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TOWN OF SCARBOROUGH, MAINE

GORHAM ROAD PHASE 2

CONTRACT SPECIFICATIONS

MARCH 3, 2022

Prepared For:

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TECHNICAL SPECIFICATIONS

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SECTION 1

GENERAL REQUIREMENTS

1.1 SUMMARY OF WORK

The work required by this contract is the rehabilitation and re-construction of Gorham Road from the Nonesuch River crossing to the end of the Phase 1 construction, just south of the intersection with Maple Avenue, a distance of approximately 3,600 feet.

New curbing and a new sidewalk will be constructed on the east side of the street between the termination of the 2022 Unitil gas main project and the new sidewalk and curbing installed in Phase 1 of the project. New storm drainage will be constructed on the east side of the street at locations shown on the project drawings, and crossing culverts and driveway culverts will be replaced. The project will include installation of a new 12" DR11 HDPE force main in the road from the start point to the end point, with connections to the existing force main at either end. The work also includes related appurtenance structures, fittings, traffic control, surface restoration, and other related work specified to complete the project.

The project will start upon completion of the Until Gas Main Replacement project. The current final completion date for that work is July 29, 2022.

The project includes a Base Bid and The Bid Alternate as further described below:

Base Bid – The scope of work included in the base bid shall include all work shown on the projects drawings and described herein, including installation of twin 24" diameter concrete crossing culverts at STA 18+25+/-.

Bid Alternate 1 – Bid Alternate 1 shall include installation of a precast 3' wide by 2ft high box culvert in place of the twin 24" concrete culverts at STA 18+25+/- shown on the drawings. The inlet and outlet inverts shall remain per the base bid design.

1.2 VACANT

1.3 PROJECT COORDINATION

- 1.3.1 Coordinate all work under this contract.
- 1.3.2 Obtain all permits necessary prior to excavation within public ways. In particular this includes obtaining the Town of Scarborough Excavating Permit and Excavating license from the Scarborough Public Works Department. The Excavation License and Excavation Permit fee will not be assessed to the Contractor.
- 1.3.3 Make arrangements for temporary storage of materials and supplies and for the timely delivery to the job site.
- 1.3.4 Assist the Engineer as required in the review of construction, the testing of materials.
- 1.3.5 Maintain up-to-date progress records and record drawings.

- 1.3.6 Maintain the project site in a neat condition.
- 1.3.7 Coordinate with all utilities, and notify the appropriate owners when excavation is scheduled in areas that may affect existing utilities.
- 1.3.8 Coordination of work with planned or required work by utility companies.

1.4 PROJECT MEETINGS

1.4.1 PRECONSTRUCTION MEETING:

- A. A preconstruction meeting will be held within 10 days after date of Notice of Award. This meeting shall be attended by the Owner, Engineer, Contractor, Subcontractors, and utility companies.
- B. The following will be undertaken:
 - 1. Distribute and discuss:
 - a. List of major Subcontractors.
 - b. Tentative construction schedule.
 - 2. Critical work sequencing and traffic control implementation, including the need for police details.
 - 3. Relation and coordination of Subcontractors.
 - 4. Designation of responsible personnel.
 - 5. Processing of field decision and Change Orders.
 - 6. Adequacy of distribution of Contract Documents.
 - 7. Submittal of Shop Drawings, project data, and samples.
 - 8. Procedures for maintaining Record Documents.
 - 9. Use of premises:
 - a. Office and storage areas.
 - b. Owner's requirements.
 - 10. Safety and first-aid procedures.
 - 11. Security procedures.
 - 12. Housekeeping procedures.
 - 13. Aggregate suppliers and submission of samples.

1.4.2 PROGRESS MEETINGS:

- A. Progress meetings will be scheduled on a mutually acceptable timetable.

- B. Attendance:
 - 1. Owner or designated representative.
 - 2. Contractor.
- C. Minimum agenda:
 - 1. Review, approve minutes of previous meeting.
 - 2. Review work progress since last meeting.
 - 3. Note field observations, problems, and decisions.
 - 4. Identify problems which impede planned progress.
 - 5. Review off-site fabrication problems.
 - 6. Develop corrective measures and procedures to regain planned schedule.
 - 7. Revise construction schedule as indicated.
 - 8. Plan progress during next work period.
 - 9. Review submittal schedules, expedite as required to maintain schedule.
 - 10. Maintaining of quality and work standards.
 - 11. Review changes proposed by Owner for:
 - a. Effect on construction schedule.
 - b. Effect on completion date.
 - 12. Complete other current business.

1.5 CONSTRUCTION SCHEDULES

1.5.1 GENERAL:

- A. The Contractor shall provide construction schedules for the project, and revise it periodically, as necessary. A detailed traffic control plan with procedures for lane shutdown, detours, etc. shall be provided to the Town and approved prior to the start of any work.
- B. The schedule shall be coordinated with other Prime Contractors and other utility companies planning work in the area.

1.5.2 FORM OF SCHEDULE:

- A. Prepare in form of horizontal bar chart
 - 1. Provide separate horizontal bar column for each trade or operation.
 - 2. Order: Chronological order of beginning of each item of work.
 - 3. Identify each column:
 - a. By major specification number.
 - b. By distinct graphic delineation.
 - 4. Horizontal time scale: Identify first work day of each week.

1.5.3 CONTENT OF SCHEDULES:

- A. Provide complete sequence of construction by activity.
 - 1. Shop drawings, project data, and samples:
 - a. Submittal dates.
 - b. Dates reviewed copies will be required.
 - 2. Completion dates for:
 - a. Submission of all submittals, including Traffic Control Plan
 - b. Fabrication and delivery timeline for precast concrete structures
 - c. Initial site preparation
 - d. Start and Completion dates for each major work activity
 - e. Surface restoration/paving
- B. Show projected percentage of completion for each item of work as of first day of each month.
- C. Include estimate of the amount of each monthly requisition for the duration of the project.

1.5.4 UPDATING:

- A. Show all changes occurring since previous submission of updated schedule.
- B. Indicate progress of each activity; show completion dates.
- C. Include:
 - 1. Major changes in scope.

2. Activities modified since previous updating.
3. Revised projections due to changes.
4. Other identifiable changes.

1.5.5 SUBMITTALS:

- A. Submit initial schedules within 10 days after date of Notice to Proceed.
 1. Engineer will review schedules and return review copy within 10 days after receipt.
 2. If required, resubmit within 7 days after return of review copy.
- B. Submit periodically updated schedules accurately depicting progress to first day of each month.
- C. Submit the number of copies required by the Contractor, plus 3 copies to be retained by the Engineer.

1.5.6 DISTRIBUTION:

- A. Distribute copies of reviewed schedules to:
 1. Job site file.
 2. Other concerned parties.
- B. Instruct recipients to report any inability to comply, and provide detailed explanation, with suggested remedies.

1.6 APPLICABLE CODES

1.6.1 GENERAL:

Comply with current edition of all local, State, and national codes applicable to the proposed construction.

1.7 SUBMITTALS

1.7.1 MATERIAL SAMPLES:

- A. Samples of any material to be used shall be furnished at the request of the Owner or his Engineer.
- B. The Contractor may be required to furnish a complete statement of the origin, composition, and manufacturer of any or all materials to be used in the construction of the work, together with samples, which may be subject to the tests provided for in these Specifications, to determine their quality or fitness for the work.

- C. Should the Contractor desire to substitute material or equipment for that specified, the cost of any additional engineering and construction work caused by such substitution shall be borne by the Contractor.

1.7.2 SHOP DRAWINGS:

- A. All shop and working drawings shall be submitted to the Engineer through the General Contractor. Each submittal of drawings shall be accompanied by a transmittal form, listing each drawing by number and manufacturer or fabricator. Each transmittal shall indicate the Contractor has reviewed the drawings and found the materials represented thereon comply with the contract requirements.
- B. The Contractor shall submit to the Engineer at least four (4) copies of all drawings and information required for the work. Three (3) copies will be retained by the Engineer. If the Contractor requires more than one (1) copy, the additional number required by the Contractor shall be submitted to the Engineer. Submittals will be examined by the Engineer only after they have been signed by the Contractor to indicate that he has reviewed and endorsed them.
- C. All drawings and information submitted shall contain compliance with the contract documents. Incomplete or inadequate submittals will be summarily rejected. Approval of such submittal, by the Engineer, shall not release the Contractor from responsibility for deviations from the contract drawings or specifications, or for errors in submittal drawings, information, schedules, quantities, dimensions, and installation requirements, except when such deviations are pointed out by the Contractor upon submittal to the Engineer. The Contractor shall check and verify all field dimensions.
- D. Submittals are required for all appurtenances showing the angle and elevation of pipes, the height of precast sections, and sufficient data to certify conformance with the Contract Documents.
- E. Submittals are required for retaining walls and shall include detailed design drawings and calculation stamped by a Professional Engineer licensed in the State of Maine.
- F. Submittals are required for cross culverts (pipes or box culverts) and shall include certification that structures are capable of withstanding H-20 loading at design depths of cover.

1.8 AS-BUILT INFORMATION

1.8.1 RECORD TIES:

The Contractor shall maintain a record of all service lead locations and locations of buried fittings, etc., throughout the project. The locations shall be recorded by 3 ties from fixed permanent points. Prior to requesting final payment, the Contractor shall submit the records. The records shall be clearly legible and include the street, tax map, lot number and reference contract drawing number. A blank form is provided at the end of this section and is to be used by the Contractor for preparation of record ties.

1.8.2 RECORD DRAWINGS:

Contractor shall furnish red-line drawings of all work within the project area to the Engineer for preparation of digital record drawings for the Town of Scarborough.

1.9 LABORATORY TESTING SERVICES

1.9.1 GENERAL:

- A. Work included: From time to time during progress of the work, the Owner will require that testing be performed. The purpose of the testing is to determine that materials provided for the work meet the specified requirements. These tests will apply to:
 - 1. Soil compaction.
 - 2. Soil and aggregate gradations.
- B. Related work described elsewhere: Requirements for testing are described in various sections of these specifications; where no testing requirements are described but the Owner decides that testing is required, testing will be performed under current pertinent standards for testing.
- C. The Contractor shall pay for all tests except compaction tests. Compaction tests shall be paid by the Owner except in the event of a failing test. All costs for failed tests shall be paid by the Contractor.

1.9.2 QUALITY ASSURANCE:

- A. Qualifications of testing laboratory: The testing laboratory will be qualified to the Owner's approval in accordance with ASTM E329 "Recommended Practice for Inspection and Testing Agencies for Concrete and Steel Used in Construction".
- B. Codes and Standards: Testing, when required, will be in accordance with all pertinent codes and regulations and with selected standards of the American Society of Testing and Materials.

1.9.3 PRODUCT HANDLING:

Promptly process and distribute all required copies of test reports and related instructions to ensure all necessary retesting and/or replacement of materials with the least possible delay in progress of the work.

1.9.4 PAYMENT FOR TESTING SERVICES:

The Contractor will pay for all testing services requested by the Owner except as specified in Section 1.9.1.C.

1.9.5 CONTRACTOR'S CONVENIENCE TESTING:

Inspection or testing performed exclusively for the Contractor's convenience shall be the sole responsibility of the Contractor.

1.9.6 COOPERATION WITH TESTING LABORATORY:

Representatives of the testing laboratory shall have access to the work at all times. Labor and equipment shall be provided at the Contractor's expense in order that the laboratory may properly perform its functions in the field.

1.9.7 SCHEDULES FOR TESTING:

A. Establishing schedule:

1. By advance discussion with the testing laboratory selected by the Owner, determine the time required for the laboratory to perform its tests and issue each of its findings.
2. Provide for all time required with the construction schedule.

B. Revising schedule: When changes of construction schedule are necessary during construction, coordinate all such changes of schedule with the testing laboratory as required.

C. Adherence to schedule: When the testing laboratory is ready to test according to the determined schedule but is prevented from testing or taking specimens due to incompleteness of the work, all extra costs for testing attributable to the delay may be deducted from sums due the Contractor.

1.9.8 TAKING SPECIMENS:

The Contractor shall furnish qualified personnel and equipment to accomplish the above sampling and/or testing under the Engineer's inspection or may, by advance arrangement, utilize equipment and personnel from the testing laboratory selected by the Owner.

1.10 PHOTOGRAPHS

1.10.1 GENERAL:

- A. Prior to the beginning of actual construction, the Contractor shall document the conditions existing on the site at that time. The existing conditions of all paving, sidewalks, driveways, trees, shrubs, gardens, fences, and structures adjacent to the site of the proposed construction shall be photographed.
- B. A digital file of each photograph shall be provided on flash drive to the Town of Scarborough. Additional sets for the Contractor shall be at his discretion.

1.10.2 PHOTOGRAPHER:

- A. Photographer shall be a competent to produce clear and complete photographs.

1.10.3 IDENTIFICATION:

An inventory list of each photograph shall be provided to the Town of Scarborough that clearly identifies the following items on each photograph.

- A. Photograph # and contract.
- B. Name of street.
- C. Description of view.
- D. Time and date of exposure.

1.10.4 VIDEO TAPE:

A video tape record will not be accepted in lieu of the photographs required in this section.

1.11 **CLEANING**

1.11.1 DESCRIPTION:

- A. Maintain premises and public properties free from accumulations of waste, debris, and rubbish, caused by operations.
- B. At completion of work, remove waste materials, rubbish, tools, equipment, machinery, and surplus materials, and clean all sight exposed surfaces; leave project clean and orderly.
- C. Conduct clearing and disposal operations to comply with local ordinances and anti-pollution laws.
- D. All new pipes and structures shall be flushed clean of sediment or accumulated debris prior to handover of the project to the Town of Scarborough.

1.12 **PROJECT CLOSEOUT**

1.12.1 SUBSTANTIAL COMPLETION:

- A. Contractor:
 - 1. Submit written certification to Engineer, that project, or designated portion of project, is substantially complete.
 - 2. Submit list of major items to be completed or corrected.
- B. Engineer, together with Owner's Representative, will review the project within seven days after receipt of certification.
- C. Should Engineer consider that work is substantially complete;
 - 1. Contractor shall prepare and submit to Engineer a list of items to be completed or corrected, as determined by the review.

2. Engineer will prepare and issue a Certificate of Substantial Completion, complete with signatures of Owner and Contractor, accompanied by Contractor's list of items to be completed or corrected, as verified and amended by Engineer.
 3. Contractor: Complete work listed for completion or correction, within designated time.
- D. Should Engineer consider that work is not substantially complete:
1. He shall immediately notify the Contractor, in writing, stating reasons.
 2. Contractor: Complete work, and send second written notice to Engineer, certifying that project, or designated portion of project, is substantially complete.
 3. Engineer will again review the work.
- E. The guarantee period will begin upon issuance by the Engineer of the Certificate of Substantial Completion.

1.12.2 FINAL REVIEW:

- A. Contractor shall submit written certification that:
1. Contract documents have been reviewed.
 2. Project has been reviewed for compliance with contract documents.
 3. Work has been completed in accordance with contract documents.
 4. All systems have been tested in presence of Owner's representative and are operational.
 5. Project is completed, and ready for final review.
- B. Engineer will make final review within seven days after receipt of certification.
- C. After the Engineer considers that work is finally complete in accordance with requirements of contract documents, he shall request Contractor to make project close-out submittals.
- D. Should Engineer consider that work is not finally complete:
1. He shall notify Contractor, in writing, stating reasons.
 2. Contractor shall take immediate steps to remedy the stated deficiencies, and send second written notice to Engineering certifying that work is complete.
 3. Engineer will again review the work.

1.12.3 EVIDENCE OF PAYMENTS AND RELEASE OF LIENS:

- A. Contractor's Affidavit of Payment of Debts and Claims.
- B. Contractor's Affidavit of Release of Liens; with:
 - 1. Consent of Surety to Final Payment:
 - 2. Contractor's release of waiver of liens. (To be reviewed by Owner prior to final Payment Certification.)
 - 3. Separate releases or waivers of liens for subcontractors, suppliers, and others with lien rights against property of Owner, together with list of those parties.
- C. All submittals shall be certified before delivery to Engineer.

1.12.4 FINAL ADJUSTMENT OF ACCOUNTS:

- A. Submit a final statement of accounting to Engineer.
- B. Statement shall reflect all adjustments.
 - 1. Original contract sum.
 - 2. Additions and deductions resulting from:
 - a. Previous Change Orders.
 - b. Cash allowances.
 - c. Unit prices.
 - d. Other adjustments.
 - e. Deductions for uncorrected work.
 - f. Deductions for liquidated damages.
 - 3. Total contract sum, as adjusted.
 - 4. Previous payments.
 - 5. Sum remaining due.

1.12.5 FINAL APPLICATION FOR PAYMENT:

Contractor shall submit final application in accordance with requirements of General and Supplementary Conditions.

1.12.6 FINAL CERTIFICATE FOR PAYMENT:

- A. Engineer will issue final certificate in accordance with provisions of General Conditions.
- B. Should final completion be materially delayed through no fault of the Contractor, the Engineer may issue a Semi-Final Certificate for Payment, in accordance with provisions of General Conditions.

1.12.7 POST-CONSTRUCTION REVIEW:

- A. Prior to expiration of one year from Date of Substantial Completion, the Engineer will make visual review of project in company with Owner and Contractor to determine whether correction of work is required, in accordance with provisions of General Conditions.
- B. For guarantees beyond one year, the Engineer will provide reviews at request of Owner, after notification to Contractor.
- C. Engineer will promptly notify Contractor, in writing, of any observed deficiencies.

1.13 MEASUREMENT AND PAYMENT

Measurement and Payment for the work of this section is defined in Section 10 of these specifications.

END OF SECTION 1

WATER, STORM OR SANITARY SEWER SERVICE LOCATION

Date Installed: _____

Town of: Scarborough

Type/Size of Service Pipe: _____

Street: _____

Connection at Main: _____

Dwelling No: _____

Depth, end of Service Pipe: _____

Occupant: _____

Length of Service Pipe Laid: _____


Owner: _____

Measured, Located by: _____

Project Contractor: _____

Location Diagram

(Provide 3 Ties to Permanent Objects)



Remarks _____

SECTION 2

EXCAVATION

2.1 SUMMARY OF WORK

2.1.1 GENERAL:

The work of this section includes all labor, material, and equipment required for clearing, grubbing, and removal, storage, and/or disposal of topsoil, paving, shrubbery, curbs, signs, or trees.

2.1.2 PAVEMENT REMOVAL:

Pavement material removed as part of this contract shall be considered surplus material and shall be hauled and disposed of by the Contractor at no additional cost to the contract in accordance with Section 2.2.9.

Complete Pavement Removal (Part of Bid Item 17)

When excavation is in a street, driveway or parking area, with a bituminous concrete surface, the existing paving shall be neatly cut in a true straight line by paving saw or compressed air cutters satisfactory to the Engineer. The paving shall be removed in a manner that will not disturb or undermine adjacent paving. No removed paving material shall be used for backfill. Pavement shall be excavated separate from other excavation. Pavement at all driveways shall be cut in a neat straight line at the limit of work. A gravel shim shall be installed to prevent the edge of pavement from breaking.

Saw cutting of pavement at the limit of work areas (i.e. match points with other adjoining public roads, sidewalks or private walkways and driveways) shall be paid for in accordance with the contract pay item established in Section 10 of these Specifications. All other saw cutting of pavement shall be incidental to the project.

Pavement Removed by Milling or Grinding (Bid Item 19)

Removing of pavement surface shall be performed with a cold milling machine or power operated planner capable of removing the existing pavement to the required depth, width, grade and slope.

The milled surface shall have a uniform texture and provide acceptable ride ability for vehicles. Should resurfacing be delayed, or the resulting milled surface is unsatisfactory for any reason, bituminous leveling course may be required. The Contractor shall clean the milled surface and surrounding area of all loose material prior to use by traffic and placement of new bituminous pavement course.

2.1.3 SHRUBS, TREES, AND BRUSH:

Trees within the excavation area shall be removed by standard cutting techniques, adhering to all safety standards, and the stumps shall be removed. Only such trees as the owner designates for removal shall be cut. The Contractor shall review the work with the Town of Scarborough prior to any work near trees. Brush and other surface vegetation within the limits designated on the Plans or established by the

Engineer shall be removed by standard cutting techniques. Cuttings and stumps shall be disposed of by the Contractor. Burning in the project area will not be permitted. All other trees shall be adequately protected throughout the work. The Contractor shall remove and dispose of all cuttings and stumps. The Contractor shall attempt to protect and avoid removal of large trees which can be retained.

2.1.4 FENCES, MARKER POSTS, GUARD RAILS, MAIL BOXES, SIGNS, AND OTHER SURFACE FEATURES

Fences, marker posts, guiderails, mailboxes, signs and other surface features shall be carefully removed where required to facilitate excavation and preserved for replacement upon completion of construction. Objects removed will be replaced to original condition by the Contractor unless directed otherwise by the Owner. Removal and resetting of signs and mailboxes shall be incidental to the contract and no separate payment shall be made.

2.1.6 EROSION CONTROL BARRIERS

Prior to beginning other excavation, the Contractor shall install erosion control barriers where necessary to control erosion.

- A. Materials: The erosion control fence shall be a complete preassembled system including 3 foot filter fabric, 4-1/2 ft. hardwood posts, support netting of polypropylene and all installation hardware. The erosion control fence shall be Envirofence as available by Mirafi or approved equal.
- B. Installation:
 - 1. Excavate a 6" x 6" trench where the fence is to be installed.
 - 2. Unroll Envirofence a section at a time and position the posts against the back (downstream) wall of the trench (net side away from direction of flow).
 - 3. Drive the post into the ground until the netting is approximately 2 inches from the trench bottom.
 - 4. Lay the toe-in flap of fabric onto the undisturbed bottom of the trench, backfill the trench and tamp the soil. Toe-in can also be accomplished by laying the fabric flap on undisturbed ground and piling and tamping fill at the base.
- C. Removal: After the surface has been restored as specified in Section 7, cut the fabric flush with finish grade and remove the stakes.

2.1.7 SILT SACKS:

Silt sacks shall be placed in accordance with the detail provided in the contract drawings where necessary to control erosion. See Section 41, Environmental Requirements of the Supplementary General Conditions.

2.2 EXCAVATION

2.2.1 CLEARING AND GRUBBING:

- A. Clearing shall consist of clearing the surface and the ground of the designated areas of all trees, down timber, logs, snags, brush undergrowth, hedges, heavy growth of grass or weeds, fences, structures, debris, and rubbish of any nature, and the disposal from the project of all spoil materials resulting from clearing.

This work shall also include the preservation from injury to defacement of all vegetation and objects designated to remain. The stumps shall be removed.

- B. Grubbing shall consist of clearing the surface and the ground of the designated areas of all stumps, roots, foundations, and the disposal from the project of all spoil materials resulting from clearing and grubbing.
- C. This work shall also include the preservation from injury to defacement of all vegetation and objects designated to remain.
- D. Disposal: The Contractor shall be responsible for the offsite disposal of all clearings and grubblings.

2.2.2 EXCAVATION AND EMBANKMENT:

Excavation shall consist of the removal, haul, disposal, and compaction if required of all material encountered in grading the project within the limits of construction. It shall include the removal and disposal of boulders, solid mortared stone masonry and concrete masonry when each is less than 2 cubic yards in volume and all soft and disintegrated rock, which can be removed with ordinary excavating machinery. It shall include grubbing that consists of the removal and disposal of all stumps, roots, bushes, grass, turf or other objectionable material.

It shall include muck excavation that shall consist of the removal and disposal of saturated or unsaturated mixtures of soils and organic matter not suitable for embankment foundation material regardless of moisture content.

Suitable soil material taken from excavation shall be used in the formation of embankment, subgrade, for backfilling at no additional cost to the contract. Soil materials classified as surplus materials in accordance with Section 2.2.9 shall be hauled and disposed of by the Contractor at no additional cost to the contract.

2.2.3 BORROW MATERIAL:

Borrow shall consist of approved material required for the construction of embankment or subgrade. Material that cannot be obtained on site from excavation must consist of earth, suitable for embankment construction. It shall be free from frozen material, perishable rubbish, peat, and other unsuitable material.

The moisture content shall be sufficient to provide the required compaction and stable embankment. In no case shall the moisture content exceed 4 percent above optimum.

The optimum moisture content shall be determined in accordance with AASHTO T180, Method C or D.

2.2.4 EMBANKMENT EXCAVATION:

The excavation for the embankment shall be conducted simultaneously with the embankment construction operations. All grubbing shall be complete before the excavation begins. The excavation area shall be excavated to the sections indicated in the drawings.

2.2.5 TRENCH EXCAVATION:

Upon removal of surface materials as specified in Section 2.1, the Contractor shall remove earth to the depth required for facility installation, or to the surface of solid rock which cannot be removed by standard excavating equipment, whichever is first encountered.

Trenches shall be excavated of all materials except solid rock, to the depths and widths indicated on the Plans. Excavation below grades indicated shall be accomplished only upon authorization of the Engineer. Any such excavation accomplished without such authorization shall be refilled with heavy gravel, thoroughly compacted, for which no additional payment shall be made.

The Contractor shall design, furnish, put in place and maintain, at his own expense, such sheeting, bracing, trench shields or other facilities necessary to support the sides of the excavation to prevent any movement which could in any way injure adjacent utilities, buildings, pipe lines, or other structures, or delay the work, or endanger workmen or bystanders. At all times the installation of such bracing, sheeting, or other protective facilities shall be sufficient to assure the safety of all workmen and any others in the vicinity of the work site. All trenching procedures, including sheeting, bracing, and other protective facilities shall be accomplished in full compliance with local, State, and Federal Safety Standards, including the latest requirements of the Occupational Health and Safety Act. The Contractor is solely responsible for accomplishing the excavation in a safe manner in compliance with all appropriate safety requirements. Sheeting, bracing, or other protective facilities shall be removed upon completion of the pipe line installation, unless such removal will endanger the work installed or adjacent structures or facilities. As soon as withdrawn, the voids left shall be carefully filled with sand and compacted. Any sheeting or bracing left in place shall be cut at least two (2) feet below the finished grade of paving.

In areas where there are no buildings, utilities, or other facilities that dictate a narrow trench, the Contractor may elect to slope back the side of the excavation to secure a safe excavation. Such sloping will be accomplished in strict accordance with appropriate safety standards as designated above. The Contractor shall be solely responsible for the stability of any sloped trench sections. Should the Contractor elect to slope back the side of a trench excavated in pavement, the Contractor shall be solely responsible for the cost of removal and replacement of pavement materials outside the pay limits shown on the project drawings (i.e. The Contractor shall not be entitled to compensation for this work).

If a stable trench cannot be achieved by sloping, then sheeting, bracing, trench shields, or other protective devices in compliance with all safety standards shall be installed as described above. Such sloping must be compatible with the right-of-way limits. In no case shall work or equipment extend beyond the limits of the right-of-way unless the Contractor makes prior specific arrangements with adjacent property owners.

2.2.6 EXCAVATION FOR STRUCTURES:

Earth shall be excavated to the depths and sections required for installation of all catch basins, manholes, or other appurtenant facilities. Care shall be taken that the foundation areas of structures are not excavated below grade or are disturbed so as to lessen their bearing capacity. Should the foundation areas be disturbed, additional excavation shall be made to undisturbed soil, and heavy gravel shall be placed and compacted to secure a stable foundation pad.

All excavations for structures shall be sheeted, braced, sloped, or otherwise protected in the same manner and meeting the safety requirements and conditions specified above under Section 2.2.5.

2.2.7 ROCK EXCAVATION:

- A. The word "rock" wherever used in these Specifications, shall mean boulders and pieces of concrete or masonry exceeding two (2) cubic yards in volume or solid ledge rock which required for its removal drilling and blasting, wedging, sledging, boring, or breaking up with a power operated tool. No soft or disintegrated rock which can be removed with a hand pick or power operated excavator or shovel; no loose, shaken, or previously blasted rock or broken stone in rock fillings or elsewhere; and no rock exterior to the maximum limit of measurement allowed, which may fall into the excavation, will be measured or allowed.
- B. All solid rock and boulders containing two cubic yards or more must be entirely removed from the excavation before they will be classified and paid for as Rock Excavation. No materials thus removed and classified as rock excavations will be allowed to be used for backfilling.
- C. Where rock is encountered in excavations, it shall be removed by blasting methods, unless directed otherwise by the Engineer. Blasting operations shall be accomplished in compliance with the "Blasting" clause of the Supplemental General Conditions. Rock shall be trimmed so that none protrudes within 6 inches of the pipe when installed to correct line and grade.
- D. The volume of ledge excavation in trench to be paid for will be computed on the following basis: The depth will be the vertical distance from the bottom of the pipe bedding to the surface of the ledge, measured on the center line of the pipe. The width shown on the Plans will be taken as the pay width. After the ledge has been uncovered by the Contractor, elevations will be taken where necessary to determine the profile of the ledge.
- E. Rock excavation for structures and roadways shall be measured by cross-sectioning the ledge surface. The depth shall be between the sectioned

surface and the bottom of the concrete or gravel base, if called for. The horizontal limits shall be to the edge of pavement section or subgrade lines unless otherwise noted on the Contract Drawings. All overblast or over-excavation shall be at the Contractor's expense. Any sections over-excavated shall be brought to grade with crushed stone.

- F. Bituminous and Portland Cement Concrete Pavements shall not be considered as rock.

2.2.8 UNAUTHORIZED EXCAVATION:

The Contractor shall not be entitled to additional compensation for unauthorized excavations carried beyond or below the lines and subgrades prescribed in the Contract Documents unless directed by the Engineer. The Contractor shall refill such unauthorized excavations at his own expense with heavy gravel or as directed by the Engineer.

2.2.9 SURPLUS MATERIAL:

All materials removed and not reused as part of this contract shall be considered surplus materials.

A. Unacceptable Surplus Materials:

Unacceptable surplus materials and surplus materials not requested to be salvaged by the town shall be removed from the project site and disposed of offsite by the Contractor at no additional cost to the contract.

When it is necessary to haul soft or wet materials over streets or pavements, the Contractor shall provide suitable watertight vehicles to prevent deposits on the streets or pavements. In all cases, materials dropped from vehicles shall be cleaned up as often as necessary or whenever directed by the Engineer, and crosswalks, streets, and pavements be kept clean and free of debris.

2.2.10 MAINTENANCE OF EXCAVATIONS:

Excavations shall be properly maintained while they are open and exposed. Sufficient suitable barricades, warning lights, flood lights, signs, etc., to protect life and property shall be installed and maintained at all times until the excavation has been backfilled and graded to a safe and satisfactory condition.

2.2.11 REMOVAL OF WATER:

The Contractor shall provide and maintain all facilities necessary for water control, including, but not limited to ditching, piping, pumping, bailing, and well pointing. The excavations shall be kept clear of ground water, surface water, seepage, sewer, or storm water during the progress of the work and until the finished work is safe from damage.

All water pumped or drained from the work shall be disposed of in a suitable manner without undue interference with other work, damage to pavements, other surfaces or property, and to minimize siltation to existing water courses. If necessary to protect such water courses, the Contractor shall provide sediment ponds or other protection

measures. The cost of such measures shall be incidental to other work and no separate payment will be made.

2.2.12 MAINTENANCE OF EXISTING FLOWS:

The existing natural stream system, sanitary sewer and drain systems must be kept in operation throughout this project. Wherever the excavation exposes or disturbs an existing sewer or drain, the Contractor shall make provisions for maintaining such flows until the excavation and other work is completed. At no time shall raw sewage be allowed to flow on the ground surface, or to stand in the excavation.

2.2.13 TEST PIT EXCAVATION:

Where designated on the Plans and where further directed by the Engineer, the Contractor shall make test pit excavations to expose existing facilities to allow the Engineer to obtain measurements or elevations. Extreme care must be taken to protect any existing utilities or structures so uncovered. All safety requirements under Section 2.2.5 shall apply to test pit excavation. Upon completion of necessary measurements, the test pit shall be backfilled in accordance with the provisions of Section 3. In paved areas, the Contractor shall place and compact temporary bituminous cold mix paving over the test pit area.

2.3 CONSTRUCTION METHODS

2.3.1 GENERAL:

Prior to beginning of excavation, grading and trenches operations in any area, all necessary clearing in that area shall have been performed in accordance with Sections 2.1 and 2.2.

Excavating operations shall be conducted so that material outside of the limits of work will not be disturbed.

The Owner may designate as unsuitable those soils that cannot be properly compacted in embankments and all such unsuitable material shall be disposed of by the Contractor.

Suitable material taken from excavation shall be used in the formation of embankment, subgrade, and for backfilling as indicated on the plans, or as directed. Excess material shall be considered surplus material and disposed of in accordance with Section 2.2.

The degree of finish for grading ditches and slopes, both fill slopes and cut slopes, shall be that obtainable from machine operations. Ditches shall be constructed to within 6 inches above or below the grade called for on the cross sections or as otherwise modified but in no case shall the ditch be finished in a condition that will not allow the flow of water. Ditches shall be graded to the extent that puddles will not form. All provisions for measurement and payment limits shall remain in force and no payment will be made for unauthorized work done beyond authorized pay limits.

2.3.2 CLEARING AND GRUBBING:

In areas designated to be cleared and grubbed, all stumps, roots, buried logs, brush, grass, and other unsatisfactory materials shall be removed.

All holes remaining after the grubbing operation in excavation areas where the depth of holes exceeds the depth of the proposed excavation shall be filled with acceptable material, moistened and properly compacted in layers to 95% optimum dry density. Any suitable material that can be used as top soil will be stockpiled or placed on designated slopes. The Contractor shall be responsible for disposing of all spoil materials.

2.3.3 ROADWAY EXCAVATION:

The roadway excavation shall be maintained in such condition that the excavation will be well drained. Temporary drains, drainage ditches and culverts shall be constructed to intercept and divert water which may adversely affect the condition of the excavation and the prosecution of the work.

Excavation shall, in general, proceed in a direction upgrade. Subgrades shall be promptly graded and rolled to minimize absorption of water. Adjacent ditches shall be graded to the extent that puddles will not form. Grubbing areas which cannot be drained shall be promptly filled with approved excavation or borrow to such an elevation that surface drainage will be effective.

If, due to unusual circumstances, drainage by gravity cannot be accomplished, the Engineer may require the Contractor to provide adequate means of pumping the area. Pumping may be required on a 24 hour a day continuous basis and no direct compensation for cost of pumping will be made.

Muck shall be removed in such a manner to ensure its complete removal with no areas remaining or trapped below the embankment. Excavated muck shall be disposed of as directed by the Engineer. When muck is encountered that was not contemplated on the plans, it shall be disposed of as indicated above.

When excavating results in a subgrade of unsuitable soil, the Engineer may require the Contractor to remove unsuitable material and backfill with approved material. The Contractor shall conduct his operations in such a way that the Engineer can take the necessary measurements before the backfill is placed.

2.3.4 WASTE AREAS:

It shall be the responsibility of the Contractor to obtain necessary permits and approvals from all pertinent State and Federal agencies and from the local Municipality prior to the establishment of waste areas of the project. In addition, written permission of the property owners shall be obtained by the Contractor, including permission to dispose of in the area, with a copy to be provided to the Engineer.

2.3.5 PREPARATION AND PROTECTION OF THE SUBGRADE:

Unless otherwise provided, the subgrade shall be brought to a condition of uniform stability and compaction for the full width of the roadway by grading and rolling

operation and shall be maintained to a tolerance not above or 3 inches below the required grade and cross section. The surface shall be compacted to uniform density and stability and graded to the extent that puddles water will not form. Any additional material required as a result of low subgrade shall be furnished and placed at the expense of the Contractor.

The required compaction shall be the same as specified for embankments. When the subgrade occurs in cuts, the required compaction shall apply to a depth of 6 inches below subgrade unless other specified.

The Contractor shall protect the subgrade from damage. Ditches and drains along the roadway shall be maintained to effectively drain the subgrade. In no case shall vehicles be allowed to travel in a single track and form ruts. No material shall be deposited on a subgrade until the subgrade has been approved.

2.4 MEASUREMENT AND PAYMENT

Measurement and Payment for the work of this section is defined in Section 10 of these Specifications.

END OF SECTION 2

SECTION 3

BACKFILLING

3.1 SUMMARY OF WORK

3.1.1 GENERAL:

The work of this Section includes all labor, materials, and equipment to perform all backfilling operations for pipelines and appurtenances all in accordance with the following Technical Specifications. The work of this Section shall be coordinated with other sections especially Sections 7 and 8.

Backfilling operations shall follow the installation of pipe or appurtenant placements as soon as practical and in accordance with the schedule set forth in Section 1.

It is the Owner's intent for the project to be constructed in a manner which will minimize either trench settlement or frost heaving due to differential soils. It is also the Owner's intent to use in-situ materials to accomplish these objectives. The Contractor shall recognize the varying compactive efforts and moisture conditioning required to compact in-situ materials and include an allowance in the bid for the effort since no additional payment will be made.

3.1.2 HEAVY GRAVEL BELOW GRADE:

In areas where the Engineer authorizes excavation below the standard pipe bedding or structure limit shown on the Plans, the Contractor shall backfill such below grade excavation with a heavy subbase gravel. The gravel shall meet the Maine Department of Transportation Specifications for Subbase Gravel Grading D, Section 703.06. No roots or other organic debris will be permitted in the gravel material.

3.1.3 PIPE BEDDING IN TRENCHES:

A. General:

The pipe bedding material shall be placed in the trench bottom as soon as excavation reaches grade and the trench section is properly shaped and trimmed. The bedding shall be brought to the grade of the underside of the pipe and carefully graded to receive the pipe. Compaction shall be sufficient to provide a firm laying base. After the pipe is laid to grade, the pipe bedding shall be brought to the level shown on the details shown on the contract drawings and shall be carefully compacted under the haunches of the pipe. Material shall be brought up uniformly on each side of the pipe.

B. Materials:

- i. Water and sewer force main piping: Bedding material shall be sand, meeting MDOT Specification 703.01 Fine Aggregate for Concrete.
- ii Gravity sewer and storm drain piping: Bedding material shall be clean $\frac{3}{4}$ " crushed stone.

3.1.4 INITIAL BACKFILL ABOVE PIPELINES:

A. General:

Upon completion of the pipe laying and bedding, the trench shall be backfilled to a point 6" above the top of the pipeline with granular material compacted to 93% of maximum dry density in accordance with ASTM D-1557.

B. Materials:

- i. Water and sewer force main piping: Initial backfill material shall be sand, meeting MDOT Specification 703.01 Fine Aggregate for Concrete.
- ii. Gravity sewer and storm drain piping: Initial backfill shall be suitable, granular backfill material consisting of sand and gravel, but free of stones or other particles larger than 2". Excavated material may be used for initial backfill where it meets these requirements

3.1.5 TRENCH BACKFILLING:

A. General:

Trench backfilling above the pipe initial backfill material shall be completed with suitable excavated material where this material is granular in nature (<10% passing #200 sieve), free of organic material, lumps of clay, debris, or other deleterious substances, and has a moisture content that allows for suitable compaction. Where excavated material does not meet these requirements, Type D Aggregate for subbase course meeting the requirements of Section 3.1.6 B. 2 and shall be used and paid for in accordance with the provisions of Section 3.2. No roots, pavement, organic matter or frozen material will be allowed in trench backfill material under any circumstances.

3.1.6 ROAD AND SIDEWALK GRAVEL:

A. Road and Sidewalk Gravel shall be placed in layers not exceeding 10 inches and compacted by mechanical means to obtain 95 percent of optimum density by Specification T-180 is obtained.

B. Road and Sidewalk Gravel shall meet requirements of the 2014 Revision of the State of Maine DOT Standard - Specifications for Highways and Bridges, Section 703.06 for Type A and D aggregate, except stones larger than 3 inches will not be allowed. In part, these specifications require the following gradations:

1. Type A - Aggregate for Base Course:

The gradation shall meet the grading requirements of the following table:

<u>Sieve Designation</u>	<u>Percent by Weight Passing Square Mesh Sieves</u>
1/2 inch	45-70
1/4 inch	30-55
No. 40	0-20
No. 200	0-6

Crushed aggregate for base shall not contain particles of rock that will not pass the 2 inch square mesh sieve.

2. Type D - Aggregate for Subbase Course:

The gradation of the part that passes a 3-inch sieve shall meet the grading requirements of the following table:

<u>Sieve Designation</u>	<u>Percent by Weight Passing Square Mesh Sieves</u>
1/2 inch	35-80
1/4 inch	25-65
No. 40	0-30
No. 200	0-7

Aggregate for subbase shall not contain particles of rock that will not pass the 4-inch square mesh sieve.

- C. Gravel depth shall be as follows:

<u>Location</u>	<u>Type D (Subbase)</u>	<u>Type A (Base)</u>
Gorham Road*	15"	6"
Sidewalks	12"	3"
Driveway Aprons	12"	3"

**** Note that gravel section in Gorham Road is assumed. The Contractor shall backfill the trench to match the base and subbase course sections in the roadway. Existing gravels may be used for backfill below the base gravel layer as long as they meet the material and conditioning requirements of this specification.***

- D. Road gravel shall be placed and graded to match the existing roadway above completed pipeline areas prior to the end of each workday. The gravel surface shall be maintained to a smooth dust-free surface condition during the interim between pipe installation and placement of the trench cap and/or pavement. Placement of road gravel, within the excavated trench area, shall be incidental to the pipeline pay items outlined in the bid schedule.

3.1.7 DUST CONTROL:

- A. Upon completion of the backfilling operations in paved areas, the undisturbed pavement shall be swept. If requested by the Engineer, the following dust control measures shall be used during the interim period between backfilling and placement of the trench cap as specified in Section 8.
1. Calcium Chloride.
 2. Sprinkling.
- B. Materials:
1. Water for Sprinkling: Water shall be fresh and free from oil, acid and injurious alkali or vegetable matter.
 2. Calcium Chloride: Calcium chloride shall be commercial grade meeting the requirements of ASTM D 98 except as waived by the Engineer.
- C. Application:

1. Water and calcium chloride shall be applied with the consent or by direction of the Engineer.
2. Calcium chloride shall be spread uniformly over the area designated by the Engineer.
3. Water shall be applied with approved equipment including a tank with pressure pump and nozzle equipped spray bar.
4. Payment for this work is included in Bid Item 4 Erosion/Sediment Control.

3.2 MEASUREMENT AND PAYMENT

Measurement and Payment for the work of this section is defined in Section 10 of these specifications.

END OF SECTION 3

SECTION 4

SEWER FORCE MAIN PIPE INSTALLATION

1.1 SUMMARY OF WORK

The work of this Section includes all labor, materials, and equipment to furnish, install, and test all sewer force main piping, fittings, and appurtenances, as indicated on the Plans, all in accordance with the following Technical Specifications and the Standards and Specifications of Scarborough Sanitary District, complete in every detail ready and for operation.

Note that Scarborough Sanitary District (SSD) has purchased and will provide HDPE DR11 force main piping, air release valves and a selection of fittings for use on this project. A list of materials to be provided by SSD that will be made available to the Contractor is appended to this Section. The listed materials are stored at the Scarborough Sanitary District facility at 415 Black Point Road in Scarborough. The Contractor shall be responsible for loading, handling and delivery of materials from the SSD facility to the project site.

1.2 REFERENCE STANDARDS

1.2.1 AWWA M55 Manual of Water Supply Practices, PE Pipe–Design and Installation

- ANSI/AWWA C111/A21.11-12 Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
- ANSI/AWWA C906-07 Polyethylene (PE) Pressure Pipe and Fittings, 4 In. (100 mm) Through 63 In. (1,600 mm), for Water Distribution and Transmission

1.2.2 Plastics Pipe Institute, PPI www.plasticpipe.org

- PPI Handbook of Polyethylene Pipe – 2009 (2nd Edition)
- PPI TR-33 Generic Butt Fusion Joining Procedure for Polyethylene Gas Pipe
- PPI TR-41 Generic Saddle Fusion Joining Procedure for Polyethylene Gas Piping 4. PPI TN-42 Recommended Minimum Training Guidelines for PE Pipe Butt Fusion
- Joining Operators for Municipal and Industrial Projects (2009)

1.2.3 ASTM www.astm.org

- ASTM D 2239 Standard Specification for Polyethylene (PE) Plastic Pipe (SIDR-PR) Based on Controlled Inside Diameter
- ASTM D 2683 Standard Specification for Socket-Type Polyethylene Fittings for Outside Diameter-Controlled Polyethylene Pipe and Tubing
- ASTM D 2737 Standard Specification for Polyethylene (PE) Plastic Tubing
- ASTM D 2774 Standard Practice for Underground Installation of Thermoplastic Pressure Piping
- ASTM D 3261 Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing
- ASTM D 3350 Standard Specification for Polyethylene Plastics Pipe and Fittings Materials

- ASTM F 585 Standard Guide for Insertion of Flexible Polyethylene Pipe Into Existing Sewers
- ASTM F 714 Standard Specification for Polyethylene (PE) Plastic Pipe (SDR- PR) Based on Outside Diameter
- ASTM F 905 Standard Practice for Qualification of Polyethylene Saddle-Fused Joints
- ASTM F 1055 Standard Specification for Electrofusion Type Polyethylene Fittings for Outside Diameter Controlled Polyethylene Pipe and Tubing
- ASTM F 1290 Standard Practice for Electrofusion Joining Polyolefin Pipe and Fittings
- ASTM F 1412 Standard Specification for Polyolefin Pipe and Fittings for Corrosive Waste Drainage Systems
- ASTM F 2164 Standard Practice for Field Leak Testing of Polyethylene (PE) Pressure Piping Systems Using Hydrostatic Pressure
- ASTM F 2206 Standard Specification for Fabricated Fittings of Butt-Fused Polyethylene (PE) Plastic Pipe, Fittings, Sheet Stock, Plate Stock, or Block Stock
- ASTM F 2620 Standard Practice for Heat Fusion Joining of Polyethylene Pipe and Fittings

1.3 SUBMITTALS

A. Requirements

1. All submittals shall be approved by the Engineer and Scarborough Sanitary District prior to delivery.
2. The Contractor shall submit to the Owner, within ten days after receipt of Notice to Proceed, a list of materials to be furnished, the names of the suppliers, and the appropriate shop drawings for all structures, appurtenances and fittings not provided by SSD.
3. The Contractor shall submit shop drawings showing installation method and the proposed method and specialized equipment to be used.
4. Manufacturers recommended fusion procedures for the products.

B. Provide Product Data

1. Joint Types
 - Restraint, if required in Contract Documents
 - a. Retainer glands
 - b. Thrust harnesses
 - c. Any other means of restraint

C. Installer Qualifications

- a. Provide certifications meeting requirements of section 3.1 for each installer. Keep certifications on project site available to Owner, Engineer, and Inspector.
- D. Provide Internal Stiffeners Data
- E. Provide Mechanical Joint Adapters Data
- F. Data Logger Records
 - a. Provide electronic data logger record to the inspector daily or on request of inspector.
 - b. Fusion Reports shall report manufacturer, component, component fusion-jointing parameters, assembly operation and joint identification, per ISO 12176-4, and the following fusion-jointing operation data:
 - i. Temp-Compensated Fusion Time & Actual Fusion Time
 - ii. Resistance before & after fusion
 - iii. Hi and Low output voltage & output current during fusion
 - iv. Total Amp-Hours applied to fitting
 - v. Input voltage and frequency before fusion
 - vi. High and Low input voltage and frequency during fusion
 - vii. Input waveform
 - viii. GPS position and quality
 - ix. Ambient temperature
 - x. Heating iron face temperatures
 - xi. Fusion pressure
 - xii. Graphic representation of the fusion cycle.
 - c. Report shall comply with ISO 12176-2 requirements for traceability databases.

1.4 DELIVERY, STORAGE AND HANDLING

A. Delivery, Storage, and Handling Requirements

1. Handle the pipe in accordance with the PPI Handbook of Polyethylene Pipe (2nd Edition), Chapter 2 using approved strapping and equipment rated for the loads encountered. Do not use chains, wire rope, forklifts or other methods or equipment that may gouge or damage the pipe or endanger persons or property.

2. Follow manufacturer's recommendations for delivery, storage, and handling.
3. No stacking of pipe is allowed, unless within a fenced contained workspace. Pipe stacking is to be in compliance with AWWA Manual of Practice M55 Table 7-1.
4. If any gouges, scrapes, or other damage to the pipe results in loss of 10% of the pipe wall thickness, cut out that section or do not use. Damages resulting from improper delivery, storage, or handling are the responsibility of the Contractor, and no additional payment shall be allowed by the Owner.

1.5 MATERIALS

Scarborough Sanitary District (SSD) has purchased and will provide HDPE DR11 force main piping, air release valves and a selection of fittings for use on this project. A list of materials to be provided by SSD that will be made available to the Contractor is appended to this Section. Any additional materials require to complete the project shall be furnished by the Contractor and shall meet the following requirements:

1.5.1 MANUFACTURERS:

- A. Only the pipe manufacturers as listed below are allowed. Other manufacturers may be considered as equals on a project basis.
 1. Performance Pipe
 2. Georg Fischer
 3. JM Eagle
 4. Driscopex
 5. WL Plastics
- B. Only the electrofusion fittings manufacturers as listed below are allowed. Other manufacturers may be considered as equals on a project basis.
 1. Agru America
 2. Georg Fischer Central Plastics
 3. Integrity Fusion Products
 4. IPEX, Inc.
 5. M.T. Deason Company
 6. Nupi Americas
 7. Plasson, USA
 8. Strongbridge-Tega
- C. Only the butt fusion fittings manufacturers as listed below are allowed. Other manufacturers may be considered as equals on a project basis.
 1. ISCO
 2. IPEX
 3. Georg Fisher
- D. Only the fusion equipment manufacturers as listed below are allowed. Other manufacturers may be considered as equals on a project basis.
 1. McElroy

1.5.2 HDPE PIPE

- A. High Density Polyethylene (HDPE) pipe and fittings shall meet the requirements of AWWA C906.
- B. HDPE must meet the following minimum Dimension Ratio: 11
- C. The outside diameter of the pipe shall be based upon the **Ductile Iron Pipe Size (DIPS)** sizing system.
- D. Polyethylene pipe shall be made from HDPE material having a material designation code of PE4710 or higher.
- E. The material shall meet the requirements of ASTM D 3350 and shall have a minimum cell classification of PE445474C.
- F. Pressure Pipe shall be approved by the Underwriter's Laboratory (UL) or Factory Mutual (FM).
- G. Pipe Markings
 - 1. Meet the minimum requirements of AWWA C906. Minimum pipe markings shall be as follows:
 - a. Manufacturer's Name or Trademark and production record
 - b. Nominal pipe size
 - c. DIPS
 - d. Dimension Ratio
 - e. AWWA C906
 - f. Seal of testing agency that verified the suitability of the pipe
 - g. Resin type (PE4710)
 - 2. Color identification to identify pipe service is required.
 - a. Stripes or colored exterior pipe product shall be green for wastewater/sewage
 - b. Pipe interior shall be gray for visual inspection.
 - c. Permanent identification of piping shall be provided by co-extruding multiple equally spaced color stripes into the pipe outside surface or by solid colored pipe shell.
 - d. The striping material shall be the same material as the pipe material except for the color.
 - e. Plain Black HDPE Pipe without color code markings may not be used.
- H. Only smooth wall HDPE will be permitted.

1.5.3 HDPE BUTT FUSION FITTINGS

- A. Butt Fusion Fittings shall be made of HDPE material with a minimum material designation code of PE4710 and with a minimum Cell Classification as required for HDPE Pipe.
- B. Butt Fusion Fittings shall meet the requirements of ASTM D3261. Molded and fabricated fittings shall have a pressure rating equal to or greater than the pipe unless otherwise specified on the plans.
 - 1. Fabricated Fittings shall be Equivalent Dimension Ratio to DR11.

2. Pipe stock used to manufacture fabricated fittings shall meet requirements of AWWA C906 and meet the material designation code of PE4710.
 3. Fabricated Fittings typically require a lower DR rating than the pipe to meet or exceed the pipe pressure rating. Calculate the difference for a fabricated fitting based on a published rerating percentage.
 4. Fabricated bend and tee fittings shall have a minimum of 3 segments.
 5. Fabricated bend fittings over 45 degrees through 90 degrees shall have a minimum of four segments.
 6. Field fabricated fittings are not allowed.
- C. All fittings shall meet the requirements of AWWA C906.
- D. Markings for molded fittings shall comply with the requirements of ASTM D 3261.
1. Standard Designation (ASTM D 3261)
 2. Manufacturer's name or trademark
 3. Material designation (PE4710)
 4. Date of manufacture or manufacturing code
 5. Size
 6. Dimension Ratio (example: DR11)
- E. Fabricated fittings shall be marked in accordance with ASTM F 2206.
1. Standard Designation (ASTM F 2206)
 2. Manufacturer's name or trademark
 3. Material designation (PE4710)
 4. Date of manufacture or manufacturing code
 5. Size
 6. Equivalent Dimension Ratio

1.5.4 HDPE ELECTROFUSION FITTINGS

- A. Electrofusion Fittings shall be made of HDPE material with a minimum material designation code of PE 4710 and with a minimum Cell Classification as noted for HDPE pipe.
- B. Electrofusion Fittings shall have a manufacturing standard of ASTM F1055. Fittings shall have a pressure rating equal to the pipe unless otherwise specified on the plans.

- C. All electrofusion fittings shall be suitable for use as pressure conduits, and have nominal burst values of four times the Working Pressure Rating (WPR) of the fitting.
- D. Markings shall be according to ASTM F 1055. 1. Standard Designation (ASTM F 2206)
 - 2. Manufacturer's name or trademark
 - 3. Material designation (PE4710)
 - 4. Date of manufacture or manufacturing code
 - 5. Size
 - 6. Equivalent Dimension Ratio

1.5.5 FLANGES AND MECHANICAL JOINT ADAPTERS (MJ ADAPTERS)

- A. Flanges and Mechanical Joint Adapters shall have a material designation code of PE4710 or higher and a minimum Cell Classification as noted for HDPE pipe.
- B. Flanged and Mechanical Joint Adapters can be made to ASTM D 3261 or if machined, must meet the requirements of ASTM F 2206.
- C. The outside diameter of Flanges shall be based on Iron Pipe Size (IPS).
- D. The MJ Adapters shall be based on Iron Pipe Size by Ductile Iron Pipe Size (IPS x DIPS).
- E. Flanges and MJ Adapters shall have a pressure rating equal to the pipe unless otherwise specified on the plans.
- F. Markings for molded or machined flange adapters or MJ Adapters shall be per ASTM D 3261.
 - 1. Manufacturer's name or trademark
 - 2. Material designation (PE4710)
 - 3. Date of manufacture or manufacturing code
 - 4. Size
 - 5. Where recessed marking is used, take care not to reduce the wall thickness below the minimum specified.
- G. Fabricated (including machined) flange adapters shall be per ASTM F 2206.
- H. Metal gland for MJ Adapter may be either AWWWA C110 (heavyweight) or AWWWA C153 (lightweight).

- I. Low alloy steel bolts shall comply with AWWA C 111.4. Bolts, rods, and hex nuts shall be manufactured from 304 stainless steel as per ANSI/ AWWA C111/A21.11.
- J. Van-Stone style, metallic (including stainless steel), convoluted, or flat-plate back-up rings and bolt materials shall follow the guidelines of Plastic Pipe Institute Technical Note # 38, and shall have the bolt-holes and bolt-circles conforming to one of these standards: ASME B-16.5 Class 150, ASME B-16.47 Series A Class 150, ASME B-16.1 Class 125, or AWWA C 207 Class 150 Series B, D, or E.
- K. The back-up ring shall provide a long-term pressure rating equal to or greater than the pressure-class of the pipe with which the flange adapter assembly will be used, and such pressure rating shall be marked on the back-up ring. The back-up ring, bolts, and nuts shall be protected from corrosion by a system such as coal-tar epoxy, galvanization, polyether, or polyester fusion bonded epoxy coatings, anodes, or cathodic protection, as specified by the Engineer.

1.5.6 MECHANICAL JOINT WEDGE ACTION RESTRAINT

- A. Mechanical Joint wedge action restraint shall only be allowed with specific permission of the Engineer in cases where an MJ Adapter is not feasible.
- B. Mechanical Joint wedge action restraint shall be designed specifically for use on HDPE pipe.
- C. The grip of the serrations shall increase as the hydrostatic pressure increases.
- D. There shall be no additional tool required for installation other than the tools required to install standard sizes of hex nuts from 5/8"-1 1/8". The hex heads, bolts and rods shall be designed to tighten clockwise. The hex heads, bolts and rods shall be manufactured to allow for disassembly and re-installation of the restraint.
- E. The gland halves shall be manufactured of high strength ductile iron in accordance with the ASTM A536 Standard, Grade 65-45-12.
- F. Rods are manufactured from 304 stainless steel and hex nuts are manufactured from 316 stainless steel as per ANSI/ AWWA C111/A21.11.
- G. The restraining gland shall comply with all applicable dimensions of ANSI/AWWA C111/A21.11 and shall be compatible with all bell and spigot (push-on) joint sockets of the standard.
- H. Stiffening insert required.

1.5.7 PIPELINE MARKERS

- A. Detectable Warning Tape - All force mains shall be clearly identified with 6-inch wide green plastic locator tape made specifically for that purpose. The tape shall be marked with black lettering clearly identifying the pipeline as sanitary sewer.

- B. Tracer wire - continuous AWG no. 12 gauge solid copper tracer wire with 30 mil thick green HDPE insulation. Perform conductivity test on the tracer wire at final inspection.

1.5.8 STIFFENING INSERT (STIFFENER)

- A. Provide Stiffeners at each MJ adapter and coupling per Manufacturers Recommended Standard Details.
- B. Stiffening inserts shall be specially designed for use on the inside of HDPE pipe in conjunction with AWWA C111 mechanical joints.
- C. Provide stainless steel per ASTM 240, type 304 or 316.
- D. Stiffener shall be manufactured within the pipe or MJ adapter by the factory.
- E. Stiffener length must be sufficient to fully encompass the area of the pipe being restrained.
- F. Inserts must be designed for underground pressurized fluid service and are pressure rated to match the pipe DR pressure rating, derated as appropriate for service temperature. Maximum test pressure limited to pipe rated pressure.
- G. Stiffener design shall prevent movement causing fitting to slide or rotate on the pipe.

1.5.9 FLEX COUPLING RESTRAINT DEVICE

- A. HDPE flex coupling restraint devices will be rated for minimum of 8,000 pounds of force.
- B. Resin used to manufacture device shall meet requirements of ASTM 3350 with minimum cell classification of 445474C.
- C. Device will include bar code and product label tag.
- D. Device will install by electrofusion.

1.5.10 WALL ANCHOR

- A. Butt fusion wall anchors, or force restraint collars, shall comply with requirements of DR11, Iron Pipe Size (IPS), minimum cell class 445474C, and meeting this specification's requirements for HDPE pipe except for striping.

1.5.11 DUCTILE IRON FITTINGS AND VALVES

- A. All ductile iron fittings shall meet ANSI/AWWA C153/A21.53 with an epoxy fusion bonded coating in accordance with ANSI/AWWA C116/A21.16. All fittings shall be pressure rated to a minimum of 200psig.
- B. Ductile iron non rising stem gate valves shall be manufactured specifically for use in wastewater applications and shall meet AWWA C500, with an epoxy fusion bonded

coating in accordance with ANSI/AWWA C116/A21.16. All valves epoxy fusion bonded coating in accordance with ANSI/AWWA C116/A21.16.

1.5.12 AIR RELEASE VALVES

A. Wastewater Air Release Valves shall be automatic float operated valves designed to release accumulated air from a piping system while the system is in operation and under pressure.

1. Valves shall be manufactured and tested in accordance with American Water Works Association (AWWA) Standard C512.

2. Manufacturer shall have a quality management system that is certified to ISO 9001 by an accredited, certifying body.

3 The valves shall have full size NPT inlets and outlets equal to the nominal valve size. The body inlet connection shall be hexagonal for a wrench connection. The body shall have 2" NPT cleanout and 1" NPT drain connections on the sides of the casting. The cover shall be bolted to the valve body and sealed with a flat gasket. A threaded adjustable orifice button shall provide drop tight shut off to the full valve pressure rating.

4. Floats shall be unconditionally guaranteed against failure including pressure surges. Extended mechanical linkage shall provide suitable mechanical advantage so that the valve will open under full operating pressure.

5. Materials

a. The valve body and cover shall be constructed of ASTM A126 Class B cast iron.

b. The orifice, float and linkage mechanism shall be constructed of Type 316 stainless steel. Non-metallic floats or linkage mechanisms are not acceptable. The orifice button shall be Buna-N.

c. Valve interiors and exteriors shall be coated with an NSF/ANSI 61 certified fusion bonded epoxy in accordance with AWWA C550.

d. The exterior of the valve shall be coated with a universal alkyd primer.

6. Manufacturer: Wastewater Air Release Valves shall be Series 48A and 49A as manufactured by Val-Matic Valve and Manufacturing Corporation, Elmhurst, IL, USA or approved equal.

1.5.13 SEWER FORCE MAIN STRUCTURES

A. Standard Precast Concrete Manholes:

1. Description: ASTM C 478 (ASTM C 478M), precast, reinforced concrete, of depth indicated, with provision for sealant joints.

2. Diameter: 48 inches (1200 mm) minimum unless otherwise indicated.

3. Ballast: Increase thickness of precast concrete sections or add concrete to base section, as required to prevent flotation.
4. Base Section: 6-inch (150-mm) minimum thickness for floor slab and 4-inch (100-mm) minimum thickness for walls and base riser section; with separate base slab or base section with integral floor.
5. Riser Sections: 4-inch (100-mm) minimum thickness, of length to provide depth indicated.
6. Top Section: Eccentric-cone type unless concentric-cone or flat-slab-top type is indicated; with top of cone of size that matches grade rings.
7. Joint Sealant: ASTM C 990 (ASTM C 990M), bitumen or butyl rubber.
8. Resilient Pipe Connectors: ASTM C 923 (ASTM C 923M), cast or fitted into manhole walls, for each pipe connection.
9. Steps: 14" aluminum or reinforced plastic manhole steps, 12" on center.
10. Grade Rings: Reinforced-concrete rings, 6- to 9-inch (150- to 225-mm) total thickness, with diameter matching manhole frame and cover, and with height as required to adjust manhole frame and cover to indicated elevation and slope.

B. Manhole Frames and Covers:

1. Description: 24" minimum clear opening size. Cover lettering: 'SEWER'
2. Material: ASTM A 48/A 48M, Class 35 gray iron unless otherwise indicated.

1.6 EXECUTION

1.6.1 INSTALLERS

- A. Only formally trained and certified fusion technicians may conduct fusions. Qualification of the fusion technician shall be demonstrated by certification in fusion training within the past year for the type of fusion, and size of the pipe, and on the specific equipment to be used on this project. Provide documentation showing current and up-to-date qualification of training obtained to fuse PE pipe in the appropriate sizes and equipment types for the job.
- B. Training in accordance with ASTM F 2620 for butt fusion.
- C. Training in accordance with ASTM F 1055 for electrofusion.
- D. Fusion joints shall be made by qualified fusion technicians per PPI TN-42.
- E. Qualified technician has documented prior experience in performing HDPE pipe installations, head fusion procedures, and testing methods.

1.6.2 INSTALLATION

- A. General

1. Install pipe, fittings, specials and appurtenances as specified herein, as specified in AWWA M55 and in accordance with the pipe manufacturer's recommendations with the intention of providing a leak-free system to the Owner.

2. Excavate and backfill trenches in accordance with the Project Manual.

B. Joining Methods

1. Butt Fusion: The pipe shall be joined by the butt fusion procedure outlined in ASTM F 2620 or PPI TR-33. All fusion joints shall be made in compliance with the pipe or fitting manufacturer's recommendations. Fusion joints shall be made by qualified fusion technicians per PPI TN-42.

2. Saddle fusion: Saddle fusion shall be done in accordance with ASTM F 2620 or TR-41 or the fitting manufacturer's recommendations and PPI TR-41.

3. Electrofusion: Electrofusion joining shall be done in accordance with the manufacturers recommended procedure. Other sources of electrofusion joining information are ASTM F 1290 and PPI TN 34. The process of electrofusion requires an electric source, a transformer, commonly called an electrofusion box that has wire leads, a method to read electronically (by laser) or otherwise input the barcode of the fitting, and a fitting that is compatible with the type of electrofusion box used. The electrofusion box must be capable of reading and storing the input parameters and the fusion results for later download to a record file.

C. Mechanical:

1. Mechanical connection of HDPE to auxiliary equipment such as valves, pumps, and fittings shall use mechanical joint adapters and other devices in conformance with the PPI Handbook of Polyethylene Pipe, Chapter 9 and AWWA Manual of Practice M55, Chapter 6.

2. Unless specified by the fitting manufacturer, a restraint harness or concrete anchor is recommended with mechanical couplings to prevent pullout.

3. Mechanical coupling shall be made by qualified technicians.

D. Joint Recording

1. Butt Fusion: The butt fusion equipment must be capable of reading and storing the input parameters and the fusion results for later download to a record file.

2. Electrofusion: The electrofusion equipment must be capable of reading and storing the input parameters and the fusion results for later download to a record file.

3. The critical parameters of each fusion joint, as required by the manufacturer and these specifications, shall be recorded by an electronic data logging device. All fusion joint data shall be included in the fusion technician's joint report.

E. Installation

1. Buried HDPE pipe and fittings shall be installed in accordance with ASTM D2321 or ASTM D2774 for pressure systems and AWWA Manual of Practice M55 Chapter 7.
2. Lay pipe with green stripe within 45-degrees either side of crown, if pipe has green stripe.
3. Pipe embedment –Pipe bedding, surround and initial backfill shall meet Maine DOT specification 703.01 Fine Aggregate for Concrete.
4. Compact backfill per ASTM D 698 and AASHTO T-99 to 95% maximum density within a road right-of-way.
5. Upon completion of the pipe installation, internal beads at fusion joints shall be removed using a reaming tool specifically designed for use in HDPE pressure pipe applications, to leave a smooth internal bore throughout the pipe.

F. Leak Testing

1. Hydrostatic leakage testing is recommended and shall comply with AWWA C651, ASTM F 2164, ASTM F 1412, AWWA Manual of Practice M55 Chapter 9, and PPI Handbook of Polyethylene Pipe Chapter 2 (2nd Edition). If the test section fails this test, the Contractor shall repair or replace all defective materials and/or workmanship at no additional cost to the Owner.
2. Prior to scheduling a test with the inspector, preform a pre-test to confirm compliance.
3. Contractor shall perform hydrostatic and leakage tests in accordance with Scarborough Sanitary District requirements.
4. Installed main shall be adequately anchored with a covering of at least 6-inches of initial backfill, if installed by an open trench method. The joints and fittings, particularly flange connections shall be left uncovered for visual leak inspection.
5. Leak tests of HDPE force main shall be conducted in accordance with ASTM F2164. The pipeline should be slowly filled with potable water and all trapped air bled off. The main should undergo a hydrostatic pressure test using pressure at the lowest elevation in the system at 150 psi. The pressure shall be maintained constant for 4-hour period by adding makeup water. After 4-hour period is completed, the pressure shall remain steady within 5% (7.5 psi) of a target 150 psi test pressure for one hour.
6. The total test time should not exceed 8 hours. If the pipeline has to be retested – the pipe must be depressurized and allowed to “relax” for at least 8 hours before the next testing sequence.
7. The pressure shall be maintained constant for 4-hour period by adding makeup water. After 4-hour period is completed, test the pressure at the lowest point.

8. Test pressure for one hour. Pressure should remain steady at 1.5 times the working pressure, but not more than the design pressure of the pipe (e.g. 200 psi for DR 11). Pressure must remain within 5% of a target test pressure for one hour.

9. In fused polyethylene water piping system no leakage shall be present. If leakage is observed at a fusion joint, complete rupture may be imminent. The Contractor shall move all personnel away from the joint and depressurize the main. Leaks, failure, or defective construction shall be promptly repaired by the Contractor at the Contractor's sole expense.

10. Payment for pressure and leakage testing shall be considered included in the price paid per linear foot for force main installation.

11. Pneumatic (compressed air) leakage testing of HDPE pressure piping is prohibited for safety reasons.

G. Pipe Marker Installation

1. Install detectable warning tape. Place the tape directly above the pipe embedment material and minimum 1-foot below the ground surface.

2. Install tracer wire. Place the tracer wire at bottom of the pipe embedment material and do not attach wire to pipe. Perform conductivity test on the tracer wire at final inspection.

H. Connections to Existing Force Main.

1. Connections to the existing force main shall be made using manufactured fittings of the same size as the force main. Ductile iron fittings shall be interior coated with Protecto 401 or approved equal.

2. Connection work shall be undertaken at night and coordinated with Scarborough Sanitary District.

I. Abandonment of Existing Force Main.

1. Existing force main piping shall be cut in a clean straight line perpendicular to the pipe length. Each end shall be fitted with a 12" DI MJ Cap to seal the pipe.

4.6 ACCEPTANCE OF NEW PIPE INSTALLATION

A. CCTV inspection and mandrel testing of all new force main piping will be required prior to acceptance of the work by Scarborough Sanitary District.

4.7 MEASUREMENT AND PAYMENT

Measurement and payment for the work of this section is defined in Section 10 of these Specifications.

END OF SECTION 4

TEAM EJP Gardiner, ME
32 PRESCOTT STREET
GARDINER, ME

04345

Telephone: 207-582-2006

11/16/21 Bid ID: 5466298 SCARBOROUGH,ME GORHAM RD FORCEMAIN

Page 1

Quantity	Sell Per	Description	Unit Price	Extended Price
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TEAM EJP IS PLEASED TO PRESENT
THE FOLLOWING PROPOSAL. PRICES
ARE BASED UPON ALL MATERIAL ON
THIS QUOTE.

DUE TO VOLATILE MARKET CONDITION
PRICES ON ALL PVC, HDPE, COPPER,
AND DUCTILE IRON PRICES ARE
SUBJECT TO CHANGE AND ARE NOT
FIRM UNTIL TIME OF SHIPMENT.

DIRECT SHIPMENTS DO NOT INCLUDE
ADDITIONAL FREIGHT CHARGES OR
FUEL SURCHARGES. ESTIMATES WILL
BE PROVIDED AT TIME OF QUOTE BUT
ARE NOT FIRM UNTIL TIME OF SHIP.
CUSTOMER WILL BE BILLED ACTUAL
FREIGHT CHARGE.

EJP TECHNICIANS WILL NOT ENTER
EXCAVATIONS UNLESS CONTRACTOR
HAS TAKEN EVERY PRECAUTION TO
ENSURE 100% OSHA COMPLIANCE.

TEAM EJP IS NOT ABLE TO CERTIFY
PRODUCT COMPLIANCE, AND DOES NOT
ACCEPT LIABILITY FOR ANY
STATEMENTS PROVIDED BY THE
MANUFACTURER THAT ARE LATER
DETERMINED TO BE FALSE OR
INACCURATE. THANK YOU.

PRICES ARE SUBJECT TO CHANGE DUE
TO THE POTENTIAL OF ADDITIONAL
TARIFFS BY THE U.S. GOVERNMENT.
IF IMPOSED, PRICES WILL INCREASE
BY THE SAME PERCENTAGE AND WILL
BE EFFECTIVE THE DATE THAT THE
NEW TARIFFS ARE IMPLEMENTED

Continued Next Page

04345

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11/16/21 Bid ID: 5466298 SCARBOROUGH,ME GORHAM RD FORCEMAIN

Page 2

Quantity	Sell Per	Description	Unit Price	Extended Price
1	EA	RENTAL FUSION #412 MACHINE	500.00	500.00
1	EA	OPERATE #412 FUSION MACHINE	1,050.00	1,050.00
1	EA	MILEAGE FIGURED ROUND TRIP, PER MILE, FROM GARDINER, MAINE	1.50	1.50
3600	FT	12 PE PIPE DR11 C906 DIPS FREIGHT: \$5600.00 6-8 WEEK LEAD TIME	28.79	103,644.00
4	EA	12 PE 45 DR 11 DIPS	320.00	1,280.00
4	EA	12" DR11 DIPS WALL ANCHORS FREIGHT: 100.00 LEAD TIME: 3-4 WKS	545.44	2,181.76
AIR RELEASE VALVE ASSEMBLY				
2	EA	12 DIPS EF SADDLE W/2" IP OUTLET	144.00	288.00
4	EA	2X4 BRASS NIPPLE	18.11	72.44
2	EA	2 BALL VALVE IP W/L LEAD FREE	66.83	133.66
2	EA	VAL-MATIC SERIES 48A AIR RELEASE LEAD TIME: 4-6 WEEKS FREIGHT: 200.00	835.05	1,670.10
CASTING FOR AIR RELEASE MH				
2	EA	26X6 MH FRAME LA266 2266Z	220.69	441.38
2	EA	26 MH COVER SCARBOROUGH SANITARY	208.26	416.52

Continued Next Page

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Page 3

Quantity	Sell Per	Description	Unit Price	Extended Price
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THANK YOU,

ZACH CHAPUT
207.582.2006
E.J. PRESCOTT
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SECTION 5

GRAVITY PIPE INSTALLATION AND RE-LOCATION OF EXISTING SERVICE LINES

5.1 SUMMARY OF WORK

The work of this Section includes all labor, materials, and equipment to furnish, install, and test all underdrains, sewers, storm drains, and services as indicated on the Plans, all in accordance with the following Technical Specifications.

5.2 MATERIALS

5.2.1 PIPELINES:

Provide any one of the following optional pipe materials. Prior to commencing work, the Contractor shall submit manufacturer's data for all piping and fittings to be used on the project. The submission shall meet the requirements of Section 1.7 of the Specifications.

A. Gravity Sewers:

1. Polyvinyl Chloride: PVC Gravity Sewer Pipe shall meet the requirements of ASTM Designation D-3034-73-SDR 35. Flexible elastomeric joints meeting ASTM D-3212 shall be used. The pipe supplier shall coordinate with the manhole construction adopted by the Contractor to assure a positive water-tight, flexible connection to the manhole. The Contractor shall note that special manhole bases are required for certain portions of the project as defined.
2. HDPE Storm Drain Piping: HDPE storm drain piping shall be twin wall pipe with a smooth interior bore and annular exterior corrugations. Pipe shall meet ASTM F2648. Pipe shall be joined using a bell and spigot joint meeting ASTM F2648. Joints shall be silt tight and gaskets shall meet ASTM F477. Pipe shall be ADS N-12, or approved equal.
3. Reinforced concrete pipe – Reinforced concrete pipe shall be manufactured in accordance with ASTM C-76-20. Joint material shall be rubber gasket in accordance with ASTM C-443.

5.2.2 FILTER FABRIC:

Filter Fabric shall be one of the following or approved equal:

Filter/Drainage Fabric

1. Mirafi 140 N
2. Phillips 66 Supac 4NP
3. Dupont Tytar 3341

5.2.3 RIGID FOAM INSULATION:

Rigid foam insulation, when required by the Contract Drawings, shall be Styrofoam SM or TG as manufactured by the Dow Chemical Company or equal.

Material submitted shall have a K factor of .20 @ 75 degrees by ASTM C518-70, 2-1b. density by ASTM C303-56, compressive strength of 30-1b. by ASTM D1621-64 and a water absorption of less than .05 meet Federal Specification HH1524B Type II, Class B.

The Contractor shall coat the insulation material in accordance with the manufacturer's instructions.

5.3 INSTALLATION

5.3.1 PIPE LAYING:

- A. The pipe shall be accurately laid to the line and grades to the satisfaction of the Engineer. The line and grade may be adjusted by the Engineer from that shown on the Drawings to meet field conditions and no extra compensation shall be claimed by the Contractor.

The Owner or his representative reserves the right to check the elevations and alignment on any pipe for conformance with proposed line and grade. Installed grades shall be within the tolerance of plus or minus 0.02 feet from theoretical computed grades. Alignment shall be within a tolerance of plus or minus 0.04 feet. Pipe grade shall be defined as the invert elevation of the pipe. Pipe not meeting the grade tolerance or of poor alignment shall be adjusted by the Contractor.

- B. No pipe laying will be allowed to begin at any point other than a manhole or other appurtenance without the expressed consent of the Engineer. The interior of each length of pipe will be swabbed and wiped clean before laying the next length. No length of pipe shall be laid until the previous length has had sufficient fine material placed and tamped about it to secure it firmly in place to present any disturbance. Bell ends shall be laid uphill. Whenever the work is stopped temporarily, or for any reason whatsoever, the end of the pipe shall be carefully protected against dirt, water, or other extraneous material. Bedding shall be as shown on the Plans.
- C. The pipe shall be cut as necessary for appurtenances. In general, the pipe material shall be cut by using a saw or milling process, approved by the pipe manufacturer and not by using any impact device, such as a hammer and chisel, to break the pipe. The pipe shall be cut, not broken. The cut end of the pipe shall be square to the axis of the pipe and any rough edges ground smooth.
- D. Clean interior of all pipe thoroughly before installation. When work is not in progress, open ends of pipe shall be closed securely, in a manner approved by the Engineer, to prevent entrance of trench water, dirt, or other substances.
- E. All joints shall be made in a dry trench in accordance with the manufacturer's recommendations.

5.3.2 RE-LOCATION AND REPAIR OF EXISTING SEWER AND WATER SERVICES:

- a. At locations where sewer service laterals conflict with the proposed work, piping shall be re-located in such as manner as to maintain a constant slope, or the minimum possible deviation from constant slope from the service side connection to the sewer main. All repair connections shall be made with manufactured fittings matching the dimensions of

the existing service. Where significant deviations in the slope of replacement service lines are required, the Engineer may direct the Contractor to install a cleanout on the new line. The end of each service repair or replacement shall be left exposed until the Construction Monitor, with the assistance of the Contractor, has taken accurate tie measurements for its location. The Contractor shall independently record all service tie locations and shall present to the Engineer three (3) bound copies of such data upon completion of the work. The end of each lead shall be marked in accordance with the detail shown on the Plans. A format for record ties is provided in Section 1 of these specifications.

- b. At locations where water service lines conflict with the proposed work, new service lines shall be installed from the corporation at the main to the curb stop in a single continuous line per Portland Water District (PWD) Standards and Section 6 of these specifications. The Contractor shall notify PWD of all service conflicts prior to undertaking any work on the water supply system so that they can schedule appropriate inspections on any new work.

5.3.3 REPAIRS TO EXISTING PIPES, CONDUIT, AND WATER LINES:

When existing gravity pipes and conduit are damaged or broken during construction, the damaged or broken portion shall be removed and replaced with a pipe of the same size and material, designed to serve the same function as the existing pipe or conduit. Connections shall be made to damaged pipe with Fernco Calder or Dresser couplings to the complete satisfaction of the Engineer. Repairs to private utilities shall meet the requirements of the utility companies. The Contractor shall make all repairs immediately following discovery of damage and shall have suitable repair materials on hand so that repairs can be made quickly. Backfilling will not be permitted until repairs have been completed to the satisfaction of the Engineer.

All water mains and services in the project area are owned and operated by Portland Water District. The Contractor shall report any damage to water mains or services immediately to PWD. Repair to damaged mains and services shall be in accordance with PWD standards and specifications and shall be undertaken to the satisfaction of PWD. Repairs to existing utilities damaged during construction shall be the sole responsibility of the Contractor. No compensation will be made for this work.

5.3.4 REMOVAL OF EXISTING PIPELINES:

Existing Pipelines: Remove or abandon existing pipelines where indicated, and plug existing remaining piping and structures where so noted on Drawing and where required or directed by the engineer. In addition, specific utility lines identified for abandonment beneath the new roadway surface shall either be removed or filled with flowable fill. Adequate vents shall be provided by the Contractor if flowable fill is used.

Asbestos cement pipe shall be handled, removed, and disposed of in accordance with all state and federal requirements.

5.4 ACCEPTANCE OF NEW PIPE INSTALLATION

- A. CCTV inspection and mandrel testing of all new gravity piping will be required prior to acceptance of the work by Town of Scarborough.

5.5 MEASUREMENT AND PAYMENT

Measurement and payment for the work of this section is defined in Section 10 of these Specifications.

END OF SECTION 5

SECTION 6

WATER SERVICE LINES

6.1 SUMMARY OF WORK

6.1.1 GENERAL/SUBMISSION REQUIREMENTS:

The Contractor shall furnish all labor, materials, forms, and equipment necessary to install replacement water service piping as shown on the Plans or where these conflict with the proposed new work associated with this project. All work on water services shall meet the standards and specifications of the Portland Water District.

6.2 MATERIALS

6.2.1 GENERAL:

All new water service lines 2" and smaller shall be copper. Copper service pipe shall be type "K", soft seamless copper tubing with no soldered joints underground.

6.3 INSTALLATION

6.3.1 REPLACEMENT SERVICE LINES:

The minimum service line diameter is 1-inch. All service line connections from the corporation main valve to the curb stop valve shall only be type "K" copper.

Customer service lines that are required to be greater than 2-inches in diameter shall be increased by 2-inch increments and the material shall be ductile iron.

Service lines conflicting with the new work shall be replaced from the corporation to the curb stop in single piece with no joints.

Portland Water District must be contacted with a minimum 72-hour advanced notice of the connection to PWD owned water pipe and service line installation to coordinate inspection and approval of the work.

6.4 MEASUREMENT AND PAYMENT

Measurement and payment for the work of this section is defined in Section 10 of these Specifications.

END OF SECTION 6

SECTION 7

LOAM, SEED, AND MISCELLANEOUS RESTORATION MEASURES

7.1 SUMMARY OF WORK

- A. The work of this section shall include furnishing, supplying and installing all surface restoration measures as identified on the plans. In general, work shall be carried out only during weather conditions favorable for seeding operations. The suitability of the weather conditions shall be determined by the Engineer.

7.2 MATERIALS

A. Loam

Loam shall be fine graded topsoil from approved source, free of large stones, clods, roots, or other foreign matter. The Contractor may be required to have loam tested and furnish report of physical and chemical content.

B. Fertilizer

Furnish in unopened containers bearing manufacturer's guaranteed statement of analysis containing 10% nitrogen, 20% phosphorus, 20% potash.

C. Limestone

Ground limestone shall contain 85% or more total carbonates, 50% passing 100 mesh sieve, 90% passing 20 mesh sieve.

D. Seed

Seed shall be furnished in containers bearing a guaranteed analysis as follows:

Finish Lawn Mix @ 4#/1000 sq. ft.

<u>Seed</u>	<u>Mix</u>
Baron Bluegrass	30%
Kentucky Bluegrass	20%
Creeping Red Fescue	35%
Perennial Rye	15%

E. Mulch

Furnish hay mulch for lawns and roadway slope areas at 90 lbs/1000 sq. ft. Between Nov. 1 and April 1 the application rate shall be doubled.

F. Erosion Control Mesh

Erosion control mesh shall be Curlex blankets by American Excelsior Company or approved equal.

G. Erosion Control Fence

The erosion control fence shall be "Envirofence" as manufactured by Mirafi, or approved equal. Refer to Section 2 for requirements.

7.3 **EXECUTION**

7.3.1 **LOAM AND SEED - SOIL PREPARATION**

- A. All slopes and other areas where loam is required shall be trimmed and shaped to the required grade. Before placing the loam, the areas under preparation shall be scarified along the contour or otherwise loosened to a depth of at least two (2) inches.
- B. Loam shall be spread on the prepared area to a uniform depth of six (6) inches. Any remaining clods and roots above two (2) inches in greatest diameter, or any other foreign matter, shall be removed. All rocks over one (1) inch in diameter shall be removed. Loam shall be brought to a true, even surface, meeting the required grade.
- C. After the topsoil has been spread and graded, and if recommended as a result of soil analysis, apply ground limestone at the rate of one hundred thirty-eight (138) pounds per thousand (1000) square feet.
- D. The commercial fertilizer shall be applied in two (2) applications. The first shall be applied within one week before the seeding at the rate of 12 pounds per 1,000 square feet, and then harrowed into the top 2 inches of the seed bed. The second application shall be applied and thoroughly watered immediately after the first cutting of the grass, at the rate of 6.5 pounds per 1,000 square feet.

7.3.2 **PLANTING LAWNS**

- A. Seeding shall comply with the Specifications of Section 618 of the State of Maine, State Highway Commission, Standard Specifications, Highways and Bridges, November 2014, and the requirements contained within these Specifications, Method 1.
- B. Hay mulch shall be applied to all surfaces.
- C. Maintain lawns, including watering, weeding, mowing, and replanting, as necessary for at least 30 days after sowing and as much longer as necessary to establish a uniform stand of the specified grasses until acceptance. After the grass has started, all areas and parts of areas which fail to show a uniform stand of grass, for any reason whatsoever, shall be re-seeded, and such areas and parts of areas shall be re-seeded repeatedly until all areas are covered with satisfactory growth of

grass. At first cutting time, keep mower blades not less than two and one-half (2-1/2) inches high.

7.3.3 LOAM AND SEED - GUARANTEE

All lawns and plant material will be guaranteed for one (1) full growing season from the date of completion of the Contract. Areas where a "full catch" of grass has not been obtained shall be re-seeded at the expense of the Contractor.

7.3.5 EROSION CONTROL MESH:

- A. Erosion control mesh shall be installed in ditches with longitudinal slopes of 2 percent or more unless rip rap is required. The loam shall be placed in the ditch, with final grading, seeding and mulching and the mesh shall be installed within 48 hours of loam placement. Fabric shall be installed by unrolling in the direction of expected water flow. Install an anchor trench at the top and bottom of the slope to prevent water from getting under the edge of the fabric. Adjacent fabric panels should be overlapped at least 4 inches. Secure fabric by placing square top staples every foot along edges and overlaps and on three foot centers in between. Staple spacing may be increased depending on conditions.

7.3.6 REMOVAL OF EROSION CONTROL MEASURES:

Erosion control silt fences and hay bales may be removed after a 90 percent "catch" of grass has been established.

7.4 MEASUREMENT AND PAYMENT

Measurement and Payment for the work of this section is defined in Section 10 of these Specifications.

END OF SECTION 7

SECTION 8

PAVEMENT CONSTRUCTION AND RESTORATION

8.1 SUMMARY OF WORK

8.1.1 GENERAL:

The Contractor shall furnish all labor, materials, and equipment necessary to construct all base and subbase courses, hot bituminous concrete, and trench caps.

8.2 MATERIALS

The following materials shall conform to the requirements specified in the MDOT Standard Specifications for Highways and Bridges, November 2014, the following subsection of Division 700, materials as follows:

Aggregate Base	703.06 (a) - Type A
Aggregate Subbase	703.06 (b) - Type D*
Aggregate for Flexible Pavements	703.07
Aggregate for Plant Mix Hot Bit. Concrete	703.09

* Stones larger than 3" shall not be allowed

All pavements shall meet the material and construction requirements of Section 401 of the MDOT Specifications. The gradation of flexible pavement shall be as defined in Section 703.09 as follows:

Binder for Streets	19 mm Hot Mix Asphalt
Surface for Streets	12.5 mm Hot Mix Asphalt
Driveways (both lifts)	9.5 mm Hot Mix Asphalt
Sidewalks (both lifts)	9.5 mm Hot Mix Asphalt

8.3 CONSTRUCTION REQUIREMENTS:

8.3.1 AGGREGATE BASE AND SUBBASE COURSE:

Unless specifically stated otherwise on the Drawings, granular fill materials used in preparation of pavement subgrade shall be placed in uncompacted lifts or layers not to exceed 10 inches loose measure and compacted to a minimum density of 92% of maximum dry density, in accordance with ASTM D 1557 at a moisture content of not more than 3% above the optimum moisture content.

When layers are of differently graded aggregate, fine grading of the lower layer will not be required.

Each layer of aggregate shall be placed over the full width of the section except when existing traffic or other conditions restrict operations over the full width layers. When the

Contractor places material to complete the full width, the exposed edge of the previously placed aggregate shall be cleaned of all contamination before additional base or subbase aggregate is placed adjacent thereto.

Aggregate base and subbase courses may be placed upon frozen surfaces when such surfaces have been properly constructed. The material as spread shall be well mixed with no pockets of either fine or coarse material. Segregation of large and fine particles will not be allowed.

Compaction of each layer shall continue until a density of not less than 95 percent of the maximum density has been achieved for the full width and depth of the layer. The maximum density shall be determined in accordance with AASHTO T-180 Method C and D, corrected by the Soils Laboratory, Bangor, Maine. The surface and compaction and stability shall be satisfactorily maintained.

If the top of any layer becomes contaminated by degradation of the aggregate or addition of foreign material, the contaminated material shall be removed and replaced with specified material.

All layers of aggregate subbase course shall be compacted to the required density immediately after placing. As soon as the compaction of any layer has been completed, the next layer shall be placed unless otherwise authorized.

The Contractor shall bear full responsibility for and make all necessary repairs to the subbase course and the subgrade until the full depth of the subbase course is placed and compacted. Repairs shall be considered incidental to the contract.

The top of any aggregate base or subbase course layer shall be scarified and loosened for a minimum depth of 1 inch immediately prior to the placing of the next layer of aggregate base or subbase. This scarifying shall be considered incidental to placing the course, and no separate payment will be made.

The surface of each layer shall be maintained during compaction operations in such a manner that a uniform texture is produced and the aggregate firmly keyed. The moisture content of the material shall be maintained at the proper percent to attain the required compaction and stability.

The completed surface of the subbase and/or base course shall be shaped and maintained to a tolerance, above or below the required cross-sectional shape, of 3/8 inch.

8.3.2 HOT BITUMINOUS PAVEMENT:

The installation of pavement shall meet the requirements of Section 401 of the MDOT Specifications.

Reconstruction of Streets: The pavement for new streets shall meet the thicknesses shown on the typical plan sections and shall meet the installation, testing, and tolerances of the current MDOT specifications.

Trench Cap: The full depth of existing bituminous concrete surface shall be neatly cut or sawed twenty-four (24) inches back from the original trench cut, or as may be required to remove any cracked or frayed material. The road gravel layer shall be brought to a level below existing grade sufficient to accommodate the thickness of trench cap specified, and graded. A coating of emulsified asphalt (tack coat) shall be applied to the edge of the existing pavement prior to placement of the bituminous concrete trench cap. In addition, the existing bituminous surface shall be milled to a width of twelve (12) inches and a depth of one inch on all sides of the trench prior to the application of the new bituminous pavement surface.

Bituminous concrete shall then be placed in 2, or 3 lifts, as shown on the Contract Drawings, and final lift rolled to match existing paving. Care will be taken to assure a good joint bond between the new and old paving.

Trench Cap	Lower Lift (s)	Upper Lift
Driveways	12.5 mm Hot Mix Asphalt	9.5 mm Hot Mix Asphalt
Sidewalks	9.5 mm Hot Mix Asphalt	9.5 mm Hot Mix Asphalt
Streets	19 mm Hot Mix Asphalt	12.5 mm Hot Mix Asphalt

Castings within the street shall be set to grade. The grade shall be checked by running string lines both in the longitudinal and transversal directions set 10' beyond the casting or at the gutter. The string shall be elevated to match the normal overlay thickness. The casting shall be within 1/16" of the string line or shall be reset.

Catch basin inlets along the gutter shall be set 1" below the normal final gutter with a transition of 10' to the depressed inlet for the uphill side and 5' from the lower and transverse sides. Within the depressional area, the binder pavement thickness shall be increased to a minimum thickness of 3-1/2". Prior to the placement of the surface pavement course, the area around the catch basin frame shall be ground to a minimum depth of 1" to allow for the placement of the surface pavement course.

Paved surfaces shall be washed and swept prior to placing the overlay.

Materials, placement, and testing of overlay materials shall conform to the Maine Department of Transportation Specifications, latest revision.

8.3.4 TEMPORARY PAVING OF TRENCHES

At all times when Gorham Road is open to traffic, a suitable well-drained and even graded running surface shall be provided to allow the safe passage of vehicular traffic. Temporary pavement may be installed by the Contractor to achieve this standard. All costs associated with installation and removal of temporary pavement shall be incidental to the Contract.

8.3.5 RESTORATION OF TRENCHES AND TIME LIMITS ON WORK IN GORHAM ROAD

Outside of permitted road closures, as approved by the Town of Scarborough, a minimum of two lanes of traffic (one in each direction) shall be maintained in Gorham Road at all times.

8.4 MEASUREMENT AND PAYMENT

Measurement and Payment for the work of this section is defined in Section 10 of these Specifications.

END OF SECTION 8

SECTION 9

APPURTENANT STRUCTURES

9.1 SUMMARY OF WORK

9.1.1 GENERAL/SUBMISSION REQUIREMENTS:

The Contractor shall furnish all labor, materials, forms, and equipment necessary to construct all appurtenant structures shown on the Plans or required by the Specifications. Prior to commencing the work, the Contractor shall provide a complete list of the manufacturers with shop drawings for all appurtenances.

9.2 MATERIALS

A. Precast Concrete Items:

1. Precast Manhole and Catch Basin Sections: Manhole super-structures shall be precast reinforced concrete of the dimensions indicated on the Plans conforming to ASTM Specification C478. Sections shall be installed with a flexible plastic gasket equal to or better than "Ram-Nek" as manufactured by K.T. Snyder Co., Houston, Texas, or sections may be fabricated to accept Tylox "0" rubber gaskets as manufactured by Hamilton Kent Manufacturing Co., Kent, Ohio. The outside of the brick work required to bring the rim to grade shall be plastered with at least 3/8" mortar, thoroughly troweled to leave a smooth waterproof exterior surface.

The Contractor shall furnish the name of the manufacturer to the Engineer prior to commencing work.

2. Precast Manhole and Catch Basin Bases: Manhole bases shall be precast reinforced concrete of the dimensions indicated on the Plans conforming to ASTM Specification C478. Bases shall be placed on a well-compacted layer of crushed stone.

Jointing system for pipe entering or leaving manholes shall be a flexible manhole sleeve cast in the base. A stainless steel pipe clamp shall be used to fix the pipe into the sleeve. All materials shall meet or exceed rubber quality standards of ASTM C-443 and C-361.

For manhole bases, a minimum of 4-1/2 inches shall be allowed between pipe invert and inside bottom of base for construction of brick inverts.

Where precast bases are used for drop manholes, a 6 inch concrete slab is to be placed under the base section large enough to receive the concrete encased drop pipes. Provide suitable ties between manhole sections and drop pipe encasements.

Prior to ordering precast manhole bases, all angles between incoming pipes are to be field checked to incorporate possible line changes required in the field layout.

3. Other Precast Items: Reinforced precast sections for other items shall meet the requirements of Sections 1 and 2 of this Section except that shop drawings and detailed structural computations must be provided to demonstrate the precast items are designed for an H-20 highway loading and will withstand an external equivalent fluid pressure of 120 lb/cf and an internal equivalent fluid pressure of 65 lb/cf. The fluid pressure shall be assumed to act from the base elevation of the structure to the proposed finish grade of the structure.

B. Castings:

The Contractor shall furnish all cast iron frames, grates, and covers conforming to the details shown on the Drawings, or as hereinbefore specified.

Castings shall be at least Class 25 conforming to the ASTM Standard Specifications for Gray Iron Castings, Designation A-48-64.

Before being shipped from the foundry, castings shall be given two coats of coal-tar-pitch varnish, applied in a satisfactory manner so as to make a smooth coating, tough, tenacious, and not brittle or brittle with any tendency to scale off.

Sanitary sewer covers shall have the name "SEWER" cast therein. Drain manhole covers shall have the name "DRAIN" cast therein.

The manhole castings for roadway or traffic areas shall be non-perforated manhole frame and cover with a minimum clear opening of 24-inches in diameter, weighing approximately 450 pounds.

Catch basin castings shall be 24" square having Rexus hinged square grates.

C. Mortar:

1. Mortar used to adjust rims and covers for manholes shall consist of the following materials and proportions by volume: 1 part of Portland cement; 1/4 part lime hydrate; and 3 parts sand.
2. For precast reinforced concrete manholes, mortar for invert construction shall consist of the following materials and proportions by volume: 1 part Portland cement and 2 parts sand. Quantity of water in mixture shall be sufficient to produce a stiff, workable mortar, but in no case shall exceed 5-1/2 gallons of water per sack of cement.

D. Brick:

Bricks for manholes and catch basins shall meet Standard Specifications for Sewer Brick, AASHTO Designation M-91-42, Grade SA, Size No. 1 wire cut. Any brick rejected by the Engineer as unsuitable shall be immediately removed from the site.

Brick used to bring STRUCTURE frames and grates to grade shall be installed with a minimum of one course and a maximum of three courses.

E. Vents:

Vents, when required by the Contract Drawings, shall be constructed of 4" diameter galvanized piping with threaded joints. The top of the vent shall have a minimum of 12 square inches of screened opening to permit air passage, and a cap to prevent extraneous material from entering the vent. The cap shall not interfere with the air passage. Vents shall be connected to appurtenances using a cast in wall pipe.

F. Concrete:

Concrete shall meet the requirements set forth below:

1. Aggregate: The aggregate shall conform to the Standard Specifications for Concrete Aggregates, ASTM Designation C-33, as revised.
 - (a) Sand shall be a medium sand with a fineness modulus of 2.60 - 2.90.
 - (b) Coarse aggregate shall not exceed 1-1/2 inches for mass concrete.
2. Cement: All cement shall be a Portland Cement conforming to the requirements of Standard Specifications of the American Society for Testing Materials, Designation C-150, as revised, Type II. An air entraining agent, approved by the Engineer, shall be used.
3. Proportioning Concrete:

Maximum Size Coarse Aggregate (Inches)	Air Content Percent by Volume
1-1/2, 2, or 2-1/2	5 +/-1
3/4 or 1	6 +/-1

The strength of the concrete shall be fixed in terms of water-cement ratio in accordance with trial batches of the materials to be used. All concrete placed under this Specification shall be mixed in the ratio not to exceed six (6) U.S. gallons of water per sack of cement, including surface water carried by the aggregate in each case. The Contractor shall determine the approximate amount of surface water contained in the aggregate, and make proper allowance. Concrete shall have a minimum 28 day strength of 3750 psi. The Contractor shall submit the proposed mix proportions to the Engineer for approval ten (10) days prior to placing concrete. Copies of recent test results for the proposed mix design shall also be submitted.

G. Insulation:

Insulation, when required by the Drawings or designed by the Engineer, shall be Styrofoam SM or TG as manufactured by the Dow Chemical Company or equal.

Material submitted shall have a K factor of .20 @ 75 degrees by ASTM C518-70, 2-1b. Density by ASTM C303-56, compressive strength of 30-1b. by ASTM D1621-64 and a water absorption of less than .05 ASTM C272-53 and meet Federal Specification HH1524B Type II, Class B.

The Contractor shall coat the insulation material in accordance with the manufacturer's instructions.

H. Bitumastic Coating:

Bitumastic coating, shall consist of two (2) coats of Mobil Corp. Coal Tar Coating or approved equal. The coating shall be used on the exterior of all sanitary appurtenances.

9.3 **INSTALLATION**

A. GENERAL:

All appurtenant structures shall be set level on compacted material as specified in Section 2 of these Specifications and as shown on the Plans.

B. MANHOLE CHANNELS:

Manhole channels shall be constructed in accordance with the details shown on the Plans. The channels and benching shall be epoxy coated concrete. Where changes in directions are made at manholes, the invert shall be shaped with as great a radius as possible, and to the complete satisfaction of the Engineer. Epoxy coated precast concrete channels shall be carefully laid to present a smooth surface as indicated on the Plans and to the satisfaction of the Engineer.

C. PIPE CONNECTIONS:

1. Stubs in Manholes: Stubs placed as specified and indicated on the Drawings shall be short pieces cut from the bell ends of appropriate pipe and shall have compatible watertight stoppers. Stubs shall be set accurately to be required line and elevation and encased in the structure masonry as indicated on the Drawings.
2. Wall Sleeves and Castings: Wall sleeves and castings as specified and indicated on the Drawings shall be accurately cast to the required location and elevations as indicated on the Drawings.

D. ALTERATIONS TO EXISTING MANHOLES AND CATCH BASINS:

Existing manholes and catch basins to be altered shall be reconstructed as indicated on the Plans or as directed by the Engineer. Adjusting to grade or connecting to an existing pipe stub is not considered an alteration.

Alterations covered include, but are not limited to, adjustments to manhole invert channel caused by new pipe connections or removal of existing pipe connections, and removal and plugging of existing catch basin lead and replacing with a new lead connection conforming to the appropriate section of the Specifications contained herein.

E. ADJUSTING EXISTING MANHOLES AND CATCH BASINS:

1. Existing manholes and catch basins to be adjusted to grade shall be reconstructed to the required grade. The existing frames, grates, and covers shall be re-used unless otherwise directed.
2. The existing structure shall be dismantled to a sufficient depth to allow reconstruction conforming to the standard details.
3. Adjustment will take place just prior to placing of surface pavement. Pavement which is removed for this adjustment shall be cut square, tack coated, and capped with bituminous concrete which matches the adjacent pavement thickness. No separate payment will be made for furnishing the bituminous cap.
4. Each structure that is adjusted shall be cleaned of accumulated silt, debris, or foreign matter prior to final acceptance of the work.

9.4 TESTING

A. All manholes and, at the option of the Engineer, wet wells and other appurtenant structures shall be tested as to water tightness. The Contractor has the option of either of the following methods:

1. Water Test: The inlet and outlet of the structure shall be plugged by watertight plugs furnished by the Contractor, and the manhole shall be filled with water. The water shall remain for sufficient time for the absorption into the concrete pipe to have been substantially completed. The amount of water loss from the manhole shall then be determined. The rate shall not exceed five (5) gallons per hour. Obvious leaks shall be repaired by the Contractor by excavating outside the structure, if required, at no cost to the Owner.
2. Vacuum: The manholes shall be vacuum tested by a method and apparatus subject to the prior approval of the Engineer. Vacuum testing shall be performed in the following manner:

The manhole shall be fully assembled, including all pipe connections into the structure. The manhole shall be in its final location and shall not have been backfilled prior to the performance of the test.

All lift holes shall be plugged with a non-shrinking mortar, as approved by the Engineer.

The seal between the manhole sections shall be in accordance with ASTM C923.

The Contractor shall plug the pipe openings, taking care to securely brace the plugs and the pipe.

With the vacuum tester set in place:

- Inflate the compression band to effect a seal between the vacuum base and the structure.
- Connect the vacuum pump to the outlet port with the valve open.
- Draw a vacuum to 10" of Hg. and close the valve.

The test shall pass if the vacuum remains at 10" Hg. or drops to 9" Hg. in a time greater than one minute. If the manhole fails the initial test, the Contractor shall locate the leak and make proper repairs. Leaks may be filled with a wet slurry of accepted quick setting material.

Any appurtenant structure which shows obvious infiltration, whether tested or not, shall be sealed to eliminate said infiltration

9.5 MEASUREMENT AND PAYMENT

Measurement and payment for the work of this section is defined in Section 10 of these Specifications.

END OF SECTION 9

SECTION 9B - GEOTECHNICAL INFORMATION

9B.1 SUMMARY OF WORK

9B.1.1 BACKGROUND INFORMATION

- A. Geotechnical investigations were undertaken within the project area for the Until gas main replacement project that will be undertaken in 2022. This information is appended to this section.
- B. Said subsurface investigations are not warranted to show the actual subsurface conditions except at the location of said test pits or investigations, and at these points are subject to inaccuracies inherent in methods used and to variations in the classification and interpretation of soil layers.
- C. Subsurface information is included only as an aid to the Bidder and it is the obligation of the Bidder to draw his own conclusions of subsurface conditions from his own investigations prior to submitting his proposal. The Contractor agrees, in signing his Contract, that he will make no claims against the Owner or Engineer, if in carrying out the work, he finds that the actual conditions encountered in performing the work do not conform to conditions presented, discussed, or anticipated prior to the commencement of work, the Contractor shall notify the Owner immediately of such differences in the conditions.

END OF SECTION 9B



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Via Email

May 24, 2019
File No. 04.0190821.05

Mr. David Hogue
Process Pipeline Services, Inc.
4 Broad Street
Plainville, Massachusetts 02762

RE: Geotechnical Data Report
Proposed Gas Pipeline
Gorham Road – Phase 2 (PPS Project Number 5297)
Scarborough, Maine

Dear Mr. Hogue:

This data report presents the results of the recent subsurface investigation completed by New England Boring Contractors, Inc. (NEBC), of Derry, New Hampshire, and logged by GZA GeoEnvironmental, Inc. (GZA) for the Gorham Road Proposed Pipeline (Phase 2) in Scarborough, Maine. GZA's work has been conducted in accordance with our revised proposal for services dated April 11, 2019. The contents of this report are subject to the *Limitations* set forth in **Appendix A**.

OBJECTIVES AND SCOPE OF SERVICES

GZA's objectives were to observe and log the drilling of test borings and provide a summary of subsurface conditions for use in the design and construction of the gas pipeline installation that is currently proposed. The site limits for the project are shown on **Figure 1, Locust Plan**. Test boring work, completed by NEBC, was coordinated and subcontracted directly through Process Pipeline Services, Inc. (PPS).

To meet these objectives, GZA completed the following Scope of Services:

- Observed and logged a subsurface exploration program consisting of 64 test borings (designated STK-GP1 to STK-GP113); and
- Prepared this memorandum summarizing our findings of subsurface conditions.

SUBSURFACE EXPLORATIONS

GZA observed the drilling of 64 test borings completed by NEBC between May 6 and May 10, 2019. The test borings were drilled and sampled to depths of approximately 4.7 to 8 feet below ground surface (bgs). Twenty-one of the 64 locations were



probed beyond 8 feet bgs using a 1-inch rod probe to refusal or to a maximum depth of 41 feet bgs. Test borings were drilled using a Geoprobe® drill rig, using 3.75-inch-inside-diameter casing and direct push techniques.

GZA personnel observed the drilling and prepared the attached **Table 1 – Boring Summary Table**. The 64 test borings were drilled at the locations shown the project utility location plans provided by PPS, dated May 1, 2019, included in **Appendix B**. Boring locations were surveyed and marked in the field by TF Moran of Bedford, New Hampshire on April 17, 2019. As-drilled locations, if off-set from the proposed surveyed location, were determined at the time of drilling using tape-tie measurements from prominent site features and are noted in both the attached figures and summary table, where applicable. Ground surface elevations at each location were surveyed by TF Moran, as shown in the project plans included in **Appendix B**. Ground surface elevations of off-set boring locations were estimated by interpolating from the existing topography shown on the project plans included in **Appendix B**.

GENERAL GEOLOGIC REVIEW

Subsurface conditions in the vicinity of the site are mapped¹ as alluvium and swamp deposits. Alluvium deposits are described as coarse to fine alluvial sand in high terraces and overlying Presumpscot Formation clays, north and south of the Nonesuch River. Generally, the alluvial sands mapped in the vicinity of the site are less than 10 feet in thickness. Swamp deposits are described as having no peat present and are distinguished from other wetlands by the presence of trees. Swamp areas are generally mapped in the immediate vicinity of the Nonesuch River.

The Presumpscot Formation consists of massive to laminated silty clays overlying glacial till and bedrock. Bedrock in the vicinity of the site is mapped² as the Cape Elizabeth Formation and the Sprint Point Formation. The Cape Elizabeth Formation is described as black to grey, laminated meta-shale and meta-siltstone. The Spring Point Formation is described as green phyllite, amphibolite and quartzo-feldspathic gneiss.

SUBSURFACE CONDITIONS

Three soil units were encountered in the test borings: roadway sub-base Sand, Silty Sand, and Silty Clay to Clay & Silt. The approximate thicknesses and generalized descriptions of the subsurface units encountered at each test boring location are presented in **Table 1**, in descending order from existing ground surface. Depths to free water, wet samples, and refusal, if encountered, are also presented in **Table 1** for each location.

Groundwater levels (free water) were measured at each boring location with a water level-indicator upon completion of drilling and do not represent stabilized groundwater levels. The groundwater observations were made at the times and under the conditions stated in the boring summary table. Fluctuations in groundwater levels will occur due to variations in season, precipitation, and other factors. Consequently, water levels during and after construction are likely to vary from those encountered in the borings at the time the observations were made.

¹ Maine Geological Survey Map of the Prouts Neck Quadrangle in Maine, OFR, 99-97, J. Clinch and W. Thompson, 1999.

² Bedrock Geologic Map of Maine, P. Osberg, A. Hussey II, and G. Boone, 1985.



CLOSING

We appreciate the opportunity to work with you on this project. Should you have any questions regarding the data contained in this report or require additional information, please contact us.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

A handwritten signature in black ink, appearing to read 'J. Baron'.

Jennifer R. Baron, P.E.
Project Manager

A handwritten signature in black ink, appearing to read 'David G. Lamothe'.

David G. Lamothe
Associate Principal

A handwritten signature in black ink, appearing to read 'Christopher L. Snow'.

Christopher L. Snow, P.E.
Consultant/Reviewer

JRB/DGL/CLS:jrb

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Attachments: Table 1 – Boring Summary Table
Appendix A – Limitations
Appendix B – Boring Location Plans



Table

TABLE 1 - BORING SUMMARY TABLE														
Proposed Gas Pipeline, Gorham Road - Phase 2, Scarborough, Maine														
PPS Project Number 5297														
May 24, 2019														
Exploration ID	As-Drilled Station	Northing	Easting	Ground Surface Elev. (ft)	Free Water Depth ¹ (ft)	Free Water Elev. ¹ (ft)	Wet Soil Depth ² (ft)	Wet Soil Elev. ² (ft)	Bottom of Exploration Depth (ft)	Bottom of Exploration Elev. (ft)	Refusal Depth (ft)	Refusal Elev. (ft)	Soil Descriptions ³	Notes
STK-GP1	19+00	284311.47	2906581.05	30.6	8.0	22.6	2.7	27.9	8.0	22.6	NE	-	0.0-1.0 Asphalt 1.0-2.7 Brown, fine to coarse SAND, little Silt (SM), dry 2.7-5.0 Grey-brown, SILT, little Gravel, trace fine to medium Sand (ML), wet 5.0-8.0 Grey Silty CLAY (ML-CL), wet	
STK-GP2	19+25	284287.06	2906585.32	31.6	ND	-	NE	-	8.0	23.6	NE	-	0.0-1.0 Asphalt 1.0-2.7 Brown, fine to coarse SAND, little Silt, trace Gravel (SM), moist 2.0-8.0 Grey-Brown Silty CLAY (ML-CL), moist	
STK-GP3	19+50	284262.35	2906590.13	32.6	ND	-	5.0	27.6	8.0	24.6	NE	-	0.0-9.0 Asphalt 0.9-2.7 Brown, fine to coarse SAND, little Silt, trace Gravel (SM), dry 2.7-8.0 Brown, fine to coarse SAND and Silt, trace Gravel (SM), moist to wet	
STK-GP4	19+75	284237.93	2906595.08	33.3	ND	-	6.0	27.3	8.0	25.3	NE	-	0.0-1.1 Asphalt 1.1-2.7 Brown, fine to coarse SAND, little Silt, trace Gravel (SM), moist 2.7-8.0 Brown, fine to coarse SAND and Silt (SM), moist to wet	
STK-GP5	20+00	284213.38	2906599.91	33.5	ND	-	6.0	27.5	8.0	25.5	NE	-	0.0-1.1 Asphalt 1.3-2.7 Brown, fine to medium SAND, little Gravel (SP), dry 2.7-8.0 Brown, fine to coarse SAND and Silt, trace Gravel (SM), moist to wet	
STK-GP6	20+25	284189.03	2906604.96	33.7	7.3	26.4	6.0	27.7	8.0	25.7	NE	-	0.0-1.2 Asphalt 1.2-2.2 Brown, fine to medium SAND, little Silt (SM), dry 2.2-8 Brown, fine to coarse SAND and Silt, trace Gravel (SM), moist to wet	
STK-GP7	20+50	284164.92	2906610.51	33.6	ND	-	NE	-	8.0	25.6	NE	-	0.0-1.0 Apshalt 1.0-2.4 Brown, fine to medium SAND, trace Gravel (SP), dry 2.4-3.9 Brown, fine SAND, little Silt, trace Gravel (SM), moist 3.9-8.0 Grey, Silty CLAY to CLAY & SILT (ML-CL), moist	
STK-GP8	20+75	284140.11	2906615.55	33.3	3.9	29.4	3.9	29.4	8.0	25.3	NE	-	0.0-1.1 Asphalt 1.1-2.9 Brown, fine to coarse SAND, little Silt, trace Gravel (SM), dry 2.9-8.0 Brown, Silty CLAY to CLAY & SILT, moist to wet	
STK-GP9	21+08	284116.20	2906621.03	33.1	ND	-	3.5	29.6	8.0	25.1	NE	-	0.0-1.5 Asphalt 1.5-2.6 Brown, fine to coarse SAND, little Silt, trace Gravel (SM), dry 2.6-3.5 Orange, fine to medium SAND, little Silt, trace Gravel (SM), moist 3.5-8.0 Grey, Silty CLAY to CLAY & SILT (ML-CL), wet	Boring offset 8 ft to the south
STK-GP10	21+25	284091.55	2906626.62	32.6	ND	-	NE	-	8.0	24.6	NE	-	0.0-1.5 Asphalt 1.5-2.5 Brown, fine to coarse SAND, little Silt, trace Gravel (SM), dry 2.5-3.5 Orange, fine SAND, little Silt, trace Gravel (SM), moist 3.5-8.0 Grey, Silty CLAY to CLAY & SILT (ML-CL), moist	
STK-GP11	21+50	284066.92	2906632.37	32.5	ND	-	NE	-	8.0	24.5	NE	-	0.0-1.6 Asphalt 1.6-2.7 Brown, fine to coarse SAND, little Silt, trace Gravel (SM), dry 2.7-3.5 Grey, fine SAND, trace Silt (SM), moist 3.5-8 Grey, Silty CLAY to CLAY & SILT (ML-CL), moist	
STK-GP12	21+75	284042.75	2906637.99	32.1	ND	-	NE	-	8.0	24.1	NE	-	0.0-1.6 Asphalt 1.6-2.9 Brown, fine to coarse SAND, little Gravel, little Silt (SM), moist 2.9-5.0 Brown, fine SAND, trace Silt (SP), moist 5.0-8.0 Grey, Silty CLAY to CLAY & SILT (ML-CL), moist	
STK-GP13	22+00	284018.33	2906643.24	31.9	4.8	27.1	4.0	27.9	8.0	23.9	NE	-	0.0-1.6 Asphalt 1.6-3.0 Brown, fine to coarse SAND, little Gravel, little Silt (SM), moist 3.0-3.8 Brown-orange, fine SAND, trace Silt (SP), moist 3.8-8.0 Grey, Silty CLAY to CLAY & SILT (ML-CL), moist to wet	
STK-GP14	22+20	283993.93	2906648.96	31.7	3.3	28.4	3.3	28.4	8.0	23.7	NE	-	0.0-1.4 Asphalt 1.4-2.7 Brown, fine to coarse SAND, little Gravel, little Silt (SM), moist 2.7-3.3 Brown-orange, fine SAND, trace Silt, trace Gravel (SP), moist 3.3-8.0 Brown, fine to coarse SAND and Silt (SM), wet	Boring offset 5.0 ft. to the north
STK-GP15	22+50	283969.45	2906654.38	31.5	4.0	27.5	4.0	27.5	8.0	23.5	NE	-	0.0-1.6 Asphalt 1.6-2.8 Brown, fine to coarse SAND, little Gravel, little Silt (SM), moist 2.8-5.8 Brown, fine to coarse SAND, trace Silt, trace Gravel (SP), moist to wet 5.8-8.0 Grey, Silty CLAY to CLAY & SILT (ML-CL), wet	
STK-GP16	22+75	283945.21	2906660.14	31.5	ND	-	NE	-	8	23.5	NE	-	0.0-1.5 Asphalt 1.5-2.6 Brown, fine to coarse SAND, little Gravel, little Silt (SM), dry 2.6-6.0 Brown-orange, fine to medium SAND, trace Silt (SP), moist 6.0-8.0 Grey, Silty CLAY to CLAY & SILT (ML-CL), moist	
STK-GP17	23+00	283920.75	2906665.95	31.3	ND	-	NE	-	10.0	21.3	10.0	21.3	0.0-1.2 Asphalt 1.2-3.0 Brown, fine to coarse SAND, little Gravel, little Silt (SM), dry 3.0-6.0 Brown, fine to medium SAND, trace Silt, trace Gravel (SP), moist 6.0-8.0 Grey, Silty CLAY to CLAY & SILT, trace fine Sand (ML-CL), moist	Geoprobe driven to 8.0 feet bgs; advanced 1-in. rod driven to refusal.

Exploration ID	As-Drilled Station	Northing	Easting	Ground Surface Elev. (ft)	Free Water Depth ¹ (ft)	Free Water Elev. ¹ (ft)	Wet Soil Depth ² (ft)	Wet Soil Elev. ² (ft)	Bottom of Exploration Depth (ft)	Bottom of Exploration Elev. (ft)	Refusal Depth (ft)	Refusal Elev. (ft)	Soil Descriptions ³	Notes
STK-GP18	23+25	283896.43	2906672.52	31.2	ND	-	NE	-	4.8	26.4	4.8	26.4	0.0-1.4 Asphalt 1.4-3.0 Brown, fine to coarse SAND, little Gravel, little Silt (SM), dry 3.0-4.8 Brown-orange, fine SAND, trace Silt, trace Gravel (SP), moist	
STK-GP19	23+50	283872.78	2906679.22	31.1	ND	-	NE	-	5.5	25.6	5.5	25.6	0.0-1.5 Asphalt 1.5-3.7 Brown, fine to coarse SAND, little Gravel, little Silt (SM), dry 3.7-5.5 Grey, GRAVEL, some fine to coarse Sand (GP), dry	Gravel appears to be weathered bedrock
STK-GP20	23+75	283848.69	2906686.17	30.7	ND	-	NE	-	4.8	25.9	4.8	25.9	0.0-1.0 Asphalt 1.0-3.5 Brown, fine to coarse SAND, little Gravel, little Silt (SM), dry 3.5-4.8 Grey, GRAVEL, some fine to coarse Sand (GP), dry	Gravel appears to be weathered bedrock
STK-GP21	24+00	283824.70	2906692.95	30.0	ND	-	NE	-	4.7	25.3	4.7	25.3	0.0-1.8 Asphalt 1.8-2.5 Brown, fine to coarse SAND, little Gravel, little Silt (SM), dry 2.5-4.7 Grey, GRAVEL, some fine to coarse Sand (GP), dry	Gravel appears to be weathered bedrock
STK-GP22	24+25	283800.92	2906700.41	29.0	4.3	24.7	4.0	25.0	7.0	22.0	7.0	22.0	0.0-2.2 Asphalt 2.2-3.6 Brown, fine to coarse SAND, little Gravel, little Silt (SM), dry 3.6-7.0 Grey, GRAVEL and fine Sand (GP-SP), moist to wet	
STK-GP23	24+50	283777.00	2906707.98	28.4	3.9	24.5	3.9	24.5	9.3	19.1	9.3	19.1	0.0-2.2 Asphalt 2.2-5.0 Brown-orange, fine to coarse SAND, little Gravel, little to trace Silt (SM), moist to wet 5.0-8.0 Brown, fine to coarse SAND and Silt, little Gravel (SM), wet	Geoprobe drilled to 8.0 feet bgs; weathered rock observed at sampler tip. Advanced 1-in. rod driven to refusal.
STK-GP24	24+75	283752.63	2906714.61	27.8	ND	-	NE	-	6.4	21.4	6.4	21.4	0.0-2.2 Asphalt 2.2-6.4 Brown, fine to coarse SAND, some to little Gravel, some Silt (SM), dry to moist	Gravel at 6.4 ft. appears to be weathered rock
STK-GP25	25+01	283729.20	2906722.97	27.5	4.0	23.5	-	-	10.0	17.5	10.0	17.5	0.0-2.0 Asphalt 2.0-5.0 No Recovery 5.0-8.0 Brown, fine to medium SAND, trace Silt (SP), wet	Geoprobe inner tube lodged into casing; no recovery between 2-5 ft. Geoprobe drilled to 8.0 feet bgs; advanced 1-in. rod driven to refusal.
STK-GP26	25+25	283705.57	2906730.83	27.3	4.2	23.1	4.2	23.1	8.0	19.3	NE	-	0.0-1.7 Asphalt 1.7-2.8 Brown, fine to coarse SAND, little Gravel, little Silt (SM), moist 2.8-8.0 Grey, fine to medium SAND and Silt, moist to wet (organic soil layer from 7.0-7.5)	
STK-GP27	25+51	283681.60	2906738.78	27.5	7.0	20.5	7.0	20.5	7.5	20.0	7.5	20.0	0.0-2.3 Asphalt 2.3-3.3 Brown, fine to medium Sand, trace Silt, trace Gravel (SP), moist 3.3-5.0 Grey, Silty CLAY <u>to</u> CLAY & SILT, moist 5.0-7.5 Grey, fine to coarse SAND, some Gravel, little Silt (SM), moist to wet	Boring offset 1 ft. to the south. Weathered rock observed between 5.0 and 7.5 feet.
STK-GP28	25+75	283658.01	2906746.35	27.5	4.6	22.9	4.6	22.9	8.0	19.5	NE	-	0.0-2.6 Asphalt 2.6-5.0 Brown, fine to coarse SAND, little Gravel, little Silt (SM), moist to wet 5.0-7.8 Grey, Silty CLAY <u>to</u> CLAY & SILT (ML-CL), wet 7.8-8.0 Brown, medium to coarse SAND (SP), wood fragments, wet	
STK-GP29	26+00	283634.30	2906753.95	27.6	-	-	-	-	-	-	-	-	Not drilled	
STK-GP30	26+25	283610.04	2906761.69	27.9	-	-	-	-	-	-	-	-	Not drilled	
STK-GP31	26+50	283586.75	2906769.52	28.3	ND	-	3.2	25.1	8.0	20.3	NE	-	0.0-1.9 Asphalt 1.9-3.2 Brown, fine to coarse SAND, little Gravel, little Silt (SM), dry 3.2-8.0 Grey, Silty CLAY <u>to</u> CLAY & SILT, trace Gravel (ML-CL), wet	
STK-GP32	26+75	283562.76	2906777.28	28.7	-	-	-	-	-	-	-	-	Not drilled	
STK-GP33	27+00	283538.87	2906783.77	29.3	4.0	25.3	4.0	25.3	12.5	16.8	12.5	16.8	0.0-2.4 Asphalt 2.4-5.0 Brown, fine to medium SAND, little Silt (SM), moist to wet 5.0-8.0 Grey, Silty CLAY <u>to</u> CLAY & SILT, some fine Sand (ML-CL), wet	Geoprobe drilled to 8.0 feet bgs; Advanced 1-in. rod driven to refusal.
STK-GP34	27+25	283514.65	2906790.57	30.0	-	-	-	-	-	-	-	-	Not drilled	
STK-GP35	27+50	283490.49	2906797.93	30.9	6.5	24.4	5.0	25.9	8.0	22.9	NE	-	0.0-1.5 Asphalt 1.5-2.5 Brown, fine to coarse SAND, little Gravel, little Silt (SM), dry 2.5-8.0 Brown, fine to medium SAND, some Silt (SM), moist to wet	
STK-GP36	27+75	283466.54	2906805.15	31.9	-	-	-	-	-	-	-	-	Not drilled	
STK-GP37	28+00	283442.47	2906812.11	33.3	ND	-	4.0	29.3	19.0	14.3	19.0	14.3	0.0-2.4 Asphalt 2.4-4.5 Brown, fine to coarse SAND, some Silt (SM), dry to moist 4.5-8.0 Grey, Silty CLAY <u>to</u> CLAY & SILT, some fine Sand, trace Gravel (ML-CL), wet	Geoprobe drilled to 8.0 feet bgs; Advanced 1-in. rod driven to refusal.
STK-GP38	28+25	283418.74	2906818.36	34.4	-	-	-	-	-	-	-	-	Not drilled	
STK-GP39	28+50	283394.35	2906825.43	41.6	ND	-	NE	-	8.0	33.6	NE	-	0.0-2.0 Asphalt 2.0-3.0 Brown, fine to coarse SAND, little Gravel, little Silt (SM), dry to moist 3.0-8.0 Grey, Silty CLAY <u>to</u> CLAY & SILT, trace Gravel (ML-CL), moist	
STK-GP40	28+75	283370.08	2906831.89	43.1	-	-	-	-	-	-	-	-	Not drilled	
STK-GP41	29+00	283346.33	2906838.94	44.6	5.0	39.6	5.0	39.6	23.5	21.1	23.5	21.1	0.0-2.2 Asphalt 2.2-3.0 Brown, fine to coarse SAND, little Gravel, little Silt (SM), moist 3.0-8.0 Grey, Silty CLAY <u>to</u> CLAY & SILT, trace fine Sand lenses/seams (ML-CL), moist to wet	Geoprobe drilled to 8.0 feet bgs; Advanced 1-in. rod driven to refusal.
STK-GP42	29+25	283322.43	2906845.93	46.3	-	-	-	-	-	-	-	-	Not drilled	
STK-GP43	29+50	283298.21	2906852.66	48.2	ND	-	NE	-	8.0	40.2	NE	-	0.0-2.0 Asphalt 2.0-8.0 Grey, Silty CLAY <u>to</u> CLAY & SILT, trace Gravel (ML-CL), moist	
STK-GP44	29+75	283274.11	2906859.85	50.1	-	-	-	-	-	-	-	-	Not drilled	

TABLE 1 - BORING SUMMARY TABLE Proposed Gas Pipeline, Gorham Road - Phase 2, Scarborough, Maine PPS Project Number 5297 May 24, 2019														
Exploration ID	As-Drilled Station	Northing	Easting	Ground Surface Elev. (ft)	Free Water Depth ¹ (ft)	Free Water Elev. ¹ (ft)	Wet Soil Depth ² (ft)	Wet Soil Elev. ² (ft)	Bottom of Exploration Depth (ft)	Bottom of Exploration Elev. (ft)	Refusal Depth (ft)	Refusal Elev. (ft)	Soil Descriptions ³	Notes
STK-GP45	30+00	283250.06	2906866.79	51.9	-	-	-	-	-	-	-	-	Not drilled	
STK-GP46	30+25	283226.14	2906873.64	53.4	-	-	-	-	-	-	-	-	Not drilled	
STK-GP47	30+50	-	-	49.0 (Est.)	ND	-	NE	-	8.0	41.0 (Est.)	NE	-	0.0-1.8 Asphalt 1.8-2.2 Brown, fine to coarse SAND, little Gravel, little Silt (SM), moist 2.2-8.0 Dark grey, Silty CLAY <u>to</u> CLAY & SILT, trace Gravel (ML-CL), moist	
STK-GP48	30+75	283178.69	2906888.51	49.8	-	-	-	-	-	-	-	-	Not drilled	
STK-GP49	31+00	283154.88	2906896.47	50.1	7.7	42.5	7.7	42.4	38.5	11.6	38.5	11.6	0.0-2.0 Asphalt 2.0-3.0 Brown, fine to coarse SAND, little Gravel, little Silt (SM), moist 3.0-4.0 Black, SILT and Sand, trace roots (ML-SP), moist 4.0-8.0 Grey, Silty CLAY <u>to</u> CLAY & SILT, moist to wet	Geoprobe drilled to 8.0 feet bgs; Advanced 1-in. rod driven to refusal.
STK-GP50	31+25	283131.01	2906904.24	50.5	-	-	-	-	-	-	-	-	Not drilled	
STK-GP51	31+50	283107.86	2906913.00	50.5	ND	-	3.1	47.4	8.0	42.5	NE	-	0.0-1.8 Asphalt 1.8-2.4 Brown, fine to coarse SAND, little Gravel, little Silt (SM), moist 2.4-3.7 Black, fine to coarse SAND and Silt (SM), wet 3.7-8.0 Grey, Silty CLAY <u>to</u> CLAY & SILT, trace Gravel (ML-CL), moist	Organic odor at approximately 2.4 ft.
STK-GP52	31+75	283084.46	2906921.19	50.8	-	-	-	-	-	-	-	-	Not drilled	
STK-GP53	32+00	283060.48	2906929.17	50.9	ND	-	2.5	48.4	41.0	9.9	NE	-	0.0-1.5 Asphalt 1.5-2.5 Brown, fine to coarse SAND, little Gravel, little Silt (SM), dry 2.5-3.0 Black, fine to coarse SAND and Silt, trace roots (SM), wet 3.0-8.0 Grey, Silty CLAY <u>to</u> CLAY & SILT (ML-CL), moist	Geoprobe drilled to 8.0 feet bgs; Advanced 1-in. rod driven to 41.0 ft (no refusal).
STK-GP54	32+25	283036.52	2906937.25	51.1	-	-	-	-	-	-	-	-	Not drilled	
STK-GP55	32+50	283012.88	2906944.92	51.2	ND	-	3.3	47.9	8.0	43.2	NE	-	0.0-2.1 Asphalt 2.1-2.7 Brown, fine to coarse SAND, little Gravel, little Silt (SM), moist 2.7-3.3 Brown-grey, fine to coarse SAND and Silt (SM), moist 3.3-3.8 Black, fine to medium SAND, trace Silt (SP), wet 3.8-8.0 Grey, Silty CLAY <u>to</u> CLAY & SILT, trace Gravel (ML-CL), moist	Organic odor at approximately 2.7 ft.
STK-GP56	32+75	282989.19	2906952.42	51.2	-	-	-	-	-	-	-	-	Not drilled	
STK-GP57	33+00	282965.36	2906959.71	51.2	ND	-	4.0	47.2	41.0	10.2	NE	-	0.0-2.0 Asphalt 2.0-4.5 Brown, fine to coarse SAND, little Gravel, little Silt (SM), moist 4.5-8.0 Grey, Silty CLAY <u>to</u> CLAY & SILT (ML-CL), moist to wet	Geoprobe drilled to 8.0 feet bgs; Advanced 1-in. rod driven to 41.0 ft (no refusal).
STK-GP58	33+25	282941.56	2906966.66	50.9	-	-	-	-	-	-	-	-	Not drilled	
STK-GP59	33+50	282917.31	2906973.84	50.6	ND	-	NE	-	8.0	42.6	NE	-	0.0-1.3 Asphalt 1.3-1.8 Brown, fine to coarse SAND, little Gravel, little Silt (SM), dry 1.8-2.6 Grey, fine to medium SAND and Silt, trace roots (SM), moist 2.6-3.1 Brown, fine to coarse SAND, trace Silt (SW), moist 3.1-8.0 Grey, Silty CLAY <u>to</u> CLAY & SILT, trace Gravel (ML-CL), moist	Organic odor at approximately 1.8 ft.
STK-GP60	33+75	282892.74	2906980.43	50.3	-	-	-	-	-	-	-	-	Not drilled	
STK-GP61	34+00	282869.11	2906987.06	50.0	ND	-	NE	-	39.5	10.5	39.5	10.5	0.0-1.5 Asphalt 1.5-2.5 Brown, fine to coarse SAND, little Gravel, little Silt (SM), moist 2.5-8.0 Brown-orange, Silty CLAY <u>to</u> CLAY & SILT (ML-CL), moist	Geoprobe drilled to 8.0 feet bgs; Advanced 1-in. rod driven to refusal.
STK-GP62	34+25	282844.61	2906993.58	49.8	-	-	-	-	-	-	-	-	Not drilled	
STK-GP63	34+50	282820.78	2906999.36	49.7	ND	-	NE	-	8.0	41.7	NE	-	0.0-2.0 Asphalt 2.0-3.0 Brown, fine to coarse SAND, little Gravel, little Silt (SM), moist 3.0-5.0 Grey-brown, fine to coarse SAND, little Silt (SM), moist 5.0-8.0 Brown, fine to medium SAND and Silt, trace wood, moist	Organic odor at approximately 5.0 ft.
STK-GP64	34+75	282796.17	2907005.07	49.8	-	-	-	-	-	-	-	-	Not drilled	
STK-GP65	35+00	282771.96	2907011.05	50.0	ND	-	NE	-	41.0	9.0	NE	-	0.0-2.0 Asphalt 2.0-3.0 Brown, fine to coarse SAND, little Gravel, little Silt (SM), moist 3.0-4.0 Grey, fine to coarse SAND and Silt, trace Gravel (SM), moist 4.0-8.0 Grey, Silty CLAY <u>to</u> CLAY & SILT (ML-CL), moist	Geoprobe drilled to 8.0 feet bgs; Advanced 1-in. rod driven to 41.0 ft (no refusal).
STK-GP66	35+25	282747.24	2907016.45	50.2	-	-	-	-	-	-	-	-	Not drilled	
STK-GP67	35+50	282723.21	2907021.48	50.7	ND	-	ND	-	8.0	42.7	NE	-	0.0-1.8 Asphalt 1.8-2.4 Brown, fine to coarse SAND, little Gravel, little Silt (SM), moist 2.4-8.0 Grey-brown, Silty CLAY <u>to</u> CLAY & SILT, trace Gravel (ML-CL), moist	
STK-GP68	35+75	282698.62	2907027.24	51.4	-	-	-	-	-	-	-	-	Not drilled	
STK-GP69	36+00	282674.55	2907032.65	51.9	ND	-	NE	-	41.0	10.9	NE	-	0.0-2.0 Asphalt 2.0-3.0 Brown, fine to coarse SAND, little Gravel, little Silt (SM), moist 3.0-4.0 Grey, fine to coarse SAND and Silt, trace Gravel (SM), moist 4.0-8.0 Grey, Silty CLAY <u>to</u> CLAY & SILT, trace Gravel (ML-CL), moist	Geoprobe drilled to 8.0 feet bgs; Advanced 1-in. rod driven to 41.0 ft (no refusal).
STK-GP70	36+25	282650.19	2907038.10	52.5	-	-	-	-	-	-	-	-	Not drilled	
STK-GP71	36+50	282625.30	2907043.32	52.9	ND	-	NE	-	8.0	44.9	NE	-	0.0-1.2 Asphalt 1.2-2.0 Brown, fine to coarse SAND, little Gravel, little Silt (SM), moist 2.0-2.4 Grey-brown, fine to medium SAND and Silt, trace Gravel, trace wood (SM), moist 2.4-5.0 Brown, fine to coarse SAND, trace Silt (SP), moist 5.0-8.0 Gray, Silty CLAY <u>to</u> CLAY & SILT, trace Gravel (ML-CL), moist	Organic odor at approximately 2.0 ft.

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TABLE 1 - BORING SUMMARY TABLE														
Proposed Gas Pipeline, Gorham Road - Phase 2, Scarborough, Maine														
PPS Project Number 5297														
May 24, 2019														
Exploration ID	As-Drilled Station	Northing	Easting	Ground Surface Elev. (ft)	Free Water Depth ¹ (ft)	Free Water Elev. ¹ (ft)	Wet Soil Depth ² (ft)	Wet Soil Elev. ² (ft)	Bottom of Exploration Depth (ft)	Bottom of Exploration Elev. (ft)	Refusal Depth (ft)	Refusal Elev. (ft)	Soil Descriptions ³	Notes
STK-GP95	42+50	282035.03	2907149.20	56.5	2.8	53.7	2.8	53.7	8.0	48.5	NE	-	0.0-1.2 Asphalt 1.2-1.7 Brown, fine to coarse SAND, little Gravel, little Silt (SM), moist 1.7-2.8 Black, fine to medium SAND and Silt, trace roots (SM), moist 2.8-6.0 Brown, fine to coarse SAND, trace Silt (SP), wet 6.0-8.0 Gray, Silty CLAY <u>to</u> CLAY & SILT, trace Gravel (ML-CL), wet	
STK-GP96	42+75	282010.12	2907152.80	56.8	-	-	-	-	-	-	-	-	Not drilled	
STK-GP97	43+00	281985.43	2907156.55	57.3	ND	-	5.0	52.3	14.2	43.1	14.2	43.1	0.0-1.7 Asphalt 1.7-2.2 Brown, fine to coarse SAND, little Gravel, little Silt (SM), moist 2.2-7.2 Black, fine to medium SAND and Silt, trace roots (SM), moist to wet 7.2-8.0 Grey, Silty CLAY <u>to</u> CLAY & SILT, trace Gravel (ML-CL), moist	Organic odor at approximately 2.2 to 7.2 ft. Geoprobe drilled to 8.0 feet bgs; Advanced 1-in. rod driven to refusal.
STK-GP98	43+25	281961.02	2907160.69	57.7	-	-	-	-	-	-	-	-	Not drilled	
STK-GP99	43+50	281936.31	2907164.74	58.2	1.2	57.0	1.2	57.0	10.0	48.2	NE	-	0.0-1.2 Asphalt 1.2-2.0 Brown, fine to coarse SAND, little Gravel, little Silt (SM), wet 2.0-2.8 Black, fine to coarse SAND, trace Silt, trace wood (SP), wet 2.8-6.5 Brown-orange, fine to medium SAND, trace Silt (SP), wet 6.5-10.0 Gray, Silty CLAY <u>to</u> CLAY & SILT, trace Gravel (ML-CL), wet	Organic odor at approximately 2.2 to 2.8 ft.
STK-GP100	43+75	281911.65	2907169.54	58.7	-	-	-	-	-	-	-	-	Not drilled	
STK-GP101	44+00	281887.37	2907174.16	59.3	ND	-	5.0	54.3	11.5	47.8	11.5	47.8	0.0-1.8 Asphalt 1.8-2.2 Brown, fine to coarse SAND, little Gravel, little Silt (SM), moist 2.2-3.0 Black, fine to medium SAND and Silt, trace roots (SM), moist 3.0-6.8 Brown, fine to medium SAND, trace Silt (SP), moist to wet 6.8-8.0 Grey, Silty CLAY <u>to</u> CLAY & SILT, trace Gravel (ML-CL), wet	Organic odor at approximately 2.2 to 3.0 ft. Geoprobe drilled to 8.0 feet bgs; Advanced 1-in. rod driven to refusal.
STK-GP102	44+25	281862.39	2907178.36	59.9	-	-	-	-	-	-	-	-	Not drilled	
STK-GP103	44+50	281838.05	2907183.58	60.5	ND	-	5.0	55.5	7.4	53.1	7.4	53.1	0.0-1.1 Asphalt 1.1-2.0 Brown, fine to coarse SAND, little Gravel, little Silt (SM), moist 2.0-3.5 Brown, fine to coarse SAND, trace Silt (SP), moist to wet 3.5-7.4 Brown, fine to coarse SAND and Silt, trace Gravel (SM), wet	
STK-GP104	44+75	281813.40	2907187.85	61.3	-	-	-	-	-	-	-	-	Not drilled	
STK-GP105	45+00	281788.90	2907192.58	62.0	4.2	57.8	5.8	56.2	7.0	55.0	7.0	62.0	0.0-1.8 Asphalt 1.8-2.5 Brown, fine to coarse SAND, little Gravel, little Silt (SM), moist 2.5-7.0 Black, fine to coarse SAND and Silt (SM), moist to wet	
STK-GP106	45+25	281764.25	2907197.56	62.8	-	-	-	-	-	-	-	-	Not drilled	
STK-GP107	45+50	281739.89	2907203.44	64.2	ND	-	NE	-	7.8	56.4	7.8	64.2	0.0-1.5 Asphalt 1.5-2.8 Brown, fine to coarse SAND, little Gravel, little Silt (SM), moist 2.8-7.8 Brown, fine to coarse SAND and Silt, trace Gravel (SM), moist	
STK-GP108	45+75	281715.88	2907209.57	64.2	-	-	-	-	-	-	-	-	Not drilled	
STK-GP109	46+00	281691.74	2907216.09	64.8	ND	-	5.0	59.8	8.0	56.8	NE	-	0.0-1.7 Asphalt 1.7-6.0 Brown, fine to coarse SAND, little Gravel, little Silt (SM), moist to wet 6.0-8.0 Gray, Silty CLAY <u>to</u> CLAY & SILT, trace Gravel (ML-CL), wet	
STK-GP110	46+25	281667.42	2907223.30	65.3	-	-	-	-	-	-	-	-	Not drilled	
STK-GP111	46+50	281643.95	2907231.50	65.2	ND	-	NE	-	8.0	57.2	NE	-	0.0-1.0 Asphalt 1.0-1.7 Brown, fine to coarse SAND, little Gravel, little Silt (SM), moist 1.7-8.0 Brown, fine to coarse SAND and Silt, trace Gravel (SM), moist	
STK-GP112	46+75	281620.31	2907239.40	65.2	-	-	-	-	-	-	-	-	Not drilled	
STK-GP113	47+00, RT 1	281596.80	2907247.93	65.2	ND	-	7.6	57.6	11.5	53.7	11.5	65.2	0.0-1.5 Asphalt 1.5-2.0 Brown, fine to coarse SAND, little Gravel, little Silt (SM), moist 2.0-7.6 Brown, fine to coarse SAND and Silt, trace Gravel (SM), moist 7.6-8.0 Gray, GRAVEL, wet	Gravel appears to be weathered bedrock. Boring offset 1 ft. west.
STK-GP114	47+25	281573.41	2907256.20	65.2	-	-	-	-	-	-	-	-	Not drilled	
STK-GP115	47+50	281549.70	2907263.76	65.2	-	-	-	-	-	-	-	-	Not drilled	

Notes:

1. ND - indicates free water was not detected. Free water was measured using a water level indicator at the completion of drilling.

2. NE - indicates wet samples were not encountered. Depth to wet soils based on visual observations at the time of drilling and is not necessarily representative of groundwater levels.

3. Soils classified by GZA using visual-manual methods using the Modified Burmister soil classification system. The Unified Soil Classification System classification symbol is included in parenthesis for each stratum.



Appendix A – Limitations



USE OF REPORT

1. GZA GeoEnvironmental, Inc. (GZA) prepared this report on behalf of, and for the exclusive use of our Client for the stated purpose(s) and location(s) identified in the Proposal for Services and/or Report. Use of this report, in whole or in part, at other locations, or for other purposes, may lead to inappropriate conclusions; and we do not accept any responsibility for the consequences of such use(s). Further, reliance by any party not expressly identified in the contract documents, for any use, without our prior written permission, shall be at that party's sole risk, and without any liability to GZA.

STANDARD OF CARE

2. GZA's findings and conclusions are based on the work conducted as part of the Scope of Services set forth in Proposal for Services and/or Report, and reflect our professional judgment. These findings and conclusions must be considered not as scientific or engineering certainties, but rather as our professional opinions concerning the limited data gathered during the course of our work. If conditions other than those described in this report are found at the subject location(s), or the design has been altered in any way, GZA shall be so notified and afforded the opportunity to revise the report, as appropriate, to reflect the unanticipated changed conditions .
3. GZA's services were performed using the degree of skill and care ordinarily exercised by qualified professionals performing the same type of services, at the same time, under similar conditions, at the same or a similar property. No warranty, expressed or implied, is made.
4. In conducting our work, GZA relied upon certain information made available by public agencies, Client and/or others. GZA did not attempt to independently verify the accuracy or completeness of that information. Inconsistencies in this information which we have noted, if any, are discussed in the Report.

SUBSURFACE CONDITIONS

5. The generalized soil profile(s) provided in our Report are based on widely-spaced subsurface explorations and are intended only to convey trends in subsurface conditions. The boundaries between strata are approximate and idealized, and were based on our assessment of subsurface conditions. The composition of strata, and the transitions between strata, may be more variable and more complex than indicated. For more specific information on soil conditions at a specific location refer to the exploration logs. The nature and extent of variations between these explorations may not become evident until further exploration or construction. If variations or other latent conditions then become evident, it will be necessary to reevaluate the conclusions and recommendations of this report.
6. In preparing this report, GZA relied on certain information provided by the Client, state and local officials, and other parties referenced therein which were made available to GZA at the time of our evaluation. GZA did not attempt to independently verify the accuracy or completeness of all information reviewed or received during the course of this evaluation.
7. Water level readings have been made in test holes (as described in this Report) and monitoring wells at the specified times and under the stated conditions. These data have been reviewed and interpretations have been made in this Report. Fluctuations in the level of the groundwater however occur due to temporal or spatial variations in areal recharge rates, soil heterogeneities, the presence of subsurface utilities, and/or natural or artificially induced perturbations. The water table encountered in the course of the work may differ from that indicated in the Report.
8. GZA's services did not include an assessment of the presence of oil or hazardous materials at the property. Consequently, we did not consider the potential impacts (if any) that contaminants in soil or groundwater may have on construction activities, or the use of structures on the property.



9. Recommendations for foundation drainage, waterproofing, and moisture control address the conventional geotechnical engineering aspects of seepage control. These recommendations may not preclude an environment that allows the infestation of mold or other biological pollutants.

COMPLIANCE WITH CODES AND REGULATIONS

10. We used reasonable care in identifying and interpreting applicable codes and regulations. These codes and regulations are subject to various, and possibly contradictory, interpretations. Compliance with codes and regulations by other parties is beyond our control.

COST ESTIMATES

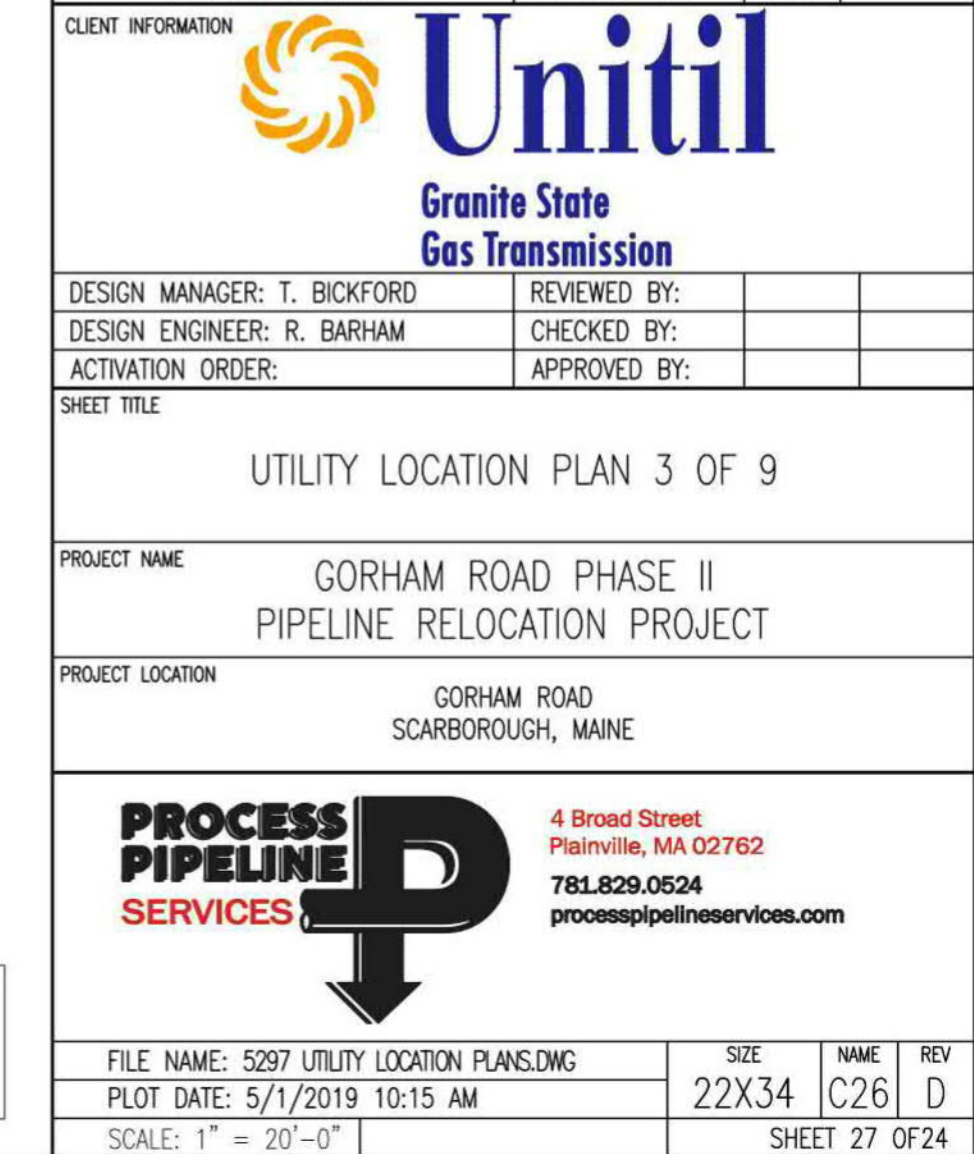
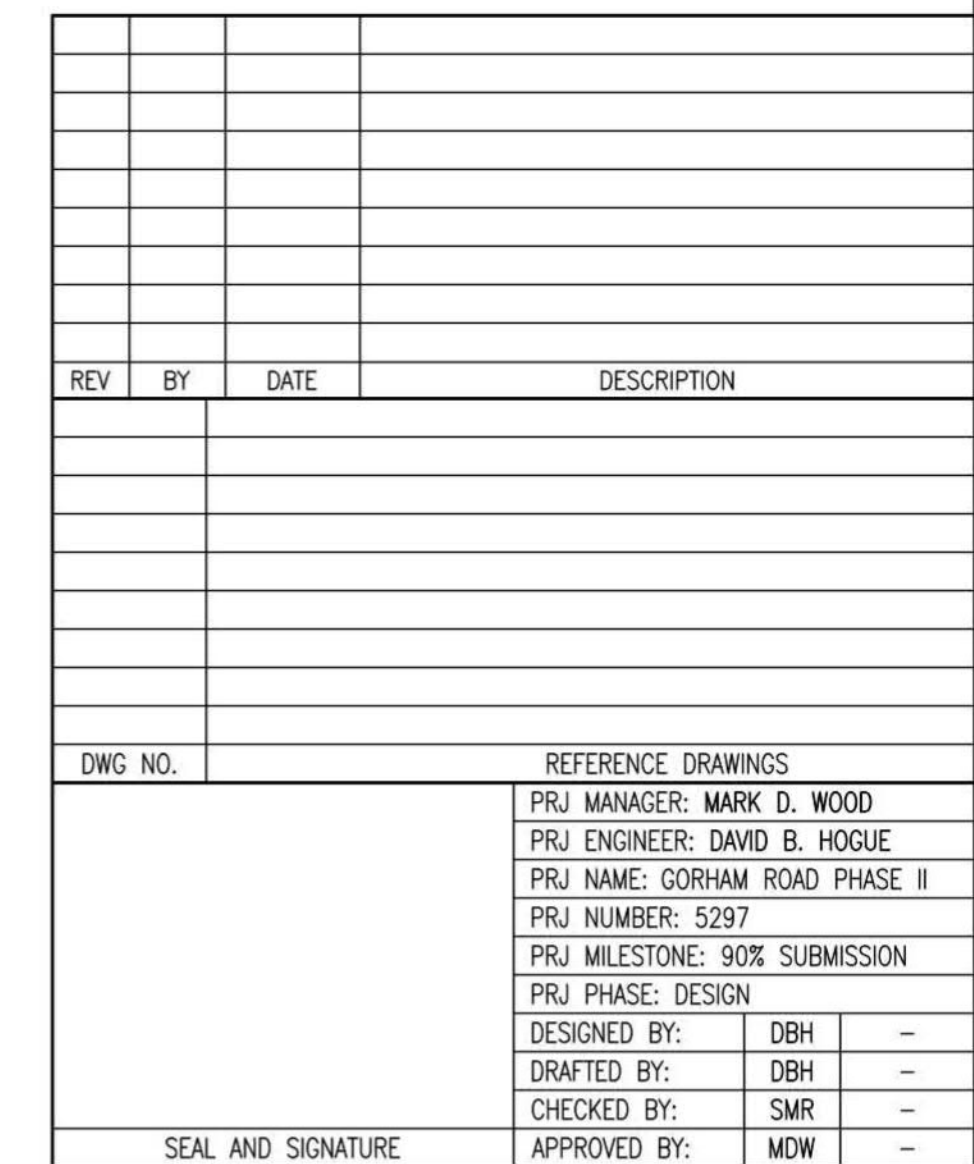
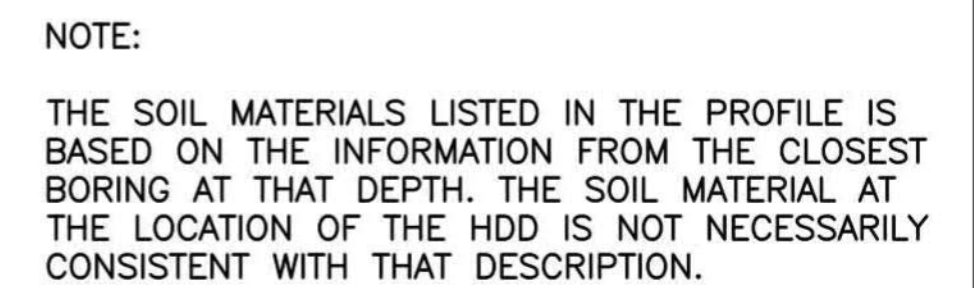
11. Unless otherwise stated, our cost estimates are only for comparative and general planning purposes. These estimates may involve approximate quantity evaluations. Note that these quantity estimates are not intended to be sufficiently accurate to develop construction bids, or to predict the actual cost of work addressed in this Report. Further, since we have no control over either when the work will take place or the labor and material costs required to plan and execute the anticipated work, our cost estimates were made by relying on our experience, the experience of others, and other sources of readily available information. Actual costs may vary over time and could be significantly more, or less, than stated in the Report.

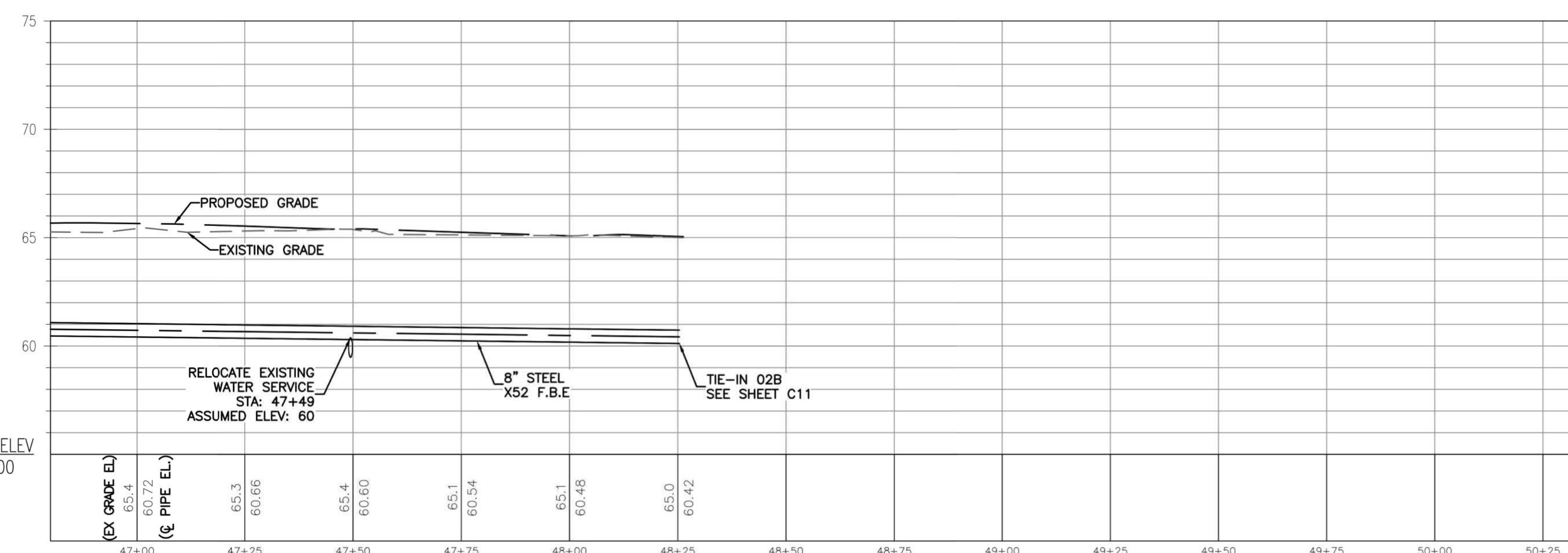
ADDITIONAL SERVICES

12. GZA recommends that we be retained to provide services during any future: site observations, design, implementation activities, construction and/or property development/redevelopment. This will allow us the opportunity to: i) observe conditions and compliance with our design concepts and opinions; ii) allow for changes in the event that conditions are other than anticipated; iii) provide modifications to our design; and iv) assess the consequences of changes in technologies and/or regulations.



Appendix B – Boring Location Plans





GRAPHIC SCALE 1" = 20'-0"

A horizontal graphic scale bar with alternating black and white segments. Below the bar, numerical labels indicate distances in feet: 20', 10', 0, 20', 40', and 60'. The segments represent 10-foot intervals.

90% SUBMISSION

[illegible]

SECTION 10

MEASUREMENT AND PAYMENT

10.1 SUMMARY OF WORK

- A. Lump Sum Bid Items
- B. Unit Price Bid Items
- C. Other Work

10.2 RELATED DOCUMENTS AND SECTIONS

- A. Section E - Bid Form
- B. Section 1 - General Conditions
- D. Individual Specification Sections

10.3 SCHEDULE OF BID ITEMS

1. Bid Item 1 – General Conditions, Bonds and Insurance

1. Description: This item includes providing bonds and insurances for the project in accordance with Section G of these specifications as well as all supervision and administrative services to adequately manage and schedule the Base Bid scope of the project.
2. Method of Measurement: This item shall have a single lump sum measurement for the project.
3. Basis of Payment: This item will be paid for at the lump sum price bid for this item. Payment shall be made as follows:
 - 20% after start of the project,
 - 30% after 30 contract calendar days have been completed,
 - 30% after 60 contract calendar days have been completed,
 - 20% upon substantial completion of the project.

2. Bid Item 2 – Traffic Control, Mobilization and Demobilization

1. Description: This item includes all work associated with Section H of these specifications (Traffic Control Requirements), including but not limited to - variable message boards, flaggers, and all signs equipment and other traffic control measures required to maintain safe traffic flow through the project area. This item also includes the mobilization and demobilization of equipment, materials, and personnel during the project for work associated with the scope of the project.
1. Method of Measurement: This item shall have a single lump sum measurement for the project.

2. Basis of Payment: This item will be paid for at the lump sum price bid for this item. Payment shall be made as follows:

- 20% after start of the project,
- 30% after 30 contract calendar days have been completed,
- 30% after 60 contract calendar days have been completed,
- 20% upon substantial completion of the project.

3. **Bid Item 3 – Provide, Install, and Maintain Sheet piling, Shoring, Bracing and Dewatering of Excavation**

1. Description: This item includes providing sheet piling, shoring, bracing, trench sloping, underpinning or other methods required to prevent cave-in or loose soil from falling into excavation, including removal and disposal, in accordance with Section 2 - Excavation and Section 3 – Backfilling.
2. Method of Measurement: This item shall have a single lump sum measurement for the project.
3. Basis of Payment: This item will be paid for at the lump sum price bid for this item. Payment shall be made as follows:
 - 40% after 30 contract calendar days have been completed,
 - 40% after 60 contract calendar days have been completed,
 - 20% upon completion of all pipe installation.

4. **Bid Item 4 – Erosion/Sediment Control**

1. Description: This item includes providing and maintaining temporary erosion and sediment control measures, including installation and maintenance of all Best Management Practices required to achieve compliance with local, State and Federal regulations and to maintain the work area and surrounding infrastructure and properties in a clean and safe condition.
2. Method of Measurement: This item shall have a single lump sum measurement for the project.
3. Basis of Payment: This item will be paid for at the lump sum price bid for this item. Payment shall be made as follows:
 - 20% after start of the project after initial measures are installed,
 - 30% after 30 contract calendar days have been completed,
 - 30% after 60 contract calendar days have been completed,
 - 20% upon substantial completion of the project.

5. **Bid Item 5 – Material Management**

1. Description: This item includes performing the necessary quantity take-off, order, schedule delivery, receive, unload, and store until required for installation of all sewer force main, fittings and appurtenances necessary to complete the project ready for use in accordance with the project plans and specifications. It shall also include coordination and scheduling with Scarborough Sanitary District material supplier the pick-up of any leftover materials not used on the project.

2. Method of Measurement: This item shall have a single lump sum measurement for the project.
3. Basis of Payment: This item will be paid for at the lump sum price bid for this item. Payment shall be made as follows:
 - 50% after start of the project,
 - 50% upon substantial completion of the project.

6. Bid Item 6 – Clearing

1. Description: This item includes clearing and removal of trees (8" or smaller), shrubs and other vegetation.
2. Method of Measurement: This item shall be measured in acres based on the area of clearing required to achieve the work shown on the project drawings.
3. Basis of Payment: The accepted quantity of this item will be paid for at the unit price per acre.

7. Bid Item 7 – Remove Single Tree Top – 8" or Larger

1. Description: This item includes removal of trees 8" or larger
2. Method of Measurement: Tree removal shall be per each.
3. Basis of Payment: The accepted quantity of these items will be paid for at the unit price bid per each for the appropriate bid item

8. Bid Item 8 – Remove Stump – 8" or Larger

1. Description: This item includes removal of tree stumps 8" or larger
2. Method of Measurement: Stump removal shall be per each.
3. Basis of Payment: The accepted quantity of these items will be paid for at the unit price bid per each for the appropriate bid item.

9. Bid Item 9 – Remove Guard Rail

1. Description: This item includes complete removal of metal guardrail as shown on the project drawings.
2. Method of Measurement: Guardrail removal shall be measured based upon the linear foot.
3. Basis of Payment: The accepted quantity of this item will be paid for at the unit price bid per linear foot.

10. Bid Item 10 – Test Pit Excavation

1. Description: This item includes excavation of test pits as indicated on the plans or as directed by the Engineer, including compacted backfill and temporary pavement, in accordance with Section 2 – Excavation and Section 8 – Pavement Construction and Restoration.
2. Method of Measurement: This item shall be measured in cubic yards, based upon in place measurement of earth removed.

3. Basis of Payment: The accepted quantity of this item will be paid for at the unit price bid per cubic yard.

11. Bid Item 11– Unclassified Excavation

1. Description: This item includes excavation of materials for box cut areas of pavement re-construction and disposal of excavated materials off-site
2. Method of Measurement: This item shall be measured in cubic yards
3. Basis of Payment: The accepted quantity of this item will be paid for at the unit price bid per cubic yard.

12. Bid Item 12 – Subbase Gravel Type “D”

1. Description: This work consists of providing and installing Type “D” subbase gravel meeting MDOT Specification 703.06 Maine DOT as identified on the plans, or as specified by the Engineer. This work shall include fine grading and compaction of installed, as well as all labor, tools and equipment necessary for complete installation. All work shall be performed in accordance with Section 3 – Backfilling.
2. Method of Measurement: This item shall be measured by the cubic yard, installed.
3. Basis of Payment: The accepted quantity of this item will be paid for at the unit price bid per cubic yard installed.

13. Bid Item 13 – Type “A” Crushed Aggregate

1. Description: This work consists of providing and installing Type “A” crushed aggregate meeting MDOT Specification 703.06 Maine DOT as identified on the plans, or as specified by the Engineer. This work shall include fine grading and compaction of installed, as well as all labor, tools and equipment necessary for complete installation. All work shall be performed in accordance with Section 3 – Backfilling.
2. Method of Measurement: This item shall be measured by the cubic yard, installed.
3. Basis of Payment: The accepted quantity of this item will be paid for at the unit price bid per cubic yard installed.

14. Bid Item 14 – Below Grade Excavation

1. Description: This work consists of installing replacement backfill below the normal bottom of the pipe bedding to the depth of authorized below grade excavation as specified by the Engineer. This work shall include furnishing the specified material, as well as all labor, tools and equipment necessary for installation. All work shall be performed in accordance with Section 3 – Backfilling.
2. Method of Measurement: This item shall be measured in cubic yards, installed.
3. Basis of Payment: The accepted quantity of this item shall be paid for at the unit price bid per cubic yard.

15. Bid Item 15 – Ledge Removal (Trench)

1. Description: This work consists of the removal and disposal of ledge material as specified by the Engineer. All work shall be performed in accordance with Section 2 – Excavation.
2. Method of Measurement: This item shall be measured in cubic yards, based upon in place measurement and limited to trench pay width.
3. Basis of Payment: The accepted quantity of this item shall be paid for at the unit price bid per cubic yard.

16. Bid Item 16 – Saw Cut Pavement

1. Description: This item includes saw cutting pavement in a “neat” line as indicated on the contract plans or as directed by the Engineer **at the limits of work along existing sidewalks, driveways, and walkways. All other saw cutting of pavement, including sawcutting for trench excavation, and pavement restoration shall be incidental to the project.**
2. Method of Measurement: This item shall be measured based upon the linear foot.
3. Basis of Payment: The accepted quantity of this item will be paid for at the unit price bid per linear foot.

17. Bid Item 17 – Remove Existing Bituminous Pavement and Concrete Pavement

1. Description: This item includes the removal of bituminous and concrete pavement, in accordance with Section 2 - Excavation.
2. Method of Measurement: This item shall be measured in square yards of surface area complete and accepted.
3. Basis of Payment: The accepted quantity of this item will be paid for at the unit price bid per square yard.

18. Bid Item 18 – Mill Butt Joints

1. Description: This work consists of removing the pavement surface with a cold milling machine or power operated planer as specified by the project plans and details, or as specified by the Engineer to install butt joints at the interface of new and existing pavement surfaces. This work shall include all labor, tools and equipment necessary for completion. All work shall be performed in accordance with Section 8 – Pavement, Curb and Sidewalk Restoration.
2. Method of Measurement: This item shall be measured in square yards
3. Basis of Payment: The accepted quantity of this item will be paid for at the unit price bid per square yard.

19. Bid Item 19 – Mill Existing Pavement Surface

1. Description: This work consists of removing the pavement surface with a cold milling machine or power operated planer as specified by the project plans and details, or as specified by the Engineer. This work shall include all labor, tools and equipment necessary for completion. All work shall be performed in accordance with Section 8 – Pavement, Curb and Sidewalk Restoration.
2. Method of Measurement: This item shall be measured per square yard.
3. Basis of Payment: The accepted quantity of this item will be paid for at the unit price bid per square yard.

20. Bid Item 20 – Binder Pavement

1. Description: This work consists of providing and installing hot bituminous concrete pavement for streets within the limits of reconstruction as identified on the plans, or as specified by the Engineer. This work shall include the furnishing and placement of granular materials and hot bituminous concrete pavement, as well as all labor, tools and equipment necessary for complete installation. All work shall be performed in accordance with Section 8 – Pavement, Curb, and Sidewalk Restoration.
2. Method of Measurement: This item shall be measured by the ton, based upon installed dimensions and depths, per the contract drawings and details.
3. Basis of Payment: The accepted quantity of this item will be paid for at the unit price bid per ton.

21. Bid Item 21 – Surface Pavement

1. Description: This work consists of furnishing and installing hot bituminous concrete pavement per the project plans and details, or as specified by the Engineer. This work shall include all labor, tools and equipment necessary for complete installation. All work shall be performed in accordance with Section 8 – Pavement, Curb and Sidewalk Restoration.
2. Method of Measurement: This item shall be measured by the ton, This item shall be measured by the ton, based upon installed dimensions and depths, per the contract drawings and details.
3. Basis of Payment: The accepted quantity of this item will be paid for at the unit price bid per ton.

22. Bid Item 22 – Shim Pavement

1. Description: This work consists of furnishing and installing hot bituminous concrete pavement per the project plans and details, or as specified by the Engineer to shim pavement grades prior to the placement of Surface Pavement. This work shall include all labor, tools and equipment necessary for complete installation.
2. Method of Measurement: This item shall be measured by the ton, based upon installed dimensions and depths, per the contract drawings and details.
3. Basis of Payment: The accepted quantity of this item will be paid for at the unit price bid per ton.

23. Bid Item 23 – Bituminous Driveway Apron

1. Description: This work consists of driveway apron reconstruction per the project plans and details, or as specified by the Engineer. This work shall include the furnishing and placement of granular materials and hot bituminous concrete pavement, as well as all labor, tools and equipment necessary for complete installation. All work shall be performed in accordance with Section 8 – Pavement, Curb and Sidewalk Restoration.
2. Method of Measurement: This item shall be measured per square yard.
3. Basis of Payment: The accepted quantity of this item will be paid for at the unit price bid per square yard.

24. Bid Item 24 – Bituminous Sidewalk

1. Description: This work consists of sidewalk construction per the project plans and details, or as specified by the Engineer. This work shall include the furnishing and placement of granular materials and hot bituminous concrete pavement, as well as all labor, tools and equipment necessary for complete installation. All work shall be performed in accordance with Section 8 – Pavement, Curb and Sidewalk Restoration.
2. Method of Measurement: This item shall be measured per square yard.
3. Basis of Payment: The accepted quantity of this item will be paid for at the unit price bid per square yard.

25. Bid Item 25 – Structural Concrete, Raised Island

1. Description: This work consists of the repair and replacement of existing raised concrete island, or islands to match existing, where these conflict with new work shown on the projects drawings.
2. Method of Measurement: This item shall be measured in square yards
3. Basis of Payment: The accepted quantity of this item will be paid for at the unit price bid per square yard.

26. Bid Item 26 – 12” HDPE Sewer Force Main Installation

1. Description: This work consists of installing sewer force main pipe per the project plans and details, including excavation and removal of materials below surface pavement to the normal bottom of the pipe bedding, as shown on the project plans and details, and backfilling, including pavement gravels and binder pavement to the base of surface pavement grade. This work shall also include sheeting, shoring, dewatering, supporting, protecting and repairing (if necessary) existing structures, as well as removing and altering existing underground obstructions which are owned by private parties. All work shall be performed in accordance with Section 2 – Excavation and Section 3 – Backfilling. This item shall also include all labor, tools, equipment, pressure and leakage testing. The Contractor shall be solely responsible for the means, methods, techniques, sequences and procedures necessary for the trenching and installation of the force main. Scarborough Sanitary District shall provide the required pipe and accessories as specified in Section 4 – Sewer Force Main. All sewer force main installation work shall be performed in accordance with Section 4 – Sewer Force Main.

2. Method of Measurement: This item shall be measured pre the linear foot.
3. Basis of Payment: The accepted quantity of this item will be paid for at the unit price bid per linear foot.

27. Bid Item 27 – Connection to Existing Sewer Force Main

1. Description: This work consists of connecting to an existing main per the project plans and details. This work shall include all labor, tools, equipment, excavation, backfilling, cutting the existing force main and installing the required fittings, bends, thrust restraints and/or adaptors to make a secure connection. The Contractor shall provide all the required fittings, valves, adaptors and restraints as specified in Section 4 – Sewer Force Main. The Contractor shall coordinate the time of connection(s) with Scarborough Sanitary District. Connection work shall be undertaken at night during the low flow period. Over-pumping of sewer flows during installation shall be the responsibility of Scarborough Sanitary District. All work shall be performed in accordance with Section 4 – Sewer Force Main.
2. Method of Measurement: This item shall be measured per each.
3. Basis of Payment: The accepted quantity of this item shall be paid for at the unit price bid per each.

28. Bid Item 28 –Sewer Force Main Air Release Valve in Manhole

1. Description: This work consists of furnishing and installing a sewer air release valve in a precast concrete manhole structure on the new sewer force main. This work shall include all labor, tools, equipment, excavation, backfilling, installing the required fittings, appurtenances, thrust restraints and/or adaptors to make a secure connection. Scarborough Sanitary District will provide piping materials, fittings, valves, adaptors and restraints as specified in Section 4 – Sewer Force Main. The Contractor shall provide the precast structure and any ancillary items required to complete the installation. All work shall be performed in accordance with Section 4 – Sewer Force Main.
2. Method of Measurement: This item shall be measured per each.
3. Basis of Payment: The accepted quantity of this item shall be paid for at the unit price bid per each.

29. Bid Item 29 – 12” Driveway Culvert

1. Description: This work consists of the installation of 12” HDPE Driveway culverts per the project plans and details, and backfilling to pavement subgrade. This work shall also include sheeting, shoring, dewatering, supporting, protecting and repairing (if necessary) existing structures, as well as removing and altering existing underground obstructions which are owned by private parties. All work shall be performed in accordance with Section 5 – Gravity Pipe Installation and Service Pipe Re-location, Section 2 - Excavation and Section 3 – Backfilling. This item shall also include all labor, tools, and equipment. This work shall include excavation and removal of existing piping, preparation of bedding, pipe installation, backfill and installation of riprap inlet and outlet protection,
2. Method of Measurement: This item shall be measured per linear foot

3. Basis of Payment: The accepted quantity of this item shall be paid for at the unit price bid per linear foot.

30. Bid Item 30 – 12” Diameter Storm Drain Pipe

1. Description: This work consists of the installation of 12” HDPE Storm Drain piping per the project plans and details, including excavation and removal of materials below surface pavement to the normal bottom of the pipe bedding, as shown on the project plans and details, and backfilling, including pavement gravels and binder pavement to the base of surface pavement grade. This work shall also include sheeting, shoring, dewatering, supporting, protecting and repairing (if necessary) existing structures, as well as removing and altering existing underground obstructions which are owned by private parties. All work shall be performed in accordance with Section 5 – Gravity Pipe Installation and Service Pipe Re-location, Section 2 - Excavation and Section 3 – Backfilling. This item shall also include all labor, tools, and equipment.
2. Method of Measurement: This item shall be measured per linear foot.
3. Basis of Payment: The accepted quantity of this item shall be paid for at the unit price bid per linear foot.

31. Bid Item 31 – 15” Diameter Storm Drain Pipe

1. Description: This work consists of the installation of 15” HDPE Storm Drain piping per the project plans and details, including excavation and removal of materials below surface pavement to the normal bottom of the pipe bedding, as shown on the project plans and details, and backfilling including pavement gravels and binder pavement to the base of surface pavement grade. This work shall also include sheeting, shoring, dewatering, supporting, protecting and repairing (if necessary) existing structures, as well as removing and altering existing underground obstructions which are owned by private parties. All work shall be performed in accordance with Section 5 – Gravity Pipe Installation and Service Pipe Re-location, Section 2 - Excavation and Section 3 – Backfilling. This item shall also include all labor, tools, and equipment.
2. Method of Measurement: This item shall be measured per linear foot.
3. Basis of Payment: The accepted quantity of this item shall be paid for at the unit price bid per linear foot.

32. Bid Item 32 – 24” Storm Drain Crossing

1. Description: This work consists of the installation of 24” reinforced concrete piping per the project plans and details, including excavation and removal of materials below surface pavement to the normal bottom of the pipe bedding, as shown on the project plans and details, and backfilling to pavement subgrade. This work shall also include sheeting, shoring, dewatering, supporting, protecting and repairing (if necessary) existing structures, as well as removing and altering existing underground obstructions which are owned by private parties. All work shall be performed in accordance with Section 5 – Gravity Pipe Installation and Service Pipe Re-location, Section 2 - Excavation

and Section 3 – Backfilling. This item shall also include all labor, tools, and equipment.

2. Method of Measurement: This item shall be measured per linear foot.
3. Basis of Payment: The accepted quantity of this item shall be paid for at the unit price bid per linear foot.

33. Bid Item 33 – Abandon Existing Sewer Force Main

1. Description: This work consists of the abandonment of an existing sewer force main, per the project plans and details. Sewer force main abandonment shall include the cutting and capping capping of remaining piping. This item includes coordination with Scarborough Sanitary District. All work shall be performed in accordance with Section 4 – Sewer Force Main.
2. Method of Measurement: This item shall be measured per lump sum.
3. Basis of Payment: The accepted quantity of this item shall be paid for at the unit price bid per lump sum.

34. Bid Item 34 – Sewer Service Repair

1. Description: This work consists of repair or replacement of sewer service piping that conflicts with the new sewer force main trench. This work shall include all labor, tools, equipment, excavation, backfilling, pressure and leakage testing, and completing the connection to the existing service line. All work shall be performed in accordance with the standards and specifications of Scarborough Sanitary District.
2. Method of Measurement: This item shall be measured per linear foot.
3. Basis of Payment: The accepted quantity of this item shall be paid for at the unit price bid per linear foot.

35. Bid Item 35 – Sanitary Sewer Cleanouts

1. Description: This work consists of the installation of sewer cleanouts on existing service piping, at the direction of the Engineer, per the project details, including excavation and removal of materials and backfilling, including pavement gravels and binder pavement (where applicable) to the base of surface pavement grade. This work shall also include sheeting, shoring, dewatering, supporting, protecting and repairing (if necessary) existing structures, as well as removing and altering existing underground obstructions which are owned by private parties.
2. Method of Measurement: This item shall be measured per each
3. Basis of Payment: The accepted quantity of this item shall be paid for at the unit price bid per each.

36. Bid Item 36 – Water Service Replacement

1. Description: This work consists of replacement of water service piping that conflicts with the new sewer force main trench. Services shall be replaced from the corporation on the existing main on the west side of Gorham Road

to the curb stop in one continuous line per the project plans and details, and Portland Water District Standards and Specifications. This work shall include all labor, tools, equipment, excavation, backfilling, pressure and leakage testing, and completing the connection to the existing service line. The Contractor shall provide the required service pipe as specified in Portland Water District Standards and Specifications. Support shall include PWD representatives to assist and coordinate turning water on from the private side of the Right of Way to the curb stop at the appropriate time. All work shall be performed in accordance with Section 6 – Water Service Piping.

2. Method of Measurement: This item shall be measured per linear foot.
3. Basis of Payment: The accepted quantity of this item shall be paid for at the unit price bid per linear foot.

37. Bid Item 37 – 6” Diameter Underdrain

1. This work consists of the installation of 6” HDPE Type C Underdrain piping per the project plans and details, including excavation and removal of materials to the normal bottom of the pipe bedding, as shown on the project plans and details, and backfilling to pavement subgrade (where applicable). This work shall also include sheeting, shoring, dewatering, supporting, protecting, and repairing (if necessary) existing structures, as well as removing and altering existing underground obstructions which are owned by private parties. All work shall be performed in accordance with Section 5 – Gravity Pipe Installation and Service Pipe Re-location, Section 2 - Excavation and Section 3 – Backfilling. This item shall also include all labor, tools, and equipment.
2. Method of Measurement: This item shall be measured per linear foot.
3. Basis of Payment: The accepted quantity of this item shall be paid for at the unit price bid per linear foot.

38. Bid Item 38 – 12” Diameter Underdrain

1. This work consists of the installation of 12” HDPE Type C Underdrain piping per the project plans and details, including excavation and removal of materials to the normal bottom of the pipe bedding, as shown on the project plans and details, and backfilling to pavement subgrade (where applicable). This work shall also include sheeting, shoring, dewatering, supporting, protecting and repairing (if necessary) existing structures, as well as removing and altering existing underground obstructions which are owned by private parties. All work shall be performed in accordance with Section 5 – Gravity Pipe Installation and Service Pipe Re-location, Section 2 - Excavation and Section 3 – Backfilling. This item shall also include all labor, tools, and equipment.
2. Method of Measurement: This item shall be measured per linear foot.
3. Basis of Payment: The accepted quantity of this item shall be paid for at the unit price bid per linear foot.

39. Bid Item 39 – 4’ Diameter Catch Basin

1. Description: This item includes installation of precast concrete structures, including excavation, backfilling, granular base, compaction, invert channels, pipe connections, internal drop inlets, frames and covers, mortar, bricks, temporary pavement repair, and leakage tests in accordance with Section 2 - Excavation; Section 3 - Backfilling; and Section 9 - Appurtenant Structures.

Reconnection of existing pipes into new manhole structures shall be incidental to these pay items and no separate payment shall be made.
2. Method of Measurement: These items shall be measured per vertical foot.
3. Basis of Payment: The accepted quantity of this item will be paid for at the unit price bid per vertical foot for the appropriate bid item (measured from invert of pipe to top of rim).

40. Bid Item 40 – 4' Diameter Manhole

1. Description: This item includes installation of precast concrete structures, including excavation, backfilling, granular base, compaction, invert channels, pipe connections, internal drop inlets, frames and covers, mortar, bricks, temporary pavement repair, and leakage tests in accordance with Section 2 - Excavation; Section 3 - Backfilling; and Section 9 - Appurtenant Structures.

Reconnection of existing pipes into new manhole structures shall be incidental to these pay items and no separate payment shall be made.
2. Method of Measurement: These items shall be measured per vertical foot.
3. Basis of Payment: The accepted quantity of this item will be paid for at the unit price bid per vertical foot for the appropriate bid item (measured from invert of pipe to top of rim).

41. Bid Item 41 – Alter Existing Catch Basin or Manhole

1. Description: This item includes all work required to modify existing manholes or catch basins to accept new piping in accordance with Section 9 – Appurtenant Structures.
2. Method of Measurement: This item shall be measured per each.
3. Basis of Payment: The accepted quantity of this item shall be paid for at the unit price bid per each.

42. Bid Item 42 – Adjust Existing Catch Basin or Manhole to Grade

1. Description: This item includes all work required to modify existing manholes or catch basins to grade in accordance with Section 9 – Appurtenant Structures.
2. Method of Measurement: This item shall be measured per each.
3. Basis of Payment: The accepted quantity of this item shall be paid for at the unit price bid per each.

43. Bid Item 43 – Pedestrian Ramp with Detectable Warning Surface

1. Description: This work consists of furnishing and installing pedestrian ramps with detectable warning surfaces per the projects plans and details. This work shall include all labor, tools and equipment necessary for complete installation.
2. Method of Measurement: This item shall be measured per each.
3. Basis of Payment: The accepted quantity of this item shall be paid for at the unit price bid per each.

44. Bid Item 44 – Concrete Slipform Curb (Vertical)

1. Description: This work consists of furnishing and installing slipform concrete curbing per the projects plans and details. This work shall include all labor, tools and equipment necessary for complete installation.
2. Method of Measurement: This item shall be measured per linear foot.
3. Basis of Payment: The accepted quantity of this item shall be paid for at the unit price bid per linear foot.

45. Bid Item 45 – Concrete Slipform Curb (Tip Down)

1. Description: This work consists of furnishing and installing slipform concrete tipdown curbs per the projects plans and details. This work shall include all labor, tools and equipment necessary for complete installation.
2. Method of Measurement: This item shall be measured per each.
3. Basis of Payment: The accepted quantity of this item shall be paid for at the unit price bid per each.

46. Bid Item 46 – Rip Rap

1. Description: This work consists of furnishing and installing riprap stone per the project plans and details. This work shall include surface preparation a installation of materials to the specified depths at the locations shown on the drawings.
2. Method of Measurement: This item shall be measured in cubic yards.
3. Basis of Payment: The accepted quantity of this item shall be paid for at the unit price bid per cubic yard.

47. Bid Item 47 – Landscape Restoration

1. Description: This work consists of restoring a landscaped area to its existing condition prior to disturbance. This work shall include all labor, tools, equipment, excavation, backfilling and furnishing materials necessary for complete restoration. All work shall be performed in accordance with Section 7 – Loam, Seed and Miscellaneous Restoration.
2. Method of Measurement: This item shall be measured by the square yard.
3. Basis of Payment: The accepted quantity of this item will be paid for at the unit price bid per square yard.

48. Bid Item 48 – Loam, Seed and Mulch

1. Description: This work consists of preparing the subgrade, furnishing and installing loam, raking and removal of stones, fertilizing, liming, mulching, seeding, watering, repair and maintenance for a one-year period. This work shall include all labor, tools and equipment necessary for complete installation. All work shall be performed in accordance with Section 7 – Loam, Seed and Miscellaneous Restoration.
2. Method of Measurement: This item shall be measured by units equal to 1,000 square feet of actual disturbed and restored areas.
3. Basis of Payment: The accepted quantity of these items will be paid for at the unit price bid for this item. Payment shall be made as follows:
 - 70% of the approved number of units after the area has been seeded and mulched.
 - 30% of the approved numbers of units shall be made after the initial mowing and removal of excess mulch after stabilization.

49. Bid Item 49 – Geotextile Fabric

1. Description: This work consists of installing geotextile fabric per the project plans and details.
2. Method of Measurement: This item shall be measured in square yards, installed
3. Basis of Payment: The accepted quantity of these items will be paid for at the unit price bid per square yard.

50. Bid Item 50 – Pavement Markings

1. Description: This work consists placing pavement markings per the project plans and details. This work shall include all labor, tools, equipment and materials necessary for complete installation. All work shall be performed in accordance with Section 8 – Pavement, Curb and Sidewalk Restoration.
2. Method of Measurement: This item shall be measured per lump sum.
3. Basis of Payment: The accepted quantity of these items will be paid for at the unit price bid per lump sum.

51. Bid Item 51 – Remove & Reset Signs

1. Description: This work consists of the removal and resetting of traffic and other miscellaneous signs per the project plans and details. This work shall include all labor, tools, equipment and materials necessary for complete removal, storage and installation.
2. Method of Measurement: This item shall be measured per each.
3. Basis of Payment: The accepted quantity of this item shall be paid for at the unit price bid per each.

52. Bid Item 52 – New Roadside Signs

1. Description: This work consists of the installation of new traffic and other miscellaneous signs per the project plans and details. This work shall include all labor, tools, equipment and materials necessary for complete removal, and installation.
2. Method of Measurement: This item shall be measured per each.
3. Basis of Payment: The accepted quantity of this item shall be paid for at the unit price bid per each.

53. Bid Item 53 – Relocate Hydrant

1. Description: This work consists of installing a fire hydrant per the project plans and details. This work shall include all materials, labor, tools, equipment, excavation, backfilling necessary for a complete installation, and removal of the existing hydrant. This work shall include installing the hydrant valve, tee, thrust/reaction blocking, crushed stone, fabric, joint restraint, and coordination of the work with Portland Water District. All work shall be performed in accordance with Portland Water District Standards and Specifications
2. Method of Measurement: This item shall be measured per each,
3. Basis of Payment: The accepted quantity of this item shall be paid for at the unit price bid per each.

54. Bid Item 54 – Remove & Reset Mailboxes – New Posts

1. Description: This work consists of the removal, storage and re-setting of mailboxes on new mailbox posts per the project plans and details. This work shall include all labor, tools, equipment, excavation and backfilling necessary for a complete installation.
2. Method of Measurement: This item shall be measured per each,
3. Basis of Payment: The accepted quantity of this item shall be paid for at the unit price bid per each.

55. Bid Item 55 – Retaining Wall

1. Description: This work consists of installing a retaining wall per the project plans and details. This work shall include all labor, tools and equipment necessary for complete installation.
2. Method of Measurement: This item shall be measured per square foot, installed
3. Basis of Payment: The accepted quantity of this item shall be paid for at the unit price bid per linear foot.

10.5 OTHER WORK

All other work required to complete the project as defined by the contract documents shall be considered incidental to the contract and no separate measurement or payment will be made.

10.6 DELETION OF WORK

The Owner reserves the right to delete the work required under any/all bid items. No change in the unit price bid for other items will be permitted if the Owner adopts this option.

END OF SECTION 10

ADVERTISEMENT FOR BIDS

Separate sealed Bids for Gorham Road Phase 2 will be received by the Town of Scarborough Purchasing Department, located at 259 U.S. Route 1, Scarborough, Maine 04074 until 2:00pm Prevailing Time, March 29, 2022.

The work required by this contract is the rehabilitation and re-construction of Gorham Road from the Nonesuch River crossing to the end of the Phase 1 construction, just south of the intersection with Maple Avenue, a distance of approximately 3,500 feet.

New curbing and a new sidewalk will be constructed on the east side of the street between the termination of the 2022 Unutil gas main project and the new sidewalk and curbing installed in Phase 1 of the project. New storm drainage will be constructed on the east side of the street at locations shown on the project drawings, and crossing culverts and driveway culverts will be replaced. The project will include installation of a new 12" DR11 HDPE force main in the road from the start point to the end point, with connections to the existing force main at either end. The work also includes related appurtenance structures, fittings, traffic control, surface restoration, and other related work specified to complete the project.

ALL POTENTIAL BIDDERS ARE REQUIRED TO REGISTER WITH THE TOWN OF SCARBOROUGH IN ORDER TO BE NOTIFIED OF ANY FUTURE CHANGES, AMENDMENTS OR ADDITIONS TO THE BID DOCUMENTS.

Registering and any questions regarding the Bid Documents should be directed to Kim Morrison, Purchasing Specialist via email at kmorrison@scarboroughmaine.org.

All work associated with this contract shall be completed within a 106 consecutive calendar day work period, excluding any approved periods of work shut down. All work associated with the Base Bid and any selected Bid Alternate shall be completed by November 15th, 2022.

The Contract Documents, consisting of Notice of Intent to Bid, Advertisement for Bids, Information for Bidders, Bid, Bid Bond, Agreement, General Conditions, Supplementary General Conditions, Payment Bond, Performance Bond, Notice of Award, Notice to Proceed, Drawings, Specifications, and Addenda can be obtained by contacting Kim Morrison, Town of Scarborough Purchasing Specialist:

E-mail: kmorrison@scarboroughmaine.org

Address: 259 US Route One, Scarborough Maine 04074

Phone: 207.730.4083

Town of Scarborough is sales tax exempt.

INFORMATION FOR BIDDERS

BIDS will be received by the Town of Scarborough, (herein called the "OWNER"), at the Purchasing Office located in Scarborough Town Hall at 259 U.S. Route 1, Scarborough, Maine 04074 until **2:00 p.m. Prevailing Time, Tuesday March 29th, 2022**. THIS IS NOT A PUBLIC BID OPENING.

Each Bid must be submitted in a sealed envelope, addressed to:

Town of Scarborough
Purchasing Department
259 U.S. Route 1
Scarborough, Maine 04074

Faxed and/or emailed bids will not be accepted.

Each sealed envelope containing a hard copy Bid and an electronic copy of the bid on a flash drive, and must be plainly marked on the outside as Bid for **Gorham Road Phase 2 Project**.

The envelope should bear on the outside the name of the Bidder, their address, their license number if applicable and the name of the project for which the Bid is submitted. If forwarded by Registered Mail, the sealed envelope containing the Bid must be enclosed in another envelope addressed to the Owner.

All Bids must be made on the required Bid form. All blank spaces for Bid prices must be filled in, in ink, or typewritten, and the Bid form must be fully completed and executed when submitted. Only one hard copy of the Bid form is required, along with an electronic copy on a flash drive.

The Town of Scarborough reserves the right to accept or reject any or all bids received, waive informalities, and award the contract to the lowest responsible bidder, with or without consideration of Bid Alternates. Town of Scarborough also reserves the right to reduce or increase the Scope of Work match available funds. Any Bid may be withdrawn prior to the above scheduled time for the opening of Bids or authorized postponement thereof. The Town of Scarborough also reserves the right to delete any bid item. Any Bid received after that time and date specified shall not be considered. No Bidder may withdraw his Bid within 90 days after the actual date of the opening thereof. Should there be reasons why the contract cannot be awarded within the specified period, the time may be extended by mutual agreement between the Owner and the Bidder.

Bidders must satisfy themselves of the accuracy of the estimated quantities in the Bid Schedule by examination of the site and a review of the drawings and specifications including Addenda. After Bids have been submitted, the Bidder shall not assert that there was a misunderstanding concerning the quantities of work or of the nature of the work to be done.

A description of the payment items, together with the intended bid evaluation procedures is contained in Section 10 – Measurement and Payment of the Technical Specifications.

The Contract Documents contain provisions required for the construction of the Project. Information obtained from an officer, agent, or employee of the owner or any other person shall not affect the risks or obligations assumed by the Contractor or relieve him from fulfilling any of the conditions of the contract.

Each Bid must be accompanied by a Bid Bond payable to the Owner for five percent (5%) of the total amount of the Base Bid Amount. As soon as the Bid prices have been compared, the Owner will return the bonds of all except the three lowest responsible Bidders. When the Agreement is executed, the Bonds of the two remaining unsuccessful Bidders will be returned. The Bid Bond of the successful Bidder will be retained until the Payment Bond and Performance Bond have been executed and approved, after which it will be returned. A certified check may be used in lieu of a Bid Bond.

Contractors should obtain such construction insurance (i.e. fire and extended coverage, workman's compensation, public liability and property damage, and "all risk" builders insurance) as is customary and appropriate. Minimum insurances for which certificates will be required are defined in the general conditions of the contract.

Attorneys-in-fact who sign Bid Bonds or Payment Bonds and Performance Bonds must file with each bond a certified and effective dated copy of their power of attorney.

The party to whom the contract is awarded will be required to execute the agreement and obtain the Performance Bond and Payment Bond equal to 100% of the contract value within ten calendar days from the date when Notice of Award is delivered to the Bidder. The Notice of Award shall be accompanied by the necessary Agreement and Bid forms. In case of failure of the Bidder to execute the Agreement, the Owner may at his option consider the Bidder in default, in which case the Bid Bond accompanying the proposal shall become the property of the Owner.

The Owner within 10 days of receipt of the acceptable Performance Bond, Payment Bond and Agreement signed by the party to whom the Agreement was awarded shall sign the Agreement and return to such party an executed duplicate of the Agreement. Should the Owner not execute the Agreement within such period, the Bidder may by written notice withdraw his signed Agreement. Such notice of withdrawal shall be effective upon receipt of the notice of the Owner.

The Notice to Proceed shall be issued within 3 business days of the execution of the Agreement by the Owner. Should there be reasons why the Notice to Proceed cannot be issued within such period, the time may be extended by mutual agreement between the Owner and Contractor. If the Notice to Proceed has not been issued within the 3 business day period or within the period mutually agreed upon, the Contractor may terminate the Agreement without further liability on the part of either party.

The Owner may make such investigations as he deems necessary to determine the ability of the Bidder to perform the Work and the Bidder shall furnish to the Owner all such information and data for this purpose as the Owner may request. The Owner reserves the right to reject any Bid if the evidence submitted by, or investigation of, such Bidder fails to satisfy the Owner that such Bidder is properly qualified to carry out the obligations of the Agreement and to complete the Work contemplated therein.

A conditional or qualified Bid will not be accepted. Award will be made to one Bidder.

All applicable laws, ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the project shall apply to the contract throughout.

Each Bidder is responsible for inspecting the site and for reading and being thoroughly familiar with the Contract Documents. The failure or omission of any Bidder to do any of the foregoing shall in no way relieve any Bidder from any obligation in respect to his Bid.

No interpretation of the meaning of the plans, specifications, or other Contract Documents will be made to any bidder orally. Every request for such interpretation should be in writing, addressed to Kim Morrison, Purchasing Specialist, Town of Scarborough, 259 US Route One, Scarborough, ME 04074 (email: kmorrison@scarboroughmaine.org) and to be given consideration, must be received at least four (4) business days prior to the date fixed for the opening of bids (by March 23rd, 2022). Any and all such interpretations and any supplemental instructions will be in the form of written addenda to the specifications which, if issued, will be emailed, with return receipt requested, to all prospective bidders, at the respective addresses furnished for such purposes, no later than two (2) business days prior to the date fixed for the opening of bids (by March 25th, 2022). Failure of any bidder to receive any such addendum or interpretation shall not relieve any bidder from any obligation under his bid as submitted. All addenda so issued shall become part of the Contract Documents.

Wherever it may be written that an equipment manufacturer must have a specified period of experience with his product, equipment which does not meet the specified experience period can be considered if the equipment supplier or manufacturer is willing to provide a bond or cash deposit for the duration of the specified time period which will guarantee replacement of that equipment in the event of failure.

Whenever a material, article, or piece of equipment is identified by reference to a manufacturer or trade name, it shall be understood that this is referenced for defining the performance of the material, article, or piece of equipment and that other products of equal capacities, quality and function shall be considered. It shall be the CONTRACTOR'S responsibility to coordinate all submittals to the TOWN ENGINEER for approval to eliminate any conflicts which might arise due to the use of the "or equal" item. Any additional costs incident to the use of "or equal" items will be paid by the CONTRACTOR.

BID

Proposal of

_____ hereinafter call "BIDDER",
organized and existing under the laws of the State of _____ doing business as
_____.
_____.*

To the Town of Scarborough, Maine (hereinafter called "OWNER").

In compliance with your Advertisement for Bids, BIDDER hereby proposed to perform all WORK for Gorham Road Phase 2 Project in strict accordance with the CONTRACT DOCUMENTS, within the time set forth therein, and at the prices stated below.

By submission of this BID, each BIDDER certifies, and in the case of a joint BID each party thereto certifies as to his own organization, that this BID has been arrived at independently, without consultation, communication, or agreement as to any matter relating to this BID with any other BIDDER or with any competitor.

BIDDER hereby agrees to commence WORK under this contract on or before a date to be specified in the NOTICE TO PROCEED and to fully complete the work of the PROJECT by November 15th, 2022. It is noted that any approved shutdown of work will not be included in the computation of calendar days. BIDDER further agrees to pay as liquidated damages, the sum of \$750.00 for each consecutive calendar day thereafter as provided in Section 15 of the General Conditions.

BIDDER acknowledges receipt of the following ADDENDUM:

*Insert "a corporation", "a partnership", or "an individual" as applicable.

SCHEDULE OF PRICES

Note: This proposal shall be filled in by the Bidders, with the Unit Prices written in numerals and the extensions shall be made by him. For complete information concerning these items, see the Specifications.

BASE BID

Bid Item	Description	Unit	Unit Price	Quantity	Amount
1	General Conditions, Bonds and Insurance	LS		1	\$ -
2	Traffic Control, Mobilization and Demobilization	LS		1	\$ -
3	Provide, Install & Maintain Sheeting, Shoring, Bracing & Dewatering of Excavations	LS		1	\$ -
4	Erosion/Sediment Control	LS		1	\$ -
5	Material Management	LS		1	\$ -
6	Clearing	AC		1.00	\$ -
7	Remove Single Tree Top only - 8" or Larger	EA		17.00	\$ -
8	Remove Stump - 8" or Larger	EA		20.00	\$ -
9	Remove Guard Rail	LF		50.00	\$ -
10	Test Pit Excavation	CY		100.00	\$ -
11	Unclassified Excavation	CY		4,700.00	\$ -
12	Aggregate - Gravel Type "D"	CY		2,225.00	\$ -
13	Aggregate - Gravel Type "A"	CY		500.00	\$ -
14	Below Grade Excavation	CY		20.00	\$ -
15	Ledge Removal (Trench)	CY		10.00	\$ -
16	Saw Cut Pavement	LF		700.00	\$ -
17	Remove Existing Pavement & Concrete	SY		4,550.00	\$ -
18	Mill Butt Joints	SY		125.00	\$ -
19	Mill Existing Pavement Surface	SY		9,500.00	\$ -
20	Binder Pavement (19mm)	TON		1,200.00	\$ -
21	Surface Pavement (12.5mm)	TON		1,850.00	\$ -
22	Shim Pavement (9.5mm)	TON		1,020.00	\$ -
23	Bituminous Driveway Apron	SY		1,150.00	\$ -
24	Bituminous Sidewalk	SY		1,500.00	\$ -
25	Structural Concrete, Raised Island	SY		25.00	\$ -
26	12" HDPE Sewer Force Main	LF		3,400.00	\$ -
27	Sewer Force Main Connections	EA		2.00	\$ -
28	Sewer Force Main Air Release Valves	EA		2.00	\$ -
29	12" Driveway Culvert	LF		200.00	\$ -
30	12" Diameter Storm Drain Pipe	LF		1,625.00	\$ -
31	15" Diameter Storm Drain Pipe	LF		100.00	\$ -
32	24" Storm Drain Crossing	LF		120.00	\$ -
33	Abandon Existing Sewer Force Main	LS		1.00	\$ -
34	Sanitary Sewer Service Repair	LF		100.00	\$ -
35	Sanitary Sewer Cleanouts	EA		3.00	\$ -
36	Water Service Replacement	LF		250.00	\$ -
37	6" Diameter Underdrain	LF		160.00	\$ -
38	12" Diameter Underdrain	LF		270.00	\$ -
39	4' Diameter Catch Basin	VF		43.00	\$ -
40	4' Diameter Manhole	VF		5.00	\$ -
41	Alter Existing Catch Basin or Manhole	EA		4.00	\$ -
42	Adjust Existing Catch Basin or Manhole to Grade	EA		17.00	\$ -
43	Pedestrian Ramp with Detectable Warning Surface	EA		12.00	\$ -
44	Concrete Slipform Curb (Vertical)	LF		2,650.00	\$ -
45	Concrete Slipform Curb (Tip Down)	EA		60	\$ -
46	Rip Rap	CY		200.00	\$ -
47	Landscape Restoration	SY		250.00	\$ -
48	Loam, Seed, and Mulch	SY		4400	\$ -
49	Geotextile Fabric	SY		400.00	\$ -

50	Pavement Markings	LS		1	\$	-
51	Remove & Reset Signs	EA		14	\$	-
52	New Roadside Signs	EA		6	\$	-
53	Relocate Hydrant	EA		2	\$	-
54	Remove & Reset Mailboxes - New Posts	EA		25	\$	-
55	Retaining Wall	SF		600	\$	-

TOTAL AMOUNT OF BASE BID	\$	-
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Revised 2-18-2022

A1	3'x2' Box Culvert	LF		60	\$	-
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TOTAL AMOUNT OF BASE BID - ALT 1	\$	-
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Revised 2-18-2022

The Town of Scarborough reserves the right to accept or reject any and all bids received, waive informalities, and award the contract to the lowest responsible bidder, with or without consideration of Bid Alternates. The Town of Scarborough reserves the right to reduce or increase the scope of work and/or delete work items using unit prices to match available funds.

Respectfully Submitted:

Signature Address

Title

License No. (if applicable) Date

(Seal - if Bid is by a Corporation)

Attest _____

AGREEMENT

This Agreement, made this ____ day of _____ by and between the Town of Scarborough, Maine, hereinafter called "Owner" and _____ doing business as a (corporation, partnership, or an individual) hereinafter called "Contractor".

WITNESSETH: That for and in consideration of the payments and agreements hereinafter mentioned:

1. The Contractor will commence and complete Gorham Road Phase 2 Project.
2. The Contractor will furnish all of the material, supplies, tools, equipment, labor, and other services necessary for the construction and completion of the project described herein.
3. The Contractor will commence the work required by the Contract Documents on or before a date to be specified in the Notice to Proceed. All work associated with the contract shall be completed within a 106 consecutive calendar day work period. All work associated with the Base Bid and any selected Bid Alternate shall be completed by November 15th, 2022 excluding periods of approved shut down of work or approved extension of time due to causes that could not have been foreseen or which were beyond the control of the Contractor.

The Contractor shall notify the Town Engineer within two (2) days of any occurrence which, in the Contractor's opinion, entitles him to an extension of "Time for Completion". Such notice shall be in writing, and shall be submitted in ample time to permit full investigation and evaluation of the Contractor's claim. The Town Engineer shall acknowledge receipt of the Contractor's notice within two (2) days of its receipt.

4. The Contractor will pay as liquidated damages, the sum of \$750.00 per day for each consecutive calendar day beyond the established date for completion that the work remains incomplete. Liquidated damages will not apply to calendar days of an approved shutdown of work.
5. The Contractor agrees to perform all of the Work described in the Contract Documents for which compensation shall be as follows:
 - A. Unit Prices and Lump Sums as contained in the Bid Schedule and defined in Section 10 – Measurement and Payment.

The prices given in the Proposal are made a part of this Contract as fully as though they were reproduced here verbatim.

Extra work not included in the Contract Documents, but authorized after the date of the Contract, that cannot be classified as coming under any of the Contract units, shall be covered by a change order as provided in Section 14 of the Contract General Conditions. The Contractor will provide the manpower and equipment rates for each crew or crews used on the project to the Owner. The crew cost shall be used to establish rates for any change orders which involve the time and materials method of determining cost.

6. The term "Contract Documents" means and includes the following:

- | | |
|-----------------------------|--------------------------------------|
| (a) Advertisement for Bids | (g) Supplementary General Conditions |
| (b) Information for Bidders | (h) Payment Bond |
| (c) Bid | (i) Performance Bond |
| (d) Bid Bond | (j) Notice of Award |
| (e) Agreement | (k) Notice to Proceed |
| (f) General Conditions | (l) Change Order |
- (m) Drawings and Specifications prepared by Atlantic Resource Consultants, LLC.
- (n) Addenda:

No.	_____	dated	_____
No.	_____	dated	_____
No.	_____	dated	_____

7. The Owner will pay to the Contractor in the manner and at such times as set forth in the General Conditions such amounts as required by the Contract Documents.
8. Retention from progress payments will be in accordance with the requirements stipulated in the General Conditions, Subpart 19 as amended.
9. This Agreement shall be binding upon all parties hereto and their respective heirs, executors, administrators, successors, and assigns.
10. Throughout the performance of this Contract, Contractor is acting in an independent capacity and not as an employee, officer, or agent of the Municipality. Additional personnel needed by the Contractor to fulfill its contractual duties shall be provided by the Contractor at its expense. Contractor is solely responsible for complying with all State and Federal laws including, but not limited to, workers compensation law. Minimum wage law, employment security law, and drug/alcohol testing laws and regulations (including 49 CFR Part 381). Contractor is also solely responsible for maintaining its vehicles and equipment is in safe and legal condition.

IN WITNESS WHEREOF, the parties hereto have executed, or caused to be executed by their duly authorized officials, this Agreement in 3 (No. of copies executed) each of which shall be deemed an original on the date first above written.

OWNER:

Town of Scarborough

By _____

Name: _____

Title: _____

(SEAL)

ATTEST:

Name _____

Please Type

Title _____

CONTRACTOR:

By _____

Name _____

Please Type

Address _____

(SEAL)

ATTEST:

Name _____

Please Type

Attach Corporate Resolution

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS: That

(Name of Contractor)

(Address of Contractor)

a _____, hereinafter called Principal.
(Corporation, Partnership or Individual)

and _____
(Name of Surety)

(Address of Surety)

hereinafter called Surety, are held and firmly bound unto

(Name of Owner)

(Address of Owner)

hereinafter called **OWNER** in the penal sum of _____
Dollars, \$(_____) in lawful money of the United States, for the payment of which sum will
and truly to be made, we bind ourselves, successors, and assigns, jointly and severally, firmly
by these presents.

THE CONDITION OF THIS OBLIGATION: is such that whereas, the Principal entered into a
certain contract with the **OWNER**, dated the _____ day of _____, 20
_____, a copy of which is hereto attached and made a part hereof for the
construction of:

NOW, THEREFORE, if the Principal shall promptly make payment to all persons, firms **SUBCONTRACTORS**, and corporations furnishing materials for or performing labor in the prosecution of the **WORK** provided for in such contract, and any authorized extension or modification thereof, including all amounts due for materials, lubricants, oil, gasoline, coal, and coke, repairs to machinery, equipment and tools, consumed or used in connection with the construction of such **WORK**, and all insurance premiums on said **WORK**, and for all labor, performed in such **WORK** whether by **SUBCONTRACTOR** or otherwise, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said Surety for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the **WORK** to be performed thereunder or the **SPECIFICATIONS** accompanying the same shall in any way affect its obligation on this **BOND**, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the **WORK** or to the **SPECIFICATIONS**.

IN WITNESS WHEREOF, this instrument is executed in _____ (Number) counter-
parts, each one of which shall be deemed an original, this the _____ day of _____,
20____.

ATTEST:

_____	_____
(Principal) Secretary	(Principal)
(SEAL)	By: _____(s)

	(Address)

Witness as to Principal	

(Address)	
_____	_____
	(Surety)

ATTEST:

By: _____
(Attorney in Fact)

Witness as to Surety

(Address)

(Address)

NOTE: Date of **BOND** must not be prior to date of Contract. If **CONTRACTOR** is Partnership, all partners should execute **BOND**.

IMPORTANT: Surety companies executing **BONDS** must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State where the **PROJECT** is located.

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS: That

(Name of Contractor)

(Address of Contractor)

a _____, hereinafter called Principal.
(Corporation, Partnership or Individual)

and _____
(Name of Surety)

(Address of Surety)

hereinafter called Surety, are held and firmly bound unto

(Name of Owner)

(Address of Owner)

hereinafter called **OWNER** in the penal sum of _____ Dollars, \$(_____) in lawful money of the United States, for the payment of which sum will and truly to be made, we bind ourselves, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION: is such that whereas, the Principal entered into a certain contract with the **OWNER**, dated the _____ day of _____, 20_____, a copy of which is hereto attached and made a part hereof for the construction of:

NOW, THEREFORE, if the Principal shall will, truly and faithfully perform its duties, all the undertakings covenants, terms conditions, and agreement of said contract during the original term thereof, and any extension thereof which may be granted by the **OWNER**, with or without notice to the Surety and during the one year guaranty period, and if he shall satisfy all claims and demands incurred under such contract, and shall fully indemnify and save harmless the **OWNER** from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the **OWNER** all outlay and expense which the **OWNER** may incur in making good any default, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said Surety for value received hereby, stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the **WORK** to be performed thereunder or the **SPECIFICATIONS** accompanying the same shall in any way affect its obligation on this **BOND**, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the **WORK** or to the **SPECIFICATIONS**.

IN WITNESS WHEREOF, this instrument is executed in _____(Number)
counter-parts, each one of which shall be deemed an original, this the _____ day of
_____, 20____.

ATTEST:

_____	_____
(Principal) Secretary	(Principal)
(SEAL)	By: _____(s)

	(Address)

Witness as to Principal	

(Address)	
_____	_____
	(Surety)

ATTEST:

By: _____
(Attorney in Fact)

Witness as to Surety

(Address)

(Address)

NOTE: Date of **BOND** must not be prior to date of Contract. If **CONTRACTOR** is Partnership, all partners should execute **BOND**.

IMPORTANT: Surety companies executing **BONDS** must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State where the **PROJECT** is located.

NOTICE OF AWARD

To: _____

PROJECT: Gorham Road Phase 2 Project.

The **OWNER** has considered the **BID** submitted by you for the above described **WORK** in response to its Advertisement for Bids dated _____, 20__ and Information for Bidders.

You are hereby notified that your **BID** has been accepted for items in the amount of \$_____.

You are required by the Information of Bidders to execute the Agreement and furnish the required **CONTRACTOR'S** Performance **BOND**, Payment **BOND** and certificates of insurance within ten (10) calendar days from the date of this Notice to you.

If you fail to execute said Agreement, and to furnish said **BONDS** within ten (10) days from the date of this Notice, said **OWNER** will be entitled to consider all your rights arising out of the **OWNER'S** acceptance of your **BID** as abandoned and as a forfeiture of your **BID BOND**. The **OWNER** will be entitled to such other rights as may be granted by law.

You are required to return an acknowledged copy of this **NOTICE OF AWARD** to the **OWNER**.

Dated this _____ day of _____, 20__.

Town of Scarborough
(Owner)

By: _____

Title: _____

ACCEPTANCE OF NOTICE

Receipt of the above **NOTICE OF AWARD** is hereby acknowledged

by _____

this the _____ day of _____, 20__.

By _____

Title _____

NOTICE TO PROCEED

To: _____

Date: _____
Project: Gorham Road Phase 2 Project.

You are hereby notified to commence **WORK** in accordance with Agreement dated _____, 20__ on or before _____, 20__. You are to complete the **WORK** of the Project by _____ or within _____ consecutive calendar days, excluding periods of approved shutdown of **WORK**. The date of completion of all **WORK** is therefore _____, 20__.

Town of Scarborough
Owner

By _____

Title _____

ACCEPTANCE OF NOTICE

Receipt of the above **NOTICE TO PROCEED** is
hereby acknowledged by

this the _____ day

of _____, 20__.

By _____

Title _____

CHANGE ORDER

Order No. _____
Date: _____
Agreement Date: _____

NAME OF PROJECT: Gorham Road Phase 2 Project.

OWNER: _____

CONTRACTOR: _____

The following changes are hereby made to the **CONTRACT DOCUMENTS**:

Justification:

See Attached

Change to **CONTRACT PRICE**

Original **CONTRACT PRICE** \$ _____

Current **CONTRACT PRICE** adjusted by previous **CHANGE ORDER** \$ _____

The **CONTRACT PRICE** due to this **CHANGE ORDER** will be \$ _____

Change to **CONTRACT TIME**

The **CONTRACT TIME** will be (increased) (decreased) by _____ calendar days.

The date for completion of all work will be _____ (Date).

Approval Required:

To be effective this Order must be approved by the State agency if it changes the scope of objective of the **PROJECT**, or as may otherwise be required by the **SUPPLEMENTAL GENERAL CONDITIONS**.

Requested by: _____

Recommended by: _____

Ordered by: _____

Accepted by: _____

CONTRACTOR'S AFFIDAVIT

STATE OF _____:

COUNTY OF _____:

Before me, the undersigned _____, a Notary Public, Justice of the Peace, or Alderman) in and for said County and State personally appeared

(individual, partner, or duly authorized representative of Corporate Contractor)

who being duly sworn according to law deposes and says that the cost of all labor, material, and equipment and outstanding claims and indebtedness of whatever nature arising out of the performance of the Contract between

THE TOWN OF SCARBOROUGH

and _____
(Contractor)

of _____

dated _____ for Gorham Road Phase 2 have been paid in full.

(Individual, Partner, or duly
authorized representative of
Corporate Contractor)

Sworn to and subscribed

before me this _____

day of _____, 20____

CERTIFICATE OF OWNER'S ATTORNEY

I, the undersigned, _____, the duly authorized and acting legal representative of the Town of Scarborough, do hereby certify as follows:

I have examined the attached contract(s), certificates of insurance and the proposed performance and payment bond(s) and I am of the opinion that each of the aforesaid documents, if properly executed, will satisfy the contract conditions for the herein described project as required by the Town of Scarborough.

Date: _____

Signature: _____

Address: _____

Address: _____

Phone: _____

GENERAL CONDITIONS

1. Definitions
2. Additional Instructions and Detail Drawings
3. Schedules, Reports and Records
4. Drawings and Specifications
5. Shop Drawings
6. Materials, Services and Facilities
7. Inspection and Testing
8. Substitutions
9. Patents
10. Surveys, Permits, Regulations
11. Protection of Work, Property, Persons
12. Supervision by Contractor
13. Changes in the Work
14. Changes in Contract Price
15. Time for Completion and Liquidated Damages
16. Correction of Work

17. Subsurface Conditions
18. Suspension of Work, Termination and Delay
19. Payments to Contractor
20. Acceptance of Final Payment as Release
21. Insurance
22. Contract Security
23. Assignments
24. Indemnification
25. Separate Contracts
26. Subcontracting
27. Engineer's Authority
28. Land and Rights-of-Way
29. Guaranty
30. Arbitration
31. Taxes

1. DEFINITIONS

1.1 Wherever used in the CONTRACT DOCUMENTS, the following terms shall have the meanings indicated which shall be applicable to both the singular and plural thereof:

1.2 ADDENDA—Written or graphic instruments issued prior to the execution of the Agreement which modify or interpret the CONTRACT DOCUMENTS, DRAWINGS and SPECIFICATIONS, by additions, deletions, clarifications or corrections.

1.3 BID—The offer or proposal of the BIDDER submitted on the prescribed form setting forth the prices for the WORK to be performed.

1.4 BIDDER—Any person, firm or corporation submitting a BID for the WORK.

1.5 BONDS—Bid, Performance, and Payment Bonds and other instruments of security, furnished by the CONTRACTOR and his surety in accordance with the CONTRACT DOCUMENTS.

1.6 CHANGE ORDER—A written order to the CONTRACTOR authorizing an addition, deletion or revision in the WORK within the general scope of the CONTRACT DOCUMENTS, or authorizing an adjustment in the CONTRACT PRICE or CONTRACT TIME.

1.7 CONTRACT DOCUMENTS—The contract, including Advertisement For Bids, Information For Bidders, BID, Bid Bond, Agreement, Payment Bond, Performance Bond, NOTICE OF AWARD, NOTICE TO PROCEED, CHANGE ORDER, DRAWINGS, SPECIFICATIONS, and ADDENDA.

1.8 CONTRACT PRICE—The total monies payable to the CONTRACTOR under the terms and conditions of the CONTRACT DOCUMENTS.

1.9 CONTRACT TIME—The number of calendar days stated in the CONTRACT DOCUMENTS for the completion of the WORK.

1.10 CONTRACTOR—The person, firm or corporation with whom the OWNER has executed the Agreement.

1.11 DRAWINGS—The part of the CONTRACT DOCUMENTS which show the characteristics and scope of the WORK to be performed and which have been prepared or approved by the ENGINEER.

1.12 ENGINEER—The person, firm or corporation named as such in the CONTRACT DOCUMENTS.

1.13 FIELD ORDER—A written order effecting a change in the WORK not involving an adjustment in the CONTRACT PRICE or an extension of the CONTRACT TIME, issued by the ENGINEER to the CONTRACTOR during construction.

1.14 NOTICE OF AWARD—The written notice of the acceptance of the BID from the OWNER to the successful BIDDER.

1.15 NOTICE TO PROCEED—Written communication issued by the OWNER to the CONTRACTOR authorizing him to proceed with the WORK and establishing the date of commencement of the WORK.

1.16 OWNER—A public or quasi-public body or authority, corporation, association, partnership, or individual for whom the WORK is to be performed.

1.17 PROJECT—The undertaking to be performed as provided in the CONTRACT DOCUMENTS.

1.18 RESIDENT PROJECT REPRESENTATIVE—The authorized representative of the OWNER who is assigned to the PROJECT site or any part thereof.

1.19 SHOP DRAWINGS—All drawings, diagrams, illustrations, brochures, schedules and other data which are prepared by the CONTRACTOR, a SUBCONTRACTOR, manufacturer, SUPPLIER or distributor, which illustrate how specific portions of the WORK shall be fabricated or installed.

1.20 SPECIFICATIONS—A part of the CONTRACT DOCUMENTS consisting of written descriptions of a technical nature of materials, equipment, construction systems, standards and workmanship.

1.21 SUBCONTRACTOR—An individual, firm or corporation having a direct contract with the CONTRACTOR or with any other SUBCONTRACTOR for the performance of a part of the WORK at the site.

1.22 SUBSTANTIAL COMPLETION—That date as certified by the ENGINEER when the construction of the PROJECT or a specified part thereof is sufficiently completed, in accordance with the CONTRACT DOCUMENTS, so that the PROJECT or specified part can be utilized for the purposes for which it is intended.

1.23 SUPPLEMENTAL GENERAL CONDITIONS—

Modifications to General Conditions required by a Federal agency for participation in the PROJECT and approved by the agency in writing prior to inclusion in the CONTRACT DOCUMENTS, or such requirements that may be imposed by applicable state laws.

1.24 SUPPLIER—Any person or organization who supplies materials or equipment for the WORK, including that fabricated to a special design, but who does not perform labor at the site.

1.25 WORK—All labor necessary to produce the construction required by the CONTRACT DOCUMENTS, and all materials and equipment incorporated or to be incorporated in the PROJECT.

1.26 WRITTEN NOTICE—Any notice to any party of the Agreement relative to any part of this Agreement in writing and considered delivered and the service thereof completed, when posted by certified or registered mail to the said party at his last given address, or delivered in person to said party or his authorized representative on the WORK.

2. ADDITIONAL INSTRUCTIONS AND DETAIL DRAWINGS

2.1 The CONTRACTOR may be furnished additional instructions and detail drawings, by the ENGINEER, as necessary to carry out the WORK required by the CONTRACT DOCUMENTS.

2.2 The additional drawings and instruction thus supplied will become a part of the CONTRACT DOCUMENTS. The CONTRACTOR shall carry out the WORK in accordance with the additional detail drawings and instructions.

SCHEDULES, REPORTS AND RECORDS

3.1 The CONTRACTOR shall submit to the OWNER such schedule of quantities and costs, progress schedules, payrolls, reports, estimates, records and other data where applicable as are required by the CONTRACT DOCUMENTS for the WORK to be performed.

3.2 Prior to the first partial payment estimate the CONTRACTOR shall submit construction progress schedules showing the order in which he proposes to carry on the WORK, including dates at which he will start the various parts of the WORK, estimated date of completion of each part and, as applicable:

3.2.1. The dates at which special detail drawings will be required; and

3.2.2. Respective dates for submission of SHOP DRAWINGS; the beginning of manufacture; the testing and the installation of materials, supplies and equipment.

3.3 The CONTRACTOR shall also submit a schedule of payments that he anticipates he will earn during the course of the WORK.

4. DRAWINGS AND SPECIFICATIONS

4.1 The intent of the DRAWINGS and SPECIFICATIONS is that the CONTRACTOR shall furnish all labor, materials, tools, equipment, and transportation necessary for the proper execution of the WORK in accordance with the CONTRACT DOCUMENTS and all incidental work necessary to complete the PROJECT in an acceptable manner, ready for use, occupancy or operation by the OWNER.

4.2 In case of conflict between the DRAWINGS and SPECIFICATIONS, the SPECIFICATIONS shall govern. Figure dimensions on DRAWINGS shall govern over scale dimensions, and detailed DRAWINGS shall govern over general DRAWINGS.

4.3 Any discrepancies found between the DRAWINGS and SPECIFICATIONS and site conditions or any inconsistencies or ambiguities in the DRAWINGS or SPECIFICATIONS shall be immediately reported to the ENGINEER, in writing, who shall promptly correct such inconsistencies or ambiguities in writing. WORK done by the CONTRACTOR after his discovery of such discrepancies, inconsistencies or ambiguities shall be done at the CONTRACTOR'S risk.

5. SHOP DRAWINGS

5.1 The CONTRACTOR shall provide SHOP DRAWINGS as may be necessary for the prosecution of the WORK as required by the CONTRACT DOCUMENTS. The ENGINEER shall promptly review all SHOP DRAWINGS. The ENGINEER'S approval of any SHOP DRAWING shall not release the CONTRACTOR from responsibility for deviations from the CONTRACT DOCUMENTS. The approval of any SHOP DRAWING which substantially deviates from the requirement of the CONTRACT DOCUMENTS shall be evidenced by a CHANGE ORDER.

5.2 When submitted for the ENGINEER'S review, SHOP DRAWINGS shall bear the CONTRACTOR'S certification that he has reviewed, checked and approved the SHOP DRAWINGS and that they are in conformance with the requirements of the CONTRACT DOCUMENTS.

5.3 Portions of the WORK requiring a SHOP DRAWING or sample submission shall not begin until the SHOP DRAWING or submission has been approved by the ENGINEER. A copy of each approved SHOP DRAWING and each approved sample shall be kept in good order by the CONTRACTOR at the site and shall be available to the ENGINEER.

6. MATERIALS, SERVICES AND FACILITIES

6.1 It is understood that, except as otherwise specifically stated in the CONTRACT DOCUMENTS, the CONTRACTOR shall provide and pay for all materials, labor, tools, equipment, water, light, power, transportation, supervision, temporary construction of any nature, and all other services and facilities of any nature whatsoever necessary to execute, complete, and deliver the WORK within the specified time.

6.2 Materials and equipment shall be so stored as to insure the preservation of their quality and fitness for the WORK. Stored materials and equipment to be incorporated in the WORK shall be located so as to facilitate prompt inspection.

6.3 Manufactured articles, materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned as directed by the manufacturer.

6.4 Materials, supplies and equipment shall be in accordance with samples submitted by the CONTRACTOR and approved by the ENGINEER.

6.5 Materials, supplies or equipment to be incorporated into the WORK shall not be purchased by the

CONTRACTOR or the SUBCONTRACTOR subject to a chattel mortgage or under a conditional sale contract or other agreement by which an interest is retained by the seller.

7. INSPECTION AND TESTING

7.1 All materials and equipment used in the construction of the PROJECT shall be subject to adequate inspection and testing in accordance with generally accepted standards, as required and defined in the CONTRACT DOCUMENTS.

7.2 The OWNER shall provide all inspection and testing services not required by the CONTRACT DOCUMENTS.

7.3 The CONTRACTOR shall provide at his expense the testing and inspection services required by the CONTRACT DOCUMENTS.

7.4 If the CONTRACT DOCUMENTS, laws, ordinances, rules, regulations or orders of any public authority having jurisdiction require any WORK to specifically be inspected, tested, or approved by someone other than the CONTRACTOR, the CONTRACTOR will give the ENGINEER timely notice of readiness. The CONTRACTOR will then furnish the ENGINEER the required certificates of inspection, testing or approval.

7.5 Inspections, tests or approvals by the engineer or others shall not relieve the CONTRACTOR from his obligations to perform the WORK in accordance with the requirements of the CONTRACT DOCUMENTS.

7.6 The ENGINEER and his representatives will at all times have access to the WORK. In addition, authorized representatives and agents of any participating Federal or state agency shall be permitted to inspect all work, materials, payrolls, records of personnel, invoices of materials, and other relevant data and records. The CONTRACTOR will provide proper facilities for such access and observation of the WORK and also for any inspection, or testing thereof.

7.7 If any WORK is covered contrary to the written instructions of the ENGINEER it must, if requested by the ENGINEER, be uncovered for his observation and replaced at the CONTRACTOR'S expense.

7.8 If the ENGINEER considers it necessary or advisable that covered WORK be inspected or tested by others, the CONTRACTOR, at the ENGINEER'S request, will uncover, expose or otherwise make available for observation, inspection or testing as the ENGINEER may require, that portion of the WORK in question, furnishing all necessary labor, materials, tools, and equipment. If it is found that such WORK is defective, the CONTRACTOR will bear all the expenses of such uncovering, exposure, observation, inspection and testing and of satisfactory reconstruction. If, however, such WORK is not found to be defective, the CONTRACTOR will be allowed an increase in the CONTRACT PRICE or an extension of the CONTRACT TIME, or both, directly attributable to such uncovering, exposure, observation, inspection, testing and reconstruction and an appropriate CHANGE ORDER shall be issued.

SUBSTITUTIONS

7.1 Whenever a material, article or piece of equip-

ment is identified on the DRAWINGS or SPECIFICATIONS by reference to brand name or catalogue number, it shall be understood that this is referenced for the purpose of defining the performance or other salient requirements and that other products of equal capacities, quality and function shall be considered. The CONTRACTOR may recommend the substitution of a material, article, or piece of equipment of equal substance and function for those referred to in the CONTRACT DOCUMENTS by reference to brand name or catalogue number, and if, in the opinion of the ENGINEER, such material, article, or piece of equipment is of equal substance and function to that specified, the ENGINEER may approve its substitution and use by the CONTRACTOR. Any cost differential shall be deductible from the CONTRACT PRICE and the CONTRACT DOCUMENTS shall be appropriately modified by CHANGE ORDER. The CONTRACTOR warrants that if substitutes are approved, no major changes in the function or general design of the PROJECT will result. Incidental changes or extra component parts required to accommodate the substitute will be made by the CONTRACTOR without a change in the CONTRACT PRICE or CONTRACT TIME.

9. PATENTS

9.1 The CONTRACTOR shall pay all applicable royalties and license fees. He shall defend all suits or claims for infringement of any patent rights and save the OWNER harmless from loss on account thereof, except that the OWNER shall be responsible for any such loss when a particular process, design, or the product of a particular manufacturer or manufacturers is specified, however if the CONTRACTOR has reason to believe that the design, process or product specified is an infringement of a patent, he shall be responsible for such loss unless he promptly gives such information to the ENGINEER.

10. SURVEYS, PERMITS, REGULATIONS

10.1 The OWNER shall furnish all boundary surveys and establish all base lines for locating the principal component parts of the WORK together with a suitable number of bench marks adjacent to the WORK as shown in the CONTRACT DOCUMENTS. From the information provided by the OWNER, unless otherwise specified in the CONTRACT DOCUMENTS, the CONTRACTOR shall develop and make all detail surveys needed for construction such as slope stakes, batter boards, stakes for pile locations and other working points, lines, elevations and cut sheets.

10.2 The CONTRACTOR shall carefully preserve bench marks, reference points and stakes and, in case of willful or careless destruction, he shall be charged with the resulting expense and shall be responsible for any mistakes that may be caused by their unnecessary loss or disturbance.

10.3 Permits and licenses of a temporary nature necessary for the prosecution of the WORK shall be secured and paid for by the CONTRACTOR unless otherwise stated in the SUPPLEMENTAL GENERAL CONDITIONS. Permits, licenses and easements for permanent structures or permanent changes in existing facilities shall be secured and paid for by the OWNER, unless otherwise specified. The CONTRACTOR shall give all notices and comply with all laws, ordinances, rules and regulations bearing on the conduct of the WORK as drawn and specified. If the CONTRACTOR

observes that the CONTRACT DOCUMENTS are at variance therewith, he shall promptly notify the ENGINEER in writing, and any necessary changes shall be adjusted as provided in Section 13, CHANGES IN THE WORK.

11. PROTECTION OF WORK, PROPERTY AND PERSONS

11.1 The CONTRACTOR will be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the WORK. He will take all necessary precautions for the safety of, and will provide the necessary protection to prevent damage, injury or loss to all employees on the WORK and other persons who may be affected thereby, all the WORK and all materials or equipment to be incorporated therein, whether in storage on or off the site, and other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

11.2 The CONTRACTOR will comply with all applicable laws, ordinances, rules, regulations and orders of any public body having jurisdiction. He will erect and maintain, as required by the conditions and progress of the WORK, all necessary safeguards for safety and protection. He will notify owners of adjacent utilities when prosecution of the WORK may affect them. The CONTRACTOR will remedy all damage, injury or loss to any property caused, directly or indirectly, in whole or in part, by the CONTRACTOR, any SUBCONTRACTOR or anyone directly or indirectly employed by any of them or anyone for whose acts any of them be liable, except damage or loss attributable to the fault of the CONTRACT DOCUMENTS or to the acts or omissions of the OWNER or the ENGINEER or anyone employed by either of them or anyone for whose acts either of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of the CONTRACTOR.

11.3 In emergencies affecting the safety of persons or the WORK or property at the site or adjacent thereto, the CONTRACTOR, without special instruction or authorization from the ENGINEER or OWNER, shall act to prevent threatened damage, injury or loss. He will give the ENGINEER prompt WRITTEN NOTICE of any significant changes in the WORK or deviations from the CONTRACT DOCUMENTS caused thereby, and a CHANGE ORDER shall thereupon be issued covering the changes and deviations involved.

12. SUPERVISION BY CONTRACTOR

12.1 The CONTRACTOR will supervise and direct the WORK. He will be solely responsible for the means, methods, techniques, sequences and procedures of construction. The CONTRACTOR will employ and maintain on the WORK a qualified supervisor or superintendent who shall have been designated in writing by the CONTRACTOR as the CONTRACTOR'S representative at the site. The supervisor shall have full authority to act on behalf of the CONTRACTOR and all communications given to the supervisor shall be as binding as if given to the CONTRACTOR. The supervisor shall be present on the site at all times as required to perform adequate supervision and coordination of the WORK.

13. CHANGES IN THE WORK

13.1 The OWNER may at any time, as the need arises,

order changes within the scope of the WORK without invalidating the Agreement. If such changes increase or decrease the amount due under the CONTRACT DOCUMENTS, or in the time required for performance of the WORK, an equitable adjustment shall be authorized by CHANGE ORDER.

13.2 The ENGINEER, also, may at any time, by issuing a FIELD ORDER, make changes in the details of the WORK. The CONTRACTOR shall proceed with the performance of any changes in the WORK so ordered by the ENGINEER unless the CONTRACTOR believes that such FIELD ORDER entitles him to a change in CONTRACT PRICE or TIME, or both, in which event he shall give the ENGINEER WRITTEN NOTICE thereof within seven (7) days after the receipt of the ordered change. Thereafter the CONTRACTOR shall document the basis for the change in CONTRACT PRICE or TIME within thirty (30) days. The CONTRACTOR shall not execute such changes pending the receipt of an executed CHANGE ORDER or further instruction from the OWNER.

14. CHANGES IN CONTRACT PRICE

14.1 The CONTRACT PRICE may be changed only by a CHANGE ORDER. The value of any WORK covered by a CHANGE ORDER or of any claim for increase or decrease in the CONTRACT PRICE shall be determined by one or more of the following methods in the order of precedence listed below:

(a) Unit prices previously approved.

(b) An agreed lump sum.

(c) The actual cost for labor, direct overhead, materials, supplies, equipment, and other services necessary to complete the work. In addition there shall be added an amount to be agreed upon but not to exceed fifteen (15) percent of the actual cost of the WORK to cover the cost of general overhead and profit.

15. TIME FOR COMPLETION AND LIQUIDATED DAMAGES

15.1 The date of beginning and the time for completion of the WORK are essential conditions of the CONTRACT DOCUMENTS and the WORK embraced shall be commenced on a date specified in the NOTICE TO PROCEED.

15.2 The CONTRACTOR will proceed with the WORK at such rate of progress to insure full completion within the CONTRACT TIME. It is expressly understood and agreed, by and between the CONTRACTOR and the OWNER, that the CONTRACT TIME for the completion of the WORK described herein is a reasonable time, taking into consideration the average climatic and economic conditions and other factors prevailing in the locality of the WORK.

15.3 If the CONTRACTOR shall fail to complete the WORK within the CONTRACT TIME, or extension of time granted by the OWNER, then the CONTRACTOR will pay to the OWNER the amount for liquidated damages as specified in the BID for each calendar day that the CONTRACTOR shall be in default after the time stipulated in the CONTRACT DOCUMENTS.

15.4 The CONTRACTOR shall not be charged with liquidated damages or any excess cost when the delay in completion of the WORK is due to the following, and the CONTRACTOR has promptly given WRITTEN NOTICE of such delay to the OWNER or ENGINEER.

15.4.1 To any preference, priority or allocation

order duly issued by the OWNER.

15.4.2 To unforeseeable causes beyond the control and without the fault or negligence of the CONTRACTOR, including but not restricted to, acts of God, or of the public enemy, acts of the OWNER, acts of another CONTRACTOR in the performance of a contract with the OWNER, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and abnormal and unforeseeable weather; and

15.4.3 To any delays of SUBCONTRACTORS occasioned by any of the causes specified in paragraphs 15.4.1 and 15.4.2 of this article.

16. CORRECTION OF WORK

16.1 The CONTRACTOR shall promptly remove from the premises all WORK rejected by the ENGINEER for failure to comply with the CONTRACT DOCUMENTS, whether incorporated in the construction or not, and the CONTRACTOR shall promptly replace and re-execute the WORK in accordance with the CONTRACT DOCUMENTS and without expense to the OWNER and shall bear the expense of making good all WORK of other CONTRACTORS destroyed or damaged by such removal or replacement.

16.2 All removal and replacement WORK shall be done at the CONTRACTOR'S expense. If the CONTRACTOR does not take action to remove such rejected WORK within ten (10) days after receipt of WRITTEN NOTICE, the OWNER may remove such WORK and store the materials at the expense of the CONTRACTOR.

17. SUBSURFACE CONDITIONS

17.1 The CONTRACTOR shall promptly, and before such conditions are disturbed, except in the event of an emergency, notify the OWNER by WRITTEN NOTICE of:

17.1.1 Subsurface or latent physical conditions at the site differing materially from those indicated in the CONTRACT DOCUMENTS; or

17.1.2 Unknown physical conditions at the site, of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in WORK of the character provided for in the CONTRACT DOCUMENTS.

17.2 The OWNER shall promptly investigate the conditions, and if he finds that such conditions do so materially differ and cause an increase or decrease in the cost of, or in the time required for, performance of the WORK, an equitable adjustment shall be made and the CONTRACT DOCUMENTS shall be modified by a CHANGE ORDER. Any claim of the CONTRACTOR for adjustment hereunder shall not be allowed unless he has given the required WRITTEN NOTICE; provided that the OWNER may, if he determines the facts so justify, consider and adjust any such claims asserted before the date of final payment.

18. SUSPENSION OF WORK, TERMINATION AND DELAY

18.1 The OWNER may suspend the WORK or any portion thereof for a period of not more than ninety days or such further time as agreed upon by the CONTRACTOR, by WRITTEN NOTICE to the CONTRACTOR and the ENGINEER which notice shall fix the date on which WORK shall be resumed. The CONTRACTOR

will resume that WORK on the date so fixed. The CONTRACTOR will be allowed an increase in the CONTRACT PRICE or an extension of the CONTRACT TIME, or both, directly attributable to any suspension.

18.2 If the CONTRACTOR is adjudged a bankrupt or insolvent, or if he makes a general assignment for the benefit of his creditors, or if a trustee or receiver is appointed for the CONTRACTOR or for any of his property, or if he files a petition to take advantage of any debtor's act, or to reorganize under the bankruptcy or applicable laws, or if he repeatedly fails to supply sufficient skilled workmen or suitable materials or equipment, or if he repeatedly fails to make prompt payments to SUBCONTRACTORS or for labor, materials or equipment or if he disregards laws, ordinances, rules, regulations or orders of any public body having jurisdiction of the WORK or if he disregards the authority of the ENGINEER, or if he otherwise violates any provision of the CONTRACT DOCUMENTS, then the OWNER may, without prejudice to any other right or remedy and after giving the CONTRACTOR and his surety a minimum of ten (10) days from delivery of a WRITTEN NOTICE, terminate the services of the CONTRACTOR and take possession of the PROJECT and of all materials, equipment, tools, construction equipment and machinery thereon owned by the CONTRACTOR, and finish the WORK by whatever method he may deem expedient. In such case the CONTRACTOR shall not be entitled to receive any further payment until the WORK is finished. If the unpaid balance of the CONTRACT PRICE exceeds the direct and indirect costs of completing the PROJECT, including compensation for additional professional services, such excess SHALL BE PAID TO THE CONTRACTOR. If such costs exceed such unpaid balance, the CONTRACTOR will pay the difference to the OWNER. Such costs incurred by the OWNER will be determined by the ENGINEER and incorporated in a CHANGE ORDER.

18.3 Where the CONTRACTOR'S services have been so terminated by the OWNER, said termination shall not affect any right of the OWNER against the CONTRACTOR then existing or which may thereafter accrue. Any retention or payment of monies by the OWNER due the CONTRACTOR will not release the CONTRACTOR from compliance with the CONTRACT DOCUMENTS.

18.4 After ten (10) days from delivery of a WRITTEN NOTICE to the CONTRACTOR and the ENGINEER, the OWNER may, without cause and without prejudice to any other right or remedy, elect to abandon the PROJECT and terminate the Contract. In such case, the CONTRACTOR shall be paid for all WORK executed and any expense sustained plus reasonable profit.

18.5 If, through no act or fault of the CONTRACTOR, the WORK is suspended for a period of more than ninety (90) days by the OWNER or under an order of court or other public authority, or the ENGINEER fails to act on any request for payment within thirty (30) days after it is submitted, or the OWNER fails to pay the CONTRACTOR substantially the sum approved by the ENGINEER or awarded by arbitrators within thirty (30) days of its approval and presentation, then the CONTRACTOR may, after ten (10) days from delivery of a WRITTEN NOTICE to the OWNER and the ENGINEER, terminate the CONTRACT and recover from the OWNER payment for all WORK exe-

cuted and all expenses sustained. In addition and in lieu of terminating the CONTRACT, if the ENGINEER has failed to act on a request for payment or if the OWNER has failed to make any payment as aforesaid, the CONTRACTOR may upon ten (10) days written notice to the OWNER and the ENGINEER stop the WORK until he has been paid all amounts then due, in which event and upon resumption of the WORK, CHANGE ORDERS shall be issued for adjusting the CONTRACT PRICE or extending the CONTRACT TIME or both to compensate for the costs and delays attributable to the stoppage of the WORK.

18.6 If the performance of all or any portion of the WORK is suspended, delayed, or interrupted as a result of a failure of the OWNER or ENGINEER to act within the time specified in the CONTRACT DOCUMENTS, or if no time is specified, within a reasonable time, an adjustment in the CONTRACT PRICE or an extension of the CONTRACT TIME, or both, shall be made by CHANGE ORDER to compensate the CONTRACTOR for the costs and delays necessarily caused by the failure of the OWNER or ENGINEER.

19. PAYMENTS TO CONTRACTOR

19.1 At least ten (10) days before each progress payment falls due (but not more often than once a month), the CONTRACTOR will submit to the ENGINEER a partial payment estimate filled out and signed by the CONTRACTOR covering the WORK performed during the period covered by the partial payment estimate and supported by such data as the ENGINEER may reasonably require. If payment is requested on the basis of materials and equipment not incorporated in the WORK but delivered and suitably stored at or near the site, the partial payment estimate shall also be accompanied by such supporting data satisfactory to the OWNER, as will establish the OWNER's title to the material and equipment and protect his interest therein, including applicable insurance. The ENGINEER will, within ten (10) days after receipt of each partial payment estimate, either indicate in writing his approval of payment and present the partial payment estimate to the OWNER, or return the partial payment estimate to the CONTRACTOR indicating in writing his reasons for refusing to approve payment. In the latter case, the CONTRACTOR may make the necessary corrections and resubmit the partial payment estimate. The OWNER will, within ten (10) days of presentation to him of an approved partial payment estimate, pay the CONTRACTOR a progress payment on the basis of the approved partial payment estimate. The OWNER shall retain ten (10) percent of the amount of each payment until final completion and acceptance of all work covered by the CONTRACT DOCUMENTS. The OWNER at any time, however, after fifty (50) percent of the WORK has been completed, if he finds that satisfactory progress is being made, shall reduce retainage to five (5%) percent on the current and remaining estimates. When the WORK is substantially complete (operational or beneficial occupancy), the retained amount may be further reduced below five (5) percent to only that amount necessary to assure completion. On completion and acceptance of a part of the WORK on which the price is stated separately in the CONTRACT DOCUMENTS, payment may be made in full, including retained percentages, less authorized deductions.

19.2 The request for payment may also include an allowance for the cost of such major materials and

equipment which are suitably stored either at or near the site.

19.3 Prior to SUBSTANTIAL COMPLETION, the OWNER, with the approval of the ENGINEER and with the concurrence of the CONTRACTOR, may use any completed or substantially completed portions of the WORK. Such use shall not constitute an acceptance of such portions of the WORK.

19.4 The OWNER shall have the right to enter the premises for the purpose of doing work not covered by the CONTRACT DOCUMENTS. This provision shall not be construed as relieving the CONTRACTOR of the sole responsibility for the care and protection of the WORK, or the restoration of any damaged WORK except such as may be caused by agents or employees of the OWNER.

19.5 Upon completion and acceptance of the WORK, the ENGINEER shall issue a certificate attached to the final payment request that the WORK has been accepted by him under the conditions of the CONTRACT DOCUMENTS. The entire balance found to be due the CONTRACTOR, including the retained percentages, but except such sums as may be lawfully retained by the OWNER, shall be paid to the CONTRACTOR within thirty (30) days of completion and acceptance of the WORK.

19.6 The CONTRACTOR will indemnify and save the OWNER or the OWNER'S agents harmless from all claims growing out of the lawful demands of SUB-CONTRACTORS, laborers, workmen, mechanics, materialmen, and furnishers of machinery and parts thereof, equipment, tools, and all supplies, incurred in the furtherance of the performance of the WORK. The CONTRACTOR shall, at the OWNER'S request, furnish satisfactory evidence that all obligations of the nature designated above have been paid, discharged, or waived. If the CONTRACTOR fails to do so the OWNER may, after having notified the CONTRACTOR, either pay unpaid bills or withhold from the CONTRACTOR'S unpaid compensation a sum of money deemed reasonably sufficient to pay any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged whereupon payment to the CONTRACTOR shall be resumed, in accordance with the terms of the CONTRACT DOCUMENTS, but in no event shall the provisions of this sentence be construed to impose any obligations upon the OWNER to either the CONTRACTOR, his Surety, or any third party. In paying any unpaid bills of the CONTRACTOR, any payment so made by the OWNER shall be considered as a payment made under the CONTRACT DOCUMENTS by the OWNER to the CONTRACTOR and the OWNER shall not be liable to the CONTRACTOR for any such payments made in good faith.

19.7 If the OWNER fails to make payment thirty (30) days after approval by the ENGINEER, in addition to other remedies available to the CONTRACTOR, there shall be added to each such payment interest at the maximum legal rate commencing on the first day after said payment is due and continuing until the payment is received by the CONTRACTOR.

20. ACCEPTANCE OF FINAL PAYMENT AS RELEASE

20.1 The acceptance by the CONTRACTOR of final payment shall be and shall operate as a release to the OWNER of all claims and all liability to the CONTRACTOR other than claims in stated amounts as may be specifically excepted by the CONTRACTOR for all things done or furnished in connection with this WORK and for every act and neglect of the OWNER and others relating to or arising out of this WORK. Any payment, however, final or otherwise, shall not release the CONTRACTOR or his sureties from any obligations under the CONTRACT DOCUMENTS or the Performance BOND and Payment BONDS.

21. INSURANCE

21.1 The CONTRACTOR shall purchase and maintain such insurance as will protect him from claims set forth below which may arise out of or result from the CONTRACTOR'S execution of the WORK, whether such execution be by himself or by any SUBCONTRACTOR or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

21.1.1 Claims under workmen's compensation, disability benefit and other similar employee benefit acts;

21.1.2 Claims for damages because of bodily injury, occupational sickness or disease, or death of employees;

21.1.3 Claims for damages because of bodily injury, sickness or disease, or death of any person other than his employees;

21.1.4 Claims for damages insured by usual personal injury liability coverage which are sustained (1) by any person as a result of an offense directly or indirectly related to the employment of such person by the CONTRACTOR, or (2) by any other person; and

21.1.5 Claims for damages because of injury to or destruction of tangible property, including loss of use resulting therefrom.

21.2 Certificates of Insurance acceptable to the OWNER shall be filed with the OWNER prior to commencement of the WORK. These Certificates shall contain a provision that coverages afforded under the policies will not be cancelled unless at least fifteen (15) days prior WRITTEN NOTICE has been given to the OWNER.

21.3 The CONTRACTOR shall procure and maintain, at his own expense, during the CONTRACT TIME, liability insurance as hereinafter specified:

21.3.1 CONTRACTOR'S General Public Liability and Property Damage Insurance including vehicle coverage issued to the CONTRACTOR and protecting him from all claims for personal injury, including death, and all claims for destruction of or damage to property, arising out of or in connection with any

operations under the CONTRACT DOCUMENTS, whether such operations be by himself or by any SUBCONTRACTOR under him, or anyone directly or indirectly employed by the CONTRACTOR or by a SUBCONTRACTOR under him. Insurance shall be written with a limit of liability of not less than \$500,000 for all damages arising out of bodily injury, including death, at any time resulting therefrom, sustained by any one person in any one accident; and a limit of liability of not less than \$500,000 aggregate for any such damages sustained by two or more persons in any one accident. Insurance shall be written with a limit of liability of not less than \$200,000 for all property damage sustained by any one person in any one accident; and a limit of liability of not less than \$200,000 aggregate for any such damage sustained by two or more persons in any one accident.

21.3.2 The CONTRACTOR shall acquire and maintain, if applicable, Fire and Extended Coverage insurance upon the PROJECT to the full insurable value thereof for the benefit of the OWNER, the CONTRACTOR, and SUBCONTRACTORS as their interest may appear. This provision shall in no way release the CONTRACTOR or CONTRACTOR'S surety from obligations under the CONTRACT DOCUMENTS to fully complete the PROJECT.

21.4 The CONTRACTOR shall procure and maintain, at his own expense, during the CONTRACT TIME, in accordance with the provisions of the laws of the state in which the work is performed, Workmen's Compensation Insurance, including occupational disease provisions, for all of his employees at the site of the PROJECT and in case any work is sublet, the CONTRACTOR shall require such SUBCONTRACTOR similarly to provide Workmen's Compensation Insurance, including occupational disease provisions, for all of the latter's employees unless such employees are covered by the protection afforded by the CONTRACTOR. In case any class of employees engaged in hazardous work under this contract at the site of the PROJECT is not protected under Workmen's Compensation statute, the CONTRACTOR shall provide, and shall cause each SUBCONTRACTOR to provide, adequate and suitable insurance for the protection of his employees not otherwise protected.

21.5 The CONTRACTOR shall secure, if applicable, "All Risk" type Builder's Risk Insurance for WORK to be performed. Unless specifically authorized by the OWNER, the amount of such insurance shall not be less than the CONTRACT PRICE totaled in the BID. The policy shall cover not less than the losses due to fire, explosion, hail, lightning, vandalism, malicious mischief, wind, collapse, riot, aircraft, and smoke during the CONTRACT TIME, and until the WORK is accepted by the OWNER. The policy shall name as the insured the CONTRACTOR, the ENGINEER, and the OWNER.

22. CONTRACT SECURITY

22.1 The CONTRACTOR shall within ten (10) days after the receipt of the NOTICE OF AWARD furnish the OWNER with a Performance Bond and a Payment Bond in penal sums equal to the amount of the CONTRACT PRICE, conditioned upon the performance by

the CONTRACTOR of all undertakings, covenants, terms, conditions and agreements of the CONTRACT DOCUMENTS, and upon the prompt payment by the CONTRACTOR to all persons supplying labor and materials in the prosecution of the WORK provided by the CONTRACT DOCUMENTS. Such BONDS shall be executed by the CONTRACTOR and a corporate bonding company licensed to transact such business in the state in which the WORK is to be performed and named on the current list of "Surety Companies Acceptable on Federal Bonds" as published in the Treasury Department Circular Number 570. The expense of these BONDS shall be borne by the CONTRACTOR. If at any time a surety on any such BOND is declared a bankrupt or loses its right to do business in the state in which the WORK is to be performed or is removed from the list of Surety Companies accepted on Federal BONDS, CONTRACTOR shall within ten (10) days after notice from the OWNER to do so, substitute an acceptable BOND (or BONDS) in such form and sum and signed by such other surety or sureties as may be satisfactory to the OWNER. The premiums on such BOND shall be paid by the CONTRACTOR. No further payments shall be deemed due nor shall be made until the new surety or sureties shall have furnished an acceptable BOND to the OWNER.

23. ASSIGNMENTS

23.1 Neither the CONTRACTOR nor the OWNER shall sell, transfer, assign or otherwise dispose of the Contract or any portion thereof, or of his right, title or interest therein, or his obligations thereunder, without written consent of the other party.

24. INDEMNIFICATION

24.1 The CONTRACTOR will indemnify and hold harmless the OWNER and the ENGINEER, and their agents and employees from and against all claims, damages, losses and expenses, including attorney's fees arising out of or resulting from the performance of the WORK, provided that any such claims, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property including the loss of use resulting therefrom, and is caused in whole or in part by any negligent or willful act or omission of the CONTRACTOR, and SUBCONTRACTOR, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable.

24.2 In any and all claims against the OWNER or the ENGINEER, or any of their agents or employees, by any employee of the CONTRACTOR, any SUBCONTRACTOR, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, the indemnification obligation shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the CONTRACTOR or any SUBCONTRACTOR under workmen's compensation acts, disability benefit acts or other employee benefits acts.

24.3 The obligation of the CONTRACTOR under this paragraph shall not extend to the liability of the ENGINEER, his agents or employees arising out of the preparation or approval of maps, DRAWINGS, opinions, reports, surveys, CHANGE ORDERS, designs or SPECIFICATIONS.

25. SEPARATE CONTRACTS

25.1 The OWNER reserves the right to let other con-

tracts in connection with this PROJECT. The CONTRACTOR shall afford other CONTRACTORS reasonable opportunity for the introduction and storage of their materials and the execution of their WORK, and shall properly connect and coordinate his WORK with theirs. If the proper execution or results of any part of the CONTRACTOR'S WORK depends upon the WORK of any other CONTRACTOR, the CONTRACTOR shall inspect and promptly report to the ENGINEER any defects in such WORK that render it unsuitable for such proper execution and results.

25.2 The OWNER may perform additional WORK related to the PROJECT by himself, or he may let other contracts containing provisions similar to these. The CONTRACTOR will afford the other CONTRACTORS who are parties to such Contracts (or the OWNER, if he is performing the additional WORK himself), reasonable opportunity for the introduction and storage of materials and equipment and the execution of WORK, and shall properly connect and coordinate his WORK with theirs.

25.3 If the performance of additional WORK by other CONTRACTORS or the OWNER is not noted in the CONTRACT DOCUMENTS prior to the execution of the CONTRACT, written notice thereof shall be given to the CONTRACTOR prior to starting any such additional WORK. If the CONTRACTOR believes that the performance of such additional WORK by the OWNER or others involves him in additional expense or entitles him to an extension of the CONTRACT TIME, he may make a claim therefor as provided in Sections 14 and 15.

26. SUBCONTRACTING

26.1 The CONTRACTOR may utilize the services of specialty SUBCONTRACTORS on those parts of the WORK which, under normal contracting practices, are performed by specialty SUBCONTRACTORS.

26.2 The CONTRACTOR shall not award WORK to SUBCONTRACTOR(s), in excess of fifty (50%) percent of the CONTRACT PRICE, without prior written approval of the OWNER.

26.3 The CONTRACTOR shall be fully responsible to the OWNER for the acts and omissions of his SUBCONTRACTORS, and of persons either directly or indirectly employed by them, as he is for the acts and omissions of persons directly employed by him.

26.4 The CONTRACTOR shall cause appropriate provisions to be inserted in all subcontracts relative to the WORK to bind SUBCONTRACTORS to the CONTRACTOR by the terms of the CONTRACT DOCUMENTS insofar as applicable to the WORK of SUBCONTRACTORS and to give the CONTRACTOR the same power as regards terminating any subcontract that the OWNER may exercise over the CONTRACTOR under any provision of the CONTRACT DOCUMENTS.

26.5 Nothing contained in this CONTRACT shall create any contractual relation between any SUBCONTRACTOR and the OWNER.

27. ENGINEER'S AUTHORITY

27.1 The ENGINEER shall act as the OWNER'S representative during the construction period. He shall decide questions which may arise as to quality and acceptability of materials furnished and WORK performed. He shall interpret the intent of the CONTRACT DOCUMENTS in a fair and unbiased manner. The

ENGINEER will make visits to the site and determine if the WORK is proceeding in accordance with the CONTRACT DOCUMENTS.

27.2 The CONTRACTOR will be held strictly to the intent of the CONTRACT DOCUMENTS in regard to the quality of materials, workmanship and execution of the WORK. Inspections may be made at the factory or fabrication plant of the source of material supply.

27.3 The ENGINEER will not be responsible for the construction means, controls, techniques, sequences, procedures, or construction safety.

27.4 The ENGINEER shall promptly make decisions relative to interpretation of the CONTRACT DOCUMENTS.

28. LAND AND RIGHTS-OF-WAY

28.1 Prior to issuance of NOTICE TO PROCEED, the OWNER shall obtain all land and rights-of-way necessary for carrying out and for the completion of the WORK to be performed pursuant to the CONTRACT DOCUMENTS, unless otherwise mutually agreed.

28.2 The OWNER shall provide to the CONTRACTOR information which delineates and describes the lands owned and rights-of-way acquired.

28.3 The CONTRACTOR shall provide at his own expense and without liability to the OWNER any additional land and access thereto that the CONTRACTOR may desire for temporary construction facilities, or for storage of materials.

29. GUARANTY

29.1 The CONTRACTOR shall guarantee all materials and equipment furnished and WORK performed for a period of one (1) year from the date of SUBSTANTIAL COMPLETION. The CONTRACTOR warrants and guarantees for a period of one (1) year from the date of SUBSTANTIAL COMPLETION of the system that the completed system is free from all defects due to faulty materials or workmanship and the CONTRACTOR shall promptly make such corrections as may be

necessary by reason of such defects including the repairs of any damage to other parts of the system resulting from such defects. The OWNER will give notice of observed defects with reasonable promptness. In the event that the CONTRACTOR should fail to make such repairs, adjustments, or other WORK that may be made necessary by such defects, the OWNER may do so and charge the CONTRACTOR the cost thereby incurred. The Performance BOND shall remain in full force and effect through the guarantee period.

30. ARBITRATION

30.1 All claims, disputes and other matters in question arising out of, or relating to, the CONTRACT DOCUMENTS or the breach thereof, except for claims which have been waived by the making and acceptance of final payment as provided by Section 20, shall be decided by arbitration in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association. This agreement to arbitrate shall be specifically enforceable under the prevailing arbitration law. The award rendered by the arbitrators shall be final, and judgment may be entered upon it in any court having jurisdiction thereof.

30.2 Notice of the demand for arbitration shall be filed in writing with the other party to the CONTRACT DOCUMENTS and with the American Arbitration Association, and a copy shall be filed with the ENGINEER. Demand for arbitration shall in no event be made on any claim, dispute or other matter in question which would be barred by the applicable statute of limitations.

30.3 The CONTRACTOR will carry on the WORK and maintain the progress schedule during any arbitration proceedings, unless otherwise mutually agreed in writing.

31. TAXES

31.1 The CONTRACTOR will pay all sales, consumer, use and other similar taxes required by the law of the place where the WORK is performed.

AMENDMENTS TO GENERAL CONDITIONS

3. SCHEDULES, REPORTS AND RECORDS

Paragraph 3.2 is deleted in its entirety; the Contractor's attention is directed to the requirements contained in Section 1 of the Technical Specifications.

4. DRAWINGS AND SPECIFICATIONS

4.4 Titles to divisions and paragraphs in these Specifications are introduced merely for convenience, and shall not be taken as a correct or complete segregation of the several units of material and labor. No responsibility, either direct or implied, is assumed by the Engineers for omissions or duplications by the Contractor, or his subcontractors, due to real or alleged error in arrangement of the matter in these Contract Documents.

4.5 Before ordering any material or doing any work, the Contractor shall verify all dimensions at the job, and shall be responsible for the correctness of same. No extra charge or compensation will be allowed because of any differences in dimensions or quantities from those indicated on the Contract Drawings, unless such difference is submitted to the Town Engineer before proceeding with the work. A limit of six (6) copies of Plans and Documents will be furnished by the Town Engineer. Additional copies may be purchased at cost.

4.6 Materials or work described in words which so applied have a well known technical or trade meaning shall be held to refer to such recognized standards.

5. SHOP DRAWINGS

The Contractor's attention is directed to the requirements contained in Section 1 of the Technical Specifications.

6. MATERIALS, SERVICES AND FACILITIES

6.6 Wherever the words "approved by", "satisfactory to", "as directed by", "submitted to", "inspected by", or similar phrases are used in this Specification, they shall be understood to mean that the material or item referred to shall be approved by, satisfactory to, as directed by, submitted to, inspected by, the Town Engineer or designated representative.

8. SUBSTITUTIONS

8.2 Should the substitution of a product or material require changes in design of the facilities, the Contractor shall bear the expense of engineering costs to affect the design changes.

10. SURVEYS, PERMITS, REGULATIONS

10.1.1 The Owner will provide electronic copies of the construction plans to the Contractor for establishment of the survey baseline provided on the plans. It shall be the Contractor's responsibility to provide all survey layout as necessary to establish horizontal and vertical control for the construction work.

10.4 The Contractor must employ a licensed Surveyor or registered professional engineer to establish proper lines and grades for each pipe laying crew. If laser beam equipment is used, frequent checks must be made to assure close adherence to line and grade. If lasers are not used, batter boards are to be set at maximum 25-foot intervals and grades transferred to the boards with a transit or level. Setting pipes to grade by use of "pop" levels or carpenters levels will not be permitted. Survey instruments shall be suitable for the accuracy required, shall be well maintained, and shall be kept in proper adjustment.

11. PROTECTION OF WORK, PROPERTY, PERSONS

11.4 The Contractor shall ascertain the true location of all underground structures of any kind whatsoever and shall be completely responsible for same regardless of their indication on Plans or Specifications. He shall make such arrangements as may be required to protect, adjust or replace same with the appropriate authority.

11.5 This project is subject to all of the safety and health regulations (Sec. 29 CFR 1518 as amended), Occupational Safety and Health Act (OSHA) as promulgated by the U. S. Department of Labor, April 1971. The Contractor is directly responsible for adhering to all requirements of this act. The Contractor shall familiarize him/herself and adhere to all stipulations of this Safety Directive.

11.6 The Contractor shall not enter upon private property for any purpose without first obtaining the permission of the Owner.

11.7 The Contractor shall protect carefully all land monuments and property marks. Property markers disturbed during construction shall be replaced by a land surveyor, registered in the State of Maine, at the Contractor's expense.

14. CHANGES IN CONTRACT PRICE

Paragraph 14.1 is deleted in its entirety and replaced with the following:

The CONTRACT PRICE may be changed only by a CHANGE ORDER. The value of any WORK covered by a CHANGE ORDER or of any claim for increase or decrease in the CONTRACT PRICE shall be determined by one or more of the following methods in the order of procedure listed below:

- a. Unit Prices Previously Approved.
- b. An agreed lump sum.
- c. Time and materials.

For all change order work performed under b, a fee for overhead and profit will be allowed over and above the "actual cost" of the work. For work performed by a subcontractor, this fee shall not exceed fifteen (15%) for the subcontractor and five percent (5%) for the general contractor. The general contractor's five percent (5%) is calculated on the subcontractor's actual cost before the fee is added. The total fee on "actual work" shall not exceed 20%. For work performed by the general contractor, this fee shall not exceed fifteen percent (15%).

The "Actual cost" of work includes the reasonable cost to the Contractor of the following:

- a. materials used as part of the work;
- b. common and skilled labor and foreman only;
- c. equipment rental for the period employed directly on the work at rates not exceeding the monthly rate contained in the current "Rental Rate Blue Book for Construction Equipment (published by the Equipment Guidebook Company);
- d. additional insurance if required, to cover public liability for injury to persons and property;
- e. Workman's Compensation Insurance, Federal Social Security and any other costs associated with payrolls and required by law.

The "Actual cost" of work does not include the following:

- a. purchase or rental of small tools and buildings;
- b. Contractor's supervision of subcontractor (these costs are part of fee outlined above);
- c. use of capital or premium on the bond unless the extra work includes an extension of time approved and authorized by the Owner;
- d. overhead and profit.

19. PAYMENTS TO CONTRACTOR

The existing Paragraph 19.1 shall be amended with the following clauses:

19.1.1 Until construction is 50% complete, as determined by the Engineer, retainage shall be 10% of the monthly payments claimed. After construction is 50% complete, and provided the Contractor has performed to the satisfaction of the Engineer and provided further that there is no specific cause for greater retainage, no further retainage will be withheld.

19.1.2 Upon substantial or final completion, the amount of retainage will be reduced to 2% the total amount due the Contractor plus an additional retainage based on the Engineer's estimate of the fair value of the punch list items and the cost of completing specified amounts for each incomplete or defective item of work. As these items are completed or corrected, they shall be paid for out of the retainage until the entire project is declared completed. The final 2% retainage shall be held during the one year warranty period and released only after the project has been accepted by the Owner.

Add an additional paragraph as follows:

19.8 The Engineer may withhold or, on account of subsequently discovered evidence, nullify the whole or part of any approved partial payment estimate to such extent as may be necessary to protect the Owner from loss on account of:

- (a) Defective work not remedied.
- (b) Claims filed or reasonable evidence indicating probable filing of claims.
- (c) Failure of Contractor to make payments properly to Subcontractors or for material or labor.
- (d) A reasonable doubt that the work can be completed for the balance then unpaid.
- (e) Damage to another Contractor.
- (f) Performance of work in violation of the terms of the contract documents.

Where work on unit price items are substantially complete but lack cleanup and/or corrections ordered by the Engineer, amounts shall be deducted from unit prices in partial payment estimates to amply cover such cleanup and corrections.

When the above grounds are removed, payment shall be made for amounts withheld because of them.

21. INSURANCE

21.1 The paragraph of the General Conditions is amended by the addition of the following:

The Contractor shall not commence work under this contract until he has obtained all the insurance required hereunder and such insurance has been approved by the Owner. The Contractor shall also not use subcontractors until all similar insurance required of the subcontractor has been approved by the Owner. The subcontractor's insurance shall not relieve or decrease the liability of the Contractor hereunder.

21.2 This existing paragraph of the General Conditions is amended by adding that Certificates of Insurance shall also be filed with Owner promptly upon renewal and upon change of any coverage or insurer, and Owner shall be permitted to examine any policy of insurance before approving the insurance provided thereunder.

21.3.1 This existing paragraph of the General Conditions shall be deleted in its entirety, with the following being added:

a. General Liability Insurance:

Comprehensive General Liability Insurance coverage for Bodily Injury and Property Damage Liability claims arising out of all premises operations, subcontracted operations, products-completed operations for a period of three (3) years, and all liability assumed by the Contractor under any contract or agreement including, but not limited to, Article 24 of the General Conditions. Such insurance shall be in the name of the Contractor and with insurers acceptable to the Owner.

Exclusions pertaining to the following operations are to be deleted if such operations are to be performed by the Contractor or anyone on his behalf.

"X" Exclusion: Damage to property as a result of blasting.

"C" Exclusion: Damage to property by the collapse of or structural injury to any building or structure due to grading of land, excavation, pile driving, shoring, raising or demolition of any building or structure.

"G" Exclusion: Damage to underground property which is defined as property, damage to wires, conduits, pipes, mains, any similar property, and any apparatus in connection therewith beneath the surface of the ground or water, caused by and occurring during the use of mechanical equipment for the purpose of grading land, paving, excavating, pile driving, etc.

The minimum limits for such insurance shall be:

Bodily Injury	--	\$1,000,000 Each Person
Bodily Injury	--	\$1,000,000 Each Occurrence
Property Damage		\$2,000,000 Each Person
Property Damage		\$2,000,000 Each Occurrence

b. Automobile Liability Insurance:

Automobile Liability Insurance coverage for claims arising out of the ownership, maintenance, or use of owned, hired, or non-owned automobiles. Such insurance shall be in the name of the Contractor and with insurers acceptable to the Owner.

The minimum limits for such insurance shall be:

Single Limit for Bodily Injury and Property Damage - \$500,000

c. Excess Liability Insurance:

Excess Liability Insurance shall be for a minimum value of \$1,000,000 in the Umbrella Form.

d. This insurance shall be endorsed to provide Broad Form Property Damage.

21.3.2 This existing paragraph of the General Conditions shall be deleted in its entirety.

21.6 The following paragraph is added to Section 21, Insurance.

The Contractor shall procure and maintain, at his own expense, during the Contract Time, in accordance with the provisions of the laws of the State of Maine, Workmen's Compensation Insurance, including occupational disease provisions, for all of his employees at the site of the project and in case any work this contract at the site of the Project is not protected under Workmen's Compensation statute, the Contractor shall provide, adequate and suitable insurance for the protection of his employees not otherwise protected.

24. INDEMNIFICATION

24.2 The Contractor and his surety shall indemnify and save harmless the Owner, his officers, and employees, from all suits, actions, or claims of any character brought because of any injuries or damage received or sustained by any person, persons, or property on account of the operations of the said Contractor; or on account of or in consequence of any neglect in safeguarding the work; or through use of unacceptable materials in construction of the work; or because of any act or omission, neglect, or misconduct of said Contractor; or because of any claims or amounts recovered from any claims or amounts arising or recovered under the "Workmen's Compensation Act", or the money due to the said Contractor under and by virtue of his contract as shall be considered necessary by the Owner for such purpose, may be retained; or in case no money is due, his surety may be held until such suit or suits, action or actions, claim or claims, for injuries or damages as aforesaid shall have been settled and suitable evidence to that effect furnished to the Owner.

30. ARBITRATION

Paragraph 30, Arbitration, is deleted and replaced by the following: 30. Litigation

30.1 All claims, disputes, and other matters arising out of, or relating to, the Contract Documents or breach thereof, except for claims which have been waived by the making and acceptance of final payment as provided by Section 20, shall be subject to litigation in accordance with the American Bar Association and laws of the State of Maine.

30.2 Notice of the demand for litigation shall be filed in writing with the other party to the Contract Documents and with the appropriate legal entities, and a copy shall be filed with the Engineer. Litigation shall in no event be made on any claim, dispute, or other matter in question which would be barred by the applicable statute of limitations.

30.3 The Contractor will carry on the work and maintain progress schedule during any litigation proceedings unless otherwise mutually agreed in writing.

SUPPLEMENTARY GENERAL CONDITIONS

- 32. Occupancy
- 33. Blasting
- 34. Construction Safety Rules and Regulations
- 35. Workmanship
- 36. Overtime Work
- 37. Handling Materials
- 38. Protection From Inclement Weather
- 39. Protection of Utilities
- 40. Maintenance of Traffic
- 41. Environmental Requirements
- 42. Temporary Enclosures and Facilities
- 43. Special Construction Requirements
- 44. Engineer's Field Office
- 45. Regulatory Agency Access to Project
- 46. Statutory Requirements in General
- 47. Non-Resident Contractors
- 48. Responsibility for Damage Claims
- 49. Sanitary Regulations
- 50. Special Scheduling Requirements
- 51. Bid Protests

32. OCCUPANCY

32.1 The Owner also reserves the right to occupy certain finished portions of the work before final acceptance. If such right is exercised, the owner will assume all responsibility for his damage to the structure, but assumption of such responsibility by the Owner in no way relieves the Contractor of his obligation as defined under Section 29, Guarantee of the General Conditions.

33. BLASTING

33.1 Blasting shall be performed only after approval has been given by the Owner for such operation.

33.2 All blasting shall be performed in accordance with all pertinent provisions of the "Manual of Accident Prevention in Construction" issued by the Associated General Contractors of America, Inc., of the "Construction Safety Rules and Regulations, as adopted by the State Board of Construction Safety, Augusta, Maine, and Maine Department of Transportation "Standard Specifications" Section 107.12, Use of Explosives. Blasting through the over burden for mass rock excavation will not be allowed. Blasting through the over burden for trench rock excavation will be allowed provided the Contractor has agreed with the quantity of trench rock excavation before blasting.

34. CONSTRUCTION SAFETY RULES AND REGULATIONS

34.1 The operations of the Contractor shall be governed by the Construction Safety Rules and Regulations as adopted by the State Board of Construction Safety, Augusta, Maine, and in particular, Parts A to M.

34.2 All equipment used on the project must be maintained and operated so as to provide maximum safety for workers and the public. The Contractor will be required to have adequate exhaust silencers on all powered equipment in close proximity to residential structures.

34.3 This project is subject to all of the Safety and Health Regulations (CFR 29 Part 1926 and all subsequent amendments) as promulgated by the U.S. Department of Labor on June 24, 1974. Contractors are urged to make themselves familiar with the requirements of these regulations.

35. WORKMANSHIP

35.1 Workmanship shall, at all times, be of a grade expected from skilled mechanics in each trade. Fitting of all materials shall be done to preserve the strength and durability of the materials and to present a clean, well worked appearance. The standards of all work shall be such as to produce first-class results throughout. Where different materials abut, or where it is necessary to cut or pass through one material with another, care must be taken not to injure or deface one material in placing the other. Various trades shall, at all times, cooperate in the installation of their work to complete the whole in a satisfactory, acceptable manner.

36. OVERTIME WORK

36.1 If, in the opinion of the Engineer, the progress of the work is such that the completion date of the Contract cannot be met for causes other than those provided in Article II, he may request the Contractor to work additional men, additional hours, or both. The cost of all such overtime shall be borne by the Contractor.

37. HANDLING MATERIALS

37.1 The Contractor, or his subcontractors, shall be responsible for the proper care and protection of all of his materials, equipment, etc., during transportation and after delivery at the site. The Contractor and each subcontractor shall handle all material as directed so that it may be inspected by the Engineer. All materials capable of being injuriously affected by weather shall be protected from injury while being transported to the site as well as while being stored there.

38. PROTECTION FROM INCLEMENT WEATHER

38.1 The Contractor shall take such action as may be required to protect labor, materials and equipment including the land, trench and appurtenances in any way connected with the project, from the effect of extremes of heat and cold, wind and rain; and other climatological conditions. Such actions by the Contractor shall meet the requirements of the Engineer. Special attention will be given to protection of concrete from freezing, laying of pipe in frozen ground, etc.

39. PROTECTION OF UTILITIES

39.1 Prior to commencement of work, the Contractor, by careful examination, must make himself familiar with all utilities in the work area, both underground and overhead. The locations shown on the Plan are based on the best information available, but the Owner and the Engineer do not warrant their accuracy in either horizontal or vertical locations, or do they warrant that all existing utilities are shown. Certain relocation work may be required by existing utilities to allow installation of the work of this Contract. The Contractor shall make arrangements with such utilities for proper on-site coordination of construction.

During construction, the Contractor shall carefully protect all utilities from damage, and will notify appropriate representatives of utilities when work is to be accomplished in proximity to their facilities. The Contractor shall be fully responsible for any damage to existing utilities. See Sections 4.1.5 of the Technical Specifications.

40. MAINTENANCE OF TRAFFIC

40.1 The Contractor shall be responsible for scheduling his work in such a manner that it shall be carried on to provide safe passage at all times for public traffic (motor vehicles, bicyclists and pedestrians within the public right-of-way) and with a minimum of obstruction to traffic.

40.2 The Contractor shall be responsible for preparing a traffic control plan for review and approval by the Town of Scarborough. The traffic control plan shall be prepared in accordance with the latest revision of the Manual on Uniform Traffic Control Devices (MUTCD) for Streets and Highways published by the U.S. Department of Commerce as well as any additional requirements of the review authorities identified above.

40.3 Traffic Control Requirements will be as follows:

- The Contractor shall provide two variable message boards for the duration of the contract to provide advanced warning of lane closures on Gorham Road.
- The contractor shall be allowed to close a single lane of Gorham Road for a distance of up to five hundred feet at any given time to protect the active work zone between the hours of 6:00am and 7:00pm on weekdays and 8:00am and 7:00pm of weekends. Traffic control must be provided and maintained at all times, with a minimum clear width of ten feet to ensure the safe and efficient movement of bi-directional traffic along the roadway.
- A Scarborough Police detail will be required in advance of any proposed lane closure. The Contractor will be responsible for coordinating with the Scarborough Police Department for the police detail; however, the Contractor will not be responsible for the costs of this detail. The Scarborough Police detail is being provided to supplement the Contractor's Traffic Control Plan and is not intended to replace or reduce any part of the Contractor's Traffic Control Plan.
- The installation of temporary pavement will be required at the end of each working day over trenches within any section of Gorham Road that is open to traffic. These work areas will be opened to traffic at the end of each day and shall be restored to surface grade with temporary pavement capable of supporting traffic loads. The surface material used for temporary pavement shall be hot mix asphalt meeting the MDOT specification (12.5mm gradation) and shall be installed to a compacted depth of not less than three inches (3in).
- The Contractor shall provide temporary pavement and lane delineation markings in all areas where roadways are open to traffic but not yet fully restored and permanently marked.
- The Contractor shall maintain access and egress from and to public streets and private properties throughout the work area at all times.
- The Contractor shall provide temporary pavement and lane delineation markings in all areas where roadways are open to traffic but not yet fully restored and permanently marked.
- The Contractor shall maintain access and egress from to private properties throughout the work area at all times.
- Additional flaggers are required at each driveway within the entire work zone lane closure area to facilitate turning vehicles entering and exiting the sites.

40.4 The Town, Police and Fire Departments will be kept continually aware of the status of any street restrictions and closings during the term of construction. The Contractor shall provide and pay for all traffic officers (excluding Scarborough Police detail) as necessary to assure traffic passage and safety. The Contractor shall provide and place all traffic control devices (warning signs, barriers, lights, and barricades, etc.) as required. All traffic controls shall be in accordance with the latest revision of the MUTCD. The cost of all traffic controls, officers, etc., shall be included in the bid items for the project and no other payment shall be made.

41. ENVIRONMENTAL REQUIREMENTS

41.1 The Contractor shall include in the appropriate contract bid items his costs for compliance with State and local environmental protection requirements including, but not limited to, the following:

41.1.1 Control of dust from excavations and spillage of materials on highways and dust from rock drilling operations.

41.1.2 Compliance with local ordinances on burning.

41.1.3 Control of erosion and washing of materials from excavated slopes and embankments.

41.1.4 Prevention of stream turbidity from dewatering and general earthwork operations.

41.2 In general, construction of necessary temporary erosion and sedimentation control devices will be in conformance with the Maine Erosion and Sediment Control BMPs prepared and maintained by the Maine Department of Environmental Protection Agency.

41.3 The Contractor shall not dispose of any excess materials on lands designated or classified as wetlands by the methodology of the Dept. of Army Corps of Engineers. The Contractor is advised to contact related agencies prior to selecting any or all sites for disposal of excess materials.

41.4 The Contractor shall have the duty and obligation to grade, mulch, and seed waste disposal areas. This work shall be incidental to the Contract price. The Contractor shall maintain a list of all disposal sites and submit an update list with each pay requisition.

42. TEMPORARY ENCLOSURES AND FACILITIES

42.1 The Contractor shall provide such temporary enclosures as the work may warrant. In addition, he shall provide the necessary temporary office, heat, utilities, telephone, and sanitary facilities, as required by the job, the Contractor, or the Engineer.

43. SPECIAL CONSTRUCTION REQUIREMENTS

43.1 During the progress of the work the Contractor shall maintain all active sewers in operation. This shall include the need to provide and maintain by-pass pumping to accommodate sanitary flows.

43.2 Castings from appurtenances scheduled for abandonment or replacement shall be delivered and stockpiled at the Town of Scarborough Department of Public Works Facility.

43.3 The Town of Scarborough shall have the right to first refusal for all excess materials.

44. ENGINEER'S FIELD OFFICE

44.1 No field office shall be required on this project.

45. REGULATORY AGENCY ACCESS TO THE PROJECT

The Contractor shall allow the City, or any authorized representatives thereof, access to the site and project records at all reasonable times.

46. STATUTORY REQUIREMENTS IN GENERAL

The Contractor shall keep himself fully informed of all existing and future State and Federal laws and municipal ordinances and regulations in any manner affecting those engaged or employed in the work, or the materials used or employed in the work, or in any way affecting the conduct of the work, and of all such orders and decrees having any jurisdiction or authority over the same and of all provisions required by law to be a part of this Contract, all of which provisions are hereby incorporated by reference and made a part thereof. If any discrepancy or inconsistency is discovered in the Drawings or Specifications or Contract for this work in relation to any such law, ordinance, regulation, order or decree, he shall report the same to the Engineer in writing. He shall at all times himself observe and comply with, and shall cause all his agents and employees to observe and comply with all such existing and future laws, ordinances, regulations, orders and decrees; and shall protect and indemnify the owner and Engineer and all of their officers, agents and servants against any claim or liability arising from or based on the violation of such law, ordinance, regulation, order or decree, whether by himself or his employees' subcontractors.

47. NON-RESIDENT CONTRACTORS

The successful bidder, if a corporation established under laws other than the State in which the proposed construction is located, shall file, at the time of the execution of the Contract, with the Owner, notice of the name of its resident attorney, appointed as required by the laws of the State in which the proposed construction is located. (In the State of Maine, Section 127 of Chapter 53 of the Revised Statutes.)

The successful bidder, if a resident of another state other than that which the proposed construction is located and not a corporation, shall file, at the time of the execution of the Contract, with the Owner a written appointment of a resident of the State in which the construction is located, having an office or place of business therein, to be his true and lawful attorney upon whom all lawful processes in any actions or proceedings against him

may be served; and in such writing, which shall set forth said attorney's place of residence, shall agree that any lawful process against him which is served on said attorney shall be of the same legal force and validity as if served on him, and that the authority shall continue in force so long as any liability remains outstanding against him in said state. The power of attorney shall be filed in the office of the Secretary of State if required, and copies certified by the Secretary shall be sufficient evidence thereof. Such appointment shall continue in force until removed by an instrument in writing, designating in a like manner some other persons upon whom such process may be served, which instrument shall be filed in the manner provided herein for the original appointment.

A nonresident Contractor shall be deemed to be:

1. A person who is not a resident in the state where the proposed construction is to be located.
2. Any partnership that has no member thereof resident in the state where the proposed construction is to be located.
3. Any corporation established under laws other than those of the state in which the proposed construction is located.

48. RESPONSIBILITY FOR DAMAGE CLAIMS

The Contractor and his surety shall indemnify and save harmless the Owner, his officers and employees, from all suits, actions, or claims of any character brought because of any injuries or damage received or sustained by any person, persons, or property on account of the operations of the said Contractor; or on account of or in consequence of any neglect in safeguarding the work; or through use of unacceptable materials in construction of the work; or because of any act or omission, neglect, or misconduct of said Contractor; or because of any claims or amounts recovered from any infringements of patent, trademark, or copyright; or from any claims or amounts arising or recovered under the "Workmen's Compensation Act", or of any other law, ordinance, order or decree; and so much of the money due the said Contractor under and by virtue of his contract as shall be considered necessary by the Owner for such purpose, may be retained; or in case no money is due, his surety may be held until such suits or suit, action or actions, claim or claims, for injuries or damages as aforesaid shall have been settled and suitable evidence to that effect furnished to the Owner.

The Contractor shall promptly pay all bills for labor, materials, machinery, water, tools, equipment, trucks, automobiles, freight, fuel, light and power and for all other things, contracted for or used by him on account of the work herein contemplated, and if at any time during the progress of the work or before final payment of any money due the Contractor under the terms of this Contract, any claim for labor, materials, water, tools, equipment, trucks, automobiles, freight, fuel, light and power, or for any other things specified as aforesaid, or for damage by reason of any acts, omissions, or neglect of said Contractor in the prosecution of the work, shall be presented to said Owner, the Owner may retain such sum or sums from the monies due the Contractor under this Contract as would be necessary to discharge all claims whether for labor, materials, or damages as aforesaid, and until the validity of such claims shall be established and finally determined, and if determined and finally established as valid, all such claims shall be paid from the amount so retained if it be sufficient for that purpose; otherwise, or if at any time the Owner shall be satisfied that any of such claims are invalid and groundless, any amount so retained shall be paid to said

Contractor, or in case of default of Contract to the Contractor's surety, and the said owner shall not be liable to any individual, firm, or party if he does not hold and retain any money due under this Contract for the purpose of payment of such claim.

If the monies so retained under this Contract are insufficient to pay all such claims presented to said Owner and adjudged by any court of competent jurisdiction to be valid obligations of said Contractor, the Owner may at its discretion pay the same and the Contractor shall repay the Owner all sums so paid. The Owner, at its option, may also use any monies due or to become due under this Contract for the Purpose of Paying any claims Presented to said Owner. Should the Contractor neglect to Pay any undisputed claim, made in writing to the owner, within thirty (30) days after the completion of the work, but continuing unsatisfied for a period of ninety (90) days, the Owner may pay such claim and deduct the amount thereof from the balance due the Contractor.

49. SANITARY REGULATIONS

Sanitary conveniences, in sufficient numbers, for the use of all persons employed on the work, and properly screened from public observation, shall be provided and maintained at suitable locations, in accordance with State and local ordinances. When no longer required, they shall be removed from the site and the contents shall be removed and disposed of in a satisfactory manner, as the occasion requires. The Contractor shall rigorously enforce the use of the approved sanitary facilities provided.

The Contractor shall supply sufficient drinking water to all his employees from approved sources. He shall obey and enforce other local sanitary regulations and orders, and shall take such precautions against infectious diseases as may be deemed necessary.

50. SPECIAL SCHEDULING REQUIREMENTS

The Contractor shall include in his planning, scheduling and cost for this project the following requirements:

50.1 The Contractor shall excavate all test pits prior to the beginning other project construction. If the test pits reveal a utility conflict with the proposed facilities, then the Engineer shall issue revised plans within five (5) calendar days of the last test pit exploration. Work shall not begin until revised plans, if required, have been made available to the Contractor.

51. BID PROTESTS

All protests arising from the Owner's procurement practices must be submitted to the Owner as soon as practical. The Owner will investigate the basis for the protest, seek the advice of legal counsel, document all meetings and actions, and attempt to resolve the protest.