANOUT DETAIL

EROSION CONTROL SOCK



SEDIMENTATION DISCHARGE CONTROL BASIN

ATTLEBORO WATER DEPT.
ATTLEBORO, MA

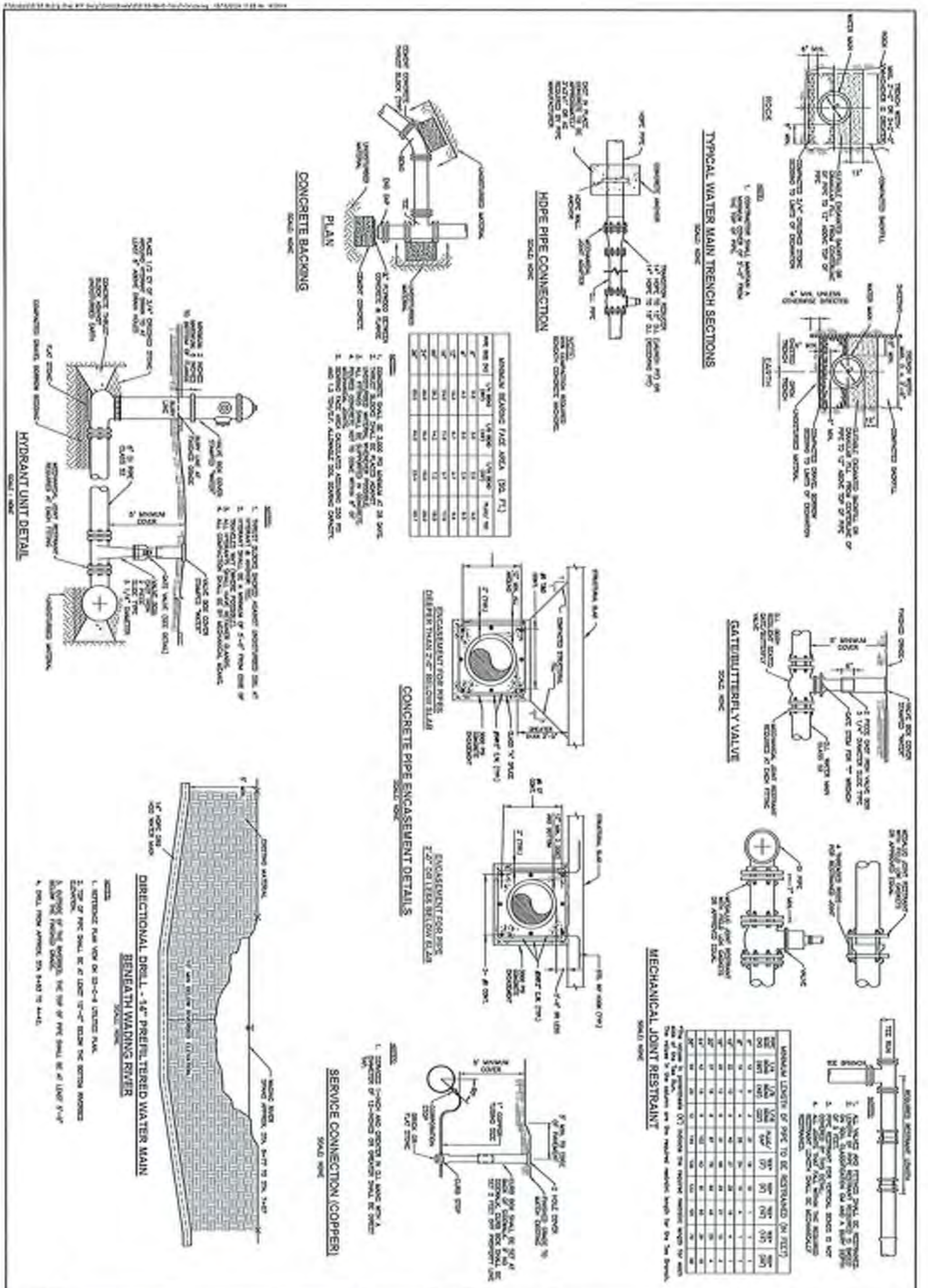
WADING RIVER
WATER TREATMENT PLANT

CIVIL
STORMWATER AND ENVIRONMENTAL CONTROLS
DETAILS SHEET 1

CONSERVATION SUBMITTAL
NOT FOR CONSTRUCTION

TATA & HOWARD

99-C-2



ATTLEBORO WATER DEPT.
ATTLEBORO, MA

WADING RIVER
WATER TREATMENT PLANT

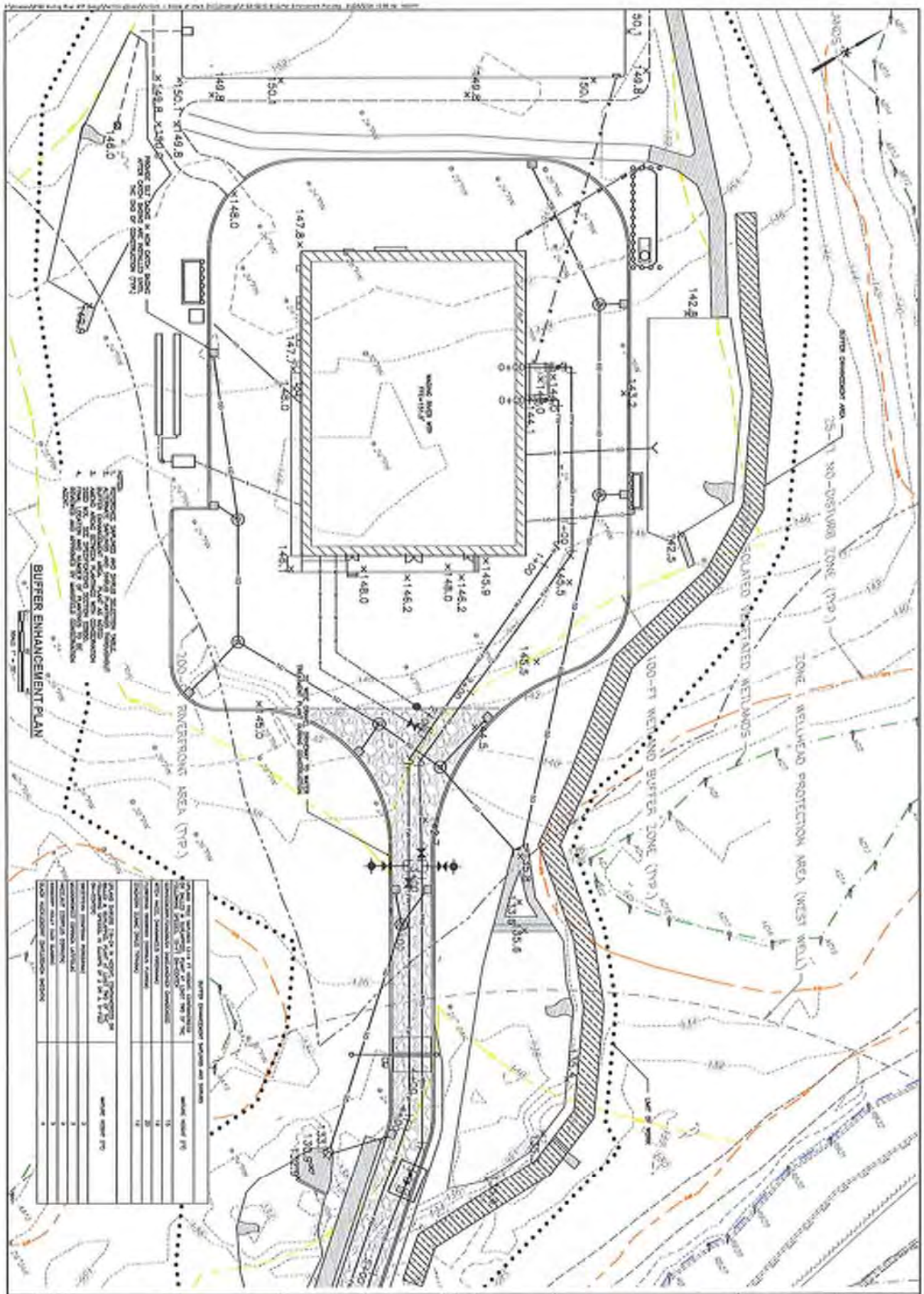
CIVIL
WATER MAIN DETAILS

CONSERVATION SUBMITTAL

NOT FOR CONSTRUCTION

TATA & HOWARD

99-C-1



02-C-8	TATA & HOWARD			CONSERVATION SUBMITTAL NOT FOR CONSTRUCTION		CIVIL BUFFER ENHANCEMENT PLAN	ATTLEBORO WATER DEPT. ATTLEBORO, MA WADING RIVER WATER TREATMENT PLANT

From: edep.confirmation@mass.gov
To: Sharon Varricchione
Cc: Katelyn Gonyer; mbarry@tataandhoward.com
Subject: eDEP Submittal Confirmation for DEP Transaction ID: 1849633
Date: Tuesday, December 17, 2024 12:47:12 PM

Thank you for using eDEP Online Filing from the Massachusetts Department of Environmental Protection. Your transaction is complete and has been submitted to MassDEP.

This email is your receipt for the eDEP Online Filing transaction described below. Please review it and keep a copy for your records.

Please do NOT reply to this message, this email address will not receive messages. For assistance with eDEP Online Filing, please email the eDEP-Support at mailto:edep-support@mass.gov or call 617-626-1111.

MassDEP is interested in how we can serve you better. To help us make improvements to eDEP, please take a minute to complete our eDEP Online Filing Survey at http://www.mass.gov/eea/agencies/massdep/service/online/edep-contacts-and-feedback.html.

To contact MassDEP Programs, please see http://mass.gov/dep/about/contacts.htm.

****
DEP Transaction ID: 1849633

Date and Time Submitted: 12/17/2024 12:47:04
****
Form Name: WPA Form 5 - OOC

Conservation Commission: MANSFIELD
Mass DEP File #: 211-1015
Applicant Name: CATHLEEN
DESIMONE
Signed by: Ryan O'Hara
Ancillary Document Uploaded/Mailed :
Attleboro Water Department Municipal Water Treatment Facility 250 Balcom St
SE 211-1015 Commissioner Sign Page
SPECIAL CONDITIONS SE 211-1015 DeSimone 250 Balcom St
****

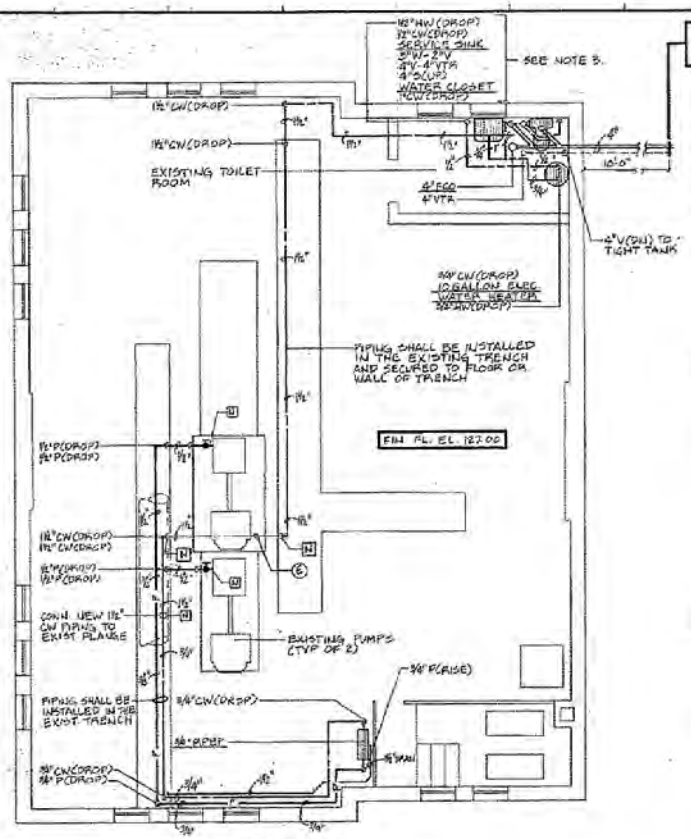
EMAIL ID OF THE USER: svarricchione@mansfieldma.com
****

EMAIL ID OF THE OTHER USERS: kgonyer@mansfieldma.com; mbarry@tataandhoward.com
****

APPENDIX G

EXISTING WATER TREATMENT PLANT

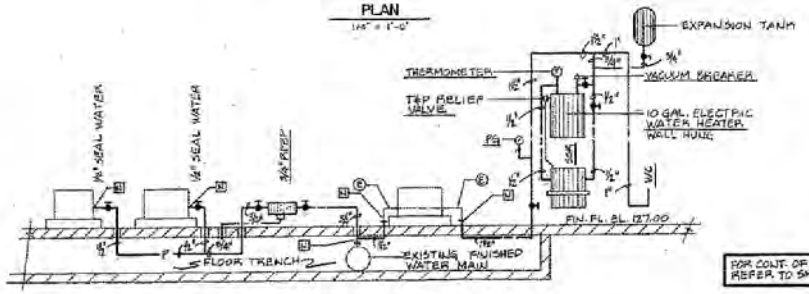
RECORD DRAWINGS



PUMPING STATION

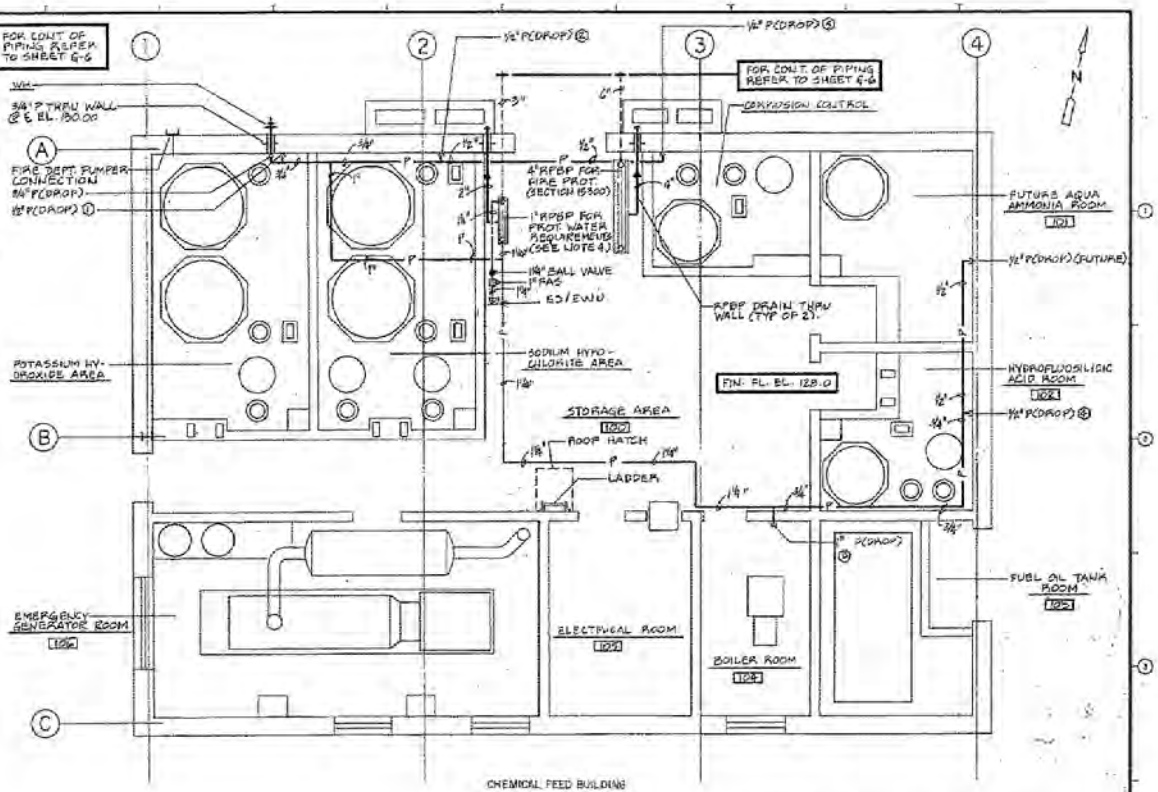
PLAN

1/4" = 1'-0"



PUMPING STATION PIPING DIAGRAM

NTS

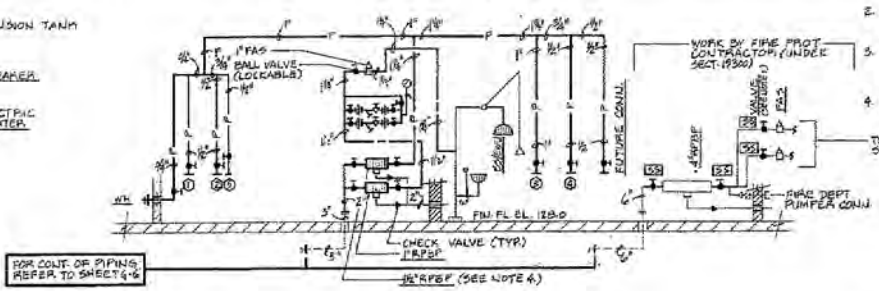


PLAN

1/4" = 1'-0"

NOTES:

1. ALL GATE VALVES FOR FIRE PROTECTION SHALL BE INSTALLED WITH SUPERVISORY SWITCHES BY FIRE PROTECTION CONTRACTOR AND WIRED BY THE ELECTRICAL CONTRACTOR.
2. ALL PROTECTED WATER OUTLETS SHALL TERMINATE WITH A BALL VALVE 4'-0" ABOVE FINISHED FLOOR.
3. REMOVE EXIST. FIXTURES, WATER HEATER AND SUPPLY AND DRAIN PIPING AND REPLACE WITH NEW. REFER TO SECTION 15405 FOR ADDITIONAL INFORMATION.
4. INSTALL 1½" RPBP FOR POTABLE WATER AND 1" RPBP FOR PROTECTED WATER.



CHEMICAL FEED BUILDING PIPING DIAGRAM

NTS

RECORD DRAWING

REV. NO.	DATE	DRWN	CHKD	REVISIONS
1	1-96	JTV		Rev For Record

DESIGNED BY: J SHERMAN
DRAWN BY: J SHERMAN
CHKD BY: R DELANEY
CHKD BY: J SHERMAN
APPROVED BY: T. MADIGAN
DATE: NOVEMBER, 1995

CAMP DRESSER & McKEE INC.

CDM

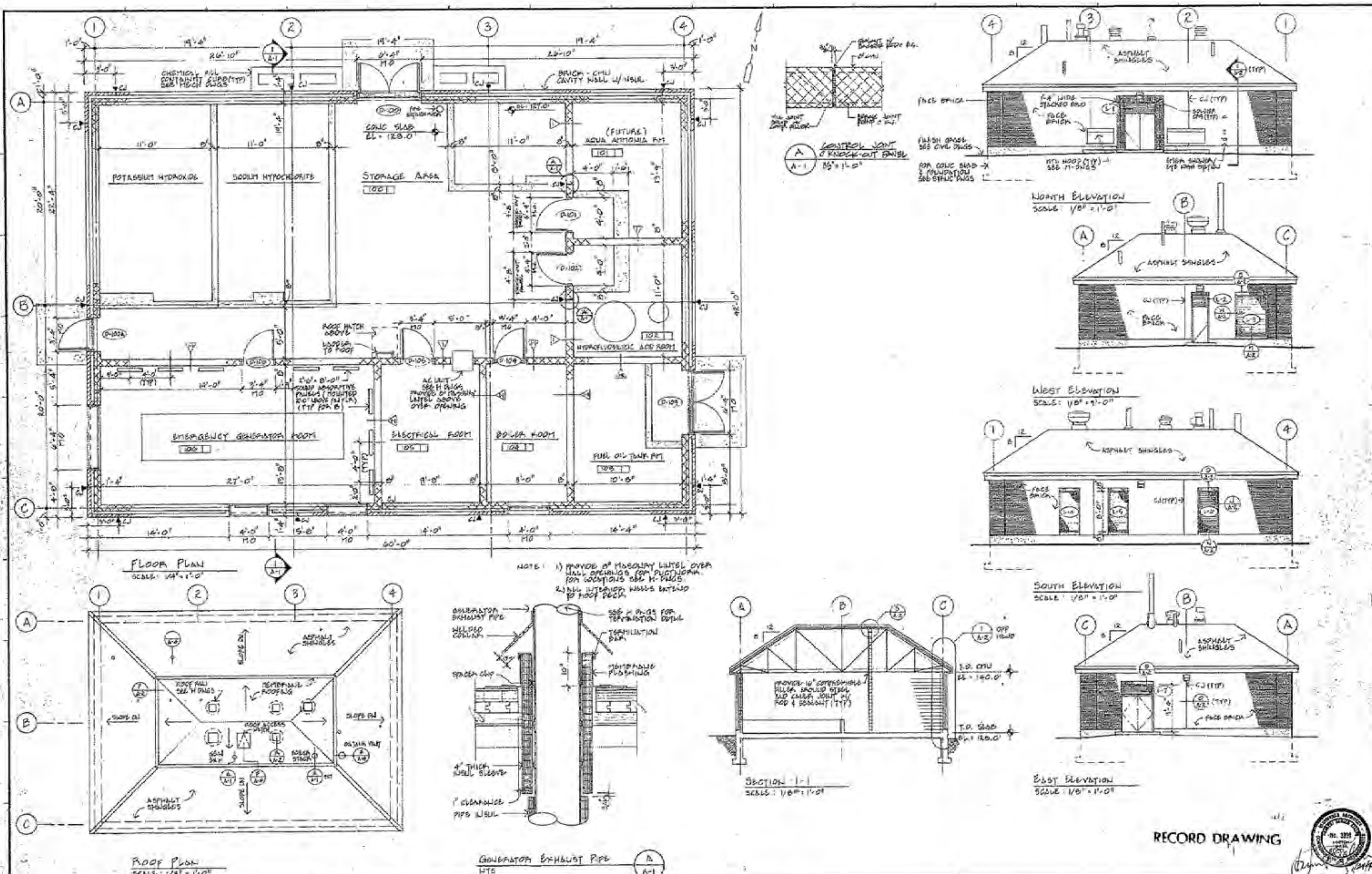
CITY OF ATTLEBORO, MASSACHUSETTS

WADING RIVER PUMPING STATION MODIFICATIONS

PUMPING STATION AND CHEMICAL FEED BUILDING PLANS AND DIAGRAMS

PROJECT NO. 725-82

SHEET NO. P-1



CAMP DRESSER & McKEE INC.

CITY OF ATTLEBORO, MASSACHUSETTS

WADING RIVER PUMPING STATION MODIFICATIONS

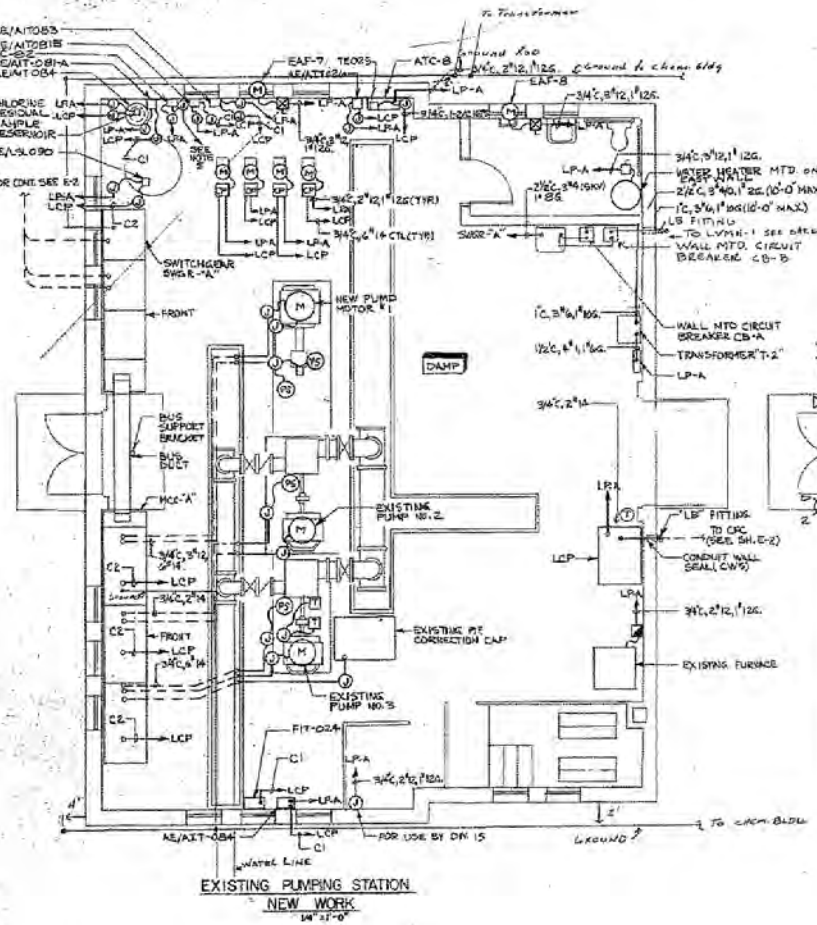
CHEMICAL FEED BUILDING
PLANS, ELEVATIONS, AND SECTION

PROJECT NO. 725-82

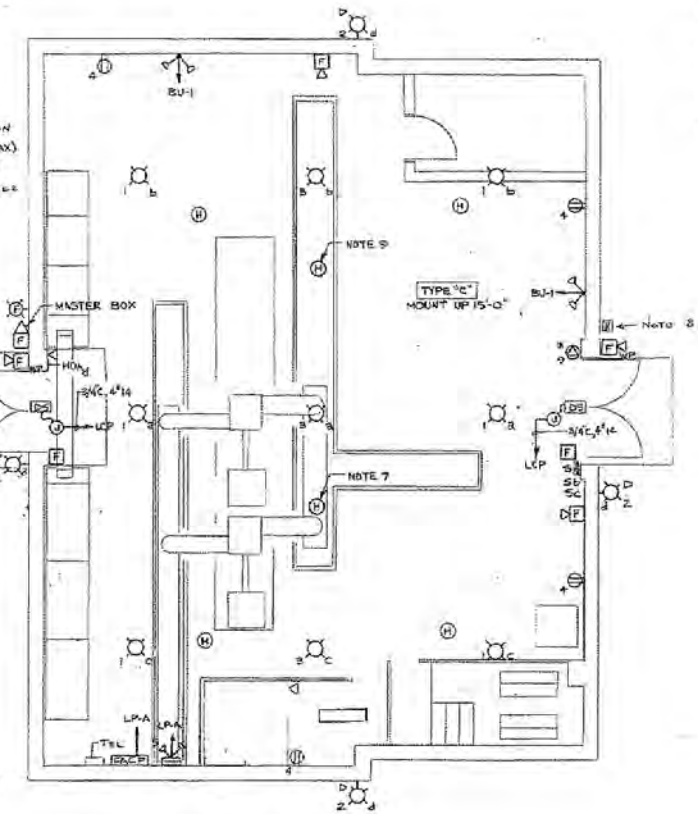
SHEET NO. A-1

DATE: NOV 1983

CDM



EXISTING PUMPING STATION
NEW WORK
1/4"=1'-0"



EXISTING PUMPING STATION
LIGHTING
1/4"=1'-0"

NOTES:

1. ALL LIGHTING EQUIPMENT INCLUDING RECEPTACLE OUTLETS SHOWN ON THIS DRAWING SHALL BE WIRED AND FED FROM LIGHTING PANEL "LP-A" AND CONNECTED TO CIRCUITS DESIGNATED BY NUMBERS ADJACENT TO FIXTURE. AND RECEPTACLE OUTLETS AND CONTROLLED BY SWITCHES INDICATED BY CORRESPONDING LETTERS.
2. FOR GROUNDING REQUIREMENTS SEE SHEET E-9.
3. FOR LIGHTING FIXTURE SCHEDULE SEE SHEET E-1.
4. SAWCUT EXISTING FLOOR (TYP.)
5. PROVIDE A 1¼" EMPTY CONDUIT FROM THE JUNCTION BOX TO THE OFFICE COMPUTER FOR FUTURE CONNECTION.
6. FOR WIRING DIAGRAMS SEE SHEET E-7.
7. LOCATED ON HIGH CEILING.
8. Attach- KEY SWITCH

CONDUIT AND WIRE LEGEND
C1 - 3/4"C, 1-2/C #16 TS
C2 - 3/4"C, 10 #14

RECORD DRAWING

ELECTRICAL

REV. NO.	DATE	DRWN	CHKD	REMARKS
	1-94	JH		Rev. Per Record

DESIGNED BY: W. LEUCI
DRAWN BY: B. SCHWARTZ
CHECKED BY: W. LEUCI
CROSS CHKD BY: P. STOCKS
APPROVED BY: R. PRATA
DATE: NOVEMBER 1993

CAMP DRESSER & McKEE INC.
CDM

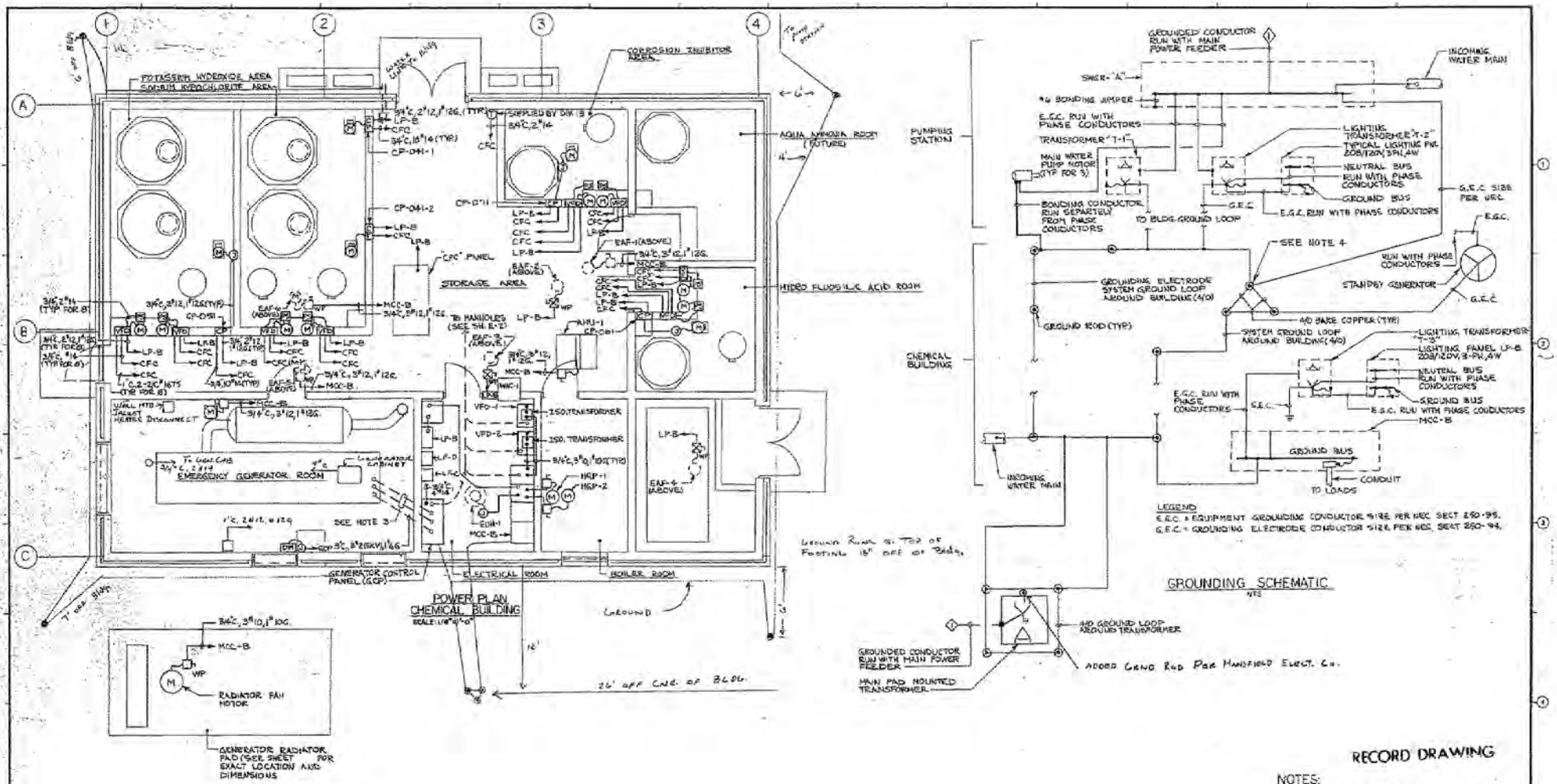
CITY OF ATTLEBORO, MASSACHUSETTS

WADING RIVER PUMPING STATION MODIFICATIONS

PUMPING STATION
POWER AND LIGHTING PLAN

PROJECT NO. 725-82

SHEET NO. E-4



REV. NO.	DATE	DRWN	CHKD	REMARKS
	1/96	JV		REV. FOR RECORD

DESIGNED BY: W. LEVEC
DRAWN BY: G. SCHWARTZ
CHKD BY: M. LEVEC
CHKD DATE FR: R. STOOPS
APPROVED BY: S. PRATA
DATE: NOVEMBER 1995

CAMP DRESSER & McKEE INC.

CDM

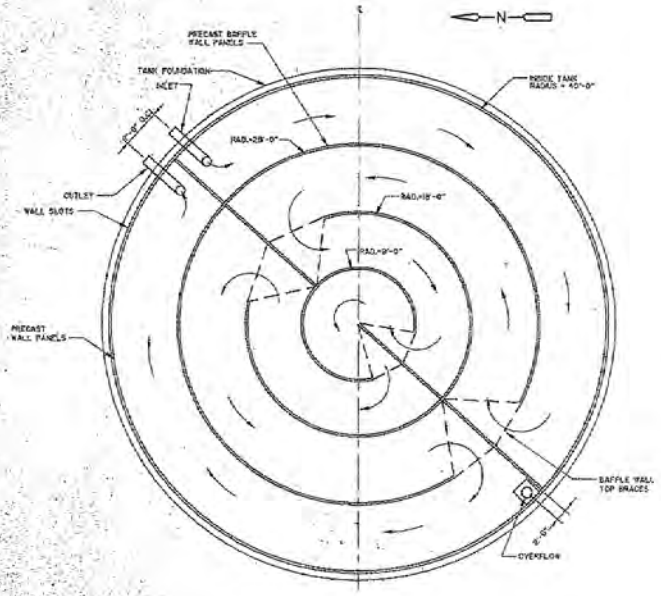
CITY OF ATTLEBORO, MASSACHUSETTS

WADING RIVER PUMPING STATION MODIFICATIONS

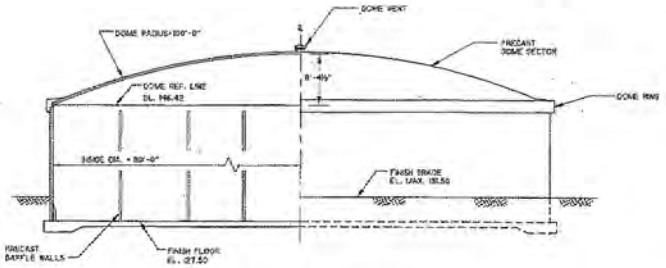
CHEMICAL FEED BUILDING
POWER PLAN AND GROUNDING SCHEMATIC

PROJECT NO. 725-82

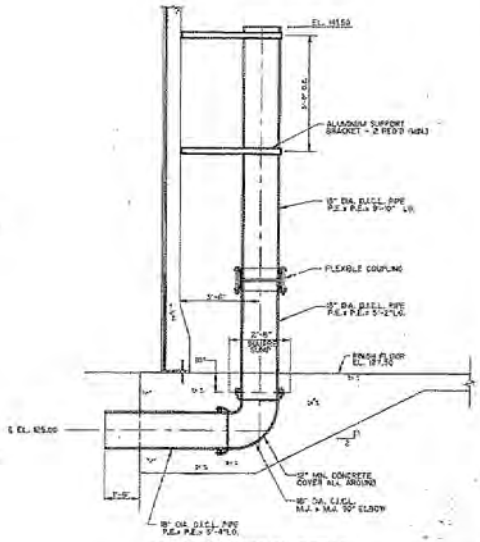
SHEET NO. E-5



FLOOR PLAN
N.T.S.



TANK SECTION & ELEVATION
N.T.S.



INLET CONNECTION DETAIL
N.T.S.

NOTE:
FOR OUTLET CONNECTION DETAIL SEE SPECIFICATIONS.

RECORD DRAWING

REV. NO.	DATE	DRWN	CHKD	REMARKS
	11-96	JM		Rev For Record

DESIGNED BY: R. STOOPS
DRAWN BY: J. MOFFAT
SHEET CHKD BY: R. STOOPS
SPECS CHKD BY: D. MORSE
APPROVED BY: T. MORGAN
DATE: NOVEMBER, 1993

CAMP DRESSER & McKEE INC.

CDM

CITY OF ATTLEBORO, MASSACHUSETTS

WADING RIVER PUMPING STATION MODIFICATIONS

PRESTRESSED CONCRETE CHLORINE CONTACT TANK PLAN, SECTION AND DETAIL

PROJECT NO. 729-82

SHEET NO. G-10

APPENDIX H

DECISION FROM THE MANSFIELD PLANNING BOARD

Town of Mansfield
6 Park Row, Mansfield, Massachusetts 02048
Phone (508)261-7363 • Fax (508)261-7343

Planning Board
Michael Feck, Chair

SPECIAL PERMIT AND SITE PLAN APPROVAL

DECISION
December 16, 2024

ON THE APPLICATION OF
City of Attleboro Water Department
For the property located at 250 Balcom Street

This decision is made pursuant to the provisions of the Massachusetts General Laws Chapter 40A, Section 9 Special Permit and Bylaw Sections 230-5.1(E)(3)(d), 5.2(B), 5.5, and 230-5.3 for the property at 250 Balcom Street for the construction of a new Water Treatment Plant (WTP) including all associated site work and utilities. The project site is owned by the City of Attleboro and is shown on Assessor's Plat 003, Lot 094 within the Residential 1 (R-1) zone.

The project site is subject to the following previous approvals:

- January 24, 2023 – Site Plan Approval for site improvements due to the emergency PFAS treatment system being housed in a temporary prefabricated metal building for winterization.

The application was duly filed with the Town Clerk on September 11, 2024. The public hearing was duly advertised in the *Sun Chronicle* on September 24, 2024, and October 1, 2024. The public hearing was opened on October 9, 2024, with testimony heard it was continued to November 13, 2024, with no testimony; and, the hearing was continued to December 11, 2024. Final action on the Special Permit was taken on December 11, 2024. Present at the public hearing were the following members:

Michael Feck, Chair
Sharon Friedman, Clerk
Ralph Penney
Joseph Cerretani
Michael McClanahan
Mark Corsillo
Beth Ashman-Collins
James Turnbull, Associate

The following documents were introduced at the October 9, 2024 public hearing.

1. Application and Certified Abutters List received 9/11/24
2. Ann MacCarthy, Chief Assessor, letter dated 9/19/24 and email dated 10/3/24
3. Katelyn Gonyer, Conservation Agent, email dated 9/23/24, and memorandum dated 10/3/24
4. Kevin Fontes, Fire Prevention Captain, email dated 9/19/24

5. Matthew Barry, Tata & Howard, emails dated 10/27/24 and 10/1/24
6. Notice of Comment Period Extension – EEA#16870 Wading River Water Treatment Plant dated 9/30/24
7. Attleboro HydroCAD Reports PRE and POST, received 10/3/24
8. Matthew Barry email dated 10/2/24
9. Contributing Area Runoff Rates dated 10/2/24
10. Pre and Post runoff Rate Summary dated 10/2/24
11. Attleboro revised stormwater plans dated 10/2/24

The following documents were introduced at the December 11, 2024 public hearing.

1. Continue Request to December 11, 2024
2. Matthew Barry, Project Engineer of Tata & Howard email dated 12/9/24

The site plan approval findings, special permit criteria, and conditions were reviewed and discussed.

Site Plan Approval FINDINGS:

Site Plan Approval criteria. The Planning Board shall approve a site plan upon its determination that:

(1) For the given location and type and extent of land use, the design of building form, building location, egress points, grading, and other elements of the development could not reasonably be altered to:

(a) Improve pedestrian, bicycle, or vehicular safety, and safety of circulation design for people with disabilities, both within the site and egressing from it;
(b) Reduce the visual intrusion of parking areas viewed from public ways or abutting premises;
(c) Reduce the volume of cut or fill;
(d) Protect and enhance existing site features;
(e) Protect adjoining premises against detrimental uses by the provision for surface water drainage, sound and sight buffers, and preservation of views, light, and air;
(f) Reduce the number of mature trees to be removed from the site;
(g) Reduce soil erosion;
(h) Reduce hazard or inconvenience to pedestrians from stormwater flow and ponding.

The proposed WTP is located on the existing parcel no. 003-094 owned by the City of Attleboro. The existing and proposed sites currently do not accommodate pedestrian or bicycle traffic due to security reasons associated with a public water supply. Both the existing site and proposed site are/will be enclosed in fenced areas per MassDEP requirements. Access to the site is gained via the proposed access road as shown on the Site Plan. Adequate access is provided around the proposed building for daily visits required by the Water Department, equipment and chemical feed delivery, snow removal, emergency responder access, etc. Handicap parking is provided for people with disabilities in addition to parking for water department operators and visitors.

Substantial setbacks are provided at the proposed WTP aiding in the screening of the building, accessory areas, and parking areas from being visually intrusive to public ways or abutting premises. Lighting will be necessary for security per MassDEP guidelines and regulations. The substantial setbacks will allow for natural screening so that the lighting will not be intrusive to the abutting premises. There will be occasional deliveries and maintenance of residual storage areas on-site that will occur during normal business hours. No unnecessary sights or sounds will occur on nights, weekends, or holidays unless under an emergency condition.

Due to the proximity to the nearby resource areas, the building location was chosen to minimize impact to the resource areas. A substantial portion of the site has been proposed in upland areas with minimal changes to existing elevations. The site is not located within a floodplain. Volumes cut to install the building footings, foundations, and various below grade tanks within the building footprint will be used to fill in the proposed areas as shown on the drawings. This will minimize the need to remove or deliver excess cut or fill to the greatest extent possible respectively from the site.

Balcom Street is a designated scenic road and is protected by state law via the Shade Tree Act and Scenic Roads Act. The proposed widening of the existing gravel access drive is minimal (Less than 250 square feet) and does not remove any shade trees within the public way. There are no stonewalls within the vicinity of the existing gravel access drive, and no historic stonewalls within the public way will be disturbed as part of this project.

Due to the size of the proposed WTP, there will be substantial clearing of the existing site as shown on the proposed site plans. No additional trees will be removed from the site that are shown outside the limits of work. Substantial stormwater improvements are being made to the proposed site to reduce soil erosion and reduce runoff per Massachusetts Stormwater Standards.

(2) Adequate water supply and waste disposal systems are available to the site.

Water usage at the WTP is expected to be minimal. The WTP may be staffed for 8 to 16 hours per day by 2 or 3 water department personnel per shift. There are two ADA-compliant bathrooms on the first floor and one bathroom on the second floor.

All wastewater (black water and grey water) will be discharged to a proposed septic system designed for 600 gallons per day. The septic system will be designed per Massachusetts Title V standards and submitted to the Mansfield Board of Health for review.

(3) The plan provides for all of the following:

(a) Adequate access to each structure for fire and service equipment;
(b) Adequate utility service and drainage;
(c) Compliance with the landscaping and screening requirements under § 230-4.3 of this bylaw.

(d) Conformance of the arrangement of parking and loading spaces in relation to the proposed uses of the premises to § 230-4.4 of this bylaw;
(e) Appropriate design features, building elevations, and design of the buildings and amenities in relation to site features, unique characteristics and neighborhood character, as may be applicable;
(f) Proper methods of disposal of refuse and other wastes resulting from the uses permitted on the site.

The proposed WTP has adequate access for fire and service equipment. The access road and the paved surfaces around the proposed building are designed for access by tractor-trailers for both chemical deliveries and materials delivery/hauling. The proposed turning radiuses will accommodate the trailers and fire equipment. All utility services are being designed by professional engineers including the electrical service (primary and secondary/emergency power), HVAC, water, wastewater, and stormwater.

The proposed building location exceeds the standards for buffer strips and screenings as required by § 230-4.3 of the Mansfield Bylaws. Nine (9) parking spaces are proposed for the WTP. Landscaped buffers or islands will not be required to break up the parking area. The areas abutting the curb near the parking areas will be loamed and seeded.

All wastewater (black water and grey water) will be discharged to a proposed septic system designed for 600 gallons per day. The septic system will be designed per Massachusetts Title V standards and submitted to the Mansfield Board of Health for review. All refuse will be stored in a dumpster to be located along the paved surface area around the side or back of the proposed WTP and will be emptied on a regularly scheduled basis.

(4) Adequate capacity is available on affected streets to accommodate the proposed project, based on a traffic study if one is required by the Planning Board. If a development is projected to cause a decrease in level of service (LOS) over the no-build condition on affected streets, the Planning Board may require mitigation measures to restore the LOS to the no-build condition.

The WTP will be located on the same City of Attleboro-owned parcel as the existing WTP but on the opposite side of Balcom Street from the existing WTP location. Once the proposed WTP is online and the existing WTP is decommissioned, the overall volume of traffic will be similar to existing conditions with the potential for a slight increase in daily water department personnel visits. There are two new chemical deliveries which would occur once monthly. There would also be one waste company that would haul out waste generated during the treatment process once monthly. Wastewater would be treated on-site via the on-site septic system. The septic tank would be pumped out every 3-5 years. Daily site visits by the City to the proposed site would remain the same as the existing site. If required by MassDEP, the proposed site may have an evening crew staffed at the proposed WTP which would be additional to the existing WTP. The proposed WTP is not anticipated to cause a decrease in the level of service over a no-build condition on affected streets.

(5) The proposed development is consistent with the goals and policies of the Mansfield Master Plan and Open Space and Recreation Plan, where applicable.

The proposed project is consistent with the Mansfield Master Plan's Accessible, Connected, and Well-Publicized Green Space Goal No. 2B which states; Preserve Mansfield's natural resources, wildlife habitats and remaining agricultural lands. The project will continue to protect and preserve the Wading River as a natural resource by continuing to implement the existing local rules and regulations set forth by the Town to protect Wading River as a natural resource. The large parcel of land owned by the City will continue to protect the area around Wading River as a surface water supply including the resource areas associated with the river (wetlands, riverfront, etc.).

SPECIAL PERMIT CRITERIA

- § 230-5.1 Surface and Groundwater Resource Protection District (E) (3) (d)
  - Any use that will render impervious more than 15% or 2,500 square feet of any lot, whichever is greater.
- § 230-5.2 Earth Removal (B)
  - No earth material shall be removed from any lot within the Town of Mansfield unless a special permit has been granted pursuant to this bylaw

(1) Impact on the health, safety, convenience, general welfare and amenities of the inhabitants of the Town

The impacts of increased impervious area and earth removal for the proposed water treatment plant (WTP) project are anticipated to be minimal regarding health, safety, convenience, general welfare, and amenities of the inhabitants of the Town of Mansfield. All impervious areas are being managed with a stormwater collection system that will treat the stormwater runoff to stormwater standards. There will be no increase in post-development stormwater runoff. Earth removal as part of the construction process will be a temporary process as approximately 11,180 cubic yards of material will be cut from the site. A portion of the cut material will be used for backfill and grading on-site while the remaining portion will be hauled off-site to an appropriate site (gravel pit, etc.). Larger cuts are due to the building's foundation and below-grade tanks and the stormwater infiltration basins. Due to the substantial footprint of the WTP building and surrounding area being developed, the cut volumes increase rather quickly even though the proposed change in grade is relatively minor.

(2) Effects on adjoining premises, neighborhood character, and social structure

The effects on adjoining premises, neighborhood character, and social structure are anticipated to be minimal. The proposed WTP will be setback from Balcom Street with substantial screening from the public way and private properties. Being a municipal development with minimal traffic and activity, the impact on the social structure will be minimal in comparison to residential, commercial, or industrial development.

(3) Vehicular and pedestrian traffic convenience, safety, and adequacy, including an assessment of movement within the site and in relation to adjacent streets, properties, or improvements

The proposed WTP is not anticipated to reduce the safety or capacity of traffic along Balcom Street. Movement within the site is designed appropriately for the vehicles that are anticipated to visit the site on an emergency, daily, weekly, monthly, or yearly basis.

(4) Adequacy of municipal facilities and services, including, but not limited to, fire and police protection, water provision, and wastewater disposal

Services related to fire and police protection are not anticipated to increase due to the development of the proposed WTP. Security systems will be incorporated in the existing Supervisory Control and Data Acquisition (SCADA) System of the Attleboro Water Department and fire alarm system will be provided. Attleborough Water Department personnel are the first to be notified of any alarms at their water treatment plants. Calls are forwarded to the Police and Fire Departments as needed when additional assistance is necessary. A fire alarm will notify the appropriate emergency personnel as required by the Fire Department. A fully automated fire protection sprinkler system is being designed by a fire protection professional engineer as part of this project. The Water Department will be using their own water that they supply in the building. An on-site wastewater disposal (septic) system has been designed per Massachusetts Title V standards and will be reviewed by the Mansfield Board of Health.

(5) Effects on the natural environment

The largest impact to the natural environment will be the removal of trees in the proposed area. While unfortunate, this is a necessary process for development of the site to provide safe drinking water in accordance with MassDEP standards. Limits of clearing will be clearly delineated prior to construction as indicated by the limit of work shown on the Drawings. Tree removal will not occur outside of the limit of work. The project area is not located within an area of estimated or priority habitats of rare wildlife. Correspondence with the Division of Fisheries and Wildlife are attached to the Notice of Intent submitted to the Mansfield Conservation Commission documenting there are no protected species affected by this project. Nearby surface and groundwater resources will be protected by the stormwater collection system that will treat the stormwater generated from all impervious areas to state standards.

(6) Fiscal impacts, including effect on the tax and employment base, municipal finances, and property values

The project will have minimal financial impact on the Town of Mansfield. The property is owned and operated by the City of Attleboro. The tax and employment base of the Town of Mansfield will not increase due to the development of the proposed WTP. Additional municipal finances from the Town of Mansfield will not be needed post-development. The existing parcel already includes a surface water supply and a water treatment plant so there is no change in use and no change in property value is anticipated.

STANDARD CONDITIONS

1. Any and all outstanding department head comments must be addressed prior to the issuance of a building permit(s).

2. Any and all new signage shall comply with the provisions of Zoning Bylaw Section 230-4.7, particularly in regard to illumination and lighting.

3. Hours of operation for demolition, construction deliveries, site work, and/or construction shall be limited to 7:00 a.m. to 5:00 p.m. Monday through Friday and 8:00 a.m. to 4:00 p.m. on Saturday. Contractors and other employees may be present on site beyond these hours but shall not engage in demolition, construction deliveries, site work, and construction outside of the hours prescribed. No work shall be done on Sundays or Massachusetts holidays. These restricted hours of operation shall not apply to interior work. All loaded vehicles shall be suitably covered to prevent dust and contents from leaving the vehicle and to protect abutters and other residents, and the public way from material spilled from the load. All public rights-of-way shall be maintained free of all mud, stones, or any either conditions that may result in a public safety hazard for vehicles or pedestrians. Sweeping or clearing must be completed daily or more frequently as deemed necessary during the operation, as directed by the Mansfield Police Chief, Director of Public Works, or Town Engineer. The applicant may be required to have a police officer present during any hauling on or off-site. The applicant shall consult with the Mansfield Police Chief as to whether or not this may be necessary and to discuss the best hauling routes. Erosion control measures should be installed around catch basins within the public right-of-way.

4. The applicant shall submit to the Inspector of Buildings a final as-built of the site plan in hard copy and the digital format specified by the Inspector of Buildings. The engineer or registered land surveyor shall certify that the construction conformed to the approved site plan or approved modifications thereto. Both the above as-built plan and the certification must be received and approved prior to issuance of the certificate of occupancy.

5. The Applicant shall record this Decision with exhibit(s) at the Bristol County Registry of Deeds or Land Court prior to the issuance of a building permit. The Applicant shall submit proof of the decision being recorded to the Planning Board.

6. The Planning Board shall sign the approved site plan. One signed copy, along with the written decision of the Planning Board, shall be transmitted to the Inspector of Buildings prior to the issuance of a building or occupancy permit.

7. The applicant shall comply with all conditions imposed by the Planning Board on the approval prior to issuance of the certificate of occupancy unless otherwise provided for in the approval.

8. The Building Inspector, Director of Planning and Development, Town Engineer, or other authorized official may conduct site visits, monitor construction work, and verify compliance with the site plan and any terms and conditions imposed by the Planning Board at the time of the approval. Failure to comply may result in denial of the Certificate of Occupancy.

9. Hours of Operation will comply with the noise ordinance regulations of the Town and will be added to the Operations and Maintenance Plan.

Approved at the 10/09/24 Planning Board meeting:
Due to the WTP not being listed as a permitted use and in accordance with the off-street parking schedule Section 230-4.4A, the Planning Board finds that nine (9) parking spaces as shown on the site plan is adequate to provide off-street parking for the proposed use as the WTP may be staffed for 8 to 16 hours per day by 2 or 3 water department personnel per shift.

On December 11, 2024, following a presentation by the applicant, questions and comments from neighborhood residents, and discussion among the Planning Board members, the application was put to a vote.

Motion by Ms. Friedman and seconded by Mr. McClanahan to close the public hearing and approve the site plan and special permit application for the 250 Balcom Street Water Treatment Plant on a scenic road with conditions based on the findings as discussed.

Deliberations of the special permit criteria.

Mr. McClanahan, in favor of the motion, said that the benefits outweigh the detriments in the fact that the City of Attleboro needs a new well. He expressed that it is a great engineering plan for approval and the benefits do outweigh the detriments to public safety.

Mr. Corsillo, in favor of the motion, said that he agreed with what Mr. McClanahan stated.

Mr. Cerretani, in favor of the motion, said that the benefits outweigh the detriments and impact on health and safety. It is a benefit to the City of Attleboro and the Town of Mansfield. They have made accommodations to the effects to adjoining premises. There are no adverse effects on vehicular and pedestrian traffic and safety. He noted that overall it is a good plan.

Mr. Penney, in favor of the motion, said that the treatment plant is needed to remove PFAS compounds to provide drinking water to the City of Attleboro and the Town of Mansfield.

Ms. Ashman-Collins, in favor of the motion, found that the benefits outweigh the detriments. The plan has considered the effects on the adjoining premises, environment, and traffic. She expressed that the applicant put forth an entirely beneficial plan for the Town and the region.

Ms. Friedman, in favor of the motion, expressed that the benefits outweigh the deficits in relation to the health and safety of the City of Attleboro and Mansfield. The effects on the adjoining premises and neighborhood character have been taken into consideration to ensure that the neighborhood would be maintained with minimal disruption. She expressed that the vehicular and pedestrian traffic is not an issue for the project. The development of the project and facilities for the City of Attleboro and Town of Mansfield are very important. The applicant has made substantial efforts to ensure that the vernal pool is not disrupted and that the scenic road would not be affected.

Mr. Feck, in favor of the motion, expressed that the benefits outweigh the detriments for the same reasons that the other Board members stated. The facility is important for removing PFAS from the water supply.

Seven (7) in favor, Zero (0) opposed, Zero (0) abstained PASSES

Further, this Special Permit and Site Plan Approval is **Granted** in accordance with the provisions of the Zoning By-Law of the Town of Mansfield and is subject to all of its regulations unless specified otherwise in this decision. It shall be the sole responsibility of the applicant and/or his or her agents to obtain building permits, and all other necessary permits or approvals required by other Town, State, or Federal Laws and Regulations. The Building Inspector is hereby authorized to grant a permit in accordance with this decision upon presentation of evidence that this permit has been duly recorded at the Bristol County Registry of Deeds. Appeals, if any, shall be made pursuant to Section 17 of Chapter 40A of the Massachusetts General Laws and shall be filed within twenty (20) days after the decision of the Planning Board has been filed with the Town Clerk.

To sign the Special Permit pursuant to the provisions of the Massachusetts General Laws Chapter 40A, Section 9 Special Permit and Bylaw Sections 230-5.1(E)(3)(d), 5.2(B), 5.5, and 230-5.3 for the property at 250 Balcom Street for the construction of a new Water Treatment Plant including all associated site work and utilities. The project site is owned by the City of Attleboro and is shown on Assessor's Plat 003, Lot 094 within the Residential 1 (R-1) zone.

Planning Board of the Town of Mansfield, Massachusetts:

In Favor:

Michael Feck, Chair

Sharon Friedman, Clerk

Joseph Cerretani

Ralph Pennoy

Michael McClanahan

Beth Ashman-Collins

Mark Corsillo

APPENDIX I

FEDERAL CROSSCUTTER MEMO

February 22, 2024

MEMORANDUM

FEDERAL CROSSCUTTERS APPLICABLE TO SRF

Through this memorandum, the Division of Municipal Services at MassDEP, intends to provide general guidance to State Revolving Fund (SRF) borrowers. This memorandum does not create any legal rights or substitutes for the applicable statue(s) and regulation(s).

I. Environmental Authorities

A. National Environmental Policy Act

The SRF Regulations require a NEPA-like review of all federally funded SRF projects. In Massachusetts, the NEPA-like review is MEPA, the Massachusetts Environmental Policy Act. Projects that require a state permit or receive state funding are required to perform a MEPA review. The MEPA regulations at 301 CMR 11.03 establish review thresholds for the submission of an Environmental Notification Form (ENF) and/or an Environmental Impact Report (EIR). If a project exceeds a MEPA threshold, the applicant must submit the Certificate from the Secretary of Energy and Environmental Affairs indicating that the project complies with MEPA. If the MEPA thresholds are not tripped, the project applicant must submit a letter for the project file indicating that the thresholds were reviewed and that no further review is required under MEPA.

B. Historic Resources

National Historic Preservation Act
Archeological and Historic Preservation Act Protection and Enhancement of the Cultural Environment
Native American Graves Protection and Repatriation Act

The requirements of the National Historic Preservation Act, the Archeological and Historic Preservation Act and the Native American Graves Protection and Repatriation Act are addressed through the Massachusetts Historical Commission (MHC). A construction loan cannot be made until all work required by the MHC has been completed and approved by them in accordance with 950 CMR 71.00. The loan may be conditioned, in some instances, to require recovery of archaeological material during construction when a sensitive area will be affected, and no reasonable alternative is available. Documentation that the requirements of MHC have been met must be included with the SRF loan application.

C. Environmentally Sensitive Lands

Protection of Wetlands
Flood Plain Management
Farmland Protection Policy Act
Migratory Bird Treaty Act

Both the Protection of Wetlands and Flood Plain Management are dealt with in the Massachusetts Wetlands Protection Act (MGL Ch. 131, Section 40) and its implementing regulations (310 CMR 10.00). The Wetlands Protection Act is enforced through each communities local Conservation

Commission. Any work within 100 feet of a wetland resource area must receive a permit from the local Conservation Commission, called an Order of Conditions. Any alteration to a resource area requires mitigation for that alteration (usually in excess of the alteration). An applicant or abutter to the project can appeal the decision of the local Conservation Commission to MassDEP, where a Superseding Order of Conditions may be issued. Large scale alterations to wetlands or flood plain may require additional MEPA review. Alterations to wetlands and/or floodplain may require additional permitting through the Army Corps of Engineers (Section 404 permit) and MassDEP (Chapter 91 license and Water Quality Certificate).The Farmland Protection Policy Act is covered under MEPA review for the conversion of agricultural land to another use. SRF applicants are required to identify which permits will be necessary for the project when submitting their loan application, and copies of the permits must be submitted before the project can be bid.

Migratory Bird Treaty Act of 1918
Authority for States to enact and implement laws or regulations to allow for greater protection of migratory birds, provided that such laws are consistent with the respective Conventions and that open seasons do not extend beyond those established at the national level. (16 U.S.C. 708)

D. Coastal Area Protection

Coastal Zone Management Act
Coastal Barriers Resources Act

Coastal Resource areas are also covered under the Massachusetts Wetlands Protection Act. These areas include: Land Under the Ocean, Designated Port Areas, Coastal Beaches, Coastal Dunes, Barrier Beaches, Coastal Banks, Rocky Intertidal Shores, Salt Marshes, Land Under Salt Ponds, Land Containing Shellfish, Banks of or Land Under the Ocean, Ponds, Streams, Rivers, Lakes or Creeks that Underlie Anadromous/Catadromous ("Fish Run"). The implementation of these regulations is under the jurisdiction of the local Conservation Commission. The Massachusetts Office of Coastal Zone Management may also need to issue a consistency certificate for projects that also require a federal permit. Large scale alterations to any of these resource areas may trip certain MEPA thresholds requiring additional state review. SRF applicants are required to identify any permits required in their loan application to MassDEP and must submit copies of all permits before the project can be bid.

E. Wild and Scenic Rivers Act

Massachusetts has three Wild and Scenic Rivers. Any work adjacent to a Wild and Scenic river would first trip the Massachusetts Wetlands Protection Act requirement for an order of conditions for work within 200 feet of a river. Any work within or adjacent to a Wild and Scenic River requires an Army Corps of Engineers (Section 404 Permit). The Army Corps coordinates their review with the National Park Service (NPS) to determine the impact on the river and whether mitigation is necessary for the work. Additional permitting may include a Chapter 91 License and a Water Quality Certificate. Larger scale alterations to the river and its adjacent wetlands may trip various MEPA thresholds.

F. Endangered Species Act

The Massachusetts Endangered Species Act (MGL Ch 131A) and its implementing regulations (321 CMR 10.00) incorporates the federal Endangered Species Act by reference and is administered through the Natural Heritage and Endangered Species program within the Massachusetts Division of

Fisheries and Wildlife. The regulations establish a list of Endangered, Threatened and Special Concern species that incorporate the list of federal Endangered and Threatened Species and established a permit program for the taking and possession of species. SRF applicants are required to consult with the Natural Heritage and Endangered Species Program during the planning of the SRF project. Endangered species, Fish and Wildlife are also reviewed as part of any MEPA submission.

G. Essential Fish Habitat

According to the federal National Marine Fisheries Service (NMFS), Essential Fish Habitat Review generally happens through the Army Corps 404/Section 10 permitting process. SRF applicants are required to identify in their loan applications whether Army Corps permitting is required and must obtain these permits before the project goes to bid. If a federal permit is required in a coastal zone, the Massachusetts Office of Coastal Zone Management must also issue a consistency certificate for the work. The State Division of Marine Fisheries also works in conjunction with the NMFS. Fish habitat is also protected under the Massachusetts Wetlands Protection Act and further waterways permitting may be required by MassDEP (Chapter 91 permit and Water Quality Certificate). There are various wetland, waterway and tideland thresholds that may trip MEPA review, which may also evaluate impacts on fish habitat.

H. Clean Air Act

All SRF applicants are required to identify if any permits are required and must submit copies of all permits before the project may be bid. The loan application identifies that a MassDEP Division of Air Quality Permit may be required. Any proposed new or modified source of air contaminants, such as carbon monoxide, hydrocarbons, nitrogen oxides, sulfur dioxide, particulate matter, volatile organic compounds, and any pollutant covered by the National Emission Standards for Hazardous Air Pollutants promulgated by EPA, must be approved. In addition, the SRF program requires that all off-road diesel vehicles be retrofitted with emission reduction equipment to reduce the levels of particulate matter, carbon monoxide and volatile organic compounds. Large scale air emissions also trip MEPA thresholds, but are unlikely in any SRF related project.

I. Safe Drinking Water Act

MassDEP regulates the discharge of pollutant to the ground waters of the Commonwealth through the Ground Water Discharge Permit Program (314 CMR 5.00). Any project proposing to discharge greater than 10,000 gallons per day must receive a permit from MassDEP. Projects discharging less than 10,000 gallons per day must receive a permit from the local Board of Health. All SRF applicants are required to identify if a ground water discharge permit is required and must obtain it before the project can be bid.

II. Social Policy Authorities

A. Civil Rights Laws (i.e., Super Crosscutters)

Title VI of the Civil Rights Act of 1964
Section 13 of the FWPCA Amendments of 1972
Section 504 of the Rehabilitation Act of 1973
The Age Discrimination Act of 1975

All SRF applicants are required to certify in the loan application that they will comply with the laws applicable to civil rights. All contracts are required to include the language contained in the Commonwealth of Massachusetts Equal Employment Opportunity, Anti-Discrimination and Affirmative Action Program, and the contractor is required to certify compliance with the program. The program prohibits discrimination against any employee or applicant for employment because of race, color, religious creed, national origin, age or sex.

B. Equal Employment Opportunity, Executive Order No. 11246

All contracts are required to include the language contained in the Commonwealth of Massachusetts Equal Employment Opportunity, Anti-Discrimination and Affirmative Action Program, and the contractor is required to certify compliance with the program.

C. Disadvantage Business Enterprise Provisions

Promoting the Use of Small, Minority, and Women-owned Businesses
Section 129 of the Small Business Administration Reauthorization and Amendment Act of 1988
Department of Veterans Affairs and Housing and Urban Development, and Independent Agencies Appropriations Act, 1993

All SRF contracts are required to include in their contracts and comply with the mandated M/W/DBE requirements of the EPA.

III. Executive Orders

The Federal Flood Risk Management Standard (FFRMS) to comply with Executive Order (EO) 14030 which reinstated EO 13690.

APPENDIX J

PROCESS VALVE SCHEDULE

Wading River Water Treatment Plant
Attleboro Water Department
Process Valve Identification List

TYPE	SIZE [IN]	TAG ID	PROCESS	OPERATOR	DWG	QUAN	NOTES:
BUTTERFLY	12	MV-100	PFW	HANDWHEEL	04-I-3	1	MIEX STANDPIPE INLET
BUTTERFLY	12	MV-101A	ME	HANDWHEEL	04-I-3	1	INTERMEDIATE PUMP #1 SUCTION
BUTTERFLY	12	MV-101B	ME	HANDWHEEL	04-I-3	1	INTERMEDIATE PUMP #2 SUCTION
BUTTERFLY	12	MV-102A	ME	HANDWHEEL	04-I-3	1	INTERMEDIATE PUMP #1 DISCHARGE
BUTTERFLY	12	MV-102B	ME	HANDWHEEL	04-I-3	1	INTERMEDIATE PUMP #2 DISCHARGE
BUTTERFLY	12	MV-110	TW	HANDWHEEL	04-I-3	1	CLEARWELL INFLUENT
BUTTERFLY	12	MV-114	TW	HANDWHEEL	04-I-3	1	FW MAIN ISOLATION
						7	
BUTTERFLY	10	MV-111A	FW	HANDWHEEL	04-I-3	1	HIGH LIFT PUMP #1 DISCHARGE
BUTTERFLY	10	MV-111B	FW	HANDWHEEL	04-I-3	1	HIGH LIFT PUMP #2 DISCHARGE
BUTTERFLY	10	MV-112A	FW	HANDWHEEL	04-I-3	1	BACKWASH PUMP #1 DISCHARGE
BUTTERFLY	10	MV-112B	FW	HANDWHEEL	04-I-3	1	BACKWASH PUMP #2 DISCHARGE
BUTTERFLY	10	MV-2000	ME	HANDWHEEL	04-I-5	1	GREENSANDPLUS FILTER #1 INFLUENT ISOLATION
BUTTERFLY	10	MV-2001	ME	HANDWHEEL	04-I-5	1	GREENSANDPLUS FILTER #2 INFLUENT ISOLATION (furnished by GS+ filter supplier)
BUTTERFLY	10	MV-2002	ME	HANDWHEEL	04-I-5	1	GREENSANDPLUS FILTER #3 INFLUENT ISOLATION (furnished by GS+ filter supplier)
BUTTERFLY	10	MOV-2020	ME	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #1 EFFLUENT (furnished by GS+ filter supplier)
BUTTERFLY	10	MOV-2021	ME	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #2 EFFLUENT (furnished by GS+ filter supplier)
BUTTERFLY	10	MOV-2022	ME	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #3 EFFLUENT (furnished by GS+ filter supplier)
BUTTERFLY	10	MV-2030	FLT	HANDWHEEL	04-I-5	1	GREENSANDPLUS FILTER #1 EFFLUENT ISOLATION (furnished by GS+ filter supplier)
BUTTERFLY	10	MV-2031	FLT	HANDWHEEL	04-I-5	1	GREENSANDPLUS FILTER #2 EFFLUENT ISOLATION (furnished by GS+ filter supplier)
BUTTERFLY	10	MV-2032	FLT	HANDWHEEL	04-I-5	1	GREENSANDPLUS FILTER #3 EFFLUENT ISOLATION (furnished by GS+ filter supplier)
BUTTERFLY	10	MV-2040	BWS	HANDWHEEL	04-I-5	1	GREENSANDPLUS FILTER #1 BACKWASH ISOLATION (furnished by GS+ filter supplier)
BUTTERFLY	10	MV-2041	BWS	HANDWHEEL	04-I-5	1	GREENSANDPLUS FILTER #2 BACKWASH ISOLATION (furnished by GS+ filter supplier)
BUTTERFLY	10	MV-2042	BWS	HANDWHEEL	04-I-5	1	GREENSANDPLUS FILTER #3 BACKWASH ISOLATION (furnished by GS+ filter supplier)
BUTTERFLY	10	MOV-2050	BWS	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #1 BACKWASH (furnished by GS+ filter supplier)
BUTTERFLY	10	MOV-2051	BWS	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #2 BACKWASH (furnished by GS+ filter supplier)
BUTTERFLY	10	MOV-2052	BWS	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #3 BACKWASH (furnished by GS+ filter supplier)
BUTTERFLY	10	MV-2070	SWW	HANDWHEEL	04-I-5	1	GREENSANDPLUS FILTER #1 SPENT WASHWATER ISOLATION (furnished by GS+ filter supplier)
BUTTERFLY	10	MV-2071	SWW	HANDWHEEL	04-I-5	1	GREENSANDPLUS FILTER #2 SPENT WASHWATER ISOLATION (furnished by GS+ filter supplier)
BUTTERFLY	10	MV-2072	SWW	HANDWHEEL	04-I-5	1	GREENSANDPLUS FILTER #2 SPENT WASHWATER ISOLATION (furnished by GS+ filter supplier)
BUTTERFLY	10	MOV-2080	FTW	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #1 RINSE (furnished by GS+ filter supplier)
BUTTERFLY	10	MOV-2081	FTW	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #2 RINSE (furnished by GS+ filter supplier)
BUTTERFLY	10	MOV-2082	FTW	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #3 RINSE (furnished by GS+ filter supplier)
BUTTERFLY	10	MV-2090	FTW	HANDWHEEL	04-I-5	1	GREENSANDPLUS FILTER #1 RINSE RATE SET/ISOLATION (furnished by GS+ filter supplier)
BUTTERFLY	10	MV-2091	FTW	HANDWHEEL	04-I-5	1	GREENSANDPLUS FILTER #2 RINSE RATE SET/ISOLATION (furnished by GS+ filter supplier)
BUTTERFLY	10	MV-2092	FTW	HANDWHEEL	04-I-5	1	GREENSANDPLUS FILTER #2 RINSE RATE SET/ISOLATION (furnished by GS+ filter supplier)
						28	
BUTTERFLY	8	MOV-2010A	ME	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #1 CELL #1 INFLUENT (furnished by GS+ filter supplier)
BUTTERFLY	8	MOV-2010B	ME	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #1 CELL #2 INFLUENT (furnished by GS+ filter supplier)
BUTTERFLY	8	MOV-2010C	ME	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #1 CELL #3 INFLUENT (furnished by GS+ filter supplier)
BUTTERFLY	8	MOV-2011A	ME	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #2 CELL #1 INFLUENT (furnished by GS+ filter supplier)
BUTTERFLY	8	MOV-2011B	ME	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #2 CELL #2 INFLUENT (furnished by GS+ filter supplier)
BUTTERFLY	8	MOV-2011C	ME	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #2 CELL #3 INFLUENT (furnished by GS+ filter supplier)
BUTTERFLY	8	MOV-2012A	ME	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #3 CELL #1 INFLUENT (furnished by GS+ filter supplier)

TYPE	SIZE [IN]	TAG ID	PROCESS	OPERATOR	DWG	QUAN	NOTES:
BUTTERFLY	8	MOV-2012B	ME	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #3 CELL #2 INFLUENT (furnished by GS+ filter supplier)
BUTTERFLY	8	MOV-2012C	ME	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #3 CELL #3 INFLUENT (furnished by GS+ filter supplier)
BUTTERFLY	8	MOV-2060A	SWW	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #1 CELL #1 SWW OUTLET (furnished by GS+ filter supplier)
BUTTERFLY	8	MOV-2060B	SWW	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #1 CELL #2 SWW OUTLET (furnished by GS+ filter supplier)
BUTTERFLY	8	MOV-20610C	SWW	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #1 CELL #3 SWW OUTLET (furnished by GS+ filter supplier)
BUTTERFLY	8	MOV-2061A	SWW	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #2 CELL #1 SWW OUTLET (furnished by GS+ filter supplier)
BUTTERFLY	8	MOV-2061B	SWW	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #2 CELL #2 SWW OUTLET (furnished by GS+ filter supplier)
BUTTERFLY	8	MOV-2061C	SWW	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #2 CELL #3 SWW OUTLET (furnished by GS+ filter supplier)
BUTTERFLY	8	MOV-2062A	SWW	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #3 CELL #1 SWW OUTLET (furnished by GS+ filter supplier)
BUTTERFLY	8	MOV-2062B	SWW	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #3 CELL #2 SWW OUTLET (furnished by GS+ filter supplier)
BUTTERFLY	8	MOV-2062C	SWW	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #3 CELL #3 SWW OUTLET (furnished by GS+ filter supplier)
BUTTERFLY	8	MV-327	SWW	HANDWHEEL	20-D-1	1	PFAS SYSTEM COMBINED SWW
						19	
BUTTERFLY	6	MV-104A	SR	HANDWHEEL	04-I-3	1	SUPERNATANT PUMP #1 DISCHARGE
BUTTERFLY	6	MV-104B	SR	HANDWHEEL	04-I-3	1	SUPERNATANT PUMP #2 DISCHARGE
BUTTERFLY	6	MV-109A	FLT	HANDWHEEL	04-I-3	1	PFAS SYSTEM #1 INFLUENT
BUTTERFLY	6	MV-109B	FLT	HANDWHEEL	04-I-3	1	PFAS SYSTEM #2 INFLUENT
BUTTERFLY	6	MV-109C	FLT	HANDWHEEL	04-I-3	1	PFAS SYSTEM #3 INFLUENT
BUTTERFLY	6	MV-300A	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-300B	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-301A	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-301B	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-302A	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-302B	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-303	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-304A	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-304B	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-305A	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-305B	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-306A	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-306B	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-310A	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-310B	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-311A	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-311B	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-312A	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-312B	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-313A	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-314A	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-314B	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-315A	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-315B	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-316A	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-316B	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-320A	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-320B	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-321A	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-321B	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)

TYPE	SIZE [IN]	TAG ID	PROCESS	OPERATOR	DWG	QUAN	NOTES:
BUTTERFLY	6	MV-322A	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-322B	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-323	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-324A	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-324B	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-325A	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-325B	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-326A	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-326B	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
						44	
BUTTERFLY	4	MOV-100	BWS	MOTOR OPERATED	20-D-1	1	BACKWASH SUPPLY TANK INLET
BUTTERFLY	4	MV-103A	SR	HANDWHEEL	20-D-1	1	SUPERNATANT PUMP #1 SUCTION
BUTTERFLY	4	MV-103B	SR	HANDWHEEL	20-D-1	1	SUPERNATANT PUMP #2 SUCTION
BUTTERFLY	4	MV-105	RES	HANDWHEEL	20-D-1	1	RESIDUALS PUMP SUCTION
BUTTERFLY	4	MV-113	AS	HANDWHEEL	20-D-1	1	PRESSURE RELIEF VALVE ISOLATION
BUTTERFLY	4	MOV-205	AS	MOTOR OPERATED	20-D-1	1	GREENSANDPLUS FILTER #1 AIR PRESSURIZATION INLET
BUTTERFLY	4	MOV-215	AS	MOTOR OPERATED	20-D-1	1	GREENSANDPLUS FILTER #2 AIR PRESSURIZATION INLET
BUTTERFLY	4	MOV-225	AS	MOTOR OPERATED	20-D-1	1	GREENSANDPLUS FILTER #3 AIR PRESSURIZATION INLET
						7	
BUTTERFLY	3	MOV-206A	AIR	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #1 CELL #1 AIR SCOUR INLET
BUTTERFLY	3	MOV-206B	AIR	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #1 CELL #2 AIR SCOUR INLET
BUTTERFLY	3	MOV-206C	AIR	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #1 CELL #3 AIR SCOUR INLET
BUTTERFLY	3	MOV-216A	AIR	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #2 CELL #1 AIR SCOUR INLET
BUTTERFLY	3	MOV-216B	AIR	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #2 CELL #2 AIR SCOUR INLET
BUTTERFLY	3	MOV-216C	AIR	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #2 CELL #3 AIR SCOUR INLET
BUTTERFLY	3	MOV-226A	AIR	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #3 CELL #1 AIR SCOUR INLET
BUTTERFLY	3	MOV-226B	AIR	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #3 CELL #2 AIR SCOUR INLET
BUTTERFLY	3	MOV-226C	AIR	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #3 CELL #3 AIR SCOUR INLET
						9	
BALL	2	MV-106	RES	HANDLE	04-I-3	1	RESIDUALS PUMP DISCHARGE
BALL	2	MV-107	RES	HANDLE	04-I-3	1	RESIDUALS DISCHARGE TO LAGOON
BALL	2	MV-108	RES	HANDLE	04-I-3	1	RESIDUALS DISCHARGE TO TRUCK FILL STATION
BALL	2	MV-109	RES	HANDLE	04-I-3	1	RESIDUALS PIPE DRAIN BACK TO SWW TANK
						4	

TYPE	SIZE [IN]	TAG ID	PROCESS	OPERATOR	DWG	QUAN	NOTES:
CHECK VALVE	12	CV-100A	IP	N/A	04-I-3	1	INTERMEDIATE PUMP #1 DISCHARGE
CHECK VALVE	12	CV-100B	IP	N/A	04-I-3	1	INTERMEDIATE PUMP #2 DISCHARGE
CHECK VALVE	10	CV-103A	FW	N/A	04-I-3	1	HIGH LIFT PUMP #1 DISCHARGE
CHECK VALVE	10	CV-103B	FW	N/A	04-I-3	1	HIGH LIFT PUMP #2 DISCHARGE
CHECK VALVE	10	CV-104A	BWW	N/A	04-I-3	1	BACKWASH PUMP #1 DISCHARGE
CHECK VALVE	10	CV-104B	BWW	N/A	04-I-3	1	BACKWASH PUMP #2 DISCHARGE
CHECK VALVE	6	CV-101A	SR	N/A	04-I-3	1	SUPERNATANT PUMP #1 DISCHARGE
CHECK VALVE	6	CV-101B	SR	N/A	04-I-3	1	SUPERNATANT PUMP #2 DISCHARGE
CHECK VALVE	4	CV-102	RES	N/A	04-I-3	1	SLUDGE PUMP FOOT VALVE
						9	
AIR RELEASE	2	AV-100A	BW	N/A	20-D-8	1	HIGH LIFT PUMP #1 AIR & VACUUM RELIEF VALVE
AIR RELEASE	2	AV-100B	BW	N/A	20-D-8	1	HIGH LIFT PUMP #2 AIR & VACUUM RELIEF VALVE
AIR RELEASE	2	AV-101A	BW	N/A	20-D-8	1	BACKWASH PUMP #1 AIR & VACUUM RELIEF VALVE
AIR RELEASE	2	AV-1010B	BW	N/A	20-D-8	1	BACKWASH PUMP #2 AIR & VACUUM RELIEF VALVE
AIR RELEASE	1	AV-102	BW	N/A	20-D-8	1	BACKWASH SUPPLY HEADER AIR RELIEF VALVE
						3	
BACKPRESSURE	12	BPV-100	TW	HYDRAULICALLY OPERATED	04-I-3	**1**	CLEARWELL INFLUENT
						1	
PRESSURE RELIEF	4	PVR-100	TW	HYDRAULICALLY OPERATED	04-I-3	**1**	FINISHED WATER SURGE ANTICIPATOR VALVE
						1	

Wading River Water Treatment Plant
Attleboro Water Department
Process Valve Identification List

TYPE	SIZE [IN]	TAG ID	PROCESS	OPERATOR	DWG	QUAN	NOTES:
BUTTERFLY	12	MV-100	PFW	HANDWHEEL	04-I-3	1	MIEX STANDPIPE INLET
BUTTERFLY	12	MV-101A	ME	HANDWHEEL	04-I-3	1	INTERMEDIATE PUMP #1 SUCTION
BUTTERFLY	12	MV-101B	ME	HANDWHEEL	04-I-3	1	INTERMEDIATE PUMP #2 SUCTION
BUTTERFLY	12	MV-102A	ME	HANDWHEEL	04-I-3	1	INTERMEDIATE PUMP #1 DISCHARGE
BUTTERFLY	12	MV-102B	ME	HANDWHEEL	04-I-3	1	INTERMEDIATE PUMP #2 DISCHARGE
BUTTERFLY	12	MV-110	TW	HANDWHEEL	04-I-3	1	CLEARWELL INFLUENT
BUTTERFLY	12	MV-114	TW	HANDWHEEL	04-I-3	1	FW MAIN ISOLATION
						7	
BUTTERFLY	10	MV-111A	FW	HANDWHEEL	04-I-3	1	HIGH LIFT PUMP #1 DISCHARGE
BUTTERFLY	10	MV-111B	FW	HANDWHEEL	04-I-3	1	HIGH LIFT PUMP #2 DISCHARGE
BUTTERFLY	10	MV-112A	FW	HANDWHEEL	04-I-3	1	BACKWASH PUMP #1 DISCHARGE
BUTTERFLY	10	MV-112B	FW	HANDWHEEL	04-I-3	1	BACKWASH PUMP #2 DISCHARGE
BUTTERFLY	10	MV-2000	ME	HANDWHEEL	04-I-5	1	GREENSANDPLUS FILTER #1 INFLUENT ISOLATION
BUTTERFLY	10	MV-2001	ME	HANDWHEEL	04-I-5	1	GREENSANDPLUS FILTER #2 INFLUENT ISOLATION (furnished by GS+ filter supplier)
BUTTERFLY	10	MV-2002	ME	HANDWHEEL	04-I-5	1	GREENSANDPLUS FILTER #3 INFLUENT ISOLATION (furnished by GS+ filter supplier)
BUTTERFLY	10	MOV-2020	ME	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #1 EFFLUENT (furnished by GS+ filter supplier)
BUTTERFLY	10	MOV-2021	ME	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #2 EFFLUENT (furnished by GS+ filter supplier)
BUTTERFLY	10	MOV-2022	ME	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #3 EFFLUENT (furnished by GS+ filter supplier)
BUTTERFLY	10	MV-2030	FLT	HANDWHEEL	04-I-5	1	GREENSANDPLUS FILTER #1 EFFLUENT ISOLATION (furnished by GS+ filter supplier)
BUTTERFLY	10	MV-2031	FLT	HANDWHEEL	04-I-5	1	GREENSANDPLUS FILTER #2 EFFLUENT ISOLATION (furnished by GS+ filter supplier)
BUTTERFLY	10	MV-2032	FLT	HANDWHEEL	04-I-5	1	GREENSANDPLUS FILTER #3 EFFLUENT ISOLATION (furnished by GS+ filter supplier)
BUTTERFLY	10	MV-2040	BWS	HANDWHEEL	04-I-5	1	GREENSANDPLUS FILTER #1 BACKWASH ISOLATION (furnished by GS+ filter supplier)
BUTTERFLY	10	MV-2041	BWS	HANDWHEEL	04-I-5	1	GREENSANDPLUS FILTER #2 BACKWASH ISOLATION (furnished by GS+ filter supplier)
BUTTERFLY	10	MV-2042	BWS	HANDWHEEL	04-I-5	1	GREENSANDPLUS FILTER #3 BACKWASH ISOLATION (furnished by GS+ filter supplier)
BUTTERFLY	10	MOV-2050	BWS	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #1 BACKWASH (furnished by GS+ filter supplier)
BUTTERFLY	10	MOV-2051	BWS	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #2 BACKWASH (furnished by GS+ filter supplier)
BUTTERFLY	10	MOV-2052	BWS	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #3 BACKWASH (furnished by GS+ filter supplier)
BUTTERFLY	10	MV-2070	SWW	HANDWHEEL	04-I-5	1	GREENSANDPLUS FILTER #1 SPENT WASHWATER ISOLATION (furnished by GS+ filter supplier)
BUTTERFLY	10	MV-2071	SWW	HANDWHEEL	04-I-5	1	GREENSANDPLUS FILTER #2 SPENT WASHWATER ISOLATION (furnished by GS+ filter supplier)
BUTTERFLY	10	MV-2072	SWW	HANDWHEEL	04-I-5	1	GREENSANDPLUS FILTER #2 SPENT WASHWATER ISOLATION (furnished by GS+ filter supplier)
BUTTERFLY	10	MOV-2080	FTW	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #1 RINSE (furnished by GS+ filter supplier)
BUTTERFLY	10	MOV-2081	FTW	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #2 RINSE (furnished by GS+ filter supplier)
BUTTERFLY	10	MOV-2082	FTW	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #3 RINSE (furnished by GS+ filter supplier)
BUTTERFLY	10	MV-2090	FTW	HANDWHEEL	04-I-5	1	GREENSANDPLUS FILTER #1 RINSE RATE SET/ISOLATION (furnished by GS+ filter supplier)
BUTTERFLY	10	MV-2091	FTW	HANDWHEEL	04-I-5	1	GREENSANDPLUS FILTER #2 RINSE RATE SET/ISOLATION (furnished by GS+ filter supplier)
BUTTERFLY	10	MV-2092	FTW	HANDWHEEL	04-I-5	1	GREENSANDPLUS FILTER #2 RINSE RATE SET/ISOLATION (furnished by GS+ filter supplier)
						28	
BUTTERFLY	8	MOV-2010A	ME	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #1 CELL #1 INFLUENT (furnished by GS+ filter supplier)
BUTTERFLY	8	MOV-2010B	ME	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #1 CELL #2 INFLUENT (furnished by GS+ filter supplier)
BUTTERFLY	8	MOV-2010C	ME	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #1 CELL #3 INFLUENT (furnished by GS+ filter supplier)
BUTTERFLY	8	MOV-2011A	ME	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #2 CELL #1 INFLUENT (furnished by GS+ filter supplier)
BUTTERFLY	8	MOV-2011B	ME	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #2 CELL #2 INFLUENT (furnished by GS+ filter supplier)
BUTTERFLY	8	MOV-2011C	ME	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #2 CELL #3 INFLUENT (furnished by GS+ filter supplier)
BUTTERFLY	8	MOV-2012A	ME	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #3 CELL #1 INFLUENT (furnished by GS+ filter supplier)

TYPE	SIZE [IN]	TAG ID	PROCESS	OPERATOR	DWG	QUAN	NOTES:
BUTTERFLY	8	MOV-2012B	ME	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #3 CELL #2 INFLUENT (furnished by GS+ filter supplier)
BUTTERFLY	8	MOV-2012C	ME	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #3 CELL #3 INFLUENT (furnished by GS+ filter supplier)
BUTTERFLY	8	MOV-2060A	SWW	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #1 CELL #1 SWW OUTLET (furnished by GS+ filter supplier)
BUTTERFLY	8	MOV-2060B	SWW	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #1 CELL #2 SWW OUTLET (furnished by GS+ filter supplier)
BUTTERFLY	8	MOV-20610C	SWW	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #1 CELL #3 SWW OUTLET (furnished by GS+ filter supplier)
BUTTERFLY	8	MOV-2061A	SWW	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #2 CELL #1 SWW OUTLET (furnished by GS+ filter supplier)
BUTTERFLY	8	MOV-2061B	SWW	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #2 CELL #2 SWW OUTLET (furnished by GS+ filter supplier)
BUTTERFLY	8	MOV-2061C	SWW	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #2 CELL #3 SWW OUTLET (furnished by GS+ filter supplier)
BUTTERFLY	8	MOV-2062A	SWW	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #3 CELL #1 SWW OUTLET (furnished by GS+ filter supplier)
BUTTERFLY	8	MOV-2062B	SWW	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #3 CELL #2 SWW OUTLET (furnished by GS+ filter supplier)
BUTTERFLY	8	MOV-2062C	SWW	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #3 CELL #3 SWW OUTLET (furnished by GS+ filter supplier)
BUTTERFLY	8	MV-327	SWW	HANDWHEEL	20-D-1	1	PFAS SYSTEM COMBINED SWW
						19	
BUTTERFLY	6	MV-104A	SR	HANDWHEEL	04-I-3	1	SUPERNATANT PUMP #1 DISCHARGE
BUTTERFLY	6	MV-104B	SR	HANDWHEEL	04-I-3	1	SUPERNATANT PUMP #2 DISCHARGE
BUTTERFLY	6	MV-109A	FLT	HANDWHEEL	04-I-3	1	PFAS SYSTEM #1 INFLUENT
BUTTERFLY	6	MV-109B	FLT	HANDWHEEL	04-I-3	1	PFAS SYSTEM #2 INFLUENT
BUTTERFLY	6	MV-109C	FLT	HANDWHEEL	04-I-3	1	PFAS SYSTEM #3 INFLUENT
BUTTERFLY	6	MV-300A	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-300B	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-301A	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-301B	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-302A	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-302B	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-303	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-304A	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-304B	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-305A	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-305B	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-306A	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-306B	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-310A	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-310B	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-311A	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-311B	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-312A	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-312B	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-313A	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-314A	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-314B	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-315A	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-315B	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-316A	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-316B	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-320A	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-320B	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-321A	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-321B	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)

TYPE	SIZE [IN]	TAG ID	PROCESS	OPERATOR	DWG	QUAN	NOTES:
BUTTERFLY	6	MV-322A	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-322B	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-323	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-324A	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-324B	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-325A	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-325B	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-326A	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
BUTTERFLY	6	MV-326B	N/A	HANDWHEEL	04-I-3	1	(furnished by PFAS system supplier)
						44	
BUTTERFLY	4	MOV-100	BWS	MOTOR OPERATED	20-D-1	1	BACKWASH SUPPLY TANK INLET
BUTTERFLY	4	MV-103A	SR	HANDWHEEL	20-D-1	1	SUPERNATANT PUMP #1 SUCTION
BUTTERFLY	4	MV-103B	SR	HANDWHEEL	20-D-1	1	SUPERNATANT PUMP #2 SUCTION
BUTTERFLY	4	MV-105	RES	HANDWHEEL	20-D-1	1	RESIDUALS PUMP SUCTION
BUTTERFLY	4	MV-113	AS	HANDWHEEL	20-D-1	1	PRESSURE RELIEF VALVE ISOLATION
BUTTERFLY	4	MOV-205	AS	MOTOR OPERATED	20-D-1	1	GREENSANDPLUS FILTER #1 AIR PRESSURIZATION INLET
BUTTERFLY	4	MOV-215	AS	MOTOR OPERATED	20-D-1	1	GREENSANDPLUS FILTER #2 AIR PRESSURIZATION INLET
BUTTERFLY	4	MOV-225	AS	MOTOR OPERATED	20-D-1	1	GREENSANDPLUS FILTER #3 AIR PRESSURIZATION INLET
						7	
BUTTERFLY	3	MOV-206A	AIR	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #1 CELL #1 AIR SCOUR INLET
BUTTERFLY	3	MOV-206B	AIR	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #1 CELL #2 AIR SCOUR INLET
BUTTERFLY	3	MOV-206C	AIR	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #1 CELL #3 AIR SCOUR INLET
BUTTERFLY	3	MOV-216A	AIR	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #2 CELL #1 AIR SCOUR INLET
BUTTERFLY	3	MOV-216B	AIR	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #2 CELL #2 AIR SCOUR INLET
BUTTERFLY	3	MOV-216C	AIR	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #2 CELL #3 AIR SCOUR INLET
BUTTERFLY	3	MOV-226A	AIR	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #3 CELL #1 AIR SCOUR INLET
BUTTERFLY	3	MOV-226B	AIR	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #3 CELL #2 AIR SCOUR INLET
BUTTERFLY	3	MOV-226C	AIR	MOTOR OPERATED	04-I-5	1	GREENSANDPLUS FILTER #3 CELL #3 AIR SCOUR INLET
						9	
BALL	2	MV-106	RES	HANDLE	04-I-3	1	RESIDUALS PUMP DISCHARGE
BALL	2	MV-107	RES	HANDLE	04-I-3	1	RESIDUALS DISCHARGE TO LAGOON
BALL	2	MV-108	RES	HANDLE	04-I-3	1	RESIDUALS DISCHARGE TO TRUCK FILL STATION
BALL	2	MV-109	RES	HANDLE	04-I-3	1	RESIDUALS PIPE DRAIN BACK TO SWW TANK
						4	

TYPE	SIZE [IN]	TAG ID	PROCESS	OPERATOR	DWG	QUAN	NOTES:
CHECK VALVE	12	CV-100A	IP	N/A	04-I-3	1	INTERMEDIATE PUMP #1 DISCHARGE
CHECK VALVE	12	CV-100B	IP	N/A	04-I-3	1	INTERMEDIATE PUMP #2 DISCHARGE
CHECK VALVE	10	CV-103A	FW	N/A	04-I-3	1	HIGH LIFT PUMP #1 DISCHARGE
CHECK VALVE	10	CV-103B	FW	N/A	04-I-3	1	HIGH LIFT PUMP #2 DISCHARGE
CHECK VALVE	10	CV-104A	BWW	N/A	04-I-3	1	BACKWASH PUMP #1 DISCHARGE
CHECK VALVE	10	CV-104B	BWW	N/A	04-I-3	1	BACKWASH PUMP #2 DISCHARGE
CHECK VALVE	6	CV-101A	SR	N/A	04-I-3	1	SUPERNATANT PUMP #1 DISCHARGE
CHECK VALVE	6	CV-101B	SR	N/A	04-I-3	1	SUPERNATANT PUMP #2 DISCHARGE
CHECK VALVE	4	CV-102	RES	N/A	04-I-3	1	SLUDGE PUMP FOOT VALVE
						9	
AIR RELEASE	2	AV-100A	BW	N/A	20-D-8	1	HIGH LIFT PUMP #1 AIR & VACUUM RELIEF VALVE
AIR RELEASE	2	AV-100B	BW	N/A	20-D-8	1	HIGH LIFT PUMP #2 AIR & VACUUM RELIEF VALVE
AIR RELEASE	2	AV-101A	BW	N/A	20-D-8	1	BACKWASH PUMP #1 AIR & VACUUM RELIEF VALVE
AIR RELEASE	2	AV-1010B	BW	N/A	20-D-8	1	BACKWASH PUMP #2 AIR & VACUUM RELIEF VALVE
AIR RELEASE	1	AV-102	BW	N/A	20-D-8	1	BACKWASH SUPPLY HEADER AIR RELIEF VALVE
						3	
BACKPRESSURE	12	BPV-100	TW	HYDRAULICALLY OPERATED	04-I-3	**1**	CLEARWELL INFLUENT
						1	
PRESSURE RELIEF	4	PVR-100	TW	HYDRAULICALLY OPERATED	04-I-3	**1**	FINISHED WATER SURGE ANTICIPATOR VALVE
						1	

APPENDIX K

NPDES CONSTRUCTION GENERAL PERMIT NOTICE OF INTENT

NPDES FORM 3510-9	EPA	UNITED STATES ENVIRONMENTAL PROTECTION AGENCY WASHINGTON, DC 20460 NOTICE OF INTENT FOR THE 2017 NPDES CONSTRUCTION GENERAL PERMIT	Form Approved. OMB No. 2040-0004

Submission of this Notice of Intent (NOI) constitutes notice that the operator identified in Section III of this form requests authorization to discharge pursuant to the NPDES Construction General Permit (CGP) permit number identified in Section II of this form. Submission of this NOI also constitutes notice that the operator identified in Section III of this form meets the eligibility requirements of Part 1.1 CGP for the project identified in Section IV of this form. Permit coverage is required prior to commencement of construction activity until you are eligible to terminate coverage as detailed in Part 8 of the CGP. To obtain authorization, you must submit a complete and accurate NOI form. Discharges are not authorized if your NOI is incomplete or inaccurate or if you were never eligible for permit coverage. Refer to the instructions at the end of this form.

I. Approval to Use Paper NOI Form

Have you been granted a waiver from electronic reporting from the Regional Office *? ☐ YES ☐ NO

If yes, check which waiver you have been granted, , the name of the EPA Regional Office staff person who granted the waiver, and the date of approval:

Waiver granted:

☐ The owner/operator's headquarters is physically located in a geographic area (i.e., ZIP code or census tract) that is identified as under-served for broadband Internet access in the most recent report from the Federal Communications Commission.

☐ The owner/operator has issues regarding available computer access or computer capability.

Name of EPA staff person that granted the waiver:

Date approval obtained: / /

*** Note: You are required to obtain approval from the applicable Regional Office prior to using this paper NOI form. If you have not obtained a waiver, you must file this form electronically using the NPDES eReporting Tool (NeT).**

II. Permit Information

NPDES ID (EPA Use Only):

Master Permit Number: (see Appendix B of the CGP for the list of eligible permit numbers)

III. Operator Information

Operator Information

Operator Name:

Are you requesting coverage under this NOI as a "federal operator" as defined in Appendix A? ☐ YES ☐ NO

Mailing Address:

Street:

City: State: ZIP Code: -

County or Similar Government Division:

Phone: - - Ext.

E-mail:

Operator Point of Contact Information:

First Name, Middle Initial, Last Name:

Title:

NOI Preparer (Complete if NOI was prepared by someone other than the certifier):

First Name, Middle Initial, Last Name:

Organization:

Phone: - - Ext.

E-mail:

IV. Project/Site Information

Project/Site Name:

Project/Site Address:

Street/Location:

City: State: ZIP Code: -

County or Similar Government Subdivision:

For the project/site you are seeking permit coverage, provide the following information:

Latitude/Longitude (Use decimal degrees and specify method):

Latitude: __ __. __ __ __ __° N (decimal degrees) Longitude: __ __ __. __ __ __ __° W (decimal degrees)

Latitude/Longitude Data Source: ☐ Map ☐ GPS ☐ Other_____ Horizontal Reference Datum: ☐ NAD 27 ☐ NAD 83 ☐ WGS 84

Is your project/site located in Indian country lands, or located on a property of religious or cultural significance to an Indian tribe? ☐ YES ☐ NO

If yes, provide the name of the Indian tribe associated with the area of Indian country (including name of Indian reservation, if applicable), or if not in Indian country, provide the name of the Indian tribe associated with the property:

Estimated Project Start Date: / / Estimated Project Completion Date: / /

Estimated Area to be Disturbed (to the nearest quarter acre): .

Type of Construction Site (check all that apply): ☐ Single-Family Residential ☐ Multi-Family Residential ☐ Commercial ☐ Industrial

☐ Institutional ☐ Highway or Road ☐ Utility ☐ Other

Will there be demolition of any structure built or renovated before January 1, 1980? ☐ YES ☐ NO

If yes, do any of the structures being demolished have at least 10,000 square feet of floor space? ☐ YES ☐ NO

Was the pre-development land use used for agriculture (see Appendix A for definition of "agricultural land")? ☐ YES ☐ NO

Have earth-disturbing activities commenced on your project/site? ☐ YES ☐ NO

If yes, is your project an "emergency-related project" (see Appendix A)? ☐ YES ☐ NO

Have stormwater discharges from your project/site been covered previously under an NPDES permit? ☐ YES ☐ NO

If yes, provide the NPDES ID (if you had coverage under EPA's 2012 CGP or the NPDES permit number if you had coverage under an EPA individual permit:

V. Discharge Information

By indicating "Yes" below, I confirm that I understand that the CGP only authorizes the allowable stormwater discharges in Part 1.2.1 and the allowable non-stormwater discharges listed in Part 1.2.2. Any discharges not expressly authorized in this permit cannot become authorized or shielded from liability under CWA section 402(k) by disclosure to EPA, state, or local authorities after issuance of this permit via any means, including the Notice of Intent (NOI) to be covered by the permit, the Stormwater Pollution Prevention Plan (SWPPP), during an inspection, etc. If any discharges requiring NPDES permit coverage other than the allowable stormwater and non-stormwater discharges listed in Parts 1.2.1 and 1.2.2 will be discharged, they must be covered under another NPDES permit.
☐ YES

Does your project/site discharge stormwater into a Municipal Separate Storm Sewer System (MS4)? ☐ YES ☐ NO

Are there any waters of the U.S. within 50 feet of your project's earth disturbances? ☐ YES ☐ NO

Receiving Waters Information: (Attach a separate list if necessary)

Point of Discharge ID	For each point of discharge, provide the following receiving water information:		
	Provide the name of the first water of the U.S. that receives stormwater directly from the point of discharge and/or from the MS4 that the point of discharge discharges to:	If the receiving water is impaired (on the CWA 303(d) list), list the pollutants that are causing the impairment:	If a TMDL been completed for this receiving waterbody, providing the following information:
			TMDL Name and ID: Pollutant(s) for which there is a TMDL:
			TMDL Name and ID: Pollutant(s) for which there is a TMDL:
			TMDL Name and ID: Pollutant(s) for which there is a TMDL:
			TMDL Name and ID: Pollutant(s) for which there is a TMDL:

			TMDL Name and ID: **Pollutant(s) for which there is a TMDL:**
			TMDL Name and ID: **Pollutant(s) for which there is a TMDL:**

Are any of the waters of the U.S. to which you discharge designated by the state or tribal authority under its antidegradation policy as a Tier 2 (or Tier 2.5) water (water quality exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water) or as a Tier 3 water (Outstanding National Resource Water)? (See Appendix F).

☐ YES ☐ NO

If yes, name(s) of receiving water(s) and its designation (Tier 2, Tier 2.5 or Tier 3):

VI. Chemical Treatment Information

Will you use polymers, flocculants, or other treatment chemicals at your construction site? ☐ YES ☐ NO

If yes, will you use cationic treatment chemicals at your construction site*? ☐ YES ☐ NO

If yes, have you been authorized to use cationic treatment chemicals by your applicable EPA Regional Office in advance of filing your NOI*? ☐ YES ☐ NO

If you have been authorized to use cationic treatment chemicals by your applicable EPA Regional Office, attach a copy of your authorization letter and include documentation of the appropriate controls and implementation procedures designed to ensure that your use of cationic treatment chemicals will not lead to a violation of water quality standards.

Please indicate the treatment chemicals that you will use:

* Note: You are ineligible for coverage under this permit unless you notify your applicable EPA Regional Office in advance and the EPA office authorizes coverage under this permit after you have included appropriate controls and implementation procedures designed to ensure that your use of cationic treatment chemicals will not lead to a violation of water quality standards.

VII. Stormwater Pollution Prevention Plan (SWPPP) Information

Has the SWPPP been prepared in advance of filing this NOI, as required? ☐ YES ☐ NO

SWPPP Contact Information:

First Name, Middle Initial Last Name:

Professional Title:

Phone: - - Ext.

E-mail:

VIII. Endangered Species Protection

Using the instructions in Appendix D of the CGP, under which criterion listed below are you eligible for coverage under this permit? Check only 1 box, include the required information and provide a sound basis for supporting the criterion selected. You must consider Endangered Species Act listed threatened or endangered species (ESA-listed) and/or designated critical habitat(s) under the jurisdiction of both the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) and select the most conservative criterion that applies.

☐ **A** No ESA-listed species and/or designated critical habitat present in action area. Using the process outlined in Appendix D of this permit, you certify that ESA-listed species and designated critical habitat(s) under the jurisdiction of the USFWS or NMFS are not likely to occur in your site's "action area" as defined in Appendix A of this permit. ***[Basis statement content: A basis statement supporting the selection of this criterion should identify the USFWS and NMFS information sources used. Attaching aerial image(s) of the site to this NOI is helpful to EPA, USFWS, and NMFS in confirming eligibility under this criterion. Please Note: NMFS' jurisdiction includes ESA-listed marine and estuarine species that spawn in inland rivers.]***

☐ **B** Eligibility requirements met by another operator under the 2017 CGP. The construction site's discharges and discharge-related activities were already addressed in another operator's valid certification of eligibility for your "action area" under eligibility Criterion A, C, D, E, or F of the 2017 CGP and you have confirmed that no additional ESA-listed species and/or designated critical habitat under the jurisdiction of USFWS and/or NMFS not considered in the that certification may be present or located in the "action area." To certify your eligibility under this criterion, there must be no lapse of NPDES permit coverage in the other CGP operator's certification. By certifying eligibility under this criterion, you agree to comply with any conditions upon which the other CGP operator's certification was based. You must include in your NOI the NPDES ID from the other 2017CGP operator's notification of authorization under this permit. If your certification is based on another 2017 CGP operator's certification under criterion C, you must provide EPA with the relevant supporting information required of existing dischargers in criterion C in your NOI form. ***[Basis statement content: A basis statement supporting the selection of this criterion should identify the eligibility criterion of the other CGP NOI, the authorization date, and confirmation that the authorization is effective.]***

If you select criterion B, provide the NPDES ID from the other operator's notification of authorization under this permit: | | | | | | | | | | |

☐ **C** Discharges not likely to adversely affect ESA-listed species and/or designated critical habitat. ESA-listed species and/or designated critical habitat(s) under the jurisdiction of the USFWS and/or NMFS are likely to occur in or near your site's "action area," and you certify to EPA that your site's discharges and discharge-related activities are not likely to adversely affect ESA-listed threatened or endangered species and/or designated critical habitat. This certification may include consideration of any stormwater controls and/or management practices you will adopt to ensure that your discharges and discharge-related activities are not likely to adversely affect ESA-listed species and/or designated critical habitat. To certify your eligibility under this criterion, indicate 1) the ESA-listed species and/or designated habitat located in your "action area" using the process outlined in Appendix D of this permit; 2) the distance between the site and the listed species and/or designated critical habitat in the action area (in miles); and 3) a rationale describing specifically how adverse effects to ESA-listed species will be avoided from the discharges and discharge-related activities. You must also include a copy of your site map from your SWPPP showing the upland and in-water extent of your "action area" with this NOI. ***[Basis statement content: A basis statement supporting the selection of this criterion should identify the information resources and expertise (e.g., state or federal biologists) used to arrive at this conclusion. Any supporting documentation should explicitly state that both ESA-listed species and designated critical habitat under the jurisdiction of the USFWS and/or NMFS were considered in the evaluation.]***

What ESA-listed species and/or designated critical habitat are located in your "action area":

Distance between your site and the ESA-listed species and/or designated critical habitat within the action area (in miles, state "on site" if the ESA-listed species and/or designated critical habitat is within the area to be disturbed):

☐ **D** Coordination with USFWS and/or NMFS has successfully concluded. Coordination between you and the USFWS and/or NMFS has concluded. The coordination must have addressed the effects of your site's discharges and discharge-related activities on ESA-listed species and/or designated critical habitat under the jurisdiction of USFWS and/or NMFS, and resulted in a written concurrence from USFWS and/or NMFS that your site's discharges and discharge-related activities are not likely to adversely affect listed species and/or critical habitat. You must include copies of the correspondence with the participating agencies in your SWPPP and this NOI. ***[Basis statement content: A basis statement supporting the selection of this criterion should identify whether USFWS or NMFS or both agencies participated in coordination, the field office/regional office(s) providing that coordination, and the date that coordination concluded.]***

☐ **E** ESA Section 7 consultation has successfully concluded. Consultation between a Federal Agency and the USFWS and/or NMFS under section 7 of the ESA has concluded. The consultation must have addressed the effects of the construction site's discharges and discharge-related activities on ESA-listed species and/or designated critical habitat under the jurisdiction of USFWS and/or NMFS. To certify eligibility under this criterion, Indicate the result of the consultation:

☐ biological opinion from USFWS and/or NMFS that concludes that the action in question (taking into account the effects of your site's discharges and discharge-related activities) is not likely to jeopardize the continued existence of listed species, nor the destruction or adverse modification of critical habitat; or

☐ written concurrence from USFWS and/or NMFS with a finding that the site's discharges and discharge-related activities are not likely to adversely affect ESA-listed species and/or designated critical habitat.

You must include copies of the correspondence between yourself and the USFWS and/or NMFS in your SWPPP and this NOI. ***[Basis statement content: A basis statement supporting the selection of this criterion should identify the federal action agencie(s) involved, the field office/regional office(s) providing that consultation, any tracking numbers of identifiers associated with that consultation (e.g., IPaC number, PCTS number), and the date the consultation was completed.]***

☐ **F** Issuance of section 10 permit. Potential take is authorized through the issuance of a permit under section 10 of the ESA by the USFWS and/or NMFS, and this authorization addresses the effects of the site's discharges and discharge-related activities on ESA-listed species and designated critical habitat. You must include copies of the correspondence between yourself and the participating agencies in your SWPPP and your NOI. ***[Basis statement content: A basis statement supporting the selection of this criterion should identify whether USFWS or NMFS or both agencies provided a section 10 permit, the field office/regional office(s) providing permit(s), any tracking numbers of identifiers associated with that consultation (e.g., IPaC number, PCTS number), and the date the permit was granted.]***

Provide a brief summary of the basis for criterion selection listed above *[the necessary content for a supportive basis statement is provided under the criterion you selected.]*.

IX. Historic Preservation

Are you installing any stormwater controls as described in Appendix E that require subsurface earth disturbance? (Appendix E, Step 1) ☐ YES ☐ NO

If yes, have prior surveys or evaluations conducted on the site have already determined historic properties do not exist, or that prior disturbances have precluded the existence of historic properties? (Appendix E, Step 2) ☐ YES ☐ NO

If no, have you determined that your installation of subsurface earth-disturbing stormwater controls will have no effect on historic properties? (Appendix E, Step 3) ☐ YES ☐ NO

If no, did the SHPO, THPO, or other tribal representative (whichever applies) respond to you within the 15 calendar days to indicate whether the subsurface earth disturbances caused by the installation of stormwater controls affect historic properties? (Appendix E, Step 4) ☐ YES ☐ NO

If yes, describe the nature of their response:

☐ Written indication that no historic properties will be affected by the installation of stormwater controls.

☐ Written indication that adverse effects to historic properties from the installation of stormwater controls can be mitigated by agreed upon actions.

☐ No agreement has been reached regarding measures to mitigate effects to historic properties from the installation of stormwater controls.

☐ Other:

X. Certification Information

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

First Name, Middle Initial, Last Name:

Title:

Signature: _____ Date: / /

Email:

Who Must File an NOI Form

Under the provisions of the Clean Water Act, as amended (33 U.S.C. 1251 et. seq.; the Act), federal law prohibits stormwater discharges from certain construction activities to waters of the U.S. unless that discharge is covered under a National Pollutant Discharge Elimination System (NPDES) permit. Operators of construction sites where one or more acres are disturbed, smaller sites that are part of a larger common plan of development or sale where there is a cumulative disturbance of at least one acre, or any other site specifically designated by the Director, must obtain coverage under an NPDES general permit. For coverage under the 2017 CGP, each person, firm, public organization, or any other entity that meets either of the following criteria must file a Notice of Intent form: (1) they have operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications; or (2) they have day-to-day operational control of those activities at the project necessary to ensure compliance with the permit conditions. If you have questions about whether you need a NPDES stormwater permit, or if you need information to determine whether EPA or your state agency is the permitting authority, contact your EPA Regional Office.

Completing the Form

Obtain and read a copy of the 2017 CGP, viewable at https://www.epa.gov/npdes/stormwater-discharges-construction-activities#cgp. To complete this form, type or print uppercase letters, in the appropriate areas only. Please place each character between the marks (abbreviate if necessary to stay within the number of characters allowed for each item). Use one space for breaks between words, but not for punctuation marks unless they are needed to clarify your response. If you have any questions on this form, telephone EPA's NOI Processing Center at (866) 352-7755. **Please submit the original document with signature in ink - do not send a photocopied signature.**

Section I. Approval to Use Paper NOI Form

You must indicate whether you have been granted a waiver from electronic reporting from the EPA Regional Office. Note that you are not authorized to use this paper NOI form unless the EPA Regional Office has approved its use. Where you have obtained approval to use this form, indicate the waiver that you have been granted, the name of the EPA staff person who granted the waiver, and the date that approval was provided.

See https://www.epa.gov/npdes/contact-us-stormwater#regional

for a list of EPA Regional Office contacts.

Section II. Permit Number

Provide the master permit number of the permit under which you are applying for coverage (see Appendix B of the general permit for the list of eligible master permit numbers)

Section III. Operator Information

Provide the legal name of the person, firm, public organization, or any other entity that operates the project described in this NOI. Refer to Appendix A of the permit for the definition of "operator".

Indicate whether you are seeking coverage under this permit as a "federal operator" as defined in Appendix A.

Also provide a point of contact, the operator's mailing address, county, telephone number, and e-mail address (to be notified via e-mail of NOI approval when available). Correspondence for the NOI will be sent to this address.

If the NOI was prepared by someone other than the certifier (for example, if the NOI was prepared by the facility SWPPP contact or a consultant for the certifier's signature), include the full name, organization, phone number, and email address of the NOI preparer.

Section IV. Project/Site Information

Enter the official or legal name and complete street address, including city, state, ZIP code, and county or similar government subdivision of the project or site. If the project or site lacks a street address, indicate the general location of the site (e.g., Intersection of State Highways 61 and 34). Complete site information must be provided for permit coverage to be granted.

Provide the latitude and longitude of your facility in decimal degrees format. The latitude and longitude of your facility can be determined in several different ways, including through the use of global positioning system (GPS) receivers, U.S. Geological Survey (U.S.G.S.) topographic or quadrangle maps, and web-based siting tools, among others. For consistency, EPA requests that measurements be taken from the approximate center of the construction site. For linear construction sites, the measurement should be taken midpoint of the site. If known, enter the horizontal reference datum for your latitude and longitude. The horizontal reference datum is shown on the bottom left corner of USGS topographic maps; it is also available for GPS receivers.

Indicate whether the project is in Indian country lands or located on a property of religious or cultural significance to an Indian tribe, and if so, provide the name of the Indian tribe associated with the area of Indian country (including name of Indian reservation, if applicable), or if not in Indian country, provide the name of the Indian tribe associated with the property.

Enter the estimated construction start and completion dates using four digits for the year (i.e., 10/06/2012). Indicate to the nearest quarter acre the estimated area to be disturbed.

Indicate the type of construction site, if demolition is occurring, and if so, if the structure has at least 10,000 square feet of floor space. Indicate whether the pre-development land use of the site was used for agriculture Appendix A defines "agricultural land" as cropland, grassland, rangeland, pasture, and other agricultural land, on which agricultural and forest-related products or livestock are produced and resource concerns may be addressed. Agricultural lands include cropped woodland, marshes, incidental areas included in the agricultural operation, and other types of agricultural land used for the production of livestock.

Indicate whether earth-disturbing activities have already commenced on your project/site. If earth-disturbing activities have commenced on your site because stormwater discharges from the site have been previously covered under a NPDES permit, you must provide the 2012 CGP NPDES ID or the NPDES permit number if coverage was under an individual permit.

Section V. Discharge Information

You must confirm that you understand that the CGP only authorizes the allowable stormwater discharges listed in Part 1.2.1 and the allowable non-stormwater discharges listed in Part 1.2.2.

Any discharges not expressly authorized under the CGP are not covered by the CGP or the permit shield provision of the CWA Section 402(k) and they cannot become authorized or shielded by disclosure to EPA, state, or local authorities via the NOI to be covered by the permit or by any other means (e.g., in the SWPPP or during an inspection). If any discharges requiring NPDES permit coverage other than the allowable stormwater and non-stormwater discharges listed in Parts 1.2.1 and 1.2.2 will be discharged, they must either be eliminated or covered under another NPDES permit.

Indicate whether discharges from the site will enter into a municipal separate storm sewer system (MS4), as defined in Appendix A.

Also, indicate whether any waters of the U.S. exist within 50 feet from your site. Note that if "yes", you are required to comply with the requirement in Part 2.2.1 of the permit to provide natural buffers or equivalent erosion and sediment controls.

For each unique point of discharge you list, you must specify the name of the first water of the U.S. that receives stormwater directly from the point of discharge and/or from the MS4 that the point of discharge discharges to. You must specify whether any waters of the U.S. that you discharge to are listed as "impaired" as defined in Appendix A, and the pollutants for which the water is impaired. You must identify any Total Maximum Daily Loads (TMDL) that have been completed for any of the waters of the U.S. that you discharge to.

Indicate whether discharges from the site will enter into a water of the U.S. that is designated as a Tier 2, Tier 2.5, or Tier 3 water. A list of Tier 2, 2.5, and 3 waters is provided as Appendix F. If the answer is "yes", name all waters designated as Tier 2, Tier 2.5, or Tier 3 to which the site will discharge.

Section VI. Chemical Treatment Information

Indicate whether the site will use polymers, flocculants, or other treatment chemicals. Indicate whether the site will employ cationic treatment chemicals. If the answer is "yes" to either question, indicate which chemical(s) you will use. Note that you are not eligible for coverage under this permit to use cationic treatment chemicals unless you notify your applicable EPA Regional Office in advance and the EPA office authorizes coverage under this permit after you have included appropriate controls and implementation procedures designed to ensure that your use of cationic treatment chemicals will not lead to a violation of water quality standards. If you have been authorized to use cationic treatment chemicals by your applicable EPA Regional Office, attach a copy of your authorization letter and include documentation of the appropriate controls and implementation procedures designed to ensure that your use of cationic treatment chemicals will not lead to a violation of water quality standards. Examples of cationic treatment chemicals include, but are not limited to, cationic polyacrylamide (C-PAM), PolyDADMAC (POLYDIALLYLDIMETHYLAMMONIUM CHLORIDE), and chitosan.

Section VII. Stormwater Pollution Prevention Plan (SWPPP) Information

All sites eligible for coverage under this permit are required to prepare a SWPPP in advance of filing the NOI, in accordance with Part 7. Indicate whether the SWPPP has been prepared in advance of filing the NOI.

Indicate the street, city, state, and ZIP code where the SWPPP can be found. Indicate the contact information (name, organization, phone, and email) for the person who developed the SWPPP for this project.

Section VIII. Endangered Species Information

Using the instructions in Appendix D, indicate under which criterion (i.e., A, B, C, D, E, or F) of the permit the applicant is eligible with regard to protection of ESA-listed endangered and threatened species and designated critical habitat. A description of the basis for the criterion selected must also be provided.

If criterion B is selected, provide the NPDES Number for the other operator who had previously certified their eligibility for the CGP under criterion A, C, D, E, or F. The Tracking Number was assigned when the operator received coverage under this permit, and is included in the notice of authorization.

If criterion C is selected, you must attach copies of your site map. See Part 7.2.4 of the permit for information about what is required to be in your site map. You must also specify the federally-listed species and/or federally-designated critical habitat that are located in the "action area" of the project, and provide the distance between the construction site and any listed endangered species and/or their designated critical habitat.

If criterion D, E, or F is selected, attach copies of any communications between you and the U.S. Fish and Wildlife Service and National Marine Fisheries Service and identify the participating agencies and Field Offices/Regional Offices you worked with in the basis statement of this NOI.

Section IX. Historic Preservation

Use the instructions in Appendix E to complete the questions on the NOI form regarding historic preservation.

Section X. Certification Information

The NOI must be signed as follows:

For a corporation: By a responsible corporate officer. For the purpose of this Section, a responsible corporate officer means:

(i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long-term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

For a partnership or sole proprietorship: By a general partner or the proprietor, respectively; or

For a municipality, state, federal, or other public agency: By either a principal executive officer or ranking elected official. For purposes of this Part, a principal executive officer of a federal agency includes (i) the chief executive officer of the agency, or

(ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of EPA). Include the name and title of the person signing the form and the date of signing. An unsigned or undated NOI form will not be considered eligible for permit coverage.

Modifying Your NOI

If you have been granted a waiver from your Regional Office from electronic reporting, and if after submitting your NOI you need to correct or update any fields on this NOI form, you may do so by indicating changes on this same form. Paperwork Reduction Act Notice

Public reporting burden for this NOI is estimated to average 3.7 hours. This estimate includes time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. Send comments regarding the burden estimate, any other aspect of the collection of information, or suggestions for improving this form, including any suggestions which may increase or reduce this burden to: Chief, Information Policy Branch 2136, U.S. Environmental Protection, Agency, 1200 Pennsylvania Avenue, NW, Washington, D.C. 20460. Include the OMB control number on any correspondence. Do not send the completed form to this address.

Submitting Your Form

Submit your NOI form by mail to one of the following addresses:

For Regular U.S. Mail Delivery:
Stormwater Notice Processing Center
Mail Code 4203M, ATTN: 2017 CGP
U.S. EPA
1200 Pennsylvania Avenue, NW
Washington, DC 20460

For Overnight/Express Mail Delivery:
Stormwater Notice Processing Center
William Jefferson Clinton East Building - Room 7420
ATTN: 2017 CGP
U.S. EPA
1201 Constitution Avenue, NW
Washington, DC 20004

Visit this website for instructions on how to submit electronically:

https://www.epa.gov/npdes/stormwater-discharges-construction-activities#ereporting