



**State of Rhode Island
Department of Administration / Division of Purchases
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**Solicitation Information
December 19, 2017**

ADDENDUM # 3

RFQ 7575502

**TITLE: Interior Renovations RIAG Building 150 South Main Street,
Providence**

SUBMISSION DEADLINE:

FRIDAY DECEMBER 29, 2017 at 11:00 am (Local Time)

- Attached includes updated information

**Tom Bovis
Interdepartmental Project Manager**

Interested parties should monitor this website, on a regular basis, for any additional information.

ADDENDUM #2



Rhode Island Attorney General
Interior Renovations
150 South Main Street
Providence, RI

RGB #6355
December 15, 2017

ADDENDUM #2
Solicitation #: 7575502

1.....Clarification Items:

a..... Project Manual

END OF TABLE OF CONTENTS

TO ALL BIDDERS OF RECORD:

This Addendum forms a part of the Contract Documents and modifies the Drawings and Project Manual as hereinafter indicated.

PROJECT MANUAL

1. Section 28 13 00 – INTEGRATED SECURITY SOFTWARE AND HARDWARE

- A. Page #6 Section 28 13 00 1.10 QUALITY ASSURANCE: Add the following sections:
2. All Security Systems/components as specified within sections 281300 and 281500 shall be furnished, installed and maintained by a single company, hereby called an Installing Contractor.
 3. The installing contractor shall be a manufactured authorized distributor, installer and service provider for each system as specified within Sections 281300 and 281500. Sub-contracting to third party vendors/companies to perform certain aspects of Sections 281300 and 281500 will not be allowed. Provide certificates of training for a minimum of (5) personnel performing the work and a letter from each manufacture addressed to the owner (or OPM) certifying that the installing contractor is an authorized distributor and installer of each system as specified herein.
 4. The installing contractor shall provide documentation that they have been manufactured certified for each system for a minimum of 5 years. Provide certification letter to OPM upon request.
 5. The installing contractor must have a minimum of five (5) trained technicians from their local office on each system as specified herein.
 6. The installing contractor shall have a current and valid contractor's license as required by the State of RI.
 7. The installing contractor shall have licensed installation personnel as required by the State of RI. ”

2. Section 28 15 00 – UNIFIED SECURITY SYSTEM

- A. Page #5 Section 23 15 0 2.1 C: Delete Sections 23 15 00 2.1 C. 2. DSC and 23 15 00 2.1 C. 2. BOSCH.

3. Section 33 20 00 – DEWATERING WELL SYSTEM

- A. Add Pages 1-18 – Section 33 20 00 DEWATERING WELL SYSTEM in its entirety as issued as part of this Addendum.

(THIS COMPLETES ADDENDUM NO. 2)

SECTION 33 20 00 – DEWATERING WELL SYSTEM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The General Conditions, Supplementary Conditions and applicable portions of Division 1 of the Specification are a part of this Section, which shall consist of all labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation and other facilities and services to execute and complete the work, whether temporary or permanent and whether or not incorporated or to be incorporated in the work; and as related to the project or projects defined in the Bidding Requirements.
- B. Coordinate work of this Section with other underground utilities and with trades responsible for their installation. Refer to respective Drawings pertaining to other work.

1.2 WORK TO BE DONE

- A. Work covered under this section consists of the installation of permanent dewatering well points inclusive of drilling and casing of well; installation of the soil pack; installation of well pumps, level sensors/triggers, connection to the existing power supply system, and installation of well control terminals, as well as excavation for and installation and backfilling of, material for incidental piping, conduit, duct banks and well access structures. Repair of pavement areas disturbed or removed during installation of the dewatering well system shall be considered incidental to this work.
- B. The contractor shall include 500 LF of crack repair within the bid item on the northeastern basement foundation wall. For each linear foot beyond 500, the Contractor shall be compensated \$10 per foot. For each linear foot less than 500, the Contract shall be credited \$8 per foot.
- C. Trench excavation, backfilling and bedding materials, together with the testing of the completed installation shall be included in this work.
- D. Removal and off-site disposal of demolished pavement, excavation spoils, and excess fill materials associated with the proposed dewatering well system work shall be included in the base bid.
- E. Work to be done includes furnishing all labor, materials, equipment and services to complete all dewatering well system work and crack repairs indicated on the Drawings, as specified herein, or both.
- F. The electrical point of connection for the dewatering well system shall match the existing service and location of the existing system. Work associated with modifying the existing connection shall be considered incidental to this work.
- G. Removal and disposal of existing pumps, discharge hoses, control boxes, and miscellaneous electrical components. The contractor shall give the Owner the opportunity to review existing equipment prior to disposal to determine if the Owner will retain any of the equipment.

- H. The Drawings and Specifications must be interpreted and are intended to complement each other. The Contractor shall furnish and install all parts, which may be required by the Drawings and omitted by the Specifications, or vice versa, just as though required by both. Should there appear to be discrepancies or question of intent, the Contractor shall refer the matter to the Owner's Representative for decision, and his interpretation shall be final, conclusive and binding.
- I. All necessary changes to the Drawings to avoid any obstacles shall be made by the Contractor with the approval of the Owner's Representative.
- J. The work shall be constructed and finished in every respect in a good, workmanlike and substantial manner, to the full intent and meaning of the Drawings and Specifications. All parts necessary for the proper and complete execution of the work, whether the same may have been specifically mentioned or not, or indicated on the Drawings, shall be done or furnished in a manner corresponding with the rest of the work as if the same were specifically herein described.
- K. Record Drawing as well as Operating & Maintenance Manual generation, in accordance to these specifications shall also be included in this work.

1.3 SCOPE

- A. The dewatering well system shown on the Drawings and described within these Specifications represents a seven-point dewatering system. The system is designed for each well to have an initial capacity of 50 gallons per minute until steady-state conditions are reached. Once steady-state conditions are achieved, each well shall be able to maintain a near constant head through cyclic pumping controlled by a float, transducer, or water level sensor.
- B. Dewatering wells are to connect and discharge to the municipal sewer system.
- C. Crack repairs are intended to repair known points of water entry into the existing building.

1.4 ORDINANCES, PERMITS AND FEES

- A. The Work under this Section shall comply with all ordinances and regulations of authorities having jurisdiction.
- B. The Contractor shall obtain and pay for any and all permits, tests and certifications required for the execution of Work under this Section.
- C. Furnish copies of Permits, Certifications and Approval Notices to the Owner's Representative prior to requesting payment.
- D. The Contractor shall include in their bid any charges by the Water Department, Utility Company, or other authorities for work done by them and charged to the Contractor.
- E. All work shall be completed by companies licensed to operate in the State of Rhode Island.

1.5 EXAMINATION OF CONDITIONS

- A. The Contractor shall fully inform himself of existing conditions on the site before submitting his bid, and shall be fully responsible for carrying out all work required to fully and properly execute

the work of the Contract, regardless of the conditions encountered in the actual Work. No claim for extra compensation or extension of time will be allowed on account of actual conditions inconsistent with those assumed, except those conditions described in the GENERAL CONDITIONS.

- B. By bidding on this portion of the work the Contractor acknowledges they have reviewed, in full, the boring logs (attached) and the letter titled "Dewatering Well Testing" (attached). The Contractor also acknowledges they have reviewed the existing electrical service and have included the work associated with connecting the new system into the bid price.
- C. Data on indicated subsurface conditions are not intended as representations or warrants of continuity of such conditions. It is expressly understood that the Owner and Owner's Representative will not be responsible for interpretations or conclusions drawn therefrom by the Contractor.
- D. Test borings and other explorations may be made by the Contractor at no cost to the Owner.

1.6 QUALITY ASSURANCE

- A. Installer: A firm which has at least five (5) years experience in work of the type and size required by this Section and which is acceptable to the Owner's Representative.
- B. References: The Contractor must supply three references for work of this type and size with their bid including names and phone numbers of contact person(s).
- C. Applicable requirements of accepted Standards and Codes shall apply to the Work of this Section and shall be so labeled or listed:
 - 1. American Society for Testing & Materials (ASTM)
 - a. ASTM: A53 Ductile Iron Castings
 - b. ASTM: D1785 Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and C1200.
 - c. ASTM: D2464 Threaded Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.
 - d. ASTM: D2466 Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40.
 - e. ASTM: D2564 Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Piping Systems.
 - f. ASTM: F477 Elastomeric Seals (Gaskets) for Joining Plastic Pipe.
 - 2. National Standard Plumbing Code (NSPC)
 - 3. National Electric Code (NEC)
 - 4. National Sanitary Foundation (NSF)
 - 5. American Society of Agricultural and Biological Engineers (ASABE)
 - 6. Underwriters Laboratories, Inc. (UL)
 - 7. Occupational Safety and Health Administration (OSHA)

1.7 TESTS

- A. Observation: The Owner's Representative will be on site at various times to observe that the system is being installed in accordance with the Specifications and Drawings.
- B. Pump Test: After completion of the system, test the operation of entire system to demonstrate that the required flow rates have been achieved, confirm operation of the level sensor/transducer/float switch, confirm operation of the alarm, and manual override of the

pumping system. Furnish and install materials required to correct inadequacies and redevelop the well until clear flow has been achieved.

- C. The Owner's Representative shall be notified 7 days in advance of scheduled pump tests for observations.

1.8 SUBMITTALS

- A. The Contractor shall provide copies of product specification sheets on all proposed equipment to be installed to the Owner's Representative for approval prior to the start of work, in accordance with the parameters of Division-1. Work on the dewatering well system may not commence until product sheets are submitted and approved. Submittals shall be marked up to show proper diameters, thicknesses, sizes, flows, and other attributes. Equipment/material to be included related to the well:
 - 1. Well casing: solid section/screened section - Contractor shall submit mill reports from the product supplier confirming the required properties.
 - 2. Well pump, motor, control box, water level sensor/pressure transducer/float for pump control - Contractor shall submit manufacturer data sheets demonstrating that the proposed products meet the performance specifications stated herein.
 - 3. Discharge hose - Contractor shall submit manufacturer data sheets showing the conduit meets specifications stated herein.
 - 4. Wiring diagram for power supply and well control system
 - 5. Grout mix design
 - 6. Soil pack gradation
 - 7. PVC drain pipe and fittings:
 - a. Showing lengths of pipe, fittings and joint details, tap and connection details, construction details, tolerance and other information, as required.
 - b. Each shipment of pipe, pipe fittings, and appurtenances, shall be accompanied by the manufacturer's notarized certificate certifying conformance with all requirements of these specifications.
 - c. The Contractor shall furnish to the Owner a written guarantee signed by the manufacturer of the pipe and pipe fittings which he proposes to furnish, which shall warrant and guarantee that the pipe and pipe fittings meet all requirements of the specifications. The form of guarantee shall, in all respects, be satisfactory to the Owner.
 - 8. PVC well access structures:
 - a. The drawings shall show the setting plans, exact profile of each unit, openings required, all inserts and other items which are to be embedded in the units.
 - b. Shop drawings showing the details of covers and frames and holes for penetrations in the structure.
- B. The Contractor shall provide calculations to demonstrate to the Owner's Representative that the installed system components are compatible. Work on the dewatering well system may not commence until calculations are submitted and approved. Calculations are required for the following work items:
 - 1. Screen Size: Contractor shall submit calculations showing the proposed screen size is adequate to prevent the transportation of fines into the well and provide the required flow into the well.
 - 2. Soil Pack: Contractor shall submit calculations demonstrating that the soil pack gradation and width is adequate to prevent the transportation of soil from the existing subsurface soils into the dewatering well and to allows the required flow into the well.
- C. The Contractor shall provide a narrative to the Owner's Representative detailing the procedure for drilling and installation of the well point system.

D. Maintenance and Operating instructions

1. Contractor shall include in their Bid an allowance for four (4) hours of instruction of Owner and/or Owner's personnel upon completion of check/test/start-up/adjust operations by a competent operator (The Owner's Representative office shall be notified at least one (1) week in advance of check/test/start-up/adjust operations).
2. Upon completion of work and prior to application for acceptance and final payment, a minimum of three (3) three ring, hard cover binders titled MAINTENANCE AND OPERATING INSTRUCTIONS FOR THE RHODE ISLAND ATTORNEY GENERAL'S OFFICE DEWATERING WELL SYSTEM, shall be submitted to the Owner's Representative office. After review and approval, the copies will be forwarded to the Owner. Included in the Maintenance and Operating binders shall be:
 - a. Table of Contents
 - b. Written description of dewatering well system.
 - c. System drawings:
 - 1) One (1) copy of the original dewatering well system plan;
 - 2) One (1) copy of the Record Drawing;
 - 3) One (1) reproducible of the Record Drawing;
 - 4) One (1) copy of the control box(es) system wiring diagram
 - d. Listing of Manufacturers.
 - e. Manufacturers' data where multiple model, type and size listings are included; clearly and conspicuously indicating those that are pertinent to this installation.
 - 1) "APPROVED" submittals of all dewatering well equipment;
 - 2) Operation;
 - 3) Maintenance: including complete troubleshooting charts.
 - 4) Parts list.
 - 5) Names, addresses and telephone numbers of recommended repair and service companies.
 - f. Guarantee data.

E. Product data sheets and installation instructions for crack repair materials.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Pipes and structures shall be handled with care and in strict accordance with manufacturer's recommendations.
- B. Materials and equipment shall be progressively delivered at the site so that there will be neither delay in the progress of the work nor an accumulation of materials that is not to be used within a reasonable time. Materials shall be so stored as to assure the preservation of their quality and fitness for the work.
- C. Stored materials, even though approved before storage, may again be inspected prior to their use in the work. Stored materials shall be located so as to facilitate their prompt inspection.
- D. Private property shall not be used for storage purposes without written permission of the owner or lessee, and if requested by the Owner's Representative copies of such written permission shall be furnished to him/her. All storage sites shall be restored to their original condition by the Contractor at his expense.

1. Avoid damage to castings from impact, abrasion, or corrosion during handling and storage.
 2. Protect materials before, during and after installation and to protect the installed work and materials for all other trades.
 3. In case of damage, immediately make all repairs and replacements to the approval of the Owner's Representative and at the Contractor's expense.
- E. Care shall be taken during transportation of the pipe such that they are not damaged.
- F. Pipes shall be stored on level ground, free of sharp objects, which could damage the pipe, and properly cribbed to prevent rolling and damage.
- G. Prevent damage to the interior and exterior walls of the pipe. Raising pipes with hooks, dropping or placing large stones against pipe, rolling over stones or sharp objects/edges and dropping pipe are prohibited. All damaged pipe and fittings shall be removed from the project site and replaced at no additional expense to the Owner.

1.10 GUARANTEE

- A. The Contractor shall obtain in the Owner's name the standard written manufacturer's guarantee of all materials furnished under this Section where such guarantees are offered in the manufacturer's published product data. All these guarantees shall be in addition to, and not in lieu of, other liabilities that the Contractor may have by law.
- B. In addition to the manufacturers guarantees the Contractor shall warrant the entire dewatering well system, both parts and labor for a period of one (1) year from the date of acceptance by the Owner.
- C. Should any problems develop within the warranty period because of inferior or faulty materials or workmanship, they shall be corrected to the satisfaction of the Owner's Representative at no additional expense to the Owner.
- D. A written warranty showing date of completion and period of warranty shall be supplied upon completion of each segment of the project.

1.11 PROCEDURE

- A. Notify all city departments and/or public utility owners concerned, of the time and location of any work that may affect them. Cooperate and coordinate with them in the protection and/or repairs of any utilities.
- B. Provide and install temporary support, adequate protection and maintenance of all structures, drains, sewers, and other obstructions encountered. Where grade or alignment is obstructed, the obstruction shall be permanently supported, relocated, removed or reconstructed as directed by the Architect.

1.12 PROJECT RECORD DOCUMENTS

- A. The Contractor shall provide and keep up-to-date a complete redlined Record Set of Drawings of the system as the project proceeds. Drawings shall be corrected daily, showing every change from the original Drawings and Specifications. Record Drawings shall specify and exactly locate:

1. Horizontal and vertical location of the well, access structures, drainage pipe, and electrical conduit/duct banks.
 2. Depth/elevation to bedrock and overall depth/elevation of well at each well.
 3. Depth/elevation of solid and screened sections of well.
 4. Depth/elevation of pump and motor components.
 5. All wire routing, wire size and splices shall be indicated.
- B. This redlined record set of drawings shall be kept at job site and shall be used only as a record set.
- C. This redlined set of documents shall also serve as work progress sheets and shall be the basis for measurement and payment for work completed. This record set of drawings shall be available at all times for observation and shall be kept in a location designated by Owner's Representative. Should this record set of drawings not be available for review or not be up-to-date at the time of the observation, it will be assumed no work has been completed. Provide copies of the redlined record set of drawings for Owner's Representative review on a monthly basis.
- D. Make neat and legible notations on this record set of drawings daily as the work proceeds, showing the work as actually installed. For example, should a piece of equipment be installed in a location that does not match the plan, indicate that equipment in a graphic manner in the location of installation and so as to match the original symbols as indicated in the original drawings. Should the equipment be different from that specified, indicate with a new graphic symbol on the drawings. The relocated equipment dimensions and northing and easting coordinates should then be transferred to the appropriate drawing in this record set of drawings at the proper time.
- E. On or before the date of final field observation, deliver corrected and completed AutoCAD computer plots of "record drawings" on vellum and AutoCAD electronic files on disk to Owner's Representative as part of contract closeout. Delivery of plots will not relieve Contractor of the responsibility of furnishing required information that may have been omitted from the prints.

PART 2 - PRODUCTS

2.1 GENERAL

- A. All materials to be incorporated in this system shall be new and without flaws or defects and of quality and performance as specified and meeting the requirements of the system. All material overages at the completion of the installation are the property of the Contractor and shall be removed from the site.
- B. No material substitutions from the products described in these specifications and shown on the drawings shall be made without prior approval and acceptance from the Owner's Representative.
- C. Any manufacturer's names and/or model numbers identified herein are intended to assist in establishing a general level of quality, configuration, functionality, and appearance required. This is NOT a proprietary specification and it should be noted that "Or equal" applies to all products denoted herein. It is understood that all manufactures will have minor variations in configuration, appearance, and product specifications and such minor variations shall not eliminate such manufacturers as an equal". It is the intent of this specification to encourage

open and competitive involvement from multiple manufacturers that are able to supply similar products.

2.2 WATER

- A. Water used for drilling and development of the well shall be potable.

2.3 SOLID SECTION CASING

- A. The solid section casing shall be rigid, smooth, clean, and capable of withstanding the pressures and forces exerted by handling, installation, groundwater, and the surrounding soil (at-rest earth pressure) and/or rock, for the duration a 50-year design life. Design properties of the soil and water shall be assumed as follows
 - 1. Dry unit weight of in-situ soil: 130 pcf
 - 2. Coefficient of at-rest earth pressure: 0.5
 - 3. Angle of internal friction: 30-degrees
 - 4. Maximum elevation of ground water surface: 15 feet
- B. Inside diameter of the well casing shall be 8-inches, as shown in the contract drawings.
- C. Splices for steel casing shall be:
 - 1. Threaded and coupled, or
 - 2. Plain ends and welded with sufficient capacity to withstand the stated loading.
- D. Splices for PVC casing shall be:
 - 1. Plain ends and welded with sufficient capacity to withstand the stated loading, or
 - 2. Bell and Spigot.

2.4 SCREENED SECTION CASING

- A. The screened section casing shall be rigid, smooth, clean, and capable of withstanding the pressures and forces exerted by handling, installation, groundwater, and the surrounding soil (at-rest earth pressure) and/or rock, for the duration a 50-year design life. Soil properties are outlined in Part 2.3 of this Section
- B. Inside diameter of the screened well casing shall be 8 inches as shown in the contract drawings.
- C. Screened casing shall be able to provide an inflow rate of at least 60 GPM over the entire length of the screened section of well.
- D. Well screen slot openings shall be designed to retain 90 percent of the filter pack material.
- E. Splices for steel or PVC screened casing shall be:
 - 1. Threaded and coupled, or
 - 2. Plain ends and welded with sufficient capacity to withstand the stated loading.

2.5 SAND/GRAVEL PACK

- A. Sand/Gravel Pack material shall be imported material that is sandy/gravelly in nature.
- B. Sand/Gravel Pack shall be designed by the Contractor.
- C. Sand/Gravel Pack shall be designed to prevent the transport of existing overburden material into the well and allow 60 GPM of groundwater flow over the entire length of the screened section of well.

2.6 WELL PUMP/MOTOR/CONTROL BOX/LEVEL SENSOR

- A. The same pump/motor/control box shall be used in all wells.
- B. The well pump/motor shall meet the following specifications:
 - 1. Shell/housing: Type 304 Stainless Steel
 - 2. Discharge Rates: At 25 feet of pumping head 50 GPM or greater
 - 3. Diameter: 4-inches or smaller
 - 4. Discharge Connection: 2-inches
 - 5. Power: The voltage of the pump motor shall be identical to the electrical power supply to the existing pumps at each well location, and either two-wire or three-wire.
 - 6. Pump/motor shall be rated for both continuous and cyclic operation.
 - 7. Pump/motor shall be rated for submersible operation.
 - 8. Pump/motor shall allow backflow or be equipped with a means to drain the discharge hose back into the well after the "Pump Off" water level has been reached.
- C. The well control box shall meet the following specifications:
 - 1. Control box shall meet standards for NEMA Type 4 enclosures.
 - 2. Control boxes shall be locked with a similarly keyed lock.
 - 3. Two-wire Systems - The two-wire pump controls shall consist of a pressure actuated switch, Square D, Class 9013, Type FSG, set to the operating range shown on the drawings. A fused disconnect switch or manual reset circuit breaker shall be provided with properly sized fuses or circuit breakers to meet amperage requirements of the pump. If the pump does not include lightning protection, a lightning arrestor shall be included with the controls.
 - 4. Three-Wire Systems - The three-wire pump controls shall be as specified for the two-wire system with the addition of a control box complete with terminal strip, starting relay, start and run capacitors, and lightning protection is not provided with the pump motor.
- D. The location of the wiring entrance through the building wall shall be the same location as the existing wiring or as agreed upon by the Owner's Representative and the property owner, and shall be made below grade where practical. Building wiring shall include connections to the existing pump power supply with a junction box, and to the pump controls. Where required by the electrical code, any wiring inside the building shall be installed in protective conduit.
- E. The sensor to activate and deactivate the pump shall be either a pressure transducer, barometric water level sensor, or a float switch.
 - 1. The sensor shall be accurate within ± 0.1 feet.
 - 2. Type: Designed specifically designed for measuring and recording water levels
 - 3. Water Level Monitoring Range
 - a. Maximum Elevation: 20.0 feet

- b. Minimum Elevation: -10.0 feet
- 4. Power Requirements
 - a. Direct power to existing electrical service, or
 - b. 10-year battery life (minimum)

2.7 DISCHARGE HOSE

- A. Discharge hose shall be made of natural and synthetic rubbers resistant to abrasion and weathering.
- B. Operational temperature range: -22°F to 185°F.
- C. Operational pressure: 150 psi Burst pressure: 450 psi

2.8 COMMON FILL

- A. Common fill shall be on-site or imported material that is gravelly in nature and shall conform to the minimum test data as specified below.
 - 1. Boulders (retained on a 3-inch sieve) up to 6 inches in diameter and not exceeding three-quarters of the thickness of horizontal layers placed after compaction
 - 2. The material shall contain not more than 17 percent by weight passing the No. 200 sieve. Common Fill placed within 3 feet 4 inches of the pavement sub-base shall contain not more than 8 percent by weight passing the No. 200 sieve.

2.9 BURIED POLYVINYL CHLORIDE PRESSURIZED PIPE:

- A. Buried polyvinyl chloride (PVC) pipe shall conform to ASTM D 1785 Schedule 40 Pipe, and shall meet the following specific requirements and exceptions:
 - 1. The pipe and fittings shall be homogeneous throughout and free from visible cracks, holes, foreign inclusion or other injurious defects. The pipe shall be as uniform as commercially practical in color, capacity, density and other physical properties.
 - 2. All fittings and accessories shall have dimensions as recommended by the manufacturer.
 - 3. Pipe shall pass impact resistance test in accordance with ASTM D 2444 and minimum pipe stiffness test at 5% deflection in accordance with ASTM D 2412.
 - 4. The normal length of pipe shall be 20 feet.
 - 5. Manning's "n" value for the pipe shall be 0.015 or less.
- B. All sections of pipe shall be solvent welded to adjacent sections in accordance with practices outlined in ASTM D2855-15. PVC solvent cement shall meet ASTM D2564.
- C. Other materials not specifically described, but required for proper and complete installation of the pipe shall be as selected by the Contractor, subject to the approval of the Owner/ Owner's Representative.

2.10 WELL ACCESS STRUCTURE, FRAMES, AND COVERS

- A. Well access structures shall be constructed of thermo-moulded PVC conforming with ASTM D1785

- B. The well access structure shall be constructed of one continuous PVC section. No horizontal or vertical joints shall be permitted.
- C. Openings for pipe insertions shall be cast into the structure or cut doghouse style at the base of the structure. Cut openings shall have no more than a ½ inch space to the drain pipe.
- D. The grates and frames furnished for all surface drainage inlets shall be ductile iron and shall be made specifically for each basin so as to provide a round bottom flange that closely matches the diameter of the surface drainage inlet. Grates for drain basins shall be capable of supporting various wheel loads as specified. Ductile iron used in the manufacture of the castings shall conform to ASTM A536 grade 70-50-05. Grates and covers shall be provided painted black.
- E. Covers shall have a non-slip surface and shall have the word "WELL", as applicable, inscribed
- F. All frames and covers shall be designed for H-20 wheel loading.
- G. The access structures shall be supported on a 3-inch thick layer of crushed stone.
- H. The name and trademark of the manufacturer shall be clearly marked on the inside of the structure.

2.11 CONCRETE FOR COVER SUPPORT AND DUCT BANKS

- A. Cement shall be Portland cement conforming to ASTM C150, Type III, high early strength and comply with Section 702 and 704 of the State Specifications.
- B. Aggregate: shall conform to ASTM C330 and shall be graded, crushed stone with a resulting unit weight of concrete of up to one hundred fifty-five (155) pounds per cubic foot, and a minimum unit weight of not less than one hundred forty-eight (148) pounds.
- C. Water: shall be clear and free of injurious and deleterious substances.
- D. Concrete: shall have a minimum strength of 4000 psi at twenty-eight (28) days and strength of 3000 psi at the time of form release.
 - 1. During the process of manufacturing of the units not less than two (2) test cylinders shall be tested at time release of the form and two (2) at age twenty-eight (28) days.
 - 2. All compression test cylinders shall be made, cured and stored in accordance with ASTM C31. Cylinders shall be tested in accordance with ASTM C39.
 - 3. All concrete shall contain 5 to 7 percent air entrainment.
 - 4. Concrete for duct banks shall be 3000 psi at twenty-eight days and strength of 2500 psi at the time of form release
- E. Admixtures shall only be used after prior approval of the Owner's Representative.

2.12 CRACK REPAIR

- A. Refer to the contract drawings for crack repair materials.

2.13 PAVEMENT REPAIR

- A. Base course Binder shall meet Class 12.5 of the RIDOT HMA mix design.

- B. Surface Course material shall meet Class 9.5 of the RIDOT HMA mix design.

PART 3 - EXECUTION

3.1 GENERAL

- A. Before work is commenced, hold a conference with the Owner's Representative to discuss general details of the work.
- B. Examine all contract documents applying to this Section noting any discrepancies and bringing the same to the attention of the Owner's Representative for timely resolution.
- C. All works indicated on drawings shall be provided whether or not specifically mentioned in the Specifications.
- D. If there are ambiguities between drawings and specifications, and specific interpretation or clarification is not issued prior to bidding, the interpretation or clarification will be made only by Owner's Representative, and Contractor shall comply with the decisions. In the event the installation contradicts the directions given, the installation shall be corrected by Contractor at no additional cost to Owner.
- E. Verify dimensions and grades at job site before work is commenced. Do not proceed with installation of the dewatering well system or well access structures when it is apparent that obstructions or grade differences exist or if conflicts in construction details, legend or specific notes are discovered. All such obstructions, conflicts, or discrepancies shall be brought to the attention of the Owner's Representative.
- F. Make all field measurements necessary for the work noting the relationship of the dewatering well system to the other trades. Coordinate with other trades. Project shall be laid out as indicated on the dewatering system plans, making minor adjustments. Major changes shall be reviewed with the Owner's Representative prior to proceeding.
- G. During progress of work, a competent superintendent and all assistants necessary shall be on site. All shall be satisfactory to the Owner's Representative. The superintendent shall not be changed, except with the consent of the Owner's Representative, unless that person proves unsatisfactory and ceases to be employed. The superintendent shall represent the Contractor in his absence and all directions given to the superintendent shall be as binding as if given to the Contractor.
- H. At all times, protect landscaping, hardscapes, structures, walls, footings, and other structures. from damage. Any inadvertent damage to existing conditions or the work of another trade shall be reported at once.
- I. Replace, or repair to the satisfaction of the Owner, all existing hardscapes disturbed during course of work. New hardscapes shall be the same type, strength, texture, finish, and be equal in every way to removed hardscapes.

3.2 PROJECT CONDITIONS

- A. Call Dig Safe: All Contractors or Subcontractors performing drilling, boring, auguring, jetting, trenching, demolition, excavation or like work shall, prior to commencement of these activities, contact utility companies having responsibility for underground transmission systems for

information relative to locations of existing underground utilities and/or an appropriate dig safe damage prevention and notification agency.

3.3 INSPECTION:

- A. All water distribution system products shall be subject to inspection and approval by Owner at the place of manufacture and/or at the site after delivery. The products shall be subject to rejection at any time due to failure to conform to the specifications. Rejected products shall be removed from the site immediately. All the products shall be carefully examined for defects, and if any are found to be broken or defective, prior to or after being placed, they shall be removed and replaced by the Contractor without any further compensation.

3.4 WELL CONSTRUCTION

- A. Well Location - The well shall be constructed in the location designated on the drawings. Any deviation in location shall be approved by the Owner's Representative.
- B. Drilling Method - The well shall be constructed using rotary drilling method. Other drilling methods may be used only with the permission of the Owner's Representative.
- C. Drilling Equipment - Drilling machines shall be of sufficient size to efficiently complete the work. If requested by the Owner's Representative, the Contractor shall present evidence of sufficient equipment and tools to complete the work.
- D. Drilling Water - Water necessary for drilling operations shall be obtained by the Contractor at their expense from a municipal water supply or a well supplying potable water
- E. Well Screen - The Contractor shall select the screen to be used based upon analysis of samples from the formation. For naturally developed wells, the screen slot size should be such that between 40 and 50 percent of the material present in the water bearing formation will be retained by the screen. For gravel-packed wells, the slot size should be such that 90 percent of the gravel pack material is retained by the screen.
- F. Formation Sampling and Well Records - The Contractor shall maintain a complete and accurately written record of types of formations encountered, depths and thicknesses of formations during construction of a well.
- G. Temporary Capping - At all times during the progress of the work, the Contractor shall use reasonable precautions to prevent either tampering with the well or the entrance of foreign material into the well. Upon completion of the well, temporary capping shall be provided.
- H. Grouting - The annular space between the well casing and borehole shall be tightly sealed to prevent the entrance of surface water and the vertical migration of contaminants along the well casing and borehole to the elevations shown on the drawings. The Contractor shall maintain records of the grouting method and the volume of grout material used.
- I. Drilling - The following specification shall apply to all wells constructed using the mud rotary drilling method:
 - 1. The Contractor shall be responsible for controlling critical drilling fluid properties such as density and viscosity to avoid excessive downhole pressure, recirculation of cuttings, and damage to the water bearing formation.

2. Drilling fluid(s) other than potable water shall be collected and disposed of off-site in accordance with all local, state, and federal laws.
3. Dust from operations shall be collected and/or misted to prevent the travel of dust particles beyond the property bounds of the site. Mist shall be from potable sources.

3.5 WELL DEVELOPMENT

- A. The Contractor shall furnish pumps, compressors, surge plungers, jets, bailers, and other equipment as well as equipment of approved size and type for measuring the water discharge and shall develop the well by such approved methods to give the maximum yield of water per foot of draw down and extract from the water-bearing formation the maximum practical yield.
- B. The developing process shall start immediately after the construction of the well and will be considered as completed when the borehole produces entirely clear water to the satisfaction of the Owner's Representative. The water shall be considered sand free when no samples taken during the pumping test contain more than 5 parts per million of sand size particles by weight. The Owner's Representative may require additional development work aimed to further improve the specific capacity of the well.
- C. Testing should not commence until complete development is achieved. Development process shall be carried out in the presence of the Owner's Representative.
- D. The Contractor shall advise the Owner's Representative in sufficient time before starting the development of the borehole.
- E. Airlift Development: Development by air compressor shall start immediately after well construction is completed and no elapsed time period is permitted. The airlift is to proceed systematically, from top to bottom until the discharge will be composed of load free clear water.
 1. Changing to further development methods such as the usage of surge plunger, jetty tool and pump development is subject to the Owner's Representative's approval.
- F. Pumping Development: Pumping Development shall consist of the following:
 1. Pumping shall be carried out by pumping equipment shall be started with a lowest discharge rate and be continued until the water is clear of sand and the water level steady; it shall then be increased gradually and continued as above, and so on, in steps until the maximum discharge is reached. The pump shall be installed at the appropriate position of the housing line, along with a $\frac{3}{4}$ " observation pipe connected to the rising main.
 2. If during pumping in stages as above, the water level for a certain discharge steadies at a large drawdown without yielding clear water, then pumping shall be interrupted and resumed periodically (jerk method).

3.6 TOLERANCES

- A. Well Diameter: The allowable tolerance for the inside diameter of the cased well is +/- 1/8 inch from the diameter shown on the plans.
- B. Horizontal Positioning: At cut-off level, the maximum permitted deviation from the center of the well shown on the drawings shall be 12 inches in any direction. Wells shall be located within the well

access structure such that the well is fully exposed from a vertical projection when the cover is removed from the access frame.

- C. Verticality: The maximum permitted deviation of the finished cased well from the vertical at any level is 1 inch in 20 (5%). The Contractor shall demonstrate to the satisfaction of Owner's Representative the well verticality is within the allowable tolerance.

3.7 WIRING INSTALLATION

- A. Wiring shall be installed along with the main line. Wire shall be laid alongside the well access structure on the building side within a concrete duct bank. Sufficient slack for expansion and contraction shall be maintained and wiring shall at no point be installed tightly. Provide and install an additional 8 inches to 12 inches slack at all changes of direction.
- B. All wire shall be laid in conduit encased in a concrete duct bank. Spacing between conduit within the duct bank shall be at least 1 inch. Concrete strength for the duct bank shall be at least 3,000 psi. The duct bank shall be located below frost depth.
- C. Contractor shall provide a complete wiring diagram showing wire routing for the connections between the controller, pumps/motors, water level sensors/transducers/float level, and alarms. See section one for the inclusion of wiring diagram in operation and maintenance manuals.

3.8 CONTROLLER INSTALLATION

- A. Contractor to install controller on wall in the Attorney General's office at the same location of the existing well controls using a licensed electrician. Contractor to wire water level sensors/transducers/float level and alarms into controller and set proper program.
- B. Wire controller and install surge arrestor to the existing electrical supply using a licensed electrician.
- C. Keys for locks shall be turned over to Owner's Representative.

3.9 INSTALLATION OF DRAIN PIPE

- A. Installation of pipe shall be performed in accordance with AWWA C605-94. The following requirements shall be met:
 - 1. All pipe shall be laid in accordance with the recommendations or specifications of the manufacturer insofar as they do not conflict with these specifications.
 - 2. Pipe and appurtenances shall be examined carefully for cracks or other defects.
 - 3. Pipe shall be laid to lines and depths shown on the drawings or approved by the Owner and the Work done with suitable tools and appliances. An even alignment of the pipes shall be maintained.
 - 4. Blocking will not be permitted. All bedding shall be graded to accommodate bells and fittings.
 - 5. Each length of pipe shall be laid to form a tight joint, as hereinafter specified, and to bring the inverts into a continuous line.
 - 6. All pipes shall be clean and free of dirt before laying and open ends shall be kept covered and free of dirt during construction.
 - 7. The work shall be conducted in such a manner that no loose excavation or other foreign material can enter the pipes.

- B. All drain lines shall be kept clean of debris and soil accumulation as a result of construction activities. Drain lines that become clogged or partially filled with sediment or debris as a result of construction activities shall be cleaned at no additional cost to the Owner.

3.10 WELL ACCESS STRUCTURE CONSTRUCTION AND INSTALLATION

- A. Set tops of grating frames and grates flush with finished surface, unless otherwise indicated.
- B. The drain basin body can be cut at the time of the final grade. No brick, stone or concrete block will be required to set the grate to the final grade height.
- C. Bottom section of the well access structure can be open to the underlying soil.
- D. Inlet for the drain pipe may be either cast into the side wall of the PVC structure or cut doghouse style into the bottom of the structure. For doghouse style penetrations joints shall be parged with mortar. Spaces large than 1 inch shall be parged with brick and mortar.
- E. Access structures shall otherwise be installed in accordance with manufacture recommendations.
- F. Access structure shall be set so as to be vertical and in true alignment. The drain basin body can be cut at the time of the final grade. No brick, stone or concrete block will be required to set the grate to the final grade height.
- G. Complete details of the tap fitting, manufacturer, and installation shall be submitted for approval.

3.11 REMOVE AND DISPOSE OF EXISTING EQUIPMENT

- A. The contractor shall remove and dispose of existing pumps, discharge hoses, control boxes, and miscellaneous electrical components associated with the existing dewatering well system.
 - 1. Discharge hoses and electrical lines need only be removed within the existing well. Hose sections that extend beneath the sidewalk or pavement do not need to be removed unless encountered during other portions of the proposed work.
 - 2. Existing electrical connections shall be removed such that there are no live connections remaining in place.
- B. Wells shall be kept in an operable manor to be used as monitoring wells.
- C. The contractor shall give the Owner the opportunity to review existing equipment prior to disposal to determine if the Owner will retain any of the equipment. Equipment retained by the Owner shall be stored at an on-site location as determined by the Owner.

3.12 CRACK REPAIR

- A. Cracks shall be repaired in accordance with the details on the contract drawings.
- B. Areas with visible efflorescence shall be cleaned
- C. Prior to completing the crack repair, efflorescence shall be cleaned from the repair area using a wire brush.

D. Crack repair priority shall be in the following order:

1. Interior Cracks
 - a. Cracks with efflorescence or other signs of water intrusion
 - b. Cracks larger than 1/4 inch
 - c. Cracks between 1/4 and 1/8 inch
 - d. Cracks between 1/8 and 1/16 inch
2. Exterior Cracks
 - a. Cracks with efflorescence or other signs of water intrusion
 - b. Cracks larger than 1/4 inch
 - c. Cracks between 1/4 and 1/8 inch
 - d. Cracks between 1/8 and 1/16 inch

3.13 EXCAVATION AND BACKFILLING

- A. All excavations shall progress under good practice and shall abide to all State and Federal regulations.
- B. The contractor shall provide the means necessary to dewater excavations so as to achieve a firm and stable subgrade upon reaching the bottom of the excavation.
- C. Excavations within the work area shall be considered unclassified.
- D. Place material in 12-inch maximum loose lifts and compact each lift to not less than 95 percent (within 1 foot of pavement subgrades) and 92 percent (all other locations and depths) of the maximum dry density as determined by the Modified Proctor Test. Make proper allowances for Bedding for Riprap, Riprap, Loam Borrow, Low Permeability Fill, and Engineered Fill.
- E. Do not operate earth-moving or other heavy equipment within a distance that will cause damage to new or existing structures. Compact embankment fill backfill as shown within the contract drawings with hand-operated vibratory compactors or other acceptable equipment in 12-inch maximum loose lifts. Compaction shall be performed in a manner, which will not damage new or existing structures and utilities.
- F. Protect excavation bottoms and sides against freezing when atmospheric temperature is less than 35 degrees Fahrenheit.
 1. In freezing weather, a layer of fill shall not be left in an uncompacted state at the close of a day's operation. Prior to terminating operations for the day, the final layer of fill, after compaction, shall be rolled with a smooth-wheeled roller to eliminate ridges of soil left by tractors, trucks and compaction equipment. Once compacted material should be protected from freezing. Material that freezes after compaction is subject to rejection, removal, and replacement at the discretion of the Owner/Engineer at no additional cost.
- G. The Contractor shall not place a layer of fill on top of snow, ice, or soil that was permitted to freeze.
 1. Removal of these unsatisfactory materials will be required as determined by the Owner/Engineer.
 2. Fill to be incorporated into the work shall not be permitted to freeze. "Breaking up" frozen soil will not be considered suitable for making frozen soils suitable for reuse.
- H. Offsite disposal of demolished pavement, excavation spoils, and excess fill materials shall be completed in accordance with all local, state, and federal laws.

3.14 ACCEPTANCE AND OPERATION BY OWNER

- A. Upon completion of the work and acceptance by the Owner, the Contractor shall be responsible for the training of the Owner's Representative(s) in the operation of the system (provide minimum 7 day written notice in advance of test). The Contractor shall furnish, in addition to the Record Drawings and operational manuals, copies of all available specification sheets and catalog sheets to the Owner's personnel responsible for the operation of the dewatering well system. The Contractor shall guarantee all parts and labor for a minimum period of one (1) year from date of acceptance.

3.15 CLEAN UP

- A. Upon completion of all installation work, Contractor shall remove all leftover materials and equipment from the site in a safe and legal manner.
- B. Contractor shall remove all debris resulting from work of this section.
- C. Contractor shall repair damaged areas of pavement to match the existing pavement thicknesses and type.

END OF SECTION 33 20 00