



STATE OF MAINE  
DEPARTMENT OF TRANSPORTATION  
16 STATE HOUSE STATION  
AUGUSTA, MAINE 04333-0016

Paul R. LePage  
GOVERNOR

David Bernhardt  
COMMISSIONER

January 9, 2018  
Subject: Barrel Bridge Replacement  
State WIN: 018957.00  
Location: York  
**Amendment No. 2**

Dear Sir/Ms.:

Please make the following changes to the Bid Documents:

In the Bid Book:

**REMOVE** pages 56 – 66, SPECIAL PROVISION - SECTION 501 - FOUNDATION PILES - (Micropiles), 11 pages, dated December, 2017, and **REPLACE** with the attached, revised SPECIAL PROVISION - SECTION 501 - FOUNDATION PILES - (Micropiles), 11 pages, dated December 27, 2017.

**REMOVE** pages 85 – 87, SPECIAL PROVISION - SECTION 535 - PRECAST, PRESTRESSED CONCRETE SUPERSTRUCTURE - (Camber), 3 pages, dated December 5, 2017, and **REPLACE** with the attached, revised SPECIAL PROVISION - SECTION 535 - PRECAST, PRESTRESSED CONCRETE SUPERSTRUCTURE - (Camber), 3 pages, dated December 20, 2017.

In the Plan Set:

**REMOVE** SHEET NUMBER 18 OF 31, MICROPILE DETAILS ABUT. 1, and **REPLACE** with the attached, revised SHEET NUMBER 18 OF 31, MICROPILE DETAILS ABUT. 1.

**REMOVE** SHEET NUMBER 19 OF 31, MICROPILE DETAILS ABUT. 2, and **REPLACE** with the attached, revised SHEET NUMBER 19 OF 31, MICROPILE DETAILS ABUT. 2.

The following questions have been received:

**Question:** What is the finish of the rebar in the precast approach slabs?

**Response:** The reinforcing in the precast approach slabs shall be Plain Reinforcing Steel meeting the requirements of ASTM A 615/A 615M, Grade 60,  $F_y = 60,000$  psi.



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**Question:** After review of Amendment No. 1 and the response to no Sunday work. This eliminates 5 days for Sundays and 1 day for no work on Labor Day. I think at a minimum 6 additional working days should be added past the 9/8/18 completion date for the inability to work on Sundays/holidays during the shutdown period.

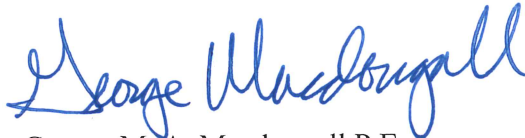
**Response:** There will be no change to the Contract time allotted for the project. The new bridge must be complete by September 8, 2018, as defined in Special Provision 107 – Completion Incentives and Disincentives.

**Question:** Two cranes, one behind both abutments will be required to erect the NEXT beams. The utility arrangements specified in Special Provision Section 104 Utilities do not provide the required clearance to operate a crane behind the west abutment. Other arrangements will be required to provide the minimum clearance from the utility lines.

**Response:** The Department Utility Coordinator will assist the Contractor in communications with the Utility Companies during construction in an effort to provide as much construction access as possible, within the limitations of Special Provision 104 – Utilities.

Consider these changes and information prior to submitting your bid on **January 10, 2018**.

Sincerely,



George M. A. Macdougall P.E.  
Contracts & Specifications Engineer

SPECIAL PROVISION  
SECTION 501  
FOUNDATION PILES  
(Micropiles)

Amend Standard Specification Section 501 - Foundation Piles to include the following:

501.01 Description This work shall consist of furnishing and constructing a micropile foundation as shown in the Plans and as specified herein. The Micropile Contractor is responsible for furnishing all materials, products, accessories, tools, equipment, services, transportation, labor and supervision, and manufacturing techniques required for installation of micropiles for this project as shown on the Plans, approved submittals and specified herein.

The Micropile Contractor shall coordinate the work so the micropiles are safely constructed. The micropile Contractor shall perform the micropile construction and related excavation in accordance with the Plans and approved submittals.

The Micropile Contractor shall select the micropile installation means and methods. The minimum micropile and casing diameters are shown on the Plans. The Micropile Contractor shall install micropiles so that ground loss or densification and any resulting settlement or vibration does not damage existing structures or facilities to remain. The Micropile Contractor is responsible for removing or advancing through all underground obstructions that may interfere with the installation of micropiles.

The Micropile Contractor will provide access so that the Engineer or their representative can monitor all aspects of micropile construction.

501.011 Definitions Definitions that apply within this Special Provision are:

Bond Breaker A device, sleeve or special treatment placed over the steel reinforcement that will prevent load transfer to the soil over that length. A bond breaker also provides full lateral support of the micropile over the length of the bond breaker. Grout placed in contact with the soil using gravity pressure only will not be considered to constitute a bond breaker.

Bond Zone The gravity grouted, pressure grouted, and/or post grouted length of a micropile that is bonded to the bedrock and transfers the applied loads to the surrounding bedrock.

Factored Design Load (FDL) The maximum factored compressive axial load for a micropile as indicated on the Plans.

Drill Casing Steel pipe of flush joint type used in the drilling process to stabilize the drill hole.

Micropile A small diameter, bonded, cast-in-place friction pile formed by removing material using non-vibratory and non-displacement methods to create a cased open, cylindrical hole in the ground, which is subsequently filled with grout and steel reinforcement.

Mill Secondary Mill rejected American Petroleum Institute (API) casing, a.k.a. “Mill Rejects,” “Structural Grade,” “Limited Service,” or “Minimum Test Pipe”.

Oversized Socket A rock socket drilled prior to micropile installation to increase the length of Permanent Steel Casing above rock in accordance with the Plans. The lower portion will be filled with grout.

Permanent Steel Casing A steel casing installed in the upper portion of a micropile to increase the micropile's moment capacity and lateral capacity against horizontal loads.

Positive circulation or flush A method of progressing and cleaning out a hole for a micropile wherein drilling fluid is injected into the hole and returns upward along the outside of the drill casing.

Production micropile A micropile which will be incorporated into the structure's foundation.

Recirculation A method of handling drilling fluid where the fluid coming back out of the hole is captured in a pan and reused.

Reinforcing Steel A bar placed through the full length of the pile, in the center of the pile to provide load transfer into the rock.

Reverse circulation A method of cleaning the inside of the drill casing. Drilling fluid is circulated down through the drill rods and returns upwards through the inside of the drill casing to flush the drill casing clean.

Tremie grouting A method used to place grout in a wet hole. A grout tube is placed to the bottom of the drill hole. While keeping the grout tube opening submerged in the grout, grout is pumped into the hole, causing the drilling fluid to be displaced upward.

501.012 Micropile Contractor's Experience Requirements and Submittal Four (4) weeks prior to the start of installation of the Micropiles, the Contractor performing the work described in this Special Provision shall submit:

1. Proof of successfully constructed Micropiles or Spun Pipe Piles, using non-displacement methods at two (2) projects under similar site conditions to those indicated in the Contract Documents.
2. A list identifying the on-site supervisors and drill rig operators assigned to the project. On-site supervisors shall have supervised the successful installation of Micropiles or

Spun Pipe Piles, on at least two (2) projects under similar site conditions to those indicated in the Contract Documents. Drill rig operators shall have at least one (1) year experience in construction of Micropile or Spun Pipe Pile foundations.

The Resident shall approve or reject the Contractor's qualifications and staff within fourteen (14) Working Days after receipt of the submission.

501.013 Submittals The Micropile Contractor will not be allowed to begin work until all related submittal requirements are satisfied and found acceptable to the Resident. At least four (4) weeks prior to the start of installation of the micropiles, the Micropile Contractor shall prepare and submit the information outlined below. All submittals will be reviewed in accordance with Standard Specification Section 105.7, Working Drawings.

Include in the Micropile Installation Plan submittal:

1. List and description of proposed equipment to be used for micropile installation, including drilling equipment, cleaning method, centralizers, installing reinforcing steel, and tremie grouting.
2. Details of proposed procedures for micropile installation including, but not limited to, method of sealing temporary casing, drilling oversized rock sockets, permanent casing placement in oversized sockets, drilling micropile casing, checking cleanliness of drill holes, installation and grouting.
3. Procedures for advancing through wood, boulders and other obstructions.
4. Procedures for containment of drilling fluid and spoils, and disposal of spoils.
5. Shop drawings for all structural steel, including the micropile components, and bond zone details. Provide information on the length of the casing sections to be used, as dictated by restrictions on Permanent Steel Casing splice locations, by the length of the drill mast and by the available overhead clearance, and the resulting location of joints. Shop drawings shall provide details and dimensions of all micropile components, and shall include a plan showing micropile designations.
6. Grout mix design including specific gravity and grout compressive strength test results completed within the last year.
7. Quality Control Plan (QCP) for the grout, in accordance with Standard Specification Section 502.1701, Quality Control, Method A and B, with the following exception: There are no permeability or entrained air requirements. This plan shall also include a description of the procedures and equipment for placing the grout and the method for monitoring quality control of the mix. At a minimum, quality control shall include: Use of a Baroid Mud Balance per American Petroleum Institute (API) Recommended Practice (RP) 13B-1, Standard Procedure for Testing Water Based Drilling Fluids, to check the specific gravity of the mixed grout prior to placement of the grout into each micropile; and compressive strength testing in accordance with AASHTO T106/ASTM C109 at a frequency of no less than one set of three (3) 2-inch grout cubes each day of operation, or per every six (6) micropiles, whichever occurs more frequently.
8. If proposed, details of post-grouting equipment and procedures, including the method,

sequence of operations and equipment required. Provide material certifications for the micropile components.

9. Layout drawings showing the proposed sequence of micropile installation. Coordinate this sequence with the proposed phasing and scheduling.
10. Estimated duration of the work, including mobilization, micropile installation, grouting, and demobilization.

The micropile Contractor shall submit certified mill test reports, properly marked, for the reinforcing steel, and coupon test results for API N-80 pipe casing, as the materials are delivered, to the Resident for record purposes. The ultimate strength, yield strength, elongation, and material properties composition shall be included. For API steel pipe used as permanent casing, the micropile Contractor shall submit a minimum of two representative coupon tests or mill certifications (if available) on each load delivered to the project.

Micropile installation records shall be submitted to the Resident within 24 hours after each micropile installation is completed. As a minimum the records shall include: micropile drilling, duration and observations; description of soil and bedrock encountered; micropile inclination; approximate final drill hole, casing reinforcement, and centralizer elevations; cut-off elevation; description of unusual behavior and/or conditions; deviations from planned parameters; grout volumes pumped; micropile materials and dimensions; micropile location; inspector name; drill method; grout method; drill rig operator.

The Micropile Contractor shall submit to the Resident within thirty (30) calendar days after completion of the micropile work a report containing:

1. As-built drawings showing the locations of the micropiles and the micropile lengths.
2. Steel manufacturer's mill test reports for the reinforcing steel, and coupon test results for permanent casing.
3. Detailed drilling records including depth to bedrock and bedrock quality.
4. Grouting records indicating the cement type, and quantity injected.
5. Results of grout cube breaks.

501.02 Materials For all steel remaining as a permanent part of the work, all Buy America provisions shall apply. Refer to Standard Specifications Subsection 105.11, Other Federal Requirements, and Standard Specifications Appendix A to Division 100, Section 3, Other Federal Requirements.

Cement grout for grouting the micropiles shall be either neat cement grout, or sand-cement grout with a water-cement ratio not more than 0.45 by weight. Water content and consistency of grout may be varied only by written approval by the Resident and Geotechnical Engineer. Expansion agent shall not be used. Minimum unconfined compressive design strength of grout shall be 5,000 psi. The grout design strength shall be achieved prior to erecting the girders. Materials for cement grout shall be in accordance with the approved submittal.

Bar Tendon Hex Nuts and Couplers Bar Tendon Hex Nuts and Couplers shall conform to ASTM A108 and develop the ultimate tensile strength of the bars without evidence of failure.

Centralizers for Permanent Steel Casing in Oversized Sockets Steel centralizers shall be welded to the bottom of Permanent Steel Casing to be installed in oversized rock sockets. Centralizer details shall be submitted by the Micropile Contractor and shall include at least two levels of centralizers along the lower 3 feet of the casing. Centralizers shall be sized such that the Permanent Steel Casing is maintained at least 0.5 inches away from the oversized socket within the lower 3 feet of the casing. Centralizers shall be sized to allow grout tremie pipe insertion to the bottom of the drill hole; and sized to allow grout to freely flow up the drill hole in the lower 3 feet of the socket.

Centralizers and Spacers for Reinforcing Steel Centralizers and spacers shall be fabricated from schedule 40 PVC pipe or tube, steel, or material non-detrimental to the reinforcing steel. Wood shall not be used. Centralizers and spacers shall be securely attached to the reinforcement; sized to position the reinforcement within 3/8 inch of plan location from center of micropile; sized to allow grout tremie pipe insertion to the bottom of the drill hole; and sized to allow grout to freely flow up the drill hole and casing without misalignment of the reinforcement.

Fine Aggregate If sand-cement is used, sand shall conform to ASTM C144/AASHTO M45.

Grout Protection Provide a minimum 1-inch grout cover over bars and ½ inch grout cover over couplers.

Permanent Steel Casing/Pipe Used As Reinforcement Steel casing for micropiles shall have the minimum outside diameter and wall thickness shown on the Plans and shall conform to API 5CT N80 with a minimum yield strength (Fy) of 80 ksi, and shall be straight-seamed. Lap welded seams are not acceptable. Mill Secondary steel casings shall meet all strength requirements, and the requirements of Buy America. The steel shall be a Prequalified Base Metal from the AWS D1.1 Structural Welded Code - Steel. For API steel pipe used as Permanent Steel Casing, submit a minimum of two representative coupon test results or mill certifications (if available) on each load delivered to the Project.

Permanent Steel Casing splices shall conform to the requirements of ASTM A148/A148M, Grade 725-585 (Grade 105-85). Threaded casing joints shall be capable of developing and transferring full strength in compression and tension and developing full bending moment capacity.

The Permanent Steel Casing shall be flush joint and the pipe joint shall be completely shouldered and with no stripped threads.

Galvanizing, if specified on the Plans, shall be in accordance with Section 506, Shop Applied Protective Coating – Steel. If splices are used, threads shall be cleaned after galvanizing.

The manufacturer or fabricator of steel pipe piling shall furnish a certificate of compliance stating that the piling being supplied conforms to these specifications. The certificate of compliance shall include test reports for tensile and chemical tests. Samples for testing shall be taken from the base metal, steel or coil or from the manufactured or fabricated piling. The certificate of compliance shall be in English units.

Plates and Shapes Structural steel plates and shapes for micropile tip attachment shall conform to ASTM A 572 Grade 50 (AASHTO M183).

Reinforcing Steel Reinforcement steel shall be continuously threaded bar, Grade 75 ksi, conforming to ASTM A615, as manufactured by DSI or approved equal. Submit certified mill test reports.

Water Water used in the grout mix shall conform to AASHTO T26 and shall be potable, clean and free from substances that may be injurious to cement and steel.

501.04 Construction Requirements Progress all micropiles using steel drill casing. Install the permanent casing prior to or in conjunction with the micropile installation. If replacement micropiles are needed because installed micropiles are unacceptable, location of the replacement micropile(s) shall be approved by the Resident. All installation techniques shall be determined and scheduled such that there will be no interconnection (grout flow between holes) or damage to previously installed micropiles.

Tolerances Install the top of the permanent casing to the elevation indicated in the Plans. Install the permanent casing so that the center of each casing does not vary from the plan location by more than 3 inches. Micropile-hole alignment of vertical micropiles shall be within 2% of design alignment. Top elevation of the micropile shall be within plus 1 inch or minus 2 inches of the design vertical elevation. Centerline of reinforcing steel shall not be more than  $\frac{3}{4}$  inch from centerline of piling.

Drilling, Soil Removal, and Permanent Casing Installation The drilling equipment and methods shall be suitable for drilling through the conditions to be encountered, with minimal disturbance to these conditions or any overlying or adjacent structures or services. The drilling equipment shall be capable of installing micropiles to a depth and size shown on the Plans and to a depth of twenty (20) percent of the micropile length beyond the tip depths shown in the Plans. Drill so that the micropile is not moved out of horizontal alignment or out of specified inclination. The Permanent Steel Casing shall be seated a minimum of three (3) feet into bedrock. Open/unsupported drill holes will not be permitted. Where oversized sockets are required in the Plans, seating the Permanent Steel Casing will consist of placing the casing in the oversized socket with centralizers and placing a 3-foot grout plug in the bottom of the socket

using tremie methods. Do not drill or flush ahead of the drill casing by more than 1 foot in soil. Perform drilling and excavation in such a manner as to prevent the collapse of the hole. Use of bentonite slurry is not permitted. Use of polymer slurry to remove cuttings from the cased hole must be approved by the Resident.

Micropile sockets shall be drilled to the minimum depth below the bottom of Permanent Steel Casing required in the Plans plus 6 inches. The socket must be confirmed by approved methods to be open to the defined nominal diameter, full length, prior to placing grout and reinforcement.

The Micropile Contractor is responsible for removing and/or advancing through all underground obstructions that may interfere with the installation of Micropiles. An impact or vibratory hammer shall not be used to advance permanent casing; this requirement does not apply to rotary percussive techniques that use top-drive hammers or down-the-hole hammers.

Control the procedures and operations to prevent undermining, damage or settlement to adjacent structures, tunnels, utilities or adjacent ground. If any undermining, damage or settlement occurs, halt operations. Provide a written plan to the Resident and the Geotechnical Engineer for review with procedures to avoid reoccurrence. Resume work only after the Resident and Geotechnical Engineer have approved the plan in writing. Repair all damage and settlement at no additional cost to the Department. Delays resulting from the plan preparation and review process shall be the sole responsibility of the Contractor, and shall be at no additional cost to the Department.

Control the procedures and operations to prevent soil or rock material from moving into the bottom of the hole at all times during installation and cleaning out. Monitor the rate of fluid flow used to progress the holes. Monitor adjacent water body for siltation resulting from drilling and flushing.

Control drilling fluid and dispose of spoil in accordance with the approved procedure.

Do not progress a hole, pressure grout, or post-grout, within a radius of five (5) pile diameters or five (5) feet, whichever is greater, of a grouted micropile until the grout for that micropile has set for 24 hours, or longer if a retarder is used. The Resident will determine the wait time if a retarder is used based on the of the grout testing.

All installation techniques shall be determined and scheduled such that there will be no interconnection or damage to micropiles in which grout has not achieved final set.

Temporary Casing Installation and Oversized Socket Drilling Where oversized sockets are required for micropile installation, the drilling equipment shall be capable of seating temporary drill casing into rock and drilling a minimum 11-inch-diameter socket to the depths indicated on the Plans and to a depth three (3) feet deeper than the depth shown on the Plans. Temporary casing shall be seated to achieve a seal and to prevent the soil and rock at the bottom of the hole

from moving into the socket during installation and cleaning out. After drilling, the oversized socket shall be flushed with water and/or air to remove drill cuttings and/or other loose debris. Construction requirements for Drilling, Soil Removal, and Permanent Casing Installation and Grout Placement shall also apply.

Micropile Splices Micropile splices shall be constructed to develop the required FDL of the micropile cross section. Lengths of Permanent Steel Casing to be spliced shall be secured in proper alignment and in such a manner that no eccentricity between the axis of the two lengths spliced or angle between them results. Threaded Permanent Steel Casing joints shall not be used within the pile cap

Reinforcing Steel, Centralizers, and Post Grout Tube Placement Reinforcing Steel shall be placed immediately prior to tremie grouting. The Reinforcing Steel surface shall be free of all deleterious substances such as soil, mud, grease or oil that might contaminate the grout or coat the reinforcement and impair bond.

Centralizers and spacers (if used) shall be sized to position the reinforcement within 3/4 inches of plan location from the center of the micropile; sized to allow grout tremie pipe insertion to the bottom of the drill hole; and sized to allow grout to freely flow up the annulus between the casing and reinforcing steel. Centralizers, spaced not to exceed 10 feet, must be used to center the reinforcement for its entire length. The uppermost and lower most centralizers shall be located a maximum of 5 feet from the ends of the micropile. Securely attach the centralizers to withstand installation stresses. Centralizers shall be provided of appropriate size to center the reinforcing steel in the bond zone and the casing.

The Micropile Contractor shall check micropile top elevations and adjust all installed micropiles to the planned elevations.

After confirming the hole is clean and open to depth, and immediately prior to grouting, lower the reinforcing steel to its specified location in the hole without dropping. If a post grout tube is used, attach it to the reinforcing steel prior to lowering it. Partially inserted reinforcing steel shall not be driven or forced into the hole. The Micropile Contractor shall remove the steel, redrill and reinsert steel when necessary to facilitate inserting at no additional cost to the Department. There shall be no interconnection or damage to micropiles in which the grout has not achieved final set.

Grout Placement The Micropile Contractor shall provide calibrated systems and equipment to measure the grout quality (including, at a minimum, compressive strength according to AASHTO T106/ASTM C109 and grout specific gravity), quantity, and pumping pressure during the grouting operations. Provide pressure gages capable of measuring the actual grout pressures used such that actual pressure readings are within the middle third of the gage. Micropiles shall be grouted immediately after installation of the reinforcing steel, preferably on the same day the load transfer bond length is drilled.

After drilling, the hole shall be flushed with water and/or air to remove drill cuttings and/or other loose debris to the satisfaction of the Geotechnical Engineer and the Resident. The grout shall not contain lumps or any other evidence of poor or incomplete mixing. Admixtures, if used, shall be mixed in accordance with manufacturer's recommendations. The grouting equipment shall be sized to enable the grout to be pumped in one continuous operation. The grout shall be kept in constant agitation prior to pumping. Fill annular space between the Permanent Steel Casing and the Reinforcing Steel with grout meeting the requirements of the approved mix design. Grout shall be placed within one (1) hour or less after mixing or within the time recommended by the manufacturer if admixtures are used, and shall be installed without significant interruption. If significant interruption occurs, the Micropile Contractor shall replace the micropile or install a new replacement micropile at a location approved by the Resident at no additional cost to the Department. Grout not placed within the allowed time will be rejected.

Provide quality control of the mix by monitoring grout quality per the QCP submitted to, and accepted by, the Department.

The grout shall be injected from the lowest point of the drill hole by means of a tremie pipe/tube until clean, pure grout flows from the top of the micropile. The grout shall be pumped through grout tubes. All grouting operations shall ensure complete continuity of the grout column. The use of compressed air to directly pressurize the fluid grout is not permissible. The entire micropile shall be grouted to the design cut-off level. Make provisions for checking the grout level in place at the end of each stage of grouting. Record the initial volume of grout required to fill the hole. Upon completion, maintain the grout level at or above the micropile cut off elevation until the grout has set. Record date and time of observed grout loss and volume of added grout.

Upon completion of grouting, the grout tube may remain in the hole, but it shall be filled with grout.

Provide means and access for grout volume measurement at the micropile installation site to the Resident and the Geotechnical Engineer.

Drilling and/or cleaning of micropiles adjacent to freshly grouted micropiles will not be allowed within 24 hours of grouting.

Grout Testing Testing will be performed in accordance with the QCP submitted to, and accepted by, the Department.

Micropile Acceptance Criteria The following shall be achieved in order for the production Micropiles to be acceptable to the Department:

1. Tolerance criteria met
2. Installed in accordance with the approved Micropile Installation Plan and Grouting QCP.
3. Installed Permanent Steel Casing to a minimum embedment of 3 feet into bedrock.

4. Where oversized sockets are used, top of grout in oversized socket is at least 9 feet below the bottom of the pile cap.
5. No damage sustained during construction.

Unacceptable Micropiles Unacceptable micropiles are micropiles which do not meet the Acceptance Criteria outlined above.

In the event that a Micropile is identified as unacceptable, the Micropile Contractor shall submit to the Resident a written plan of remedial action showing how to correct the problem and prevent its reoccurrence. The Micropile Contractor shall repair, augment, or replace the unacceptable micropile in accordance with the approved remedial plan at no additional cost to the Department. No repair shall be permitted until the written plan is approved by the Resident.

#### 501.05 Method of Measurement

All work related to mobilization and demobilization of any equipment or temporary access and/or working platforms required to satisfactorily complete all micropile installation shall be measured on a lump sum basis.

Micropiles will be measured as the number of accepted micropiles installed. This measurement shall not include micropiles damaged prior to completion of the work unless remedied to the satisfaction of the Resident.

#### 501.06 Basis of Payment

Drilling Equipment Mobilization This item shall include the cost of furnishing all labor, equipment, and materials needed to complete micropile installation, including transporting, erecting, dismantling and removing all construction equipment. The lump sum price for this item will be paid once all equipment is mobilized to the Project site.

Micropiles The unit bid price shall include cost of the micropiles (installed and accepted), development and execution of an approved QCP, furnishing all labor, materials and equipment necessary to complete the work, and submit reports. All costs to repair all damage and settlement to adjacent ground and structures shall be incidental to the pay item for micropiles and at no additional cost to the Department. All costs to repair, augment and/or replace all rejected micropiles shall be incidental to the pay item for micropiles and at no additional cost to the Department. Micropiles that fail to meet the Acceptance Criteria will be rejected and no payment will be made for these micropiles. Separate payment will not be made for advancing through boulders wood, or other obstructions including all incidental costs under the pay item for micropiles. The Micropile Contractor is responsible for estimating the grout take. There will be no extra payment for grout overruns. All costs associated with micropile installation include full compensation for any temporary or permanent casings, augers, grouting operations, drilling equipment, or specialty tools needed to micropiles shall be incidental to the contract pay item for micropiles.

York, Maine  
Barrell Bridge  
WIN 18957.00  
December 27, 2017

Payment will be made under:

<u>Pay Item:</u>	<u>Pay Unit</u>
501.804 Drilling Equipment Mobilization - Micropiles	Lump Sum
501.220 Micropiles	Each

SPECIAL PROVISION  
SECTION 535  
PRECAST, PRESTRESSED CONCRETE SUPERSTRUCTURE  
(Camber)

The following is added to Standard Specifications Section 535:

535.01 Description This work shall include submittal of calculated beam camber, submittal of a Camber Management Plan, measurement of actual beam camber, management of beam camber, survey of erected beams, adjustment of dimensions and elevations shown on the Plans, and all labor and equipment necessary to meet the requirements specified herein. All camber adjustments shall allow for construction of the bridge to the Profile shown on the Plans.

All Work specified herein is the responsibility of the Contractor unless otherwise specified.

535.011 Definitions

Adjustment Value The difference between the assumed Final Camber shown on the Plans and the anticipated Final Camber.

Camber Management Plan An outline of proposed means and methods for adjusting or mitigating camber growth and adjusting bridge geometry for beam camber at erection.

Final Camber The beam camber in the completed bridge i.e. beam camber after deflections due to deck, curb and bridge rail weights have occurred. Anticipated Final Camber will be considered the measured beam camber at the time of beam erection minus the deflection due to superimposed loads.

The acceptable range of Final Camber is 0 inches to 3.5 inches. The Final Camber represents the variation in the final deck thickness from each Abutment Centerline of Bearing to midspan.

535.03 Working Drawings The Working Drawings shall include calculated camber at release and at the time of beam erection based on the Contractor's and fabricator's anticipated schedules.

The Working Drawings shall include a Camber Management Plan. The Camber Management Plan may include:

Application of temporary load prior to beam erection. The Camber Management Plan shall include proposed location and magnitude of temporary loads, location of beam support points, and proposed means of load application e.g. temporary concrete barrier.

Adjustment of beam support points prior to beam erection.

Addition of shims or grout pads between the precast concrete abutment elements and Elastomeric Bearing Pads. Shims shall be steel; no other material will be accepted.

Other means and methods may be submitted for review.

The Camber Management Plan shall include procedures for varying the camber management techniques relative to the degree in which the camber varies from the camber values on the approved Working Drawings. The Camber Management Plan shall include procedures for addressing over and under cambered beams.

535.221 Camber Tolerance Beam camber at release and beam camber at erection shall be within the tolerance permitted in the Precast/Prestressed Concrete Institute Manual for Quality Control for Plants and Production of Structural Precast Concrete Products (MNL-116). Use Double Tee tolerances for NEXT Beams. Camber tolerance will be measured from the camber values on the approved Working Drawings.

535.24 Installation of Slabs, Beams and Girders Measure beam camber no more than 3 days prior to Precast Abutment element installation. Calculate the Adjustment Value based on the measured camber:

Assumed Final Camber shown on the Plans	0.00 in
Measured beam camber	-
Calculated deck deflection	+ 0.75 in
Calculated curb and bridge rail deflection	+ 0.1 in
<hr/>	
Adjustment Value (in inches)	
Unit Conversion	x 1 ft / 12 in
<hr/>	
Adjustment Value (in feet)	

Adjust dimensions and elevations as follows:

Bottom of Abutment No. 1 elevation shown on the Plans	2.00
Adjustment Value (in feet)	+
<hr/> Final Bottom of Abutment No. 1 elevation	

Bottom of Abutment No. 2 elevation shown on the Plans	2.00
Adjustment Value (in feet)	+
<hr/> Final Bottom of Abutment No. 2 elevation	

Prior to precast concrete abutment element erection, final bottom of abutment elevations will be subject to the approval of the Department.

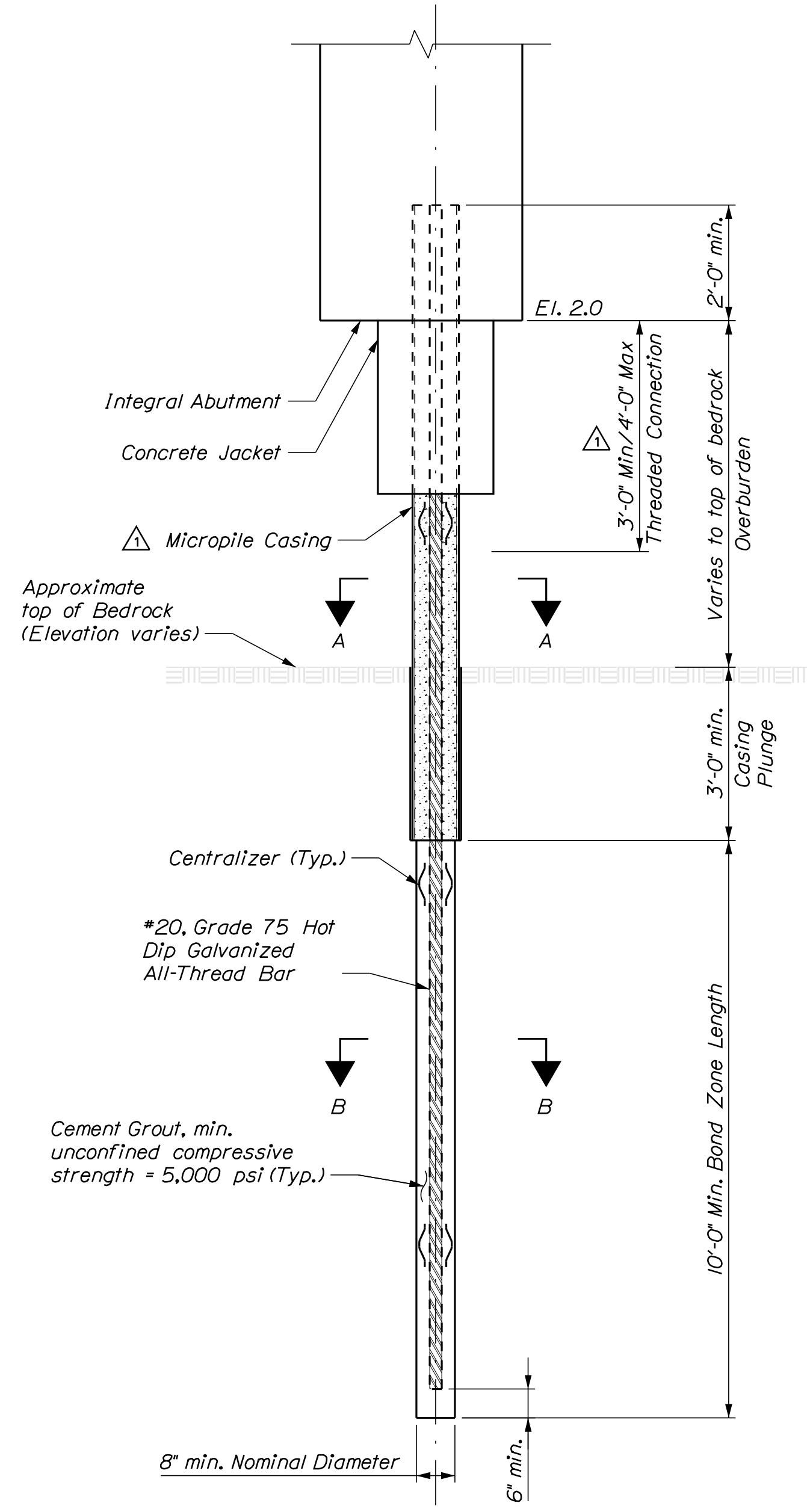
Deck thickness at the Abutment Centerline of Bearings shown on the Plans	9.0 in
Adjustment Value (in inches)	-
<hr/> Final Deck thickness at each Abutment Centerline of Bearing	

At each Abutment Centerline of Bearing, the minimum deck thickness is 8 inches and the maximum deck thickness is 11.5 inches. The deck thickness at midspan shall be 8 inches. Survey the beams after erection and adjust deck thicknesses as necessary to provide a tangent final Profile. Prior to deck concrete placement, final deck thicknesses will be subject to the approval of the Department.

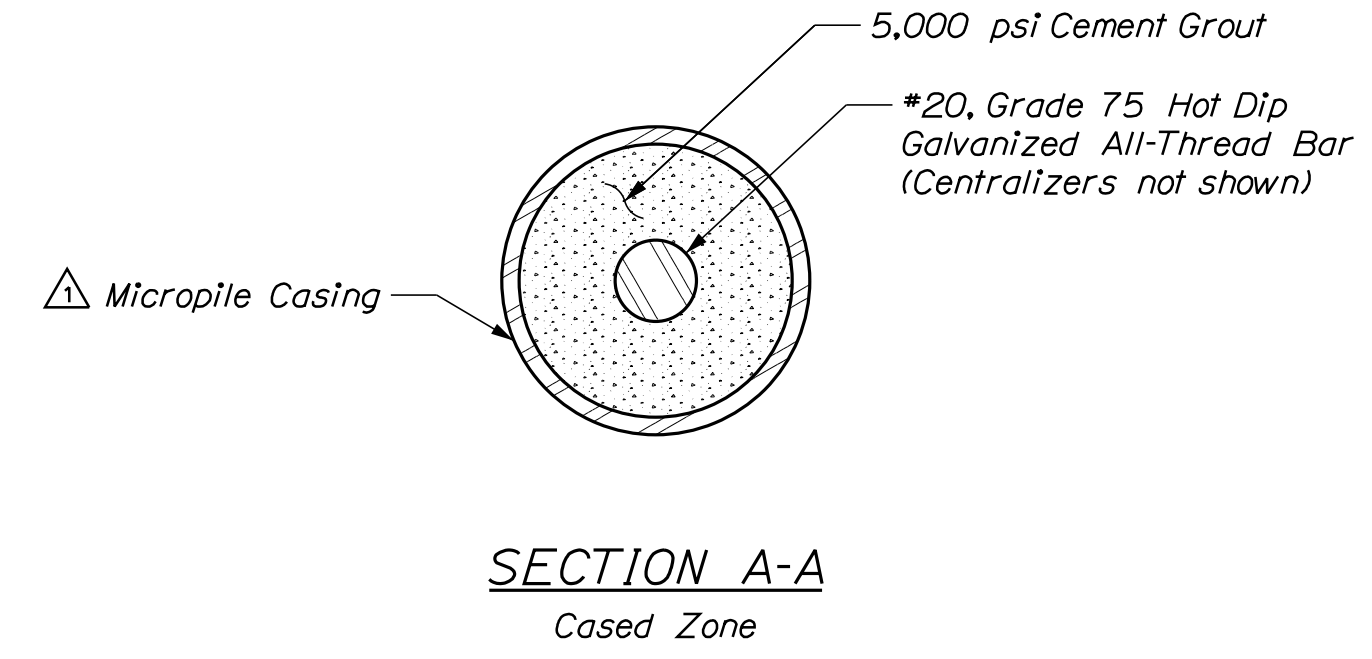
535.26 Method of Measurement The Work specified herein will not be directly measured.

535.27 Basis of Payment The Work specified herein is included under Item No. 535.622, Prestressed Structural Concrete NEXT Beam. No separate payment will be made.

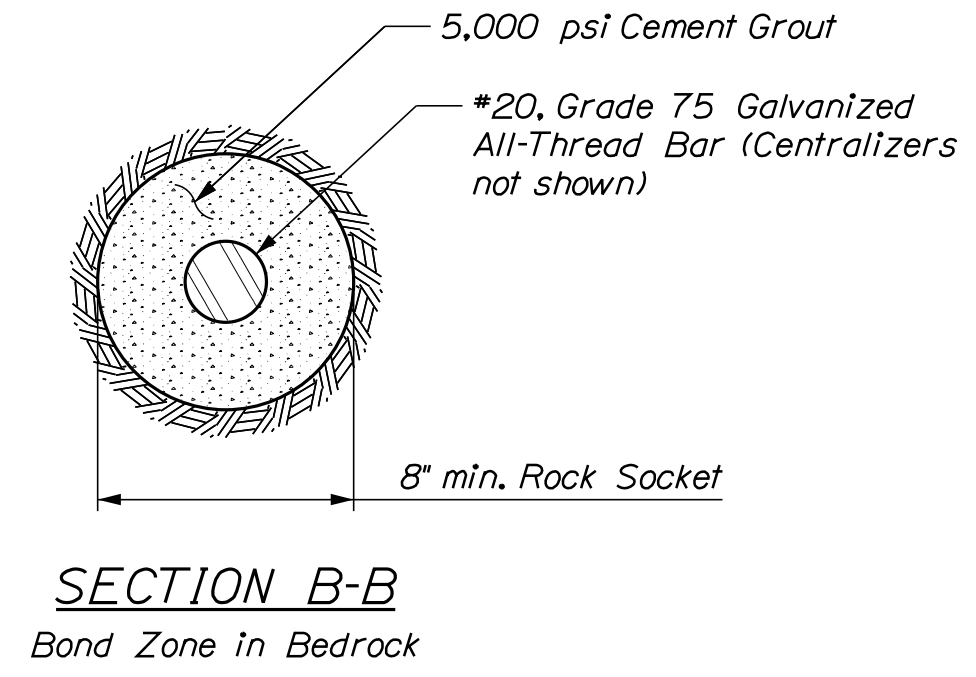




MICROPILE ELEVATION



SECTION A-A  
Cased Zone



SECTION B-B  
Bond Zone in Bedrock

STATE OF MAINE  
DEPARTMENT OF TRANSPORTATION

018957.00

BRIDGE NO. 3500 WIN 018957.00 BRIDGE PLANS

SIGNATURE

P.E. NUMBER

DATE

PROJ. MANAGER	BY	DATE
D. Eaton	HNTB	Dec. 2017
V.H.B.	HNTB	Dec. 2017

DESIGN DETAILED	CHECKED-REVIEWED	DESIGN DETAILED	DESIGN DETAILED	REVISIONS 1	REVISIONS 2	REVISIONS 3	REVISIONS 4	FIELD CHANGES

BARRELL BRIDGE  
DOLLY GORDON BROOK  
YORK COUNTY

YORK  
MICROPILE DETAILS ABUT. 2

SHEET NUMBER

19

OF 31