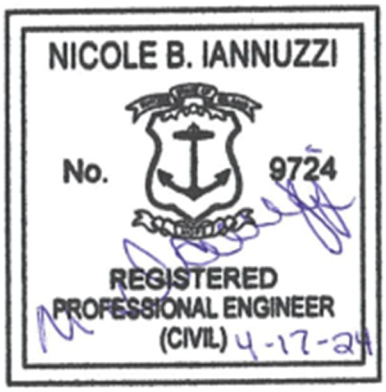
North Kingstown, Rhode Island

WICKFORD WATERFRONT IMPROVEMENTS

April 2024

Bidding Requirements, Bond Forms, Contract Agreement, Conditions of the Contract and Technical Specifications



Professional Registration No.: 9724

BETA
www.BETA-Inc.com

701 George Washington Highway
Lincoln, Rhode Island 02865
401.333.2382

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Attachments

DIVISION 0

SECTION 00100

NOTICE TO BIDDERS
TOWN OF NORTH KINGSTOWN, RHODE ISLAND
WICKFORD WATERFRONT IMPROVEMENTS PROJECT

The **Town of North Kingstown, Rhode Island** invites sealed bids for **"Town of North Kingstown, Rhode Island, Wickford Waterfront Improvements Project"**, in accordance with the Contract Documents prepared by BETA GROUP, INC., Consulting Engineers, 701 George Washington Highway, Lincoln, RI 02865.

Bid documents may be obtained and bids MUST be filed with the Purchasing/Finance Department Town Municipal Offices, 100 Fairway Drive, North Kingstown, Rhode Island 02852. Bid documents may also be obtained at (northkingstownri.gov/Bids) by registering and/or logging in as a vendor. Bids (one original marked "MASTER", one copy and one electronic copy on USB flash drive) must be submitted in a sealed envelope and clearly marked on the outside "**WICKFORD WATERFRONT IMPROVEMENTS PROJECT – and the bidding date of May 2, 2024**". Bids will be opened at 10:00 AM at the North Kingstown Town Hall, 100 Fairway Drive on May 2, 2024 . Successful bidders must furnish a performance bond on 100 percent of the proposed contract within 15 days after the award. The Town reserves all rights to reject any and all bids, or any part thereof, or to go on the open market when is deemed to be in the best interest of the Town.

The location, general characteristics, and principal details of the Work are indicated in a set of Contract Documents, entitled **"Town of North Kingstown, Rhode Island, Wickford Waterfront Improvements Project."**

The work in this Contract includes, but is not limited to:

- Removal of existing pavement
- Removal and replacement of subgrade material with gravel borrow base course material
- Installation of new granite curb as required
- Installation of cement concrete sidewalk
- Installation of new brick and asphalt walkways
- Installation of Stormwater Bioretention Basins
- Installation of Accessible Curb Ramps
- Installation of new retaining wall
- Installation of Tide Gates
- Structure adjustments as required
- Installation of new drainage pipe
- Re-building of drainage structures as required
- Driveway reconstruction as required
- Installation of pavement markings
- Installation of drainage manholes
- Installation of catch basins
- Installation of porous pavers and underdrains

- Installation of erosion controls
- Safety controls and signing for construction operations
- All other incidental items included in the contract documents

Bids shall be on a Unit Price basis.

The Town of North Kingstown will award the contract to the single, lowest, responsible bidder.

The Time of Completion for this project shall be **300 calendar days** (excluding winter shutdown from November 15th to April 15th where paving will not be permitted, but weather permitting, other construction activities will be permitted as approved by Town and Engineer) from a Contractor's receipt of a Notice to Proceed.

Bid Security: Certified, treasurer's or cashier's check or bid bond in the sum of five (5) percent of the Total Bid is required.

Contract Documents may be examined and obtained at the Office of the Town Clerk, North Kingstown Town Hall, 100 Fairway Drive, North Kingstown, RI 02852.

Bidders requesting Contract Documents to be mailed to them will be responsible for all shipping costs. Bidders shall coordinate mailing with the office of the Town Clerk, 100 Fairway Drive, North Kingstown, RI 02852, (401) 268-1552. The Town of North Kingstown is not responsible for delivery of any mailed, delivered documents, or delivery of said documents within the prescribed time set for the receipt of bids.

Direct all inquiries in writing to: Nicole Iannuzzi, P.E., BETA Group, Inc. Fax (401) 333-9225
Email: NIannuzzi@BETA-Inc.com

Attention of Bidders is particularly referred to the Federal and State requirements as to conditions of employment to be observed and wage rates to be paid under the Contract as determined by the Department of Labor and Industries under the provision of Chapters 12 and 13 of Title 37, General Laws of Rhode Island, 1956, as amended.

The Bidders attention is also called to the "Equal Opportunity Clause", the "Nondiscrimination in Employment", and the Federal and State MBE/WBE requirements (15%) of the Contract. Of that 15% requirement, 7.5% shall be awarded to minority owned business enterprises, and 7.5% shall be awarded to woman owned business enterprises.

The Bidders attention is also called to the Event Date restrictions shown in Spec Section 01100, work will not be permitted during these days, and the site shall be opened to the public.

Any contract or contracts awarded under the Advertisement for Bids will be funded in part by grants from the RI Infrastructure Bank Municipal Resiliency Program, RI Commerce Corporation Main Street Rhode Island Streetscape Improvement Grant and RIDEM Climate Resilience Fund.

No Bidder may withdraw his bid within Ninety (90) days after the actual date of the opening thereof.

The successful Bidder must furnish 100 percent Performance and Labor and Materials Bonds.

The Owner and Engineer, being considered the sole and only judge, reserves the right to waive any informalities in, or to reject, any or all bids, should the Owner deem it to be in the owner's best interest to do so.

Town of North Kingstown , Rhode Island
Town Clerk

END OF SECTION

SECTION 00200

INFORMATION FOR BIDDERS

1.01 RECEIPT AND OPENING OF BIDS

A. Sealed bids must be submitted in SEALED ENVELOPES, addressed to the **Purchasing/Finance, Town Municipal Offices, 100 Fairway Drive, North Kingstown, Rhode Island 02852**, and clearly marked with the name of the item bid, and the date and time of opening. Bids will be received by the Purchasing Agent up to the specified time as noted on the Notice to Bidders, and publicly opened and read aloud at the specified time.

B. Proposals submitted for a specified item must not be combined under the same cover with any other bid item.

C. It is the bidder's responsibility to see that their bid is delivered within the time and at the place prescribed. Proposals received prior to the time of opening will be securely kept unopened. No responsibility will attach to any officer or person for the premature opening of a proposal not properly addressed and identified.

D. Any bid received after the time and date specified shall not be considered, by messenger or by mail, even if it is determined by the Town that such non-arrival before the time set for opening was due solely to delay in the mails for which the bidder is not responsible. Conditional or qualified bids will not be accepted.

1.02 LOCATION AND WORK TO BE DONE

A. The location, general characteristics, and principal details of the Work are indicated in a set of Contract Documents, entitled **"Town of North Kingstown, Rhode Island, Wickford Waterfront Improvements Project. "**

B. Additional drawings showing details in accordance with which the Work is to be done will be furnished from time to time by the Engineer, if found necessary, and shall then become part of the Drawings.

C. The Contractor shall furnish all labor, services, materials, equipment, plant machinery, apparatus, appliances, tools, supplies and all other things necessary to perform all work required for the completion of each item of the Work and as herein specified.

D. The Work to be done and paid for under any item shall not be limited to the exact extent mentioned or described, but shall include all incidental work necessary or customarily done for the completion of that item.

1.03 QUESTIONS REGARDING DRAWINGS AND DOCUMENTS

A. In general, no answer will be given to prospective bidders in reply to an oral question of the intent or meaning of the Drawings or other Contract Documents, or the equality or use of products or methods other than those designated or described on the Drawings or in the Specifications. Any information given to bidders other than by means of the Drawings and other Contract Documents, including Addenda, as described below, is given informally, for information and the convenience of the bidder only and is not guaranteed. The bidder agrees that such information shall not be used as the basis of nor shall the giving of any such information entitle the bidder to assert any claim or demand against the Owner or the Engineer on account thereof.

B. To receive consideration, such questions shall be submitted in writing/email or faxed to the Engineer. For this purpose:

Nicole Iannuzzi, P.E.
BETA Group, Inc.
701 George Washington Hwy, Lincoln, RI 02865
Telephone (401) 333-2382, Fax (401) 333-9225
Email: NIannuzzi@BETA-Inc.com

To be considered, all questions must be received by the engineer no later than 4:00 PM on April 24, 2024. If the question involves the equality or use of products or methods, it must be accompanied by drawings, specifications, or other data in sufficient detail to enable the Engineer to determine the equality or suitability of the product or method. In general, the Engineer will neither approve nor disapprove particular products prior to the opening of Bids; such products will be considered when offered by the Contractor for incorporation into the Work.

C. The Engineer will set forth as Addenda, which shall become a part of the Contract Documents, such questions received as above provided as in his sole judgement are appropriate or necessary and his decision regarding each. At least five days prior to the receipt of Bids, he will send a copy of these Addenda to those prospective bidders known to have taken out sets of the Drawings and other Contract Documents.

D. The Contractor agrees to use the products and methods designated or described in the Specifications as amended by the Addenda.

1.04 BIDDERS TO INVESTIGATE

A. Bidders are required to submit their Bids upon the following express conditions, which shall apply to and be deemed a part of every Bid received, viz.:

B. Bidders must satisfy themselves by personal examination of the Work and by such other means as they may wish, as to the actual conditions there existing, the character and requirements of the Work and difficulties attendant upon its execution, and the accuracy of all estimated quantities stated in the Bid.

1.05 INFORMATION NOT GUARANTEED

A. All information given on the Drawings or in the other Contract Drawings relating to subsurface and other conditions, natural phenomena, existing pipes and other structures is from the best sources at present available to the Owner. All such information is furnished only for the information and convenience of bidders and is not guaranteed.

B. It is agreed and understood that the Owner does not warrant or guarantee that the subsurface or other conditions, natural phenomena, existing pipes or other structures encountered during construction will be the same as those indicated on the Drawings or in the other Contract Documents.

C. It is agreed further and understood that no bidder or Contractor shall use or be entitled to use any of the information made available to him or obtained in any examination made by him in any manner as a basis of or ground for any claim or demand against the Owner or the Engineer, arising from or by reason of any variance which may exist between the information made available and the actual subsurface or other conditions, natural phenomena, existing pipes of other structures actually encountered during the construction work, except as may otherwise be expressly provided for in the Contract Documents.

1.06 CONDITIONS OF WORK

A. Each bidder must inform himself fully of the conditions relating to the construction and labor under which the work is now or will be performed; failure to do so will not relieve the successful bidder of his obligation to furnish all materials and all labor necessary to carry out the provisions of the Contract Documents and to complete the contemplated Work for the consideration set forth in his bid. Insofar as possible, the Contractor, in the carrying out of his work, shall employ such methods or means as will not cause any interruption of or interference with: the operation of the existing sewer; traffic; use of existing facilities and utilities; locations of existing utilities and structures affecting the work or other similar conditions at the site; character of equipment and facilities needed preliminary to and during prosecution of the work; requirements of owners and controlling authorities, having jurisdiction over the various lands, existing structures, facilities, and utilities; and all other conditions affecting the work to be done, and the labor and materials needed; and he shall make his bid in sole reliance thereon; and shall not, at any time after submission of a bid, assert that there was any misunderstanding in regard to the nature or amount of the work to be done.

1.07 BID SECURITY

A. Each bid must be accompanied by a certified check on, or a treasurer's or cashier's check issued by, a responsible bank or trust company and payable to the order of the Owner, or by a bid bond prepared on the form of BID BOND attached hereto duly executed and acknowledged by the bidder, as Principal, and by a surety company qualified to do business ion the State of Rhode Island and satisfactory to the Owner, as Surety. The check or bid bond shall be in the sum of five (5) percent of the total bid and shall be enclosed in the sealed envelope containing the Bid.

B. Each such check or bid bond may be held by the Owner as security for the fulfillment of the bidder's agreements as hereinabove set forth and as set forth in the BID. Should the bidder fail to fulfill such agreements, his bid check shall become the property of the Owner or if a bid bond was furnished, the bid bond shall become payable to the Owner, as liquidated damages; otherwise, the bid check shall be returned to the bidder as hereinafter provided, or if the security is a bid bond, the bid bond shall become null and void.

C. Bid checks will be returned to all except the three lowest bidders within five days, Sundays and legal holidays excluded, after the opening of Bids, and to the three lowest bidders within five days, Sunday and legal holidays excluded, after the Owner and the accepted bidder have executed the AGREEMENT. In the event that the AGREEMENT has not been executed by both the accepted bidder and the Owner within 90 consecutive calendar days after the opening of Bids, the bid check will be returned promptly upon demand of any bidder who has not been notified of the acceptance of his Bid.

D. Bid checks accompanying Bids, which are rejected, will be returned within five days, Sundays and legal holidays excluded, after rejection.

E. None of the three lowest Bids shall be deemed rejected, notwithstanding acceptance of any Bid, until the AGREEMENT has been executed by both the Owner and the accepted bidder.

1.08 COMPARISON OF BIDS

A. Bids will be compared on the basis of the experience and competence of the bidders and on the basis of the totals of the quantities listed in the proposal under the enumerated items at the unit prices or lump sums bid for these items. The Contract will be awarded to the lowest responsive, responsible, experienced and eligible bidder as solely determined by the Owner and/or its authorized representatives or agents. However, the Owner may reject any and all bids if it is in the public interest to do so.

B. The term, "Lowest responsive, responsible, experienced and eligible bidder," shall mean, in the sole opinion and judgment of the Owner, the bidder whose bid is the lowest of those bidders possessing the skill, experience, ability and integrity necessary for the

faithful performance of the Work; who meets the provisions set forth under Paragraph 1.13 – "Ability, Qualifications and Experience of Bidder" as specified above; and who shall certify that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed in the work. The Owner's decision or judgment on these matters shall be final, conclusive, and binding for all parties involved.

C. Bids should be made on each separate item of work shown in the bid (proposal) with reasonable relation to the probable cost of doing the work included in such items. The Owner reserves the right to reject, wholly, any bid on which an item or items thereof are obviously unbalanced or appear to the Owner to be so unbalanced as to affect or to be liable to affect adversely any interests of the Owner. The attention of the bidder is called to the fact that unbalancing of bids may adversely affect the Contractor if certain portions for the Work are increased or decreased as provided in the Contract Documents.

D. A bidder shall state the proposed price for the work by which the bids will be compared. This price shall cover all expenses incidental to the completion of the work in full conformity with the Contract, Specifications, and Drawings. In the event that there is a discrepancy between the unit prices and the extended totals, the unit prices shall govern. In the event that there is a discrepancy between the lump-sum or unit prices written in words and numerical figures, the prices written in words shall govern. No bid will be accepted which does not contain a unit price or lump sum as indicated for each of the applicable items enumerated in the proposal form.

1.09 ITEMS AND INDETERMINATE ITEMS

A. The Work to be done under this Contract has been divided into parts or items to enable each bidder to bid on different portions of the work in accordance with his estimate of their cost and so that the actual quantity of work executed under each item may be paid for at the price bid for that particular item, even though such quantity is greater or less than the estimated quantity stated in the BID.

B. The quantities listed in the bid are approximate. The Owner does not expressly or by implication represent that the actual amounts of work will even approximately correspond there with, but does call particular attention to the uncertainty in the quantities of the work involved which can not be predicted in advance. The work under certain items may be materially greater or less than those given in the Bid as may be necessary in the judgment of the Owner complete the work contemplated in the Contract. Attention is particularly called to the fact that the quantity of work to be done under some bid items may be largely dependent on subsurface ground conditions encountered and, therefore, the quantities of work to be done under the various items may vary substantially from the estimated quantities or may even be omitted.

C. Certain items in the BID cover classes of work of doubtful necessity or work for which it is impractical to estimate approximate quantities. Such items have been marked "Indeterminate". Prices for certain of such items have been stipulated in advance by the Owner as stated in the BID.

D. Only such quantities of the respective items of work actually performed and accepted will be paid for. An increase or decrease in quantity for any item shall not be regarded as grounds for an increase or decrease in the bid prices.

1.10 REDUCTION IN SCOPE OF WORK

A. The Owner reserves the right to decrease the scope of the work to be done under this Contract and to omit any work in order to bring the cost within available funds. To this end, the Owner reserves the right to reduce the quantity of any items or omit all of any as set forth in the BID, either prior to executing the Contract or at any time during the progress of the Work. The Owner further reserves the right, at any time during the progress of the Work, to restore all or part of any items previously omitted or reduced. Exercise by the Owner of the above rights shall not constitute any grounds or basis of claim for damages or for anticipated profits on the work omitted.

1.11 CONTRACT BONDS

A. The Bidder whose Bid is accepted agrees to furnish the Contract Bonds in the forms which follow in Section 00600, titled CONTRACT BONDS, each in the sum of the full amount of the Bid and/or Contract Price as determined by the Engineer, and duly executed and acknowledged by the said bidder as Principal and by a surety company qualified to do business under the laws of Rhode Island and satisfactory to the Owner, as Surety, for the faithful performance of the contract and payment for labor and materials. The premiums for such Bonds shall be paid by the Contractor.

B. Surety Companies executing the Contract Bonds must also appear on the U.S. Treasury Department's most current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (Amended) by the Audit Staff Bureau of Accounts.

1.12 POWER OF ATTORNEY

A. Attorneys-in-fact who sign Bid Bonds or Contract Bonds must file with each Bond a certified and effectively dated copy of their power of attorney.

1.13 EXECUTION OF AGREEMENT

A. The Bidder whose Bid is accepted will be required and agrees to duly execute the AGREEMENT and furnish the required CONTRACT BONDS within the time limit stated in the BID after notification that the AGREEMENT is ready for signature.

B. The Bidder whose Bid is accepted upon his failure or refusal to duly execute the AGREEMENT and furnish the required CONTRACT BONDS within the time limit stated in the BID, shall forfeit to the Owner as liquidated damages for such failure or refusal, the surety deposited with his BID.

1.14 TIME FOR COMPLETION AND LIQUIDATED DAMAGES

A. The bidder must agree to commence work on or before the date specified in the written "NOTICE TO PROCEED" issued by the Owner, and/or Engineer acting on behalf of the Owner, and to fully complete the project within the time specified in Table A of the Agreement, after the date specified in the written "NOTICE TO PROCEED" as stipulated in Table A of the AGREEMENT. The bidder must further agree to pay as liquidated damages to the Owner, the sum as specified in Table A of the Agreement for each consecutive calendar day thereafter as hereafter provided in the AGREEMENT.

B. No work shall be completed during the winter shutdown period from November 15th through the following April 15th, unless directed or approved by the Engineer

C. The Time of Completion for this project shall be **300 calendar days** (excluding winter shutdown from November 15th to April 15th where paving will not be permitted, but weather permitting, other construction activities will be permitted as approved by Town and Engineer) from a Contractor's receipt of a Notice to Proceed.

1.15 LAWS AND REGULATIONS

A. The bidder's attention is directed to the fact that all applicable Federal and State laws, municipal ordinances, and rules and regulations or authorities having jurisdiction over construction of the project, shall apply to the Contract throughout, and shall be deemed to be included in the Contract the same as though herein written out in full.

1.16 WORK ON STATE, MUNICIPAL, AND PRIVATE PROPERTY

A. Particular attention is hereby directed to the fact that portions of the Work included under this Contract will be done within the limits of properties that are State-owned, municipal-owned, or privately owned. The Contractor shall be responsible for coordinating the prosecution of the Work of this Contract with the property owner and for providing work in accordance with any additional requirements as specified herein.

1.17 DATUM OR LEVELS

A. The figures given in the Contract and Specification or upon the Drawings after the word elevation shall mean the distance in feet referenced to the National American Vertical Datum of 1988 (NAVD88).

B. The horizontal datum used in the Contract and Specifications or upon the Drawings references Rhode Island State Plan, North American Horizontal Datum of 1983 (NAD83.)

C. Existing conditions survey of property lines and grades performed by Garofalo & Associates, Inc., 85 Corliss Street, Providence, RI 02940 in November 2015.

1.18 STATE SALES AND USE TAX

A. Materials and equipment purchased for installation under this Contract are exempt from the Rhode Island Sales Tax. The Contractor shall file for exemption on behalf of the Owner with the State of Rhode Island Division of Taxation as required by law. The exemption from the Sales Tax shall be taken into account by the Contractor during bidding.

1.19 PROTECTION OF LIVES AND HEALTH

A. The project is subject to all of the Safety and Health Regulations as promulgated by the United States Department of Labor (Title 29, Part 1926/1910 CFR, latest revisions); the Contract Work Hours and Safety Standards Act (40 U.S.C. 327 et seq.) as supplemented by the Department of Labor Regulations (Title 29 CFR Part 5); and OSHA 2207, latest revisions; and all subsequent amendments thereto. Contractors are urged to make themselves familiar with the requirements of these regulations.

1.20 NONDISCRIMINATION IN EMPLOYMENT

A. Contracts for work under this bid (proposal) will obligate the Contractors and subcontractors not to discriminate in employment practices.

B. The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, age, handicap, or national origin. The Contractor shall take affirmative action to ensure that applicants are employed and the employees are treated during employment without regard to their race, color, religion, sex, age, handicap, or national origin. Such actions shall include, but not be limited to, the following: employment, upgrading; demotions, or transfers; recruitment or recruitment advertising, layoffs, or terminations; rates of pay or other forms of compensation; selection for training including apprenticeship; and participation in recreational and education activities. The Contractor agrees to post in conspicuous places available to employees and applicants for employment notice to be provided setting forth the provisions of this non-discrimination clause. The Contractor will in all solicitations or advertisements for employees placed by or on behalf on the Contractor state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, age, handicap or national origin. The Contractor will cause the foregoing provisions to be inserted in all sub-contracts for any work covered by this Contract so that such provisions will be binding upon each sub-contractor and upon sub-contracts for standard commercial supplies or raw materials.

C. The Contractor shall keep such records and submit such reports concerning the racial and ethnic origin of applicants for employment and employees as the Owner may require as consistent with Federal and State law. The Contractor agrees to comply with such rules, regulations, or guidelines as the State of Rhode Island may implement these requirements. Bidders and Contractors must, if required, submit a compliance report

(EPA Form 5720-4) concerning their employment practices and policies in order to maintain their eligibility to receive award of the Contract.

D. Successful bidders and Contractors must, if required, submit a list of all Subcontractors who will perform work on the project, and written signed statements from authorized agents of labor pools with which they will or may deal with for employees on the work, together with any information to the effect that such labor pools' practices or policies are in conformity with said Executive Order that they will affirmatively cooperate in or offer no hindrance to the recruitment, employment, and equal treatment of employees seeking employment and performing work under this Contract; or a certification as to when such agents or labor pools have failed or refused to furnish them, prior to award of the Contract.

E. The successful bidder will be required to comply with Equal Opportunity Requirements and to abide by the prevailing wage rates for Public Work Projects for all employees on the job. It is the responsibility of Bidders to inform themselves as to the local labor conditions, overtime compensation, health and welfare contributions, labor supply and prospective changes or adjustment of wage rates. Information is available at the Department of Labor.

F. The successful bidder must be prepared to comply with the provisions of the General Laws of Rhode Island and attention is called to Title 37, Chapter 13, Section 1-16, relative to the payment of wages, obligations and charges by Contractors on public works projects. Non-resident Contractors are subject to Section 44-1-6 of the RI General Laws, as amended, regarding OUT-OF-STATE CONTRACTORS.

G. The successful bidder will be required to conform to all provisions of the federal Davis-Bacon and Related Acts which requires all laborers and mechanics employed by contractors and subcontractors in excess of $2,000 to pay their laborers and mechanics not less than the prevailing wage rates and fringe benefits, as determined by the Secretary of Labor, for corresponding classes of laborers and mechanics employed on similar projects in the area.

1.21 SEQUENCE OF OPERATIONS

A. The Contractor must submit to the Engineer within fourteen (14) calendar days after execution of the Contractor Documents, a sequence of operations, giving detailed plans and schedules of his operation including any elements for by-pass pumping and/or flow diversion during the Work. Said sequence of operations shall be reviewed and must be approved by the Owner and Engineer prior to the start of the Work. The Owner reserves the right to limit or, if found necessary and/or required, delay construction, or certain activities thereof, in certain areas of the Contract should the Owner deem it to be in the public's best interest to do so.

B. The Contractor shall have no claim for additional compensation or damage on account of any such delays and/or required sequence of operations.

C. The Contractor shall maintain uninterrupted utility services at all times, and plan his work accordingly.

D. The Contractor shall coordinate his activities with any other contract and/or contractor to complete the Work as detailed on the Plans and Specifications.

E. Attention is called to the requirements of Specification 02500, Section 3.01.H, which states that the Contractor shall install the temporary trench pavement course at the end of each working day.

1.22 PREPARATION OF BID

A. Each bid must be submitted on the prescribed form. All blank spaces for bid prices must be filled in, in ink or typewritten, both in words and figures. Erasures or other changes must be explained or noted over the signature of the bidder.

B. Each bid must be submitted in sealed envelopes, clearly labeled, so as to guard against opening prior to the time set therefore.

C. The Town may consider any bid not prepared and submitted in accordance with the provisions hereof and reserves the right to reject any or all proposals in whole or in part, toward any item, group of items, or total bid; to waive any technical defect or formality in same, or to accept any proposal deemed to be in the best interest of the Town.

1.23 TELEGRAPHIC MODIFICATION

A. Telephonic, telegraphic or oral bids, amendments or withdrawals will not be accepted.

1.24 WITHDRAWAL OF BIDS

A. Bids may be withdrawn personally or by written request at any time prior to the time specified for the opening. Bids may be modified in the same manner. Negligence on the part of the bidder in preparing the bid confers no right of withdrawal or modifications of their bid after such bid has been opened.

1.25 QUALIFICATIONS OF THE BIDDER

A. The Town reserves the right to request each bidder to present evidence that they are normally engaged in purveying the type of product or equipment bid on. No bid shall be considered from bidders who are unable to show that they are normally engaged in purveying the type of product or equipment specified in the bid proposal.

B. Contractor shall have relevant experience with similar projects within the last five years.

C. To receive full consideration, the bidder must submit literature and necessary details, when applicable, on the material or service he proposes to furnish in order that the Town may have full information available when analyzing the proposals.

1.26 OBLIGATIONS OF THE BIDDER

A. At the time of opening of bids, each bidder will be presumed to have inspected the Specifications and Contract Documents (including all addenda) which has been sent to the address given by such bidder. The failure or omission of any bidder to receive or examine any form, instrument, or document shall in no way relieve any bidder from any obligation in respect to their bid.

B. Any exceptions or deviations from the provisions contained in this Specification must be explained in detail and attached to proposal. If such deviations do not depart from the intent of this notice and are in the best interest of the Town, the proposal will receive careful consideration.

1.27 "OR EQUAL" BIDDING

A. The Town intends to permit liberal scope in bidding and specifically does not intend to limit bidding to any one make or model. Whenever a material, article or piece of equipment is identified by reference to manufacturers' or vendors' names, trade names, catalogue numbers, etc., it is intended merely to establish a standard; and any proposed material, article, or equipment of other manufacturers and vendors which will perform adequately the duties imposed by the general design will be considered equally acceptable provided it is in the opinion of the Town to be of equal substance and function.

1.28 PRICES

A. Bidders shall state the proposed price in the manner as designated in the Bid Proposal Form. In the event that there is a discrepancy between unit prices and the extended totals, the unit prices shall govern. In the event that there is a discrepancy between the price written in words and written in figures, the prices written in words shall govern.

B. The prices in this bid shall be irrevocable for ninety (90) days, or until the bid is awarded by the Town Council. After award by the Town Council, said prices shall then remain firm for the duration of the Contract.

1.29 TAX EXEMPTIONS

A. The Town is exempt from payment of the Rhode Island Sales Tax under the 1956 General Laws of the State of Rhode Island, 44-18-30 Para. I, as amended. The Town is exempt from payment of Federal Excise Taxes. The prices bid must be exclusive of taxes

and will be so construed. Exemption certificates will be completed as required by the successful bidder.

1.30 CONTRACT PERIOD AND TERM OF AGREEMENT (WHEN APPLICABLE)

A. Contract period is found in the Contract Agreement. If financially advantageous to the Town of North Kingstown, these contracts may be renewed or extended, from time to time, when agreed to, in writing, by both parties.

1.31 LABOR REGULATIONS (WHEN APPLICABLE)

A. The following paragraphs regarding nondiscrimination in employment shall be included and become part of these specifications:

1. Contractors shall comply with the provisions of the General Laws of Rhode Island and attention is called to Title 37, Chapter 13, Section 1-16, relative to the payment of wages, obligations and charges by Contractors on public works projects.

2. Non-resident Contractors are subject to Section 44-1-6 of the Rhode Island General Laws, as amended. (OUT OF STATE CONTRACTORS.)

3. The successful bidder will be required to comply with the Davis-Bacon Act (40USC 2 to a-7) as supplemented by Department of Labor regulations (29CFR Part 5).

4. The successful bidder will be required to comply with the Contract Works Hours and Safety Standards Act (40 USC 327-330) as supplemented by Dept. of Labor Regulations (29CFR, Part 5).

5. The successful bidder will be required to comply with Executive Order 11246, entitled Equal Employment Opportunity, as amended, and as supplemented in Department of Labor regulations (41 CFR Part 60).

6. The successful bidder will be required to comply with the Copeland "Anti-Kickback" Act (18 USC 874) as supplemented in Department of Labor regulations (29 CFR, Part 3).

7. The successful bidder will be required to comply with the Safety and Health regulations (29 CFR, Part 1926 and all subsequent amendments) as promulgated by the Department of Labor.

8. The successful bidder will be required to comply with Title VI of the Civil Rights Act of 1964 (P.L. 88-352).

1.32 INSURANCE (WHEN APPLICABLE)

A. The Vendor shall assume responsibility and liability for all injuries to persons or damages to property, directly or indirectly due to, or arising out of, their operations under the

contract and shall be responsible for the proper care and protection of all work performed until completion and final acceptance by the Town.

B. The Vendor shall also indemnify and save harmless the Town of North Kingstown against any and all claims of whatever kind and nature due to, or arising out of, their breach or failure to perform any of the terms, conditions, or covenants of the contract resulting from acceptance of their bid.

C. The Vendor shall furnish the Purchasing Agent with certificates of insurance from companies acceptable to the Town of North Kingstown. All insurance companies listed on certificates must be licensed to do business in the State of Rhode Island. The Vendor shall provide a certificate of insurance as specified in the bid specifications. Contracts of insurance (covering all operations under this contract) shall be kept in force until the contractor's work is acceptable by the Town.

D. The limits of the insurance must be at least in the amounts specified below;*

1. Commercial General Liability-Occurrence Form $1,000,000/$1,000,000.
2. Automobile Liability - $1,000,000. With both of the above naming the Town and Engineer as additional insured.
3. Worker's Compensation (if legally allowed and available). Waiver of subrogation applies to Worker's Compensation
4. Professional Liability - $1,000,000.

E. The Vendor shall secure, pay for and maintain insurance as necessary to protect themselves against loss of owned or rented capital equipment and tools, with provision for waiver of subrogation against the Owner, and shall secure, pay for and maintain insurance as necessary to protect against errors and omissions which may result from this project.

1.33 LAWS, ORDINANCES AND CODES

A. All applicable Federal and State Laws, Ordinances and Codes of the Town of North Kingstown and regulations of all authorities having jurisdiction over this Project shall apply to this contract the same as though written herein in full.

B. The Town of North Kingstown will not award the Contract to any Contractor who is, at the time, ineligible under the provisions of any applicable regulations issued by the Secretary of Labor, United State Department of Labor, or is not qualified under applicable Ordinances of the Town of North Kingstown, or the laws of the State of Rhode Island.

END OF SECTION

SECTION 00300

BID

To the Town of North Kingstown, Rhode Island, herein called the "Owner", for
"Wickford Waterfront Improvements Project."

The Undersigned, as a bidder herein referred to as singular and masculine, declares as follows:

_____
(Name of Bidder)

(1) The only parties interested in this BID as Principals are named herein;

(2) this BID is made without collusion with any other person, firm, or corporation;

(3) no officer, agent, or employee of the Owner is directly or indirectly interested in this BID;

(4) he has carefully examined the site of the proposed Work and fully informed and satisfied himself as to the conditions there existing, the character and requirements of the proposed Work, the difficulties attendant upon its execution and the accuracy of all estimated quantities stated in this BID, and he has carefully read and examined the Drawings, the annexed proposed AGREEMENT and the Specifications and other Contract Documents therein referred to and knows and understands the terms and provisions thereof;

(5) he understands that information relative to subsurface and other conditions, natural phenomena, existing pipes and other structures (surface and/or subsurface) has been furnished only for his information and convenience without any warranty or guarantee, expressed or implied, that the subsurface and/or other conditions, natural phenomena, existing pipes and other structures (surface and/or subsurface) actually encountered will be the same as those shown on the Drawings or in any of the other Contract Documents and he agrees that he shall not use or be entitled to use any such information made available to him through the Contract Documents or otherwise or obtained by him in his own examination of the site, as a basis of or ground for any claim against the Owner or the Engineer arising from or by reason of any variance which may exist between the aforesaid information made available to or acquired by him and the subsurface and/or other conditions, natural phenomena, existing pipes and other structures (surface and/or subsurface) actually encountered during the construction work, and he has made due allowance therefore in this BID;

(6) and he understands that the quantities of work tabulated in this BID or indicated on the Drawings or in the Specifications or other Contract Documents are only approximate and are subject to increase or decrease as deemed necessary by the Engineer; and he agrees that, if this BID is accepted he will contract with the Owner, as provided in the copy of the Contract Documents deposited in the office of the Engineer, this BID form being part of said Contract Documents, and that he will perform all the work and furnish all the

materials and equipment, and provide all labor, services, plant, machinery, apparatus, appliances, tools, supplies and all other things required by the Contract Documents in the manner and within the time therein prescribed and according to the requirements of the Engineer as therein set forth, and that he will take in full compensation therefore the total dollar amount tabulated from the actual measured quantities of said work and each unit or lump sum price stated in this BID as hereinafter set forth.

(Note: All entries in the entire BID must be made clearly and written legibly in ink or typewritten; price bid must be written in both words and figures.)

Item No.	Qty./Unit	Item with Unit Price Written in Words (and Figures)		Total in Figures
1	75 LF	REMOVE AND DISPOSE CURB per linear foot,		
		_____	dollars	
		and _____cents	($_____)	($_____)
2	400 LF	REMOVE AND RESET CURB per linear foot,		
		_____	dollars	
		and _____cents	($_____)	($_____)
3	150 LF	REMOVE AND STACK CURB per linear foot,		
		_____	dollars	
		and _____cents	($_____)	($_____)
4	50 SY	REMOVE AND DISPOSE SIDEWALKS per square yard,		
		_____	dollars	
		and _____cents	($_____)	($_____)
5	6,200 SY	REMOVE AND DISPOSE PAVEMENT per square yard,		
		_____	dollars	
		and _____cents	($_____)	($_____)

Item No.	Qty./Unit	Item with Unit Price Written in Words (and Figures)		Total in Figures
6	4 EACH	REMOVE AND DISPOSE CATCH BASINS per each,		
		_____	dollars	
		and _____cents	($_____)	($_____)
7	1 EACH	REMOVE AND DISPOSE MANHOLE per each,		
		_____	dollars	
		and _____cents	($_____)	($_____)
8	130 LF	REMOVE AND DISPOSE PIPE - ALL SIZES per linear foot,		
		_____	dollars	
		and _____cents	($_____)	($_____)
9	40 LF	ABANDON IN PLACE GRAVITY DRAIN PIPE per linear foot,		
		_____	dollars	
		and _____cents	($_____)	($_____)
10	1800* CY	UNCLASSIFIED EXCAVATION per cubic yard,		
		_____	dollars	
		and _____cents	($_____)	($_____)

Item No.	Qty./Unit	Item with Unit Price Written in Words (and Figures)		Total in Figures
11	40* CY	ROCK EXCAVATION per cubic yard,		
		_____	dollars	
		and _____cents	($_____)	($_____)
12	700 CY	STRUCTURAL EXCAVATION EARTH per cubic yard,		
		_____	dollars	
		and _____cents	($_____)	($_____)
13	360 CY	STRUCTURAL EXCAVATION MASONRY per cubic yard,		
		_____	dollars	
		and _____cents	($_____)	($_____)
14	310 CY	CRUSHED STONE FILL UNDER STRUCTURES per cubic yard,		
		_____	dollars	
		and _____cents	($_____)	($_____)
15	100 CY	PERVIOUS STRUCTURE BACKFILL per cubic yard,		
		_____	dollars	
		and _____cents	($_____)	($_____)

Item No.	Qty./Unit	Item with Unit Price Written in Words (and Figures)		Total in Figures
16	1 LS	TEMPORARY COFFERDAMS AND CONTROL OF WATER per lump sum,		
		_____	dollars	
		and _____cents	($_____)	($_____)
17	4,700 SY	POLYPROPYLENE TRIAXIAL GEOGRID BASE REINFORCEMENT per square yard,		
		_____	dollars	
		and _____cents	($_____)	($_____)
18	25* CY	CONTROLLED DENSITY FILL per cubic yard,		
		_____	dollars	
		and _____cents	($_____)	($_____)
19	1 LS	SITE PREPARATION per lump sum,		
		_____	dollars	
		and _____cents	($_____)	($_____)
20	2 EACH	TIDE GATE per each,		
		_____	dollars	
		and _____cents	($_____)	($_____)
21	950 SY	PERMEABLE PAVERS per square yard,		
		_____	dollars	
		and _____cents	($_____)	($_____)

Item No.	Qty./Unit	Item with Unit Price Written in Words (and Figures)		Total in Figures
22	1 LS	BMP 1 - BIORETENTION BASIN per lump sum,		
		_____	dollars	
		and _____cents	($_____)	($_____)
23	1 LS	BMP 2 - BIORETENTION BASIN per lump sum,		
		_____	dollars	
		and _____cents	($_____)	($_____)
24	50 SY	REMOVE AND RESET BRICK PAVERS per square yard,		
		_____	dollars	
		and _____cents	($_____)	($_____)
25	90 SY	INSTALL BRICK PAVERS per square yard,		
		_____	dollars	
		and _____cents	($_____)	($_____)
26	55 SY	REMOVE AND REPLACE BRICK CROSSWALK per square yard,		
		_____	dollars	
		and _____cents	($_____)	($_____)
27	25 EACH	BOLLARD AND ROPE - ALL TYPES per each,		
		_____	dollars	
		and _____cents	($_____)	($_____)

Item No.	Qty./Unit	Item with Unit Price Written in Words (and Figures)		Total in Figures
28	50 SY	INSTALL BEACHSTONE PAVERS per square yard,		
		_____	dollars	
		and _____cents	($_____)	($_____)
29	1500* CY	GRAVEL BORROW per cubic yard,		
		_____	dollars	
		and _____cents	($_____)	($_____)
30	810 TON	CLASS 19.0 HMA per ton,		
		_____	dollars	
		and _____cents	($_____)	($_____)
31	540 TON	CLASS 9.5 HMA per ton,		
		_____	dollars	
		and _____cents	($_____)	($_____)
32	10 TON	BITUMINOUS CONCRETE TEMPORARY PAVEMENT per ton,		
		_____	dollars	
		and _____cents	($_____)	($_____)
33	10 LF	CONSTRUCT 12 INCH CLASS IV GRAVITY DRAIN PIPE per linear foot,		
		_____	dollars	
		and _____cents	($_____)	($_____)

Item No.	Qty./Unit	Item with Unit Price Written in Words (and Figures)		Total in Figures
34	90 LF	CONSTRUCT 15 INCH CLASS IV GRAVITY DRAIN PIPE per linear foot,		
		_____	dollars	
		and _____cents	($_____)	($_____)
35	5 EACH	FRAME AND GRATE per each,		
		_____	dollars	
		and _____cents	($_____)	($_____)
36	4 EACH	FRAME AND COVER per each,		
		_____	dollars	
		and _____cents	($_____)	($_____)
37	5 EACH	PRECAST CATCH BASIN 4' DIAMETER STANDARD 4.4.0 per each,		
		_____	dollars	
		and _____cents	($_____)	($_____)
38	2 EACH	PRECAST MANHOLE 4' DIAMETER STANDARD 4.2.0 per each,		
		_____	dollars	
		and _____cents	($_____)	($_____)

Item No.	Qty./Unit	Item with Unit Price Written in Words (and Figures)		Total in Figures
39	1 EACH	PRECAST MANHOLE 5' DIAMETER STANDARD 4.2.1 per each,		
		_____	dollars	
		and _____cents	($_____)	($_____)
40	1 EACH	5' DOGHOUSE MANHOLE per each,		
		_____	dollars	
		and _____cents	($_____)	($_____)
41	150 LF	CLEANING AND FLUSHING PIPE ALL SIZES per linear foot,		
		_____	dollars	
		and _____cents	($_____)	($_____)
42	1 EACH	CLEANING AND FLUSHING VERTICAL STRUCTURES per each,		
		_____	dollars	
		and _____cents	($_____)	($_____)
43	1,240 LF	TREATED TIMBER PILES FURNISH AND DRIVE per linear foot,		
		_____	dollars	
		and _____cents	($_____)	($_____)

Item No.	Qty./Unit	Item with Unit Price Written in Words (and Figures)		Total in Figures
44	2 EACH	PILE LOAD TEST per each,		
		_____	dollars	
		and _____cents	($_____)	($_____)
45	1 LS	TEMPORARY EARTH RETAINING SYSTEM per lump sum,		
		_____	dollars	
		and _____cents	($_____)	($_____)
46	1,400 LF	TEMPORARY CHAIN LINK FENCE per linear foot,		
		_____	dollars	
		and _____cents	($_____)	($_____)
47	2 EACH	TEMPORARY CHAIN LINK GATE per each,		
		_____	dollars	
		and _____cents	($_____)	($_____)
48	20 CY	PORTLAND CEMENT SIDEWALK MONOLITHIC STANDARD 43.1.0 per cubic yard,		
		_____	dollars	
		and _____cents	($_____)	($_____)

Item No.	Qty./Unit	Item with Unit Price Written in Words (and Figures)		Total in Figures
49	600 LF	GRANITE CURB, QUARRY SPLIT STRAIGHT, STANDARD 7.3.0 per linear foot,		
		_____	dollars	
		and _____cents	($_____)	($_____)
50	200 LF	GRANITE CURB, QUARRY SPLIT CIRCULAR, STANDARD 7.3.0 per linear foot,		
		_____	dollars	
		and _____cents	($_____)	($_____)
51	480 LF	4" GRANITE CURB per linear foot,		
		_____	dollars	
		and _____cents	($_____)	($_____)
52	4 EACH	WHEELCHAIR RAMP per each,		
		_____	dollars	
		and _____cents	($_____)	($_____)
53	1 LS	MASONRY RETAINING WALL per lump sum,		
		_____	dollars	
		and _____cents	($_____)	($_____)

Item No.	Qty./Unit	Item with Unit Price Written in Words (and Figures)		Total in Figures
54	1 ALL	POLICE DETAIL per allowance,		
		___One Hundred and Five Thousand_____	dollars	
		and ___Zero_____cents	($_105,000_____)	($_105,000_____)
55	25* CY	EXCAVATION AND BACKFILL FOR TEST PITS per cubic yard,		
		_____	dollars	
		and _____cents	($_____)	($_____)
56	86 TON	RIPRAP TYPE R-5 per ton,		
		_____	dollars	
		and _____cents	($_____)	($_____)
57	1 LS	GEOTEXTILE BEHIND MASONRY WALL per lump sum,		
		_____	dollars	
		and _____cents	($_____)	($_____)
58	1** LS	MOBILIZATION per lump sum,		
		_____	dollars	
		and _____cents	($_____)	($_____)

Item No.	Qty./Unit	Item with Unit Price Written in Words (and Figures)		Total in Figures
59	1 LS	MAINTENANCE AND MOVEMENT TRAFFIC PROTECTION per lump sum,		
		_____	dollars	
		and _____cents	($_____)	($_____)
60	200 SY	LOAM BORROW per square yard,		
		_____	dollars	
		and _____cents	($_____)	($_____)
61	1 LS	LANDSCAPE AREA 1 per lump sum,		
		_____	dollars	
		and _____cents	($_____)	($_____)
62	200 SY	RESIDENTIAL SEEDING (TYPE 2) per square yard,		
		_____	dollars	
		and _____cents	($_____)	($_____)
63	25 SY	JUTE MESH per square yard,		
		_____	dollars	
		and _____cents	($_____)	($_____)
64	3,200 LF	4 INCH WHITE FINAL EPOXY RESIN PAVEMENT MARKINGS per linear foot,		
		_____	dollars	
		and _____cents	($_____)	($_____)

Item No.	Qty./Unit	Item with Unit Price Written in Words (and Figures)		Total in Figures
65	14 EACH	FINAL EPOXY PAVEMENT MARKINGS ARROWS, WORDS, OR SYMBOLS per each,		
		_____	dollars	
		and _____cents	($_____)	($_____)
66	1 ALL	TESTING OF MATERIALS AND METHODS per allowance,		
		____Five Thousand_____	dollars	
		and ___Zero_____cents	($_5,000_____)	($_5,000_____)
67	1 LS	PARKING WAYFINDING SIGNS per lump sum,		
		_____	dollars	
		and _____cents	($_____)	($_____)

==========

NOTE:
* Denotes indeterminate item; quantity assumed for comparison of bids.

**The lump sum price for this item shall not exceed five percent (5%) of the total amount of the bid, excluding this item.

CONTRACT TOTAL OF BID:

_____

_____Dollars and _____ cents

$_____
Total Bid in Figures

_____

The undersigned agrees that for extra work, if any, performed in accordance with the terms and provisions of the annexed form of AGREEMENT, he will accept compensation as stipulated therein as full payment for such extra work.

If the Bid is accepted by the OWNER, the undersigned agrees to commence work under this Contract on a date to be specified in a written "Notice to Proceed" by the Owner and complete the entire work provided to be done under this Contract within the time stipulated in Table "A" of the AGREEMENT. If this bid is accepted by the Owner, the undersigned, also agrees to comply with the provisions of Section 1.14 “Liquidated Damages” and Table A of the Agreement.

As provided in the INFORMATION FOR BIDDERS, the bidder hereby agrees that he will not withdraw this BID, within 90 consecutive calendar days after the actual date of the opening of Bids, and that, if the Owner shall accept this BID, the bidder will duly execute and acknowledge the AGREEMENT and furnish, duly executed and acknowledged, the required CONTRACT BONDS within fourteen (14) consecutive calendar days after notification that the AGREEMENT and other Contract Documents are ready for signature.

Should the bidder fail to execute any of his agreements as hereinabove set forth, the Owner shall have the right to retain as liquidated damages, the Bid Security attached in the sum of (5 percent of Total Bid) _____ _____ Dollars, ($_____) which shall become the Owner's property for the delay and additional expense to the Owner caused thereby. If a bid bond was given, it is agreed that the amount thereof shall be paid as liquidated damages to the Owner by the Surety. (Bidder must fill in this blank.)

The bidder hereby acknowledges the receipt of, and has included in this BID, the following Addenda:

(To be filled in by Bidder, if Addenda are issued.)

Addendum No. _____, dated _____

Addendum No. _____, dated _____

Addendum No. _____, dated _____

The bidder, by submittal of this BID, agrees with the Owner that the amount of the bid security deposited with this BID fairly and reasonably represents the amount of damages the Owner will suffer due to the failure of the bidder to fulfill his agreements as above provided.

(SEAL) _____ L.S.
(Name of Bidder)

By _____
(Signature and title of authorized representative)

_____
(Business address)

_____
(City and State)

Date _____

The bidder is a corporation incorporated in the State (or Commonwealth) of _____ - a partnership - an individual. (Bidder must add and delete as necessary to make this sentence read correctly.)

(Note: If the bidder is a corporation, affix corporate seal and give below the names of its President, Treasurer, and General Manager, if any; if a partnership, give full names and residential addresses of all partners; and if an individual, give residential address, if different from business address.)

The required names and addresses of all persons interested in the foregoing Bid, as Principals, are as follows:

_____

_____

_____

_____

(Add supplementary page if necessary)

CERTIFICATE OF AUTHORIZATION
FOR
BIDDING REPRESENTATIVE

(Note: Bidder must complete for certification of authorized representative signing Bid.)

At a duly authorized meeting of the Board of Directors of the

_____ held on _____,
(Name of Corporation) (Date)

at which all the Directors were present or waived notice, it was voted that

_____ _____
(Name of Authorized Representative) (Title)

of this company shall be, and hereby is, authorized to execute bidding documents, contracts and bonds in the name and on behalf of said company, and to affix the corporate seal thereto, and such execution of any contract obligation in this company's name on its behalf of such

_____ under seal of the company shall be valid and binding upon this company.
(Title)

A true copy

ATTEST_____
(Clerk)

Place of Business_____

_____

I hereby certify that I am the clerk of the _____
(Name of Corporation)

_____, that _____
(Name of Authorized Representative)

is the duly elected _____ of said company, and that the
(Title)

above vote has not been amended or rescinded and remains in full force and effect as of the date of this contract.

Corporate
_____Seal
(Clerk)

STATEMENT OF BIDDERS' QUALIFICATIONS

The following shall accompany the bid and is required as evidence of the bidder's qualifications to perform the work, as bid upon, in accordance with the contract drawings and specifications. This statement must be notarized. All questions must be answered. Additional data may be submitted on separate attached sheets.

1. Name of Bidder _____

2. Permanent Main Office Address _____

3. Official Mailing Address for This Contract _____

4. When Organized? _____

5. Where Incorporated, if a Corporation _____

6. Years Contracting under Present Name _____

7. List contracts on hand, and those completed similar in nature to this kind of project.

Owner	Engineer	Contract	Description	Contract Amount	Completion Date

8. List any work the firm has failed to complete, state where and why.

_____

9. If you have ever defaulted on any contract, state where and why.

_____

10. List full names and residences of all principals (i.e.: Officers, Directors, Partners, Owners) interested in this bid.

Name Residence Title Firm

_____

_____

_____

_____

_____

_____

_____

11. State name(s) and qualifications of resident supervisor(s) for this project.

_____

_____

_____

12. List major equipment available for this project and identify ownership or rental.

_____

_____

_____

_____

13. Will you furnish a detailed financial statement and other information, requested by the Owner?

_____

14. List bank references for verifying financial ability of your company.

Name Address

_____

_____

15. The undersigned hereby authorized and requests any person, firm or corporation, to furnish all information requested by the Owner and/or its designated agents relative to the recitals comprising this Statement of the Bidder's Qualifications.

Dated at _____ this _____ day of _____20___.

_____
(Name of Bidder)

By: _____

_____
(Title)

State of _____

County of _____

_____ being duly sworn in person, deposes and says

that he is _____ of _____,
(Title) (Name of Bidder)

that he is the firm's duly authorized agent to execute these contract documents, and that the answers to the foregoing questions and all statements therein contained are correct and true.

Subscribed and sworn to before me this _____ day of _____ 20___.

(SEAL)

_____
(Notary Public)

_____
(My Commission Expires)

STATEMENT OF PROPOSED SUBCONTRACTORS

The following shall accompany the bid and is required as evidence of the bidder's qualifications to perform the work as bid upon, in accordance with the contract drawings and specifications. The Bidder must state the names and appurtenant information of all major subcontractors he proposed to use to complete the work as bid upon. Additional data may be submitted on separate attached sheets.

If subcontractors are not to be used to complete the Work and/or any portion thereof, as herein bid upon, the Bidder must acknowledge by writing "NONE" _____.

Description of Work_____

Approximate percentage of Total Bid_____

Proposed Subcontractor, Name_____

Address_____

Description of Work_____

Approximate percentage of Total Bid_____

Proposed Subcontractor, Name _____

Address _____

Description of Work _____

Approximate percentage of Total Bid _____

Proposed Subcontractor, Name _____

Address _____

Bidder to insert description of work, percentage of Total BID, and subcontractors' names as may be required.

This is to certify that all names of the above-mentioned subcontractors are submitted with full knowledge and consent of the respective parties.

The Bidder warrants that none of the proposed subcontractors have any conflict of interest as respects this contract.

Date _____

Bidder

_____
(Name of Bidder)

By

_____
(Signature)

_____
(Title)

_____
(Business Address)

_____
(City and State)

STATE OF RHODE ISLAND

UTILIZATION OF MINORITY BUSINESS ENTERPRISES

This project is subject to Chapter 37-14.1 of the Rhode Island General Laws, and regulations promulgated thereunder, which require that fifteen percent (15%) of the dollar value of work performed on the project be performed by minority business enterprises. Of that fifteen percent (15%), minority business enterprises owned and controlled by a minority owner shall be awarded a minimum of 7.5%, and minority business enterprises owned and controlled by a woman shall be awarded a minimum of 7.5%.

The Bidder, as part of the Bid, must submit a MBE PLAN outlining the manner in which he shall make a substantial and concerted effort to meet the fifteen percent (15%) MBE requirement and submit said plan to the Director of the Rhode Island Department of Administration for approval.

The plan shall include a projection of the number and types of subcontracts to be awarded and a projection of the number and types of MBE's likely to be available to compete for subcontracts from the prime contractor over the period of the project.

PROPOSED MBE/WBE PLAN

(All bidders must complete and submit this State Plan with Bid, attach additional sheets as needed)

Proposed MBE Subcontractor	Description of Work	Dollar Value ($)	% of Total Contract

Total MBE Participation $ _____ _____

Bidder to insert description of work, percentage of Total BID, and MBE subcontractors' names as may be required.

This is to certify that all names of the above-mentioned MBE subcontractors are submitted with full knowledge and consent of the respective parties.

The Bidder warrants that none of the proposed MBE subcontractors have any conflict of interest as respects this contract.

Date _____ Bidder

_____
(Name of Bidder)

By

_____
(Signature)

_____
(Title)

_____
(Business Address)

_____
(City and State)

END OF SECTION

SECTION 00400

BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we the undersigned (Insert Name of Bidder) _____, as Principal, and (Insert Name of Surety) _____, as Surety, are hereby held and firmly bound and obligated unto the Town of North Kingstown, Rhode Island , as Owner, in the sum

of _____Dollars ($_____),

(amounting to 5% of the Total Bid) as liquidated damages for payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns.

The condition of the above obligation is such that whereas the Principal has submitted to the Town of North Kingstown, Rhode Island a certain Bid attached hereto and hereby made a part hereof, to enter into a contract in writing, hereinafter referred to as the "AGREEMENT" and/or "Contract", for “Wickford Waterfront Improvements Project .”

NOW THEREFORE,

(a) If said BID shall be rejected or withdrawn as provided in the INFORMATION FOR BIDDERS attached hereto or, in the alternative,

(b) If said BID shall be accepted and the Principal shall duly execute and deliver the form of AGREEMENT attached hereto and shall furnish the specified bonds for the faithful performance of the AGREEMENT and/or Contract and for the payment for labor and materials furnished for the performance of the AGREEMENT and/or Contract,

then this obligation shall be void, otherwise it shall remain in full force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder in no event shall exceed the amount of this obligation.

The Surety, for value received, hereby agrees that the obligations of said Surety and its bond shall in no way be impaired or affected by any extensions of the time with which such BID may be accepted, and said Surety does hereby waive notice of any such extensions.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, have duly executed this bond on the _____ day of _____, 20 _____.

(SEAL) _____ L.S.
(Name of Principal)

BY: _____
(Signature)

_____
(Title)

_____
(Name of Surety (Seal)

BY: _____
(Signature and Title)

BY: _____
Attorney-In-Fact

Sealed and delivered in
the presence of:

_____

_____

IMPORTANT: Surety Companies executing BONDS must appear on the U.S. Treasury Department's most current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Audit Staff Bureau of Accounts and be authorized to transact business in the state where the PROJECT is located.

If the Bond is signed on behalf of the Surety by an Attorney-In-Fact, there should be attached, a duly certified copy of his power of attorney showing his authority to sign such Bond.

SECTION 00500

CONTRACT AGREEMENT
TOWN OF NORTH KINGSTOWN, RHODE ISLAND
WICKFORD WATERFRONT IMPROVEMENTS PROJECT

THIS AGREEMENT, is executed this _____ day of _____ in the year Two Thousand and Twenty Four (herein referred to as the "AGREEMENT") by and between the Town of North Kingstown, Rhode Island, party of the first part, and _____ (Name of Contractor) party of the second part.

WITNESSETH, that the parties to these presents, each in consideration of the undertakings, promises, and agreements on the part of the other herein contained, have undertaken, promised, and agreed and do hereby undertake, promise, and agree, the party of the first part for itself, its successors and assigns, and the party of the second part for himself and his heirs, executors, administrators, successors and assigns, as follows:

1.01 DEFINITIONS

Wherever the words hereinafter defined or pronouns used in their stead occur in the Contract Documents, they shall have the following meaning indicated which shall be applicable to both the singular and plural thereof:

ADDENDA - Written or graphic instruments prior to the opening of Bids which Clarify, correct or change the Bidding Requirements or Contract Documents.

AGREEMENT - the written contract between Owner and Contractor covering the Work to be performed.

"AS DIRECTED," "AS ORDERED," "AS REQUESTED," "AS REQUIRED", "AS PERMITTED," or words of like import are used, it shall be understood that the direction, order, request, requirement, or permission of the Engineer is intended.

"APPROVED," "ACCEPTABLE," "SUITABLE," "SATISFACTORY," and words of like import shall mean approved by, acceptable to, suitable to, or satisfactory to the Engineer.

APPLICATION FOR PAYMENT - Form used by Contractor in requesting progress or final payments, format to be acceptable to the Engineer.
bid - The offer or proposal of the bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
Bidder - Any person, firm or corporation submitting a bid for the work.

CHANGE ORDER - A document recommended by the Engineer, which is signed by the Contractor and Owner authorizing the addition, deletion or revision in the Work, or adjustment in the Contract Price or Contract Time, issued on or after the effective date of the Agreement.

CONTRACTOR - The person, firm or corporation with whom the Owner has entered into the Agreement.
Contract Bonds - Bid, Performance, and Labor and Materials Bonds and other instruments of security furnished by the Contractor and his surety in accordance with the Contract Documents.

CONTRACT DOCUMENTS - The Agreement, Addenda, Bid, Post Bid documentation submitted prior to the Notice Award, The Notice to Proceed, Bonds, General Conditions, Supplementary Conditions, The Specifications, the Drawings, all written Amendments, Change Orders, Field Orders, and Engineers written interpretations and clarifications.

CONTRACT PRICE - The total monies payable to the Contractor under the terms and conditions of the Contract Documents.

CONTRACT TIME - The number of calendar days stated in the Contract Documents for the completion of the Work.

CONSTRUCTION SUPERINTENDENT - That person designated by the Contractor to carry out the provisions of the Contract.

DATUM OR LEVELS - The figures given in the Contract and Specifications or upon the Drawings after the word elevation or abbreviation of it, are in relation to the North American Vertical Datum (NAVD 88).

DRAWINGS - The part of the Contract Drawings which show the characteristics and Scope of the Work to be performed and which have been prepared or approved by the Engineer.

EARTH - Wherever used as the name of an excavated material or material to be excavated, shall mean all kinds of material other than rock as defined in this section.

ELEVATION - The figures given on the Drawings or in the other Contract Documents after the word "elevation" or abbreviation of it shall mean the distance in feet above the datum adopted by the Engineer.

ENGINEER - The person, firm or corporation duly appointed by the Owner to undertake the duties and powers herein assigned to the Engineer, acting either directly or through duly authorized representatives. (For this Contract, BETA Group, Inc.)

FIELD ORDER - A written order issued by the Engineer which orders minor changes in the Work which do not involve a change in the Contract Price or an extension of the Contract time.

GENERAL REQUIREMENTS - Sections of Division 1 of the Specifications.

"HEREIN," "HEREINAFTER," "HEREUNDER," and words of like import shall be deemed to refer to the Contract Documents.

NOTICE OF AWARD - The written notice of the acceptance of the Bid from the Owner to the successful Bidder.
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.

OWNER - The public body or authority, corporation, association, firm or person with whom the Contractor has entered into the Agreement and for whom the Work is to be provided.

PROJECT OR CONTRACT - The undertaking to be performed in the Contract Documents.

PROJECT REPRESENTATIVE - The authorized representative of the owner who is assigned to the project site or any part thereof.

ROCK - wherever used as the name of an excavated material to be excavated, shall mean only boulders and pieces of concrete and masonry exceeding 1 cu. yd. in volume, or igneous, sedimentary, metamorphic, and conglomerate rock which, in the opinion of the Engineer, requires, for its removal, drilling and blasting, wedging, sledging, barring, 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 limits of measurement allowed, which may fall into the excavation, will be measured or allowed as "rock."

SHOP DRAWINGS - All drawings, diagrams, schedules and other data or information prepared for and submitted by the Contractor, to illustrate portions of the Work.

SPECIFICATIONS - The portions of the Contract documents consisting of written technical descriptions of materials, equipment, construction systems, standards and workmanship as applied to the Work and certain administrative details applicable thereto.
subcontractor - An individual, firm or corporation, approved by the Owner and Engineer having a direct contract with the Contractor or with any other Sub-Contractor for the performance of a part of the Work on the Project.

SUBSTANTIAL COMPLETION - Date certified by the Engineer when construction is sufficiently complete, in accordance with the Contract Documents, so the Owner can occupy or utilize the Work or designated portion thereof for which it was intended, as expressed in the Contract documents.

SUPPLEMENTARY CONDITIONS - The part of the Contract Documents which amends or supplements the General Conditions.

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.

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.

WORK - The entire completed construction or the various separately identifiable parts thereof required to be furnished under the Contract Documents. Work includes and is the result of performing or furnishing labor and furnishing and incorporating materials and equipment into the construction, and performing or furnishing services and furnishing documents, all as required by the Contract Documents.

1.02 THE CONTRACT DOCUMENTS

A. The Contract Documents, as defined above, are sometimes herein referred to as the "Contract".

The Contract Documents are complementary, and what is called for by any one shall be as binding as if called for by all. In the event of any conflict or inconsistency between the provisions of the AGREEMENT and the provisions of any of the other Contract Documents, the provisions of the AGREEMENT shall prevail.

A. Reference to standard specifications, manuals or codes of any technical society, organization or association, or to the laws or regulations of any governmental authority, whether such reference be specific or by implication, shall mean the edition of the standard specification, manual, code or laws or regulations identified in the reference. In the event a particular edition is not identified, the reference shall mean the latest amended edition in effect at the time of receipt of the Bid. However, no provision of any referenced standard specification, manual or code (whether or not specifically incorporated by reference in the Contract Documents) shall change the duties and responsibilities of the Owner, the Contractor or the Designer, or any of their consultants, agents or employees from those set forth in the Contract Documents, nor shall it be effective to assign to the Engineer, or any of the Engineer's consultants, agents or employees, any duty or authority to supervise or direct the furnishing or performance of the work or any

duty or authority to undertake responsibility contrary to the provisions of the AGREEMENT.

1.03 OBLIGATIONS AND LIABILITY OF CONTRACTOR

A. The Contractor shall do all the work and perform and furnish all the labor, services, materials, equipment, plant, machinery, apparatus, appliances, tools, supplies and all other things (except as otherwise expressly provided herein) necessary and as herein specified for the proper performance and completion of the Work in the manner and within the time hereinafter specified, in strict accordance with the Drawings, Specifications and other Contract Documents, in conformity with the directions and to the satisfaction of the Engineer, and at the prices herein agreed upon therefor.

B. All parts of the Work and all fixtures, equipment, apparatus and other items indicated on the Drawings and not mentioned in the Specifications, or vice versa, and all work and material usual and necessary to make the work complete in all its parts, including all incidental work necessary to make it complete and satisfactory and ready for use and operation, whether or not they are indicated on the Drawings or mentioned in the Specifications, shall be furnished and executed the same as if they were called for both by the Drawings and by the Specifications.

C. The Contractor shall coordinate his operations with those of any other contractors who may be employed on other work of the Owner, shall avoid interference therewith, and shall cooperate in the arrangements for storage of materials and equipment.

D. The Contractor shall conduct his work so as to interfere as little as possible with private business and public travel. Wherever and whenever necessary or required, he shall maintain fences, furnish watchmen, maintain lights, and take such other precaution as may be necessary to protect life and property.

E. The Contractor shall indemnify and save harmless the Owner and the Engineer and their officers, agents, servants and employees, from and against any and all claims, demands, suits, proceedings, liabilities, judgments, awards, losses, damages, costs and expenses, including attorneys' fees, on account of bodily injury, sickness, disease or death sustained by any person or persons or injury or damage to or destruction of any property, directly or indirectly arising out of, relating to or in connection with the Work, whether or not due or claimed to be due in whole or in part to the active, passive or concurrent negligence or fault of the Contractor, his officers, agents, servants or employees, any of his subcontractors, or any of their respective officers, agents, servants or employees and/or any other person or persons, and whether or not such claims, demands, suits or proceedings are just, unjust, groundless, false or fraudulent; and the Contractor shall and does hereby assume and agrees to pay for the defense of all such claims, demands, suits and proceedings, provided, however, that the Contractor shall not be required to indemnify the Engineer, his officers, agents, servants or employees, against any such damages occasioned solely by defects in maps, plans, drawings, designs or specifications prepared, acquired or used by the Engineer and/or solely by the negligence or fault of the Engineer; and provided further, that the Contractor shall not be required to indemnify the Owner, his officers, agents, servants or employees, against any such damages occasioned solely by acts or omissions of the Owner other than supervisory acts or omissions of the Owner in the Work.

F. The Contractor shall have complete responsibility for the Work and the protection thereof, and for preventing injuries to persons and damage to the Work and property and utilities on or about the Work, until final completion and final acceptance thereof. He shall in no way be relieved of his responsibility by and right of the Engineer to give permission or directions relating to any part of the Work, by any such permission or directions given, or by failure of the Engineer to give such permission or directions. The Contractor shall bear all costs, expenses, losses and damages on account of the quantity or character of the Work or the nature of the land (including but not limited to subsurface conditions) in or under or on which the Work is done being different from that indicated or shown in the Contract Documents or from what was estimated or expected, or on account of the weather, elements, or other causes.

G. The Contractor shall conduct his operations so as not to damage existing structures or work installed either by him or by other contractors. In case of any such damage resulting from his operations, he shall repair and make good as new the damaged portions at his own expense with the consent of the damaged party. In the event that consent is not given, the Contractor shall continue liable for the damage caused.

H. The Contractor shall be as fully responsible to the Owner for the acts and omissions of his subcontractors,

their officers, agents, servants and employees as he is for his own acts and omissions and those of his own officers, agents, servants and employees.

I. Should the Contractor sustain any loss, damage or delay through any act or omission of any other contractor or any subcontractor of any such other contractor, the Contractor shall have no claim against the Owner therefor, other than for an extension of time, but shall have recourse solely to such other contractor or subcontractor.

J. If any other contractor or any subcontractor of any such other contractor shall suffer or claim to have suffered loss, damage or delay by reason of the acts or omissions of the contractor or of any of his subcontractors, the Contractor agrees to assume the defense against any such claim and to reimburse such other contractor or subcontractor for such loss or damage.

K. The Contractor agrees to and does hereby indemnify and save harmless the Owner from and against any and all claims by such other contractors or subcontractors alleging such loss, damage or delay from and against any and all claims, demands, suits, proceedings, liabilities, judgments, awards, losses, damages, costs and expenses, including attorneys' fees, arising out of, relating to or resulting from such claims.

L. The Contractor shall promptly pay all federal, state and local taxes which may be assessed against him in connection with the Work or his operations under the AGREEMENT and/or the other Contract Documents, including, but not limited to, taxes attributable to the purchase of material and equipment, to the performance of services, and the employment of persons in the prosecution of the Work.

M. Asbestos, PCBs, Petroleum, Hazardous Waste or Radioactive Material

1. The Owner shall be responsible for any Asbestos, PCBs, Petroleum, Hazardous Waste or Radioactive Material uncovered or revealed at the site which was not shown or indicated in Drawings or Specification or identified in the Contract Documents to be within the scope of the Work and which may present a substantial danger to persons or property exposed thereto in connection with the Work at the site. The Owner shall not be responsible for any such materials brought to the site by the Contractor, Subcontractors, Suppliers or anyone else for whom the Contractor is responsible.

2. To the fullest extent permitted by Laws and Regulations, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Engineer, Engineer’s Consultants and the officers, directors, employees, agents other consultants and subcontractors of each and any of them from and against all claims, costs, losses and damages arising out of or resulting from such hazardous condition, provided that: (i) any such claim, cost, loss or damage is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom, and (ii) nothing in this subparagraph shall obligate the Owner to indemnify any person or entity from and against the consequences of that person’s or entity’s own negligence.

1.04 AUTHORITY OF THE ENGINEER

A. The Engineer shall be the sole judge of the intent and meaning of the Drawings and Specifications and his decisions thereon and his interpretation thereof shall be final, conclusive and binding on all parties.

B. The Engineer shall be the Owner's representative during the life of the Contract and he shall observe the Work in progress on behalf of the Owner. He shall have authority (1) to act on behalf of the Owner to the extent expressly provided in the Contract or otherwise in writing; (2) to determine the amount, quality, acceptability and fitness of all work, materials and equipment required by the Contract; and (3) to decide all questions which arise in relation to the Work, the execution thereof, and the fulfillment of the Contract.

C. The Contractor shall proceed without delay to perform the work as directed, instructed, determined or decided by the Engineer and shall comply promptly with such directions, instructions, determinations or decisions. If the Contractor has any objection thereto he may, within ten (10) days of having received any such direction, instruction, determination or decision, require that any such direction, instruction, determination or decision be put in writing and within ten (10) days after receipt of any such writing he may file a written protest with the Owner stating clearly and in detail his objections, the reasons therefor, and the nature and amount of additional compensation, if any, to which he claims he will be entitled thereby. A copy of such protest shall be filed with the Engineer at the same time it is filed with the Owner. Unless the Contractor requires that any such direction, instruction, determination or decision be put in writing within ten (10) days of having received such direction, instruction, determination or decision and unless the

Contractor files such written protest with the Owner and Engineer within such ten (10) day period, he shall be deemed to have waived all grounds for protest of such direction, instruction, determination, or decision and all claims for additional compensation or damages occasioned thereby, and shall further be deemed to have accepted such direction, instruction, determination, or decision as being fair, reasonable, and finally determinative of his obligations and rights under the Contract.

1.05 SUPERVISION OF WORK

A. The Contractor shall be solely responsible for supervision of the Work, shall give the work the constant attention necessary to ensure the expeditious and orderly progress thereof, and shall cooperate with the Engineer in every possible way.

B. At all times, the Contractor shall have his agent on the Work a competent superintendent capable of reading and thoroughly understanding the Drawings and Specifications, with full authority to execute the directions of the Engineer without delay and to supply promptly such labor, services, materials, equipment, plant, apparatus, appliances, tools, supplies and other items as may be required. Such superintendent shall not be removed from the Work without the prior written consent of the Engineer. If, in the opinion of the Engineer, the superintendent or any successor proves incompetent, the Contractor shall replace him with another person approved by the Engineer; such approval, however, shall in no way relieve or diminish the Contractor's responsibility for supervision of the Work.

C. Whenever the Contractor or his agent or superintendent is not present on any part of the Work where it may be necessary to give directions or instructions with respect to such work, such directions or instructions may be given by the Engineer to and shall be received and obeyed by the designated foreman or any other person in charge of the particular work involved.

1.06 INSURANCE

A. Before starting and until final completion and acceptance of the Work and expiration of the guarantee period provided for in the AGREEMENT the Contractor shall procure and maintain insurance of the types specified in paragraphs (1) to (10), inclusive, below, and to the limits for this insurance specified in Table A at the end of this section. All insurance shall be obtained from companies satisfactory to the Owner and Engineer.

B. Insurance shall be in such forms as will protect the Contractor from all claims and liability for damages for bodily and personal injury, including accidental death, and for property damage, which may arise from operations under the Contract, whether such operations be by himself, his subcontractors, or by anyone directly or indirectly employed or engaged by him.

C. The Town of North Kingstown, Rhode Island and their Engineer, BETA Group, Inc., shall be named as an "additionally insured".

D. The following types of insurance shall be provided on all policies:

1. Workmen's Compensation and Employer's Liability Insurance.

2. Bodily Injury Insurance for operations and completed operations and Contractor's Protective Bodily Injury Insurance.

3. Property Damage Insurance for operations and completed operations and Contractor's Protective Property Damage Insurance, each including coverage for injury to or destruction of wires or pipes and similar property and appurtenant apparatus and the collapse of or structural injury to any building or structure except those on which work under the Contract is being done. Blasting and explosion coverage shall be obtained if there is a need for blasting under the Contract, and no blasting shall be performed until such insurance has been secured.

4. Bodily Injury Insurance covering the operation of all motor vehicles owned by the Contractor.

5. Personal Injury Insurance to cover claims for personal injury and including claims brought by employees.

6. Property Damage Insurance covering the operation of all motor vehicles owned by the Contractor.

7. Insurance to cover bodily injuries and property damage resulting from the use of motor vehicles not owned by the Contractor, while such vehicles are being operated in connection with the prosecution of the Work.

8. Contractual Liability Insurance covering the liability assumed by the Contractor under the fifth paragraph of that subsection titled "Obligations and Liability of Contractor" of this AGREEMENT.

9. Owner's Protective Liability and Property Damage Insurance to protect the Owner and the Engineer against claims for Property damage and for bodily injuries, including accidental death, caused by the operations of the Contractor or his subcontractors on the Work. The policy shall indicate the Owner and the Engineer as the named insured. A copy of the policy shall be furnished to the Owner and a Certificate of Insurance shall be furnished to the Engineer.

10. Builders' Risk Insurance with an "All Risk" Installation Floater covering loss by fire and extended coverage in the completed value form in the amount of the total insurable value of all structures, materials, and equipment to be built and installed. The insurance shall be obtained from a company satisfactory to the Owner. The policy shall indicate Owner, the Contractor, all subcontractors, and the Engineer as the named insured with loss payable to the Owner as Trustee. The policy shall provide for a 30-day notice to the Owner of cancellation or restrictive amendment. A copy of the policy shall be furnished to the Owner and a Certificate of Insurance shall be furnished to the Engineer. The insurance shall be obtained before the work is started and shall be maintained until the date of completion of the work as stated in the final estimate, or until the Owner occupies or otherwise take possession of the structure, whichever occurs first.

11. Contractor must purchase and maintain excess liability insurance in the umbrella form with respect to each coverage specified in Table A. Evidence of such excess liability shall be delivered to the owner in the form of a certificate indicating the policy numbers and limits of liability of all underlying insurance. The umbrella liability insurance policy shall have a combined single limit of not less than $5,000,000 with respect to each coverage. Such insurance shall contain a provision that the coverage afforded will not be canceled or materially changed until at least thirty (30) calendar days prior written notice has been given to the Owner. The insurance shall be obtained before the work is started and shall be maintained until the date of completion of the work as stated in the final estimate, or until the Owner occupies or otherwise take possession of the structure, whichever occurs first.

E. All policies shall be so written that the Owner will be notified in writing of cancellation or restrictive amendment at least 30 days prior to the effective date of such cancellation or amendment.

F. Certificates from the Contractor's insurance carriers stating the coverage provided, the limits of liability, and expiration dates shall be filed in triplicate with the Owner before operations are begun. Such certificates shall be on the form furnished by the Owner.

G. Certificates from the contractor naming the Town of North Kingstown, Rhode Island as additionally insured must be received by the Owner prior to initiating the work.

H. Renewal certificates must be furnished by the Contractor prior to the expiration date of any of the initial insurances.

I. No insurance required or furnished hereunder shall in any way relieve the Contractor of or diminish any of his responsibilities, obligations and liabilities under the Contract.

1.07 PATENTS

A. The Contractor's attention is directed to the following "Patent Indemnity Clause" illustrating the format and/or required wording therefore which shall be used by all manufacturers and/or suppliers, as deemed necessary by the Owner and Engineer, as an Indemnification and Hold Harmless Agreement.

B. This Agreement shall be accepted and approved in form by the Owner and Engineer prior to the approval and/or installation of the product.

PATENT INDEMNIFICATION

"In consideration for their purchase and use of the (Name of product and/or equipment) manufactured by (name of Manufacturer) and for other good and valuable consideration, (Name of Manufacturer) agrees to defend and hold harmless (Name of Contractor), BETA Group, Inc., and the (Name of Owner), and their employees and agents, from and against any liability, loss, cost, expense or damage including reasonable attorneys' and accountants' fees incurred by these entities in defending or prosecuting any claim for such liability, loss, cost, expense or damage resulting or arising out of a claim that the use of the above mentioned product and/or equipment delivered hereunder directly infringes any United States Patent, provided that (Name of Manufacturer) is given authority, information, and assistance for the defense of such suit, and (Name of Manufacturer) shall pay all damages and costs assessed against the above named entities for the use of such produce and/or equipment provided, however, that this indemnification shall not apply to equipment of (Name of Contractor) design,

and provided further that if the use of such product and/or equipment is enjoined in any suit, (Name of Manufacturer) shall at its own expense and its option either procure for (name of Contractor) the right to continue the normal use of such produce and/or equipment, replace said product and/or equipment, modify said equipment or refund the purchase price thereof; and provided further that (Name of Manufacturer) indemnity as to use shall not apply to infringement resulting from the use of the produce and/or equipment delivered hereunder in combination with other items where use of the product and/or equipment per se does not constitute infringement."

1.08 COMPLIANCE WITH LAWS

A. The Contractor shall keep himself fully informed of all existing and future federal, state, and local laws, ordinances, rules, and regulations affecting those engaged or employed on the Work, the materials and equipment used in the Work or the conduct of the Work, and of all orders, decrees and other requirements of bodies of tribunals having any jurisdiction or authority over the same. If any discrepancy or inconsistency is discovered in the Drawings, Specifications or other Contract Documents in relation to any such law, ordinance, rule, regulation, order, decree or other requirement, the Contractor shall forthwith report the same to the Engineer in writing. The Contractor shall at all times observe and comply with, and cause all his agents, with all such existing and future laws, ordinances, rules, regulations, orders, decrees and other requirements, and he shall protect, indemnify and save harmless the Owner, its officers, agents, servants and employees, from and against any and all claims, demands, suits, proceedings, liabilities, judgements, penalties, losses, damages, costs and expenses, including attorneys' fees, arising from or based upon any violation or claimed violation of any such law, ordinance, rule, regulation, order, decree or other requirement, whether committed by the Contractor or any of his agents, servants, employees or subcontractors.

1.09 PROVISIONS REQUIRED BY LAW DEEMED INSERTED

A. Each and every provision of law and clause required by law to be inserted in the Contract shall be deemed to be inserted herein, and the Contract shall be read and enforced as though they were included herein. If through mistake or otherwise any such provision is not inserted, or is not correctly inserted, then upon the application of either party, the Contract shall forthwith be physically amended to make such insertion.

1.10 PERMITS

A. The Contractor shall, at his own expense, take out and maintain all necessary permits from the county, municipal, or other public authorities; shall give the notices required by law; and shall post all bonds and pay all fees and charges incident to the due and lawful prosecution of the Work.

1.11 NOT TO SUBLET OR ASSIGN

A. The Contractor shall constantly give his personal attention to the faithful prosecution of the Work, shall keep the same under his personal control, shall not assign the Contract or sublet the Work or any part thereof without the previous written consent of the Owner, and shall not assign any of the moneys payable under the Contract, or his claim thereto, unless by and with the like written consent of the Owner and the Surety on the Contract Bonds. Any assignment or subletting in violation hereof shall be void and unenforceable.

B. The Contractor shall not sublet or assign work to a subcontractor(s), for a total in excess of fifty (50) percent of the Contract Price, without prior written approval of the Owner and Engineer.

C. The Contractor shall be fully responsible to the Owner for the acts and omissions of his subcontractors, suppliers, and of persons either directly or indirectly employed by them as he is for the acts and omissions of persons directly employed by him.

D. The Contractor shall cause appropriate provisions, and applicable State or Federal regulations, to be inserted in all subcontractors 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.

E. The Contractor's attention is directed to the fact that nothing contained in this Contract shall create any contractual relation between any subcontractor and the Owner.

1.12 DELAY BY OWNER

A. The Owner may delay the beginning of the Work or any part thereof if the necessary lands or rights-of-

way for such work shall not have been obtained. The Contractor shall have no claim for additional compensation or damages on account of such delay, but shall be entitled only to any extension of time as hereinafter provided.

1.13 TIME FOR COMPLETION

A. The rate of progress shall be such that the Work shall be performed and completed in accordance with the Contract before the expiration of the time limit stipulated in Table A at the end of this section, except as otherwise expressly provided herein.

B. It is agreed that the rate of progress herein required has been purposely made low enough to allow for the ordinary and foreseeable delays incident to construction work of this character. No extension of time will be given for ordinary or foreseeable delays, inclement weather, or accidents, and the occurrence of such will not relieve the Contractor from the necessity of maintaining this rate of progress and completing the Work within the stipulated time limit.

C. If delays are caused by acts of God, acts of Government, unavoidable strikes, extra work, or other cause or contingencies clearly beyond the control or responsibility of the Contractor, the Contractor may be entitled to additional time to perform and complete the Work, provided that the Contractor shall, within ten (10) days from the beginning of such delay notify the Owner in writing, with a copy to the Engineer, of the cause and particulars of the delay. Upon receipt of such notification, the Owner shall review and evaluate the cause and extent of the delay. If, under the terms of the AGREEMENT, the delay is properly excusable, the Owner will, in writing, appropriately extend the time for completion of the Work. (This paragraph will be interpreted to include delays in receipt of equipment provided that the Contractor placed his order and submitted shop drawings for such equipment promptly after execution of the Contract, that he has shown due diligence in following the progress of the order, and that the time required for delivery is in accordance with conditions generally prevailing in the industry.) The Contractor agrees that he shall not have or assert any claim for nor shall he be entitled to any additional compensation or damages on account of such delays.

D. The time in which the Work is to be performed and completed is of the essence of this AGREEMENT.

1.14 LIQUIDATED DAMAGES

A. In case the Contractor fails to complete the Work satisfactorily on or before the date of completion fixed herein or as duly extended as hereinbefore provided, the Contractor agrees that the Owner shall deduct from the payments due the Contractor each month the sum set forth in Table A at the end of this section for each calendar day of delay, which sum is agreed upon not as a penalty, but as fixed and liquidated damages for each day of such delay. If the payments due the Contractor are less than the amount of such liquidated damages, said damages shall be deducted from any other moneys due or to become due the Contractor, and, in case such damages shall exceed the amount of all moneys due or to become due the Contractor, the Contractor or his Surety shall pay the balance to the Owner.

1.15 NIGHT, SATURDAY, SUNDAY AND HOLIDAY WORK

A. No work shall be done at night, on Saturday on Sunday or on a holiday except (1) usual protective work, such as pumping and the tending of lights, (2) work done in case of emergency threatening injury to persons or property, or (3) if all of the conditions set forth in the next paragraph below are met.

B. No work other than that included in (1) and (2) above shall be done at night except when (a) in the sole judgment of the Owner, the work will be of advantage to the Owner and can be performed satisfactorily at night, (b) the work will be done by a crew organized for regular and continuous night work, and (c) in the sole judgment of the Owner and Engineer, adequate noise prevention measures are incorporated into the Work by the Contractor to minimize any noise impact within the work area and (d) the Owner has given written permission for such night work. The Contractor is responsible for obtaining all permits and approvals required.

1.16 EMPLOY COMPETENT PERSONS

A. The Contractor shall employ only competent persons on the Work and shall not employ persons or means which may cause strikes, work stoppages or any disturbances by persons employed by the Contractor, any subcontractor, the Owner, the Engineer or any other contractor. Whenever the Engineer notifies the Contractor in writing that in his opinion any person on the Work is incompetent, unfaithful, disorderly, or otherwise unsatisfactory, or not employed in accordance with the provisions of the Contract, such person shall be discharged from the Work and shall not

again be employed on it, except with the written consent of the Engineer.

1.17 EMPLOY SUFFICIENT LABOR AND EQUIPMENT

A. If in the sole judgment of the Engineer the Contractor is not employing sufficient labor, plant, equipment or other means to complete the Work within the time specified, the Engineer may, after giving written notice, require the Contractor to employ such additional labor, plant, equipment and other means as the Engineer deems necessary to enable the Work to progress properly.

1.18 INTOXICATING LIQUORS AND/OR DRUGS

A. The Contractor shall not sell and shall neither permit nor suffer the introduction and/or use of intoxicating liquors and/or drugs upon or about the Work.

1.19 ACCESS TO WORK

A. The Owner, the Engineer, and their officers, agents, servants and employees may at any and all times and for any and all purposes, enter upon the Work and the site thereof and the premises used by the Contractor, and the Contractor shall at all times provide safe and proper facilities therefor.

1.20 EXAMINATION OF WORK

A. The Engineer shall be furnished by the Contractor with every reasonable facility for examining and inspecting the Work and for ascertaining that the Work is being performed in accordance with the requirements and intent of the Contract, even to the extent of requiring the uncovering or taking down portions of furnished work by the Contractor.

B. Should the work thus uncovered or taken down prove satisfactory, the cost of uncovering or taking down and the replacement thereof shall be considered as extra work unless the original work was done in violation of the Contract in point of time or in the absence of the Engineer or his inspector and without his written authorization, which case said cost shall be borne by the Contractor. Should the work uncovered or taken down prove unsatisfactory, said cost shall likewise borne by the Contractor.

C. Examination of inspection of the Work shall not relieve the Contractor of any of his obligations to perform and complete the Work as required by the Contract.

1.21 DEFECTIVE WORK, ETC.

A. Until acceptance and during the applicable guarantee period thereafter, the Contractor shall promptly, without charge, repair, correct or replace work, equipment, materials, apparatus or parts thereof which are defective, damaged or unsuitable or which in any way fail to comply with or be in strict accordance with the provisions and requirements of the Contract or applicable guarantee and shall pay to the Owner all resulting costs, expenses, losses or damages suffered by the Owner.

B. If any material, equipment, apparatus or other items brought upon the site for use or incorporation in the Work, or selected for the same, is rejected by the Engineer as unsuitable or not in conformity with the Specifications or any of the other Contract Documents, the Contractor shall forthwith remove such materials, equipment, apparatus and other items from the site of the Work and shall at his own cost and expense make good and replace the same and any material furnished by the Owner which shall be damaged or rendered defective by the handling or improper installation by the Contractor, his agents, servants, employees or subcontractors.

1.22 PROTECTION AGAINST WATER AND STORM

A. The Contractor shall take all precautions necessary to prevent damage to the Work by storms or by water entering the site of the Work directly or through the ground. In case of damage by storm or water, the Contractor shall at his own cost and expense make such repairs or replacements or rebuild such parts of the Work as the Engineer may require in order that the finished Work may be completed as required by the Contract.

1.23 RIGHT TO MATERIALS

A. Nothing in the Contract shall be construed as vesting in the Contractor any right of property in the materials, equipment, apparatus and other items furnished after they have been installed or incorporated in or attached or affixed to the Work or the site, but all such materials, equipment, apparatus and other items shall, upon being so installed, incorporated, attached or

affixed, become the property of the Owner. Nothing in this subsection shall relieve the Contractor of his duty to protect and maintain all such materials, equipment, apparatus and other items.

1.24 CHANGES

A. The Owner, through the Engineer, may make changes in the Work and in the Drawings and Specifications therefor by making alterations therein, additions thereto or omissions therefrom. All work resulting from such changes shall be performed and furnished under the pursuant to the terms and conditions of the Contract. If such changes result in an increase or decrease in the Work to be done hereunder, or increase or decrease the quantities thereof, adjustment in compensation shall be made therefor at the unit prices stipulated in the Contract for such work, except that if unit prices are not stipulated for such work, compensation for additional or increased work shall be made as provided hereinafter under the subsection titled "Extra Work"; and for eliminated or decreased work the Contractor shall allow the Owner a reasonable credit as determined by the Engineer.

B. Except in an emergency endangering life or property, no change shall be made unless in pursuance of a written order from the Engineer authorizing the change, and no claim for additional compensation shall be valid unless the change is so ordered.

C. The Contractor agrees that he shall neither have nor assert any claim for or be entitled to any additional compensation for damages or for loss of anticipated profits on work that is eliminated.

1.25 EXTRA WORK

A. The Contractor shall perform any extra work (work in connection with the Contract but not provided for herein) when and as ordered in writing by the Engineer, at the unit prices stipulated in the Contract for such work or, if none are so stipulated, whether (a) at the price agreed upon before such work is commenced and named in the written order for such work, or (b) if the Engineer so elects, for the reasonable cost of such work, as determined by the contractor and approved by the Engineer, plus a percentage of such cost, as set forth below. No extra work shall be paid for unless specifically ordered as such in writing by the Engineer.

B. The Contractor shall submit claim for any extra work within ten (10) calendar days of performing said extra work.

C. The cost of extra work done under (b) above shall include the reasonable cost to the Contractor of materials used and equipment installed, common and skilled labor, and foremen, and the fair rental of all machinery and equipment used on the extra work for the period of such use.

D. At the request of the Engineer, the Contractor shall furnish itemized statements for the cost of the extra work ordered as above and give the Engineer access to all records, accounts, bills and vouchers and correspondence relating thereto.

E. The Contractor may include in the cost of extra work the amounts of additional premiums, if any, (other than premiums on bonds) paid on the required insurance on account of such extra work, of Social Security or other direct assessments upon the Contractor's payroll by Federal or other properly authorized public agencies, and of other approved assessments when such assessments are not normally included in payments made by the Contractor directly to his employees, but in fact are, and are customarily recognized as, part of the cost of doing work.

F. The fair rental for all machinery and equipment shall be based upon the most recent edition of "Compilation of Rental Rates for Construction Equipment," published by the Associated Equipment Distributors, or a similar publication approved by the Engineer. Rental for machinery and equipment shall be based upon an appropriate fraction of the approved monthly rate schedule. If said extra work requires the use of machinery or equipment not already on the site of the Work the cost of transportation, not exceeding a distance of 100 miles, of such machinery or equipment to and from the Work shall be added to the fair monthly rental; provided, however, that this shall not apply to machinery or equipment already required to be furnished under the terms of the Contract.

G. The Contractor shall not include in the cost of extra work any cost or rental of small tools, building, or any portion of the time of the Contractor, his superintendent, or his office and engineering staff.

H. To the cost of extra work done by the Contractor's own forces under (b) above (determined as stated above), the Contractor may add 15 percent to cover his

overhead, use of capital, the premium on the Bonds as assessed upon the amount of this extra work, and profit.

I. In the case of extra work done under (b) by a subcontractor the subcontractor shall compute, as above, his cost for the extra work, to which he may add 15 percent as in the case of the Contractor. The Contractor shall be allowed an additional 5 percent of the subcontractor's initial cost for the extra work prior to the 15 percent adjustment, to cover the costs of the Contractor's overhead use of capital, the premium on the Bonds as assessed upon the amount of this work, and profit. Said subcontractor's cost must be reasonable and approved by the Engineer.

J. If extra work is done under (b) above, the Contractor and/or subcontractor shall keep daily records of such extra work. The daily record shall include the names of men employed, the nature of the work performed, and hours worked, materials and equipment incorporated, and machinery or equipment used, if any, in the prosecution of such extra work. This daily record, to constitute verification that the work was done, must be signed both by the Contractor's authorized representative and by the Engineer. A separate daily record shall be submitted for each Extra Work Order.

1.26 EXTENSION OF TIME ON ACCOUNT OF EXTRA WORK

A. When extra work is ordered near the completion of the Contract or at any time during the progress of the Work which unavoidably increases the time for the completion of the Work, and extension of time shall be granted as hereinbefore provided.

1.27 CHANGES NOT TO AFFECT BONDS

A. It is distinctly agreed and understood that any changes made in the Work or the Drawings or Specifications therefor (whether such changes increase or decrease the amount thereof or the time required for its performance) or any changes in the manner of time of payments made by the Owner to the Contractor, or any other modifications of the Contract, shall in no way annul, release, diminish or affect the liability of the Surety on the CONTRACT BONDS given by the Contractor, it being the intent hereof that notwithstanding such changes the liability of the Surety on said bonds continue and remain in full force and effect.

1.28 CLAIMS FOR DAMAGES

A. If the Contractor makes claim for any damages alleged to have been sustained by breach of contract or otherwise, he shall, within ten (10) days after occurrence of the alleged breach or within ten (10) days after such damages are alleged to have been sustained, whichever date is the earlier, file with the Engineer a written, itemized statement of the details of the alleged breach and the details and amount of the alleged damages. The Contractor agrees that unless such statement is made and filed as so required, his claim for damages shall be deemed waived, invalid and unenforceable, and that he shall not be entitled to any compensation for any such alleged damages. Within ten (10) days after the timely filing of such statement, the Engineer shall file with the Owner a copy of the statement, together with his recommendations for action by the Owner.

B. The Contractor shall not be entitled to claim any additional compensation for damages by reason of any direction instruction, determination or decision of the Engineer, nor shall any such claims be considered, unless the Contractor shall have complied in all respects with the Article titled "Authority of the Engineer", including, but not limited to the filing of a written protest in the manner and within the time therein provided.

1.29 ABANDONMENT OF WORK OR OTHER DEFAULT

A. If the Work shall be abandoned, or any part thereof shall be sublet without previous written consent of the Owner, or the Contract or any moneys payable hereunder shall be assigned otherwise than as herein specified, or if at any time the Engineer shall be of the opinion, and shall so certify in writing, that the conditions herein specified as to rate of progress are not being complied with, or that the Work or any part thereof is being unnecessarily or unreasonably delayed, or that the Contractor has violated or is in default under any of the provisions of the Contract, or if the Contractor becomes bankrupt or insolvent or goes or is put into liquidation or dissolution, either voluntarily or involuntarily, or petitions for an arrangement or reorganization under the Bankruptcy Act, or makes a general assignment for the benefit of creditors or otherwise acknowledges insolvency, the happening of any of which shall be and constitute a default under the Contract, the Owner may notify the Contractor in writing, with a copy of such notice mailed to the Surety, to discontinue all Work or any part thereof; thereupon the Contractor shall discontinue such Work

or such part thereof as the Owner may designate; and the Owner may, upon giving such notice, by contract or otherwise as it may determine, complete the Work or such part thereof and charge the entire cost and expense of so completing the Work or such part thereof to the Contractor. In addition to the said entire cost and expense of completing the Work, the Owner shall be entitled to reimbursement from the Contractor and the Contractor agrees to pay to the Owner any losses, damages, costs and expenses, including attorney's fees, sustained or incurred by the Owner by reason of any of the foregoing causes. For the purposes of such completion the Owner may for itself or for any Contractors employed by the Owner take possession of and use or cause to be used any and all materials, equipment, plant, machinery, appliances, tools, supplies and such other items of every description that may be found or located at the site of the Work.

B. All costs, expenses, losses, damages, attorney's fees and any and all other charges incurred by the Owner under this subsection shall be charged against the Contractor and deducted and/or paid by the Owner out of any moneys due of payable or to become due or payable under the Contract to the Contractor; in computing the amounts chargeable to the Contractor the Owner shall not be held to a basis of the lowest prices for which the completion of the Work or any part thereof might have been accomplished, but all sums actually paid or obligated therefor to effect its prompt completion shall be charged to and against the account of the Contractor. In case the costs, expenses, losses, damages, attorney's fees and other charges together with all payments theretofore made to or for the account of the Contractor are less than the sum which would have been payable under the Contract if the Work had been properly performed and completed by the Contractor, the Contractor shall be entitled to receive the difference, and, in case such costs, expenses, losses, damages, attorneys' fees and other charges, together with all payments theretofore made to or for the account of the Contractor, shall exceed the said sum, the Contractor shall pay the amount of the excess to the Owner.

1.30 PRICES FOR WORK

A. The Owner shall pay and the Contractor shall receive the prices stipulated in the BID made a part hereof as full compensation for everything performed and furnished and for all risks and obligations undertaken by the Contractor under and as required by the Contract.

1.31 MONEYS MAY BE RETAINED

A. The Owner may at any time retain from any moneys which would otherwise be payable hereunder so much thereof as the Owner may deem necessary to complete the Work hereunder and to reimburse it for all costs, expenses, losses, damage and damages chargeable to the Contractor hereunder, in accordance with the States General Laws.

1.32 FORMAL ACCEPTANCE

A. This Agreement constitutes an entire contract for one whole and complete Work or result. Fixing of the date of completion and acceptance of the Work or a specified part thereof shall only be effective when accomplished by a writing specifically so stating and signed by the Owner.

1.33 PROGRESS ESTIMATES

A. Once a month, except as hereinafter provided, the Engineer shall make an estimate in writing of the total amount and value of the work done to the first of the month by the Contractor. The Owner shall retain a percentage of such estimated value, as set forth in Table A at the end of this section, as part security for fulfillment of the Contract by the Contractor and shall deduct from the balance all previous payments made to the Contractor, all sums chargeable against the Contractor and all sums to be retained under the provisions of the Contract.

B. The Owner shall pay monthly to the Contractor the balance not deducted and/or retained as aforesaid, except that payment may be withheld at any time if, in the sole judgment of the Engineer, the work is not proceeding in accordance with the Contract. If the Owner deems it expedient to do so, it may cause estimates and payments to be made more frequently than one in each month. No progress estimate or payment need be made when, in the sole judgement of the Engineer, the total value of the work done since the last estimate amounts to less than the amount set forth in Table A at the end of this section.

C. Estimates of lump-sum items shall be based on a schedule dividing each such item into its appropriate component parts together with a quantity and a unit price for each part so that the sum of the products of prices and quantities will equal the Contract price for the item. This schedule must be submitted by the Contractor for and must have the approval of the Engineer before the first estimate becomes due.

D. If the Engineer determines that the progress of the Work will be benefited by the delivery to the site of certain materials and equipment, when available, in advance of actual requirement therefor and if such materials and equipment are delivered and properly stored, protected and insured as determined by the Engineer, the cost to the Contractor or subcontractor as established by invoices or other suitable vouchers satisfactory to the Engineer, less the retained percentages as above provided, may be included in the progress estimates; provided always that there be duly executed and delivered by the Contractor to the Engineer at the same time a Bill of Sale in form satisfactory to the Owner, transferring and assigning to the Owner full ownership and title to such materials or equipment.

1.34 PARTIAL ACCEPTANCE

A. The Owner may, at any time in a written order to the Contractor (1) declare that he intends to use a specified part of the Work which in his opinion is sufficiently complete, in accordance with the Contract Documents, to permit its use; (2) enclose a tentative list of items remaining to be completed or corrected, and (3) fix the date of acceptance of that specified part of the Work.

B. Within 45 days after acceptance under this subsection, the Engineer shall make an estimate in writing of the amount and value of the part of the Work so accepted. The Owner shall pay said amount to the Contractor after deducting therefrom all previous payments, all charges against the Contractor as provided for hereunder, and all amounts to be retained under the provisions of the Contract, said payment to be made at the time of the next monthly progress estimate.

C. Acceptance by the Owner under this subsection shall not relieve the Contractor of any obligations under the Contract Documents except to the extent agreed upon in writing between the Owner and the Contractor.

D. The Owner shall have the right to exclude the Contractor from any part of the Work which has been accepted, but the Owner will allow the Contractor reasonable access thereto to complete or correct items on the tentative list.

1.35 FINAL ESTIMATE AND PAYMENT

A. All quantities shown on progress estimates and all prior payments shall be subject to correction in the final estimate and payment as determined by the Engineer.

B. 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 under or by virtue of this Agreement; and upon satisfactory completion of the work performed under this Agreement, as a condition before final payment under this Agreement or as a termination settlement under this Agreement the Contractor shall execute and deliver to the Owner a release of all claims against the Owner arising under or by virtue of, this Agreement, except claims which are specifically exempted by the Contractor to be set forth herein. Unless otherwise provided in this Agreement, by State law or otherwise expressly agreed to be the parties to this Agreement, any payment, including final payment under, this Agreement or settlement upon termination of this Agreement shall not constitute a waiver of the Owner's claims against the Contractor or his sureties under this Agreement or applicable Performance and Labor and Materials Bonds.

1.36 LIENS

A. If at any time any notices of lien are filed and labor performed or materials or equipment manufactured, furnished, or delivered to or for the Work, the Contractor shall, at its own cost and expense, promptly discharge, remove or otherwise dispose of the same, and until such discharge, removal or disposition, the Owner shall have the right to retain from any moneys payable hereunder an amount which, in its sole judgement, it deems necessary to satisfy such liens and pay the costs and expenses, including attorneys' fees, of defending any actions brought to enforce the same, or incurred in connection therewith or by reason thereof.

1.37 CLAIMS

A. If at any time there be any evidence of any claims for which the Contractor is or may be liable or responsible hereunder, the Contractor shall promptly settle or otherwise dispose of the same, and until such claims are settled or disposed of, the Owner may retain from any moneys which would otherwise be payable hereunder so much thereof as, in its sole judgement, it may deem necessary to settle or otherwise dispose of such claims and to pay the costs and expenses,

including attorney's fees, of defending any actions brought to enforce such claims, or incurred in connection therewith or by reason thereof.

1.38 APPLICATION OF MONEYS RETAINED

A. The Owner may apply any moneys retained hereunder to reimburse itself for any and all costs, expenses, losses, damage and damages, liabilities, suits, judgements and awards incurred, suffered or sustained by the Owner and chargeable to the Contractor hereunder or as determined hereunder.

1.39 NO WAIVER

A. Neither the inspection by the Owner or the Engineer, nor any order, measurement, approval, determination, decision or certificate by the Engineer, nor any order by the Owner for the payment of money, nor any payment for or use, occupancy, possession or acceptance of the whole or any part of the Work by the Owner, nor any extension of time, nor any other act or omission of the Owner or of the Engineer shall constitute or be deemed to be an acceptance of any defective or improper work, materials, or equipment nor operate as a waiver of any requirement or provision of the Contract, nor of any remedy, power or right of or herein reserved to the Owner, nor of any right to damages for breach of contract. Any and all rights and/or remedies provided for in the Contract are intended and shall be construed to be cumulative; and, in addition to each and every other right and remedy provided for herein or by law, the Owner shall be entitled as of right to a writ of injunction against any breach or threatened breach of the Contract by the Contractor, by his subcontractors or by any other person or persons.

1.40 LIABILITY OF OWNER

A. No person, firm or corporation, other than the Contractor who signed this Contract as such, shall have any interest herein or right hereunder. No claim shall be made or be valid either against the Owner or any agent of the Owner and neither the Owner nor any agent of the Owner shall be liable for or be held to pay any money, except as herein provided. The acceptance by the Contractor of the payment as fixed in the final estimate shall operate as and shall be a full and complete release of the Owner and of every agent of the Owner of and from any and all claims, demands, damages and liabilities of, by or to the Contractor for anything done or furnished for or arising out of or relating to or by reason of the Work or for or on account of any act or neglect of the Owner or of an agent of the Owner or of any other person, arising out of, relating to or by reason of the Work, except the claim against the Owner for the unpaid balance, if any there be, of the amounts retained as herein provided.

1.41 GUARANTEE

A. The Contractor guarantees that the Work and services to be performed under the Contract, and all workmanship, materials and equipment performed, furnished, used or installed in the construction of the same, shall be free from defects and flaws, and shall be performed and furnished in strict accordance with the Drawings, Specifications, and other Contract Documents, that the strength of all parts of all manufactured equipment shall be adequate and as specified and that the performance test requirements of the Contract shall be fulfilled. This guarantee shall be for a period of one year from and after the date of completion and acceptance of the Work as stated in the final estimate. If part of the Work is accepted in accordance with that subsection of this AGREEMENT titled "Partial Acceptance", the guarantee for that part of the Work shall be for a period of one year from the date fixed for such acceptance.

B. If at any time within the said period of guarantee any part of the Work requires repairing, correction or replacement, the Owner may notify the Contractor in writing to make the required repairs, correction, or replacements. If the Contractor neglects to commence making such repairs, correction, or replacements to the satisfaction of the Owner within three (3) days from the date of receipt of such notice, or having commenced fails to prosecute such Work with diligence, the Owner may employ other persons to make the same, and all direct and indirect costs of making said repairs, correction or replacements, including compensation for additional professional services, shall be paid by the Contractor.

1.42 RETAIN MONEY FOR REPAIRS

A. The Owner may retain out of the moneys otherwise payable to the Contractor hereunder a percentage of the amount thereof as set forth in Table A at the end of this section, and may expend the same, in the manner hereinafter provided, in making such repairs, corrections and replacements in the Work as the Owner, in its sole judgement, may deem necessary.

B. If at any time within the said period of guarantee any part of the Work requires repairing, correction or replacement, the Owner may notify the Contractor in

writing to make the required repairs, correction or replacements. If the Contractor neglects to commence making such repairs, correction, or replacements to the satisfaction of the Owner within three (3) days from the date of receipt of such notice, or having commenced fails to prosecute such work with diligence, the Owner may employ other persons to make the same. The Owner shall pay the cost and expense of the same out of the amounts retained for that purpose. Upon the expiration of the said period of guarantee, provided that the Work at that time is in good order, the Contractor will be entitled to receive the whole or such part of the sum last aforesaid, if any, as may remain after the cost and expense of making said repairs, correction or replacements, in the manner aforesaid, have been paid therefrom.

1.43 RETURN OF DRAWINGS

A. All Drawings furnished by the Owner or the Engineer to the Contractor may be used only in connection with the prosecution of the Work and shall be returned by the Contractor upon completion of the Work.

1.44 CLEANING UP

A. The Contractor at all times shall keep the site of the Work free from rubbish and debris caused by his operations under the Contract. When the Work has been completed, the Contractor shall remove from the site of the Work all of his plant, machinery, tools, construction equipment, temporary work, and surplus materials so as to leave the Work and the site clean and ready for use.

1.45 LEGAL ADDRESS OF CONTRACTOR

A. The Contractor's business address and his office at or near the site of the Work are both hereby designated as places to which communications shall be delivered. The depositing of any letter, notice, or other communication in a postpaid wrapper directed to the Contractor's business address in a post office box regularly maintained by the Post Office Department or the delivery at either designated address of any letter, notice, or other communication by mail or otherwise shall be deemed sufficient service thereof upon the Contractor, and the date of such service shall be the date of receipt. The first-named address may be charged at any time by an instrument in writing, executed and acknowledged by the Contractor delivered to the Engineer. Service of any notice, letter, or other communication upon the Contractor personally shall likewise be deemed sufficient service.

1.46 HEADINGS

A. The headings or titles of any section, subsection, paragraph, provision, or part of the Contract Documents shall not be deemed to limit or restrict the content, meaning or effect of such section, subsection, paragraph, provision or part.

1.47 MODIFICATION OR TERMINATION

A. Except as otherwise expressly provided herein, the Contract may not be modified or terminated except in writing signed by the parties hereto.

1.48 REMEDIES AND ARBITRATION

A. The Contractor's attention is directed to the fact that this Contract is subject to the Public Works Arbitration Act of R.I. General Laws Section 37-16-1 et., seq Unless otherwise provided in this agreement, all claims, counterclaims, disputes and other matters in question between the Owner and the Contractor arising out of, or relating to, this Agreement or in performance interpretation or breach of it will be decided by arbitration at the election of either party, or in a court of competent jurisdiction within the State in which the Owner is located.

B. Any dispute to be arbitrated shall be done so in accordance with the Construction Industry Arbitration Rules and Regulations of the American Arbitration Association, and judgment upon the award rendered by the Arbitrator(s) may be entered in any court having jurisdiction thereof.

C. However, to the extend allowed by law, if neither party wishes to elect arbitration, and if both parties agree, such claim or controversy may be litigated in a court of competent jurisdiction, as provided in this Agreement. Furthermore, if either party elects to bring such claim or controversy to arbitration, it shall first notify the other party and allow that other party ten (10) calendar days (before filing) within which to have the claim mediated, and shall negotiate in good faith during any such mediation effort.

D. In addition, the method of the appointment of an arbitrator shall vary for the method set forth in Article 13 (Appointment form Panel) of the American Arbitration Association (AAA) Construction Industry Arbitration Rules only so far as that: the AAA Shall submit a second, but no further, set of lists should the parties fail to agree upon any of the persons names, or if acceptable arbitrators are unable to act, or if for any

other reason the appointment cannot be made from the original submitted lists. If for any reason an appointment cannot be made from the second set of lists, the AAA shall have the power to make the appointment from other members of the Panel without the submission of any additional lists.

1.49 DIRECT LABOR COST

A. Direct labor cost percentage for change orders shall be ____ percent. (Direct labor cost percent shall be established following award and prior to execution of the Contract).

1.50 MINORITY BUSINESS

A. The goal for minority business enterprise (MBE) and women business enterprise (WBE) participation for this contract is a minimum of **fifteen percent (15%) MBE**, on the basis of the total dollars paid. In addition, the project is subject to Chapter 37-14.1 of the Rhode Island General Laws, and regulations, which require that 7.5% of the dollar value of the work performed on the project, be performed by certified minority business enterprise and 7.5% be performed by certified woman owned business enterprise. The Contractor shall take all affirmative steps necessary to achieve this goal, and shall provide reports documenting the portion of contract and subcontract dollars paid to minority businesses, and its efforts to achieve the goals, with each invoice submitted or at such greater intervals as specified by the Town of North Kingstown, Rhode Island. The Contractor shall require similar reports from its subcontractors.

1.51 TERMINATION FOR CONVENIENCE

A. This Agreement may be terminated by the Owner upon not less than seven days' written notice for the Owner's convenience. In the case of termination for convenience, the Owner shall be responsible for amounts due the Contractor for work performed through the date of termination, provided that the Contractor shall submit a request for payment in accordance with the provisions hereof. The Contractor shall have no other claim for payments due with respect to such termination including any claim for lost profits with respect to the balance of the project.

1.52 EQUAL EMPLOYMENT OPPORTUNITY, ANTIDISCRIMINATION AND AFFIRMATIVE ACTION

A. The Contractor shall not discriminate against or exclude any person from participation herein on grounds of race, religion, color, sex, age, or national origin; and that it shall take affirmative actions to insure that applicants are employed, and that employees are treated during their employment, without regard to race, religion, color, sex, age, handicapped status, or national origin.

1.53 PRICE ADJUSTMENT – LIQUID ASPHALT AND DIESEL FUEL

A. The intent of this provision is to insure adequate and fair compensation for unpredictable and fluctuating costs which, from time to time, occur in the prices of Liquid Asphalt and Diesel Fuel. The price adjustment provisions are made part of the Contract to assure more realistic bidding and encourage competition.

B. The base price is the unit price of the material (FOB Terminal), as determined by the RIDOT, just prior to the project bid date.

C. The period price is the unit price of the material (FOB Terminal), as determined by the RIDOT, for any one month period following the bid date during which the price varies from the base price.

D. Price adjustment will be determined by the difference between the Period Price and the Base Price. Price adjustments will only be made at the end of each month during which; a) work was accomplished on the project; and b) prices increase or decrease by 15% or more. Price adjustments will not be allowed beyond the completion date of the Contract or an approved extension thereof.

E. Liquid Asphalt Cement. The asphalt content will be the optimum amount used in every ton of bituminous concrete mixture, as determined by the RIDOT Standard Specifications. The Price Adjustment will be determined by multiplying the total weight of liquid asphalt, in tons, by the difference between the base price and period price.

F. Diesel Fuel. The fuel for operating the plant, and the fuel for hauling and placing bituminous concrete, will equal the total number of tons of bituminous concrete placed during the month in question times a

fuel adjustment factor of 2.5 gallons of fuel per ton of bituminous concrete. Tonnage of bituminous concrete placed during the month in question will equal the sum of the weights indicated on the Daily Automated Recordation printout slips provided at the plant. The Price Adjustment will be determined by multiplying the total volume of fuel, in gallons, by the difference between the base price and the period price.

G. No price adjustment will be made for Liquid Asphalt Cement or Diesel Fuel unless the amount of the adjustment exceeds $500.00 and more than 15% for the month.

IN WITNESS WHEREOF, the parties to this AGREEMENT have hereunto set their hands and seals, and have executed, or caused to be executed by their duly authorized officials, the AGREEMENT in Four (4) copies, each of which shall be deemed an original, as of the day and year first above-written.

WITNESSES

Town of North Kingstown, Rhode Island,
(Owner - party of the first part)

BY: _____

_____

(SEAL)

ATTEST:

_____

_____

_____
(Contractor - party of the second part)

BY: _____

_____

(SEAL)

_____
(Title)

ATTEST:

_____ _____

_____ _____
(Address)

Approved As To Form:

_____
Legal Counsel for Town of North Kingstown, Rhode Island

CERTIFICATE OF ACKNOWLEDGMENT OF CONTRACTOR IF A CORPORATION

For AGREEMENT

State of _____)

County _____)

on this _____ day of _____, 20 _____, before me personally

came _____ to me known, who being me duly

sworn, did depose and say as follows:

That he resides at _____

and is the _____

of _____

the corporation described in and which executed the foregoing instrument; that he knows the corporate seal of said corporation; that the seal affixed to the foregoing instrument is such corporate seal and it was so affixed by order of the Board of Directors of said corporation; and that by the like order he signed thereto his name and official designation.

_____

Notary Public (Seal)

My commission expires _____

CERTIFICATE OF OWNER'S LEGAL COUNSEL

I, the undersigned, _____ the duly authorized and acting legal

representative of the _____, acting herein through its

_____, do hereby certify as follows:

I have examined the foregoing contract and surety bonds and the manner of execution thereof, and I am of the opinion that each of the aforesaid agreements has been duly executed by the proper parties thereto acting through their duly authorized representatives; that said representatives have full power and authority to execute said agreements on behalf of the respective parties named thereon; and that the foregoing agreements constitute valid and legally binding obligations upon the parties executing the same in accordance with the terms, conditions, and provisions thereof.

By:_____
(Signature)

Date: _____

_____
(Name)

_____
(Title)

_____
(Address)

_____
(City, State, Postal code)

TABLE A

Agreement subsection reference	Item	Minimum limits
1.06	Workman's Compensation and Employer's Liability Insurance	As required by the law of the State of Rhode Island
1.06	Public Liability including Contractor's Protective, Completed Operations and Contractual Liability	Bodily Injury _____ **$1,000,000** each occurrence **$2,000,000** aggregate Property Damage Including C.U.* Coverage _____ **$1,000,000** each occurrence **$1,000,000** aggregate _____ Blasting and explosion coverage shall be obtained if there is a need for blasting under the contract.
1.06	Personal Injury Insurance	**$2,000,000** aggregate
1.06	Automobile Liability including coverage for owned, hired or borrowed vehicles	Bodily Injury _____ **$1,000,000** each person **$2,000,000** each occurrence Property Damage _____ **$1,000,000** each occurrence

1.06	Owner's Protective Liability & Property Damage	Bodily Injury _____ **$1,000,000** each occurrence **$2,000,000** aggregate Property Damage _____ **$1,000,000** each occurrence **$1,000,000** aggregate
1.06	Builder's Risk Insurance	Total insurable value of all structures, materials, and equipment to be built and installed.
1.06	Professional Liability	$1,000,000 each occurrence
1.06	Excess Umbrella Policy	$5,000,000 combined single limit
1.13	a) Time of Completion	Within 300 consecutive calendar days (excluding winter shut down from Nov 15th to April 15th) after the date specified in the Notice to Proceed
1.14	Liquidated Damages for each consecutive calendar day of delay in completion time	$ 1,000
1.33	Percentage of Progress Estimates to be Retained The retainage to be paid the Contractor within Ninety (90) days of the date the work is accepted By the awarding authority unless a dispute exists With respect to the work.	5% until 90 days following final completion of the work
1.33	Amount of Minimum Progress Estimates	$10,000

INSURANCE CERTIFICATE
SHEET 1 OF 2
Issued to
The Town of North Kingstown, Rhode Island

This is to certify that this Company, _____, (Name of Insurance Company) has enforced the following policies covering all work and operations of _____ (Name of Contractor), as the designate Contractor under a Contract with the Town of North Kingstown, Rhode Island, as the designated Owner, dated _____ Wickford Waterfront Improvements Project.

POLICY NUMBER EFFECTIVE AND KINDS OF INSURANCE		LIMITS	EXPIRATION DATE
Workmen's Compensation and Employers Liability and Harbor Workers Coverage *			Number: _____ Effective: _____ Expires: _____
Public Liability including Contractor's Protective Personal Injury, Completed Operations, and Contractual Liability**	Bodily Injury	$_____ each occurrence $_____ aggregate	Number: _____ Effective: _____ Expires: _____
***Note: Explosion Collapse and underground coverage is provided	Property Damage including C.U. Coverage***	$_____ each occurrence $_____ aggregate	
	Personal Injury	$_____ aggregate	

* Longshoremen's and Harbor Workers' Coverage may be deleted if not required by contract.

** Contractual Liability covers the liability assumed by the Contractor under the subsection entitled "Obligations and Liability of Contractor" of the AGREEMENT, as required by subsection entitled "Insurance" of the agreement.

*** Blasting coverage is not required.

INSURANCE CERTIFICATE

SHEET 2 OF 2

Issued to

The Town of North Kingstown, Rhode Island

Contract Reference: Town of North Kingstown, Rhode Island,
Wickford Waterfront Improvements Project.

POLICY NUMBER EFFECTIVE AND KINDS OF INSURANCE	LIMITS		EXPIRATION DATE
Automobile Liability including Coverage for hired or borrowed vehicles	Bodily Injury	$_____ each person $_____ each occurrence	Number: _____ Effective: _____ Expires: _____
	Property Damage	$_____ each occurrence	
Owner's Protective Liability and Property Damage	Bodily Injury	$ _____ each occurrence $ _____ aggregate	Number: _____ Effective: _____
	Property Damage	$ _____ each occurrence $ _____ aggregate	

Note: A copy of the Owner's Protective Policy for the Owner is to be furnished with the completed certificates.

Town of North Kingstown, Rhode Island, and Beta Group, Inc. to be named as additional insured as applicable.

It is agreed that thirty (30) days notice of cancellation or restrictive amendment of said policies shall be mailed to Owner.

_____
INSURANCE COMPANY

_____
INSURANCE AGENCY

BY: _____
AUTHORIZED AGENT OR OFFICER

DATE: _____

SECTION 00600

CONTRACT BONDS

PERFORMANCE BOND

(NOTE: This Bond is issued simultaneously with the attached Labor and Materials Bond in favor of the Owner.)

KNOW ALL MEN BY THESE PRESENTS:

That we, _____
(an individual, a partnership, a corporation)

duly organized under the Laws of the State (or Commonwealth) of _____,

and having a usual place of business at _____,

_____,

as Principal, and _____ , a corporation duly organized

under the Laws of the State (or Commonwealth) of _____,

and duly authorized to do business in the State (or Commonwealth) of Rhode Island ,

and having a usual place of business at _____
as Surety, are holden and stand firmly bound and obligated unto Town of North Kingstown, Rhode Island, as obligee, in the sum of

_____
lawful money of the United States of America, to and for the true payment whereof we bind ourselves and, each of us, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal, be means of a written AGREEMENT (which together with the Contract Documents in said AGREEMENT referred to are collectively sometimes referred to as the "Contract") dated _____ , has entered into a contract with the said obligee for **Wickford Waterfront Improvements Project,** in the **Town of North Kingstown, Rhode Island,** a copy of which agreement is attached hereto and by references made a part hereof.

NOW THEREFORE, THE CONDITION of this obligation is such that if the Principal shall well and truly keep and fully and faithfully perform all of the terms and conditions of said AGREEMENT and of the "Contract Documents" referred to in said AGREEMENT (which collectively are hereinafter and in said AGREEMENT sometimes referred to as the "Contract") and all modifications thereof on the Principal's part to be performed, this obligation shall be

void; otherwise it shall remain in full force and effect.

Whenever the said Principal shall be, and declared by the Owner to be, in default under the said Contract, the Owner having performed the Owner's obligations thereunder Surety, for value received, shall promptly remedy the default, or, at the option of the Owner, shall promptly.

(a) Complete the said AGREEMENT and/or Contract in accordance with its terms and conditions, or

(b) Obtain a bid or bids for submission to and the approval of the Owner for completing the said AGREEMENT and/or Contract and any modifications thereof in accordance with the terms and conditions thereof, and upon determination by the Owner and the Surety of the lowest responsible and acceptable bidder, arrange for a contract between such bidder and the Owner, and make available to the Owner as the work progresses (even though there should be default or a succession of defaults under the contract or contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less a sum that shall be equal to the difference between the Contract price as fixed and provided in said AGREEMENT and/or Contract or any modifications thereof to be pair thereunder to the Principal and the amount previously paid by the Owner to and/or for the account of and/or chargeable against the Principal, but not exceeding (including other costs and damages for which the Surety may be liable hereunder) the amount set forth in the first paragraph hereof.

The Surety, for value received, agrees further that no changes in, omissions from, or alterations, modifications or additions to the terms and provisions of said AGREEMENT and/or Contract or the Work to be performed thereunder, and that no extensions of time given or changes made in the manner or time of making payments thereunder, shall in any way effect the Surety's obligations on this bond, and the Surety hereby waives notice of any such changes, omissions, alterations, modifications, additions or extensions.

No right of action shall accrue on this Bond to or for the use of any persons other than the Owner named herein or the heirs, executors, administrators, successors and assigns of the Owner.

IN WITNESS WHEREOF, we have hereunto set our hands and seals to _____

_____ counterparts of this bond, this _____ day of _____,

in the year Two Thousand and _____.

_____ (SEAL)
Principal

_____ (SEAL)
Principal

_____ (SEAL)
Principal

_____ (SEAL)
Surety

_____ (SEAL)
Surety

NOTE:

If the Principal (Contractor) is a partnership, the Bond should be signed by each of the partners.

If the Principal (Contractor) is a corporation, the Bond should be signed in its correct corporate name by its duly authorized officer or officers.

If this Bond is signed on behalf of the Surety by an attorney-in-fact, there should be attached to it a duly certified copy of his power of attorney showing his authority to sign such Bonds.

There should be executed an appropriate number of counterparts of the Bond corresponding to the number of counterparts of the AGREEMENT.

Date of Bond must not be prior to the date of Contract.

Important

Surety Companies executing BONDS must appear on the U.S. Treasury Department's most current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Audit Staff Bureau of Accounts and be authorized to transact business in the state where the PROJECT is located.

The attention of the Surety Companies and Principal executing this Performance Bond is Directed to the fact that said Bond shall remain in full effect throughout the life of any guaranty or warranty periods stipulated in the Contract Documents and/or Agreement.

LABOR AND MATERIALS BOND

(NOTE: This Bond is issued simultaneously with the attached Performance Bonds in favor of the Owner.)

KNOW ALL MEN BY THESE PRESENTS:

That we, _____
(an individual, a partnership, a corporation)

duly organized under the Laws of the State (or Commonwealth) of _____,

having a usual place of business at _____,

_____,

as Principal, and _____a corporation duly organized

under the Laws of the State (or Commonwealth) of _____,

and duly authorized to do business in the State(or Commonwealth) of _____,

and having a usual place of business at _____,
as Surety, are holden and stand firmly bound and obligated unto the **Town of North Kingstown, Rhode Island**, as obligee, in the sum of

_____
lawful money of the United States of America, to and for the true payment whereof we bind ourselves and, each of us, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal, be means of a written AGREEMENT (which together with the Contract Documents in said AGREEMENT referred to are collectively sometimes referred to as the "Contract") dated _____, has entered into a contract with the said Obligee for **Wickford Waterfront Improvements Project,** in the **Town of North Kingstown, Rhode Island**, a copy of which agreement is attached hereto and by references made a part hereof.

NOW, THEREFORE, THE CONDITION of this obligation is such, that if the Principal shall promptly make payments to all claimants as hereinafter defined, for all labor performed or furnished and for all materials and equipment furnished for or used in or in connection with the Work called for by said AGREEMENT and/or Contract and any modifications thereof, including lumber used but not incorporated in said Work, and for the rental or hire of vehicles, tools and other appliances and equipment furnished for or used in connection with said Work, this obligation shall be void; otherwise it shall remain in full force and effect, subject, however, to the following conditions:

(a) A claimant is defined as one having a direct contract with the Principal or with a subcontractor of the Principal for labor, materials and/or equipment used or reasonably required for use in the performance of the said Work, labor and materials being construed to include that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental or equipment directly applicable to the said AGREEMENT and/or Contract and any modifications thereof.

(b) The above named Principal and Surety hereby jointly and severally agree with the Owner that every claimant as herein defined, who has not been paid in full before the expiration of a period of ninety (90) days after the date on which the last of such claimant's work or labor was done or performed, or materials or equipment were furnished by such claimant, may sue on this bond for the use of such claimant, prosecute the suit to final judgment for such sum or sums as may be justly due claimant, and have execution thereon. The Owner shall not be liable for the payment of any costs or expenses of any such suit.

(c) No suit or action shall be commenced hereunder by any claimant.

Unless claimant, other than one having a direct contract with the Principal, shall have given written notice to any two of the following: the Principal, the Owner, or the Surety above named, within ninety (90) days after such claimant did or performed the last of the work or labor, or furnished the last of the materials or equipment for which said claim is made, stating with substantial accuracy the amount claimed and the name of the party to whom the materials or equipment were furnished, or for whom the work or labor was done or performed. Such notice shall be served by mailing the same by registered mail or certified mail, postage prepaid, in an envelope addressed to the Principal, Owner or Surety at any place where an office is regularly maintained for the transaction of business, or served in any manner in which legal process may be served in the state in which the said Work is located, save that such service need not be made by a public officer;

After the expiration of one (1) year following the date on which the Principal ceased work on said AGREEMENT and/or Contract and any modifications thereof, it being understood, however, that if any limitation embodied in this bond is prohibited by any law controlling the construction hereof, such limitation shall be deemed to be amended so as to be equal to the minimum period of limitation permitted by such law.

Other than in a state court of competent jurisdiction in and for the county or other political subdivision of the State in which the said Work, or any part thereof, is situated, or in the United States District Court for the district in which the said Work, or any part thereof, is situated, and not elsewhere.

(d) The amount of this bond shall be reduced by and to the extent of any payment or payments made in good faith hereunder, inclusive of the payment by Surety of mechanics liens which may be filed of record against said AGREEMENT and/Contract or said Work, whether or not claim for the amount of such lien be presented under and against this bond.

The surety, for value received, agrees further that no changes in, omissions from, or alterations, modifications or additions to the terms and provisions of said AGREEMENT and/or Contract or the Work to be performed thereunder, and that no extensions of time given or changes made in the manner or time of making payments thereunder, shall in any way affect the Surety's obligations on this Bond, and the Surety hereby waives notice of any such changes, omissions, alterations, modifications, additions or extensions.

IN WITNESS WHEREOF, we have hereunto set our hands and seals to _____ counterparts of this Bond, this _____ day of _____, in the year Two Thousand and _____.

_____ (SEAL)
Principal

_____ (SEAL)
Principal

_____ (SEAL)
Principal

_____ (SEAL)
Surety

_____ (SEAL)
Surety

NOTE:
If the Principal (Contractor) is a partnership, the Bond should be signed by each of the partners.

If the Principal (Contractor) is a corporation, the Bond should be signed in its correct corporate name by its duly authorized officer or officers.

If this Bond is signed on behalf of the Surety by an attorney-in-fact, there should be attached to it a duly certified copy of his power of attorney showing his authority to sign such Bonds.

There should be executed an approximate number of counterparts of the Bond corresponding to the number of counterparts of the AGREEMENT.

Date of Bond must not be prior to the date of Contract.

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.

The attention of the Surety Companies and Principal executing this Labor and Materials Bond is directed to the fact that said Bond shall remain in full effect throughout the life of any guaranty or warranty periods stipulated in the Contract Documents and/or Agreement.

CERTIFICATE OF ACKNOWLEDGMENT OF CONTRACTOR IF A CORPORATION
For CONTRACT BONDS

State of _____)

County of _____)

On this _____ day of _____ , 20 _____ , before

me personally came _____ to me known, who being by me duly

sworn, did depose and say as follows:

That he resides at _____

and is the _____

of _____

the corporation described in and which executed the foregoing instrument; that he knows the corporate seal of said corporation; that the seal affixed to the foregoing instrument is such corporate seal and it was so affixed by order of the Board of Directors of said corporation; and that by the like order he signed thereto his name and official designation.

_____
Notary Public (Seal)

My commission expires _____

SECTION 00700

GENERAL CONDITIONS

1.01 GENERAL PROVISIONS

A. The duties and obligations imposed by these General Conditions will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right and remedy to which they apply.

B. Sections of Division 1, General Requirements govern the execution of the Work of all sections of the specifications.

C. The Specifications are written in imperative and streamlined form. This imperative language is directed to the Contractor, unless stated otherwise.

1.02 DEFINITIONS

A. Wherever the words as listed in subsection 1.01 of the AGREEMENT or pronouns used in their stead occur in the Contract Documents, they shall have the meanings as given in the AGREEMENT.

1.03 MATERIALS AND EQUIPMENT

A. General

1. Unless otherwise provided in the Contract Documents, only new materials and equipment shall be incorporated in the Work.

2. As soon as possible after execution of the AGREEMENT, submit to the Engineer the names and addresses of the manufacturers and suppliers of all materials and equipment proposed to be incorporated into the Work.

3. When shop and working drawings are required as specified below, submit, prior to the submission of such drawings, data in sufficient detail to enable the Engineer to determine whether the manufacturer and/or the supplier have the ability to furnish a product meeting the Specifications.

4. Submit data relating to the materials and equipment proposed to be incorporated into the Work in sufficient detail to enable the Engineer to identify and evaluate the particular product and to determine whether it conforms to the Contract requirements. Such data shall be submitted in a manner similar to that specified for submission of shop and working drawings.

B. Handling

1. Handle, haul, and distribute materials and all surplus materials on the different portions of the Work, required to complete the Work in accordance with the Contract Documents.

2. Provide suitable storage room for materials and equipment during the progress of the Work, and be responsible for the protection, loss of, or damage to materials and equipment furnished under this Contract, until the final completion and acceptance of the Work.

3. Pay all storage and demurrage charges by transportation companies and vendors.

C. Storage of Excavated Material

1. Place excavated materials and equipment to be incorporated in the Work so as not to injure any part of the Work or existing facilities and so that free access can be had at all times to all parts of the Work and to all public utility installations in the vicinity of the Work.

2. Materials shall be kept neatly piled and compactly stored in such locations as will cause a minimum of inconvenience to public travel and adjoining owners, tenants and occupants.

D. Inspection

1. All materials and equipment furnished by the Contractor to be incorporated in the Work shall be subject to the inspection of the Engineer.

2. No material shall be processed or fabricated for the Work or delivered to the work site without prior concurrence of the Engineer.

3. Facilities and labor for the storage, handling, and inspection of all materials and equipment shall be furnished by the Contractor.

4. Defective materials and equipment shall be removed immediately from the site of the Work.

E. Inspection away from Site

1. If work to be done, away from the construction site, is to be inspected on behalf of the Owner during its fabrication, manufacture, or testing, or before shipment, the Contractor shall give notice to the Engineer of the place and time where such fabrication, manufacture, testing, or shipping is to be done. Such notice shall be in writing and delivered to the Engineer in ample time, as determined solely by the Engineer, so that the necessary arrangements for the inspection can be made.

F. Samples

1. Submit samples of materials for tests, as the Engineer deems necessary to demonstrate conformance with the Specifications. Such samples, including concrete test cylinders, shall be furnished, taken, stored, packed, and shipped by the Contractor as directed by the Engineer.

2. Furnish suitable molds for making concrete test cylinders. Except as otherwise expressly specified, the Owner shall make arrangements for, and pay for, the tests.

3. Pack samples so as to reach their destination in good condition, and label to indicate the material represented, the name of the building or work and location for which the material is intended, and the name of the Contractor submitting the sample. To ensure consideration of samples, notify the Engineer by letter that the samples have been shipped and properly describe the samples in the letter. Send letter of notification separate from the samples.

4. Submit data and samples, or place his orders, sufficiently early to permit consideration, inspection and testing before the materials and equipment are needed for incorporation in the Work. The consequences for failure to do so shall be the Contractor's sole responsibility.

5. In order to demonstrate the proficiency of workmen, or to facilitate the choice among several textures, types, finishes, surfaces, etc., provide such samples of workmanship of wall, floor, finish, etc., as may be required.

6. After review of the samples, data, etc. the materials and equipment used for the Work shall in all respects conform therewith.

G. Shop Testing

1. When required, furnish to the Engineer in triplicate, sworn copies of manufacturer's shop or mill tests (or reports from independent testing laboratories) relative to materials, equipment performance ratings, and concrete data.

1.04 CONTRACTOR'S SHOP AND WORKING DRAWINGS

A. Submit shop drawings to the Engineer for review and approval.

B. All submittals will be identified as the Engineer may require and in the number of copies also as required by the Engineer.

C. The data shown on the Shop Drawings will be complete regarding quantities, dimensions, specified performance and design criteria, materials and other

data as particular to the Work that the Contractor proposes to provide.

1.05 OCCUPYING PRIVATE LAND

A. Entering or occupying with men, tools, materials, or equipment, any land outside the rights-of-way or property of the Owner (except after written consent from the proper parties) will not be permitted. A copy of the written consent shall be given to the Engineer.

1.06 INTERFERENCE WITH AND PROTECTION OF STREETS

A. Obtain permits from the governing authorities prior to obstructing any portion of a street, road, or private way. If any street, road or private way is rendered unsafe by the Contractor's operations, he shall make such repairs or provide such temporary ways or guards as ordered by the governing authorities.

B. Maintain streets, roads, private ways, and walks not closed in a passable and safe condition,

C. Provide at least 24 hours in advance, notice to the Owner, Police, Fire and School Departments in writing, with a copy to the Engineer, if the closure of a street or road is necessary. Cooperate with all Departments in the establishment of alternate routes and provide adequate detour signs, plainly marked and well lighted, in order to minimize confusion.

1.07 SAFETY

A. Take all precautions and provide safeguards to prevent personal injury and property damage. Provide protection for all persons including but not limited to employees and employees of other contractors and subcontractors; members of the public; and employees, agents and representatives of the Owner, the Engineer, and regulatory agencies that may be on or about the Work. Provide protection for all public and private property including but not limited to structures, pipes, and utilities, above and below ground.

B. Provide and maintain all safety equipment such as fences, barriers, signs, lights, walkways, guards and fire prevention and fire-fighting equipment.

C. Comply with all applicable Federal, State and local laws, ordinances, rules and regulations and lawful orders of all authorities having jurisdiction for the safety of persons and protection of property.

D. Designate a responsible member of his organization at the site whose duty shall be the prevention of accidents. This responsible person shall have the authority to take immediate action to correct unsafe or hazardous conditions and to enforce safety precautions and programs.

1.08 EXISTING FACILITIES

A. Dimensions of Existing Structures

1. Where the dimensions and locations of existing structures are of importance in the installation or connection of any part of the Work, verify such dimensions and locations in the field before the fabrication of any material or equipment which is dependent on the correctness of such information.

B. Proposed Pipe Location

1. Exterior pipelines will be located substantially as indicated on the Drawings, but the right is reserved to the Owner, acting through the Engineer, to make such modifications in location as may be found desirable to avoid interference with existing structures or for other reasons. Where fittings, etc., are noted on the Drawings, such notation is for the Contractor's convenience and does not relieve him for laying and jointing different or additional items where required.

2. Small interior piping is indicated diagrammatically on the Drawings, and the exact location is to be determined in the field. Piping shall be arranged in a neat, compact, and workmanlike manner, with a minimum of crossing and interlacing, so as not to interfere with equipment or access way, and, in general, without diagonal runs.

C. Interference with Existing Works

1. Conduct operations so as to interfere as little as possible with existing works. Develop a program, in cooperation with the Engineer and interested officials, which shall provide for the construction and putting into service of the new works in the most orderly manner possible. This program shall be adhered to except as deviations therefrom are expressly permitted. All work of connecting with, cutting into, and reconstructing existing pipes or structures shall be planned to interfere with the

operation of the existing facilities for the shortest time when the demands on the facilities best permit such interference, even though it may be necessary to work outside of normal working hours to meet these requirements. Electrical connections should be coordinated with the Owner so as to minimize disruption of normal plant operations. Before starting work which will interfere with the operation of existing facilities, perform preparatory work and see that all tools, materials and equipment are made ready and at hand.

2. Repair utilities damaged by the Contractors operations during the progress of the work, and be responsible for correcting all damages to existing utilities and structures at no additional expense to the Owner. Contact the proper utility or authority to correct or make any changes due to utility or other obstructions during the work but the entire responsibility and expense shall be with the Contractor.

3. Make such minor modifications in the work relating to existing structures as may be necessary, without additional compensation.

4. Submit no claim for additional compensation by reason of delay or inconvenience in adapting his operations to the need for continuous flow of sewage.

D. Existing Utilities or Connections

1. The location of existing underground pipes, conduits, and structures, as shown, has been collected from the best available sources. The Owner, together with its agents, does not imply nor guarantee the data and information in connection with underground pipes, conduits, structures and such other parts as to their completeness, nor their locations as indicated. The Contractor shall assume that there are existing water, sewer, gas and other utility connections to each and every building enroute, whether they appear on the drawings or not. An expense and/or delay occasioned by utilities and structures, or damage thereof, including those not shown, shall be the responsibility of the Contractor, at no additional expense to the Owner.

2. Above ground utilities may be present in the areas of the proposed Work. Take all necessary actions and/or precautions, including, but not limited to, utility company notification and necessary relocations (both temporary and permanent), to insure proper protection of those aboveground utilities and appurtenances to be affected by his operations. All costs associated with the aboveground utilities shall be paid by the Contractor at no additional expense to the Owner.

3. If and when encountered, existing utilities shall be properly supported and protected during the construction work and the Engineer shall be notified accordingly. The operation of existing utilities shall not be interrupted except with written permission of the operator and owner of such utilities. Allow ample time for all measures as may be required for the continuance of existing utility operations. Take extreme precautions to minimize disruption of utilities. Make prompt and full restitution for repairs by others for all disruptions caused by operations required to perform the Work.

4. Comply with all requirements of utility organizations involved.

E. Failure to Repair

1. Any emergency rising from the interruption of electric, telephone, gas, water, or sewer service due to the activities of the Contractor, shall be repaired by the Contractor as quickly as is possible.

2. If and when, in the opinion of the Owner, the Contractor is not initiating repair work as expeditiously as possible upon notification to do so, the Owner, may at his own option, make the necessary repairs using his own forces or those of others. The cost of such repairs shall be subtracted from the payments due to the Contractor.

F. Disturbance of Bounds

1. Replace all bounds disturbed during the construction operation, at no additional cost to the Owner. The bounds shall be relocated by a land surveyor approved by the Engineer and registered in the State that the Work is to be done.

1.09 WORK TO CONFORM

A. During its progress and on its completion, the Work shall confirm to the lines, levels, and grades indicated on the Drawings or given by the Engineer and shall be built in strict accordance with the Contract Documents and the directions given from time to time by the Engineer.

B. All work done without instructions having been given therefore by the Engineer, without proper lines or levels, or performed during the absence of the Engineer, will not be estimated or paid for except when such work is authorized by the Engineer in writing. Work so done may be ordered uncovered or taken down, removed, and replaced at the Contractor's expense.

1.10 PLANNING AND PROGRESS SCHEDULES

A. Before starting the Work and from time to time during its progress, as the Engineer may request, the Contractor shall submit to the Engineer a written description of the methods he plans to use in doing the Work and the various steps he intends to take.

B. Within 14 calendar days after the date of formal execution of the AGREEMENT, the Contractor shall prepare and submit to the Engineer (a) a written schedule fixing the dates on which additional drawings, if any, will be needed by the Contractor and (b) a written schedule fixing the respective dates for the start and completion of various parts of the Work. Each such schedule shall be subject to review from time to time during the progress of the Work.

1.11 PRECAUTIONS DURING ADVERSE WEATHER

A. During adverse weather and against the possibility thereof, take all necessary precautions so that the Work may be properly done and satisfactory in all respects. When required by the manufacturer of the material or equipment to be installed, protection shall be provided by use of tarpaulins, wood and building-paper shelters, or other suitable means.

B. During cold weather, materials shall be preheated, if required, and the materials and adjacent structure into which they are to be incorporated shall be made and kept sufficiently warm so that a proper bond will take place and a proper curing, aging, or drying will result. Protected spaces shall be artificially heated by suitable means that will result in a moist or dry atmosphere according to the particular requirements of the work being protected. Ingredients for concrete and mortar shall be sufficiently heated so that the mixture will be warm throughout when used.

1.12 TEMPORARY HEAT

A. If temporary heat is required for the protection of the Work, provide and install suitable heating apparatus, provide adequate and proper fuel, and shall maintain heat as required.

B. Temporary heating apparatus shall be installed and operated in such manner that finished work will not be damaged.

1.13 ELECTRICAL ENERGY

A. Make all necessary applications and arrangements and pay all fees and charges for electrical energy for power and light necessary for the proper completion of the Work and during its entire progress. Provide and pay for all temporary wiring, switches, connections, and meters.

B. Provide sufficient electric lighting so that all work may be done in a workmanlike manner when there is not sufficient daylight.

1.14 CERTIFICATES OF CONFORMANCE

A. Furnish to the Engineer, in the manner as directed and prior to actual installation, notarized certificates of conformance for all materials to be furnished under this Contract. The notarized certificates of conformance shall state that the material to be furnished meets or exceeds all requirements specified under the Contract Documents. When so directed, the manufacturer’s notarized certificates of conformance, certifying that the materials meet the requirements specified shall accompany each shipment of material. Unless otherwise specifically specified and/or directed by the Engineer, all testing of materials required under this Contract shall be provided by the Contractor at no additional expense to the Owner.

1.15 PATENTS

A. Pay, at no additional expense to the Owner, all applicable royalties and license fees associated with the materials and construction methods to be used under this Contract. Defend all suits or claims for infringements of any patent rights, and save the Owner and Engineer harmless from loss on account thereof, except that the Owner shall be responsible for any such loss when a particular process, design, or product of a particular manufacturer (s) is specifically specified with no option to the Contractor. 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 Owner.

B. Refer to Specification Section 00500, 1.07, Patents, regarding the Contractor's responsibilities for any patent rights associated with the materials and construction methods to be used under this Contract.

1.16 “OR EQUAL" CLAUSE

A. Whenever a material or article required is specified or shown on the drawings by using the name of the proprietary product of a particular manufacturer or vendor, any material or article which will perform adequately, in the Engineer's sole judgment and/or opinion, the duties imposed by the general design may be considered equal and satisfactory providing the material or article so proposed is of equal substance. It shall not be purchased or installed without his written approval. In all cases new material shall be used in the project.

B. If more than one brand, name of material, device, or piece of equipment is shown or specified, each should be regarded as the equal of the other. Any other brand, make of material, device or equipment, which in the opinion of the OWNER and/or ENGINEER, is the recognized equal of that specified (considering quality, workmanship, and economy of operation), and is suitable for the purpose intended, may be accepted.

C. ENGINEER will be allowed a reasonable time within which to evaluate submittals for Substitute Items. ENGINEER will be the sole judge of acceptability. No “Or Equal” or Substitute Item will be ordered, installed or utilized without ENGINEER’s prior written acceptance which will be evidenced by either a Change Order or an approved Shop Drawing. OWNER may require CONTRACTOR to furnish at CONTRACTOR’s expense a special performance guarantee or other surety with respect to any “or equal” or substitute. ENGINEER will record time required by ENGINEER and ENGINEER’s Consultants in evaluating substitutes proposed or submitted by CONTRACTOR and in making changes to the Contract Documents. Whether or not ENGINEER accepts a Substitute Item so proposed or submitted by CONTRACTOR, CONTRACTOR shall reimburse OWNER for the charges of ENGINEER and ENGINEER's Consultants for evaluating each such proposed Substitute Item.

1.17 ADDITIONAL OR SUBSTITUTE BONDS

A. If at any time the Owner, for justifiable cause, shall be or become dissatisfied with any Surety or Sureties than upon the performance or payment bonds, the Contractor shall, within five (5) calendar days after notice from the Owner so to do, substitute an acceptable bond (or bonds) in such form and sum and signed by such other Surety or Sureties as may be acceptable to the Owner. The Contractor shall pay the premiums on such bonds with no additional expense to the Owner. No further payments shall be deemed due nor will be made until the new Surety or Sureties shall have furnished such as acceptable bond to the Owner.

1.18 SEPARATE CONTRACTS

A. The Owner reserves the right to let other contracts in connection with the construction of the contemplated work of this project or contiguous projects of the Owner. The Contractor, therefore, will afford any such other contractors reasonable opportunity for the introductions and storage of their materials and the execution of their work, will properly connect and coordinate his work with theirs, and will not commit or permit any act which will interfere with the performance of their work.

B. Coordinate operations with those of other contractors. Cooperation will be required in the arrangement for the storage of materials and in the detailed execution of the work.

C. It is essential that all parties interested in the project cooperate to the end that the entire project will be brought to a successful conclusion as rapidly as possible, but the Owner cannot guarantee that no interference or delay will be caused thereby. Interference and delay resulting form such cooperation shall not be basis of claims against the Owner.

1.19 PAYROLLS OF CONTRACTOR AND SUBCONTRACTORS

A. The Contractor and each of his Subcontractors shall prepare his payrolls on forms prescribed and in accordance with instructions to be furnished by the Owner. Within seven (7) days after the regular payment date of the payroll, the Contractor shall deliver to the Owner, with copies to the Engineer, a certified legible copy or copies of each such payroll. Each such payroll shall contain the statement required by the Federal Regulations issued pursuant to the "Anti-Kickback Statute", (48 Stat. 948; 18 U.S.C. 874; 40 U.S.C. 276C).

B. Carrying any person on his payrolls not employed by him will not be permitted. Carrying employees of a subcontractor on his payrolls will not be permitted, but such employees must be carried on the payrolls of the employing subcontractor.

C. Each Contractor or Subcontractor shall preserve his weekly payroll records for a period of three (3) years form the date of completion of the Contract. The payroll records shall set out accurately and completely the name, occupational classification, and hourly wage rate of each employee, hours worked by him during the payroll period and full weekly wages earned by him, and deductions made from such weekly wages and the actual weekly waged paid to him. Such payroll records shall be made available at all times for inspection by the Owner or his authorized representatives, the Engineer or by agents of the United States Department of Labor.

1.20 PAYMENTS BY CONTRACTOR

A. Pay for all traffic control, safety, transportation and utility services not later than the 20th day of the calendar month following that in which services are rendered. Reimbursable costs for services rendered, as specified in the Contract Documents, shall not be incorporated into partial payment estimates until such time that the Contractor submits to the Engineer actual paid invoices from those in which services were rendered.

1.21 "DIG SAFE" LAW

A. Comply with the Rhode Island General Law, Chapter 39-1.2, "Excavation Near Underground Utility Facilities" which became effective on July 1, 1984.

B. Before commencing with the construction of any work, identify any water main, gas main, telephone duct, electric duct, and/or other utility present which is or could be in conflict with the proposed work.

C. Relocation of the affected utilities shall be done as directed by the Owner and in accordance with the requirements of the utility company.

D. The attention of the Contractor is directed to the fact that certain utility companies may not fall under the provisions of "DIG SAFE". Individual utility company notifications by the Contractor shall be necessary to insure proper notification and protection of all existing utilities affected by this Contract.

1.22 FIRE PREVENTION AND PROTECTION

A. State and municipal rules and regulations with respect to fire prevention, fire-resistant construction and fire protection shall be strictly adhered to and all work and facilities necessary therefore shall be provided and maintained by the Contractor in an approved manner.

B. Provide fire protection equipment such as water tanks, hoses, pumps, extinguishers, and other materials, and apparatus, for the protection of the contract work, and adjacent property. Trained personnel experiences in the operation of all fire protection equipment and apparatus shall be available on the site whenever work is in progress, and at such other times as may be necessary for the safety of the public and the work.

1.23 DUST CONTROL

A. Exercise every precaution and means to prevent and control dust arising out of all construction operations from becoming a nuisance to abutting property owners or surrounding neighborhoods. Pavements adjoining pipe trench shall be kept clean of excess materials wherever and whenever directed by the Engineer. Repeated daily dust control treatment shall be provided to satisfactorily prevent the spread of dust until permanent pavement repairs are made and until earth stockpiles have been removed, and all construction operations that might cause dust have been completed. No extra payment will be made for dust control measures, compensation shall be considered to be included in the prices stipulated for the appropriate items as listed in the Bid.

1.24 DISPOSAL OF DEBRIS

A. The materials from the demolition, and those used in the construction of the Work throughout the project, shall be deposited in such a manner so as to not endanger persons or the Work, and so that free access may be had at any time to all hydrants, gates and existing equipment in the vicinity of the work. The materials shall be kept trimmed-up so as to be of as little inconvenience as possible to the public travel and plant operations. All excavated materials not approved for backfill and fill, all surplus material, and all rock and boulders resulting from the excavations, shall be removed and satisfactorily disposed of off the site by the Contractor, at no additional expense to the Owner.

B. The materials being removed from the pipelines and manholes during the cleaning process shall be deposited in such a manner as to not endanger the public, plant personnel or persons performing the work. Such debris deposits may be of such nature,

high in biological organic contents, or chemically aggressive that they will require proper disposal in a safe, health risk free, environment. Contact the Owner and Engineer and all agencies having jurisdiction thereof, for approval of debris disposal methods and locations of disposal, prior to disposing of any or all debris removed form pipe cleaning methods. All debris shall be removed and satisfactorily disposed of off the work site, at no additional expense to the Owner.

1.25 NIGHT, SATURDAY, SUNDAY AND HOLIDAY WORK

A. No work shall be done at night or on Saturdays, or Sundays or holidays without the prior written approval of the Owner and Engineer.

1.26 LENGTH OF WORK DAY

A. The Owner retains the right to restrict the Contractor to an eight-hour workday. Such restrictions shall not be the basis for damages or claims against the Owner.

B. The Contractor's attentions is also directed to the fact that should it be deemed necessary to perform various items of work during off-peak flow or traffic hours, early morning or late night hours, then he shall notify the Engineer a minimum of 24 hours in advance as to his intentions and reasons for the change in work hours. The Contractor shall be responsible for properly contacting and informing all involved parties of such a change in work hours. The Contractor shall not be entitled to any additional compensation from the Owner for any expenses that may be incurred by change of working hours and/or scheduling.

1.27 HURRICANE PROTECTION

A. Should hurricane warnings be issued, the Contractor shall take every practicable precaution to minimize danger to persons, to the work and to adjacent property. These precautions shall include closing all openings; removing all loose materials, tools and/or equipment from exposed locations; and removing or securing scaffolding and other temporary work.

1.28 REDUCTION IN SCOPE OF WORK

A. The Owner reserves the right to decrease the scope of the work to be done under this Contract and to omit any work should the Owner deem it to be in the public interest to do so. To this end, the Owner reserves the right to reduce the quantity of any items or omit all of any as set forth in the BID, either prior to executing the contract or at any time during the progress of the work. The Owner further reserves the right, at anytime during the progress of the work, to restore all or part of any items previously omitted or reduced. Exercise by the Owner of the above rights shall not constitute any ground or basis of claim for damages or for anticipated profits on the work omitted.

END OF SECTION

SECTION 00800

SUPPLEMENTARY CONDITIONS

1.01 GENERAL

A. These Supplementary Conditions are requirements which amend or supplement the General Conditions specified elsewhere.

B. The duties and obligations imposed by these Supplementary Conditions will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right and remedy to which they apply.

C. Assertion of any claim for any additional compensation or damages on account of and/or the fulfillment of these Supplementary Conditions will not be allowed.

1.02 LIMITS OF NORMAL EXCAVATION

A. In determining the quantities of excavation to which unit prices shall apply, the limits of normal width and depth of excavation shall be as described below, unless other limits are indicated in the Contract Documents.

1. For pipes in trenches, less than or equal to a depth of 10.0-feet, the normal width of the trench shall be measured between vertical planes which are a distance apart equal to the sum of 48 inches plus the nominal inside diameter of the pipe.

2. For pipes in trenches, between a depth greater than 10.0-feet and a depth of 20.0-feet, the normal width of the trench shall be measured between vertical planes which are a distance apart equal to the sum of 60-inches plus the nominal inside diameter of the pipe.

3. If the width so computed is less than 5.0-feet for trenches up to 10.0 feet deep than a width of 5.0 feet shall be the normal width. If the width so computed is less than 6.0-feet for trenches greater than 10.0-feet up to 20.0-feet than a width of 6.0-feet shall be the normal width.

4. The normal depth shall be measured to a distance of 0.5 feet below the bottom of the pipe in earth and 0.5 feet in rock, unless there be a cradle underneath the pipe, in which case the normal depth shall be measured to the underside of the cradle. The trench width for the cradle shall be assumed to be that specified above for pipes in the trench.

B. Quantities for payment shall be in accordance with the above limits or the actual widths, **whichever is less.**

C. For concrete placed directly against undisturbed earth, the normal width and depth of the excavation for such concrete shall be measured to the neat lines of the concrete as indicated on the Drawings or as ordered.

D. For concrete placed against rock surfaces resulting from rock excavation, the normal width and depth of the excavation shall be measured to 4 inches outside the neat lines of the concrete as indicated on the Drawings or as ordered.

E. For other structures, except manholes as noted below, the normal width shall be measured between vertical planes 1.0 feet outside the neat lines of the several parts of the structure, except that the width at any elevation shall be measured as not less than the width at a lower elevation. The normal depth shall be measured to the underside of that part of the structure for which the excavation is made.

F. No additional width or depth of trenches excavated in earth or rock shall be allowed at standard circular manholes. The pay limit for rock

removed outside proposed manholes shall commence one foot (1.0) outside the widest dimension of the structure or shall be the maximum connecting trench width, whichever is greater.

G. Wherever bell holes are required for jointing pipe, they shall be provided without additional compensation over and above that resulting from measurements as above described.

1.03 BOLTS, ANCHOR BOLTS AND NUTS

A. Furnish bolts, anchor bolts, nuts, washers, plates and bolt sleeves required by equipment to be installed under this Contract in accordance herewith. Anchor bolts shall have suitable washers and, where so required, their nuts shall be hexagonal.

B. Anchor bolts, nuts, washers, plates, and bolt sleeves shall be galvanized unless otherwise indicated or specified.

C. Expansion bolts shall have malleable iron and lead composition elements of the required number of units and size.

D. Unless otherwise specified, stud, tap, and machine bolts, and nuts shall conform to the requirements of ASTM Standard Specification for Carbon Steel Externally and Internally Threaded Standard Fasteners, Designation A307. Hexagonal nuts of the same quality of metal as the bolts shall be used. All threads shall be clean cut and shall conform to ANSI Standard B1.1-1974 for Unified Inch Screw Threads (UN and UNR Thread Form).

E. Bolts, anchor bolts, nuts and washers, specified to be galvanized, shall be zinc coated, after being threaded, by the hot-dip process in conformity with the ASTM Standard Specification for Zinc (Hot-Galvanized) Coatings on Products Fabricated from Rolled, Pressed and Forged Steel Shapes, Plates, Bars and Strip, Designation A123, or the ASTM Standard Specifications for Zinc Coating (Hot Dip) on Iron and Steel Hardware, Designation A153, as is appropriate.

F. Bolts, anchor bolts, nuts, and washers specified to be stainless steel shall be Type 316 stainless steel unless otherwise indicated or specified.

G. Anchor bolts and expansion bolts shall be set accurately. If anchor bolts are set before the concrete has been placed, they shall be carefully held in suitable templates of acceptable design. Where indicated on the Drawings, specified, or required, anchor bolts shall be provided with square plates at least 4 inches by 4 inches by 3/8 inches or shall have square heads and washers and be set in the concrete forms with suitable pipe sleeves, or both. If anchor or expansion bolts are set after the concrete has been placed, all necessary drilling and grouting or caulking shall be done by the Contractor and care shall be take not to damage the structure or finish by cracking, chipping, spalling, or otherwise during the drilling and caulking.

1.04 CONCRETE INSERTS

A. Concrete inserts for hangers shall be designed to support safely, in the concrete that is used, the maximum load that can be imposed by the hangers used in the inserts. Inserts for hangers shall be of a type which will permit adjustment of the hangers both horizontally (in one plane) and vertically and locking of the hanger head or nut. All inserts shall be galvanized.

1.05 SLEEVES

A. Unless otherwise indicated on the Drawings or specified, openings for the passage of pipes through floors and walls shall be formed of sleeves of standard-weight, galvanized steel pipe. The sleeves shall be of ample diameter to pass the pipe and its insulation, if any, and to permit such expansion as may occur. Sleeves shall be of sufficient length to be flush at the walls and the bottom of slabs and to project 1 inch above the finished floor surface. Threaded nipples shall not be used as sleeves.

B. Sleeves in exterior walls below ground or in walls to have liquids on one or both sides shall have a 2 inch annular fin of 1/8 inch plate welded with a continuous weld completely around the sleeve at about mid-length. Sleeves shall be galvanized after the fins are attached.

C. All sleeves shall be set accurately before the concrete is placed or shall be built in accurately as the masonry is being built.

1.06 CUTTING AND PATCHING

A. The Contractor shall leave all chases or openings for the installation of his own or any other contractor's or subcontractor's work, or shall cut the same in existing work, and shall see that all sleeves or forms are at the Work and properly set in ample time to prevent delays. He shall see that all such chases, openings, and sleeves are located accurately and are of proper size and shape and shall consult with the Engineer and the contractors and subcontractors concerned in reference to this work.

B. In case of his failure to leave or cut all such openings or have all such sleeves provided and set in proper time, he shall cut them or set them afterwards at his own expense, but in so doing he shall confine the cutting to the smallest extent possible consistent with the work to be done. In no case shall piers or structural members be cut without the written consent of the Engineer.

C. The Contractor shall carefully fit around, close up, repair, patch, and point around the work specified herein to the satisfaction of the Engineer.

D. All of this work shall be done by careful workmen competent to do such work and with the proper small hand tools. Power tools shall not be used except where, in the opinion of the Engineer, the type of tool proposed can be used without damage to any work or structures and without inconvenience or interference with the operation of any facilities. The Engineer's concurrence with the type of tools shall not in any way relieve or diminish the responsibility of the Contractor for such damage, inconvenience, or interference resulting from the use of such tools.

E. The Contractor shall not cut or alter the work of any subcontractors or any other contractor, nor permit any of his subcontractors to cut or alter the work of any other contractor, or subcontractor, except with the written consent of the contractor or subcontractor whose work is to be cut or altered or with the written consent of the Engineer. All cutting and patching or repairing made necessary by the negligence, carelessness, or incompetence of the Contractor or any of his subcontractors shall be done by or at the expense of the Contractor and shall be the full responsibility of the Contractor.

1.07 FOUNDATIONS, INSTALLATION AND GROUTING

A. Furnish materials and construct suitable concrete foundation for all equipment installed under this Contract, even though such foundations may not be indicated on the Drawings. The tops of foundations shall be at such elevations as will permit grouting as specified below.

B. Equipment shall be installed by skilled mechanics and in accordance with the instruction of the manufacturer.

C. In setting pumps, motors, and other items of equipment customarily grouted, make an allowance of at least 1-in. for grout under the equipment bases. Shims used to level and adjust the bases shall be steel. Shims may be left embedded in the grout, in which case they shall be installed neatly and so as to be as inconspicuous as possible in the completed work. Unless otherwise permitted, all grout shall be a suitable nonshrink grout.

D. Grout shall be mixed and placed in accordance with the recommendations of the manufacturer. Where practicable, the grout shall be placed through the grout holes in the base and worked outward and under the edges of the base and across the rough top of the concrete foundation to a peripheral form so constructed as to provide a suitable chamber around the top edge of the finished foundation.

E. Where such procedure is impracticable, the method of placing grout shall be as permitted by the Engineer. After the grout has hardened sufficiently, all forms, hoppers, and excess grout shall be removed, and all exposed grout surfaces shall be patched in an approved manner, if necessary, given a burlap-rubbed finish, and painted with at least two coats of an acceptable paint.

1.08 SERVICES OF MANUFACTURER'S REPRESENTATIVE

A. Arrange for the services of qualified factory service representatives from the companies manufacturing or supplying equipment and/or materials to be used or installed in the work as specified, to perform the following duties.

B. After installation of the listed equipment has been completed and the equipment is presumably ready for operation, but before others operate it, the representative shall inspect, operate, test, and adjust the equipment. The inspection shall include but shall not be limited to, the following points as applicable:

1. Soundness (without cracked or otherwise damaged parts).

2. Completeness in all details, as specified.

3. Correctness of setting, alignment, and relative arrangement of various parts.

4. Adequacy and correctness of packing, sealing and lubricants.

C. The operation, testing, and adjustment shall be as required to prove that the equipment is left in proper condition for satisfactory operation under the conditions specified.

D. On completion of his work, the manufacturer's or supplier's representative shall submit in triplicate to the Engineer a complete signed report of the result

of his inspection, operation, adjustments, and tests. The report shall include detailed descriptions of the points inspected, tests and adjustments made, quantitative results obtained if such are specified, and suggestions for precautions to be taken to ensure proper maintenance. The report also shall include a certificate that specifically states "the equipment conforms to the requirements of the Contract and is ready for permanent operation and that nothing in the installation will render the manufacturer's warranty null and void".

E. After the Engineer has reviewed the reports from the manufacturer's representatives, the Contractor shall make all arrangements to have the manufacturer's representatives present when the field acceptance tests are made by the Engineer without additional cost to the Owner.

1.09 OPERATING INSTRUCTIONS AND PARTS LISTS

A. Where reference is made in the Technical Specifications to operating instructions and spare parts lists, furnish, for each piece of equipment, six complete sets giving the information listed below:

1. Clear and concise instructions for the operation, adjustment, and lubrication and other maintenance of the equipment. These instructions shall include a complete lubrication chart.

2. List of all parts for the equipment, with catalog numbers and other data necessary for ordering replacement parts.

B. Such instructions and parts lists shall be annotated to indicate only the specific equipment furnished. References to other sizes and types or models of similar equipment shall be deleted or neatly lined out.

C. Such operating instructions and parts lists shall be delivered to the Engineer at the same time that the equipment to which they pertain is delivered to the site.

1.10 LUBRICANTS

A. During testing and prior to acceptance, furnish all lubricants necessary for the proper lubrication of all equipment furnished under this Contract.

1.11 SPECIAL TOOLS

A. For each type of equipment furnished provide a complete set of all special tools (including grease guns or other lubricating devices) which may be necessary for the adjustment, operation, maintenance, and disassembly of such equipment. Tools shall be high-grade, smooth, forged, alloy, tool steel. Grease guns shall be lever type.

B. Special tools are considered to be those tools which because of their limited use are not normally available, but which are necessary for the particular equipment.

C. Special tools shall be delivered at the same time as the equipment to which they pertain. Properly store and safeguard such special tools until completion of the work, at which time they shall be formally transmitted and delivered to the Owner.

1.12 EQUIPMENT DRIVE GUARDS

A. All equipment driven by open shafts, belts, chains, or gears shall be provided with acceptable all-metal guards enclosing the drive mechanism. Guards shall be constructed of galvanized sheet steel or galvanized woven wire or expanded metal set in a frame of galvanized steel members. Guards shall be secured in position by steel braces or straps that will permit easy removal for servicing the equipment. The guards shall conform in all respects to all applicable safety codes and regulations.

1.13 PROTECTION AGAINST ELECTROLYSIS

A. Where dissimilar metals are used in conjunction with each other, suitable insulation shall be provided between adjoining surfaces so as to eliminate direct contact and any resultant electrolysis. The insulation shall be bituminous impregnated felt, heavy bituminous coatings, nonmetallic separators or washers, or by other acceptable materials.

1.14 COVERING EXCAVATED TRENCH

A. In addition to the requirements in Section 00700 titled Interference with and Protection of Streets. Cover all open excavations when construction operations are suspended at the end of the day, or in excavated trenches where work is not actually in progress. Cover shall be capable of withstanding AASHTO H20-S16 loading. This cover shall consist of steel plates or some other satisfactory cover of adequate size and strength suitably held in place to keep all traffic out of excavations, all as verified in writing by the Contractor. The cover shall be laid over the excavation until it is backfilled.

1.15 MAINTAINING TRENCH EXCAVATIONS

A. The length of trench opened at any time, from point where ground is being broken to completed backfill, and also the amount of space in streets or public and private lands occupied by equipment, trench, and supplies, shall not exceed the length of space considered reasonably necessary and expedient by the Engineer. In determining the length of open trench or spaces for equipment, materials, supplies and other necessities, the Engineer will consider: the nature of the lands or streets where work is being done; types and methods of construction and equipment being used; inconvenience to the public or to private parties; possible dangers; and other proper matters. All work must be constructed with a minimum inconvenience and danger to the public and all other parties concerned.

B. Whenever any trench obstructs pedestrian and vehicular traffic in or to any public street, private driveway or property entrance, or on private property, take such means as may be necessary to maintain pedestrian and vehicular traffic and access. Until such time as the work may have attained sufficient strength to support backfill, or if for any other reason it is not expedient to backfill the trench immediately, construct and maintain suitable plank crossing and bridges to carry essential traffic in or to the street, driveway or property in question, as specified or directed.

C. Suitable signs, lights, and such items required by Police Authorities to direct traffic, shall be furnished and maintained by the Contractor at his own expense.

D. Keep streets and premises free from unnecessary obstructions, debris and all other materials. The Engineer may, at any time, order all equipment, materials, surplus from excavations, debris and all other materials lying outside that length of working space, promptly removed. Should the Contractor fail to remove such material within 24 hours after notice to remove the same, the Owner may cause any part or all of such materials to be removed by such persons as he may employ, at the Contractor's expense; and may deduct the costs thereof from payments which may be or may become, due to the Contractor under the Contract. In special cases, where public safety urgently demands it, the Owner may cause such materials to be removed at the Contractor's expense without prior notice.

1.16 DISRUPTION OF STORM DRAINS

A. Portions of the Work may be located in areas that are serviced by storm drains. Take extreme precaution to minimize disruption of the drains, and repair and/or make restitution for repairs by others for all disruptions caused by the construction operations.

1.17 PRECAUTION AGAINST HYDRAULIC UPLIFT DURING CONSTRUCTION

A. Protect all structures against hydraulic uplift until such structures have beneficially completed.

1.18 BLASTING AND PRE-CONSTRUCTION BLASTING SURVEY

A. Blasting will not be permitted.

1.19 NAMEPLATES

A. With the exceptions mentioned below, each piece of equipment shall be provided with a substantial nameplate of noncorrodible metal, securely fastened in place and clearly and permanently inscribed with the manufacturer's name, model or type designation, serial number, principal rated capacities, electrical or other power characteristics, and similar information as appropriate. Coordinate nameplate text requirements with Engineer prior to fabrication. Nameplates shall be securely mounted in a readily visible location approved by the Engineer. Equipment Specification sections may contain additional information regarding nameplates.

B. This requirement shall not apply to standard manually operated hydrants or to gate, globe, check, and plug valves.

C. Each process valve shall be provided with a substantial tag of noncorrodible metal securely fastened in place and inscribed with an identification number in conformance with the Valve Identification Schedule indicated on the drawings or furnished later by the Engineer.

1.20 SPECIAL SAFETY PRECAUTIONS

A. Contractor to note that the project involves working near bodies of water. Use appropriate equipment and provide adequate safety equipment.

B. Contractor to note that the project involves working within a right-of-way and the presence of overhead utility lines. Use appropriate equipment and provide adequate safety equipment.

C. Contractor shall take all necessary safety precautions in completing the work including coordinating with and complying with emergency procedures and requirements of the Owner, Police Department, Fire Department, and the Rhode Island Department of Environmental Management. The Contractor shall comply with all applicable federal, state and local laws, ordinances, rules and regulations and lawful orders of all authorities having jurisdiction for the safety of persons and protection of property. The Contractor shall have all necessary safety apparatus on-site and workers shall be instructed in its use.

1.21 LAND, EASEMENTS, AND RIGHTS-OF-WAY

A. As indicated, a portion of the work may be located within easements and/or rights-of-way, obtained or which will be obtained by the Owner, through private property. On all other lands, the Contractor has no rights unless he obtains them from the proper parties as specified in Section 00700, Occupying Private Land.

B. Prior to issuance of the Notice to Proceed, the Owner shall obtain all land, easements 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.

C. The Owner shall provide to the Contractor information which delineates and describes the lands owned and rights-of-way acquired.

D. 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.

E. If however, lands, easements or rights-of-way cannot be obtained before work on the project begins, the Contractor shall begin his work upon such land, easements or rights-of-way as have been previously acquired by the Owner, and no claims for damages whatsoever will be allowed by reason of its inability to procure the lands, easements, or rights-of-way for the said work, the Contractor shall not be entitled to make or assert a claim for damages by reason of the said delay, or to withdraw from the Contract except by consent of the Owner. Time for completion of work will be extended to such time as the Owner determines will compensate for the time lost by such delay, such determination to set forth in writing.

1.22 CLEANING FINISHED WORK

A. After the work is completed, the pipes, manholes and structures shall be carefully cleaned free of debris and dirt, broken masonry, and mortar, and left in first class condition, ready to use. All temporary or excess materials shall be disposed of off-site and the work left broom clean, to the satisfaction of the Engineer.

END OF SECTION

DIVISION 1

SECTION 01010

SUMMARY OF WORK

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Work covered by the Contract, listing of Owner, Project location, Engineer. Sequence requirements, the Contractor's use of the premises and Owner's occupancy requirements.

1.02 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work includes, but is not necessarily limited to:

- Removal of existing pavement
- Installation of permanent bituminous base and surface course
- Removal of and replacement of subgrade material with gravel borrow base course material
- Removal and resetting of existing granite curb
- Removal and resetting of existing brick pavers
- Installation of new granite curb as required
- Structure adjustments as required
- Installation of new drainage pipe including tide gate
- Re-building of drainage structures as required
- Driveway reconstruction as required
- Installation of permeable pavers and associated subgrade materials/underdrain and cleanouts
- Installation of bioretention basin media
- Installation of retaining wall
- Installation of cement concrete sidewalk and wheel chair ramps
- Installation of river stone pavers
- Installation of signage
- Installation of planting materials
- Installation of pavement markings
- Installation of catch basin, manholes, and associated frames and grates/covers
- Installation of erosion controls
- Safety controls and signing for construction operations;
- All other incidental items included in the Contract Documents; and

B. All work done under this contract shall be in conformance with the Rhode Island Department of Transportation Standard Specifications for Road and Bridge

Construction, latest addition, with all revisions and the State and Federal Special Provisions included in the Contract Documents. Standard details for this project are Rhode Island Standard Details, latest edition, with all revisions or the Town of North Kingstown Standard Details. All traffic control devices and signage to be in accordance with the U.S. Department of Transportation Federal Highway Administration Manual on Uniform Traffic Control Devices (MUTCD), latest edition at time of Bid.

C. References within the Standard Specifications to RIDOT, the Department, or the Engineer shall, for the purposes of this Contract, be construed to mean the Town of North Kingstown or its designated representative.

1.03 OWNER

A. Town of North Kingstown, Rhode Island
100 Fairway Drive
North Kingstown, Rhode Island 02852
Telephone: 401-294-3331
Contact: Aly Sparks

1.04 PROJECT LOCATION

A. Wickford Waterfront in North Kingstown, Rhode Island.

1.05 ENGINEER

A. BETA Group, Inc.
701 George Washington Highway
Lincoln, Rhode Island 02865
Telephone: 401-333-2382
Fax: 401-333-9225
Contact: Nicole Iannuzzi, P.E.

1.06 WORK SEQUENCE

A. In order that Work may be conducted with minimum inconvenience to the public and, work under this Contract may be coordinated with other work which may be under construction or contemplated, and that work under the Contract may conform to conditions which it has been undertaken or conditions attached to a right-of-way or particular location for this work, the Engineer may determine the point or points and time or times when portions of work will commence or be carried on and may issue orders pertaining to the work sequence, relative to the rate of progress on several portions of the work.

B. All trench work shall be covered at the end of the work day with either temporary bituminous patching or steel plates to ensure public safety.

1.07 CONTRACTOR USE OF PREMISES

A. The Contractor's use of premises shall be within the limits shown on the Drawings and as defined in Section 00500 – Contract Agreement, for the performance of the Work.

B. The Contractor shall assume full responsibility for security of all materials and equipment on the site, including those of his subcontractor's.

C. If directed by the Owner, the Contractor shall move any stored items that interfere with operations of the Owner.

D. Obtain and pay for use of additional storage or work areas if needed to perform the Work.

1.08 OWNER OCCUPANCY REQUIREMENTS

A. Unless otherwise specifically approved, all roadways within the project area must remain in full service at all times throughout the duration of the project unless otherwise approved by the Town. Also, access to properties must be maintained.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

SECTION 01020

ALLOWANCES

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes

1. Contingencies and their respective value which have been established in the BID as an estimated lump sum to facilitate comparison of bids only.

B. Related Sections

1. Section 00300 - Bid Forms
2. Section 01025 - Measurement and Payment

1.02 ALLOWANCES

A. Bid Item No. 54 – Police Detail

1. Coordinate and schedule uniformed traffic Police detail prior to commencement of work on public ways.

B. Bid Item No 66 – Testing of Material and Methods

1. Provide services of an independent testing laboratory in accordance with Section 01410.

C. Non-Allowance Utility Modifications/Relocations

1. In the event that a utility company, department or entity responsible for a utility called for to be modified or relocated does not customarily perform said work on utilities under their jurisdiction, the Contractor shall perform all necessary modification or relocation work with his own forces and/or subcontractors suitably experienced in the work required, and shall be compensated for same through other items in the contract, as specified. There shall be no allowances set aside for such work.

2. The performance of modification/relocation utility work by the Contractor, and not a utility company, department or entity responsible for said utility, shall not relieve the Contractor of the responsibility to adhere at all times to the applicable requirements of the utility company, department or entity with jurisdiction over the utility in question.

1.03 PAYMENT PROCEDURES

A. Under these items, the Contractor shall be reimbursed for charges for the allowances required and authorized by the Owner and Engineer, as detailed in Section 01025 - Measurement and Payment.

B. The lump-sum price for allowances is established in Section 00300 - Bid Forms as an estimated figure to facilitate comparison of bids only. The actual amount to be paid under this item shall constitute full compensation for services rendered.

C. The lump-sum price for this item shall NOT include any costs associated with services rendered for routine utility markings, repair damages incurred as a result of the Contractor's operations, relocations of utilities done at the Contractor's request and/or convenience, or any other unauthorized services rendered by utility companies. The purpose of this item is strictly for the Contractor's reimbursement for those services authorized by the Owner or Engineer prior to the work being performed.

D. The Contractor will be paid based on the actual PAID invoiced amount from the authority in question as approved by the Engineer. If the total cost for such charges is greater or less than the allowance amount stated under this item of the BID, a debit or credit of the difference in cost shall be to the Owner.

E. The Contractor shall not be entitled to apply any mark-up (e.g. for handling, profit, or processing) to invoices submitted by service providers for payment under an allowance.

PART 2 PRODUCTS

2.01 MATERIALS

A. Materials as required and ordered by the Engineer shall conform to the Contract Documents.

PART 3 EXECUTION

3.01 INSTALLATION

A. Installation, relocation, or repair of utilities, shall be performed in accordance with the Contract Documents.

END OF SECTION

SECTION 01025

MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes
   1. Measurement and payment criteria applicable to the Work performed under a unit price and/or lump sum payment method of Items listed in the BID.

B. RELATED SECTIONS
   1. Section 00300 - Bid
   2. Section 00500 - Agreement
   3. Section 01020 - Allowances
   4. Section 01026 - Schedule of Values

1.02 UNIT QUANTITIES SPECIFIED

A. Quantities and measurements indicated in SECTION 00300 are for bidding and contract purposes only. Quantities and measurements supplied or placed in the Work and verified by the Engineer shall determine payment.

B. If the actual Work requires more or fewer quantities than those quantities indicated, provide the required quantities at the unit price contracted.

1.03 MEASUREMENTS OF QUANTITIES

A. Measurement by Volume: Measured by cubic dimension using mean length, width and height or thickness.

B. Measurement by Area: Measured by square dimension using mean length and width or radius.

C. Linear Measurement: Measured by linear dimension, along the horizontal projection of the centerline or mean chord.

D. At appropriate points in this text, specifications are given with respect to measuring or estimating certain quantities and the sums due for the same. Except as otherwise provided, the Engineer shall determine the appropriate method for measuring and computing each quantity, and for estimating the sums due for the various kinds of work and material, using such methods, tools and degrees of precision as are suitable for the particular measurement, Item or computation. When so requested by the Engineer, assistance in measuring or determining quantities, shall be provided by the Contractor, by furnishing copies of invoices, or by other means.

E. For estimating quantities in which the computations of areas by analytic and geometric methods would be laborious, as determined by the Engineer, it is stipulated and agreed that the planimeter shall be considered an instrument of precision adapted to the measurement of such areas and may be used for this purpose.

1.04 UNIT PRICES

A. Payment will be computed on the basis of the unit price bid in SECTION 00300 for each Item and the quantity of units completed. Unit prices are to include cost of all necessary materials, labor, equipment, overhead, profit and other applicable costs. (See Par. 1.06, this Section.)

1.05 LUMP SUM PRICES

A. Payment will be computed on the basis of the percentage of work completed on each Item in the contract BID as determined by the Engineer. Lump sum prices are to include the cost of all necessary materials, labor, equipment, overhead, profit and other applicable costs. (See Par. 1.06, this Section.)

B. The Contractor's breakdown (submit under SECTION 01026) of the lump sum bid will be used only as a guide to determine the percentage of completion.

1.06 PRICES INCLUDE

A. The prices stated in the Proposal include full compensation not only for furnishing all the labor, equipment and material needed for, and for performing the work, but also for assuming all risks of any kind for expenses arising by reason of the nature of the soil, ground water, or the action of the elements; for all excavation and backfilling; for the removal of and delay or damage occasioned by trees, stumps, pipes, ducts, timber, masonry or other obstacles; for removing, protecting, repairing, or restoring, without cost to the Owner, all pipes, ducts, drains, sewers, culverts, conduits, curbs, gutters, walks, fences, tracks, or other obstacles, road pavements and other ground surfacing whether shown on plans or not for draining, damming, pumping or otherwise handling and removing, without damage to the work or to other parties, and without needless nuisance, all water or sewage from whatever source which might affect the work or its progress, or be encountered in excavations made for the work; for all signs, fencing, lighting, watching, guarding, temporary surfacing, bridging, snow removal, etc., necessary to maintain and protect travel on streets, walks and private ways; for making all provisions necessary to maintain and protect buildings, fences, poles, trees, structures, pipes, ducts and other public or private property affected or endangered by the work; for the repair or replacement of such things if injured by neglect of such provisions for removing all surplus or rejected materials as may be directed; for replacing, repairing and maintaining the surfaces of streets, highways, public and private lands if and where disturbed by work performed under the Contract or by negligence in the performance of work under the Contract; for furnishing the requisite filling materials in case of any deficiency or lack of suitable materials; for obtaining all permits and licenses and complying with the requirements thereof, including the cost of furnishing any security needed in connection therewith;

for protection against inclement or cold weather; for all expensbies incurred by or on account of the suspension; interruption or discontinuance of work; for the cost of the surety bond and adequate insurance; for all taxes, fees, union dues, etc., for which the Contractor may be or become liable, arising out of his operations incidental to the Contract; for providing equipment on the site and off site; for providing a field office and its appurtenances and for all general and incidental expenses; for tools, implements and equipment required to build and put into good working order all work contemplated by the Contract; for maintaining and guaranteeing the same as provided; and for fulfilling all obligations assumed by the Contractor under the Contract and its related documents.

B. The Owner shall pay and the Contractor shall receive the prices stipulated in the BID made a part hereof as full compensation for everything performed and for all risks and obligations undertaken by the Contractor under and as required by the Contract.

1.07 PAYMENT

A. In general, payment will be made for all Contract work satisfactorily completed and accepted through the end of the previous month. The payment will include any additional work which has been completed and approved and change order work agreed upon by the Owner and Contractor which has been completed and approved (See SECTION 00500).

B. Each application for payment, up to the date of substantial completion as determined by the Engineer, will indicate the total value of a minimum five percent (5%) retainage to be held by the Owner, based on the total value of all work completed under the contract and approved for payment to-date. The rate of retainage subsequent to the established date of substantial completion may, at the Owner's approval, be reduced from five percent (5%) to two percent (2%), and a portion of the monies held as retainage at the five percent (5%) rate may be requested by and released to the Contractor as part of his application for payment in an amount which results in a balance of two percent (2%) retainage being held by the Owner.

C. Retainage in the amount of two percent (2%) of the value of all work completed under the contract shall be retained by the Owner for a warranty period of not less than one (1) year from the date of project completion as determined by the Engineer (not to be construed as substantial completion), at or after which time the Contractor may request the release of final retainage in full, provided that all work has been satisfactorily completed and adequately performed during the warranty period. The Owner shall be the sole judge of whether work has been satisfactorily completed and has adequately performed.

D. Monthly applications for payment shall also indicate the reduction or increase to the total Contract price when an approved change order results in a net reduction or net increase in the cost and quantity of work to be performed under the Contract.

E. Special billings and charges against the Contract as credit or payment to the Owner, that are not for change order work, may be subtracted from monies due on any

monthly application for payment, but shall not serve to reduce the total Contract price.

F. Final payment for Work governed by unit prices will be made on the basis of the actual measurements and quantities accepted by the Engineer multiplied by the unit price for work which is incorporated in or made necessary by the Work.

1.08 BID ITEM METHOD OF MEASUREMENT AND BASIS OF PAYMENT

BID ITEM NO. 1 REMOVE AND DISPOSE CURB
BID ITEM NO. 2 REMOVE AND RESET CURB
BID ITEM NO. 3 REMOVE AND STACK CURB

A. METHOD OF MEASUREMENT

1. The quantity of curb to be paid for will be the length actually removed and reset, removed and stacked, removed and disposed in its entirety to the limits as indicated on the plan, or as directed by the engineer and measured as follows:
   a. The length of curb shall be as measured along the centerline of all curb.
   b. The quantity of curb removed and discarded and removed and stacked will be the length ordered to be removed and actually removed from site, but not included for payment under the items of Removed and Reset.

B. BASIS OF PAYMENT

1. The unit price for curb Removed and Reset, Removed and Disposed and Removed and Stacked shall constitute full compensation for excavation, sawcutting pavement, cutting of curb, backfill, compaction, fine grading, all bedding, concrete, formwork, removal and replacement of gravel borrow and all other work incidental to removing and resetting existing curbing, removing and disposing curb, removing and stacking curb and not specifically included for payment under other Items. No additional compensation will be made for transporting curb to another area of the project to be reset.
2. The unit price for curb removed and stacked shall constitute full compensation for transportation to North Kingstown DPW Yard. (2050 Davisville Road, North Kingstown, RI 02852)
3. Remove and Dispose Curb will be paid for at the contract unit price per linear foot of curb removed and disposed at a legal offsite location.

BID ITEM NO. 4 REMOVE AND DISPOSE SIDEWALKS

A. METHOD OF MEASUREMENT

1. The quantity of remove and dispose sidewalks to be paid for under this item shall be measured per square yard, based on the actual area of existing sidewalk removed and disposed, as indicated on the Drawings or as otherwise directed by the Engineer.

B. BASIS OF PAYMENT

1. The unit price for this item shall include full compensation for all labor, equipment, materials and incidentals needed to complete the following:

   a. Sawcutting, excavation, removal and legally disposing of the existing sidewalk;
   b. Furnishing and installing backfill gravel borrow material including compaction as specified and any fine grading required;

c. Resetting or replacement of all signposts and resetting of existing curb boxes and castings in sidewalk area;
d. Any and all other work, whether direct or incidental, associated with removing and disposing sidewalks not specifically identified herein.

BID ITEM NO. 5 REMOVE AND DISPOSE PAVEMENT

A. METHOD OF MEASUREMENT

1. The quantity of pavement to be removed and disposed under this item shall be measured per square yard, based on the actual area of existing pavement removed and disposed, as indicated on the Drawings or as otherwise directed by the Engineer.

B. BASIS OF PAYMENT

1. The unit price for this item shall include full compensation for all labor, equipment, materials and incidentals needed to complete the following:

a. Excavation, removal and legally disposing of the existing pavement; including any sawcutting of the existing pavements including any existing bituminous concrete and concrete base or reinforced concrete base, and masonry;
b. Calcium chloride and water for roadway dust control;
c. Protection of existing curb and saw cutting at curb line if necessary;
d. Resetting or replacement of all signposts and resetting of existing curb boxes and castings in pavement area
e. Any and all other work, whether direct or incidental, associated with removing and disposing flexible pavement not specifically identified herein.

BID ITEM NO. 6 REMOVE AND DISPOSE CATCH BASINS
BID ITEM NO. 7 REMOVE AND DISPOSE MANHOLE

A. METHOD OF MEASUREMENT

1. The quantity of remove and dispose catch basins and remove and dispose manholes to be paid for under these items shall be measured per each, based on the actual number of existing catch basins and manholes removed and disposed, as indicated on the Drawings or as otherwise directed by the Engineer.

B. BASIS OF PAYMENT

1. The unit price for this item shall include full compensation for all labor, equipment, materials and incidentals needed to complete the following:

a. Excavation, removal and legally disposing of the existing structures; including any sawcutting of the existing pavements and removal and disposal of all existing pavements, including any existing bituminous concrete and concrete base or reinforced concrete base, and masonry or concrete walls;

b. The work shall include any temporary excavation support, dewatering, furnishing and installing backfill material including compacting the material as specified;
c. Removing and legally disposing of any accumulated debris within the structure;
d. Removing and legally disposing of existing frames, grates and covers;
e. Protection and support of existing utilities, maintaining flows of all utilities, and repairing and/or replacing damaged or impacted existing utilities not specifically included for payment under other items;
f. Any and all other work, whether direct or incidental, associated with removing and disposing drain structures not specifically identified herein.

BID ITEM NO. 8 REMOVE AND DISPOSE PIPE – ALL SIZES

A. METHOD OF MEASUREMENT

1. The quantity of remove and dispose existing pipe to be paid for under this item shall be measured by the linear foot taken along the centerline of the removed and disposed pipe.

B. BASIS OF PAYMENT

1. The unit price for this item shall include full compensation for all labor, equipment, materials and incidentals needed to complete the following:

a. Excavation, removal, and legally disposing of the existing drain pipe; including any sawcutting of the existing pavements and removal and disposal of all existing pavements, including any existing bituminous concrete, concrete base or reinforced concrete base (if encountered), masonry or concrete walls;
b. The work shall include any temporary excavation support, dewatering, furnishing and installing gravel backfill material including compacting the material as specified;
c. Removing and legally disposing of any accumulated debris or sediment within the pipe;
d. Furnishing and installing gravel borrow to backfill the excavated pipe;
e. Plugging connecting drainage structures or pipe called out to remain;
f. Any and all other work, whether direct or incidental, associated with the removal and disposal of the existing drain pipe not specifically identified herein.

BID ITEM NO. 9 ABANDON-IN-PLACE GRAVITY DRAIN PIPE

A. METHOD OF MEASUREMENT

1. The quantity of gravity drain abandonment to be paid for under this item shall be measured by the linear foot along the horizontal projection of the centerline of the abandoned drain, excluding the length of manholes and catch basins, measured to the limits of the manhole inside diameter or the catch basin inside face of wall.

B. BASIS OF PAYMENT

1. The unit price for this item shall include full compensation for all labor, equipment, materials and incidentals needed to complete the following:

    a. Abandoning-in-place existing pipes by plugging pipe ends and filling the pipeline with controlled density fill, complete-in-place.
    b. Any and all other work, whether direct or incidental, associated with the abandonment of the gravity drains not specifically identified herein.

BID ITEM NO. 10 UNCLASSIFIED EXCAVATION

A. METHOD OF MEASUREMENT

1. The quantity of unclassified excavation to be paid for under this item shall be measured per cubic yard, based on the total number of cubic yards of materials excavated and either re-used in the Work or disposed of at an off-site location which are not incidental to the performance of other work items.

B. BASIS OF PAYMENT

1. The unit price for this item shall include full compensation for all labor, equipment, materials and incidentals needed to complete the following:

    a. Excavation of all materials (except rock), including but not limited to silt, loam, sand, organic matter, gravel or other soils, temporary pavements, berms, curbs, tree roots, and any other materials;
    b. Stockpiling and re-handling excavated materials for reuse on other portions of this project, or removing and legally disposing of excavated materials at an off-site location (the Contractor shall locate and secure an acceptable disposal site for all excess materials);
    c. No separate payment will be made for sawcutting;
    d. Any and all other work, whether direct or incidental, associated with excavation of unclassified materials not specifically identified herein.

BID ITEM NO. 11 ROCK EXCAVATION

A. METHOD OF MEASUREMENT

1. The quantity of rock excavation to be paid for under this item shall be measured per cubic yard, based on the total number of cubic yards of rock removed, measured in place before excavation, within the payment limits indicated on the Drawings and as defined in the Specifications, unless rock excavation beyond such limits has been authorized in writing by the Engineer, in which case, measurements shall be made to the authorized limits.

B. BASIS OF PAYMENT

1. The unit price for this item shall include full compensation for all labor, equipment, materials and incidentals needed to complete the following:

   a. Removal and proper disposal of boulders in excess of 1 C.Y. in volume (measurement and volume determination to be made by Engineer);
   b. Breaking or fracturing of solid contiguous rock by mechanical means (rock hammer, jackhammer); blasting of rock shall not be allowed under any circumstances;
   c. Excavation of all broken rock to the authorized limits as determined by the Engineer;
   d. Replacement of excavated rock with sand, gravel borrow or crushed stone as specified and detailed on the Drawings, at the direction of the Engineer;
   e. Proper disposal of excavated rock at an off-site location;
   f. Any and all other work, whether direct or incidental, associated with the excavation and disposal of rock not specifically identified herein.

2. Where rock is encountered, it shall be uncovered but not excavated until measurements have been made by the Engineer, unless in the opinion of the Engineer, satisfactory measurements can be made in some other manner.

3. Excavated rock which has not yet been disposed of shall not be included for payment.

4. For bid items which include incidental earth excavation, the bidder shall include in his unit prices the cost of performing the entire excavation as earth. The unit price for this item is intended to represent the difference between the cost of rock excavation & disposal and the cost of earth excavation which would have taken place as part of the other bid items. The unit price for this item shall be paid in addition to the incidental earth excavation costs included in the other items; no adjustment to the unit prices for other items which include earth excavation shall be made in the event that rock is encountered and excavated in lieu of earth.

BID ITEM NO. 12 STRUCTURAL EXCAVATION EARTH

A. METHOD OF MEASUREMENT

1. General: Structural Excavation Earth will be measured by the cubic yards of material removed. The volume will be computed by taking the difference in elevation between the existing ground surface and the surface of the completed structure excavation at plan grade between the designated horizontal pay lines described below.

   When bedrock, boulders, or masonry are encountered, notify the Engineer and expose the items so that the necessary measurements can be taken for structure excavation. If this notice is not provided or if any material is removed before measurements are taken, the Engineer will presume that measurements taken when the Engineer first observes the material in question will provide the true quantity of excavation.

2. Pay Lines: Horizontal payment limits will be measured between plumb lines and 2 ft outside of the neat lines of the original foundations only as shown on the Plans. However, should the size of the footing be increased by more than 2 ft in any direction, the area of the footing that extends beyond the original payment lines will be used for determining the additional amount of excavation. No allowance for rock overbreak will be made beyond the above limits or more than 6 in. below the bottom of footing.

B. BASIS OF PAYMENT

1. Payment will be for the completed and accepted quantities at the Contract unit price per cubic yard. The price constitute full compensation for all labor, materials, and equipment, including removal within the prescribed limits, disposal of surplus material, stockpiling, hauling, and all incidentals required to finish the work, complete and accepted.

BID ITEM NO. 13 STRUCTURAL EXCAVATION MASONRY

A. METHOD OF MEASUREMENT

1. General: Structure Excavation Masonry will be measured by the cubic yards of material removed. The volume will be computed by taking the difference in elevation between the top and bottom of the existing stone masonry retaining wall between the designated horizontal pay lines described below.

2. Pay Lines: Horizontal payment limits will be measured between front and rear face of the original stone masonry retaining wall only as shown on the Plans. However, should the size of the wall be increased by more than 2 ft in any direction, the area of the wall that extends beyond the original payment lines will be used for determining the additional amount of excavation. No allowance for rock overbreak will be made beyond the above limits or more than 6 in. below the bottom of footing.

B. BASIS OF PAYMENT

1. Payment will be for the completed and accepted quantities at the Contract unit price per cubic yard. The prices constitute full compensation for all labor, materials, and equipment, including removal within the prescribed limits, disposal of surplus material, stockpiling, hauling, and all incidentals required to finish the work, complete and accepted.

BID ITEM NO. 14 CRUSHED STONE FILL UNDER STRUCTURES

A. METHOD OF MEASUREMENT

1. Crushed stone fill under structures will be measured by the cubic yards placed.

B. BASIS OF PAYMENT

1. Payment will be for the completed and accepted quantities at the Contract unit price per cubic yard. The prices constitute full compensation for all labor, materials, and equipment, backfilling and disposal of surplus material, stockpiling, hauling, placing, compaction, preparation of the subgrade, and all incidentals required to finish the work, complete and accepted.

BID ITEM NO. 15 PERVIOUS STRUCTURE BACKFILL

A. METHOD OF MEASUREMENT

1. Pervious fill will be measured by the cubic yards placed.

B. BASIS OF PAYMENT

1. Payment will be for the completed and accepted quantities at the Contract unit price per cubic yard. The prices constitute full compensation for all labor, materials, and equipment, backfilling and disposal of surplus material, stockpiling, hauling, placing, compaction, preparation of the subgrade, and all incidentals required to finish the work, complete and accepted.

BID ITEM NO. 16 TEMPORARY COFFERDAMS AND CONTROL OF WATER

A. METHOD OF MEASUREMENT

1. Temporary Cofferdams and Control of Water shall be paid for on a lump sum basis as accepted by The Engineer.

B. BASIS OF PAYMENT

1. The unit price for this item shall constitute full and complete compensation for all labor, equipment, materials, settlement tanks, hay bales, sedimentation (silt) fence, temporary diversion measures, pumps, removal, storage, transportation, and disposal of water, etc., required to control water and dewater a portion of the Wickford Harbor (as shown on plans) to complete the work.

BID ITEM NO. 17 POLYPROPYLENE TRIAXIAL GEOGRID BASE REINFORCEMENT

A. METHOD OF MEASUREMENT

1. The quantity of geogrid base reinforcement shall be measured by the number of square yards of geogrid base reinforcement installed, complete-in-place, in accordance with the Plans and/or as directed by the Engineer.

B. BASIS OF PAYMENT

1. The unit price for this item shall include full compensation for all labor, equipment, materials and incidentals needed to complete the following:
   a. Preparing underlying subgrade material for installation;
   b. Trimming and fine grading the subgrade;
   c. Furnishing and installing the geogrid base reinforcement;
   d. Adjusting, cutting, and altering the reinforcement around existing or proposed obstacles;
   e. Any and all other work, whether direct or incidental, associated with the furnishing and installing geogrid base reinforcement not specifically identified herein.

BID ITEM NO. 18 CONTROLLED DENSITY FILL

A. METHOD OF MEASUREMENT

1. The quantity of controlled density fill to be paid for under this item shall be measured per cubic yard, based on the total number of cubic yards of controlled density fill installed, complete-in-place, as directed by the Engineer.

B. BASIS OF PAYMENT

1. The unit price for this item shall include full compensation for all labor, equipment, materials and incidentals needed to complete the following:

   a. Furnishing and placing controlled density fill, as directed by the Engineer and as specified;
   b. Procedures, materials and equipment to protect the control density fill until set-up;
   c. Any and all other work, whether direct or incidental, associated with furnishing and placing controlled density fill not specifically identified herein.

BID ITEM NO. 19 SITE PREPARATION

A. METHOD OF MEASUREMENT

1. This item shall be paid for at the contract unit price bid per lump sum.

B. BASIS OF PAYMENT

1. The unit price for this item shall include full compensation for all labor, equipment, materials and incidentals needed to complete the following:

   a. Furnishing, placing, relocating, maintaining, removing and disposing of erosion control measures, including but not limited to catch basin inserts, compost filter socks, staked hay bale/silt fence erosion barriers, sediment control traps,

construction entrances, and dewatering basins throughout the duration of the Work, as indicated on the Drawings or as otherwise directed by the Engineer;

b. Excavation as needed to establish perimeter controls and sediment barriers: silt sock will be installed around the perimeter of the site, except at construction entrances;
c. Removal and replacement of any damaged erosion control measures at no additional cost;
d. Removal and legal disposal of all accumulated sediment;
e. After completion of the drainage work, removal of compost filter socks including grading, raking, and seeding as necessary to match the surrounding area;
f. Furnishing, placing, relocating, maintaining, removing and disposing of any temporary gravel or crushed stone access roads/construction entrances or ways created within the project limits;
g. All labor, materials and equipment needed to protect trees and shrubs during construction as indicated on the Drawings or as otherwise directed by the Engineer. The unit price shall also include costs to remove and dispose of tree and shrub protection once construction is complete;
h. The contractor shall install tree and shrub protection (RI STD. 51.1.0 and 51.2.0) on all trees and shrubs in close proximity to the work.
i. RI STD 9.9.0 construction access will be installed as directed by the engineer.
j. Removal of trees and stumps; furnishing and installing backfill material including compacting the material as specified;
k. Legally disposing of trees and stumps;
l. Any and all other work, whether direct or incidental, associated with site preparation not specifically identified herein.

BID ITEM NO. 20 TIDE GATE

A. METHOD OF MEASUREMENT

1. The quantity of tide gates to be paid for under this item shall be measured per each, based on the actual number of tide gates furnished and installed, complete-in-place, as indicated on the Drawings or as otherwise directed by the Engineer.

B. BASIS OF PAYMENT

1. The unit price for this item shall include full compensation for all labor, equipment, materials and incidentals needed to complete the following:

    a. Furnishing and installing, complete-in-place, tide gates, including procuring the tide gate, cleaning and flushing the pipe prior to installation, dewatering, installing the tide gates, including all fittings, cuffs, clamps, and all other work and materials required to complete the work as indicated on the Drawings and as specified;
    b. Any and all other work, whether direct or incidental, associated with the construction of the tide gates not specifically identified herein.

BID ITEM NO. 21 PERMEABLE PAVERS

A. METHOD OF MEASUREMENT

1. The quantity of permeable pavers to be paid for under this item shall be measured by the number of square yards of permeable pavers installed, along with subgrade materials, complete-in-place, in accordance with the Plans and/or as directed by the Engineer.

B. BASIS OF PAYMENT

1. The unit price for this item shall include full compensation for all labor, equipment, materials and incidentals needed to complete the following:

   a. Trimming and fine grading the sub base;
   b. Excavation support and dewatering;
   c. Furnishing and installing non woven impermeable filter fabric;
   d. Furnishing and placing keystone reservoir course to the depths and grades shown on the plans;
   e. Furnishing and placing pea stone filter blanket material to the depths and grades shown on the plans;
   f. Furnishing and placing filter course material to the depths and grades shown on the plans;
   g. Furnishing and placing choker course crushed stone to the depths and grades shown on the plans;
   h. Furnishing and placing open graded, crushed angular chipstone to the depths and grades shown on the plans;
   i. Furnishing and installing concrete pavers;
   j. Sawcutting, removal and disposal of any temporary pavement, grading of the subgrade, special compaction requirements, matching existing pavement, and casting and valve box adjustments;
   k. Furnishing and installing the underdrain within the reservoir layer, including all excavation, furnishing and installing tees, cleanouts and other adapters or couplings required to install the system complete-in-place, as specified and indicated on the Drawings;
   l. Any and all other work, whether direct or incidental, associated with the furnishing and installing of permeable pavers not specifically identified herein.

BID ITEM NO. 22 BMP 1 – BIORETENTION BASIN
BID ITEM NO. 23 BMP 2 – BIORETENTION BASIN

A. METHOD OF MEASUREMENT

1. The quantity of bioretention basin construction to be paid for under these items shall be paid for on a lump sum basis.

B. BASIS OF PAYMENT

1. The unit price for this item shall include full compensation for all labor, equipment, materials and incidentals needed to complete the following:

   a. Excavation of all materials within bioretention basin and sediment forebay limits to the grades required by the plans;
   b. Stockpiling and rehandling of excavated materials for use on other portions of the project;
   c. Removing and legally disposing of all excess material at a legal off-site location;
   d. Furnishing and installing the underdrain, complete-in-place, including all excavation, disposal of material, crushed stone for pipe bedding material, gravel borrow backfill, compacting materials as specified, and all incidental work not specifically included for payment under other items;
   e. Furnishing and installing tees, cleanouts and other adapters or couplings required to install the system complete-in-place, as specified and indicated on the Drawings;
   f. Furnishing and installation of stormwater pretreatment inlet device, complete-in-place, including excavation, bedding, compaction, and gravel backfill as directed by the Engineer. Includes all other work incidental to furnishing and installing new stormwater pretreatment inlet devices;
   g. Excavation support and dewatering;
   h. Furnishing and installing riprap pads and filter fabric according to the specifications and details;
   i. Furnishing and installing biodegradable jute mesh and temporary seeding;
   j. Furnishing and installing bioretention media to the depths and grades shown on the plans;
   k. Furnishing and installing gravel borrow fill material, as required;
   l. Furnishing and installing non-woven impermeable filter fabric;
   m. Furnishing and installing loam, seed, mulch and plantings as shown on the plans;
   n. Full depth saw cutting, removal and disposal of asphalt;
   o. Trimming and fine grading to the lines and grades called for on the plans;
   p. Other work, whether direct or incidental, associated with the furnishing and installation of the infiltration basin and forebay not specifically identified herein.

BID ITEM NO. 24 REMOVE AND RESET BRICK PAVERS

A. METHOD OF MEASUREMENT

1. The quantity of remove and reset brick pavers to be paid for under this item shall be measured per square yard, based on the actual area of existing brick pavers removed and reset, as indicated on the Drawings or as otherwise directed by the Engineer.

B. BASIS OF PAYMENT

1. The unit price for this item shall include full compensation for all labor, equipment, materials and incidentals needed to complete the following:

a. Excavation, removal and legally disposing of the unsuitable bricks; including any sawcutting of the existing pavements and removal and disposal of all existing pavements, including any existing bituminous concrete and concrete base or reinforced concrete base, and unsuitable setting bed;
b. Furnishing and installing gravel borrow base course;
c. Furnishing and installing replacement stonedust setting bed;
d. Compacting setting bed and gravel borrow;
e. Trimming and fine grading the setting bed and gravel borrow;
f. Resetting existing brick pavers;
g. Resetting or replacement of all signposts and resetting of curb boxes and castings;
h. Any and all other work, whether direct or incidental, associated with removing and resetting brick pavers not specifically identified herein.

BID ITEM NO. 25 INSTALL BRICK PAVERS

A. METHOD OF MEASUREMENT

1. The quantity of install brick pavers to be paid for under this item shall be measured per square yard, based on the actual area of new brick pavers installed, as indicated on the Drawings or as otherwise directed by the Engineer.

B. BASIS OF PAYMENT

1. The unit price for this item shall include full compensation for all labor, equipment, materials and incidentals needed to complete the following:

a. Excavation, removal and legally disposing of the unsuitable material, including existing soil, any sawcutting of the existing pavements and removal and disposal, pavements, including any existing bituminous concrete and concrete base or and reinforced concrete base;
b. Furnishing and installing new gravel base, new setting bed, and new brick pavers to match existing;
c. Compacting subbase, new gravel base and setting bed;
d. Trimming and fine grading the gravel base and setting bed;
e. Resetting or replacement of all signposts and resetting of curb boxes and castings;
f. Any and all other work, whether direct or incidental, associated with installing new brick pavers not specifically identified herein.

BID ITEM NO. 26 REMOVE AND REPLACE BRICK PAVER CROSSWALK

A. METHOD OF MEASUREMENT

1. The quantity of remove and replace brick pavers crosswalk to be paid for under this item shall be measured per square yard, based on the actual area of existing brick

paver crosswalks removed and the area of new brick paver crosswalks installed, as indicated on the Drawings or as otherwise directed by the Engineer.

B. BASIS OF PAYMENT

1. The unit price for this item shall include full compensation for all labor, equipment, materials, and incidentals needed to complete the following:

a. Excavation, removal and legally disposing of existing brick paver crosswalks, including any sawcutting of the existing pavement and removal of all existing pavement, including any existing bituminous concrete and concrete base or reinforced concrete base, and the unsuitable material;
b. Furnishing and installing new gravel base, new granite curb, new concrete curb lock, new reinforced concrete base, new sand setting bed, new filter fabric, new filter stone, and new brick pavers to match existing;
c. Compacting subbase, new gravel base and setting bed;
d. Trimming and fine grading the gravel base and setting bed;
e. Coring or forming 4" diameter drain holes;
f. Any and all other work, whether direct or incidental, associated with installing new brick pavers not specifically identified herein.

BID ITEM NO. 27 BOLLARD AND ROPE – ALL TYPES

A. METHOD OF MEASUREMENT

1. The quantity of install bollard and rope – all types to be paid for under this item shall be measured per each, based on the actual number of bollards – all types installed, as indicated on the Drawings or as otherwise directed by the Engineer.

B. BASIS OF PAYMENT

1. The unit price for this item shall include full compensation for all labor, equipment, materials and incidentals needed to complete the following:

a. Excavation, removal and legally disposing of the unsuitable material, including existing soil, or any existing bituminous concrete and concrete base or and reinforced concrete base;
b. Furnishing and installing new gravel base, bollards – all types, rope, fiberglass caps and fasteners;
c. Timber railing post and nautical rope installed on the top of masonry wall shall be paid for under Item No. 53 – Masonry Retaining Wall.
d. Any and all other work, whether direct or incidental, associated with bollard and rope – all types not specifically identified herein.

BID ITEM NO. 28 INSTALL BEACHSTONE PAVERS

A. METHOD OF MEASUREMENT

1. The quantity of install beachstone pavers to be paid for under this item shall be measured per square yard, based on the actual area of new beachstone pavers installed, as indicated on the Drawings or as otherwise directed by the Engineer.

B. BASIS OF PAYMENT

1. The unit price for this item shall include full compensation for all labor, equipment, materials and incidentals needed to complete the following:

    a. Excavation, removal and legally disposing of the unsuitable material, including existing soil, existing pavements and removal and disposal, pavements, including any existing bituminous concrete and concrete base or and reinforced concrete base;
    b. Furnishing and installing new gravel base, new mortar setting bed, new concrete base and new beachstone pavers;
    c. Compacting subbase and new gravel base;
    d. Trimming and fine grading the sub base and new gravel base;
    e. Resetting or replacement of all signposts and resetting of curb boxes and castings;
    f. Any and all other work, whether direct or incidental, associated with installing new beachstone pavers not specifically identified herein.

BID ITEM NO. 29 GRAVEL BORROW

A. METHOD OF MEASUREMENT

1. The quantity of gravel borrow to be paid for under this item shall be measured per cubic yard, based on the total number of cubic yards of gravel borrow installed, complete-in-place, as directed by the Engineer.

B. BASIS OF PAYMENT

1. The unit price for this item shall include full compensation for all labor, equipment, materials and incidentals needed to complete the following:

    a. Furnishing, placing, fine grading and compacting gravel borrow to the relative density required for the specific location or application for which it is being used.
    b. Any and all other work, whether direct or incidental, associated with furnishing and placing gravel borrow not specifically identified herein.

2. Gravel borrow outside the limits of normal excavation shall be furnished, placed, and compacted at the Contractor's expense, and no payment under this item will be made for such gravel.

3. Gravel borrow used to backfill rock excavations will not be measured for payment under this Item but shall be included in the unit price for "Rock Excavation".

4. Gravel borrow included in other items will not be paid for under this item.

BID ITEM NO. 30 CLASS 19.0 HMA
BID ITEM NO. 31 CLASS 9.5 HMA

A. METHOD OF MEASUREMENT

1. The quantity of hot mix asphalt pavement course to be paid for under this item shall be equal to the actual amount of pavement, furnished and installed to the depths indicated, measured by the ton of hot mix asphalt pavement actually installed, as indicated on the Drawings or as directed by the Engineer. The quantity shall be determined only by weight slips that have been properly countersigned by the Engineer at the time of delivery.

B. BASIS OF PAYMENT

1. The quantity of hot mix asphalt pavement to be paid for under this item shall be equal to the actual amount of pavement, furnished and installed to the depths indicated, measured by the ton of hot mix asphalt pavement actually installed, as indicated on the Drawings or as directed by the Engineer.

2. The unit price for hot mix asphalt shall constitute full compensation for furnishing and installing the bituminous base course and bituminous surface course.

3. The unit price shall include sawcutting, thoroughly sweeping all surfaces to be paved, fine grading and compaction of the gravel base course; special compaction requirements; matching existing pavement; casting and valve box adjustments; applying required prime coats and tack coats; furnish, prepare and apply joint sealer, resetting or replacement of all signposts, furnishing and installing temporary pavement markings all types and sizes, hand work necessary for driveways; and constructing the pavement complete, as specified and as indicated on the Drawings and not specifically included for payment under other items.

4. The Contractor shall be responsible to ensure that at the end of final paving operations, flow to drainage structures has been re-established and that no isolated depressions remain. There shall be no separate payment for this provision; it shall be considered incidental to paving operations;

BID ITEM NO. 32 BITUMINOUS CONCRETE TEMPORARY PAVEMENT

A. METHOD OF MEASUREMENT

1. The quantity of Bituminous Concrete Temporary Pavement to be paid for under this item shall be equal to the actual amount of bituminous concrete, furnished and

installed to the depths indicated, and measured by the ton to the trench payment limits as indicated on the Drawings.

2. Temporary pavement installed beyond the specified payment limits shall not be measured for payment.

B. BASIS OF PAYMENT

1. The unit price for this item shall include full compensation for all labor, equipment, materials and incidentals needed to complete the following:

   a. Furnishing, placing and compacting temporary patching material to the relative density required for the specific location or application for which it is being used;
   b. Removal and disposal of any existing pavement, including berm, at an off-site location;
   c. Thoroughly sweeping of all surfaces to be paved; and constructing the pavement complete, as specified and as indicated and not specifically included for payment under other items;
   d. Compaction and trimming and fine grading will be paid for under this item.
   e. Any full-depth sawcutting of bituminous pavement required to complete the work shall be paid for under this item, no separate payment shall be made.
   f. Special compaction requirements; matching existing pavement; casting and valve box adjustments; applying required prime coats and tack coats; hand work necessary for driveways;
   a. There will be no separate payment for the work of removing the temporary bituminous concrete.
   g. Other work, whether direct or incidental, associated with furnishing and placing temporary patching material not specifically identified herein.

BID ITEM NO. 33 CONSTRUCT 12 INCH CLASS IV GRAVITY DRAIN PIPE
BID ITEM NO. 34 CONSTRUCT 15 INCH CLASS IV GRAVITY DRAIN PIPE

A. METHOD OF MEASUREMENT

1. The quantities of gravity drain pipes to be paid for under these items shall be measured by the linear foot along the horizontal projection of the centerline of the completed drain, excluding the length of manholes and catch basins, measured to the limits of the manhole inside diameter or the catch basin inside face of wall.

B. BASIS OF PAYMENT

1. The unit prices for these items shall include full compensation for all labor, equipment, materials and incidentals needed to complete the following:

   a. Furnishing and installing the gravity drains, complete-in-place, including all excavation, excavation support, disposal of material, furnishing and installing gravel borrow backfill, crushed stone for pipe bedding/backfill material,

compacting materials as specified, filter fabric and all incidental work not specifically included for payment under other items;

b. Excavation shall also include any sawcutting of the existing pavements and removal and disposal of all existing pavements, including any existing bituminous concrete, masonry or concrete walls or reinforced concrete base (if encountered);
c. Protection and support of existing utilities, maintaining flows of all utilities, and repairing and/or replacing damaged or impacted existing utilities not specifically included for payment under other items;
d. Implementing safety precautions, including designing and implementing excavation support;
e. Designing, furnishing, installing, operating, maintaining and removing temporary dewatering systems required to lower and control water levels and hydrostatic pressures during construction, as well as the appropriate disposal of pumped water;
f. Furnishing and installing tees, cleanouts and other adapters or couplings required to install the system complete-in-place, as specified and indicated on the Drawings;
g. Connecting new gravity drains to the new/existing gravity drain structures or system, including all excavation, modifications to existing structures (including but not limited to form work, coring, cutting, concrete work, masonry and bricks), modifying and/or removing existing pipe (all materials and sizes), and furnishing and installing adapters and couplings;
h. Any and all other work, whether direct or incidental, associated with the furnishing and installation of the gravity drains not specifically identified herein.

BID ITEM NO. 35 FRAME AND GRATE

A. METHOD OF MEASUREMENT

1. The quantity of Frame and Grate to be paid for under this item shall be measured per each, based on the actual number of frame and grates installed, complete-in-place, as indicated on the Drawings or as otherwise directed by the Engineer.

B. BASIS OF PAYMENT

1. The unit price shall include full and complete compensation for installing frames and grates as directed by the Engineer, including any required rebuilding and/or remodeling of the brick or cone of the drainage structure, at the locations shown on the Drawings or as otherwise directed by the Engineer, and all other materials, tools, equipment, labor and incidentals necessary to complete the work.

BID ITEM NO. 36 FRAME AND COVER

A. METHOD OF MEASUREMENT

1. The quantity of Frame and Cover to be paid for under this item shall be measured per each, based on the actual number of frame and covers installed, complete-in-place, as indicated on the Drawings or as otherwise directed by the Engineer.

B. BASIS OF PAYMENT

1. The unit price shall include full and complete compensation for installing frames and covers as directed by the Engineer, including any required rebuilding and/or remodeling of the brick or cone of the drainage structure, at the locations shown on the Drawings or as otherwise directed by the Engineer, and all other materials, tools, equipment, labor and incidentals necessary to complete the work.

BID ITEM NO. 37 PRECAST CATCH BASIN 4' DIAMETER STANDARD 4.4.0

A. METHOD OF MEASUREMENT

1. The quantity of precast catch basins to be paid for under this item shall be measured per each, based on the actual number of precast catch basins installed, complete-in-place, as indicated on the Drawings or as otherwise directed by the Engineer.

B. BASIS OF PAYMENT

1. The unit price for this item shall include full compensation for all labor, equipment, materials and incidentals needed to complete the following:

   a. Furnishing and installing, complete-in-place, precast concrete catch basins, including sawcutting, temporary excavation support, dewatering, excavation and disposal of material, furnishing and installing bedding materials, furnishing and installing base sections, flat slab tops, connecting proposed structures to existing pipes, backfill with gravel borrow, and all other work and materials required to complete the work as indicated on the Drawings and as specified;
   b. Any and all other work, whether direct or incidental, associated with the construction of the precast catch basins not specifically identified herein.

BID ITEM NO. 38 PRECAST MANHOLE 4' DIAMETER STANDARD 4.2.0
BID ITEM NO. 39 PRECAST MANHOLE 5' DIAMETER STANDARD 4.2.1
BID ITEM NO. 40 5' DOGHOUSE MANHOLE

A. METHOD OF MEASUREMENT

1. The quantity of drain manholes to be paid for under this item shall be measured per each, based on the actual number of drain manholes and doghouse manholes furnished and installed between zero and twelve (12) feet in depth, complete-in-place, as indicated on the Drawings or as otherwise directed by the Engineer.

B. BASIS OF PAYMENT

1. The unit price for this item shall include full compensation for all labor, equipment, materials and incidentals needed to complete the following:

a. Furnishing and installing, complete-in-place, precast concrete drain manholes and doghouse manholes, including sawcutting, temporary excavation support, dewatering, excavation and disposal of material, furnishing and installing crushed stone bedding material, construction of inverts, base sections, risers, cones or flat slab tops (as required), frames and covers, connecting proposed structures to existing drain pipes, backfill with gravel borrow, and all other work and materials required to complete the work as indicated on the Drawings and as specified;
b. Any and all other work, whether direct or incidental, associated with the construction of the drain manholes and doghouse manholes not specifically identified herein.

BID ITEM NO. 41 CLEANING AND FLUSHING PIPE ALL SIZES

A. METHOD OF MEASUREMENT

1. The quantity of cleaning and flushing pipe to be paid for under this item shall be measured by the linear foot along the horizontal projection of the centerline of the pipe, excluding the length of manholes and catch basins, measured to the limits of the manhole inside diameter or the catch basin inside face of wall.

B. BASIS OF PAYMENT

1. The unit prices for this item shall include full compensation for all labor, equipment, materials and incidentals needed to complete the following:

a. Cleaning and flushing gravity drains, complete-in-place, including furnishing erosion control, legal disposal of material, filter fabric and all incidental work not specifically included for payment under other items;
b. Protection and support of existing utilities, maintaining flows of all utilities, and repairing and/or replacing damaged or impacted existing utilities not specifically included for payment under other items;
c. Any and all other work, whether direct or incidental, associated with the cleaning and flushing of pipes not specifically identified herein.

BID ITEM NO. 42 CLEANING AND FLUSHING VERTICAL STRUCTURES

A. METHOD OF MEASUREMENT

1. The quantity of cleaning and flushing vertical structures to be paid for under this item shall be measured per each drainage structure cleaned as indicated on the Drawings or as otherwise directed by the Engineer.

B. BASIS OF PAYMENT

1. The unit prices for this item shall include full compensation for all labor, equipment, materials and incidentals needed to complete the following:

a. Cleaning and flushing vertical, complete-in-place, including furnishing erosion control, legal disposal of material, and all incidental work not specifically included for payment under other items;
b. Protection and support of existing utilities, maintaining flows of all utilities, and repairing and/or replacing damaged or impacted existing utilities not specifically included for payment under other items;
c. Any and all other work, whether direct or incidental, associated with the cleaning and flushing of pipes not specifically identified herein.

BID ITEM NO. 43 TREATED TIMBER PILES FURNISH AND DRIVE

A. METHOD OF MEASUREMENT

1. Piles Furnished:
   a. Piles furnished will be measured to the nearest linear foot of pile, calculated from the tip elevation to the specified cut-off elevation. Measurement for Preliminary Test Piles will be made for that length authorized by the Engineer in writing before delivery of piles based on the Plans and discussions with the Contractor and Construction Manager.
   b. The additional footage of production or preliminary piles furnished at the Contractor's option will not be included in the quantity measured for payment. Piles furnished by the Contractor to replace piles that were previously accepted by the Engineer, but subsequently damaged before completion of the Contract, will not be measured for payment.

2. Piles Driven:
   a. Pile driven will be measured to the nearest linear foot of pile, calculated from the tip elevation to the specified cut-off elevation.
   b. Pile cut-offs shall be considered incidental to this item and will not be measured separately for payment.

3. Test piles driven before the installation of production piles and used for pile load tests that pass the testing without damage and are accepted by the Engineer will be measured for payment by the linear foot as production pile.

4. Preconstruction and Post Construction Surveys shall be considered incifental to thei item and will not be measured for separate payment.

B. BASIS OF PAYMENT

1. Payment for completed and accepted quantities shall be per linear foot. The prices constitute full compensation for all labor, materials, tools, equipment, and all incidental items of work necessary to finish the work, complete and accepted.
2. Remove and replace any broken, improperly driven, or otherwise defective pile as directed by the Engineer at no additional cost. Where a loading test is abandoned because of reasons for which the Contractor is responsible, there will be no payment for the abandoned test.

3. Templates and support piles will remain the property of the Contractor, and no separate payment will be made for furnishing materials or labor to construct templates or for support piles.
4. There will be no payment for the initial pile or for any costs of attempting to remove the obstruction. Payment will be made for the alternative pile or piles (due to an unmovable obstruction) at the Contract unit prices. However, the Contractor shall have no claim for delay if this contingency should arise and no claim for moving his equipment to and from the pile location.
5. Pile dewatering, cleanout, and spoil/water containment and disposal will be considered included in the installation of the pile types. No separate measurement or payment will be made for this work.
6. Metal boots, drive points, drive shoes, and closure plates are incidental to the work and will not be paid for separately. No payment will be made for splicers or splicing made at the Contractor's initiative.
7. Preboring is incidental to the work and will not be paid for separately.

BID ITEM NO. 44 PILE LOAD TEST

A. METHOD OF MEASUREMENT

1. Pile load tests will be measured by the number of pile load tests performed.

B. BASIS OF PAYMENT

1. Payment for completed and accepted quantities shall be each. The prices constitute full compensation for all labor, materials, tools, equipment, and all incidental items of work necessary to finish the work, complete and accepted.
2. Anchor or tension piles installed at the Contractor's option for use in conducting pile load tests will not be paid for separately.

BID ITEM NO. 45 TEMPORARY EARTH RETAINING SYSTEM

A. METHOD OF MEASUREMENT

1. This Item will not be measured for payment. Temporary Earth Retaining System will be paid for at the contract Lump Sum price as listed in the Proposal and as accepted by The Engineer.

B. BASIS OF PAYMENT

2. The price so stated shall constitute full and complete compensation for all labor, equipment, and materials required to design, install and remove the approved earth retaining system to complete the work.

BID ITEM NO. 46 TEMPORARY CHAIN LINK FENCE

A. METHOD OF MEASUREMENT

1. The quantity of temporary chain link fence to be paid for under this item shall be measured by the linear foot taken along the centerline of the chain link fence.

B. BASIS OF PAYMENT

1. The unit price for this item shall include full compensation for all labor, equipment, materials and incidentals needed to complete the following:

    a. Furnishing and installing temporary chain link fence including posts and post holders, framework, hardware and appurtenances;
    b. Relocating the temporary chain link fence as necessary during the construction period as directed by the Engineer;
    c. Maintaining the temporary chain link fence;
    d. Replacement and/or restoration of fence damaged due to construction activities, accidents, vandalism, and/or damaged in any manner;
    e. Removing the temporary chain link fence at the conclusion of the construction period;
    f. Any and all other work, whether direct or incidental, associated with the installation and removal of temporary chain link fence not specifically identified herein.

BID ITEM NO. 47 TEMPORARY CHAIN LINK GATE

A. METHOD OF MEASUREMENT

1. The quantity of temporary chain link gate to be paid for under this item shall be measured per each.

B. BASIS OF PAYMENT

1. The unit price for this item shall include full compensation for all labor, equipment, materials and incidentals needed to complete the following:

    a. Furnishing and installing temporary chain link fence gate;
    b. Relocating the temporary chain link fence gate as necessary during the construction period as directed by the Engineer;
    c. Maintaining the temporary chain link gate;
    d. Replacement and/or restoration of gate damaged due to construction activities, accidents, vandalism, and/or damaged in any manner;
    e. Removing the temporary chain link fence gate at the conclusion of the construction period;
    f. Any and all other work, whether direct or incidental, associated with the installation and removal of temporary chain link fence gate not specifically identified herein.

BID ITEM NO. 48 PORTLAND CEMENT CONCRETE SIDEWALK MONOLITHIC STANDARD 43.1.0

A. METHOD OF MEASUREMENT

1. Cement Concrete Sidewalks will be measured in cubic yards.

B. BASIS OF PAYMENT

1. The quantity of concrete sidewalks to be paid for under this item shall be measured by the number of cubic yards of concrete actually placed in accordance with the Drawings and/or as directed by the Engineer.

2. The unit price shall constitute full and complete compensation for all labor, materials and equipment, including expansion joint material, reinforcement, and all other incidentals required to finish the work, complete and accepted by the Engineer.

3. The unit price shall include saw cutting, trimming and fine grading gravel sub base, formwork, placing concrete, finishing, properly curing and protecting the fresh concrete, resetting or replacement of all signposts and resetting of curb boxes and castings all as required to construct the Work and not specifically included for payment under other items.

4. Gravel will be paid for at the contract unit price per cubic yard under the Gravel Borrow Subbase item.

5. Excavation will be paid for at the contract unit price per cubic yard under the Unclassified Excavation item.

BID ITEM NO. 49 GRANITE CURB, QUARRY SPLIT STRAIGHT, STANDARD 7.3.0

BID ITEM NO. 50 GRANITE CURB, QUARRY SPLIT CIRCULAR, STANDARD 7.3.0

BID ITEM NO. 51 4" GRANITE CURB

A. METHOD OF MEASUREMENT

1. The length of curb shall be as measured per linear foot, along the front arris of the curb, except that where the curb is set on a curve having a radius of 10 feet or less, the measurement will be made along the curb at the lowest exposed level after completion of shoulder or pavement.

B. BASIS OF PAYMENT

1. Curb will be paid for at the contract unit price per linear foot under the item for the particular type of curb, complete in place. Curved granite curb shall include all curb (except curb corners), cut to specified radius and set on curve. The price of the

curbing will include compensation for all excavation, furnishing and installing the granite curb, trimming and fine grading, sawcutting, gravel borrow, cement concrete for the foundations as well as any and all other work required to furnish and install granite curb not specifically identified herein.

BID ITEM NO. 52 WHEELCHAIR RAMP

A. METHOD OF MEASUREMENT

1. Granite wheelchair ramp curb will be measured per each, based on the actual number of wheelchair ramps installed, complete in place.

B. BASIS OF PAYMENT

1. The unit price shall constitute full and complete compensation for all labor, materials and equipment, including expansion joint material, reinforcement, and all other incidentals required to finish the work, complete and accepted by the Engineer.

2. The unit price shall include saw cutting, trimming and fine grading gravel sub base, formwork, placing concrete, finishing, properly curing and protecting the fresh concrete, installation of ADA required detectable warning devices (RIDOT standard), furnishing and installing granite transition curb of varying lengths (with gravel borrow and cement concrete foundation as required) to construct an ADA accessible ramp, and resetting of curb boxes and castings all as required to construct the Work and not specifically included for payment under other items.

3. Gravel will be paid for at the contract unit price per cubic yard Item 23, Gravel Borrow.

4. Excavation will be paid for at the contract unit price per cubic yard under Item 8, Unclassified Excavation.

BID ITEM NO. 53 MASONRY RETAINING WALL

A. METHOD OF MEASUREMENT

1. Masonry Retaining shall be paid for on a lump sum basis as accepted by The Engineer.

B. BASIS OF PAYMENT

1. Cost of Masonry Retaining Wall be paid by Lump Sum. The work includes the complete cost of placing the approved concrete footing, steel reinforcing for concrete footing, stone masonry wall, granite coping, painted galvanized railing base, timber railing post, and nautical rope complete and accepted.

BID ITEM NO. 54 POLICE DETAIL

A. METHOD OF MEASUREMENT

1. Police Detail shall be paid for under an allowance based on the actual work performed.

B. BASIS OF PAYMENT

1. The allowance for this item shall include full compensation for all police details required to complete the work. Signed police detail slips must be submitted to the Engineer in order to receive compensation for said work.
2. If a police detail is scheduled and the contractor cancels the scheduled work and does not cancel the police detail, it will be the sole responsibility of the Contractor to pay the police detail fee for said day.

BID ITEM NO. 55 EXCAVATION AND BACKFILL FOR TEST PITS

A. METHOD OF MEASUREMENT

1. The quantity of excavation and backfill for test pits to be paid for under this Item shall be the number of cubic yards excavated, measured to the extent of the work done as ordered by the Engineer or as indicated on the Drawings for test pits.

B. BASIS OF PAYMENT

1. The unit price for this item shall include full compensation for all labor, equipment, materials and incidentals needed to complete the following:

    a. Excavation including any sawcutting of the existing pavements and removal and disposal of all existing pavements, including any existing bituminous concrete, concrete base or reinforced concrete base (if encountered);
    b. The work shall include any temporary excavation support, dewatering, furnishing and installing backfill material including compacting the material as specified,
    c. Installation of a minimum 3-inch temporary bituminous pavement patch over test pit area;
    d. Collection and recording of data and existing conditions discovered as a result of the test pit;
    e. Data to be collected shall be approved by the Engineer prior to the start of the work. The Contractor or its subcontractor shall submit all findings in a form acceptable by the Engineer;
    f. Volume of Test Pits which data has not yet been submitted shall not be included for payment;
    g. Any and all other work, whether direct or incidental, associated with excavation and backfill for test pits not specifically identified herein.

BID ITEM NO. 56 RIPRAP TYPE R-5

A. METHOD OF MEASUREMENT

1. Riprap will be measured by the number of tons as measured by the actual scale weight, in tons, of the material placed and accepted.

B. BASIS OF PAYMENT

1. Cost of Riprap will be paid for the completed and accepted quantity by TON. The work also includes the cost of placing stone bedding and filter fabric for riprap.

2. The price constitutes full for all labor, materials, and equipment, bedding, preparation of subgrade, filter fabric for riprap, bedding material, trimming and fine grading, hauling and placing the material, and all incidentals required to finish the work, complete and accepted.

3. Riprap placed outside the specified limits will not be paid for, and the Contractor will be required to remove and dispose of the excess riprap at no additional cost to the Project.

BID ITEM NO. 57 GEOTEXTILE BEHIND MASONRY WALL

A. METHOD OF MEASUREMENT

1. Geotextile Behind Masonry Wall shall be paid for on a lump sum basis as accepted by The Engineer.

B. BASIS OF PAYMENT

1. Cost of Filter Fabric will be paid by Lump Sum as installed behind new retaining wall.

2. The price constitutes full for all labor, materials, and equipment, hauling and placing filter fabric, and all incidentals required to finish the work, complete and accepted.

BID ITEM NO. 58 MOBILIZATION

A. METHOD OF MEASUREMENT

1. Mobilization shall be paid for on a lump sum basis.

2. The lump sum price for this item shall not exceed five percent (5%) of the total amount of the bid, excluding this item.

3. A maximum of fifty percent (50%) of the Mobilization & Demobilization lump sum shall be payable in the initial payment requisition. The balance of the lump sum shall

be payable upon completion of the project, after all temporary items and measures have been removed and suitably disposed of and final restoration has been completed.

B. BASIS OF PAYMENT

1. The lump sum price for this item shall include full compensation for all labor, equipment, materials and incidentals needed to complete the following:

   a. Initiating and administering the contract, including but not limited to furnishing performance and payment bonds and all other securities and insurances required, project meetings, securing of all necessary permits, etc., for providing all other materials, supplies, tools, equipment, labor, financing, supervision, temporary structures, and any and all other administrative expenses incurred in carrying out the work and furnishing the materials, keeping records and preparing required reports, and assuming risks, which have not been included in the prices in other items of the Bid Proposal;
   b. Submitting all required shop drawings;
   c. Costs, exclusive of the cost of materials, for mobilizing all machinery, plant, tools, and other equipment necessary to carry on and complete the work;
   d. Establishing and maintaining survey controls for the construction layout of the overall project by a qualified professional, using appropriate means and methods to insure the accuracy of the layout, as specified and/or as directed by the Engineer;
   e. Re-establishing all benchmarks, concrete bounds, iron pins, and all permanent property boundary markers;
   f. Coordinating and scheduling the use of uniformed traffic persons including tracking or verifying hours worked by traffic persons;
   g. Costs for all material testing and quality control testing required by the Contract Documents;
   h. Furnishing, installing and removal of tree protection and/or shrub protection as directed by the engineer.
   i. Furnishing and spreading calcium chloride and/or water in order to control (minimize) dust at the Work areas;
   j. Costs for demobilizing all machinery, plant, tools, and other equipment used to perform the work upon completion of the project;
   k. Costs for performing final cleanup of the project area, exclusive of specific restoration to be paid for under other items.

BID ITEM NO. 59 MAINTENANCE AND MOVEMENT TRAFFIC PROTECTION

A. METHOD OF MEASUREMENT

1. Traffic Protection shall be paid for on a lump sum basis.

2. A maximum of fifty percent (50%) of the traffic control lump sum shall be payable in the initial payment requisition. The balance of the lump sum shall be payable upon completion of the project, after all temporary items and measures have been removed and suitably disposed of and final restoration has been completed.

B. BASIS OF PAYMENT

1. The lump sum for this item shall include full compensation for all labor, equipment, materials and incidentals needed to complete the following:

   a. Fabricating, furnishing, erecting, maintaining, removing and relocating the traffic management devices for the overall project, complete-in-place, as directed by the Engineer;
   b. Providing additional traffic management devices to provide a clear and visible traffic control through the project area, if required;
   c. The Contractor shall be required to reposition the traffic control devices as many times as necessary to ensure the safe passage of vehicular traffic and pedestrians. Supplemental signs and traffic control devices directing traffic around and/or through the work zones shall be supplied as operations require or as directed by the Engineer. Payment for these traffic control measures shall be included as part of this item and no additional payment will be made.
   d. At a minimum, traffic control shall include the following:

Quantity	Description
4	Construction Zone Sign
2	Police Officer Ahead Sign
50	Reflectorized Drum

   These signs shall be modified as necessary to reflect the actual work and roadway conditions at all times. The Contractor shall be responsible for making the determination as to which signs are appropriate.
   e. Other work, whether direct or incidental, associated with the traffic control not specifically identified herein.

BID ITEM NO. 60 LOAM BORROW

A. METHOD OF MEASUREMENT

1. The quantity of loam borrow shall be measured by the number of square yards of loam borrow installed with a minimum depth of 6 inches, complete-in-place, in accordance with the Plans and/or as directed by the Engineer.

B. BASIS OF PAYMENT

1. The unit price for this item shall include full compensation for all labor, equipment, materials and incidentals needed to complete the following:

   a. Trimming and fine grading the sub base;
   b. Placing loam borrow;
   c. Resetting or replacement of all signposts and resetting of curb boxes and castings in loamed and seeded areas;
   d. Any and all other work, whether direct or incidental, associated with the furnishing and installing loam borrow not specifically identified herein.

BID ITEM NO. 61 LANDSCAPE AREA 1

A. METHOD OF MEASUREMENT

1. The quantity of landscape planting areas shall be measured per lump sum, complete-in-place, in accordance with the Plans and/or as directed by the Engineer.

B. BASIS OF PAYMENT

1. The unit price for this item shall include full compensation for all labor, equipment, materials and incidentals needed to furnish all plants, seed, mulch, soil amendments, all layout and installation of all landscape plantings, including all preparation, trimming, fine grading, fertilization, grass seeding operations, mulching and any and all work considered incidental and not specifically identified herein, complete and accepted in place.

BID ITEM NO. 62 RESIDENTIAL SEEDING (TYPE 2)

A. METHOD OF MEASUREMENT

1. The quantity of residential seeding shall be measured by the number of square yards, surface measurement, of the area in which seed has been installed, complete-in-place, in accordance with the Plans and/or as directed by the Engineer.

B. BASIS OF PAYMENT

1. The unit price for this item shall include full compensation for all labor, equipment, materials and incidentals needed to complete the following:

    a. Furnishing and placing seed, lime and fertilizer;
    b. Protecting and maintaining the loamed and seeded area until such time as an acceptable level of grass growth has been established;
    c. Resetting or replacement of all signposts and resetting of curb boxes and castings in loamed and seeded areas;
    d. Any and all other work, whether direct or incidental, associated with the restoration of vegetated areas not specifically identified herein.

BID ITEM NO. 63 JUTE MESH

A. METHOD OF MEASUREMENT

1. The quantity of jute mesh shall be measured by the number of square yards, surface measurement, of the area in which jute mesh has been installed, complete-in-place, in accordance with the Plans and/or as directed by the Engineer.

B. BASIS OF PAYMENT

1. The unit price for this item shall include full compensation for all labor, equipment, materials and incidentals needed to furnish and install staking, biodegradable jute mesh, and temporary seeding to stabilize slopes during construction.

BID ITEM NO. 64 4 INCH WHITE FINAL EPOXY RESIN PAVEMENT MARKINGS

A. METHOD OF MEASUREMENT

1. Markings are to be paid for on the actual linear feet of reflectorized, epoxy lines applied under the various items of the Contract. The lengths of solid lines will be obtained by:

    a. Calculation from established base line stations or
    b. Use of a measuring wheel or

B. BASIS OF PAYMENT

1. Permanent Pavement Markings will be paid for at the contract unit price per foot which shall include full compensation for furnishing all labor, materials and equipment required or incidental to satisfactorily complete the work. The cost of maintaining and protecting traffic during marking operations shall be included in the bid price. No payment will be made for the repair or replacement of defective pavement markings.

BID ITEM NO. 65 FINAL EPOXY RESIN PAVEMENT MARKING FINAL EPOXY PAMENT MARKINGS ARROWS, WORDS OR SYMBOLS

A. METHOD OF MEASUREMENT

1. Markings are to be paid under these item shall be measured per each.

B. BASIS OF PAYMENT

1. Permanent Pavement Markings will be paid for at the contract unit price per each which shall include full compensation for furnishing all labor, materials and equipment required or incidental to satisfactorily complete the work. The cost of maintaining and protecting traffic during marking operations shall be included in the bid price. No payment will be made for the repair or replacement of defective pavement markings.

BID ITEM NO. 66 TESTING OF MATERIALS AND METHODS

A. METHOD OF MEASUREMENT

1. Under this item, the Contractor shall be reimbursed for certain charges, authorized by the Engineer associated with testing of materials including but not limited to in-situ material, gravel borrow, concrete, and bituminous concrete.

2. The allowance price for this item established in the BID is an estimated figure to facilitate comparison of bids only. The actual amount to be paid under this item shall constitute full compensation for costs associated with the testing of materials as approved by the Owner/Engineer.

3. The purpose of this item is strictly for the Contractor's reimbursement for those services authorized by the Engineer.

4. The allowance price for this item shall NOT include any costs associated with services rendered for testing done at Contractor's request and/or convenience.

B. BASIS OF PAYMENT

1. The Contractor will be paid based on the actual PAID invoiced amount from the testing company in question, as approved by the Engineer. If the total cost for such charges is greater or less than the allowance amount stated under this item of the BID, a debit or credit of the difference in cost shall be to the Owner.

2. The allowance for this item shall include full compensation to complete the following:

   a. Cost for testing of materials including but not limited to in-situ material, gravel borrow, crushed stone, concrete, and bituminous concrete;
   b. Any and all other work, whether direct or incidental, associated with the testing of materials not specifically identified herein.

3. Invoices for work to provide testing shall be provided to the Contractor, who will include copy of the PAID invoice with his payment requisition.

BID ITEM NO. 67 PARKING WAYFINDING SIGNS

A. METHOD OF MEASUREMENT

1. The quantity of parking wayfinding signage to be paid for under this item shall be measured per lump sum, based on the actual number of parking wayfinding signage installed, as indicated on the Drawings or as otherwise directed by the Engineer.

B. BASIS OF PAYMENT

1. The unit price for this item shall include full compensation for all labor, equipment, materials and incidentals needed to complete the following:

    a. Furnishing and installing Parking Trail Blazers signs, complete in place, including excavation and disposal of material, furnishing and installing gravel borrow bedding, concrete foundations, erecting the supports, including construction of the concrete bases, steel reinforcement and anchor bolts, furnishing and installing post assembly, furnishing and installing the signage and all other work and materials required to complete the work as indicated on the Drawings and as specified.;
    b. Furnishing and installing Destination ID Signs, complete-in-place, including excavation and disposal of material, furnishing and installing gravel borrow bedding, concrete foundations, granite posts, name plate lettering, backfill with gravel borrow and all other work and materials required to complete the work as indicated on the Drawings and as specified;
    c. Restoration of any disturbed area to existing conditions;
    d. Any and all other work, whether direct or incidental, associated with parking wayfinding signage not specifically identified herein.

PART 2 PRODUCTS NOT USED

PART 3 EXECUTION NOT USED

END OF SECTION

SECTION 01026

SCHEDULE OF VALUES

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes

1. Requirements for breakdown of lump sum bid.

B. Related Sections

1. Section 01300 - Submittals

1.02 BREAKDOWN OF LUMP SUM BID

A. Within 20 business days of the date of the executed Contract, a list detailing the breakdown of the lump sums bid by the appropriate Divisions of these Specifications or as otherwise directed by the Engineer, shall be submitted for review and concurrence by the Engineer. This list will be used by the Engineer as a guide in preparing estimates for payment. The list shall be an accurate representation of costs required to complete the Work in accordance with the Contract Documents.

B. A schedule of the monthly value of work done based on the Progress Schedule submitted under Section 01300 - Submittals shall be submitted within 20 business days of the date of the executed Contract. The schedule shall show the total sum of work done for each month of the projected construction period and shall be updated monthly to reflect the actual amount requisitioned for payment.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

SECTION 01035

MODIFICATION PROCEDURES

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes

1. Procedures for making modifications to the Contract by change orders or other means.

B. Related Sections

1. Document 00500 - Agreement

1.02 CHANGE ORDERS

A. In general Change Orders will be issued for modification of Contract documents which will incorporate changes in the Contract requirements, including additions or deletions in the Work; for unforeseen field conditions which will necessitate changes in the Work; changes in code provisions or other requirements of federal, state or local authority requiring changes in the Work; changes in the availability of products or for incorporating new products into the work and for changes directed by the Engineer for the benefit of the Owner.

B. Authority to execute Change Orders shall be that of the Engineer and not of the Contractor. Changes Orders will, in general, originate by a "Change Order Proposal Request" or by issuance of a "Construction Change Authorization".

C. Unless authorized by the Engineer, no work shall be performed that is involved in the change until a formal Change Order is issued.

D. To initiate a Change Order, the Engineer will forward a Change Order proposal request describing the proposed changes and if required, include additional or revised drawings and specifications soliciting a formal quotation of cost and time to complete the proposed Change Order work. Upon reaching mutual agreement on the cost and time, the Engineer will sign his approval of the Change Order and submit it to the Contractor for his full signature of acceptance.

1.03 FIELD ORDERS

A. The Engineer may, to avoid costly removal of, or alterations to, present on-going work, issue a Work Directive Change authorizing the Contractor to proceed, subject to later negotiation of the price of the change.

1.04 PRICE AGREEMENTS

A. Prices agreed upon to cover the Change Orders may be either by mutual acceptance of a lump sum or by unit prices as stated in the Contract bid proposal or actual direct cost plus a percentage for overhead, profit and other expenses consistent with Section 00500 – Contract Agreement.

B. Work done by a subcontractor entitles the General Contractor a percentage of the sum of the actual direct cost, not including the subcontractor's overhead and profit, consistent with Section 00500 – Contract Agreement.

C. Method for computing the cost of the change shall be based on the net additional increase. No overhead and profit shall be deducted from prices for changes deleting work.

D. The Change Order form document shall indicate the net adjustment (+/-) to the total Contract price as a result thereof including extension or reduction of time when applicable.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

SECTION 01040

COORDINATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Requirements for coordinating the various parts of Work under this Contract.

1.02 REQUIREMENTS

A. Coordinate scheduling, submittals, and Work of the various Sections of specifications to assure efficient and orderly sequence of installation of interdependent construction elements.

B. Coordinate completion and cleanup of Work of separate Sections in preparation for Substantial Completion.

C. After Owner occupancy of premises, coordinate access to site for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

D. Coordinate work with all utility companies necessary for completion of work under this contract.

1. North Kingstown Water Department
   G. Timothy Cranston
   401-268-1520

2. National Grid – Gas
   May Zhen
   781-907-3463

3. National Grid – Electric
   Sean McGovern
   401-255-2498

4. North Kingstown Sewer Department
   401-268-1500

5. Verizon
   Peter DeCosta
   508-944-6701

6. North Kingstown Fire Department
   Scott Kettelle, Fire Chief
   401-294-3346

E. Coordinate work with all other interested parties necessary for completion of work under this contract.

1. North Kingstown Engineering Department
   Aly Sparks, P.E., Town Engineer
   401-294-3331

PART 2 PRODUCTS NOT USED

PART 3 EXECUTION NOT USED

END OF SECTION

SECTION 01045

CUTTING, CORING AND PATCHING

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes

1. Requirements and limitations for cutting, coring and rough and finish patching of holes and openings in existing construction.

B. Related Sections

1. Section 01300 – Submittals

1.02 SUBMITTALS

A. In accordance with Section 01300 submit written request in advance of cutting or alteration which affects the following:

1. Structural integrity of any element of Project.
2. Integrity of weather-exposed or moisture-resistant element.
3. Efficiency, maintenance, or safety of any operational element.
4. Visual qualities of sight exposed elements.
5. Work of Owner or separate contractor.

B. Include in request:

1. Identification of Project.
2. Location and description of affected work.
3. Necessity for cutting or alteration.
4. Description of proposed work, and products to be used.
5. Alternatives to cutting and patching.
6. Effect on work of Owner or separate contractor.
7. Written permission of affected separate contractor.
8. Date and time work will be executed.

C. Should conditions of the Work, or schedule, indicate a required change of materials or methods for cutting and patching, notify the Engineer and secure his written permission and the required Change Order prior to proceeding.

PART 2 PRODUCTS

2.01 MATERIALS

A. Concrete and grout for rough patching shall be as specified in Division 3 of this Specification.

B. Materials for finish patching shall be equal to those of adjacent construction.

C. For replacement of items removed, use materials complying with pertinent sections of these specifications.

D. Sealing cored holes in sewer manholes and other structures to be with a resilient seal similar to Kor-N-Seal made by National Pollution Control Systems, Inc., Nashua, NH or similar product.

PART 3 EXECUTION

3.01 GENERAL:

A. All cutting and coring shall be performed in such a manner as to limit the extent of patching.

B. All holes cut through concrete and masonry walls, slabs or arches shall be core drilled unless otherwise approved in writing to the Engineer. No structural members shall be cut without approval of the Engineer and all such cutting shall be done in a manner directed by the Engineer. No holes may be drilled in beams or other structural members without obtaining prior approval. All work shall be performed by craftsmen skilled in this type of work.

C. If holes are cored through floor slabs they shall be drilled from below the slab.

D. Rough patching shall be such as to bring the cut or cored area flush with existing construction unless otherwise shown. Finish patching shall match the color, texture and finish of existing surfaces as approved.

3.02 EXAMINATION

A. Site Verification of Conditions

1. Inspect existing conditions, including elements subject to movement or damage during cutting, excavating, patching, and backfilling.
2. After uncovering the work, inspect conditions affecting installation of new work.
3. If uncovered conditions are not as anticipated, immediately notify the Engineer.

4. Do not proceed until unsatisfactory conditions are corrected.

3.03 PREPARATION

A. Protection

1. Provide required protection including, but not necessarily limited to, shoring, bracing, and support to maintain structural integrity of the Work.
2. Perform cutting and demolition by methods which will prevent damage to portions of the Work.

B. Surface Preparation

1. Provide proper surfaces to receive installation of repair and new work.

3.04 CORING:

A. Coring shall be performed with an approved non-impact rotary tool with diamond core drills. Size of holes shall be suitable for pipe, conduit, sleeves, equipment or mechanical seals to be installed.

B. All equipment shall conform to OSHA standards and specifications pertaining to plugs, noise and fume pollution, wiring and maintenance.

C. Provide protection for existing equipment, utilities and critical areas against water or other damage caused by drilling operation.

D. Slurry or tailings resulting from coring operations shall be vacuumed or otherwise removed from the area following drilling.

3.05 CUTTING:

A. Cutting shall be performed with a concrete wall saw and diamond saw blades of proper size.

B. Provide for control of slurry generated by sawing operation on both sides of wall.

C. The cutting of a reinforced concrete wall shall be done so as not to damage the bond between the concrete and the reinforcing steel left in structure. The cut shall be made so that steel neither protrudes nor is recessed from face of the cut.

D. Adequate bracing of area to be cut shall be installed prior to start of cutting. Check area during sawing operations for partial cracking and provide additional bracing as required to prevent a release or toppling of cut area during sawing operations.

E. Provide equipment of adequate size to remove cut panel.

3.06 FIELD QUALITY CONTROL

A. In addition to other requirements specified, upon the Engineer's request uncover work to provide for inspection by the Engineer of covered work, and remove samples of installed materials for testing.

B. Do not cut or alter work performed under separate contracts without the Engineer's written permission.

3.07 ADJUSTING

A. Perform fitting and adjusting of products to provide finished installation complying with the specified tolerances and finishes.

END OF SECTION

SECTION 01050

FIELD ENGINEERING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Survey work and other field engineering responsibilities of the Contractor.

1.02 REQUIREMENTS

A. The Contractor shall be responsible for layout of the work and the establishing of lines and grades.

B. Establish elevations, lines, levels, reference marks, batter boards, etc., required during the progress of the Work. Verify such marks by instrument to confirm accuracy.

C. Locate and protect survey control and reference points.

D. Make, check, and be responsible for all measurements and dimensions necessary for the proper construction of the Work.

E. The Engineer will be permitted to check the lines, elevations, reference marks, batter boards, etc., set by the Contractor. The Contractor shall correct any errors found in lines, elevations, reference marks, batter boards, etc. Such a check shall not be construed as approval of the Contractor's work and shall not relieve or diminish the responsibility of the Contractor for the accurate construction and completion of the Work.

F. Control datum for survey as shown on Drawings.

1.03 QUALITY ASSURANCE

A. Qualifications

1. Employ a Civil Engineer or Land Surveyor registered within the State of Rhode Island, acceptable to the Engineer.

B. Certifications

1. Submit certificate signed by the Contractor’s Engineer or Land Surveyor stating elevations and locations of the Work are in conformance with the Contract Documents.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

SECTION 01060

REGULATORY REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Building codes, Mechanical codes, and Electrical codes, Regulations, Permits and Fees applicable to the project.

1.02 PERMITS BY CONTRACTOR

A. The Contractor shall secure all necessary permits from the state, city or town authorities having jurisdiction, for digging of trenches in the streets or highways and all other building and construction operations requiring permits.

1.03 CODES

A. The Contractor shall conform to the requirements of and pay all fees imposed by local and State Building Authorities having jurisdiction over the Work. The Contractor is responsible to conform to all building, mechanical, electrical and plumbing code requirements.

B. The Contractor shall conform to the latest requirements of the following codes:

1. Federal, State and Municipal Laws
2. Rhode Island State Building Codes, National Building Code Regulation SBC-1
3. Rhode Island State Building Codes, Plumbing Code Regulation SBC-3
4. Rhode Island State Building Codes, Mechanical Code Regulation SBC-4
5. Rhode Island State Building Codes, Electrical Code Regulation SBC-5
6. Any prevailing rules and regulations pertaining to adequate protection and/or guarding of any moving parts or otherwise hazardous locations.

1.04 FEES

A. The cost of all permits secured by the Contractor shall be borne by him and shall be considered as having been included in the price or prices stated in the Bid. Copies of all required permits shall be filed with the Engineer prior to starting work for which a permit is required.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

SECTION 01067

STATE OF RHODE ISLAND AND FEDERAL REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. RHODE ISLAND SALES AND USE TAX
B. HISTORICAL ARTICLES
C. PREVAILING MINIMUM WAGE RATES
D. EXCERPTS FROM RHODE ISLAND LAWS
E. REQUIREMENTS FOR MINORITY BUSINESS ENTERPRISE, EQUAL OPPORTUNITY AND NONDISCRIMINATION

1.02 RHODE ISLAND SALES AND USE TAX

A. Materials and equipment purchased for installation under this Contract are exempt from the Rhode Island Sales Tax. The Contractor shall file for exemption on behalf of the Owner, with the State of Rhode Island Department of Taxation as required by law. The exemption from the Sales Tax shall be taken into account by the Contractor during bidding.

1.03 HISTORICAL ARTICLES

A. During the life of this Contract, the Contractor is herewith required to immediately notify the following organizations in the event that any articles such as "charcoal," "bone," "shell," "cultural objects - fire cracked stones or stone flaking material" or any other such related items of historical significance are discovered.

1. Owner
2. Local Historical Society
3. Rhode Island Historical Commissioner
4. Engineer

1.04 PREVAILING MINIMUM WAGE RATES

A. Local prevailing minimum wage rates apply to this project. It is the responsibility of the Contractor before bid openings to request, if necessary, any additional information on local prevailing Wage Rates for those tradespeople who are not covered by the applicable local Wage Decision, but who may be employed for the proposed work under this Contract.

B. The attention of the Contractor is also directed to Specification Subsection 00700, 1.19 in regards to the requirements for certified payrolls. The Contractor shall routinely prepare and submit as a part of the required certified payrolls the "PRIME CONTRACTOR'S OVERALL PAYROLL CERTIFICATION" form.

C. The Contractor is required to adhere to the requirements of the Davis-Bacon Act.

1.05 EXCERPTS FROM RHODE ISLAND LAWS

A. The Contractor and each of his subcontractors shall especially note his obligations to comply with the following statues or excerpts therefrom and any current revisions thereof contained in the General Laws of Rhode Island.

B. These laws reflect changes made through the end of the 1992 legislative session. While every attempt at accuracy has been made, these are not certified true copies of these laws. The responsibility for compliance with all applicable provisions of Rhode Island laws relating to bidding, award, and performance of public works contracts is the Contractor's. Certified true and complete copies of any Rhode Island laws and regulations may be obtained from the Office of the Rhode Island Secretary of State.

R.I.G.L.
Title, Chapter, Section EXCERPT

5-6-2 WORK FOR WHICH LICENSE REQUIRED

"No person, firm, or corporation shall enter into, engage in, or work at the business of installing wire, conduits, apparatus, fixtures and other appliances for carrying or using electricity for light, heat or other purpose, unless such person, firm or corporation shall have received a license and a certificate therefore, issued by the State Board of Examiners of Electricians."

28-26-6 LICENSE REQUIRED FOR OPERATION OF HOISTING MACHINERY - PUBLIC CONTRACTS

"No persons shall operate or be in direct charge of a hoisting or excavation gasoline, steam, diesel, electric or compressed air hoist, shovel, crane, excavator, of five horsepower or more without obtaining a license to do so as provided in this chapter. No user or agent of use of any such described steam, gasoline, diesel, electric or compressed air hoisting machinery shall permit it to be operated unless it is operated by a duly licensed person as hereinafter provided by this chapter.

Every contract in the construction of public works by the State, or by any City of Town, or by persons contracting therewith for such construction, shall contain a clause embodying the provisions of this section."

Chapter 116

From Chapter 116 of the General Laws of Rhode Island, 1938, relative to the conditions precedent, etc., to carrying on business within this State by foreign corporations:

"The certificate and power of attorney mentioned in the General Corporation Law, properly filled out, subscribed and sworn to, and accompanied by a certified copy of the Charter, articles of association or other similar organization papers, together with all amendments thereto, must be filed in the office of the Secretary of State by all foreign corporations intending to carry on business within this State, or for a foreign corporation to enforce in the courts of this State any contract made within the State."

Detailed information regarding Chapter 116 of the General Laws of Rhode Island, 1938, relative to the conditions precedent, etc., to carrying on business within this State for foreign corporations may be obtained from the Secretary of State, State House, Smith Street, Providence, Rhode Island.

1.06 REQUIREMENTS FOR MINORITY BUSINESS ENTERPRISE, EQUAL OPPORTUNITY AND NONDISCRIMINATION

A. Contracts for work under the bid (proposal) will obligate the contractors and subcontractors not to discriminate in employment practices.

B. The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, age, handicap, or national origin. The Contractor shall take affirmative action to ensure that applicants are employed and the employees are treated during employment without regard to their race, color, religion, sex, age, handicap, or national origin. Such actions shall include, but not be limited to, the following: employment, upgrading, demotions, or transfers; recruitment or recruitment advertising, selection for training including apprenticeship; and participation in recreational and educational activities. The Contractor agrees to post in conspicuous places available to employees and applicants for employment, notice to be provided, setting forth the provisions of this non-discrimination clause. The Contractor will cause the foregoing provisions to be inserted in all subcontracts for any work covered by this Contract so that such provisions will be binding upon each subcontractor and upon subcontractors for standard commercial supplies or raw materials.

C. The Contractor shall keep such records and submit such reports concerning the racial and ethnic origin of applicants for employment and employees as the Owner may require as consistent with Federal and State law.

D. The Contractor agrees to comply with such rules, regulations, or guidelines as the State of Rhode Island may issue to implement these requirements. The Contractor further warrants that it will comply with, Title VI of the Civil rights Act of 1964, 42 U.S.C. 200d to d4.

E. Contractors shall comply with the provisions of the General Laws of Rhode Island and attention is called to Title 37, Chapter 13, Section 1-16, relative to the payment of wages, obligations and charges by Contractors on public works projects. Non-resident Contractors are subject to Section 44-1-6 of the RI General Laws, as amended, regarding OUT-OF-STATE CONTRACTORS.

F. The Contractor will be required to comply with Equal Opportunity Requirements and to abide by the prevailing wage rates for Public Works Projects for all employees on the job. It is the responsibility of contractors to inform themselves as to the local labor conditions, overtime compensation, health and welfare contributions, labor supply and prospective changes or adjustment of wage rates. Information is available at the Department of Labor.

G. The attention of the Contractor is directed to the fact that this Contract is subject to both Federal and State requirements regarding Minority Business Enterprises (MBE) and Woman's Business Enterprises (WBE) participation. The Contractor hereby agrees to ensure compliance with all Federal and State MBE/WBE requirements to provide maximum opportunity for such participation.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

SECTION 01090

REFERENCE STANDARDS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Reference material, abbreviations, and terms used in the Construction Documents and establishes edition dates and complete titles for standards referenced elsewhere in the Specifications.

1.02 QUALITY ASSURANCE

A. For products or workmanship specified by association, trade, or Federal Standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. Obtain copies of standards when required by Contract Documents.

C. Maintain copy at jobsite during submittals, planning, and progress of the specific work, until Substantial Completion.

D. Should specified reference standards conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.

E. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.03 SCHEDULE OF REFERENCES

AA	Aluminum Association 818 Connecticut Ave. N.W. Washington, DC 20006
AASHTO	American Association of State Highway and Transportation Officials 444 North Capitol Street, N.W. Washington, DC 20001
ACI	American Concrete Institute Box 19150 Reford Station Detroit, MI 48219
AFBMA	Anti-Friction Bearing Manufacturers Association

AGC	Associated General Contractors of America 1956 E Street, N.W. Washington, DC 20006
AGM	American Gear Manufacturers Association
AI	Asphalt Institute Asphalt Institute Building College Park, MD 20740
AISC	American Institute of Steel Construction 400 North Michigan Avenue Eighth Floor Chicago, IL 60611
AISI	American Iron and Steel Institute 1000 16th Street, N.W. Washington, DC 20036
AMCA	Air Movement and Control Association 30 West University Drive Arlington Heights, IL 60004
ANS	American National Standard
ANSI	American National Standards Institute 1430 Broadway New York, NY 10018
API	American Petroleum Institute
ARI	Air-Conditioning and Refrigeration Institute 1501 Wilson Boulevard Arlington, VA 22209
ASCE	American Society of Civil Engineers 345 East 47th Street New York, NY 10017
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers 1791 Tullie Circle, N.E. Atlanta, GA 30329

ASME	American Society of Mechanical Engineers 345 East 47th Street New York, NY 10017
ASPA	American Sod Producers Association 4415 West Harrison Street Hillside, IL 60162
ASTM	American Society for Testing and Materials 1916 Race Street Philadelphia, PA 19103
AWG	American or Brown and Sharpe Wire Gage
AWPA	American Wood-Preservers' Association 7735 Old Georgetown Road Bethesda, MD 20014
AWS	American Welding Society
AWWA	American Water Works Association 6666 West Quincy Avenue Denver, CO 80235
BIA	Brick Institute of America 11490 Commerce Park Drive Reston, VA 22091
CS	Commercial Standard
EJCDC	Engineers' Joint Contract Document Committee American Consulting Engineers Council 1015 15th Street, N.W. Washington, DC 20005
FM	Factory Mutual System 1151 Boston-Providence Turnpike PO Box 688 Norwood, Massachusetts 02062
Fed Spec.	Federal Specification General Services Administration Specification and Consumer Information Distribution Section (WFSIS) Washington Navy Yard, Bldg. 197 Washington, DC 20407

IBR	Institute of Boiler and Radiator Manufacturers
ICBO	International Conference of Building Officials 5360 S. Workman Mill Road Whittier, CA 90601
IPS	Iron Pipe Size
JIC	Joint Industry Conference Standards
MIL	Military Specification Naval Publications and Forms Center 5801 Tabor Avenue Philadelphia, PA 19120
NASSCO	National Association of Sewer Service Companies 101 Wymore Road, Suite 521 Altamonte, FL 32714
NBS	National Bureau of Standards
NCMA	National Concrete Masonry Association PO Box 781 Herndon, VA 22070
NCPWB	National Certified Pipe Welding Bureau
NEMA	National Electrical Manufacturers' Association 2101 'L' Street, N.W. Washington, DC 20037
NFPA	National Fire Protection Association Battery March Park Quincy, MA 02269
NPT	National Pipe Thread
OS&Y	Outside screw and yoke
PCA	Portland Cement Association 5420 Old Orchard Road Skokie, IL 60077

SMACNA	Sheet Metal and Air Conditioning Contractors' National Assoc. 8224 Old Court House Road Vienna, VA 22180
Stl. WG	U.S. Steel Wire Washburn and Moen, American Steel and Wire or Roebling Gage
UL	Underwriters' Laboratories, Inc. 333 Pfingston Road Northbrook, IL 60062
USS Gage	United States Standard Gage
125-lb. ANS 250-lb. ANS	American National Standard for Cast-Iron Pipe Flanges and Flange Fittings, Designation B16.1-1975, for the appropriate class

1.04 EDITION DATES

A. Reference to publications and reference material shall be understood to mean the latest edition, unless stated otherwise.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

SECTION 01100

MISCELLANEOUS AND SPECIAL PROJECT REQUIREMENTS

PART 1 - GENERAL

1.01 DESCRIPTION:

A. This section includes coordination with others and restrictions on Contractor's operations.

B. Related Work Described Elsewhere:

1. Summary of Work, Section 01010
2. Traffic Regulation, Section 01570

1.02 CONSTRUCTION WORK HOUR RESTRICTIONS BY ENGINEER AND OWNER

A. Except as otherwise specifically allowed elsewhere in the Contract Documents, normal construction activity shall take place only between the hours of 7:30 AM and 5:00 PM excluding, Saturdays, Sundays, and legal holidays. The Contractor shall plan the Work so as to avoid working beyond these hours. However, if despite the Contractor's diligent efforts, the Contractor believes that overtime work is necessary in order for the Contractor to complete the Work, the Contractor may apply to the Engineer and to the Owner for approval to perform overtime work, which approval may be withheld in their sole discretion. No additional compensation or time extension shall be due to the Contractor whether approval is granted or denied.

B. If the Contractor believes that overtime work is necessary, the Contractor shall obtain prior approval from the Engineer and the Owner. The Contractor shall file a request for such approval in writing and shall include the specific reasons therefore and the time that the overtime work is expected to be concluded. Overtime work will normally be limited to evening hours (5:00 PM to 8:00 PM) Monday through Friday and daytime hours (7:30 AM to 5:00PM) on Saturdays except in special circumstances approved by the Engineer and the Owner.

1.03 CONSTRUCTION WORK HOUR RESTRICTIONS BY TOWN OF NORTH KINGSTOWN

A. The Contractor's construction operations shall comply with all Laws, Permits and the Town of North Kingstown Code of Ordinances including the Noise Ordinance in Chapter 8 Article VI. Should the Contractor sustain any delay or damages in the prosecution of the Work due to the Contractor's failure to conform to the requirements of the Permit, Laws or Ordinances as determined by the Town of North Kingstown or other regulatory agency, the Contractor shall not be entitled to an extension of

Contract Time or Contract Price.

1.04 SEASONAL RESTRICTIONS

A. The Engineer will determine when conditions are unfavorable for work and may order the work or any portion of the work suspended whenever, in his opinion, the conditions are not such as will insure first class work.

B. Pouring of concrete shall be prosecuted from April 15th through November 1st.

C. Paving of asphalt roads and sidewalks shall be prosecuted from April 15th through November 15th.

D. Water work including temporary potable water bypass shall be prosecuted from April 15th through November 15th.

1.05 EVENT DATE RESTRICTIONS

A. No work shall be permitted during these dates and the site shall be opened to the maximum extent practicable.

1. April 13-16, 2024
2. May 11, 2024
3. May 29, 2024
4. June 8, 2024
5. June 24-25, 2024
6. July 13, 2024
7. August 10, 2024
8. September 15, 2024
9. October 13-14, 2024
10. October 21-22, 2024
11. October 26-29, 2024
12. November 11, 2024
13. November 25, 2024
14. November 30 – December 3, 2024

1.06 PROHIBITION OF BLASTING

A. The Contractor shall be prohibited from performing blasting at the site.

1.07 SCHEUDLING AND PHASING

A. Contractor to submit phasing plan for grading and paving parking lot with schedule within 14 calendar days of formal execution of the agreement.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01200

PROJECT MEETINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Administrative and procedural requirements for project meetings.

1.02 PRECONSTRUCTION CONFERENCE

A. The Engineer will schedule and administer a pre-construction conference.

B. The pre-construction conference will be scheduled and administered within fourteen (14) calendar days after the dated "Notice to Proceed". The Contractor shall be prepared to address such topics as projected construction schedules, major personnel, critical work areas, construction facilities and shop drawing submittals.

1.03 PROGRESS MEETINGS

A. The Engineer will schedule and administer progress meetings and specially called meetings throughout the duration of the Work at minimum monthly intervals.

B. The time and location of such meetings shall be designated by the Engineer and shall be convenient for all parties involved.

C. The Engineer will, prepare agenda with copies for participants, preside at meetings, record minutes, and distribute copies to participants, and those affected by decisions made.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

SECTION 01300

SUBMITTALS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Requirements for submission of schedules and shop drawings.

1.02 PROGRESS SCHEDULE

A. Within fourteen (14) calendar days after execution of the Contract Documents, the Contractor shall submit to the Engineer for review a construction progress schedule conforming to requirements specified. This schedule should show the proposed dates of commencement and completion of each of the various subdivisions of work required under this Contract and the anticipated monthly percentage of completion based on the total contract price. The Contractor shall be responsible for updating and/or revising this schedule whenever directed by the Engineer throughout the duration of the Contract.

B. Special attention is directed to the requirement that the Contractor shall start the Work, as specified under this Contract, no later than thirty (30) calendar days after the execution of the Contract Documents, unless otherwise directed by the Owner. The Contractor shall comply with all pre-construction requirements as specified. The Owner reserves the right to delay the commencement of the Work or any part thereof if the specified requirements as determined by the Engineer have not been satisfied. The Owner further reserves the right to limit or, delay construction, or certain activities thereof, in certain areas of the Contract should the Owner deem it to be in the public's best interest and/or safety to do so.

C. The Contractor shall contact the appropriate town or city authorities concerning any public or semi-public events that may occur during the construction period that may affect construction. The Contractor alone shall be responsible for arranging his construction sequence to conform to any restrictions these events may impose. No claims for extras will be allowed because of any delay, extra materials handling, extra excavation, etc. caused by the imposed restrictions. However, additional time may be granted for completion of the work to compensate for delays caused by said restrictions.

1.03 SHOP DRAWINGS

A. Submit six (6) copies of all shop and working drawings of concrete reinforcement, structural details, piping layout, wiring, materials fabricated especially for the Contract, and materials and equipment for which such drawings are specifically requested.

B. A maximum of two (2) submittals of each shop drawing will be reviewed by the Engineer. If more submittals are required due to the Contractor's neglect or failure to fulfill the requirements of the Contract plans and specifications, or to make corrections or modifications required by the Engineer in the review of the first two submittals, the Engineer will review the submittal and the Contractor will be responsible for the cost of the review, as determined by the Owner based on the Engineer's documentation of time and rates for additional services established in the Engineering Agreement between the Owner and the Engineer.

C. If resubmittals on shop and working drawings are required, the Engineer will retain three (3) copies and three (3) copies will be returned to the Contractor. When resubmittals are returned to the Engineer, six copies of the complete submittal shall again be required.

D. Such drawings shall show the principal dimensions, weight, structural and operating features, space required, clearances, type and/or brand of finish or shop coat, grease fittings, etc., depending on the subject of the drawing. When the dimensions are of particular importance, or when specified, the drawings shall be certified by the manufacturer or fabricator as correct for the Contract.

E. When so specified or if considered by the Engineer to be acceptable, manufacturer's specifications, catalog data, descriptive matter, illustrations, etc., may be submitted in place of shop and working drawings.

F. The Contractor shall be responsible for the prompt and timely submittal of all shop and working drawings to eliminate delay to the Work due to the absence of such drawings. All shop and working drawings must be submitted to the Engineer within thirty (30) calendar days prior to incorporation into the Work, unless otherwise permitted by the Engineer. **Prior to the submittal of any shop drawings, the Contractor shall submit a schedule of proposed shop drawing transmittals.** The schedule shall identify the subject matter of each transmittal, the corresponding specification section number and the proposed date of submission. Prior to and during the progress of the Work the schedule shall be revised and resubmitted as requested by the Engineer.

G. No material or equipment shall be purchased or fabricated for the Contract until the required shop and working drawings have been submitted as hereinabove provided and reviewed for conformance to the Contract requirements. All such materials and equipment and the work involved in their installation or incorporation into the Work shall then be as shown in and represented by said drawings.

H. Until the necessary review has been made, the Contractor shall not proceed with any portion of the Work (such as the construction of foundations) for which review is required.

I. All shop and working drawings shall be submitted to the Engineer by and/or through the Contractor, who shall be responsible for obtaining shop and working drawings from his subcontractors and returning reviewed drawings to them. All shop and working drawings shall be prepared on standard size, 24 inch by 36 inch sheets, except those which are made by changing existing standard shop and working drawings. All drawings shall be clearly marked with the names of the Owner, Contractor, and building, equipment, or structure to which the drawing applies, and shall be suitable numbered. Submitted shop drawings shall be accompanied by a letter of transmittal, completed by the Contractor as approved by the Engineer.

J. Only drawings which have been checked and corrected by the fabricator should be submitted to the Contractor by his subcontractors and vendors. Prior to submitting drawings to the Engineer, the Contractor shall check thoroughly all such drawings to satisfy himself that the subject matter thereof conforms to the Drawings and Specifications in all respects. All drawings which are correct shall be marked with the date, checker's name, and indication of the Contractor's approval, and then shall be submitted to the Engineer; other drawings shall be returned for correction.

K. If a shop drawing shows any deviation from the Contract requirements, the Contractor shall make specific mention of the deviations in his letter of transmittal.

L. The review of shop and working drawings by the Engineer will be general only, and nothing contained in this Section shall relieve, diminish or alter in any respect the responsibilities of the Contractor under the Contract Documents and in particular, the specific responsibility of the Contractor for details of design and dimensions necessary for proper fitting and construction of the work as required by the Contract and for achieving the result and performance as specified. The Contractor shall be responsible for errors and omissions in shop drawings.

M. Should the Contractor submit equipment that requires modifications to the structures, piping, electrical conduit, wires, appurtenances, or layouts etc., either existing or as detailed on the Drawings, he shall also submit details of the proposed modifications. If such equipment and modifications are accepted, the Contractor, at no additional cost to the Owner, shall do the work necessary to make such modifications.

N. The Contractor shall furnish additional copies of shop drawings or catalog cuts when so requested.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

SECTION 01400

QUALITY CONTROL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Requirements for Contractor’s quality control of products, suppliers, manufacturers, services, site conditions, and workmanship, to produce Work of specified quality.

1.02 QUALITY ASSURANCE/CONTROL OF INSTALLATION

A. Comply fully with manufacturers' instructions, including each step in sequence.

B. Should manufacturers' instructions conflict with Contract Documents, request clarification from Engineer before proceeding.

C. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

D. Perform work by persons qualified to produce workmanship of specified quality.

E. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement.

1.03 FIELD SAMPLES

A. Install field samples at the site as required by individual specifications sections for review.

B. Acceptable samples represent a quality level for the Work.

C. Where field sample is specified to be removed, clear area only after field sample has been accepted by the Engineer.

1.04 CERTIFIED WELDERS

A. Structural welds shall be made only by operators who have been qualified by tests, as prescribed in the "Standard Qualification Procedure" of the American Welders Society, to perform the type of work required.

B. Pipe welds shall be made only by operators who have been qualified by the National Certified Pipe Welding Bureau and each operator's qualification record shall be submitted to the Engineer before any work is preformed.

C. Shop welding shall be in accordance with the "Code for Welding in Building Construction".

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

SECTION 01410

TESTING LABORATORY SERVICES

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes

1. Qualification, duties and responsibilities of testing laboratories.
2. Coordination and scheduling responsibilities of the Contractor.

B. Related Sections

1. Section 01600 - Materials and Equipment

1.02 PAYMENT PROCEDURES

A. Initial Testing

1. Testing will be performed as required by the Engineer.

B. Retesting

1. When initial tests indicate noncompliance with the Contract Documents, subsequent retesting occasioned by the noncompliance shall be performed by the same testing agency.

C. Contractors Convenience Testing

1. Inspecting and testing performed exclusively for the Contractor's quality control purpose and for conformance with the specifications shall be the sole responsibility of the Contractor.

1.03 REFERENCES

A. American Society for Testing and Materials (ASTM)

1. E329, Agencies Engaged in Construction Inspection and/or Testing

1.04 REQUIREMENTS

A. Work included:

1. Cooperate with the Owner's selected testing agency and all others responsible or testing and inspecting the Work.
2. Provide other testing and inspecting as specified to be furnished by the Contractor in this Section and/or elsewhere in the Contract Documents.
3. Where no testing requirements are described, but the Owner directs testing, the Contractor shall provide testing under the requirements of this Specification.

B. Work not included:

1. Selection of testing laboratory: The Owner will select a qualified independent testing laboratory.

1.05 QUALITY ASSURANCE

A. Qualifications

1. The testing laboratory will be qualified to the Owner's approval in accordance with ASTM E329.

B. Regulatory requirements

1. Testing, when required, will be in accordance with all pertinent codes and regulations and with selected standards of the American Society for Testing and Materials.
2. Regulatory Requirements Inspections and tests required by codes or ordinances, or by a plan approved authority, and which are made by a legally constituted authority, shall be the responsibility of and shall be paid for by the Contractor, unless otherwise provided in the Contract Documents.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Comply with pertinent provisions of Section 01600 - Materials and Equipment.

B. Promptly process and distribute, to the Engineer, required copies of test reports and instructions to assure necessary retesting and replacement of materials with the least possible delay in progress of the Work.

1.07 SCHEDULING

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 to issue each of its findings.
2. Provide all required time within the construction schedule.
3. Coordinate testing activity with the appropriate testing laboratory.

B. Revising schedule

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

C. Adherence to schedule

1. When the testing laboratory is ready to test according to the established schedule, but is prevented from testing or taking specimens due to incompleteness of the Work, all extra charges for testing attributable to the delay may be back-charged to the Contractor and shall not be borne by the Owner.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

3.01 FIELD QUALITY CONTROL

A. Site Tests

1. Representatives of the testing laboratory shall have access to the Work at all times and at all locations where the Work is in progress. Provide facilities for such access to enable the laboratory to perform its functions properly.
2. All specimens and samples for testing, unless otherwise provided in the Contract Documents, shall be taken by the testing personnel. All sampling equipment and personnel will be provided by the testing laboratory. All deliveries of specimens and samples to the testing laboratory will be performed by the testing laboratory.
3. Sieve and Proctor analysis are required for all in-situ aggregate to be used in the Work. Sieve and Proctor analysis to be stamped and signed by a Professional Engineer registered in the State of Rhode Island.
4. Sieve analysis are required for all aggregate and soils delivered to the job site to be used in the Work. Sieve analysis to be stamped and signed by a Professional Engineer registered in the State of Rhode Island.
5. Soil compaction testing for paved areas shall be performed for every 3,000 square feet of parking lot, but no less than two tests per lot. Contractor responsible for all Proctor’s.
6. Soil compaction testing to be performed for every 50 linear feet of excavated trench repair. Contractor responsible for all Proctor’s.

END OF SECTION

SECTION 01560

TEMPORARY CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Requirements for cleaning, maintenance of the site, barriers and fences required during construction.

1.02 CLEANING DURING CONSTRUCTION

A. Unless otherwise specified under the various trade Sections of the Specifications, the General Contractor shall perform clean-up operations during construction as herein specified.

1. Control accumulation of waste materials and rubbish; periodically dispose of off-site. Bear all costs, including fees resulting from disposal.
2. Clean interior areas prior to start finish work and maintain areas free of dust and other contaminants during finishing operations.
3. Maintain project in accordance with all local, State and Federal Regulatory Requirements.
4. Store volatile wastes in covered metal containers, and remove from premises.
5. Prevent accumulation of wastes that create hazardous conditions.
6. Provide adequate ventilation during use of volatile or noxious substances

B. Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.

1. Do not burn or bury rubbish and waste materials on site.
2. Do not dispose or volatile wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains.
3. Do not dispose of wastes into streams or waterways.
4. Use only those materials which will not create hazards to health or property and which will not damage surfaces.
5. Use only those cleaning materials and methods recommended by manufacturer of surface material to be cleaned.
6. Execute cleaning to ensure that the buildings, the sites, and adjacent properties are maintained free from accumulations of waste materials and rubbish and wind blown debris, resulting from construction operations.

7. Provide on-site containers for collection of waste materials, debris, and rubbish.
8. Remove waste materials, debris, and rubbish from the site periodically and dispose of at legal disposal areas off the construction site.
9. Handle material in a controlled manner with as little handling as possible. Do not drop or throw materials from heights.
10. Schedule cleaning operations so that dust and other contaminants resulting from cleaning process will not damage surrounding surfaces.
11. During its progress, the work and the adjacent areas affected thereby shall be kept cleaned up and all rubbish, surplus materials, and unneeded construction equipment shall be removed and all damage repaired so that the public and property owners will be inconvenienced as little as possible.
12. Where material or debris has washed or flowed into or been placed in existing watercourses, ditches, gutters, drains, pipes, structures, work done under this contract, or elsewhere during the course of the Contractor's operations, such material or debris shall be entirely removed and satisfactorily disposed of during the progress of the work, and the ditches, channels, drains, pipes, structures, and work, etc. shall, upon completion of the work, be left in a clean and neat condition.

1.03 DUST CONTROL

A. Provide adequate means for the purpose of preventing dust caused by construction operations throughout the period of the construction contract.

B. This provision does not supersede any specific requirements for methods of construction or applicable general conditions or performance obligations of the General Contractor.

1.04 EROSION AND SEDIMENT CONTROL

A. Plan and execute construction by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.

B. Minimize amount of bare soil exposed at one time.

C. Provide temporary measures such as berms, dikes, and drains, to prevent water flow.

D. Construct fill and waste areas by selective placement to avoid erosive surface silts for clays.

E. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.

F. Construct sediment control devices for discharge from dewatering trenches.

G. Construct all sedimentation control devices shown on the plans.

1.05 NOISE CONTROL

A. Develop and maintain a noise-abatement program and enforce strict discipline over all personnel to keep noise to a minimum.

B. Execute construction work by methods and by use of equipment which will reduce excess noise.

1. Equip air compressors with Silencers, and power equipment with mufflers.
2. Manage vehicular traffic and scheduling to reduce noise.

1.06 POLLUTION CONTROL

A. Special care shall be taken to prevent contamination or muddying up or interfering in any way with the stream flows, if any along the line of work. No waste matter of any kind will be allowed to discharge into the stream flows or impounded water of any pools or other bodies of water.

1.07 SURFACE WATER CONTROL

A. Take all precautions to prevent damage to the work or equipment by high waters or by storms. The Engineer with the approval of the Owner may prohibit the carrying out of any work at any time when in his judgement, high water or storm conditions are unfavorable or not suitable, or at any time, regardless of the weather, when proper precautions are not being taken to safeguard previously constructed work or work in progress.

B. In case of damage caused by the failure of the Contractor to take adequate precautions, the Contractor shall repair or replace equipment damaged and shall make such repairs or rebuild such parts of the damaged work, as the Engineer may require, at no additional expense to the Owner.

1.08 BARRIERS AND ENCLOSURES

A. Fences and Barricades

1. Provide and maintain temporary fences, barriers, lights, guardrails, and barricades as indicated in the Contract Documents, or as necessary to secure the Work and adjacent property, and protect persons and property.

2. Obtain necessary approvals and permits and provide temporary expedients as necessary to accommodate tasks requiring items mentioned herein.

B. Protection of Trees

1. The Contractor shall take care not to harm trees along the sides of roads or with in the existing facility in which the construction work is to be done or trees on adjacent lands except as indicated on the drawings or with the written permission of the Owner and any other owner of the trees involved. Care shall be taken not to cut tree roots so as to harm the growth of trees to remain.
2. If, in the opinion of the Engineer, any trees damaged during construction can be repaired, the Contractor shall satisfactorily repair same at no further cost to the Owner.
3. If, in the opinion of the Engineer, any tree damaged during construction cannot be repaired and should be removed, the Contractor shall satisfactorily remove and replace, in kind, same at no further cost to the Owner.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

SECTION 01570

TRAFFIC REGULATIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Requirements for traffic control for the duration of the Contract.

1.02 REFERENCES

A. This specification includes requirements of additional specifications as listed. The Contractor shall perform the Work in accordance with requirements of the referenced specification in addition to the requirements of this Specification Section 01570.

B. The Contractor shall obtain and familiarize himself with all requirements of these specifications.

1. Rhode Island Department of Transportation Standard Specification for Road and Bridge Construction, including all addenda issued by the State of Rhode Island Department of Public Works. (referred to as the Standard Specification).

2. The most recent version of the Manual on uniform Traffic Control Devices (MUTCD)

1.03 PERFORMANCE REQUIREMENTS

A. Contractor shall have the sole responsibility for the maintenance and protection of traffic.

B. An authorized representative of the Contractor shall be available on a 24-hour basis for the duration of the Contract for the purpose of correcting construction related impediments or hazards.

1.04 SUBMITTALS

A. Shop Drawings

3. In accordance with SECTION 01300 – SUBMITTALS, submit a traffic plan delineating requirements of this section, the Contract Drawings, and the Town of North Kingstown requirements.

4. Traffic control plans shall detail all typical work zones and detours.

1.05 SITE CONDITIONS

A. Replace at no cost to the Town of North Kingstown pavement markings, legends and lane arrows removed or damaged by the construction operation.

B. Restore temporary detours to original condition.

C. Replace traffic signal loops damaged during construction within 72 hours.

1.06 SCHEDULING

A. There shall be no time limitations on construction operations except those hours and locations where noise regulations may apply and except as required for the maintenance of traffic as required by the Town of North Kingstown.

B. Keep closing of travel lanes to a minimum.

C. Notify Town departments 48 hours prior to construction operations on travel ways.

1. Police Department – (401) 294-3311.
2. Fire Department – (401) 294-3346.
3. Department of Public Works – (401) 294-3331.

PART 2 PRODUCTS

2.01 TRAFFIC CONTROL DEVISES

A. In accordance with the Standard Specification.

PART 3 EXECUTION

3.01 INSTALLATION OF TRAFFIC CONTROL DEVICES

A. In accordance with the Standard Specification.

3.02 PROTECTION OF TRAFFIC

A. Barricade trenches and roadway excavations at the end of each work period with temporary precast concrete barriers, properly lighted and marked to guide traffic to designated travel lane. Or other means acceptable to the Engineer and approved on the Traffic Plan.

B. Maintain and protect traffic movements for the entire length of the project.

C. Keep one lane of traffic open at all times except for brief stoppages dictated by the construction operation involving safety of vehicles in the travel lanes.

D. Maintain access to business and private ways during construction operations as much as possible. The contractor shall coordinate access to private ways and parking restrictions within the roadways with the DPW Director, the resident engineer and the residents adjacent to the project prior to commencing work within the neighborhood block.

E. Furnish sufficient number of signs, temporary precast concrete barriers, warning lights, drums and traffic cones to warn traffic of construction and guide traffic through the construction area.

3.03 TRAFFIC PERSONS

A. Contractor shall procure the service of uniformed traffic persons as required to perform construction while safely managing the movement of non-construction traffic through active project areas. The Contractor shall be responsible for determining the need for uniformed traffic persons over the course of the project, and shall schedule traffic persons in a timely fashion in advance of when said traffic persons will be needed.

B. If in the event that no work is scheduled during a work day, it is the responsibility of the Contractor to cancel the police detail if one had been previously been scheduled. If the Contractor fails to cancel the police detail in adequate time, the Contractor shall be responsible for the cost of the police detail for that day.

C. Traffic persons shall be Town of North Kingstown police officers, unless otherwise authorized or required (e.g. if an adequate number Town of North Kingstown police officers are unavailable to serve as uniformed traffic persons).

D. Traffic persons used by the Contractor shall be compensated directly by the Town of North Kingstown, based on the number of hours actually worked (both straight time and overtime) and the corresponding hourly rates for each time classification. Contractor shall be responsible for tracking or verifying hours worked by traffic persons on the project.

E. The intent is to insure public safety by police direction of traffic. Police are not to serve as watchmen to protect the Contractor's equipment and materials, or to warn pedestrians of such hazards as open trenches.

F. Nothing contained herein shall be construed as relieving the Contractor of any of his responsibilities for protection of persons and property under the terms of the Contract.

END OF SECTION

SECTION 01600

MATERIALS AND EQUIPMENT

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes

1. Requirements for delivery, storage, handling and installation of systems, materials, manufactured units, equipment, components, and accessories used in the work.

B. Related Sections

1. Section 01300 - Submittals

1.02 DELIVERY

A. Refer to Specifications' Sections for requirements pertaining to delivery and handling of materials and equipment.

B. Transport products by methods to avoid product damage; deliver in undamaged condition in manufacturers' unopened containers or packaging, dry.

C. Provide equipment and personnel to handle products by methods to prevent soiling or damage.

D. Promptly inspect shipments to assure that products comply with requirements, that quantities are correct, and products are undamaged.

1.03 STORAGE AND PROTECTION

A. Refer to Specifications' Sections for requirements pertaining to storage and protection of materials and equipment.

B. Store products in accordance with manufacturers' instruction, with seals and labels intact and legible. Store sensitive products in weather tight enclosures; maintain within temperature and humidity ranges required by manufacturers' instructions.

C. For exterior storage of fabricated products, place on sloped supports above ground. Cover products subject to deterioration with impervious sheet covering; provide ventilation to avoid condensation.

D. Store loose granular materials on solid surfaces in a well-drained area; prevent mixing with foreign matter.

E. Arrange storage to provide access for inspection. Periodically inspect to assure that products are undamaged, and are maintained under required conditions.

1.04 INSTALLATION STANDARDS

A. Comply with Specifications and referenced standards as minimum requirements.

B. Components required to be supplied in quantity within a Specification Section shall be the same, and shall be interchangeable.

C. Do not use materials and equipment removed from existing structures, except as specifically required, or allowed, by the Contract Documents.

D. Perform work by persons qualified to produce workmanship of specified quality.

E. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, and racking.

F. When work is specified to comply with manufacturers' instructions, submit copies as specified in Section 01300 - Submittals, distribute copies to persons involved, and maintain one set in field office.

G. Perform work in accordance with details of instructions and specified requirements.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

SECTION 01700

CONTRACT CLOSE-OUT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Requirements for specific administrative procedures, record keeping, close-out submittals, and forms used at substantial and final completion of the Work.

B. Contractor shall satisfy all administrative requirements within the Contract Documents and the Requirements listed in this section prior to Contract Close-out.

1.02 FINAL CLEANING

A. On or before the completion of the work, the Contractor shall, unless otherwise especially directed or permitted in writing, tear down and remove all temporary buildings and structures built by him; shall remove all temporary works, tools, and machinery or other construction equipment furnished by him; shall remove all rubbish from any grounds which he has occupied; and shall leave the roads and all parts of the premises and adjacent property affected by his operations in a neat and satisfactory condition.

B. The Contractor shall restore or replace, when and as directed, any public or private property damage by his work, equipment, or employees, to a condition at least equal to that existing immediately prior to the beginning of operations. To this end, the Contractor shall do as required, all necessary highway or driveway, walk and landscaping work. Suitable materials, equipment, and methods shall be used for such restoration. The restoration of existing property or structures shall be done as promptly as practicable as work progresses and shall not be left until the end of the contract period.

C. Unless otherwise specified under the various Sections of the Specifications, the Contract or shall perform final cleaning operations as herein specified prior to final inspection.

D. At completion of work, remove waste materials, rubbish tools, equipment, machinery and surplus materials, and clean all sight-exposed surfaces; leave project clean and ready for occupancy.

E. Cleaning shall include all surfaces, interior and exterior in which the Contractor and all Subcontractors have had access whether existing or new.

F. Refer to Sections of the Specifications for cleaning of specific products or work.

G. Use only those materials which will not create hazards to health or property and which will not damage surfaces.

H. Use only those cleaning materials and methods that are recommended by the manufacturer of surfaces material to be cleaned.

I. Employ experienced workmen, or professional cleaners, for final cleaning operations.

1.03 PROJECT RECORD DOCUMENTS

A. Project Record Documents also referred here as As-Built Drawings shall consist of all the contract drawings.

B. The Contractor and all Subcontractors shall be required to maintain one set of As-Built Drawings, as the work relates to their Sections of the Specifications, at the site.

C. As-Built Drawings shall be stored and maintained in the General Contractor's field office apart from other documents used for construction. The As-Built Drawings shall be maintained in a clean, dry, and legible condition and shall not be used for construction purposes.

D. As-Built Drawings shall be available at all time for inspection by the Engineer. All deficiencies noted shall be promptly corrected.

E. The following information shall be indicated on the As-Built Drawings for storm drain construction:

1. Rim elevations on inlets, catch basins, manholes and other structures.
2. Invert elevations of all pipes within inlets, catch basins, manholes, end sections, headwalls, culverts and other structures.
3. Linear distance along drain from structure to structure, and branch connections, including size and type of pipe.
4. Recalculated pipe slopes based on as-built elevations.
5. Location of manholes, inlets, catch basins, outlets, headwalls, other structures and service line connections with 3 swing ties.

F. At the end of each month and before payment for materials installed, the Contractor, and his Subcontractors, shall review As-Built Drawings for purpose of payment. If the changes in location of all installed elements are not shown on the as-built drawings and verified in the field, then the material shall not be considered as installed and payment will be withheld.

G. At the completion of the contract, each Subcontractor shall submit to the Contractor a complete set of his respective As-Built Drawings indicating all changes. After checking the above drawings, the Contractor shall certify in writing on the title sheet of the drawings that they are complete and correct and shall submit the As-Built Drawings to the Engineer.

1.04 WARRANTIES

A. Comply with requirements of Section 01740 Warranties.

1.05 FINAL INSPECTION

A. The Contractor shall submit written certification that:

1. Project has been inspected for compliance with Contract Documents.
2. Equipment and systems have been tested in the presence of the manufacturer's representative and are operational and satisfactory.
3. Project is completed, and ready for final inspection.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

SECTION 01740

WARRANTIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. General administrative and procedural requirements for warranties required by the Contract Documents, including manufacturers standard warranties on products and special warranties.

1.02 SUBMITTAL

A. Submit written warranties to the Owner prior to the date fixed by the Engineer for Substantial Completion. If the Certificate of Substantial Completion designates a commencement date for warranties other than a date of Substantial Completion for the Work, or a designed portion of the Work, submit written warranties upon request of the Owner.

B. When a designated portion of the Work is completed and occupied or used by the Owner, by separate agreement with the Contractor during the construction period, submit properly executed warranties to the Owner prior to acceptance of this portion of the Work.

C. Refer to individual Sections of Division 2 through 16 for specific content requirements, and particular requirements for submittal of special warranties.

1.03 WARRANTY REQUIREMENT

A. Related Damages and Losses: When correcting warranted Work that has failed, remove and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted Work.

B. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.

C. Replacement Cost: Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of Contract Documents. The Contractor is responsible for the cost of replacing or

rebuilding defective Work regardless of whether the Owner has benefited from use of the Work through a portion of its anticipated useful service life.

D. Owner's Recourse: Written warranties made to the Owner are in addition to implied warranties, and shall not limit the duties, obligations, rights and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the Owner can enforce such other duties, obligations, rights, or remedies.

E. Rejection of Warranties: The Owner reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the contract Documents.

F. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products, nor does it relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.

1.04 DEFINITIONS

A. Standard Product Warranties are preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to the Owner.

B. Special Warranties are written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for the Owner.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

SECTION 01800

MAINTENANCE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Procedures for maintaining work completed under this Contract.

1.02 MAINTENANCE PERIOD

A. The general maintenance period for all construction or materials under this Contract shall be one (1) year subsequent to the date of the acceptance of the work by the Owner, or as provided by other sections of this Specification.

B. If the Owner puts any structure or equipment to use prior to acceptance of all work under the Contract, the maintenance period for such structures or equipment shall be calculated from the time use begins.

C. Contractor agrees to replace the material which does not conform to the Contract requirements, and to repair any damage of material or work without cost to the Owner, to satisfaction of Engineer, in conformance with Contract Documents provided orders for replacement and/or repairs are received in writing by the Contractor within the one year period.

D. This Section shall in no way limit the duration of the Contractor's responsibility for the correction of any defect due to workmanship or materials provided by the Contractor which are not in compliance with the Contract Documents.

1.03 ABUSE OF WORK

A. Contractor is not obligated to perform work of replacement or repair that he may prove is required because of abuse by parties other than the Contractor, after the date the Owner puts to continuous use the work requiring replacements or repair, or after date the Owner has approved the Certificate of Completion.

1.04 EMERGENCY REPAIRS

A. If the Owner deems necessary, the Owner shall order replacement or repairs be undertaken within 24 hours.

B. If the Contractor delays or fails to make the ordered replacement or repairs within the time specified, the Owner shall have the right to make such replacements or repairs and the expense shall be deducted from moneys due the Contractor, or moneys of the Contractor retained by the Owner.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

DIVISION 2

SECTION 02140

DEWATERING

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes

1. Requirements for designing, furnishing, installing, maintaining, operating and removal of temporary dewatering systems required to lower and control water levels and hydrostatic pressures during construction.
2. Requirements for disposing of pumped water.

B. Related Sections

1. Section 02200 – Earth Excavation, Backfill and Grading

1.02 DEFINITIONS

A. Dewatering: Lowering the zone of saturation and intercepting groundwater seepage which would otherwise emerge from the slopes or bottom of the excavations. The purposes of dewatering are to increase the stability of excavated slopes; prevent loss of material from beneath the slopes or bottom of the excavation; improve the excavating and hauling characteristics of on site soil; prevent rupture or heaving of the bottom of an excavation; and dispose of pumped water. In addition, dewatering is required to place and compact structural fill.

1.03 DESIGN REQUIREMENTS

A. The Contractor is responsible for the adequacy of the dewatering system.

B. Design dewatering systems to:

1. Effectively reduce the hydrostatic pressure and lower the groundwater levels to a minimum of 2 feet below excavation in soil;
2. Develop a substantially dry and stable subgrade for the protection of subsequent operations;
3. Result in no damage to adjacent buildings, structures, utilities and other work, included in this contract.
4. Depressurize stratified layers of sand that may be confined by silt layers so that a stable excavation bottom is maintained.

C. Methods may include sump pumping, single or multiple stage well point or jet eductor well point systems, deep wells, or combinations thereof.

D. Locate dewatering facilities where they will not interfere with existing utilities, facilities and/or construction work to be done under this Contract.

E. Contractor is responsible to obtain all necessary permits from state and local authorities regarding the operation and discharge of the dewatering system, and to conduct all necessary sampling and testing that may be required by those authorities.

1.04 SUBMITTALS

A. Shop Drawings

1. In accordance with Section 01300 submit the following prior to dewatering system installation:

   a. Proposed system components.
   b. Operational plan to include locations and depth of components.
   c. Method of disposal of pumped water, including method of insuring proper sediment removal should upset in dewatering system occur.

2. Provide test pit data.

   a. Depth
   b. Soil material encountered
   c. Depth to groundwater
   d. Depth to sewer

B. Quality Assurance/Control Submittals

1. In accordance with Section 01300 submit the following:

   a. Dewatering systems to be designed under the direct supervision of a professional Civil Engineer registered in the state which the work is to be done.
   b. Complete Certificate of Design at the end of this section.
   c. Provide documentation demonstrating ability and experience of installing contractor for the type of conditions under this contract.
   d. Names, addresses and telephone numbers of supervisory personnel actively involved in at least five successful projects requiring dewatering.

1.05 PROJECT/SITE CONDITIONS

A. Environmental Requirements

1. Dispose of all pumped water in accordance with all U.S. Environmental Protection Agency, Rhode Island Department of Environmental Management (RIDEM), and Town of Bristol requirements.

B. Existing Conditions

1. Groundwater surface is subject to fluctuations during periods of heavy precipitation.
2. Conduct test pits during the initial phases of work to determine soil conditions.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

3.01 SITE PREPARATION

A. Surface Drainage

1. Construct dikes, ditches, pipe lines, sumps or other means to intercept and divert precipitation and surface water away from excavations.

B. Drainage of Excavated Areas

1. Construct dikes, ditches, pipe lines, sumps or other means to collect surface and seepage water which may enter the excavation.
2. Discharge water through settling basins or method approved by Engineer when water is to be deposited into an existing watercourse.

3.02 INSTALLATION

A. Advise Engineer of changes made to Operation Plan as submitted under article 1.05 of this section, made to accommodate field conditions.

3.03 MONITORING

A. Observe and record daily the elevation of the groundwater during the length of the dewatering operation and provide data to Engineer on daily basis.

3.04 OPERATION

A. Operate dewatering systems to lower the groundwater level in excavations allowing all subsequent work to be done on a stable dry subgrade.

B. Modify dewatering procedures which cause, or threaten to cause, damage to new or existing facilities, to prevent further damage. Modifications made at no additional expense to the Owner.

C. Maintain the water level a minimum of two (2) feet below subgrade or at lower elevation to eliminate hydrostatic pressure on structures.

D. Prevent disturbance of foundation soils and loss of ground as water is removed.

E. Notify the Engineer of disturbance to the foundation soils caused by an interruption or inadequacy of the dewatering system.

F. Maintain on site, auxiliary equipment to operate the dewatering system continuously while excavations are opened below elevation of final grade.

3.05 DISPOSAL OF WATER

A. Discharge water in a manner that will not cause erosion, flooding, damage to existing facilities, completed Work or adjacent property, improved or otherwise.

3.06 REMOVAL

A. Remove all material and equipment from the site upon completion of dewatering operations.

B. Seal all dewatering wells upon completion of the dewatering by pressure injecting a grout capable of sealing the wells and preventing leakage.

END OF SECTION

CERTIFICATE OF DESIGN

Re: Contract Between

OWNER: _____
(Name)

and

CONTRACTOR: _____
(Name)

on

CONTRACT: _____
(Title)

_____ Dated:_____
(Number)

Contractor hereby certifies that_____
(Designer)

1. Is licensed or registered to perform professional engineering work in the state of

_____
(Location of Project)

2. Is qualified to design the_____
(Item)
specified in Section_____ of the subject contract;

3. Has designed_____before;

4. Has prepared the design in full compliance with the applications and requirements of Section_____ of subject contract including all applicable laws, regulations, rules and codes; and

5. The work has been signed and sealed pursuant to the applicable state law.

FOR: _____
(Contractor)

BY: _____
(Signature)

_____ Dated:_____
(Name and Title)

SECTION 02141
TEMPORARY COFFERDAMS AND CONTROL OF WATER

PART 1 GENERAL

1.01 SUMMARY

A. Temporary Cofferdams and Control of Water shall be in accordance with Section 203 and 208 of the 2022 Edition Rhode Island Department of Transportation Standard Specifications for Road & Bridge Construction and the following. Control of Water criteria in the specification is intended to be used only in conjunction with removal of the existing stone masonry retaining wall and construction of the new stone masonry retaining wall. The Contractor is directed to Section 02140 for dewatering requirements not related to construction of the stone masonry retaining wall.

B. The work shall consist of furnishing, installing, maintaining, and removing temporary dewatering systems for the rebuilding of the masonry retaining wall. The work of this item shall also include all actions necessary to move, remove, replace, and/or protect water control measures, personnel, equipment, and work-in-progress in the event of high flows in the harbor.

C. Uncontaminated groundwater shall be pumped out of the excavation area to dewatering basins to remove sediments (to the maximum extent possible). Adequate sizing and location of the dewatering basin shall be determined by the Contractor, in accordance with the Soil Erosion and Sediment Control Plan.

D. Prior to working in the stream bed of the Wickford Harbor, the Contractor will submit shop drawings and design calculations to the Engineer for approval in accordance with Subsection 105.02 of the Standard Specifications. The procedure and drawings shall depict the proposed materials and methods of controlling and dewatering the Wickford Harbor for the removal of the existing stone wall, excavation, and placement of new stone masonry wall to the limits shown on the contract drawings. These plans shall be in conformance with the Plans and these specifications. The procedure and drawings must always allow for the continued normal flow of the harbor through diversion of the water around the work site. The materials and methods not specifically mentioned shall comply with the Standard Specifications where applicable.

E. The Engineer has the right to order the Contractor to stop all operations when in his judgement the Contractor's water control operations are failing to produce adequate results or are posing a threat to the environment.

PART 2 EXECUTION

2.01 METHOD OF CONSTRUCTION

A. The Contractor shall construct and maintain all necessary portable dams, cofferdams, and other temporary diversion and protective works; shall furnish all materials required therefore; and shall furnish, install, maintain and operate all necessary equipment for the temporary dewatering systems from the work area, as stated in these specifications. During stone wall removal and stone masonry placement operations the Contractor shall divert the flow of water away from the existing wall down to existing stream bed elevations.

B. Maintenance of Water Diversion Systems: Throughout the period that work areas are kept dewatered, water diversion systems (i.e. portable dams, cofferdams) shall be inspected regularly by the Contractor and properly maintained. Sufficient materials and equipment shall be available on site to carry out any repair work that may be required.

C. Removal of Temporary Facilities: After having served their purpose, all temporary water diversion systems and other diversion and protective works shall be completely removed. The Contractor shall be responsible for complete and proper diversion of water during all stages of this project and shall repair, at no expense to the Department, any damage to the foundations, structures, or any other part of the work caused by floods, high water, or failure of any part of the diversion of protective works for any cause whatsoever. Upon completion of all work, the Contractor shall remove and legally dispose all sediments collected in ponds. Sediment ponds shall be filled with suitable, compacted fill and the site shall be graded to near existing topography.

D. Contractor's Wastewater: All water which has been polluted by materials such as sediment, oil, grease, cement and concrete, paints or chemicals used by the Contractor's operation shall be disposed of in an approved manner and in accordance with all applicable permits and local, state, and federal regulations. Temporary sediment basins or method approved by the Engineer shall be utilized to appropriately control discharged groundwater or accumulated stormwater, in accordance with the Soil Erosion and Sediment Control Plan. It shall be the contractor's responsibility that no wastewater enters the harbor at any point in time.

END OF SECTION

SECTION 02160

TEMPORARY EARTH RETAINING SYSTEMS

PART 1 GENERAL

1.01 DESCRIPTION

A. The work under this Item shall consist of the installation and removal of temporary earth retaining systems required to retain excavations for the removal and replacement of the existing stone masonry wall. The temporary earth retaining systems shall be installed and removed in accordance with the Section 805 of the Standard Specifications, except as herein specified, or as directed by the Engineer. Payment for Cofferdam in front of wall shall be paid separately in accordance with Section 02141.

B. The Contractor shall properly design and furnish all labor and materials necessary and shall construct complete, all sheeting, bracing supports, and appurtenances required to perform the Work including sheet piling for construction of structures and buildings, trench support and cofferdams, permanent and temporary alike, as indicated on the Drawings and specified or as otherwise directed by the Engineer or required by agencies having jurisdiction over the Work.

C. Wood timber or steel sheeting shall be used except where otherwise indicated, specified, or directed by the Engineer and agencies having jurisdiction over the work.

1.02 DESIGN RESPONSIBILITY

A. The Contractor shall be fully responsible for providing complete and adequately designed sheeting as required and/or directed by the Engineer in accordance with the provisions set forth herein. The sheeting shall be designed to resist hydrostatic pressures in accordance with the Contractor’s dewatering design.

B. The Contractor shall engage, at his own expense, the services of a fully competent and qualified Professional Engineer, hereinafter referred to as the "Contractor's Engineer", registered in the State in which the Work is being constructed, for the design of all sheeting requirements to accomplish the Work specified, and for supervising the proper on-site installation associated therewith. The Contractor's Engineer shall be acceptable to the Engineer and demonstrate a minimum of ten (10) years documented experience in the field of sheeting design and implementation. Prior to the actual employment of the Contractor's Engineer, the Contractor shall submit to the Engineer, to the full extent deemed necessary, a detailed resume stating the Contractor's Engineer's professional qualifications, related experience and references, and if requested, examples of work similar to that required for the Work specified, for a general review by the Engineer and a means of documenting the requisite experience hereinbefore specified. Only after a satisfactory review of the Contractor's Engineer's overall qualifications by the Engineer in fulfillment of the requisite experience hereinbefore specified shall the Contractor finalize such employment and begin the design aspects of the Work.

C. The Contractor's attention is directed to the fact the acceptance of the Contractor's Engineer and/or his/her qualifications by the Owner and/or Engineer shall not be an overall approval of the Contractor's Engineer nor the sheeting designs and methods of installation employed

during the Work. It being understood that all sheeting requirements necessary to accomplish the Work specified and/or indicated on the Drawings shall be designed by and installed under the direct supervision of the Contractor's Engineer who shall ultimately and fully bear the responsibility for that Work.

1.03 QUALITY ASSURANCE

A. The Contractor's Engineer shall provide and maintain throughout the sheeting installation and/or Work sufficient supervision and technical guidance to the Contractor for proper sheeting materials, equipment, operations and methods to the extent necessary to assure strict compliance with the Contractor's Engineer's design, all safety procedures and standard requirements for such Work, and the successful completion of the Work. Failure to provide and/or maintain such supervision and/or technical guidance during the Work shall in no way relieve the Contractor's Engineer and/or the Contractor from their overall responsibilities and obligations under the Contract, nor shall it be a basis for any claim by either against the Owner and/or Engineer.

B. The Contractor and Contractor's Engineer shall fully indemnify and save harmless the Owner and Engineer and their agents, employees and representatives, from and against any and all claims as stipulated under the Agreement, whether directly or indirectly arising out of, relating to or in connection with the Work.

C. Quality assurances and proper safety procedures must be maintained at all times and be in strict accordance with the Contractor's Engineer's requirements and consistent with all federal, state and local regulatory agencies having jurisdiction over the Work. Should any conflict in requirements, regulations, restrictions or codes exist between that which is specified by the Contractor's Engineer and any federal, state or local agency, the more stringent application shall prevail.

1.04 PRODUCTS AND DESIGN CRITERIA

A. The overall sheeting design, quality of materials and methods of installation for all sheeting applications necessary to accomplish the Work specified shall be consistent with the established standards of the construction industry and must, as a minimum, comply with the requirements for earth support systems for excavations as defined by current US Department of Labor, Occupational Safety and Health Act (OSHA) regulation applicable thereto, and any other federal, state and local agencies having jurisdiction and/or requirements pertaining thereto including Building Code requirements for the State in which the work is being performed. The design and implementation thereof shall be in accordance with sound engineering practice and modern accepted principles of soil mechanics, and shall include the effects of hydrostatic forces and all surcharge loads which may be reasonable anticipated. The methods employed shall be to the extent necessary to permit the proper and satisfactory installation and construction of the Work specified; to withstand all loads and forces encountered; to provide soil restraint and control of water as required; to insure the safety of the workers and all other personnel on or near the site; to prevent injurious caving or erosion, or loss of ground; to maintain at all times proper and safe pedestrian, vehicular traffic on public and private streets, property and rights-of-way; and to stabilize unforeseen areas of work encountered during the execution of the Work as deemed necessary by the Owner and/or Engineer.

B. The Contractor and Contractor's Engineer's attention is directed to the fact that should any additional investigations, subsurface explorations and/or other appurtenant information be required to fulfill the needs of this design, as determined by the Contractor's Engineer above and beyond that which is already provided under these Contract Documents, the Contractor shall obtain all such information and data required at his own expense.

1.05 SHOP DRAWINGS AND/OR DESCRIPTIVE LITERATURE

A. Prior to the installation of any sheeting, the Contractor shall submit to the Engineer for documentation ONLY, complete sheeting layout and detail drawings and sheeting descriptions bearing the Contractor's Engineer's State of Rhode Island Professional Seal and signature. Said submission shall be for informational purposes only as a means of documenting the work to be performed and will not be considered an approval or disapproval of the design and/or the implementation thereof. This submission will not relieve the Contractor of the sole responsibility for the adequacy of the system nor shall it be construed as an approval or guarantee that the Contractor's proposed equipment, materials and methods for the sheeting, bracing or appurtenances will be adequate for the work required at the locations of and for the Work required by this Contract.

B. Included as part of this submission, the Contractor's Engineer must provide a complete listing of all references, codes and specifications used by the Contractor's Engineer and required by any federal, state or local agency having jurisdiction, and to which the sheeting design conforms.

C. Specific design calculations are not to be submitted to the Engineer. In the event design calculations are submitted to the Engineer, they shall be returned to the Contractor without review or checking by the Engineer.

1.06 CERTIFICATE OF DESIGN

A. The Contractor's special attention is directed to the required "Certificate of Design", the form of which is provided at the end of this Section. The Contractor and Contractor's Engineer shall complete this "Certificate" in its entirety for each location of work to be done, and any revisions associated there with, and submit it simultaneously with, as an integral part thereof, the sheeting submission. Any submission made without the completed "Certificate", appropriately signed and sealed, shall be returned to the Contractor. The Owner and/or Engineer hereby reserves the right to delay sheeting work and/or any work associated with, or dependent upon, the proper implementation of sheeting, without cause for claim against the Owner or Engineer, until a complete and appropriate submission is rendered. This Certification shall indicate that the sheeting, bracing and all appurtenances related thereto are designed to withstand the required loads, forces to be encountered, and to provide soil and water control, and are in compliance with these specifications and all federal, state or local agencies having jurisdiction over the Work to be performed.

PART 2 PRODUCTS

2.01 MATERIALS

A. Timber sheeting and bracing:

1. Timber sheeting and bracing may be of any species of wood which will satisfactorily withstand all driving and construction stresses and the loads to which the members will be subjected. Sheeting shall not be less than 3 inches nominal thickness and shall be provided with continuous interlocks. All timber sheeting and bracing shall be free from worm-holes, windshakes, loose knots, decayed or unsound portions or other defects which might impair its strength or tightness.

B. Steel sheeting:

1. The shapes, sizes, and lengths of steel sheeting to be utilized are optional with the Contractor, providing they are satisfactory to withstand all driving and construction stresses and provided with continuous interlocks.

C. Bracing, Hardware and Fastenings:

1. Bracing and other supports whether of steel or of timber, shall be of the strength and dimensions necessary to satisfactorily withstand the loads to which they will be subjected. All bracing and other supports shall be free from any defects which might impair this strength. The Contractor shall provide all necessary hardware and fastenings necessary in connections with satisfactory installation of all sheeting and bracing.

PART 3 EXECUTION

3.01 INSTALLATION

A. The Contractor shall be fully responsible for ensuring adequate safety measures are provided at all times and shall comply with all safety requirements of federal, state and local agencies having jurisdiction over the Work. Installation of the sheeting including all bracing, supports and appurtenances, shall be adequate to permit the performance of the Work and be in accordance with the requirements of the Contractor's Engineer and the sheeting design associated therewith.

B. Any movements of sheeting and/or appurtenances which prevent the proper completion of the work shall be corrected at the expense of the Contractor.

C. Sheeting shall be installed in a manner which will prevent the disturbance of the surrounding surface, subsurface conditions and/or structures. Any such disturbances shall be corrected at the Contractor's expense and to the satisfaction of the Engineer.

3.02 REMOVAL

A. All sheeting shall be removed except as shown on the Contract Drawings or directed by the Engineer.

B. All sheeting approved for removal by the Engineer shall become the property of the Contractor.

C. All restoration and clean up shall be as indicated and as specified.

CERTIFICATE OF DESIGN

_____(Owner)

Contract Reference: _____

_____, dated _____.

In accordance with the provisions of the above referenced Contract, as the designated Contractor,

_____

_____
(Contractor's Name and Address)

hereby certifies that _____

_____
(Contractor's Engineer's Name and Address)

(1) Is properly licensed and currently registered as a Professional Engineer in the State (or Commonwealth) of _____;

(2) Is fully qualified to design and supervise the _____

_____
(Item of work and location)

In accordance with the provision specified under the appropriate Section and/or Subsections of the Contract Documents:

(3) Has successfully designed and supervised _____

_____
(Item of work)

before and demonstrates a minimum of ten (10) documented years of proven experience in such field;

(4) Has personally examined the type(s) and locations(s) of the Work required under this Contract, and the overall conditions associated therewith, to the extent necessary to fully satisfy his or her professional responsibilities for designing and supervising the above referenced work;

(5) Has prepared the attached design in full compliance with the applications and requirements of the Contract Documents, sound engineering practice, modern accepted principles of construction, and all applicable federal, state and local laws, regulations, rules and codes having jurisdiction over the Work;

(6) Will provide sufficient supervision and technical guidance to the Contractor throughout the Work to ensure compliance with the design and all quality assurances necessary to successfully complete the Work;

(7) Hereby indemnifies and holds harmless the_____

_____and BETA Group, Inc.,
(name of owner)

and their agents, employees and representatives, from and against any and all claims, whether directly or indirectly, arising out of, relating to or in connection with the Work; and

(8) This "Certificate of Design" together with all applicable designs, drawings, details, specifications on other related documents necessary to complete the Work as specified, have been signed and sealed pursuant to applicable state law.

In recognition and observance of the above referenced statements, the undersigned parties hereby acknowledge and accept the responsibilities and obligations associated therewith.

CONTRACTOR:	CONTRACTOR'S ENGINEER:
_____	_____
(Contractor's Name)	(Engineer's Name)
_____	_____
By: _____	By: _____
_____	_____
(Name and Title)	(Name and Title)
Date: _____	Date: _____
(SEAL)	(P.E. STAMP)

(Note: Contractor to fully reference all attachments below)

_____

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END OF SECTION

SECTION 02200

EARTH EXCAVATION, BACKFILL, FILL AND GRADING

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes

1. Requirements for; excavating in earth for trenches and structures; backfilling excavations; furnishing necessary material; compaction; constructing embankments and fills; miscellaneous earth excavations and miscellaneous grading.

B. Related Sections

1. Section 01025 - Measurement and Payment
2. Section 01410 - Testing Laboratory Services
3. Section 02140 – Dewatering
4. Section 02149 – Maintaining Existing Flow
5. Section 02160 – Excavation Support
6. Section 02215 - Aggregate Materials
7. Section 03300 - Cast-In-Place Concrete

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM).

1. D1557, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2,700 kN-m/m^3)).

1.03 MEASUREMENT AND PAYMENT PROCEDURES

A. Test Pits

1. Where determination of the exact location of pipe or other underground structure is necessary for doing the work properly, the Contractor may be required to excavate test pits to determine such locations. When such test pits may be properly considered as incidental to other excavation, the Contractor shall receive no additional compensation, the work being understood to be included as part of the excavation. When the Engineer orders test pits beyond the limits of excavation he considers a part of the work, such test pits shall be paid for as specified in SECTION 01025.

1.04 QUALITY ASSURANCE

A. Field Samples

1. Provide samples of materials as requested by the Engineer, to the Quality Control Engineer hired by the Owner, prior to delivery of materials on site, in order to facilitate field testing of compaction operations and material properties.

1.05 PROJECT/SITE CONDITIONS

A. Existing Conditions

1. There are pipes, drains, and other utilities in locations not indicated on drawings, no attempt has been made to show all services, and completeness or accuracy of information given is not guaranteed.

1.06 MAINTENANCE

A. Maintain all work in accordance with SECTION 01800.

PART 2 PRODUCTS

2.01 MATERIALS

A. Suitable Aggregate

1. The nature of materials will govern both acceptability for backfill and methods best suited for placement and compaction.
2. All material whether from excavations or from borrow pits, after being placed and properly compact, will make a dense stable fill and containing no vegetation, masses of roots, individual roots more than 18 inches long, or more than 1/2 inch in diameter, stones over 6 inches in diameter, or porous matter.
3. Organic matter to be well distributed and not to exceed minor quantities.

B. Trench and Excavation Backfill

1. In general, and unless other material is indicated on drawings or specified, material used for backfilling trenches and excavations shall be suitable material which was removed in the course of making the construction excavations. If sufficient suitable material is not available from the excavations, the backfill material shall be crushed stone, gravel borrow or select borrow as directed by the Engineer, in according to respective Specification Sections.

C. Structure Backfill

1. Unless otherwise indicated or specified, all fill and backfill under structures and pavement adjacent to structures shall be compacted gravel borrow containing not more than 10 percent material passing a 200 sieve. When coarse aggregate and fine aggregate are indicated or specified for use under structures, they shall conform to the requirements for coarse and fine aggregate specified in SECTION 03300.

D. Filling and Embankment Backfill

1. Suitable selected materials available from the excavations and not required for backfill around pipes or against structures may be used for filling and building embankments, except as otherwise specified. Material needed in addition to that available from construction operations shall be obtained from suitable gravel banks or other suitable deposits. The Contractor shall furnish, at his own expense, all borrow material needed on the work.

E. Additional materials

1. Concrete: In accordance with SECTION 03300.
2. Crushed stone: In accordance with SECTION 02215.
3. Gravel borrow: In accordance with SECTION 02215.
4. Selected borrow: In accordance with SECTION 02215.

2.02 EQUIPMENT

A. Well Points

1. Designed to drain soil and prevent saturated soil from flowing into excavation.

B. Pumping Units

1. Designed for use with the wellpoints, capable of maintaining a high vacuum and, handling large volumes of air and water at the same time.

C. Underdrain Pipe

1. HDPE pipe enclosed in crushed stone encased in filter fabric.
2. Sewer pipe of quality known as "seconds".

2.03 SOURCE QUALITY CONTROL

A. Provide Engineer with access to location of off site sources of materials.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify all existing utilities and facilities prior to excavation.

3.02 PROTECTION

A. Utilities

1. Support and protect from damage existing pipes, poles, wires, fences, curbing, property line markers, and other structures, which the Engineer decides must be preserved in place without being temporarily or permanently relocated.
2. Restore items damaged during construction without compensation, to a condition at least equal prior to construction.

B. Trees

1. Enclose the trunks of trees adjacent to work with substantial wooden boxes of height necessary to protect trees from injury from piled material, equipment, operations or otherwise.
2. Employ excavating machinery and cranes of suitable type and size and operate with care to prevent injury to trees not to be cut and particularly to overhanging branches and limbs.
3. When trimming is required, make all cuts smooth and neat without splitting or crushing.
4. Cover cut areas with an application of grafting wax or tree healing paint.
5. Branches, limbs, and roots shall not be cut except by permission of the Engineer.

C. Plantings

1. Protect by suitable means or temporarily replant and maintain cultivated hedges, shrubs, and plants which may be injured by the Contractor's operations
2. Replant in their original positions and care for until growth is re-established, once the construction operations have been substantially completed.
3. If cultivated hedges, shrubs, and plants are injured to such a degree as to affect their growth or diminish their beauty or usefulness, they shall be replaced by items of kind and quality at least equal to which existed prior to the start of the Work.

D. Paved surfaces

1. Do not use or operate tractors, bulldozers, or other power-operated equipment with treads or wheels shaped as to cut or injure paved surfaces.
2. All surfaces which have been injured by the Contractor's operations shall be restored to a condition at least equal to which existed prior to start of the Work.
3. Suitable materials and methods shall be used for such restoration.

3.03 PREPARATION

A. Pavement Removal

1. Remove only existing pavement as necessary for the prosecution of the work.
2. Engineer may require that pavement be cut with pneumatic tools or saws without extra compensation to Contractor, where in the opinion of the Engineer it is necessary to prevent damage to the remaining road surface.
3. Dispose of large pieces of broken pavement before proceeding with excavation.

B. Top Soil Removal

1. Unless otherwise noted, from areas which excavations are to be made, loam and topsoil shall be carefully removed and separately stored to be used again as directed; or, if the Contractor prefers not to separate surface materials, he shall furnish, as directed, loam and topsoil at least equal in quantity and quality to that excavated, at no cost to the owner.

C. Subgrade

1. Remove loam and topsoil, loose vegetable matter, stumps, large roots, etc., from areas where embankments will be built or material will be placed for grading.
2. Shape as indicated on the drawings and prepare by forking, furrowing, or plowing to bond first layer of the new material placed.

3.04 RELOCATION AND REPLACEMENT OF EXISTING STRUCTURES

A. The structures to which the provisions of this article apply include pipes, wires, and other structures which meet all of the following:

1. Are not indicated on the drawings or otherwise provided for.
2. Encroach upon or are encountered near and substantially parallel to the edge of the excavation.
3. In the opinion of the Engineer will impede progress to such an extent that satisfactory construction cannot proceed until they have been changed in location, removed (to be later restored), or replaced.

B. In removing existing pipes or other structures, the Contractor should use care to avoid damage to materials, and the Engineer shall include for payment only those new

materials which, in his judgment, are necessary to replace those unavoidably damaged.

C. Whenever the Contractor encounters certain existing structures as described above and is so ordered in writing, he shall do the whole or such portions of the work as he may be directed to change the location of, remove and later restore, or replace such structures, or to assist the Owner thereof in so doing. For all such work, the Contractor shall be paid under such items of work as may be applicable, otherwise as Extra Work.

D. When fences interfere with the Contractor's operations, he shall remove and (unless otherwise specified) later restore them to a condition which existed prior to the start of the Work, all without additional compensation. The restoration of fences shall be done as promptly as possible and not left until the end of the construction period.

3.05 SHEETING AND BRACING

A. Provide in accordance with specification Section 02160.

3.06 DEWATERING

A. Provide in accordance with specification Section 02140.

3.07 EXCAVATION

A. Execute operation of dewatering, sheeting and bracing without undermining or disturbing foundations of existing structures or of work previously completed under this contract.

B. Excavate to widths that provide suitable room for:

1. Building structures or laying and jointing piping.
2. Placing all sheeting, bracing, and supports.
3. Cofferdamming, pumping and draining.

C. Render bottom of excavations firm, dry and acceptable in all respects.

D. Do not plow, scrap or dig by machinery, earth at finished subgrade which results in disturbance of material below subgrade, unless indicated or specified, and remove with pick and shovel, last of material to be excavated, just before placing pipe, masonry or other structure.

E. Make all excavations in open, except as otherwise specified or permitted.

F. Excavation Near Existing Facilities

1. As the excavation approaches pipes, conduits, or other underground structures, digging by machinery shall be discontinued and the excavation shall be done by means of hand tools. Such manual excavation when incidental to normal excavation shall be included in the work to be done under items involving normal excavation.

G. Unauthorized Excavation

1. If the bottom of any excavation is taken out beyond the limits indicated or prescribed, the resulting void shall be backfilled at the Contractor's expense with thoroughly compacted gravel borrow, if the excavation was for a pipeline, or with Class B concrete, if the excavation was for a masonry structure.

H. Unsuitable Material

1. If material unsuitable for foundation (in the opinion of the Engineer) is found at or below the grade to which excavation would normally be carried in accordance with the drawings and/or specifications, the Contractor shall remove such material to the required width and depth and replace it with thoroughly compacted, crushed stone, gravel borrow, fine aggregate or concrete as directed.

3.08 TRENCHING

A. Trench Excavation

1. Where pipe is to be laid in specified bedding material or concrete cradle, the trench may be excavated by machinery to, or to just below, the designated subgrade, provided that the material remaining at the bottom of the trench is no more than slightly disturbed, as approved by the Engineer.
2. Where pipe is to be laid directly on the trench bottom, the lower part of trenches in earth shall not be excavated to subgrade by machinery, but, just before the pipe is to be placed, the last of the material to be excavated shall be removed by means of hand tools to form a flat or shaped bottom, true to grade, so that the pipe will have a uniform and continuous bearing and support on firm and undisturbed material between joints except for limited areas where the use of pipe slings may have disturbed the bottom.

B. Depth Of Trench

1. Excavate trench to depths permitting the pipe to be laid at the elevations, slopes, or depths of cover indicated on the drawings, and at uniform slopes between indicated elevations.

C. Width Of Trench

1. Excavate trench as narrow as practicable and do not widen by scraping or loosening materials from the sides. Every effort shall be made to keep the sides of the trenches firm and undisturbed until backfilling has been completed and consolidated.
2. Excavate trenches with approximately vertical sides between the elevation of the center of the pipe and an elevation 1 ft. above the top of the pipe.

D. Trench Excavation In Fill

1. If pipe is to be laid in embankments or other recently filled material, the material shall first be placed to the top of the fill or to a height of at least 1 ft. above the top of the pipe, whichever is the lesser. Particular care shall be taken to ensure maximum consolidation of material under the pipe location. The pipe trench shall then be excavated as though in undisturbed material.

E. Length of trench open at any one time will be controlled by conditions, subject to any limits that may be prescribed by Engineer.

3.09 BACKFILLING

A. General

1. Frozen material shall not be placed in the backfill nor shall backfill be placed upon frozen material. Previously frozen material shall be removed or shall be otherwise treated as required, before new backfill is placed.

B. Fill And Backfill Under Structures

1. The fill and backfill materials shall be placed in layers not exceeding 6 in. in thickness. Unless otherwise indicated or specified, each layer shall be compacted to 95 percent in accordance with ASTM D1557.

C. Backfilling Around Structures

1. Do not place backfill against or on structures until they have attained sufficient strength to support the loads (including construction loads) to which they will be subjected, without distortion, cracking, or other damage. As soon as practicable after the structures are structurally adequate and other necessary work has been done, special leakage tests, if required, shall be made. Promptly after the completion of such tests, the backfilling shall be started and then shall proceed until its completion. The best of the excavated materials shall be used in backfilling within 2 ft. of the structure. Unequal soil pressures shall be avoided by depositing the material evenly around the structure.
2. The material shall be placed and compacted to 90 percent in accordance with ASTM D1557 unless otherwise indicated or specified.

D. Backfilling Pipe Trenches

1. As soon as practicable after the pipes have been laid and the joints have acquired a suitable degree of hardness, if applicable, or the structures have been built and are structurally adequate to support the loads, including construction loads to which they will be subjected, the backfilling shall be started and thereafter it shall proceed until its completion.
2. With the exception mentioned below in this paragraph, trenches shall not be backfilled at pipe joints until after that section of the pipeline has successfully passed any specified tests required. Should the Contractor wish to minimize the maintenance of lights and barricades and the obstruction of traffic, he may, at his own risk backfill the entire trench, omitting or including backfill at joints as soon as practicable after the joints have acquired a suitable degree of hardness, if applicable, and the related structures have acquired a suitable degree of strength. He shall, however, be responsible for removing and later replacing such backfill, at his own expense, should he be ordered to do so in order to locate and repair or replace leaking or defective joints or pipe.
3. No stone or rock fragment larger than 12 in. in greatest dimension shall be placed in the backfill nor shall large masses of backfill material be dropped into the trench in such a manner as to endanger the pipeline. If necessary, a timber grillage shall be used to break the fall of material dropped from a height of more than 5 ft. Pieces of bituminous pavement shall be excluded from the backfill unless their use is expressly permitted, in which case they shall be broken up as directed.
4. Zone Around Pipe
    a. Backfilled with the materials and to the limits indicated on the drawings.
    b. Material shall be compacted to 90 percent by tamping.
5. Remainder of Trench
    a. Compact by water-jetting, or tamping, in accordance with the nature of the material to 95 percent in accordance with ASTM D1557. Water-jetting may be used wherever the material does not contain so much clay or loam as to delay or prevent satisfactory drainage. However, tamping shall be used if water-jetting does not compact the material to the density required.
6. Excavated material which is acceptable to the Engineer for surfacing or pavement subbase shall be placed at the top of the backfill to such depths as may be specified elsewhere or as directed. The surface shall be brought to the required grade and stones raked out and removed.

E. Placing And Compacting Embankment Material

1. After the subgrade has been prepared as hereinbefore specified, the material shall be placed thereon and built up in successive layers until it has reached the required elevation.

2. Layers shall not exceed 12 in. in thickness before compaction. In embankments at structures, the layers shall have a slight downward slope away from the structure; in other embankments the layers shall have a slight downward slope away from the center. In general, the finer and less pervious materials shall be placed against the structures or in the center, and the coarser and more pervious materials, upon the outer parts of embankments.

3. Each layer of material shall be compacted by the use of approved rollers or other approved means so as to secure a dense, stable, and thoroughly compacted mass. At such points as cannot be reached by mobile mechanical equipment, the materials shall be thoroughly compacted by the use of suitable power-driven tampers.

4. Previously placed or new materials shall be moistened by sprinkling, if required, to ensure proper bond and compaction. No compacting shall be done when the material is too wet, from either rain or too great an application of water, to compact it properly; at such times the work shall be suspended until the previously placed and new materials have dried out sufficiently to permit proper compaction, or such other precautions shall be taken as may be necessary to obtain proper compaction.

5. The portion of embankments constructed below proposed structures shall be compacted to 95 percent in accordance with ASTM D1557. The top 2 ft. of an embankment below a pavement base shall be compacted to 95 percent. All other embankments shall be compacted to 90 percent in accordance with ASTM D1557.

3.10 METHODS OF COMPACTION

A. Water-Jetting

1. Saturate backfill material throughout its full depth and at frequent intervals across and along the trench until all slumping ceases.

2. Furnish one or more jet pipes, each of sufficient length to reach the specified depth and of sufficient diameter (not less than 1-1/4 in.) to supply an adequate flow of water to compact the material.

3. Equip jet pipe with a quick-acting valve, supply water through a fire hose from a hydrant or a pump having adequate pressure and capacity to achieve the required results.

B. Tamping and Rolling

1. Deposit backfill material and spread in uniform, parallel layers not exceeding 8 in. thick before compaction. Before the next layer is placed, each layer shall be tamped to obtain a thoroughly compacted mass. Care shall be taken that the material close to the bank, as well as in all other portions of the trench, is thoroughly compacted. When the trench width and the depth to which backfill has been placed are sufficient to make it feasible, and it can be done effectively

and without damage to the pipe, backfill may, on approval, be compacted by the use of suitable rollers, tractors, or similar power equipment instead of by tamping. For compaction by tamping (or rolling), the rate at which backfilling material is deposited in the trench shall not exceed that permitted by the facilities for its spreading, leveling, and compacting.

2. If necessary to ensure proper compaction by tamping (or rolling), the backfill material shall first be wet by sprinkling. However, no compaction by tamping (or rolling) shall be done when the material is too wet either from rain or too great an application of water to be compacted properly; at such times the work shall be suspended until the previously placed and new materials have dried out sufficiently to permit proper compacting, or such other precautions shall be taken as may be necessary to obtain proper compaction.

C. Miscellaneous Requirements.

1. Whatever method of compacting backfill is used, care shall be taken that stones and lumps shall not become nested and that all voids between stones shall be completely filled with fine material. Only suitable quantities of stones and rock fragments shall be used in the backfill; the Contractor shall, as part of the work done under the items involving earth excavation and rock excavation as appropriate, furnish and place all other necessary backfill material.

2. All voids left by the removal of sheeting shall be completely backfilled with suitable materials, and thoroughly compacted.

3.11 DISPOSAL OF SURPLUS EXCAVATED MATERIALS

A. No excavated materials shall be removed from the site of the work or disposed of by the Contractor except as directed or permitted by the Engineer.

B. Surplus excavated materials suitable for backfill shall be used to backfill normal excavations in rock or to replace other materials unacceptable for use as backfill; shall be neatly deposited and graded so as to make or widen fills, flatten side slopes, or fill depressions; or shall be neatly deposited for other purposes within a haul of 1 mile from the point of excavation; all as directed or permitted and without additional compensation. Prior to re-use of in-situ material, the material shall be tested to determine if the material meets the requirements of applicable Specification Section for crushed stone, gravel borrow, or select borrow.

C. Surplus excavated materials not needed as specified above shall be hauled away and dumped by the Contractor, at his expense, at appropriate locations, and in accordance with arrangements made by him.

3.12 DUST CONTROL

A. During the progress of the Work, maintain the area of activities, by sweeping and sprinkling of streets to minimize the creation and dispersion of dust. If the Engineer

decides that it is necessary to use calcium chloride for more effective dust control, the Contractor shall furnish and spread the material, as directed.

3.13 BRIDGING TRENCHES

A. Provide suitable and safe bridges and other crossings where required for the accommodation of travel, and to provide access to private property during construction. Remove once bridges and crossings are no longer needed.

3.14 FIELD QUALITY CONTROL

A. Site Tests

1. In accordance with SECTION 01410

3.15 CARE AND RESTORATION OF PROPERTY

A. Restoration of existing property or structures shall be completed within 5 business days of completing the work within the property. and not left until the end of the construction period.

END OF SECTION

SECTION 02201

STRUCTURAL EXCAVATION EARTH

PART 1 GENERAL

1.01 SUMMARY

A. Structural Excavation Earth shall be in accordance with Section 203 of the 2022 Edition Rhode Island Department of Transportation Standard Specifications for Road & Bridge Construction and the following.

B. Requirements for structural earth excavation behind, beneath, and in front of the existing stone retaining wall to be removed. Limits of Structural Excavation Earth to be as shown on the Contract Drawings and as specified in the Rhode Island Standard Specifications.

C. Related Sections

1. Section 01025 - Measurement and Payment
2. Section 02140 – Temporary Cofferdam and Dewatering
3. Section 02160 – Excavation Support

1.02 PROJECT/SITE CONDITIONS

A. Existing Conditions

1. There are pipes, drains, and other utilities in locations not indicated on the drawings, no attempt has been made to show all services, and completeness or accuracy of information given is not guaranteed.

1.03 MAINTENANCE

A. Maintain all work in accordance with SECTION 01800.

PART 2 EXECUTION

2.01 PROTECTION

A. Utilities

1. Support and protect from damage existing pipes, poles, wires, fences, curbing, property line markers, and other structures, which the Engineer decides must be preserved in place without being temporarily or permanently relocated.

2. Restore items damaged during construction without compensation, to a condition at least equal prior to construction.

B. Paved surfaces

1. Do not use or operate tractors, bulldozers, or other power-operated equipment with treads or wheels shaped as to cut or injure paved surfaces not to be replaced.
2. All surfaces, not to be replaced, which have been injured by the Contractor's operations shall be restored to a condition at least equal to which existed prior to start of the Work.
3. Suitable materials and methods shall be used for such restoration.

2.02 PREPARATION

A. Pavement Removal

1. Remove only existing pavement as necessary for the prosecution of the work.
2. Engineer may require that pavement be cut with pneumatic tools or saws without extra compensation to Contractor, where in the opinion of the Engineer it is necessary to prevent damage to the remaining road surface.
3. Dispose of large pieces of broken pavement before proceeding with excavation.

2.03 SHEETING AND BRACING

A. Provide in accordance with specification Section 02160.

2.04 TEMPORARY COFFERDAM AND DEWATERING

A. Temporary cofferdam and dewatering in front of the stone masonry wall shall be Provided in accordance with specification Section 02140.

2.05 EXCAVATION

A. Limits of Structural Excavation Earth shall be per the Rhode Island Standard Specifications and as shown on the Contract Drawings.

B. Excavation Near Existing Facilities

1. As the excavation approaches pipes, conduits, or other underground structures, digging by machinery shall be discontinued and the excavation shall be done by means of hand tools. Such manual excavation when incidental to normal excavation shall be included in the work to be done under items involving normal excavation.

C. Unauthorized Excavation

1. If the bottom of any excavation is taken out beyond the limits indicated or prescribed, the resulting void shall be backfilled at the Contractor's expense as directed by the Engineer.

2.06 DISPOSAL OF SURPLUS EXCAVATED MATERIALS

A. Surplus excavated materials not needed as specified above shall be hauled away and dumped by the Contractor, at his expense, at appropriate locations, and in accordance with arrangements made by him.

2.07 DUST CONTROL

A. During the progress of the Work, maintain the area of activities, by sweeping and sprinkling of streets to minimize the creation and dispersion of dust. If the Engineer decides that it is necessary to use calcium chloride for more effective dust control, the Contractor shall furnish and spread the material, as directed.

2.08 CARE AND RESTORATION OF PROPERTY

A. Restoration of existing property or structures shall be completed within 5 business days of completing the work within the property. and not left until the end of the construction period.

END OF SECTION

SECTION 02202

STRUCTURAL EXCAVATION MASONRY

PART 1 GENERAL

1.01 SUMMARY

A. Structural Excavation Masonry shall be in accordance with Section 203 of the 2024 Edition Rhode Island Department of Transportation Standard Specifications for Road & Bridge Construction and the following.

B. Requirements for masonry excavation shall be for removal of the existing stone masonry wall. Limits of Structural Excavation Masonry to be as shown on the Contract Drawings demolition details..

C. Related Sections

1. Section 01025 - Measurement and Payment
2. Section 02140 – Temporary Cofferdam and Dewatering
3. Section 02160 – Excavation Support

1.02 PROJECT/SITE CONDITIONS

A. Existing Conditions

1. There are pipes, drains, and other utilities in locations not indicated on drawings, no attempt has been made to show all services, and completeness or accuracy of information given is not guaranteed.

1.03 MAINTENANCE

A. Maintain all work in accordance with SECTION 01800.

PART 2 EXECUTION

2.01 EXAMINATION

A. Verify all existing utilities and facilities prior to excavation.

2.02 PROTECTION

A. Utilities

1. Support and protect from damage existing pipes, poles, wires, fences, curbing, property line markers, and other structures, which the Engineer decides must be preserved in place without being temporarily or permanently relocated.
2. Restore items damaged during construction without compensation, to a condition at least equal prior to construction.

2.03 SHEETING AND BRACING

A. Provide in accordance with specification Section 02160.

2.04 TEMPORARY COFFERDAM AND DEWATERING

A. Provide in accordance with specification Section 02140.

2.05 EXCAVATION

A. Limits of Structural Excavation Masonry shall be as shown on the Contract Drawings demolition details.

END OF SECTION

SECTION 02203

CRUSHED STONE FILL UNDER STRUCTURES

PART 1 GENERAL

1.01 SUMMARY

A. Crushed Stone Fill Under Structures shall be in accordance with Section 203 of the 2024 Edition Rhode Island Department of Transportation Standard Specifications for Road & Bridge Construction and the following.

B. Requirements for Crushed Stone Fill Under Structures shall be behind and below the new masonry retaining wall and footing. Limits of Crushed Stone Fill Under Structures to be as shown on the Contract Drawings and as specified in the Rhode Island Standard Specifications.

C. Related Sections

1. Section 01025 - Measurement and Payment
2. Section 02140 – Temporary Cofferdam and Dewatering
3. Section 02160 – Excavation Support

PART 2 PRODUCTS

2.01 BACKFILLING

A. General

1. Frozen material shall not be placed in the backfill nor shall backfill be placed upon frozen material. Previously frozen material shall be removed or shall be otherwise treated as required, before new backfill is placed.

B. Backfilling Around Structures

1. Do not place backfill against or on structures until they have attained sufficient strength to support the loads (including construction loads) to which they will be subjected, without distortion, cracking, or other damage. As soon as practicable after the structures are structurally adequate and other necessary work has been done

END OF SECTION

SECTION 02204

PERVIOUS FILL

PART 1 GENERAL

1.01 SUMMARY

A. Crushed Stone Fill Under Structures shall be in accordance with Section 203 and M01 of the 2024 Edition Rhode Island Department of Transportation Standard Specifications for Road & Bridge Construction and the following.

B. Requirements for Pervious Fill shall be behind the new masonry retaining wall. Limits of Pervious Fill to be as shown on the Contract Drawings.

C. Related Sections

1. Section 01025 - Measurement and Payment
2. Section 02140 – Temporary Cofferdam and Dewatering
3. Section 02160 – Excavation Support

PART 2 PRODUCTS

2.01 BACKFILLING

A. General

1. Frozen material shall not be placed in the backfill nor shall backfill be placed upon frozen material. Previously frozen material shall be removed or shall be otherwise treated as required, before new backfill is placed.

B. Backfilling Around Structures

1. Do not place backfill against or on structures until they have attained sufficient strength to support the loads (including construction loads) to which they will be subjected, without distortion, cracking, or other damage. As soon as practicable after the structures are structurally adequate and other necessary work has been done

END OF SECTION

SECTION 02210

ROCK EXCAVATION

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes

1. Requirements for removal and disposal of rock.

B. Related Sections

1. Section 00500-Agreement
2. Section 00800- Supplementary Conditions
3. Section 02200-Earth Excavation, Backfill, Fill and Grading

1.02 DEFINITIONS

A. Rock-as defined in SECTION 00500.

1.03 REQUIREMENTS

A. Excavate rock if encountered, to the lines and grades indicated on the drawings or as directed, dispose of the excavated material, and furnish acceptable material for backfill in place of the excavated rock.

B. Excavate rock in pipe trenches to a limit which provides 6-inches clearance minimum from the pipe after it has been laid. Before the pipe is laid, the trench shall be backfilled to the correct subgrade with thoroughly compacted, suitable material or, when so specified or indicated on the drawings, with the same material as that required for bedding the pipe, furnished and placed at the expense of the Contractor.

C. The use of explosives will not be allowed.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

3.01 EXCESS ROCK EXCAVATION

A. If rock is excavated beyond the limits of payment indicated on the drawings, specified, or authorized in writing by the Engineer, the excess excavation, whether resulting from overbreakage or other causes, shall be backfilled, by and at the expense of the Contractor, as specified below in this section.

B. In pipe trenches, excess excavation below the elevation of the top of the bedding, cradle, or envelope shall be filled with material of the same type, placed and compacted in the same manner, as specified for the bedding, cradle, or envelope. Excess excavation above said elevation shall be filled with earth as specified in the article titled "Backfilling Pipe Trenches" in SECTION 02200.

C. In excavations for structures, excess excavation in the rock beneath foundations shall be filled with 3000 psi concrete. Other excess excavation shall be filled with earth as specified in the article titled "Backfilling Around Structures" in SECTION 02200.

3.02 SHATTERED ROCK

A. If the rock below normal depth is shattered, and the Engineer considers such shattered rock to be unfit for foundations, the shattered rock shall be removed and the excavation shall be backfilled with concrete as required, except that in pipe trenches screened gravel shall be used for backfill. All such removal and backfilling shall be done by and at the expense of the Contractor.

3.03 PREPARATION OF ROCK SURFACES

A. Whenever so directed during the progress of the work, remove all dirt and loose rock from designated areas and shall clean the surface of the rock thoroughly, using steam to melt snow and ice, if necessary. Water in depressions shall then be removed as required so that the whole surface of the designated area can be inspected to determine whether seams or other defects exist.

B. The surfaces of rock foundations shall be left sufficiently rough to bond well with the masonry and embankments to be built thereon, and if required, shall be cut to rough benches or steps.

C. Before any masonry or embankment is built on or against the rock, the rock shall be scrupulously freed from all vegetation, dirt, sand, clay, boulders, scale, excessively cracked rock, loose fragments, ice, snow, and other objectionable substances. Picking, barring, wedging, streams of water under sufficient pressure, stiff brushes, hammers, steam jets, and other effective means shall be used to accomplish this cleaning. Remove free water left on the surface of the rock.

3.04 REMOVAL OF BOULDERS

A. Remove piles of boulders and loose rock encountered within the limits of earth embankments and dispose in a suitable place.

3.05 DISPOSAL OF EXCAVATED ROCK

A. All excavated rock shall be handled, transported and disposed of by the Contractor, at his expense, at appropriate locations, and in accordance with arrangements made by him without additional cost to the Owner.

B. Excavated rock may be used in backfilling trenches subject to the following limitations:

1. Pieces of rock larger than permitted under the article titled "Backfilling Pipe Trenches" in SECTION 02200 shall not be used for this purpose.

2. The quantity of rock used as backfill in any location shall not be so great as to result in the formation of voids.

3. Rock backfill shall not be placed within 36 in. of the surface of the finish grade.

C. Surplus excavated rock shall be disposed of as specified for surplus excavated material as specified in SECTION 02200.

3.06 BACKFILLING ROCK EXCAVATIONS

A. Where rock has been excavated and the excavation is to be backfilled, the backfilling above normal depth shall be done as specified in SECTION 02200. If material suitable for backfilling is not available in sufficient quantity from other excavations, the Contractor shall, at his own expense, furnish suitable material from outside sources.

END OF SECTION

SECTION 02215

AGGREGATE MATERIALS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes

1. Requirements for furnishing and placing materials, which include Crushed Stone, Gravel Borrow and Select Borrow.
2. Location of specified materials as detailed on the Drawings or as directed by the Engineer for excavation below normal depth, utility support, replacement of unsuitable material or elsewhere, as ordered.

B. Related Sections

1. Section 02200 - Earth Excavation, Backfill, Fill and Grading.
2. Section 02500 - Paving

1.02 REFERENCES

A. This specification makes reference to the requirements of additional specifications as listed. The Contractor shall obtain and familiarize himself with all requirements referenced by this specification.

1. Rhode Island Department of Transportation Standard Specifications for Road and Bridge Construction, together with all errata addenda additional revisions, and supplemental specifications, (referred to as Standard Specification).

B. American Association of State Highway and Transportation Officials (AASHTO).

1. T11, Amount of Material Finer than 0.075 mm Sieve in Aggregate
2. T27, Sieve Analysis of Fine and Coarse Aggregates.

C. American Society for Testing and Materials (ASTM).

1. D1557, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2,700 kN-m/m^3)).

1.03 DEFINITIONS

A. The term Screened Gravel as used in the Contract Documents shall mean Crushed Stone.

1.04 SUBMITTALS

A. Shop Drawings

1. Provide sieve analysis when gradation requirements are given in the Specification.

B. Samples

1. Furnish representative sample including location of source with Shop Drawing transmittal sheet.

1.05 QUALITY ASSURANCE

A. Field Samples

1. The attention of the Contractor is directed to the fact that under Specification SECTION 00700, 1.03 Materials and Equipment, all materials furnished by the Contractor to be incorporated into the Work shall be subject to the inspection of the Engineer. The Engineer shall be the sole judge as to the acceptability of proposed materials and said judgement shall be final, conclusive, and binding.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Storage and Protection

1. In accordance with Specification SECTION 00700, 1.03 Materials and Equipment.

PART 2 PRODUCTS

2.01 MATERIALS

A. Crushed Stone

1. For bedding and pipe zone material for pipe larger than 3 inches diameter. Well graded in size from 3/8 inches to 3/4 inches or such other sizes as may be approved.
2. For bedding and pipe zone material for plastic pipe 3 inches diameter and less, maximum particle size shall be 3/8 inches.
3. Clean, hard, and durable particles or fragments, free from dirt, vegetation, or other objectionable matter, and free from an excess of soft, thin elongated, laminated or disintegrated pieces.
4. Screened Stone of similar size and grading to this specification may be used instead of Crushed Stone.

B. Crushed Stone Under Structures

1. Crushed stone material must meet the requirements set forth in the Standard Specifications.

C. Gravel Borrow

1. Shall be in accordance with the RIDOT Standard Specifications, Section M.01.09, Table 1, Column 1b.

D. Selected Borrow

1. Use natural soils and/or rock free of roots, leaves, organics and clay, having not more than eight (8) percent by weight passing the No. 200 sieve and having a maximum stone size no greater than two thirds the loose lift thickness.

2. Use only material well-graded throughout entire size range, free of ice or frost and aggregations of frozen soil particles.
3. Material must meet compaction requirements indicated or as specified.

E. Gravel Base Course

1. In accordance with SECTION 02500.

F. Common Borrow

1. Shall meet RIDOT Standard M.01.01 Common Borrow.

2.02 SOURCE QUALITY CONTROL

A. Test, Inspection

1. Engineer may elect to sample material supplied at the source.
2. Assist the Engineer and/or personnel from the designated testing laboratory in obtaining samples.

PART 3 EXECUTION

3.01 INSTALLATION

A. Crushed Stone

1. Spread in layers of uniform thickness not greater than 6 inches.
2. Compact thoroughly by means of a suitable vibrator or mechanical tamper.

B. Gravel Borrow

1. Spread in layers of uniform thickness not exceeding 12 inches before compaction and moistened or allowed to dry as directed.
2. Compact thoroughly by means of suitable power-driven tampers or other power-driven equipment.
3. Compaction shall conform to 95% of minimum dry density per ASTM D1557.
4. The percolation rate for the compacted bank-run gravel shall not exceed 5 minutes per inch.

C. Select Borrow/Suitable Material

1. Spread in layers of uniform thickness not exceeding 12 in. (loose lift) before compaction and moistened or allowed to dry.
2. Compact thoroughly by means of suitable power-driven tampers or other power-driven equipment unless otherwise directed by the Engineer.

3.02 FIELD QUALITY CONTROL

A. Material and compaction testing

1. In accordance with SECTION 01410.

END OF SECTION

SECTION 02220

RIPRAP TYPE R-5

PART 1 GENERAL

1.01 SUMMARY

A. Riprap shall be Type R-5 in accordance with Section 920 of the 2024 Edition Rhode Island Department of Transportation Standard Specifications for Road & Bridge Construction and the following.

B. Requirements for Riprap in front of the new stone masonry retaining wall. Limits to be as shown on the Contract Drawings.

C. Riprap Bedding shall be FS-2 in accordance with Section M10.03 of the Standard Specifications and be considered incidental to this item. No separate payment will be made for the bedding.

END OF SECTION

SECTION 02224

CONTROLLED DENSITY FILL

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes

1. Requirements for flowable concrete fill to be used in place of compacted soil for general backfill of trenches.

B. Related Sections

1. Section 02200 - Earth Excavation, Backfill, Fill and Grading
2. Section 03300 - Cast-In-Place Concrete

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM)

1. C33, Standard Specification for Concrete Aggregates.
2. C150, Standard Specification for Portland Cement.
3. C260, Standard Specification for Air-Entraining Admixtures for Concrete.
4. C494, Standard Specification for Chemical Admixtures for Concrete
5. C618, Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete.
6. C989, Standard Specification for Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars

B. American Concrete Institute (ACI)

1. ACI Committee 229, Standard Specification for Controlled Low Strength Materials (CLSM).

1.03 DEFINITIONS

A. Controlled Density Fill (CDF), also known as “Flowable Fill” and “Ready-mix Fill.” Self-compacting, self-leveling, cementitious material used for backfills, fills and structural fills.

B. Very Flowable - Exhibits characteristics needed for small or confined areas and required to flow over long distances.

C. Flowable - Where the above flowability characteristics are not required.

D. Excavatable - May be removed in the future if required.

E. Non-excavatable - Not expected to be removed in the future.

1.04 DESIGN REQUIREMENTS

A. Provide a mixture of Portland cement, aggregates, water and mineral admixtures with a low cement content and high slump to reduce strength development for possible removal and minimize settlement after placement.

B. The proposed mix should maximize the flow characteristics of the material while producing the necessary strength.

C. The design mixes shall have the following strengths at 28 days:

1. Excavatable fill,
    a. Class I (flowable) and II (very flowable), 30 to 100 psi., 150 psi maximum at one (1) year
2. Non-excavatable fill,
    a. Class III (flowable) and IV (very flowable), 100 to 1200* psi.

    * Specific compressive strength(s) for structural applications are noted on the Contract Drawings

D. Air Content to be minimum 15%

E. Slump, using the modified method consisting of a six (6) inch long by three (3) inch inside diameter straight tube of non porous material.

1. Class I and III: 6” to 8” diameter
2. Class II and IV: 9” to 14” diameter

1.05 PERFORMANCE REQUIREMENTS

A. Provide fill of homogeneous structure which when cured, will have the required strength, water tightness, and durability. To this end, it is essential that careful attention be given to the selection of materials, mixtures, placing and curing of the fill.

1.06 SUBMITTALS

A. In accordance with Section 01300, submit the following,

1. Mix design data not limited to, but including maximum and minimum strengths, air content, setting times, flowability and yield.
2. Certification by the supplier stating compatibility with the project requirements and the Contractor's installation methods.

1.07 QUALITY ASSURANCE

A. Furnish the supplier with information as to the intended use of the CDF.

PART 2 PRODUCTS

2.01 MATERIALS

A. Portland Cement: ASTM C150, Type II American-made. (AASHTO M 85)

B. Water: Clean, potable and complying with ASTM C94. (AASHTO M 157)

C. Aggregates: ASTM C33 or a non-reactive aggregate source free of contaminants which exhibits high flow properties for controlled density fill. (AASHTO M 6, M 80)

D. Air entraining admixture conforming to ASTM C260, or as approved by the Engineer.

E. Chemical Admixtures: In accordance with ASTM C494. (AASHTO M 195)

F. Fly Ash: Meet requirements of ASTM C618 Class C or Class F. (AASHTO M 295)

G. Granulated Blast Furnace Slag: In accordance with ASTM C989. (AASHTO M 302)

PART 3 EXECUTION

3.01 GENERAL

A. The Contractor shall follow the guideline set forth in ACI 229, except non standard materials shall not be used.

3.02 PREPARATION

A. Pipes and all other members to be encased in CDF shall be temporarily secured in place to prevent displacement during fill placement.

B. To reduce hydrostatic pressure and limit displacement potential, Contractor may use a high air generator in the fill mixture to lower unit weights.

C. Pre-job test all pump applications prior to day of placement with actual equipment.

D. Secure site during the placement for the CDF. Cautions include but are not limited to barricades, fences, lights and steel plates.

E. Work shall be sequenced so as to keep traffic flowing within the project area.

3.03 INSTALLATION

A. CDF shall be batched at concrete plants and hauled to job sites in ready-mix trucks with continuous agitating drums.

B. During waiting period prior to discharge, truck drums shall agitate mixture.

C. CDF shall be installed in accordance with supplier's recommendations.

3.04 FIELD QUALITY CONTROL

A. All CDF to be used in the work shall be subject to testing to determine whether it conforms to the requirements of the specifications. The methods of testing shall be in accordance with the National Ready Mixed Concrete Association, Guide Specification for Controlled Low Strength Materials (CLSM) Article 8.0 Quality Control. The place, time, frequency, and method of sampling will be determined by the Engineer in accordance with the particular conditions of this project.

3.05 PROTECTION

A. Open trenches shall not be left uncovered overnight.

END OF SECTION

SECTION 02272

GEOTEXTILE MATERIALS BEHIND MASONRY WALL

PART 1 GENERAL

1.01 SUMMARY

A. Filter Fabric shall be in accordance with Section 920 and M20 of the 2024 Edition Rhode Island Department of Transportation Standard Specifications for Road & Bridge Construction and the following.

B. Requirements for Filter Fabric behind new stone masonry wall, to be placed vertically as a separation fabric between the crushed stone and native soil. Limits to be as shown on the Contract Drawings.

C. Cost of filter fabric for riprap shall be paid separately under Item 02220 – Riprap.

1.02 QUALITY ASSURANCE

A. General

1. Producer of fabric to maintain competent laboratory at point of manufacture to insure quality control in accordance with ASTM testing procedures.
2. Laboratory to maintain records of quality control results.

1.03 SUBMITTALS

A. Shop Drawings

1. Submit in accordance with SECTION 01300
2. Include manufacturer’s recommended method of joining of adjacent fabric panels.

B. Certificate of Conformance

1. Upon each shipment/delivery of product to the work site, furnish mill certificate(s) from the company manufacturing the fabric attesting that the fabric meets the chemical, physical, manufacturing and performance requirements specified. Fabric will be rejected if it is found to have defects, rips, flaws, deterioration or other damage.

1.04 DELIVERY, STORAGE AND HANDLING

A. Provide fabric in rolls wrapped with a heavy-duty protective covering to protect fabric from, mud, dirt, dust, debris and other deleterious sources until it is installed. Label each roll of fabric with number or symbol to identify production run.

B. Do not expose fabric to ultraviolet radiation (sunlight) for more than 20 days total in period of time following manufacture until fabric is installed and covered.

C. If Engineer determines material is damaged in any way or has excessive sunlight exposure, the Contractor shall immediately make all repairs and replacements as directed by the Engineer, at no additional cost to the Owner.

PART 2 EXECUTION

2.01 REPAIR

A. Geotextile fabric damaged during installation shall be repaired by a piece of geotextile material cut, placed and adequately anchored over the damaged area, subject to a 3-foot minimum overlap requirement or as directed by the Engineer.

B. If detrimental movement of the geotextile fabric occurs during any step of the installation, as determined solely by the Engineer, the Contractor shall remove the cover material and/or sections of fabric to the limits deemed necessary and reinstall the fabric.

C. Any fabric damage during its installation or during placement of cover materials shall be replaced by the Contractor at no additional cost to the Owner.

END OF SECTION

SECTION 02273

GEOGRID

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes

1. Requirements for installation of geogrid under gravel subbase.

B. Related Sections

1. Section 02500 – Paving
2. Section 02560 – Brick Paver Crosswalk

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM)

1. D5261, Measuring Mass per Unit Area of Geotextiles.
2. D5262, Standard Test Method for Evaluating the Unconfined Tension Creep and Creep Rupture Behavior of Geosynthetics
3. D6637, Test Method for Determining Tensile Properties of Geogrids by the Single or Multi-Rib Tensile Method

1.03 QUALITY ASSURANCE

A. General

1. Producer of geogrid to maintain competent laboratory at point of manufacture to ensure quality control in accordance with ASTM testing procedures.
2. Laboratory to maintain records of quality control results.

1.04 SUBMITTALS

A. Shop Drawings

1. Submit in accordance with SECTION 01300
2. Include manufacturer’s recommended method of installing adjacent geogrids.

Certificate of Conformance

3. Upon each shipment/delivery of product to the work site, furnish mill certificate(s) from the company manufacturing the fabric attesting that the fabric meets the chemical, physical, manufacturing and performance requirements specified. Geogrids will be rejected if it is found to have defects, rips, flaws, deterioration or other damage.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURER/MATERIAL

Geo-Textile material to be installed shall be Tensar® TriAx® TX140 Geogrid (or approved equal) as directed by the Engineer.

Geo-Textile material shall meet these minimum requirements:

Index Properties	Longitudinal	Diagonal	Transverse	General
Rib pitch, mm (in)	40 (1.60)	40 (1.60)		rectangular
Mid-rib depth, mm (in)		1.2 (0.05)	1.2 (0.05)	triangular
Mid-rib width, mm (in)		1.1 (0.04)	1.1 (0.04)	
Rib shape				
Aperture shape				

Structural Integrity	
Junction efficiency, %	93
Aperture stability. Kg-cm/deg @ 5.0kg-cm	3.0
Radial Stiffness at low strain, kN/m @ 0.5% strain (lbs/ft @ 0.5% strain)	(15,430)

Durability	
Resistance to chemical degradation	100%
Resistance to ultra-violet light and weathering	100%

All existing base material shall be removed unless otherwise directed by the Engineer. The Contractor shall replace with either Crushed Processed Gravel or other Excess Material as directed. Any new material shall meet Town Specifications and corresponding specifications located within The Rhode Island Standard Specifications for Road and Bridge Construction, amended February 2024 with all latest revisions.

PART 3 EXECUTION

3.01 PROCEDURE

A. After the top course of asphalt, and all oddities (concrete road base, cobblestones, Belgian blocks, etc.), have been removed, the Contractor shall excavate to the required depth below the final top grade of the new roadway elevation. After which the Contractor shall then install the Geo-Textile material to all manufacturers' specifications. The contractor shall then backfill to the required depths with in-situ material, Excess Material, or Crushed Processed Gravel as directed by the Engineer.

Clear subgrade of all sharp objects, large stones, roots, debris, or any other foreign materials that may contribute to puncturing, shearing, rupturing or tearing of the geotextile.

END OF SECTION

SECTION 02370

STORMWATER POLLUTION PREVENTION

PART 1 GENERAL

1.01 SCOPE

A. The work specified in this section includes the installation, maintenance, and removal of perimeter erosion controls, check dams, temporary dewatering basins, storm drain protection, stilling basins for water pollution control, turbidity curtains/floating silt curtains, and construction accesses. Soil erosion and sediment controls shown on the Plans shall be installed by the Contractor. Some soil erosion and sediment controls specified herein may or may not be shown or detailed on the Drawings, but may be utilized by the Contractor.Soil erosion and sediment controls not detailed on the Plans shall be in accordance with this specification and the latest edition of the Rhode Island Department of Environmental Management (RIDEM) Soil Erosion and Sediment Control Handbook, and all addendums. The methods described in this section are approved means for soil erosion and sediment control, the actual means and methods shall be determined by the Contractor. The Contractor shall be responsible for preparing and establishing a stormwater pollution prevention plan at each work site for approval by the Engineer.

B. Related Work Described Elsewhere:

1. Earth Excavation, Backfill, Fill, and Grading, Section 02200.
2. Aggregate Materials, Section 02215.

1.02 GENERAL REQUIREMENTS.

A. Perimeter Erosion Controls: Work shall consist of the provision of perimeter erosion controls in reasonably close conformity with the dimensions and details indicated on the Drawings, all in accordance with these Specifications. Perimeter erosion controls consist of the following two types:

1. Compost Filter Socks: Filter socks shall be constructed as indicated on the Drawings.
2. Silt Fence. Silt fencing shall consist of oak fence posts to which are attached industrial support netting and sediment control filter fabric, and are constructed as indicated on the Drawings.

B. Check Dams: Work shall consist of the provision of check dams and dikes in reasonably close conformity with the RIDEM Soil Erosion and Sediment Control Handbook. Check dams consist of the following three types:

1. Baled Hay Ditch and Swale Erosion Checks. Baled hay ditch and swale erosion checks shall consist of baled hay or straw, each bale of which is embedded and attached to the ground with wood stakes.
2. Sand Bag Erosion Dikes. This work shall consist of the placement of sand bags across either riprap or earth ditches, thereby forming a dike, to create temporary stilling basins for pollution control.
3. Stone Check Dams. This work shall consist of the placement of stone in ditches or drainage swales to reduce flow velocities, to prevent soil erosion.

C. Temporary Dewatering Basins: Work shall consist of the provision of temporary dewatering basins for the purpose of controlling water pollution caused by sediment-laden discharge from excavation sites. The basins shall be constructed in reasonably close conformity to means and methods of the RIDEM Soil Erosion and Sediment Control Handbook. Temporary dewatering basins consist of the following two types:

1. Dewatering Basin. The basin consists of a rectangular concrete barrier enclosure, the bottom and sides of which are lined with filter fabric. The bottom fabric is stabilized with filter stone. The basin is divided into the required number of 12-foot sections by stone berms approximately 18-inches high.
2. Filter Fabric Retention Basin. The basin consists of a rectangular enclosure formed by a 2-foot high chain link fence. Both the fence and the bottom of the enclosure are lined with filter fabric which is stabilized by a layer of rock riprap.

D. Storm Drain Protection: Work shall consist of the provision of temporary storm drain protection facilities. Storm drain protection facilities shall consist of the following three types:

1. Sandbag Gutter Inlet Sediment Barrier. This work consists of placing a sandbag barrier upstream of a gutter inlet prior to the placement of roadway pavement.
2. Silt Fence Catch Basin Inlet Protection. This work consists of placing filter fabric between frames and grates (beneath grates) of catch basins.
3. Baled Hay Catch Basin Inlet Protection. This work consists of placing baled hay around catch basin inlets. Baled hay inlet protection shall be constructed as indicated on the Drawings.

E. Stilling Basins for Water Pollution Control: Work shall consist of the provision of temporary and/or permanent stilling basins in accordance with the RIDEM Soil Erosion and Sediment Control Handbook.

F. Construction Accesses: Work shall consist of the provision of temporary construction accesses of stabilized stone pads for the purpose of reducing the amount of mud that construction vehicles track onto Town roadways.

1.03 QUALITY CONTROL.

A. Provide Quality Assurance / Quality Control services in accordance with Section 01400.

1.04 SUBMITTALS.

A. In accordance with Section 01300 submit a Stormwater Pollution Prevention Plan in conformance with the requirements specified in the General Permit for Storm Water Discharges Associated with Construction Activities (Section 01060).

1.05 REFERENCE STANDARDS.

A. Rhode Island Department of Environmental Management (RIDEM). 1988. Recommendations of the Stormwater Management and Erosion Control Committee Regarding the Development and Implementation of Technical Guidelines for Stormwater Management. RIDEM, Office of Environmental Coordination, Providence, RI.

B. Latest Version of RI Stormwater Design & Installation Standards Manual

C. Rhode Island Department of Environmental Management and USDA Soil Conservation Service (SCS). 1989. Rhode Island Soil Erosion And Sediment Control Handbook. RIDEM, Providence, RI.

D. Rhode Island Discharge Elimination System. General Permit for Discharges Associated with Construction Activities.

E. Rhode Island Department of Transportation Standard Specifications for Road and Bridge Construction, together with all errata addenda additional revisions, and supplemental specifications, (referred to as the Standard Specification).

F. American Society for Testing and Materials (ASTM)

1. ASTM B928/B928M-09 – Standard Specification for High Magnesium Aluminum Alloy Sheet and Plate for Marine Service and Similar Environments.

PART 2 PRODUCTS

2.01 MATERIALS

A. Perimeter Erosion Controls:

1. Compost Filter Socks: Filter sock materials and compost materials shall be in accordance with AASHTO Designation MP 9-06. Wooden stakes shall be 2 inch by 2 inch x 3 feet untreated hardwood, installed at 5-foot intervals on center, and of a length that shall project into the soil 1 foot leaving 3-4 inches protruding above the filter sock.
2. Silt Fence. The filter fabric shall be a material suitable for erosion control applications. Wood posts shall be oak, two (2) inch by two (2) inch in section, and at least four and one half (4-1/2) feet in length. Support netting shall be heavy-duty plastic mesh. For prefabricated silt fence, one (1) inch by one (1) inch wood posts will be permitted.

B. Check Dams:

1. Baled Hay Ditch and Swale Erosion Checks. Baled hay or straw shall be baled within twelve months of use. Bindings shall be sufficiently strong to act as handles when placing bales in position by hand. The minimum dimension of any bale shall be 18 inches. Wood stakes shall be oak, 1-inch by 1-inch in section, and at least three (3) feet in length.
2. Sand Bag Erosion Dikes. The sand bags and the sand material shall be of a quality acceptable to the Engineer. Dumped stone, when required, shall meet the requirements for Modified NSA Class R-4 riprap in Section 02220.The filled sand bags will weigh a minimum of 60 pounds.
3. Stone Check Dams. The stone shall meet the requirements for Filter Stone under Table I, Column V.

C. Temporary Dewatering Basins:

1. Dewatering Basins. Precast concrete barrier units shall conform to the RIDEM Soil Erosion and Sediment Control Handbook. Filter fabric shall conform to the applicable requirements of Article 2.01, Item A, Para. 2; Silt Fence, of these Specifications. Filter stone shall conform to the requirements of Section 02215. Sand bags shall be of a quality acceptable to the Engineer. Hay bales and wood stakes shall conform to the requirements of Article 2.01, Item A, Para. 1 of these Specifications.

D. Storm Drain Protection:

1. Sandbag Gutter Inlet Sediment Barrier. The sandbags and the sand material shall be of a quality acceptable to the Engineer.
2. Filter Fabric Catch Basin Inlet Protection. The filter fabric shall be a material suitable for erosion control applications utilized.
3. Baled Hay Catch Basin Inlet Protection. Baled hay or straw and wood stakes shall conform to the requirements of Article 2.01, Item A, Para. 1 of these Specifications.

E. Stilling Basins for Water Pollution Control: The various materials required for the construction of stilling basins will be determined by the Contractor and provided in the Soil Erosion and Sediment Control Plan for approval by the Engineer.

F. Construction Accesses: Construction access shall consist of crushed stone that meets the requirements of Section 02215. The filter fabric shall be a material suitable for erosion control applications utilized.

PART 3 EXECUTION

3.01 GENERAL.

A. Construction Methods: Those erosion and pollution controls indicated on the Drawings shall be installed to the satisfaction of the Engineer before the commencement of any construction.

3.02 INSTALLATION.

A. Perimeter Erosion Controls:

1. Compost Filter Socks: Filter socks shall be constructed at the locations, and in accordance with the details indicated on the Drawings to the satisfaction of the Design Builder. The following stipulations also apply:
   a. Trenching is not required. Compost filter socks shall be placed over the top of ground, wooden stakes shall be driven through the center of the filter socks to anchor them to the ground. To ensure optimum performance, heavy vegetation shall be cut down or removed, and extremely uneven surfaces shall be graded to ensure that the compost filter sock uniformly contacts the ground surface.
   b. Compost tubes may be vegetated by incorporating seed into the compost, prior to placing it in the tube.
   c. Compost Filter Socks require no trenching in, but must be staked.
   d. Installation: No trenching is required; therefore, soil is not disturbed upon installation. Once the filter sock is filled and put in place, it should be anchored. The preferred anchoring method is to drive stakes through the center of the sock at regular intervals; alternatively, stakes can be placed on the downstream side of the sock. The ends of the filter sock should be directed upslope, to prevent stormwater from running around the end of the sock. The filter sock may be vegetated by incorporating seed into the compost when filling the filter sock.
   e. Since compost filter socks do not have to be trenched into the ground, they can be installed on frozen ground, pavement or cement. For placement on pavement or cement concrete blocks can placed to hold the sock in place.
2. Silt Fence. Silt fence shall be constructed at the locations, and in accordance with the details indicated on the Drawings, to the satisfaction of the Engineer. The following stipulations also apply:
   a. A six (6) inch by six (6) inch minimum trench shall be dug where the fence is to be installed.
   b. The fence shall be positioned in the trench with the fence posts set at eight (8) feet on center (maximum).
   c. The sedimentation control fabric and the industrial netting shall be stapled to each post. When joints are necessary, filter fabric shall be spliced together only at support posts. Splices shall consist of a six (6) inch overlap, and shall be securely sealed.
   d. Each wood post with industrial support netting and filter fabric attached shall be driven into the undisturbed soil in the trench as indicated on the Drawings.
   e. The trench shall be backfilled and the soil compacted over the filter fabric.
   f. The installed height of the fence shall be two and one half (2-1/2) feet (minimum). However, height shall not exceed 36-inches since higher barriers impound volumes of water sufficient to cause failure of the fence structure.

B. Check Dams:

1. Baled Hay Ditch and Swale Erosion Checks. Erosion checks shall consist of two or more bales placed and staked perpendicular to the flow line of a ditch formed by the intersection of its slopes. The following stipulations also apply:
    a. A pair of erosion checks shall be placed a minimum of 12 feet apart at each location.
    b. The ditch erosion checks shall be entrenched and backfilled. The trench shall be excavated the width of the bale(s) and the length of the check to a minimum depth of three (3) inches. After the bales are staked and chinked, the excavated soil shall be backfilled against the check. Backfill shall conform to the ground level on the downhill side and shall be built up to four (4) inches against the uphill side.
    c. The bales are to be installed so that the bindings are oriented around the sides of the bales rather than their tops and bottoms.
    d. The edges of overlapped bales shall overlap in such a manner that there will be no opening between the bales. Where bales butt together the gap between bales shall be chinked with loose straw to prevent water from escaping.
    e. Each bale shall be securely anchored by a least two stakes driven through the bale. The first stake in each bale should be driven toward the previously laid bale to force the bales together.
    f. All earth ditch areas are required to have the protection of baled hay ditch erosion checks prior to their outfall onto existing ground, or natural or man-made water courses.
    g. The haybale barrier shall be extended such a length that the bottoms of the end bales are higher in elevation than the top of the lowest middle bale. This configuration will insure that the sediment-laden runoff will flow either through or over the barrier, but not around it.
2. Sand Bag Erosion Dikes. Sand bags will be placed a minimum of four layers high. Over the center of the ditch the top layer of sand bags will have a weir opening equal to one half the bottom ditch width. The sand bags shall be extended such a length that the bottom of the end sand bags are higher in elevation than the top of the lowest middle sand bag. When the sand bag dike is constructed across an earth ditch, the down stream side of the dike at the weir opening is to be protected with Modified NSA Class R-4 dumped riprap.
3. Stone Check Dams. Stone shall be placed across the ditch or swale to achieve complete coverage and shaped to the required configuration by the use of hand tools. The stone shall be sloped from the sides of the ditch/swale towards the center such that the center is six (6) inches lower than the stone at the sides of the ditch/swale. The check dam shall have two to one (2:1) horizontal to vertical side slopes and shall not exceed two (2) feet in height.

C. Temporary Dewatering Basins:

1. Dewatering Basin. The following stipulations shall apply:

a. The precast concrete barrier units shall be placed on level, or nearly level, ground.
b. Filter fabric shall be placed on the bottom of the entire area enclosed by the concrete barrier units. If more than one sheet of fabric is required, the adja- cent section shall be overlapped a minimum of 12 inches to insure full coverage. Filter fabric shall be turned up along the inside face of the concrete barriers to the top of same, there to be folded across the top of the barriers. The fabric will be maintained in position by the placement of sand bags, end- to-end, along the top of the concrete barrier enclosure.
c. A minimum layer of six (6) inches of filter stone shall be spread over the bottom of the basin. Stone berms shall be constructed at 12 foot intervals along the length of the basin.

2. Filter Fabric Retention Basin. The following stipulations shall apply:

a. The filter fabric retention basin will be placed on stabilized and level, or nearly level, ground to prevent erosion by water exiting the basin.
b. A six (6) inch by six (6) inch minimum trench shall be dug where the basin is to be constructed.
c. The filter fabric and wire backing shall be three (3) feet wide (minimum) positioned in the trench and secured to metal posts positioned 4-feet on center (maximum).
d. d. The metal posts shall be driven into undisturbed soil next to the trench to a minimum depth of 12-inches.
e. Fill material shall be placed in the trench and compacted.
f. The installed height of the fence shall be two (2) feet (minimum).
g. A minimum layer of six (6) inches of filter stone (Modified NSA Class R-4 riprap) shall be spread evenly over the bottom of the basin.

D. Storm Drain Protection:

1. Sandbag Gutter Inlet Sediment Barrier. The following stipulations shall apply:

a. The sandbags shall be placed in a curved row extending from the curb or berm. The row shall be at least six (6) feet upstream of the inlet and should overlap the curb or berm.
b. Several layers of sandbags shall be placed over the first layer to a minimum height of one (1) foot. The bags shall be overlayed and packed tightly together.
c. A gap of one sandbag should be left in the middle of the top row to serve as a spillway. The spillway shall be a least eight (8) inches high.
d. Additional sediment storage capacity can be obtained by constructing a series of these barriers along the gutter upstream of the inlet.

2. Filter Fabric Catch Basin Inlet Protection. The following stipulations shall apply:

a. The filter fabric shall extend to a height between four (4) and six (6) inches above the top of the inlet grate around the entire perimeter of the grate.
b. Filter fabric shall be installed beneath the grate, secured between the frame and the grate.

c. Filter fabric shall be installed with sufficient excess material below the grate to provide at least six (6) inches of vertical clearance between the fabric and the bottom of the grate.

3. Baled Hay Catch Basin Inlet Protection. The baled hay inlet protection shall be constructed as indicated on the Drawings. The following stipulations shall also apply:

   a. The bales shall be entrenched and backfilled. The trench shall be excavated the width of the bale and the length of the check to a minimum depth of three (3) inches. After the bales are staked and chinked, the excavated soil shall be backfilled against the check. Backfill shall conform to the ground level on the inside and shall be built up to four (4) inches around the outside.
   b. The bales are to be installed so that the bindings are oriented around the sides of the bales rather than along their tops and bottoms.
   c. Each bale shall be securely anchored by at least two stakes driven through the bale. The first stake in each bale should be driven toward the previously laid bale to force the bales together.
   d. The gaps between bales shall be chinked (filled by wedging) with straw to prevent water from escaping between bales.

E. Stilling Basins for Water Pollution Control:

1. The stilling basins will be constructed in such a manner to allow any material which may cause a natural water course or the surrounding environment to be damaged to be retained in the basin. During the life of the Contract, the Contractor will be required to periodically clean the pool and to maintain the basin to the satisfaction of the Engineer. If the basin is temporary, the Contractor will be required to fill the basin with suitable material and to restore the area in which the basin was located to either its original condition or to the requirements of the Contract.

2. In all cases the stilling basins are to be constructed immediately after the clearing and grubbing operation and before commencement of any excavation and/or embankment. The single exception to this requirement is the construction of a leveling course to create a work platform. Excavation for stilling basins is to take place from the downstream end of the basin and to proceed upstream. Prior to the start of excavation, temporary baled hay ditch erosion checks are to be constructed immediately beyond the downstream end of the basin. When the basin is complete the above temporary erosion control measures are to be removed.

F. Construction Accesses: Construction accesses shall be constructed at the locations, and in accordance with the details as indicated on the Drawings, to the satisfaction of the Engineer. Construction accesses shall be constructed as detailed in Section 211 of the Standard Specifications.

3.03 MAINTENANCE AND CLEANING.

A. Definitions:

1. Cleaning consists of removing debris and accumulated sediment-laden deposits from the upstream side of perimeter controls, check dams and temporary drainage protection and from the bottom of temporary dewatering basins and stilling basins. All material so-removed shall be legally disposed of.
2. Maintenance consists of the repair and restoration to original configuration of damage sustained by erosion and pollution controls caused by "normal" rainfall events. (Abnormal weather events are defined in Article 3.03, Item 1)

B. Methods:

1. Erosion and pollution controls shall be maintained by the Contractor to the satisfaction of the Engineer. Erosion and pollution controls must be able to prevent, under normal weather conditions, both the movement of soil materials and the intrusion of sediment-laden discharges into environmentally sensitive areas.
2. Construction shall not commence or continue until all specified erosion and pollution controls are in place, properly installed and accepted by the Engineer.
3. Erosion and pollution controls shall be routinely inspected by the Engineer. The Engineer shall notify the Contractor immediately if problems develop. The Contractor shall commence cleaning and maintenance measures no later than the next consecutive calendar day after receiving a directive from the Engineer to perform such measures. The Contractor shall aggressively and expeditiously perform such cleaning and maintenance work until the original problem is remedied to the complete satisfaction of the Engineer. In the event of a weekend storm, the Contractor must have resources available to restore, and, if necessary, to replace any damaged controls.

C. Applicable Controls:

1. The specific erosion and pollution control facilities to be cleaned and maintained under this Section are outlined in Article 1.02 and consist of the following:
    a. Perimeter Controls:
        1) Baled Hay Erosion Checks
        2) Silt Fence
    b. Check Dams:
        1) Baled Hay Ditch and Swale Erosion Checks
        2) Sand Bag Erosion Dikes
        3) Stone Check Dams
    c. Temporary Dewatering Basins:
        1) Dewatering Basins
        2) Filter Fabric Retention Basins
    d. Storm Drain Protection:
        1) Sandbag Gutter Inlet Sediment Barrier

2) Filter Fabric Catch Basin Inlet Protection
3) Baled Hay Catch Basin Inlet Protection

e. Stilling Basins
f. Construction Accesses

D. Materials:

1. Materials required to repair and restore damaged erosion and pollution controls shall meet the applicable requirements of Article 2.01, Items A thru G; for Perimeter Erosion Controls, Check Dams, Temporary Dewatering Basins, Storm Drain Protection, Stilling Basins and Construction Accesses, respectively, of these Specifications.

E. Threshold for Cleaning Erosion Controls:

1. Erosion and pollution controls will be cleaned when directed by the Engineer, after a rainstorm, and when sediment deposits reach the heights indicated in the following table:

	Height
a. Perimeter Controls	
1) Baled Hay Erosion Checks	1/2 Bale Height
2) Silt Fence	6-inches
b. Check Dams	
1) Baled Hay Erosion Checks	1/2 Bale Height
2) Sand Bag Erosion Dike	1/2 Dike Height
3) Stone Check Dam	1/2 Dam Height
c. Temporary Dewatering Basins	
1) Dewatering Basins	1/2 Original Basin Height
2) Filter Fabric Retention Basin	1/2 Original Basin Height
d. Storm Drain Protection	
1) Sandbag Gutter Inlet Sediment Barrier	1/2 Dike Height
2) Filter Fabric Catch Basin Inlet Protection	4 inches
3) Baled Hay Catch Basin Inlet Protection	1/2 Bale Height
e. Stilling Basins	1/2 Depth Below Outlet Elevation

F. Other Requirements:

1. Perimeter Controls, Check Dams and Storm Drain Protection. The following requirements apply:

a. Damaged controls will be repaired or replaced after each storm events.
b. Before controls are removed all accumulated sediment on the upstream side shall be removed and legally disposed of.
c. Erosion controls shall not be removed until the adjacent exposed areas are relatively free from future uncontrolled discharges.

d. The Engineer has the authority to verify, enforce, and to specify maintenance activities and to ensure that erosion and pollution controls have been properly maintained.

2. Temporary Dewatering Basins and Stilling Basins. The following requirements apply:

   a. The basins will be periodically inspected for signs of erosion around the basin and downslope area.
   b. Repairs will be promptly carried.
   c. The Engineer has the authority to verify, enforce, and to specify maintenance activities and to ensure that controls have been properly maintained.

3. Construction Accesses. The following requirements apply:

   a. The construction access shall be maintained to keep mud and debris from tracking onto public roadways. This may require additional stone or additional length as required.
   b. Erosion controls shall not be removed until the adjacent exposed areas are relatively free from future uncontrolled discharges.
   c. The Engineer has the authority to verify, enforce, and to specify maintenance activities and to ensure that erosion and pollution controls have been properly maintained.

G. Failure of Erosion and Pollution Controls:

1. This Article 3.03; Maintenance and Cleaning, is based on the concept that erosion and pollution controls will essentially remain intact under normal rainfall events and that any damage sustained by said controls under normal rainfall may be repaired under the maintenance provisions set forth herein.

2. However, under abnormal weather events it is possible that erosion and pollution controls may be damaged to the extent that the Engineer may direct that they be replaced in their entirety. Under such abnormal conditions the Contractor will replace the particular facilities, and be compensated for same, under the applicable provisions set forth in regarding PERIMETER CONTROLS, CHECK DAMS, TEMPORARY DEWATERING BASINS, STORM DRAIN PROTECTION, STILLING BASINS, and SILT FENCE, respectively, of these Specifications.

H. Definition of Abnormal Weather Conditions:

1. For the purposes of Article 3.03, Item G, abnormal weather events are defined as follows:

   a. For a duration of 1-hour; rainfall equal to or greater than 1/2-inch.
   b. For a duration of 12-hours; rainfall equal to or greater than 2-inches.
   c. For a duration of 24-hours; rainfall equal to or greater than 3-inches.
   d. Extreme weather conditions such as hurricanes, tornadoes, floods, blizzards, etc. Daily rainfall records may be obtained from the National Weather Service.

3.04 REMOVAL.

A. Perimeter Erosion Controls:

1. Baled Hay Erosion Checks. All stakes must be removed from the haybales at a time designated by the Engineer. In general, the bales will be allowed to rot in place. If the Contract requires the haybales to be removed, they may be removed only when the adjacent exposed area has been stabilized, i.e., the area has an established grass or stone cover or has been paved, and is free from future uncontrolled discharges. Prior to such removal, however, all silt, mud, and debris entrapped by the haybales shall be removed and the area cleaned up in accordance with the applicable provisions of Article 3.03 of these Specifications. Immediately upon removal of the bales the remaining exposed areas (under the bales) will be backfilled, raked, and graded as necessary to match the surrounding grade and then seeded.

2. Silt Fence. This work will include the removal of the silt fence erosion checks and posts. Silt fence will not be left to rot in place. The silt fence may be removed only when the adjacent exposed area is stabilized, i.e., the area has an established grass or stone cover or has been paved, and is free from future uncontrolled discharges. Prior to such removal, however, all silt, mud, and debris entrapped by the silt fence shall be removed and the area cleaned up in accordance with the applicable provisions of Article 3.03 of these Specifications. Immediately upon removal of the bales the remaining exposed areas (under the bales) will be backfilled, raked, and graded as necessary to match the surrounding grade and then seeded.

B. Check Dams:

1. 1. Baled Hay Ditch and Swale Erosion Checks. Bales of hay used in this work will not normally be left to rot in place. The bales may be removed only when the adjacent exposed area is stabilized, i.e., the area has an established grass or stone cover or has been paved, and is free from future uncontrolled discharges. Prior to such removal, however, all silt, mud, and debris entrapped by the respective erosion checks shall be removed and the area cleaned up in accordance with the applicable provisions of Article 3.03 of these Specifications. Immediately upon removal of the bales, the remaining exposed areas (under the bales) will be backfilled, raked, and graded as necessary to match the surrounding grade and then seeded.

2. Sand Bag Erosion Dikes. Sand bag erosion dikes will be removed prior to the completion of the project at a time designated by the Engineer. Prior to such removal, however, all silt, mud, and debris entrapped by the erosion dike shall be removed and the area cleaned up in accordance with the applicable provisions of Article 3.03 of these Specifications.

3. Stone Check Dams. Stone check dams will be removed prior to the completion of the project at a time designated by the Engineer. Prior to such removal, however, all silt, mud and debris entrapped by the check dam shall be removed and the area cleaned up in accordance with the applicable provisions of Article 3.03 of these Specifications.

C. Temporary Dewatering Basins:

1. Dewatering Basin. The dewatering basin will not be removed until all dewatering operations are complete. Prior to such removal, however, all accumulated sediment within the basin shall be removed and legally disposed of in accordance with the applicable requirements of Article 3.03 of these Specifications. The area covered by the basin shall be seeded and mulched immediately after the basin is removed.
2. Filter Fabric Retention Basin. Removal requirements for the filter fabric retention basin are the same as set forth above for the dewatering basin.

D. Storm Drain Protection:

1. Sandbag Gutter Inlet Sediment Barrier. The sandbag sediment barrier will be removed prior to the completion of the project at a time designated by the Engineer. Prior to such removal, however, all silt, mud, and debris entrapped by the sediment barrier shall be removed and the area cleaned up in accordance with the applicable provisions of Article 3.03 of these Specifications.
2. Filter Fabric Catch Basin Inlet Protection. The filter fabric inlet protection shall be removed and the area prepared for pavement construction once the contributing drainage area is free from future uncontrolled discharges. Prior to such removal, however, all silt, mud, and debris entrapped by the filter fabric shall be removed and the area cleaned up in accordance with the applicable provisions of Article 3.03 of these Specifications.
3. Baled Hay Catch Basin Inlet Protection. The baled hay inlet protection shall be removed and the area prepared for pavement construction the contributing drainage area is free from future uncontrolled discharges. Prior to such removal, however, all silt, mud, and debris entrapped by the baled hay shall be removed and the area cleaned up in accordance with the applicable provisions of Article 3.03 of these Specifications.

E. Construction Accesses: This work will include the removal of the construction accesses. The construction accesses may be removed only when the adjacent exposed area is stabilized, i.e., the area has an established grass or stone cover or has been paved, and is free from future uncontrolled discharges. The construction accesses shall be removed and the area prepared for final cover.

END OF SECTION

SECTION 02450

TREATED TIMBER PILES FURNISH AND DRIVE

PART 1 GENERAL

1.01 SUMMARY

A. Timber Piles shall be in accordance with Section 804 of the 2024 Edition Rhode Island Department of Transportation Standard Specifications for Road & Bridge Construction and the following.

B. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this section. See Plans for pile spacing, pile design loads, size and length of piles, and cutoff elevation of piles.

C. Piles shall be treated end-bearing piles and fitted with a metal boot or steel point attachment. Cost of metal boot or steel point attachment shall be incidental to this work and will not be paid separately.

D. Supply piles of the following types as indicated:
   1. Timber piles, peeled and treated, driven.

1.02 REFERENCE

A. American Association of State Highway and Transportation Officials (AASHTO).

- AASHTO M-133. Specification for Preservative and Pressure Treatment Process for Timber.

B. American Society for Testing and Materials (ASTM).

- ASTM D 25 Specifications for Round Timber Piles
- ASTM D 1443 Method of Testing Piles Under Static Axial Compressive Load
- ASTM D 3689 Method of Testing Individual Piles Under Axial Tension Load
- ASTM D 7381 Developing Stress for Round Timber Piling Based on Full-Scale Tests
- ASTM D 4945 Standard Test Method for High-Strain Dynamic Testing of Deep Foundations
- ASTM 1143 Standard Test Methods for Deep Foundations Under Static Axial Compressive Load

C. American Wood Protection Association (AWPA)

- M3 Standard Quality Control Procedures for Wood Preserving Plants
- M4 Standard for the Care of Preservative Treated Wood Products
- U1 Use Category System: User Specifications for Treated Wood

1.03 SUBMITTALS

A. In accordance with Section 01300, submit the following:

1. Contractor's Experience

    a. At least 45 calendar days before the planned start of construction, the Contractor shall submit project reference list and a personnel list. The project reference list shall include a brief project description with the owner's name and current phone number. The personnel list shall identify the Supervising Project Engineer, drill rig operators, and on-site foremen to be assigned to the project. The personnel list shall contain a summary of each individual's experience and be complete enough for the Engineer to determine whether each individual satisfies the required qualifications, see article 1.05.

B. Pile Driving Sequential Layout:

    a. Submit layout drawings showing the proposed sequence of driving the piles.

    b. On the sequential layout, show each pile identification as indicated on the Contract Drawings, its driving sequence number, type, size, load bearing capacity and pile tip elevation planned.

C. Pile Driving Record: Maintain a pile driving record during pile driving and submit it to the Project Engineer upon completion of pile driving. On the record, indicate for each pile driven the information specified in B above, and the following: type and rating of driving equipment, overall blow count per foot, number of blows per inch penetration for the last 12 inches, and any unusual conditions encountered during driving.

D. Submit data on round timber pile treatment data, including certification by treating plant-stating type of preservative solution and pressure process used, net amount of preservative retained, and compliance with applicable standards.

END OF SECTION

SECTION 02460

PILE LOAD TEST

PART 1 GENERAL

1.01 SUMMARY

A. Pile Load Test shall be in accordance with Section 804 of the 2024 Edition Rhode Island Department of Transportation Standard Specifications for Road & Bridge Construction and the following.

B. Perform two static load quick tests on test piles in accordance with Section 804 of the Rhode Island Standard Specifications and ASTM D 1143. Location of test piles to be selected by the Contractor and Approved by the Engineer. Piles tested shall be separated by a minimum of 60-feet. If test piles are not damaged and accepted by the Engineer upon completion of the test, those piles may be used for production.

C. Related Sections

1. Section 02450 – Timber Piles Furnish and Drive

END OF SECTION

SECTION 02500

PAVING

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes
   1. Requirements for construction of all temporary and permanent pavement on paved areas affected or damaged by his operations, whether inside or outside the normal trench limits, as indicated on the drawings and as herein specified.

B. Related Sections
   1. Section 02200 - Earth Excavation, Backfill, Fill and Grading

1.02 REFERENCES

A. This specification makes reference to the requirements of additional specifications as listed. The Contractor shall obtain and familiarize himself with all requirements referenced by this specification prior to preparation and installation of any pavements.
   1. Rhode Island Department of Transportation, Standard Specifications for Road and Bridge Construction, including all addenda issued prior to March 1, 2018, issued by the State of Rhode Island Department of Transportation, (referred to as the Standard Specification).

B. American Society for Testing and Materials
   1. C117 Standard Test Method for Materials Finer than 75-µm (No. 200) Sieve in Mineral Aggregates by Washing
   2. C136 Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates

1.03. PAVEMENT SCHEDULE

A. The Contractors attention is directed to the various pavements required under this contract, and their locations as detailed below.

B. All pavement thickness specified in this specification shall be of the thickness required after compaction.

Parking Lot Pavement:

Description:	**Parking Lot Pavement**
Requirements:	2” Class 9.5 HMA Surface Course
	3” Class 19.0 HMA Base Course
	8” Gravel Base Course (Minimum)
	Polypropylene Triaxial Geogrid

Description:	**Temporary – Trench Patch**
Requirements:	3” Class 9.5 HMA (Trench Width)
	12” Gravel Base Course

PART 2 PRODUCTS

2.01 MATERIALS

A. Asphalt Tack
   1. Tack coat shall consist of emulsified asphalt, grade RS-1 or cutback asphalt grade RC-70 conforming to the requirements of the Rhode Island Standard Specification Section 403 and M.03.01.

B. Bituminous Base
   1. Bituminous Base shall conform to the requirements of the Rhode Island Standard Specification Section 401 and Class 19.0 HMA for Base Course.

C. Bituminous Leveling Course
   1. Bituminous Leveling Course shall conform to the requirements of the Rhode Island Standard Specification Section 401 and Class 12.5 HMA for Leveling Course.

D. Bituminous Surface
   1. Bituminous Surface Course shall conform to the requirements of the Rhode Island Standard Specification Section 401 and Class 9.5 HMA for Surface Course.

E. Permanent Trench Patch
   1. Permanent Trench Patch shall be Bituminous Base conforming to the requirements of the State of Rhode Island Standard Specification, Subsection 401, M.03.01 for Base Course, and Class 9.5 HMA for Base Course.

F. Temporary Trench Patch
   1. Temporary Pavement shall be Temporary Patching Material/Trenches conforming to the requirements of the State of Rhode Island Standard Specification, Subsection 410, Class 9.5 HMA, and M.03.04 for High Performance Cold Patching Material.

G. Gravel Base Course
   1. Gravel base course in accordance with State of Rhode Island Standard Specification, Subsection M.01.09, Meeting the gradation requirements of Table 1, Column 1, with 100% passing 3-inch Square Mesh Sieves.

2.02 SOURCE QUALITY CONTROL

A. The paving plant used by the Contractor for preparation of bituminous paving materials shall be acceptable to the Engineer who shall have the right to inspect the plant and the making of the material.

PART 3 EXECUTION

3.01 PREPARATION

A. Prior to placing pavement, all backfill shall have been properly compacted as specified under SECTION 02200 to eliminate settling of backfill. No pavement shall be placed over poorly compacted backfill. Backfill and gravel base course shall be compacted, brought to the proper elevation, and dressed so that new pavement construction shall be at the required grade. The Contractor shall maintain the surfaces of all excavated and disturbed areas until the pavement is placed. If there is a time lapse of more than 24 hours between completion of preparation of subgrade or placing of gravel base course and placing of paving, or if subgrade or gravel base course has been eroded or disturbed by traffic, the subgrade or gravel base course shall be restored before placing pavement.

B. When installing permanent pavement on bituminous concrete roadway the edges of existing pavement shall be cut back 12-inches, or more as required, from the trench excavation wall or damaged area to sound undamaged material, straightened, cleaned, and painted with an accepted asphalt emulsion to ensure a satisfactory bond between it and the newly placed surface courses. Existing surface courses shall be stripped from the bituminous concrete base course for at least a 6-inch width and trimmed square and straight so that new permanent surfacing shall be placed on undisturbed bituminous concrete base course. Existing pavement shall be swept clean prior to placing any asphalt emulsion over it. Existing pavement that will be under new pavement shall be painted with asphalt emulsion to ensure a satisfactory bond.

C. Before permanent pavement is installed, the base shall be brought to the proper grade, and temporary pavement and excess gravel base shall be removed.

D. All manhole covers, catch basin grates, valve and meter boxes, curbs, walks, walls and fences shall be adequately protected and left in a clean condition. Where required, the grades of manhole covers, catch basin grates, valve boxes, and other similar items shall be adjusted to conform to the finished pavement grade.

E. Contractor shall remove and acceptably dispose of all surplus and unsuitable material.

F. The bituminous base course within the trench shall be brought to the surface (total 5-inches of base course installed).

G. Existing pavement shall be swept clean prior to placing any asphalt emulsion over it. Existing pavement that will be under new pavement shall be painted with asphalt emulsion to ensure a satisfactory bond.

H. Temporary trench patch shall be installed at the end of each working day, no open trenches will be allowed overnight unless otherwise approved by the Engineer.

3.02 INSTALLATION

A. General
   1. All construction methods and materials shall be satisfactory to the Engineer.
   2. Unless indicated otherwise, all permanent bituminous pavements shall be installed in two courses or more. Bituminous base courses shall be carefully spread and raked to a uniform surface and thoroughly rolled before application of the top course.
   3. All top courses of permanent paving shall be applied with acceptable mechanical spreaders in widths of at least 9 feet.
   4. The rolling for all bituminous and gravel base courses shall conform to the standards listed in the appropriate Subsection of the Standard Specification.
   5. Pavement shall be placed so that the entire roadway or paved area shall have a true and uniform surface, and the pavement shall conform to the proper grade and cross section with a smooth transition to existing pavement.

B. Gravel Base Course
   1. The gravel base shall be placed to such depth that the furnished compacted gravel base course is the depth as indicated on the drawings and specified herein.
   2. The top of the compacted gravel base shall be below the furnish grade a distance required to accommodate the compacted pavement material as indicated on the drawings and specified herein.

C. Bituminous Base
   1. Bituminous Base shall be used in city streets and parking areas as listed in Article 1.03 of this specification.
   2. Bituminous Base shall be placed to the thickness as indicated in Article 1.03 of this Specification and installed in accordance with the requirements of the Standard Specification and as detailed in the Contract Drawings.

D. Permanent Pavement Patch
   1. Permanent pavement patch shall be placed over all trenches in paved areas where directed by the Engineer.

2. The Contractor, shall install the permanent trench patch upon the removal of the temporary trench patch, completing the backfilling and compaction of the trenches in the streets and the placing of the gravel base course.
2. Maximum pavement thickness per course not to exceed 3 inches.
3. Permanent Pavement Patch shall be placed in two courses and shall consist of 4-inch compacted thickness of Class 12.5 HMA Base Course, on a 12-inch compacted thickness gravel base as directed by the Engineer.
4. Contractor to vary pavement thickness to maintain a minimum cross sectional slope equaling 0.02 ft/ft.
5. Cut back distances shall be directed by the Engineer, however under no circumstances less than the minimum indicated in the chart below.

E. Temporary Pavement Patch
1. Temporary pavement shall be placed over all trenches in paved areas where directed by the Engineer.
2. The Contractor, upon completing the backfilling and compaction of the trenches in the streets and the placing of the gravel base course, shall be required to construct temporary pavement at the end of each day.
2. Maximum pavement thickness per course not to exceed 3 inches.
3. Temporary Pavement Patch shall be placed in one course and shall consist of a 3-inch compacted thickness of Class 9.5 HMA Surface Course, on a 12-inch compacted thickness gravel base as directed by the Engineer.
4. Contractor to vary pavement thickness to maintain a minimum cross sectional slope equaling 0.02 ft/ft.
5. Cut back distances shall be directed by the Engineer, however under no circumstances less than the minimum indicated in the chart below.
6. Once the Temporary Pavement Patch is complete and set for a minimum of 90 days, the entire parking lot pavement structure will be replaced in accordance with Section 1.03.

E. Bituminous Leveling Course
1. Bituminous Leveling Course shall be used in the streets as listed in Article 1.03 of this specification.
2. Bituminous Leveling Course may be required on all streets as determined by the Engineer. If required, bituminous leveling course shall be installed in accordance with the requirements of the Standard Specification and as detailed in the Contract Drawings.

F. Bituminous Surface
1. Bituminous Surface shall be used in the streets as listed in Article 1.03 of this specification.
2. Bituminous Surface shall be placed to the thickness as indicated in Article 1.03 of this Specification and installed in accordance with the requirements of the Standard Specification and as detailed in the Contract Drawings.

G. Sidewalks, Driveways, Parking Lots and Curbing

1. Sidewalks, driveways, parking lots and curbing that are removed or damaged by the Contractor's operations shall be restored to a condition at least equal to that in which they are found immediately prior to the start of operations. Materials and methods used for such restoration shall be in conformance with the requirements of the State of Rhode Island Standard Specification.
2. Where the trench location is in a sidewalk, the entire width of the sidewalk shall be replaced with new material. Side forms shall be set so as to obtain and preserve a straight edge along both sides of the walk.
3. Where trench is in a driveway, the driveway shall be repaved across its entire width with even edges.
4. Parking lots shall be repaved in accordance with Article 3.01 of this section.
5. Gravel base course under sidewalks and driveways shall not be less than 12" inch thick.

H. Surface Maintenance
1. During the guarantee period, the Contractor shall maintain the bituminous surface and shall promptly make good all defects such as cracks, depressions, and holes that may occur. At all times, the surfacing shall be kept in a safe and satisfactory condition for traffic. If defects occur in surfacing constructed by the Contractor, the Contractor shall remove all bituminous concrete and base course as is necessary to properly correct the defect. After removing bituminous concrete and base course, the Contractor shall correct the cause of the defect and replace the base course and bituminous concrete in accordance with these specifications.

END OF SECTION

SECTION 02521

BEACHSTONE PAVING

PART 1 GENERAL

1.01 RELATED DOCUMENTS:

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

1.02 DESCRIPTION OF WORK:

A. Provide all materials, equipment and labor necessary to complete the work included on the drawings or as specified herein.

B. The principal work of this section includes, but may not limited to the following:

1. Beachstone Paving

1.03 QUALITY ASSURANCE:

A. The contractor is cautioned that the visual effect and appearance is extremely important project element and that its installation must conform with the detail and intent of the drawings and specifications. Fabrication must be completed by a contractor or subcontractor with five years experience in such work; therefore, the contractor will be required to submit the name of the subcontractor he intends to employ and verification of experience, capability, and facilities to the Engineer for approval.

1.04 SUBMITTALS:

A. Submit manufacturer’s product data for the Beachstone Paver and accessory required.

B. Submit three (3) full size samples of the beachstone paver. The samples shall demonstrate the final surface color, finish, texture and shape that will be provided throughout the project.

1.05 PROJECT CONDITIONS:

A. Protect partially completed masonry work against weather damage and moisture when work is not in progress.

B. Cold weather construction:

1. Precondition masonry materials to maintain min. 50 degree F. temperature when installed.
2. Protect masonry from freezing when the air temperature is 40 degrees F. and below. Heat materials and provide temporary protection of completed work.

Comply with BIA "Construction and Protection Recommendations for Cold Weather Masonry Construction and NCMA "TEK Bulleting No. 16A".

3. No masonry work will be permitted when air temp. is below 25 degrees F.
4. Do not use frozen materials or those mixed or coated with or frost.
5. Do not build on frozen work. Remove and replace masonry work damaged by frost or freezing.
6. Protect completed work against freezing for not less than 4 days after laying.

C. Protect adjacent work from damage, soiling and staining during masonry operations.

1.06 DELIVERY, STORAGE AND HANDLING:

A. All materials for the work of this section shall be delivered, stored and handled to preclude damage of any nature. Manufactured materials shall be delivered and stored in their original containers, plainly marked with product and manufacturer's name.

PART 2 PRODUCTS

A. All materials shall be in accordance with the applicable Rhode Island Standard Specification for Road and Bridge Construction (1997 Edition) unless otherwise specified below.

2.02 BEACHSTONE:

A. Beachstone shall be clean, hard durable stone not less than four inches (4"), no more than six inches (6") in diameter by three inches (3") to four inches (4") thick. Stones shall be uniformly rounded in shape, smooth texture and of blue-gray color.

2.03 MORTAR:

A. Mortar for beachstone setting bed and joints between beachstone shall be one part Portland Cement Type II, two parts pointing sand, and one fifth (1/5) part hydrated lime.

PART 3 EXECUTION

3.01 PREPARATION:

A. base material without additional expense to the State. The line and grade of the finished surface shall conform to the elevations shown on the drawings. The surface will be tested with an approved six foot (6') lightweight, metal straight edge furnished by the contractor, at locations selected by the Engineer. The variation or tolerance of the surface from the testing edge between any two contacts with the surface shall not exceed one half inch (1/2") at any point. All humps or depressions exceeding the one half inch (1/2") tolerance shall be corrected by removing the defective work without additional expense to the owner.

B. The contractor shall install eight inches (8") of gravel borrow and compact to ninety-five percent (95%). The contractor shall submit compaction test reports for each area less than one thousand square fee (1000 d.f.) and for every one thousand square feet (1000 s.f.) for areas greater than one thousand square feet (1000 s.f.). Gravel borrow testing less than

ninety-five percent (95%) proctor shall be recompacted until it meets the above required compaction.

C. Elevation of Subgrade: Any irregularities in the line and grade of compacted gravel borrow work shall be corrected during the installation of the surface by varying bedding depth if approved by the Engineer, otherwise by adjusting the base material without additional expense to the State. The line and grade of the finished surface shall conform to the elevations shown on the drawings. The surface will be tested with an approved six foot (6') lightweight, metal straight edge furnished by the contractor, at locations selected by the Engineer. The variation or tolerance of the surface from the testing edge between any two contacts with the surface shall not exceed one half inch (1/2") at any point. All humps or depressions exceeding the one half inch (1/2") tolerance shall be corrected by removing the defective work without additional expense to the owner.

3.02 BEACHSTONE PAVING:

A. Place pavers as shown on drawings. Adjust bed to allow top of all pavers to meet required elevations. Pavers space one quarter inch (1/4") minimum, on half inch (1/2") maximum. Tamp pavers firmly into mortar bed. Fog mist pavers and joints. Place cement grout full into joints and toll joint smoothly concave between pavers with one quarter inch (1/4") maximum between valley of joint and crown of pavers.

B. Remove all excessive grout from pavers and clean with damp sawdust. Ten days later, clean with solution approved by Engineer.

1. Where geometry of paving areas does not allow receiving full size units, smaller units may be used.

END OF SECTION

SECTION 02530

RESTORATION OF CURB, SIDEWALKS AND VEGETATED AREAS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes

1. Requirements for removal and replacement of granite curb, concrete and bituminous sidewalks including sidewalks at driveways and wheelchair ramps.
2. Requirements for restoration of vegetated areas, plantings and tree beds.
3. Requirements for construction of sidewalks in sensitive tree areas.
4. Restoration to include those areas designated by the Contract Drawings and those affected or damaged by the construction operations, outside the limits of Work.

B. Related Sections

1. Section 01060 – Regulatory Requirements
2. Section 02200 – Earth Excavation, Backfill, Fill and Grading

1.02 REFERENCES

A. This specification makes reference to the requirements of additional specifications as listed. The Contractor shall obtain and familiarize himself with all requirements referenced by this specification.

1. Materials and construction methods shall conform, insofar as applicable, to the requirements of the Rhode Island Department of Transportation, Standard Specifications for Road and Bridge Construction, 2013 Edition, together with all errata addenda additional revisions, and supplemental specifications, (referred to as the Standard Specification).

1.03 SUBMITTALS

A. Submit in accordance with Section 01300,

1. Sieve analysis for aggregates and loams.
2. Mix designs for batched materials.
3. Certifications for landscape material.
4. Samples when requested by the Engineer.

5. Submit with seed, certificates confirming seed mixture, purity, germinating value, and crop year identification.

PART 2 PRODUCTS

2.01 MATERIALS

A. Gravel Borrow

1. In accordance with State of Rhode Island Standard Specification, Subsection M.01.02, Meeting the gradation requirements of Table 1, Column 1, with 100% Passing 3-inch Square Mesh Sieves.

B. Concrete Curb

1. In accordance with the requirements of the State of Rhode Island Standard Specification, Section M.09.

C. Granite Curb

1. In accordance with the requirements of the State of Rhode Island Standard Specification, Section M.09.

D. Cement Concrete

1. In accordance with the requirements of the State of Rhode Island Standard Specification, Section M 02.

E. Bituminous Concrete

1. In accordance with the requirements of the Rhode Island Standard Specification Section 401 for Surface Course, Class 12.5 HMA and the gradation requirements for Class 12.5 HMA or sidewalk in section M.03.01.

F. Plant Materials

1. In accordance with Section M.18 of the Rhode Island Standard Specification.

2.02 LOAM

A. Fertile, natural topsoil, typical of locality, without admixture of subsoil, refuse or other foreign materials, and obtained from well-drained arable site. Mixture of sand, silt and clay particles in approximately equal proportions. Free of stumps, roots, heavy or stiff clay, stones large than 1 inch in diameter, lumps, coarse sand, noxious weeds, sticks, brush or other deleterious matter.

B. Not less than 4 percent nor more than 20 percent organic matter as determined by loss on ignition of oven-dried samples.

C. Loam test samples dried to constant weight at temperature of 230 degrees. F., plus or minus nine degrees.

D. Use loam, having prior vegetative growth that did not contain toxic amounts of either acid or alkaline elements.

2.03 LIME, FERTILIZER AND SEED

A. Ground agricultural limestone containing not less than 85 percent of total carbonates.

B. Complete fertilizer, at least 50 percent of nitrogen derived from natural organic sources of ureaform and containing following percentages by weight:

Nitrogen 10% Phosphorus 10% Potash 10%

C. Turf grass seed, clean, high in germinating value and latest year's crop mixture as follows:

Name	Minimum Proportion by Weight	Percent Purity	Percent Germination
Kentucky bluegrass	20%	87%	85%
Merion Kentucky bluegrass	20%	87%	85%
Red Chewings fescue	45%	98%	85%
Italian rye	15%	98%	90%

2.04 SOURCE QUALITY CONTROL

A. The plants used by the Contractor for preparation of bituminous paving materials and cement concrete shall be acceptable to the Engineer who shall have the right to inspect the plant and the making of the material.

PART 3 EXECUTION

3.01 INSTALLATION/RESTORATION

A. Excavation to be in accordance with Section 02200 unless otherwise noted in the referenced specification below.

B. Granite Curb

1. Installing or Remove, Salvage and Reset granite curb at the locations indicated on the Drawings or as directed by the Engineer shall be in accordance with Section 906 of the State of Rhode Island Standard Specification.

C. Concrete Curb

1. Installation of concrete curb at the locations indicated on the Drawings or as directed by the Engineer shall be in accordance with Section 906 of the State of Rhode Island Standard Specification.

D. Bituminous Concrete Berm or Bituminous Concrete Curb

1. Installation of concrete curb at the locations indicated on the Drawings or as directed by the Engineer shall be in accordance with Section 906 of the State of Rhode Island Standard Specification.
2. Installation of bituminous concrete berm shall conform to Section 906.03.4 Method A of the Rhode Island Standard Specification.

E. Sidewalks

1. Installation of new or replacing existing sidewalks, driveways and wheelchair ramps at the locations shown on the Drawings or as directed by the Engineer to be in accordance with Section 905 of the State of Rhode Island Standard Specification.

F. Vegetated Areas, Plantings and Tree Beds

1. Restore all disturbed areas in accordance with the following Sections of the State of Rhode Island Standard Specification.
    a. Loam in accordance with L.01
    b. Seeding in accordance with L.02
    c. Plantings and Tree Beds in accordance with L.06 and L.08

G. Tree Root Pruning

1. This work shall include both mechanical and manual pruning of existing tree roots in order to allow for the installation of drain lines and/or other work without causing extensive damage to the root system. Pruning work shall be performed at the locations indicated on the Plans or as directed by the Engineer.
2. All work shall be performed under direct on site supervision of the Engineer.
3. All work indicated on the plans or as directed by the Engineer shall be performed under direct on-site supervision of a Rhode Island Licensed Arborist (A copy of the arborist's current license must be given to the Engineer seven days in advance of the work beginning) and shall be retained by the Contractor.
4. Excavation shall proceed in shallow layers that do not exceed 4 inches in depth until the root system is located. The Contractor shall carefully hand dig the soil from the delineated areas taking care not to rip or otherwise damage the roots during excavation process.
5. Remove material taking special care not to damage underlying tree roots. The root system may be located directly existing surface in some areas. The Engineer must be present during work near tree roots.

6. Remove and dispose all debris immediately from the job site. No stockpiling of removed material will be allowed around the root zone of any tree.

7. The tree roots will not be allowed to remain uncovered for more than one (1) hour. Loam borrow will be placed over the tree roots until the final cover is installed. The roots will also be kept moist, and not allowed to dry out. Water shall be provided by the contractor until the actual surface is placed within the sidewalk area. Heavy equipment shall not be permitted to traverse the remaining root system.

8. The roots to be pruned shall be field verified prior to commencement of this item by the Contractor and the Engineer. Roots shall be pruned using hand equipment which must be disinfected, sharp, and approved by the Engineer. Manual root pruning limits may be extended to other areas within the project area at the discretion of the Engineer.

H. Restoration Limits

1. Where the trench location is in a sidewalk, the entire width of the sidewalk shall be replaced with new material. Side forms shall be set so as to obtain and preserve a straight edge along both sides of the walk.

2. Sidewalks shall be cut at existing joints or as directed otherwise by the Engineer.

3. Where trench is in a driveway, the driveway shall be repaved across its entire width with even edges.

I. Restoration Outside Limits of Work

1. Sidewalks, driveways, parking lots and curbing that are or damaged by the Contractor's operations shall be restored to a condition at least equal to that in which they are found immediately prior to the start of operations. Materials and methods used for such restoration shall be in conformance with the requirements of the Standard Specification.

2. There shall be no cost to the Owner for this work.

J. Salvaged Granite Curb

1. All existing granite curb which remains unused at the end of the project shall be returned by the Contractor to the Town of North Kingstown Department of Public Works. Coordinate delivery of unused curb with Department of Public Works personnel.

3.02 LOAM

A. Spread loam on areas to 6-inch depth after compaction, fine grade and compact.

3.03 LIME, FERTILIZER AND SEEDING

A. Apply lime by mechanical means at rate of 3000 pounds per acre.

B. Apply fertilizer at rate of 1200 pounds per acre.

C. Remove weeds or replace loam and reestablish finish grades, if any delays in seeding lawn areas and weeds grow on surface or loam is washed out prior to sowing seed and without additional compensation. Sow seed at rate of 175 pounds per acre on calm day, by mechanical means. "Hydro-Seeding" not permitted unless otherwise permitted or required by Engineer. Sow one-half of seed in one direction, and other half at right angles to original direction. Rake seed lightly into loam, to depth of not more than 1/4 inch and compact by means of an acceptable lawn roller weighing 100 to 150 pounds per linear foot of width.

D. Water lawn areas adequately at time of sowing and daily thereafter with fine spray, and continue throughout maintenance and protection period.

E. Seed during approximate time periods of April 1 to May 15 and August 15 to October 1, and only when weather and soil conditions are suitable for such work, unless otherwise permitted.

3.04 MAINTENANCE OF SEEDED AREAS

A. Maintain lawn areas and other seed areas at maximum height of 2-1/2 inches by mowing at least three times. Weed thoroughly once and maintained until time of final acceptance. Reseed and refertilize with original mixtures, watering or whatever is necessary to establish over entire area of lawn and other seeded areas a close stand of grasses specified, and reasonably free of weeds and undesirable coarse native grasses.

B. Begin maintenance immediately after each portion of lawn is seeded and continue for minimum of 45 days.

C. Repair or replace all seeded areas which, in judgment of Engineer, have not survived and grown in satisfactory manner, for a period of one year after acceptance.

D. Seeding replacement, same seed mixture as specified and furnished and installed as specified.

3.05 TEMPORARY COVER CROP

A. Sow a temporary cover crop of buckwheat, domestic rye grass or other acceptable seed if there is insufficient time in the planting season to complete seeding, fertilizing, and permanent seeding at the option of Contractor or order of Engineer. Cut and water cover crop as necessary until the beginning of the following planting season, at which time it shall be plowed or harrowed into soil, the areas shall be fertilized and permanent seed crop sown as specified.

END OF SECTION

SECTION 02550

REFLECTORIZED PAVEMENT MARKINGS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes

1. Epoxy Resin Pavement Markings – All Sizes and Colors.

B. Related Sections

1. Section 01025 - Measurement and Payment
2. Section 02500 – Paving

1.03 REFERENCES

A. Materials and construction methods shall conform, insofar as applicable, to the requirements of the Rhode Island Department of Transportation, Standard Specifications for Road and Bridge Construction, including all addenda, issued by the State of Rhode Island Department of Public Works, (referred to as the Standard Specification).

PART 2 - PRODUCTS

2.01 PERMANENT PAVEMENT MARKINGS

A. Permanent pavement markings shall be epoxy resin pavement markings and shall be in accordance with the requirements of the "Manual on Uniform Traffic Control Devices", 2009, including all revisions.

B. Before placing the permanent pavement markings, the Contractor shall ensure that all existing pavement markings have been properly removed from the existing surfaces. For all permanent pavement markings, it is the Contractor's responsibility to reflect the exact location of all existing pavement markings onto the final surface course, unless otherwise shown on the Plans. The Contractor shall make the necessary arrangements to enable him to reestablish these locations before any construction commences. Epoxy resin pavement markings shall be placed on the final surface course no sooner than 2 weeks but not later than 4 weeks from the completion of paving operation.

PART 3 - EXECUTION

3.01 PREPARATION

A. Before placing the permanent pavement markings, the Contractor shall ensure that all existing pavement markings have been properly removed from the existing surfaces. For all permanent pavement markings, it is the Contractor's responsibility to reflect the exact location of all existing pavement markings onto the final surface course, unless otherwise shown on the Plans. The Contractor shall make the necessary arrangements to enable him to reestablish these locations before any construction commences.

3.02 INSTALLATION

A. Epoxy resin pavement markings shall be placed on the final surface course no sooner than 2 weeks but not later than 4 weeks from the completion of paving operation.

3.03 TOLERANCES

A. See Rhode Island Standard Specifications.

END OF SECTION

SECTION 02560

BRICK PAVER CROSSWALK

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes
   1. Requirements for this work consists of furnishing and installing the Brick Paver Crosswalks in conformance with the Plans and/or as directed by the Engineer, all in accordance with the Rhode Island Standard Specifications for Road and Bridge Construction, latest Edition. .

B. Related Sections
   1. Section 02200 - Earth Excavation, Backfill, Fill and Grading
   2. Section 03300 – Cast-in-Place Concrete

1.02 REFERENCES

A. This specification makes reference to the requirements of additional specifications as listed. The Contractor shall obtain and familiarize himself with all requirements referenced by this specification prior to preparation and installation of any crosswalks.
   1. Rhode Island Department of Transportation, Standard Specifications for Road and Bridge Construction, including all addenda issued prior to March 1, 2018, issued by the State of Rhode Island Department of Transportation, (referred to as the Standard Specification).

B. American Society for Testing and Materials
   1. C117 Standard Test Method for Materials Finer than 75-µm (No. 200) Sieve in Mineral Aggregates by Washing
   2. C136 Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates

C. Quality Control
   1. Material Samples: The contractor will be required to submit three samples of each material and paving element to the Engineer for approval before ordering material(s). The samples shall demonstrate the final surface color, finish, and shape that will be provided throughout the project. All samples shall be full size.
   2. Reports: Test reports and certificates shall be submitted for each material and paving element.

D. Qualifications
   1. The contractor is cautioned that the visual effect and appearance of the surface is an extremely important project element and that its installation must conform with the details and intent of the drawings and specifications. Paving must be installed

by a contractor or subcontractor with five years' experience on projects of a similar size and character. The contractor will be required to submit the name of the subcontractor he intends to employ and verification of experience, capability, and facilities to the Engineer for approval.

PART 2 PRODUCTS

2.01 MATERIALS

A. Brick Pavers: Shall be 2 3/4 inch by 4 inch by 8 inch chamfered edge with lugs and shall be Type F. Brick Pavers shall conform to ASTM C1272-07.

1. Brick pavers shall match the brick pavers in the existing cross walks.
2. The average comprehensive strength shall be a minimum of 10,000 psi and an average water absorption of no more than 6% (24 hour submersion at room temperature). The radius of rupture shall be not less than 1,000 pounds per square inch.
3. Maximum allowable breakage of product is 5% by weight. .
4. The Engineer has the right to reject pavers prior to installation if the pavers in question reflect an extreme divergence from the approved sample in color range, texture, or appearance.

B. Granite Curb: Shall in accordance with the applicable sections of the RI DOT Standard Specifications unless otherwise specified below.

1. The finished face of the granite curb shall be placed towards the Brick Paver with the batter (back) towards the road. Any projections of the face greater than 1/8" shall be removed.

C. Sand Setting Bed: Shall be sound, sharp, washed, natural sand complying with gradation requirements of ASTM C 33 for fine aggregate, maximum 03% silt and shall be free of deleterious or foreign matter and soluble salts.

1.

Sieve Size	Percentage Passing by Weight
3 inches	100
2 ½"	90-100
2"	35-70
1 ½"	0-15
3/4"	0-5

D Filter Fabric: Provide a 6" square piece of filter fabric for each 4" diameter drain hole. Filter fabric shall conform to the following performance characteristics, measured per the test methods referenced:

1. 4 oz., nonwoven needle punched geotextile composed of 100% polypropylene staple fibers that are inert to biological degradation and resists naturally encountered chemicals, alkalis, and acids.
2. Grab Tensile Strength: ASTM D 4632: 115 lbs.
3. Grab Tensile Elongation: ASTM D 4632: 50%
4. Trapezoidal Tear: ASTM D 4533: 50 lbs.

5. Puncture: ASTM D 4833: 65 lbs.
6. Apparent Opening Size: ASTM D 4751: 0.212 mm, 70 U.S. Sieve
7. Permittivity: ASTM D 4491: 2.0 sec -1
8. Flow Rate: ASTM D 4491: 140 gal/min/s.f.

E. Filter Stone: Shall be in accordance with section M01.07 of the Rhode Island Standard Specifications for Road and Bridge Construction, latest Edition..

F. Polymeric Sand: Shall be HP Nextgel – High Performance Polymeric Sand as produced by Techniseal or approved equal. Color shall be grey.

PART 3 CONSTRUCTION METHOD:

3.01 GENERAL

Well in advance of placing brick pavers, sample panels of brick paving utilizing a plywood base shall be constructed at the site, as directed by the Engineer for the Engineer's approval of material, workmanship, range of color, bond and texture of surface. Sufficient time shall be given to the Engineer and the Town to view and approve the materials, method of laying, and workmanship. Sample panels shall consist of at least 25 bricks and shall remain on site at all times until otherwise directed by the Engineer.

3.02 PREPARATION

Verify substrates and installation conditions to ensure that sub-base material is well compacted and to grade. Do not start unit masonry work until unsatisfactory conditions are corrected.

Establish lines and levels. Finish grade of the Brick Paver Crosswalk shall match the adjacent road in both profile and cross section.

3.03 INSTALLATION

The Contractor shall set the granite curbing in place as shown on the plans with the face towards the brick pavers. Care shall be taken when placing the curb, ensuring that the curbs are parallel and aligned properly so that full sized brick pavers will not have to be trimmed. The Contractor shall then install the concrete base for the cross walks. Core drill or form 4" diameter drain holes on the low side of the crosswalk 12" on center. Fill holes with filter stone and cover with filter fabric.

The Contractor shall place the sand setting bed and compact the bed to a finished thickness of 1 inch. Compaction shall be by a mechanical vibrator resulting in a compaction of ninety-five percent (95%) of maximum density. Once compacted, the top 1/4 inch shall be loosened with a hand rake.

The Contractor shall place the brick paver in the pattern as shown on the Plans. Pavers shall be tamped firmly into the sand setting bedding and shall meet the required finish grade. Each paver shall be adjusted to obtain a uniform joint as provided by the lug.

Where the geometry of paving area does not allow receiving full size units or pavers require fitting against the edges, the paver shall be cut. All pavers shall be saw cut to straight and even surfaces without chipping. Pavers with chips, cracks, and/or irregularities as a result of saw cutting shall not be permitted.

Once the brick pavers have been installed, the Contractor shall spread sweep Polymeric Sand over surface to fill joints completely. Follow manufactures directions for maximum depth, maximum width, and installation procedures. Once all joints have been filled, the Contractor shall sweep clean all pavers and surrounding surfaces.

The Contractor shall remove from the site all excess materials, debris, tools, and equipment. The Contractor shall repair damage resulting from brick paver work at his/her expense.

Delivery, Storage, and Handling: All materials for the work of this section shall be delivered, store, and handled to preclude damage of any nature. Manufactured materials shall be delivered and stored in their original containers, plainly marked with product and manufacturer's name.

END OF SECTION

SECTION 02565

BRICK PAVERS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes
   1. Requirements for this work consists of furnishing and installing the brick pavers on prepared aggregate setting beds in conformance with the Plans and/or as directed by the Engineer, all in accordance with the Rhode Island Standard Specifications for Road and Bridge Construction, latest Edition. .

B. Related Sections
   1. Section 02200 - Earth Excavation, Backfill, Fill and Grading

1.02 REFERENCES

A. This specification makes reference to the requirements of additional specifications as listed. The Contractor shall obtain and familiarize himself with all requirements referenced by this specification prior to preparation and installation of any pavements.

   1. Rhode Island Department of Transportation, Standard Specifications for Road and Bridge Construction, including all addenda issued prior to March 1, 2018, issued by the State of Rhode Island Department of Transportation, (referred to as the Standard Specification).

B. American Society for Testing and Materials

   1. C117 Standard Test Method for Materials Finer than 75-µm (No. 200) Sieve in Mineral Aggregates by Washing
   2. C136 Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates

PART 2 PRODUCTS

2.01 MATERIALS

A. Brick Pavers: Shall match the existing brick pavers that they will be adjacent to.

1. The average comprehensive strength shall be a minimum of 10,000 psi and an average water absorption of no more than 6% (24 hour submersion at room temperature). The radius of rupture shall be not less than 1,000 pounds per square inch.
2. Maximum allowable breakage of product is 5% by weight. .

3. The Engineer has the right to reject pavers prior to installation if the pavers in question reflect an extreme divergence from the approved sample in color range, texture, or appearance.

B. Sand Setting Bed: Shall be sound, sharp, washed, natural sand complying with gradation requirements of ASTM C 33 for fine aggregate, maximum 03% silt and shall be free of deleterious or foreign matter and soluble salts.

1.

Sieve Size	Percentage Passing by Weight
3 inches	100
2 ½"	90-100
2"	35-70
1 ½"	0-15
3/4"	0-5

C. Polymeric Sand: Shall be HP Nextgel – High Performance Polymeric Sand as produced by Techniseal or approved equal. Color shall be grey.

PART 3 EXECUTION

3.01 GENERAL

Well in advance of placing brick pavers, sample panels of brick paving utilizing a plywood base shall be constructed at the site, as directed by the Engineer for the Engineer's approval of material, workmanship, range of color, bond and texture of surface. Sufficient time shall be given to the Engineer and the Town to view and approve the materials, method of laying, and workmanship. Sample panels shall consist of at least 25 bricks and shall remain on site at all times until otherwise directed by the Engineer.

3.02 PREPARATION

Verify substrates and installation conditions to ensure that sub-base material is well compacted and to grade. Do not start unit masonry work until unsatisfactory conditions are corrected.

Establish lines and levels. Finish grade of the Brick Pavers shall match the adjacent brick pavers in both profile and cross section.

3.03 INSTALLATION

The Contractor shall excavate the areas identified on the plans to the limits and depths shown. Place the gravel base and compact to ninety-five percent (95%) of maximum density. Once compacted, the top 1/4 inch shall be loosened with a hand rake. Place the sand setting bed and compact the bed to a finished thickness of 1 inch. Compaction shall be by a mechanical vibrator resulting in a compaction of ninety-five percent (95%) of maximum density. Once compacted, the top 1/4 inch shall be loosened with a hand rake.

The Contractor shall place the brick paver in the pattern to match that of the existing brick pavers. Pavers shall be tamped firmly into the sand setting bedding and shall meet the required finish grade. Each paver shall be adjusted to obtain a uniform joint.

Where the geometry of paving area does not allow receiving full size units or pavers require fitting against the edges, the paver shall be cut. All pavers shall be saw cut to straight and even surfaces without chipping. Pavers with chips, cracks, and/or irregularities as a result of saw cutting shall not be permitted.

Once the brick pavers have been installed, the Contractor shall spread sweep Polymeric Sand over surface to fill joints completely. Follow manufactures directions for maximum depth, maximum width, and installation procedures. Once all joints have been filled, the Contractor shall sweep clean all pavers and surrounding surfaces.

The Contractor shall remove from the site all excess materials, debris, tools, and equipment. The Contractor shall repair damage resulting from brick paver work at his/her expense.

Delivery, Storage, and Handling: All materials for the work of this section shall be delivered, store, and handled to preclude damage of any nature. Manufactured materials shall be delivered and stored in their original containers, plainly marked with product and manufacturer's name.

END OF SECTION

SECTION 02599

PERMEABLE PAVERS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes
   1. Requirements for this work consists of furnishing and installing the pervious pavers on prepared aggregate setting beds in conformance with the Plans and/or as directed by the Engineer, all in accordance with the Rhode Island Standard Specifications for Road and Bridge Construction, latest Edition. .

B. Related Sections
   1. Section 02200 - Earth Excavation, Backfill, Fill and Grading

1.02 REFERENCES

A. This specification makes reference to the requirements of additional specifications as listed. The Contractor shall obtain and familiarize himself with all requirements referenced by this specification prior to preparation and installation of any pavements.

   1. Rhode Island Department of Transportation, Standard Specifications for Road and Bridge Construction, including all addenda issued prior to March 1, 2018, issued by the State of Rhode Island Department of Transportation, (referred to as the Standard Specification).

B. American Society for Testing and Materials

   1. C117 Standard Test Method for Materials Finer than 75-µm (No. 200) Sieve in Mineral Aggregates by Washing
   2. C136 Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates

PART 2 PRODUCTS

2.01 MATERIALS

A. Concrete Pavers: Shall be open-graded friction course hot mix asphalt conforming to the following: (Is this sentence correct, seems like cut and paste)

   1. All Concrete pavers shall meet the minimum material and physical properties set forth in ASTM C 936, Standard Specification for Interlocking Concrete Paving Units. Average compressive strength 8000 psi (55MPa). No unit individual unit shall be permitted under 7,200 psi (50 MPa).

2. Average absorption of 5% with no unit greater than 7% when tested according to ASTM C 140.
3. Resistance to 50 freeze-thaw cycles, when tested according to ASTM C1645, with no breakage greater than 1.0% loss in dry weight of any individual unit. Conduct this test method not more than 12 months prior to delivery of units.
4. Accept only pigments in concrete pavers conforming to ASTM C 979. ACI Report No. 212.3R provides guidance on the use of pigments.
5. Maximum allowable breakage of product is 5% by weight.
6. TX Active is a Portland Cement (white) Type I, II, and III complying with ASTM C 150 with the addition of proprietary particles of titanium dioxide (TiO2) specifically engineered for use in the manufacture of concrete and concrete products.
7. Specific Paver Information:
   a. Concrete Paver Type A: Pavers shall be a rectangular, brick-like in proportion and appearance
   b. Size shall be 9.5"l x 4.8"w x 3.1" thick with a detailed textured surface that has variation within the paver family and features integral color in the wearing surface.
   c. Paver shall be configured w/ spacer bars to permit 1/4" permeable joints.
   d. Color shall be a blend of Opal and Steel Grey color laid in a Herringbone pattern.
   e. Paver shall have perimeter integral spacer 'lugs' designed to insure open void space and equidistant spacing on all four sides of the pavers.
   f. The Engineer has the right to reject pavers prior to installation if the pavers in question reflect an extreme divergence from the approved sample in color range, texture, or appearance.

8. Paver Type A design is based on a Unilock Eco-Priora Premier style paver appearance to be laid in a Herrningbone (EcoPriora 5x10 HB E) pattern and color to be a blend with the followings properties represented: 70% Opal, 30% Steel Grey Blend with a Smooth Premier Finish. (Verify colors is available with Unilock)

9. A product with the above physical properties and visual qualities in this color range is manufactured by Unilock 35 Commerce Drive Ma., Uxbridge Ma.01569 www.unilock.com

   Manufacturer's name and/or model numbers identified herein are intended to assist in establishing a general level of quality, configuration, functionality, and appearance required. This is NOT a proprietary specification and it should be noted that "or equivalent" applies to products denoted herein. It is understood that all manufacturers will have minor variations in configuration, appearance, and product specifications and such minor variations shall not eliminate such manufacturers as an equivalent. It is the intent of this specification to encourage open and competitive involvement from multiple manufacturers that are able to supply similar products.

B. **Paver Setting Bed and Permeable Open Joint Aggregate:** The chip stone setting bed and joint aggregate shall conform to the requirements of Section M.01 of the RI Standard Specifications for Road and Bridge Construction, Latest Edition including all revisions and the following:

Chip stone shall consist of crushed quarry rock and shall be washed, sharp angular stone per ASTM #8 without fines for use as permeable joint aggregate and bedding course. Gradation is as follows:

Chip Stone Setting Bed and Open Joint Aggregate

Sieve Size	Percent Passing (by weight)
1/2”	100%
3/8”	85-100%
#4	10-30%
#8	0-10%
#16	0-5%

ASTM #8 Aggregate for Setting Bed and Permeable Open Joint Crushed Stone

C. **Choker Course:** Shall conform to the applicable requirements of subsection M.01.09, Table I, Column III (Keystone) of the Standard Specifications, with the additional requirement that all stone be thoroughly washed and free of fines (particles smaller than the minimum sieve size allowed for the material). The presence of fines in the choker course could compromise the proper function of the pervious pavement.

D. **Filter Course:** Shall be clean medium sand and conform to the applicable requirements of washed concrete sand as required by AASHTO M6. The filter course shall meet the following grain size distribution ranges:

Sieve Size	% Passing
#4	100%
#8	80% - 90%
#40	10% - 20%
#200	0% - 2%

In addition to the preceding, the material shall have D_{15} and D_{85} particle size targets of 0.025" and 0.125", respectively.

E. **Filter Blanket Stone Course:** The filter blanket crushed stone shall conform to the requirements of Section M.01 of the RI Standard Specifications for Road and Bridge Construction, Latest Edition including all revisions and the following:

Filter blanket shall be a 3" thick layer of 3/8" crushed stone consisting of 100% crushed quarry rock, thoroughly washed and free of fines. Gradation is as follows:

Peastone Filter Blanket Stone Course

Sieve Size	Percent Passing (by weight)
1”	100%
1/2”	80-90%
3/8”	55-65%
#4	40-50%
#8	25-35%
#40	0-15%
#200	0-2%

In addition to the preceding, the material shall have D_{15} and D_{85} particle size targets of 0.25” and 0.50”, respectively.

F. **Reservoir Course:** Shall conform to the applicable requirements of subsection M.01.09, Table I, Column III of the Standard Specifications, with the additional requirement that all stone be thoroughly washed and free of fines (particles smaller than the minimum sieve size allowed for the material). The presence of fines in the reservoir course could compromise the proper function of the pervious pavement.

Reservoir Course Keystone (M.01.09 Table I Column III)

Sieve Size	Percent Passing (by weight)
1”	100%
3/4”	90-100%
1/2”	20-55%
3/8”	0-20%
#4	0-5%

G. **Impermeable Liner:** The impermeable plastic liner shall be non-woven high density polyethylene (HDPE) liner specifically designed for use in subsurface lining/containment applications. Liner properties shall meet or exceed the following minimum requirements:

Property (Unit)	Unit	Test Method	Minimum Requirements
Thickness	mils	ASTM D5199	30
Break Strength	lb/in	ASTM D6693	114
Break Elongation	%	ASTM D6693	800
Tear Resistance	lb	ASTM D1004	16
Puncture Resistance	lb	ASTM D4833	42
Seam Shear Strength	lb/in	ASTM D6392	45
UV Resistance	%	ASTM D5885	35

The liner shall be fabricated and delivered in rolls, not sheets.

To keep the number of overlay joints to a minimum, liner shall be provided in sections not less than fifteen (15) feet in width unless otherwise approved by the Engineer prior to the delivery to the site.

PART 3 EXECUTION

3.01 PREPARATION

A. **Excavation:** Excavate the areas identified on the plans to the limits and depths shown. Excavate to establish depth of reservoir material and establish underdrain piping connections. Coordinate work with excavation related to Tree Conservation Measures. Coordinate work with the installation of granite curbing and curb lock to be installed as pervious edge restraint.

B. **Pre-Installation of Pervious Paving System:** The Contractor shall take elevations at 10' intervals of adjacent curb-line roadway pavement edge. Submit in report form to the Engineer for review. Where elevations vary from those shown on the plans submit proposed revised roadway/ curbline /sidewalk elevations to assure drainage to the Engineer for approval.

1. Identify vertical and horizontal locations of all utilities in the area to be excavated. Preparation of work means installation of all utilities within the area is complete.
2. Examine areas indicated to receive paving for compliance with requirements for installation tolerances and other conditions affecting performance before placing Concrete Pavers.
    a. Verify that subgrade preparation, scarification, surface conditions, and elevations conform to specified requirements.
    b. Verify location, type, and elevations of all edge conditions - granite curb, restraints, concrete collars around utility structures, and drainage inlets.
    c. Verify that the subgrade soil is free from standing water and soil fines.
    d. Stockpile Reservoir Course, Filter Blanket, Filter Course and Crushed Stone Course Aggregate materials such that they are free from standing water, uniformly graded, free of any organic material or sediment, debris, and ready for placement.
    e. Remove any excess thickness of soil applied over the excavated soil subgrade to trap sediment from adjacent construction activities before placing the Geotextile and Permeable Subbase Aggregate materials.
    f. Keep area where pavement is to be constructed free from sediment during entire job. Remove and replace all Geotextile, Reservoir Course, Sand Filter, Filter Blanket, crushed stone etc. if material becomes contaminated with sediment with clean materials. Replacement shall occur at no cost to the Owner.
    g. Elevation of Sub-grade: Any irregularities in the line and grade of sub-grade work shall be corrected during the installation of the surface by varying bedding depth if approved by the Engineer; otherwise adjustment of the base material shall be completed without additional expense to the Owner. The line and grade of the

finished surface shall conform to the elevations shown on the drawings. The surface will be tested with an approved 10', lightweight, metal straight edge furnished by the Contractor, at locations selected by the Engineer. The variation or tolerance of the surface from the testing edge between any two contacts with the surface shall not exceed 3/4" at any point. All humps or depressions exceeding the 3/4" tolerance shall be corrected by removing and reinstalling the defective work without additional expense to the Owner.

h. Inspect and where necessary trim with diamond wheel angle grinder, saws, or chisels any excessive curb thickness on the paver side of the curb that would create unnecessarily wide (+3/8") paver joints or require that pavers are cut in order to fit flush.
i. Proceed with installation only after any unsatisfactory conditions determined have been corrected.

3.02 INSTALLATION

1. **General:** The "Permeable Pavers" construction shall be performed in accordance with all applicable requirements of these specifications and as shown on the plans. In addition, the Contractor shall take care to minimize compaction of existing soils. Excavation and grading shall be performed using only light equipment, such as a compact loader or a dozer/loader with marsh tracks. The Contractor shall take care to avoid compaction of the subbase materials.

2. **Uncompacted Native Subgrade Preparation:** The existing un-compacted native subgrade under the porous pavement parking area shall NOT be compacted. If accumulation of fine materials or surface ponding occurs due to erosion, the material shall be removed by light equipment and legally disposed. The underlying soils shall be scarified to a depth of 6 inches. Prior the placement of the reservoir course, the Engineer shall inspect the subgrade to verify that it is suitable for placement of the reservoir course stone.

3. **Impermeable Liner:** Shall be placed on the bottom of the excavation and side slopes in accordance with the manufacturer's recommendations and as shown on the plans. Overlap the ends 18", lapped in the direction of natural drainage.

4. **Reservoir Crushed Stone Course:** Shall be installed in two (2) 6"-inch maximum lifts (minimum two (2) lifts for proposed reservoir course thickness), and shall be stabilized in place using an eight (8) to ten (10) ton smooth-drum vibratory roller, which shall make a minimum of eight (8) passes over each lift of the reservoir course stone. Initial passes shall be with the roller in vibratory mode, final passes in static mode. Care shall be taken not to over-roll any of the lifts; rolling shall stop whenever the stone is observed to be sliding/shifting in place. Verify placement tolerances: Do not exceed the specified surface grade of the compacted Reservoir Course material more than ±3/4 in. (20 mm) over a 10 ft. (3 m) long straightedge laid in any direction.

5. **Underdrainage:** Conduct pre-installation conference to review excavation perimeter and under drain piping while work is being performed. Install underdrainage and coordinate placement of the drain with the installation of the initial lift of the reservoir course. Establish positive drainage and make drainage connections.

6. **Filter Blanket & Filter Course:** Shall each be installed to a minimum of 90% and a maximum of 95% relative density, in accordance with AASHTO T-180 Method C or D. In addition, the Contractor shall determine the D_{15} and D_{85} particle sizes for both materials, and shall provide testing results to the Engineer for evaluation.

7. **Crushed Stone Course:** Shall be installed in one 4" lift to achieve the full depth shown of the proposed layer, and shall be stabilized in place using an 2000 lb. (1ton) – 5000lb. (2.5ton) plate compactor or small vibratory roller, which shall make approximately eight (8) to ten (10) passes over the stone. The course shall not be over-compacted: do not crush the stone, do not to over-roll any of the lifts; rolling shall stop whenever the stone is observed to be sliding/shifting in place. Verify placement tolerances. Do not exceed the specified surface grade of the compacted Crushed Stone Course more than ±1/2 in. over a 10 ft long straightedge laid and measured in any direction.

8. **Permeable Paving Setting Bed:** The Contractor shall install the permeable aggregate setting bed evenly across the crushed stone course to a nominal thickness of 1-1/2 in. (40 mm). Work the stone initially placed into the void space of the crushed stone layer to create an even and stable surface. Establish a screeding system to distribute aggregate in the bedding layer. Do not substantially exceed screed area which cannot be covered by pavers in one day. Inspect the Setting Bed Aggregate course prior to commencing the placement of the Permeable Concrete Pavers. Acceptance of the Setting Bed Aggregate occurs with the initiation of final placement of Concrete Paver A.

9. **Preliminary placement of Concrete Paver Type A** Place a sample area of Concrete Paver Type A to verify proper depth of material after compaction. Do not disturb the screeded permeable setting bed aggregate. Occasionally inspect and verify the Permeable Setting Bed Aggregate course though-out initial placement of the permeable concrete pavers.

10. **Concrete Paver Type A Installation:** Select and mix Concrete Pavers Type A from a minimum of three (3) bundles simultaneously drawing the paver vertically rather than horizontally, as they are placed, to produce uniform blend of colors and textures. By installing from a minimum of three (3) bundles simultaneously, variation in color shall be dispersed and blended throughout the project. Exercise care in handling face mix pavers to prevent surfaces from contacting paver backs or edges of other units. Do not attempt to install unit pavers with chips, cracks, voids, discolorations, and other defects that might be visible in finished work.

11. Install Paver Type A in the following patterns: Along the travelled pavement edge at the flush curb edge restraint, install a double soldier course of pavers perpendicular to the curbing. Infill the remainder of the paving field with a herringbone pattern as indicated on the plans set at 90 degrees to the curbing. Adjust joint pattern at pavement edges such that cutting of edge pavers is minimized. Cut all pavers exposed to vehicular tires no smaller than one-third of a whole paver.

12. Use string lines or chalk lines on Permeable Setting Bed aggregate to hold all pattern lines true. Maintain edge alignment and re-check dimensions regularly to prevent paver 'creep'. Place units hand tight against spacer bars. Adjust horizontal placement of laid pavers to align straight. When installation is performed with mechanical equipment, use only unit pavers with spacer bars on sides of each unit. Provide space between paver units of 1/32 in. (1 mm) wide to achieve straight bond lines. Do not exceed joint (bond) lines more than ±1/2 in. (±15 mm) over 50 ft. (15 m) from string lines.

13. Fill gaps between units or at edges of the paved area that exceed 3/8 inch (10 mm) with pieces cut to fit from full-size unit pavers. Where geometry of paving areas does not allow receiving full size units, units shall be saw-cut cleanly to fit. Cut unit pavers with motor-driven wet masonry saw equipment to provide clean, sharp, un-chipped edges. Cut units to provide pattern indicated and to fit adjoining work neatly. Use full units without cutting where possible. Hammer cutting is not acceptable. Always utilize the largest paver size possible for cutting. No paver shape cut from less than 1/3 of a whole paver will be allowed. Care shall be used to maintain all joint spacing around cut shapes to be consistent with the paver field Stagger joint spacing where cut paver meets the paver field.

14. Do not allow traffic on installed pavers until all Joint Sand or Joint Open Aggregate has been vibrated into joints. Keep skid steer and forklift equipment off newly laid pavers that have not received initial compaction and Permeable Joint Aggregate material.

15. Vibrate pavers into leveling course with a low-amplitude plate vibrator capable of up to 5000-lbf (22-kN) compaction force at 80 to 90 Hz. Perform at least three passes across paving with vibrator. Vibrate as follows: After edge pavers are installed and there is a completed surface. Compact installed concrete pavers to within 6 feet (1,800 mm) of the laying face before ending each day's work. Cover pavers that have not been compacted and leveling course on which pavers have not been placed, with non-staining plastic sheets to prevent Permeable Setting Bed Aggregate from becoming disturbed.

16. Protect Concrete Paver surface from scuffing during compaction when utilizing a vibratory plate compactor to bed the pavers. ALL FINSIHED PAVER SURFACES MUST BE PROTECTED prior to compacting. Acceptable protection methods include:

a. Neoprene or urethane pad fully mounted to a plate compactor (Paver manufacturer shall provide)
b. ¼ "Plywood sheets laid over the installed work.

Note: Any pavers installed that incur damage during compaction shall be replaced immediately at no additional cost to the Owner. Remove any cracked or structurally damaged pavers and replace with new units prior to installing joint aggregate.

17. **Permeable Open Joint Aggregate:** Evenly spread and sweep in the paver joints immediately after vibrating the pavers into the setting bed course, then repeat until the joints are completely full and remain full after passes with the compaction equipment. Remove excess material.

    This process typically requires at least 4 passes with a plate compactor, and the process shall be repeated until the jointing is proven sound, complete, and is approved by the Engineer. The process and final number of passes required are a function of the effectiveness of the placement of the open joint aggregate, with the requirement being proper 'bedding' of the open joint material into the setting bed, and not a specific compaction density.

18. Tolerances: Do not exceed 1/32-inch (0.8-mm) unit-to-unit offset from flush (lippage). The installed work shall not exceed 1/8 inch in 10 feet (3 mm in 3 m) from level, or indicated slope, for finished surface of paving. Remove all excess Permeable Open Joint Aggregate and broom clean from surface when installation is approved by the Engineer.

19. Remove all debris from joint and provide additional Permeable Open Joint Aggregate material after 120 days and before 150 days after date of Substantial Completion/Provisional Acceptance. The Contractor shall return and fill Permeable Joint Aggregate material full to the lip of the paver.

20. Repairing, cleaning and sealing Pavers. At the time of re-jointing the pavers, inspect, remove and replace any Concrete Pavers Type A that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. The Engineer will determine loose, broken, stained or otherwise damaged or non-uniform pavers that do not match the appearance of the overall field of adjoining pavers. Replacements, as determined by the Engineer shall be done immediately prior to the final inspection. Provide new units to match adjoining units and install in same manner as original units, with same joint treatment and with no evidence of replacement. Cleaning: Remove excess dirt, debris, stains, grit, etc. from exposed paver surfaces; wash and scrub clean. Clean Permeable Concrete Pavers in accordance with the manufacturer's written recommendations and to the satisfaction of the Engineer. Seal concrete pavers as recommended by the manufacturer to resist staining.

END OF SECTION

SECTION 02607

PRECAST CONCRETE MANHOLES

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes

1. Requirements for modular precast concrete manhole sections with tongue-and-groove joints, cast iron covers, accessories and appurtenances.

B. Related Sections

1. Section 02622 - Polyvinylchloride Gravity Sewer Pipe
2. Section 03300 - Cast-In-Place Concrete

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM)

1. A48/A48M-00 Standard Specification for Gray Iron Castings
2. A615/A615M-01b Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
3. C32-93(1999)e1 Standard Specification for Sewer and Manhole Brick (Made From Clay or Shale), AASHTO Designation M91-42, Red Sewer Brick Only Grade SS.
4. C144-02 Standard Specification for Aggregate for Masonry Mortar
5. C150-02a Standard Specification for Portland Cement
6. C207-91(1997) Standard Specification for Hydrated Lime for Masonry Purposes
7. C443-02 Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets
8. C478-02a Standard Specification for Precast Reinforced Concrete Manhole Sections
9. C923-00 Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes and Laterals
10. C990-01a Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants
11. D4101-02a Standard Specification for Polypropylene Injection and Extrusion Materials

B. This specification makes reference to the requirements of additional specifications as listed. The Contractor shall obtain and familiarize himself with all requirements referenced by this specification.

1. Rhode Island Department of Transportation, Standard Specifications for Road and Bridge Construction, including all addenda, (referred to as the Standard Specification).

1.03 SYSTEM DESCRIPTION

A. Design Requirements

1. Manholes shall conform in shape, size, dimensions, materials, and other respects to the details indicated in the Contract drawings.
2. All manholes shall have concrete bases. Invert channels shall be brick construction.
3. Manhole walls (barrels and cones) shall be precast concrete sections. The top of the cone (not to be more than 12-in.) shall be built of brickwork to permit adjustment of the frame to meet the finished surface.
4. The inverts shall conform accurately to the size of the adjoining pipes. Side inverts shall be curved and main inverts (where direction changes) shall be laid out in smooth curves of the longest possible radius which is tangent, within the manhole, to the centerlines of adjoining pipelines.

1.04 SUBMITTALS

A. Shop Drawings

1. In accordance with Specification Section 01300.

B. Samples

1. Provide representative samples of materials if requested by the Engineer.

PART 2 PRODUCTS

2.01 PRECAST CONCRETE SECTIONS

A. Conform to the ASTM C478 with the following exceptions and additional requirements:

1. All cast in place concrete shall conform to the requirements specified under Section 03300.
2. Wall sections to be 5-inch thick minimum.
3. Type II cement in accordance with ASTM C150.

4. 4.0 feet and 5.0 feet diameter manholes minimum of 4,000 psi - 28 days compressive strength.
5. 6.0 foot diameter manhole minimum of 5,000 psi. - 28 days compressive strength except as otherwise permitted.
6. Sections shall be cured by subjecting them to thoroughly saturated steam at a temperature between 100°F and 130°F. for a period of not less than 12 hours or, when necessary for such additional item as may be needed to enable the sections to meet the strength requirements.
7. No more than two lift holes may be cast or drilled into each section.
8. The date of manufacture and the name of trademark of the manufacturer shall be clearly marked on the inside of the barrel.
9. Acceptance of the sections will be on the basis of material tests and inspection of the completed product.

B. Flat Slab Tops

1. Thickness and reinforcement as indicated on the drawings and in accordance with ASTM C478.

C. Cones

1. Cones shall be precast sections of construction similar to above.

D. Bases

1. The tops of the bases shall be suitably shaped by means of accurate bell-ring forms to receive the barrel sections.
2. All holes for pipes shall be cast in the base sections so that there is a clear distance of four inches minimum between the inside bottom of the base section and the pipe invert.
3. Base pad shall be pre-cast with extended base as indicated on drawings and herein specified.
4. Openings for pipe and materials to be embedded in the wall of the base for these joints shall be cast in the base at the required locations during the manufacture of the base.

2.02 COMPONENTS

A. Pipe Seals

1. Pre-molded elastomeric-sealed joints fitted or cast integrally into the pipe opening of the manhole base and/or wall section.
2. Provide a watertight joint.
3. Maximum 10-degree omni-directional deflection.
4. In accordance with ASTM C923.

5. Seals to be:

    a. Lock Joint Flexible Manhole Sleeve by Interpace Corp., Parsippany, NJ;
    b. Kor-N-Seal by National Pollution Control Systems, Inc., Nashua, NH;
    c. A-LOK manhole pipe seal by A-LOK Corp., Trenton, NJ;
    d. or an acceptable equivalent product.

6. All materials, accessories and construction methods used in making the joints shall be supplied or approved by the manufacturer of the pre-molded elastomeric-sealed joint. Furnish manufacturer's written instructions to the Engineer.

B. Aluminum Manhole Steps

1. Cast into walls of the precast sections to form a continuous ladder with a distance of 12 inches between steps.

2. Aluminum drop-front type.

3. Acceptable Manufacturers:

    a. Stock No. 12653B made by Aluminum Company of America, Pittsburgh, PA.
    b. Stock No. F-14-2-B made by New Jersey Aluminum Co., New Brunswick, N.J.,
    c. Approved Equal.

4. Before the steps are built into the masonry and after thorough cleaning, those parts of aluminum steps which will be embedded shall be given a protective coating of an acceptable, heavy-bodied, bituminous material. The cleaning shall be done by suitable means and with suitable cleaning agents to ensure that the surfaces to be coated are free from all foreign matter such as dirt, oil, and grease. The steps shall be thoroughly rinsed and dried before the coating is applied and the coating shall have become thoroughly dry before the steps are built into the masonry.

C. Plastic Manhole Steps

1. Install in walls of the precast sections to form a continuous ladder with a distance of twelve inches (12) between steps.

2. Copolymer Polypropylene plastic manhole step Model PS2-PFSL as manufactured by M. A. Industries, Inc., Peachtree City, Georgia or approved equal.

3. Plastic steps to be in conformance with ASTM D4101 for Type II propylene copolymers.

4. Plastic to encase 1/2-inch grade 60 steel reinforcing rod conforming to ASTM A615.

D. Exterior Coating

1. The material shall be:

    a. Minwax Fibrous Brush Coat made by the Minwax Co., New York, N.Y. or

b. Tremco 121 Foundation Coating made by the Koppers Co., Inc., Pittsburgh, PA; or
c. Acceptable equivalent product.

E. Rubber Gaskets (between manhole sections)

1. In accordance with ASTM C443.
2. Gasket configuration per manufacturer's recommendation.

F. Butyl Resin Gaskets (between manhole sections)

1. In accordance with ASTM C990.
2. Gasket configuration per manufacturer's recommendation.

2.03 ACCESSORIES

A. Manhole Frames and Covers

1. Furnish all cast-iron manhole frames and covers conforming to the details shown on the drawings, or as hereinbefore specified.
2. Castings shall be of good quality, strong, tough, even-grained cast iron, smooth, free from scale, lumps, blisters, sand holes, and defects of every nature which would render them unfit for the service for which they are intended. Contact surfaces of covers and frame seats shall be machined to prevent rocking of covers.
3. Casting shall be thoroughly cleaned and subject to a careful hammer inspection.
4. Castings shall be at least Class 25 conforming to ASTM A48.
5. Standard drain manhole frames and covers to have 24 inch opening, and be manufactured by E.L. LeBaron Foundry Co. (East Jordan Iron Works), Model no. LK256-2-000 or approved equal. Pattern of cover and lettering shall comply with the Owner's standards.
6. Standard sanitary sewer manhole frames and covers to have a 24 inch opening, and be E.L. LeBaron Foundry Co. (East Jordan Iron Works), Model LC246, or approved equal. Pattern of cover and lettering shall comply with the Owner's standards.
7. Watertight sanitary sewer manhole frames and covers to have 24 inch diameter covers with 4 bolts, and gasket, and be E.L. LeBaron Foundry Co., Model LCB246, or approved equal. Pattern of cover and lettering shall comply with the Owner's standards.

B. Brick

1. Sound, hard, and uniformly burned brick, regular and uniform in shape and size, of compact texture, and satisfactory to the Engineer.
2. In accordance with ASTM C32.
3. In accordance with AASHTO M91-42, Red Sewer Brick Only Grade SS.

4. Reject brick shall be immediately removed from the work.

C. Mortar for Brickwork

1. Composed of Portland cement, hydrated lime, and sand in which the volume of sand shall not exceed three times the sum of the volume of cement and lime.
2. The proportions of cement and lime shall be 1:1/4.
3. Cement shall be Type II Portland cement in accordance with Specification SECTION 03300.
4. Hydrated lime shall be Type S conforming to the ASTM C207.
5. Hydrated lime shall be "Mortaseal" manufactured by U.S. Gypsum,"4X Hydrate" manufactured by the New England Lime Company or approved equal.
6. Sand shall conform to ASTM C144.

2.04 STUBS IN MANHOLES

A. The stubs shall be of PVC pipe and shall have PVC stoppers sealed with premolded gasket joints in accordance with Specification SECTION 02622.

B. Lengths as indicated on the Drawings.

2.05 DROP INLETS

A. Construct with pipe as specified in SECTION 02622 or with precast concrete sections provided by the manhole manufacturer with all materials conforming to this Specification.

2.06 STRUCTURES FOR DRAINAGE WORK

A. All Manholes, Inlets and Catch Basins to be used for drains shall be in accordance with Section 702 of the Rhode Island Standard Specification.

PART 3 EXECUTION

3.01 INSTALLATION

A. Manhole Sections

1. Set so as to be vertical and with sections and steps in true alignment.
2. Rubber gaskets shall be installed in all joints in accordance with the manufacturer's recommendations.
3. All holes in sections used for their handling shall be thoroughly plugged with rubber plugs made specifically for this purpose or with mortar. The mortar shall be one (1) part cement to one and one half (1-1/2) parts sand, mixed slightly damp to the touch (just short of "balling"), hammered into the holes until it is dense and

an excess of paste appears on the surface, and then finished smooth and flush with the adjoining surfaces.

B. Rubber and/or Butyl Resin Gaskets (between manhole sections)

1. In accordance with manufacturers recommendation.
2. Install in all joints between precast sections.

C. Brickwork

1. Only clean bricks shall be used.
2. Bricks shall be moistened by suitable means, until they are neither so dry as to absorb water from the mortar nor so wet as to be slippery when laid.
3. Each brick shall be laid in a full bed and joint of mortar without requiring subsequent grouting, flushing, or filling, and shall be thoroughly bonded.

D. Plastering And Curing Brick Masonry

1. Outside faces of brick masonry adjustment courses shall be plastered with mortar to a thickness of on half (1/2) inch.
2. If required, the masonry shall be properly moistened prior to application of the mortar.
3. The plaster shall be carefully spread and troweled. After hardening, the plaster shall be carefully checked by being tapped for bond and soundness.
4. Unbonded or unsound plaster shall be removed and replaced.
5. Brick masonry and plaster shall be protected from too rapid drying by the use of burlaps kept moist, or by other suitable means, and shall be protected from the weather and frost, to insure maximum strength.

E. Exterior Coating

1. The exterior surfaces of all manholes shall be given two coats of bituminous waterproofing material.
2. The waterproofing material shall be applied by brush or spray and in accordance with the instructions of the manufacturer.
3. Time shall be allowed between coats to permit sufficient drying so that the application of the second coat has no effect on the first coat.

3.02 SETTING MANHOLE FRAMES AND COVERS

A. Manhole frames shall be set with the tops conforming accurately to the grade of the pavement or finished ground surface or as indicated on the drawings or directed. Frames shall be set concentric with the top of the masonry and in full bed of mortar so that the space between the top of the manhole masonry and the bottom flange of the frame shall be completely filled and made watertight. A thick ring of mortar

extending to the outer edge of the masonry shall be placed all around and on the top of the bottom flange. The mortar shall be smoothly finished and have a slight slope to shed water away from the frame.

B. Manhole covers shall be left in place in the frames on completion of work at the manholes.

C. Manhole frames and covers installed in State Roads to have concrete collars in accordance with RI Standard Detail 4.95.

3.03 INSTALLING STUBS IN MANHOLES

A. Stubs shall be set accurately to the required line and elevation and shall be installed in the manhole as indicated on the drawings and in accordance with Specification SECTION 02622.

3.04 DROP INLETS

A. Construct to the required line and elevations as indicated on the Drawings.

3.05 CLEANING

A. Manholes to be free of construction debris prior to final inspection.

3.06 STRUCTURES FOR DRAINAGE WORK

A. Installation of all Manholes, Inlets and Catch Basins to be used for drains shall be in accordance with Section 702 of the Rhode Island Standard Specification.

END OF SECTION

SECTION 02610

MANHOLE REHABILITATION

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes

1. Requirements for the following work.
    a. Replacing missing, loose, or broken brick masonry and mortar joints, and patching all holes, voids, and spalled areas.
    b. Replacing all unsound, damaged, or missing manhole steps, as directed.
    c. Sealing of the manhole to eliminate infiltration.
    d. Replacing manhole frame and cover, as directed.
    e. Applying coating materials.

B. Related Sections

1. Section 02149 Maintaining Existing Flows

1.02 REFERENCES

A. American Association of State Highway and Transportation Officials (ASSHTO)

1. AASHTO M91 - Red Sewer Brick Only Grade SS.

B. American Society for Testing and Materials (ASTM)

1. ASTM C32 - Specification for Sewer and Manhole Brick (Made from clay or shale). Grade SS
2. ASTM C94 - Specification for Ready-Mixed Concrete.
3. ASTM C109 - Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-inch or 50-mm Cube Specimens).
4. ASTM C144 - Specification for Aggregate for Masonry Mortar.
5. ASTM C150 - Specification for Portland Cement.
6. ASTM C207 - Specification for Hydrated Lime for Masonry Purposes.
7. ASTM C267 - Test Method for Chemical Resistance of Mortars, Grouts, and Monolithic Surfacings and Polymer Concretes.
8. ASTM C293 - Test Method for Flexural Strength of Concrete (Using Simple Beam With Center-Point Loading)
9. ASTM C321 - Test Method for Bond Strength of Chemical-Resistant Mortars.
10. ASTM C496 - Test Method for Splitting Tensile strength of Cylindrical Concrete Specimens.

11. ASTM C596 - Test Method for Drying Shrinkage of Mortar Containing Hydraulic Cement.
12. ASTM C666 - Test Method for Resistance of Concrete to Rapid Freezing and Thawing.
13. ASTM C827 - Test Method for Change in Height at Early Ages of Cylindrical Specimens from Cementitious Mixtures.
14. ASTM C882 - Test Method for Bond Strength of Epoxy-Resin Systems Used with Concrete by Slant Shear.

C. National Association of Sewer Service Companies (NASSCO)

1. NASSCO Recommended Specifications for Sewer Collection System Rehabilitation.

1.03 SUBMITTALS

A. Submit in shop drawings accordance with Specification Section 01300.

1. Product Data: Provide data on grouting, plugging, patching, coating and lining materials; manhole steps; mortar components; manhole frames and covers, as applicable; and sewer brick.
2. Mortar design mix.
3. Manufacturer's preparation/mixing/installation/application instructions for grouting, plugging, patching, coating and lining materials.
4. Outline of the procedures proposed for the accomplishment of work. Include a detailed description of the means and methods, and equipment to be used for each operation.

1.04 QUALITY ASSURANCE

A. The materials used to plug, patch, coat and line manholes shall comprise of a system specifically recommended by the manufacturer for sanitary sewer manhole rehabilitation.

B. Perform general work in accordance with NASSCO Recommended Specifications for Sewer Collection System Rehabilitation.

1.05 QUALIFICATIONS

A. Installer: Company specializing in performing the work described in this Section shall demonstrate by documentation to the Engineer a minimum of three (3) years documented experience. The installer shall be a fully licensed applicator by the applicable manufacturer. The installer shall also be required to furnish a minimum of five (5) references where selected products have been successfully utilized under similar conditions.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, protect and handle products to site under provisions of Section 01600 and in strict accordance with the manufacturer's recommendations/instructions.

B. Maintain packaged materials clean, dry and protected against dampness, freezing, foreign matter and/or any other compromising conditions.

PART 2 PRODUCTS

2.01 MATERIALS

A. Brick

1. Sound, hard, and uniformly burned brick, regular and uniform in shape and size, of compact texture, and satisfactory to the Engineer. Brick shall comply with ASTM C32 and AASHTO M91 for sewer brick type S.S.
2. Rejected brick shall be immediately removed from the work.

B. Mortar for Brickwork

1. Composed of portland cement, hydrated lime, and sand in which the volume of sand shall not exceed three times the sum of the volume of cement and lime. The proportions of cement and lime shall be 4:1.
2. Cement shall be Type II Portland cement conforming to ASTM C150.
3. Hydrated lime shall be Type S conforming to ASTM C207. Hydrated lime shall be "Mortaseal" manufactured by US Gypsum, "4X Hydrate" manufactured by the New England Lime Company or an acceptable equivalent product.
4. Sand shall conform to ASTM C144.

C. Manhole Steps

1. Steel reinforced copolymer, polypropylene plastic with flexible "fins" designed to flex on insertion into manhole wall but to catch and hold upon any attempt to pull them out. Manhole steps shall be as manufactured by M.A. Industries Inc., Peachtree City, GA or an acceptable equivalent product.

D. Manhole Frames and Covers

1. Owners standard or as detailed on the Drawings.

E. Patching Material

1. Patching material shall be a rapid-setting, fiber reinforced, high-early-strength, corrosion/sulfate resistant calcium aluminate based cementitious material shall be used as a patching material for making repairs in concrete, brick, or other

masonry constructed structures. Material shall be mixed and applied in strict accordance with the manufacturer's recommendations and shall have the following minimum requirements:

a.	Compressive Strength, ASTM C109:	1400 psi @ 6 hours
b.	Bond, ASTM C321:	140 psi @ 28 days
c.	Cement:	Calcium Aluminate Cement Sulfate Resistant
d.	Applied Density:	105 ± 5 lbs per cubic foot
e.	Shrinkage, ASTM C596:	0% @ 90% relative humidity

2. Patching material shall be Strong-Seal® QSR as manufactured by Strong Seal Systems Corporation, Pine Bluff, AK or an acceptable equivalent.

F. Infiltration Control Material

1. Infiltration control material shall be a rapid-setting, high-early-strength, cementitious material specifically formulated for leak control applications, stopping infiltrating groundwater and making repairs in concrete, brick, or other masonry constructed structures. Material shall be mixed and applied in strict accordance with the manufacturer's recommendations and shall have the following minimum requirements:

a.	Compressive Strength, ASTM C109:	400 to 600 psi @1-hour 1,800 to 2400 psi @ 24-hours
b.	Expansion, ASTM C827:	0.10-percent
c.	Sulfate Resistance, ASTM C267:	No weight loss after 15-cycles; 2,000 ppm
d.	Freeze/Thaw Resistance, ASTM C666, Method A:	100 cycles
e.	Placement time:	Less than 1 minute

2. Infiltration control material shall be Strong-Plug® as manufactured by Strong Seal Systems Corporation, Pine Bluff, AK or an acceptable equivalent.

G. Grouting Material

1. Chemical Sealing Materials shall be made of Acrylamide base gel and shall meet or exceed the following requirements:
   a. A minimum of ten (10%) percent acrylamide base material by weight in the total sealant mix, higher concentration of acrylamide base material may be used to increase strength or offset dilution during injection.
   b. The ability to tolerate some dilution and react in moving water during injection.
   c. A viscosity of approximately two (2) centipoise, which can be increased with additives.
   d. A constant viscosity during reaction period.
   e. A controllable reaction time from 10 seconds to 1 hour.

f. A reaction (curing), which produces a homogeneous, chemically non biodegradable gel.
g. The ability to increase mix viscosity, density and gel strength by the use of additives.

2. The Chemical sealing materials shall be AV100 Grout by Avanti International, Webster, TX, or an acceptable equivalent product.

H. Liner Material

1. Liner material shall be a spray-applied, acid resistant, calcium aluminate cementitious liner material blended of 100% pure fused calcium aluminate clinker and calcium aluminate cement, and reinforced with alkaline resistant fiberglass rods. Liner material shall be specifically formulated for use to form a structurally enhanced monolithic liner covering all interior substrate surfaces exposed to harsh hydrogen sulfide conditions as typically found in municipal sanitary sewer systems regardless of surface pH. Material shall be factory blended requiring only the addition of clean and potable water (per ASTM C94 laboratory procedures). Material shall be mixed and applied in strict accordance with the manufacturer's recommendations and shall have the following minimum requirements at 28-days:

a. Compressive Strength, ASTM C109:	Greater than 9,000 psi
b. Tensile Strength, ASTM C496:	Greater than 800 psi
c. Flexural Strength, ASTM C293:	Greater than 1,200 psi
d. Shrinkage, ASTM C596:	0% @ 90% Relative Humidity
e. Bond, ASTM C882:	Greater then 2,000 psi
f. Applied Density:	145 ± 5 lbs per cubic foot
g. Freeze/Thaw Resistance, ASTM C666:	100 cycles, no damage

2. Liner material shall be Strong-Seal® High Performance Mix as manufactured by Strong Seal Systems Corporation, Pine Bluff, AK or an acceptable equivalent.

PART 3 EXECUTION

3.01 REHABILITATION WORK

A. Rehabilitate manholes as indicated and as specified herein.

B. Rehabilitation includes sealing manholes to eliminate infiltration.

C. Manhole sealing includes the following:

1. Cleaning; surface preparation; stopping active leaks, applying patching/grouting materials as applicable to all holes or voids around steps, joints, or pipes and all spalled areas; and replacing missing bricks and re-pointing all missing and loose mortar joints.

2. Applying coating/liner compounds and cementitious coating system to invert, bench, walls cone, corbel and chimney.

3.02 EXAMINATION

A. Verify that surfaces are ready to receive work.

B. Beginning of installation means acceptance of existing surfaces.

3.03 PREPARATION

A. Bypass sewage flow to allow performance of the work. Provide the necessary pumps, conduits, and other equipment to divert the flow of sewage around the manhole in which work is to be performed. Handling existing sewage flows and bypass pumping shall be in accordance with Specification Section 02149.

B. Prepare surfaces in accordance with mortar and coating manufacturer's instructions.

C. Clean all concrete and masonry surfaces to be rehabilitated. Completely remove all sewage residue, grease, oil, laitance, coatings, loose bricks, mortar, unsound concrete and other foreign materials. Remove all cracked or disintegrated material to expose a sound subbase.

D. All cracks not subject to movement and greater than one sixteenth (1/16) inch wide shall be routed out to a minimum width and depth of one half (1/2) inch.

E. Remove and dispose of all solids and semi-solids resulting from the preparation operations in accordance with Specification Section 00700, 1.24, B.

F. The primary means of cleaning the manhole shall be water blasting using high-pressure water only. Other methods such as dry sandblasting, acid-wash, concrete cleaners, degreasers or mechanical means may be required to properly clean the surface. All surfaces on which these other methods are used shall be thoroughly rinsed, scrubbed, and neutralized to remove cleaning agents and their reactant products.

G. Water blast equipment shall utilize a minimum pressure of 5,000 psi and be capable of providing up to 10,000 psi of pressure when required. Muriatic acid (hydrochloric acid) solution, if used, shall be one part acid to ten parts water and shall be applied by spraying from above the manhole.

H. After surface preparation and prior to application of mortars and coatings, infiltration shall be stopped by either plugging, chemical grout sealing, or channeled through "bleed" pipes installed at the bottom of the manhole.

3.04 CHEMICAL GROUT SEALING

A. At each point of leakage within the manhole structure a hole shall be drilled from within the manhole and shall extend through the entire wall. In cases where there are multiple leaks around the circumference of the manhole, fewer holes may be drilled, providing all leakage is stopped from these holes.

B. Install grout ports or sealant injection devices in these previously drilled holes in such a way as to provide a watertight seal between the holes and the injection device.

C. Inject chemical grout into the installed ports under pressure using equipment appropriate for the particular application. The injection equipment shall consist of chemical pumps, chemical containers, injection packers, hoses, valves, and all necessary equipment required to seal manholes. The chemical injection pumps shall be equipped with pressure meters that will provide for monitoring pressure during injection of the chemical grout.

D. Continue injection of grout until material refusal is recorded on the pressure gage of the pumping unit.

E. Care shall be taken during the pumping operation to avoid excessive pressures that may damage the manhole structure.

F. Upon completion of the injection remove the ports and fill the remaining holes with patching compound.

3.05 BLEED PIPES

A. Drill holes and install "bleed" pipes around the bottom of the manhole wall to act as relief ports for water to flow from other active leaks to allow performance of the work.

B. Remove bleed pipes and seal holes after all other manhole sealing work is complete.

3.06 PLUGGING COMPOUND

A. Apply plugging compound in accordance with manufacturer's instructions.

3.07 PATCHING COMPOUND

A. All material shall be mixed and applied in accordance with the manufacturers instructions.

B. Installation to be performed by mechanics skilled in the application of the particular type of system.

C. Prior to application, dampen area to be patched. Pack material into the area to be patched, troweling the minimum amount required to achieve a level finish. Allow adequate curing time.

3.08 BRICKWORK

A. Only clean bricks shall be used. Bricks shall be moistened by suitable means, as directed, until they are neither so dry as to absorb water from the mortar nor so wet as to be slippery when laid.

B. Each brick shall be laid in a full bed and joint of mortar without requiring subsequent grouting, flushing, or filling, and shall be thoroughly bonded as directed.

3.09 MANHOLE STEPS

A. Remove all unsound and damaged steps as directed by the Engineer.

B. Drill holes to allow minimum of three (3) inch embedment into the manhole wall or until the fins designed to catch are fully embedded.

C. Clean holes by suitable means to remove all foreign matter such as dirt, oil, and grease.

D. Fill all holes and voids with non-shrink grout. Work grout into space to eliminate voids.

3.10 MANHOLE FRAMES AND COVERS

A. Remove and dispose of the cast-in-place concrete collar around the existing frame. Material in the exposed area shall be dug out to a depth sufficient to permit the required repairs.

B. Remove the existing manhole frame and cover, and if specified herein and/or directed by the Engineer for full replacement, dispose of the existing frame and cover as directed. It shall be the responsibility of the Contractor, at no additional cost to the Owner, to repair any damage to the manhole chimney or corbel caused by the removal of the existing manhole frame and the reinstallation/replacement of the same.

C. Frames shall be set concentric with the top of the masonry and fastened as indicated. A thick ring of mortar extending to the outer edge of the masonry shall be placed all around and on the top of the bottom flange. The mortar shall be smoothly finished and have a slight slope to shed water away from the frame.

D. Manhole covers shall be left in-place within the installed frames on completion of other work at the manholes.

3.11 INVERT REPAIR

A. After preparation has been completed, remove all loose material and wash wall again.

B. Any bench, invert or service line repairs shall be made at this time using the quick setting patching material (article 2.01) and shall be used per manufacturer's recommendations.

C. Invert repair shall be performed on all inverts with visible damage or infiltration. After blocking flow through the manhole and thoroughly cleaning the invert, the quick setting patch material (article 2.01) shall be applied to the invert in an expeditious manner. The mix shall be troweled uniformly onto the invert at a minimum thickness of one half (1/2) inch, extending out onto the bench sufficiently to tie into the monolithic liner to be spray applied. The finished invert shall be smooth and free of ridges. The flow may be re-established in the manhole within 30 minutes after placement of the material.

3.12 CEMENTITIOUS LINER

A. All material shall be mixed and applied in accordance with the manufacturers instructions.

B. Installation to be performed by mechanics skilled and licensed by the manufacturer in the application of the particular type of system.

C. Application of the cementitious liner shall be according to the manufacturers recommendations and as approved by the Engineer. Two coats of liner shall be applied with the minimum thickness of one half (1/2) inch per coat.

3.13 FINAL ACCEPTANCE

A. After the specified types of rehabilitation work have been completed, visually inspect each manhole in the presence of the Engineer for full compliance with the Specifications including watertightness against leakage. Repair all visible leaks and defects observed during inspection. Final acceptance of the completed work shall be determined solely on an acceptable concurrence by the Owner/Engineer.

B. The Owner/Engineer reserves the right to re-inspect the rehabilitated manholes at any time during the warranty period. During such inspections should there be any leakage and/or other defects found in the work the Contractor shall fully correct the elements of work in question as determined by the Owner/Engineer within thirty (30) days at no additional cost to the Owner.

END OF SECTION

SECTION 02614

REINFORCED-CONCRETE DRAIN PIPE

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes

1. Requirements for furnishing and installing the reinforced-concrete pipe as indicated on the drawings.

B. Related Sections

1. Section 02200 - Earthwork.
2. Section 02215 - Aggregate Materials.

1.02 QUALITY ASSURANCE

A. Reinforced-concrete pipe shall be made by a manufacturer of established good reputation in the industry and in a plant adapted to meet the design requirements of the pipe.

1.03 REFERENCES

A. American Association of State Highway and Transportation Officials.

1. M 170, Standard Specification for Reinforced Concrete Culvert, Storm Drain and Sewer Pipe.

B. American Society for Testing and Materials (ASTM).

1. C76, Specification for Reinforced Concrete Culvert, Storm Drain and Sewer Pipe.
2. C361, Specification for Reinforced Concrete Low-Head Pressure Pipe.
3. C443, Specification for Joints for Circular Concrete Culvert and Sewer Pipe, Using Rubber Gaskets.
4. C497, Standard Test Methods for Concrete Pipe, Manhole Sections, or Tile.

1.04 SUBMITTALS

A. In accordance with SECTION 01300 submit for review drawings showing the pipe dimensions reinforcement, joint, and other details for each type and class of pipe to be furnished for the project. All pipe furnished under the contract shall be manufactured only in accordance with the specifications and the reviewed drawings.

PART 2 PRODUCTS

2.01 PIPE

A. Each unit of pipe shall have an interior surface, which is free from roughness, projections, indentations, offsets, or irregularities of any kind. The pipe units shall be of the classes indicated on the drawings and shall conform to ASTM C76 and AASHTO M170 with the following exceptions and additions:

1. Type II cement shall be used unless otherwise permitted by the Engineer. Admixtures shall not be used except with the prior permission of the Engineer.
2. Aggregates shall conform to the requirements set forth hereinafter.
3. Elliptical reinforcement will not be permitted. Longitudinal reinforcement shall be continuous. Reinforcement shall have a minimum cover of 3/4 in.
4. Absorption shall be as specified under "inspection, Tests and Acceptance."
5. Pipe units have a minimum laying length of 8 ft., except as otherwise indicated or permitted by the Engineer.
6. Pipe units shall be cured in accordance with ASTM C76.
7. No pipe shall be shipped until the pipe has meet strength requirements in accordance with ASTM C76.
8. There shall be no lift holes in the pipe.
9. Mortar used for repairs shall have a minimum compressive strength of 4,000 psi. at the end of 7 days and 5,000 psi. at the end of 28 days, when tested in 3-in. by 6 in. cylinders stored in the standard manner. Only those repairs permitted by the above-mentioned ASTM C76 will be allowed.
10. The date of manufacture, class of pipe unit, size of pipe unit, and trademark of the manufacturer shall be clearly and permanently marked on the inside and the outside at one end of each pipe unit.
11. Certified copies of tests on materials and the pipe units will be required.

B. Specials, if required, shall conform to the specifications for straight pipe insofar as applicable. Special design or construction necessary for specials shall be subject to acceptance by the Engineer.

2.02 JOINTS

A. Pipe joints shall be of the rubber gasket type in which the gaskets are in compression and which will permit both longitudinal and angular movement. Each unit of pipe shall be provided with proper ends made of concrete formed true to size and formed on machined rings to ensure accurate joint surface. Joints and gaskets shall be O-ring or ribbed gasket type and shall conform to the requirements of ASTM C443, and ASTM C361 and to the additional requirements specified.

2.03 INSPECTION, TESTS AND ACCEPTANCE

A. Acceptance will be on the basis of tests of materials, absorption tests, plant load-bearing tests, pressure tests, and inspection of the complete product. The required tests are enumerated hereinafter. The quality of all materials used in the pipe, the process of manufacture, and the finished pipe shall be subject to inspection by the

Engineer. Inspection may be made at the place of manufacture, or on the work site after delivery, or both, and the pipe shall be subject to rejection at any time due to failure to meet any of the specification requirements, even though sample pipe units may have been accepted as satisfactory at the place of manufacture. All pipe which is rejected shall be immediately removed from the project site by the Contractor.

B. Tests and certified copies in triplicate of test results will be required for the materials and the finished pipe units as described herein. If less than 100 units of a given size and class of pipe are required, the Contractor may submit certified copies of tests made on identical pipe units made by the same manufacturer within the past year. If more than 100 units of a given size and class of pipe are required, the Contractor shall, at his own expense, engage the services of an acceptable independent testing laboratory to perform or witness all tests, other than mill tests on reinforcing steel and cement, and certify the results. In addition, the Owner reserves the right to have any or all pipe units inspected or tested, or both, by an independent testing laboratory at either the manufacturer's plant or elsewhere. Such additional inspection and/or tests shall be at the Owner's expense and shall be the test results of record.

C. All pipe units to be tested shall be selected at random by the Engineer. Unless otherwise permitted, all load-bearing tests on pipe units shall be made in the presence of the Engineer.

D. All tests shall be made in accordance with the latest applicable ASTM specifications.

1. Reinforcing Steel--Mill test reports, or reports on samples taken from each shipment to the pipe manufacturer, shall be submitted for reinforcing steel to be used on this project stating that the reinforcing meets the specified requirements.
2. Cement--Mill test reports shall be submitted for each shipment to the pipe manufacturer of cement to be used on this project stating that the cement meets the specified requirements. All cement accepted for this project shall be kept segregated from other cement.
3. Aggregates--Tests reports shall be submitted stating that the aggregates to be used on this project meet the requirements for concrete aggregates as specified "Fine Aggregate" and "Coarse Aggregate" under SECTION 03300. The first report shall be submitted prior to the manufacturer of any pipe for this project. Additional tests and reports shall be made monthly thereafter during the production of the pipe.
4. Absorption Tests--Three cores shall be taken from each pipe unit that is to be load tested. The cores shall be taken before the load-bearing tests are performed. All cores shall be tested for absorption by the boiling absorption test. Average absorption shall not exceed 8 percent of the dry weight and no single test shall exceed 9 percent.
5. Pipe Unit Load-Bearing Tests (ASTM C497)--A load-bearing test shall be made on one pipe unit of each size and class and the report of the test submitted before delivery to the project of that size and class of pipe unit. An additional test will be required for each 200 units of each size and class of pipe. The load-bearing test shall be performed after the cores for the absorption tests have been taken. Each load-bearing test shall be carried to the specified load to produce the 0.01 in.

crack. If the 0.01 in. crack is not formed, the pipe unit may be used in the project. Cored holes shall be plugged with the mortar specified above for repairs.

6. Pressure Test (ASTM C497)--A pressure test shall be made on two pipe units of each size and class to be used. Each pipe unit shall be bulkheaded independently and then joined together in a normal manner with the joint to be used in the work. The pipe units shall be held in place in such manner that no external compression force is exerted on the joint during the test. The test pressure shall be an average internal hydrostatic pressure of 12 psi and shall be maintained for at least 10 minutes without visible leakage from the joint. A description of the bulk-heading and pipe holding arrangement shall be submitted to the Engineer for review prior to performing the test. All pressure tests shall be made in the presence of the Engineer.
7. Concrete Cylinders--Compression tests shall be made on standard concrete cylinders for the first or test pipe unit and then for every 100 cubic yards of concrete used in pipe manufacture, or for each additional 200 units of pipe, whichever represents the lesser amount of concrete. Four cylinder shall be made for each test and they shall be broken at 7, 14, and 28 days with one cylinder as a spare to be used in the event of an unsatisfactory break. The reports shall be submitted within three days after each of the compression tests.

PART 3 EXECUTION

3.01 HANDLING PIPE

A. Each pipe unit shall be handled into its position in the trench only in such manner and by such means as is acceptable to the Engineer.

B. The Contractor will be required to furnish suitable devices to permit satisfactory support of all parts of the pipe unit when it is lifted.

3.02 INSTALLATION

A. Each pipe unit shall be inspected before being installed. Any pipe discovered to be defective either before or after installation shall be removed and replaced with a sound pipe.

B. Except as otherwise indicated on the drawings, the pipe shall be supported by compacted crushed stone. No pipe or fitting shall be permanently supported on saddles, blocking, or stones. Crushed stone shall be as specified under SECTION 02215.

C. Suitable bell holes shall be provided, so that after placement only the barrel of the pipe receives bearing pressure from the supporting material.

D. All pipe units shall be cleared of all debris, dirt, etc., before being installed and shall be kept clean until accepted in the completed work.

E. Pipe and fittings shall be installed to the lines and grades indicated on the drawings or as required by the Engineer. Care shall be taken to ensure true alignments.

F. Before any joint is made. the unit shall be checked to assure that a close joint with the next adjoining unit has been maintained and that the inverts are matched and conform to the required grade. The pipe shall not be driven down to the required grade by striking it with a shovel handle, timber, or other unyielding object.

G. All joint surfaces shall be cleaned. Immediately before jointing the pipe, the bell or groove shall be lubricated in accordance with the manufacturer's recommendation. Each pipe unit shall then be carefully pushed into place without damage to pipe or gasket. Suitable devices shall be used to force the pipe unit together so that they will fit with a minimum open recess inside and outside and have tightly seated joints. Care shall be taken not to use such force as to wedge apart and split the bell or groove ends. Joints shall not be pulled or cramped without the permission of the Engineer.

H. Immediately after the pipe joint is completed, the position of the gasket in the joint shall be inspected using a suitable feeler gage furnished by the Contractor, to be sure it is properly put together and is tight. Joints in which the gasket is damaged or not properly positioned shall be pulled apart and remade using a new gasket.

I. Where any two pipe units do not fit each other closely enough to enable them to be properly jointed, they shall be removed and replaced with suitable units and new gaskets.

J. Details of gasket installation and joint assembly shall follow the directions of the manufacturer of the joint materials and of the pipe, all subject to acceptance by the Engineer. The resulting joints shall be watertight and flexible.

K. After each pipe to be supported on screened gravel has been properly bedded, enough gravel shall be placed between the pipe and the sides of the trench, and thoroughly compacted, to hold the pipe in correct alignment. Bell holes provided for jointing shall be filled with screened gravel and compacted, and then screened gravel shall be placed and compacted to complete the pipe bedding, as indicated on the drawings.

L. The Contractor shall take all necessary precautions to prevent floatation of the pipe in the trench.

M. At all times when pipe installation is not in progress, the open ends of the pipe shall be closed with temporary watertight plugs or by other suitable means. If water is in the trench when work is to be resumed, the plug shall not be removed until all conditions are suitable to prevent water, earth, or other material from entering the pipe.

N. Pipelines shall not be used as conductors for trench drainage during construction.

3.03 CLEANING

A. Care shall be taken to prevent earth, water, and other materials from entering the pipeline. As soon as possible after the pipe and manholes are completed, the Contractor shall clean out pipelines and manholes, being careful to prevent soil, water, and debris from entering any existing pipe.

END OF SECTION

SECTION 02622

POLYVINYL CHLORIDE GRAVITY SEWER PIPE

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes

1. Requirements for furnishing, installing and testing polyvinyl chloride (PVC) gravity sewer pipe and fittings.

B. Related Sections

1. Section 02200 - Earthwork
2. Section 02215 - Aggregate Materials

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM) Publications

1. D3034, Specification for Type PSM Poly (vinyl chloride) (PVC) Sewer Pipe and Fittings.
2. D3212, Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals.
3. F477, Specification for Elastometric Seals (Gaskets) for Joining Plastic Pipe.
4. F679, Specification for Poly (vinyl chloride) (PVC) Large - Diameter Plastic Gravity Sewer Pipe and Fittings.

1.03 SUBMITTALS

A. Shop Drawings

1. In accordance with SECTION 01300 - SUBMITTALS.
2. Submit for review shop drawings showing pipe dimensions, joints, joint gaskets, and other details for each size of pipe to be furnished for the project.
3. All pipe furnished under the contract shall be manufactured only in accordance with the Specifications and the reviewed drawings.

B. Samples

1. Submit samples of products if requested by the Engineer.

1.04 QUALITY ASSURANCE

A. Certifications

1. All pipe delivered to the job site shall be accompanied by test reports certifying that the pipe and fittings conform to the herein-mentioned ASTM specifications.

2. Pipe shall be subject to thorough inspection and tests, the right being reserved for the Engineer to apply such tests as he deems necessary.
3. All tests shall be made in accordance with the methods prescribed by the herein-mentioned ASTM specifications, and the acceptance or rejection shall be based on the test results.
4. Assist the Engineer in inspecting the pipe upon delivery.
5. Pipe not conforming to the requirements of this contract will be rejected and shall be immediately removed from the site by the Contractor.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Storage and Protection

1. All pipe shall be stored at the site until installation in accordance with the manufactures recommendations.

PART 2 PRODUCTS

2.01 MATERIALS

A. Pipe, Fittings, and Specials

1. Diameters 4-inch through 15-inch, in conformance with ASTM D3034.
2. Diameters 18-inch through 27-inch in conformance with ASTM F679, stiffness (PS) 175 psi
3. The pipe shall have pipe diameter to wall thickness ratio (SDR) of a maximum of 35, unless otherwise indicated and/or approved by the Engineer.

B. Straight Pipe

1. Lengths of not more than 13 ft...

C. Y-branches

1. Lengths of not more than 3 ft., unless otherwise permitted by the Engineer.
2. Saddle Y-branches will not be allowed.

D. Specials

1. Conform to the specifications for straight pipe as applicable and to the details indicated on the drawings or bound into the back of the specifications.

E. Joints

1. Conforming to ASTM D3212.
2. Push-on bell and spigot joints using elastomeric ring gaskets

F. Gaskets

1. Conforming to ASTM F477.
2. Securely fixed into place in the bells so that they cannot be dislodged during joint assembly.

3. Composition and texture which is resistant to common ingredients of sewage and industrial wastes, including oils and groundwater, and which will endure permanently under the conditions of the proposed use.

G. Lubricant

1. In accordance with manufacturers requirements.

PART 3 EXECUTION

3.01 PREPARATION

A. Inspection of Pipe

1. Inspect each pipe unit before being installed.
2. No single piece of pipe shall be laid unless it is generally straight and undamaged.
3. The centerline of the pipe shall not deviate from a straight line drawn between the centers of the openings at the ends of the pipe by more than 1/16 in. per ft. of length.
4. If a piece of pipe fails to meet this required check for straightness, it shall be rejected and removed from the site.
5. Any pipe unit or fitting discovered to be defective either before or after installation shall be removed and replaced with a sound unit.

B. Handling of Pipe

1. Each pipe unit shall be handled into its position in the trench, by such means as acceptable to the Engineer. Care shall be taken to avoid damaging the pipe and fittings.

3.02 INSTALLATION

A. Placement

1. Except as otherwise indicated on the drawings, support pipe with compacted Crushed Stone in accordance with Specification SECTION 02215. No pipe or fitting shall be permanently supported on saddles, blocking, or stones.
2. Provide suitable depressions in crushed stone to accept pipe bells, so that after placement, only the barrel of the pipe receives bearing pressure from the supporting material.
3. Clear pipe and fittings of debris, dirt, etc., before being installed; keep clean until accepted in the completed work.
4. Install pipe and fittings to the lines and grades indicated on the drawings or as required by the Engineer. Care shall be taken to ensure true alignments and gradients.

B. Joining Pipe

1. Before any joint is made, the previously installed unit shall be checked to assure that a close joint with the adjoining unit has been maintained and that the inverts are matched and conform to the required grade.

2. The pipe shall not be driven down to the required grade by striking it with a shovel handle, timber or other unyielding object.
3. All joint surfaces shall be cleaned. Immediately before jointing the pipe, the bell or groove shall be lubricated in accordance with the manufacturer's recommendation.
4. Each pipe unit shall then be carefully pushed into place without damage to pipe or gasket.
5. Suitable devices shall be used to force the pipe units together so that they will fit with a minimum open recess inside and outside and have tightly sealed joints.
6. Care shall be taken not to use such force as to wedge apart and split the bell or groove ends.
7. Joints shall not be "pulled" or "cramped" unless permitted by the Engineer.
8. Where any two pipe units do not fit each other closely enough to enable them to be properly jointed, they shall be removed and replaced with suitable units.
9. Gasket installation and joint assembly shall follow the directions of the manufacturers of the joint material and of the pipe, all subject to review by the Engineer. The resulting joints shall be watertight and flexible.
10. Open ends of pipe and branches shall be closed with polyvinyl chloride stoppers secured in place in an acceptable manner.

C. Rejecting Pipe

1. Pipe of a particular manufacturer may be rejected if there are more than five unsatisfactory joint assembly operations or "bell breaks" in 100 consecutive joints, even though the pipe and joint conform to the appropriate ASTM Specifications as hereinbefore specified. If the pipe is unsatisfactory, as determined above, the Contractor shall, if required, remove all pipe of that manufacturer of the same shipment from the work and shall furnish pipe from another manufacturer which will conform to all of the requirements of these specifications.

D. Bedding Pipe

1. After each pipe has been properly placed, enough crushed stone shall be placed between the pipe and the sides of the trench, and thoroughly compacted, to hold the pipe in correct alignment.
2. Bell holes (depressions), provided for jointing, shall be filled with crushed stone and compacted, and then crushed stone shall be placed and compacted to complete the pipe bedding, as indicated on the drawings.

E. Protecting Pipe

1. Take all necessary precautions to prevent flotation of the pipe in the trench.
2. Close the open ends of the pipe with temporary watertight plugs; at all times pipe installation is not in progress.
3. If water is in the trench when work is to be resumed, the plug shall not be removed until suitable provisions have been made to prevent water, earth, or other substances from entering the pipe.
4. Pipelines shall not be used as conductors for trench drainage during construction.

F. Backfilling Pipelines

1. In accordance with SECTION 02200.

3.03 ALLOWABLE PIPE DEFLECTION

A. Pipe provided under this specification shall be installed not exceeding a maximum deflection of 3.5 percent. Deflection shall be computed by multiplying the amount of deflection (nominal diameter less minimum diameter when measured) by 100 and dividing by the nominal diameter of the pipe.

B. Upon completion of a section of sewer, including placement and compaction of backfill, the Contractor shall measure the amount of deflection by pulling a specially designed gauge assembly through the completed section. The gage assembly shall be in accordance with the recommendations of the pipe manufacturer and be acceptable to the Engineer.

C. Should the installed pipe fail to meet this requirement, the Contractor shall do all work to correct the problem as the Engineer may require without additional compensation.

3.04 CLEANING

A. Care shall be taken to prevent earth, water, and other materials from entering the pipeline. As soon as possible after the pipe and manholes are completed, clean out the pipeline and manholes, being careful to prevent soil, water, and debris from entering any existing sewer.

3.05 FIELD QUALITY CONTROL

A. Pipeline Flushing

1. Care shall be taken to prevent earth, water, and other materials from entering the pipe... As soon as possible after the pipe and manholes are completed on any street, flush out the new pipeline, using a rubber ball ahead of the water, flushing water or debris will not be permitted to enter any existing sewer.

B. Inspection by Light

1. The alignment of the pipe will be checked by shining a flashlight through the pipe from one manhole to the adjacent manhole. The inspector must be able to see the full circumference of the lighted pipe for its entire length when looking through the pipe from the adjacent manhole towards the manhole from which the light is being emitted.

C. Leakage Tests

1. The pipeline shall be made as nearly watertight as practicable, and leakage tests and measurements shall be made after the pipeline has been backfilled.

2. Where the groundwater level is more than 1 ft. above the top of the pipe at its upper end, the Contractor shall conduct either infiltration tests or low pressure air tests.
3. Where the groundwater level is less than 1 ft. above the top of the pipe at its upper end, conduct either exfiltration tests or low-pressure air tests.
4. At the time of the test, determine the groundwater elevation from observation wells, excavations or other means, all subject to review by the Engineer.
5. For making the infiltration and exfiltration tests, furnish suitable test plugs, water pumps, and appurtenances, and all labor required to properly conduct the tests on sections of acceptable length.
6. The sewers shall be tested before any connections are made to buildings.
7. Provide all instruments, weirs, bulkheads, water and equipment required to test the sewer.
8. Should the sections under test fail to meet the requirements, the Contractor shall do all work of locating and repairing leaks and retesting as the Engineer may require without additional compensation.
9. If, the in the judgment of the Engineer, it is impracticable to follow the procedures specified in this Specification for any reason, acceptable modifications in the procedures shall be made as required, but in any event, the Contractor shall be responsible for the ultimate tightness of the line.

D. Low Pressure Air Test

1. For making the low-pressure air tests, use equipment specifically designed and manufactured for the purpose of testing sewer pipelines using low-pressure air. The equipment shall be provided with an air regulator valve or air safety so set that the internal air pressure in the pipeline cannot exceed 8 psig.
2. The leakage test using low pressure air shall be made on each manhole-to-manhole section of pipeline after placement of the backfill.
3. Pneumatic plugs shall have a sealing length equal to or greater than the diameter of the pipe to be tested. Pneumatic plugs shall resist internal test pressures without requiring external bracing or blocking.
4. All air used shall pass through a single control panel.
5. Low-pressure air shall be introduced into the sealed line until the internal air pressure reaches 4 psig. greater than the maximum pressure exerted by the groundwater that may be above the invert of the pipe at the time of the test. However, the internal air pressure in the sealed line shall not be allowed to exceed 8 psig. When the maximum pressure exerted by the groundwater is greater than 4 psig. conduct only an infiltration test.
6. At least two minutes shall be allowed for the air pressure to stabilize in the section under test. After the stabilization period, the low-pressure air supply hose shall be quickly disconnected from the control panel. The time required in minutes for the pressure in the section under test to decrease from 3.5 to 2.5 psig (greater than the maximum pressure exerted by groundwater that may be above the invert of the pipe) shall not be less than that shown in the following table:

Pipe diameter in inches	Minutes	Pipe diameter in inches	Minutes
6	3.0	18	9.0
8	4.0	21	10.0
10	5.0	24	11.5
12	5.5	27	13.0
15	7.5		

E. Infiltration Test

1. For making the infiltration tests, underdrains, if used, shall be plugged and other groundwater drainage shall be stopped to permit the groundwater to return to its normal level insofar as practicable.
2. Upon completion of a section of the sewer, dewater it and conduct a satisfactory test to measure the infiltration for at least 24 hours. The amount of infiltration, including manholes, tees, and connections, shall not exceed 100 gal. per inch diameter per mile of sewer per 24 hours.

F. Exfiltration Test

1. For making the exfiltration tests, the sewers shall be subjected to an internal pressure by plugging the pipe at the lower end and then filling the pipelines and manholes with clean water to a height of 2 ft. above the top of the sewer at its upper end. Where conditions between manholes, may result in test pressures which would cause leakage at the stoppers in branches, provisions shall be made by suitable ties, braces, and wedges to secure the stoppers against leakage resulting from the test pressure.
2. The rate of leakage from the sewers shall be determined by measuring the amount of water required to maintain the level 2 ft. above the top of the pipe.
3. Leakage from the sewers under test shall not exceed the requirements for leakage into sewers as hereinbefore specified.

END OF SECTION

SECTION 02699

CHECKMATE ULTRAFLEX SLIP-IN INLINE CHECK VALVES
SPECIFICATION TT-CMUF-SL

PART 1 GENERAL

1.01 SUBMITTALS

A. Submit product literature that includes information on the performance and operation of the valve, materials of construction, dimensions and weights, elastomer characteristics, headloss, flow data and pressure ratings.

B. Upon request, provide shop drawings that clearly identify the valve materials of construction and dimensions.

1.02 QUALITY ASSURANCE

A. Supplier shall have at least twelve (12) years experience in the design and manufacture of "CheckMate™" style elastomeric check valves.

B. B. Manufacturer shall have designed, fabricated and have at least five (5) current installation of a "CheckMate" style elastomeric check valves in the 72" (1800mm) size. Manufacturer must provide documentation, including project name, location, and references

C. Manufacturer shall have conducted independent hydraulic testing to determine headloss, jet velocity and vertical opening height characteristics on a minimum of three (3) sizes of CheckMate Valves ranging from 6" (150mm) through 24" (600mm). The testing must have been conducted for free discharge (pressurized and open channel flow discharging to atmosphere) and submerged conditions

PART 2 PRODUCTS

2.01 CHECKMATER ULTRAFLEX ELASTOMERIC CHECK VALVES

A. Check Valves are to be all rubber and the flow operated check type with slip-in cuff connection. The entire CheckMate Ultraflex Valve shall be ply reinforced throughout the body, saddle and bill, which is cured and vulcanized into a one-piece unibody construction. A separate valve body or pipe used as the housing is not acceptable. The valve shall be manufactured with no metal, mechanical hinges or fasteners, which would be used to secure any component of the valve to a valve housing. The port area of the saddle shall contour into a circumferential sealing area (the "bill") that is concentric with the pipe which shall allow passage of flow in one direction

while preventing reverse flow. The entire valve shall fit within the pipe inside diameter. The saddle area of the valve must be flat, not conical, and integral with the rubber body above centerline in order to not produce any areas or voids that can collect or trap debris. The valve must be easily installed in pipes with poor end condition without the need to modify or utilize the headwall or structure to seal and anchor the valve. Once installed, the CheckMate Ultraflex Valve shall not protrude beyond the face of the structure or end of the pipe.

B. The CheckMate Ultraflex Valve shall incorporate multiple concave grooves molded integrally into the flat saddle wall thickness extending longitudinally a minimum of 80% of the length of the saddle to reduce opening resistance and reduce headloss.

C. The CheckMate Ultraflex Valve shall incorporate a custom shaped notch in the end of the bill to reduce cracking pressure. The notch shall be at the invert/bottom of the bill and symmetrical about the valve centerline. The longitudinal length of the notch shall be no greater than half the length of the bill.

D. The outside diameter of the upstream and downstream sections of the valve must be circumferentially in contact with the inside diameter of the pipe.

E. Slip-in style CheckMate Ultraflex Valves will be furnished with a set of stainless steel expansion clamps. The clamps, which will secure the valve in place, shall be installed in the upstream or downstream cuff of the valve, depending on installation orientation, and shall expand outwards by means of a turnbuckle. Each band shall be pre-drilled allowing for the valve to be pinned and secured into position in accordance with the manufacturer's installation instructions.

F. Manufacturer must have flow test data from an accredited hydraulics laboratory to confirm pressure drop and hydraulic data.

G. Company name, plant location, valve size patent number, and serial number shall be bonded to the check valve.

2.02 FUNCTION

A. When line pressure exceeds the backpressure, the line pressure forces the bill and saddle of the valve open, allowing flow to pass. When the backpressure exceeds the line pressure, or in the absence of any upstream or downstream pressure, the bill and saddle of the valve is forced closed, preventing backflow.

2.03 MANUFACTURER

A. All valves shall be Series CMUF-SL slip-in CheckMate Ultraflex Valves as manufactured by Tideflex Technologies®, A Division of Red Valve Company, Carnegie, PA 15106, local representative New England Environmental, 781-275-1001. All valves shall be manufactured in the U.S.A.

PART 3 EXECUTION

3.01 INSTALLATION

A. Valve shall be installed in accordance with manufacturer's written Installation and Operation Manual and approved submittals.

3.02 MANUFACTURER'S CUSTOMER SERVICE

A. Manufacturer's authorized representative shall be available for customer service during installation and start-up, and to train personnel in the operation, maintenance and troubleshooting of the valve.

B. If specified, the manufacturer shall also make customer service available directly from the factory in addition to authorized representatives for assistance during installation and start-up, and to train personnel in the operation, maintenance and troubleshooting of the valve.

END OF SECTION

SECTION 02720

CATCH BASINS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes
   1. Requirements to construct, adjust abandon, or rebuild all catch basins as indicated on the drawing and as specified.

1.02 REFERENCES

A. This specification makes reference to the requirements of additional specifications as listed. The Contractor shall obtain and familiarize himself with all requirements referenced by this specification.

   1. Materials and construction methods shall conform, insofar as applicable, to the requirements of the Rhode Island Department of Transportation Standard Specifications for Road and Bridge Construction, together with all errata addenda additional revisions, and supplemental specifications, (referred to as the Standard Specification).

B. American Society for Testing and Materials (ASTM).

1. A48, Specification for Gray Iron Castings.
2. C32, Specification for Sewer and Manhole Brick (Made from Clay or Shale).
3. C139, Specification for Concrete Masonry Units for Construction of Catch Basins and Manholes.
4. C150, Specification for Portland Cement.
5. C207, Specification for Hydrated Lime for Masonry Purposes.
6. C478, Specification for Precast Reinforced Concrete Manhole Sections.

1.03 DESIGN REQUIREMENTS

A. Catch basins shall conform in shape, size, dimensions, materials, and other respects to the details indicated on the drawings or bound in the specifications or as ordered by the Engineer.

PART 2 PRODUCTS

2.01 MATERIALS

A. Catch basin walls shall be precast concrete masonry units. The top of the cone (not to exceed 6 inches.) shall be built of brickwork to permit adjustment of the frame to meet the finished surface.

B. Catch basin sumps shall be one piece precast concrete or concrete masonry units on cast-in-place or precast concrete bases.

C. The cast-iron frames and grates shall be the standard as indicated on the drawings.

D. All cast-in-place concrete shall be 4,000 psi and shall conform to the requirements specified under SECTION 03300.

2.02 PRECAST CONCRETE MASONRY UNITS

A. Precast concrete masonry units shall be machine-made solid segments, conforming to ASTM C139 with the following exceptions and additional requirements:
   1. Type II cement shall be used except as otherwise permitted.
   2. The width of the units shall be as indicated on the drawings.
   3. The inside and outside surfaces of the units shall be curved to the necessary radius and so designed that the interior surfaces of the structures shall be cylindrical, except the top batter courses shall be designed to reduce uniformly the inside section of the structure to the required size and shape at the top.
   4. Units shall be designed such that only full-length units are required to lay any one course.
   5. Acceptance of the units will be on the basis of material tests and inspection of the completed product.

2.03 PRECAST CONCRETE SUMPS

A. Precast concrete sumps shall conform to the ASTM C478, with the following exceptions and additional requirements:
   1. The wall section shall be not less than 6-inch thick.
   2. Type II cement shall be used except as otherwise permitted.
   3. Sumps shall be cured by subjecting them to thoroughly saturated steam at a temperature between 100 and 130 degrees. F. for a period of not less than 12 hours or, when necessary, for such additional time as may be needed to enable the sections to meet the strength requirements.
   4. No more than two lift holes may be cast or drilled in each sump.
   5. Acceptance of the sumps will be on the basis of material tests and inspection of the completed product.

B. All holes in sumps used for their handling shall be thoroughly plugged with rubber plugs made specifically for this purpose or with mortar. The mortar shall be one part cement to 1-1/2 parts sand, mixed slightly damp to the touch (just short of "balling"), hammered into the holes until it is dense and an excess of paste appears on the surface, and then finished smooth and flush with the adjoining surfaces.

2.04 BRICKS

A. The brick shall be sound, hard, and uniformly burned brick, regular and uniform in shape and size, of compact texture, and satisfactory to the Engineer. Brick shall

conform to ASTM C32 for Grade SS, hard brick, except that the mean of five tests for absorption shall not exceed 8 percent by weight.

B. Rejected brick shall be immediately removed from the work.

2.05 MORTAR FOR BRICKWORK

A. The mortar shall be composed of Portland cement, hydrated lime, and sand, in which the volume of sand shall not exceed three times the sum of the volumes of cement and lime. The proportions of cement and lime shall be as directed and may vary from 1:1/4 for dense, hard-burned brick to 1:3/4 for softer brick. In general, mortar for Grade SS Brick shall be mixed in the proportions of 1-1/2:4-1/2.

B. Cement shall be Type II Portland cement conforming to the ASTM C150.

C. Hydrated lime shall be Type S conforming to the ASTM C207.

D. The sand shall comply with the specifications for fine aggregate, specified in Section 03300, except that all of the sand shall pass a No. 8 sieve.

2.06 MORTAR FOR MASONRY UNITS

A. Mortar shall be composed of one part portland cement and two parts of sand by volume with sufficient water to form a workable mixture. Cement and sand shall be as specified for mortar for brickwork.

2.07 CATCH BASIN FRAMES AND GRATES

A. Furnish and install all cast-iron catch basin frames and grates conforming to the details indicated on the drawings and as specified.

B. Castings shall be of good quality, strong, tough, even-grained cast iron, smooth, free from scale, lumps, blisters, sand holes, and defects of every nature which would render them unfit for the service for which they are intended. Contact surfaces of grates and frame seats shall be machined to prevent cocking of grates.

C. All castings shall be thoroughly cleaned and subject to a careful hammer inspection.

D. Castings shall be at least Class 25 conforming to the ASTM A48.

E. Unless otherwise specified or indicated on the drawings, castings in paved areas shall be capable of withstanding AASHTO H-20 loading and shall meet the requirements of the municipality in which they are installed.

F. All grates to be pedestrian and bicycle safe.

2.08 CURB INLETS

A. Granite for curb inlets shall have a horizontal bed. The stone shall be sawn or peen hammered on top, and the front and back edges shall be pitched true to line. The back face for a distance of 3-inches down from the top shall have no projection greater than 1 inch. The front face shall be straight split, free from drill holes, and it shall have no projection greater than 1-inch or depression greater than 1/2 inch for a distance of 10-inch down from the top, and for the remaining distance there shall be no depression or projection greater than 1 inch. The ends shall be squared with the top for the depth of the face finish and so cut that the curb inlet can be set with joints of not more than 1/2 inch.

B. Granite curb inlet shall be 3 ft. minimum in length, plus or minus 1/2 inch, from 17 to 19 inches in depth, 7 inch wide at the top and at least 7 inches wide at the bottom.

C. A gutter mouth at least 3 inches in depth and at least 2 feet in length shall be cut in the front face of the stone as shown on the plans.

D. Where curb inlets are used to replace a section of existing curbing, the width of the curb inlet shall be the same as the adjoining existing curbing.

PART 3 EXECUTION

3.01 LAYING BRICKWORK AND GRADING RINGS

A. Only clean bricks and grading rings shall be used. Bricks shall be moistened by suitable means, as directed, until they are neither so dry as to absorb water from the mortar nor so wet as to be slippery when laid.

B. Each brick shall be laid in a full bed and joint of mortar without requiring subsequent grouting, flushing, or filling, and shall be thoroughly bonded as directed.

C. Each grading ring shall be laid in a full bed of mortar and shall be thoroughly bonded.

3.02 PLASTERING AND CURING BRICK MASONRY

A. Outside faces of brick masonry shall be plastered with mortar from 1/4 in. to 3/8 in thick. If required, the masonry shall be properly moistened prior to application of the mortar. The plaster shall be carefully spread and troweled. After hardening, the plaster shall be carefully checked by tapping for bond and soundness. Unbounded or unsound plaster shall be removed and replaced.

B. Brick masonry and plaster shall be protected from too rapid drying by the use of burlaps kept moist, or by other acceptable means, and shall be protected from the weather and frost, all as required.

3.03 SETTING CASTINGS

A. Curb inlets and frames shall be set with the tops conforming accurately to the grade of the pavement or finished ground surface or as indicated on the drawings or directed. Circular frames shall be set concentric with the top of the masonry and in a full bed of mortar so that the space between the top of the manhole masonry and the bottom flange of the frame shall be completely filled and made watertight. A thick ring of mortar extending to the outer edge of the masonry shall be placed all around and on the top of the bottom flange. The mortar shall be smoothly finished and have a slight slope to shed water away from the frame.

B. Grates shall be left in place in the frames on completion of other work at the manholes.

3.04 CATCH BASINS ADJUSTED TO GRADE

A. Existing catch basin tops shall be adjusted to line and grade as indicated on the drawings or as directed by the Engineer.

B. All catch basins adjusted to grade shall be provided with concrete grading rings of brick as specified for new drain manholes.

3.05 REBUILDING OF EXISTING CATCH BASIN

A. Cut suitable openings in existing structures to make connections to drains as indicated on the drawings and as specified or directed. In doing so, confine the cutting to the smallest amount possible consistent with the work to be done.

B. After the drains are installed, carefully fit around, close up, and repair the structures watertight, all as acceptable to the Engineer.

C. Prior to starting work, assembled all tools, materials, and construction equipment required to complete the work in the shortest possible time.

END OF SECTION

SECTION 02750

ABANDONMENT OF EXISTING SEWERS AND DRAINS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes

1. Requirements for abandoning existing combined sewers, sanitary sewers, storm drains and manholes as indicated on the Drawings and as specified.

B. Related Sections

1. Section 02149 – Maintaining Existing Flows
2. Section 02200 – Earth Excavation
3. Section 02224 – Controlled Density Fill
4. Section 03300 - Cast-In-Place Concrete

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM)

1. C32, Standard Specification of Sewer and Manhole Brick (Made from Clay or Shale), AASHTO Designation M91-42, Red Sewer Brick Only Grade SS.
2. C144, Standard Specification for Aggregate for Masonry Mortar.
3. C150, Standard Specification for Portland Cement.
4. C207, Standard Specification for Hydrated Lime for Masonry Purposes.

1.03 SUBMITTALS

A. Shop Drawings

1. In accordance with Specification SECTION 01300 - SUBMITTALS.

B. Samples

1. Provide representative samples of materials if requested by the Engineer.

PART 2 PRODUCTS

2.01 PLUGS

A. General

1. Plugs shall meet the following thickness requirements:

Sewer/Drain Diameter	Thickness of Plug Concrete	Brick & Mortar
15-inch and less	12-inch	8-inch
15 to 30-inch	24-inch	16-inch
Greater than 30-inch	36-inch	24-inch

2. For non-circular pipes, the largest cross-sectional dimension shall govern in determining the size of the plug.
3. Bricks with more than one layer of thickness shall be interlocked.
4. Mechanical plugs will not be allowed.

B. Cement

1. Minimum 4,000 psi cement concrete materials in accordance with Section 03300, or brick masonry.

C. Brick

1. Sound, hard, and uniformly burned brick, regular and uniform in shape and size, of compact texture, and satisfactory to the Engineer.
2. In accordance with ASTM C32, Red Sewer Brick Only Grade SS.
3. In accordance with AASHTO M91-42, Red Sewer Brick Only Grade SS.

D. Mortar for Brickwork

1. Composed of Portland cement, hydrated lime, and sand in which the volume of sand shall not exceed three times the sum of the volume of cement and lime.
2. The proportions of cement and lime shall be 1:1/4.
3. Cement shall be Type II Portland cement in accordance with ASTM C150.
4. Hydrated lime shall be Type S conforming to the ASTM C207.
5. Hydrated lime shall be "Mortaseal" manufactured by U.S. Gypsum or
6. "4X Hydrate" manufactured by the New England Lime Company or
7. An acceptable equivalent product.
8. The sand shall conform to ASTM C144.

E. Pipe Fill Material

1. Class II Controlled Density Fill (excavatable fill, very flowable)

F. Manhole Fill Material

1. Sand in accordance with Section 03300, Fine Aggregate.

PART 3 EXECUTION

3.01 INSTALLATION

A. Plugs

1. Plug existing combined sewers, sanitary sewers and storm drains, as indicated on the Drawings and as specified.
2. Plugs shall withstand the full soil and groundwater pressure.
3. Pipe entering a manhole or catch basin that is to be abandoned shall have a plug installed that is flush with the interior of the structure.
4. Sewer and drain services six (6) inches or eight (8) inches in diameter shall be plugged with a precast concrete plug. Such plugs shall be made watertight with an application around the plug of an approved watertight compound.

B. Pipe Fill

1. Existing combined sewers, sanitary sewers and storm drains to be abandoned that are greater or equal to 12 inches in diameter shall be abandoned, plugged and filled with Class II Controlled Density Fill (excavatable fill, very flowable). Fill a minimum of 95% of the total inside volume of the pipe.
2. Existing combined sewers, sanitary sewers and storm drains to be abandoned that are less than 12-inches in diameter shall be abandoned and plugged, but not filled.
3. Underdrains shall be filled as indicated.

C. Manhole Fill

1. Clean manhole of all special waste and debris.
2. Plug pipelines entering manhole as specified above.
3. Remove and dispose frame and cover and all concrete and masonry to a minimum depth of four (4) feet below existing ground surface.
4. Bottom of manhole to be core drilled, drilled or broken to allow unrestricted migration of groundwater through the manhole.
5. Fill remaining manhole structure with compacted sand.
6. Backfill excavation in accordance with Section 02200,

END OF SECTION

SECTION 02763

PIPELINE CLEANING

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes

1. Requirements for cleaning and TV inspection of drainage pipes.

B. Water for Construction

1. The Owner shall supply all water required by the Contractor for the pipeline cleaning.. The Contractor must coordinate acceptable supply locations and contact the Owner in advance prior to use of any water for the Project.

C. Related Sections

1. Section 01570 - Traffic Regulation and Permits
2. Section 02149 - Maintaining Existing Flow
3. Section 02764 - Television Inspection
4. Section 02767 – Disposal of Materials

1.02 REFERENCES

A. National Association of Sewer Service Companies

1. NASSCO Recommended Specifications for Sewer Collection System Rehabilitation.

1.03 CLEANING AND DISPOSAL REQUIREMENTS

A. The Contractor's attention is directed to the requirements set forth by the **Rhode Island Department of Environmental Management (RIDEM)** regarding "Special Wastes" and the proper disposal thereof. All waste materials and debris, as designated by the Owner and/or Engineer including but not limited to any pump station, sewers and associated structures, or any portions thereof, including but not limited to sludge, grit sediment, dirt, sand, rock, grease, roots and other liquid, solid or slime-solid material contained therein, shall be considered, "Special Wastes".

B. Remove dirt, grease, rocks, sand, iron tuberculation and other materials and obstructions from the pipeline.

C. Pipeline Cleaning shall be performed by hydraulically propelled or high velocity jet cleaning equipment. Selection of equipment shall be based on such field conditions as access availability and type of debris to be removed.

D. Clean pipeline to restore a minimum of 95 percent of the original carrying capacity of the pipe, and suitably to permit lining of the pipeline.

E. The Contractor is required to test and dispose of any waste material removed from the pipeline in accordance with State and Federal requirements. Testing of waste material will be at the Contractor's expense.

F. The Contractor shall notify the Engineer of the proposed disposal location and requirements of that disposal facility to allow disposal of waste material.

G. The Contractor is required to store any waste material until all testing requirements of the proposed facility have been met and shall submit copies of all test results to the Engineer.

1.04 SUBMITTALS

A. Submit in accordance with Specification Section 01300.

1. Provide detailed plans and descriptions outlining cleaning and television inspection procedures and all provisions and precautions regarding the handling of existing sewage flows.

1.05 QUALITY ASSURANCE

A. Perform general work in accordance with NASSCO recommended specifications for sewer collection system rehabilitation.

1.06 QUALIFICATIONS

A. Company specializing in performing the work of this section with minimum of three (3) years experience.

1.07 TRAFFIC CONTROL

A. In accordance with Specification Section 01570.

PART 2 PRODUCTS NOT USED

PART 3 EXECUTION

3.01 CLEANING PROCEDURES

A. Sewer Cleaning

1. The designated pipelines shall be cleaned using hydraulically propelled or high velocity jet cleaning equipment.
2. Selection of the equipment used shall be based on the conditions of the lines at the time the work commences.
3. Equipment and methods selected shall be satisfactory to the Engineer.
4. Equipment selected for cleaning shall be capable of removing dirt, grease, rocks, sand, iron tuberculation and other deleterious materials and obstruction from the pipelines.

B. Material Removal

1. Sludge, dirt, sand rocks, grease and other solid or semi-solid material resulting from the cleaning operation shall be removed at the downstream manhole of the section which could cause line stoppages.

C. Disposal of Materials

1. Solids or semi-solids resulting from the cleaning operations shall be removed from the site and disposed in accordance with Specification Section 02767.

D. Cleaning Precautions

1. During all pipeline cleaning operations, satisfactory precautions shall be taken to protect the pipelines from damage that might be inflicted by the improper use of cleaning equipment.
2. Whenever hydraulically propelled cleaning tools, which depend upon water pressure to provide their cleaning force or any tools which retard the flow of water in the pipeline are used, precautions shall be taken to ensure that the water pressure created does not cause any damage or flooding to public or private property.
3. The flow of sewage in the sewer lines shall be utilized to provide necessary pressures by hydraulic cleaning devices whenever possible.
4. When additional quantities of water from fire hydrants are necessary to avoid delay in normal working procedures, the water shall be conserved and not used unnecessarily.
5. No fire hydrant shall be obstructed in case of a fire in the area served by the hydrant nor shall a hydrant be used for the purpose described unless a vacuum break is provided.

E. Root Removal:

1. Any visible roots shall be removed as required by the Engineer.
2. Roots shall be removed in all sections by mechanical methods.
3. Chemical root treatment shall also be used as approved by the Engineer.
    a. Herbicide to be EPA approved.
    b. Herbicide must be integral part of chemical sealant material.
    c. Application to be done in accordance with manufacturers written instructions.
    d. Any surrounding vegetation damaged due to Contractors operation shall be replaced at no expense to the Owner.

F. Pumping and flow bypassing

1. The Contractor shall supply the necessary pumps, conduits and other equipment to divert the flow of sewage around the pipeline section in which work is to be performed.
2. Handling existing sewage flows and bypass pumping shall be in accordance with Specification Section 02149.

G. Flow Control Precautions

1. Whenever flows in a sewer line are blocked, plugged or bypassed, sufficient precautions must be taken to protect the sewer lines from damage that might be inflicted by excessive sewer surcharging.

2. Further, precautions must be taken to ensure that sewer flow control operations do not cause flooding or damage to public or private property being served by the sewers involved.

3. Coordination with private property owners is required.

3.02 FIELD QUALITY CONTROL

A. After cleaning, the sewer pipes shall be visually inspected by means of closed-circuit television. The inspection shall be recorded on DVD's and printed TV inspection logs in accordance with Specification Section 02764.

B. After videotaping the cleaned pipeline any pipe not sufficiently cleaned shall be cleaned again to obtain satisfactory results at no additional cost to the Owner.

C. Provide two digital video disks (DVDs), one original and one copy to document conditions following completion of the cleaning process.

END OF SECTION

SECTION 02830

PLANTS: TREES, SHRUBS, GROUNDCOVERS, AND PERENNIALS

PART 1 GENERAL

1.01 GENERAL PROVISIONS

A. The General Documents, as listed on the Table of Contents, and applicable parts of Division 01, GENERAL REQUIREMENTS, shall be included in and made a part of this Section.

B. Examine all Contract Documents and all other Sections of the Specifications for requirements therein affecting the work of this Section.

1.02 DESCRIPTION OF WORK

A. Provide all materials, equipment, and labor necessary to complete the work as indicated on the drawings or as specified herein.

B. The principal work of this section includes, but may not be limited to, the following:

1. Layout and Excavation of Plant Holes
2. Planting and Backfilling
3. Watering
4. Pre-emergent Weed Control
5. Mulching
6. Fertilizing
7. Staking and Guying
8. Anti-desiccant Application
9. Tags and Labels
10. Plant Replacement Guarantee

1.03 RELATED WORK UNDER OTHER SECTIONS

A. The following items of related work are specified and included in other Sections of the Specifications:

1. Section 31 20 00, EARTHWORK
2. Section 32 05 13, SOILS FOR EXTERIOR IMPROVEMENTS
3. Section 32 84 00, PLANTING IRRIGATION
4. Section 32 91 13, SOIL PREPARATION
5. Section 32 91 19, LANDSCAPE GRADING
6. Section 32 92 19, SEEDING
7. Section 32 92 23, SODDING

1.04 SUBMITTALS

A. Submittals shall be in in accordance with Section 01 33 00 SUBMITTALS.

B. At least ninety (90) days prior to plant material installation, the Contractor shall identify the planting and maintenance supervisor or foreman. This shall include providing a resume that outlines their experience and identifies any licenses, certifications, and/or professional organization memberships.

C. At least ninety (90) days prior to plant material installation, the Contractor shall identify the arborist and provide a copy of their valid license.

D. At least ninety (90) days prior to intended use, the Contractor shall provide the following samples and submittals for approval. The Contractor shall not order materials until Engineer's approval of submittal has been obtained. Delivered materials shall match the approved samples. Should the source of supply be changed within the course of the contract, the Contractor shall submit new samples or submittals for approval per the original submission.

1. Screened Loam: Submit a 5 lb. sample accompanied by certified laboratory test results meeting the requirements outlined in Part 2, PRODUCTS herein. Testing shall be from each proposed source including stockpiles.
2. Anti-desiccant: Submit manufacture's product data. Also submit invoice(s) of total purchased material that states material is for this contract.
3. Fertilizer: Submit manufacture's product data showing, at a minimum, composition and analysis of fertilizer. Also submit invoice(s) of total purchased material that states material is for this contract.
4. Water Retention Agent: Submit manufacturer's product data. Also submit invoice(s) of total purchased material that states material is for this contract.
5. Tree Staking Accessories: Submit manufacturer's product data and a 3' sample of guying material.
6. Pre-Emergent Weed Control: Submit manufacturer's product data. Also submit invoice(s) of total purchased material that states material is for this contract.
7. Mulch: Submit a 5 lb. sample accompanied by certified laboratory test results meeting the requirements outlined in Part 2, PRODUCTS herein.
8. Water: Submit source of Water accompanied by certified laboratory test results meeting the requirements outlined in Part 2, PRODUCTS herein. Testing shall be from each proposed source. The Contractor shall submit a watering schedule for all plantings on the project. Watering schedule shall include all methods and equipment for providing water to plants.

E. At least ninety (90) days prior to installation the Contractor shall submit confirmation of availability for all plants on the plant list, accompanied by written certification as to source of plant material. When the specified types and sizes of plants are not available, substitutions may be made upon written request by the Contractor and approval by the Engineer. Request for substitution shall be accompanied with a list of nurseries contacted in the search for the required plant and a record of other attempts to locate the required material. Requests shall also include sources of plants found that may be of a smaller or larger size, or a different shape or habit than specified, or plants of the same genus and species but different cultivar, or which may otherwise not meet the requirements of the specifications, but which may be available for substitution. Substitutions proposed by the Contractor shall have equivalent overall form, height, horticultural characteristics, and value and must be approved in writing by the Engineer prior to tagging. If substitutions are approved by the Engineer, the Contractor shall submit an updated plant list.

F. Based on the submitted plant list provided by the Contractor and subsequent approval by the Engineer, the Contractor shall provide accommodations to visit, inspect, and tag approved

representative specimens of the Trees, Shrubs, Groundcover, and Perennials. At least each tree, one shrub, one groundcover, and one perennial of each variety and each size is to be tagged with a waterproof tag or seal bearing legible designation of botanical and common names, size, and project name.

G. If approved by the Engineer, plant photographs may be submitted for approval. Photographs shall be PDF, JPEG, or 3" by 5" format and in color. Take photographs from an angle depicting true size and condition of the plant. For trees and shrubs include a measuring device with units of measure clearly discernible. Submit a photograph of each tree and a representative photograph of one shrub, one groundcover, and one perennial of each variety and each size. For shrubs, groundcover, and perennials where more than ten plants are required, include a photograph showing the average plant, the best quality plant, and the worst quality plant to be furnished. Identify each photograph with botanical and common names, name of growing nursery, and project name.

1.05 MEASUREMENT AND PAYMENT

A. The trees, shrubs, groundcovers, and perennials paid for under this item shall be measured per each plant.

B. The unit price shall include compensation for all labor and materials to furnish and install the plantings complete, including Plant Replacement Guarantee following acceptance of the work.

C. The unit price shall include compensation for all labor and materials to furnish and install loam, fertilizers and additives, tree supporting materials, pine bark mulch and water.

1.06 REFERENCES

A. American National Standards Institute:

1. ANSI Z60.1 - Nursery Stock, latest edition, published by the American Association of Nurserymen, Inc. (AAN)
2. ANSI A300 – Tree, Shrub and Other Woody Plant Maintenance – Part 1 - Pruning, latest edition.

B. Interpretation of plant names and descriptions shall reference the following documents. Where the names and/or plant descriptions disagree between the documents, the most current document shall prevail.

1. USDA – The Germplasm Resources Information Network (GRIN) – Plant Germplasm.
2. Manual of Woody Landscape Plants, Michael Dirr, latest edition, published by Stripes Publishing.

C. United States Department of Agriculture, Agricultural Research Service, USDA Plant Hardiness Zone Ma, latest edition.

D. Commonwealth of Massachusetts Standard Specifications for Highways and Bridges, Divisions II and III, latest edition and amendments.

1.07 QUALITY ASSURANCE

A. Plant Installation and Maintenance Contractor: Contractor shall have experience with at least five projects of a similar scale and complexity as this project within the last five years.

B. Planting and maintenance shall be done by horticultural trained and skilled workers, and with three years continuous experience in handling and installing plant material and thorough understanding of nursery practices. The work shall be done under the direct supervision of a qualified planting supervisor or foreman.

C. The landscape supervisor or foreman shall have a demonstrated background of at least five years continuous experience in management, handling, installation, and maintenance of plant material, must be a Massachusetts Certified Horticulturist or Massachusetts Certified Landscape Professional, and must be on site at all that landscape construction or maintenance is in progress.

D. An arborist, licensed by the Commonwealth of Massachusetts is required for all pruning work.

E. At least all trees and one shrub of each variety and size is to be tagged with a waterproof tag or seal bearing legible designation of botanical and common names and size., and all other standard products shall be delivered sealed and unbroken.

F. Do not make substitutions without written approval. If specified landscape material is not available, obtain approval for substitution from the Engineer.

G. Where formal planting arrangements are shown, select stock with uniform height and spread, and label with numbers to assure symmetry in planting.

H. The Engineer reserves the right to inspect all plant materials for compliance with specifications, and to reject unsatisfactory or defective work at any time during progress of work.

1.08 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. All areas to be planted shall be inspected by the Contractor before starting work and any defects shall be reported to the Engineer prior to beginning this work. The commencement of work by the Contractor shall indicate acceptance of the areas to be planted and assumption of full responsibility for the work of this Section.

B. The Contractor shall be solely responsible for judging the full extent of work requirements involved, including, but not limited to the potential need for storing and maintaining trees temporarily and/or re-handling plants prior to final installation.

C. Protect all plants and products from weather or other damaging or deteriorating conditions.

D. Plants which have been damaged or have deteriorated in transit or storage are not acceptable.

E. Keep plants moist, fresh, and protected against exposure to sun, wind, and freezing temperatures whether in the receiving yard, in transit, while being handled, or at the job site awaiting planting.

F. Deliver trees, shrubs, and groundcover after preparations for planting have been completed and plant immediately.

G. Planting Dates: Prepare a proposed planting schedule. Schedule dates for each type of landscape work during normal seasons for such work. Once accepted, revise dates only as approved in writing, after documentation of reasons for delays.

Planting Deciduous material:	Spring	March 15 to June 15
	Fall	September 15 to December 1
Evergreen material:	Spring	March 15 to May 30
	Fall	August 15 to November 15

H. All trees shall be planted within the same season that they are dug. No heeling in of trees over the winter or planting out of season will be permitted.

I. Those species known to be fall digging hazards shall be dug during the spring season only. Fall planting of these species shall be permitted only with certification from the nursery of the time of digging, and at the discretion of the Engineer.

J. Correlate planting schedule with specified maintenance periods to provide maintenance to date of acceptance.

K. Coordination with Lawns: Plant trees, shrubs, and groundcover after final grades are established and prior to planting of lawns, unless otherwise acceptable to Engineer. If planting of trees and shrubs occurs after lawn work, protect lawn areas and promptly repair damage to lawns resulting from planting operations.

1.09 VERIFICATION

A. Should discrepancies exist between plant quantities as shown in the Planting Schedule or List and on the Planting Plan, quantities shown on the Planting Plan shall prevail. Contractor shall then install all plants as shown on the plan at no additional cost.

PART 2 PRODUCTS

2.01 SCREENED LOAM

A. Screened fertile, friable, medium textured sandy loam with no admixture of refuse or any natural or introduced materials toxic to plant growth and free from subsoil and stumps, roots, brush, stones, clay lumps or other extraneous matter over one inch (1”) in any diameter and which will prevent the healthy development of the grass.

B. Sandy loam shall possess good filtration and permeability rates, and shall possess a mechanical analysis where: N 85% of sand size is 0.5 to 1.0 mm and N 95% of sand mix is between 0.5 and 2.0 mm and no more than 5% of mix is less than 0.5 mm.

C. Acidity range of approximately pH 5.5 to 7.5 when tested according to methods of testing or A.O.A.C. and organic content not less than 3% nor more than 20% as determined by wet

combustion method (Chromic acid reduction). Topsoil may be amended to meet such requirements. Provide analysis prior to delivering topsoil to site, including recommended rates and types of soil additives to achieve desired mix.

D. On site topsoils (stockpiles) shall be free of debris, roots and branches. It shall be made to conform to the requirements for sandy loam furnished from the site as specified herein.

2.02 ANTI-DESICCANT

A. Emulsion which permits transpiration while retarding excessive loss of moisture from plants. Deliver in manufacturer's fully identified containers and mix according to manufacturer's direction.

2.03 TREE AND SHRUB FERTILIZER

A. Fertilizer for amending loam to meet test laboratory requirements for the particular type of planting to be done shall be a non-phytotoxic biostimulant formulated to promote rapid root growth and regeneration. It shall be derived from organic composts and humus extracts and is compatible with fertilizers, herbicides, pesticides, fungicides and absorbent gels.

B. In addition to the soil amendment required above, fertilizer shall be provided for each plant through the use of slow-release fertilizer packets, packaged in plastic sacks with micropore holes, which provide for a controlled release of nutrients gradually over a minimum eight-year period. Tablets are acceptable.

C. Each packet shall consist of four ounces of water soluble fertilizer with a minimum guaranteed analysis of available elements as follows:

Nitrogen	16%
Phosphoric Acid	8%
Potash	16%

2.04 STAKE AND GUYING MATERIALS

A. Guy web: Shall be a flat, low abrasion woven fiber webbing with a break strength of 900 pounds or better. The width of the webbing shall be no less than 5/8 inch, nor greater than ¾ inch. The length shall be sufficient enough to be attached to the tree trunk and stake.

B. Stakes: Shall be on a hardwood source, free of knots, insects, and fungi. Stakes shall be of uniform size and shape and shall be a minimum of two inches (2”) x three inches (3”) x eight feet (8’). Stakes shall be pointed with a taper of no less than four inches (4”) and driven three feet into the ground.

C. The above ground stake height shall be eight inches (8”) above the point of attachment. The type of stakes shall be uniform throughout the job. The top ten inches (10”) of the stakes shall be tapped with red duct tape.

2.05 PRE-EMERGENT WEED CONTROL

A. Pre-emergent weed control shall be provided for all trees, shrubs, and groundcover plant beds. Deliver in manufacturer's fully identified containers, and apply according to manufacturer's directions.

2.06 MULCH

A. Pine Bark Mulch shall be derived from softwood evergreen tree bark aged to a minimum of six months and no more than eighteen months. The bark shall be shredded so that the resulting pieces are no more than one half inch (1/2") thick and no longer than three inches (3"). The mulch shall be free of stringy material and shall not contain an excess of fine particles. The mulch shall be brown in color, free of leaves, twigs, sod, weeds, shavings, and other foreign materials which are injurious to healthy plant growth.

B. Mulch shall be ninety-eight (98) percent organic matter with a pH range of 3.5 to 4.5. Moisture content of packaged material is not to exceed thirty-five (35) percent.

2.07 WATER

A. Clean, fresh potable water, free from injurious chemicals and other toxic substances harmful to plant life. No brackish water will be permitted.

2.08 PLANT MATERIALS

A. General: Plant materials shall conform in size, grade, and quality to the *"*American Association of Nurserymen Standards for Nursery Stock*,"* as approved by the American National Standards Institute (ANSI) in effect at the time of bidding.

1. Plants of other kinds than those named in the Plant Schedule on the Drawings shall not be accepted without written approval of Engineer.
2. All plant material shall comply with state and federal laws and regulations limiting movement or prohibiting plant material due to disease, insect, and weed. Documentation certificates required by law shall accompany each shipment of plants.
3. Replacement plants larger in size than those specified may be used if approved by Engineer, provided use of larger plants does not increase Contract price or adversely modify the project.
4. If use of larger plants is approved, increase ball of earth for spread of roots in proportion to size of plant.

B. Selection of Nursery Stock:

1. At least fifteen (15) days prior to the date on which the plant selections are to be made and at least thirty (30) days prior to the expected planting date, the Contractor shall request, in writing, that the Engineer designate a representative from its technical staff to select and tag trees to be furnished.
2. The letter of request shall also have attached a certification from the supplier attesting to the fact that the stock to be selected from is, in fact, the particular plants required under this Section. No substitutions will be permitted.

3. The Contractor shall arrange for and bear the cost of transportation, meals in transit, and overnight accommodations, if necessary, for the Engineer's representative during the period of time required to select and tag the required number of stock.
4. All trees shall be tagged at the source prior to digging. The Engineer will inspect and tag all trees with the Contractor.
5. The Contractor shall provide the necessary tags or seals for identifying the trees at the source. The tags are of durable construction and are numbered sequentially with raised lettering.

2.09 GENERAL QUALIFICATIONS:

A. Plants shall be healthy examples of their species or variety, with the color, shape, size and distribution of trunk, stems, branches, buds and leaves normal to the plant type specified.

B. Trunk shall be relatively straight and vertical, and free of wounds that penetrate to the wood, sunburned areas, conks (fungal fruiting bodies), wood cracks, sap leakage, signs of boring insects, galls, cankers, girdling ties, or lesions (mechanical injury).

C. All graft unions, where applicable, shall be completely closed without visible sign of graft rejection. All grafts shall be visible above the soil line.

D. Trunk caliper and taper shall be sufficient so that the lower five feet of the trunk remains vertical without a stake. Auxiliary stake may be used to maintain a straight leader in the upper half of the tree.

E. All plants shall be in accordance with the American Standard for Nursery Stock of the American Association of Nurserymen.

F. Trees shall be freshly dug. No plants from cold storage or previously heeled in stock will be accepted.

G. All plants shall be nursery grown. No collected plants will be accepted.

H. Only plants grown with in Hardiness Zones 1 through 5, as established by the Arnold Arboretum, Jamaica Plain, Massachusetts, or USDA zones 2-6 will be accepted. The Contractor shall certify in writing that the stock has actually been grown under Zone 5 or hardier conditions. Plants will not be accepted without such certification.

I. Plants shall be sound, healthy, and vigorous of growth, free of disease, insect pests, eggs or larvae. All parts shall be moist and show active green cambium when cut.

2.10 TREE ROOTS

A. The root system of each tree shall be well provided with dense, fibrous roots.

B. The root collar shall be within or above the upper 2 inches of the substrate/soil.

C. The root system shall be reasonably free of stem girdling roots over the root collar or kinked roots from nursery production practices.

D. Root systems shall be solid natural balls of earth firmly wrapped with untreated eight (8) ounce organic burlap, securely held in place by stout cord or wire. Processed or manufactured root balls or inorganic (plastic) burlap will not be accepted. No trees will be accepted if the ball of earth surrounding its roots has been badly cracked or broken.

E. The diameter and depth of the root ball must be sufficient to encompass the fibrous and feeding root system necessary for healthy development of the tree.

2.11 TREE TRUNK

A. The trunk of each tree shall be a single uncut leader and straight trunk growing from a single unmutilated crown of roots. No part of the trunk shall be conspicuously crooked as compared with normal trees of the same variety. **No trees, which have had their leaders cut, scared, scraped, bruised, or wounded, will be accepted.**

B. The trunk shall be free from sunscald, frost cracks, or wounds resulting from abrasions, fire, insect or disease damage, or other causes. No pruning wounds shall be present having a diameter exceeding two inches and such wounds must show vigorous bark growth on all edges. Trees shall not be pruned prior to delivery.

2.12 TREE HEIGHT:

A. When indicated, the overall height of the trees (measured from the crown of the roots to the tip of the top branch) shall be not less than the minimum size designated.

B. Height from the ground to the lowest branch shall be eighty (80) inches. The required height to the lowest branch may be accomplished by pruning after installation if, in the Engineer's opinion, this does not detract from the shape or form of the tree or cause unsightly scars.

2.13 HANDLING:

A. Plants shall be dug, handled, and transported so as to prevent damage of any sort including but not limited to breakage of branches, scraped or bruised trunk, or broken root ball.

B. Plants shall be protected from desiccation during digging, storage, and transportation by watering, covering, and application of anti-desiccants, as necessary to ensure their continued health and viability.

C. When plants cannot be transported and planted immediately upon being dug they shall be stored and protected from desiccation and extremes in temperature by being heeled in, watered, and/or sprayed with an anti-desiccant.

2.14 INSPECTION UPON DELIVERY:

A. Inspection and approval of plants at the source shall not impair the right of subsequent inspection and rejection upon delivery to the site, if the Engineer finds that the plants have declined noticeable due to handling abuse, lack of maintenance, or other causes. Costs of replacements for plants found deficient at time of delivery shall be borne by the Contractor.

PART 3 EXECUTION

3.01 PLANTING

A. Layout: **Determine location of underground utilities and layout plants so as to avoid possible damage to such structures.** Plant pits and bed locations, per plans, shall be staked on ground by contractor and approved by the Engineer's Representative prior to excavation. Should discrepancies exist between plant quantities in Planting Schedule and Planting Plan, quantities shown on the Planting Plan shall govern. Adjustments in locations and outline shall be made as directed in field. Labor, equipment, and new smooth stakes are to be furnished by the Contractor for this purpose.

B. Excavation: Planting beds and pits shall conform to the approved staked locations and outlines. Holes dug for plantings shall, in all cases, be large enough to accommodate the complete root system of the plant (tree, shrub, and groundcover) to be received, as well as sufficient amounts of approved backfill around the periphery of the rootball as shown on the details. All sod, weeds, roots, cobbles, and stones and other objectionable materials excavated from the plant holes which is unsuitable for use as backfill, shall be removed from the site immediately and disposed of legally.

C. If the subsoil appears to be injurious to plant health, the Contractor shall, at the Engineer's direction, fill the planting pit with enough planting mix to provide a twelve (12) inch depth when firmly tamped in place, prior to setting trees in place. If the subsoil does not appear to be deleterious, the root ball shall be set directly on level, undisturbed subgrade.

D. Plant Hole Size: The minimum plant hole size, unless otherwise specified on the plans or directed by the Engineer's Representative, shall be as follows:

1. Trees and Shrubs - The planting hole shall be twice the diameter of the rootball in width, and no deeper than two inches (2") less than the distance from the bottom of the rootball to the root flare (i.e. a 12" tall ball will require a 10" deep hole). Any excavation in excess of that required, shall be replaced and compacted to eighty-five percent (85%) of maximum density.
2. Groundcover - The planting hole shall be twice the diameter of the rootball in width and equal to the depth from the bottom of the rootball to the level at which it was grown in the nursery. Any excavation in excess of that required shall be replaced and compacted to eighty-five percent (85%) of maximum density.
3. Any rocks or underground obstructions shall be removed to a depth necessary for planting as specified, unless alternate locations for the planting are approved by the Engineer's Representative. If removal of obstructions results in a deeper hole than specified for planting, backfill material shall be added and compacted to eighty-five percent (85%) of maximum density to the correct depth.

E. Backfill Mix: Add loam to suitable soil excavated from the planting hole to create mix for planting pits. Backfill Mix shall be at least thirty-three percent (33%) loam.

3.02 SETTING PLANTS

A. Plants shall be handled in such a manner that the soil of the rootball will not be loosened from the roots. Carefully place plant into the prepared hole. Cut and remove rope and wires and remove or layback the top 2/3 of burlap off the root ball, if the ball is wrapped in burlap and

rope tied. Do not pull burlap and wires out from under the root ball. Remove all non-biodegradable root ball materials if present. Set plants plumb and fill in around the rootball to two thirds (2/3) the depth of the hole with backfill mix. Thoroughly tamp the backfill mix to eighty-five percent (85%) of maximum density.

B. Fill remaining area of planting hole with water.

C. Once the water has completely drained, fill remaining area of hole with backfill mix and thoroughly tamp to eighty-five percent (85%) of maximum density. Form a six inch (6”) saucer around the edge of the backfill hole by constructing a berm. The finish height of the compacted berm shall be three inches (3”). No excess soil shall be allowed to remain within the plant saucer. Fill saucer with water.

3.03 PRUNING OF NEW PLANT MATERIAL

A. Prune each tree in accordance with the requirements of “Pruning” as outlined in ANSI A300 to preserve the natural character of the plant. All pruning shall be by a certified arborist.

B. Prune only dead, broken, badly bruised, or deformed branches, and all suckers, and in such a manner as to preserve natural character of plant.

C. Perform all pruning with clean, sharp tools, and with cuts flush and clean. Do not apply paint or asphalt emulsion tree wound compound on cut area.

D. Contractor to encourage apical dominance by removing one co-dominant leader as required.

E. Pruning shall be undertaken to encourage good scaffold branching.

F. Trees which have had their leaders cut, or so damaged that cutting is necessary, will not be accepted. There shall be no abrasion of bark, nor fresh cuts of limbs over one-half inch (1/2").

G. All pruning shall be done in the presence of the Engineer’s representative.

3.04 WATERING

A. The plants shall be watered immediately following planting.

B. Soak the plants thoroughly again within a twenty-four (24) hour period after the initial planting.

C. Additional watering shall be made at least once every week unless otherwise directed, until final acceptance of the plant material.

3.05 FERTILIZING

A. Install fertilizer packets at depth of six (6) to eight (8) inches equally spaced around the plant, as it is being backfilled. Packets shall be installed per the manufacturer’s instructions. Packets shall not be cut, ripped, or damaged. The application rates for fertilizer packets shall be one packet for each inch of tree trunk caliper. As documentation of compliance with this requirement the Contractor shall provide the Engineer with receipted invoice showing the project name and quantity of packets supplied.

3.06 GUYING AND STAKING

A. Immediately after planting, stake trees as indicated on detail drawing or as directed by Engineer.

B. Place two stakes outside of the planting pit, exercising care not to damage the soil berm.

C. Guy all trees with a caliper of two inches (2") or greater and all evergreen trees greater than four feet (4'). Guy webbing shall be attached at a point no higher than one half (1/2) the height of the tree, nor lower than one-third (1/3) the height of the tree.

D. Guy trees to each stake near top of stake and intertwine webbing at tree trunk. The guy webbing shall lay flat against the trunk. Draw guy webbing tight enough to remove slack but not enough to cause deflation or strain to the plant.

3.07 MULCHING PLANTS

A. Application of mulch should only occur after planting operations have been completed and initial watering has taken place. Mulch shall be applied no later than forty-eight (48) hours after planting.

B. Prior to the placement of mulch, the contractor shall apply a pre-emergent weed control within the entire area to be mulched. Pre-emergent weed control shall be applied by a commercial applicator, licensed in the state in which the work is being performed, at a rate in accordance with the manufacturer's installation.

C. Mulch shall be applied a minimum of three (3) inches in depth for all individual trees and planting beds, as indicated graphically or verbally on the drawings.

D. Where mulch abuts seeded lawn areas or other finish grade materials, edge of planting bed shall be cut smooth and cleanly. Mulch shall be placed carefully so as not to spill into adjacent areas. Any excess or spilled mulch shall be promptly removed from the project area.

3.08 TRUNK WRAPPING

A. Remove all trunk wrap and trunk protection devices prior to staking and guying operations unless otherwise directed by the Engineer's Representative.

3.09 ANTI-DESICCANT SPRAYING

A. Spray anti-desiccant as directed by the manufacturer's recommendation and as approved by the Engineer's Representative.

3.10 TAGS AND LABELS

A. Leave all tree tag and label seals unbroken and visible on plant material until final inspection. Remove all seals immediately after final inspection.

3.11 PLANTING ON BANKS

A. For planting on bank 2:1 or steeper or as directed by the Engineer's, apply jute mesh loosely but smoothly to fit the contour of the finished grade parallel to, and in same direction as, the flow of water. The up-slope end of each separate strip or piece of jute mesh shall be buried in a six inch (6") minimum vertical anchor slot or junction slot with the soil tamped firmly against the mesh. Where more than one width of material is required, edges shall overlap a minimum of twelve inches (12"), and the up-slope section of mesh will be on top. Down-hill ends of the jute mesh shall be folded under approximately four inches (4") and stapled into place. Staples will be inserted through the mesh along edges, overlaps, and in the center of all jute mesh strips at intervals not greater than three feet (3'). All anchor slots, junction slots, check slots, and terminal folds shall have five (5) staples spaced not more than nine inches (9") on center across widths.

B. On seeded banks, jute shall be applied immediately after seeding. On shrub banks, apply jute after finish grading. Cut openings in mesh for each plant and mulch as specified.

3.12 PRELIMINARY ACCEPTANCE

A. After the completion of planting and all other related operations the Contractor shall make written request to the Engineer for a formal inspection of the work. If plant materials and workmanship are acceptable upon inspection, written notice will be given to the Contractor stating that the work has received Preliminary Acceptance and that the Establishment Period has commenced from the date of the notice.

3.13 PLANT REPLACEMENT GUARANTEE

A. Following completion of the Establishment Period the trees shall be guaranteed for a period of one (1) year. At the end of the guarantee period, a Final Inspection with the Contractor and Engineer will be held to determine whether any plant material replacements are required.

B. During the guarantee period the Contractor shall provide tree care as required to produce an acceptable planting at the Final Inspection. To be found acceptable at that time each tree shall have been established in place for at least one (1) year, shall show at least 75% healthy growth and shall have the natural character of its species as determined by the Engineer.

C. Trees found unacceptable, unhealthy, or dead shall be removed promptly from the site and replaced during the specified planting season. Replacements shall be of the same species and size and shall conform in all respects to the specifications for furnishing and installing new plants. Replacements shall be maintained and guaranteed as specified for the original plantings. If, at the end of the guarantee period for the replacement planting, the replacement is not in acceptable condition, the Engineer may elect to accept a credit in lieu of a second replacement.

D. Cost of replacements shall be borne by the Contractor, except when such replacement is required due to vandalism or neglect by others.

E. At the end of the Guarantee period the Contractor shall remove and dispose of all stakes and guys, as a condition of final acceptance and release of retainage.

F. "Vandalism" is intended to mean: any acts, whether intentional or accidental, by other persons occurring following final acceptance which clearly result in breakage or other damage to individual plants or plant beds, and which may reasonably be considered to be beyond Contractor's reasonable control, as determined by the Engineer's Representative.

END OF SECTION

SECTION 02840

MASONRY RETAINING WALL

PART 1 GENERAL WALL

1.01 SUMMARY

A. All work, labor, materials, and incidentals associated with this item shall be in accordance with 2024 Edition Rhode Island Department of Transportation Standard Specifications for Road & Bridge Construction and the following.

B. Requirements for new masonry wall shall be to the Limits as shown on the Contract Drawings.

C. New masonry wall to have a reinforced concrete footing, granite stone coping, and nautical rope railing. Cost of all labor, materials, and incidentals associated with, but not limited to, installation of the concrete footing, steel reinforcing for concrete footing, granite coping, painted galvanized railing base, timber railing post, and nautical rope shall be considered part of this work. No additional payment will be made for the aforementioned items.

D. The wall should be rebuilt with use of the existing stones to the greatest extent possible. The stones from the existing walls should be salvaged and stacked. Any missing stone should be granite ashlar not rubble. The work should be undertaken or supervised by a contractor in accordance with Rhode Island Standard Specifications. The mortar joints should be concave so the wall appears dry-laid with the mortar matching the color of stone.

E. New or existing stone types shall not be mixed to create an irregular wall appearance. Any new stone required for the wall facade shall match the size, shape, and color of the existing stones.

F. All installed components of the masonry retaining wall work shall be properly installed and adequately protected under the responsibility of the Contractor until Final Acceptance of the Project by the Owner.

1.02 REFERENCES

A. Reinforced Concrete Footing for Masonry Retaining Wall

1. Concrete footing shall be Class XX ¾" in accordance with Section 600 and 808 of the Rhode Island Standard Specifications.
2. Reinforcing steel used in the footing shall be in accordance with Section 810 of the Rhode Island Standard Specifications. Reinforcing steel shall be galvanized in accordance with Section M05.06 of the Rhode Island Standard Specifications.

B. Stone Masonry Retaining Wall

1. Masonry retaining wall shall be granite ashlar in accordance with Section 807, 911, and 939 of the Rhode Island Standard Specifications.

C. Granite Cap Stone

1. For Cut Stone: ASTM Standards: C-97, C-99, C-170, C-241, C-615, C-880
2. National Building Granite Quarries Association, Inc. (NBGQA) Specifications for Architectural Granite.

D. Nautical Rope Railing

1. The railing base shall be fabricated, galvanized, and painted black in accordance with Section 824, M05, and 825 of the Rhode Island Standard Specifications, respectfully.
2. Timber railing post shall be pressure treated in accordance with Section 806 of the Rhode Island Standard Specifications.

PART 2 GRANITE COPING

2.01 SUBMITTALS

A. Stone Quarry/ Stone Fabrication Facility. Provide the Company Name, location, years in business (minimum of ten (10) years of related experience) with photographic samples or other proof of a minimum of five (5) projects featuring similar types of projects or related work with regard to scale, size, shape fit and finish. Provide a minimum of five (2) references, with full contact information. The Manufacturer must be certified according to the National Building Granite Quarries Association.

B. Mason/Stone Installer: Provide Company Name, location, years in business (minimum of 10 years of related experience) with photographic samples or other proof of projects featuring similar types of projects or related work with regard to scale, size, shape fit and finish. Provide a minimum of five (2) references, with full contact information.

C. Foreman: Provide the name and credentials of the person assigned to oversee the implementation process, including the on-site activities. The foreman shall be an experienced installer who has completed Stone Work, fabrication and installations similar in material, design, and extent to that indicated for this Project and whose work has resulted in constructions with a record of successful in-service performance. Provide a minimum of five (2) previous projects for which the Foreman was directly responsible.

D. Sufficient samples (Minimum of one (1) 12” long piece of the proposed granite shall be submitted to the Engineer and Owner’s Representative to show the texture, finish, and anticipated range of color to be supplied.

E. The granite supplier shall submit copies of all full shop drawings to the Owner's Representative for approval where applicable. These drawings shall show all sizes, dimensions, layout, finishes, bedding, bonding, capstone jointing and anchoring details, and identifying names and numbers of each piece of granite in non-staining paint. Coordinate layout for the rope railing post base locations. Cored base holes shall have a minimum 18" clear edge distance.

F. Submit Certificate of Compliance for the epoxy anchor system as RIDOT approved materials.

2.02 QUALITY CONTROL

A. The General Contractor shall submit all Supplier, Fabricator, Mason or Installer, Foreman, and all Contractor qualifications required upon the presentation of the initial Schedule of Values for the Project. The General Contractor shall provide tests from a qualified independent testing entity and submit test reports for review and approval prior to the granite fabrication.

B. Granite shall conform to ASTM C-615, Architectural Grade Granite. All granite shall meet the following structural standards ASTM C97, ASTM C99, ASTM C170, ASTM C241, and ASTM C880.

C. All Granite shall be free from flaws, reeds, rifts, laminations, cracks, seams, starts or other such defects. Sample must be approved prior to proceeding with the work.

D. Exposed surfaces shall be free from spots, spalls, chips, stains, discoloration and other defects including variations that would affect the appearance outside the approved sample range.

E. The Owner reserves the right to perform independent testing by a qualified testing laboratory. Impact hammer, sonoscope, or other nondestructive device may be permitted but will not be used as sole basis for approval or rejection of Granite.

F. Fabricator and Mason shall coordinate for the Owner's Representative to review three (3) capstone templates installed and fit in place for to final approval prior to completing fabrication and installation of capstones. Templates shall be made of ¾" thick plywood, fabricated full scale, cut to lengths indicated on the plans.

2.03 DELIVERY, STORAGE, AND HANDLING

A. Packing and Loading

1. Finished granite shall be carefully packed and loaded for shipment by the fabricator using all reasonable and customary precautions against damage in transit. No material which may cause staining or discoloration shall be used for blocking or packing.

B. Delivery

1. Written Notice shall be provided to the Owner and Owner's Representative 48 hours prior to delivery to the site. Upon arrival to the site all pieces shall be uncovered, inventoried and inspected for shipping damage prior to preparing for off loading. No unloading shall occur if damage is found. All damaged Stone shall be immediately identified and reviewed with the Owner's Representative.

2. Upon final receipt at the Job Site or storage yard, and authorization to unload, the granite shall be off loaded using extreme care and with appropriately sized equipment. All granite shall be handled with wide belt nylon straps. The use of chains is not permitted. All off loaded stone shall be stacked on timber cribbing or platforms beginning at a minimum of 6" above the ground, with 4" cribbing spaces between, and care shall be taken to prevent staining from soil, plastic, tarps, strapping, ropes or other incidentals during storage. If storage is to be for a prolonged period, polyethylene or other suitable plastic film may be placed over all stones if used with spaces and configured for even air circulation and as an overall protective covering. Holes in the stones shall be plugged during freezing weather to prevent the accumulation of water. Salt shall not be used for melting of ice in on or adjacent to granite.

C. Granite shall be carefully handled to prevent chipping, breakage soiling or other damage. Steel 'Pinch' or wrecking bars shall not be used without protecting the edges of the granite with wood or other rigid materials. All lifting shall be conducted with wide belt nylon slings. Use of chains in contact with the granite cut stones is prohibited. Lifting straps containing tar, grease or any other substances which might mar or cause staining to damage to the granite finishes shall not be used.

D. If material is damaged in the unloading process, immediately notify the Owner's Representative for a determination on responsibility, suitability for reuse or rejection. If rejected the Contractor shall take charge and replace the stone pieces identified at no charge. Back charges to the supplier shall be if made only with prior notification.

2.04 SOURCE OF SUPPLY

A. Supplier: All granite shall be obtained from quarries in the United States or Canada with adequate capacity and facilities to meet the specified requirements. Cutting and finishing shall be done by a firm equipped to process the material promptly on order and in strict accord with specifications. The supplier shall provide written, photographic of otherwise documented evidence to this effect to the Owner and Owners Representative.

B. Quarries shall show evidence by way of written or otherwise documented environmentally responsible practices, and shall have a method for the diversion of stone scrap or cuttings from the waste stream thru recycling or re-purposing, and shall have a system that minimizes the use of potable water in cutting through the recycling and reuse of water.

2.05 GRANITE CUT STONE:

A. GENERAL: All granite shall be of good quality as graded by the National Building Granite Quarries Association, Inc., free of cracks, seams, fissures or starts which may impair its structural integrity or function.

B. The Granite provided for all capstone shall architectural grade, naturally occurring, fine to medium grain textured, light to medium gray in color without pronounced or detracting veining flecking, quartz pockets, or discoloration. Some granite types that may meet this criteria are Woodbury Gray, Chelmsford Gray, North Jay.

C. GRANITE FINISHES: the National Building Granite Quarries Association, Inc shall define Finishes used in bold in the schedule below. Finishes are defined as follows:

1. Polished: Mirror gloss, with sharp reflections.
2. Honed: Dull sheen, without reflections.
3. Fine rubbed: Smooth and free from scratches; no sheen.
4. Rubbed: Plane surface with occasional slight "trails" or scratches.
5. Shot ground: Plane surface with pronounced circular markings or trails having no regular pattern.
6. Thermal: Finish produced by application of high temperature flame to the surface. Large surfaces may have shadow lines caused by overlapping of the torch.

2.06 FABRICATION

A. Granite shall be of the sizes and dimensions indicated in the final approved shop drawings.

B. Face variation from a true plane shall be as follows:

1. Honed: 3/64 inch.
2. Thermaled: 3/16 inch.

C. Back variation: ¼ inch on any piece under 12” thick, ½” above 12” thick.

D. Back sides may be roughly dressed when not exposed to view.

E. Arris lines shall be cut sharp and square or to the angle specified, shown and approved in the shop drawings. Where exposed, all corners shall be eased.

2.07 FLATNESS TOLERANCES

A. A 4’ dimension in any direction on the surface shall determine variation from true plane, or flat surfaces. Such variations on polish, honed, and fine rubbed surfaces shall not exceed tolerances listed below or 1/3 of the specified joint width, whichever is greater. On surfaces having other finishes, the maximum variation from true plane shall not exceed the tolerance listed below or 1/2 of the specified joint width, whichever is greater.

1. Polished, honed or fine rubbed finishes.....3/64 inch
2. Sawn, 4-cut, 6-cut, and 8-cut finishes…….,……. 1/8 inch
3. Thermal and coarse stippled finishes…….3/16 inch
4. Split face, Rock Face or other rough-cut finishes…….. 1 inch

2.08 INCIDENTAL CUTTING AND DRILLING

A. Incidental cutting is required to accomplish the necessary fit and angle points in the river wall. Cut stone with new blades specifically for cutting stone. Make all cuts plumb unless directed otherwise. Utilize water when cutting.

B. All cutting and drilling of bore holes, and holes for dowels and anchors shall be considered incidental to the cost of fabricating and installing the stones, regardless of where work is performed. Fabricate and drill all holes to the greatest extent possible in controlled shop conditions off-site.

2.09 INSTALLATION:

A. General:

1. Lay out all stone pieces that intersect or connect to other elements, either in the shop or in the field, for review of fitment and composition. Maintain all desired relationships as shown on the plans. Plan and allow for 'flex' length cap stone pieces that may be required to be field-cut to fit.
2. Template capstone sizes and shapes for factory fabrication and drilling of anchor bolt holes where conditions permit.
3. Re-butt or otherwise field cut both ends of adjoining stones in the field as noted and /or determined necessary.

B. Specific:

1. Granite Placement. Before placing granite, the Contractor shall verify that all conditions are ready for placement of granite. Verify that all lay-out and grade information is accurate and complete.
2. Insure that during all granite installation and before placement of any concrete, all reinforcement, and any embedded items is coordinated, complete and that required inspections have been performed.
3. All setting shall be performed by competent granite setters under qualified supervision and in accordance with the approved shop drawings.Set capstone level. Shim as necessary. Set granite pieces to obtain the reveals and angles and orientations shown in the plans.

Stones with chips, cracks, stains or defects that might be visible shall not be installed. Granite to be set shall be clean and dry. Granite shall be set to the described line and grade. Joints shall be at the specified thickness as indicated on the plans. Direct contact bearing between granite pieces shall be prohibited.

4. Set Granite Capstones as shown on drawings.
5. All work involving epoxy, cement base coating and protective coating to ad-here strictly to the manufacturer's current printed recommendations as to temperatures at time of application. No use of epoxy materials allowed when either the temperature of the Granite Capstone or the ambient temperature is below 50 degrees F, 24 hours before, during, or for a period of 48 hours after the completion of the installation. Temporary heat may be used to meet the specified requirements. All epoxy, shall be new and used within the shelf life limitations set forth by the manufacturer.
6. Surfaces shall be clean and sound. Surfaces may be dry, damp or wet, but free of standing water. Remove dust, laitance, grease, curing compounds, impregnations, waxes, foreign particles and disintegrated materials by abrasion methods such as sandblasting.
7. Mortar joints between capstones as per manufacturers recommendations. All exposed surfaces shall be kept free from mortar at all times. Pointed joints shall have a smooth, shallow concave surface, approximately 3/16 inch radius.
8. Relieve all exterior corners and ease edges of permanently exposed Granite.

END OF SECTION

SECTION 02930

LOAMING AND SEEDING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Requirements for loaming, fertilizing, seeding, and related work in areas disturbed in the process of performing the Work under this contract.

1.02 SUBMITTALS

A. In accordance with SECTION 01300 submit the following:

1. Submit with seed, certificates confirming seed mixture, purity, germinating value, and crop year identification.
2. Submit test samples of loam.

1.03 DELIVERY, STORAGE AND HANDLING

A. Fertilizer:

1. Delivered mixed as specified in standard size, unopened containers showing weight, analysis, and name of manufacturer.
2. Store in weather proof place.

B. Seed:

1. Delivered in original unopened containers with mixture listed.

PART 2 PRODUCTS

2.01 LOAM

A. Fertile, natural topsoil, typical of locality, without admixture of subsoil, refuse or other foreign materials, and obtained from well-drained arable site. Mixture of sand, silt and clay particles in approximately equal proportions. Free of stumps, roots, heavy or stiff clay, stones large than 1 inch in diameter, lumps, coarse sand, noxious weeds, sticks, brush or other deleterious matter.

B. Not less than 4 percent nor more than 20 percent organic matter as determined by loss on ignition of oven-dried samples.

C. Loam test samples dried to constant weight at temperature of 230 degrees. F., plus or minus nine degrees.

D. Use loam, having prior vegetative growth that did not contain toxic amounts of either acid or alkaline elements.

2.02 LIME, FERTILIZER AND SEED

A. Ground agricultural limestone containing not less than 85 percent of total carbonates.

B. Complete fertilizer, at least 50 percent of nitrogen derived from natural organic sources of ureaform and containing following percentages by weight:

Nitrogen 10% Phosphorus 10% Potash 10%

C. Turf grass seed, clean, high in germinating value and latest year's crop mixture as follows:

Name	Minimum Proportion by Weight	Percent Purity	Percent Germination
Kentucky bluegrass	20%	87%	85%
Merion Kentucky bluegrass	20%	87%	85%
Red Chewings fescue	45%	98%	85%
Italian rye	15%	98%	90%

PART 3 EXECUTION

3.01 GENERAL

A. Supply suitable quantities of water, hose and appurtenances.

3.02 LOAM

A. Spread loam on areas to 6-inch depth after compaction, fine grade and compact.

3.03 LIME, FERTILIZER AND SEEDING

A. Apply lime by mechanical means at rate of 3000 pounds per acre.

B. Apply fertilizer at rate of 1200 pounds per acre.

C. Remove weeds or replace loam and reestablish finish grades, if any delays in seeding lawn areas and weeds grow on surface or loam is washed out prior to sowing seed and without additional compensation. Sow seed at rate of 175 pounds per acre on calm day, by mechanical means. "Hydro-Seeding" not permitted unless otherwise permitted or required by Engineer. Sow one-half of seed in one direction, and other half at right angles to original direction. Rake seed lightly into loam, to depth of not more than 1/4 inch and compact by means of an acceptable lawn roller weighing 100 to 150 pounds per linear foot of width.

D. Water lawn areas adequately at time of sowing and daily thereafter with fine spray, and continue throughout maintenance and protection period.

E. Seed during approximate time periods of April 1 to May 15 and August 15 to October 1, and only when weather and soil conditions are suitable for such work, unless otherwise permitted.

3.04 MAINTENANCE OF SEEDED AREAS

A. Maintain lawn areas and other seed areas at maximum height of 2-1/2 inches by mowing at least three times. Weed thoroughly once and maintained until time of final acceptance. Reseed and refertilize with original mixtures, watering or whatever is necessary to establish over entire area of lawn and other seeded areas a close stand of grasses specified, and reasonably free of weeds and undesirable coarse native grasses.

B. Begin maintenance immediately after each portion of lawn is seeded and continue for minimum of 45 days.

C. Repair or replace all seeded areas which, in judgment of Engineer, have not survived and grown in satisfactory manner, for a period of one year after acceptance.

D. Seeding replacement, same seed mixture as specified and furnished and installed as specified.

3.05 TEMPORARY COVER CROP

A. Sow a temporary cover crop of buckwheat, domestic rye grass or other acceptable seed if there is insufficient time in the planting season to complete seeding, fertilizing, and permanent seeding at the option of Contractor or order of Engineer. Cut and water cover crop as necessary until the beginning of the following planting season, at which time it shall be plowed or harrowed into soil, the areas shall be fertilized and permanent seed crop sown as specified.

END OF SECTION

SECTION 02999

BIORETENTION BASINS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes
   1. This work consists of constructing bioretention basins complete-in-place as indicated on the Plans or as directed by the Engineer, all in accordance with these Specifications.

B. Related Sections
   1. Section 02200 - Earth Excavation, Backfill, Fill and Grading

1.02 REFERENCES

A. This specification makes reference to the requirements of additional specifications as listed. The Contractor shall obtain and familiarize himself with all requirements referenced by this specification prior to preparation and installation of any pavements.
   1. Rhode Island Department of Transportation, Standard Specifications for Road and Bridge Construction, including all addenda issued prior to March 1, 2018, issued by the State of Rhode Island Department of Transportation, (referred to as the Standard Specification).

B. American Society for Testing and Materials
   1. C117 Standard Test Method for Materials Finer than 75-µm (No. 200) Sieve in Mineral Aggregates by Washing
   2. C136 Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates

PART 2 PRODUCTS

2.01 MATERIALS

A. Pea Gravel
   1. Shall be in accordance with M.01.06 – KEYSTONE and M.01.09 – Table I, Column III of the RIDOT Standard Specifications.

B. Overflow Riser
   1. Precast Concrete Manhole Sections – Shall be in accordance with all applicable requirements of SECTION 702 - MANHOLES, INLETS, AND CATCH BASINS and SECTION M.04.03 - CATCH BASINS, MANHOLES, DROP INLETS, PAVED WATERWAYS AND MISCELLANEOUS SMALL STRUCTURES of the RIDOT Standard Specifications, and with the construction details for this project.

2. Rebar – Shall be in accordance with Section M.05.01 – BAR REINFORCEMENT (as applicable) of the RIDOT Standard Specifications.

C. Impermeable Liner

1. The impermeable plastic liner shall be nonwoven high-density polyethylene (HDPE) liner specifically designed for use in subsurface lining/containment applications. Liner properties shall meet or exceed the following minimum requirements:

Property (Unit)	Unit	Test Method	Requirements
Thickness	mils	ASTM D5199	30
Break Strength	lb/in	ASTM D6693	114
Break Elongation	%	ASTM D6693	800
Tear Resistance	lb	ASTM D1004	16
Puncture Resistance	lb	ASTM D4833	42
Seam Shear Strength	lb/in	ASTM D6392	45
UV Resistance	%	ASTM D5885	35

The liner shall be fabricated and delivered in rolls, not sheets.

To keep the number of overlay joints to a minimum, liner shall be provided in sections not less than fifteen (15) feet in width unless otherwise approved by the Engineer prior to the delivery to the site.

D. Perforated PVC Underdrain and Clean

1. Shall be in accordance with sections M.04 – DRAINAGE and 703 – UNDERDRAINS AND COMBINATION DRAINS of the RIDOT Standard Specifications and AASHTO M-278.

E. Bioretention Soil

1. Shall be free of stones, rocks, cobbles, brush, stumps, roots and other materials larger than two inches. The soil shall have a composition on a volume basis of 85-88% sand (ASTM C-33), 8-12% (no more than 2% clay) soil fines (pass No. 200 Sieve), and 3-5% organic matter. If bioretention soils depth is less than 4 feet, a well-aged (3 months minimum), well aerated leaf compost shall be added to the mixture. The leaf compost shall be at least 20% but not more than 25% by volume.
   Samples: The Contractor shall submit two 10-lb samples of the bioretention soil. Samples must meet the specifications prior to delivering material to the site.

F. Loam

1. Shall be in accordance with M.18.01 – LOAM of the RIDOT Standard Specifications.

G. Seed

1. Lime, Fertilizer, Mulch and Water – Shall conform to the applicable requirements of SECTION M.18; LANDSCAPING MATERIALS of the Rhode Island Department of Transportation Standard Specifications for Road and Bridge Construction, latest edition, and its amendments unless otherwise specified below.
2. Seed Mixes – Seed Mix A shall be "New England Erosion Control/Restoration Mix for Detention Basins and Moist Sites" as produced by New England Wetland Plants, Inc. or approved equal. Seed Mix B shall be "New England Warm Season Grass Mix" as produced by New England Wetland Plants, Inc. or approved equal.

H. Jute Mesh

1. Shall be a short-term (up to twelve month) biodegradable material consisting of straw fibers interwoven between top and bottom polypropylene nets. All components of the mesh shall be photodegradable. Jute mesh shall be suitable for use on slopes of the magnitude on which the material is to be used and shall be capable of providing erosion protection for moderate flow velocities of up to 6.0 feet/second.

PART 3 EXECUTION

3.01 PREPARATION

"Bioretention Basin" shall be performed in accordance with all applicable requirements of these specifications and as shown on the plans and detailed layouts. In addition, Contractor shall take care to minimize compaction of existing soils. Excavation and grading shall be performed using only light equipment, such as a compact loader or a dozer/loader with marsh tracks.

3.02 INSTALLATION

A. Overflow Risers
1. Shall be installed in accordance with all applicable requirements of SECTION 702 - MANHOLES, INLETS, AND CATCH BASINS of the RIDOT Standard Specifications, and as shown on the plans and detail layouts.

B. Perforated PVC Underdrain and Cleanout
1. Shall be in accordance with all applicable requirements of SECTION 703 – UNDERDRAINS AND CLEANOUTS of the RIDOT Standard Specifications, and as shown on the plans and detail layouts.

C. Impermeable Liner
1. Subgrade Preparation – Clear subgrade of all sharp objects, large stones, roots, debris, or any other foreign objects that may contribute to puncturing, shearing, rupturing, or tearing of the impermeable plastic liner. Grade area as smooth as possible and inspect subgrade. Repair all unstable areas or soft spots with the installation of gravel prior to the placement of the impermeable plastic liner.

2. Plastic Liner Installation – The impermeable plastic liner shall be installed as shown on the plans, detail layouts, and manufacturer's instructions and recommendations. The proposed product shall be approved by the Engineer prior to the commencement of any drainage construction. Liner shall be installed to the limits depicted on the project plans and basin details.
3. Repair – Impermeable plastic liner damaged during installation shall be repaired as directed by the Engineer. If detrimental movement of the impermeable plastic liner occurs during any step of the installation, as determined by the Engineer, the Contractor shall remove the cover material and/or sections of the impermeable plastic liner to the limits deemed necessary and reinstall the impermeable plastic liner. Any impermeable plastic liner damaged during its installation or during placement of cover materials shall be replaced by the Contractor at no additional cost to the Department.

D. Seed Mix A

1. Seeding Dates – Full advantage shall be taken of time and weather conditions best suited for seeding. The required dates for seeding the Seed Mix A shall be as follows:
   Spring Seeding: April 1 to May 31.
   Fall Seeding: August 15 to October 15.
2. Seeding at other than the above time will be allowed only with the written permission of the Engineer. The Engineer may suspend work when he/she determines that soil or weather conditions are unsuitable for raking and/or seeding. The Contractor may resume work when directed by the Engineer. The Contractor shall notify the Engineer at least 48 hours in advance of the time intended for commencement of seeding; no payment will be made for work performed when the Engineer is not present. In cases where there is existing or new plant material, care shall be taken to ensure that no lime, fertilizer, mulch and/or seed mix comes in contact with the plant material or their mulched areas.
3. Preparation of Areas for Seeding – Areas to receive Seed Mix A shall be raked by hand so as to produce a loose, friable seed bed. All sticks, litter, wire, weeds, cable, cobbles or stones larger than 1 inch in any dimension shall be removed and legally disposed of. The finish grade of the Seed Mix A area shall blend into the adjacent seeded areas (when applicable). Where the seed bed has become compacted, it shall be scarified to a depth of 5 inches prior to raking. No seeding will be permitted on areas where the seed bed has not been properly prepared or where the soil is compacted.
4. Application of Lime – Pelletized Lime shall be applied dry and spread evenly over the entire surface to be seeded. Unless otherwise specified, the application rate shall be 1 ton per acre. Raking shall be completed after the fertilizer has been applied.
5. Application of Fertilizer – After the application of lime, fertilizer shall be spread at a rate of Five hundred pounds (500 lbs.) per acre. Both the lime and fertilizer shall be thoroughly incorporated into the soil by raking. Raking shall be in accordance with the applicable requirements of subsection Preparation of Areas for Seeding, above.

6. Sowing of Seed – After the seed bed has been prepared as outlined in subsections Preparation of Areas for Seeding, Application of Lime and Application of Fertilizer above, the Seed Mix A shall be applied at a rate of 40 lbs. per acre. Application of fertilizer, grass seed, and cellulose fiber mulch may be accomplished in one operation by the use of a hydroseeder.
7. Mulching – All seeded areas shall be covered with cellulose fiber mulch. Cellulose fiber mulch may be applied separately or as part of a hydroseeding operation. If cellulose fiber mulch is applied separately, it shall be applied immediately after the seeding operation. Cellulose fiber mulch that becomes adhered to signs, sign posts, lighting standards, new or existing plant materials and/or walls shall be removed.
8. Care During Construction – Any areas which fail to show a uniform growth of the Seed Mix A for any reason whatsoever shall be reseeded until the areas are covered with a satisfactory growth of grass as approved by the Engineer. The seed, fertilizer, etc. used in the reseeding operations shall be at the same application rates and during appropriate seeding dates as those previously specified unless otherwise directed by the Engineer.
9. Watering – The Contractor shall water the seeded areas within 72 hours of the seeding operation. One additional watering may be required, and such will be at the discretion of the Engineer. Water shall be applied at a controlled rate and in such a manner to ensure the water reaches the root zone. Watering operations shall not flood adjacent areas, erode soil or cause any damage to the seeded areas.
10. Failure to Perform Care During Construction – If the Engineer decides that the Care During Construction tasks as specified in the Contract have not been performed, a daily charge of $100.00 per day will be deducted from monies due the Contractor as a charge for failure to comply with this Specification. The daily charge will continue each consecutive calendar day until the deficiencies have been corrected to the satisfaction of the Engineer.

E. Seed Mix B

1. Seeding Dates – Full advantage shall be taken of time and weather conditions best suited for seeding. The required dates for seeding the Seed Mix A shall be as follows:
   Spring Seeding: April 1 to May 31.
   Fall Seeding: August 15 to October 15.
2. Seeding at other than the above time will be allowed only with the written permission of the Engineer. The Engineer may suspend work when he/she determines that soil or weather conditions are unsuitable for raking and/or seeding. The Contractor may resume work when directed by the Engineer. The Contractor shall notify the Engineer at least 48 hours in advance of the time intended for commencement of seeding; no payment will be made for work performed when the Engineer is not present. In cases where there is existing or new plant material, care shall be taken to ensure that no lime, fertilizer, mulch and/or seed mix comes in contact with the plant material or their mulched areas.
3. Preparation of Areas for Seeding – Areas to receive Seed Mix B shall be raked by hand so as to produce a loose, friable seed bed. All sticks, litter, wire, weeds, cable, cobbles or stones larger than 1 inch in any dimension shall be removed and

legally disposed of. The finish grade of the Seed Mix B area shall blend into the adjacent seeded areas (when applicable). Where the seed bed has become compacted, it shall be scarified to a depth of 5 inches prior to raking. No seeding will be permitted on areas where the seed bed has not been properly prepared or where the soil is compacted.

4. Application of Lime – Pelletized Lime shall be applied dry and spread evenly over the entire surface to be seeded. Unless otherwise specified, the application rate shall be 1 ton per acre. Raking shall be completed after the fertilizer has been applied.
5. Application of Fertilizer – After the application of lime, fertilizer shall be spread at a rate of Five hundred pounds (500 lbs.) per acre. Both the lime and fertilizer shall be thoroughly incorporated into the soil by raking. Raking shall be in accordance with the applicable requirements of subsection Preparation of Areas for Seeding, above.
6. Sowing of Seed – After the seed bed has been prepared as outlined in subsections Preparation of Areas for Seeding, Application of Lime and Application of Fertilizer above, the Seed Mix B shall be applied at a rate of 25 lbs. per acre. Application of fertilizer, grass seed, and cellulose fiber mulch may be accomplished in one operation by the use of a hydroseeder.
7. Mulching – All seeded areas shall be covered with cellulose fiber mulch. Cellulose fiber mulch may be applied separately or as part of a hydroseeding operation. If cellulose fiber mulch is applied separately, it shall be applied immediately after the seeding operation. Cellulose fiber mulch that becomes adhered to signs, sign posts, lighting standards, new or existing plant materials and/or walls shall be removed.
8. Care During Construction – Any areas which fail to show a uniform growth of the Seed Mix B for any reason whatsoever shall be reseeded until the areas are covered with a satisfactory growth of grass as approved by the Engineer. The seed, fertilizer, etc. used in the reseeding operations shall be at the same application rates and during appropriate seeding dates as those previously specified unless otherwise directed by the Engineer.
9. Watering – The Contractor shall water the seeded areas within 72 hours of the seeding operation. One additional watering may be required, and such will be at the discretion of the Engineer. Water shall be applied at a controlled rate and in such a manner to ensure the water reaches the root zone. Watering operations shall not flood adjacent areas, erode soil or cause any damage to the seeded areas.
10. Failure to Perform Care During Construction – If the Engineer decides that the Care During Construction tasks as specified in the Contract have not been performed, a daily charge of $100.00 per day will be deducted from monies due the Contractor as a charge for failure to comply with this Specification. The daily charge will continue each consecutive calendar day until the deficiencies have been corrected to the satisfaction of the Engineer.

E. Jute Mesh

1. In areas where loaming and seeding alone is found to be inadequate to stabilize a graded slope, jute mesh shall be installed in accordance with the construction detail for same and/or applicable manufacturer's instructions. The Engineer shall

determine the need for the use of jute mesh, which shall be applied in the locations and to the extents directed by the Engineer.

END OF SECTION

DIVISION 3

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Requirements for furnishing and installing forms, reinforcing steel, concrete and expansion and/or construction joints.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM)

1. A185, Specification for Steel Welded Wire Fabric, Plain, for Concrete Reinforcement.
2. A615, Specification for deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
3. C31, Practice for Making and Curing Concrete Test Cylinders in the Field.
4. C33, Specification for Concrete Aggregates.
5. C39, Test Method for Compressive Strength of Cylindrical Concrete Specimens.
6. C42, Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
7. C94, Specification for ready Mixed Concrete.
8. C143, Test Method for Slump of Hydraulic Cement Concrete.
9. C150, Specification for Portland Cement.
10. C172, Practice for Sampling Freshly Mixed Concrete.
11. C231, Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
12. C260, Test Method for Air-Entraining Admixtures for Concrete.
13. C494, Specification for Chemical Admixtures for Concrete.
14. C920, Specification for Elastomeric Joint sealants.
15. D994, Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type)
16. D1056, Specification for Flexible Cellular Materials-Sponge or Expanded Rubber.
17. D1751, Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).

B. American Concrete Institute (ACI):

1. ACI 301, Specification for Structural Concrete for Buildings.
2. ACI 304, Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete.
3. ACI 305, Recommended Practice for Hot Weather Concreting.
4. ACI 306, Recommended Practice for Cold Weather Concreting.

5. ACI 315, Building Code Requirements for Reinforced Concrete.
6. ACI 347, Guide to Formwork for Concrete.

C. Concrete Reinforcing Steel Institute (CRSI):

1. Manual of Standard Practice.

1.03 SUBMITTALS

A. Submit Shop Drawings in accordance with SECTION 01300 for the following:

1. Reinforcing Steel
   a. Furnish in detail and completeness that all fabrication and placement at the site can be accomplished without the use of contract drawings for reference.
   b. Include number of pieces, sizes, and grade of reinforcing steel, accessories, and any other information required for fabrication and placement.
   c. Show joint layout and design
   d. Check structural and site drawings for anchor bolts, anchors, inserts, conduits, sleeves, and any other items which are required to be embedded in concrete, and make necessary provisions as required so that reinforcing steel will not interfere with the placement of such embedded items.
2. Concrete mix designs.
3. Grout manufacturer/design mix (if included in this section)
4. Manufacturer’s data for ancillary materials such as joint fillers and sealants, epoxy bonding compound.

1.04 QUALITY ASSURANCE

A. Selection of testing laboratory in accordance with SECTION 01410.

B. Sample and Test Concrete as follows:

1. Test Specimens: Make, cure and have tested, a minimum of one set of four test specimens from the concrete of each day's pour and for each fifty cubic yards of concrete cast in accordance with ASTM C172, C31 and C39. One cylinder shall be broken after seven days and three cylinders after twenty-eight days.
2. Slump: A slump test shall be made for each truckload of concrete in accordance with ASTM C143. Slumps greater than design mix limit will be grounds for rejection of the concrete.
3. Air Content: An air content test shall be made from each day's pour of concrete by the pressure method in accordance with ASTM C231. Air contents above or below the limits specified will be grounds for rejection of the concrete.
4. In the event the compressive strength of the cylinders, when tested, is below the specified minimum, the Engineer may require test cores of the hardened structure to be taken by the Testing Laboratory in accordance with ASTM C42. If such test indicates that the core specimen is below the required strength, the concrete in question shall be removed and replaced without cost to the Owner. Any other work damaged as a result of this concrete removal shall be replaced with new materials to the satisfaction of the Engineer at no additional cost to the Owner.

The cost of coring will be deducted from the contract amount. Where the Testing Laboratory has taken core cylinders and the concrete proves to be satisfactory, core holes shall be filled in a manner satisfactory to the Engineer at no additional cost to the Owner.

5. The Contractor shall coordinate the date and location of tests with the Engineer before any concrete work is started.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Reinforcing steel.

1. Transport to the site, store, and cover in a manner which will ensure that no damage shall occur to it from moisture, dirt, grease, or any other cause that might impair bond to concrete or chip protective epoxy coating.
2. Store on the site at all times, a supply of approved reinforcing steel to ensure that there will be no delay of the work.
3. Identification of steel shall be maintained after bundles are broken.

PART 2 PRODUCTS

2.01 MATERIALS

A. Portland Cement.

1. In accordance with ASTM C150, Type II of U.S. manufacture.
2. Only one brand of cement shall be used on the project.

B. Aggregates.

1. Fine aggregate, in accordance with ASTM C33, clean and graded from 1/4 inch to fines.
2. Coarse aggregate, in accordance with ASTM C33, clean and graded from 1/4 inch to maximum sizes hereinafter specified.

C. Air Entraining Agent.

1. In accordance with ASTM C260.

D. Water Reducing Agent.

1. In accordance with ASTM C494 Type A.

E. Microsilica Admixture.

1. Packaged in easily dispersing form.

F. Water.

1. Clean and potable,
2. Free of impurities detrimental to concrete.

G. Reinforcing Bars.

1. New, deformed billet steel bars, in accordance with ASTM A615, Grade 60.

H. Welded Wire Fabric

1. In accordance with ASTM A185.

I. Accessories.

1. Reinforcement accessories, consisting of spacers, chairs, ties, and similar items shall be provided as required for spacing, assembling, and supporting reinforcement in place.
2. All accessories shall be dielectric coated steel or approved plastic accessories, conforming to the applicable requirements of the CRSI Standards.

J. Tie wire.

1. 16 gauge or heavier black annealed wire.

K. Form Ties and Spreaders.

1. Standard metal form clamp assemble and plastic cone, of type acting as spreaders and leaving no metal within 1 inch of concrete face.
2. Provide form tie with water stop for all walls to be in contact with earth or liquid.
3. Inner tie rod shall be left in concrete when forms are removed.
4. No wire ties or wood spreaders will be permitted. Use ½" x 1" C.T. plastic cones for sinkages.

L. Form Coatings.

1. Non-grain raising and non-staining type that will not leave residual matter on surface of concrete or adversely affect proper bonding of subsequent application of other material applied to concrete surface.
2. "Nox-Crete Form Coating" as manufactured by Nox-Crete Company, or approved equal.
3. Coatings containing mineral oils or the non-drying ingredients will not be permitted.

M. Grout.

1. High-strength, non-shrink grout with saltwater resistance.
2. Five Star Special Grout 120 or equivalent.

2.02 CONCRETE STRENGTHS AND PROPORTIONS

A. Cast-in-place concrete shall have the minimum compressive strength at 28 days as indicated on the Drawings.

B. The exact proportions for the mix, including amounts admixture (if any), and water, shall be determined by the concrete supplier.

C. The proportions of aggregate to cement for any concrete shall be such as to produce a mixture which will work readily into the corners and angles of the forms and around reinforcement with the method of placing employed not he work, but without permitting the materials to segregate or excess free water to collect on the surface.

D. Air-Entrainment: The air content in all concrete shall be maintained at 5 to 7 percent.

2.03 PREMOLDED JOINT FILLER

A. Bituminous Type.

1. In accordance with ASTM D994 or D1751.

B. Sponge Rubber Type.

1. Neoprene, closed-cell, expanded in accordance with ASTM D1056, Type 2C5, with a compression deflection, 25 percent deflection (limits), 17 to 24 psi (119 to 168 kPa) minimum.

2.04 POURABLE JOINT FILLERS

A. Filler for Nonpotable Water Structures

1. Specific Gravity: Greater than 1.0 for cured, in-place filler.
2. Vertical and Sloped Joints: Furnish gun grade material that will remain as placed in joints and will not run down slope.
3. Suitable for continuous immersion and exposure to liquid being contained in the structure.

2.05 JOINT SEALANTS

A. In slabs.

1. In accordance with ASTM C920 for poured 2-component polyurethane sealant.
2. Sikaflex-2c, as manufactured by Sika Corporation or approved equivalent.

B. In walls.

1. Type II, Class A, compound conforming to Interim Federal Specification TT-S-00227E (3) (COM-NBS) for Sealing Compound; Elastomeric Type, Multi-Component (for Caulking, Sealing, and Glazing in Buildings and Other Structures).
2. Sikaflex-1a, as manufactured by Sika Corporation or approved equivalent.

2.06 EPOXY BONDING COMPOUND

A. The epoxy bonding compound shall be a three-component, solvent-free, moisture-tolerant, epoxy modified, cementitious product specifically formulated as a bonding agent and anti-corrosion coating. The product shall have suitable contact time, fluidity, and application temperature for this type of application.

PART 3 EXECUTION

3.01 FORMWORK

A. Falsework for Forms

1. Build and maintain necessary false work for the forms.

B. Construction of Forms

1. General
   a. Construct in accordance with ACI 347.
   b. Construct of sound material, to the correct shape and dimensions, mortar tight, of sufficient strength, and so braced and tied together that the movement of men, equipment, materials, or placing and vibrating the concrete will not throw them out of line or position.
2. Embedded Items
   a. Make provisions for pipes, sleeves, anchors, inserts, reglets, anchor slots, nailers, water stops, and other features.
   b. Do not embed wood, other than necessary nailing blocks, in concrete.
   c. Extended complete cooperation to suppliers of embedded items in their installation.
   d. Secure information for embedded items from other trades as required.
   e. Securely anchored embedded items in correct location and alignment prior to placing concrete.
3. Openings for Items Passing Through Concrete
   a. Establish exact locations, sizes, and other conditions required for openings and attachment of work specified under other sections.
   b. Coordination work of this nature in order that there will be no unnecessary cutting and patching of concrete.
   c. Cutting and repairing of concrete as a result of failure to provide for such openings shall be paid for by the Contractor at no additional expense to the Owner.

C. Removing Forms and False work

1. Forms shall not be removed for at least 72 hours after concrete has been placed.
2. Forms shall not be removed until the concrete has attained sufficient strength to insure stability.

3.02 REINFORCING STEEL

A. General

1. Place reinforcing steel in accordance with the drawings and approved shop drawings and the applicable requirements of the CRSI, Manual of Practice.
2. Install reinforcement accurately and secure against movement, particularly under the weight of workmen and the placement of concrete.

B. Reinforcing Steel Supports

1. Support bars on approved plastic or dielectric-coated metal chairs or spacers, accurately placed and securely fastened to forms or steel reinforcement in place.
2. Supply additional bars, whether specifically shown on the drawings or not, where necessary to securely fasten reinforcement in place.
3. Support legs of accessories in forms without embedding in form surface.
4. Spacing of chairs and accessories shall conform to CRSI, Manual of Standard Practice. Accurately space hoops and stirrups and wire to the reinforcement.
5. Permit no loose wood inside forms.
6. Lifting of welded wire fabric into proper position while concrete is being poured rather than supporting fabric on chairs will not be permitted.

C. Placing and Tying

1. Set in place, space, and rigidly and securely tie or wire with tie wire at all splices and at all crossing points and intersections in the positions shown, or as directed.
2. Rebending of bars on the job to accommodate the job to accommodate existing conditions will not be permitted without the written approval of the Engineer
3. Point ends of wire ties away from forms.

D. Spacing

1. Minimum center to center distance between parallel bars shall be in accordance with the details on the drawings, or, where not shown, the clear spacing shall be 2 times the bar diameter but in no case less than 1½ inches or less than 1½ times the maximum size aggregate.

E. Splices

1. Maximum 50% of steel spliced occurring within lap length.
2. Top bars shall be 1.3 times values given in 3.01.D.5.c.
3. Splice lengths.
   a. #6 bars and smaller: 50-bar diameter
   b. #7 bars and larger: 60-bar diameter

F. Concrete Covering

1. In accordance with ACI 315, except where shown otherwise on drawings.

3.03 CONCRETE

A. Mixing of Concrete

1. All concrete shall be ready-mixed concrete, and shall be mixed and delivered in accordance with ASTM C 94. The batch plant of the concrete producer shall be certified for compliance with the standards established by the National Ready-Mixed Concrete Association.
2. In the event concrete is mixed at a central batching plant, the delivery shall be arranged so that intervals between batches are kept to a minimum, and in any event not more than thirty (30) minutes. Trucks shall be in first class condition and kept in constant rotation during delivery.

3. Concrete shall be placed within 90 minutes after cement has been mixed with aggregate or 45 minutes after addition of water and admixtures.
4. No admixtures, except those mentioned in paragraph 2.1 shall be used. Calcium chloride will not be permitted.
5. Truck delivery slips of all concrete delivered to the job shall indicate the quantity and quality of concrete, additives, date and time of batching and delivery, and the location of placement. Delivery slips shall be forwarded to the Engineer at the end of each pour.

B. Cold Weather Concreting.

1. In accordance with ACI 306.
2. Concrete shall not be mixed or placed when the temperature is below 40 degrees F, or when conditions indicate that the temperature will fall below 40 degrees F within 72 hours unless precautions are taken to protect the concrete.
3. Concrete temperature shall be maintained, when deposited, at not less than 60 degrees F. Reinforcement, forms, and ground which concrete will contact must be completely free of frost.
4. Concrete and formwork must be kept at a temperature of not less than 50 degrees F. for not less than 96 hours after placing.
5. Calcium chloride shall not be used.

C. Hot Weather Concreting.

1. In accordance with ACI 305.
2. The maximum temperature of the concrete, when deposited, shall be 85 degrees F. If the weather causes the placing temperature to exceed 85 degrees F., the mix shall be cooled by methods approved by the Engineer.
3. No concrete shall be deposited when the air temperature is greater than 90 degrees F.

D. Conveying and Placing Concrete.

1. In accordance with ACI 304.
2. Notification: Before placing concrete, forms shall be thoroughly inspected. All chips, dirt, etc., shall be removed, all temporary bracing and cleats taken out, all openings for pipes, etc., properly boxed, all forms properly secured in their correct position and made tight, all reinforcement, anchors, and embedded items secured in their proper places. Concrete which may be on the forms or reinforcement, and which is set and dry, shall be cleaned off, and the forms and steel washed off before proceeding. Remove all foreign matter from forms and excavations.
3. Water shall be removed from place of deposit before concrete is placed unless otherwise permitted by the Engineer. Any flow of water into an excavation shall be diverted through proper side drains into a sump, or shall be removed by other approved methods which will avoid washing away the freshly deposited concrete.
4. Soil on which concrete will be poured shall be thoroughly wetted (except in freezing weather).

5. Anchors and Embedded Items: Anchors, bolts, sleeves, inserts, wood blocking, and any other items to be embedded in concrete shall be accurately secured in position before the concrete is placed. Aluminum shall not be embedded in concrete.
6. Handling and Depositing
    a. Before any concrete is placed, notify all whose work is in any way connected with or influenced by the concrete work, and give them reasonable time to complete all portions of their work that must be completed before concrete is deposited.
    b. Immediately before concrete is placed, inspect all forms to insure that they are in proper position, sufficiently rigid, thoroughly clean, properly oiled and free from foreign materials, and that all reinforcement is in proper position.
    c. Concreting, once started, shall be carried on as a continuous operation until the section of approved size and shape is completed.
    d. Concrete shall be conveyed as rapidly as practicable from the mixer to the place of final deposit by methods that prevent the separation or loss of ingredients. It shall be deposited, as nearly as practicable, in its final position to avoid re-handling or flowing.
    e. Concrete shall not be dropped freely where reinforcement will cause segregation, nor shall it be dropped freely more than six (6) feet. Concrete shall be deposited to maintain a plastic surface approximately horizontal.
    f. Concrete that has partially hardened shall not be deposited in the work.
7. Pumping
    a. Concrete may be placed by pumping if first approved in writing by the Engineer for the location proposed.
    b. Equipment for pumping shall be of such size and design as to ensure a practically continuous flow of concrete at the delivery end without separation of materials.
    c. The concrete mix shall be designed to the same requirements as herein before specified, and may be richer in lubricating components in order to allow proper pumping.
    d. Concrete shall not be pumped through aluminum pipes.
8. Vibrating and Compacting
    a. All concrete shall be thoroughly consolidated and compacted by suitable means during the operation of placing, and shall be thoroughly worked around reinforcement, embedded items, and into the corners of the forms. All concrete against forms shall be thoroughly spaded. Internal vibrators shall be used under experienced supervision, and shall be kept out of contact with reinforcement and wood forms. Vibrators shall not be used in a manner that forces mortar between individual form members.
    b. Vibrators shall be flexible electric type or approved compressed air type, adequately powered and capable of transmitting to the concrete not less than 7,000 impulses per minute. Vibration shall be sufficiently intense to cause the concrete to flow or settle readily into place without separation of the ingredients. A sufficient number of vibrators shall be employed so that complete compaction is secured throughout the entire volume of each layer of

concrete. At least one (1) vibrator shall be kept in readiness as a spare for emergency use. Vibrators shall be such that the concrete becomes uniformly plastic with their use.

c. Vibration shall be close to the forms but shall not be continued at one spot to the extent that large areas of grout are formed or the heavier aggregates are caused to settle. Care shall be taken to not disturb concrete that has its initial set.
d. Where conditions make compacting difficult, or where the reinforcement is congested, batches of mortar containing the same proportions of cement to sand as used in the concrete shall first be deposited in the forms, to a depth of at least one (1) inch.
e. The responsibility for providing fully filled out, smooth, clean, and properly aligned surfaces free from objectionable pockets shall rest entirely with the Contractor.

3.04 CONSTRUCTION JOINTS

A. Construction joints shall be located a maximum of 40 feet apart. If, for any reason, the contractor feels a change is necessary, he shall prepare a placing plan and submit it to the Engineer for approval.

B. Where a joint is to be made, the surface of the concrete shall be sandblasted or thoroughly picked, thoroughly cleaned, and all laitance removed. In addition to the foregoing, joints shall be thoroughly wetted, but not saturated, and slushed with a coat of grout immediately before the placing of new concrete.

C. Approved keys shall be used at all joints, unless detailed otherwise.

D. Forms shall be retightened before placing of concrete is continued. There shall be an interval of at least 48 hours between adjacent pours.

E. Bonding Concrete at Construction Joints

1. To new concrete construction joints:
   a. Thoroughly clean and saturate joint with water.
   b. Cover horizontal wall surfaces as specified in this Section, and immediately place concrete.
   c. Limit concrete lift placed immediately on top of bonding compound to 12 inches thick.
   d. Thoroughly vibrate to mix and consolidate bonding compound and concrete together.

F. Bonding new concrete to old concrete:

1. Mechanically roughen existing concrete surfaces to a clean, rough surface using appropriate mechanical means to remove the existing concrete surface, and provide a minimum roughness profile of 1/4 inch.

2. Saturate surface with water for 24 hours, cover with epoxy bonding compound and place concrete as specified for new concrete.

G. Expansion Joints

1. Expansion joints shall be located as shown on contract drawings.
2. The joint shall include a joint filler, a bond breaker, and joint sealant and installed as indicated on contract drawings.

H. Joint Sealants.

1. Prepare surface in accordance with manufacturers directions.
2. Apply primer as recommended by sealant manufacturer.
3. Install sealant with the proper tools and methods as directed by the sealant manufacturer.

I. Patching

1. Immediately after stripping forms, patch minor defects, form-tie holes, honeycombed areas, etc., before concrete is thoroughly dry.
2. Repair gravel pockets by cutting out to solid surface, form key, and thoroughly wet before placing patching mortar consisting of 1-part cement to 2 parts fine sand; compact into place and neatly finish. Honeycombed areas or gravel pockets which, in the Engineer's opinion are too large and unsatisfactory for mortar patching as described above, shall be cut out to solid surface, keyed, and packed solids with matching concrete to produce firm bond and surface.
3. The Contractor shall do all the cutting as required by himself or other trades. All such work shall be of the minimum size required. No excessive cutting will be permitted, or shall any structural members or reinforcement be cut.
4. The Contractor shall do all patching after work by other trades has been installed, where required, using Portland Cement Mortar 1:2 mix.

J. Protection and Curing

1. Protect concrete from injurious action of the elements and defacement of any nature during construction operations.
2. Keep concrete in a thoroughly moist condition from the time it is placed until it has cured, for at least seven (7) days.
3. Carefully protect exposed concrete corners from damage.
4. Allow no slabs to become dry at any time until curing operations are complete. In general, slabs shall be cured with non-staining curing paper, hosing or fog spray; vertical surfaces shall be curing with Burlene or fog spray or an approved curing compound.
5. Protect fresh concrete from drying winds, rain, damage, or spoiling. Curing paper shall be lapped 4 inches minimum at joints and sealed with waterproof tape.

K. Concrete Finishes

1. Unexposed Surfaces: All unexposed surfaces shall have any form finish, at the Contractor's option.
2. Wearing Surface Finish: Float the surface by hand using a wooden or magnesium float. Finish with a flexible bristle broom. Permit surface to harden sufficiently

to retain the scoring or ridges. Broom perpendicular to traffic or at right angles to the slope of the slab.

3. Addition of Material: The addition of cement, sand, water, or mortar to slab surfaces while finishing concrete is strictly prohibited.

L. Defective Work

1. The following concrete work shall be considered defective and may be ordered by the Engineer to be removed and replaced at Contractor's expense:
   a. Incorrectly formed.
   b. Not plumb or level.
   c. Not specified strength.
   d. Containing rock pockets, voids, honeycomb, or cold joints.
   e. Containing wood or foreign matter.
   f. Otherwise not in accordance with the intent of the Drawings and Specifications.

END OF SECTION

DIVISION 5

SECTION 05131

PARKING WAYFINDING SIGNAGE

PART 1 PART 1 – GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. Furnish signage complete with all appurtenances as specified or required for a complete installation including signage, hardware, and posts. The Contractor shall provide all labor, material, equipment, and services necessary to furnish and install.

1.03 REFERENCES

A. The following standards shall apply to the work of this Section.

1. The Standard Specifications.
   a. Section 901 Cement Concrete Masonry
   b. Section M4 Cement and Cement Concrete Materials
   c. National Building Granite Quarries Association, Inc. (NBGQA):
   d. Specifications for Architectural Granite

1.04 SUBMITTALS

A. Product Data: For each type of product.

1. Shop Drawings: For signage.
   a. Include fabrication and installation details and attachments to other work.
   b. Show sign mounting heights, locations of supplementary supports to be provided by other installers, and accessories.
   c. Show message list, typestyles, graphic elements, and layout for each sign at least half size.
2. Samples for Initial Selection: For each type of sign assembly, exposed component, and exposed finish.
3. Include representative Samples of available typestyles and graphic symbols.
   a. Samples for Verification: For each type of sign assembly, showing all components and with the required finish(es), in manufacturer's standard size unless otherwise indicated and as follows:
4. Panel: Not less than 12 inches (300 mm) square, including corner.

1.05 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of signs that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:
   a. Deterioration of finishes beyond normal weathering.
   b. Separation or delamination of sheet materials and components.
2. Warranty Period: Five years from date of Substantial Completion.

1.06 PERMITS

A. The Town will obtain and pay for permits as required for signs.

1.07 QUALITY ASSURANCE

A. Qualifications of manufacturer: A firm with 5 years experienced in fabricating signs similar to the project as well as sufficient production capacity to manufacture required units. Provide documentation of 3 successful projects similar in design for review and approval.

1. Observe applicable codes, sign ordinances and ADA guidelines for handicapped and fire/life safety signing. All exterior signs located in the public right-of-way, including local city, county and state roadways, shall comply with the 2009 MUTCD standards, including Revisions.

1.08 DELIVERY, STORAGE, AND HANDLING

A. All items shall be delivered to the job adequately protected from damage during transit. Items shall be adequately protected against staining, chipping, and other damage. Cracked, chipped, or stained items will be rejected and shall not be employed in the work. All items shall be delivered to Groton Town Public Works 134 Groton Long Point Rd, Groton, CT 06340 P: (860) 448-4083.

PART 2 PART 2 – MATERIALS

2.01 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer to design sign structure and anchorage of post-and-panel sign type(s) according to structural performance requirements.

B. Structural Performance: Signs and supporting elements shall withstand the effects of gravity and other loads within limits and under conditions indicated.

1. Uniform Wind Load: Statewide Building Code requirements.
2. Concentrated Horizontal Load: Statewide Building Code requirements.
3. Uniform and concentrated loads need not be assumed to act concurrently.

C. Thermal Movements: For exterior signs, allow for thermal movements from ambient and surface temperature changes.

1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

D. Accessibility Standard: Comply with applicable provisions in the USDOJ's "2010 ADA Standards for Accessible Design" and ICC A117.1.

2.02 WAYFINDING SIGNS

A. Sign fabrication shall be done in a plant properly equipped to produce the types of signs specified. Sign panels shall show careful workmanship and present a reasonably plane surface with the message and outlines clear and sharp.

B. The attached drawings show design intent only. The fabricator is responsible for fabrication and overall level of quality. Any changes in design, materials, fabrication techniques or details necessary to the successful completion of this project should be communicated to the designer and the owner in a timely fashion. Shop drawings shall be submitted for approval by the design team prior to final fabrication.

C. Further development and engineering of designer's details (for fabrication and installation) is expected and should be shown in the shop drawings.

D. The designer recognizes that manufacturers may have shop fabrication techniques that differ from details shown. Suggested changes in fabrication that do not alter the design intent nor reduce the quality will be considered by the designer provided they are submitted in sketch from as soon as possible prior to shop drawing preparation.

E. Any value engineering changes during fabrication shall be split evenly between the contractor and owner.

F. Provide workmanship and materials, free of defects. Defective is defined to include: Delamination, abnormal deterioration, fading and discoloration, weathering, failure of securing to substrates indicated, cracking, corrosion or coating damage, or visible scratches on surfaces.

G. Signage shall not bear manufacturer's code or other identifying marks on any area or part, which may be visible in the normal positioning, attitude, or use of the sign item.

H. Aluminum extrusions: For mounting plates and structural frames shall conform to ASTM B-221, alloy 6063-T6. Shapes, sizes and weights of members shall be as required for structural stability. All connections of aluminum members shall be heli-arc welded, continuous fillets, ground smooth on all exposed surfaces, unless specifically detailed otherwise. Aluminum finishes shall be hereinafter specified.

I. Aluminum sheet and plate: Type 5052-H-32 alloy aluminum, thickness as indicated. For painted finish, faces shall be etched to give an even stain finish and remove oxidation, then conversion coated to improve paint adhesion and inhibit corrosion. Surface shall be belt-sanded for a smooth finish, edges filed, and ground then immersed in hot alkaline cleaner to remove contamination. For anodized finish, prepare for finish AA-M31- C21-A31. Aluminum should have consistency of color and finish throughout the project.

J. Hangers, brackets and accessories: Shall be of the type and size indicated. Where such items are not specifically called for, provide hangers, brackets and accessories as required for the proper execution of the work, as approved by the owner.

K. Paint for aluminum: All coating to protect aluminum by uniformly penetrating, filling, and sealing surface pores. Coating should provide an invisible barrier to weathering, airborne contaminants, graffiti, industrial air pollution, mildew, and salt air. Coating should not yellow, peel or flake. Coating should be guaranteed in conformance with Warranty. Sign panels shall be pre-drilled in proper locations before any priming, painting or coating processes. Aluminum should have consistency of color and finish throughout the project.

L. Vinyl Legends: Use 3M High Intensity Prismatic Reflective Sheeting Series 3930, with 3M ElectroCut Film 1170 overlaminate. Custom color background and characters printed with 3M inks directly. Series 3930 sheeting incorporates a pressure sensitive adhesive and should be applied to the sign substrate at temperature of 65°F/18°C or higher.

M. Square Post: Extruded aluminum tube 6061, .250" wall thickness.

N. Granite: All Granite shall be light gray granite, fine to medium textured. Fabricate per the drawings. Thermal finish all exposed faces.

O. Granite shall be standard grade, sound and uniform in quality, texture, and strength, and shall be free of flaws, reeds, rifts, laminations, cracks, seams, starts, or other defects that may impair its strength, durability, function, or appearance. Exposed surfaces shall be free from spots, spalls, chips, stains, discoloration, or other defects that would affect its appearance.

P. Granite shall have the following properties:

1. Bulk Density (ASTM C 97): 167.1 pcf, minimum.
2. Absorption (ASTM C 97): 0.16 percent, minimum.
3. Compressive Strength (ASTM C 170): 17750 pounds per square inch, minimum.
4. Modulus of Rupture (ASTM C 99): 1540 pounds per square inch, minimum.

Q. Acceptable manufactures/Granite names:

1. Williams Stone - Williams Blue Sky Gray
2. New England Stone Industries - Kitledge Gray
3. Swenson Granite Company - Woodbury Gray
4. Or equivalent

R. All granite shall be obtained from quarries having adequate capacity and facilities to meet the requirements noted in this Section. Cutting and finishing shall be done by a firm equipped to process the material promptly on order and in strict accord with this Section.

2.03 ACCESSORIES

A. Material for attachment shall conform to the following specifications:

	Part	Aluminum: ASTM	Stainless Steel: AISI
1.	Bolts	B211 6061-T6 Alloy	Type 304 or 305
2.	Rivets	B316 6061-T6 Alloy	Type 304 or 305
3.	Nuts	B211 6061-T6	Type 304 or 305
4.	Washers	B209 Alclad 2024-T4	Type 304 or 305

B. Any additional hardware needed shall be included and be deemed incidental to the work.

PART 3 EXECUTION

3.01 INSTALLATION

A. All signs will be shop-fabricated, and where practical, delivered to the site completely assembled. All signs that cannot be delivered fully assembled shall be erected and assembled so that all parts fit accurately with hairline joints.

B. Set posts accurately in locations indicated on the Contract Documents level and plumb as directed by the Engineer and to indicated tolerances.

C. Clean all signs following installation with a mild, non-streaking, wall cleaning solution for normal dirt and fingerprints. Care should be taken not to scratch the sign surface.

D. Install granite in accordance with the requirements of the Contract Documents. Set anchors, supports, fasteners, and other attachments indicated or necessary to secure stone units in place. Set all stone pieces accurately in locations indicated on the Contract Documents with arises and faces aligned according to the relationships shown on the Contract Documents and approved Shop Drawings, as directed by the Engineer and to indicated tolerances.

END OF SECTION

DIVISION 6

SECTION 06131

NAUTICAL BARRIER

PART 1 GENERAL

1.01 RELATED DOCUMENTS:

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

1.02 DESCRIPTION OF WORK:

A. Provide all materials, equipment, and labor necessary to complete the work included on the drawings or as specified herein.

B. The principal work of this section includes, but may not limited to the following:

1. Nautical Barrier
2. Nautical End Post

1.03 QUALITY ASSURANCE:

A. The contractor is cautioned that the visual effect and appearance is extremely important project element and that its installation must conform with the detail and intent of the drawings and specifications. Fabrication must be completed by a contractor or subcontractor with five years experience in such work; therefore, the contractor will be required to submit the name of the subcontractor he intends to employ and verification of experience, capability, and facilities to the Engineer for approval.

1.04 SUBMITTALS:

A. Submit manufacturer's product data for each material type and accessory required.

B. The contractor will be required to submit three samples of each material to the Engineer for approval before ordering material(s). The samples shall demonstrate the final surface color, finish and shape that will be provided throughout the project. All samples shall be full size.

1.05 PROJECT CONDITIONS:

A. Protect partially completed masonry work against weather damage and moisture when work is not in progress.

B. Protect adjacent work from damage, soiling, and staining during masonry operation.

1.06 DELIVERY, STORAGE, AND HANDLING.

A. All materials for the work of this section shall be delivered, stored and handled to preclude damage of any nature. Manufactured materials shall be delivered and stored in their original containers, plainly marked with product and manufacturer's name.

PART 2 PRODUCTS

2.01 WOOD POST:

A. Southern Yellow Pine, CCA-C, treated to retention level of .60, UC4B, AWPA U1 and cut and capped to dimensions as shown on plans.

2.02 ROPE:

A. Two inches (2”) in diameter, 124,000 lb. break strength, 100% polyester double braid rope.

2.03 FIBERGLASS CAPS:

A. Molded fiberglass caps, sized to fit posts as shown on the plans. Caps shall have white gel coat surface.

2.04 FASTENERS:

A. All fasteners shall be hot dipped galvanized in accordance with ASTM A153, dimensioned as shown on plans.

PART 3 EXECUTION

3.01 GENERAL:

A. Prior to installation, the contractor shall field locate the Nautical Bollard End Posts. Once the locations have been approved by the Engineer, the contractor shall install the Nautical Bollard End Post.

3.02 POSTS:

A. Posts shall be set plumb, in hand or mechanically dug holes. Post holes shall be backfilled with acceptable material placed in layers and thoroughly compacted.

3.03 ROPE:

A. Rope elements shall be installed as shown on plans.

3.04 FIBERGLASS CAPS:

A. Prior to joining the post, the contractor shall install the fiberglass cap. Care shall be taken so that no damage to the cap or post will result.

END OF SECTION

ATTACHMENTS

ATTACHMENT 1 - CRMC Assent

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State of Rhode Island
Coastal Resources Management Council
Oliver H. Stedman Government Center
4808 Tower Hill Road, Suite 116
Wakefield, RI 02879-1900

(401) 783-3370
Fax (401) 783-3767

ASSENT

CRMC File No.: 2023-01-037 CRMC Assent No.: A2023-01-037

Whereas, of

Town of North Kingstown
Planning and Development
100 Fairway Drive
North Kingstown, RI 02852

has applied to the Coastal Resources Management Council for assent to: Construct and maintain improvements to the Wickford Municipal Parking Lot consisting of replacing 178ft. of deteriorated riprap wall with a granite block seawall, stormwater management and water quality treatment, installation of tide gates on outfalls, limited fill to raise grades, and reconfiguring parking area, and represents that they are the owner(s) of the riparian rights attached to the property involved and submitted plans of the work to be done.

Now, said Council, having fully considered said application in accordance with all the regulations as set forth in the Administrative Procedures Act does hereby authorize said applicant, subject to the provisions of Title 46, Chapter 23 of the General Laws of Rhode Island, 1956, as amended, and all laws which are or may be in force applicable thereto: **Construct and maintain improvements to the Wickford Municipal Parking Lot consisting of replacing 178ft. of deteriorated riprap wall with a granite block seawall, stormwater management and water quality treatment, installation of tide gates on outfalls, limited fill to raise grades, and reconfiguring parking area;** located at plat 117, lot 208,212,213,214,288; Brown Street, North Kingstown, RI, in accordance with said plans submitted to this Council and approved by this Council. All work being permitted must be completed on or before **September 22, 2026,** after which date this assent is null and void, (unless written application requesting an extension is received by CRMC sixty (60) days prior to expiration date).

Applicant agrees that as a condition to the granting of this assent, members of the Coastal Resources Management Council or its staff shall have access to applicant's property to make on-site inspections to insure compliance with the assent.

Licensee shall be fully and completely liable to State, and shall waive any claims against State for contribution or otherwise, and shall indemnify, defend, and save harmless State and its agencies, employees, officers, directors, and agents with respect to any and all liability, damages (including damages to land, aquatic life, and other natural resources), expenses, causes of action, suits, claims, costs (including testing, auditing, surveying, and investigating costs), fees (including attorneys' fees and costs), penalties (civil and criminal), and response, cleanup, or remediation costs assessed against or imposed upon Licensee, State, or the Property, as a result of Licensee's control of the Property, or Licensee's use, disposal, transportation, generation and/or sale of Hazardous Substances or that of Licensee's employees, agents, assigns, sublicensees, contractors, subcontractors, permittees, or invitees.

Nothing in this assent shall be construed to impair the legal rights of this granting authority or of any person. By this assent the granting authority by no manner, shape, or form assumes any liability or responsibility implied, or in fact, for the stability or permanence of said project; nor by this assent is there any liability implied or in fact assumed or imposed on the granting authority. Further, the granting authority by its representatives or duly authorized agents shall have the right to inspect said project at all times including, but not limited to, the construction, completion, and all times thereafter.

This Assent is granted with the specific proviso that the construction authorized therein will be maintained in good condition by the owner thereof, his heirs, successors, or assigns for a period of fifty (50) years from the date thereof, after which time this permission shall terminate necessitating either complete removal or a new application.

Permits issued by the CRMC are issued for a finite period of time, confer no property rights, and are valid only with the conditions and stipulations under which they are granted. Permits imply no guarantee of renewal, and may be subject to denial, revocation, or modification.

If this matter appeared before the full Council, a copy of the legal decision from this proceeding may be acquired by contacting the CRMC office in writing.

A copy of this Assent shall be kept on site during construction.

Application for future alteration of the shoreline or other construction or alteration within the CRMC jurisdiction shall be submitted to the CRMC for review prior to commencing such activity.

All applicable policies, prohibitions, and standards of the RICRMP shall be upheld.

All local, state or federal ordinances and regulations must be complied with.

Please be advised that as a further conditions of this Assent, it is hereby stipulated that you and/or your agents shall comply at all times with Federal and State Water Quality Standards and other State standards and regulations regarding water quality, and shall exercise such supervision over and control of these facilities to prevent the dumping or discarding or refuse, sanitary wastes and other pollutants in the tidal waters, either from vessels docked at said facilities or from land adjacent thereto.

No work that involves alteration to wetlands or waters of the United States shall be done under this Assent until the required Federal Permit has been obtained.

Non-compliance with this assent shall result in legal action and/or revocation of this permit.

CAUTION:

The limits of authorized work shall be only for that which was approved by the CRMC. Any activities or alterations in which deviate from this assent or what was detailed on the CRMC approved plans will require a separate application and review. Additionally, if the information provided to the CRMC for this review is inaccurate or did not reveal all necessary information or data, then this permit may be found to be null and void. Plans for any future alteration of the shoreline or construction or alteration within the 200' zone of CRMC jurisdiction or in coastal waters must be submitted for review to the CRMC prior to commencing such activity.

Permits, licenses or easements issued by the Council are valid only with the conditions and stipulation under which they are granted and imply no guarantee of renewal. The initial application or an application for renewal may be subject to denial or modification. If an application is granted, said permit, license and easement may be subject to revocation and/or modification for failure to comply with the conditions and stipulations under which the same was issued or for other good cause.

ATTENTION: ALL STRUCTURES AND FILLED AREAS IN THE TIDAL, COASTAL, OR NAVIGABLE WATERS OF THE STATE OF RHODE ISLAND ARE SUBJECT TO:

1. The Superior Property Rights of the State of Rhode Island in the Submerged and Submersible Lands of the Coastal, Tidal, and Navigable Waters;
2. The Superior Navigation Servitude of the United States;
3. The Police Powers of the State of Rhode Island and the United States to regulate Structures in the Tidal, Coastal, or Navigable Waters.

THE SUBMERGED AND SUBMERSIBLE LANDS OF THE TIDAL, COASTAL, AND NAVIGABLE WATERS OF THE STATE ARE OWNED BY THE STATE AND HELD IN TRUST FOR THE PUBLIC. CONVEYANCE OF THESE LANDS IS ILLEGAL; TITLES PURPORTING TO TRANSFER SUCH LANDS ARE VOID. ASSENTS THAT INVOLVE THE FILLING OR USE OF THE STATES SUBMERGED LANDS ARE GRANTED WITH THE PROVISO THAT IT IS SUBJECT TO THE IMPOSITION OF A USAGE FEE TO BE ESTABLISHED BY THE COASTAL RESOURCES MANAGEMENT COUNCIL.

The lands adjacent to tidal waters and/or access to these lands may be impacted or rendered unusable in the future due to sea level rise, storm surge, and shoreline erosion. Online resources including STORMTOOLS, Shoreline Change Maps, and Sea Levels Affecting Marshes Model (SLAMM) Maps can be accessed through the CRMC website (www.crmc.ri.gov). The Council recommends the use of these resources to evaluate the flood extent and inundation from sea level rise, storm surge and erosion and damages to land, aquatic life, loss of public access and other natural resources on and near the site of the above assent. The project life may be shortened by these processes and may require additional adaptation measure up to and including relocation of the project. By issuing this assent the granting authority neither explicitly nor implicitly assumes any liability or responsibility for the stability or permanence of said project under future climate and shoreline conditions.

SPECIFIC STIPULATIONS OF APPROVAL

General Stipulations

A. The applicant shall record this assent in its entirety in the land evidence records of the City/Town of North Kingstown within thirty (30) days of the date of assent issuance. Certification by the Town Clerk's office that this stipulation has been complied with shall be furnished to Coastal Resources Management Council by the applicant within fifteen (15) days thereafter. Failure to comply with provision will render this assent null and void.

B. For the purpose of this permit, the coastal feature shall be the man-made seawall; and the inland edge of the coastal feature shall be the top of the seawall.

C. The approved plan shall be those entitled "Town of North Kingstown, Rhode Island Wickford Waterfront Improvements" Prepared by BETA Inc, dated December 2022 and bearing CRMC approval stamp dated 9/20/2023. Except as stipulated or modified herein, all details and specifications thereon shall be strictly adhered to. Any and all changes require written approval from this office.

D. Prior to commencement of site alterations, you shall post the CRMC assent card. This assent card must be maintained at the site in a conspicuous location until such a time that the project is complete.

Earthwork Stipulations

A. All soil erosion, runoff, sedimentation, and construction activity pollution prevention control measures must be implemented in accordance with CRMC approved site plan (referenced herein) and the approved Soil Erosion and Sediment Control Plan dated December 2022 and bearing CRMC approval stamp dated 9/20/2023.

B. Prior to the initiation of site alterations or construction including the mobilization of construction vehicles, equipment or machinery, the Limit of Disturbance (LOD) shall be adequately delineated on site (by survey methods where appropriate). No equipment access, equipment or material storage or other activities including construction vehicle parking shall occur beyond the Limit of Disturbance, even on a temporary basis.

C. Prior to conducting earthwork and other land disturbing activities, erosion, runoff and sediment control measures shall be installed and maintained in accordance with good engineering practices including the applicable details found in the manufacturer's specifications and/or in the Rhode Island Soil Erosion and Sediment Control Handbook (as amended). These measures must be maintained until the site is stabilized through the establishment of vegetative cover and/or construction of the approved facilities (buildings, roadways, parking areas, etc.) has stabilized soils sufficiently to prevent erosion and sedimentation.

D. All discharges which result from dewatering operations must flow into pumping settling basins, portable sediment tanks or portable sediment bags which are properly installed and maintained in accordance with good engineering practices including the applicable details found in the manufacturer's specifications and/or in the Rhode Island Soil Erosion and Sediment Control Handbook (as amended).

E. Temporary measures shall be installed to protect permanent or long-term stormwater control and treatment measures as they are installed and throughout the construction phase of the project so that they will function properly when they are brought online. Construction activity shall be restricted in areas where infiltration measures are proposed to prevent compaction. In cases where it is not possible to avoid the area, methods shall be taken to restore the infiltration capacity of the soils.

F. All areas of disturbed soils which are impacted by construction, site work and related activities shall be temporarily stabilized throughout the site construction period. Soil stabilization may be achieved through appropriate temporary measures as described by the Rhode Island Soil Erosion and Sediment Control Handbook (as amended). Where the season is not conducive to the establishment of vegetative cover, other temporary measures shall be employed including the application of mulch and/or use of fiber rolls (erosion control blankets, etc.). Temporary erosion, runoff and sediment controls shall be employed and maintained until temporary or permanent vegetative cover can be achieved and/or site improvements such as approved buildings, roadways and parking areas are constructed resulting in a lack of exposed soil.

G. Stabilization of disturbed areas must, at a minimum, be initiated immediately whenever any clearing, grading, excavating or other earth disturbance activities have permanently ceased on any portion of the site, or temporarily ceased on any portion of the site and will not resume for a period exceeding 14 calendar days. Stabilization must be completed using vegetative stabilization measures or using alternative measures whenever vegetative measures are deemed impracticable or during periods of drought. All disturbed soils exposed prior to October 15th shall be seeded by that date. Any such areas which do not have adequate vegetative stabilization by November 15th must be stabilized through the use of non-vegetative erosion control measures. If work continues within any of these areas during the period from October 15th through April 15th, care must be taken to ensure that only the area required for that day's work is exposed, and all erodible soil must be restabilized within five (5) working days.

H. Construction sites must be inspected by or under the supervision of the owner and operator at least once every seven (7) calendar days and within 24 hours after any storm event which generates at least 0.25 inches of rainfall per 24-hour period and/or after a significant amount of runoff. If an inspection reveals a problem, the operator must initiate work to fix the problem immediately after discovering the problem and complete such work by the close of the next workday, if the problem does not require significant repair or replacement, or if the problem can be corrected through routine maintenance.

I. There shall be no discharge or disposal of toxic waste, hazardous materials, oil, grease and other lubricants, excess fertilizer, pesticides or other chemicals or controlled materials either on site or in any area which may enter a wetland, watercourse, or groundwater. All spills of such materials shall be reported to the RI Department of Environmental Management for appropriate remediation. All used lubricants, excess chemicals, fertilizers, pesticides, etc., shall be removed from the site for transport, handling and disposal in accordance with all applicable state and federal regulations.

J. All excess excavated materials (soils, rock, gravel, etc.), excess construction materials, demolition debris, temporary erosion, runoff, and sediment control measures, etc., shall be removed from the site for appropriate re-use and/or proper disposal at a suitable upland location or landfill. All toxic materials and waste shall be properly transported and disposed of in accordance with applicable state and federal regulations.

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K. Upon the successful stabilization of exposed soils, all temporary (interim) erosion, runoff, and sediment control measures as well as pollution prevention measures shall be appropriately decommissioned and removed from the site for re-use and/or for disposal at a suitable, legal upland location or landfill. All temporary sediment basins, sediment traps and channels, etc., shall be removed and/or restored in accordance with the approved site plans.

Stipulations for Stormwater Management

A. The Permittee shall construct and maintain the stormwater management practices in accordance with the CRMC approved site plan (referenced herein) and the submitted Stormwater Management Plan dated December 2022, Revised April 2023 and bearing CRMC approval stamp dated 9/20/2023.

B. All stormwater management practices shall be operated and maintained in accordance with the Operation and Maintenance (O&M) Plan, dated December 2022, Revised April 2023 and bearing CRMC approval stamp dated 9/20/2023

Seawall Stipulations

A. The new seawall shall be located no farther seaward than the existing structure.

B. The top of the proposed structure shall be set at the elevation of 7.5 feet

C. The seawall shall be rebuilt in accordance with The Rhode Island Historical Preservation and Heritage Commission recommendations as follows: The wall should be rebuilt to look like the original with use of the existing stones to the greatest extent possible. The stones from the existing walls should be salvaged and stacked. Any missing stones should be granite ashlar not rubble. The work should be undertaken by of under the supervision of a journey-level mason. The mortar joints should be concave so that the wall appears dry-laid with the mortar joints matching the color of the stone.

In Witness Whereof, said Coastal Resources Management Council has hereto set their hands and seal this **22nd day of September in the year two-thousand-twenty-three.**

Laura Miguel, Deputy Director
Coastal Resources Management Council

/bms

RECEIVED FOR RECORD
TOWN OF NORTH KINGSTOWN, RI
OCT 03, 2023 10:20 AM
Jeannette Alsward
TOWN CLERK

ATTACHMENT 2 - RIDEM Water Quality Certification

RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF WATER RESOURCES
235 Promenade Street, Providence, Rhode Island 02908-5767

March 29, 2023

Town of North Kingstown
c/o Nicole LaFontaine
100 Fairway Drive
North Kingstown, RI 02852

RE: Water Quality Certification (WQC): Wickford Waterfront Improvements
Brown Street, Assessor's Plat 117, Lot 208, 212, 213, 214, 288, North Kingstown
WQC/STW File No. 23-010

Dear Ms. LaFontaine:

The Rhode Island Department of Environmental Management Office of Water Resources (RIDEM OWR) has reviewed the above-referenced project for compliance with the State Water Quality Regulations (250-RICR-150-05-1). The application materials indicate that no new fill will be required for the proposed project in regard to the instillation of a new retaining wall. Upon review of the application materials, we have determined, at this time, that this project does not require a Water Quality Certification based on the current State Water Quality Regulations.

Even though a permit is not required, please note that the Water Quality Regulations prohibit any discharge of pollutants into waters of the State. In order to prevent this discharge, proper erosion and sediment controls must be used during construction of the proposed project.

This letter does not bar the Department, or any of its various Divisions, from instituting any investigation and /or enforcement actions that it may deem necessary for violations of any and all applicable statutes, and/or regulations.

Should you have any questions or require additional information, you may contact me or Michael Arguello at Michael.Arguello@dem.ri.gov or (401)222-6820 ext 277-7602.

Sincerely,

Neal Personeus, Principal Environmental Scientist
neal.personeus@dem.ri.gov, 401-222-6820 ext 277-7610
Federal 401/State WQC Program; GWD/UIC Program
Office of Water Resources

ec: Charles Horbert, Deputy Administrator, Groundwater & Freshwater Wetlands Protection
Nicole Iannuzzi, Beta Group, Inc.

ATTACHMENT 3 - Army Corps of Engineers Permit

DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NEW ENGLAND DISTRICT
696 VIRGINIA ROAD
CONCORD MA 01742-2751

March 30, 2023

Regulatory Division
File Number: NAE-2022-02414

Ms. Nicole LaFontaine
Town of North Kingstown
100 Fairway Drive
North Kingstown, Rhode Island 02852
nlafontaine@northkingstown.org

RI CRMC Application Number: 2023-01-037

Dear Ms. LaFontaine:

The U.S. Army Corps of Engineers (USACE) has reviewed your permit application for the Wickford Waterfront Improvements Project. The project area abuts Wickford Harbor and is located in Wickford Village, off Brown Street in the Town of North Kingstown, Rhode Island (41.5703°N, 71.4511°W). To reduce flooding, the project will raise an existing vertical granite shoreline barrier by 18 inches and will demolish and replace an existing riprap revetment with a new granite block wall, in addition to parking lot reconstruction, stormwater drainage improvements, and the installation of bioretention basins. The replacement wall will be 178 feet long and will be installed landward and within the same footprint of the existing barrier. The in-water work area, encompassing 870 square feet, will be temporarily dewatered during construction using a 229-foot-long steel cofferdam. There will be 60, 12-inch diameter, timber piles installed below the mean high water (MHW) line to support the new wall. The project will also relocate a stormwater drainage outlet to the new wall that will consist of a new concrete pipe, 22 feet long and 15 inches in diameter, and contain a tide gate within it to limit flooding of the adjacent parking lot. This project is shown on the enclosed plans titled “Wickford Waterfront Improvements Project, Town of North Kingstown, Rhode Island,” on 22 sheets dated March 30, 2023.

Based on the information you have provided, we verify that the Pre-Construction Notification (PCN) activity is authorized under General Permit 2 of the enclosed May 6, 2022, federal permits known as the Rhode Island General Permits (GPs). The GPs are also available at https://www.nae.usace.army.mil/Missions/Regulatory/State-General-Permits/Rhode-Island-General-Permit.

Please review the enclosed GPs carefully, in particular the general conditions beginning on page 43, and ensure that you and all personnel performing work authorized by the GPs are fully aware of and comply with its terms and conditions. A copy of the

GPs and this verification letter shall be available at the work site as required by General Condition 14. You must perform this work in compliance with the following special conditions:

1. In-water work that produces greater than minimal turbidity or sedimentation in tidal waters shall be limited to the period between October 15 and January 31, of any year(s).

2. For replacement or maintenance of sloped stabilization structures, stabilization materials such as riprap shall not extend waterward of the existing toe of slope. Replacement vertical structures shall be located within the existing footprint where possible but limited to the area within 18 inches of existing structures.

3. The wall shall be rebuilt to look like the original wall and shall use the existing stones to the greatest extent possible. The stones from the existing wall shall be salvaged and stacked. Any missing stones shall be granite ashlar and not rubble. The work shall be undertaken by or under the supervision of a journey-level mason. The mortar joints shall be concave so that the wall will appear dry-laid with the mortar matching the color of the stone.

4. You must complete and return the enclosed Work Start Notification Form to this office at least two weeks before the anticipated starting date. You must also complete and return the enclosed Compliance Certification Form within one month following the completion of the authorized work.

This authorization expires on May 6, 2027. You must commence or have under contract to commence the work authorized herein by May 6, 2027, and complete the work by May 6, 2028. If not, you must contact this office to determine the need for further authorization and we recommend you contact us *before* the work authorized herein expires. Please contact us immediately if you change the plans or construction methods for work within our jurisdiction as we must approve any changes before you undertake them. Performing work within our jurisdiction that is not specifically authorized by this determination or failing to comply with the special condition(s) provided above and all the terms and conditions of the GPs may subject you to the enforcement provisions of our regulations.

This authorization does not obviate the need to obtain other federal, state, or local authorizations required by law. Applicants are responsible for applying for and obtaining any other approvals.

This determination becomes valid only after the Rhode Island CRMC issues their required authorization. The CRMC contact information is provided on Page 55 of the GPs.

We continually strive to improve our customer service. For us to better serve you, we would appreciate your completing our Customer Service Survey located at https://regulatory.ops.usace.army.mil/customer-service-survey/.

Please contact Daniel Breen, of my staff, at (978) 318-8831 or Daniel.B.Breen@usace.army.mil if you have any questions.

Sincerely,

Kevin R Kotelly

Kevin R. Kotelly, P.E.
Chief, Permits & Enforcement Branch
Regulatory Division

Enclosures

cc:
Nicole Iannuzzi, BETA Group, Inc., Lincoln, RI; niannuzzi@BETA-Inc.com
Todd Davis, BETA Group, Inc., Lincoln, RI; tdavis@BETA-Inc.com
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Sabrina Pereira, NMFS, Gloucester, MA; sabrina.pereira@noaa.gov

ATTACHMENT 4- Rhode Island Historical Preservation and Heritage Commission Letter

STATE OF RHODE ISLAND

HISTORICAL PRESERVATION & HERITAGE COMMISSION

Old State House 150 Benefit Street Providence, RI 02903

Telephone 401-222-2678 Fax 401-222-2968
TTY 401-222-3700 www.preservation.ri.gov

March 22, 2023

Via email: daniel.b.breen@usace.army.mil

Daniel Breen
Regulatory Division
U.S. Army Corps of Engineers - New England District
696 Virginia Road
Concord, Massachusetts 01742-2751

Re: RIHPHC Project No. 17137
Applicant: Town of North Kingstown
Wickford Waterfront
North Kingstown, Rhode Island

Dear Mr. Breen:

The Rhode Island Historical Preservation and Heritage Commission (RIHPHC) staff has reviewed the information that you provided for the above-referenced project. The U.S. Army Corps of Engineers has received a permit application from the Town of North Kingstown proposing hardscaping improvements along Wickford Cove in North Kingstown.

The Town proposes parking lot improvements, the installation of bioretention basics, and the demolition and reconstruction of retaining walls along Wickford Cove. The project is located within the Wickford Village Historic District, which is listed in the National Register of Historic Places. Stone walls and retaining walls are contributing resources to this historic district. The Town has shown that repairing the wall is not preferred; they have agreed to use the existing stones to the greatest extent possible to rebuild the retaining wall, and new stones will closely match the historic. Based on the information available, it is the RIHPHC's conclusion that the project will have no adverse effect on historic properties if the following conditions are met:

> The wall should be rebuilt to look like the original with use of the existing stones to the greatest extent possible. The stones from the existing walls should be salvaged and stacked. Any missing stones should be granite ashlar not rubble. The work should be undertaken by or under the supervision of a journey-level mason. The mortar joints should be concave so that the wall appears dry-laid with the mortar matching the color of the stone.

These comments are provided in accordance with Section 106 of the National Historic Preservation Act. If you have any questions, please contact RIHPHC Project Review Coordinator Elizabeth Totten at 401-222-2671 or elizabeth.totten@preservation.ri.gov.

Sincerely,

Elizabeth Totten
FOR

Jeffrey Emidy
Executive Director
Interim State Historic Preservation Officer

230322.03est