



TOWN OF YORKTOWN

BID AND SPECIFICATIONS

FOR THE

PAR 3 GOLF COURSE SEWER CONNECTION

BID#26-2

Ed Lachterman
Town Supervisor

Daniel A. Ciarcia
Town Engineer

Dated: April, 2026

TOWN OF YORKTOWN
PAR 3 GOLF – SEWER CONNECTION
BID #26-2
INSTRUCTIONS TO BIDDERS

NOTICE IS HERE GIVEN that sealed bids will be received by the Town Clerk, Town of Yorktown, Yorktown, NY until **10:00 A.M. on Friday, May 1, 2026** at Town Hall, 363 Underhill Avenue, Yorktown Heights, N.Y. 10598 for the **Par 3 Golf Sewer Connection, Bid #26-2**. Copies of the Bid Documents will be available in the office of the Town of Yorktown Town Clerk located at 363 Underhill Avenue, Yorktown Heights, NY 10598. A completed Bid Proposal Form must be returned to the Town Clerk, 363 Underhill Avenue, Yorktown Heights, NY 10598, marked: **“Bid – Par 3 Golf Sewer Connection.”**

The Bid Documents consists of the following documents:

1. **Instructions to Bidders**
2. **Part One** Bid Proposal Form
3. **Part Two** General Terms and Conditions of Bid
4. **Part Three** Specifications
5. **Part Four** Addenda, if any
6. **Part Five** Labor rates, if any
7. **Non-Collusive Bidding Certificate**

\ Wherever in the Bid Documents any section or paragraph is stamped "VOID", only the section(s) or paragraph(s) so stamped are void. All other sections(s) and paragraph(s) remain in full force and effect.

A submitted bid will consist of

1. one original completed **Bid Proposal Form**, signed on behalf of Bidder with information for all blanks supplied, and a detailed listing of any exceptions taken by Bidder; and
2. a signed and notarized Non-Collusive Bidding Certificate:

Diana L. Quast, Town Clerk
Master Municipal Clerk

**TOWN OF YORKTOWN
PAR 3 GOLF – SEWER CONNECTION
BID #26-2**

PART ONE

BID PROPOSAL FORM

The Town of Yorktown seeks bids from qualified parties:

BIDDER'S OFFICIAL CORPORATE NAME (required, if bidder is a corporation):

BIDDER'S D/B/A NAME (if any) _____

Dollar Amount: \$ _____

Amount in words: _____

The price(s) set forth above shall remain valid for one (1) year from the date of bid award.

Prices in the bid must cover all of bidder's costs. There shall be no additional charges to the Town for delivery, training, set-up, etc.

Name of person authorized to submit bid for bidder:

Signed: _____

[Signature of authorized person, if not a corporate officer attach corporate resolution authorizing submission of bid.]

TITLE of authorized person: _____

BIDDER'S CORPORATE NAME:

BIDDER CONTACT INFORMATION:

PRINT NAME: _____

TITLE: _____

Address: _____ State: _____ Zip: _____

Phone: _____

Fax: _____

Email: _____@_____

- END OF BID PROPOSAL FORM -

**TOWN OF YORKTOWN
SERVICES AND PUBLIC WORKS CONTRACTS BID**

PART TWO

General Terms and Conditions of Bid

<u>Section Numbers</u>	<u>Heading</u>
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Section 2.	Pre-Bid Site Inspection
Section 3.	Quality and Samples
Section 4.	Request for information and/or clarification of the Bid Documents
Section 5.	Non-Collusion
Section 6.	Late Bids
Section 7.	Bid Opening
Section 8.	Acceptance and Rejection
Section 9.	Appeal of Determination of Non-Responsiveness and Non-Responsibility
Section 10.	Award
Section 11.	Notice of Award
Section 12.	Performance And Payment Bond
Section 13.	Assignment Prohibited
Section 14.	Special Requirements
Section 15.	Purchase of Additional Quantities of Bid Items
Section 16.	Contractor's Subcontracts and Material Lists
Section 17.	Representative Always Present
Section 18.	Performance
Section 19.	Insurance Requirements
Section 20.	Indemnification

<u>Section Numbers</u>	<u>Heading</u>
Section 21.	Delivery Point
Section 22.	Date of Delivery
Section 23.	Damages
Section 24.	Warranty/Guarantee
Section 25.	Breach of Contract/Termination
Section 26.	Prevailing Wage Rates and Supplements
Section 27.	Estimates and Payments
Section 28.	Payments to Subcontractors and Materialmen by Contractor
Section 29.	Change in Contract Price
Section 30.	Proper Method of Work and Materials
Section 31.	Utilities and Service Lines
Section 32.	Protection, Existing Structures
Section 33.	Acceleration of the Work
Section 34.	Stopping Work
Section 35.	Change in the Contract Time
Section 36.	Disputed Work – Notice of Claims For Damages

Section 1. Bid Proposal Form

- 1.1** The bidder shall complete the Bid Proposal Form by filling in the unit price and the total price in the appropriate designated spaces. Unit price and total price of each item bid shall be written legibly in ink, or typed. All bids shall be signed in ink. Any erasures or alterations shall be initialed in ink by the signer. The completed Bid Proposal Form shall be submitted, along with any documentation in support of the bid proposal if required by the Bid Documents, in a sealed envelope addressed as required in the Invitation to Bidders on or before the time and at the place so designated. Any Bid Proposal Form which has been materially altered in any way may render the bid nonresponsive and the bid rejected.
- 1.2** In the event of a discrepancy between the unit price and the total price of the Bid Proposal Form, the unit price will prevail. In the event of a discrepancy between the written bid amount and the numerical bid amount, the written amount will take precedence and be controlling as to the amount of the Bid. All items not bid shall be indicated as “not bid” in the total price space. When bids are requested on a lump sum basis, bidder must bid on each item in the lump sum group. Any bidder desiring to bid “no charge” on an item in a group must so indicate.
- 1.3** Failure to comply with the provisions of this section may be grounds for rejection of the bid proposal.
- 1.4** Correction or withdrawal of a bid because of an inadvertent, non-judgmental mistake in the Bid Proposal Form requires careful consideration to protect the integrity of the competitive bidding process, and to ensure fairness. If the mistake is attributable to an error in judgment, the Bid Proposal Form may not be corrected. Bid correction or withdrawal by reason of the non-judgmental mistake is permissible at the sole discretion of the Town Clerk, but only to the extent that it is not contrary to the interests of the Town or the fair treatment of other bidders.
- 1.5** By signing the Bid Proposal Form, the bidder certifies that:
 - i.** the person whose signature appears below is legally empowered to bind the bidder;
 - ii.** the bidder has read the complete Bid Documents and understands and agrees to all terms and conditions set forth in the Bid Documents;
 - iii.** if accepted by the Town, the bid is guaranteed as written and will be implemented as stated;
 - iv.** By submission of the bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of its knowledge and belief that each bidder is not on the list created pursuant to paragraph (b) of subdivision 3 of section 165-a of the New York State Finance Law.¹

¹ List found at <http://ogs.ny.gov/about/regs/docs/ListofEntities.pdf>.

- 1.6 The bidder understands and agrees that quantities shown on the Bid Proposal Form opposite items of the work for which unit prices have been requested are approximate estimated quantities, and that during the progress of the work the Town may find it advisable and shall have the right to omit portions of the work, and to increase or decrease the shown approximate estimated quantities, or the scope of the whole work; and that the Town reserves the right to add to or take from the total amount of the work up to a limit of thirty (30%) percent of the total amount of the contract based upon the executed contract price for all the specified work.
- 1.7 The bidder shall make no claim for anticipated profits or loss of profits, because of any difference between the quantities of the various classes of work actually done, or of the materials actually furnished, and the original specified scope of work and the shown approximate estimated quantities.
- 1.8 All prices bid include a sum sufficient for the preparation and submission of approved final “As-builts”, record drawings, guarantees, warranties, and operations and maintenance manuals.
- 1.9 All plans and other like records compiled by the contractor in completing the work under this contract shall become the property of the Town. The Contractor may retain copies of each such plan or record for its own use.
- 1.10 The contractor shall secure and pay for all necessary permits for the proper executing and completion of work.
- 1.11 The Town is exempt from all federal, state and local taxes.

Section 2. Pre-Bid Site Inspection

- 2.1 The bidder shall satisfy itself by personal examination of the location of the proposed work and surroundings thereof, and by such other means as it may prefer, as to the scope of the work and the accuracy of the approximate estimated quantities; and shall not at any time after submission of the bid dispute such approximate estimated quantities or assert that there was any misrepresentation by the Town or any misunderstanding by the bidder in regard to the quantity or kind of materials to be furnished, or work to be done. Failure to do so will not relieve a successful bidder contractor (“contractor”) of the obligation to furnish all material and labor necessary to carry out the provisions of the contract documents and to complete the contemplated work for the consideration set forth in its bid.
- 2.2 Unless otherwise stated, the bidder is free and encouraged to examine the work site during normal work hours preceding the submission of the bid. For those bidders requesting further clarification of the conditions, an appointment with the Town's representative, can be requested, by contacting the, Town Clerk.
- 2.3 At the time of the opening of bids each bidder will be presumed to have inspected the sites and to have read and to be thoroughly familiar with the Bid Documents.

Section 3. Quality and Samples

- 3.1 All equipment, material and supplies bid upon must conform to the description and specifications set forth in the in the Bid Documents, or their reasonable equivalent.
- 3.2 References in the Bid Documents to type, style, brand or trade name, and catalog are intended to be descriptive only and not restrictive.

Section 4. Request for information or interpretation and/or clarification of the Bid Documents

- 4.1 The bidder shall have seven (7) business days prior to the bid opening date to notify the Town Clerk in writing of any errors or defects in the Bid Documents which would prevent the bidder from providing a responsive bid.
- 4.2 No interpretation of the Bid Documents will be made to any bidder orally by any representative of the Town.
- 4.3 Any request for information or interpretation and/or clarification of the Bid Documents must be addressed in writing to Diana Quast, Yorktown Town Clerk, 363 Underhill Avenue, Yorktown Height, NY 10598, and be submitted not later than five (5) business days prior to the date fixed for the opening of bids.
- 4.4 Any written response to a request for information or interpretation and/or clarification of the Bid Documents shall be issued by Town Clerk and will be incorporated into and made part of the Bid Documents and will be made available in the same manner and method as the Bid Documents. The Town Clerk's decision shall be final and binding on all parties. The failure of any bidder to receive such Addenda will not relieve the contractor of any obligation to comply with the terms and conditions of the Addenda.
- 4.5 The Bid Documents, including the drawings, Bid Documents, have been prepared with care and are intended to show as clearly as is practicable the work required to be done. The bidder must realize however, that construction details cannot always be accurately anticipated and that in executing the work, field conditions may require reasonable modifications in the details of the plans and quantities of work involved. Work under all items in the contract must be carried out to meet these field conditions to the satisfaction of the Town and in accordance with the Bid Documents. The bidder shall not take advantage of any apparent errors or omission in the Bid Documents. In the event the contractor discovers an error or omission in the Bid Documents, it shall immediately notify the Town. The Town will then make such corrections and interpretations as may be deemed necessary for fulfilling the intent of the Bid Documents.
- 4.6 A bidder's failure to request a clarification, interpretation, etc. of any portion of the Bid Documents or to point out any inconsistency therein will preclude such bidder from thereafter claiming any ambiguity, inconsistency, or error which should have been discovered by a reasonably prudent bidder and from asserting any claim for damages arising directly or indirectly therefrom.

Section 5. Non-Collusion

- 5.1 The bidder shall certify that it has complied with all of the requirements stated in the non-collusive bidding certificate by signing the form included in the Bid Documents. Failure by the bidder to complete and sign the non-collusive bidding certificate will constitute grounds for rejection of the bid.

Section 6. Late Bids

- 6.1 All bids received after the deadline date and time stated in the Instructions to Bidders will not be considered and will be returned to the bidder unopened. The bidder assumes the risk of any delay in the mail and the handling of the mail by the employees of the Town. Whether sent by mail or by means of personal delivery, the bidder assumes all responsibility for having the bid delivered on time and to the place specified above.

Section 7. Bid Opening

- 7.1 Sealed bids will be publicly opened on the date and time specified in the Instructions to Bidders. Bids may be read aloud to those persons present when practicable. Any bidder may request to review any submitted Bid Proposal Forms by arranging a mutually convenient time with the Town Clerk.
- 7.2 The prices stated in the Bid Proposal Form are irrevocable until the Notice of Award is issued, unless the bid is withdrawn only after the expiration of sixty (60) days from the bid opening and only in writing received by the Town Clerk and in advance of the issuance of the Notice of Award.

Section 8. Acceptance or Rejection

- 8.1 A responsive bid is one that complies with all material terms and conditions of the Bid Documents.
- 8.2 If the lowest price bid or proposal is found non-responsive, a determination setting in detail and with specificity the reasons for such finding shall be issued by the Town Clerk. A copy of such determination shall be mailed to the non-responsive bidder no later than two (2) business days after the determination is made.
- 8.3 The Town reserves the sole right to waive any informality that is a matter of form rather than substance without prejudice to other bidders and what is in the best interests of the Town. The Town's decision shall be final and binding.
- 8.4 Any corporation not incorporated under the Laws of New York State, must furnish a copy of its certificate of authority, from the New York State Secretary of State, to do business in the State of New York, in accordance with Article 13 of the New York State Business Corporation Law.
- 8.5 The Town will consider the qualifications of all bidders and may conduct such investigation as it deems necessary to assist in the evaluation of any bid. The Town reserves the right to reject any bid if the evidence submitted by, or the investigation of such bidder fails to satisfy the Town, in the Town's sole discretion, that it is

properly qualified to carry out the obligations of the contract and to complete the contemplated work. In evaluating a bidder's responsibility the Town may consider the following factors:

- i. financial resources;
- ii. technical qualifications;
- iii. experience;
- iv. organization, material, equipment, facilities, and personnel resources and expertise (or the ability to obtain them) necessary to carry out the work and to comply with required delivery or performance schedules, taking into consideration other business commitments;
- v. a satisfactory record of performance;
- vi. a satisfactory record of business integrity;
- vii. where the contract includes provisions for reimbursement of contractor costs, the existence of accounting and auditing procedures adequate to control property funds, or other assets, accurately delineate costs, and attribute them to their causes; and
- viii. compliance with requirements for the utilization of small, minority-owned, and women-owned businesses as subcontractors.

8.6 The Town reserves the right to require additional information as it deems appropriate concerning the history of any bidder's performance of prior contracts. The final determination of whether the bidder possesses the requisite experience rests in the sole discretion of the Town. Failure of a bidder to provide relevant information specifically requested by the Town may be grounds for a determination of non-responsive and/or non-responsible.

Section 9. Appeal of Determination of Non-Responsiveness or Non-Responsible

- 9.1** Any determination that a bid is non-responsive or a bidder is non-responsible may be appealed as set forth herein.
- 9.2** Time Limit; A bidder shall have five (5) business days from receipt of the determination of non-responsiveness or non-responsible to file an appeal with the Town Clerk. Receipt of notice by the bidder shall be deemed to be no later than five (5) business days from the date of mailing or upon delivery, if delivered. Filing of the appeal shall be accomplished by actual delivery of the appeal document to the Town Clerk. The bidder shall also send a copy of its appeal, for informational purposes, to the Town Attorney.
- 9.3** Form and Content; The appeal shall be in writing and shall briefly state all the facts or other basis upon which the bidder contests the finding of non-responsiveness or non-responsible. Supporting documentation, if any, shall be included.

- 9.4 Stay of Award of Contract Pending. Award of the contract shall be stayed pending the determination of the Town Clerk unless the Town Clerk makes a determination that proceeding with the award without delay is necessary to protect substantial Town's interests. Where such a determination is made, the bidder shall be advised of this action in the determination of non-responsiveness or, if the stay is removed at any time after the bidder has been notified of determination of non-responsiveness or non-responsible, notification shall be provided to the bidder no later than two (2) business days after such determination is made. The Town Clerk shall consider the appeal, and may, in his or her sole discretion, meet with the bidder to discuss the merits of the appeal. The Town Clerk shall make a prompt determination with respect to the merits of the appeal, a copy of which shall be sent to the bidder. The Town Clerk's determination shall be final.

Section 10. Award

- 10.1 Town reserves the right to make an award within sixty (60) days after the date of the bid opening, during which period bids may not be withdrawn.
- 10.2 The Award will be made to the responsible and responsive bidder submitting the lowest bid that fully complies with all the specifications stated in the Bid documents.
- 10.3 Town reserves the right to reject all bids and to purchase any or all items on contracts awarded by agencies or departments of the State of New York or of the Town, if such items can be obtained on substantially the same terms, conditions, specifications, and at a lower price.

Section 11. Notice of Award

- 11.1 If the bid is awarded by Town, a written Notice of Award will be issued by the Town Clerk to the contractor. Such Notice of Award will constitute a binding enforceable contract between the contractor and the Town of Yorktown. These General Terms and Conditions shall be incorporated into the contract as material terms.
- 11.2 The Town may issue a Notice of Award based on either Lowest Responsible Bid or Best Value, in accordance with the 2012 amendments to General Municipal Law § 103, as implemented by Yorktown Town Code Chapter 78 entitled *Procurement for Goods and Services*.
- 11.3 Upon receipt of the Notice of Award the contractor will be required to submit to the Town Clerk a completed W-9 form in addition to any other information or documents required by the Town. Failure to supply a completed W-9 form or such other information or documents required by the Town will invalidate the bid.

Section 12. Performance And Payment Bond

- 12.1 If a Performance and Payment bond is required in accordance with the Instruction to Bidders, the "Bid Bond and Consent of Surety" Form must be executed by the contractor's Surety Company and submitted to the Town.

Section 13. Assignment Prohibited

13.1 The contractor shall not assign, transfer, convey or otherwise dispose of the contract or any part of it or any monies due and payable under the contract, without prior written approval of the Town. If such approvals are granted by the Town, they shall in no way relieve the contractor or from any obligations under the terms of the contract.

Section 14. Special Requirements

14.1 Special requirements for any bid may supersede and/or be added to any provision contained in these General Terms and Conditions.

Section 15. Purchase of Additional Quantities of Bid Items

15.1 The Town may purchase additional quantities of the bid items at any time during the contract period, for the same price and under the same terms and conditions as set in the Bid Proposal Form.

Section 16. Contractor's Subcontracts And Material Lists

16.1 Within fifteen (15) days after execution of the Contract, the contractor shall submit to the Town for approval a list of the subcontractors, materialmen and materials that the contractor plans to use in the performance of the work and statements of the work they are to perform. The format and content of the list shall be in accordance with directives from the Town. No part of the work may be sublet until after the contractor has received the Town's approval. The contractor shall be fully responsible for all acts and omissions of its subcontractors and persons directly or indirectly employed by them, and the Town's approval to sublet parts of the work will in no way relieve the contractor of any of its obligations under the Contract. All dealings of the Town with the subcontractors shall be through the contractor..

16.2 The contractor shall insert appropriate clauses in all subcontracts to bind the subcontractors to the contractor by all applicable provisions of the contract documents executed between the contractor and the Town, but this shall not be construed as creating any contractual relationships between subcontractors and the Town. Prior to approval of the subcontractors, the Town has the right to review and recommend changes in the subcontracts. The Town reserves the right to reject any subcontractor proposed by the contractor if in the reasonable opinion of the Town such subcontractor lacks the experience or capability to perform its subcontract work or is otherwise non-responsible.

16.3 The contractor shall insert appropriate clauses in each subcontract that require that if the contractor is terminated by the Town either for default or convenience that at the sole option of the Town the subcontract shall automatically attorn to the Town and the subcontractor shall continue without delay or interruption to fully perform all of the obligations required by its subcontract.

Section 17. Representative Always Present

17.1 The contractor in case of its absence from the work shall have a competent representative or foreman present, who shall obey without delay, all instructions of the Town in the prosecution and completion of the work in conformity with the

contract, and shall have full authority to supply labor and material immediately.

17.2 The contractor, or its superintendent, shall attend job meetings with the Town for the purpose of discussing expedition, execution and coordination of the work. Job meetings will be scheduled periodically (the first to be prior to commencement of construction) at a time and place designated by the Town.

17.3 The contractor shall not commence any work prior to the first (pre-construction) meeting between the contractor, Town, and other concerned governmental and utility company representatives.

Section 18. Performance

18.1 All work performed and all materials furnished shall be in reasonably close conformity with the lines, grades, cross sections, dimensions and materials requirements, including tolerances, shown in the Bid Documents.

18.2 Plan dimensions and contract specification values are to be considered as the target value to be strived for and complied with as the design value from which any deviations are allowed. It is the intent of the specifications that the materials and workmanship shall be uniform in character and shall conform as nearly as realistically possible to the prescribed target value or to the middle portion of the tolerance range. The purpose of the tolerance range is to accommodate occasional minor variations from the median zone that are unavoidable for practical reasons. When a maximum or minimum value is specified, the production and processing of the material and the performance of the work shall be so controlled that material or work shall not be preponderantly of borderline quality or dimension.

18.3 Figured dimensions on the plans shall be given preference over scaled dimensions, but shall be checked by the contractor before starting construction. Information and data on the contract documents shall take precedence in the following order (1) Drawing; Details, Sections, Plans, Notes, General Notes, (2) Technical Specifications, (3) General Specifications. Any errors, omissions or discrepancies shall be brought to the attention of the Town whose decision thereon shall be final.

18.4 In the event that the Town determines that the materials or the finished product in which the materials used are not within reasonably close conformity with the Bid Documents but that reasonably acceptable work had been produced, the Town shall then make a determination if the work shall be accepted and remain in place. In this event, the Town will document the basis of acceptance by contract modification, subject to the approval of the Town Board, which will provide for an appropriate adjustment in the contract price for such work or materials as deems necessary.

18.5 In the event that the Town determines that the materials or the finished product in which the materials used are not within reasonably close conformity with the Bid Documents and have resulted in an inferior or unsatisfactory product, the work or materials shall be removed and replaced or otherwise corrected by and at the expense of the contractor.

- 18.6** All traffic control devices (signs, signals, markings, and devices placed by the authority of a public body or official having jurisdiction for the purpose of regulating, warning or guiding traffic) shall be in conformity with the latest edition of the New York State Manual of Uniform Traffic Control Devices or other such standard as directed by the Town.
- 18.7** Time being of the essence, the contractor shall take notice that the timely completion of the work called for under the contract is of the greatest importance. The contractor shall commence its work within ten (10) days after "Notice of Award" has been given it by the Town (unless a definite starting date is otherwise stated). Prior to commencing its work, the contractor shall notify the Town, at least forty-eight (48) hours prior to the planned date of its "start".

Section 19. Insurance Requirements

- 19.1** The contractor, upon award of the contract, shall provide at its own cost and expense the following insurance to the Town from insurance companies licensed in the State of New York, carrying a Best's financial rating of "A" or better, which insurance shall be evidenced by certificates and/or policies as determined by the Town.
- 19.2** Each certificate or policy shall require that, thirty (30) days prior to cancellation or material change in the policies, notice thereof shall be given to the Town Clerk by registered mail, return receipt requested, for all of the following stated insurance policies. All such notices shall name the contractor and identify the contract number or description.
- 19.3** All policies and certificates of insurance shall be approved by the Town prior to the inception of any work.
- i.** Workmen's Compensation: The contractor shall evidence compliance with Workers' Compensation Law, or as otherwise directed by the Town.
 - ii.** Commercial General Liability Insurance with minimum limits of liability per occurrence of \$1,000,000 with the Town named as an additional insured.
 - iii.** Automobile Liability Insurance with minimum limits of liability per occurrence of \$1,000,000 with the Town named as an additional insured.
 - iv.** Additional insurance may be required on an individual basis for extra hazardous contracts and specific service agreements. If such additional insurance is required for a specific contract, that requirement will be described in the Special Requirements of the contract specifications.
 - v.** If any of the insurance requirements are not complied with at their renewal dates, payments to the contractor will be withheld until those requirements have been met, or at the option of the Town, the Town may pay the Renewal Premium and withhold such payments from any monies due the contractor.

- vi. If at any time any of the foregoing policies shall be or become unsatisfactory to the Town, as to form or substance, or if a company issuing any such policy shall be or become unsatisfactory to the Town, the contractor shall upon notice to that effect from the Town, promptly obtain a new policy, submit the same to the Town for approval and submit a certificate thereof as herein above provided. Upon failure of the contractor to furnish, deliver and maintain such insurance as above provided, the contract, at the election of the Town, may be forthwith declared suspended, discontinued or terminated. Failure of the contractor to secure and/or maintain or the taking out and/or maintenance of any required insurance, shall not relieve the contractor from any liability under the contract, nor shall the insurance requirements be construed to conflict with or otherwise limit the obligations of the contractor concerning indemnification.
- vii. In the event that claims in excess of the insured amounts provided herein, are filed by reason of any operations under the contract, the amount of excess of such claims or any portion thereof, may be withheld from payment due or to become due the contractor until such time as the contractor shall furnish such additional security covering such claims as may be determined by the Town.

Section 20. Indemnification

- 20.1 The contractor hereby agrees to indemnify and save harmless the Town, its officers, employees, elected officials, and agents from and against all liability, loss or damage the Town may suffer, arising directly or indirectly out of the contract between the contractor and the Town. The Contractor further agrees to provide defense for and defend any claims or causes of action of any kind or character directly or indirectly arising out of this Agreement at its sole expense and agrees to bear all other costs and expenses relating thereto. The foregoing provisions shall not be construed to cause the contractor to indemnify the Town, its officers, elected officials, agents or employees from its or their sole negligence.
- 20.2 Neither the acceptance of the completed work nor payment therefore shall release the Contractor from its obligation under this section.

Section 21. Delivery Point

- 21.1 Shipping of any products shall be FOB Destination. Delivery shall be at the location set forth in the Specifications except on national, state or local holidays when Town buildings are closed. Bidder shall be responsible to verify that the appropriate Town building for delivery is open prior to delivering items. All bid items shall be unloaded and placed within the particular Town building, at points of delivery, and in quantities, as directed by the Town. Any costs incurred by the Town or bidder due to the failure of bidder to comply with this requirement will be the responsibility of bidder. Bidder should be prepared to furnish proof of delivery, if requested by Town. Deliveries shall be made in accordance with the specifications, and shall be made Monday through Friday from 8 a.m. to 2 p.m. unless otherwise stated in the Specific Specifications.

21.2 If bidder is shipping bid items to Town using a third-party carrier (US Postal Service, UPS, FedEx), there shall be no additional shipping charge to the Town.

21.3 Delivery will not be complete until the good are inspected and accepted by the Town.

Section 22. Date of Delivery

22.1 Delivery of all materials included under this bid shall be made not later than the date specified in the Bid Documents or Project Schedule. If contractor cannot meet the delivery date specified in Bid Documents or Project Schedule, contractor shall state on the bid form the proposed date of delivery and such date will considered when determining responsiveness in awarding the bid.

Section 23. Damages

23.1 The contractor shall be fully responsible for shipping and delivery of materials specified in the Bid Documents or Project Schedule in an undamaged condition. Town will not consider the carrier responsible for damaged or delayed deliveries. Any bid item damaged or broken when delivered to Town shall be replaced immediately by contractor at no cost to the Town.

Section 24. Warranty/Guarantee

24.1 It is the intent of the Bid Documents to require first-class work and materials and any work not fully covered herein Bid Documents shall be interpreted to require first-class work and materials, and such interpretations shall be binding upon the Contractor. The contractor shall be fully responsible for performance of work in a satisfactory manner with satisfactory results in the discretion of the Town quality materials.

24.2 Contractor is deemed to warrant and guarantee all work performed under this agreement.

24.3 Unless otherwise stated in other parts of the specifications, all work performed or goods supplied under the contract shall be guaranteed by the contractor against all defects resulting from the use of inferior materials, equipment or workmanship, for a period of one (1) year from the date of final completion and acceptance of the work, which shall be defined as the date of the Town's approval of the final Certificate for Payment or from the date the Town takes possession and makes full use of the constructed facility.

24.4 Any goods furnished must be standard, new, latest model of the regular stock product, as required by the specifications, with parts regularly used for the type of equipment offered.

24.5 No attachment or part will be substituted or applied contrary to manufacturer's recommended and standard practice. All regularly manufactured stock electrical items must bear the label of the Underwriters Laboratories, Inc. Any equipment, part or constructed item which is or becomes defective during the guarantee period shall be replaced or redone by the contractor, including all labor at no additional

charge to the Town. All replacements shall carry the same guarantee as the original equipment. The contractor shall make any such replacement promptly upon receiving written notice from Town.

Section 25. Breach of Contract/Termination

25.1 If contractor fails to deliver as ordered, or within the time specified, or within reasonable time as interpreted by Town, or fails to make replacement of rejected or defective goods, whether so requested immediately or as directed by Town, that shall constitute a breach of the contract, and Town may arrange to have the work performed from other sources to take the place of the work product found defective or not delivered. Without limiting the foregoing, Town reserves the right to terminate the contract upon breach upon within ten (10) days written notice provided to the contractor.

Section 26. Prevailing Wage Rates And Supplements

26.1 Wages to be Paid and Supplements to be Provided

- i. The contractor shall, at its own cost and expense, comply with all provisions of the Labor Law (i.e. prevailing rate of wages and supplements), Lien Law, Workmen's Compensation Law and all other laws and ordinances affecting the contract or order, either Federal, State or local.

26.2 Records to be kept on Site

The contractor, subcontractors at any tier shall certify their payrolls and keep them on site and available, in addition to the following informative records:

- i. Record of hours worked by each workman, laborer and mechanic on each day;
- ii. Record of days worked each week by each workman, laborer and mechanic;
- iii. Schedule of occupation or occupations at which each workman, laborer and mechanic on the project is employed during each work day and week;
- iv. Schedule of hourly wage rates paid to each workman, laborer and mechanic for each occupation.
- v. A statement or declaration signed by each workman, laborer and mechanic attesting that they have been provided with a written notice, informing them of the prevailing wage rates and supplements requirement for the contract.

Section 27. Estimates and Payments

27.1 As the work progresses but not more often than once a month and then on such days as the Town shall direct, the contractor will submit a requisition in writing of the amount and value of the work performed and the materials and equipment provided to the date of the requisition, less any amount previously paid to the contractor.

27.2 From each requisition, the Town will retain five percent (5%) plus one hundred fifty percent (150%) of the amount necessary to satisfy any claims, liens or judgments against the contractor that have not been suitably discharged. The Town

will thereupon cause the balance of the requisition therein to be paid to the contractor.

- 27.3** As a condition to the making of any progress payment as set forth in this paragraph, the Town, in its sole discretion may require the contractor to submit such document as may be reasonably required to establish that the contractor and its subcontractors have timely and properly paid their respective subcontractors and materialmen at any tier.
- 27.4** When the work or major portion thereof, as contemplated by the terms of the contract are substantially completed in the judgment of the Town, the contractor shall submit a requisition for the remainder of the contract balance. An amount equal to two (2) times the value of the remaining items to be completed plus one hundred fifty percent (150%) of the amount that the Town deems necessary to satisfy to satisfy any claims, liens or judgments against the contractor which have not been suitably discharged shall be deducted from the requisition. As the remaining items of work are satisfactorily completed or corrected, the Town will, upon receipt of a requisition, pay for these items less one hundred fifty percent (150%) of the amount necessary to satisfy any claims, liens or judgments.
- 27.5** All estimates will be made for actual quantities for work performed and materials and equipment incorporated in the work as determined by the measurements of the Town, and this determination shall be accepted as final, conclusive and binding upon the contractor. All estimates will be subject to correction in any succeeding estimate.
- 27.6** Payment will be made only upon the written request of the contractor. Payment requests shall be processed by the Town no more than one (1) time per month. Payment will be made for materials pertinent to the project which have been delivered to the site or off-site by the contractor suitably stored and secured in first-class condition as required by the Town. The contractor must submit certified copies of the manufacturer's or vendor's invoices or statements establishing the true purchase value of the material or equipment; freight bills, release of liens and certificate of insurance covering all equipment and materials.
- 27.7** The Contractor shall be responsible for safeguarding stored equipment and materials against loss or damage of any nature whatsoever, shall retain title until incorporated into the work and acceptance by the Town and in case of loss or damage, the contractor shall replace such lost or damaged equipment and materials at no cost to the Town. After receipt of payment, the contractor shall not remove from the site equipment and materials for which such payment was made without written authorization from the Town.
- 27.8** Within thirty (30) days after receiving written notice from the Contractor of substantial completion of the work under this Agreement, the Town will cause an inspection to be made of the work done under the contract. If, upon such inspection, the Town determines that the work is substantially complete, a Substantial Completion Payment to the contractor for the work done under the contract, less any and all deductions authorized to be made by the Town under the contract or by law, will be issued.

- 27.9 As a condition precedent to receiving payment therefore, the Contractor must have received Town approval of all Shop Drawing submittals, the Operation and Maintenance Manuals, and As-Built Drawing(s).
- 27.10 Together with its application for substantial completion payment the Contractor shall also deliver to the Town a verified statement certifying that all claims or liabilities arising from the completed work, including all charges for Extra Work, Change Orders, additional time, damages or credits (collectively referred to as "claims") have been presented to the Town. All such claims shall be described in sufficient detail so as to be easily identified. The contractor's failure to submit the verified statement shall constitute a full and final waiver of all claims against the Town from the beginning of the project through the date of substantial completion as established by the Town. The presentation of the verified statement to the Town shall not constitute an acknowledgement by the Town that any such claim is valid. The Town expressly reserves its right to assert that any such claim(s) is waived or precluded by reason of other provisions of the contract documents. Only claims particularly identified on the contractor's verified statement shall be preserved; all other claims whatever nature shall be deemed waived and released. It shall also submit proof of title of the materials and equipment covered by the contract. The contractor shall also, prior to the issuance of said Substantial Completion Payment, supply to the Town affidavits and certificates for labor, material and equipment (where applicable).
- 27.11 Within ten (10) days after receiving written notice from the contractor of completion of all the work, the Town will make a final inspection. If upon inspection the Town determines that no further work is needed, the Town will request that the Town approve the completion of the project and authorize payment of the Final Estimate.

Section 28. Payments To Subcontractors And Materialmen By Contractor

- 28.1 Within fifteen (15) calendar days of the receipt of any payment from the Town, the contractor shall pay each of its subcontractors and materialmen the proceeds from the payment representing the value of the work performed and/or materials furnished by the subcontractor and/or materialmen as reflected in the payment from the Town less an amount necessary to satisfy any claims, liens or judgment against the subcontractor or materialman which have not been suitably discharged and less any retained amount as hereafter described.
- 28.2 Nothing provided herein shall create any obligation on the part of the Town to pay or to see the payment of any moneys to any subcontractor or materialman from any contractor nor shall anything provided herein serve to create any relationship in contract or otherwise, implied or expressed between the subcontractor or materialman and the Town. Notwithstanding anything to the foregoing, the Town may tender payments to the Contractor in the form of joint or dual payee checks.

Section 29. Change in the Contract Price

- 29.1 The Contract Price constitutes the total compensation (subject to authorized adjustments) payable to the contractor for performing the work pursuant to the

contract. All duties, responsibilities and obligations assigned to or undertaken by the contractor shall be at its expense without change in the Contract Price.

- 29.2** The Contract Price may only be changed by a Change Order. Any claim for an increase in the Contract Price shall be based on written notice delivered to Town within fifteen (15) days of the occurrence of the event giving rise to the claim. Notice of the amount of the claim with supporting data shall be delivered within twenty (20) days of such occurrence unless the Town allows an additional period of time to ascertain accurate cost data. Any change in the Contract Price resulting from any such claim shall be incorporated in a Change Order. All change orders are subject to the determination and approval of the Town Board.

Section 30. Proper Method of Work And Proper Materials

- 30.1** The Town shall have the power in general to direct the order and sequence of the work, which will be such as to permit the entire work under the contract to be begun and to proceed as rapidly as possible, and such as to bring the several parts of the work to a successful completion at about the same time.
- 30.2** If at any time before the commencement or during the progress of the work the materials and appliances used or to be used appear to the Town as insufficient or improper for securing the quality of work required, or the required rate of progress, he may order the contractor to increase its efficiency or to improve their character, and the contractor shall promptly conform to such order; but the failure of the Town to demand any increase of such efficiency or improvement shall not release the Contractor from its obligation to secure the quality of work or the rate of progress specified.\
- 30.3** The Contractor will establish the lines, grades and measurements necessary in his opinion to properly locate the work, by setting suitably marked offset or reference stakes. These stakes are referenced to the control points, coordinates and similar data that may be shown on the contract drawings, but the Town reserves the right to modify that information.
- 30.4** The Contractor shall carefully and properly preserve all stakes, pins and markers required at no additional costs to the Town. All existing property lines and survey monuments which may, of necessity have to be disturbed during the construction work, will be property tied to fixed points and reset by the Contractor at no cost to the Town.

Section 31. Utilities and Service Lines

- 31.1** The Contractor is hereby warned that a reasonable opportunity is to be given the municipalities and public service corporations to alter and install pipes, conduits or other structures prior to placing to pavement. No guarantee is given that public utility structures and service lines herein shown are correctly located. Locations given are from the best available information.

Section 32. Protection, Existing Structures

- 32.1** The Contractor, at his expense, shall protect adjacent and other property or premises from damage of any kind during the progress of the work and shall erect and

maintain guards around his work in such a way as to afford protection to the public. The Contractor shall be held responsible for improper, illegal, or negligent conduct of himself, his subcontractors, employees and agents in and about said work or in the execution of the work covered by this Contract.

- 32.2** The Contractor shall, at his expense, sustain in their places and permanently protect from direct or indirect injury any and all pipelines, subways, pavements, sidewalks, curbs, railways, buildings, trees, poles, wells, and other property in the vicinity of his work, whether over-or underground, or which appear within the trench or excavations, and he shall assume all costs and expenses for direct or indirect damage which may be occasioned by injury to any of them.
- 32.3** The Contractor's liability shall also include the damage or injury sustained by any structure whatsoever due to settlement of trenches or excavations or to settlement or lateral movement of the sides of such trenches or excavations, whether such movement occurs during or after excavation or backfilling of such trenches or excavations. His liability to so support and protect all such structures from damage or injury shall continue without limitation, throughout the Contract period and during the period of guarantee.
- 32.4** The Contractor shall at all times have on the ground suitable and sufficient material and shall use the same as may be necessary or required for sustaining and supporting any and all such structures which are uncovered, undermined, weakened, endangered, threatened, or otherwise materially affected.
- 32.5** In case injury occurs to any portion of a pipeline or structure, or to the material surrounding or supporting the same, through blasting or similar operations, the Contractor shall immediately notify the Engineer, and, at his expense, shall remove such injured work and shall rebuild the pipeline or structure and shall replace the material surrounding the supporting the same, or shall furnish such material and perform such work of repairs or replacement as the Town may order. Any damage whatsoever shall be promptly, completely and satisfactorily repaired by the Contractor at his expense.

Section 33. Acceleration of the Work

- 33.1** The Town may, at its sole discretion and as circumstances reasonably require, require the contractor to accelerate the schedule of performance by providing overtime, extended day, extra crews, Saturday, Sunday and/or holiday work and/or by having all or any subcontractors designated by the Town provide overtime, extended day, extra crews, Saturday, Sunday or holiday work by the contractor's or his subcontractor's own forces.
- 33.2** The Town, pursuant to a validly issued written change order, may reimburse the contractor for the direct cost to the contractor of the premium time for the labor utilized by the contractor in such overtime, extended day, extra crews, Saturday, Sunday or holiday work (but not for the straight time costs of such labor) together with any social security and state or federal unemployment insurance taxes in connection with such premium time. However, no overhead, supervision costs, commissions, profit or other costs and expenses of any nature whatsoever, including impact costs or costs associated with lost efficiency or productivity, shall be payable in connection therewith.

33.3 Anything to the foregoing notwithstanding, in the event that the contractor has fallen behind schedule or in the Town's judgment appears likely to fall behind schedule, Town shall have the absolute right to direct the contractor to accelerate the performance of its work, including that of its subcontractors, and the full costs for such acceleration shall be borne solely by the contractor.

Section 34. Stopping Work

34.1 Town May Suspend Work:

- i. The Town may, at any time and without cause, suspend the work or any portion thereof for a period of not more than ninety (90) days by notice in writing to the contractor which shall fix the date on which work shall be resumed. The contractor shall resume the Work on the date so fixed. Subject to the approval of the Town Board, the contractor may be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to any suspension.

34.2 The Town May Terminate:

A. Upon the occurrence of any one or more of the following events:

1. If the contractor is adjudged bankrupt or insolvent,
2. If the contractor makes a general assignment for the benefit of creditors,
3. If a trustee or receiver is appointed for the contractor or for any of the contractor's property,
4. If the contractor files a petition to take advantage of any debtor's act, or to reorganize under the bankruptcy or similar laws,
5. If the contractor repeatedly fails to supply sufficient skilled workers or suitable materials or equipment,
6. If the contractor repeatedly fails to make prompt payments to Subcontractors or for labor, materials or equipment,
7. If the contractor disregards laws, ordinances, rules, regulations or orders of any public body having jurisdiction,
8. If the contractor disregards the authority of the Town, or
9. If the contractor otherwise violates in any substantial way any provisions of the Bid Documents or the Contract. The Town may after giving the contractor and its Surety seven (7) days written notice, terminate the services of the contractor, exclude the contractor from the site, incorporate in the Work all materials and equipment stored at the site or for which Town has paid the contractor but which are stored elsewhere, and finish the Work as Town may deem expedient. In such case the contractor shall not be entitled to receive any further payment until the work is finished. If the unpaid balance of the Contract Price exceeds the direct and indirect costs of completing the work, including compensation for additional professional

services, such excess shall be paid to the contractor. If such costs exceed such unpaid balance, the contractor shall pay the difference to the Town.

- B.** Where the contractor's services have been so terminated by the Town, the termination shall not affect any rights of Town against the contractor then existing or which may thereafter accrue. Any retention or payment of moneys due the contractor by Town will not release the contractor from liability.
- C.** Upon seven (7) days written notice to the contractor, Town may, without cause and without prejudice to any other right or remedy, elect to abandon the work and terminate the Agreement. In such case, the contractor shall be paid (without duplication of any items):
 - 1. For completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date or termination, including fair and reasonable sum of overhead and profit on such work;
 - 2. For expenses sustained prior to effective date of termination in performing services and furnishing labor, materials or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;
 - 3. For amounts paid in settlement of terminated contracts with Subcontractors, manufacturers, fabricators, suppliers or distributors and others; and
 - 4. For reasonable expenses directly attributable to termination. contractor shall not be paid on account of loss of anticipated profits or revenue or other economic loss or any consequential damages arising out of such termination.

Section 35. Change in the Contract Time

- 35.1** The contractor agrees that it will make no claim against the Town or any of its representatives for damages for delay, interference or disruption in the performance of its Contract occasioned by any act or omission to act by the Town or any of its representatives, or occasioned by any act or omission of any other contractor and further agrees that any such claim shall be fully compensated for by an extension of time to complete the performance of the work as provided herein.
- 35.2** The Contract Time may only be changed by a Change Order. Any claim for an extension in the Contract Time shall be based on written notice delivered to Town within fifteen (15) days of the occurrence of the event giving rise to the claim. Notice of the extent of the claim with supporting data shall be delivered within twenty (20) days of such occurrence unless the Town allows an additional period of time to ascertain more accurate data. Any change in the Contract Time resulting from any such claim shall be incorporated in a Change Order.
- 35.3** The Contract Time will be extended in an amount equal to time lost due to delays beyond the control of the contractor. Such delays shall include, but not be limited to, acts or neglect by Town, or to fires, floods, labor disputes, epidemics, abnormal

weather conditions, or acts of God. No extension of the Contract Time will be granted where the delay is attributable to a subcontractor, manufacturer, fabricator, supplier or distributor or any other party performing services or furnishing material or equipment on behalf of the contractor unless such party's delay is attributable to one of the above enumerated causes.

35.4 The time limits concerning Substantial Completion and final completion as stated in the Contract Documents are of the essence. The provisions of this section shall not exclude recovery for damages (including compensation for additional professional services) for delay by either party, provided, however that the contractor shall not be entitled to damages for any delay occurring as a consequence of a delay if the performance of said additional work was noted in the Contract Documents and the delay (by others) was not directly caused by the fault of the Town.

Section 36 Disputed Work - Notice of Claims For Damages

36.1 If the contractor is of the opinion that any work required, necessitated, or ordered violates or conflicts with or is not required by the terms and provisions of the contract, he must promptly, within five (5) calendar days after being directed to perform such work, notify the Town, in writing, of its contentions with respect thereto and request a final determination thereon. If the Town determines that the work in question is contract and not extra work, or that the order complained of is proper, he will direct the Contractor in writing to proceed and the Contractor shall promptly comply. In order, however, to preserve its right to claim compensation for such work or damages resulting from such compliance, the Contractor must, within seven (7) calendar days after receiving notice of the Town's determination and direction, notify the Town, in writing that the work is being performed or that the determination and direction is being complied with, under protest. Failure of the Contractor to so notify shall be deemed as a waiver of claim for extra compensation or damages therefore.

36.2 The contractor is bound by the provisions of all applicable laws, including but not limited to the General Municipal Law and the Town Law, as related to the presentation of claims.

36.3 While the contractor is performing disputed work or complying with a determination or order under protest in accordance with this Article, in each such case the contractor shall furnish the Town daily with three copies of written statements signed by the Contractor's representatives at the site showing:

- i.** the name of each workman employed on such work or engaged in complying with such determination or order, the number of hours employed thereon, and the character of the work each is doing; and
- ii.** the nature and quantity of any materials, plant and equipment furnished or used in connection with the performance of such work or compliance with such order, and from whom purchased or rented.

- 36.4** The contractor shall carry on the work and maintain the progress schedule during all disputes or disagreements with the Town. No work shall be delayed or postponed pending resolution of any disputes or disagreements, except as the contractor and Town may otherwise agree in writing.
- 36.5** Before final acceptance of the work by the Town, all matters of dispute must be adjusted to the mutual satisfaction of the parties thereto. Determinations and decisions in case any questions shall arise, shall constitute a condition precedent to the right of the Contractor to receive the money therefore, until the matter in question has been adjusted.

PART THREE

TECHNICAL SPECIFICATIONS

SECTION 0101

SITE PREPARATION AND REMOVALS

PART 1: WORK

1.01 DESCRIPTION

Under this work, the Contractor shall furnish all labor, materials and equipment necessary to perform clearing, grubbing and removals within the proposed construction area as required to complete the proposed improvements. This shall include such work as removing shrubbery, trees, roots, stumps, stones, vines, topsoil, organic matter, masonry, large boulders, concrete pavement and curbs, concrete rubble, asphalt, existing utilities, rubbish and other objectionable materials. The Engineer, at his discretion, may require additional work under this section if he deems this work necessary to comply with the intent of this project. Any work not included under this specification but required for the successful completion of project work, as deemed by the Engineer, shall be performed by the Contractor as directed by the Engineer and paid for under Item 1002 Additional Miscellaneous Work.

The Contractor shall carefully protect all trees and shrubs and other growth to be protected as shown on the contract drawings. Restoration shall be as specified in Section 0706 Site Restoration of these specifications. The Engineer shall have the final authority on the removal of all trees and existing features to remain. The Contractor at his expense in accordance with Section 0706 Site Restoration and the General Conditions shall replace any trees removed contrary to the orders of the Engineer. The Contractor shall be responsible for any and all damages to property caused by the removals operations. All damaged trees and plants or improvements shall be replaced or restored to their original condition to the satisfaction of the Engineer. Further any new or existing improvements to remain shall also be protected throughout the construction of the project. The Contractor will be responsible at his expense to replace any improvements damaged by his company workers and those of any subcontractors hired by the Contractor.

All materials removed under this item, which are not to be reset, shall be promptly and legally disposed of offsite by the Contractor. Burning material shall not be allowed. No removed trees, shrubs, stumps, roots, wood chips or branches may be used as backfill.

PART 2: MATERIALS

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PART 3: METHOD

3.01 DESCRIPTION

Unless otherwise directed, the Contractor shall thoroughly clear, grub and remove all objectionable surface material flush with existing grades. Trees, stumps, roots and shrubs will be removed to a depth of two feet below subgrade or as required to provide a suitable subgrade upon which the proposed facilities shall be constructed.

Note that existing topsoil shall be stored as shown on the Contract Drawings and protected during the course of construction.

All debris, refuse, solid waste, tires, wooden planks, junk of any nature, etc. shall also be removed from the site and disposed of legally in a manner that meets all applicable Federal, State and local codes and ordinances.

3.02 CLEARING AND REMOVALS

From areas to be cleared, the Contractor shall cut or otherwise remove all sapling trees, brush, and other vegetable matter such as snags, bark, shrubbery, trees, roots, stumps, stones, vines, topsoil, organic matter, masonry, large boulders, concrete pavement and curbs, concrete rubble, asphalt, existing utilities to be removed, rubbish and other objectionable materials. No debris may be disposed of on premises.

3.03 GRUBBING

The site has been previously cleared of all trees, tree stumps. Grubbing is not required under this contract.

3.04 STRIPPING

All stumps, roots, foreign matter, topsoil, loam and unsuitable earth shall be stripped from the ground surface. The topsoil and loam shall be utilized insofar as possible, for finished surfacing unless otherwise directed by the Engineer. Only excess or unsuitable soils shall be taken from the site unless otherwise directed by the Engineer.

Strip topsoil to depths encountered in a manner that prevents intermingling of topsoil with underlying subsoil or other objectionable material.

The Contractor shall not strip topsoil from within the drip line of any tree to remain.

3.05 STOCKPILING

The Contractor shall stockpile topsoil in storage piles as shown on the Contract Drawings and where approved by the Engineer. Construct stockpiles so that surface water drains freely.

3.06 DISPOSAL

The Contractor shall protect topsoil piles if required by the work. Silt fencing around the perimeter shall be installed to prevent soil erosion and sedimentation. All material not scheduled for reuse or stockpiling shall become the property of the Contractor and shall be suitably disposed of off site in accordance with all applicable laws, ordinances, rules and regulations, unless otherwise directed by the Engineer.

All removed trees, shrubs, stumps, roots, wood chips or branches, concrete debris, asphalt debris, remains of utilities or other structures, or any debris remaining from site preparation or excavation must be disposed of off-site. No woody debris must be used as fill or backfill or embankments or dikes.

Such disposal shall be performed as promptly as possible after removal of the material and shall not be left until the final period of cleaning up. It is the Contractors responsibility to properly dispose of any materials to be removed off-site as per all sections of these specifications. The Contractor is responsible to find a legitimate disposal site and must obtain any permits or licenses required for proper disposal. The Contractor is responsible for any fees or fines associated with the proper disposal of any materials outline in all sections of these specifications.

PART 4: MEASUREMENT AND PAYMENT

4.01 DESCRIPTION

The cost for this work item shall be included in the **Project Lump Sum** bid and shall include the cost of all labor, materials and equipment necessary to clear and remove all objectionable material within the limits shown on the Contract Drawings and as directed by the Engineer.

The work shall include but not be limited to clearing surface material, removal and disposal of shrubbery, trees, stones, vines, topsoil, organic matter, masonry, large boulders, concrete rubble, concrete pavement and curbs, concrete rubble, asphalt, existing utilities to be removed, rubbish and other objectionable materials as determined and directed by the Engineer.

SECTION 0102

SURVEY AND STAKEOUT

PART 1: WORK

1.01 DESCRIPTION

Under this work, the Contractor shall perform all necessary land surveying required to construct all elements of the project as shown on the Contract Drawings and described in the Specifications. The Contractor is to protect all boundary and survey markers that are either shown on the plans or discovered on the project site. This work shall include but not be limited to stakeout, layout, elevations and markers for all aspects of the project, as shown and as required, and shall be performed by a NYS Licensed Land Surveyor and experienced personnel. This work shall include three (3) copies and a digital copy of the project "As-Built" including underground utilities and structures (water service, electric, drainage).

PART 2: MATERIALS

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PART 3: METHOD

3.01 DESCRIPTION

All work performed and materials utilized for Survey and Stakeout shall be as specified in Sections 625-1.01, 625-.2.01, 625-3.01, of the New York State Department of Transportation Standard Specifications of January 1, 2026 and shall be done to the satisfaction of the Engineer.

PART 4: MEASUREMENT AND PAYMENT

4.01 DESCRIPTION

The cost for this work item shall be included in the **Project Lump Sum** bid and shall include the cost of all labor, materials and equipment necessary for all Survey and Stakeout. The Lump Sum price bid shall include the cost of furnishing of all labor, materials and equipment required to do all survey and stakeout work, and any incidental work required to complete the work as specified in the Contract Documents and Specifications, and to the satisfaction of the Engineer.

SECTION 0103

EROSION AND SEDIMENT CONTROL

PART 1: WORK

1.01 DESCRIPTION

Under this work, the Contractor shall provide all materials, equipment, and labor to install and maintain the measures which are required to prevent erosion and control sediment as per the Contract Drawings and/or direction of the Engineer. The Contractor shall be responsible to continuously maintain, reinstall or relocate the erosion and sediment controls (E&SC) throughout the duration of the project and until such time as the site is stable and so directed to remove such practices by the Engineer. The Contractor shall understand that the transport of sediment off the site in any form is fully his responsibility and he shall clean, repair damage, and pay imposed fines at the Contractor's expense.

1.02 REFERENCE

New York State Standards and Specifications for Erosion and Sediment Control (NYSSSESC), July 2024 or latest edition.

PART 2: MATERIALS

2.01 STABILIZED CONSTRUCTION ENTRANCE

- A. Stabilized construction entrances shall be provided at all construction site traffic entrance/exit points, as specified in the Standard Specifications For Stabilized Construction Entrance included in the NYSSSESC. A stabilized construction entrance shall be provided, location as shown on the Contract Drawings. The Contractor's actual plans to enter and exit the construction site may require additional installations; these will be provided as required to provide complete site access coverage, at no cost to the Owner.

The symbols shown on the Contract Drawings are schematic only and do not precisely indicate locations of the stabilized construction entrances. These stabilized entrances shall be provided as close to paved-surface roadways as practicable.

- B. The stabilized construction entrances shall be provided to any activity on the site; maintained throughout construction and removed, and area restored, following construction, unless incorporated as part of the work.

2.02 SILT FENCE

- A. Silt fences, as specified in the Standard Specifications for Silt Fence included in the NYSSSESC shall be installed and maintained to control and prevent sediment movement. The silt fence shall be installed in the locations shown on the drawings or any other location

deemed necessary by the Engineer and shall meet the specifications as per the standard detail.

Required locations for these fences will at the minimum include the following:

1. All areas down gradient of the construction site; including areas between the construction site and waterways and wetlands.
 2. Steeply sloped areas as required.
 3. Other areas as shown on the Contract Drawings or as directed by the Engineer.
- B. Silt fences shall be installed prior to site disturbance that requires such protection, and maintained throughout the period of disturbance.
- C. Silt fences shall be removed following establishment of sufficient vegetation to control and prevent erosion.

2.03 SOIL STOCKPILE

Areas are provided for temporary stockpiling of delivered soil material for the construction. These areas will be contained with sediment fences to prevent the movement of sediment. The stockpiles, if not active for more than seven (7) days, will be seeded and mulched. The stockpile areas were placed to best suit the proposed construction activity. The stockpile will be installed as per the drawings.

2.04 TEMPORARY VEGETATIVE COVER

This stabilization measure may be temporary and in other cases permanent vegetative cover is used. The vegetative cover specifications are based on the NYSSSESC Manual. On the Constructions Plans are notes, locations, and specifications as to the vegetative cover requirements. In the notes, there are specific situations and time constraints related to stabilization of disturbed areas. The specifications give seed and fertilizer mixes as well as placement. Any disturbed area expected to remain exposed for more than seven (7) days shall receive temporary vegetative cover.

2.05 TEMPORARY SEDIMENT TRAP

The Erosion and Sediment Control Plan provides the location for temporary sediment traps. The sediment traps are to be placed in the location of the point of concentration of runoff and therefore the logical place to collect sediment or as directed by the Engineer. This practice can be relocated or additional traps may be installed to accommodate the current construction phase. Within the Erosion Control Notes and Construction Sequence, there are specific requirements for the installation and maintenance during construction. These can be found in the Construction Plans. Upon stabilization of the site, the sediment trap will be removed. The size of the sediment trap shall be determined by the Engineer if needed.

2.06 STORM DRAIN INLET PROTECTION

The inlet protection is specified to provide a permeable barrier around drainage inlets to reduce sediment content in runoff before entering the storm drain system. These shall be installed over each drainage inlet and shall be replaced as necessary based on sediment accumulation and at the direction of the Engineer.

2.07 EROSION BLANKETS

Erosion blankets and seeding shall be used for the stabilization of slopes 3:1 or greater or as otherwise specified. The blankets shall be installed as per the Plans and Details, and the manufacturer's specifications. They shall be stapled or staked in place as per the manufacturer's specifications. The blankets may be installed at locations other than those shown on the Plans as directed by the Engineer.

2.08 SOIL RESTORATION

The Contractor shall provide Soil restoration which is a practice for construction projects where soil compaction occurs to soils which will be permanently vegetated. This compaction is typically a result of heavy vehicle traffic, cutting or filling, and areas which may receive heavy surcharges. Soil restoration can be done by tilling or aerating the soil to a depth of 12-inches. In heavy traffic areas, 3-inches of compost shall be placed over the compacted areas prior to the tilling. After the restoration, a 3/8" metal bar should be able to be hand pushed into the soil. Areas within the drip-line of trees should not be tilled. This work will be done at the direction of the Engineer.

2.09 WATER BARS

Where designated on the plan or as directed by the Engineer the Contractor shall install water bars. Water bars shall be used for diversion of surface runoff to limit the accumulation of erosive velocities of water. The water bars should be installed as per the Contract Drawings and Details. The water bars may be installed at locations other than those shown on the Contract Drawings as directed by the Engineer.

2.10 WASTE DISPOSAL

The Contractor is responsible the proper disposal of all solid, sanitary and toxic waste in accordance with applicable local, state and federal regulations. It is prohibited to burn, bury or pour out onto ground or into the storm sewers any solvents, paints, stains, gasoline, diesel fuel, used motor oil, hydraulic fluid, anti-freeze, cement curing compounds, or other toxic or hazardous wastes. The Contractor shall be responsible for disposal of all waste off site.

2.11 CONCRETE TRUCK WASHOUT

The Contractor is responsible for designating a wash out area for cement trucks. This shall be a diked area where the washings can be collected and disposed of properly when they harden.

2.12 DUST CONTROL

The Contractor shall insure the generation of dust shall be minimized by limiting the extent of exposed soils and re-establishing vegetative cover in these areas as soon as possible. Additional and/or temporary methods to minimize dust may include wetting, mulching, spray adhesives, stone covering and wind barriers. The Contractor shall have the necessary access to water to perform this task.

2.13 STABILIZATION

The Contractor shall initiate stabilization measures as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than seven (7) days

after the construction activity in that portion of the site has temporarily or permanently ceased. This requirement does not apply in the following instance:

Where the initiation of stabilization measures by the 7th day after construction activity temporarily or permanently ceased is precluded by snow cover or frozen ground conditions, stabilization measures shall be initiated as soon as practicable.

All areas not designated as buildings, roads, driveways, parking lots, walks, or aprons shall be established as lawn or vegetative areas.

2.14 DEWATERING ACTIVITIES SEDIMENT CONTROL

All waters which the Contractor pumps from excavations on this Project shall be routed through a portable sedimentation tank so as to remove all sediments carried by such water. The tank shall be in accordance with the Standard Specifications for Portable Sediment Tank included in NYSSSESC. The tank(s) shall be provided at any and all excavation locations, as warranted by dewatering activities.

2.15 CLEANING UP

As the work progresses, clean up the streets and rights of way and grade and round the backfill within the limits of the excavation. Mark soft trenches with signs, and adequate lights. Promptly refill, compact and grade all areas which settle subsequent to the initial backfilling.

All streets utilized by or worked on by the Contractor will be swept with approved self-contained mechanical sweeping equipment as directed by the Engineer but at least once every two (2) weeks until acceptance of the work by the Engineer.

Upon completion of the work haul all dirt and rubbish from the work site and leave the site clean to the satisfaction of the Engineer. Remove all surplus material, tools and temporary structures from the site.

PART 3: METHOD

3.01 DESCRIPTION

All work shall be in compliance with the drawings and shall follow the NYSSSESC. The Contractor shall install all E&SC practices as per the plan, details and notes as detailed on the Contract Drawings and these specifications. They shall adhere to the greatest extent possible the construction sequence and when not possible shall notify the Engineer to discuss modifications. Further, the contractor shall insure that at the end of each work day that the site shall be stabilized and the roadway clean of any soil tracked off site. In the event a precipitation event is forecasted, the Contractor shall prepare the site by inspecting and if necessary clean and repair all E&SC, stabilize open areas, place tarps over open soil piles and install temporary diversions to prevent the erosion of soils and possible transport of sediment off site or into the town drainage system. Where necessary if the Contractor shall protect open excavations or trenches during forecasted precipitation event by diverting concentrated surface flows per the means provided on the plans or as directed by the Engineer.

PART 4: MEASUREMENT AND PAYMENT

4.01 DESCRIPTION

The cost for this work item shall be included in the **Project Lump Sum** bid and shall include the cost of all labor, materials and equipment necessary to complete the work as specified in the Contract Documents and Specifications, and to the satisfaction of the Engineer.

SECTION 0201

EARTHWORK

PART 1: WORK

1.01 DESCRIPTION

Under this work, the Contractor shall furnish all labor, materials and equipment necessary to perform all excavation and grading not specifically included in other bid items and required to complete the proposed improvements of the project in the areas designated in the Contract Documents as shown on the Site Plan and specified herein. Work shall include but not be limited to the following:

- A. Excavation – General & Rock
- B. General grading for all site improvements including all grassed and surrounding areas.
- C. Backfilling and compaction as required.
- D. Screening of excavated material as required
- E. Dewatering or addition of water as required.
- F. Stockpiling and reuse of excavated material, topsoil and stone.
Protection of excavations.

- G. Proper disposal of excess and unsuitable materials resulting from earthwork operations.

Included in this item of work are the following item numbers:

0201.1	Earthwork - General
201.2	Earthwork – Rock Excavation

Item 0201.1 Earthwork - General: The Contractor shall include the cost of furnishing all labor, materials and equipment, excavation, grading, screening of excavated material as required, placement and compaction. Excavation shall include transportation and stockpiling of material and miscellaneous survey work necessary to complete the work specified under this section as directed by the Engineer or Town.

Item 0201.2 Earthwork – Rock Excavation: The Contractor shall include the cost of furnishing all labor, materials and equipment, rock excavation, rock removal, grading, screening of excavated material as required, placement and compaction. Excavation shall include transportation and stockpiling of material and miscellaneous survey work necessary to complete the work specified under this section as directed by the Engineer or Town. For bid purposes, **100 cubic yards** have been assumed for this work.

The Engineer at his discretion may require additional work under this section if he deems this work necessary to comply with the intent of this project. Any work not included under this specification but required for the successful completion of project work, as deemed by the Engineer, shall be performed by

the Contractor as directed by the Engineer and paid for under Item 1000 Additional Miscellaneous Work.

1.02 RELATED WORK SPECIFIED ELSEWHERE

1. Section 0101 Site Preparation and Removals
2. Section 0102 Survey and Stakeout
3. Section 0103 Erosion and Sediment Control
4. Section 0202 Unclassified Excavation
5. Section 0203 Select Fill Material
6. Section 0301 Cast-In-Place Concrete
7. Section 0402 Furnish and Install Sanitary Sewers
8. Section 0501 Precast Concrete Manholes
9. Section 0601 Sewage Pumping Station
10. Section 0701 Pipe Jacking
11. Section 0802 Electrical Work
12. Section 0901 Site Restoration

1.03 REFERENCES

- A. General: The work shall comply with the most recent standards or tentative standards as published at the date of the contract and as listed in this specification using the abbreviation shown.
- B. American Society for Testing and Materials (ASTM):
 1. D 698 Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft).
 2. D 1556 Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
 3. D 1557 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³)(2,700 kN-m/m³).
 4. D 2167 Standard Test Method for Density and Unit Weight of Soil In Place by the Rubber Balloon Method.
 5. D 2216 Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass.
 6. D 2487 Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).
 7. D 2922 Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
 8. D 2937 Standard Test Methods for Density of Soil in Place by the Drive-Cylinder Method.
 9. D 3017 Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).
 10. D 4318 Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
- C. New York State Department of Environmental Conservation – 6NYCRR PART 375

1.04 DEFINITIONS

- A. Unclassified Excavation: For the purposes of payment, material shall not be classified except for those items specifically listed in the Bid Form.
- B. Rock: For the purposes of classified excavation, rock shall be defined as material that cannot be dislodged by a Caterpillar Model No. D-8N, heavy duty track-type tractor, rated at not less than 285 hp flywheel power and equipped with a single shank hydraulic ripper, capable of exerting not less than 45,000 lbs breakout force. Rock excavation includes up to 6 inches over-excavation below the required excavation depth. Excavated rock shall be quantified by measuring the volume of removed rock and reducing this amount by 35%. This definition of rock does not include materials such as hardpan, loose rock, concrete or other materials that can be removed by means other than drilling and blasting, but which for reasons of economy in excavating the CONTRACTOR chooses to remove by drilling and blasting.
- C. Trench Rock: For the purposes of classified excavation, trench rock shall be defined as material encountered in trench excavation that cannot be dislodged by a Caterpillar Model No. 215D-LC track-type hydraulic excavator, equipped with a 42-inch wide short-tip radius rock bucket, rated at not less than 120 hp flywheel power with bucket-curling force of not less than 25,000 lbs and stick-crowd force of not less than 18,000 lbs. Trench rock excavation includes up to 6 inches over-excavation below the required excavation depth. Rock shall be quantified by measuring the extent of rock in the trench, not by measuring the volume of removed rock. This definition of trench rock does not include materials such as hardpan, loose rock, concrete or other materials that can be removed by means other than drilling and blasting, but which for reasons of economy in excavating the CONTRACTOR chooses to remove by drilling and blasting.
- D. Unsuitable Material: For the purposes of classified excavation, unsuitable material shall be defined as material below subgrade elevation that exhibits excessive pumping or that does not meet density requirements due to unsatisfactory material as determined by Geotechnical Engineer.
- E. Satisfactory Materials: Materials classified by ASTM D 2487 as GW, GP, GM, GC, SW, SP, SM, SC, ML, and CL are satisfactory as fill for overlot grading and are satisfactory in-situ. Materials shall have a minimum compacted density of 95 pounds per cubic foot and a plasticity index in excess of 15.
- F. Unsatisfactory Materials: Materials classified by ASTM D 2487 as OL, OH, MH, CH, and PT are unsatisfactory in-situ and as fill. Unsatisfactory materials also include those materials containing roots and other organic matter, trash, debris, frozen materials, and stones larger than 6 inches. Fill materials containing stones larger than 3 inches shall not be used in the uppermost 2 feet.
- G. Cohesionless and Cohesive Materials: Cohesive materials include materials classified as GC, SC, ML, CL, MH, and CH. Cohesionless materials include materials classified in ASTM D 2487 as GW, GP, SW, and SP. Materials classified as GM and SM will be identified as cohesionless only when the minus #40 fraction has a plasticity index of zero as classified by ASTM D 4318.
- H. Degree of Compaction: Degree of compaction is a percentage of the maximum density obtained by the test procedure presented in ASTM D 698 or ASTM D 1557 as specified, abbreviated below as a percent of laboratory maximum density.

- I. Topsoil: Material obtained from excavations, suitable for topsoils shall consist of friable clay loam, free from roots, stones, other undesirable material and shall be capable of supporting a good growth of grass.
- K. Native Material: Excavated material that has been stockpiled onsite for later re-use.
- L. Geotechnical Engineer: A representative of a commercial geotechnical testing laboratory which will be used by the CONTRACTOR to provide the required quality assurance testing.

1.05 DESIGN REQUIREMENTS
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1.06 SUBMITTALS

- A. Product Data: Submit manufacturers' information for the following:
 - 1. Each type of plastic warning tape.
 - 2. Drainage filter fabric.
 - 3. Separation fabric.
- B. Samples: For the following:
 - 1. 30-lb (14-kg) samples, sealed in airtight containers, of each proposed soil material from borrow sources.
- C. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated:
 - 1. Classification according to ASTM D 2487 of each on-site or borrow soil material proposed for fill and backfill.
 - 2. Laboratory compaction curve according to ASTM D 1557 for each on-site or borrow soil material proposed for fill and backfill.
- D. New York State Department of Environmental Conservation – 6NYCRR PART 375
 - 1. Laboratory test results.

1.07 QUALITY ASSURANCE

- A. Geotechnical Testing Agency Qualifications: An independent testing agency qualified according to ASTM E 329 to conduct soil materials and rock-definition testing, as documented according to ASTM D 3740 and ASTM E 548.
- B. Regulatory Requirements
 - 1. Town of Yorktown: Work of this Section shall conform to all requirements of the Town of Yorktown, Department of Parks and Recreation regulations and all applicable regulations of governmental authorities having jurisdiction including safety, health, noise, and anti-pollution regulations. Where more severe requirements than those contained in the Town of Yorktown, Department of Parks and Recreation regulations are given in this Section, the requirements of this Section shall govern.

2. New York State Department of Environmental Conservation

3. New York State Department of Transportation

1.08 PROJECT CONDITIONS

- A. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Owner and then only after arranging to provide temporary utility services according to requirements indicated:
 - 1. Notify Owner not less than three days in advance of proposed utility interruptions.
 - 2. Do not proceed with utility interruptions without Owner's written permission.
 - 3. Contact utility-locator service for area where Project is located before the start of work.
- B. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies to shut off services if lines are active.
- C. Special Conditions: This is an active golf course and the Contractor shall make every effort to minimize any disruptions to the operation of the facility. The Contractor shall notify the Town a minimum of 48 hours prior to the start of work that may impact the facility and shall provide a detailed schedule and time line for each work activity so that the Town can properly plan and notify the public of any potential disruptions.

1.09 DELIVERY, STORAGE, AND HANDLING

- A. Protect material from the elements and from other damage on the site before, during, and after installation.
- B. The Contractor shall replace and pay for any material and work damaged to the satisfaction of the Town and Engineer.

PART 2: MATERIALS

2.01 DESCRIPTION

- A. General: Imported materials utilized for this Project shall be obtained from a source that has been licensed or permitted for such use by local and state authorities. The Contractor shall be required to submit evidence of such if so requested.
- B. All excavated materials which in the opinion of the Engineer are suitable for backfilling shall be stockpiled at the locations shown on the Contract Drawings for later re-use. All surplus materials and materials not suitable for backfill shall be removed from the site and disposed of by the Contractor. No additional payment will be made for this, but the cost thereof shall be deemed included in the price for the item for which work is being performed.
- C. Excavated Material: Excavated material shall be used as backfill under this item unless the Engineer deems the material to be unsuitable. Excavated material used as backfill and

grading, shall meet the gradation requirements for Granular Fill. No additional payment will be made for this work.

2.02 BACKFILL MATERIAL

- A. All fill materials shall be free Materials containing excessive amounts of water, plastic clay, vegetation, organic matter, debris, pavement, construction debris, stones or boulders over 6 inches in greatest dimension, frozen material, and material which, in the opinion of the Engineer is unsuitable shall be immediately removed from the site. Materials from other sources may be used upon approval by the Geotechnical Engineer. Fill materials in the uppermost 2 feet shall not have any rocks larger than 3 inches in diameter.
1. Imported soil or fill materials to the site shall be analyzed for the following chemical parameters using EPA methods. Volatiles, Semi-Volatiles, TAL Metals, Pesticides/Herbicides, PCB's. Concentrations shall be compared to the NYSDEC Technical Assistance Guidance Memorandum (TAGM) and approved by the ENGINEER. Samples shall be taken at a frequency of 1 per 5,000 cubic yards if originating from a natural borrow source and 1 per 1,000 cubic yards if manufactured or recycled.
- B. Borrow Material: Where undercutting or construction of embankments are required and the Engineer deems that onsite material is unsuitable, he may require that the Contractor import suitable fill material. Suitable soil materials are defined as those complying with ASTM D2487 soil classification groups SM, SW, and SP or NYSDOT Item 733-09 Select Borrow or as directed by the Engineer. The source shall be approved by the Engineer. Borrow Material if ordered by the Engineer will be paid under Item 1002. No payment will be made without the prior approval of the Engineer or Town.
- C. Select Granular Fill: Material for use in replacing undercut areas or in construction of embankments or where called for shall be approved by the Engineer and obtained from approved sources. Suitable soil materials shall be sound, durable, sand, gravel, stone, or blends of these materials, free from organic and other deleterious materials conforming to NYSDOT Item 733-1101 and have the following gradation as determined by ASTM Designation D-422, Particle Size Analysis of Soils:

Sieve Size Max	% Passing by Weight
4 inch	100
No. 40	5 – 70
No.200	0 -15

Select Granular Fill, if ordered by the Engineer, shall be paid under Item 1002. No payment will be made without the prior approval of the Engineer or Town.

- D. Granular Fill: Material for use as backfill where called for by the Engineer shall be approved by the Engineer and obtained from approved sources. Native material may be used as backfill provided it meets the gradation specified below. Granular fill shall consist of suitable soil materials and shall be sound, durable, sand, gravel, stone, or blends of these materials, free from organic and other deleterious materials having the following gradation as determined by ASTM Designation D-422, Particle Size Analysis of Soils:

Sieve Size Max	% Passing by Weight
1 inch	100
No. 40	5 – 70
No.200	0 -15

Granular Fill, if ordered by the Engineer, shall be paid under Item 1002. No payment will be made without the prior approval of the Engineer or Town.

E. Site Stripped Topsoil may be used as fill in landscape areas only.

PART 3: METHOD

3.01 DESCRIPTION

The Contractor shall perform the required work under this section in accordance with the conditions and requirements as specified. The Contractor shall perform and execute all necessary unclassified excavation required to finish the work needed to complete all items or as directed by the Engineer.

The Contractor shall supply all labor and equipment to complete the work and will make provisions for sheeting, bracing or trench boxes for deep trench excavations. It is the Contractors obligation to make certain that grades stakes, bench marks, and offset staking are in place and accurately reflect elevations as per the construction drawings.

Excavation shall generally be taken to mean the removal of soil, pavements, curbs, sidewalks, stumps, boulders, concrete and other material of any nature whatsoever that may be encountered.

The methods of excavation shall also be defined as the following.

Conservation of Topsoil: Topsoil shall be removed as required without contamination with subsoil and stockpiled if the material is to be re-used convenient to areas for later application or at locations specified. Any surplus of topsoil from excavations and grading shall be stockpiled in location approved by the Town. A silt fence shall be installed on the downslope side and the stockpiles seeded.

- A. Conservation of Excavated Material: Excavated material shall be removed as required and stockpiled if the material is to be re-used convenient to areas for later re-use or at locations specified. Any surplus of material from excavations and grading shall be stockpiled in location approved by the Town. A silt fence shall be installed on the downslope side and the stockpiles seeded.
- B. Conservation of Stone & Rock: Stone and rock shall be excavated as maybe required and stockpiled if the material is to be re-used convenient to areas for later application or at locations specified.
 - 1. The existing stone walls within the work area to be demolished shall be stock piled for later re-use. Stone not incorporated into the work shall become the property of the Town.

2. The Contractor shall carefully protect all trees and shrubs and other landscape vegetation to remain shall be protected as per specification "Site Restoration." The Town shall have the final authority on the removal of all trees and existing features to remain. The Contractor at his expense in accordance with the Section 0901 Site Restoration and the General Conditions shall replace any trees removed contrary to the orders of the Town. The Contractor shall be responsible for any and all damages to property caused by the removals operations. All damaged trees and plants or improvements shall be replaced or restored to their original condition to the satisfaction of the Town. Further any new or existing improvements to remain shall also be protected throughout the construction of the project. The Contractor will be responsible at his expense to replace any improvements damaged by his company workers and those of any subcontractors under the Contractor.

All materials removed under this item, which are not to be reset, shall be promptly and legally disposed of offsite by the Contractor. Burning material shall not be allowed. No removed trees, shrubs, stumps, roots, wood chips or branches may be used as backfill.

3.02 PERFORMANCE AND LIMITS

A. General

All areas subject to earthwork shall be brought to the required elevations and grades by excavating, filling, and grading. Excavated materials found suitable by the Engineer, shall be used in making embankments and filling the low areas of the work, and at such places as the Engineer may direct. Where required embankments shall be constructed as directed by the Engineer. The soil shall be placed in successive horizontal layers not over six (6") inches in depth, extending across the entire fill. It shall be spread and shall then be thoroughly compacted by rolling with a self-propelling roller weighing not less than ten (10) tons to the satisfaction of the Engineer. In places where the use of this roller is impracticable or where subsurface or surface structures may be damaged a lighter weight one may be substituted or the area shall be compacted by mechanical tamping, all with the approval, and to the satisfaction of the Engineer. Any hollows and/or depressions which may result from rolling and compacting shall be filled with like or acceptable material, and the sub-grade shall again be compacted. This shall be repeated until all depressions are eliminated. Where clay or plastic soils are encountered rolling shall be done in such a manor as to avoid a plastic condition. In all cases these type soils should not be rolled when wet.

The Contractor shall make sure to level the bottoms of all excavations accurately to the limits and levels shown on the plans or as directed by the Engineer to receive the bottom of structures or other work supported on soil. Where the excavation limit has been exceeded by error on the part of the Contractor, the over excavated zone will be filled to the correct grade. At the discretion of the Engineer this zone will be filled with concrete or compacted crushed stone. The Contractor will not receive any additional payment for these corrective measures. Further all soft, wet, clay or other objectionable material below the proposed sub-grade shall be removed to the satisfaction of the Engineer. The excavated zone shall be brought up to

sub-grade level with material acceptable to the engineer. Under foundations and structures, 3000 psi concrete will be used. Otherwise Crushed Stone will be used, placed in 6" lifts and fully compacted to the satisfaction of the Engineer. Payment shall be included in the item that requires this fill.

The Contractor shall maintain the banks of excavation in a safe and stable condition. The Contractor shall furnish and install temporary sheet piling or planks, braces and shores of good sound timber of adequate strength, and shall remove such piling or shoring as the foundation work progresses.

When the excavations have been completed to the required depth as shown on the drawings, the Contractor shall do no more work until after inspection by the Engineer, who shall order the foundation or other work to proceed, or further excavation, as the conditions indicate and no foundation or other work shall be done until the excavation therefore have been approved by the Engineer.

3.03 PREPARATION

- A. Compaction of the Subgrade - All subgrade materials shall be compacted prior to placement of fill or permeable aggregate base material as follows:
 - 1. Compact the subgrade a minimum depth of 16 inches below the subgrade surface under all locations.
 - 2. Any soft or yielding areas shall be re-compacted or removed and replaced with suitable material to meet required compaction requirements.
- B. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
- C. Protect subgrades and foundation soils against freezing temperatures or frost. Provide protective insulating materials as necessary.
- D. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.
- E. Rock: Rock shall be removed to a minimum depth of 12 inches below the subgrade elevation. The excavated area shall be brought up to subgrade with approved material placed and compacted as described herein

3.04 DEWATERING

- A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.

B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.

1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.
2. Install a dewatering system to keep subgrades dry and convey ground water away from excavations. Maintain until dewatering is no longer required.

3.05 APPROVAL OF SUBGRADE

A. Notify Engineer when excavations have reached required subgrade.

1. If Engineer determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed by the Engineer. The Contractor shall conduct his operations to allow the Engineer to measure the cross-sections before placing the backfill.
2. Additional excavation and replacement material as ordered by the Engineer will be paid for under the corresponding pay item according to Contract provisions.
3. If unsatisfactory subgrade results from inadequate surface drainage or lack of maintenance, the Contractor shall excavate and replace the unsatisfactory material at his own cost. No additional payment will be made.

B. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Engineer.

3.06 EXCAVATION - GENERAL

A. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.

1. Excavation: After topsoil removal has been completed, excavation of every description, regardless of material encountered, within the grading limits of the project shall be performed to the lines and grades indicated. Satisfactory excavation material to be re-used shall be transported to and placed in fill areas within the limits of the work. All unsuitable material including any soil which is disturbed by the CONTRACTOR's operations and surplus material shall be disposed of at locations off site secured by CONTRACTOR and approved by the Town. Excavations carried below the depths indicated, shall, except as otherwise specified, be refilled to the proper grade with satisfactory material as directed. All additional work of this nature shall be at the CONTRACTOR's expense, unless otherwise provided for in the Bid Form. Excavation and filling shall be performed in a manner and sequence that will provide drainage at all times. Excavations shall be kept free from water while construction therein is in progress. If the CONTRACTOR fails to

provide adequate drainage and any material becomes soft or otherwise unsuitable as a result, such material shall be removed and replaced with satisfactory on-site material or borrow material from approved sources, or shall be dried and recompact as directed by the Geotechnical Engineer at no additional cost to the Town.

2. Excavation includes excavating pavements and obstructions visible on surface; underground structures, utilities, and other items indicated to be removed; together with soil, boulders, and other materials not classified as rock or unauthorized excavation.
3. Intermittent drilling; blasting, if permitted; ram hammering; or ripping of material not classified as rock excavation is earth excavation.
4. Rock excavation includes removal, stockpiling and disposal of rock.
5. Do not excavate rock until it has been classified and cross-sectioned by the Contractor's surveyor.
6. Unsuitable and excess material shall be disposed of in designated waste areas or as directed.

B. Unauthorized Excavation:

1. Unauthorized excavation consists of removal of materials beyond indicated subgrade elevations or dimensions without specific instruction from the Town or the Geotechnical Engineer.
2. Under footings or foundations, fill unauthorized excavations by extending the indicated bottom elevation of the footing or base to the unauthorized excavation bottom, but in no way altering the required top elevation.
3. Elsewhere, backfill and compact unauthorized excavations as specified for authorized excavations, unless otherwise directed by the Geotechnical Engineer.

C. Trench Excavation

1. Excavation for Trenches: Excavate to widths shown on the Drawings and depths indicated or required to establish indicated slope and invert elevations.
 - a. Produce an evenly graded, flat trench bottom at the subgrade elevation required for installation of pipe and bedding material.
 - b. Place backfill material directly into trench or excavation in lifts as shown on the Contract Drawings.

3.07 APPROVAL OF SUBGRADE

- A. Notify Engineer when excavations have reached required subgrade.
- B. If Engineer determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.
 1. Additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.

- C. Proof Rolling – The Engineer may require that the subgrade be proof rolled with heavy pneumatic - tired equipment to identify soft pockets and areas of excess yielding.
- D. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Engineer.

3.08 STORAGE OF SOIL MATERIALS

- A. Stockpile borrow materials and satisfactory excavated soil materials. Stockpile soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Contain stockpiles with silt fence.
 - 1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.09 BACKFILL

Upon completion of excavation work and installation of the structures, utilities or other work required under that item the Contractor shall request an inspection prior to backfilling. Work shall not proceed prior to inspection and approval by the Engineer. Structures may; not be backfilled prior to approval by the Engineer. The excavated voids around masonry and other work shall be filled with clean excavated soil and compacted in layers of six (6”) inches of depth. No direct payment shall be made for re-handling of excavated materials for backfilling structures, nor for any other purposes necessary to complete the work as shown on the Contract Drawings, but the compensation will be considered as having been included in the base bid for this project. Re-handling of excavated materials shall be incidental to and shall be included in any additional work which resulted as an outcome of a change made to the Contract Drawings, and is ordered in writing by the Engineer. Backfilling inside of sheeting shall be placed before sheeting is removed. After areas and trenches have been excavated and structures constructed therein, the spaces around and above them shall be carefully backfilled with acceptable material. Backfill shall be placed on both sides of structures to approximately the same elevation at the same time. All backfill shall be thoroughly tamped and rammed in place in layers not over six (6) inches in depth, using rammers of a weight acceptable to the Engineer. If directed by the Engineer, the backfill shall be thoroughly saturated with water as it is placed. Backfill adjacent to foundation walls shall be pneumatically compacted only when permitted and under the supervision of the Engineer.

- A. Prior to back fill operations the following shall be completed to the satisfaction of the Engineer:
 - 1. Underground utilities shall be surveyed for record documents.
 - 2. All underground utilities shall be tested.

3.10 FILL

- A. Preparation: Remove vegetation, topsoil, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface before placing fills.
- B. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.
- C. Place and compact fill material in layers to required elevations.
- D. No stones larger than six (6) inches in any dimension shall be placed within two (2) feet of finished subgrade elevations under pavement or walks.

3.11 MOISTURE CONTROL

The Contractor shall furnish all materials, equipment and labor required to keep the site of the work free from water, ice and snow during construction. Shall provide ample means and equipment with which to promptly remove and dispose of all water and drainage during excavation and keep all excavations dry until the structures to be constructed are completed. Pipe laying or masonry construction will not be permitted if water is in the excavation. Prior to making a connection to an existing manhole or pipe line install a plug in the existing piping to prevent groundwater or drainage from entering. Leave the plug in place until its removal is directed by the Engineer.

Under no circumstances will completed portions of the work be used as a means of dewatering trenches, unless specifically provided for under a Specification Item, no direct payment will be made for dewatering, including the use of deep wells, but compensation therefore will be considered as being included in the unit prices bid for the various items of the Contract.

- A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill layer before compaction to within 3 percent of optimum moisture content.
 - 1. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.
 - 2. Remove and replace, or scarify and air-dry, otherwise satisfactory soil material that exceeds optimum moisture content by 3 percent and is too wet to compact to specified dry unit weight.

3.12 COMPACTION OF BACKFILLS AND FILLS

- A. Place backfill and fill materials in layers not more than 12 inches in loose depth for material compacted by heavy compaction equipment, and not more than 8 inches in loose depth for material compacted by hand-operated tampers.

- B. Place backfill and fill materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.
- C. Compact soil to not less than the following percentages of maximum dry unit weight according to ASTM D 1557:
 - 1. Under structures, building slabs, steps, and pavements, scarify and recompact top 12 inches (300 mm) of existing subgrade and each layer of backfill or fill material at 95 percent.
 - 2. Under walkways, scarify and re-compact top 6 inches (150 mm) below subgrade and compact each layer of backfill or fill material at 92 percent.
 - 3. Under lawn or unpaved areas, scarify and re-compact top 6 inches (150 mm) below subgrade and compact each layer of backfill or fill material at 85 percent.

3.13 GRADING

- A. General: Uniformly grade areas to a smooth surface, free from irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
 - 1. Provide a smooth transition between adjacent existing grades and new grades.
 - 2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.
- B. Site Grading; Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances;
 - 1. Lawn or Unpaved Areas; Plus or minus 1 inch (25 mm)
 - 2. Walks: Plus or minus 1 inch (25 mm).
 - 3. Pavements: Plus or minus ½ inch (13 mm).

3.14 FIELD QUALITY CONTROL

- A. Testing Agency: The Contractor shall hire a qualified independent geotechnical/environmental engineering testing agency to perform laboratory and field

quality-control testing.

- B. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earthwork only after test results for previously completed work comply with requirements.
- C. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable. Tests will be performed at the following locations and frequencies:
 - 1. Trench Backfill: At each compacted initial and final backfill layer, at least one test for each 150 feet (46 m) or less trench length, but no fewer than two tests.
- D. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; re-compact and retest until specified compaction is obtained.
- E. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- F. Repair and reestablish grades to the specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
- G. Control Survey - Prior to commencement of this work, the Contractor shall check the existing bench marks and reference points located on or out of the site as indicated. The Contractor shall establish newly standard bench marks and control stakes for the work within the site as approved by the Engineer. A single benchmark must be established prior to any work and maintained by a licensed Surveyor of record during the entire construction process.
 - 1. Principal points – Principle points shall be established taking advantage of the existing reference points. Individual principal point posts shall be of wood, 4" x 4" size, with an indicating nail on the top, the surface of the post above the ground shall be painted white.
 - 2. Bench marks - When establishing bench marks within the site, a minimum of one (1) back and forth leveling operation shall be carried out. Establishment of temporary bench marks and stakes shall be determined and performed by the Contractor. Temporary bench mark posts shall be of wood, 2" x 2" in size, with an indicating nail on the top, the surface of the post above ground shall be painted.
 - 3. Grade Verification: A certified survey shall be performed on a 25-foot grid to verify grade and elevation of the subgrade.

- H. Finished Grading: The finished surface of the subgrade shall have a finished grade in accordance with the Plans and Specifications. Final subgrade shall be established to within a tolerance of +/- .5" (.04') of the designed subgrade elevation.

3.15 USE OR DISPOSAL OF EXCAVATED MATERIAL

- A. All undesirable material such as excavated boulders larger than 2 cubic feet, concrete, wood, metals, debris or any other deleterious material shall be removed from the site under this item. Stones under 2 cubic feet may be placed back into the excavation but shall be placed at least two (2') feet from the surface and three (3') feet away from pipes, footings or structures. Clean select fill approved by the Engineer shall be used for backfill to replace the removed debris and shall be provided and placed under this item.
- B. Any structures to be abandoned shall be broken down and excavated or removed to a depth of four (4') feet below the finished surface. Structures with solid bottoms shall be sufficiently broken to allow for drainage and the void backfilled with suitable materials approved by the Engineer. Any open ends of abandoned pipes shall be plugged to the satisfaction of the Engineer.
- C. All excavated materials which in the opinion of the Engineer are suitable for backfilling shall be stored or placed within the limits of the Contract, where directed by the Town. All surplus materials and materials not suitable for backfill shall be removed from the site and disposed of by the Contractor. No additional payment will be made for this, but the cost thereof shall be deemed included in the price for the item for which work is being performed.
- D. Where service connections for sewer, water, electric or other utility are encountered in the excavations, the service through same shall not be interrupted or disturbed by the Contractor except on order and direction of the Engineer. In the event that there is a need to disturb or relocate an existing service connection the Contractor is to notify the Engineer and the owner of the service connection and supplier of the service and a plan of action established prior to any such disturbance.
- E. Where settling occurs before project acceptance, the Contractor shall remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing. The Contractor shall restore the appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to the greatest extent possible.

3.16 SAFETY COMPLIANCE

All shoring work shall meet or exceed the requirements of the New York State Department of Labor Industrial Code Rule 23 and Title 29 Code of Federal Regulations Part 1926, Safety and Health Regulations for Construction.

Utilities and Services: It is the Contractor's responsibility to detect and protect existing utilities (to remain) from damage during construction. Prior to the start of construction the Contractor is required to

notify:

1. UFPO (Underground Facilities Protective Organization) (800) 272-4480 (non-members must be contacted separately)
2. 16 NYCRR Part 753 "Protection of Underground Facilities" mandates that the Contractor notify all underground facility operators in the area no less than two (2) and not more than ten (10) business days before the start of excavation to ensure that utility service lines are properly marked prior to excavation.

The Contractor's obligation to protect utilities is not relieved by calling the One Call Center. The Contractor shall understand that not all utilities may be located and he is responsible to locate other utilities, to the best of his ability, using electronic probes, or other methods, prior to the start of excavation. The Contractor shall then proceed cautiously and perform hand excavation, as necessary, to protect the utility as directed by the Engineer and the operator of the utility, at no extra cost. If a utility is inadvertently damaged, it is the Contractor's responsibility to restore that utility to operating condition, equal to that existing prior to damage. The Contractor shall remain at the site with the damaged utility until it has been restored and there is no danger to the public (i.e., exposed live electrical wires, etc.).

PART 4: MEASUREMENT AND PAYMENT

4.01 DESCRIPTION

The cost for this work item shall be included in the **Project Lump Sum** bid and shall include the cost of all labor, materials and equipment necessary to clear and remove all objectionable material within the limits shown on the Contract Drawings and as directed by the Engineer.

The work shall include but not be limited to Under this work, the Contractor shall furnish all labor, materials and equipment necessary to perform all excavation and grading not specifically included in other bid items and required to complete the proposed improvements of the project in the areas designated in the Contract Documents as shown on the Site Plan and specified herein. Work shall include but not be limited to the following:

- A. Excavation – General & Rock
- B. General grading for all site improvements including all grass and surrounding areas.
- C. Backfilling and compaction as required.
- D. Screening of excavated material as required
- E. Dewatering or addition of water as required.
- F. Stockpiling and reuse of excavated material, topsoil and stone.
- G. Protection of excavations.
- H. Proper disposal of excess and unsuitable materials resulting from earthwork operations.

SECTION 0202

UNCLASSIFIED EXCAVATION

PART 1: WORK

1.01 DESCRIPTION

Under this work, the Contractor shall perform all excavation not specifically included in other bid items and required for the completion of the project. All excavated materials deemed unsuitable by the Engineer, shall be removed and disposed of in accordance with the specifications. Where such excavation also includes test pits, extra width or depth of trench, cuts to sub-grade, or where other miscellaneous excavation shall be done at the direction of the Engineer or Town. The work under this section shall not be performed without the prior written authorization of the Engineer or Town.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 0101 Site Preparation and Removals
- B. Section 0102 Survey and Stakeout
- C. Section 0103 Erosion and Sediment Control
- D. Section 0202 Unclassified Excavation
- E. Section 0203 Select Fill Material
- F. Section 0301 Cast-In-Place Concrete
- G. Section 0402 Furnish and Install Sanitary Sewers
- H. Section 0501 Precast Concrete Manholes
- I. Section 0601 Sewage Pumping Station
- J. Section 0701 Pipe Jacking
- K. Section 0802 Electrical Work
- L. Section 0901 Site Restoration

PART 2: MATERIAL

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PART 3: METHOD

3.01 DESCRIPTION

The Contractor shall perform the required excavation in accordance with the conditions and requirements as specified. The Contractor shall perform and execute all necessary unclassified excavation required to finish the work needed to complete all items or as directed by the Engineer. The Contractor shall supply all labor and equipment to complete the work and will make provisions for sheeting, bracing or trench boxes for deep trench excavations. It is the Contractors obligation to make certain that grades stakes, bench marks, and offset staking are in place and accurately reflect elevations as per the construction drawings.

Excavation shall generally be taken to mean the removal of soil, pavements, curbs, sidewalks, stumps, boulders, concrete and other material of any nature whatsoever that may be encountered. The methods of excavation shall also be defined as the following.

3.02 PERFORMANCE AND LIMITS

All areas subject to earthwork shall be brought to the required elevations and grades by excavating, filling, and grading. Excavated materials found suitable by the Engineer, shall be used in making

embankments and filling the low areas of the work, and at such places as the Engineer may direct. Where required embankments shall be constructed as directed by the Engineer. The soil shall be placed in successive horizontal layers not over six (6") inches in depth, extending across the entire fill. It shall be spread and shall then be thoroughly compacted by rolling with a self-propelling roller weighing not less than ten (10) tons to the satisfaction of the Engineer. In places where the use of this roller is impracticable or where subsurface or surface structures may be damaged a lighter weight one may be substituted or the area shall be compacted by mechanical tamping, all with the approval, and to the satisfaction of the Engineer. Any hollows and/or depressions which may result from rolling and compacting, shall be filled with like or acceptable material, and the sub-grade shall again be compacted. This shall be repeated until all depressions are eliminated. Where clay or plastic soils are encountered rolling shall be done in such a manner as to avoid a plastic condition. In all cases these type soils should not be rolled when wet.

The Contractor shall make sure to level the bottoms of all excavations accurately to the limits and levels shown on the plans or as directed by the Engineer to receive the bottom of structures or other work supported on soil. Where the excavation limit has been exceeded by error on the part of the Contractor, the over excavated zone will be filled to the correct grade. At the discretion of the Engineer this zone will be filled with concrete or compacted crushed stone.

The Contractor will not receive any additional payment for these corrective measures. Further all soft, wet, clay or other objectionable material below the proposed sub-grade shall be removed to the satisfaction of the Engineer. The excavated zone shall be brought up to sub-grade level with material acceptable to the engineer. Under foundations and structures, 3000 psi concrete will be used. Otherwise Crushed Stone will be used, placed in 6" lifts and fully compacted to the satisfaction of the Engineer. Payment shall be included in the item that requires this fill.

The Contractor shall maintain the banks of excavation in a safe and stable condition. The Contractor shall furnish and install temporary sheet piling or planks, braces and shores of good sound timber of adequate strength, and shall remove such piling or shoring as the foundation work progresses. When the excavations have been completed to the required depth as shown on the drawings, the Contractor shall do no more work until after inspection by the Engineer, who shall order the foundation or other work to proceed, or further excavation, as the conditions indicate and no foundation or other work shall be done until the excavation therefore have been approved by the Engineer.

3.03 USE OR DISPOSAL OF EXCAVATED MATERIAL

All undesirable material such as excavated boulders larger than 2 cubic feet, concrete, wood, metals, debris or any other deleterious material shall be removed from the site under this item. Stones under 2 cubic feet may be placed back into the excavation but shall be placed at least two (2') feet from the surface and three (3') feet away from pipes, footings or structures. Clean select fill approved by the Engineer shall be used for backfill to replace the removed debris and shall be provided and placed under this item.

Any structures to be abandoned shall be broken down and excavated or removed to a depth of four (4') feet below the finished surface. Structures with solid bottoms shall be sufficiently broken to allow for drainage and the void backfilled with suitable materials approved by the Engineer. Any open ends of abandoned pipes shall be plugged to the satisfaction of the Engineer.

All excavated materials which in the opinion of the Engineer are suitable for backfilling shall be stored or placed within the limits of the Contract, where directed by the Engineer. All surplus materials and materials not suitable for backfill shall be removed from the site and disposed of by the Contractor. No additional payment will be made for this, but the cost thereof shall be deemed included in the price for

the item for which work is being performed.

Where service connections for sewer, water, electric or other utility are encountered in the excavations, the service through same shall not be interrupted or disturbed by the Contractor except on order and direction of the Engineer. In the event that there is a need to disturb or relocate an existing service connection the Contractor is to notify the Engineer of the service connection and supplier of the service and a plan of action established prior to any such disturbance.

3.04 BACKFILLING

Upon completion of excavation work and installation of the structures, utilities or other work required under that item the Contractor shall request an inspection prior to backfilling. Work shall not proceed prior to inspection and approval by the Engineer. Structures may; not be backfilled prior to approval by the Engineer. The excavated voids around masonry and other work shall be filled with clean excavated soil and compacted in layers of six (6") inches of depth. No direct payment shall be made for re-handling of excavated materials for backfilling structures, nor for any other purposes necessary to complete the work as shown on the Contract Drawings, but the compensation will be considered as having been included in the base bid for this project. Re-handling of excavated materials shall be incidental to and shall be included in any additional work which resulted as a outcome of a change made to the Contract Drawings, and is ordered in writing by the Engineer. Backfilling inside of sheeting shall be placed before sheeting is removed. After areas and trenches have been excavated and structures constructed therein, the spaces around and above them shall be carefully backfilled with acceptable material. Backfill shall be placed on both sides of structures to approximately the same elevation at the same time. All backfill shall be thoroughly tamped and rammed in place in layers not over six (6) inches in depth, using rammers of a weight acceptable to the Engineer. If directed by the Engineer, the backfill shall be thoroughly saturated with water as it is placed. Backfill adjacent to foundation walls shall be pneumatically compacted only when permitted and under the supervision of the Engineer.

3.05 DEWATERING

The Contractor shall furnish all materials, equipment and labor required to keep the site of the work free from water, ice and snow during construction. Shall provide ample means and equipment with which to promptly remove and dispose of all water and drainage during excavation, and keep all excavations dry until the structures to be constructed are completed. Pipe laying or masonry construction will not be permitted if water is in the excavation. Prior to making a connection to an existing manhole or pipe line install a plug in the existing piping to prevent groundwater or drainage from entering. Leave the plug in place until its removal is directed by the Engineer.

Under no circumstances will completed portions of the work be used as a means of dewatering trenches. Unless specifically provided for under a Specification Item, no direct payment will be made for dewatering, including the use of deep wells, but compensation therefore will be considered as being included in the unit prices bid for the various items of the Contract.

3.06 SAFETY COMPLIANCE

All shoring work shall meet or exceed the requirements of the New York State Department of Labor Industrial Code Rule 23 and Title 29 Code of Federal Regulations Part 1926, Safety and Health Regulations for Construction.

UTILITIES AND SERVICES: It is the Contractor's responsibility to detect and protect existing utilities (to remain) from damage during construction. Prior to the start of construction the Contractor is required to notify:

- UFPO (Underground Facilities Protective Organization)

- (800) 272-4480 (non-members must be contacted separately)
- 16 NYCRR Part 753 "Protection of Underground Facilities" mandates that the Contractor notify all underground facility operators in the area no less than two (2) and not more than ten (10) business days before the start of excavation to ensure that utility service lines are properly marked prior to excavation.

The Contractor's obligation to protect utilities is not relieved by calling the One Call Center. The Contractor shall understand that not all utilities may be located and he is responsible to locate other utilities, to the best of his ability, using electronic probes, or other methods, prior to the start of excavation. The Contractor shall then proceed cautiously and perform hand excavation, as necessary, to protect the utility as directed by the Engineer and the operator of the utility, at no extra cost. If a utility is inadvertently damaged, it is the Contractor's responsibility to restore that utility to operating condition, equal to that existing prior to damage. The Contractor shall remain at the site with the damaged utility until it has been restored and there is no danger to the public (i.e., exposed live electrical wires, etc).

PART 3: METHOD

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PART 4: MEASUREMENT AND PAYMENT

4.01 DESCRIPTION

The cost for this work item shall be included in the **Project Lump Sum** bid and shall include the cost of all labor, materials, equipment, removal and disposal of surplus material as necessary to complete the work complete as specified in the Contract Documents and Specifications, and to the satisfaction of the Engineer. No additional payment will be made for unauthorized work or for work outside the limits shown on the Contract Drawings.

SECTION 020

SELECT FILL MATERIAL

PART 1: WORK

1.01 DESCRIPTION

Under this work, the Contractor shall include the cost of furnishing all labor, materials and equipment as necessary to furnish and install select fill material if specified and required to complete the proposed improvements of the project under this section or as directed by the Engineer or Town. The work under this section shall not be performed without the prior written authorization of the Engineer or Town. Work shall include but not be limited to the following:

1. Furnish and install select granular fill from off-site sources to extent required and of materials specified as necessitated by or encountered during the course of the work due to field conditions as approved by the Engineer or Town.
2. For work ordered by the Engineer or Town.
3. Grading required to establish subgrades.

4. Compaction as required.
5. Dewatering or addition of water as required.
6. Stockpiling
7. Required Laboratory Testing

Included in this item of work are the following item numbers:

0203.1	Borrow Material
0203.2	Select Granular Fill
0203.3	Crushed Stone Fill

Item 0203.1 Borrow Material: the Contractor shall include the cost of furnishing all labor, materials and equipment as necessary to furnish and install borrow material if specified and required to complete the proposed improvements of the project under this section as directed by the Engineer or Town.

Item 0203.2 Select Granular Fill: the Contractor shall include the cost of furnishing all labor, materials and equipment as necessary to furnish and install select granular fill material if specified and required to complete the proposed improvements of the project under this section as directed by the Engineer or Town.

Item 0203.3 Crushed Stone Fill: the Contractor shall include the cost of furnishing all labor, materials and equipment as necessary to furnish and install select granular fill material if specified and required to complete the proposed improvements of the project under this section as directed by the Engineer or Town.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 0101 Site Preparation and Removals
- B. Section 0102 Survey and Stakeout
- C. Section 0103 Erosion and Sediment Control
- D. Section 0201 Earthwork
- E. Section 0202 Unclassified Excavation
- F. Section 0203 Select Fill Material
- G. Section 0301 Cast-In-Place Concrete
- H. Section 0401 Furnish and Install Sanitary Sewers
- I. Section 0501 Precast Concrete Manholes
- J. Section 0601 Sewage Pumping Station
- K. Section 0701 Pipe Jacking
- L. Section 0802 Electrical Work
- M. Section 0901 Site Restoration

1.06 REFERENCES

- A. General: The work shall comply with the most recent standards or tentative standards as published at the date of the contract and as listed in this specification using the abbreviation shown.
- B. New York State Department of Transportation
- C. American Society for Testing and Materials (ASTM):
 - 11. D 698 Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft)
 - 12. D 1556 Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method
 - 13. D 1557 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³)(2,700 kN-m/m³)
 - 14. D 2216 Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
 - 15. D 2487 Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System)
 - 16. D 3017 Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)
 - 17. D6938 Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)
 - 18. D 4318 Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
- D. New York State Department of Environmental Conservation – 6NYCRR PART 375

1.07 DEFINITIONS

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1.08 DESIGN REQUIREMENTS

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1.06 SUBMITTALS

- A. Samples: For the following:
 - 1. 10-lb (4.5-kg) samples, sealed in airtight containers, of each proposed soil material from source.
- B. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated:
 - 1. Classification according to ASTM D 2487 of each soil material proposed for select fill and backfill.

2. Laboratory compaction curve according to ASTM D 1557 for each on-site or borrow soil material proposed for fill and backfill.
3. Laboratory testing for backfill must meet the requirements of 6 NYCRR 375-6.7(d)

1.07 QUALITY ASSURANCE

- A. Geotechnical Testing Agency Qualifications: The Contractor shall hire an Independent Testing Agency testing agency qualified according to ASTM E 329 to conduct soil materials and rock-definition testing, as documented according to ASTM D 3740 and ASTM E 548.
- B. Regulatory Requirements
 4. Town of Yorktown: Work of this Section shall conform to all requirements of the Town of Yorktown, Department of Parks and Recreation regulations and all applicable regulations of governmental authorities having jurisdiction including safety, health, noise, and anti-pollution regulations. Where more severe requirements than those contained in the Town of Yorktown, regulations are given in this Section, the requirements of this Section shall govern.
 5. New York State Department of Environmental Conservation

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Protect material from the elements and from other damage on the site before, during, and after installation.
- B. The Contractor shall replace and pay for any material and work damaged to the satisfaction of the Town and Engineer.

1.09 PROJECT CONDITIONS

- A. Existing Utilities: Do not interrupt utilities serving facilities occupied by Town or others unless permitted in writing by the Town representative and then only after arranging to provide temporary utility services according to requirements indicated:
 1. Notify Town not less than three days in advance of proposed utility interruptions.
 2. Do not proceed with utility interruptions without Town's written permission.
 3. Contact utility-locator service for area where Project is located before the start of work.
- B. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies to shut off services if lines are active.

PART 2: MATERIALS

1) GENERAL

All materials utilized for this Project shall be obtained from a source that has been licensed or permitted for such use by local and state authorities. The Contractor shall be required to submit evidence of such

if so requested.

All fill materials shall be free Materials containing excessive amounts of water, plastic clay, vegetation, organic matter, debris, pavement, construction debris, stones or boulders over 1 inches in greatest dimension, frozen material, and material which, in the opinion of the Engineer is unsuitable shall be immediately removed from the site. Materials from other sources may be used upon approval by the Engineer.

Imported soil or fill materials to the site shall be analyzed for the following chemical parameters using EPA methods. Volatiles, Semi-Volatiles, TAL Metals, Pesticides/Herbicides, PCB's. Concentrations shall be compared to the NYSDEC Technical Assistance Guidance Memorandum (TAGM) and approved by the Engineer.

Samples shall be taken at a frequency of 1 per 5,000 cubic yards if originating from a natural borrow source and 1 per 1,000 cubic yards if manufactured or recycled.

- A. Borrow Material: Material for use in replacing undercut areas or in construction of embankments or where called for shall be approved by the Engineer and obtained from approved sources. Suitable soil materials shall be sound, durable, sand, gravel, stone, or blends of these materials, free from organic and other deleterious materials conforming to materials classified by ASTM D 2487 as GM, GC, SW, SP, SM, SC, materials containing stones larger than 3 inches shall not be used in the uppermost 2 feet or conforming to NYSDOT Item 733-09 Select Borrow and have the following gradation as determined by ASTM Designation D-422, Particle Size Analysis of Soils:

Sieve Size Max	% Passing by Weight
No. 40	0 – 70
No.200	0 -15

- B. Select Granular Fill: Material for use in replacing undercut areas or in construction of embankments or where called for shall be approved by the Engineer and obtained from approved sources. Suitable soil materials shall be sound, durable, sand, gravel, stone, or blends of these materials, free from organic and other deleterious materials conforming to NYSDOT Item 733-1101 and have the following gradation as determined by ASTM Designation D-422, Particle Size Analysis of Soils:

Sieve Size Max	% Passing by Weight
4 inch	100
No. 40	5 – 70
No.200	0 -15

- C. Crushed Stone Fill: Material for use in replacing undercut areas or in construction of embankments or where called for shall be approved by the Engineer and obtained from approved sources. Suitable soil materials shall be sound, durable stone materials, free from organic and other deleterious materials. Crushed Stone shall conform to NYSDOT Item 703-0201 have the following gradation as determined by ASTM Designation D-422, Particle Size Analysis of Soils:

Sieve Size Max	% Passing by Weight
1 inch	100
½ inch	45 to 85
¼ inch	30 to 65
No.10	15 to 45
No.200	0 to 5

PART 3: METHOD

3.01 DESCRIPTION

The Contractor shall perform the required work under this section in accordance with the conditions and requirements as specified. The Contractor shall perform and execute all necessary unclassified excavation required to finish the work needed to complete all items or as directed by the Engineer.

It is the Contractors obligation to make certain that grades stakes, bench marks, and offset staking are in place and accurately reflect elevations as per the construction drawings or as directed by the Engineer.

3.02 PREPARATION

- A. All areas subject to earthwork shall be brought to the required elevations and grades by excavating, filling, and grading. The Contractor shall make sure to level the bottoms of all excavations accurately to the limits and levels shown on the plans or as directed by the Engineer to receive the bottom of structures or other work supported on soil. Where the excavation limit has been exceeded by error on the part of the Contractor, the over excavated zone will be filled to the correct grade. At the discretion of the Engineer this zone will be filled with concrete or compacted crushed stone. The Contractor will not receive any additional payment for these corrective measures. Further all soft, wet, clay or other objectionable material below the proposed sub-grade shall be removed to the satisfaction of the Engineer. The excavated zone shall be brought up to sub-grade level with material acceptable to the engineer.
- B. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
- C. Protect subgrades and foundation soils against freezing temperatures or frost. Provide protective insulating materials as necessary.
- D. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.
- E. When the excavations have been completed to the required depth as shown on the drawings or as directed by the Engineer, the Contractor shall do no more work until after inspection by the Engineer, who shall order the work to proceed.

3.03 DEWATERING

- A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.
- B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.
- C. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.
- D. Install a dewatering system to keep subgrades dry and convey ground water away from excavations. Maintain until dewatering is no longer required.

3.04 COMPACTION OF BACKFILLS AND FILLS

- A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill layer before compaction to within 3 percent of optimum moisture content.
 - 1. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.
 - 2. Remove and replace, or scarify and air-dry, otherwise satisfactory soil material that exceeds optimum moisture content by 3 percent and is too wet to compact to specified dry unit weight.
- D. Place backfill and fill materials in layers not more than 12 inches in loose depth for material compacted by heavy compaction equipment, and not more than 8 inches in loose depth for material compacted by hand-operated tampers.
 - 1. Fill shall be spread and shall then be thoroughly compacted by rolling with a self-propelling roller weighing not less than ten (10) tons to the satisfaction of the Engineer. In places where the use of this roller is impracticable or where subsurface or surface structures may be damaged a lighter weight one may be substituted or the area shall be compacted by mechanical tamping, all with the approval, and to the satisfaction of the Engineer. Any hollows and/or depressions which may result from rolling and compacting shall be filled with like or acceptable material, and the sub-grade shall again be compacted. This shall be repeated until all depressions are eliminated. Where clay or plastic soils are encountered rolling shall be done in such a manor as to avoid a plastic condition. In all cases these type soils should not be rolled when wet.
- E. Compact soil to not less than the following percentages of maximum dry unit weight according to ASTM D 1557:

1. Under structures, building slabs, steps, and pavements, scarify and recompact top 12 inches (300 mm) of existing subgrade and each layer of backfill or fill material at 95 percent.
2. Under walkways, scarify and re-compact top 6 inches (150 mm) below subgrade and compact each layer of backfill or fill material at 92 percent.
3. Under lawn or unpaved areas, scarify and re-compact top 6 inches (150 mm) below subgrade and compact each layer of backfill or fill material at 85 percent.

3.05 GRADING

- A. General: Uniformly grade areas to a smooth surface, free from irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
1. Provide a smooth transition between adjacent existing grades and new grades.
 2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.
- E. Site Grading; Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances;
1. Lawn or Unpaved Areas; Plus or minus 1 inch (25 mm).
 2. Walks: Plus or minus 1 inch (25 mm).
 3. Pavements: Plus or minus ½ inch (13 mm).

3.06 FIELD QUALITY CONTROL

- A. Testing Agency: The Contractor shall hire a qualified independent geotechnical/environmental engineering testing agency to perform laboratory and field quality-control testing.
- B. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed

with subsequent earthwork only after test results for previously completed work comply with requirements.

- C. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 6938, and ASTM D 2937, as applicable. Tests will be performed at the following locations and frequencies:
 - 1. Paved and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 2000 sq. ft. (186 sq. m) or less of paved area or building slab, but in no case fewer than three tests.
 - 2. Foundation Wall Backfill: At each compacted backfill layer, at least one test for each 100 feet (30m) or less of wall length, but no fewer than two tests.
 - 3. Trench Backfill: At each compacted; initial and final backfill layer, at least one test for each 150 feet (46 m) or less of trench length, but no fewer than two tests.
- D. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; re-compact and retest until specified compaction is obtained.
- E. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- F. Repair and reestablish grades to the specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.

PART 4: MEASUREMENT AND PAYMENT

4.01 METHOD OF MEASUREMENT

Select Fill Material will be measured in cubic yards, measured to the nearest whole cubic yard, computed in the final compacted position.

4.02 BASIS OF PAYMENT

The cost for this work item shall be included in the **Project Lump Sum** bid and shall include the cost of all labor, materials, equipment, removal and disposal of surplus material as necessary to complete the work complete as specified in the Contract Documents and Specifications, and to the satisfaction of the Engineer. No additional payment will be made for unauthorized work or for work outside the limits shown on the Contract Drawings.

Included in this item of work are the following item numbers:

0203.1	Borrow Material
0203.2	Select Granular Fill
0203.2	Crushed Stone Fill

Item 0203.1 Borrow Material: the Contractor shall include the cost of furnishing all labor, materials and equipment as necessary to furnish and install borrow material if specified and required to complete the proposed improvements of the project under this section as directed by the Engineer or Town.

Item 0203.2 Select Granular Fill: the Contractor shall include the cost of furnishing all labor, materials and equipment as necessary to furnish and install select granular fill material if specified and required to complete the proposed improvements of the project under this section as directed by the Engineer or Town.

Item 0203.3 Crushed Stone Fill: the Contractor shall include the cost of furnishing all labor, materials and equipment as necessary to furnish and install select granular fill material if specified and required to complete the proposed improvements of the project under this section as directed by the Engineer or Town.

SECTION 0301

CAST IN PLACE CONCRETE (CURBS, SIDEWALKS, STEPS AND PAVEMENTS)

PART 1: WORK

1.01 DESCRIPTION

Under this work, the Contractor shall furnish all materials, equipment, labor and services required to provide for cast-in place concrete structures. Work includes the installation of formwork, reinforcement, expansion joints, special formwork or form liners for concrete with smooth finishes and other items listed herein within the site. This work shall include the construction of all C.I.P. Curbs, Retaining Walls, Sidewalks, Steps, and Pavements at the locations shown on the Contract Documents, details and these specifications. The Contractor shall coordinate his work and shall allow ample time and facility for the Work of other Divisions to be installed.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 0101 Site Preparation and Removals
- B. Section 0102 Survey and Stakeout
- C. Section 0103 Erosion and Sediment Control
- D. Section 0201 Earthwork

- E. Section 0202 Unclassified Excavation
- F. Section 0203 Select Fill Material
- G. Section 0301 Cast-In-Place Concrete
- H. Section 0901 Site Restoration

1.03 REFERENCES

References and industry standards listed in this Section are applicable to the Work in this Section unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by governing codes or regulations, the recommendations, suggestions, and requirements described in the referenced standards shall be deemed mandatory and applicable to the Work.

- A. American Society of Testing and Materials (ASTM) standards, latest editions.
- B. American Concrete Institute (ACI) standards, latest editions.
- C. "Placing Reinforcing Bars - CRSI-WCRSI Recommended Practices", latest edition. Concrete Reinforcing Steel Institute.

1.04 DEFINITIONS

- A. Exposed to view

Situated so that it can be seen from eye level from a public location. A public location is that which is accessible to persons not responsible for operation or maintenance of the building.

- B. NYS DOT Standard Specifications

This shall refer to the New York State Department of Transportation Standard Specifications of January 2026 or latest edition of addendums.

1.05 DESIGN REQUIREMENTS

- A. Performance Characteristics:

1. Walls: Normal weight concrete with a minimum 28 day compressive strength of 4000 psi, air entrained, and a maximum water to cement ratio of 0.45
2. Curbs: Normal weight concrete with a minimum compressive strength of 3500 psi, air entrained, and a maximum water to cement ratio of 0.45

3. Exterior Slabs on Grade (pavements, stairs, etc): Normal weight concrete with a minimum 28 day compressive strength of 3500 psi, air entrained, and a maximum water to cement ratio of 0.40.
- B. Mix design for concrete with smooth form is to contain a high-range water reducer (super plasticizer).

1.06 SUBMITTALS

A. Product Data

Submit manufacturers' information for the following:

1. Admixtures
2. Curing compounds
3. Bonding Agent
4. Welded Wire Fabric
5. Overlaid plyform formwork and formliners
6. Expansion joint filler
7. Expansion joint sealant

B. Quality Control Submittals

1. Design Data: Submit design mixes for concrete, including list of admixtures to be used, to the Testing Laboratory and the Engineer of Record. After approval and prior to placement, send the approved mix the Village Authority.
2. Certificates: Concrete producer's Computer Batch Ticket must be presented at site before concrete is placed for every load of concrete delivered.

3. Contractor Qualifications: Provide proof of Installer, Producer, and Rebar Detailer qualifications specified under “Quality Assurance”.

1.07 QUALITY ASSURANCE

A. Qualifications

1. Concrete Installer: Company specializing in performing the Work of this Section shall have three years minimum experience on successful projects of similar size.
2. Concrete Producer: Company specializing in the production of concrete shall be certified by the National Ready Mixed Concrete Association (NRMCA) and shall have certification acceptable to either the Village or the NYS Department of Transportation. The plant shall use NYSDOT approved trucks and drivers shall be certified by the NRMCA.
3. Rebar Detailer: Company shall be specialized in the detailing of reinforcing bar shop drawings with a minimum of three years’ experience.

A. Regulatory Requirements

1. Town Code: Work of this Section shall conform to all requirements of the Town Code and all applicable regulations of governmental authorities having jurisdiction including safety, health, noise, and anti-pollution regulations. Where more severe requirements than those contained in the Village Code are given in this Section, the requirements of this Section shall govern.
2. Industry Standards: The ACI Standards listed under references apply to Work of this Section. Where more severe requirements than those contained in the Standards are given in this Section or the Building Code, requirements of this Section or the Building Code shall govern. The Contractor shall keep a copy of ACI SP-15 - "Field Reference Manual" at the site.

B. Certifications

Acquire cement and aggregate from same source for all work. If a change in suppliers is required, a new mix submittal must be produced with the new material and submitted for approval.

C. Coordination

Coordinate this work with the work of other Divisions so that items to be installed are done so correctly and in proper sequence.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Protect material from the elements and from other damage on the site before, during, and after installation. Store reinforcement in a location to prevent rusting, etc.
- B. Ensure proper identification of reinforcement after bundles are broken.
- C. Replace and pay for material and work damaged to the satisfaction of the Engineer.

1.09 ENVIRONMENTAL REQUIREMENTS

- A. Adequately protect concrete placed during rain, sleet, or snow, or when the mean daily temperature falls below 40°F or rises above 90°F as provided in Article 3.07.

PART 2: MATERIALS

2.01 MATERIALS

- A. Rough Formwork: Shall be Commercial Douglas Fir, DFPA: 5/8" thick minimum.
- B. Overlaid Plyform Formwork: Shall be B-Matte Formguard by Simpson Timber Company or equal by Dayton Richmond Concrete Accessories.
- C. Smooth Form Finish Formliner: Shall be #340 Smooth Face by Greenstreak or equal by Architectural Polymers.
- D. Release Agent: VOC compliant material such as those of the Cresset Chemical Company for coating forms.
- E. Form Ties: Wire ties not permitted. Form ties for exposed concrete shall be adjustable, leave no metal closer than 1¹/₂" to the surface, and free of devices which leave holes or depressions larger than 7/8" back of exposed surface.

- F. Reinforcing Bars: All reinforcing bars shall be of deformed type of new billet steel conforming to current requirements of ASTM A615 Grade 60. No rail or re-rolled steel will be permitted. All bars shall be epoxy coated in accordance with ASTM A775.
- G. Welded Steel Wire Fabric: Wire Fabric shall conform to the requirements of ASTM A185. All wire mesh shall be epoxy coated in accordance with ASTM A884.
- H. Supports for Reinforcement: Support for reinforcement supported by ground shall be coated wire bar supports or bar supports made of dielectric material or other acceptable materials or precast concrete block, 4" square minimum, having a compressive strength equal to that of the concrete being placed. Wire bar supports shall be coated with dielectric material for a minimum distance of 2" from the point of contact with the epoxy-coated reinforcing bars.
- I. Cement: Shall conform to ASTM C150 Type II and shall be of the non air-entrained type.
- J. Admixtures
1. The use of admixtures shall comply with the requirements of Section 500 and all related sections of the NYS DOT Standard Specifications. The final soluble chloride content in concrete, percent by weight of cement, due to the addition of admixtures and other ingredients shall not exceed 0.05 at 28 days.
 2. Air-entraining admixtures shall conform to ASTM C260.
 3. Chemical admixtures shall conform to ASTM C494.
- K. Water: Shall be clean potable water free of injurious foreign matter conforming to the requirements of Section 500 and all related sections of the NYS DOT Standard Specifications.
- L. Aggregate: Aggregate shall conform to ASTM C33, No.57, No.67 or No.8. Maximum size of coarse aggregate shall conform to paragraph 3.3.2 of ACI 318.
- M. Curing Compounds:
1. Clear Curing and Sealing Compound (A.I.M. Regulations - VOC Compliant, 350 g/l): Liquid type membrane-forming curing compound, clear styrene acrylate type, complying with ASTM C1315, Type I, Class A, 25% solids content minimum. Moisture loss shall be not more than 0.40 Kg/m² when applied at 300 sq. ft./gal. Manufacturer's certification is required.

1. Curing Compounds shall be "Super Diamond Clear VOX" by The Euclid Chemical Company or "Masterkure 100W" by Master Builders.

N. Bonding Agent

1. Epoxy/acrylic resin that will not form a vapor barrier with the concrete with the following properties:
 - a. Bond strength of 1800 psi in 2 hours when tested in accordance with ASTM C882.
 - b. Flexural strength of 2000 psi in 28 days when tested in accordance with ASTM C78.
 - c. Tensile strength of 600 psi in 28 days when tested in accordance with ASTM C496.
2. Bonding agent shall be "CR246 Sto Bonding and Anti-corrosion Agent" by Sto Concrete Restoration Division or Armatec 110 by Sika Corp.

O. Expansion Joint Filler: Closed-Cell Polyurethane or Closed-Cell Expanded polyethylene Joint Filler - Resilient, compressible, semi-rigid; W.R. Meadow's Ceramar; A.C. Horn's Closed Cell Plastic Foam Filler, Code 5401; Sonneborn's Sonoflex F.

P. Expansion Joint Sealant: Type 1A Sealant

1. For Horizontal Joints: Two-part, self-leveling polyurethane sealant for traffic bearing construction; Mameco's Vulkem 255, Pecora's Urexpan NR-200, or Bostik's Chem-Calk 550 or Products Research & Chemical's RC-2SL.
2. For Vertical Joints: Two-part, non-sag polyurethane sealant; Mameco's Vulkem 227, Pecora's Dynatrol II, or Bostik's Chem-Calk 500 or Products Research & Chemical's RC-2.

2.02 MIXES

A. General

Concrete for all parts of the Work shall be of the specified quality capable of being placed without excessive segregation and, when hardened, of developing all characteristics required by the Specifications and Drawings.

B. Strength

Strength requirements given in Part 1 of this Specification are based on 28-day compressive strength, unless high early strength is specified, in which case required strengths are based on 7-day compressive strength.

C. Method of Proportioning

1. Proportion concrete mix of strength listed in B above in accordance with the requirements of Section 500 and all related sections of the NYS DOT Standard Specifications. The Testing Laboratory and the Engineer of Record will review the design mix.
2. Mix designs are specific to material used, concrete producer, and method of placement. Each mix design must be reviewed and accepted by the Engineer of Record.
3. Proportion and produce normal weight concrete to have a maximum slump of 4" or less. A tolerance of up to 1" above the indicated maximum shall be allowed for individual batches provided the average for all batches or the most recent 10 batches tested, whichever is fewer, does not exceed the maximum limit. The slump shall be determined by ASTM C143. Concrete containing High Range Water Reducer shall have a slump not exceeding 9", unless otherwise approved by the Engineer of Record. The concrete shall arrive at the job site at a slump of 2" to 3", be verified by the Owners Representative's, and the HRWR admixture added to increase the slump to the approved level.
4. Concrete shall be air-entrained with an air content for the grading size of coarse aggregate as follows:
 - a. No.8.....7¹/₂%
 - b. No.57 or 67.....6%

Tolerance on air content as delivered shall be +1.5%.

2.03 SOURCE QUALITY CONTROL

A. Tests

1. The Engineer of Record will review the proposed materials for compliance with the Specifications prior to construction.
2. The Testing Laboratory will perform field tests as work progresses as listed in "Field Quality Control".

B. Inspection

1. Testing Laboratory

- a. Concrete work is subject to Quality Control Inspection.
- b. The Owners' Representative will assign a licensed concrete testing laboratory to perform the required field testing. The Site Inspector shall be ACI Certified. The Testing Laboratory will review the mix design, perform field testing, and inspect the work as it progresses. The listing of services to be performed by the testing Laboratory is given in Section 1.6 of ACI 301.
- c. The Testing Laboratory must be present when the concrete is being placed. The Owners Representative may elect to have the laboratory present at the plant to witness the batching and mixing of the concrete.

2. Notification

- a. Notify the Owners Representative in writing at least forty-eight hours in advance of each concrete placement. The Owners Representative will notify the Testing Laboratory immediately to order out the necessary concrete technicians to cover the work.
- b. Once the concrete technicians are ordered out and a cancellation follows, the Contractor will be charged Four Hundred Fifty Dollars for each technician so ordered to appear, unless a cancellation order is issued to the Laboratory by 3 PM the day before the concrete placement.
- c. During the placement of the concrete, notify the Owners Representative immediately of any delay at the concrete plant or at the job site. Where the Owners Representative decides to provide a technician at the plant, do not mix concrete or add admixtures unless the Technician is present. Do not add admixtures to be added at the site unless the Technician is present.

3. Contractors' Responsibility for Quality Control

- a. The Owners Representative and the Owners Representative's Testing Laboratory shall receive the producer's Computer Batch Ticket for each truck.

- b. The tests and inspections, as provided in the Code, do not in any way relieve the Contractor of responsibility to construct the Work in accordance with the Drawings and Specifications and to use safe, standard methods of construction at all times, safeguarding the public, workmen, and structure. The Contractor shall be solely responsible for the physical control of the materials and concrete mixes, and shall see that such mix designs, tests, and controls are in accordance with the Code and Specifications. The Contractor's superintendent shall attest that the work was installed in accordance with the documents.

PART 3: METHOD

3.01 EXAMINATION

- A. Prior to placement of concrete, verify that the concrete cover over the reinforcement is that specified on Drawings.
- B. Verify that reinforcement and all other embedded items are provided and held securely, positioned accurately, and will not be a detriment to concrete placement.
- C. Examine all adjoining work on which this Work is in anyway dependent for proper installation and workmanship. Report to the Owners Representative on any condition that prevents the performance of this Work.

3.02 PROTECTION

- A. Protect concrete members on grade and subgrade from freezing before and after installation.
Provide blankets and other necessary items.
- B. Protect adjacent finished materials and previously poured concrete against spatter during concrete placement.
- C. Provide and maintain barricades and safeguards around openings, etc. to protect workmen from injury and to comply with all Building Code, OSHA, and other authorities having jurisdiction regulations.

3.03 FORMWORK

- A. Provide formwork wherever necessary to confine concrete to the required shapes shown on Drawings. Follow all procedures of Section 2 of ACI 301, ACI 347, and Section 500 and all related sections of the NYS DOT Standard Specifications. Formwork, reinforcement, and embedded items shall be clean of all accumulated mortar from previous concreting and other foreign material. Repair or replace any formwork as required.

- B. Cover the surfaces of the rough or overlaid plyform formwork (when used) with an approved form release agent that will effectively prevent absorption of moisture, prevent bonding with the concrete, and which will not stain the concrete surfaces. Do not apply oil or release agents on formwork for concrete to receive additional concrete (such as at construction joints). Apply at a rate that will help achieve the finish specified below. Follow manufacture's recommendations.
- C. Adequately support and substantially brace formwork to hold lines and shape. Securely brace forms against lateral deflection. Formwork shall be tight jointed to prevent leakage of concrete.
- D. Place chamfer strips in the corners of forms to produce beveled edges (chamfers) on permanently exposed surfaces.
- E. Provide "Rough Form Finish" for surfaces not exposed to view. Use plywood or metal forms coated with a release agent.
- F. Provide "Smooth Form Finish" for surfaces exposed to view and the elements. Use dress, square-edged lumber with form liner or overlaid plyform forms with applicable release agent. Do not exceed manufacture's recommendations for number of re-uses for the form liner or overlaid plyform. Arrange the forms or form liner in an orderly and symmetrical fashion, keeping the number of seams to a practical minimum.
- G. Remove forms in such a manner as to assure the complete safety of the structure as required by Section 500 and all related sections of the NYS DOT Standard Specifications. Formwork not supporting the weight of the concrete may be removed as soon as the concrete has hardened sufficiently to resist damage from removal operations and as required by H below.
- H. When repair of surface defects or finishing is required at an early age, remove forms as soon as the concrete has hardened sufficiently to resist damage from removal operations.

3.04 REINFORCEMENT

- A. Place reinforcement in accordance with CRSI "Placing Reinforcement Bars", Section 500 and all related sections of the NYS DOT Standard Specifications.
- B. Unless otherwise permitted, welding of crossing bars (tack welding) for assembly of reinforcement is prohibited.

- C. Support and fasten all reinforcement together to prevent displacement by construction loads or placing of concrete.
- D. Lifting of bars and welded wire fabric into position during placement of concrete is not permitted.
- E. Where the concrete surface will be exposed to the weather in the finished structure, the portions of all accessories within 1/2" of the concrete surface shall be non-corrosive or protected against corrosion.
- F. Provide minimum protective cover given in Section 500 and all related sections of the NYS DOT Standard Specifications if not indicated on Drawings.
- G. All splices not shown on the Project Drawings shall be shown on the shop drawings and approved by the Engineer of Record.
- H. All embedment lengths not shown on the Project Drawings shall be shown on the shop drawings and approved by the Engineer of Record.

3.05 PREPARATION

- A. Remove ice, excess water, trash, and rubbish from forms.
- B. Remove hardened concrete from inner surfaces of conveying equipment and all formwork, reinforcement, and dowels.
- C. Prepare previously placed concrete to be in contact with new concrete in the manner described under "Construction Joints."
- D. Prepare existing concrete to be in contact with new concrete by roughening and cleaning the surface and applying a bonding agent. Surface must be free of laitance. Concrete must be placed after agent cures and within 24 hours of applying bonding agent in accordance with the directions of the manufacturer.
- E. Do not place concrete on frozen ground.

3.06 JOINTS AND EMBEDDED ITEMS

A. Construction Joints

1. Make joints not shown on Drawings at locations that will least impair the strength of the structure and comply with requirements of Section 500 and all related sections of the NYS DOT Standard Specifications. Such location is subject to the approval of the Engineer of Record.
2. Continue reinforcement across joints. Provide longitudinal keys at least 1¹/₂" deep in walls and provide other keys as required.
3. Thoroughly clean concrete surface of oil, grease, and other contaminants and remove all laitance prior to placement of adjoining concrete. Roughen surface of the concrete in an approved manner that will expose the aggregate uniformly and will not leave laitance, loosened particles of aggregate, or damaged concrete at the surface. Dampen surface immediately prior to placement.

B. Expansion Joints

1. Do not extend reinforcement or other embedded metal items bonded to concrete continuously through expansion joint. Provide smooth dowels greased on one end at the joints or insert into pvc sleeve of length greater than the dowel length by .75" minimum.
2. Provide expansion joint filler at the joint of the sizes indicated on the Drawings or specified herein.

C. Embedded items

1. Place all fence sleeves, shoes, and other embedded items required for the Work of other Divisions or for their support prior to concreting.
2. Provide ample notice and opportunity for items of other Division to be introduced and/or furnished for installation before concrete is placed. Coordinate the Work of the other Divisions so all items are placed in their proper location.
3. Set metal pipe sleeves, sockets, shoes, etc. into concrete to receive fence posts or any other items, all as indicated on details.

3.07 MIXING AND PLACING CONCRETE

A. General

1. Notify Owners Representative at least 48 hours in advance of each concrete placement. Do not place concrete without approval of the Owners Representative.
2. Do not allow rainwater to increase mixing water nor damage surface finish.
3. When placing concrete in cold weather (below 40°F), concrete shall have an accelerating admixture added.
4. Production of concrete, including batching and mixing, shall be done in accordance with the requirements of Section 4 of ACI 301 and Section BC 1905.8 of the Building Code.
5. Placement of concrete shall be done in accordance with the requirements of Section 5 of ACI 301 and Section 500 and all related sections of the NYS DOT Standard Specifications. All consolidation shall be done by vibration.

B. Mixing

1. Batch, mix, and transport ready-mixed concrete in accordance with the appropriate sections of ASTM C94 and Section 500 and all related sections of the NYS DOT Standard Specifications. Truck mixers and agitators shall meet the requirements of the Truck Mixers Manufacturer's Bureau or shall comply with Section 8.1.2 of ASTM C94 and shall be NYSDOT approved. All trucks shall have working revolution counters and site gages.
2. Batch and mix other concrete in accordance with subsection 4.3.1 of ACI 301.
3. Use of chemical admixtures must be approved by the Engineer of Record.
4. Unless otherwise approved by the Engineer of Record, concrete shall be deposited within 1½ hours or 300 revolutions of the mixing drum, whichever comes first, after introduction of water to the cement or cement to the aggregate. When the ambient temperature rises above 90°F, the time shall be decreased to 1 hour.
5. Tempering and control of mixing water

- a. Mix concrete only in quantities for immediate use. Concrete which has started to set shall not be retempered but shall be discarded. Water shall not be added at the site.
 - b. For concrete containing HRWR (Superplasticizer), if loss of slump occurs, HRWR may be redosed at the site as long as a "flash set" has not occurred. Redosage procedures must be discussed and approved by the Engineer of Record and the admixture manufacturer.
- C. Placing: Place concrete in accordance with ACI 304R, ACI 318, and Section 500 and all related sections of the NYS DOT Standard Specifications.
1. Consolidate all concrete by vibration so that the concrete is thoroughly worked around the reinforcement, around embedded items and into corners of forms, eliminating all air or stone pocket or weakness. Internal vibrators shall be the largest size and most powerful that can be used in the Work, as described in Table 5.1.5 of ACI 309R, with a minimum frequency of 7000 revolutions per minute and shall be operated by competent workmen. Over-vibrating and use of vibrators to transport concrete within forms is not permitted. Insert and withdraw vibrators at many points, from 18" to 30" apart. At each insertion, the duration shall be sufficient to consolidate the concrete but not sufficient to cause segregation, generally from 5 to 15 sec duration. Keep a spare vibrator on the job site during all concrete placing operations.
 2. Cold Weather Concrete Protection
When the mean daily temperature of the atmosphere is less than 40°F during concreting, or within 24 hours thereafter, follow the procedures outlined in ACI 306R to protect the concrete. Temperature of the plastic concrete shall be no lower than 55°F. Heat all forms, reinforcing steel, and surfaces to receive concrete above the freezing point and keep them completely free of frost, snow, and ice.
 3. Hot Weather Protection: When the mean daily temperature of the atmosphere is over 90°F during concreting, follow the procedures outlined in ACI 305R to protect the concrete.

3.08 FINISHING OF FORMED SURFACES AND REPAIR OF SURFACE DEFECTS

A. General

1. Remove forms as soon as practicable.
2. Repair surface defects, including tie holes and cracks, immediately after form removal. Patches shall be of quality to match the specified finish.
3. Remove oil, grease, compounds, and other contaminants from surfaces and areas to be repaired.
4. Provide finishes specified below immediately after form removal.
5. Provide curing and protection.

B. Repair of Surface Defects

Repair surface defects in accordance with subsection 5.3.6 of ACI 301. At the Owners Representative's discretion, repair mortars and coatings shall be employed to rectify defects. Materials shall be as selected by the Owners Representative.

C. Tie Holes and Other Repairs

1. Remove ties, nails, and other form accessories below the concrete surface when the surface is exposed to view and/or the elements. For surfaces not exposed to view or the above-mentioned conditions, remove metal to the surface.
2. Undercut surfaces of holes. After cleaning and thoroughly dampening the holes, fill them solid with the patching mortar. The mortar shall match the color of the existing concrete for concrete exposed to view as specified in paragraph B above.

D. Formed Finishes

1. Rough Form Finish: Provide for concrete not exposed to view.
 - a. Repair concrete surface as indicated above.

- b. Chip or rub off fins exceeding 1/4" in height.
2. Smooth Form Finish: Provide for concrete exposed to view. Provide for concrete exposed to view. Concrete shall have a CS 3 or better finish as developed by the Cresset Chemical Company and shall have been placed without the need for patching or removal of fins, etc.
 - a. Repair concrete surfaces as indicated above.
 - b. Chip or rub off fins completely and grind smooth.
 - c. Provide smooth rubbed finish as follows no later than the day following form removal.
3. Wet the surfaces and rub with a No. 16 carborundum brick or other equal abrasive to obtain a smooth, even surface of uniform appearance without applying any cement or other coating.
4. Obtain the final finish by thoroughly rubbing with a No. 30 carborundum brick. The surface shall be wet for a period of 3 days. The Owners Representative shall be the sole judge if the finish is proper.

E. Acceptance of Concrete Finish

If the finish produced is not acceptable to the Owners Representative, the Contractor shall be responsible for all costs incurred to produce an acceptable finish by whatever means determined by the Owners Representative. Remove stains, rust, efflorescence, and other surface deposits to the satisfaction of the Owners Representative.

3.09 PAVEMENTS AND SLABS

A. General

1. Mixing and placing shall be carefully coordinated with finishing. Do not place concrete more rapidly than it can be spread, straightedged, and darbied or bull floated. Provide leveling, floating, troweling, etc. at the correct time interval after pouring to prevent dusting and a non-durable surface as specified in ACI 302.1R. These operations must be performed before bleeding water has an opportunity to collect on the surface.

2. To obtain good surfaces and avoid cold joints, the size of finishing crews shall be planned with due regard for the effects of concrete temperature and atmospheric conditions on the rate of hardening of the concrete.

B. Finishing

1. Slope pavements uniformly toward drains. If pitch or elevations are not shown on Drawings, provide a minimum of 1/8" per foot.
2. Finish pavement surface to a true smooth plane and texture with a toothed roller or float with a wood float. Score concrete pavement in squares of approximately 5'-0" and/or as shown on Drawings. Each rectangular slab shall have all edges neatly rounded with proper tools and be bound on all sides by a troweled border about 1" in width.
3. Level ramp, step and driveway surfaces with wood float and follow with a broom finish perpendicular to direction of traffic.

C. Placement

1. General

- a. Aggregate base material and preparation as per the plans or as is given in Section 500 and all related sections of the NYS DOT Standard Specifications.
- b. Where pavements to remain are damaged or destroyed as a result of the Work, patch, repair, or replace as required. Color to match existing.
- c. Subgrade and/or aggregate base shall be free of frost before concrete placing begins.
- d. Control Joints:
 - 1) Primary Method: Soff-Cut System method, by Soff-Cut International, Corona, CA (800)776-3328. Finishers must have documented successful experience in the use of this method prior to this project. Install cuts within 2 hours after final finish at each saw cut location. Use 1/8 inch thick blade, cutting 1¹/₄ inch into slab.

- 2) Optional Method (Where Soff-Cut System Method Equipment is Not Available):

Properly time cutting with the set of the concrete. Saw-cut control joints within 12 hours after finishing. Start cutting as soon as the concrete has hardened sufficiently to prevent aggregates being dislodged by the saw. Complete cutting before shrinkage stresses become sufficient to produce cracking. Use 1/4-inch-thick blade, cutting 1/4 slab depth.

- e. Dampen subgrade or aggregate base immediately prior to placement of concrete.
- f. Pour slab to required thickness after installation of reinforcement.

2. Pavements

- a. Provide 4" thick concrete slab unless otherwise indicated.
- b. Provide 6x6-W2.9xW2.9 WWF placed 1¹/₂" from top surface.

3. Driveways

- a. Provide 7" thick concrete slab.
- b. Provide 4x4-W4xW4 placed 2" from top surface.

4. Expansion joints

- a. Provide expansion joints for all exterior concrete pavement, slabs under asphalt, driveways, etc. specified under this Section. Expansion joints shall occur at intervals not to exceed 20' in each direction or as indicated on Drawings.
- b. Provide continuous expansion joints at the following locations: Driveways and other concrete pavements abutting area walls, buildings, retaining or any other walls, check pieces, steps, curbs.
- c. Expansion joint shall be 1/2" wide, full depth minus 1/4" to allow for the poured joint sealer.

3.10 MISCELLANEOUS CONCRETE WORK

- A. Provide curbs, footings, walls, ramps, and other miscellaneous concrete work.

3.11 PATCHING AND BONDING TO EXISTING CONCRETE

- A. Provide bonding agent whenever new concrete is to be poured against existing concrete, whenever the time between concrete pours is longer than that allowed for proper bond, and wherever bonding agent is indicated on the Drawings to be applied.
- B. Remove loose concrete from surface to be bonded with new concrete and clean. Remove rust from reinforcement and structural steel by power chipping and power-driven brushes.
- C. Apply bonding agent in accordance with manufacturer's specifications. Pour concrete as soon as bonding agent has cured and within 24 hours after placement. If the 24-hour period has Elapsed, then the bonding agent must be reapplied.

3.12 CURING AND PROTECTION

A. General

- 1. Begin curing concrete immediately after placement and finishing. Protect all freshly deposited concrete from premature drying and excessively hot or cold temperatures and maintain it with minimal moisture loss at a relatively constant temperature for the period of time necessary for the hydration of the cement and proper hardening of the concrete. Detailed procedures are given in ACI 308.
- 2. Do not apply curing compounds to surfaces receiving additional concrete. Provide only wet curing.

B. Procedure

- 1. Concrete surfaces not in contact with forms:
 - a. Ponding or continuous non-manual sprinkling.
 - b. Absorptive mat or fabric, sand, or other covering kept continuously wet.
 - c. Curing compounds conforming to ASTM C1315.

2. Concrete surfaces in contact with forms:
 - a. Minimize moisture loss from forms exposed to heating by the sun by keeping forms wet until they are removed.
 - b. After form removal, cure with one of the methods listed in 1 above.
3. Continue curing until a total of 7 days has elapsed during which the temperature of the air in contact with concrete has remained above 50°F. Prevent rapid drying during and at the end of the curing period.
4. Remove all curing compounds with cleaners recommended by curing compound the manufacturer.

C. Cold Weather Curing

Concrete must be protected from water loss. This shall be accomplished by the application as soon as possible without harm to the concrete surfaces of either (a) exhaust steam, or vapor-resistant paper or polyethylene film, or (b) curing compounds. In all other respects, curing shall conform to applicable provisions of this Section. Concrete temperature shall be maintained between 50°F and 70°F.

D. Hot Weather Curing

1. During the period June 1 to October 1 or when hot weather conditions require it, maintain continuous water curing for a minimum period of twenty-four hours. Provide for wind breaks, shading, and other necessary provisions.
2. After 24 hours, curing shall be by one of the methods specified under B above. In all other respects, curing shall conform to applicable provisions of this Specification. Upon termination of the specified moist curing, every effort should be made to reduce the rate of drying by avoiding air circulation.

- E. Protection from mechanical injury: Protect concrete from mechanical disturbances during curing period as described under "Protection and Cleaning".

3.13 TOLERANCES

- A. Construct formwork so that concrete surfaces will conform to the tolerance limits listed in ACI 117.
- B. Establish and maintain in an undisturbed condition and until final completion and acceptance of the project sufficient control points and bench marks to be used for reference purposes to check tolerances.
- C. Place reinforcing bars in accordance with the tolerances given in Section 500 and all related sections of the NYS DOT Standard Specifications.
- D. Move bars as necessary to avoid interference with other reinforcement, conduits, or imbedded items. If bars are moved more than one bar diameter, or enough to exceed the above tolerances, the resulting arrangements are subject to approval by the Engineer of Record.
- E. Place concrete to meet tolerances specified in ACI 117, unless specified otherwise herein.

3.14 FIELD QUALITY CONTROL

A. Tests

Tests to be performed by the Owners Representative's Testing Laboratory during construction are as follows:

1. Compliance of materials to Specifications tested from production samples.
2. Determination of the slump of the concrete for each sample taken and whenever consistency of the concrete appears to vary using ASTM C143. The Testing Laboratory will reject any concrete that does not meet the slump requirements.
3. Determination of water content of freshly mixed concrete utilizing the procedure of AASHTO TP23. Concrete that does not meet the maximum water to cement ratio or the proportions given in the approved design mix will be immediately rejected regardless of slump.
4. Strength tests: The frequency of conducting strength tests of concrete shall be in accordance with Section 500 and all related sections of the NYS DOT Standard Specifications, with additional cylinders taken for an additional strength test and one

cylinder for a 7-day break. Strength tests shall be performed for each 50 cubic yards, or portions thereof, of concrete placed in any one day's concreting. Specimens will be stored at the site in the insulated curing box provided by the Contractor. Each group of specimens is considered one strength test. One cylinder will be broken at 7 days for information. Strength test shall be at 28 days for acceptance. The cylinders for the additional strength test will be utilized for either a strength test or other types of testing only if the 28-day breaks are low or durability of the concrete is in question. If one specimen in a test manifests evidence of improper sampling, molding, or testing, it shall be discarded and the average strength of the remaining cylinders shall be considered the test result. Should all specimens in a test show any of the above defects, the entire test shall be discarded.

5. Determination of air content and unit weight of concrete sample for each strength test in accordance with ASTM C173 or C231 and ASTM C138.
6. Determination of temperature of concrete sample for each strength test.
7. Determination of water soluble chloride content in the concrete, percent by weight of cement, of each sample.

B. Inspection

1. Refer to "Source Quality Control" for responsibility and procedure.
2. The lab will inspect placement of reinforcement and thickness of members prior to placement.
3. Keep a record of all inspections, the name of the persons making them, and the name of the foreman in charge of formwork at the site. Submit to the Owners Representative's on the site a copy of the inspection records prior to each concrete placement. In addition, Contractor shall comply with any inspection requirements set forth by the Tow of Yorktown.
4. The Contractor shall cooperate in the making of all tests by the Laboratory Technician by:
 - a. Providing an insulated curing box of sufficient size and strength to contain all specimens made in any four consecutive working days. The Contractor shall furnish an outlet to provide the necessary temperature in the storage box, pending delivery to the Laboratory of the test cylinders.

- b. Providing a buggy for transporting the concrete taken from the mixer (and/or point of placement) to the location of the curing box for testing and the preparation of specimens.
- c. Protecting the property of the Laboratory and keeping test specimens free from vibration and other disturbances.
- d. Providing a microwave of the size specified in AASHTO TP23 and a portable generator.

C. Evaluation and Acceptance of Concrete

- 1. Strength tests on concrete will be evaluated according to Section 500 and all related sections of the NYS DOT Standard Specifications by the Engineer of Record. If the tests fail, the adequacy of the concrete will be checked according to the requirements of Section 500 and all related sections of the NYS DOT Standard Specifications. Concrete exposed to the elements with indications of poor durability will be rejected regardless of strength and will be subject to petrographic examination.
- 2. Pay for additional costs of labor and materials required at the job for all damages resulting from testing. Remove and replace concrete work that is not of adequate strength or weather resistance and cannot be made to work by remedial methods acceptable to the Owners Representative at own cost. The Contractor shall be held responsible for all delays and damages to the work of other Divisions that occur as a result of non-conformance.
- 3. Pay for all expenses borne by the Owners Representative resulting from low strength test procedures or evidence of poor durability (such as high slump) specified above.

3.15 PROTECTION AND CLEANING

- A. During the curing period, and thereafter as conditions may require, protect the concrete from damaging mechanical disturbances, particularly excessive load stresses, heavy shock, and excess vibration. Protect all finished concrete surfaces from damage caused by construction equipment, materials or methods, and by rain or running water.

3.16 ACCEPTANCE OF CONCRETE WORK

- A. The provisions of Subchapter 1.6 of ACI 301 apply to the acceptance of the concrete work.
- B. Concrete work judged inadequate by structural analysis, core test, results of load test or deemed unacceptable due to appearance or durability concerns shall be repaired, reinforced with additional construction if so directed by the Engineer of Record, or be replaced if so directed by the Engineer at the Contractor's expense.

PART 4: MEASUREMENT AND PAYMENT

4.01 DESCRIPTION

The cost for this work item shall be included in the **Project Lump Sum** bid and shall include the cost of all labor, materials, equipment, removal and disposal of surplus material as necessary to complete the work. Included in this work item shall be the costs for all C.I.P. Curbs, Retaining Walls, Sidewalks, Steps, and Pavements. The work under this item shall not be limited to excavation, backfilling, sub-base material, removal and disposal of surplus material, concrete, reinforcing, expansion joints, asphalt repair or patching, and any incidental work required to complete the work in accordance with the Contract Documents and Specifications, and to the satisfaction of the Engineer.

The Contractor shall include in his bid the costs for concrete Inspection (including but not limited to cylinder preparation, test materials, deliver to testing lab, lab fees and reports) involved in pouring test cylinders as specified herein. The cylinders shall be numbered, dated and tested for crush strength and slump by a laboratory approved by the Town Engineer. Test cylinders shall be collected on site by the laboratory and test results shall be submitted directly to the Village Engineer by the laboratory. Test cylinders shall be scheduled by the Contractor for collection by the lab no more than seven (7) days after the pour. The Contractor shall allow the cylinders to cure on-site for seven (7) days and shall be responsible for the proper handling and protection of the cylinders at all times.

SECTION 0401

FURNISH AND INSTALL SANITARY SEWERS

PART 1: WORK

1.01 DESCRIPTION

Under this item the Contractor shall furnish and install sanitary sewer main and sewer manholes. The mains shall be installed at the locations and grades shown on the Contract Drawings. Further the sewer mains, manholes, and appurtenance shall conform to these specifications and the contract drawings.

- A. Sewer Laterals: Included in this item is the cost for furnishing pipe, valves and appurtenances required for sewer service connections. The Contractor shall end all sewer service connection within 3'-0" of a building and shall temporarily seal the open ends and provide wooded stakes markers at 1 foot above grade. All work shall be coordinated with the Owner. The trench shall be continued to the building foundation to the point of connection.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- N. Section 0101 Site Preparation and Removals
- O. Section 0102 Survey and Stakeout
- P. Section 0103 Erosion and Sediment Control
- Q. Section 0201 Earthwork
- R. Section 0202 Unclassified Excavation
- S. Section 0203 Select Fill Material
- T. Section 0301 Cast-In-Place Concrete
- U. Section 0401 Furnish and Install Sanitary Sewers
- V. Section 0501 Precast Concrete Manholes
- W. Section 0601 Sewage Pumping Station
- X. Section 0701 Pipe Jacking
- Y. Section 0802 Electrical Work
- Z. Section 0901 Site Restoration

1.03 REFERENCES

References and industry standards listed in this Section are applicable to the Work in this Section unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by governing codes or regulations, the recommendations, suggestions, and requirements described in the referenced standards shall be deemed mandatory and applicable to the Work.

- A. American Society of Testing and Materials (ASTM)
- B. American National Standards Institute (ANSI)
- C. The Cast Iron Soil Pipe Institute (CISPI)

1.04 SUBMITTALS

- A. Product Data: Manufacturer's specifications with all pertinent information regarding dimensions, fittings and installation instructions.

1.05 HANDLING OF MATERIAL

Furnish, deliver and distribute all materials at the site of the work. Protect all materials from the weather where required. Unload all pipe, precast manholes and other material with proper hoists, loaders or skidding to avoid shock or damage to the materials.

Mark and immediately remove all damaged material from the site of the Work.

1.06 CLEARING AND CARE OF PROPERTY

Prior to removal and excavation, cut all bituminous pavement and sidewalk and/or all concrete sidewalk to the designated limits. Saw cut all concrete pavement to the designated limits, as applicable.

In streets, roadways and pathways, maintain a minimum of one (1) lane open at all times for emergency vehicles as well as for golf carts and pedestrian traffic. Provide and maintain steel plates over trench areas for maintenance of traffic where required and maintain access to driveways at all times.

Prior to the start of work, photograph the work site in public streets and easement areas as directed by the Engineer. In easement areas take photographs along the center line of the easement, at intervals as indicated on the Contract Drawings to show the general easement and adjacent area. Provide the Engineer with duplicate 8 inch x 10 inch copies of all photographs which are taken. The cost of photographs will be included in the Lump Sum Bid for the installation of the sanitary sewers.

1.07 ACCESS TO SITE

Include in the Lump Sum Bid the cost of all materials and equipment required to permit access to the work site in wooded, swamp and open areas. Access to the work site must be assumed to be available only along the easement areas and public streets shown on the Contract Drawings. Any regrading permitted for access roadways or work. Site access will be restored to the condition which existed prior to construction. Any fill or road stone required for access roads will be provided at the Contractor's expense.

PART 2: PRODUCTS AND MATERIALS

2.01 GENERAL

Each length of pipe and each fitting shall be marked in accordance with the applicable ASTM Designation.

2.02 DRAINAGE PIPE AND FITTINGS

PVC Sewer Pipe, Building Sewer Connections, and Fittings; (4 inches Diameter and Larger): SDR 35 and ASTM D 3034.

2.03 SOLVENT CEMENTS

Solvent cement used for joining plastic pipe and fittings shall not be utilized.

2.04 CRUSHED STONE BEDDING

Generally, all sewer pipes shall be laid and covered on a crushed stone bed, as shown on the Contract Drawings. Crushed stone, where required for pipe and under structures, will be a clean well-graded crushed stone three-quarters (3/4") inch in size. The number of cubic yards installed shall not be paid separately and shall be included in the Lump Sum Bid.

2.05 MANHOLE CONSTRUCTION

Manholes will be made of precast reinforced concrete barrel sections, constructed in accordance with the details shown on the Contract Drawings. They will be fitted with cast iron frames and covers, and aluminum drop-type manhole steps. Invert channels will be smooth and accurately shaped, as shown on the Contract Drawings.

Except where drop manhole sections are used the invert channels will be sloped through the manhole from the inlet or inlets to the manhole outlet. At drop manholes the invert channel will slope from the invert of the drop section or sections to the manhole outlet.

On those manholes located where a sewer extension may be made in the future and as directed by the Engineer, install stubs of the material, length and diameter and invert elevation indicated on the Contract Drawings.

PART 3: METHOD

3.01 ALIGNMENT AND GRADE

Lay and maintain the sewers to the required lines and grades at the required locations. The Contractor will correct any deviation from established lines and grades at his own cost. Wherever obstructions not shown on the Contract Drawings are encountered during progress of the work and they interfere to such an extent that an alteration in the Contract Drawings is required, the Engineer will have the authority to change the Contract Drawings and order a deviation from the line and grade shown on the Contract Drawings.

Prior to excavation, mark the location of all underground utilities on the surface of the ground. Caution will be taken in preparing for excavation so that the exact location of the underground structures including pipe lines may be determined.

Excavate test pits to determine the location of existing underground structures and pipelines as directed by the Engineer. Payment for making test pits shall not be paid separately and shall be included in the Lump Sum Bid.

3.02 EXCAVATION AND PREPARATION OF TRENCH

Excavate the trench in open cut from the surface of the ground, except where otherwise indicated on the Contract Drawings. The Contractor will be responsible for the protection of all existing adjacent piping, structures and other utilities and will repair any damage at his own expense.

Limit the length of trench to be excavated each day to that length which can be backfilled before the completion of work each day. In open field areas, the trench may be excavated ahead of pipe laying, but in no case will trench excavation be made more than two hundred linear feet in advance of pipe laying. Excavate the trench to the depth required so as to provide a uniform and continuous bearing and support for the compacted bedding and the pipe as detailed on the Contract Drawings. Trenches excavated below the specified grade will be brought back to grade by filling with approved concrete, crushed stone bedding or bank run sand and gravel and thoroughly compacted as directed by the Engineer and at no cost to the Owner.

Stockpile all excavated material in such a manner so as not to endanger the work or to limit free access to all parts of the work. Maintain access to utility valve boxes, manholes and fire hydrants at all times. Material deemed unsuitable by the Engineer for backfilling, will be removed from the site and disposed of as directed by the Engineer. Stockpile excess material suitable for backfilling about the job site, for use as backfill for any settlement that may occur subsequent to the initial trench backfilling. All excavated unsuitable materials must be replaced by clean fill approved by the Engineer. No additional payment will be made for replacement material.

It is the Contractor's responsibility to properly dispose of any materials to be removed off-site as per all sections of these specifications. The Contractor is responsible to find a legitimate disposal site and must obtain any permits or licenses required for proper disposal. The Contractor is responsible for any fees or fines associated with the proper disposal of any materials outlined in all sections of these specifications.

3.03 STEEL TRENCH BOXES

Steel trench boxes, (trench shields), may be used in lieu of temporary timber sheeting at the Contractor's option in trenches up to twenty (20') feet in depth, unless prohibited by the Engineer. The use of steel trench boxes and the type and fabrication of the boxes will be subject to applicable State and Federal Codes and Standards. In using trench boxes, the trench sides will be maintained in the placing and removal of the boxes to avoid opening the trench to excessive widths. All bedding and backfill to twenty-four (24") inches above the pipe will be properly tamped in place and maintained in position when the boxes are moved or removed to avoid disturbing the pipe and affecting the alignment and grade of the pipe. In unstable ground additional pea gravel or mixed crushed stone up to size 3/4 inch properly compacted in place will be required from the top of the pipe to twelve (12") inches above the pipe, as directed by the Engineer.

No direct payment will be made for steel trench boxes and shall be included in the Lump Sum Bid.

3.04 TEMPORARY SHEETING

Temporary timber or steel sheeting, except that which has been ordered left in place, may be removed after backfilling has been completed or has been brought up to such an elevation as to permit its safe removal. Sheeting and bracing may be removed before compacting of the trench, but only in such manner as will insure adequate protection of the sewers and/or other existing utilities, adjacent ground and structures. Take extreme care to fill all of the voids left after withdrawal of the sheeting.

No direct payment will be made for temporary sheeting and shall be included in the Lump Sum Bid.

3.05 DEWATERING

Provide ample means and equipment with which to promptly remove and dispose of all water and drainage during excavation and keep all excavations dry until the structures to be constructed are completed. Pipe laying or masonry construction will not be permitted if water is in the excavation. Prior to making a connection to an existing manhole or pipe line install a plug in the existing piping to prevent groundwater or drainage from entering. Leave the plug in place until its removal is directed by the Engineer.

Under no circumstances will complete portions of the work be used as a means of dewatering trenches.

Unless specifically provided for under a Specification Item, no direct payment will be made for dewatering, including the use of deep wells, but compensation therefore will be considered as being included in the unit prices bid for the various items of the Contract.

3.06 PIPE LAYING

Proper equipment, tools and facilities, satisfactory to the Engineer will be provided and used by the Contractor for the safe and efficient prosecution of the work.

Handle pipe and all materials used in sewer construction so as to prevent damage to the materials and protective coatings or linings.

Carefully clean all pipe and fittings to remove any foreign material which may have fallen into the pipe. Take every precaution to prevent foreign material from entering the pipe while it is being placed in the line.

Do not place tools, clothing or other materials and equipment in the pipe during the laying operations. When pipe laying is not in progress, close the open end of the pipe with a watertight plug or other means approved by the Engineer. This provision will apply during the noon hour as well as overnight or any time when pipe laying is not in progress.

If water is in the trench, leaving the plug in place until the trench is pumped completely dry. Do not lay

pipe in water or when, in the opinion of the Engineer, trench conditions are unsuitable.

Use a laser beam or grade string and batter boards for line and grade, to set the final position of each length of pipe. Keep three batter boards with grade string in place at all times during pipe laying. When the gradient of the pipe line to be constructed is less than 0.40 feet per hundred feet, set the batter boards from reference points by use of an engineer's level. Generally all pipe laying will proceed in an uphill direction with the bell ends of the pipe facing the direction of laying.

Do not use blocking of any sort to support the pipe except as a temporary method of holding the pipe in position for assembly. Remove temporary blocks during initial backfilling and tamping. Secure the pipe in place with backfill material placed as specified. Provide sufficient backfill to prevent flotation of the pipe.

Where pipe is cut to fit into manholes the work will be done in a satisfactory manner so as to leave a smooth end at right angles to the axis of the pipe.

3.07 PVC PIPE

Each PVC pipe joint should be performed as recommended by the pipe manufacturer. The elastomeric gaskets may be supplied separately in cartons or prepositioned in the bell joint or coupling at the factory. When gaskets are color coded, be sure to consult the pipe manufacturer or his literature for the significance. In all cases, clean the gasket, the bell or coupling interior, especially the groove area (except when gasket is permanently installed) and the spigot area with a rag, brush or paper towel to remove any dirt or foreign material before the assembling. Inspect the gasket, pipe spigot bevel, gasket groove and sealing surfaces for damage or de-formation. When gaskets are separate, use only gaskets which are designed for and supplied with the pipe. Insert them as recommended by the manufacturer.

Lubricant should be applied as specified by the pipe manufacturer. Bacterial growth, damage to the gaskets or the pipe may be promoted by use of non-approved lubricants. Use only lubricant supplied by the pipe manufacturer. Do not lubricate either the gasket or the gasket groove in bells where the gaskets must be field installed. Lubrication of the gasket or groove can cause pushouts ("fish-mouthing") when the spigot is inserted. Lubrication of factory installed, non-removable type gaskets should be performed only if recommended by the pipe manufacturer.

After lubrication, the pipe is ready to be joined. Good alignment of the pipe is essential for ease of assembly. Align the spigot to the bell and insert the spigot into the bell until it contacts the gasket uniformly. Apply firm steady pressure either by hand or by bar and block assembly until the spigot easily slips through the gasket. Often a slight twisting motion applied by hand or with a strap wrench lessens the initial insertion force required to make up the joint. Do not swing or "stab" the joint; that is, do not suspend the pipe and swing it into the bell.

The spigot end of the pipe is marked by the manufacturer to indicate the proper depth of insertion. Gasketed joints four (4") inches and smaller can usually be assembled using only manual force. Larger joints, however, may require mechanical assistance to apply enough insertion force. The bar and block method is recommended as a workman is able to feel the amount of force being used and whether the joint goes together smoothly. Special jointing tools employing ratchets or jacks are available if desired. The use of power equipment, such as backhoe bucket, is specifically not recommended as excessive force may be applied with resulting damage to the gasket or bell.

The temperature of the bell and gasket may affect the insertion force required. Most gasket materials

become harder with decreasing temperature which may result in a larger force being required for spigot insertion. Where gaskets are field installed in weather below 40° F, it is suggested that the gaskets be kept warm (between 40° F and 90° F), installed in the gasket groove and the joint made quickly before the gaskets cool to the ambient temperature.

If undue resistance to insertion of the pipe end is encountered or the reference mark does not position properly, disassemble the joint and check the position of the gasket. If it is twisted or pushed out of its seat ("fish-mouthed"), inspect components, repair or replace damaged items, clean the components and repeat the assembly steps. Be sure both pipe lengths are in concentric alignment. If the gasket was not out of position, verify proper location of the reference mark. Relocate the reference mark if it is out of position. Few fittings allow as much spigot insertion length as do pipe bells and couplings. For short-body iron fittings, it may be necessary to remove the beveled PFC spigot end to insure joint tightness.

There are several restrained joint systems commercially available for use with PVC gasketed joint pipe. Any of a number of these systems may be used depending on the specific requirements of the project.

To joint field-cut pipe, it is necessary to first prepare the pipe end. A square cut is essential for proper assembly. The pipe can be easily cut with a hacksaw, handsaw or a power handsaw with a steel blade or abrasive disc. It is recommended that the pipe be marked around its entire circumference prior to cutting to assure a square cut. Use a factory-finished beveled end as a guide for proper bevel angle and depth of bevel plus the distance to the insertion reference mark. The end may be beveled using a pipe beveling tool or a wood rasp which will cut the correct taper. A portable sander or abrasive disc may also be used to bevel the pipe end. Round off any sharp edges on the leading edge of the bevel with a pocket knife or a file. Sharp edges or improper field beveling can result in cut gaskets or gasket posits.

3.07 JOINTING

The methods and materials used in jointing the pipe will be as recommended by the pipe manufacturer. Prior to the start of work, pipe layers will be instructed by a representative of the pipe manufacturer in the proper method to be used and the Contractor will insure that these methods are followed. The Contractor will keep on file in his field office, written installation instructions from each manufacturer of pipe used on the Project. These installation instructions will be available to the Engineer at all times.

A. PUSH ON JOINTS

On push on joints lubricate the gasket after it is inserted in the socket, and assemble the joint in accordance with the manufacturer's recommendations.

3.08 BUILDING SEWERS

Building sewers will be provided as shown on the Contract Drawings or as directed by the Engineer in accordance with the details on the Contract Drawings.

In general, the wye or tee fitting will be of the same material as the main sewer pipe. Where building sewer pipe is of a different material from that of the main sewer pipe, an approved adapter will be provided at the end of each building sewer with adequate bracing to withstand pressure during testing.

Lay the building sewer in the same manner as specified for the main sewer except that batter boards are

not required.

Mark the terminus of each building sewer with a pressure-treated marker stake extending one (1') foot above the ground surface. The building sewer shall be brought to within three feet of the building foundation at the location designated by the Owner.

3.09 PRECAST CONCRETE MANHOLES

Precast concrete barrel manholes will be constructed of reinforced concrete as detailed on the Contract Drawings and as specified in Section 0501 Precast Concrete Manholes. Precast base sections will be provided with mechanical joint outlets or with openings four (4") inches larger in diameter than the outside diameter of the sewer pipe to be inserted.

Thoroughly clean and lubricate the joints and gaskets of the precast sections of the manholes to be placed together, prior to jointing. Subsequent to placing the manhole sections together check for proper jointing. The manhole steps in each section will be aligned to form a continuous ladder to the top of the manhole.

Plug the lift holes in the precast sections with a rubber stopper, fill with mortar and make watertight. Plug all interior and exterior joints and waterproof manhole as required to provide a watertight structure.

The pipe outside the manhole wall shall be surrounded by crushed stone to provide soil-free passage of water into the pipe. The pipe will be maintained by the Contractor until the testing of the manhole and all adjacent pipe have been approved in writing by the Engineer.

3.10 MANHOLE FRAMES AND COVERS

Construct manholes to such height above the sewer as shown or as ordered. Level off the top of the wall of all manholes with mortar and brick, as necessary, so as to form a flat surface upon which the manhole frame may rest. In roadway areas, the top of the frame will be set one and one-half (1-1/2") inches below the elevation of the top of the final pavement.

Prior to permanent pavement construction the frame will be raised to within one and one-half (1-1/2") inches of the final pavement elevation. Payment for raising frames, if necessary, will be included in the unit price stipulated for the manhole.

At locations where the frames will not be adjusted at a later date and upon adjusting manhole frames in paved areas in preparation for construction of permanent pavement set the frames to conform to such elevations as are indicated on the Contract Drawings or as required, setting the manhole frames in a full bed of "Trowel Grade" asphaltic base damp proofing material to effect a water seal. The material will be spread on the outside of the brick masonry down four (4") inches on the precast shell. Provide watertight and locking type covers as detailed and where shown on the Contract Drawings. Refer to Section 0501 Precast Concrete Manholes for additional details and requirements.

3.11 DROP MANHOLE CONNECTIONS

Construct drop manhole connections as shown on the Contract Drawings with precast drop manhole sections or with tees, cut elbows and pipe consistent with the type of pipe used for the sewers. All joints will be made with rubber gaskets. Provide a watertight seal between the pipe and the manhole wall.

3.12 BACKFILLING

A. BACKFILLING STRUCTURES

As manholes and the various structures or parts of structures are completed, fill the space outside and around the walls with material excavated from the site and stored for the purpose. Between the structures and the adjacent unexcavated material, place the backfill in twelve (12") inch layers and compact with approved, flat-faced mechanical tampers, to avoid future settlement. Place the fill evenly to such a height as will bring the finished grade up to the required elevations. Manholes set in the pavement shall be to backfilled in accordance with the BACKFILLING TRENCHES section below. Refer to Section 0201Earthwork for additional details and requirements.

B. BACKFILLING TRENCHES

Upon completion of pipe laying, start backfilling immediately, and continue so that at the end of the working day all pipe is completely backfilled. Where shown on the Contract Drawings or required by governmental agencies, backfill all trenches completely so that the construction area is in a passable condition at the end of each working day.

1. Bottom of Trench

Place backfill continuously by hand in layers not exceeding six (6") inches in thickness and carefully and thoroughly consolidate by tamping alternately on both sides of the pipe to a height of twenty-four (24") inches above the top of the pipe with selected material. The selected material will be free from stones larger than three (3") inches in diameter, frozen material, lumber, pavement or rubbish. In no case will material be allowed to fall directly on a pipe from a bucket, and in all cases the bucket must be lowered so that the shock of the falling earth will not injure the pipe or structure.

2. Upper Trench

Backfill placed more than twenty-four (24") inches above the top of the pipe will be free of stones eight (8") inches in diameter or larger.

C. BACKFILLING MATERIAL REQUIREMENTS

Pipe foundations, to a depth of one (1) foot above the pipe, shall be placed in 12-inch layers and thoroughly compacted by approved mechanical methods to ensure firm bedding and side support. The density requirement is 95% minimum compaction in accordance with ASTM

Method D1557.

When backfill reaches one (1) foot above the top of the pipe, the entire surface shall be compacted by mechanical means. The remainder of the trench shall be backfilled in layers not exceeding eighteen (18) inches thick and each layer thoroughly compacted with a backhoe mounted hydraulic or vibratory tamper, up to four (4) feet under pavement (below bottom of pavement base).

The upper four (4) feet shall be compacted using hand-guided or small self-propelled vibratory or static rollers or pads in layers not exceeding twelve (12) inches in thickness.

The Engineer may order in-place density tests to ascertain conformance with the compaction requirements. Tests may be ordered for every 200 cubic yards of fill or backfill placed or at 75 linear foot intervals of pipeline backfilled, or frequencies deemed necessary by the Engineer, and shall be at no additional expense to the owner. The Contactor shall dig test holes at no additional cost to the Owner when requested for the purpose of taking an in-place density test below the current fill level.

1. In Open Areas (Easements)

Backfilling trenches more than twenty-four (24") inches above the top of pipe in areas where roadways, sidewalks, driveways, utilities, fences or curbing do not exist or will not be constructed may be done with bulldozer or power shovel except as otherwise noted on the Contract Drawings. Where backfilling is permitted with bulldozer or power shovel, provide supervision in addition to the machine operator at the point of backfilling to carefully supervise this operation. Backfill material must not be dropped directly in the open trench. Slide the backfill down the inclined face of the material in the trench.

Where sufficient satisfactory backfill material is unavailable at the excavation site, provide such material from stockpiled surplus. If surplus material is not available on the site the Contractor shall furnish suitable fill material. No additional payment will be made for this work.

2. Under Utilities

Utilities crossing or located within the trench will be protected and supported by placing three-quarter (3/4") inch crushed stone bedding below the utility to the subgrade of the trench. The crushed stone bedding will be confined by driving timber sheeting in the trench a minimum of two (2) feet from each side of the utility pipe or conduit. The timber sheeting will be left in place and will be extended to a point two (2') feet below the pipe or conduit. The crushed stone bedding will be placed and compacted to the center of the utility pipe or conduit. The crushed stone bedding will be placed and compacted to the center of the utility pipe or conduit to provide a stable permanent bedding for the utility.

3.13 PAVEMENT REPLACEMENT

Immediately upon completion of backfilling in roadway areas construct temporary pavement which will be the riding surface until installation of permanent pavement. The temporary pavement will be maintained in a safe usable condition, flush with the existing pavement surfaces by addition of temporary paving material as required until the permanent wearing course is placed over it. Temporary and permanent pavement will be installed in accordance with the details shown on the Contract Drawings and Specification Section 0302 "New Asphalt Pavement."

3.14 TESTING

During the progress of construction and/or upon completion of the same, the Contractor will test the sewers and appurtenances. The Contractor will test the sewers and appurtenances. The Engineer will designate which type of test is to be performed, and the manner in which it will be conducted. The Engineer reserves the right to order an air test to confirm a water test. All manholes will be tested separately by the water exfiltration method. All lines will be blocked to withstand internal pressure as required under Paragraph a-2 below.

Where applicable, test sewers and appurtenances in lengths between manholes of more than 1000 feet will not be permitted.

Sewers will not be tested until at least two (2) weeks after installation of building sewers but must be tested prior to extension of the building sewers past the easement line or street property line. Repair sewers and manholes which fail to meet tests until the necessary requirements of this Specification are complied with as evidenced by subsequent tests. Ground water leakage into manholes will be sufficient reason for requiring the Contractor to uncover or expose any portion of the manhole for a thorough examination by the Engineer, after which the manhole will be repaired and again tested by the Contractor

Final acceptance of the entire length of sewer constructed under this Contract will not be issued until leakage has been reduced to rates not exceeding the maximum rates specified as permissible.

A. Water Testing

The maximum allowable infiltration or exfiltration rate is 100 gallons/day/inch diameter/mile of pipe. The duration of the tests will be a minimum of 24 hours, and the procedure to be used for these tests are as follows:

B. Infiltration Test

Furnish all labor, equipment, tools, and materials, including weirs necessary for such tests. Install the weir in such manholes as directed by the Engineer. Where weir measurements are not suitable in the Engineer's opinion, other methods of measurement, as he will determine, may be adopted. In order for infiltration tests to be permitted the Contractor will be required to determine groundwater elevations along the sewer route to ensure the levels are above the level of the sewer which fairly represent actual service conditions as they may vary throughout the year. The rate of infiltration will be measured every four hours, or at other intervals of time as may be directed by the Engineer.

C. Exfiltration Test for Pipelines

Supply all water, plugs and all labor and equipment for the test. The exfiltration test will be made by filling the sewer line with water so as to obtain a hydrostatic head, on the top of the pipe in the upstream manhole of the line under test, of at least five (5') feet, but not greater than ten (10') feet. The amount of ex-filtration will be obtained by observing the rate of drop in the water level at the upstream manhole hourly for the two (2) hour test.

D. Exfiltration Test for Manholes

Supply all water, plugs, and all labor and equipment for the test. The exfiltration test will be made by filling the manhole with water to the bottom of the cone section. After sufficient allowance for absorption of the water in the concrete walls, the amount of exfiltration will be obtained by observing the water level in the manhole for a minimum period of four (4) hours. The allowable drop in the water level in four (4) hours for a four (4') foot diameter manhole will be calculated at the same rate as that of the pipe.

E. Low Pressure Air Testing

Low pressure air test procedures shall conform to ASTM C828 except as modified by the UNI-Bell Plastic Pipe Association Publication UNI-B-6-98, for Low Pressure Air Testing of Installed Sewer Pipe.

If at any time during the guarantee period the Engineer determines that a sewer line has excessive infiltration the Contractor will retest that portion of the line and make necessary repairs until the line passes the water test as specified above.

No direct payment will be made for testing, repairing or retesting. The cost for such tests will be included in the unit price bid for pipe.

Should any test of installed pipe disclose leakage greater than that specified, the Contractor will, at his own expense, locate and repair the cause until the leakage is within the specified allowance.

For any section of sewers or for any manhole not meeting the test designated by the Engineer the Contractor will determine the cause of the failure and make any necessary repairs in a manner satisfactory to the Engineer. This will include digging up, repairing or replacing damaged pipe, fittings and manholes, as well as television inspection of the section of sewer.

3.15 FINAL INSPECTION PRECEDING ACCEPTANCE

Final inspection of the work will include a visual inspection of each section of sewer by looking from manhole to manhole with the aid of reflected sunlight or an electric torch. The pipe will be true to both line and grade, will show no leaks, will be free from cracks and from protruding joint materials and contain no deposits of sand, dirt or other materials which will reduce the full cross-sectional area.

Ground water infiltration will not exceed the rates stipulated and will be distributed uniformly throughout the collecting system and not occur through a few joints. All finished work will be neat in appearance and of first-class workmanship. Furnish laborers to assist the Engineer in this inspection.

At the end of the guarantee period as set forth in the contract documents, any sections of sewers that are damaged will be properly repaired or replaced by the Contractor at his expense as directed by the Engineer. The Engineer may require additional testing of those sections of sewer, where repairs are made, or where excess infiltration is observed during this final inspection before release of the Contractor from the guarantee period, and payment of the **retainage** on the Contract. The cost of this final inspection is included in the testing of the sewers and appurtenances and is paid for under the various pipe items bid unless a unit price for this work is set forth in the proposal.

PART 4: MEASURE MENT AND PAYMENT

4.01 DESCRIPTION

The cost for this work item shall be included in the **Project Lump Sum** bid and shall include the cost of all labor, materials and equipment necessary to complete the work as shown on the Contract Drawings. All labor, materials and equipment including but not limited to saw cutting asphalt and concrete, excavation including trenching and sheeting, select backfilling and compaction, sub-base material, removal and disposal of surplus material, proposed drainage sewer pipe, laying of pipe, connection to any structures, fittings and connections, manhole structures, temporary pavement, pavement repair or patching, and any incidental work required to complete the work as specified in the Contract Documents and Specifications, and to the satisfaction of the Engineer.

The price bid shall also include the cost for furnishing and installing the all pipe, valves and appurtenances required for sewer service connections. The Contractor shall end all sewer service connection within 3'-0" of a building and shall temporarily seal the open ends and provide wooded stakes markers at grade. All work shall be coordinated with the Owner. The trench shall be continued to the building foundation to the point of connection.

SECTION 0402

FURNISH AND INSTALL FORCE MAIN

PART 1: WORK

1.01 DESCRIPTION

Under this item the Contractor shall furnish and install sanitary force main and sanitary sewer manholes at the locations and grades shown on the Contract Drawings and these specifications. This work shall include the cost of all labor, materials and equipment necessary to complete the work including all piping, fittings and sanitary sewer manholes. This work shall not be limited to excavation, saw cutting

asphalt and concrete, trenching and sheeting, screening of excavated material as required, backfilling and compaction, connections, temporary pavement, pavement repair or patching, street closure permits, and any incidental work required to complete the work as specified in the Contract Documents and Specifications, and to the satisfaction of the Engineer or Town.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- AA. Section 0101 Site Preparation and Removals
- BB. Section 0102 Survey and Stakeout
- CC. Section 0103 Erosion and Sediment Control
- DD. Section 0201 Earthwork
- EE. Section 0202 Unclassified Excavation
- FF. Section 0203 Select Fill Material
- GG. Section 0301 Cast-In-Place Concrete
- HH. Section 0401 Furnish and Install Sanitary Sewers
- II. Section 0501 Precast Concrete Manholes
- JJ. Section 0601 Sewage Pumping Station
- KK. Section 0701 Pipe Jacking
- LL. Section 0901 Site Restoration

1.03 REFERENCES

References and industry standards listed in this Section are applicable to the Work in this Section unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by governing codes or regulations, the recommendations, suggestions, and requirements described in the referenced standards shall be deemed mandatory and applicable to the Work.

- A. Materials for water systems shall meet the appropriate American Standard Testing Materials (ASTM) Standard:
 - 1. ASTM D-1784 made from Class 12454-B virgin compounds.
 - 2. ASTM F 477, for gaskets ASTM 2855, for solvent-cemented
 - 3. ASTM D-1248, Type 3, Category 3, 4 or 5, P23, P33 or P34, Class C
- B. 10 State Standards – Recommended Standards for Wastewater Facilities
- C. Rules and Regulations of the Westchester County Department of Health

1.04 SUBMITTALS

- A. Product Data: Manufacturer's specifications including dimensions and coatings.
- B. Quality Control Submittals: Statement of compliance with ANSI & AWWA Specifications.

PART 2: MATERIAL

2.01 BACKFILL MATERIAL

- A. Excavated Material: Excavated material shall be used as backfill under this item unless the Engineer deems the material to be unsuitable. Excavated material used as backfill and grading, shall meet the gradation requirements for Granular Fill. No additional payment will be made for this work but the cost thereof shall be deemed included in the price for the item for which work is being performed.
- B. Granular Fill: Material for use in replacing undercut areas or in construction of embankments or where called for shall be approved by the Engineer and obtained from approved sources. Suitable soil materials shall be sound, durable, sand, gravel, stone, or blends of these materials, free from organic and other deleterious materials and shall have the following gradation as determined by ASTM Designation D-422, Particle Size Analysis of Soils:

Sieve Size Max	% Passing by Weight
1 inch	100
No. 40	5 – 70
No.200	0 -15

- 1. If the Engineer deems the excavated material to be unacceptable, Granular Fill shall be to backfill the forcemain. Granular Fill, if ordered by the Engineer, shall be paid under Item 1002. No payment will be made without the prior approval of the Engineer or Town.

- C. Crushed Stone: Shall conform to NYSDOT Item 703-0201 have the following gradation as determined by ASTM Designation D-422, Particle Size Analysis of Soils:

Sieve Size Max	% Passing by Weight
1 inch	100
½ inch	45 to 85
¼ inch	30 to 65
No.10	15 to 45
No.200	0 to 5

2.02 PVC FORCEMAIN

All pressure lateral sewer pipe and fittings shall be not less than 1-1/4 inch in diameter PVC or HDPE.

A. Acceptable Materials:

1. Polyvinyl Chloride Pipe (PVC)

- a. Minimum diameter and strength - 4" SCH 80
- b. Pipe and fittings- ASTM D-1784 made from Class 12454-B virgin compounds
- c. Joints - ASTM F 477, for gaskets ASTM 2855, for solvent-cemented
- d. Curb Stop - Minimum size: 4" brass ball Ford model B11 555 or equivalent.

2. Curb Box

- a. Minimum size: Ford model EA1-50-40-42R or equivalent.

2.03 SEWER

- A. Check Valve - Minimum size: 4" PVC full ported passage Way Environment One Corp. or equivalent.

PART 3: METHOD

3.01 DEFINITION

Earth excavation shall mean the removal from the trench lines of all materials except rock, and shall include topsoil, trees, hedges, shrubs, vegetation and structures above and below ground. All excavation carried beyond the lines and grades shown on the contract drawing, or established by the Engineer, together with the disposal of excavated material, shall be at the contractor's expense.

All unnecessary excavation will be filled with Backfill Material as specified in D. Backfilling of these specifications by the contractor at his own expense as directed by the Engineer.

3.02 ALIGNMENT AND GRADE

Lay and maintain the sewers to the required lines and grades at the required locations. The Contractor will correct any deviation from established lines and grades at his own cost. Wherever obstructions not shown on the Plans are encountered during progress of the work and they interfere to such an extent that an alteration in the Plans is required, the Engineer will have the authority to change the Plans and order a deviation from the line and grade shown on the Plans.

Prior to excavation, mark the location of all underground utilities on the surface of the ground. Caution

will be taken in preparing for excavation so that the exact location of the underground structures including pipe lines may be determined.

Excavate test pits to determine the location of existing underground structures and pipe lines as directed by the Engineer. No direct payment will be made for test pits and shall be included in the Lump Sum Bid

3.03 EXCAVATION AND PREPARATION OF TRENCH

Excavate the trench in open cut from the surface of the ground, except where otherwise indicated on the Plans. The Contractor shall be responsible for the protection of all existing adjacent piping, structures and other utilities and will repair any damage at his own expense.

The trench shall be properly excavated to provide a uniform and continuous bearing and support for the pipe on solid and undisturbed ground at every point between the bell holes. The finished sub-grade shall be prepared accurately by means of hand tools. If the soil conditions at sub-grade are unsuitable, the Contractor shall excavate the trench below the pipe invert, to the limits shown or ordered and place the pipe on foundation material or concrete.

In rock trench, the bedding of the pipe in foundation material or concrete shall be in accordance with the details shown or specified. Special care in handling shall be exercised during delivery and unloading of pipe to avoid damage. Damaged pipe shall be rejected and replaced. The pipe shall be stored in such a manner as to keep the interior free from dirt and foreign matter.

Limit the length of trench to be excavated each day to that length which can be backfilled before the completion of work each day. In open field areas, the trench may be excavated ahead of pipe laying, but in no case will trench excavation be made more than two hundred linear feet in advance of pipe laying. Excavate the trench to the depth required so as to provide a uniform and continuous bearing and support for the compacted bedding and the pipe as detailed on the Plans. Trenches excavated below the specified grade will be brought back to grade by filling with approved concrete, crushed stone bedding or bank run sand and gravel and thoroughly compacted as directed by the Engineer and at no cost to the Owner.

Stockpile all excavated material in such a manner so as not to endanger the work or to limit free access to all parts of the work. Maintain access to utility valve boxes, manholes and fire hydrants at all times. Material deemed unsuitable by the Engineer for backfilling, will be removed from the site and disposed of as directed by the Engineer. Stockpile excess material suitable for backfilling about the job site, for use as backfill for any settlement that may occur subsequent to the initial trench backfilling. All excavated unsuitable materials must be replaced by clean fill approved by the Engineer. Surplus excess material, which is suitable for backfill, is the property of the Owner and will be disposed of as directed, within two miles of the site of the work or as directed by the Engineer. All disposal areas will be leveled and graded as directed by the Engineer.

3.04 STEEL TRENCH BOXES

Steel trench boxes, (trench shields), may be used in lieu of temporary timber sheeting at the Contractor's

option in trenches up to twenty (20') feet in depth, unless prohibited by the Engineer. The use of steel trench boxes and the type and fabrication of the boxes will be subject to applicable State and Federal Codes and Standards. In using trench boxes, the trench sides will be maintained in the placing and removal of the boxes to avoid opening the trench to excessive widths. All bedding and backfill to twenty-four (24") inches above the pipe will be properly tamped in place and maintained in position when the boxes are moved or

removed to avoid disturbing the pipe and affecting the alignment and grade of the pipe. In unstable ground additional pea gravel or mixed crushed stone up to size 3/4 inch properly compacted in place will be required from the top of the pipe to twelve (12") inches above the pipe, as directed by the Engineer.

No direct payment will be made for temporary sheeting, but compensation therefore will be considered as being included in the unit prices bid for the various items of the Contract.

3.05 TEMPORARY SHEETING

Temporary timber or steel sheeting, except that which has been ordered left in place, may be removed after backfilling has been completed or has been brought up to such an elevation as to permit its safe removal. Sheeting and bracing may be removed before compacting of the trench, but only in such manner as will insure adequate protection of the water mains and/or other existing utilities, adjacent ground and structures. Take extreme care to fill all of the voids left after withdrawal of the sheeting.

No direct payment will be made for temporary sheeting, but compensation therefore will be considered as being included in the unit prices bid for the various items of the Contract.

3.06 DEWATERING

Provide ample means and equipment with which to promptly remove and dispose of all water and drainage during excavation, and keep all excavations dry until the pipes to be installed are completed. Pipe laying will not be permitted if water is in the excavation. Prior to making a connection to an existing pipe line install a plug in the existing piping to prevent groundwater or drainage from entering. Leave the plug in place until its removal is directed by the Engineer.

Under no circumstances will completed portions of the work be used as a means of dewatering trenches.

Unless specifically provided for under a Specification Item, no direct payment will be made for dewatering, including the use of deep wells and shall be included in the Lump Sum Bid

3.07 INSTALLATION

All pipe and fittings shall be installed to the lines and elevations shown, ordered or specified.

Unless otherwise specified, laying of ductile iron pipe shall comply with the applicable provisions of 10 State Standards – Recommended Standards for Wastewater Facilities and the Rules and Regulations of the Westchester County Department of Health. The laying condition of the pipe shall consist of pipe being laid in a flat bottom trench with backfill material consistent with the provided details. The depth of trench in general shall be such as to provide no less than 4 feet and no more than 5 feet of cover over the pipe.

In accordance with the manufacturer's recommendations, proper and suitable tools and equipment shall be used for the safe and convenient handling and laying of pipe and fittings. Deflections at the pipe joints shall be limited to 75% of the maximum amount recommended by the manufacturer.

No water shall be allowed to gather in excavations or trenches. All excavations must be properly refilled to grade in compacted layers and the original type of surface replaced. Streets, sidewalks, parkways and other public property disturbed in the course of the work shall be restored in a manner satisfactory to the Sewer District and any other authority having jurisdiction. Soil or foreign matter shall be kept out of the pipe during construction and damage of pipe shall not be allowed. Open ends of pipes shall be kept plugged or bulk headed during construction.

No defective materials shall be used or installed.

In order to be accepted by the Town, all manhole frame sets shall be set to finish grade, all valve boxes and curb boxes shall be set squarely down on the valve or curb stop and shall be centered and plumb over the wrench nut of the valve or operating rod of the curb stop and shall not be over extended. All valves and curb stops shall be suitable marked.

3.08 INSPECTION AND TESTING OF PIPE

Inspection of all sanitary sewer pipe and appurtenances shall fall under the guidelines of the Sewer District Quality Assurance Program.

- A. Inspection is considered full time while contractor is doing sanitary work, laying pipe backfilling 2' minimum over pipe, backfilled laterals, setting structures, wet wells, prefabricated pump stations and testing. Bench and trough, frame sets, air release, blow-off, flushing, odor control buildings and laterals, if left open, will be considered periodic inspection.
- B. Hydrostatic testing shall be performed on the finished system after it is completely backfilled. Test to Conform to AWWA C600-93 Section 4. Parameters are:
 - 1. Test Pressure – 120 PSI minimum – Test Duration 2 Hours
 - 2. Allowable leakage, per thousand feet of pipe:

Pipe Diameter	Leakage	Pipe Diameter	Leakage
1-1/4"	0.20 gallons	4"	0.66 gallons
1-1/2"	0.25 gallons	6"	0.99 gallons
2"	0.25 gallons	8"	1.32 gallons
2-1/2"	0.41 gallons	10"	1.64 gallons

3"	0.55 gallons		
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3.09 BACKFILLING (EXCEPT ROAD AREAS)

- A. No backfill shall be placed until the pipe has been inspected in place and approved by the Engineer. All backfilling will consist of approved sound material, free from organic material, rubbish, or other unsuitable materials. No material containing stones having a dimension of greater than 10 inches will be used for backfill. Backfill will be placed in uniform horizontal layers and properly compacted. No stones will be permitted within 2 feet of the pipe. The trench will be backfilled to a depth of 2 feet over the top of the pipe, and tamped solidly in a manner that will not produce unequal pressures or injure the pipe.
- B. Backfilling will be carried out as soon as possible after the pipe has been inspected and approved. The length of pipe trench left open after inspection and approval will not be greater than 100 feet during working hours, and 25 feet at the end of each working day; and approved temporary fencing around open excavation will be required at night, on week ends, and on holidays or when work is not in progress for any extended period of time. All backfilling will be in conformance with the Contract Drawings.
- C. All trenches within the existing pavement areas including driveways will be backfilled with granular material meeting the specifications of New York State Department of Transportation Item 722.04 Type 4.
- D. Pipe foundations, to a depth of one (1) foot above the pipe, shall be placed in 12-inch layers and thoroughly compacted by approved mechanical methods to ensure firm bedding and side support. The density requirement is 95% minimum compaction in accordance with ASTM Method D1557.
- E. When backfill reaches one (1) foot above the top of the pipe, the entire surface shall be compacted by mechanical means. The remainder of the trench shall be backfilled in layers not exceeding eighteen (18) inches thick and each layer thoroughly compacted with a backhoe mounted hydraulic or vibratory tamper, up to four (4) feet under pavement (below bottom of pavement base). The upper four (4) feet shall be compacted using hand-guided or small self-propelled vibratory or static rollers or pads in layers not exceeding twelve (12) inches in thickness.
- F. The Town may order in-place density tests to ascertain conformance with the compaction requirements. Tests may be ordered for every 200 cubic yards of fill or backfill placed or at 75 linear foot intervals of pipeline backfilled, or frequencies deemed necessary by the Owner. The contractor shall dig test holes at no additional cost to the Owner when requested for the purpose of taking an in-place density test below the current fill level. Excavated material in excess of that required for backfill, including material unsuitable for backfill, will be disposed of at the expense of the contractor at a place of disposal approved by the Engineer or Water Superintendent

3.10 PAVEMENT

Cuts for pavement removal will be made with straight paralleled sides with pneumatic cutters or other

approved power tools. All cuts and shall be straight and true and follow the limits set in the plans. No payment will be made for additional excavation or pavement for any overcutting.

All trenches in the pavement area will be backfilled with material as specified under Section 0201 of these specifications, "Backfilling." The backfill in the road trench area will be placed uniformly in layers of one foot and will be firmly compacted by an approved mechanical tamper.

3.11 SAFETY, PUBLIC CONVENIENCE AND TRAFFIC CONTROL

The Contractor will conduct his operations in such a manner as to provide maximum safety for all employees on the work and the public as well. The contractor will provide suitable bridges, barricades, railings, or other protection about open trenches, and warning signs and flashing lights for any obstructions to the traffic. No driveway entrances will remain blocked overnight. The Contractor will promptly comply with such regulations as may be prescribed by the Engineer and will, when so directed, properly correct any unsafe conditions created by, or unsafe practices on the part of his employees. In the event of the contractor's failure to comply, the Engineer or his representative may take the necessary measures to correct the conditions or practices complained of, and all costs thereto, will be deducted from any monies due the contractor. Failure of the Engineer to direct the correction of unsafe conditions or practices will not relieve the contractor of his responsibilities thereunder. The contractor will provide traffic control when required by the Engineer. The contractor will fully cooperate at all times regarding traffic control, and will promptly comply with regulations prescribed by the Engineer. No direct payment will be made for traffic control and shall be included in the Lump Sum Bid. Flagmen shall be provided at all times when working within public roads or driveways.

PART 4: MEASUREMENT AND PAYMENT

4.01 DESCRIPTION

The cost for this work item shall be included in the **Project Lump Sum** bid and shall include the cost of all labor, materials and equipment necessary to complete the work as shown on the Contract Drawings. All labor, materials and equipment including but not limited to excavation, saw cutting asphalt and concrete, trenching and sheeting, screening of excavated material as required, backfilling and compaction, sub-base material, removal and disposal of surplus material, proposed force main pipe, valves, fittings, couplings, restraints, concrete thrust blocks, laying of pipe, connection to other pipes, temporary pavement, pavement repair or patching, street closure permits, and any incidental work required to complete the work as specified in the Contract Documents and Specifications, and to the satisfaction of the Engineer or Town.

The price bid shall also include the cost for furnishing and installing the all pipe, valves and appurtenances required for sewer service connections.

SECTION 051

PRECAST CONCRETE MANHOLES

PART 1: WORK

1.01 DESCRIPTION

Under this work, the Contractor shall furnish and install precast concrete manholes as indicated on the Drawings and as specified herein. Subsequently, in this Section, these items will be referred to as "precast unit". This shall also include the cost of all labor, materials and equipment necessary to complete the work including all piping, fittings, all frames, covers, traps, steps/rungs, and other miscellaneous items to be fabricated with or installed on the precast units. This work shall not be limited to excavation, saw cutting asphalt and concrete, trenching and sheeting, screening of excavated material as required, backfilling and compaction, connections, temporary pavement (if necessary), pavement repair or patching (if necessary), and any incidental work required to complete the work as specified in the Contract Documents and Specifications, and to the satisfaction of the Engineer or Town.

The cost for cleaning all manholes of silt and debris prior to final acceptance of the project by the Town shall be included in this work. No additional payment will be made.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 0101 Site Preparation and Removals
- B. Section 0102 Survey and Stakeout
- C. Section 0103 Erosion and Sediment Control
- D. Section 0201 Earthwork
- E. Section 0202 Unclassified Excavation
- F. Section 0203 Select Fill Material
- G. Section 0301 Cast-In-Place Concrete
- H. Section 0401 Furnish and Install Gravity Sewer
- I. Section 0402 Furnish and Install Force Main
- J. Section 0501 Precast Concrete Manholes
- K. Section 0601 Sewage Pumping Station
- L. Section 0701 Pipe Jacking
- M. Section 0801 Electrical Work
- N. Section 0901 Site Restoration

1.03 REFERENCES

- A. American Society for Testing and Materials (ASTM)
- B. Federal Specifications (FS)
- C. American Association of State Highway and Transportation Officials (AASHTO)
- D. Standard drainage specifications of the Town.
- E. International Concrete Repair Institute (ICRI)

1.04 DEFINITIONS

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1.05 DESIGN REQUIREMENTS

- A. Precast concrete manholes shall meet The Town of Yorktown requirements and be capable of withstanding an AASHTO HS20 loading.
- B. Precast concrete manholes shall be manufactured using normal weight concrete with a minimum compressive strength of 4000 psi, air-entrained, and a maximum water to cement ratio of 0.42.

1.06 MANUFACTURER

- A. All manufacturers of materials shall be as approved by The Town of Yorktown or as specified by the plans. The Contractor may offer substitutions for approval.
- B. Frames & Castings – Expanded Supply Products Inc. 3330 Route 9, Cold Spring, New York, 10518, (845) 265-3772
- C. Precast Structures – Expanded Supply Products Inc. 3330 Route 9, Cold Spring, New York, 10518, (845) 265-3772

1.07 SUBMITTALS

- A. Product Data

Submit manufacturer's product data on each of the following:

1. Each type of cast iron cover and frame
2. Each type of step/rung
3. Trap
4. Butyl Gasket
5. Coating

B. Shop Drawings

Before casting units, submit shop drawings of each item to be cast, showing details of all pipe entries, finish grades and other pertinent information. Ensure the orientation of the catch basin properly accounts for the required grating slot direction.

C. Quality Control Submittals

1. Design Data: Submit design mixes for concrete, including list of admixtures to be used, and preliminary trial mix test results.
2. Test Reports: Daily testing logs.
3. Certification: From testing laboratory that construction of the precast units is in compliance with the requirements of the Town and this specification.
4. Contractor Qualifications: Provide proof of Manufacturer and Concrete Laboratory qualifications specified under “Quality Assurance”.

1.08 QUALITY ASSURANCE

A. Qualifications

1. Precast Unit Manufacturer: Company specializing in the production of precast concrete site structures shall have a minimum of five years’ experience.

2. Concrete Laboratory: Concrete laboratory providing design mixes and quality control inspection shall be approved by the Town of Croton-On-Hudson and shall meet the requirements of ASTM E329.

1.09 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store, and handle precast units in such manner so as not to damage the units.

PART 2: PRODUCTS AND MATERIALS

2.01 MANUFACTURERS

- A. All manufacturers of materials shall be approved by The Town or as specified by the plans. The Contractor may offer substitutions for approval.

2.02 BACKFILL MATERIAL

- C. Excavated Material: Excavated material shall be used as backfill under this item unless the Engineer deems the material to be unsuitable. Excavated material used as backfill and grading, shall meet the gradation requirements for Granular Fill. No additional payment will be made for this work, but the cost thereof shall be deemed included in the Project Lump Sum Bid price.
- D. Granular Fill: Material for use in replacing undercut areas or in construction of embankments or where called for shall be approved by the Engineer and obtained from approved sources. Suitable soil materials shall be sound, durable, sand, gravel, stone, or blends of these materials, free from organic and other deleterious materials and shall have the following gradation as determined by ASTM Designation D-422, Particle Size Analysis of Soils:

Sieve Size Max	% Passing by Weight
1 inch	100
No. 40	5 – 70
No.200	0 -15

1. If the Engineer deems the excavated material to be unacceptable, Granular Fill shall be to backfill the precast concrete manholes. Crushed stone, if ordered by the Engineer, shall be paid under Item 1002. No payment will be made without the prior approval of the Engineer or Town.

E. Crushed Stone: Shall conform to NYSDOT Item 703-0201 have the following gradation as determined by ASTM Designation D-422, Particle Size Analysis of Soils:

Sieve Size Max	% Passing by Weight
1 inch	100
½ inch	45 to 85
¼ inch	30 to 65
No.10	15 to 45
No.200	0 to 5

1. If the Engineer deems the excavated material to be unacceptable, Granular Fill shall be to backfill the precast concrete manholes. Crushed stone, if ordered by the Engineer, shall be paid under Item 1002. No payment will be made without the prior approval of the Engineer or Town.

2.03 MATERIALS

A. Cement

Shall conform to ASTM C150, Type II, and shall be of the non air-entrained types:

B. Admixtures

1. The use of admixtures shall comply with the requirements of Section 500 and all related sections of the NYS DOT Standard Specifications. The final soluble chloride content in concrete, percent by weight of cement, due to the addition of admixtures and other ingredients shall not exceed .05 at 28 days.
2. Air-entraining admixtures shall conform to ASTM C260.
3. Chemical admixtures shall conform to ASTM C494.

C. Water

Shall be clean potable water free of injurious foreign matter conforming to the requirements for water specified in ASTM C94.

D. Aggregates

Fine and coarse aggregates shall be regarded as separate ingredients. Each size of coarse aggregate, as well as the combination of sizes when two or more are used, shall conform to the appropriate grading requirements of the applicable ASTM specifications. Maximum size of coarse aggregate shall conform to paragraph 3.3.3 of ACI 318. Aggregates shall conform to ASTM C33 and be of Size No.67 or No.8.

E. Concrete Reinforcement

1. Reinforcing Bars: All reinforcing bars shall be of deformed type of new billet steel conforming to current requirements of ASTM A615, grade 60. No rail or re-rolled steel will be permitted.

2. Welded Steel Wire Fabric: Wire Fabric shall conform to the requirements of ASTM A185.

F. Manhole Frame and Cover

1. Cast iron frame and cover with type as specified on the plans or equal product approved by the Town's Representative.

G. Catch Basin Frame and Cover

Cast iron frame and cover with type as specified on the plans or equal product approved by the Town's Representative.

H. Precast Concrete Manholes /rungs:

Type as specified on the plans or equal product approved by the Town's Representative.

A. Self-sealing Butyl Gasket

7/8" x 7/8" or 1" diameter conforming to Fed. Spec. SS-S-00210.

B. Expansion Screw Anchors with malleable lead shields in accordance with Federal Specifications FF-S-325C, Group 1, Type 1, Class 1.

2.04 MIXES

A. General

Concrete for all parts of the Work shall be of the specified quality capable of being placed without excessive segregation and, when hardened, of developing all characteristics required by the Specifications and Drawings.

B. Strength

Strength requirements given in Part 1 of this Specification are based on 28-day compressive strength.

C. Provide the following air content for the grading size of coarse aggregate as follows:

1. No.8.....7½%
2. No. **57 or 67**.....6%

Tolerance on air content as delivered shall be +1.5%.

2.05 FABRICATION

- A. Fabricate the precast concrete manholes to the sizes and shapes shown on the Drawings, with pipe openings, precast collars, rungs/steps, lift inserts and other items as indicated.
- B. Cast units in tight, well-built forms; vibrate concrete to ensure smooth, laitance-free surfaces.
- C. Finished units shall be warp-free, of uniform thicknesses with shapes, sizes, pipe openings, inserts and all other details as shown on the Drawings and as specified herein.
- D. Provide 5/8" threaded dowels at pipe opening locations to provide attachment for piping.
- E. Provide scoring for bond on bottom slab of the precast units as detailed on the Drawings. Provide keys at all joints.

PART 3: METHOD

3.01 INSTALLATION

- A. Install precast concrete manholes at locations shown on the Drawings; place level and plumb, and to proper depths. Catch basins are to be placed to ensure that the long direction of the slot of the grating will be perpendicular to the flow of pedestrian traffic. Coordinate with pipe connection locations. Install butyl gaskets at joints on both horizontal surfaces of keyed joint, in such manner to seal each joint completely, providing adequate lap. One 9" or less diameter opening per unit is permitted to be core drilled in the field due to fabrication errors. Any other unit requiring greater diameter or greater opening shall be rejected.
- B. Install precast collars and manhole brick set in Type M mortar to allow for placement of the covers at the correct rim invert elevation.
- C. Install cast iron frames and covers, and traps, as detailed on the Drawings and as recommended by the manufacturer. Grates are to be placed with the long direction of the slot perpendicular to the flow of pedestrian traffic when placed in walkways.
- D. Units with large spalls (greater than 2" in depth and 2 SF in area) and openings greater than 9" in diameter placed in the wrong location are rejected and shall be replaced. Minor spalls and openings 9" or less placed in the wrong location are to be patched as follows:
 - 1. Roughen surface or perimeter of opening to a fractured aggregate surface.
 - 2. In openings, drill and install a minimum of four 1/2" dia ss expansion anchors with 4" extension.
 - 3. At openings, install butyl sealant around perimeter.
 - 4. Apply slurry coat of hydraulic repair mortar of type approved by the A/E of Record to all surfaces to receive repair mortar.
 - 5. Install hydraulic repair mortar to match existing contours and thicknesses of members.
- D. Make pipe-to-precast concrete manholes connections using non-shrink grout.

PART 4: MEASUREMENT AND PAYMENT

4.01 DESCRIPTION

Payment for all Work under this item shall be at the **Project Bid Price** bid including frames and grates, installed in place as shown on the Contract Drawings and shall include the cost of furnishing all labor, materials and equipment including but not limited to excavation, select backfilling and compaction, removal and disposal of surplus material, proposed and existing drainage pipe connections, brick masonry, concrete block, concrete, precast structures, frames and grates, reinforcing, bolts or other connections, asphalt saw cutting, temporary pavement, pavement repair or patching, and any incidental work required to complete the work in accordance with the Contract Drawings and Specifications, to the satisfaction of the Engineer.

Note: Included in this work shall be the cost for precast concrete manholes of silt and debris prior to final acceptance of the project by the Town.

SECTION 0703

SEWAGE PUMPING STATION

PART 1 GENERAL

1.01 DESCRIPTION

Under this item the Contractor Shall Furnish and Install a completely operational sewage pumping station including pumps, flow metering equipment, motor controllers, emergency generator, odor control equipment, piping, plastic and metal fabrications, valves, painting, etc. for the collection and transfer of raw domestic sanitary wastewater.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 0101 Site Preparation and Removals
- B. Section 0102 Survey and Stakeout
- C. Section 0103 Erosion and Sediment Control
- D. Section 0201 Earthwork
- E. Section 0202 Unclassified Excavation
- F. Section 0203 Select Fill Material

- G. Section 0301 Cast-In-Place Concrete
- H. Section 0401 Furnish and Install Gravity Sewer
- I. Section 0402 Furnish and Install Force Main
- J. Section 0501 Precast Concrete Manholes
- K. Section 0601 Sewage Pumping Station
- L. Section 0701 Pipe Jacking
- M. Section 0801 Electrical Work
- N. Section 0901 Site Restoration

1.03 REFERENCES

References and industry standards listed in this Section are applicable to the Work in this Section unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by governing codes or regulations, the recommendations, suggestions, and requirements described in the referenced standards shall be deemed mandatory and applicable to the Work.

- A. Materials for waste water systems shall meet the appropriate American Standard Testing Materials (ASTM) Standard.
- B. NEMA Standards
- C. 10 State Standards – Recommended Standards for Wastewater Facilities
- D. Rules and Regulations of the Westchester County Department of Health

1.04 SUBMITTALS

- A. Product Data: Catalog sheets, specifications.
 - 1. Sewage Pumps, Sump Pumps:
 - a. Dimensions.
 - b. Illustration/description of construction.
 - c. Hydraulic performance curve.
 - d. Pump performance as a function of rotor speed. (Metering Pumps).
 - 2. Pump controls.
 - 3. Flow Metering Equipment:
 - a. Dimensions for all items.

b. Electrical wiring diagram for interconnection of flow metering equipment.

4. Valves (all types).

5. Pressure gages.

6. PVC Piping.

7. Flange adapters.

8. Paints and Coatings:

a. Furnish the manufacturer's recommended directions for application of the paints and coatings.

B. Shop Drawings:

1. Motor Controller Electric Schematic Wiring Diagrams:

a. Furnish schematic control wiring diagrams for the motor controllers for the 2 grinder pumps, mixer, and metering pumps

b. Show control of equipment action, its sequence of operation, and its relationship with the action other interrelated equipment as described in Paragraph 3.01 D. and Paragraph 3.01 E.

c. The control wiring diagrams shall be specifically prepared for this contract and reprinted copies of catalog wiring diagrams, modified for this contract, or wiring diagrams previously prepared for other customers, will be rejected and returned as not approved.

C. Quality Control Submittals:

1. Company Field Advisor Data:

a. Name, business address and telephone number of Company Field Advisor secured for the required services.

b. Certified statement from the Company listing the qualifications of the Company Field Advisor.

c. Services and each product for which authorization is given by the Company, listed

specifically for this project.

2. Test Reports, Pump Test Curves:

- a. In addition to the catalog curves, furnish pump curves, for tests conducted in compliance with the standards of the Hydraulic Institute and performed at the pump manufacturer's plant.
- b. Furnish tests for the 2 grinder pumps.
- c. Furnish curves for tests performed on the actual assembled pumps to be furnished. Curves derived from tests made on models, at reduced speeds, or equal pumps fabricated for others at a previous date will be rejected and returned as not approved.
- d. Submit tabulated test data results together with the graphic performance curves for each pump. Present curves, in English Units, for total dynamic head, efficiency, and horsepower as functions of discharge rate. Include all specific points listed in Paragraph 2.02 A. on the curve plots.
- e. Furnish curves from tests that are witnessed, dated, and certified correct by the Company Field Advisor.

1.05 QUALITY ASSURANCE

A. Company Field Advisor: Secure the services of a Company Field Advisor for the flow metering equipment for a minimum of 8 working hours. Delays that are due to faulty installation and wiring that unreasonably extends that service visit shall not be included as part of the 8 working hours.

1. The Field Advisor shall check the flow meter equipment for installation, wiring, and operation. Include in the review of equipment operation an evaluation of the accuracy of the flow recorder for simulated signals that represent the full zero gpm to 250 gpm range of the recorder. Recalibrate the instrument as may be required.

1.06 MAINTENANCE

A. Manuals: Provide maintenance manuals bound within soft covers for each item of equipment furnished for the pumping station. Identify the equipment on the front covers and present in triplicate to the Engineer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. FLYGT, Xylem, Inc., 14125 South Brudge Circle, Charlotte, N.C. 28273, Tel:704-205-9080

B. Piping:

1. Ductile Cast Iron:

- a. Clow Corporation.
- b. United States Piping and Foundry Co.
- c. Atlantic States Cast Iron Pipe Co.

2. Plastic: Plastic Piping Systems, 255 Old New Brunswick Road, Piscataway, NJ 08854.

3. Flange Adapters: EBAA Iron Sales, P.O. Box 857, Eastland, TX 76448.

2.02PUMP STATION

A. Pump Station - 2 required

- 1. Pumps shall be a COMPIT 2000 DUPLEX GRINDER PUMP STATION as manufactured by FLYGT or approved equal.

A. Cavity Grinder Pump - 2 required.

- 1. Pump motor shall be Progressing Cavity Grinder Pump manufactured by FLYGT, Model M3068.175 PC or approved equal.

2.03PUMP CONTROLS

A. General – 2 Required

- 1. Contractor shall furnish all labor, materials, equipment, and incidentals required to provide a custom duplex pump control panel to operate (2) 1.7 HP submersible explosion proof pumps.
- 2. The pump control panel shall be assembled and tested by a shop meeting UL standard 698A for industrial intrinsically safe controls. Each control panel shall receive a factory test to ensure proper operation prior to shipment.

B. Construction

1. For each pump, a run light and a hand-off-auto switch shall be provided. The run lights and hand-off-auto switches shall be properly labeled as to function. The run lights shall match the hand-off-auto switches in appearance. Run lights shall be green.
2. A pump controller shall be provided for control logic. It shall be a dedicated, solid-state controller, which is easily replaceable with un-pluggable terminal blocks on all wiring inputs and outputs. Controller shall be surface mounted on the back panel, shall be UL listed, and shall operate on 120VAC $\pm 10\%$, 50–70 Hz, with an operating temperature of -10°C to 60°C . A HMI shall be included that will allow adjustment of pump on/off levels and alarm levels. The wet well level shall be displayed on screen.

PART 3 EXECUTION

3.01 INSTALLATION

A. Pump Station and Controls

1. Shall be installed in accordance with the Manufactures installation specifications.
2. Fix the centerline elevation of the top pipe bends for cutter pump discharge piping based on the approved dimensional catalog drawings to be submitted for the metering pumps. Install all other piping at the elevations noted or indicated by the drawings.

3.02 FIELD QUALITY CONTROL

A. Test Preparation:

1. Notify the Engineer at least 3 working days prior to testing so arrangements can be made to witness the test. All tests shall be witnessed by the Engineer.
2. Obtain the services of the Company Field Advisor for the flow metering equipment prior to or during the testing of the sewage pumps.
3. Test pumps only after the sewage force main connecting the Facility with the Town's sewage system has been completed.
4. Clean construction debris from pumping station wet well before adding water for testing. Obtain verification from the Engineer that the wet well is clean.

3.04 CLEANING

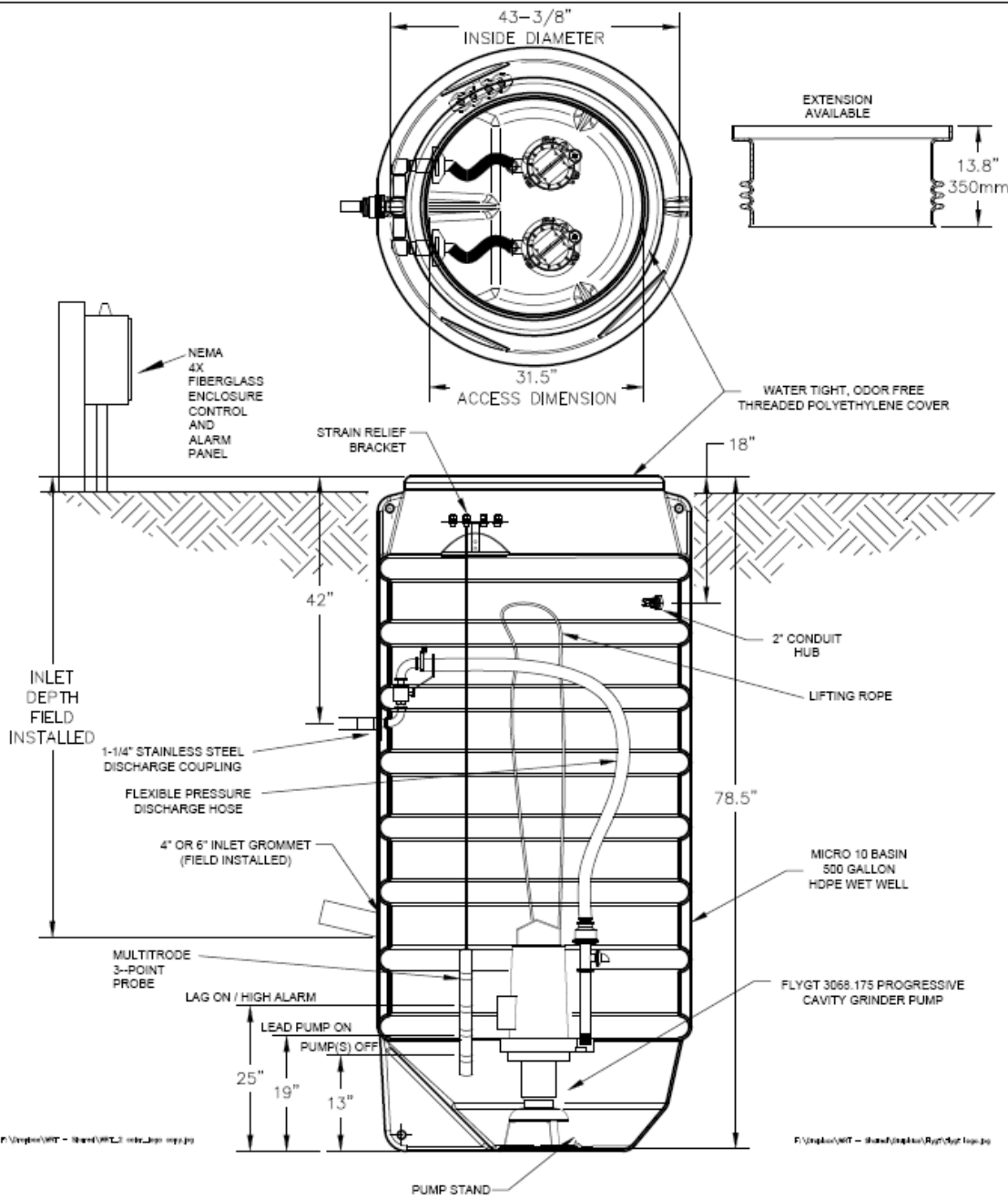
- A. Clean all room areas of construction debris, papers, dirt, etc. Leave the spaces broom clean. In addition, hose down with water the floor areas of both the Bar Screen Room and the Pump Room.

PART 4: MEASUREMENT AND PAYMENT

4.01 DESCRIPTION

Payment for this Work shall be at the **Project Lump Sum** bid and shall include the cost of all labor, materials and equipment necessary to complete the work as shown on the Contract Drawings. All labor, materials and equipment including but not limited to excavation, trenching and sheeting, select backfilling and compaction, removal and disposal of surplus material. The work shall include all work, assembly and connections to complete and supply a fully operational pump station including; proposed pump station, control panels, electrical connections, enclosures, force main pipe connections, valves, fittings, couplings, restraints, connection to other pipe; all inspections, testing and certifications, and any incidental work required to complete the work as specified in the Contract Documents and Specifications, and to the satisfaction of the Engineer or Town.

COMPIT 2000 DUPLEX GRINDER PUMP STATION

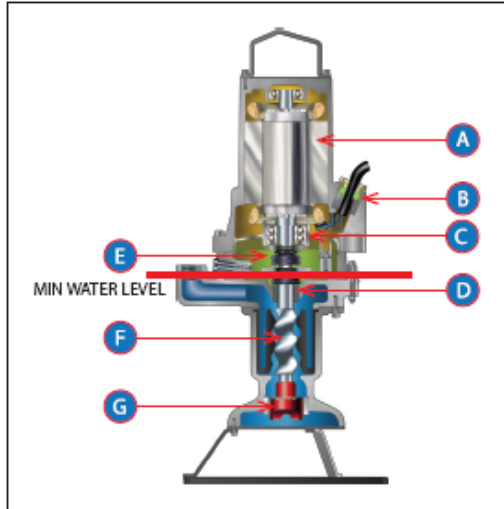




M-3068.175 PC

Submersible Pump

Progressing Cavity Grinder Pump Capacity up to 15.5 GPM, heads up to 240 ft



Specifications:

- A **Motor:** The municipal grade squirrel cage induction motor NEMA type B, Class F (155°C) Designed and manufactured by Flygt to power this exact pump. The manufacturing process utilizes trickle impregnation method for insulating the windings. This method uses a capillary action to pull the resin into the windings producing over 90% fill rate.
- B **Cable Entry:** The Flygt 3068.175 PC Pump is designed to withstand over 80 ft. of submersion. The sealing and separate strain relief reduce the risk of damage from improper handling.
- C **Double row bearings:** Shaft stability is enhanced by two row angular contact ball bearing pre-packed with high temperature grease.
- D **Wear Ring:** Provides extra shaft stability improving seal and motor life.
- E **Shaft sealing:** The 3068.175 utilizes the same double mechanical seal arrangement used in the Flygt municipal grade pumps. Two independent mechanical seal assembled in tandem run in a food grade oil bath that ensure a clean environment with no foreign debris to damage the seal assemblies. Because the seals do not run in the pump media they are protected against damage from dry run or debris that may get through the grinding assembly.
- F **Rotor/Stator:** Stainless steel rotor paired with Nitrile rubber abrasion resistant stator provide long life and efficient pumping.
- G **Grinding Assembly:** The grinding wheel is manufactured from Hard Iron TM that has been proven in the municipal market to last at least four times as long as hardened cast iron and twice as long as duplex stainless steel.

Applications:

The M-3068.175 PC is designed for residential and commercial pressure sewer systems.



Approval:

CSA approved to UL Standard #778.



Controls:

Compatible controls include single phase capacitor type panels for the most economical up front cost. The VFD phase conversion panels add higher level of security and performance. Both options are available for use with float switches or 3 point probe.


Accessories:

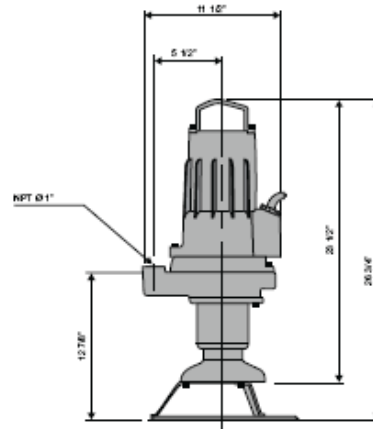
Compit polyethylene basin assemblies are available in various sizes from 120 gallons of storage up to over 600 gallons. Fiberglass basins with guide rails or hose are available in many custom configurations.

Flygt is a member of the following associations:



M-3068.175 PC
Performance Data

		PERFORMANCE CURVE		PRODUCT MF3068.175	TYPE HT
HP	Phase	Volt	FLA	Comments	
1.7	1	115	16	Progressing cavity hydraulic end provides consistent performance over a wide range of system pressures. Class F motor with stator windings trickle impregnated with resin eliminating air pockets allowing the motor to run cooler.	
		230	8.1		
	3	200	8.2		
		208	9.1		
		230	6.7		
		480	3.4		
		575	2.8		



Xylem, Inc. | 14125 South Bridge Circle | Charlotte, NC 28273 | Tel 704.409.9700 | Fax 704.295.9080 | 855:XYL-H201 (855-995-4261)
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M-3068.175 PC

SECTION 0701

PIPE JACKING

PART 1 GENERAL

1.01 DESCRIPTION

Under this item the Contractor shall be responsible for the design and construction of all aspects of the Pipe Jacking System including any temporary works and temporary pit/shaft supporting structures. All design assumptions regarding subsurface conditions, equipment requirements, groundwater and other factors are the responsibility of the Contractor and shall be fully documented. Based on the alignment shown on the Contract Drawings, the Contractor shall design and size the excavated profile to accommodate all temporary and permanent works. No additional payment will be made casing pipes, casing spacers, and end seals, utility pipe and shall include all labor and equipment costs required to complete the work, where shown on the Contract Drawings or as specified herein. No additional payment will be made for the disposal of surplus materials and restoration of disturbed areas.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- MM. Section 0101 Site Preparation and Removals
- NN. Section 0102 Survey and Stakeout
- OO. Section 0103 Erosion and Sediment Control
- PP. Section 0201 Earthwork
- QQ. Section 0202 Unclassified Excavation
- RR. Section 0203 Select Fill Material
- SS. Section 0301 Cast-In-Place Concrete
- TT. Section 0401 Furnish and Install Sanitary Sewers
- UU. Section 0501 Precast Concrete Manholes
- VV. Section 0601 Furnish and Install Sanitary Sewer
- WW. Section 0901 Site Restoration

1.03 REFERENCES

References and industry standards listed in this Section are applicable to the Work in this Section unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by governing codes or regulations, the recommendations, suggestions, and requirements described in the referenced standards shall be deemed mandatory and applicable to the Work.

- A. All products, installation and testing of force mains and gravity sewers shall meet the requirements of Regulation 61-67, Standards for Wastewater Facility Construction or State Primary Drinking Water Regulations (R61-58).
- B. All products, installation and testing of force mains and gravity sewers shall meet the requirements of "Recommended Standards for Wastewater Facilities" (Ten State Standards), latest edition.
- C. AASHTO M190 - Standard Specification for Asphalt-Coated Corrugated Metal Culvert Pipe and Pipe-Arches.
- D. American Society for Testing Materials:
 - 1. ASTM A36 - Standard Specification for Carbon Structural Steel.
 - 2. ASTM A123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - 3. ASTM A139 - Standard Specification for Electric-Fusion (Arc)-Welded Steel Pipe (NPS 4 and Over).
 - 4. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength.
 - 5. ASTM A563 - Standard Specification for Carbon and Alloy Steel Nuts.
 - 6. ASTM B695 - Standard Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel.
 - 7. ASTM A1011 - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength.
 - 8. ASTM D1894 - Standard Test Method for Static and Kinetic Coefficients of Friction of Plastic Film and Sheeting.
 - 9. Additional applicable ASTM standards which are not specifically listed above.

1.04 SUBMITTALS

- A. Shop Drawings - The design is to be certified by a Professional Engineer Licensed in the State of New York and shall be submitted to the Engineer for review prior to commencement of work. The Contractor shall not proceed with any work until the Contractor's design has been accepted by the Engineer. Acceptance of the Contractor's design by the Engineer in no way diminishes the responsibility of the Contractor for the design.
- B. Design Drawings - Table 1 below outlines the minimum required design drawings for the works under the contract.

Drawing	Type
Site Layout	Plan
Shaft/Pit Construction	Typical Details
Shaft/Pit Layout	Plan
Alignment	Plan
As-Built	Plan

- C. Design Calculations - The Contractor shall submit to the Engineer for approval calculations showing the anticipated installation forces to be imposed on the jacking pipe. These calculations are required to take into account jacking loads, joint configuration, stress transfer, joint seal design, frictional forces, ground conditions, groundwater, angular deflection and any fluids used in the installation process.
- D. Work Plan - Work under this Section may require construction or work in areas with many variables such as utilities, traffic, etc. The Contractor is responsible for creating a work plan to ensure the safety and proper installation with respect to the existing job site conditions.
- E. Health & Safety Plan – Plan shall be in conformance with all applicable OSHA Regulations.
- F. Product Data: Catalog Sheets & Specifications.

Upon receiving the Owner's Notice to Proceed, submit Manufacturer's specifications and other data needed to prove compliance with the specified requirements, including the following:

1. Casing pipe showing sizes, thickness, and joints.

2. End seals.
3. Casing Spacers showing recommended spacing.
4. Jack and bore plan for each Casing Pipe location.
5. Dewatering plan.

1.05 QUALITY ASSURANCE

B. Pipe Jacking Operations

1. Quality Assurance Submittals:

- a. Qualifications: Name, business address and telephone number of the Contractor who will be completing this portion of the work.
- b. List of all key personnel and qualifications
- c. List of at least three prior projects

B. Closeout

Provide Record Drawings showing the actual locations of casing pipe including invert elevations, pipe material, thickness, and diameter.

C. Warranty

Provide a two-year materials and workmanship warranty. The contractor shall be responsible for correcting defects in the Work during the warranty period, including defective material and workmanship.

PART 2 PRODUCTS

2.01 CASING PIPE

1. All casing pipe shall be new, no used pipe will be accepted.

2. Steel complying with ASTM A139 for Grade B with minimum yield strength of 35,00 psi.
3. Steel plate shall comply with ASTM A36.
4. Pipe ends shall be suitable for field welding.
5. All utilities within casing pipe shall be restrained joint.
6. Minimum wall thickness shall be as follows:

Diameter of Casing (Inches)	Minimum Thickness (Inches)	Wall
6 - 14	1/4	
16 & 18	5/16	
20 & 22	3/8	
24 & 26	7/16	
28 - 32	1/2	
34 - 38	9/16	
40 - 42	5/8	
44 - 52	3/4	
54 - 62	7/8	
62 - 72	1	

2.2 CASING SPACERS

- A. For utilities installed in casing provide casing spacers.
- B. Provide casing spacers as required by manufacturer, with a minimum of 1 spacer per ten linear feet of pipe for ductile iron pipe and a minimum of 1 spacer per six linear feet for PVC pipe.
- C. Provide spacer with shell of 14-gauge T-304 stainless steel and shell liner of 0.090" thick PVC, 85-90 durometer.
- D. Provide a minimum of three (3) 5/16" stainless steel connecting bolts and lock nuts per flange.
- E. Runners from 2" wide ultra-high molecular weight polymer with a high resistance to abrasion and a coefficient of friction of 0.11 -0.13 in accordance with ASTM D1894.

F. Provide 7” wide risers.

G. Support runners on 14-gauge reinforced 1/2” wide T-304 stainless steel risers welded to shell.

H. All metal surfaces to be fully passivated to resist corrosion

I. The diameter as measured over the runners shall exceed the pipeline bell or coupling outside diameter.

J. Provide adequate clearance between outside of casing spacer and interior of casing pipe.

K. Provide pipeline casing spacers as manufactured by BWM Company, Cascade Manufacturing, or approved equal.

2.3 END SEALS

A. Provide 3/16" thick rubber end seal to seal each end of the casing.

B. Secure to casing and carrier pipe with 1/2” wide T-304 stainless steel bands.

C. Provide end seals as manufactured by BWM Company, Cascade Manufacturing, or approved equal.

PART 3 EXECUTION

3.01 INSTALLATION

A. GENERAL

1. Comply with pertinent provisions of Section 1.02 of these Specifications.
2. Confirm location of all utilities and structures within the work area prior to beginning jack and bore operations.
3. Rock or water encountered shall not constitute additional compensation unless explicitly included in the Contract Documents.

4. Thoroughly clean casing pipe after jack and bore operations are completed.
5. Design of the bore pits is the responsibility of the Contractor. Lengths shown on the Contract Drawings are minimum and may be extended for the convenience of the Contractor at no additional cost to the Owner.
6. The Contractor shall be held responsible and accountable for the coordinating and scheduling of all construction work within the project site. Blasting will not be permitted if rock is encountered during pipe jacking operations.

B. ENTRY AND EXIT PITS

1. Locate to avoid interference with traffic, adjacent structures, etc.
2. Excavate to required depth, providing sheeting and shoring necessary for protection of the Work and for safety of personnel.
3. Dewater pits by use of pumps, drains or other approved methods. No water may be discharged onto roadway surfaces, paths, Shrub Oak Brook or protected areas.

C. SURFACE SETTLEMENT MONITORING

1. Provide surface settlement markers, placed as specified and as directed by the Engineer. The Contractor shall place settlement markers as directed by the Engineer or Town. At a minimum, markers shall be placed long the centerline of the casing at 10-foot intervals and offset 10 feet each way from the centerline of the tunnel. Settlement markers shall be tied into benchmarks and indices sufficiently removed as not to be affected by the casing operations.
2. Make observations of surface settlement markers, placed as required herein, at regular time intervals acceptable to the Engineer. In the event settlement or heave on any marker exceeds 1 inch, the Contractor shall immediately cease work and using a method approved by the Engineer and the authority having jurisdiction over the project site, take immediate action to restore surface elevations to that existing prior to start of casing operations.

3. Take readings and permanently record surface elevations prior to start of dewatering operations and/or shaft excavation. The following schedule shall be used for obtaining and recording elevation readings: all settlement markers, once a week; all settlement markers within 20 feet of the casing heading, at the beginning of each day; more frequently at the Engineer's direction if settlement is identified. Make all elevation measurements to the nearest 0.01 foot.
4. The Contractor shall cooperate fully with Engineer or Town. Any settlement shall be corrected by, and at the expense of, the Contractor.
5. Promptly report any settlement and horizontal movement immediately to the Engineer and take immediate remedial action.

3.01 JACKING AND BORING

A. Shaft

1. Conduct jacking and boring operations from a shaft excavated at one end of the section to be bored. Where conditions and accessibility are suitable, place the shaft on the downstream end of the bore.
2. The shaft shall be rectangular and excavated to a width and length required for ample working space. If necessary, sheet and shore shaft properly on all sides. Shaft sheeting shall be timber or steel piling of ample strength to safely withstand all structural loadings of whatever nature due to site and soil conditions. Keep preparations dry during all operations. Perform pumping operations as necessary.
3. The bottom of the shaft shall be firm and unyielding to form an adequate foundation upon which to work. In the event the shaft bottom is not stable, excavate to such additional depth as required and place a gravel sub-base or a concrete sub-base if directed by the Engineer due to soil conditions.

B. Jacking Rails and Frame

1. Set jacking rails to proper line and grade within the shaft. Secure rails in place to prevent settlement or movement during operations. The jacking rails shall cradle and hold the

casing pipe on true line and grade during the progress of installing the casing.

2. Place backing between the heels of jacking rails and the rear of the shaft. The backing shall be adequate to withstand all jacking forces and loads.
3. The jacking frame shall be of adequate design for the magnitude of the job. Apply thrust to the end of the pipe in such a manner to impart a uniformly balanced load to the pipe barrel without damaging the joint ends of the pipe. Jacking and boring of casing pipes shall be accomplished by the dry auger boring method without jetting, sluicing or wet boring.
4. Auger the hole and jack the casing through the soil simultaneously.
5. Bored installations shall have a bored-hole diameter essentially the same as the outside diameter of the casing pipe to be installed.
6. Execute boring ahead of the casing pipe with extreme care, commensurate with the rate of casing pipe penetration. Boring may proceed slightly in advance of the penetrating pipe and shall be made in such a manner to prevent any voids in the earth around the outside perimeter of the pipe. Make all investigations and determine if the soil conditions are such as to require the use of a shield.
7. As the casing is installed, check the horizontal and vertical alignment frequently. Make corrections prior to continuing operation. For casing pipe installations over 100 feet in length, the auger shall be removed and the alignment and grade checked at minimum intervals of 60 feet.
8. Any casing pipe damaged in jacking operations shall be repaired, if approved by the Engineer, or removed and replaced at Contractor's own expense.
9. Lengths of casing pipe as long as practical shall be used, except as restricted otherwise. Joints between casing pipe sections shall be watertight butt joints with complete joint penetration, single groove welds, for the entire joint circumference, in accordance with AWS recommended procedures. Prior to welding the joints, the Contractor shall ensure that both ends of the casing sections being welded are square.
10. The Contractor shall prepare a contingency plan which will allow the use of a casing lubricant, such as bentonite, in the event excessive frictional forces jeopardize the successful completion of a casing installation.

11. Once the jacking procedure has begun, it should be continued without stopping until completed, subject to weather and conditions beyond the control of the Contractor.
12. Care shall be taken to ensure that casing pipe installed by jacking and boring method will be at the proper alignment and grade. Casings for gravity sanitary sewer shall not vary more than 3/32" per foot of length from the indicated grade. Any improperly installed or otherwise defective casing shall be removed and replaced at no additional cost to the Owner.
13. The Contractor shall maintain and operate pumps and other necessary drainage system equipment to keep work dewatered at all times.
14. Adequate sheeting, shoring and bracing for embankments, operating pits and other appurtenances shall be placed and maintained to ensure that work proceeds safely and expeditiously. Upon completion of the required work, the sheeting, shoring and bracing shall be left in place, cut off or removed, as designated by the Engineer.
15. Trench excavation, all classes and types of excavation, the removal of rock, muck, debris, the excavation of all working pits and backfill requirements are included under this Section.
16. All surplus material shall be removed from the right-of-way and the excavation finished flush with the surrounding ground.
17. Grout backfill shall be used for unused holes or abandoned pipes.

3.02 ROCK EXCAVATION

In the event that rock is encountered during the installation of the casing pipe which, in the opinion of the Engineer, cannot be removed through the casing, the Engineer may authorize the Contractor to complete the crossing by tunneling or at the Contractor's option, the Contractor may continue to install the casing and remove the rock through the casing at no additional cost to the Owner.

3.03 CASING INSTALLATION

A. General

Install casings by dry-boring through the casing while simultaneously jacking the casing. Any

proposed alternate method shall be approved in writing by the Engineer. Joints shall be welded to provide a watertight joint. After construction of the casing is complete, and accepted, install the utility line as indicated on Contract Drawings

1. Provide spacers sized to achieve pipe slope and elevations indicated on the Contract Drawings.
2. Check the alignment and grade of the casing and prepare a plan to set the pipe at proper alignment, grade and elevation, without any sags or high spots. Install the utility in the casing pipe ensuring each joint is properly restrained before the joint is installed into the casing.
3. Inspect the casing, ensuring that all foreign material is removed from the casing and the casing meets alignment criteria for the type of carrier pipe being used.
4. For pressure systems, the casing deflection shall not exceed the maximum deflection recommended by the carrier pipe. Install casing spacers on the carrier pipe per the manufacturer's instructions. For sanitary and storm sewer provide spacer sizing and length necessary to obtain the pipe slope and elevations as shown on the plans. Provide centered or restrained configuration.
5. Install the carrier pipe in the casing ensuring each joint is pushed "home" before the joint is installed into the casing. Provide restrained joint carrier pipe for all joints inside of casing.

B. End Seals

Install rubber end seals in accordance with manufacturer's instructions.

3.03 SHEETING REMOVAL

Remove sheeting used for shoring from the shaft and off the job site. The removal of sheeting, shoring and bracing shall be done in such a manner as not to endanger or damage either new or existing structures, private or public properties and to avoid cave-ins or sliding in the banks.

3.05 RESTORATION

Restore all disturbed areas and repair any damaged that occurred during the completion of the work to original or better conditions. All damaged areas shall be repaired at no additional cost to the Owner.

PART 4: MEASUREMENT AND PAYMENT

4.01 DESCRIPTION

Payment for this work shall be at the **Project Lump Sum** bid and shall include under this item design and construction of all aspects of the Pipe Jacking System including any temporary works and temporary pit/shaft supporting structures. All design assumptions regarding subsurface conditions, equipment requirements, groundwater and other factors are the responsibility of the Contractor and shall be fully documented. Based on the alignment shown on the Contract Drawings, the Contractor shall design and size the excavated profile to accommodate all temporary and permanent works. No additional payment will be made casing pipes, casing spacers, and end seals, utility pipe and shall include all labor and equipment costs required to complete the work, where shown on the Contract Drawings or as specified herein. No additional payment will be made for the disposal of surplus materials and restoration of disturbed areas.

SECTION 0801

ELECTRICAL WORK

PART 1: WORK

1.01 DESCRIPTION

The Contractor shall be responsible for the installation of all service connections for the pump station at the site as follows.

- A. The Contractor will be responsible to include the furnishing and installation of all fixtures, switches, outlets, GFCI outlets indoor and outdoor, wire, conduit, underground conduit, pull boxes, electrical breaker panels etc. where required not furnished by the pump manufacturer.
- B. The Contractor will arrange for power to be brought to a pump station and will determine the power requirements and sizing of all wiring meet the site requirements and all applicable codes. The Contractor shall coordinate his work and shall allow ample time and facility for the work of other Sections to be installed.

1.02 RELATED SECTIONS

- A. Section 0101 Site Preparation and Removals
- B. Section 0102 Survey and Stakeout

- C. Section 0202 Unclassified Excavation
- D. Section 0601 Sewage Pumping Station
- E. Section 0906 Site Restoration

1.03 REFERENCES

References and industry standards listed in this Section are applicable to the Work in this Section unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by governing codes or regulations, the recommendations, suggestions, and requirements described in the referenced standards shall be deemed mandatory and applicable to the Work.

- A. American National Standards Institute (ANSI)
- B. American Society for Testing and Materials International (ASTM)
- C. C. National Electrical Manufacturers Association (NEMA)
- D. National Electrical Code (NEC)
- E. New York State Electrical Code (Latest Version)
- F. Where conflicts occur between the referenced standards, the most stringent requirements shall apply.

1.04 SUBMITTALS

- A. Underwriters Certificate of the completed works Certified by a Qualified Electrical Underwriter with credentials accepted by the Town of Yorktown.
- B. Product Data:
 - 1. Catalog sheets for all supplied electrical equipment and supplies.
- C. UL Listing: Equipment and materials for which Underwriters' Laboratories, Inc. (UL) provides product listing service shall be listed and bear the listing mark.
- D. Underwriter's Certificate: A New York Board of Fire Underwriters inspection or certificate is not required.

1.05 QUALITY ASSURANCE

A. Company Field Advisor:

The Contractor shall contact a manufacturer's representative when installing the lights to meet at the site and review the installation requirements.

- B.** All Electrical work shall be performed under the direction supervision of licensed contractors meeting the requirements of the Town of Yorktown Building Department.
- C.** Qualifications: The persons performing the Work of this Section and their supervisor shall be personally experienced in electrical work and shall have been regularly performing such work for a minimum of 3 years.

1.06 PERMITS, TESTING, AND INSPECTIONS

- A.** The Contractors shall be responsible for obtaining all permits necessary to complete work. This will include all preparation of plans, permit applications, provision of insurance requirements, and fees. The Town will directly reimburse the Contractor for any filing fees.
- B.** The Contractor is responsible to coordinate with the Town Departments and the all testing of electrical work.
- C.** The Contractor is responsible to provide all certificates of final approval from the appropriate agency and where necessary provide asbuilt certification documents.

1.06 WARRANTY

The contractor shall provide a warranty that all work has been completed in conformance with the Contract Documents and with all applicable codes. The Contractor shall warranty all work for five (5) years.

PART 2: MATERIALS

2.01 ELECTRICAL - GENERAL

- A.** Conductors: Copper, insulated with Type FEP, THHN, THW, THW-2, THWN, THWN-2, XHH, XHHW, XHHW-2 insulation rated 600 volts and shall UL listed. Electrician shall properly size wire for application.

B. Galvanized Steel Outlet Boxes: Standard galvanized steel boxes and device covers by Appleton Electric Co., Beck Mfg./Picoma Industries, Cooper/Crouse-Hinds, Raco/Div. of Hubbell, or Steel City/T & B Corp.

C. Galvanized Steel Junction and Pull Boxes: Code gage, galvanized steel screw cover boxes by Delta Metal Products Inc., Hoffman Enclosures Inc., Hubbell Wiegmann, Lee Products Co., or Rittal/Electromate.

D. Specific Purpose Outlet Boxes: As fabricated by equipment manufacturers for mounting their equipment thereon.

E. Local Switches:

1. Single Pole, 15A, 120/277 V ac: Bryant's 4801, Crouse-Hinds/AH's 1891, General Electric's GE5931-1G, Hubbell's 1201, Leviton's 1201, Pass & Seymour's 15AC1, or Slater's 710-BR.

2. Double Pole, 15A, 120/277 V ac: Bryant's 4802, Crouse-Hinds/AH's 1892, General Electric's GE5932-1G, Hubbell's 1202, Leviton's 1202, Pass & Seymour's 15AC2, or Slater's 712-BR.

3. Three-Way, 15A, 120/277 V ac: Bryant's 4803, Crouse-Hinds/AH's 1893, General Electric's GE5933-1, Hubbell's 1203, Leviton's 1203, Pass & Seymour's 15AC3, or Slater's 713-BR.

4. Four-Way, 15A, 120/277 V ac: Bryant's 4804, Crouse-Hinds/AH's 1894, General Electric's GE5934-1G, Hubbell's 1204, Leviton's 1204, Pass & Seymour's 15AC4, or Slater's 714-BR.

F. Receptacles:

1. Single Receptacle, NEMA 5-15R (15A, 125 V, 2P, 3W): Bryant's 5251, Crouse-Hinds/AH's 5251, General Electric's 5251-1, Hubbell's 5251, Leviton's 5251, Pass & Seymour's 5251, or Slater's 5361-AG-BR.

2. Duplex Receptacle, NEMA 5-15R (15A, 125 V, 2P, 3W): Bryant's 5262, Crouse-Hinds/AH's 5252-S, General Electric's GEN5252-1, Hubbell's 5252, Leviton's 5252, Pass & Seymour's 5252 or Slater's 5252-AG-BR.
3. Ground Fault Interrupter Receptacle Rated 15A (NEMA 5-15R), Circuit-Ampacity 20A: Bryant's GFR52FT, Crouse-Hinds/AH's 1591-F, General Electric's TGTR15B, Leviton's 6194, Pass & Seymour's 1591-F, or Slater's SIR-15-F-BR.

2.02 CONDUIT

- A. PVC Conduit shall be Prime Conduit Schedule 40, CSA and UL listed, rated for use with 90° C conductors, ETL Listed to UL 651 or approved equal.
- B. Material shall comply with NEMA Specification TC-2 (Conduit), TC- 3 (Fittings) and UL 51 (Conduit) and 514b (Fittings).
- C. Conduit and fittings shall carry an ETL label or printline (Conduit - on each 10 foot length; Fittings – stamped or molded on each fitting).
- D. Conduit and fittings shall be identified for type and manufacturer and shall be traceable to location of plant and date manufactured. The markings shall be legible and permanent.
- E. Conduit shall be made from polyvinyl chloride compound (recognized by ETL) which includes inert modifiers to improve weatherability and heat distortion. Clean rework material, generated by the manufacturer's own conduit production, may be used by the same manufacturer, provided the end products meet the requirements of this specification.
- F. Fittings - The conduit and fittings shall be homogeneous plastic material free from visible cracks, holes or foreign inclusions. The conduit bore shall be smooth and free of blisters, nicks or other imperfections which could mar conductors or cables.
- G. All conduit and fittings shall be solvent cemented in applications in accordance with instructions from the Manufacturer.

2.03 ELECTRICAL WIRE

- A. The wire shall be sized in accordance with National Electrical Code, but shall be a minimum of No. 8 American Wire Gauge, unless otherwise specified by a utility company providing power supply.

- B. Conductors: Copper, insulated with Type FEP, THHN, THW, THW-2, THWN, THWN-2, XHH, XHHW, XHHW-2 insulation rated 600 volts and shall UL listed.

- C. Electricians shall properly size wire for application.

PART 3: METHOD

3.01 GENERAL

- A. The Contractor shall follow all applicable electrical codes, and shall follow the manufacturer's installation instructions.

- B. The Contractor shall examine the Drawings and familiarize himself with location and site conditions so that details of construction will best suit mounting conditions and/or obstructions at the project site.

- C. Install the Work in accordance with the requirements of NFPA 70 - National Electrical Code and the NYS Electrical Code and all references contained within, and the standard electrical practices.

PART 4: MEASUREMENT AND PAYMENT

4.01 DESCRIPTION

Payment for all Work under this item shall be at the **Project Lump Sum** bid and shall include the cost of all plans, permits, inspections, testing, labor, materials and equipment necessary to complete the work as shown on the Contract Drawings. All labor, materials and equipment including but not limited to the proposed supply and installation of all underground conduit, conduit, wiring, switches, outlets, pull boxes, electrical panels, or other connections and any incidental work required to complete the work as specified in the Contract Documents and Specifications, and to the satisfaction of the Engineer. Included in this work shall be all underground service for power to be brought to pump station. No additional payment will be made for this work.

SECTION 0901

SITE RESTORATION

PART 1: WORK

1.01 DESCRIPTION

Under this work, the Contractor shall furnish and supply all materials, labor and equipment to landscape and restore the site in accordance with the Contract Drawings and Specifications. This shall include all rough and fine grading, topsoil, sodding, seeding, plantings, fertilizers, stone, and mulches to complete the project to the satisfaction of the Engineer or Town.

Included in this Work Item are the following:

- 0901.1 Seeding
- 0901.2 Landscape Plantings
- 0901.3 Tree Planting
- 0901.4 Golf Cart Pathways
- 0901.5 Restore Concrete Curb

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 0101 Site Preparation and Removals
- B. Section 0102 Survey and Stakeout
- C. Section 0103 Erosion and Sediment Control
- D. Section 0201 Earthwork
- E. Section 0202 Unclassified Excavation
- F. Section 0203 Select Fill Material
- G. Section 0301 Cast-In-Place Concrete
- H. Section 0401 Furnish and Install Gravity Sewer
- I. Section 0402 Furnish and Install Force Main
- J. Section 0501 Precast Concrete Manholes
- K. Section 0601 Sewage Pumping Station
- L. Section 0701 Pipe Jacking
- M. Section 0801 Electrical Work

1.03 REFERENCES

References and industry standards listed in this Section are applicable to the Work in this Section unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by governing codes or regulations, the recommendations, suggestions, and requirements described in the

referenced standards shall be deemed mandatory and applicable to the Work.

A. New York State Standard's Specifications for Erosion and Sediment Control

1.04 QUALITY ASSURANCE

A. The Contractor shall also guarantee an 80% survival rate of all plants and vegetation for three (3) years for which he will post a bond.

1.05 SUBMITTALS

A. Provide the following information:

1. Source and information on off-site topsoil to be supplied.
2. Source of sod grass
3. Information on fertilizer to be used.
4. Information on seed to be used.
5. Information on mulches to be used.

PART 2: PRODUCTS AND MATERIALS

2.01 TOPSOIL

A. Topsoil furnished from off the site shall be natural, fertile, friable agricultural soil, capable of sustaining vigorous plant growth, free from stones, roots, sticks, and other foreign substances and shall pass a 1/4-inch screen.

B. The topsoil shall have an acidity range of pH 5.0 to pH 7.0 and shall contain not less than 6 percent organic matter.

C. Topsoil (loam) shall contain between 7 and 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand.

D. The Engineer reserves the right to reject any topsoil with too high a percentage of clay.

2.02 FERTILIZER

A. Fertilizer shall be as follows: 100% organic: (15-0-10) shall be applied as per label directions. All fertilizer shall be phosphorus free.

2.03 GRASS SEED

A. The seed used on this project shall be fresh, re-cleaned and of the latest crop year.

B. The seed shall conform to Federal and state standards.

C. Each type of grass in the mixture shall meet or exceed the minimum percentage of purity and germination listed for that type of grass with a maximum weed content of 0.1 percent.

The table below presents the suggested seed mixture to be used on this Project. A turf grass specialist may submit variations from these suggestions subject to the Engineers review. The suggested mixture listed shall be provided if the Engineer does not review a variation.

% by Weight	Variety	Purity %	Germination
50	Kentucky Blue Grass	85	80
20	Red or Chewing Fescue	97	80
30	Red Top	92	90
<hr/>			
100			

2.04 SOD GRASS

Sod: Turf sod containing 95 percent pure permanent dense growth Kentucky Blue and fine leaved Fescue grasses. Color, leaf texture, and density shall be uniform. Sod shall be free of diseases, nematodes, and insects.

1. Mowed Height When Harvested: 1-1/2 to 2-1/2 inches.
2. Thatch: Maximum 1/2 inch.
3. Weeds:
 - a. Free of Bermuda grass, quack grass, Johnson grass, poison ivy, nut sedge, nimble will, Canada thistle, bind weed, bent grass, wild garlic, ground ivy, perennial sorrel, and brome grass.
 - b. Containing less than 5 jimson weed, mustard, lamb’s quarter, chick weed, cress, or crab grass plants per 100 sq ft.

2.05 TREES AND SHRUBS

Refer to Landscape Plan for specifications of all trees and shrubs.

PART 3: METHOD

3.01 AREAS AND FEATURES TO BE RESTORED

- A. All areas, including natural and artificial features occurring thereon, which are damaged or disturbed by the Contractors operations, shall be restored, repaired or replaced to the same or superior condition which existed prior to construction unless otherwise shown on the Contract Drawings.
- B. Grassed or lawn areas shall be dressed with topsoil, raked, fertilized, seeded, mulched, and

maintained as specified in later part. Existing cultivated or landscape items such as trees, shrubs, hedges, saplings, vines, ground cover vegetation, etc., shall be reestablished or replaced with new materials.

- C. Walls, fences, ditches, drains, culverts, roadways, pathways, golf cart pathways, driveways, concrete curbs, posts, and all other artificial features shall be repaired, restored or replaced to the same or superior condition which existed prior to construction.

3.02 AREAS TO BE RESTORED

- A. When the project site is to be modified and developed to meet new conditions, the Contractor shall perform all required grading, top soiling, fertilizing, seeding, planting, restoration of pathways, golf cart pathways, and driveways, mulching of construction and maintenance of areas, all in accordance with the Contract Drawings and as specified herein.
- B. Unless shown otherwise on the Contract Drawings, the entire unpaved area within the limits of construction and within the overall areas excavated and backfilled shall be so developed.
- C. New landscaping work and artificial features, if any, are shown on the Drawings and specified elsewhere.

3.03 FINE GRADING

- A. Areas requiring topsoil shall be fine graded to within 4 inches of finished grade to provide a minimum compacted thickness of 4 inches of topsoil at all locations.

All such areas, whether in cut or fill, shall be raked to a depth of one (1) inch, be parallel to finished grade as shown or required, and shall be free of all stones, roots, rubbish, and other deleterious material.

3.04 TOP SOILING

- A. Topsoil shall be furnished and spread in the required areas to a depth of approximately 4 inches.
- B. Stockpiled topsoil may be used if it is acceptable to the Engineer. In the event this topsoil is not satisfactory, or is inadequate to cover the required areas, the Contractor shall furnish the required amount of satisfactory topsoil from approved sources off the site.
- C. Topsoil shall not be delivered or placed in a muddy condition. The soil shall be uniformly compacted with a light hand roller to a final depth of not less than 4 inches. When finished, the surface shall conform to the finished grades shown or required and shall have a smooth pulverized surface at the time of seeding. Any irregularities shall be corrected before the fertilizer and seed are placed. Any subsequent settlement or displacement of the topsoil shall be restored to an acceptable condition at the Contractors expense.

3.05 FERTILIZING

- A. The fertilizer shall be uniformly spread by a mechanical spreader at the rate of 25 pounds per

1,000 square feet.

- B. The fertilizer shall be incorporated into the upper 2 inches of topsoil immediately after spreading. Fertilizer shall be 100% organic: (15-0-10) shall be applied as per label directions. All fertilizer shall be phosphorus free.

3.06 SEEDING

- A. Seed shall be applied at a rate of not less than 5 pounds per 1,000 square feet, using a mechanical spreader.
- B. All seed furnished under this item shall be delivered in standard size, unopened bags of the vendor, showing the weight, mixture, vendor=s name and guaranteed analysis.
- C. Seed shall be properly stored by the Contractor at the site of the contract and any seed damaged during storage shall be replaced by him.
- D. Seeding is to be done in dry or moderately dry soil and at times when the wind velocity does not exceed 5 mile per hour.
- E. After the finished grading is completed and just before seeding, the areas to be seeded shall be loosened to a depth of 1 inch and raked to true lines, free from all variations, bumps, ridges and depressions which will hold water.
- F. All sticks, stones, roots, or other objectionable materials, which might interfere with the formation of the fine seed bed, shall be removed from the soil.
- G. Upon completion of the seeding, the area shall be raked lightly and rolled with a light hand roller.
- H. The process of spraying grass seeds, water, fertilizer and mulch known as hydro-seeding or hydro-mulching may be utilized.
 - 1. Presoaking, the spraying of the materials, and watering after spraying shall be in strict accordance with the manufacturer=s instructions.
 - 2. All materials, protection, maintenance, etc., shall be in conformance with this specification. The mulch may be a wood fiber material compatible with the spray equipment.

3.07 MULCHING, PROTECTION AND MAINTENANCE

- A. The Contractor shall protect and maintain seeded areas to assure a full even stand of grass.
- B. Immediately after seeding and rolling, the Contractor shall apply oat, wheat, or rye straw, free from noxious weeds, as a mulch to a loose depth of about 1 inch. This is established as a minimum requirement for seeded areas. Where required by weather and/or site conditions the Contractor shall provide additional or anchored mulch as necessary to maintain the seedlings. The mulching shall be in accordance with the Standard Specifications for mulching, as included within the New York Guidelines for Urban Erosion and Sediment

Control.

- C. The Contractor shall perform all watering, mowing and reseeding as necessary for a minimum of 30 days, and until final acceptance of the Contract, to ensure the establishment of a uniform stand of specified grasses.
- D. Any portion of the seeded areas failing to produce a full uniform stand of grass from any cause, shall be reseeded at full rate and re-fertilized at one-half rate and protected and maintained until such a full stand has been obtained.

3.08 SOD PLACEMENT

A. PREPARATION

1. Scarify topsoil to depth of 2 inches in compacted areas.
2. Apply 100% organic: (15-0-10), applied as per label directions. All fertilizer shall be phosphorus free.
3. Rake fertilizer into top 2 inches of topsoil.
4. Water dry soil to depth of 4 inches 48 hours before sodding.

B. INSTALLATION

1. Begin sodding at bottom of slopes.
2. Install sod in strips, edge to edge, parallel to contours, with staggered joints.
3. Do not stretch or overlap sod.
4. Peg sod on slope ratio of 1 on 2 or steeper with minimum of two 8 inch stakes per sq yd.
5. Sprinkle sod immediately after installation.
6. Tamp or roll sufficiently to incorporate sod with topsoil.
7. Water sod and soil to depth of 4 inches within four hours after tamping or rolling.

3.09 LAWN ESTABLISHMENT

- A. Maintain the sod at heights between 1-1/2 and 2-1/2 inches. Include a minimum of 2 mowings.
- B. Water sod once a week between April 1 and October 1. Provide 3 gallons per sq yd per watering. Apply fungicides or use any other horticultural operation necessary for proper establishment and maintenance of sodded areas.

- C. Care for sodded areas until all Work of this Contract is completed and accepted.
- D. Replace sod in areas which show bare spots, deterioration, or is otherwise deemed unacceptable by the Engineer.

3.10 PLANTING

- A. The Contractor shall reestablish all existing cultivated or landscape items, trees, shrubs, vines and ground covers as per the plan. He shall provide additional or modify existing vegetation, as shown on the plan. Existing trees, plants, shrubs, saplings, ground cover, vines, etc., not shown to be removed which are disturbed or damaged by the Contractors operations shall be replaced with new plant materials.
- B. All new plant materials shall be of the same genus and species, size, and shall be placed in the location as per the plan. Depending on the size and type of material, and when ordered by the Engineer, guy wires, stakes, anchors and wrappings shall be furnished and installed in a proper manner to brace and protect the plant. The Contractor shall, as soon as practicable, water and maintain all reestablished, replaced or disturbed plant material that fails to respond properly within the three-year guarantee period shall be replaced as specified above at the Contractors expense. Classifications of plants, dimensions, planting procedures, etc., shall conform to ANSI Standard Z-60.1.

3.11 RESTORATION SCHEDULE

- A. It is the intent of this Item to require restoration of all disturbed areas of earth, driveways, and pathways in which were disturbed as a result of this Contract. This work should proceed immediately as required to restore the Golf Course to the same or superior condition which existed prior to construction unless otherwise shown on the Contract Drawings. Restoration of vegetation may include or consist of permanent restoration as specified, or alternative temporary cover in accordance with the New York Guidelines for Urban Erosion and Sediment Control. In the event temporary cover is provided, all requirements for permanent restoration will still apply.

PART 4: MEASUREMENT AND PAYMENT

4.01 DESCRIPTION

The cost for this work item shall be included in the **Project Lump Sum** bid and shall include the cost of all labor, materials and equipment necessary to complete the work as shown on the Contract Drawings. The Contractor shall furnish and supply all materials, labor and equipment to landscape and restore the site in accordance with the Contract Drawings and Specifications. This work shall include but not be limited to excavation including trenching and sheeting, select backfilling and compaction, sub-base material, all rough and fine grading, topsoil, sodding, seeding, plantings, fertilizers, stone, mulches, removal and disposal of surplus material and any incidental work required to complete the work to the satisfaction of the Engineer or Town.

SECTION 1001

SITE MOBILIZATION & DEMOBILIZATION

PART 1: WORK

1.01 DESCRIPTION

The work under this item consists of the mobilization and demobilization of the contractor's forces and equipment necessary for performing the work required under the contract. It does not include mobilization and demobilization for specific items of work for which payment is provided elsewhere in the contract. Mobilization will not be considered as work in fulfilling the contract requirements for commencement of work.

Special Note: The Staging Area for the Project has been established and is shown the Erosion & Sediment Control Plan.

1.02 RELATED WORK SPECIFIED ELSEWHERE

THIS SECTION LEFT BLANK

1.03 REFERENCES

THIS SECTION LEFT BLANK

1.04 DEFINITIONS

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1.05 SUBMITTALS

THIS SECTION LEFT BLANK

PART 2: MATERIALS

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PART 3: METHOD

3.01 DESCRIPTION

Mobilization shall include all activities and associated costs for transportation of contractor's personnel, equipment, and operating supplies to the site and other necessary general facilities for the contractor's operations at the site; premiums paid for performance and payment bonds including coinsurance and

reinsurance agreements as applicable; and other items specified in this contract.

Demobilization shall include all activities and costs for transportation of personnel, equipment, and supplies not required or included in the contract from the site; including the disassembly, removal, and site cleanup, and other facilities assembled on the site specifically for this contract.

PART 4: MEASUREMENT AND PAYMENT

4.01 DESCRIPTION

Payment for all Work under this item shall be at the **Project Lump Sum** and consists of the mobilization and demobilization of the contractor's forces and equipment necessary for performing the work required under the contract. The amount bid for mobilization shall not exceed four percent (4%) of the total contract bid price excluding the bid price for mobilization. The amount bid shall be payable to the Contractor on a monthly basis as a percentage of the work complete beginning with the first progress estimate made for other contract work.

SECTION 1001

MISCELLANEOUS ADDITIONAL WORK

PART 1: WORK

1.01 DESCRIPTION

Under this item, each Contactor shall furnish all labor, material and equipment required to accomplish miscellaneous additional work:

- a. Necessitated by encountering during the course of the work field conditions of a nature not determinable during design; or
- b. For which no unit prices are applicable; or
- c. For work ordered by the Engineer or Town.

PART 2: MATERIALS

This Section Left Blank

PART 3: METHOD

3.01 DESCRIPTION

All work performed and materials utilized shall be as specified in the contract documents and shall be to the satisfaction of the Engineer.

PART 4: MEASUREMENT AND PAYMENT

4.01 DESCRIPTION

The cost for this work item shall be deducted from the Stipend Amount included in the **Project Bid Sheet** and shall include the cost of all labor, materials and equipment necessary to perform the work. Only that miscellaneous additional work shall be performed by the Contractor which has been authorized by the Owner in writing, prior to its commencement.

- A. Article “Increase or Decrease of Quantities: Elimination of Items” of the information for Bidders, will still apply relative to the percentage of the total awarded contract price that the work under the contract may be increased or decreased.
- B. Payment – The total amount paid to the Contractor will be determined in strict accordance with the provisions of Article “Extra Work: Increase Compensation
- C. Decreased Work: Credit to the Owner” of the General Clauses, and such payment will include only that overhead and profit that is applicable to the work performed under this item. The Contractor shall include in its total bid the lump sum printed in the Project Bid Sheet and any bid other than the specified amount will be considered informal.

NON-COLLUSIVE BIDDING CERTIFICATION

This Non-Collusive Bidding Certificate is made pursuant to Section 103-d of the General Municipal Law of the State of New York.

By submission of this bid, Bidder and each person signing on behalf of Bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of his or her knowledge and belief:

The prices in this bid have been arrived at independently without collusion, consultation, communication, or agreement for the purpose of restricting competition, as to any matter relating to such prices with any other Bidder or with any competitor;

Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by Bidder and will not knowingly be disclosed by Bidder prior to opening, directly or indirectly, to any other bidder or to any competitor; and

No attempt has been made or will be made by the bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.

A bid shall not be considered for award nor shall any award be made where (1) (2) and (3) above, have not been complied with; provided, however, that if in any case Bidder cannot make the foregoing certification, Bidder shall so state and shall furnish with the bid a signed statement which sets forth in detail the reasons therefore. Where (1) (2) and (3) above have not been complied with, the bid shall not be considered for award nor shall any award be made unless the head of the purchasing unit of the political subdivision, public department, agency or official thereof to which the bid is made, or his designee, determines that such disclosure was not made for the purpose of restricting competition.

Dated: _____

Bidder: _____
(Legal name of person, firm or corporation)

By: _____
(Signature)

(Please Print Name)

(Title)

State of New York)
Town of _____)ss.:

On the ____ day of _____ in the year 2026 before me, the undersigned, personally appeared _____, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name(s) is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument.

(Notary Public)



Sheet
of

TOWN OF YORKTOWN
GOLF COURSE
795 EAST MAIN STREET (ROUTE 6)
Town of Yorktown, Westchester, NY

EROSION & SEDIMENT CONTROL PLAN

DATE	1-12-24
DESIGNED BY	RF
SCALE	AS SHOWN

NO.	DATE	DESCRIPTION

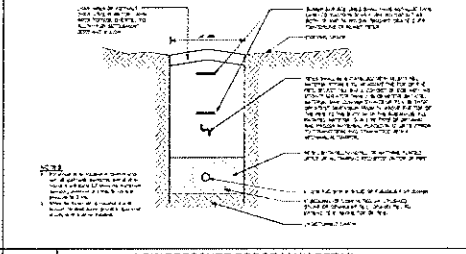
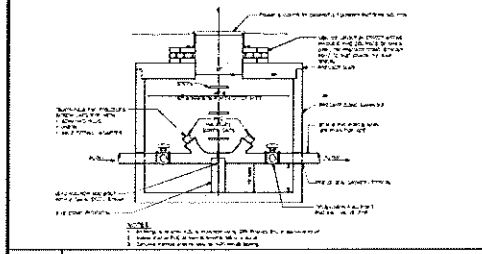
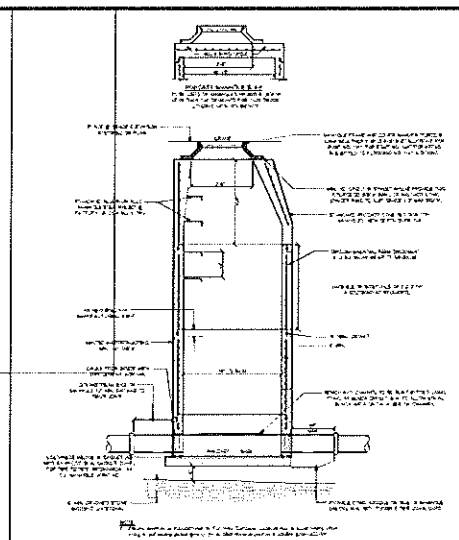
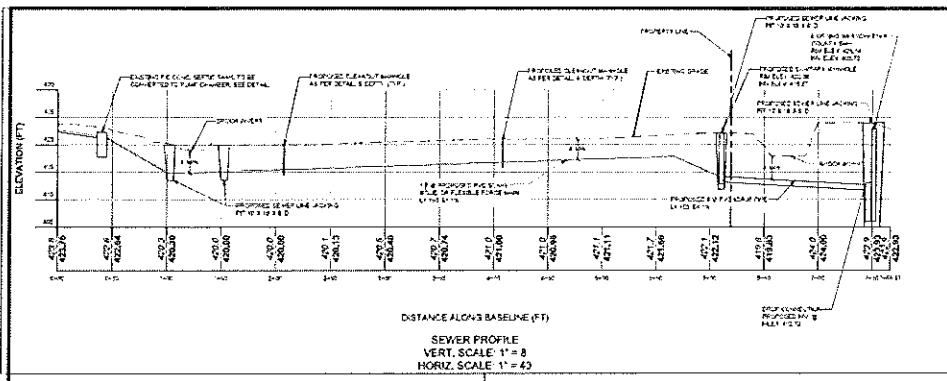


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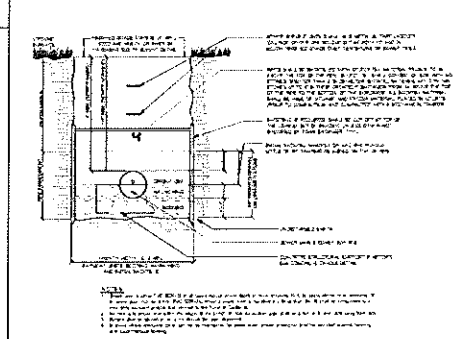
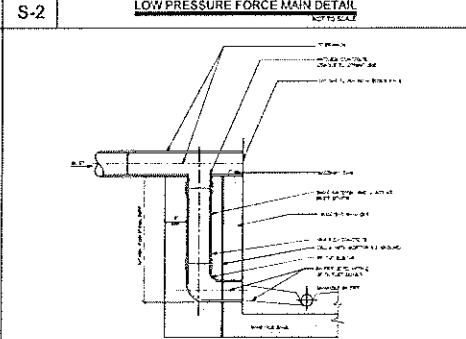
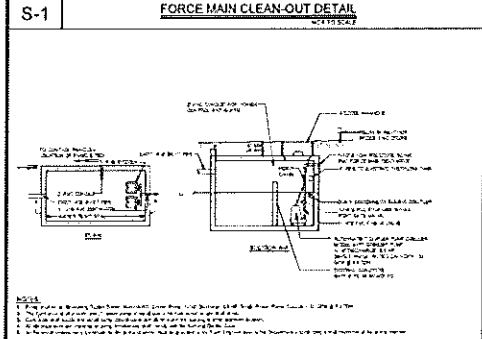


Project No. 240

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S-6 SEWER MANHOLE DETAIL
NOT TO SCALE



S-3 PUMP CHAMBER DETAIL
NOT TO SCALE

S-4 DROP MANHOLE DETAIL
NOT TO SCALE

S-5 SEWER MAIN / SEWER SERVICE TRENCH DETAIL
NOT TO SCALE


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 Civil Engineers - Land Planners
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 Fax: 914.338.1101
 www.sanddesign.com


 State of New York
 No. 10000
 Expires 12/31/2010

SEWER DETAILS

**TOWN OF YORKTOWN
 GOLF COURSE
 175 EAST MAIN STREET (ROUTE 9)
 YORKTOWN, NY 10598**