Contract Documents
for
Water District No. 2
Distribution System Replacement
Town of North Castle, New York
Contract No. 1 - General

GHD CONSULTING SERVICES INC.
One Remington Park Drive
Cazenovia, New York

STATE OF NEW YORK
KEVIN CASTRO
070882
LICENSED PROFESSIONAL ENGINEER

FOR CONSTRUCTION

It is a violation of the New York State Education Law for any person unless he is acting under the direction of a licensed professional engineer, to alter an item on this specification in any way. If an item is altered, the altering engineer shall affix to the item his seal and the notation "altered by" followed by his signature and the date of such alteration, and a specific description of the alteration.

2014

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2014

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TECHNICAL PROVISIONS (continued)

INVITATION TO BID
WATER DISTRICT NO. 2 DISTRIBUTION SYSTEM REPLACEMENT
TOWN OF NORTH CASTLE, NEW YORK

NOTICE IS HEREBY GIVEN that the Town of North Castle, NY will receive sealed bids for construction of a water distribution system replacement in North Castle Water District No. 2, Windmill Farm, Armonk, NY. Bids will be received at the office of the Town Clerk, 15 Bedford Road, Armonk, NY until 2:00 p.m. local time on June 6, 2014, at which time immediately thereafter the bids will be publicly opened and read aloud.

The Work consists of replacement of approximately 48,000 linear feet of existing water distribution system piping, complete with all equipment and accessories in accordance with the Bidding Documents heretofore prepared by GHD Consulting Services Inc.

All Bidders must register as a planholder with GHD (contact information below) in order to receive addenda, if any. Confirmation of addendum receipt is required on the bid forms. Bidding Documents and plans may be obtained from GHD by contacting and registering with:

Christine Williams
One Remington Park Drive
Cazenovia, NY 13035
(315) 679-5800
christine.williams@ghd.com

To obtain a printed copy of the Bidding Documents, a deposit of $125 in the form of a check or money order payable to GHD Consulting Services Inc. will be required. As an alternative, the Bidding Documents may be obtained from GHD in electronic (.pdf) format only, with no deposit required. All questions regarding distribution of Bidding Documents shall be directed to Christine Williams at GHD via the contact information provided above.

The Bidding Documents may be examined on the Town website http://www.northcastleny.com and at the following locations:

GHD Consulting Services Inc. 150 Grand Street White Plains NY 10601	Office of Town Clerk Town of North Castle 15 Bedford Road Armonk, NY 10504	Construction Contractors Association of the Hudson Valley 330 Meadow Avenue Newburgh, NY 12550

Bids shall be made on the Proposal Forms furnished with the bid documents and must be accompanied by a Bid Bond (on the form included in the Bidding Documents) issued by a surety meeting the requirements of paragraphs 5.01 and 5.02 of the General Conditions, or a certified cashier's check, drawn on a solvent bank, in the amount of not less than 5% of the total amount of the Bid. Checks shall be made payable to the Town of North Castle, NY and are to be held by the Town as a guarantee for the proper execution and delivery of the Contract and bonds to secure the faithful performance thereof. In default of such execution and delivery of Contract and Bonds, the amount of the deposit represented by the check shall be forfeited to and retained by the Town of North Castle as liquidated damages.

Bids shall be enclosed in a sealed envelope bearing the name and address of the Bidder, addressed to Anne Curran, Town Clerk, 15 Bedford Road, Armonk, NY 10504 and endorsed "Water District No. 2 Distribution System Replacement."

The Town of North Castle reserves the right to waive any informalities or to reject any or all Bids.

Dated: _____

_____
Anne Curran, Town Clerk

SECTION 00100

INSTRUCTIONS TO BIDDERS

ARTICLE 1 - DEFINED TERMS

1.01. Terms used in these Instructions to Bidders have the meanings indicated in the General Conditions and Supplementary Conditions. Additional terms used in these Instructions to Bidders have the meanings indicated below:

A. Bidder - The individual or entity who submits a Bid directly to Owner.

B. Issuing Office - The office from which the Bidding Documents are to be issued and where the bidding procedures are to be administered.

C. Successful Bidder - The lowest responsible Bidder submitting a responsive Bid to whom Owner (on the basis of Owner's evaluation as hereinafter provided) makes an award.

D. Prefixes to Referenced Paragraph Numbers are as follows:

Instructions to Bidders: "I-_____."
General Conditions; "GC-_____."
Supplementary Conditions; "SC-____."

ARTICLE 2 - COPIES OF BIDDING DOCUMENTS

2.01. Complete sets of the Bidding Documents in the number and for the deposit sum stated in the advertisement or invitation to bid may be obtained from GHD Consulting Services Inc. The deposit will be refunded to each document holder of record who returns a complete set of Bidding Documents in good condition within 30 days after opening of Bids.

2.02. Complete sets of Bidding Documents shall be used in preparing Bids; neither Owner nor Engineer assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

2.03. Owner and Engineer, in making copies of Bidding Documents available on the above terms, do so only for the purpose of obtaining Bids for the Work and do not authorize or confer a license for any other use.

ARTICLE 3 - QUALIFICATIONS OF BIDDERS

3.01. To demonstrate Bidder's qualifications to perform the Work, within 10 days of Owner's and/or Engineer's request, Bidder shall submit written evidence such as financial data, previous experience, present commitments, and such other data as may be identified herein or requested by Owner and/or Engineer.

A. Evidence of Bidder's authority to do business in the state where the Project is located

B. Bidder's state contractor License number, if applicable.

3.02. Bidder is advised to carefully review those portions of the Bid Form requiring Bidder's representations and certifications.

ARTICLE 4 - EXAMINATION OF BIDDING DOCUMENTS, OTHER RELATED DATA, AND SITE

4.01. Subsurface and Physical Conditions

A. The Supplementary Conditions identify:

1. Those reports known to Owner of explorations and tests of subsurface conditions at or contiguous to the Site.

2. Those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except underground facilities).

B. Copies of reports and drawings referenced in Paragraph 4.01.A will be made available by Owner to any Bidder on request. Those reports and drawings are not part of the Contract Documents. Bidder is responsible for any interpretation or conclusion Bidder draws from any data, interpretations, opinions or information contained in such reports or shown or indicated in such drawings.

4.02. Underground Facilities

A. Information and data shown or indicated in the Bidding Documents with respect to existing Underground Facilities at or contiguous to the Site is based upon information and data furnished to Owner and Engineer by owners of such Underground Facilities, including Owner or others.

4.03. Hazardous Environmental Condition

A. The Supplementary Conditions identify any reports and drawings known to Owner relating to a Hazardous Environmental Condition identified at the Site.

B. Copies of such reports and drawings referenced in Paragraph 4.03A will be made available by Owner to any Bidder on request. Those reports and drawings are not part of the Contract Documents. Bidder is responsible for any interpretation or conclusion Bidder draws from any data, interpretations, opinions, or information contained in such reports or shown or indicated in such drawings.

4.04. Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to subsurface conditions, other physical conditions and Underground Facilities, and possible changes in the Bidding Documents due to differing or unanticipated subsurface or physical conditions appear in paragraphs 4.02, 4.03, and 4.04 of the General Conditions. Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to a Hazardous Environmental Condition at the Site, if any, and possible changes in the Contract Documents due to any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work appear in paragraph 4.06 of the General Conditions.

4.05. Reference is made to Article 7 of the Supplementary Conditions for the identification of the general nature of other work that is planned to be performed at the Site by others (such as utilities, other prime contractors, and Owner) that relates to the Work contemplated by these Bidding Documents. On request, Owner will provide to each Bidder for examination access to or copies of Contract Documents (other than portions thereof related to price) for such other work if they exist.

A. Paragraph 6.13.C of the General Conditions indicates that if an Owner safety program exists, it will be noted in the Supplementary Conditions.

4.06. It is the responsibility of each Bidder before submitting a Bid to:

A. examine and carefully study the Bidding Documents, including addenda, and the other related data identified in the Bidding Documents;

B. visit the Site and become familiar with and satisfy Bidder as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work;

C. become familiar with and satisfy Bidder as to all federal, state, and local Laws and Regulations that may affect cost, progress, or performance of the Work;

D. carefully study all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) that have been identified in Paragraph 4.02 of the Supplementary Conditions, and (2) reports and drawings of Hazardous Environmental Conditions, if any, at the Site that have been identified in the Paragraph 4.06 of the Supplementary Conditions;

E. consider the information known to Bidder; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, including applying any specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents; and (3) Bidder's safety precautions and programs;

F. agree at the time of submitting its Bid that no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of its Bid for performance of the Work at the price(s) bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents;

G. become aware of the general nature of the work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents;

H. correlate the information known to Bidder, information and observations obtained from visits to the Site, reports and drawings identified in the Bidding Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Bidding Documents;

I. promptly give Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder discovers in the Bidding Documents and confirm that the written resolution thereof by Engineer is acceptable to Bidder; and

J. determine that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work.

4.07. The submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article 4, that without exception the Bid is premised

upon performing and furnishing the Work required by the Bidding Documents and applying any specific means, methods, techniques, sequences, and procedures of construction that may be shown or indicated or expressly required by the Bidding Documents, that Bidder has given Engineer written notice of all conflicts, errors, ambiguities, and discrepancies that Bidder has discovered in the Bidding Documents and the written resolutions thereof by Engineer are acceptable to Bidder, and that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing the Work.

ARTICLE 5 - PRE-BID CONFERENCE

5.01. A pre-Bid conference will be held as indicated in the Invitation to Bid.

ARTICLE 6 - SITE AND OTHER AREAS

6.01. The Site is identified in the Bidding Documents. Easements for permanent structures or permanent changes in existing facilities are to be obtained and paid for by Owner unless otherwise provided in the Bidding Documents. All additional lands and access thereto required for temporary construction facilities, construction equipment, or storage of materials and equipment to be incorporated in the Work are to be obtained and paid for by Contractor.

ARTICLE 7 - INTERPRETATIONS AND ADDENDA

7.01. All questions about the meaning or intent of the Bidding Documents are to be submitted to Engineer in writing. Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda mailed or delivered to all parties recorded by Engineer as having received the Bidding Documents. Only questions answered by Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect. Questions received after the deadline stated at the Pre-Bid Meeting or as modified in subsequent Addenda will not be answered.

7.02. Addenda may be issued to clarify, correct, or change the Bidding Documents as deemed advisable by Owner or Engineer.

ARTICLE 8 - BID SECURITY

8.01. A Bid must be accompanied by Bid security made payable to Owner in an amount of 5 percent of Bidder's maximum Bid price and in the form of a certified check, bank money order, or a Bid Bond (on the form attached) issued by a surety meeting the requirements of paragraphs 5.01 and 5.02 of the General Conditions.

8.02. The Bid security of the Successful Bidder will be retained until such Bidder has executed the Contract Documents, furnished the required contract security and met the other conditions of the Notice of Award, whereupon the Bid security will be returned. If the Successful Bidder fails to execute and deliver the Contract Documents and furnish the required contract security within 15 days after the Notice of Award, Owner may consider Bidder to be in default, annul the Notice of Award and the Bid Security of that Bidder will be forfeited. Such forfeiture shall be Owner's exclusive remedy if Bidder defaults. The Bid security of other Bidders whom Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of seven days after the Effective Date of the Agreement or 45 days after the Bid opening, whereupon Bid security furnished by such Bidders will be returned.

8.03. Bid security of other Bidders whom Owner believes do not have a reasonable chance of receiving the award will be returned within seven days after the Bid opening.

ARTICLE 9 - CONTRACT TIMES

9.01. The number of days within which, or the dates by which, the Work is to be substantially completed and ready for final payment are set forth in the Agreement.

ARTICLE 10 - LIQUIDATED DAMAGES

10.01. Provisions for liquidated damages, if any, are set forth in the Agreement.

ARTICLE 11 - SUBSTITUTE AND "OR-EQUAL" ITEMS

11.01 The Contract, if awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents without consideration of possible substitute or "or-equal" items. Whenever it is specified or described in the Bidding Documents that a substitute or "or-equal" item of material or equipment may be furnished or used by Contractor if acceptable to Engineer, application for such acceptance will not be considered by Engineer until after the Effective Date of the Agreement.

ARTICLE 12 - SUBCONTRACTORS, SUPPLIERS AND OTHERS

12.01. The Bid Form requires identification of Subcontractors on the form provided. In addition, if the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, individuals, or entities to be submitted to Owner in advance of a specified date prior to the Effective Date of the Agreement, the apparent Successful Bidder, and any other Bidder so requested, shall within five days after Bid opening, submit to Owner a list of all such Subcontractors, Suppliers, individuals, or entities proposed for those portions of the Work for which such identification is required. Such list shall be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor, Supplier, individual, or entity if requested by Owner. If Owner or Engineer, after due investigation, has reasonable objection to any proposed Subcontractor, Supplier, individual, or entity, Owner may, before the Notice of Award is given, request apparent Successful Bidder to submit a substitute.

12.02. If apparent Successful Bidder declines to make any such substitution, Owner may award the Contract to the next lowest Bidder that proposes to use acceptable Subcontractors, Suppliers, individuals, or entities. Declining to make requested substitutions will not constitute grounds for forfeiture of the Bid security of any Bidder. Any Subcontractor, Supplier, individual, or entity so listed and against which Owner or Engineer makes no written objection prior to the giving of the Notice of Award will be deemed acceptable to Owner and Engineer subject to revocation of such acceptance after the Effective Date of the Agreement as provided in Paragraph 6.06 of the General Conditions.

12.03. Contractor shall not be required to employ any Subcontractor, Supplier, individual, or entity against whom Contractor has reasonable objection.

ARTICLE 13 - PREPARATION OF BID

13.01. The Bid Form is included with the Bidding Documents. Additional copies may be obtained from Engineer.

13.02. All blanks on the Bid Form shall be completed in ink and the Bid Form signed in ink. Erasures or alterations shall be initialed in ink by the person signing the Bid Form. A Bid price shall be indicated for each Bid Item listed therein.

13.03. A Bid by a corporation shall be executed in the corporate name by the president or a vice-president or other corporate officer accompanied by evidence of authority to sign. The corporate seal shall be affixed and attested by the secretary or an assistant secretary. The corporate address and state of incorporation shall be shown.

13.04. A Bid by a partnership shall be executed in the partnership name and signed by a partner (whose title must appear under the signature), accompanied by evidence of authority to sign. The official address of the partnership shall be shown.

13.05. A Bid by a limited liability company shall be executed in the name of the firm by a member and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm must be shown.

13.06. A Bid by an individual shall show the Bidder's name and official address.

13.07. A Bid by a joint venture shall be executed by each joint venture in the manner indicated on the Bid form. The official address of the joint venture must be shown.

13.08. All names shall be printed in ink below the signatures.

13.09. The Bid shall contain an acknowledgment of receipt of all Addenda, the numbers of which shall be filled in on the Bid Form.

13.10. Postal and e-mail addresses and telephone number for communications regarding the Bid shall be shown.

13.11. The Bid shall contain evidence of Bidder's authority and qualification to do business in the state where the Project is located, or Bidder shall covenant in writing to obtain such authority and qualification prior to award of the Contract and attach such covenant to the Bid. Bidder's state Contractor license number, if any, shall also be shown on the Bid Form.

ARTICLE 14 - BASIS OF BID; COMPARISON OF BIDS

14.01. Lump Sum

A. Bidders shall submit a Bid on a lump sum basis as set forth in the Bid Form.

14.02. Unit Price

A. Bidders shall submit a Bid on a unit price basis for each item of Work listed in the Bid schedule.

B. The total of all estimated prices will be the sum of the products of the estimated quantity of each item and the corresponding unit price. The final quantities and Contract Price will be determined in accordance with Paragraph 11.03 of the General Conditions.

C. Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.

14.03. Allowances

A. For cash allowances the Bid price shall include such amounts as the Bidder deems proper for Contractor's overhead, costs, profit, and other expenses on account of cash allowances, if any, named in the Contract Documents, in accordance with Paragraph 11.02.B of the General Conditions.

ARTICLE 15 - SUBMITTAL OF BID

15.01. With each copy of the Bidding Documents, a Bidder is furnished one copy of the Bid Form, and, if required, the Bid Bond Form. The copy of the Bid Form is to be completed and submitted with the Bid security and all required attachments to the Bid stated in the Bid Form.

15.02. A Bid shall be submitted no later than the date and time prescribed and at the place indicated in the advertisement or invitation to bid and shall be enclosed in a plainly marked package with the Project title (and, if applicable, the designated portion of the Project for which the Bid is submitted), the name and address of Bidder, and shall be accompanied by the Bid security and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid shall be enclosed in a separate envelope plainly marked on the outside with the notation “BID ENCLOSED.”

ARTICLE 16 - MODIFICATION AND WITHDRAWAL OF BID

16.01. A Bid may be modified or withdrawn by an appropriate document duly executed in the same manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids.

16.02. If within 24 hours after Bids are opened any Bidder files a duly signed written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid, that Bidder may withdraw its Bid, and the Bid security will be returned. Thereafter, if the Work is rebid, that Bidder will be disqualified from further bidding on the Work.

ARTICLE 17 - OPENING OF BIDS

17.01. Bids will be opened at the time and place indicated in the Advertisement or Invitation to Bid and, unless obviously non-responsive, read aloud publicly. An abstract of the amounts of the base Bids and major alternates, if any, will be made available to Bidders after the opening of Bids.

ARTICLE 18 - BIDS TO REMAIN SUBJECT TO ACCEPTANCE

18.01. All Bids will remain subject to acceptance for the period of time stated in the Bid Form, but Owner may, in its sole discretion, release any Bid and return the Bid Security prior to the end of this period.

ARTICLE 19 - EVALUATION OF BIDS AND AWARD OF CONTRACT

19.01. Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner further reserves the right to reject the Bid of any Bidder whom it finds, after reasonable inquiry and evaluation, to be non-responsible. Owner may also reject the Bid of any Bidder if Owner believes that it would not be in the best interest of the Project to make an award to that Bidder. Owner also reserves the right to waive

all informalities not involving price, time, or changes in the Work and to negotiate contract terms with the Successful Bidder.

19.02. More than one Bid for the same Work from an individual or entity under the same or different names will not be considered. Reasonable grounds for believing that any Bidder has an interest in more than one Bid for the Work may be cause for disqualification of that Bidder and the rejection of all Bids in which that Bidder has an interest.

19.03. In evaluating Bids, Owner will consider whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices and other data, as may be requested in the Bid Form or prior to the Notice of Award.

19.04. In evaluating Bidders, Owner will consider the qualifications of Bidders and may consider the qualifications and experience of Subcontractors, Suppliers, and other individuals or entities proposed for those portions of the Work for which the identity of Subcontractors, Suppliers, and other individuals or entities must be submitted as provided in the Supplementary Conditions.

19.05. Owner may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders, proposed Subcontractors, Suppliers, individuals, or entities to perform the Work in accordance with the Contract Documents.

19.06. If the Contract is to be awarded, Owner will award the Contract to the Bidder who is in the best interests of the Project.

ARTICLE 20 - CONTRACT SECURITY AND INSURANCE

20.01. Article 5 of the General Conditions, as may be modified by the Supplementary Conditions, sets forth Owner's requirements as to performance and payment bonds and insurance. When the Successful Bidder delivers the executed Agreement to Owner, it shall be accompanied by such bonds.

ARTICLE 21 - SIGNING OF AGREEMENT

21.01. When Owner issues a Notice of Award to the Successful Bidder, it shall be accompanied by the required number of unsigned counterparts of the Agreement along with the other Contract Documents which are identified in the Agreement as attached thereto. Within 15 days thereafter, Successful Bidder shall sign and deliver the required number of counterparts of the Agreement and attached documents to Owner. Within ten days thereafter, Owner shall deliver one fully signed counterpart to Successful Bidder with a complete set of the Drawings with appropriate identification.

ARTICLE 22 - COPIES OF CONTRACT DOCUMENTS

22.01. GHD will furnish copies of Contract Documents to Contractor with the awarded bid as follows:

Two sets of full-size drawings.
Two sets of bound Contract Documents.

ARTICLE 23 - SALES AND USE TAXES

23.01. Owner is exempt from New York State sales and use taxes on materials and equipment to be incorporated in the Work. Such taxes shall not be included in the Bid. Refer to Paragraph 6.10 of the Supplementary Conditions for additional information.

ARTICLE 24 - RETAINAGE

24.01. Provisions concerning Contractor's rights to deposit securities in lieu of retainage are set forth in the Agreement.

ARTICLE 25 - PREVAILING WAGE RATES

25.01. The Contractor must comply with prevailing wage rates as set forth by the New York State Department of Labor (NYSDOL) and as outlined in the Supplementary Conditions.

25.02. Wage rates for this project are available on the NYSDOL website. To retrieve the wage rate schedule, follow the steps outlined below:

1. Go to www.labor.state.ny.us.

2. Click the link "Prevailing Wage" in the yellow bar at the bottom of the page.

3. Under the section "Prevailing Wage Schedule Links," select "View of Previously Requested Prevailing Wage Schedule Using PRC#."

4. Enter **2014001802** as the PRC# for this project and click "Submit."

5. To download the schedule, click the link "Original Wage Schedule" in the upper right of the page.

END OF SECTION

CONTRACTOR'S BID
FOR
CONSTRUCTION OF CONTRACT NO. 1
WATER DISTRICT NO. 2 DISTRIBUTION SYSTEM REPLACEMENT
TOWN OF NORTH CASTLE, NEW YORK

ARTICLE 1 - BID RECIPIENT

1.01. THIS BID IS SUBMITTED TO:

Town of North Castle
15 Bedford Road
Armonk, NY 10504

1.02. The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

ARTICLE 2 - BIDDER'S ACKNOWLEDGEMENTS

2.01. Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for 45 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

ARTICLE 3 - BIDDER'S REPRESENTATIONS

3.01. In submitting this Bid, Bidder represents that:

A. Bidder has examined and carefully studied the Bidding Documents, other related data identified in the Bidding Documents, and the following Addenda, receipt of all which is hereby acknowledged:

Addendum No.	Addendum Date
_____	_____
_____	_____
_____	_____

B. Bidder has visited the Site and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

C. Bidder is familiar with and is satisfied as to all Laws and Regulations that may affect cost, progress, and performance of the Work.

D. Bidder has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) that have been identified in SC-4.02 as containing reliable "technical data", and (2) reports and drawings of Hazardous Environmental Conditions, if any, at the Site that have been identified in SC-4.06 as containing reliable "technical data."

E. Bidder has considered the information known to Bidder; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, including applying the specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents; and (3) Bidder's safety precautions and programs.

F. Based on the information and observations referred to in Paragraph 3.01.E above, Bidder does not consider that any further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price(s) bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents.

G. Bidder is aware of the general nature of work to be performed by others at the Site that relates to the Work as indicated in the Bidding Documents.

H. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and the written resolution thereof by Engineer is acceptable to Bidder.

I. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work for which this Bid is submitted.

ARTICLE 4 - BIDDER'S CERTIFICATION

4.01. Bidder certifies that:

A. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation;

B. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid;

C. Bidder has not solicited or induced any individual or entity to refrain from bidding; and

D. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Article:

1. "corrupt practice" means the offering, giving, receiving, or soliciting of any thing of value likely to influence the action of a public official in the bidding process;

2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;

3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels; and

4. “coercive practice” means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

ARTICLE 5 - BASIS OF BID

5.01. Bidder will perform the Work in accordance with the Contract Documents for the prices shown in the Bid Schedule that follow.

5.02. Bidder acknowledges that Bidder’s price(s) constitute Bidder’s sole compensation for performing all Work required by the Contract Documents, and if a particular part of the Work is not listed specifically in the Bid Item Descriptions, Bidder has included that part of the Work in the Bid Item Description which it most logically belongs.

A. Schedule A: Lump Sum Bid Items: Lump Sum items included all Work in the Contract Documents except items specifically identified as Unit Price Work, Contingent Unit Price Work, Additive Alternates, Deductive Alternates, and Allowances.

Item No.	Description	Total Price
A-1	General Construction	$
Subtotal (Item A-1)		**$**

B. Schedule B: Unit Price Work: Measurement and payment of Unit Price Work is defined in Section 01025, Unit Price Items.

1. Unit Prices have been computed in accordance with General Conditions Article 11.03.B.

2. Bidders acknowledge that estimated quantities are not guaranteed, and are solely for the purposes of comparison of Bids, and final payment for all Unit Price Work will be based on actual quantities, determined as provided in the Contract Documents.

Item No.	Description	Unit	Estimated Quantity	Unit Price	Bid Price
B-1	Exploratory Excavation	CY	200	$	$
B-2	Excavation Below Subgrade (Additional Trench Excavation)	CY	500	$	$
B-3	Rock Excavation	CY	500	$	$
B-4	6-Inch Ductile Iron Water Main and Fittings, In Place	LF	600	$	$
B-5	8-Inch Ductile Iron Water Main and Fittings, In Place	LF	48,200	$	$
B-6	12-Inch Ductile Iron Water Main and Fittings, In Place	LF	1,600	$	$
B-7	Hydrant Assembly, Complete	Each	130	$	$
B-8	6-Inch Gate Valve, In Place	Each	10	$	$

Item No.	Description	Unit	Estimated Quantity	Unit Price	Bid Price
B-9	8-Inch Gate Valve, In Place	Each	110	$	$
B-10	12-Inch Gate Valve, In Place	Each	10	$	$
B-11	Copper Water Service Connections, Near Side	LF	190	$	$
B-12	Copper Water Service Connections, Far Side	LF	210	$	$
B-13	1-Inch Corporation Stop, Curb Box, Curb Stop, and Covers	Each	373	$	$
B-14	Additional Compact Ductile Iron Fittings, In Place	Lb.	10,000	$	$
B-15	Select Backfill Materials, NYSDOT Course 304, Type 4 (Pipe Trench Special Backfill)	CY	500	$	$
B-16	Temporary Pavement Replacement	SY	17,000	$	$
B-17	Abandonment of Existing Water Services	Each	372	$	$
B-18	Permanent Pavement Replacement	SY	300	$	$
B-19	Asphalt Curb Replacement	LF	2,000	$	$
B-20	Concrete Curb Replacement	LF	1,000	$	$
B-21	Abandonment of Existing Valves	Each	60	$	$
B-22	Existing Hydrant Removal	Each	77	$	$
B-23	Anti-Seep Collars	Each	25	$	$
B-24	Asphalt Driveway Restoration	SY	25	$	$
B-25	Concrete Driveway Replacement	CY	10	$	$
B-26	Concrete Encasement	CY	15	$	$
B-27	Pipe Abandonment/Removal	Each	15	$	$
B-28	Temporary Water Service	LF	7,600	$	$
B-29	Sample Stations	Each	8	$	$
B-30	Meter Pits	Each	2	$	$
B-31	Final Cleanup and Site Restoration	LF	50,500	$	$
B-32	Pavement Milling/Demolition	SY	12,500	$	$
Subtotal (Sum of Items B-1 through B-32)				**$**	**$**

C. Schedule C: Allowances:

1. Bidder agrees to provide the following allowances as part of the Work in accordance with General Conditions Article 11.02.

2. Engineer will consult with Contractor for consideration and selection of products and select products in consultation with Owner and transmit decision to Contractor. On notification of selection by Engineer, Contractor shall execute purchase agreement with designated Supplier, arrange for and process Shop Drawings and Samples, arrange for delivery, and promptly inspect products upon delivery for completeness, damage, and defects.

Item No.	Description	Total Price
C-1	NYS Route 22 Crossing	$100,000
C-2	Town of North Castle Assistance	$10,000
Subtotal (Sum of Items C-1 and C-2)		**$110,000**

D. Schedule D: Total Bid Price:

1. Determination of the apparent low Bidder shall be based on the Total Bid Price determined as follows.

2. In case of a discrepancy between lump sum prices written in words and in figures, the lump sum prices written in words shall govern. In case of a discrepancy between lump sum prices bid and extended totals, the lump sum prices will govern.

Item No.	Total Price
Schedule A Total (Lump Sum Bid Items)	$
Schedule B Total (Unit Price Work)	$
Schedule C (Allowances)	$110,000
TOTAL BID PRICE	**$**

TOTAL BID PRICE (in words)_____

_____

ARTICLE 6 - TIME OF COMPLETION

6.01. Bidder agrees that the Work will be substantially completed and ready for final payment in accordance with paragraph 14.07 of the General Conditions on or before the dates or within the number of calendar days indicated in the Agreement.

6.02. Bidder accepts the provisions of the Agreement as to liquidated damages.

ARTICLE 7 - ATTACHMENTS TO THIS BID

7.01. The following documents are submitted with and made a condition of this Bid:

A. Required Bid Security in the form of Bid Bond or certified check.

B. Statement of Surety's Intent.

C. Required Bidder's Qualification Statement with supporting data.

D. List of Proposed Subcontractors.

E. List of Project References.

F. Non-Collusive Bidding Certification

G. List of Proposed Suppliers.

H. Certification by Bidder Regarding Equal Employment Opportunity.

I. Bid Bond (Penal Sum Form).

ARTICLE 8 - DEFINED TERMS

8.01. The terms used in this Bid with initial capital letters have the meanings indicated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions.

ARTICLE 9 - BID SUBMITTAL

This Bid is submitted by:

If Bidder is:

An Individual
Name (typed or printed): _____

By_____
(Individual's Name)

Doing business as:_____

A Partnership
Partnership Name: _____ (SEAL)

By_____
(Signature of general partner--attach evidence of authority to sign)

Name (typed or printed): _____

A Corporation
Corporation Name: _____ (SEAL)

State of Incorporation: _____

Type (General Business, Professional, Service, Limited Liability): _____
_____

By_____
(Signature--attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

Attest: _____(CORPORATE SEAL)
(Signature of Corporate Secretary)

Date of Qualification to do business in State where Project is located is: _____

A Joint Venture
Name of Joint Venture: _____

First Joint Venturer Name: _____(SEAL)

By_____
(Signature of joint venturer partner--attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

Second Joint Venturer Name: _____ (SEAL)

By_____
(Signature--attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

(Each joint venturer must sign. The manner of signing for each individual, partnership and corporation that is a party to the joint venture should be in the manner indicated above.)

Bidder's Business Address _____

Phone No. _____ Fax No. _____

Email _____

SUBMITTED on _____, 20_____

State Contractor License No. _____ if applicable.

END OF SECTION

BID SECURITY

(ATTACH BID SECURITY TO THIS PAGE IF CERTIFIED CHECK.)

STATEMENT OF SURETY'S INTENT

(To be completed if Bid Security is to be Certified or Bank Cashier's Check)

To: _____
(Owner)

We have reviewed the Bid of _____
(Contractor)

of _____
(Address)

for _____
_____
(Project)

Bids for which will be received on _____
(Bid Opening Date)

and wish to advise that should this Bid of the Contractor be accepted and the Contract awarded to him, it is our present intention to become surety on the performance bond and labor and material bond required by the Contract.

Any arrangement for the bonds required by the Contract is a matter between the Contractor and ourselves and we assume no liability to you or third parties if for any reason we do not execute the requisite bonds.

We are duly authorized to do business in the State of _____.

Attest:

_____ _____

_____
Surety's Authorized Signature(s)

Attach Power of Attorney

(Corporate seal if any. If no seal, write "No Seal" across this place and sign.)

(This form must be completed prior to the submission of the bid.)

BIDDER'S QUALIFICATION STATEMENT

To induce the making of this Contract, the Bidder represents to the Owner the following, as evidence of Bidder's Qualifications to perform the work herein specified:

1. How many years has your organization been in business under the name in which you propose to execute this Contract?
   ___Years

2. What projects of character similar to that proposed has your present organization completed? Give the information indicated by the following tabulations:

NAME, ADDRESS, AND PHONE NO. OF OWNER FOR WHOM WORK WAS DONE	DESCRIPTION OF WORK	APPROXIMATE AMOUNT OF CONTRACT	APPROXIMATE DATE WORK WAS DONE

3. Has your present organization ever failed to complete any work awarded to it? If so, state when, where and why.

_____

_____

4. Do you have, or can you procure the necessary personnel, equipment, facilities and financial resources to immediately undertake and satisfactorily complete the work contemplated in this Contract?

5. (Other requirements as pertinent).

LIST OF PROPOSED SUBCONTRACTORS

This document is an Attachment to the Bid Form and is a legally binding part thereof;

Each Bidder shall complete this "List of Proposed Subcontractors" in its entirety. Failure to do so shall render the Bid Form non-responsive and be grounds for its rejection by Owner. If Bidder intends to self perform the type of work indicates, write "Self Perform" under Subcontractor Name. If work is not applicable, indicate "N/A" in box.

Type of Work	Subcontractor Name and Address	Certified Disadvantage Business Enterprise?	Subcontract Amount	State Contractor License Number
Dewatering				
Civil/Piping				
Concrete				

Total Subcontracted Amount: $_____

Percent of Total Contract: _____%

LIST OF PROJECT REFERENCES

NON-COLLUSIVE BIDDING CERTIFICATION

Section 103-d of the General Municipal Law requires the following statement subscribed by the bidder as true under the penalties of perjury: Non-Collusive Bidding Certification.

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

(1) 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.

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

(3) 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.

Section 103-d of the General Municipal Law, as amended by Chapter 675 L 1966, in addition to requiring the above certification, provides as follows:

(b) 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 the bidder cannot make the foregoing certification, the 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.

The fact that a bidder (a) has published price lists, rates or tariffs covering items being procured, (b) has informed prospective customers of proposed or pending publication of new or revised price lists for such items or has sold the same items to other customers at the same prices being bid, does not constitute, without more, a disclosure within the meaning of subparagraph one (a).

Any bid hereafter made to any political subdivision of the state or any public department, agency or official thereof by a corporate bidder for work or services performed or to be performed or goods sold or to be sold, where competitive bidding is required by statute, rule, regulation, or local law, and where such bid contains the certification referred to in subdivision one of this section, shall be deemed to have been authorized by the board of directors of the bidder, and such authorization shall be deemed to include the signing and submission of the bids and the inclusion therein of the certificate as to non-collusion as the act and deed of the corporation.

Dated:_____, 20____

Signed: _____Name

_____Title

_____ Company

_____ Address

Corporate Seal

LIST OF PROPOSED SUPPLIERS

CERTIFICATION BY BIDDER REGARDING
EQUAL EMPLOYMENT OPPORTUNITY

_____

Name of Bidder Project No.

INSTRUCTIONS

This certification is required pursuant to Executive Order 11246, Part II, Section 203(b), (30 F.R. 12319-25). Each bidder shall state in his bid proposal whether he has participated in any previous contract or subcontract subject to the equal opportunity clause; and, if so, whether he has filed all compliance reports due under applicable filing requirements.

CONTRACTOR'S CERTIFICATION

Contractor's Name: _____

Address: _____

1. Bidder has participated in a previous contract or subcontract subject to the Equal Opportunity Clause. YES _____ NO_____

2. Compliance reports were required to be filed in connection with such contract or subcontract.
   YES _____ NO_____

   If YES, state what reports were filed and with what agency.

3. Bidder has filed all compliance reports due under applicable instructions, including SF-100.
   YES _____ NO_____

4. If answer to item 3 is "NO", please explain in detail on reverse side of this certification.

Certification - The information above is true and complete to the best of my knowledge and belief. A willfully false statement is punishable by law. (U.S. Code, Title 18, Section 1001.)

_____

(NAME AND TITLE OF SIGNER – PLEASE TYPE)

_____ _____

(SIGNATURE) (DATE)

BID BOND

Any singular reference to Bidder, Surety, Owner or other party shall be considered plural where applicable.

BIDDER *(Name and Address)*:

SURETY *(Name and Address of Principal Place of Business)*:

OWNER *(Name and Address)*:

BID
Bid Due Date:
Description *(Project Name and Include Location)*:

BOND
Bond Number:
Date *(Not earlier than Bid due date)*:
Penal sum _____ $ _____
(Words) (Figures)

Surety and Bidder, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Bid Bond to be duly executed by an authorized officer, agent, or representative.

BIDDER

_____ (Seal)
Bidder's Name and Corporate Seal

By: _____
Signature

_____
Print Name

_____
Title

Attest: _____
Signature

_____
Title

SURETY

_____ (Seal)
Surety's Name and Corporate Seal

By: _____
Signature (Attach Power of Attorney)

_____
Print Name

_____
Title

Attest: _____
Signature

_____
Title

Note: Above addresses are to be used for giving any required notice. Provide execution by any additional parties, such as joint venturers, if necessary.

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Bidder's and Surety's liability. Recovery of such penal sum under the terms of this Bond shall be Owner's sole and exclusive remedy upon default of Bidder.

2. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.

3. This obligation shall be null and void if:

3.1 Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or

3.2 All Bids are rejected by Owner, or

3.3 Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).

4. Payment under this Bond will be due and payable upon default of Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.

5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions shall not in the aggregate exceed 120 days from Bid due date without Surety's written consent.

6. No suit or action shall be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety and in no case later than one year after Bid due date.

7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.

8. Notices required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.

9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.

10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.

11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

AGREEMENT

THIS AGREEMENT is by and between the TOWN OF NORTH CASTLE, NY (Owner) and _____ _____ (Contractor).

Owner and Contractor, hereby agree as follows:

ARTICLE 1 - WORK

1.01. Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows:

Removing and replacing the existing water distribution system.

ARTICLE 2 - THE PROJECT

2.01. The Project for which the Work under the Contract Documents may be the whole or only a part is generally described as follows:

Water District No. 2 Distribution System Replacement
Town of North Castle, NY

ARTICLE 3 - ENGINEER

3.01. The Project has been designed by GHD Consulting Services Inc. (Engineer), which is to act as Owner's representative, assume all duties and responsibilities, and have the rights and authority assigned to Engineer in the Contract Documents in connection with the completion of the Work in accordance with the Contract Documents.

ARTICLE 4 - CONTRACT TIMES

4.01. Time of the Essence

A. All time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.

4.02. Days to Achieve Substantial Completion and Final Payment

A. The Work shall be substantially completed within 240 days after the date when the Contract Times commence to run as provided in paragraph 2.03 of the General Conditions, and completed and ready for final payment in accordance with paragraph 14.07 of the General Conditions within 400 days after the date when the Contract Times commence to run.

4.03. Liquidated Damages

A. Contractor and Owner recognize that time is of the essence as stated in Paragraph 4.01 above of this Agreement and that Owner will suffer financial loss if the Work is not completed within the times specified in paragraph 4.02 above, plus any extensions thereof allowed in accordance with Article 12 of the General Conditions. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a

penalty), Contractor shall pay Owner $1,000 for each day that expires after the time specified in Paragraph 4.02 for Substantial Completion until the Work is substantially complete. After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Time or any proper extension thereof granted by Owner, Contractor shall pay Owner $1,000 for each day that expires after the time specified in Paragraph 4.02 above for completion and readiness for final payment until the Work is completed and ready for final payment.

ARTICLE 5 - CONTRACT PRICE

5.01. Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents an amount in current funds equal to the amounts determined pursuant to the following:

A. For all Unit Price Work, an amount equal to the sum of the established unit price shown on the Bid Form for each separately identified item of Unit Price Work times the actual quantity of that item:

B. For all Unit Price Work, an amount equal to the sum of the established unit price shown on the Bid Form for each separately identified item of Unit Price Work times the actual quantity of that item.

C. For all Work, at the prices stated in Bid Form, attached hereto as an exhibit.

ARTICLE 6 - PAYMENT PROCEDURES

6.01. Submittal and Processing of Payments

A. Contractor shall submit Applications for Payment in accordance with Article 14 of the General Conditions. Applications for Payment will be processed by Engineer as provided in the General Conditions.

6.02. Progress Payments; Retainage

A. Owner shall make progress payments on account of the Contract Price on the basis of Contractor's Applications for Payment on or about the first Wednesday of each month during performance of the Work as provided in the following subparagraph. All such payments will be measured by the Schedule of Values established as provided in Paragraph 2.07.A of the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no Schedule of Values, as provided in the General Requirements. When the Payment Application is returned and approved by Engineer, the application will be placed on the agenda for the next available Town Board meeting for Town Board approval.

1. Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments previously made and less such amounts as Engineer may determine or Owner may withhold, including but not limited to liquidated damages, in accordance with Paragraph 14.02 of the General Conditions.

a. 95% of the Work completed (with the balance being retained) 95% of the value of undamaged materials and equipment not incorporated in the Work but delivered, suitably stored, and accompanied by documentation

satisfactory to Owner in accordance with Paragraph 14.02 of the General Conditions and Supplementary Conditions, less in each case the aggregate of payments previously made, and less such amounts which may be lawfully deducted.

B. Upon Substantial Completion, Owner shall pay an amount sufficient to increase total payments to Contractor to 100% of the Work completed, less such amounts as Engineer shall determine in accordance with Paragraph 14.02.B.5 of the General Conditions and less 200% of Engineer's estimate of the value of Work to be completed or corrected as shown on the tentative list of items to be completed or corrected attached to the certificate of Substantial Completion.

6.03. Final Payment

A. Upon final completion and acceptance of the Work in accordance with Paragraph 14.07 of the General Conditions, Owner shall pay the remainder of the Contract Price as recommended by Engineer as provided in said Paragraph 14.07.

ARTICLE 7 - INTEREST

7.01. All moneys not paid when due as provided in Article 14 of the General Conditions shall bear interest at the rate of 5% per annum.

ARTICLE 8 - CONTRACTOR'S REPRESENTATIONS

8.01. In order to induce Owner to enter into this Agreement, Contractor makes the following representations:

A. Contractor has examined and carefully studied the Contract Documents and the other related data identified in the Bidding Documents.

B. Contractor has visited the Site and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

C. Contractor is familiar with and is satisfied as to all federal, state, and local Laws and Regulations that may affect cost, progress, and performance of the Work.

D. Contractor has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) , if any, that have been identified in Paragraph SC-4.02 of the Supplementary Conditions as containing reliable “technical data”, and (2) reports and drawings of Hazardous Environmental Conditions, if any, at the Site that have been identified in Paragraph SC-4.06 of the Supplementary Conditions as containing reliable “technical data”.

E. Contractor has considered the information known to Contractor; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Contract Documents; and the Site-related reports and drawings identified in the Contract Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, or performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, including any specific means, methods, techniques, sequences, and procedures

of construction expressly required by the Contract Documents; (3 Contractor's safety precautions and programs.

F. Based on the information and observations referred to in the previous paragraph , Contractor does not consider that any further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract Documents.

G. Contractor is aware of the general nature of work to be performed by others at the Site that relates to the Work as indicated in the Contract Documents.

H. Contractor has given Engineer written notice of all conflicts errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.

I. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

ARTICLE 9 - CONTRACT DOCUMENTS

9.01. Contents

A. The Contract Documents consist of the following:

1. This Agreement (pages 1 to 7, inclusive).

2. Performance Bond (pages 1 to 3, inclusive).

3. Payment Bond (pages 1 to 3, inclusive).

4. General Conditions (pages 1 to 50, inclusive).

5. Supplementary Conditions (pages 1 to 14, inclusive).

6. Specifications as listed in the table of contents of the Project Manual.

7. Drawings consisting of 50 sheets with each sheet bearing the following general title: "Town of North Castle, NY, Water District No. 2, Distribution System Replacement." Exhibit D to this Agreement contains a list of specific drawing titles.

8. Addenda (Nos. ____ to _____, inclusive).

9. Exhibits to this Agreement (enumerated as follows):

a. Bid Form (pages ___ to ___, inclusive).

b. Documentation submitted by Contractor prior to Notice of Award (pages ____ to ___, inclusive).

c. List other required attachments (if any), such as documents required by funding or lending agencies.

10. The following which may be delivered or issued on or after the Effective Date of the Agreement and are not attached hereto:

a. Notice to Proceed (pages ___ to __, inclusive).

b. Work Change Directives.

c. Change Orders.

B. There are no Contract Documents other than those listed above in this Article 9.

C. The Contract Documents may only be amended, modified, or supplemented as provided in Paragraph 3.04 of the General Conditions.

ARTICLE 10 - MISCELLANEOUS

10.01. Terms

A. Terms used in this Agreement have the meanings stated in the General Conditions and the Supplementary Conditions.

10.02. Assignment of Contract

A. No assignment by a party hereto of any rights under or interests in the Contract will be binding on another party hereto without the written consent of the party sought to be bound; and, specifically but without limitation, moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

10.03. Successors and Assigns

A. Owner and Contractor each binds itself, its partners, successors, assigns, and legal representatives to the other party hereto, its partners, successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

10.04. Severability

A. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon Owner and Contractor, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

10.05. Contractor's Certifications

A. Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 10.05:

1. "corrupt practice" means the offering, giving, receiving, or soliciting of any thing of value likely to influence the action of a public official in the bidding process or in the Contract execution;

2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of Owner, (b) to establish Bid or Contract prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;

3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of owner, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and

4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

(continued)

IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement. Counterparts have been delivered to Owner and Contractor. All portions of the Contract Documents have been signed or have been identified by Owner and Contractor or on their behalf.

This Agreement will be effective on _____, 20___, (which is the Effective Date of the Agreement).

Owner _____	Contractor _____
By _____	By _____
Title: _____	Title: _____

(If Contractor is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)

Attest _____	Attest _____
Title _____	Title _____
Address for giving notices:	Address for giving notices:
_____	_____
_____	_____
	License No. _____ (where applicable)

If Owner is a corporation, attach evidence of authority to sign. If Owner is a public body, attach evidence of authority to sign and resolution or other documents authorizing execution of Owner-Contractor Agreement.

END OF SECTION

EXHIBIT A

NOTICE OF AWARD
NOTICE TO PROCEED

Notice of Award

Date: _____

Project:	
Owner:	Owner's Contract No.:
Contract:	Engineer's Project No.:
Bidder:	
Bidder's Address: *[send Notice of Award Certified Mail, Return Receipt Requested]*	

You are notified that your Bid dated _____for the above Contract has been considered. You are the Successful Bidder and are awarded a Contract for _____.

[Indicate total Work, alternates, or sections of Work awarded.]

The Contract Price of your Contract is _____ Dollars $_____).

[Insert appropriate data if unit prices are used. Change language for cost-plus contracts.]

_____ copies of the proposed Contract Documents (except Drawings) accompany this Notice of Award.

_____ sets of the Drawings will be delivered separately or otherwise made available to you immediately.

You must comply with the following conditions precedent within [15] days of the date you receive this Notice of Award.

1. Deliver to the Owner [_____] fully executed counterparts of the Contract Documents.
2. Deliver with the executed Contract Documents the Contract security [Bonds] as specified in the Instructions to Bidders (Article 20), General Conditions (Paragraph 5.01), and Supplementary Conditions (Paragraph SC-5.01).
3. Other conditions precedent: _____

Failure to comply with these conditions within the time specified will entitle Owner to consider you in default, annul this Notice of Award, and declare your Bid security forfeited.

Within ten days after you comply with the above conditions, Owner will return to you one fully executed counterpart of the Contract Documents.

_____
Owner

By:_____
Authorized Signature

_____
Title

Copy to Engineer

Notice to Proceed

Date: _____

Project:	
Owner:	Owner's Contract No.:
Contract:	Engineer's Project No.:
Contractor:	
Contractor's Address: *[send Certified Mail, Return Receipt Requested]*	

You are notified that the Contract Times under the above Contract will commence to run on _____. On or before that date, you are to start performing your obligations under the Contract Documents. In accordance with Article 4 of the Agreement, the date of Substantial Completion is _____, and the date of readiness for final payment is _____[(or) the number of days to achieve Substantial Completion is _____, and the number of days to achieve readiness for final payment is _____].

Before you may start any Work at the Site, Paragraph 2.01.B of the General Conditions provides that you and Owner must each deliver to the other (with copies to Engineer and other identified additional insureds and loss payees) certificates of insurance which each is required to purchase and maintain in accordance with the Contract Documents.

Also, before you may start any Work at the Site, you must:

_____ *[add other requirements]*.

_____ _____
Owner
Given by:

_____ _____
Authorized Signature

_____ _____
Title

_____ _____
Date

Copy to Engineer

EXHIBIT B

PERFORMANCE BOND
AND PAYMENT BOND

PERFORMANCE BOND

Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

CONTRACTOR (*Name and Address*):

SURETY (*Name, and Address of Principal Place of Business*):

OWNER (*Name and Address*):

CONTRACT
Effective Date of Agreement:
Amount:
Description (*Name and Location*):

BOND
Bond Number:
Date (*Not earlier than Effective Date of Agreement*):
Amount:
Modifications to this Bond Form:

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Performance Bond to be duly executed by an authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL

_____ (Seal)
Contractor's Name and Corporate Seal

By: _____
Signature

_____
Print Name

_____
Title

Attest: _____
Signature

_____
Title

SURETY

_____ (Seal)
Surety's Name and Corporate Seal

By: _____
Signature (Attach Power of Attorney)

_____
Print Name

_____
Title

Attest: _____
Signature

_____
Title

Note: Provide execution by additional parties, such as joint venturers, if necessary.

Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to Owner for the performance of the Contract, which is incorporated herein by reference.

1. If Contractor performs the Contract, Surety and Contractor have no obligation under this Bond, except to participate in conferences as provided in Paragraph 2.1.

2. If there is no Owner Default, Surety's obligation under this Bond shall arise after:
   - 2.1 Owner has notified Contractor and Surety, at the addresses described in Paragraph 9 below, that Owner is considering declaring a Contractor Default and has requested and attempted to arrange a conference with Contractor and Surety to be held not later than 15 days after receipt of such notice to discuss methods of performing the Contract. If Owner, Contractor, and Surety agree, Contractor shall be allowed a reasonable time to perform the Contract, but such an agreement shall not waive Owner's right, if any, subsequently to declare a Contractor Default; and
   - 2.2 Owner has declared a Contractor Default and formally terminated Contractor's right to complete the Contract. Such Contractor Default shall not be declared earlier than 20 days after Contractor and Surety have received notice as provided in Paragraph 2.1; and
   - 2.3 Owner has agreed to pay the Balance of the Contract Price to:
     1. Surety in accordance with the terms of the Contract; or
     2. Another contractor selected pursuant to Paragraph 3.3 to perform the Contract.

3. When Owner has satisfied the conditions of Paragraph 2, Surety shall promptly, and at Surety's expense, take one of the following actions:

   - 3.1 Arrange for Contractor, with consent of Owner, to perform and complete the Contract; or
   - 3.2 Undertake to perform and complete the Contract itself, through its agents or through independent contractors; or
   - 3.3 Obtain bids or negotiated proposals from qualified contractors acceptable to Owner for a contract for performance and completion of the Contract, arrange for a contract to be prepared for execution by Owner and contractor selected with Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Contract, and pay to Owner the amount of damages as described in Paragraph 5 in excess of the Balance of the Contract Price incurred by Owner resulting from Contractor Default; or
   - 3.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor, and with reasonable promptness under the circumstances:
     1. After investigation, determine the amount for which it may be liable to Owner and, as soon as practicable after the amount is determined, tender payment therefor to Owner; or
     2. Deny liability in whole or in part and notify Owner citing reasons therefor.

4. If Surety does not proceed as provided in Paragraph 3 with reasonable promptness, Surety shall be deemed to be in default on this Bond 15 days after receipt of an additional written notice from Owner to Surety demanding that Surety perform its obligations under this Bond, and Owner shall be entitled to enforce any remedy available to Owner. If Surety proceeds as provided in Paragraph 3.4, and Owner refuses the payment tendered or Surety has denied liability, in whole or in part, without further notice Owner shall be entitled to enforce any remedy available to Owner.

5. After Owner has terminated Contractor's right to complete the Contract, and if Surety elects to act under Paragraph 3.1, 3.2, or 3.3 above, then the responsibilities of Surety to Owner shall not be greater than those of Contractor under the Contract, and the responsibilities of Owner to Surety shall not be greater than those of Owner under the Contract. To the limit of the amount of this Bond, but subject to commitment by Owner of the Balance of the Contract Price to mitigation of costs and damages on the Contract, Surety is obligated without duplication for:

5.1 The responsibilities of Contractor for correction of defective Work and completion of the Contract;
5.2 Additional legal, design professional, and delay costs resulting from Contractor's Default, and resulting from the actions of or failure to act of Surety under Paragraph 3; and
5.3 Liquidated damages, or if no liquidated damages are specified in the Contract, actual damages caused by delayed performance or non-performance of Contractor.

6. Surety shall not be liable to Owner or others for obligations of Contractor that are unrelated to the Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than Owner or its heirs, executors, administrators, or successors.

7. Surety hereby waives notice of any change, including changes of time, to Contract or to related subcontracts, purchase orders, and other obligations.

8. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the Work or part of the Work is located, and shall be instituted within two years after Contractor Default or within two years after Contractor ceased working or within two years after Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

9. Notice to Surety, Owner, or Contractor shall be mailed or delivered to the address shown on the signature page.

10. When this Bond has been furnished to comply with a statutory requirement in the location where the Contract was to be performed, any provision in this Bond conflicting with said statutory requirement shall be deemed deleted herefrom and provisions conforming to such statutory requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

11. Definitions.

11.1 Balance of the Contract Price: The total amount payable by Owner to Contractor under the Contract after all proper adjustments have been made, including allowance to Contractor of any amounts received or to be received by Owner in settlement of insurance or other Claims for damages to which Contractor is entitled, reduced by all valid and proper payments made to or on behalf of Contractor under the Contract.
11.2 Contract: The agreement between Owner and Contractor identified on the signature page, including all Contract Documents and changes thereto.
11.3 Contractor Default: Failure of Contractor, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Contract.
11.4 Owner Default: Failure of Owner, which has neither been remedied nor waived, to pay Contractor as required by the Contract or to perform and complete or otherwise comply with the other terms thereof.

FOR INFORMATION ONLY – (*Name, Address and Telephone*) Surety Agency or Broker: Owner's Representative (*Engineer or other party*):

PAYMENT BOND

Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

CONTRACTOR (*Name and Address*):

SURETY (*Name, and Address of Principal Place of Business*):

OWNER (*Name and Address*):

CONTRACT
Effective Date of Agreement:
Amount:
Description *(Name and Location)*:

BOND
Bond Number:
Date (*Not earlier than Effective Date of Agreement*):
Amount:
Modifications to this Bond Form:

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Payment Bond to be duly executed by an authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL

_____ (Seal)
Contractor's Name and Corporate Seal

By: _____
Signature

_____
Print Name

_____
Title

Attest: _____
Signature

_____
Title

SURETY

_____ (Seal)
Surety's Name and Corporate Seal

By: _____
Signature (Attach Power of Attorney)

_____
Print Name

_____
Title

Attest: _____
Signature

_____
Title

Note: Provide execution by additional parties, such as joint venturers, if necessary.

1. Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to Owner to pay for labor, materials, and equipment furnished by Claimants for use in the performance of the Contract, which is incorporated herein by reference.

2. With respect to Owner, this obligation shall be null and void if Contractor:

2.1 Promptly makes payment, directly or indirectly, for all sums due Claimants, and

2.2 Defends, indemnifies, and holds harmless Owner from all claims, demands, liens, or suits alleging non-payment by Contractor by any person or entity who furnished labor, materials, or equipment for use in the performance of the Contract, provided Owner has promptly notified Contractor and Surety (at the addresses described in Paragraph 12) of any claims, demands, liens, or suits and tendered defense of such claims, demands, liens, or suits to Contractor and Surety, and provided there is no Owner Default.

3. With respect to Claimants, this obligation shall be null and void if Contractor promptly makes payment, directly or indirectly, for all sums due.

4. Surety shall have no obligation to Claimants under this Bond until:

4.1 Claimants who are employed by or have a direct contract with Contractor have given notice to Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to Owner, stating that a claim is being made under this Bond and, with substantial accuracy, the amount of the claim.

4.2 Claimants who do not have a direct contract with Contractor:

1. Have furnished written notice to Contractor and sent a copy, or notice thereof, to Owner, within 90 days after having last performed labor or last furnished materials or equipment included in the claim stating, with substantial accuracy, the amount of the claim and the name of the party to whom the materials or equipment were furnished or supplied, or for whom the labor was done or performed; and
2. Have either received a rejection in whole or in part from Contractor, or not received within 30 days of furnishing the above notice any communication from Contractor by which Contractor had indicated the claim will be paid directly or indirectly; and
3. Not having been paid within the above 30 days, have sent a written notice to Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to Owner, stating that a claim is being made under this Bond and enclosing a copy of the previous written notice furnished to Contractor.

5. If a notice by a Claimant required by Paragraph 4 is provided by Owner to Contractor or to Surety, that is sufficient compliance.

6. When a Claimant has satisfied the conditions of Paragraph 4, the Surety shall promptly and at Surety's expense take the following actions:

6.1 Send an answer to that Claimant, with a copy to Owner, within 45 days after receipt of the claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed.

6.2 Pay or arrange for payment of any undisputed amounts.

7. Surety's total obligation shall not exceed the amount of this Bond, and the amount of this Bond shall be credited for any payments made in good faith by Surety.

8. Amounts owed by Owner to Contractor under the Contract shall be used for the performance of the Contract and to satisfy claims, if any, under any performance bond. By Contractor furnishing and Owner accepting this Bond, they agree that all funds earned by Contractor in the performance of the Contract are dedicated to satisfy obligations of Contractor and Surety under this Bond, subject to Owner's priority to use the funds for the completion of the Work.

9. Surety shall not be liable to Owner, Claimants, or others for obligations of Contractor that are unrelated to the Contract. Owner shall not be liable for payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligations to make payments to, give notices on behalf of, or otherwise have obligations to Claimants under this Bond.

10. Surety hereby waives notice of any change, including changes of time, to the Contract or to related subcontracts, purchase orders, and other obligations.

11. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the location in which the Work or part of the Work is located or after the expiration of one year from the date (1) on which the Claimant gave the notice required by Paragraph 4.1 or Paragraph 4.2.3, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

12. Notice to Surety, Owner, or Contractor shall be mailed or delivered to the addresses shown on the signature page. Actual receipt of notice by Surety, Owner, or Contractor, however accomplished, shall be sufficient compliance as of the date received at the address shown on the signature page.

13. When this Bond has been furnished to comply with a statutory requirement in the location where the Contract was to be performed, any provision in this Bond conflicting with said statutory requirement shall be deemed deleted herefrom and provisions conforming to such statutory requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory Bond and not as a common law bond.

14. Upon request of any person or entity appearing to be a potential beneficiary of this Bond, Contractor shall promptly furnish a copy of this Bond or shall permit a copy to be made.

15. Definitions

15.1 Claimant: An individual or entity having a direct contract with Contractor, or with a first-tier subcontractor of Contractor, to furnish labor, materials, or equipment for use in the performance of the Contract. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Contract, architectural and engineering services required for performance of the Work of Contractor and Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.

15.2 Contract: The agreement between Owner and Contractor identified on the signature page, including all Contract Documents and changes thereto.

15.3 Owner Default: Failure of Owner, which has neither been remedied nor waived, to pay Contractor as required by the Contract, or to perform and complete or otherwise comply with the other terms thereof.

FOR INFORMATION ONLY – (*Name, Address, and Telephone*) Surety Agency or Broker: Owner's Representative (*Engineer or other*):

EXHIBIT C

CERTIFICATES OF INSURANCE

EXHIBIT D

IDENTIFICATION OF CONTRACT DRAWINGS

EXHIBIT D

IDENTIFICATION OF CONTRACT DRAWINGS

The Contract Drawings show the character and scope of the work to be performed and have been prepared or approved by Engineer. The drawings, all of which constitute an integral part of the Contract Documents as approved for construction on the date so designated on said drawings, carry the Engineer's identifying Job No. 8616265 and are listed below by sheet number and title:

CONTRACT NO. 1 - GENERAL

Drawing No.	Drawing Title
G01	Cover Sheet
G02	General Notes, Abbreviations, Legend, Overview Plan, & Drawing List
C01	Evergreen Row Plan & Profile
C02	Evergreen Row Plan & Profile
C03	Evergreen Row Plan & Profile
C04	Evergreen Row Plan & Profile
C05	Evergreen Row Plan & Profile
C06	North Lane Plan & Profile
C07	North Lake Road Plan & Profile
C08	North Lake Road Plan & Profile
C09	North Lake Road Plan & Profile
C10	North Lake Road Plan & Profile
C11	Fox Ridge Plan & Profile
C12	Fox Ridge Plan & Profile
C13	Fox Ridge and Elm Place Plan & Profile
C14	Upland Lane Plan & Profile
C15	Upland Lane Plan & Profile
C16	Hardscrabble Circle & North Ridge Plan & Profile
C17	Hardscrabble Plan & Profile
C18	Thornewood Road Plan & Profile
C19	Thornewood Road Plan & Profile
C20	Thornewood Road Plan & Profile
C21	Windmill Road Plan & Profile
C22	Windmill Road Plan & Profile
C23	Windmill Road Plan & Profile
C24	Windmill Road Plan & Profile
C25	Windmill Road Plan & Profile
C26	Windmill Road Plan & Profile
C27	Windmill Road Plan & Profile
C28	Windmill Road Plan & Profile
C31	Thorne Lane Plan & Profile
C32	Maple Way Plan & Profile
C33	Maple Way & Spruce Hollow Plan & Profile
C34	Spruce Hill Plan & Profile
C35	Spruce Hill Plan & Profile
C36	Long Pond Road Plan & Profile
C37	Long Pond Road Plan & Profile
C38	Long Pond Road Plan & Profile
C39	Long Pond Road Plan & Profile
C40	Long Pond Road Plan & Profile

EXHIBIT D (continued)

C41	Pond Lane Plan & Profile
C42	Pond Lane Plan & Profile
C43	Mill Lane & Oak Ridge Court Plan & Profile
C44	Valley Lane & Banksville Road Plan & Profile
C45	Banksville Road Plan & Profile
C46	Details
C47	Details
C48	Details
C49	Details
C50	Details

This document has important legal consequences; consultation with an attorney is encouraged with respect to its use or modification. This document should be adapted to the particular circumstances of the contemplated Project and the controlling Laws and Regulations.

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by

ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

and

Issued and Published Jointly by

AMERICAN COUNCIL OF ENGINEERING COMPANIES

ASSOCIATED GENERAL CONTRACTORS OF AMERICA

AMERICAN SOCIETY OF CIVIL ENGINEERS

PROFESSIONAL ENGINEERS IN PRIVATE PRACTICE
A Practice Division of the
NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS

Endorsed by

CONSTRUCTION SPECIFICATIONS INSTITUTE

These General Conditions have been prepared for use with the Suggested Forms of Agreement Between Owner and Contractor (EJCDC C-520 or C-525, 2007 Editions). Their provisions are interrelated and a change in one may necessitate a change in the other. Comments concerning their usage are contained in the Narrative Guide to the EJCDC Construction Documents (EJCDC C-001, 2007 Edition). For guidance in the preparation of Supplementary Conditions, see Guide to the Preparation of Supplementary Conditions (EJCDC C-800, 2007 Edition).

1420 King Street, Alexandria, VA 22314-2794
(703) 684-2882
www.nspe.org

American Council of Engineering Companies
1015 15th Street N.W., Washington, DC 20005
(202) 347-7474
www.acec.org

American Society of Civil Engineers
1801 Alexander Bell Drive, Reston, VA 20191-4400
(800) 548-2723
www.asce.org

Associated General Contractors of America
2300 Wilson Boulevard, Suite 400, Arlington, VA 22201-3308
(703) 548-3118
www.agc.org

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

A. Wherever used in the Bidding Requirements or Contract Documents and printed with initial capital letters, the terms listed below will have the meanings indicated which are applicable to both the singular and plural thereof. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.

1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.

2. *Agreement*—The written instrument which is evidence of the agreement between Owner and Contractor covering the Work.

3. ▸*Application for Payment*—The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

4. *Asbestos*—Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.

5. *Bid*—The offer or proposal of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

6. *Bidder*—The individual or entity who submits a Bid directly to Owner.

7. *Bidding Documents*—The Bidding Requirements and the proposed Contract Documents (including all Addenda).

8. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid security of acceptable form, if any, and the Bid Form with any supplements.

9. *Change Order*—A document recommended by Engineer which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Agreement.

10. *Claim*—A demand or assertion by Owner or Contractor seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.

11. *Contract*—The entire and integrated written agreement between the Owner and Contractor concerning the Work. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.

12. *Contract Documents*—Those items so designated in the Agreement. Only printed or hard copies of the items listed in the Agreement are Contract Documents. Approved Shop Drawings, other Contractor submittals, and the reports and drawings of subsurface and physical conditions are not Contract Documents.

13. *Contract Price*—The moneys payable by Owner to Contractor for completion of the Work in accordance with the Contract Documents as stated in the Agreement (subject to the provisions of Paragraph 11.03 in the case of Unit Price Work).

▸ See Supplementary Conditions.

14. *Contract Times*—The number of days or the dates stated in the Agreement to: (i) achieve Milestones, if any; (ii) achieve Substantial Completion; and (iii) complete the Work so that it is ready for final payment as evidenced by Engineer's written recommendation of final payment.

15. *Contractor*—The individual or entity with whom Owner has entered into the Agreement.

16. *Cost of the Work*—See Paragraph 11.01 for definition.

17. *Drawings*—That part of the Contract Documents prepared or approved by Engineer which graphically shows the scope, extent, and character of the Work to be performed by Contractor. Shop Drawings and other Contractor submittals are not Drawings as so defined.

18. *Effective Date of the Agreement*—The date indicated in the Agreement on which it becomes effective, but if no such date is indicated, it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.

19. *Engineer*—The individual or entity named as such in the Agreement.

20. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but which does not involve a change in the Contract Price or the Contract Times.

21. *General Requirements*—Sections of Division 1 of the Specifications.

22. *Hazardous Environmental Condition*—The presence at the Site of Asbestos, PCBs, Petroleum, Hazardous Waste, or Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto.

23. *Hazardous Waste*—The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.

24. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

25. *Liens*—Charges, security interests, or encumbrances upon Project funds, real property, or personal property.

26. *Milestone*—A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.

27. *Notice of Award*—The written notice by Owner to the Successful Bidder stating that upon timely compliance by the Successful Bidder with the conditions precedent listed therein, Owner will sign and deliver the Agreement.

28. *Notice to Proceed*—A written notice given by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work under the Contract Documents.

29. *Owner*—The individual or entity with whom Contractor has entered into the Agreement and for whom the Work is to be performed.

30. *PCBs*—Polychlorinated biphenyls.

31. *Petroleum*—Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60ºF and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Waste and crude oils.

32. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor's plan to accomplish the Work within the Contract Times.

33. *Project*—The total construction of which the Work to be performed under the Contract Documents may be the whole, or a part.

34. *Project Manual*—The bound documentary information prepared for bidding and constructing the Work. A listing of the contents of the Project Manual, which may be bound in one or more volumes, is contained in the table(s) of contents.

35. *Radioactive Material*—Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.

36. *Resident Project Representative*—The authorized representative of Engineer who may be assigned to the Site or any part thereof.

37. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.

38. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements to support scheduled performance of related construction activities.

39. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

40. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.

41. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by Owner which are designated for the use of Contractor.

42. *Specifications*—That part of the Contract Documents consisting of written requirements for materials, equipment, systems, standards and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable thereto.

43. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work at the Site.

44. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion thereof.

45. *Successful Bidder*—The Bidder submitting a responsive Bid to whom Owner makes an award.

46. *Supplementary Conditions*—That part of the Contract Documents which amends or supplements these General Conditions.

47. *Supplier*—A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or Subcontractor.

48. *Underground Facilities*—All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those

that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.

49. *Unit Price Work*—Work to be paid for on the basis of unit prices.

50. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.

51. *Work Change Directive*—A written statement to Contractor issued on or after the Effective Date of the Agreement and signed by Owner and recommended by Engineer ordering an addition, deletion, or revision in the Work, or responding to differing or unforeseen subsurface or physical conditions under which the Work is to be performed or to emergencies. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the change ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.

1.02 ►Terminology

A. The words and terms discussed in Paragraph 1.02.B through F are not defined but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.

B. *Intent of Certain Terms or Adjectives:*

1. The Contract Documents include the terms "as allowed," "as approved," "as ordered," "as directed" or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives "reasonable," "suitable," "acceptable," "proper," "satisfactory," or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Paragraph 9.09 or any other provision of the Contract Documents.

C. *Day:*

1. The word "day" means a calendar day of 24 hours measured from midnight to the next midnight.

D. *Defective:*

1. The word "defective," when modifying the word "Work," refers to Work that is unsatisfactory, faulty, or deficient in that it:

a. does not conform to the Contract Documents; or

b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or

c. has been damaged prior to Engineer's recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 14.04 or 14.05).

►See Supplementary Conditions.

E. *Furnish, Install, Perform, Provide:*

1. The word "furnish," when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.

2. The word "install," when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.

3. The words "perform" or "provide," when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.

4. When "furnish," "install," "perform," or "provide" is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of Contractor, "provide" is implied.

F. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2 – PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

A. When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.

B. *Evidence of Insurance:* Before any Work at the Site is started, Contractor and Owner shall each deliver to the other, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which either of them or any additional insured may reasonably request) which Contractor and Owner respectively are required to purchase and maintain in accordance with Article 5.

2.02 *Copies of Documents*

A. Owner shall furnish to Contractor up to ten printed or hard copies of the Drawings and Project Manual. Additional copies will be furnished upon request at the cost of reproduction.

2.03 *Commencement of Contract Times; Notice to Proceed*

A. ►The Contract Times will commence to run on the thirtieth day after the Effective Date of the Agreement or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Agreement. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Agreement, whichever date is earlier.

2.04 *Starting the Work*

A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to the date on which the Contract Times commence to run.

►See Supplementary Conditions.

2.05 *Before Starting Construction*

A. ►*Preliminary Schedules:* Within 10 days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), Contractor shall submit to Engineer for timely review:

1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract Documents;

2. a preliminary Schedule of Submittals; and

3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.06 *Preconstruction Conference; Designation of Authorized Representatives*

A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.05.A, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, and maintaining required records.

B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit instructions, receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.07 *Initial Acceptance of Schedules*

A. At least 10 days before submission of the first Application for Payment a conference attended by Contractor, Engineer, and others as appropriate will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.05.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.

1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.

2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.

3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to component parts of the Work.

ARTICLE 3 – CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

3.01 *Intent*

A. The Contract Documents are complementary; what is required by one is as binding as if required by all.

►See Supplementary Conditions.

B. It is the intent of the Contract Documents to describe a functionally complete project (or part thereof) to be constructed in accordance with the Contract Documents. Any labor, documentation, services, materials, or equipment that reasonably may be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the indicated result will be provided whether or not specifically called for, at no additional cost to Owner.

C. Clarifications and interpretations of the Contract Documents shall be issued by Engineer as provided in Article 9.

3.02 *Reference Standards*

A. Standards, Specifications, Codes, Laws, and Regulations

1. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.

2. No provision of any such standard, specification, manual, or code, or any instruction of a Supplier, shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees, from those set forth in the Contract Documents. No such provision or instruction shall be effective to assign to Owner, Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies:*

1. *Contractor's Review of Contract Documents Before Starting Work*: Before undertaking each part of the Work, Contractor shall carefully study and compare the Contract Documents and check and verify pertinent figures therein and all applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy which Contractor discovers, or has actual knowledge of, and shall obtain a written interpretation or clarification from Engineer before proceeding with any Work affected thereby.

2. *Contractor's Review of Contract Documents During Performance of Work*: If, during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation , (b) any standard, specification, manual, or code, or (c) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 6.16.A) until an amendment or supplement to the Contract Documents has been issued by one of the methods indicated in Paragraph 3.04.

3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

B. *Resolving Discrepancies:*

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between the provisions of the Contract Documents and:

a. the provisions of any standard, specification, manual, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference in the Contract Documents); or

b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Amending and Supplementing Contract Documents*

A. The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof by either a Change Order or a Work Change Directive.

B. The requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, by one or more of the following ways:

1. A Field Order;

2. Engineer's approval of a Shop Drawing or Sample (subject to the provisions of Paragraph 6.17.D.3); or

3. Engineer's written interpretation or clarification.

3.05 *Reuse of Documents*

A. Contractor and any Subcontractor or Supplier shall not:

1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media editions; or

2. reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer.

B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

3.06 *Electronic Data*

A. Unless otherwise stated in the Supplementary Conditions, the data furnished by Owner or Engineer to Contractor, or by Contractor to Owner or Engineer, that may be relied upon are limited to the printed copies (also known as hard copies). Files in electronic media format of text, data, graphics, or other types are furnished only for the convenience of the receiving party. Any conclusion or information obtained or derived from such electronic files will be at the user's sole risk. If there is a discrepancy between the electronic files and the hard copies, the hard copies govern.

B. Because data stored in electronic media format can deteriorate or be modified inadvertently or otherwise without authorization of the data's creator, the party receiving electronic files agrees that it will perform acceptance tests or procedures within 60 days, after which the receiving party shall be deemed to have accepted the data thus transferred. Any errors detected within the 60-day acceptance period will be corrected by the transferring party.

C. When transferring documents in electronic media format, the transferring party makes no representations as to long term compatibility, usability, or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by the data's creator.

ARTICLE 4 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS; REFERENCE POINTS

4.01 *Availability of Lands*

A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work. Owner will obtain in a timely manner and pay for easements for permanent structures or permanent changes in existing facilities. If Contractor and Owner are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, as a result of any delay in Owner's furnishing the Site or a part thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which the Work is to be performed and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.

C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

4.02 ►*Subsurface and Physical Conditions*

A. *Reports and Drawings:* The Supplementary Conditions identify:

1. those reports known to Owner of explorations and tests of subsurface conditions at or contiguous to the Site; and

2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities).

B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or

3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions, or information.

4.03 *Differing Subsurface or Physical Conditions*

A. *Notice:* If Contractor believes that any subsurface or physical condition that is uncovered or revealed either:

1. is of such a nature as to establish that any "technical data" on which Contractor is entitled to rely as provided in Paragraph 4.02 is materially inaccurate; or

2. is of such a nature as to require a change in the Contract Documents; or

►See Supplementary Conditions.

3. differs materially from that shown or indicated in the Contract Documents; or

4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so.

B. *Engineer's Review*: After receipt of written notice as required by Paragraph 4.03.A, Engineer will promptly review the pertinent condition, determine the necessity of Owner's obtaining additional exploration or tests with respect thereto, and advise Owner in writing (with a copy to Contractor) of Engineer's findings and conclusions.

C. *Possible Price and Times Adjustments:*

1. The Contract Price or the Contract Times, or both, will be equitably adjusted to the extent that the existence of such differing subsurface or physical condition causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

   a. such condition must meet any one or more of the categories described in Paragraph 4.03.A; and

   b. with respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraphs 9.07 and 11.03.

2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times if:

   a. Contractor knew of the existence of such conditions at the time Contractor made a final commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract; or

   b. the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such final commitment; or

   c. Contractor failed to give the written notice as required by Paragraph 4.03.A.

3. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, a Claim may be made therefor as provided in Paragraph 10.05. However, neither Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

4.04 *Underground Facilities*

A. *Shown or Indicated:* The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:

1. Owner and Engineer shall not be responsible for the accuracy or completeness of any such information or data provided by others; and

2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:

   a. reviewing and checking all such information and data;

   b. locating all Underground Facilities shown or indicated in the Contract Documents;

   c. coordination of the Work with the owners of such Underground Facilities, including Owner, during construction; and

   d. the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.

B. *Not Shown or Indicated:*

1. If an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated, or not shown or indicated with reasonable accuracy in the Contract Documents, Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer. Engineer will promptly review the Underground Facility and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the consequences of the existence or location of the Underground Facility. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

2. If Engineer concludes that a change in the Contract Documents is required, a Work Change Directive or a Change Order will be issued to reflect and document such consequences. An equitable adjustment shall be made in the Contract Price or Contract Times, or both, to the extent that they are attributable to the existence or location of any Underground Facility that was not shown or indicated or not shown or indicated with reasonable accuracy in the Contract Documents and that Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment in Contract Price or Contract Times, Owner or Contractor may make a Claim therefor as provided in Paragraph 10.05.

4.05 *Reference Points*

A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.06 ►*Hazardous Environmental Condition at Site*

A. *Reports and Drawings:* The Supplementary Conditions identify those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at the Site.

B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical

►See Supplementary Conditions.

data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or

3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions or information.

C. Contractor shall not be responsible for any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work. Contractor shall be responsible for a Hazardous Environmental Condition created with any materials brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible.

D. If Contractor encounters a Hazardous Environmental Condition or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, Contractor shall immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 6.16.A); and (iii) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 4.06.E.

E. Contractor shall not be required to resume Work in connection with such condition or in any affected area until after Owner has obtained any required permits related thereto and delivered written notice to Contractor: (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work; or (ii) specifying any special conditions under which such Work may be resumed safely. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, either party may make a Claim therefor as provided in Paragraph 10.05.

F. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of an adjustment in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a Claim therefor as provided in Paragraph 10.05. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 7.

G. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition: (i) was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be included within the scope of the Work, and (ii) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.G shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

H. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.H shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

I. The provisions of Paragraphs 4.02, 4.03, and 4.04 do not apply to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 5 – BONDS AND INSURANCE

5.01 *Performance, Payment, and Other Bonds*

A. Contractor shall furnish performance and payment bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all of Contractor's obligations under the Contract Documents. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 13.07, whichever is later, except as provided otherwise by Laws or Regulations or by the Contract Documents. Contractor shall also furnish such other bonds as are required by the Contract Documents.

B. ►All bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All bonds signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed each bond.

C. If the surety on any bond furnished by Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of Paragraph 5.01.B, Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the requirements of Paragraphs 5.01.B and 5.02.

5.02 *Licensed Sureties and Insurers*

A. All bonds and insurance required by the Contract Documents to be purchased and maintained by Owner or Contractor shall be obtained from surety or insurance companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds or insurance policies for the limits and coverages so required. Such surety and insurance companies shall also meet such additional requirements and qualifications as may be provided in the Supplementary Conditions.

5.03 *Certificates of Insurance*

A. Contractor shall deliver to Owner, with copies to each additional insured and loss payee identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Owner or any other additional insured) which Contractor is required to purchase and maintain.

B. Owner shall deliver to Contractor, with copies to each additional insured and loss payee identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Contractor or any other additional insured) which Owner is required to purchase and maintain.

►See Supplementary Conditions.

C. Failure of Owner to demand such certificates or other evidence of Contractor's full compliance with these insurance requirements or failure of Owner to identify a deficiency in compliance from the evidence provided shall not be construed as a waiver of Contractor's obligation to maintain such insurance.

D. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor.

E. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner in the Contract Documents.

5.04 *Contractor's Insurance*

A. Contractor shall purchase and maintain such insurance as is appropriate for the Work being performed and as will provide protection from claims set forth below which may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable:

1. claims under workers' compensation, disability benefits, and other similar employee benefit acts;

2. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees;

3. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees;

4. claims for damages insured by reasonably available personal injury liability coverage which are sustained:

   a. by any person as a result of an offense directly or indirectly related to the employment of such person by Contractor, or

   b. by any other person for any other reason;

5. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom; and

6. claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.

B. ►The policies of insurance required by this Paragraph 5.04 shall:

1. with respect to insurance required by Paragraphs 5.04.A.3 through 5.04.A.6 inclusive, be written on an occurrence basis, include as additional insureds (subject to any customary exclusion regarding professional liability) Owner and Engineer, and any other individuals or entities identified in the Supplementary Conditions, all of whom shall be listed as additional insureds, and include coverage for the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of all such additional insureds, and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby;

2. include at least the specific coverages and be written for not less than the limits of liability provided in the Supplementary Conditions or required by Laws or Regulations, whichever is greater;

►See Supplementary Conditions.

3. include contractual liability insurance covering Contractor's indemnity obligations under Paragraphs 6.11 and 6.20;

4. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other additional insured identified in the Supplementary Conditions to whom a certificate of insurance has been issued (and the certificates of insurance furnished by the Contractor pursuant to Paragraph 5.03 will so provide);

5. remain in effect at least until final payment and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work in accordance with Paragraph 13.07; and

6. include completed operations coverage:

   a. Such insurance shall remain in effect for two years after final payment.

   b. Contractor shall furnish Owner and each other additional insured identified in the Supplementary Conditions, to whom a certificate of insurance has been issued, evidence satisfactory to Owner and any such additional insured of continuation of such insurance at final payment and one year thereafter.

5.05 ►*Owner's Liability Insurance*

A. In addition to the insurance required to be provided by Contractor under Paragraph 5.04, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.

5.06 *Property Insurance*

A. ►Unless otherwise provided in the Supplementary Conditions, Owner shall purchase and maintain property insurance upon the Work at the Site in the amount of the full replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:

1. include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as a loss payee;

2. be written on a Builder's Risk "all-risk" policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage (other than that caused by flood), and such other perils or causes of loss as may be specifically required by the Supplementary Conditions.

3. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);

4. cover materials and equipment stored at the Site or at another location that was agreed to in writing by Owner prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by Engineer;

5. allow for partial utilization of the Work by Owner;

►See Supplementary Conditions.

6. include testing and startup; and

7. be maintained in effect until final payment is made unless otherwise agreed to in writing by Owner, Contractor, and Engineer with 30 days written notice to each other loss payee to whom a certificate of insurance has been issued.

B. ►Owner shall purchase and maintain such equipment breakdown insurance or additional property insurance as may be required by the Supplementary Conditions or Laws and Regulations which will include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as a loss payee.

C. All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 5.06 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other loss payee to whom a certificate of insurance has been issued and will contain waiver provisions in accordance with Paragraph 5.07.

D. Owner shall not be responsible for purchasing and maintaining any property insurance specified in this Paragraph 5.06 to protect the interests of Contractor, Subcontractors, or others in the Work to the extent of any deductible amounts that are identified in the Supplementary Conditions. The risk of loss within such identified deductible amount will be borne by Contractor, Subcontractors, or others suffering any such loss, and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.

E. If Contractor requests in writing that other special insurance be included in the property insurance policies provided under this Paragraph 5.06, Owner shall, if possible, include such insurance, and the cost thereof will be charged to Contractor by appropriate Change Order. Prior to commencement of the Work at the Site, Owner shall in writing advise Contractor whether or not such other insurance has been procured by Owner.

5.07 *Waiver of Rights*

A. Owner and Contractor intend that all policies purchased in accordance with Paragraph 5.06 will protect Owner, Contractor, Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions as loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) in such policies and will provide primary coverage for all losses and damages caused by the perils or causes of loss covered thereby. All such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any of the insureds or loss payees thereunder. Owner and Contractor waive all rights against each other and their respective officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them for all losses and damages caused by, arising out of or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Subcontractors and Engineer, and all other individuals or entities identified in the Supplementary Conditions as loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner as trustee or otherwise payable under any policy so issued.

B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them for:

►See Supplementary Conditions.

1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and

2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial utilization pursuant to Paragraph 14.05, after Substantial Completion pursuant to Paragraph 14.04, or after final payment pursuant to Paragraph 14.07.

C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 5.07.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them.

5.08 *Receipt and Application of Insurance Proceeds*

A. Any insured loss under the policies of insurance required by Paragraph 5.06 will be adjusted with Owner and made payable to Owner as fiduciary for the loss payees, as their interests may appear, subject to the requirements of any applicable mortgage clause and of Paragraph 5.08.B. Owner shall deposit in a separate account any money so received and shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the moneys so received applied on account thereof, and the Work and the cost thereof covered by an appropriate Change Order.

B. Owner as fiduciary shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within 15 days after the occurrence of loss to Owner's exercise of this power. If such objection be made, Owner as fiduciary shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If no such agreement among the parties in interest is reached, Owner as fiduciary shall adjust and settle the loss with the insurers and, if required in writing by any party in interest, Owner as fiduciary shall give bond for the proper performance of such duties.

5.09 *Acceptance of Bonds and Insurance; Option to Replace*

A. If either Owner or Contractor has any objection to the coverage afforded by or other provisions of the bonds or insurance required to be purchased and maintained by the other party in accordance with Article 5 on the basis of non-conformance with the Contract Documents, the objecting party shall so notify the other party in writing within 10 days after receipt of the certificates (or other evidence requested) required by Paragraph 2.01.B. Owner and Contractor shall each provide to the other such additional information in respect of insurance provided as the other may reasonably request. If either party does not purchase or maintain all of the bonds and insurance required of such party by the Contract Documents, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage. Without prejudice to any other right or remedy, the other party may elect to obtain equivalent bonds or insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and a Change Order shall be issued to adjust the Contract Price accordingly.

5.10 *Partial Utilization, Acknowledgment of Property Insurer*

A. If Owner finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 14.05, no such use or occupancy shall commence before the insurers providing the property insurance pursuant to Paragraph 5.06 have acknowledged notice thereof and in writing effected any changes in coverage necessitated thereby. The insurers providing the property insurance shall consent by endorsement on the policy or policies, but the property insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy.

ARTICLE 6 – CONTRACTOR'S RESPONSIBILITIES

6.01 *Supervision and Superintendence*

A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction. Contractor shall not be responsible for the negligence of Owner or Engineer in the design or specification of a specific means, method, technique, sequence, or procedure of construction which is shown or indicated in and expressly required by the Contract Documents.

B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

6.02 *Labor; Working Hours*

A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.

B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours. Contractor will not permit the performance of Work on a Saturday, Sunday, or any legal holiday without Owner's written consent (which will not be unreasonably withheld) given after prior written notice to Engineer.

6.03 *Services, Materials, and Equipment*

A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start-up, and completion of the Work.

B. All materials and equipment incorporated into the Work shall be as specified or, if not specified, shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.

C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

6.04 *Progress Schedule*

A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.07 as it may be adjusted from time to time as provided below.

1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.07) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times. Such adjustments will comply with any provisions of the General Requirements applicable thereto.

2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 12. Adjustments in Contract Times may only be made by a Change Order.

6.05 ►*Substitutes and "Or-Equals"*

A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or-equal" item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to Engineer for review under the circumstances described below.

1. *"Or-Equal" Items:* If in Engineer's sole discretion an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by Engineer as an "or-equal" item, in which case review and approval of the proposed item may, in Engineer's sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purposes of this Paragraph 6.05.A.1, a proposed item of material or equipment will be considered functionally equal to an item so named if:

a. in the exercise of reasonable judgment Engineer determines that:

1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;

2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole; and

3) it has a proven record of performance and availability of responsive service.

b. Contractor certifies that, if approved and incorporated into the Work:

1) there will be no increase in cost to the Owner or increase in Contract Times; and

2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.

2. ►*Substitute Items:*

a. If in Engineer's sole discretion an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item under Paragraph 6.05.A.1, it will be considered a proposed substitute item.

b. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefor. Requests for review of proposed substitute items of material or equipment will not be accepted by Engineer from anyone other than Contractor.

c. The requirements for review by Engineer will be as set forth in Paragraph 6.05.A.2.d, as supplemented by the General Requirements, and as Engineer may decide is appropriate under the circumstances.

d. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:

1) shall certify that the proposed substitute item will:

a) perform adequately the functions and achieve the results called for by the general design,

b) be similar in substance to that specified, and

►See Supplementary Conditions.

c) be suited to the same use as that specified;

2) will state:

a) the extent, if any, to which the use of the proposed substitute item will prejudice Contractor's achievement of Substantial Completion on time,

b) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item, and

c) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty;

3) will identify:

a) all variations of the proposed substitute item from that specified, and

b) available engineering, sales, maintenance, repair, and replacement services; and

4) shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change.

B. *Substitute Construction Methods or Procedures:* If a specific means, method, technique, sequence, or procedure of construction is expressly required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved by Engineer. Contractor shall submit sufficient information to allow Engineer, in Engineer's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The requirements for review by Engineer will be similar to those provided in Paragraph 6.05.A.2.

C. ►*Engineer's Evaluation:* Engineer will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to Paragraphs 6.05.A and 6.05.B. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No "or equal" or substitute will be ordered, installed or utilized until Engineer's review is complete, which will be evidenced by a Change Order in the case of a substitute and an approved Shop Drawing for an "or equal." Engineer will advise Contractor in writing of any negative determination.

D. *Special Guarantee:* Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.

E. *Engineer's Cost Reimbursement*: Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor pursuant to Paragraphs 6.05.A.2 and 6.05.B. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.

F. *Contractor's Expense*: Contractor shall provide all data in support of any proposed substitute or "or-equal" at Contractor's expense.

►See Supplementary Conditions.

6.06 *Concerning Subcontractors, Suppliers, and Others*

A. Contractor shall not employ any Subcontractor, Supplier, or other individual or entity (including those acceptable to Owner as indicated in Paragraph 6.06.B), whether initially or as a replacement, against whom Owner may have reasonable objection. Contractor shall not be required to employ any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against whom Contractor has reasonable objection.

B. If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, or other individuals or entities to be submitted to Owner in advance for acceptance by Owner by a specified date prior to the Effective Date of the Agreement, and if Contractor has submitted a list thereof in accordance with the Supplementary Conditions, Owner's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Bidding Documents or the Contract Documents) of any such Subcontractor, Supplier, or other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity, and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate Change Order will be issued. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of any right of Owner or Engineer to reject defective Work.

C. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions. Nothing in the Contract Documents:

1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier or other individual or entity; nor

2. shall create any obligation on the part of Owner or Engineer to pay or to see to the payment of any moneys due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.

D. Contractor shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work under a direct or indirect contract with Contractor.

E. Contractor shall require all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work to communicate with Engineer through Contractor.

F. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.

G. All Work performed for Contractor by a Subcontractor or Supplier will be pursuant to an appropriate agreement between Contractor and the Subcontractor or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer. Whenever any such agreement is with a Subcontractor or Supplier who is listed as a loss payee on the property insurance provided in Paragraph 5.06, the agreement between the Contractor and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against Owner, Contractor, Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work. If the insurers on any such policies require separate waiver forms to be signed by any Subcontractor or Supplier, Contractor will obtain the same.

6.07 *Patent Fees and Royalties*

A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.

B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.

C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

6.08 *Permits*

A. ►Unless otherwise provided in the Supplementary Conditions, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of opening of Bids, or, if there are no Bids, on the Effective Date of the Agreement. Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

6.09 *Laws and Regulations*

A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.

B. If Contractor performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work. However, it shall not be Contractor's responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.

C. Changes in Laws or Regulations not known at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids) having an effect on the cost or time of performance of the Work shall be the subject of an adjustment in Contract Price or Contract Times. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

►See Supplementary Conditions.

6.10 *Taxes*

A. ►Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

6.11 *Use of Site and Other Areas*

A. *Limitation on Use of Site and Other Areas:*

1. Contractor shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site and other areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and other areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof, or of any adjacent land or areas resulting from the performance of the Work.

2. Should any claim be made by any such owner or occupant because of the performance of the Work, Contractor shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law.

3. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused by or based upon Contractor's performance of the Work.

B. *Removal of Debris During Performance of the Work:* During the progress of the Work Contractor shall keep the Site and other areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.

C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

D. *Loading Structures:* Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

6.12 ►*Record Documents*

A. Contractor shall maintain in a safe place at the Site one record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, and written interpretations and clarifications in good order and annotated to show changes made during construction. These record documents together with all approved Samples and a counterpart of all approved Shop Drawings will be available to Engineer for reference. Upon completion of the Work, these record documents, Samples, and Shop Drawings will be delivered to Engineer for Owner.

►See Supplementary Conditions.

6.13 *Safety and Protection*

A. Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:

1. all persons on the Site or who may be affected by the Work;

2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and

3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.

B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property.

C. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. The Supplementary Conditions identify any Owner's safety programs that are applicable to the Work.

D. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.

E. All damage, injury, or loss to any property referred to in Paragraph 6.13.A.2 or 6.13.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).

F. Contractor's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 14.07.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

6.14 *Safety Representative*

A. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

6.15 *Hazard Communication Programs*

A. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

6.16 ►*Emergencies*

A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

6.17 ►*Shop Drawings and Samples*

A. Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals (as required by Paragraph 2.07). Each submittal will be identified as Engineer may require.

1. *Shop Drawings:*

a. Submit number of copies specified in the General Requirements.

b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide and to enable Engineer to review the information for the limited purposes required by Paragraph 6.17.D.

2. *Samples:*

a. Submit number of Samples specified in the Specifications.

b. Clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 6.17.D.

B. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.

C. *Submittal Procedures:*

1. Before submitting each Shop Drawing or Sample, Contractor shall have:

a. reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;

b. determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;

c. determined and verified the suitability of all materials offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and

d. determined and verified all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.

►See Supplementary Conditions.

2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review and approval of that submittal.

3. With each submittal, Contractor shall give Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be both a written communication separate from the Shop Drawings or Sample submittal; and, in addition, by a specific notation made on each Shop Drawing or Sample submitted to Engineer for review and approval of each such variation.

D. *Engineer's Review:*

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.

2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

3. Engineer's review and approval shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 6.17.C.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer's review and approval shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 6.17.C.1.

E. *Resubmittal Procedures:*

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.

6.18 *Continuing the Work*

A. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted by Paragraph 15.04 or as Owner and Contractor may otherwise agree in writing.

6.19 *Contractor's General Warranty and Guarantee*

A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on representation of Contractor's warranty and guarantee.

B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:

1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or

2. normal wear and tear under normal usage.

C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:

1. observations by Engineer;

2. recommendation by Engineer or payment by Owner of any progress or final payment;

3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;

4. use or occupancy of the Work or any part thereof by Owner;

5. any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice of acceptability by Engineer;

6. any inspection, test, or approval by others; or

7. any correction of defective Work by Owner.

6.20 *Indemnification*

A. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable .

B. In any and all claims against Owner or Engineer or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 6.20.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

C. The indemnification obligations of Contractor under Paragraph 6.20.A shall not extend to the liability of Engineer and Engineer's officers, directors, members, partners, employees, agents, consultants and subcontractors arising out of:

1. the preparation or approval of, or the failure to prepare or approve maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or

2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

6.21 ►*Delegation of Professional Design Services*

A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's

►See Supplementary Conditions.

responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable law.

B. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.

C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.

D. Pursuant to this Paragraph 6.21, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 6.17.D.1.

E. Contractor shall not be responsible for the adequacy of the performance or design criteria required by the Contract Documents.

ARTICLE 7 – ►OTHER WORK AT THE SITE

7.01 ►*Related Work at Site*

A. Owner may perform other work related to the Project at the Site with Owner's employees, or through other direct contracts therefor, or have other work performed by utility owners. If such other work is not noted in the Contract Documents, then:

1. written notice thereof will be given to Contractor prior to starting any such other work; and

2. if Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times that should be allowed as a result of such other work, a Claim may be made therefor as provided in Paragraph 10.05.

B. Contractor shall afford each other contractor who is a party to such a direct contract, each utility owner, and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work, and properly coordinate the Work with theirs. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected. The duties and responsibilities of Contractor under this Paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of Contractor in said direct contracts between Owner and such utility owners and other contractors.

C. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 7, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

►See Supplementary Conditions.

7.02 ►*Coordination*

A. If Owner intends to contract with others for the performance of other work on the Project at the Site, the following will be set forth in Supplementary Conditions:

1. the individual or entity who will have authority and responsibility for coordination of the activities among the various contractors will be identified;

2. the specific matters to be covered by such authority and responsibility will be itemized; and

3. the extent of such authority and responsibilities will be provided.

B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

7.03 *Legal Relationships*

A. Paragraphs 7.01.A and 7.02 are not applicable for utilities not under the control of Owner.

B. Each other direct contract of Owner under Paragraph 7.01.A shall provide that the other contractor is liable to Owner and Contractor for the reasonable direct delay and disruption costs incurred by Contractor as a result of the other contractor's wrongful actions or inactions.

C. Contractor shall be liable to Owner and any other contractor under direct contract to Owner for the reasonable direct delay and disruption costs incurred by such other contractor as a result of Contractor's wrongful action or inactions.

ARTICLE 8 – OWNER'S RESPONSIBILITIES

8.01 *Communications to Contractor*

A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

8.02 *Replacement of Engineer*

A. In case of termination of the employment of Engineer, Owner shall appoint an engineer to whom Contractor makes no reasonable objection, whose status under the Contract Documents shall be that of the former Engineer.

8.03 *Furnish Data*

A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

8.04 *Pay When Due*

A. Owner shall make payments to Contractor when they are due as provided in Paragraphs 14.02.C and 14.07.C.

8.05 *Lands and Easements; Reports and Tests*

A. Owner's duties with respect to providing lands and easements and providing engineering surveys to establish reference points are set forth in Paragraphs 4.01 and 4.05. Paragraph 4.02 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of subsurface conditions and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

8.06 *Insurance*

A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 5.

8.07 *Change Orders*

A. Owner is obligated to execute Change Orders as indicated in Paragraph 10.03.

8.08 *Inspections, Tests, and Approvals*

A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 13.03.B.

8.09 ►*Limitations on Owner's Responsibilities*

A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

8.10 *Undisclosed Hazardous Environmental Condition*

A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 4.06.

8.11 *Evidence of Financial Arrangements*

A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents.

8.12 *Compliance with Safety Program*

A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed pursuant to Paragraph 6.13.D.

ARTICLE 9 – ENGINEER'S STATUS DURING CONSTRUCTION

9.01 *Owner's Representative*

A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract Documents.

9.02 *Visits to Site*

A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents.

►See Supplementary Conditions.

On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.

B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 9.09. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

9.03 ►*Project Representative*

A. If Owner and Engineer agree, Engineer will furnish a Resident Project Representative to assist Engineer in providing more extensive observation of the Work. The authority and responsibilities of any such Resident Project Representative and assistants will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 9.09. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

9.04 *Authorized Variations in Work*

A. Engineer may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. These may be accomplished by a Field Order and will be binding on Owner and also on Contractor, who shall perform the Work involved promptly. If Owner or Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, and the parties are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

9.05 *Rejecting Defective Work*

A. Engineer will have authority to reject Work which Engineer believes to be defective, or that Engineer believes will not produce a completed Project that conforms to the Contract Documents or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Engineer will also have authority to require special inspection or testing of the Work as provided in Paragraph 13.04, whether or not the Work is fabricated, installed, or completed.

9.06 *Shop Drawings, Change Orders and Payments*

A. In connection with Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, see Paragraph 6.17.

B. In connection with Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, see Paragraph 6.21.

C. In connection with Engineer's authority as to Change Orders, see Articles 10, 11, and 12.

D. In connection with Engineer's authority as to Applications for Payment, see Article 14.

9.07 *Determinations for Unit Price Work*

A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a

►See Supplementary Conditions.

written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of Paragraph 10.05.

9.08 *Decisions on Requirements of Contract Documents and Acceptability of Work*

A. Engineer will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. All matters in question and other matters between Owner and Contractor arising prior to the date final payment is due relating to the acceptability of the Work, and the interpretation of the requirements of the Contract Documents pertaining to the performance of the Work, will be referred initially to Engineer in writing within 30 days of the event giving rise to the question.

B. Engineer will, with reasonable promptness, render a written decision on the issue referred. If Owner or Contractor believes that any such decision entitles them to an adjustment in the Contract Price or Contract Times or both, a Claim may be made under Paragraph 10.05. The date of Engineer's decision shall be the date of the event giving rise to the issues referenced for the purposes of Paragraph 10.05.B.

C. Engineer's written decision on the issue referred will be final and binding on Owner and Contractor, subject to the provisions of Paragraph 10.05.

D. When functioning as interpreter and judge under this Paragraph 9.08, Engineer will not show partiality to Owner or Contractor and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity.

9.09 *Limitations on Engineer's Authority and Responsibilities*

A. Neither Engineer's authority or responsibility under this Article 9 or under any other provision of the Contract Documents nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.

D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 14.07.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals that the results certified indicate compliance with, the Contract Documents.

E. The limitations upon authority and responsibility set forth in this Paragraph 9.09 shall also apply to the Resident Project Representative, if any, and assistants, if any.

9.10 *Compliance with Safety Program*

A. While at the Site, Engineer's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Engineer has been informed pursuant to Paragraph 6.13.D.

ARTICLE 10 – CHANGES IN THE WORK; CLAIMS

10.01 *Authorized Changes in the Work*

A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work by a Change Order, or a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).

B. If Owner and Contractor are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Work Change Directive, a Claim may be made therefor as provided in Paragraph 10.05.

10.02 *Unauthorized Changes in the Work*

A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents as amended, modified, or supplemented as provided in Paragraph 3.04, except in the case of an emergency as provided in Paragraph 6.16 or in the case of uncovering Work as provided in Paragraph 13.04.D.

10.03 *Execution of Change Orders*

A. Owner and Contractor shall execute appropriate Change Orders recommended by Engineer covering:

1. changes in the Work which are: (i) ordered by Owner pursuant to Paragraph 10.01.A, (ii) required because of acceptance of defective Work under Paragraph 13.08.A or Owner's correction of defective Work under Paragraph 13.09, or (iii) agreed to by the parties;

2. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive; and

3. changes in the Contract Price or Contract Times which embody the substance of any written decision rendered by Engineer pursuant to Paragraph 10.05; provided that, in lieu of executing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and Regulations, but during any such appeal, Contractor shall carry on the Work and adhere to the Progress Schedule as provided in Paragraph 6.18.A.

10.04 *Notification to Surety*

A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

10.05 *Claims*

A. *Engineer's Decision Required*: All Claims, except those waived pursuant to Paragraph 14.09, shall be referred to the Engineer for decision. A decision by Engineer shall be required as a condition precedent to any exercise by Owner or Contractor of any rights or remedies either may otherwise have under the Contract Documents or by Laws and Regulations in respect of such Claims.

B. *Notice:* Written notice stating the general nature of each Claim shall be delivered by the claimant to Engineer and the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto. The responsibility to substantiate a Claim shall rest with the party making the Claim. Notice of the amount or extent of the Claim, with supporting data shall be delivered to the Engineer and the other party to the Contract within 60

days after the start of such event (unless Engineer allows additional time for claimant to submit additional or more accurate data in support of such Claim). A Claim for an adjustment in Contract Price shall be prepared in accordance with the provisions of Paragraph 12.01.B. A Claim for an adjustment in Contract Times shall be prepared in accordance with the provisions of Paragraph 12.02.B. Each Claim shall be accompanied by claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant believes it is entitled as a result of said event. The opposing party shall submit any response to Engineer and the claimant within 30 days after receipt of the claimant's last submittal (unless Engineer allows additional time).

C. *Engineer's Action*: Engineer will review each Claim and, within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any, take one of the following actions in writing:

1. deny the Claim in whole or in part;

2. approve the Claim; or

3. notify the parties that the Engineer is unable to resolve the Claim if, in the Engineer's sole discretion, it would be inappropriate for the Engineer to do so. For purposes of further resolution of the Claim, such notice shall be deemed a denial.

D. In the event that Engineer does not take action on a Claim within said 30 days, the Claim shall be deemed denied.

E. Engineer's written action under Paragraph 10.05.C or denial pursuant to Paragraphs 10.05.C.3 or 10.05.D will be final and binding upon Owner and Contractor, unless Owner or Contractor invoke the dispute resolution procedure set forth in Article 16 within 30 days of such action or denial.

F. No Claim for an adjustment in Contract Price or Contract Times will be valid if not submitted in accordance with this Paragraph 10.05.

ARTICLE 11 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

11.01 *Cost of the Work*

A. *Costs Included:* The term Cost of the Work means the sum of all costs, except those excluded in Paragraph 11.01.B, necessarily incurred and paid by Contractor in the proper performance of the Work. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, the costs to be reimbursed to Contractor will be only those additional or incremental costs required because of the change in the Work or because of the event giving rise to the Claim. Except as otherwise may be agreed to in writing by Owner, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall not include any of the costs itemized in Paragraph 11.01.B, and shall include only the following items:

1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates and refunds and returns from sale of surplus

materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.

3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 11.01.

4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.

5. Supplemental costs including the following:

   a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.

   b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.

   c. ►Rentals of all construction equipment and machinery, and the parts thereof whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.

   d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.

   e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.

   f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 5.06.D), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.

   g. The cost of utilities, fuel, and sanitary facilities at the Site.

   h. Minor expenses such as telegrams, long distance telephone calls, telephone service at the Site, express and courier services, and similar petty cash items in connection with the Work.

   i. The costs of premiums for all bonds and insurance Contractor is required by the Contract Documents to purchase and maintain.

►See Supplementary Conditions.

B. *Costs Excluded:* The term Cost of the Work shall not include any of the following items:

1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expediters, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 11.01.A.1 or specifically covered by Paragraph 11.01.A.4, all of which are to be considered administrative costs covered by the Contractor's fee.

2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.

3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.

4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.

5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraphs 11.01.A.

C. *Contractor's Fee:* When all the Work is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 12.01.C.

D. ►*Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to Paragraphs 11.01.A and 11.01.B, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

11.02 *Allowances*

A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.

B. *Cash Allowances:*

1. Contractor agrees that:

a. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and

b. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.

C. *Contingency Allowance:*

1. Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.

►See Supplementary Conditions.

D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

11.03 *Unit Price Work*

A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.

B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by Contractor will be made by Engineer subject to the provisions of Paragraph 9.07.

C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.

D. ►Owner or Contractor may make a Claim for an adjustment in the Contract Price in accordance with Paragraph 10.05 if:

1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and

2. there is no corresponding adjustment with respect to any other item of Work; and

3. Contractor believes that Contractor is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price and the parties are unable to agree as to the amount of any such increase or decrease.

ARTICLE 12 – CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES

12.01 ►*Change of Contract Price*

A. The Contract Price may only be changed by a Change Order. Any Claim for an adjustment in the Contract Price shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.

B. The value of any Work covered by a Change Order or of any Claim for an adjustment in the Contract Price will be determined as follows:

1. where the Work involved is covered by unit prices contained in the Contract Documents, by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 11.03); or

2. where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 12.01.C.2); or

3. where the Work involved is not covered by unit prices contained in the Contract Documents and agreement to a lump sum is not reached under Paragraph 12.01.B.2, on the basis of the Cost of the Work (determined as provided in Paragraph 11.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 12.01.C).

C. *Contractor's Fee:* The Contractor's fee for overhead and profit shall be determined as follows:

►See Supplementary Conditions.

1. a mutually acceptable fixed fee; or

2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:

   a. for costs incurred under Paragraphs 11.01.A.1 and 11.01.A.2, the Contractor's fee shall be 15 percent;

   b. for costs incurred under Paragraph 11.01.A.3, the Contractor's fee shall be five percent;

   c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 12.01.C.2.a and 12.01.C.2.b is that the Subcontractor who actually performs the Work, at whatever tier, will be paid a fee of 15 percent of the costs incurred by such Subcontractor under Paragraphs 11.01.A.1 and 11.01.A.2 and that any higher tier Subcontractor and Contractor will each be paid a fee of five percent of the amount paid to the next lower tier Subcontractor;

   d. no fee shall be payable on the basis of costs itemized under Paragraphs 11.01.A.4, 11.01.A.5, and 11.01.B;

   e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and

   f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 12.01.C.2.a through 12.01.C.2.e, inclusive.

12.02 *Change of Contract Times*

A. The Contract Times may only be changed by a Change Order. Any Claim for an adjustment in the Contract Times shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.

B. Any adjustment of the Contract Times covered by a Change Order or any Claim for an adjustment in the Contract Times will be determined in accordance with the provisions of this Article 12.

12.03 *Delays*

A. Where Contractor is prevented from completing any part of the Work within the Contract Times due to delay beyond the control of Contractor, the Contract Times will be extended in an amount equal to the time lost due to such delay if a Claim is made therefor as provided in Paragraph 12.02.A. Delays beyond the control of Contractor shall include, but not be limited to, acts or neglect by Owner, acts or neglect of utility owners or other contractors performing other work as contemplated by Article 7, fires, floods, epidemics, abnormal weather conditions, or acts of God.

B. If Owner, Engineer, or other contractors or utility owners performing other work for Owner as contemplated by Article 7, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.

C. If Contractor is delayed in the performance or progress of the Work by fire, flood, epidemic, abnormal weather conditions, acts of God, acts or failures to act of utility owners not under the control of Owner, or other causes not the fault of and beyond control of Owner and Contractor, then Contractor shall be entitled to an equitable adjustment in Contract Times, if such adjustment is essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays described in this Paragraph 12.03.C.

D. Owner, Engineer, and their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

E. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delays within the control of Contractor. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of Contractor.

ARTICLE 13 – ► TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

13.01 *Notice of Defects*

A. Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor. Defective Work may be rejected, corrected, or accepted as provided in this Article 13.

13.02 *Access to Work*

A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and governmental agencies with jurisdictional interests will have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply therewith as applicable.

13.03 *Tests and Inspections*

A. Contractor shall give Engineer timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.

B. Owner shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except:

1. for inspections, tests, or approvals covered by Paragraphs 13.03.C and 13.03.D below;

2. that costs incurred in connection with tests or inspections conducted pursuant to Paragraph 13.04.B shall be paid as provided in Paragraph 13.04.C; and

3. as otherwise specifically provided in the Contract Documents.

C. ►If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.

D. Contractor shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work; or acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to Owner and Engineer.

►See Supplementary Conditions.
►See Supplementary Conditions.

E. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation.

F. Uncovering Work as provided in Paragraph 13.03.E shall be at Contractor's expense unless Contractor has given Engineer timely notice of Contractor's intention to cover the same and Engineer has not acted with reasonable promptness in response to such notice.

13.04 *Uncovering Work*

A. If any Work is covered contrary to the written request of Engineer, it must, if requested by Engineer, be uncovered for Engineer's observation and replaced at Contractor's expense.

B. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, furnishing all necessary labor, material, and equipment.

C. If it is found that the uncovered Work is defective, Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05.

D. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

13.05 *Owner May Stop the Work*

A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

13.06 *Correction or Removal of Defective Work*

A. Promptly after receipt of written notice, Contractor shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by Engineer, remove it from the Project and replace it with Work that is not defective. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or removal (including but not limited to all costs of repair or replacement of work of others).

B. When correcting defective Work under the terms of this Paragraph 13.06 or Paragraph 13.07, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

13.07 *Correction Period*

A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents) or by any specific provision of the

Contract Documents, any Work is found to be defective, or if the repair of any damages to the land or areas made available for Contractor's use by Owner or permitted by Laws and Regulations as contemplated in Paragraph 6.11.A is found to be defective, Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:

1. repair such defective land or areas; or

2. correct such defective Work; or

3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and

4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others or other land or areas resulting therefrom.

B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by Contractor.

C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.

D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this Paragraph 13.07, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

E. Contractor's obligations under this Paragraph 13.07 are in addition to any other obligation or warranty. The provisions of this Paragraph 13.07 shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

13.08 *Acceptance of Defective Work*

A. If, instead of requiring correction or removal and replacement of defective Work, Owner (and, prior to Engineer's recommendation of final payment, Engineer) prefers to accept it, Owner may do so. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness) and for the diminished value of the Work to the extent not otherwise paid by Contractor pursuant to this sentence. If any such acceptance occurs prior to Engineer's recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work, and Owner shall be entitled to an appropriate decrease in the Contract Price, reflecting the diminished value of Work so accepted. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05. If the acceptance occurs after such recommendation, an appropriate amount will be paid by Contractor to Owner.

13.09 *Owner May Correct Defective Work*

A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace rejected Work as required by Engineer in accordance with Paragraph 13.06.A, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other

provision of the Contract Documents, Owner may, after seven days written notice to Contractor, correct, or remedy any such deficiency.

B. In exercising the rights and remedies under this Paragraph 13.09, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, take possession of Contractor's tools, appliances, construction equipment and machinery at the Site, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this Paragraph.

C. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 13.09 will be charged against Contractor, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of the adjustment, Owner may make a Claim therefor as provided in Paragraph 10.05. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.

D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 13.09.

ARTICLE 14 – PAYMENTS TO CONTRACTOR AND COMPLETION

14.01 ►*Schedule of Values*

A. The Schedule of Values established as provided in Paragraph 2.07.A will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed.

14.02 ►*Progress Payment*

A. ►*Applications for Payments:*

1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.

2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.

3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

►See Supplementary Conditions.

B. *Review of Applications:*

1. Engineer will, within 10 days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to Owner or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.

2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:

   a. the Work has progressed to the point indicated;

   b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 9.07, and any other qualifications stated in the recommendation); and

   c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.

3. By recommending any such payment Engineer will not thereby be deemed to have represented that:

   a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract Documents; or

   b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.

4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:

   a. to supervise, direct, or control the Work, or

   b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or

   c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or

   d. to make any examination to ascertain how or for what purposes Contractor has used the moneys paid on account of the Contract Price, or

   e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.

5. ►Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 14.02.B.2. Engineer may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent inspections or tests, revise or revoke any such payment recommendation previously made, to such extent as may be necessary in Engineer's opinion to protect Owner from loss because:

►See Supplementary Conditions.

a. the Work is defective, or completed Work has been damaged, requiring correction or replacement;

b. the Contract Price has been reduced by Change Orders;

c. Owner has been required to correct defective Work or complete Work in accordance with Paragraph 13.09; or

d. Engineer has actual knowledge of the occurrence of any of the events enumerated in Paragraph 15.02.A.

C. ►*Payment Becomes Due:*

1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended will (subject to the provisions of Paragraph 14.02.D) become due, and when due will be paid by Owner to Contractor.

D. *Reduction in Payment:*

1. Owner may refuse to make payment of the full amount recommended by Engineer because:

a. claims have been made against Owner on account of Contractor's performance or furnishing of the Work;

b. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;

c. there are other items entitling Owner to a set-off against the amount recommended; or

d. Owner has actual knowledge of the occurrence of any of the events enumerated in Paragraphs 14.02.B.5.a through 14.02.B.5.c or Paragraph 15.02.A.

2. If Owner refuses to make payment of the full amount recommended by Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, when Contractor remedies the reasons for such action.

3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 14.02.C.1 and subject to interest as provided in the Agreement.

14.03 *Contractor's Warranty of Title*

A. Contractor warrants and guarantees that title to all Work, materials, and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to Owner no later than the time of payment free and clear of all Liens.

14.04 *Substantial Completion*

A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete (except for items specifically listed by Contractor as incomplete) and request that Engineer issue a certificate of Substantial Completion.

►See Supplementary Conditions.

B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.

C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a tentative certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment. Owner shall have seven days after receipt of the tentative certificate during which to make written objection to Engineer as to any provisions of the certificate or attached list. If, after considering such objections, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the tentative certificate to Owner, notify Contractor in writing, stating the reasons therefor. If, after consideration of Owner's objections, Engineer considers the Work substantially complete, Engineer will, within said 14 days, execute and deliver to Owner and Contractor a definitive certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as Engineer believes justified after consideration of any objections from Owner.

D. At the time of delivery of the tentative certificate of Substantial Completion, Engineer will deliver to Owner and Contractor a written recommendation as to division of responsibilities pending final payment between Owner and Contractor with respect to security, operation, safety, and protection of the Work, maintenance, heat, utilities, insurance, and warranties and guarantees. Unless Owner and Contractor agree otherwise in writing and so inform Engineer in writing prior to Engineer's issuing the definitive certificate of Substantial Completion, Engineer's aforesaid recommendation will be binding on Owner and Contractor until final payment.

E. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the tentative list.

14.05 *Partial Utilization*

A. ►Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:

1. Owner at any time may request Contractor in writing to permit Owner to use or occupy any such part of the Work which Owner believes to be ready for its intended use and substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 14.04.A through D for that part of the Work.

2. Contractor at any time may notify Owner and Engineer in writing that Contractor considers any such part of the Work ready for its intended use and substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.

3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 14.04 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 5.10 regarding property insurance.

►See Supplementary Conditions.

14.06 *Final Inspection*

A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

14.07 ►*Final Payment*

A. *Application for Payment:*

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, marked-up record documents (as provided in Paragraph 6.12), and other documents, Contractor may make application for final payment following the procedure for progress payments.

2. The final Application for Payment shall be accompanied (except as previously delivered) by:

   a. all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required by Paragraph 5.04.B.6;

   b. consent of the surety, if any, to final payment;

   c. a list of all Claims against Owner that Contractor believes are unsettled; and

   d. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of or Liens filed in connection with the Work.

3. In lieu of the releases or waivers of Liens specified in Paragraph 14.07.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (i) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (ii) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien.

B. *Engineer's Review of Application and Acceptance:*

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract Documents have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of payment and present the Application for Payment to Owner for payment. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable subject to the provisions of Paragraph 14.09. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

►See Supplementary Conditions.

C. ►*Payment Becomes Due:*

1. Thirty days after the presentation to Owner of the Application for Payment and accompanying documentation, the amount recommended by Engineer, less any sum Owner is entitled to set off against Engineer's recommendation, including but not limited to liquidated damages, will become due and will be paid by Owner to Contractor.

14.08 ►*Final Completion Delayed*

A. If, through no fault of Contractor, final completion of the Work is significantly delayed, and if Engineer so confirms, Owner shall, upon receipt of Contractor's final Application for Payment (for Work fully completed and accepted) and recommendation of Engineer, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by Owner for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if bonds have been furnished as required in Paragraph 5.01, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by Contractor to Engineer with the Application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

14.09 *Waiver of Claims*

A. The making and acceptance of final payment will constitute:

1. a waiver of all Claims by Owner against Contractor, except Claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 14.06, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from Contractor's continuing obligations under the Contract Documents; and

2. a waiver of all Claims by Contractor against Owner other than those previously made in accordance with the requirements herein and expressly acknowledged by Owner in writing as still unsettled.

ARTICLE 15 – SUSPENSION OF WORK AND TERMINATION

15.01 *Owner May Suspend Work*

A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by notice in writing to Contractor and Engineer which will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be granted an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension if Contractor makes a Claim therefor as provided in Paragraph 10.05.

15.02 *Owner May Terminate for Cause*

A. The occurrence of any one or more of the following events will justify termination for cause:

1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule established under Paragraph 2.07 as adjusted from time to time pursuant to Paragraph 6.04);

2. Contractor's disregard of Laws or Regulations of any public body having jurisdiction;

3. Contractor's repeated disregard of the authority of Engineer; or

►See Supplementary Conditions.

4. Contractor's violation in any substantial way of any provisions of the Contract Documents.

B. If one or more of the events identified in Paragraph 15.02.A occur, Owner may, after giving Contractor (and surety) seven days written notice of its intent to terminate the services of Contractor:

1. exclude Contractor from the Site, and take possession of the Work and of all Contractor's tools, appliances, construction equipment, and machinery at the Site, and use the same to the full extent they could be used by Contractor (without liability to Contractor for trespass or conversion);

2. incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere; and

3. complete the Work as Owner may deem expedient.

C. If Owner proceeds as provided in Paragraph 15.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Owner arising out of or relating to completing the Work, such excess will be paid to Contractor. If such claims, costs, losses, and damages exceed such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this Paragraph, Owner shall not be required to obtain the lowest price for the Work performed.

D. Notwithstanding Paragraphs 15.02.B and 15.02.C, Contractor's services will not be terminated if Contractor begins within seven days of receipt of notice of intent to terminate to correct its failure to perform and proceeds diligently to cure such failure within no more than 30 days of receipt of said notice.

E. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue. Any retention or payment of moneys due Contractor by Owner will not release Contractor from liability.

F. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 5.01.A, the termination procedures of that bond shall supersede the provisions of Paragraphs 15.02.B and 15.02.C.

15.03 *Owner May Terminate For Convenience*

A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):

1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;

2. expenses sustained prior to the 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. all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred in settlement of terminated contracts with Subcontractors, Suppliers, and others; and

4. reasonable expenses directly attributable to termination.

B. Contractor shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

15.04 *Contractor May Stop Work or Terminate*

A. If, through no act or fault of Contractor, (i) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (ii) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (iii) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the Contract and recover from Owner payment on the same terms as provided in Paragraph 15.03.

B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this Paragraph 15.04 are not intended to preclude Contractor from making a Claim under Paragraph 10.05 for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this Paragraph.

ARTICLE 16 – DISPUTE RESOLUTION

16.01 ►*Methods and Procedures*

A. Either Owner or Contractor may request mediation of any Claim submitted to Engineer for a decision under Paragraph 10.05 before such decision becomes final and binding. The mediation will be governed by the Construction Industry Mediation Rules of the American Arbitration Association in effect as of the Effective Date of the Agreement. The request for mediation shall be submitted in writing to the American Arbitration Association and the other party to the Contract. Timely submission of the request shall stay the effect of Paragraph 10.05.E.

B. Owner and Contractor shall participate in the mediation process in good faith. The process shall be concluded within 60 days of filing of the request. The date of termination of the mediation shall be determined by application of the mediation rules referenced above.

C. If the Claim is not resolved by mediation, Engineer's action under Paragraph 10.05.C or a denial pursuant to Paragraphs 10.05.C.3 or 10.05.D shall become final and binding 30 days after termination of the mediation unless, within that time period, Owner or Contractor:

1. elects in writing to invoke any dispute resolution process provided for in the Supplementary Conditions; or

2. agrees with the other party to submit the Claim to another dispute resolution process; or

3. gives written notice to the other party of the intent to submit the Claim to a court of competent jurisdiction.

ARTICLE 17 – MISCELLANEOUS

17.01 ►*Giving Notice*

A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:

1. delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended; or

►See Supplementary Conditions.

2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

17.02 *Computation of Times*

A. When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

17.03 *Cumulative Remedies*

A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract Documents. The provisions of this Paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

17.04 *Survival of Obligations*

A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

17.05 *Controlling Law*

A. This Contract is to be governed by the law of the state in which the Project is located.

17.06 *Headings*

A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract, EJCDC C-700 (2007 Edition). All provisions which are not so amended or supplemented remain in full force and effect.

The terms used in these Supplementary Conditions have the meanings indicated in the General Conditions. Additional terms used in these Supplementary Conditions have the meanings indicated herein, which are applicable to both the singular and plural thereof.

ARTICLE 1 - DEFINITIONS AND TERMINOLOGY

SC-1.01 *Defined Terms*

SC-1.01 Modify existing definitions as follows:

3. Replace the phrase “acceptable to Engineer” in Paragraph 1.01.A.3 of the General Conditions with the phrase “furnished by the Engineer.”

SC-1.01 Add the following definitions immediately following Subparagraph 1.01.A.51:

52. General Contractor –The individual or entity with whom Owner has entered into an Agreement to perform the portions of the Work assigned in the Contract Documents to the General Contractor.

ARTICLE 2 - PRELIMINARY MATTERS

SC-2.02 *Copies of Documents*

SC-2.02 Delete Paragraph 2.02.A in its entirety and insert the following in its place:

A. Owner shall furnish to Contractor up to two printed or hard copies of the Drawings and Project Manual and one set in electronic format. Additional copies will be furnished upon request at the cost of reproduction.

SC-2.02 In Paragraph 2.02.A, replace “up to ten” with “up to 2”.

SC-2.03 *Commencement of Contract Times; Notice to Proceed*

SC-2.03 In the last sentence of Paragraph 2.03.A, replace “later than the sixtieth day after the day of Bid Opening” with “later than the 75th day after the day of Bid Opening”.

ARTICLE 3 - CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

(No Amendments to General Conditions.)

ARTICLE 4 - AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; REFERENCE POINTS

SC-4.02 *Subsurface and Physical Conditions*

SC-4.02 Add the following new paragraphs immediately after Paragraph 4.02.B:

C. The following reports of explorations and tests of subsurface conditions at or contiguous to the Site are known to Owner:

1. Report dated January 2014, prepared by Geologic, NY Inc. entitled: "Subsurface Report, Water District No. 2 Water Distribution System Replacement, North Castle, NY." The information contained in such report constitutes technical data upon which Contractor may rely.

D. In the preparation of Drawings and Specifications, Engineer relied upon the following drawings of physical conditions in or relating to existing surface and subsurface structures (except Underground Facilities) which are at or contiguous to the Site:

1. Drawings dated January 12, 2014, prepared by D.W. Hannig, LS PC, entitled "North Castle Planimetrics." All of the information in such drawings constitutes technical data on which Contractor may rely, appearing on Contract Drawing Nos. C001 through C045.

2. Strip maps/drawings dated 1948-1950, prepared by Town of North Castle entitled "Windmill Farms Water Works Corporation," consisting of sheets numbered 1 to 46, inclusive. All of the information in such drawings constitutes technical data on which Contractor may rely.

3. Drawings dated February 2014, prepared by Consolidated Edison Co. of NY Inc. entitled "GAS MAINS AND SERVICE PLATES," consisting of sheets numbered 78-CR, CT, CU, CS to 85- CR, CT, CU, CS, CW, CX inclusive. All of the information in such drawings constitutes technical data on which Contractor may rely,

4. Drawings dated February 2014, prepared by Consolidated Edison Co. of NY Inc. entitled "ELECTRIC LOW TENSION MAINS AND SERVICE PLATES," consisting of sheets numbered 78-CR, CT, CU, CS to 85- CR, CT, CU, CS, CW, CX, inclusive. All of the information in such drawings constitutes technical data on which Contractor may rely

E. Copies of reports and drawings itemized in SC-4.02.C and SC 4.02.D that are not included with Bidding Documents may be examined at Town of North Castle Clerk's Office during regular business hours. These reports and drawings are not part of the Contract Documents, but the "technical data" contained therein upon which Contractor may rely as identified and established above are incorporated therein by reference. Contractor is not entitled to rely upon other information and data utilized by Engineer and Engineer's Consultants in the preparation of Drawings and Specifications.

SC-4.06 *Hazardous Environmental Condition at Site*

SC-4.06 Delete Paragraphs 4.06.A and 4.06.B in their entirety and insert the following:

A. No reports or drawings related to Hazardous Environmental Conditions at the Site are known to Owner.

ARTICLE 5 - BONDS AND INSURANCE

SC-5.04 *Contractor's Liability Insurance*

SC-5.04 Add the following new Paragraphs immediately after paragraph 5.04.B:

C. The limits of liability for the insurance required by Paragraph 5.04 of the General Conditions shall provide coverage for not less than the following amounts or greater where required by Laws and Regulations:

1. Workers' Compensation, and related coverages under paragraphs 5.04.A.1 and A.2 of the General Conditions:

a.	State:	Statutory
b.	Applicable Federal (e.g., Longshoreman's):	Statutory
c.	Employer's Liability:	$500,000

2. Contractor's General Liability under paragraphs 5.04.A.3 through A.6 of the General Conditions which shall include completed operations and product liability coverages and eliminate the exclusion with respect to property under the care, custody, and control of Contractor:

a.	General Aggregate:	$2,000,000
b.	Products - Completed Operations Aggregate:	$1,000,000
c.	Personal and Advertising Injury:	$1,000,000
d.	Each Occurrence (Bodily Injury and Property Damage):	$1,000,000

e. Property Damage liability insurance will provide Explosion, Collapse, and Underground coverages where applicable.

f. Excess or Umbrella Liability

1)	General Aggregate:	$3,000,000
2)	Each Occurrence:	$3,000,000

3. Automobile Liability under paragraph 5.04.A.6 of the General Conditions:

a.	Bodily Injury:	
	Each Person	$1,000,000
	Each Accident	$1,000,000

b. Property Damage:
Each Accident $1,000,000

c. Combined Single Limit of: $1,000,000

4. The Contractual Liability coverage required by paragraph 5.04.B.4 of the General Conditions shall provide coverage for not less than the following amounts:

a. Bodily Injury:
Each Accident $1,000,000
Annual Aggregate $2,000,000

b. Property Damage:
Each Accident $1,000,000
Annual Aggregate $2,000,000

SC-5.06 *Property Insurance*

SC-5.06 Delete Paragraph 5.06.B and replace with the following:

B. Contractor shall purchase and maintain equipment breakdown and any other additional property insurance required by Laws and Regulations, which insurance will include the interest of Owner, Contractor, Subcontractors, Engineer, and Engineer's Consultants listed herein as additional insureds, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as a loss payee.

ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES

SC-6.02 *Labor; Working Hours*

SC-6.02. Add the following new Paragraphs immediately after Paragraph 6.02.B:

C. Normal working hours are defined as 8:00 a.m. to 5:00 p.m., Monday through Friday, excluding holidays. The following are considered holidays during which work at the Site is not allowed:

- New Year's Day
- Memorial Day
- Independence Day
- Labor Day
- Thanksgiving
- Day after Thanksgiving
- Christmas

D. Should Contractor's working hours extend outside normal working hours, any and all costs for weekend, Holiday, and/or on Site overtime services of Engineer's personnel, including but not limited to direct salaries, fringe benefits, overhead and profit, administration and supervision, incurred by Owner, will be the sole obligation of Contractor. The overtime rates shall be $150 per hour for a representative of the Client

and $120 per hour for representative of Engineer. In addition, Contractor shall pay for all travel costs for the above parties to reach the Site on weekends, Holidays, and/or after hours work.

SC-6.05 *Substitutes and "Or Equals*"

SC-6.05. Add the following language at the end of the last sentence of Subparagraph 6.05.A:

After award of the Contract, no substitutes or "or-equals" may be submitted for items unless otherwise instructed by Owner.

SC-6.05 Add the following subparagraph immediately after Subparagraph 6.05.A.1.b:

c. Contractor provides a line-by-line comparison of the proposed product to the specified product. Line-by-line comparison shall not only include all specified features, but shall also include all other design and/or manufacturing differences between the proposed product and the specified product. Line-by-line comparison shall show no significant design or manufacturing differences that, in the Engineer's opinion, could result in lesser quality, performance, or reliability of the proposed product compared to the specified product.

SC-6.05.A.2. Add the following subparagraph immediately after Subparagraph 6.05.A.2.d of the General Conditions:

e. If the substitute item requires modifications to the structures, piping, layouts, etc., detailed on the Drawings or described in the Contract Documents, the application shall also include details of proposed modifications necessary to accommodate the substitute item. Such details shall include scaled layouts, dimensions, and other pertinent information to enable Engineer to evaluate the entire application. If the substitute item and proposed modifications are approved, Contractor, at no additional cost to Owner, shall do all work necessary to make such modifications and absorb all costs of any related changes imposed on other contractors. Final details of such modifications shall be prepared and submitted for approval by Contractor in accordance with Specification Section 01300, Submittals.

SC-6.05.A. Add the following paragraph immediately after Paragraph 6.05.A.2 of the General Conditions:

3. Time Constraints: All applications for use of substitutes or 'or equal' items shall be submitted to Engineer within 90 days of the Effective Date of the Agreement. No applications will be considered thereafter unless Contractor produces satisfactory evidence that the specified item is no longer manufactured or is unavailable for the Project.

SC-6.05.C. Add the following subparagraph after Paragraph 6.05.C of the General Conditions:

1. In order to aid Engineer in determining the equality of a proposed 'or equal' or substitute item (when compared to the item actually specified), Contractor shall arrange for the performance of any tests requested by Engineer. The nature, extent, tester and supervisions of such tests including engineering costs, shall be borne by Contractor. Certified test results shall be mailed directly to Engineer for all tests requested.

SC-6.06 *Concerning Subcontractors, Suppliers, and Others*

SC-6.06 Add a new paragraph immediately after Paragraph 6.06.G:

H. Owner may furnish to any Subcontractor or Supplier, to the extent practical, information about amounts paid to Contractor on account of Work performed for Contractor by a particular Subcontractor or Supplier.

SC-6.08 *Permits*

SC-6.08.A. Add the following subparagraph to Paragraph 6.08.A of the General Conditions:

1. Owner shall obtain and pay for all permits in connection with this Project. Contractor is required to comply with all requirements of permits imposed upon Owner in the same manner required by Owner.

2. Contractor shall hire a third-party qualified professional to perform the Stormwater Pollution Prevention Plan inspections.

3. Contractor shall sign onto NYSDOT Highway Work Permit 32 for work associated with New York State Route 22 crossing.

SC-6.10 *Taxes*

SC-6.10 Add a new Paragraph immediately after Paragraph 6.10.A:

B. Owner is exempt from payment of sales and compensating use taxes of the State of New York and of cities and counties thereof on all materials to be incorporated into the Work.

1. Owner will furnish the required certificates of tax exemption to Contractor for use in the purchase of supplies and materials to be incorporated into the Work.

2. Owner's exemption does not apply to construction tools, machinery, equipment, or other property purchased by or leased by Contractor, or to supplies or materials not incorporated into the Work.

SC-6.12 *Record Documents*

SC-6.12 Add the following paragraph immediately after Paragraph 6.12.A:

B. If Owner utilizes any part of the Project in accordance with paragraph GC-14.05, Contractor shall provide Engineer for Owner's use, a complete set of record drawings current to the date of Owner's utilization.

SC-6.16 *Emergencies*

Add the following paragraph after Paragraph 6.16.A of the General Conditions:

B. Contractor shall designate one person to respond to emergencies and act on the Contractor's behalf during off-work hours at the Site. The person's name, address, and

telephone number shall be provided to Owner during the preconstruction conference and the designated person shall be on call during off-work hours. Response time shall not exceed one hour after notification is given by Owner and/or Engineer that an emergency exists at the Site.

SC-6.17 *Shop Drawings and Samples*

SC-6.17 Add the following new paragraphs immediately after Paragraph 6.17.E:

F. Furnish required submittals with sufficient information and accuracy in order to obtain required approval of an item with no more than three submittals. Engineer will record Engineer's time for reviewing subsequent submittals of Shop Drawings, Samples, or other items requiring approval Owner will deduct costs for such services from progress payments made to Contractor.

G. In the event that Contractor requests a change of a previously approved item, OWNER will deduct costs for Engineer's charges for its review time unless the need for such change is beyond the control of Contractor.

ARTICLE 7 - OTHER WORK

SC-7.02 *Coordination*

SC-7.02 Delete Paragraph 7.02.A in its entirety and replace with the following:

A. Owner does not anticipate letting other direct contracts for this project.

ARTICLE 8 - OWNER'S RESPONSIBILITIES

SC-8.09 *Limitations on Owner's Responsibilities*

Add the following paragraph immediately after Paragraph 8.09.A of the General Conditions:

B. Owner will let other direct Contracts and will have authority and responsibility for coordination of the various contractors. The extent of Owner's responsibilities under this arrangement are set forth in paragraph SC-7.02.A of the Supplementary Conditions.

ARTICLE 9 - ENGINEER'S STATUS DURING CONSTRUCTION

SC-9.03 *Project Representative*

SC-9.03 Add the following new paragraphs immediately after Paragraph 9.03.A:

B. The Resident Project Representative (RPR) will be Engineer's employee or agent at the Site, will act as directed by and under the supervision of Engineer, and will confer with Engineer regarding RPR's actions. RPR's dealings in matters pertaining to the Work in general shall be with Engineer and Contractor. RPR's dealings with Subcontractors shall be through or with the full knowledge and approval of Contractor. The RPR shall:

1. *Schedules:* Review the progress schedule, schedule of Shop Drawing and Sample submittals, and schedule of values prepared by Contractor and consult with Engineer concerning acceptability.

2. *Conferences and Meetings:* Attend meetings with Contractor, such as preconstruction conferences, progress meetings, job conferences and other project-related meetings, and prepare and circulate copies of minutes thereof.

3. *Liaison*:

    a. Serve as Engineer's liaison with Contractor, working principally through Contractor's authorized representative, assist in providing information regarding the intent of the Contract Documents.

    b. Assist Engineer in serving as Owner's liaison with Contractor when Contractor's operations affect Owner's on-Site operations.

    c. Assist in obtaining from Owner additional details or information, when required for proper execution of the Work.

4. *Interpretation of Contract Documents:* Report to Engineer when clarifications and interpretations of the Contract Documents are needed and transmit to Contractor clarifications and interpretations as issued by Engineer.

5. *Shop Drawings and Samples:*

    a. Record date of receipt of Samples and approved Shop Drawings.

    b. Receive Samples which are furnished at the Site by Contractor, and notify Engineer of availability of Samples for examination.

6. *Modifications:* Consider and evaluate Contractor's suggestions for modifications in Drawings or Specifications and report such suggestions, together with RPR's recommendations, to Engineer. Transmit to Contractor in writing decisions as issued by Engineer.

7. *Review of Work and Rejection of Defective Work*:

    a. Conduct on-Site observations of Contractor's work in progress to assist Engineer in determining if the Work is in general proceeding in accordance with the Contract Documents.

    b. Report to Engineer whenever RPR believes that any part of Contractor's work in progress will not produce a completed Project that conforms generally to the Contract Documents or will imperil the integrity of the design concept of the completed Project as a functioning whole as indicated in the Contract Documents, or has been damaged, or does not meet the requirements of any inspection, test or approval required to be made; and advise Engineer of that part of work in progress that RPR

believes should be corrected or rejected or should be uncovered for observation, or requires special testing, inspection or approval.

8. *Inspections, Tests, and System Startups:*

   a. Verify that tests, equipment, and systems start-ups and operating and maintenance training are conducted in the presence of appropriate Owner's personnel, and that Contractor maintains adequate records thereof.

   b. Observe, record, and report to Engineer appropriate details relative to the test procedures and systems start-ups.

9. *Records:*

   a. Record names, addresses, fax numbers, e-mail addresses, web site locations, and telephone numbers of all Contractors, Subcontractors, and major Suppliers of materials and equipment.

   b. Maintain records for use in preparing Project documentation.

10. *Reports:*

   a. Furnish to Engineer periodic reports as required of progress of the Work and of Contractor's compliance with the progress schedule and schedule of Shop Drawing and Sample submittals.

   b. Draft and recommend to Engineer proposed Change Orders, Work Change Directives, and Field Orders. Obtain backup material from Contractor.

   c. Immediately notify Engineer of the occurrence of any Site accidents, emergencies, acts of God endangering the Work, damage to property by fire or other causes, or the discovery of any Hazardous Environmental Condition.

11. *Payment Requests:* Review Applications for Payment with Contractor for compliance with the established procedure for their submission and forward with recommendations to Engineer, noting particularly the relationship of the payment requested to the schedule of values, Work completed, and materials and equipment delivered at the Site but not incorporated in the Work.

12. *Certificates, Operation and Maintenance Manuals:* During the course of the Work, verify that materials and equipment certificates, operation and maintenance manuals and other data required by the Specifications to be assembled and furnished by Contractor are applicable to the items actually installed and in accordance with the Contract Documents, and have these documents delivered to Engineer for review and forwarding to Owner prior to payment for that part of the Work.

13. *Completion*:

a. Participate in a Substantial Completion inspection, assist in the determination of Substantial Completion and the preparation of lists of items to be completed or corrected.

b. Participate in a final inspection in the company of Engineer, Owner, and Contractor and prepare a final list of items to be completed and deficiencies to be remedied.

c. Observe whether all items on the final list have been completed or corrected and make recommendations to Engineer concerning acceptance and issuance of the Notice of Acceptability of the Work.

C. The RPR shall not:

1. Authorize any deviation from the Contract Documents or substitution of materials or equipment (including “or-equal” items).

2. Exceed limitations of Engineer’s authority as set forth in the Contract Documents.

3. Undertake any of the responsibilities of Contractor, Subcontractors, Suppliers, or Contractor’s superintendent.

4. Advise on, issue directions relative to, or assume control over any aspect of the means, methods, techniques, sequences or procedures of Contractor’s work unless such advice or directions are specifically required by the Contract Documents.

5. Advise on, issue directions regarding, or assume control over safety practices, precautions, and programs in connection with the activities or operations of Owner or Contractor.

6. Participate in specialized field or laboratory tests or inspections conducted off-site by others except as specifically authorized by Engineer.

7. Accept Shop Drawing or Sample submittals from anyone other than Contractor.

8. Authorize Owner to occupy the Project in whole or in part.

ARTICLE 10 - CHANGES IN THE WORK; CLAIMS

(No Amendments to General Conditions.)

ARTICLE 11 - COST OF THE WORK; CASH ALLOWANCES; UNIT PRICE WORK

SC-11.01 *Cost of the Work*

SC-11.01.A.5.c. Delete Paragraph 11.01.A.5.c in its entirety and insert the following in its place:

c. Construction Equipment and Machinery - Costs for equipment and machinery owned by Contractor will be paid at a rate shown for such equipment in the cite the rate book appropriate for the Project. An hourly rate will be computed by dividing the monthly rates by 176. These computed rates will include all operating costs. Costs will include the time the equipment or machinery is in use on the changed Work and the costs of transportation, loading, unloading, assembly, dismantling, and removal when directly attributable to the changed Work. The cost of any such equipment or machinery, or parts thereof, shall cease to accrue when the use thereof is no longer necessary for the changed Work. Equipment or machinery with a value of less than $1,000 will be considered small tools.

SC-11.01.D. Add the following to the end of Paragraph 11.01.D of the General Conditions:

When requested by Engineer, Contractor shall identify sources used to determine rental rates of equipment and submit related evidence to Engineer to support such data.

SC-11.03 *Unit Price Work*

SC-11.03.D. Delete Paragraph 11.03.D in its entirety and insert the following in its place:

D. The unit price of an item of Unit Price Work shall be subject to re-evaluation and adjustment under the following conditions:

1. if the Bid price of a particular item of Unit Price Work amounts to 25 percent or more of the Contract Price and the variation in the quantity of that particular item of Unit Price Work performed by Contractor differs by more than 30 percent from the estimated quantity of such item indicated in the Agreement; and

2. if there is no corresponding adjustment with respect to any other item of Work; and

3. if Contractor believes that Contractor has incurred additional expense as a result thereof; or if Owner believes that the quantity variation entitles Owner to an adjustment in the unit price, either Owner or Contractor may make a Claim for an adjustment in the Contract Price in accordance with Article 10 if the parties are unable to agree as to the effect of any such variations in the quantity of Unit Price Work performed.

4. Adjusted unit prices, if any, shall be applied as follows:

a. Quantity Overruns: Applied only to the difference between the total quantity of completed Work and the calculated quantity of Work at the variation limit for a particular item of Unit Price Work.

b. Quantity Underruns: The difference between the adjusted unit price and the original unit price (stated in the Agreement) shall be applied to the total quantity of completed Work for a particular item of Unit Price Work.

ARTICLE 12 - CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES

SC-12.01 *Change of Contract Price*

SC-12.01.C *Contractor's Fee*. Delete the semicolon at the end of Subparagraph 12.01.C.2.c, and add the following language:

> , provided, however, that on any subcontracted work the total maximum fee to be paid by Owner under this subparagraph shall be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the work;

ARTICLE 13 - TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

(No Amendments to General Conditions.)

ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION

SC-14.01 *Schedule of Values*

SC-14.01.A. Replace the phrase "form of Application for Payment acceptable to Engineer" in the first sentence with the phrase "form of Application for Payment furnished by Engineer."

SC-14.02.A. Add the following to the end of Subparagraph 14.02.A.1 of the General Conditions:

> By signing the Application and Certificate for Payment, Contractor certifies that all items, units, quantities, and prices of Work and material in the estimate are correct, that all claimed Work has been performed and materials supplied in full accordance with the Contract, and that Contractor has no claims for damages, losses or expense against Owner for compensation in addition to that provided for in the application except such claims for change of Contract Price as Contractor has filed with Engineer and Owner in writing (in accordance with Article 10) prior to the date of his certifying the application.

SC-14.02.B. Add the following subparagraph after subparagraph 14.02.B.5.d of the General Conditions:

> e. or because of Contractor's failure to submit certifications, affidavits, schedules, or other written information when and as required in the Contract Documents, or Contractor's failure to make submittals in accordance with the Schedule of Submittals.

SC-14.02.C. *Payment Becomes Due*

SC-14.02.C.1. In Subparagraph 14.02.C.1, replace "Ten days," with "30 days."

SC-14.07 *Final Payment*

SC-14.07.A. Add the following subparagraph immediately after Paragraph 14.07.A.3:

> 4. The application shall be made on forms provided by Engineer. By signing the application and certificate for payment, Contractor certifies that the total cost of the Work and the amount due Contractor for payment is full compensation for all Work done under the

terms of the Contract in its original form; that the payment is full compensation for all Work ordered to be done under Change Orders; and that the payment is full compensation for all other Work done by Contractor and for all damages, losses, and expense incurred by Contractor for doing and furnishing everything relating to or arising out of the Work, and that Contractor waives all right to claim or receive any further compensation in addition to that provided for in the final payment except as provided in paragraph 14.09.

ARTICLE 15 - SUSPENSION OF WORK AND TERMINATION

(No Amendments to General Conditions.)

ARTICLE 16 - DISPUTE RESOLUTION

SC-16.01 *Methods and Procedures*

SC-16.01 Delete Paragraph 16.01.C in its entirety and insert the following in its place:

C. If the Claim is not resolved by mediation, Engineer's action under Paragraph 10.05.C or a denial pursuant to Paragraphs 10.05.C.3 or 10.05.D shall become final and binding 30 days after termination of the mediation unless, within that time period, Owner or Contractor:

1. elects in writing to demand arbitration of the Claim, pursuant to Paragraph SC-16.02; or

2. agrees with the other party to submit the Claim to another dispute resolution process.

ARTICLE 17 - MISCELLANEOUS

Add the following new paragraphs immediately after Paragraph 17.06:

SC-17.07 *Labor and Legal Requirements*

A. Contractor shall abide by all regulations and laws that relate to labor that may affect the Work of this Contract, including Federal, State, County, Town, City, and Village regulations.

B. The latest Prevailing Wage Rate Schedules setting forth minimum wages and supplements for this area of the state, together with labor standard provisions and non-discrimination in employment provisions are appended to the Agreement.

C. The Contractor shall make provision for the disability benefits, unemployment insurance and social security required by law.

D. The Contractor shall keep himself fully informed of all laws of the State (in which the Project is located) and of the United States of America, and of all municipal laws and ordinances in any manner affecting the Work of this Contract, and of all orders or decrees of any body or tribunal having any jurisdiction or authority in any manner affecting such

Work, and shall be responsible for strict compliance therewith. If any clause of this Contract does not conform to any such law, such clause shall be void insofar as it conflicts with such law, and such law shall be operative in lieu thereof.

E. Each and every provision of law and clause required by law to be inserted in this Contract should be, is and is deemed to be inserted herein, and if through a mistake or otherwise any such provision is not inserted, or it is not correctly inserted, then upon the application of either party the Contract shall forthwith be amended physically to make such insertion.

F. If any provision herein shall be as to destroy the mutuality of this Contract or to render it invalid or illegal, then if such provision shall not appear to have been so material that without it the Contract would not have been made by the parties, it shall not be deemed to form part thereof but the balance of the Contract shall remain in full force and effect.

SECTION 01010

SUMMARY OF WORK

PART 1 GENERAL

1.01. SECTION INCLUDES

A. Project Work covered by Contract Documents.

B. Contractor's use of site and premises.

C. Limits of Work area.

D. Construction permits and easements.

E. Owner occupancy.

F. Work sequence and milestone dates

G. Connections to existing facilities.

1.02. PROJECT – WORK COVERED BY CONTRACT DOCUMENTS

A. Work covered by the Contract Documents is described in the Agreement.

B. Work not specifically identified in the Bid Item Descriptions, but nevertheless required in the Contract Documents, shall be performed as shown and/or specified.

1.03. CONTRACTS

A. Perform Work of each Prime Contract under separate lump sum and unit price contracts with the Owner.

B. Work of each separate Contract is identified in the following Articles in the Contract Documents.

1.04. CONTRACTOR USE OF SITE AND PREMISES

A. Limit use of Site to allow:

1. Owner occupancy.

2. Work by Owner.

1.05. LIMITS OF WORK AREA

A. Confine construction operations within the area shown on the Drawings.

B. Storage of equipment and materials, or erection and use of sheds outside of the Contract Limits, if such areas are the property of Owner, shall be used only with Owner's approval. Such storage or temporary structures, even within the Contract Limits, shall be confined to Owner's property and shall not be placed on properties designated as easements or rights-of-way.

1.06. CONSTRUCTION PERMITS

A. Owner will obtain and pay for necessary construction permits from those authorities or agencies having jurisdiction over land areas, utilities, or structures which are located within the contract limits and which will be occupied, encountered, used, or temporarily interrupted by Contractor's operations.

B. When construction permits are accompanied by regulations or requirements issued by a particular authority or agency, it shall be Contractor's responsibility to familiarize himself and comply with such regulations or requirements as they apply to his operations on this project. Any costs associated with additional field supervision by authorities or agencies shall be the Contractor's responsibility.

C. Contractor shall acquire and pay for all New York State Department of Transportation (NYSDOT) permits.

1.07. OWNER OCCUPANCY

A. The Owner will occupy the premises during the entire period of construction for the conduct of normal operations.

B. Cooperate with Owner to minimize conflict, and to facilitate Owner's operations.

C. Schedule the Work to accommodate Owner occupancy.

1.08. OPERATION OF EXISTING FACILITIES

A. Normal operations of the existing facilities will be performed by Owner. Only Owner's staff is allowed to operate existing facilities including equipment, valves, gates, motor controls, etc.

1. Provide Owner and Engineer a minimum of five working days written notice of necessary operation of existing valves, pumps, or equipment to facilitate construction activities.

2. Contractor's activities shall not disrupt Owner's access to operate and maintain existing equipment and facilities. Contractor shall furnish any temporary access required, including ladders, which shall comply with OSHA laws and regulations, for necessary operations.

3. Contractor's operations shall not disrupt truck access for the delivery or hauling of materials and suppliers to and from the Site.

4. Existing isolation valves shown on Drawings or identified in the field shall not be relied upon to be operable. Contractor is responsible for isolating lines where necessary or where called for by Engineer.

1.09. CONNECTIONS TO EXISTING FACILITIES

A. Contractor shall provide all cutting and patching required for connection to existing facilities.

B. Temporary connections to existing facilities are covered in Section 01500, Temporary Facilities.

1.10. WORK SEQUENCE AND MILESTONE DATES

A. Construct work in sequence to accommodate the Owner's paving schedule during the construction phase. Water mains in three roadways shall be installed first as identified in the following schedule. Once the three roadways' water mains have been installed, pressure tested, and disinfected; all services have been transferred to the new main and are put back into service; and existing main has been abandoned in place and the roadway has been restricted, the Contractor shall proceed with the remaining portion of the project. A suggested order of work is as follows:

Road	From Station	To Station	Notes
Evergreen Row	Tank	0+00 / 54+30	To completed first
North Lake Road	0+00	24+00	Also included 13+00 - 36+60 on C007 and C008
Pond Lake	0+00	23+42	Dry tap connection at 8-inch CIP along Long Pond Road
Oak Ridge	0+00	4+81	
North Lane	0+00	13+00	
North Ridge	0+00	4+50	
Fox Ridge Road	0+00	24+00	
Fox Ridge Court	0+00	4+55	
Elm Place	0+00	6+24	
Dogwood Drive	0+00	5+83	
Long Pond Road	25+00	32+50	Use dry tap from Pond Lane
Upland Lane	2+00	5+00	Existing water main needs to be located
Maple Way	0+00	18+00	
Windmill Road	0+00	4+75	
Spruce	0+00	4+68	
Spruce Hill Road	0+00	18+40	
Long Pond Road	32+00	51+64	Tie into existing water supply
Long Pond Road	0+00	25+00	
Mill Lane	0+00	5+04	Tie into stub at Pond Lane
Windmill Road	10+25	25+00	
Windmill Road	4+75	10+25	In same trench as existing water main
Upland Lane	9+00	25+05	Connect to proposed stub at North Lane
Hardscrabble Circle	0+00	15+95	
Upland Lane	5+00	9+00	Installed in existing pipe trench
Thornwood	0+00	34+10	Tie into Fox Ridge Road
Windmill Road	25+00	55+00	
Windmill Road	55+00	85+52	
Service easement	0+00	4+25	6-inch DIP
Long Pond Court	0+00	4+90	6-inch DIP
Windmill Place	0+00	22+23	

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

SECTION 01019

CONTRACT CONSIDERATIONS

PART 1 GENERAL

1.01. SECTION INCLUDES

A. Cash allowances.

B. Schedule of Values.

C. Application for Payment.

D. Change procedures.

E. Alternates.

1.02. DEFINITIONS

A. Mobilization - Mobilization includes, but is not limited to, performance of preparatory construction operations, including the movement of personnel and equipment to the Project Site; application, fee payment, and acquisition of all required permits (i.e. erosion and sediment control plans, temporary and permanent building and trade permits, utility connections, etc.); and the establishment of Engineer's and Contractor's offices, buildings, and other facilities required at the Site in order to begin work on a substantial phase of the Contract. The cost of insurance and bonds.

1.03. CASH ALLOWANCES

A. Engineer Responsibilities

1. Consult with Contractor for consideration and selection of products.

2. Select products in consultation with Owner and transmit decision to Contractor.

B. Contractor Responsibilities

1. Assist Owner and/or Engineer in acquiring NYSDOT permits.

2. Submit proposal on cost to furnish and install all materials, labor, and tools required for cash allowance description.

3. Submit receipts and documentation substantiating costs with Application for Payment.

4. Differences between allowance amount and actual costs will be adjusted by change order prior to final payment.

C. Cash Allowance Schedule

1. New York State Route 22 Crossing ($100,000) - Under this cash allowance, the Contractor shall provide all materials, labor, and tools to furnish and install Class 56, 12-inch ductile iron pipe with casing pipe under New York State Route 22.

2. Town of North Castle Assistance ($10,000) - Under this cash allowance, when the Contractor requires assistance from the Owner with the operation of the existing and proposed system, the Town's personnel shall be paid for under this allowance. The Town will submit an invoice to the Contractor for these services on a monthly basis. The Contractor shall submit the copy of the paid monthly invoice with the monthly Payment Application for reimbursement from the allowance.

1.04. SCHEDULE OF VALUES

A. Submit three hard copies of Schedule of Values and one electronic copy in Microsoft Excel of Schedule of Values in accordance with the time frames identified in General and Supplemental Conditions.

B. Line items shall be subdivided into the Bid Items shown on the Bid Form.

C. The sum of all line items in the Schedule of Values shall equal the Total Bid Price included on the Bid Form.

D. Each line item shall include a directly proportional amount of the Contractor's overhead and profit.

E. Schedule of Values shall serve as a breakdown Work used to establish progress payments. Progress payments for lump sum items will be made based on the percentages of completion of the work items included in the Schedule of Values for each lump sum item. Progress payments for Unit Price Work will be based on actual quantities of work performed. Progress payments for Contingent Unit Price work will only be made if work is authorized by Owner and/Engineer. Progress payments for Allowances will be made as described elsewhere in the Contract Documents.

F. For Lump Sum Bid Items, the following Format shall be followed when developing the Schedule of Values.

1. If Mobilization is not identified in the Bid Form as a separate Bid Item, Contractor may include in the Schedule of Values a line item for Mobilization as part of a Lump Sum Bid Item.

a. Lump sum line item shall include all work described in the definition of mobilization included herein.

b. Costs for bonds and insurance shall be included in the lump sum mobilization line item.

c. When Contractor has made utility connections, installed Contractor's field offices, Owner's and/or Engineer's field offices, and all other facilities required to begin work on a substantial portion of the Project, a payment of 50 percent of the lump sum mobilization Bid item will be made provided Contractor has already satisfied the requirements of General Condition Article GC-2.07. The remaining 50 percent will be prorated over the next five monthly progress payments.

d. Mobilization cost shall not be greater than 5 percent of the Total Bid Price.

2. Included separate line items for demobilization and contract closeout.

3. Site work shall be subdivided into itemized quantities and unit costs for all individual construction components. Items shall be separated according to specification section titles listed in the Table of Contents.

   a. Sitework shall not include earthwork (such as excavation) or structural work (such as foundations) specific to a particular structure or process.

   b. Include erosion and sediment control under sitework.

   c. Include bypass pumping under sitework and include daily, weekly, or monthly unit costs for providing and operating the bypass pumping system(s).

   d. Include dewatering under sitework and include daily costs for each structure.

   e. Include off-site hauling of fill material under sitework.

   f. Include site restoration.

   g. Include piping.

      1) Piping and ductbanks shall be subdivided into itemized quantities and unit costs for individual components.

      2) Identify major piping by pipe diameter and material as individual line items (i.e. 12-inch ductile iron pipe).

      3) Piping costs shall be stated as cost per unit length, based on the number of linear feet for each piping system estimated by Contractor.

      4) Piping installation costs may include labor, excavation, bedding, encasement, and/or backfill if desired.

   h. Include valves and hydrants based on valve type and size.

4. Revise Schedule of Values to include executed Change Orders with each Application for Payment. List each Proposed Change Order (PCO) that is incorporated into executed Change Orders.

1.05. APPLICATIONS FOR PAYMENT

A. Submit three original signature versions of each application on forms furnished by Engineer.

B. Contractor must have all record documents as identified in General Conditions Article 6.12 current and up to date prior to submitting Applications for Payment.

1.06. CHANGE PROCEDURES

A. Supplementing the General Conditions and Supplementary Conditions, Engineer may issue a Proposal Request or Notice of Change which includes a detailed description of a proposed change with supplementary or revised drawings and specifications, a change in Contract Time for executing the change and the period of time during which the requested price will be considered valid. Contractor shall prepare and submit a proposal to perform the indicated work indicating a proposed adjustment in Contract Price and Contract Times within 10 days.

B. Contractor may propose changes by submitting a request for change to Engineer, describing the proposed change and its full effect on the Work. Include a statement describing the reason for the change, and the effect on the Contract Price and Contract Time with full documentation and a statement describing the effect on Work by separate or other contractors.

C. Execution of Change Orders - Engineer will issue Change Orders for signatures of parties in the following order: Engineer, Contractor, Owner.

1.07. ALTERNATES

A. Bid alternates identified on the Bid Form will be reviewed and accepted or rejected at the Owner's discretion prior to execution of the Agreement. Accepted Additive and Deductive Alternates will be identified in the Agreement. Accepted Additive Alternates will be included in the Work and accepted deductive alternatives will not be included in the Work.

1.08. STANDARD FORMS

A. Use EJCDC Change Order Form No. C-941, attached to this section.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

SECTION 01025

UNIT PRICE ITEMS
(BID ITEM DESCRIPTIONS)

PART 1 GENERAL

1.01. SECTION INCLUDES

A. Price make-up.

B. Elements of Bid Item Description page.

C. List of unit price items.

D. Bid Item Descriptions - Attached pages.

1.02. PRICE MAKE-UP

A. Unit prices bid by Contractor are deemed to be full compensation for all required labor, products, tools, equipment, plant, transportation, testing, inspection, services, incidentals, administrative, procedures, applicable taxes, permit fees, overhead, profit, and other miscellaneous expenses.

1.03. ELEMENTS OF BID ITEM DESCRIPTION PAGE

A. Identification of unit price item, as set forth in the Bid Form.

B. Brief statement of work involved in the item.

C. Listing of components of work which make-up the item including reference to the Specification section(s) covering each component.

D. Cross-references to associated work not included in the item.

E. Criteria to be applied in measuring number of completed units, for payment purposes.

F. Limitations, if any, imposed on the measurement of completed units, for payment purposes.

1.04. LIST OF UNIT PRICE ITEMS - CONTRACT NO. 1

Bid Item No.	Bid Item Description
B-1	Exploratory Excavation
B-2	Excavation Below Subgrade (Additional Trench Excavation)
B-3	Rock Removal
B-4	6-Inch Ductile Iron Water Main and Fittings, In Place
B-5	8-Inch Ductile Iron Water Main and Fittings, In Place
B-6	12-Inch Ductile Iron Water Main and Fittings, In Place
B-7	Hydrant Assembly, Complete

Bid Item No.	Bid Item Description
B-8	6-Inch Gate Valve, In Place
B-9	8-Inch Gate Valve, In Place
B-10	12-Inch Gate Valve, In Place
B-11	Copper Water Service Connections, Near Side
B-12	Copper Water Service Connections, Far Side
B-13	1-Inch Corporation Stop, Curb Box, Curb Stop, and Covers
B-14	Additional Compact Ductile Iron Fittings, In Place
B-15	Select Backfill Materials, NYSDOT Course 304, Type 4 (Pipe Trench Special Backfill)
B-16	Temporary Pavement Replacement
B-17	Abandonment of Existing Water Services
B-18	Permanent Pavement Replacement
B-19	Asphalt Curb Replacement
B-20	Concrete Curb Replacement
B-21	Abandonment of Existing Valves
B-22	Existing Hydrant Removal
B-23	Anti-Seep Collars
B-24	Asphalt Driveway Restoration
B-25	Concrete Driveway Replacement
B-26	Concrete Encasement
B-27	Pipe Abandonment/Removal
B-28	Temporary Water Service
B-29	Sample Stations
B-30	Meter Pits
B-31	Final Cleanup and Site Restoration
B-32	Pavement Milling/Demolition

1.05. BID ITEM DESCRIPTIONS

A. Bid Item Description pages are attached at the end of this section.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

UNIT PRICE ITEM BID ITEM B-1

EXPLORATORY EXCAVATION

A. DESCRIPTION

Under this Item, the Contractor shall perform exploratory excavations where shown on the Contract Drawings or where ordered by the Engineer to determine the location and elevation of existing utilities.

B. WORK INCLUDED UNDER THIS ITEM

General Requirements (Sections 01010 through 01700)
Pavement Cuts (Section 02112)
Removal of Water (Section 02141)
Sheeting and Bracing (Section 02161)
Trenching (Section 02225)
Compaction (Section 02228)
Temporary Paving (Section 02507)
Site Rehabilitation (Section 02980)

C. ASSOCIATED WORK NOT INCLUDED UNDER THIS ITEM

Excavation Below Subgrade (Bid Item B-2)
Pavement Replacement (Bid Items B-16 and B-18)
Select Backfill Material: NYSDOT Course 304, Type 4 (Bid Item B-15)

D. METHOD OF PAYMENT

Payment for this Item will be made on a unit price per cubic yard basis.

E. MEASUREMENT AND LIMITS

The quantity for which payment will be made shall be the total number of cubic yards of excavation ordered by the Engineer and as measured (depth, length, width) in place by the Engineer.

UNIT PRICE ITEM BID ITEM B-2

EXCAVATION BELOW SUBGRADE (ADDITIONAL TRENCH EXCAVATION)

A. DESCRIPTION

Under this Item, the Contractor shall, as a result of moderately unstable or unstable foundation conditions, excavate below the bottom of subgrade of the trench or below the bottom of the structure.

B. WORK INCLUDED UNDER THIS ITEM

Trenching (Section 02225)
Sheeting and Bracing (Section 02161)
Removal of Water (Section 02141)

C. ASSOCIATED WORK NOT INCLUDED UNDER THIS ITEM

Trenching for Normal Bedding Conditions (Applicable Bid Items)
Select Backfill (Bid Item B-15)
Rock Removal (Bid Item B-3)

D. METHOD OF PAYMENT

Payment for this Item will be made on a unit price per cubic yard basis.

E. MEASUREMENT AND LIMITS

The quantity for which payment will be made shall be the total cubic yards of unsuitable material excavated from pipe trenches as measured (depth and length) in its undisturbed state and within the limits shown on the Contract Drawings and as accepted by the Engineer.

UNIT PRICE ITEM

BID ITEM B-3

ROCK REMOVAL

A. DESCRIPTION

Under this Item, the Contractor shall furnish all labor, materials, and equipment necessary to excavate rock shown and described in the Contract Documents

B. WORK INCLUDED UNDER THIS ITEM

General Requirements (Sections 01010 through 01700)
Rock Removal (Section 02226)

C. ASSOCIATED WORK NOT INCLUDED UNDER THIS ITEM

All Other Bid Items

D. METHOD OF PAYMENT

Payment for this Item will be made on a unit price per cubic yard basis.

E. MEASUREMENT AND LIMITS

The quantity for which payment will be made shall be the actual cubic yardage of rock excavated as measured by the Engineer (depth, width, and length) in its undisturbed state and within the limits shown on the Contract Drawings.

UNIT PRICE ITEM BID ITEM B-4

6-INCH DUCTILE IRON WATER MAIN AND FITTINGS, IN PLACE

A. DESCRIPTION

Under this Item, the Contractor shall provide all labor, materials, and equipment necessary to excavate for, furnish, install, pressure test, disinfect, 6-inch diameter ductile iron water main and fittings, with normal pipe bedding, backfill, and compaction as shown on the Contract Drawings and as specified herein.

B. WORK INCLUDED UNDER THIS ITEM

General Requirements (Sections 01010 through 01700)
Pavement Cutting (Section 02112)
Trenching (Section 02225)
Compaction (Section 02228)
Sheeting and Bracing (Section 02161)
Furnish and Install 6-Inch Ductile Iron Water Main and Fittings (Section 02661)
Pressure Testing of Water Distribution Systems (Section 02674)
Disinfection of Water Distribution Systems (Section 02675)
Protection of Existing Facilities (Section 02205)
Thrust Blocks (Sections 03001 and 02661 and Contract Drawings)

C. ASSOCIATED WORK NOT INCLUDED UNDER THIS ITEM

Work Required Under Other Bid Items
Additional Fittings, in Place (Bid Item B-14)
Hydrant Assembly, Complete (Bid Item B-7)
Pavement (Bid Items B-16 and B-18)
Select Backfill Material: NYSDOT Course 304, Type 4 (Bid Item B-15)
6-Inch Gate Valves (Bid Item B-8)
Excavation Below Subgrade (Bid Item B-2)
Rock Removal (Bid Item B-3)

D. METHOD OF PAYMENT

Payment for this Item will be made on a unit price per linear foot basis and in accordance with the Contractor's unit price bid.

E. MEASUREMENT AND LIMITS

The quantity for which payment will be made shall be the total linear footage of 6-inch diameter water main and fittings installed complete as specified as measured along the centerline of the installed pipe.

UNIT PRICE ITEM BID ITEM B-5

8-INCH DUCTILE IRON WATER MAIN AND FITTINGS, IN PLACE

A. DESCRIPTION

Under this Item, the Contractor shall provide all labor, materials, and equipment necessary to excavate for , furnish, install and test 8-inch diameter ductile iron water main and fittings, with normal pipe bedding, backfill, and compaction as shown on the Contract Drawings and as specified herein.

B. WORK INCLUDED UNDER THIS ITEM

General Requirements (Sections 01010 through 01700)
Pavement Cutting (Section 02112)
Trenching (Section 02225)
Compaction (Section 02228)
Sheeting and Bracing (Section 02161)
Removal of Water (Section 02141)
Furnish and Install 8-Inch Ductile Iron Water Main and Fittings (Section 02661)
Pressure Testing of Water Distribution Systems (Section 02674)
Disinfection of Water Distribution Systems (Section 02675)
Protection of Existing Facilities (Section 02205)
Thrust Blocks (Sections 03001 and 02661 and Contract Drawings)

C. ASSOCIATED WORK NOT INCLUDED UNDER THIS ITEM

Work Required Under Other Bid Items
Additional Fittings, in Place (Bid Item B-14)
Hydrant Assembly, Complete (Bid Item B-7)
Pavement (Bid Items B-16 and B-18)
Select Backfill Material: NYSDOT Course 304, Type 4 (Bid Item B-15)
8-Inch Gate Valves (Bid Item B-9)
Excavation Below Subgrade (Bid Item B-2)
Rock Removal (Bid Item B-3)

D. METHOD OF PAYMENT

Payment for this Item will be made on a unit price per linear foot basis and in accordance with the Contractor's unit price bid.

E. MEASUREMENT AND LIMITS

The quantity for which payment will be made shall be the total linear footage of 8-inch diameter water main and fittings installed complete as specified as measured along the centerline of the installed pipe.

UNIT PRICE ITEM BID ITEM B-6

12-INCH DUCTILE IRON WATER MAIN AND FITTINGS, IN PLACE

A. DESCRIPTION

Under this Item, the Contractor shall provide all labor, materials, and equipment necessary to excavate for, furnish, install and test 12-inch diameter ductile iron water main and fittings, with normal pipe bedding, backfill, and compaction as shown on the Contract Drawings and as specified herein.

B. WORK INCLUDED UNDER THIS ITEM

General Requirements (Sections 01010 through 01700)
Pavement Cutting (Section 02112)
Trenching (Section 02225)
Compaction (Section 02228)
Sheeting and Bracing (Section 02161)
Removal of Water (Section 02141)
Furnish and Install 12-Inch Ductile Iron Water Main and Fittings (Section 02661)
Pressure Testing of Water Distribution Systems (Section 02674)
Disinfection of Water Distribution Systems (Section 02675)
Protection of Existing Facilities (Section 02205)
Thrust Blocks (Sections 03001 and 02661 and Contract Drawings)

C. ASSOCIATED WORK NOT INCLUDED UNDER THIS ITEM

Work Required Under Other Bid Items
Additional Fittings, in Place (Bid Item B-14)
Hydrant Assembly, Complete (Bid Item B-7)
Select Backfill Material: NYSDOT Course 304, Type 4 (Bid Item B-15)
Pavement Restoration (Bid Items B-16 and B-18)
12-Inch Gate Valves (Bid Item B-10)
Final Cleanup and Site Restoration (Bid Item A-2)
Excavation Below Subgrade (Bid Item B-2)
Rock Removal (Bid Item B-3)

D. METHOD OF PAYMENT

Payment for this Item will be made on a unit price per linear foot basis and in accordance with the Contractor's unit price bid.

E. MEASUREMENT AND LIMITS

The quantity for which payment will be made shall be the total linear footage of 12-inch diameter water main and fittings installed complete as specified as measured along the centerline of the installed pipe.

UNIT PRICE ITEM BID ITEM B-7

HYDRANT ASSEMBLY, COMPLETE

A. DESCRIPTION

Under this Item, the Contractor shall provide all labor, materials, and equipment necessary to furnish and install a hydrant, 6-inch gate valve, valve box and cover, 6-inch pipe lateral, and required fittings necessary for a complete hydrant installation at the locations shown on the Contract Drawings and as specified herein.

B. WORK INCLUDED UNDER THIS ITEM

General Requirements (Sections 01010 through 01700)
Furnish, Install and Test Fire Hydrant Assembly (Section 02662)
Removal of Water (Section 02141)
Trenching (Section 02225)
Compaction (Section 02228)
Pressure Testing of Water Distribution Systems (Section 02674)
Disinfection of Water Distribution Systems (Section 02675)
Painting (Section 02662)
Concrete Thrust Blocks (Section 03001)

C. ASSOCIATED WORK NOT INCLUDED UNDER THIS ITEM

6-, 8- and 12-Inch Ductile Iron Water Main and Fittings, in Place (Bid Items B-8, B-9, and B-10)
Pavement Replacement (Bid Items B-18 and B-19)
Final Cleanup and Site Restoration (Bid Item A-2)

D. METHOD OF PAYMENT

Payment for this Item will be made on a unit price basis for the number of units (hydrant assemblies) installed, complete as specified and in accordance with the Contractor's unit price bid.

E. MEASUREMENT AND LIMITS

The quantity for which payment will be made shall be the total number of installed units. One unit (hydrant assembly) shall consist of a hydrant, valve, valve box and cover, 6-inch pipe lateral, fittings, necessary restraints and couplings.

UNIT PRICE ITEM BID ITEM B-8

6-INCH GATE VALVE, IN PLACE

A. DESCRIPTION

Under this Item, the Contractor shall provide all labor, materials, and equipment necessary to furnish, install and test 6-inch gate valve, including valve boxes and cover, thrust block, and anchoring as shown on the Contract Drawings and as specified herein.

B. WORK INCLUDED UNDER THIS ITEM

General Requirements (Sections 01010 through 01700)
Furnish and Install 6-Inch Gate Valve, Valve Box and Cover (Section 02662 and as Shown on the Contract Drawings)
Concrete (Section 03001)

C. ASSOCIATED WORK NOT INCLUDED UNDER THIS ITEM

6-Inch Ductile Iron Water Main and Fittings, In Place (Bid Item B-4)
Final Cleanup and Site Restoration (Bid Item A-2)
Hydrant Assembly (Bid Item B-7)

D. METHOD OF PAYMENT

Payment for this Item will be made on a unit price in accordance with the Contractor's unit price bid.

E. MEASUREMENT AND LIMITS

The quantity for which payment will be made shall be the total number of installed units, complete or specified. One unit shall constitute the new 6-inch gate valve, valve box, and cover with associated thrust block and anchoring.

UNIT PRICE ITEM BID ITEM B-9

8-INCH GATE VALVE, IN PLACE

A. DESCRIPTION

Under this Item, the Contractor shall provide all labor, materials, and equipment necessary to furnish, install and test 8-inch gate valve, including valve boxes and cover, thrust block, and anchoring as shown on the Contract Drawings and as specified herein.

B. WORK INCLUDED UNDER THIS ITEM

General Requirements (Sections 01010 through 01700)
Furnish and Install 8-Inch Gate Valve, Valve Box and Cover
(Section 02662 and as Shown on the Contract Drawings)
Concrete (Section 03001)

C. ASSOCIATED WORK NOT INCLUDED UNDER THIS ITEM

Work Required Under Other Bid Items
8-Inch Ductile Iron Water Main and Fittings, In Place (Bid Item B-5)
Final Cleanup and Site Restoration (Bid Item A-2)

D. METHOD OF PAYMENT

Payment for this Item will be made on a unit price in accordance with the Contractor's unit price bid.

E. MEASUREMENT AND LIMITS

The quantity for which payment will be made shall be the total number of installed units, complete or specified. One unit shall constitute the new 8-inch gate valve, valve box, and cover with associated thrust block and anchoring.

UNIT PRICE ITEM BID ITEM B-10

12-INCH GATE VALVE, IN PLACE

A. DESCRIPTION

Under this Item, the Contractor shall provide all labor, materials, and equipment necessary to furnish, install and test 12-inch gate valve, including valve boxes and cover, thrust block, and anchoring as shown on the Contract Drawings and as specified herein.

B. WORK INCLUDED UNDER THIS ITEM

General Requirements (Sections 01010 through 01700)
Furnish and Install 12-Inch Gate Valve, Valve Box and Cover (Section 02662 and as Shown on the Contract Drawings)
Concrete (Section 03001)

C. ASSOCIATED WORK NOT INCLUDED UNDER THIS ITEM

Work Required Under Other Bid Items
12-Inch Ductile Iron Water Main and Fittings, In Place (Bid Item B-6)
Final Cleanup and Site Restoration (Bid Item A-2)

D. METHOD OF PAYMENT

Payment for this Item will be made on a unit price in accordance with the Contractor's unit price bid.

E. MEASUREMENT AND LIMITS

The quantity for which payment will be made shall be the total number of installed units, complete or specified. One unit shall constitute the new 12-inch gate valve, valve box, and cover with associated thrust block and anchoring.

UNIT PRICE ITEM BID ITEM B-11

COPPER WATER SERVICE CONNECTIONS, NEAR-SIDE

A. DESCRIPTION

Under this Item, the Contractor shall provide all labor, materials, and equipment necessary to furnish and install a water service line from the water main to the curb stop, including any size adapters, and including crossing at the pavement area by open cut methods as shown on the Contract Drawings and as specified herein.

B. WORK INCLUDED UNDER THIS ITEM

General Requirements (Sections 01010 through 01700)
Construction Facilities and Temporary Controls (Section 01500)
Trenching (Section 02225)
Pavement Cutting (Section 02112)
Removal of Water (Section 02141)
Sheeting and Bracing (Section 02161)
Compaction (Section 02228)
Furnish and Install 1-Inch Type K Copper Tubing (Section 02661)

C. ASSOCIATED WORK NOT INCLUDED UNDER THIS ITEM

6-, 8- and 12-Inch Ductile Iron Water Main and Fittings, in Place (Bid Items B-4, B-5, and B-6)
Pavement Restoration (Bid Items B-16 and B-18)
Select Backfill Material: NYSDOT Course 304, Type 4 (Bid Item B-15)
Final Cleanup and Site Restoration (Bid Item A-2)
Rock Removal (Bid Item B-3)

D. METHOD OF PAYMENT

Payment for this Item will be made on a unit price per linear foot basis and in accordance with the Contractor's unit price bid.

E. MEASUREMENT AND LIMITS

The quantity for which payment will be made shall be the total linear footage of 1-inch copper tubing as measured along the centerline of the installed tubing, complete as specified, between the corporation stop and the curb stop.

UNIT PRICE ITEM BID ITEM B-12

COPPER WATER SERVICE CONNECTIONS, FAR-SIDE

A. DESCRIPTION

Under this Item, the Contractor shall provide all labor, materials, and equipment necessary to furnish and install a water service line from the water main to the curb stop, including at the crossing pavement area by boring or driving methods, as shown on the Contract Drawings and as specified herein.

B. WORK INCLUDED UNDER THIS ITEM

General Requirements (Sections 01010 through 01700)
Construction Facilities and Temporary Controls (Section 01500)
Trenching (Section 02225)
Pavement Cutting (Section 02112)
Removal of Water (Section 02141)
Sheeting and Bracing (Section 02161)
Compaction (Section 02228)
Furnish and Install 1-Inch Type K Copper Tubing (Section 02661)

C. ASSOCIATED WORK NOT INCLUDED UNDER THIS ITEM

6-, 8- and 12-Inch Ductile Iron Water Main and Fittings, in Place (Bid Items B-4, B-5, and B-6)
Pavement Restoration (Bid Items B-16 and B-18)
Select Backfill Material: NYSDOT Course 304, Type 4 (Bid Item B-15)
Final Cleanup and Site Restoration (Bid Item A-2)
Rock Removal (Bid Item B-3)

D. METHOD OF PAYMENT

Payment for this Item will be made on a unit price per linear foot basis and in accordance with the Contractor's unit price bid.

E. MEASUREMENT AND LIMITS

The quantity for which payment will be made shall be the total linear footage of 1-inch copper tubing as measured along the centerline of the installed tubing, complete as specified, between the corporation stop and the curb stop.

UNIT PRICE ITEM BID ITEM B-13

1-INCH CORPORATION STOP, CURB STOP, CURB BOX, AND COVERS

A. DESCRIPTION

Under this Item, the Contractor shall provide all labor, materials, and equipment necessary to furnish and install a 1-inch corporation stop, curb stop, curb box, and covers as shown on the Contract Drawings and as specified herein.

B. WORK INCLUDED UNDER THIS ITEM

General Requirements (Sections 01010 through 01700)
Furnish and Install Saddle and Corporation Stop (Section 02662)
Periodic Cleanup (Section 01500)
Removal of Water (Section 02141)
Trenching (Section 02225)
Compaction (Section 02228)

C. ASSOCIATED WORK NOT INCLUDED UNDER THIS ITEM

Final Cleanup and Site Restoration (Bid Item A-2)
Copper Water Service Connections (Bid Items B-11 and B-12)
Permanent Pavement Replacement (Bid Item B-18)
Select Backfill (Bid Item B-15)

D. METHOD OF PAYMENT

Payment for this Item will be made on a unit price per connection basis and in accordance with the Contractor's unit price bid.

E. MEASUREMENT AND LIMITS

The quantity for which payment will be made shall be the total number of installed units. One unit shall consist of a corporation stop, curb stop, curb box, covers, and connection to the water main.

UNIT PRICE ITEM BID ITEM B-14

ADDITIONAL COMPACT DUCTILE IRON FITTINGS, IN PLACE

A. DESCRIPTION

Under this Item, the Contractor shall provide all labor, materials, and Equipment necessary to furnish and install all additional compact ductile iron fittings as ordered by the Engineer and as specified herein.

B. WORK INCLUDED UNDER THIS ITEM

General Requirements (Sections 01010 through 01700)
Furnish and Install Ductile Iron Fittings, Mechanical Joint (Section 02661)
Additional Excavation and Backfill (Section 02225)
Concrete Thrust Block (Sections 03001 and 02661 and shop drawings)

C. ASSOCIATED WORK NOT INCLUDED UNDER THIS ITEM

6-, 8- and 12-Inch Ductile Iron Water Main and Fittings, in Place (Bid Items B-4, B-5, and B-6)
Hydrant Assembly (Bid Item B-7)
Pavement Restoration (Bid Items B-16 and B-18)
Final Cleanup and Site Restoration (Bid Item A-2)

D. METHOD OF PAYMENT

Payment for this Item will be made on a unit price basis for the weight in pounds of fittings installed complete as specified and in accordance with the Contractor's unit price bid.

E. MEASUREMENT AND LIMITS

The quantity for which payment will be made shall be determined by itemizing and adding the weight, in pounds, for all additional fittings installed complete as specified, as ordered by the Engineer. Weights shall be taken as the manufacturer's reported weights of the fittings exclusive of the weight of the joint accessories.

UNIT PRICE ITEM BID ITEM B-15

SELECT BACKFILL MATERIAL: NYSDOT COURSE 304, TYPE 4 (PIPE TRENCH SPECIAL BACKFILL)

A. DESCRIPTION

Under this Item, the Contractor shall furnish, place, and compact select backfill material, NYSDOT Course 304, Type 4, above the normal pipe foundation as shown on the Contract Drawings and where ordered by the Owner and as specified herein.

B. WORK INCLUDED UNDER THIS ITEM

Furnish, Install, and Compact NYSDOT Course 304, Type 4
Trenching (Section 02225)
Compaction (Section 02228)

C. ASSOCIATED WORK NOT INCLUDED UNDER THIS ITEM

Exploratory Excavation (Bid Item B-1)
Ductile Iron Water Main and Fittings (Bid Items B-4, B-5, and B-6)
Additional Fittings (Bid Item B-14)
Copper Water Services (Bid Items B-11 and B-12)
Valves (Bid Items B-8, B-9, and 10)
Final Cleanup and Site Restoration (Bid Item A-2)

D. METHOD OF PAYMENT

Payment for this Item will be made on a unit price per cubic yard basis.

E. MEASUREMENT AND LIMITS

The quantity for which payment will be made shall be the total cubic yards of NYSDOT Course 304, Type 4 material, furnished, placed, and compacted as measured (depth and length) in place within the limits as shown in the trench detail on the Contract Drawings. No payment will be made for on-site material which meets the requirements of NYSDOT Course 304, Type 4, and which is owned by the Owner.

UNIT PRICE ITEM BID ITEM B-16

TEMPORARY PAVEMENT REPLACEMENT

A. DESCRIPTION

Under this Item, Contractor shall furnish all labor, equipment, and materials necessary to install, complete temporary pavement replacement for the widths and length shown on the payment limits of the Contract Drawings and/or described in the Contract Documents.

B. WORK INCLUDED UNDER THIS ITEM

General Requirements (Sections 01010 through 01700)
Temporary Paving (Section 02507)

C. ASSOCIATED WORK NOT INCLUDED UNDER THIS ITEM

Select Backfill (Bid Item B-15)
Ductile Iron Water Main and Fittings (Bid Items B-4, B-5, and B-6)
Permanent Pavement Replacement (Bid Item B-18)

D. METHOD OF PAYMENT

Payment for this Item will be made on a unit price per square yard basis.

E. MEASUREMENT AND LIMITS

The quantity for which payment will be made shall be the total square yardage of temporary pavement, placed as shown on the Contract Drawings, as measured in place along the centerline of the waterline by the Engineer.

UNIT PRICE ITEM BID ITEM B-17

ABANDONMENT OF EXISTING WATER SERVICES

A. DESCRIPTION

This Item includes all costs associated with cutting and capping existing water services where shown on the Contract Drawings.

B. WORK INCLUDED UNDER THIS ITEM

Contract Considerations (Section 01019)
Submittals (Section 01300)
Material and Equipment (Section 01600)
Trenching (Section 02225)
Compaction (Section 02228)
Pavement Cutting (Section 02112)
Periodic Cleanup (Section 01500)

C. ASSOCIATED WORK NOT INCLUDED UNDER THIS ITEM

Work Required Under Other Bid Items
Pavement Replacement (Contract Drawings)

D. METHOD OF PAYMENT

Payment for this Item will be made on a unit price basis and in accordance with the Contractor's unit price bid.

E. MEASUREMENT AND LIMITS

The quantity for which payment will be made shall be the total number of units disconnected. Each unit shall consist of excavating for the existing service and shutting off corporation and disconnecting the existing service piping.

UNIT PRICE ITEM BID ITEM B-18

PERMANENT PAVEMENT REPLACEMENT

A. DESCRIPTION

Under this Item, Contractor shall furnish all labor, equipment, and materials necessary to install, complete, permanent pavement replacement for the widths and length shown on the payment limits on the Contract Drawings and/or described in the Contract Documents.

B. WORK INCLUDED UNDER THIS ITEM

General Requirements (Sections 01010 through 01700)
Trenching (Section 02225)
Dispose of Excavated Material (Section 01500)
Hot Mix Asphalt Paving (Section 02510)

C. ASSOCIATED WORK NOT INCLUDED UNDER THIS ITEM

Select Backfill Material (Bid Item B-15)
Temporary Pavement Replacement (Bid Item B-16)

D. METHOD OF PAYMENT

Payment for this Item will be made on a unit price per square yard basis.

E. MEASUREMENT AND LIMITS

The quantity for which payment will be made shall be the total square yardage of final pavement, placed as shown on the Contract Drawings, as measured in place along the centerline of the water main or service by the Engineer.

UNIT PRICE ITEM BID ITEM B-19

ASPHALT CURB REPLACEMENT

A. DESCRIPTION

Under this Item, Contractor shall furnish all labor, equipment, and materials necessary and perform all work to install and/or replace curb as shown or where directed by the Engineer.

B. WORK INCLUDED UNDER THIS ITEM

General Requirements (Sections 01010 through 01700)
Pavement Cuts (Section 02112)
Removal of Water (Section 02141)
Sheeting and Bracing (Section 02161)
Protection of Existing Facilities (Section 02205)
Compaction (Section 02228)
Hot Mix Asphalt Paving (Section 02510)
Site Rehabilitation (Section 02980)

C. ASSOCIATED WORK NOT INCLUDED UNDER THIS ITEM

Work Required Under Other Bid Items

D. METHOD OF PAYMENT

Payment for this Item will be made on a unit price per linear foot for asphalt curb, installed complete as specified as measured in place by the Engineer.

E. MEASUREMENT AND LIMITS

The quantity for which payment will be made shall be the total number of linear feet of asphalt curbing, installed complete as specified as measured in place by the Engineer.

UNIT PRICE ITEM BID ITEM B-20

CONCRETE CURB REPLACEMENT

A. DESCRIPTION

Under this Item, Contractor shall furnish all labor, equipment, and materials necessary and perform all work to install and/or replace curb as shown or where directed by the Engineer.

B. WORK INCLUDED UNDER THIS ITEM

General Requirements (Sections 01010 through 01700)
Pavement Cuts (Section 02112)
Removal of Water (Section 02141)
Sheeting and Bracing (Section 02161)
Protection of Existing Facilities (Section 02205)
Compaction (Section 02228)
Hot Mix Asphalt Paving (Section 02510)
Concrete Curbs (Section 02524)
Site Rehabilitation (Section 02980)

C. ASSOCIATED WORK NOT INCLUDED UNDER THIS ITEM

Work Required Under Other Bid Items

D. METHOD OF PAYMENT

Payment for this Item will be made on a unit price per linear foot for concrete curb, installed complete as specified as measured in place by the Engineer.

E. MEASUREMENT AND LIMITS

The quantity for which payment will be made shall be the total number of linear feet of curbing, installed complete as specified as measured in place by the Engineer.

UNIT PRICE ITEM BID ITEM B-21

ABANDONMENT OF EXISTING VALVES

A. DESCRIPTION

Under this Item, the Contractor shall provide all labor, equipment, and materials necessary to abandon all existing valve assemblies as shown and/or described in the Contract Documents.

B. WORK INCLUDED UNDER THIS ITEM

Pavement Cutting, Removal of Water, Sheeting and Bracing, Protection of Existing Facilities (Sections 02112, 02141, 02161, and 02205)
Trenching and Compaction (Sections 02225 and 02228)
Abandon, Remove, and Dispose of Existing Valves (Section 02030)
Furnish and Install Pipe Backfill Consisting of Subbase Course Material Above Pipe Bedding to Road Subbase (All Paved or Driveway Areas) (Section 02225 and Contract Drawings)
Concrete (Section 03001)
Contract Drawings

C. ASSOCIATED WORK NOT INCLUDED UNDER THIS ITEM

Work Required Under Other Bid Items

D. METHOD OF PAYMENT

Payment for this Item will be made on a unit price per each valve abandoned.

E. MEASUREMENT AND LIMITS

The quantity for which payment will be made shall be the total number of existing valves identified on the Contract Drawings.

UNIT PRICE ITEM BID ITEM B-22

EXISTING HYDRANT REMOVAL

A. DESCRIPTION

Under this Item, the Contractor shall provide all labor, equipment, and materials necessary to remove all existing hydrant assemblies as shown and/or described in the Contract Documents.

B. WORK INCLUDED UNDER THIS ITEM

Pavement Cutting, Removal of Water, Sheeting and Bracing, Protection of Existing Facilities (Sections 02112, 02141, 02161, and 02205)
Trenching and Compaction (Sections 02225 and 02228)
Demolish, Remove, and Dispose of Existing Hydrants (Section 02030)
Furnish and Install Pipe Backfill Consisting of Subbase Course Material Above Pipe Bedding to Road Subbase (All Paved or Driveway Areas) (Section 02225 and Contract Drawings)
Concrete (Section 03001)
Contract Drawings

C. ASSOCIATED WORK NOT INCLUDED UNDER THIS ITEM

Work Required Under Other Bid Items

D. METHOD OF PAYMENT

Payment for this Item will be made on a unit price per each hydrant for removal.

E. MEASUREMENT AND LIMITS

The quantity for which payment will be made shall be the total number of existing hydrants identified on the Contract Drawings.

UNIT PRICE ITEM

BID ITEM B-23

ANTI-SEEP COLLARS

A. DESCRIPTION

Under this Item, the Contractor shall furnish all labor, equipment, and materials necessary to install an anti-seep collar as indicated in the Contract Documents or as ordered by the Engineer.

B. WORK INCLUDED UNDER THIS ITEM

Furnish and Install Anti-Seep Collar
Additional Excavation for Keyways Into Sides of Trench

C. ASSOCIATED WORK NOT INCLUDED UNDER THIS ITEM

All Other Bid Items

D. METHOD OF PAYMENT

Payment for this Item shall be made on a unit price per each basis and in accordance with the Contractor's unit price bid.

E. MEASUREMENT AND LIMITS

The quantity for which payment shall be made shall be the total number of anti-seep collars installed, complete as specified.

UNIT PRICE ITEM BID ITEM B-24

ASPHALT DRIVEWAY RESTORATION

A. DESCRIPTION

Under this Item, Contractor shall furnish all labor, equipment, and materials necessary and perform all work to install and/or replace damaged sidewalk, curb, and driveway as shown or where directed by the Engineer.

B. WORK INCLUDED UNDER THIS ITEM

General Requirements (Sections 01010 through 01700)
Pavement Cuts (Section 02112)
Removal of Water (Section 02141)
Sheeting and Bracing (Section 02161)
Protection of Existing Facilities (Section 02205)
Compaction (Section 02228)
Hot Mix Asphalt Paving (Section 02510)
Concrete Curbs (Section 02524)
Site Rehabilitation (Section 02980)

C. ASSOCIATED WORK NOT INCLUDED UNDER THIS ITEM

Work Required Under Other Bid Items

D. METHOD OF PAYMENT

Payment for this Item will be made on a unit price per square yard basis and in accordance with the Contractor's unit price bid.

E. MEASUREMENT AND LIMITS

The quantity for which payment will be made shall be the total number of square yards of asphalt driveway installed complete as specified as measured in place by the Engineer within the payment limits shown on the Contract Drawings.

UNIT PRICE ITEM BID ITEM B-25

CONCRETE DRIVEWAY REPLACEMENT

A. DESCRIPTION

Under this Item, the Contractor shall furnish all labor, equipment, and materials necessary and perform all work to install and/or replace damaged driveway as shown on the Contract Drawings or where directed by the Engineer.

B. WORK INCLUDED UNDER THIS ITEM

Excavation, Trenching, Backfill and Compaction (Sections 02225 and 02228)
Lines and Grades (Contract Drawings)
Preparation of Subgrade (Contract Drawings)
Furnish, Install, and Compact 6 Inches of Subbase Course (Section 03001)
Furnish and Install Reinforcement (Section 03001)
Construction Joints (Section 03001)
Curing (Section 03001)
Adjust Any Existing Utility Appurtenances to Proper Grade
Concrete (Section 03001)

C. ASSOCIATED WORK NOT INCLUDED UNDER THIS ITEM

Final Cleanup and Site Restoration (Bid Item B-30)

D. METHOD OF PAYMENT

Payment for this Item shall be based on a unit price per cubic yard basis for driveways.

E. MEASUREMENT AND LIMITS

The quantity for which payment will be made shall be the total number of cubic yards of driveway installed complete as specified as measured in place by the Engineer.

UNIT PRICE ITEM BID ITEM B-26

CONCRETE ENCASEMENT

A. DESCRIPTION

Under this Item, the Contractor shall, ordered by the Engineer, furnish and place fill concrete around piping, without forms, at locations designated on the Contract Drawings or in the field by the Engineer.

B. WORK INCLUDED UNDER THIS ITEM

Furnish and Place 2,500 Psi Concrete Including Compaction and Curing (Section 03001)

C. ASSOCIATED WORK NOT INCLUDED UNDER THIS ITEM

Concrete to be Furnished and Installed Under Other Bid Items

D. METHOD OF PAYMENT

Payment for this Item will be made on a unit price per cubic yard basis.

E. MEASUREMENT AND LIMITS

The quantity for which payment will be made shall be the total cubic yards of concrete actually incorporated in the work as measured in place or as determined from the shipment invoices, less any waste or dumped concrete not incorporated in the work.

UNIT PRICE ITEM BID ITEM B-27

PIPE ABANDONMENT/REMOVAL

A. DESCRIPTION

Under this Item, the Contractor shall furnish all labor, equipment, and materials necessary to plug and abandon piping as shown and/or described in the Contract Documents.

B. WORK INCLUDED UNDER THIS ITEM

General Requirements (Sections 01010 through 01700)
Protection of Existing Facilities (Section 02205)
Pipe Abandonment (Contract Drawings)

C. ASSOCIATED WORK NOT INCLUDED UNDER THIS ITEM

Work Required Under Other Bid Items

D. METHOD OF PAYMENT

Payment for this Item will be made on a unit price per pipe abandoned.

E. MEASUREMENT AND LIMITS

The quantity for which payment will be made shall be the total number of pipe abandonments as ordered by the Engineer.

UNIT PRICE ITEM BID ITEM B-28

TEMPORARY BYPASS WATER SYSTEM

A. DESCRIPTION

Under this Item, the Contractor shall Furnishing, all labor, material and equipment necessary to install and remove temporary bypass pipe, valves and appurtenances where shown on the Contract Drawings or where ordered by the Engineer.

B. WORK INCLUDED UNDER THIS ITEM

General Requirements (Sections 01010 through 01700)
Distribution of Service Interruption Notices
Pavement Cuts (Section 02112)
Sheeting and Bracing (Section 02161)
Removal of Water (Section 02141)
Bulkheads (Section 02665)
Furnish, Install and Remove Temporary Bypass Pipe, Valves, Appurtenances and Services (Section 02665)
Covering Burying Temporary Bypass Pipe Connections to Water Sources (Section 02665)
Temporary Surface Restoration (Sections 02507 and 02980)
Furnishing, Installing, Ramping Edges and Removing Steel Plates
Disinfection Flushing Bacteriological Sampling and Associated Fees
Obtaining Approval from Westchester County Department of Public Health
Protection Including But Not Limited to Flashers and Barricades
24-Hour Maintenance (Section 02665)
Excavation Backfill Surface Restoration and Furnishing All Labor, Material and Equipment Necessary to Complete the Work
Disposal of Excess and Unsuitable Materials (Section 02225)
Compaction (Section 02228)
Paving (Section 02665)
Site Rehabilitation (Section 02980)

C. ASSOCIATED WORK NOT INCLUDED UNDER THIS ITEM

Excavation Below Subgrade (Bid Item B-2)
Pavement Replacement (Bid Items B-16 and B-18)
Select Backfill Material: NYSDOT Course 304, Type 4 (Bid Item B-15)
Temporary Paving (Bid Item B-16)

D. METHOD OF PAYMENT

Payment for this Item will be made on a unit price per linear foot basis.

E. MEASUREMENT AND LIMITS

The quantity for which payment will be made shall be the total number of linear feet of temporary bypass pipe as measured by the Engineer

UNIT PRICE ITEM

BID ITEM B-29

SAMPLE STATIONS

A. DESCRIPTION

Under this Item, the Contractor shall provide all labor, material, and equipment necessary to excavate, furnish, and install sample stations, corporation stop, 3/4-inch copper tubing, curb stop, vent tube, aluminum housings, and fittings with bedding, backfill, compaction as shown on the Contract Drawings and as specified.
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B. WORK INCLUDED UNDER THIS ITEM

Trenching (Section 02225)
Water Valves and Hydrants (Section 02662)
Contract Drawings

C. ASSOCIATED WORK NOT INCLUDED UNDER THIS ITEM

All Other Bid Items

D. METHOD OF PAYMENT

Payment for this Item will be made on a unit price for the number of units installed.

E. MEASUREMENT AND LIMITS

The quantity for which payment will be made shall be the total number of units installed. One unit shall consist of parts, fittings and tubing identified in the specifications and detail number 18/C48 of the Contract Drawings.

UNIT PRICE ITEM

BID ITEM B-30

METER PITS

A. DESCRIPTION

Under this Item, the Contractor shall provide all labor, material, and equipment necessary to excavate, furnish, and install sample stations, corporation stop, copper tubing, curb stop, PVC meter pit or concrete vault, and fittings with bedding, backfill, compaction as shown on the Contract Drawings and as specified.
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B. WORK INCLUDED UNDER THIS ITEM

Trenching (Section 02225)
Water Distribution Piping (Section 02661)
Water Valves and Hydrants (Section 02662)
Concrete Vaults (Section 03481)
Contract Drawings

C. ASSOCIATED WORK NOT INCLUDED UNDER THIS ITEM

All Other Bid Items

D. METHOD OF PAYMENT

Payment for this Item will be made on a unit price for the number of units installed.

E. MEASUREMENT AND LIMITS

The quantity for which payment will be made shall be the total number of units installed. One unit shall consist of parts, fittings and tubing identified in the specifications and Contract Drawing details.

UNIT PRICE ITEM BID ITEM B-29

FINAL CLEANUP AND SITE RESTORATION

A. DESCRIPTION

Under this Item, the Contractor shall furnish all labor, equipment, and materials necessary to perform all work necessary to restore all non-paved areas of construction to a condition equal to or superior to that existing prior to construction activities.

B. WORK INCLUDED UNDER THIS ITEM

Fully restore to acceptable condition existing items removed or damaged by the Contractor's Operations, including but not limited to, property line corner pins, monuments, trees, shrubbery, lawns, ground cover, drainage facilities, catch basins, guard posts, road shoulders, general landscaping, brick or stone sidewalk areas, and restoration of any items not included under other Bid Items (Section 02980)

C. ASSOCIATED WORK NOT INCLUDED UNDER THIS ITEM

Permanent Pavement Replacement (Bid Item B-18)
Temporary Pavement Replacement (Bid Item B-16)
Pavement Milling (Bid Item B-30)
Asphalt Driveways (Bid Item B-24)
Concrete Curb and Driveway Replacement (Bid Items B-20 and B-25)

D. METHOD OF PAYMENT

Payment for this Item will be based on a unit price per linear foot basis and in accordance with the Contractor's unit price bid.

E. MEASUREMENT AND LIMITS

The quantity for which payment will be made shall be the total linear footage of installed open cut water main pipe that has been satisfactorily tested, complete as specified, as measured along the centerline of the installed pipe (less restoration in paved gravel areas and concrete bid items).

UNIT PRICE ITEM BID ITEM B-30

PAVEMENT MILLING/DEMOLITION

A. DESCRIPTION

Under this Item, the Contractor shall furnish all labor, equipment, and materials necessary to mill asphalt road pavement to the limits shown on the Contract Drawings or as directed by Engineer in accordance with the method specified in the Contract Documents.

B. WORK INCLUDED UNDER THIS ITEM

Mill Existing Paved Surfaces (Section 02510)
Protect, Maintain, and Adjust As Required, All Catch Basins, Inlets, Manhole Frames, and Valve Boxes (Section 02510)
Remove and Dispose of Pavement Millings and/or Rubble (Sections 02225 and 02510)

C. ASSOCIATED WORK NOT INCLUDED UNDER THIS ITEM

Temporary Asphalt Pavement
Asphalt Driveways and Parking Areas
Final Cleanup and Site Restoration

D. METHOD OF PAYMENT

Payment for this Item will be made on a unit price basis and in accordance with the Contractor's unit price bid.

E. MEASUREMENT AND LIMITS

The quantity for which payment will be made shall be the total square yards of pavement, milled as specified, measured by the Engineer within the existing limits of the original road as shown on the Contract Drawings.

SECTION 01039

COORDINATION AND MEETINGS

PART 1 GENERAL

1.01. SECTION INCLUDES

A. Coordination.

B. Field engineering.

C. Preconstruction conference.

D. Site mobilization conference.

E. Progress meetings.

F. Connection conference.

1.02. COORDINATION

A. Coordinate scheduled work sequences and related operations beforehand with appropriate local, county, or state officials and agencies including affected property owners, when Project is to be located in or adjacent to a public right-of-way.

B. Coordinate scheduling, submittals, and Work of the various Specification sections to assure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

C. Verify that utility requirement characteristics of operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

D. Coordinate space requirements and installation of mechanical and electrical work which are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with line of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

E. In finished areas, except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.

F. Coordinate completion and clean up of work of separate sections in preparation for Substantial Completion and for portions of work designated for Owner's partial utilization.

G. After Owner use of facilities, coordinate access to Site for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

1.03. FIELD ENGINEERING

A. Control datum for survey work is that provided by Engineer as shown on the Drawings.

B. Engineer will provide one control point at the existing water storage tank.

C. Engineer reserves right to inspect or check results of Contractor field engineering services specified herein for conformance with the Contract Documents.

D. Contractor shall provide field engineering services as follows:

1. Employ a land surveyor licensed in the State of New York.

2. Protect all control and reference points. Accurately replace any such point which is damaged or moved.

3. Provide correct lines, grades, locations and elevations for construction of all Project components.

4. Provide correct information for preparation of Project record documents.

5. Submit a copy of a registered Site drawing and certificate signed by the land surveyor who provided field engineering services that the locations and elevations of the Work are in conformance with the Contract Documents.

1.04. PRECONSTRUCTION CONFERENCE

A. Engineer will schedule a conference after the Effective Date of Agreement.

B. Attendance Required - Owner, Engineer, Contractor, and the Westchester County Department of Health.

C. Agenda

1. Distribution of extra sets of Contract Documents.

2. Submission of list of Subcontractors, list of products, Schedule of Submittals, Schedule of Values, and Progress Schedule.

3. Designation of personnel representing the parties in contract, and Engineer.

4. Procedures and processing of field decisions, submittals, substitutions, Applications for Payments, proposal requests, Change Orders and Contract closeout procedures.

5. Scheduling.

6. Scheduling activities of testing laboratory.

7. Requirements of regulatory agencies.

8. Use of premises by Owner and Contractor.

9. Temporary facilities to be provided by Owner; and by Contractor.

10. Procedures for testing.

11. Procedures for maintaining record documents.

12. Maintenance of vehicular traffic.

13. Periodic cleanup of Site.

14. Notification of utilities' owners.

D. Engineer will record minutes and distribute copies to participants.

1.05. SITE MOBILIZATION CONFERENCE

A. Engineer and Owner will schedule a conference at the Project site prior to Contractor occupancy.

B. Attendance Required - Owner, Engineer, the Westchester County Department of Health, Contractor, Contractor's superintendent, and major subcontractors.

C. Agenda

1. Use of premises by Owner and Contractor.

2. Owner's requirements and partial occupancy.

3. Construction facilities and controls provided by Owner.

4. Temporary utilities provided by Owner.

5. Survey layout.

6. Security and housekeeping procedures.

7. Schedules.

8. Procedures for testing.

9. Procedures for water main breaks during construction.

10. Procedures for maintaining record documents.

11. Requirements for disinfection of equipment.

12. Inspection and acceptance of water mains put into service during construction period.

13. Requirements of regulatory agencies.

D. Record minutes and distribute copies within 10 days after meeting to participants and to those affected by decisions made.

1.06. PROGRESS MEETINGS

A. Engineer will schedule and administer meetings throughout progress of the Work at maximum monthly intervals.

B. Engineer will make arrangements for meetings, prepare agenda with copies for participants, preside at meetings, record minutes, and distribute copies within 10 days to participants, and those affected by decisions made.

C. Attendance Required - Engineer, job superintendent of each prime Contractor, major Subcontractors and Suppliers, as appropriate to agenda topics for each meeting.

D. Agenda

1. Review minutes of previous meetings.

2. Review of Work progress.

3. Field observations, problems, and decisions.

4. Identification of problems which impede planned progress.

5. Review of submittals schedule and status of submittals.

6. Review of off-site fabrication and delivery schedules.

7. Maintenance of Progress Schedule.

8. Corrective measures to regain projected schedules.

9. Planned progress during succeeding work period.

10. Coordination of projected progress.

11. Maintenance of quality and work standards.

12. Effect of proposed changes on Progress Schedule and coordination.

13. Other business relating to Work.

1.07. CONNECTION CONFERENCE

A. Engineer will schedule a coordinating conference at least 14 days prior to the connection to the existing distribution system.

B. Attendance Required - Owner, Engineer, Contractor, and job superintendent.

C. Agenda

1. Determine status of equipment.

2. Ascertain presence of materials required to be at site for connection procedure.

3. Review responsibilities of Owner and Contractor.

4. Establish connection procedure; develop schedule(s) when appropriate.

5. General coordination of all aspects of connection.

D. Engineer will record minutes of meeting and distribute copies within five days to participants.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

SECTION 01300

SUBMITTALS

PART 1 GENERAL

1.01. SECTION INCLUDES

A. Submittal procedures.

B. Schedule of submittals.

C. Shop drawings.

D. Manufacturer's instructions.

1.02. SUBMITTAL PROCEDURES

A. Transmit each required submittal using Engineer accepted form.

B. Number the submittals as follows:

1. First: Specification section number.

2. Submittal number within the Specification section.

3. Review cycle number.

4. Title of submittal.

5. For example:

a. 15073-01-01 – Field lock gaskets for DIP (first review cycle)

b. 15073-01-02 - Field lock gaskets for DIP (second review cycle)

c. 15073-02-01 – Flange pipe and fittings (first review cycle)

d. 15073-02-02 – Flange pipe and fittings (second review cycle)

e. 15073-02-03 – Flange pipe and fittings (third review cycle)

C. Identify Project, Contractor, Subcontractor, and Supplier; pertinent Drawing number and detail number(s), and Specification sections, as appropriate.

D. Apply stamp, signed or initialed providing certification required by General Condition Article 6.17.C.2. At a minimum, stamp shall include the following information:

1. Submittal Number _____
2. Deviations: None_____; As Listed _____
3. Reference Specification Section _____
4. Reference Drawing Number _____
5. Space Requirement: As Designed_____ Different, As Listed _____
6. Representation is made to Owner and Engineer that Contractor has satisfied the

requirements of General Conditions Article 6.17.C.1.a through d, associated Supplementary Conditions, and that the Contractor hereby approves this submittal.
Contractor _____
Signature _____
Date _____
Date _____

E. Schedule submittals to expedite the Project, and deliver to parties in the quantities and at the locations specified herein.

F. Identify deviations from Contract Documents in accordance with General Conditions Article 6.17.C.3.

G. Identify product and/or system limitations which may be detrimental to successful performance of the completed Work.

H. Identify space requirements which differ from those designed and/or shown on the Contract Documents.

I. Provide space for Contractor and Engineer review stamps.

J. Revise and resubmit in accordance with General Conditions Article 6.17.E. Identify all changes made since previous submittal in a cover letter or memorandum.

K. Distribute copies of reviewed submittals to concerned parties. Instruct parties to promptly report any inability to comply with provisions.

L. Submittals not required will not be recognized or processed.

M. Items shall not be fabricated or delivered without fully approved Shop Drawings.

N. Ensure no associated work begins until associated Shop Drawings are fully approved.

O. Fabrication prior to receiving an “Approved” or “Approved as Corrected – No Resubmittal Required” is at Contractor’s risk.

1.03. SCHEDULE OF SUBMITTALS

A. Submit three copies of preliminary Schedule of Submittals in accordance with General Conditions Article 2.05.

B. Revise and resubmit until acceptable to Engineer.

1.04. SHOP DRAWINGS

A. Provide information in accordance with General Conditions Article 6.17 as supplemented herein and as required by individual Specification sections.

B. Shop Drawing submittals shall include all descriptive data, performance characteristics, material specifications, spare parts list, drawings, piping diagrams, wiring schematics, and shall be complete and accurate to indicate item-by-item compliance with the Contract Documents.

C. Shop Drawings shall be drawn at scales matching those on the Drawings depicting the same items.

D. All catalog cuts, manufacturer's specifications, drawings, and verbal descriptions shall be clearly marked to allow identification of the specific products used.

E. If the submittal deviates from the requirements of the Specifications in any way, it shall be clearly marked in the submittal with the justifying reason stated for evaluation by Engineer.

F. Submit five opaque reproductions to Engineer, three copies of which will be retained by the Engineer.

1.05. MANUFACTURER'S INSTRUCTIONS

A. When specified in individual specification sections, submit manufacturers' printed instructions for delivery, storage, assembly, installation, startup, adjusting, and finishing, in quantities specified for shop drawings.

B. Identify conflicts between manufacturers' instructions and Contract Documents.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

SECTION 01310

PROGRESS SCHEDULE

PART 1 GENERAL

1.01. SUMMARY

A. This Specification section covers the development and utilization of the Progress Schedule. In the event of conflicts or discrepancies with any other provisions of the Contract Documents relating to such, this section shall govern.

1.02. DEFINITIONS

A. Terms used herein shall be in accordance with the definitions set forth in the Associated General Contractor's of America (GCA) publication, "Construction Planning & Scheduling".

1.03. BASIC REQUIREMENTS

A. Schedule and monitor all Work using Critical Path Method (CPM) techniques. Scheduling software shall be Microsoft Project.

B. Progress Schedule shall be maintained throughout entire Contract and shall be used by Contractor to schedule, plan, organize, and execute the Work.

C. Progress Schedule shall:

1. Comply with Contract Times identified in the Agreement.

2. Reflect all mandated sequencing identified in Contract Documents.

3. Include adequate time for Engineer's review of submittals. Under no circumstances will the progress schedule be allowed to include Engineer review times shorter than those prescribed in Section 01300, Submittals and individual Specification sections. The need for resubmittals based on Engineer's review will not entitle Contractor to Contract Time extensions and the Progress Schedule must include adequate time for resubmittals.

4. Include time required by Contract Documents based on work days lost due to inclement weather.

5. Progress Schedule shall include adequate time for testing and startup.

D. Each activity, except Notice to Proceed, shall have at least one predecessor. Each activity, except final completion, shall have at least one successor.

E. Construction activities shall have a maximum duration of 20 work days. All durations shall be developed based on definitive manpower and resource planning.

F. Float is not for the exclusive benefit of the Owner or Contractor and must be used in the best interest of the Project in order to maintain Contract Times. Contractor will not be allowed to sequester float through such strategies as extended activity durations, extensive crew/resource sequencing, etc.

1.04. SUBMITTALS

A. Submit the following in accordance with the procedures identified in Section 01300, Submittals:

1. Preliminary 90-Day Progress Schedule

a. Submit one electronic version on compact disc and three 11-inch x 17-inch hard copies of bar chart within time frame identified in General Conditions Article 2.05.A.1.

b. Bar chart shall show the following for each activity:

1) Activity ID

2) Activity description

3) Original duration

4) Early start

5) Early finish

2. Detailed Baseline Progress Schedule

a. Submit one electronic version on compact disc and three 11-inch x 17-inch hard copies of bar chart within 30 days after acceptance of preliminary Progress Schedule.

b. Bar chart shall clearly identify the critical path and shall provide a tabulated listing of the following for each activity:

1) Activity ID

2) Activity description

3) Original duration

4) Percent complete

5) Remaining duration

6) Early start

7) Early finish

8) Late start

9) Late finish

10) Total float

1.05. PROGRESS SCHEDULE ARCHITECTURE

A. Each activity in the Progress Schedule shall include:

1. A unique activity identification (ID) number

2. Activity description

3. Original Duration

4. Responsibility code assigning activities to Contractor, Subcontractors, Engineer, Owner, or other entity.

B. Calendars - At a minimum, establish the following calendars:

1. Work day calendar excluding all holidays identified in the Contract Documents.

2. Calendar days for activities with durations based on calendar days.

1.06. PRELIMINARY 90-DAY PROGRESS SCHEDULE

A. Include the following:

1. Detailed activities with associated logic for first 90 days after Notice to Proceed. The Preliminary 90-Day Progress Schedule shall include, but not be limited to, mobilization, sitework, demolition, key procurement activities (i.e., submissions, approvals, fabrication and delivery) and all other work that will occur in the first 90 days after Notice to Proceed.

2. The balance of the Work shall be shown in a summary log and shall include a summary of activities for construction of each proposed system.

1.07. DETAILED BASELINE PROGRESS SCHEDULE

A. Baseline Progress Schedule shall include no activity progress.

B. Incorporate 90-day preliminary Progress Schedule.

C. Provide sufficient detail to allow use for planning, scheduling, and control all Work included in Contract. The degree of detail shall be to the satisfaction of the Engineer, and shall account for the following Project specific items:

1. Structural breakdown of Project.

2. Required phasing.

3. Milestones.

4. Maintaining operation of existing facilities.

5. Subcontractor work plans.

6. Crew flows and sizes.

7. Access to site and work areas.

8. Identification of coordination between Contractor, subcontractors, and suppliers.

9. Testing and disinfection/connection.

10. Service transfer.

D. In addition to a breakdown of physical construction activities specified herein, include activities for the following:

1. Submittals

2. Engineer's review of submittals

3. Fabrication and delivery of materials and equipment

4. Finish milestone activity for all Functional Tests associated with a given system.

E. The accepted baseline Progress Schedule will form the basis of the first monthly update.

1.08. SCHEDULING MEETINGS

A. Attend monthly meetings with Engineer one week prior to submitting monthly Progress Schedule updates.

B. Review proposed activity progress completed during the period, current status of the Project, planned work for the next period, and areas where Contractor needs to coordinate with Owner and/or Engineer.

1.09. REVISIONS

A. Engineer will be the custodian of all official versions of the Progress Schedule including the 90-Day Preliminary Progress Schedule, the baseline Progress Schedule, and each acceptable subsequent monthly update included with Applications for Payment.

B. The Owner, Engineer, and Contractor shall have the right to propose revisions to the Progress Schedule if it is deemed to be in the best interest of the Project.

C. All Owner, Engineer, and Contractor proposed revisions must be submitted to each party no later than seven days prior to the date by which Contractor must submit monthly updates in order for proposed revisions to be considered for that update.

D. Objections to Proposed Revisions:

1. If Owner, Engineer, and/or Contractor object to proposed revisions made by any other party, the objecting party shall provide written notice to each other party within seven days of receipt of proposed revisions, stating objections.

2. Proposed revisions that are not mutually agreeable shall be discussed at the monthly scheduling meetings.

E. Engineer shall have final say on acceptance or rejection of all proposed Progress Schedule revisions based solely on requirements of the Contract Documents.

F. All Engineer accepted revisions will be incorporated into the next Progress Schedule update.

1.10. RECOVERY SCHEDULES

A. If Contractor fails to achieve planned progress, as indicated in the Progress Schedule, and lack of progress delays the critical path or an intermediate Milestone by more than 10 work

days, submit a proposed recovery schedule to Engineer identifying how Contractor will recover lost time.

B. Failure to submit a recovery schedule and failure to cooperate with the Owner and/or Engineer in the recovery schedule process shall allow Owner the right to order Contractor to increase manpower to recover lost time, without adjustment to the Contract Price. Furthermore, Owner has the right to withhold progress payments until such time as Contractor's progress is brought into compliance with Progress Schedule.

1.11. DELAYS AND EXTENSIONS OF CONTRACT TIMES

A. When Contractor believes that Contract Times will be delayed by circumstances outside of its control, Contractor shall include the following with its notice of claim:

1. Summary of all requested extensions to Contract Times.

2. Cause of the delay, actions Contractor proposes to take to minimize delays, and actions Contractor proposes for Owner and/or Engineer to minimize delays.

B. Engineer will review each claim. If acceptable to Engineer, Engineer will provide written notice to Owner within 14 days of submission, copying Contractor on correspondence, recommending that the fragnet should be incorporated into the Progress Schedule and a Change Order should be issued providing requested extension of Contract Times. Owner will provide written notice to Contractor within 14 days of receipt of Engineer's recommendation, either concurring or denying Engineer's recommendation.

C. If a claim submittal is not acceptable to Engineer, Engineer will provide written notice to Contractor identifying deficiencies with claim. Contractor will have 7 days from receipt of Engineer's written notice to submit a revised claim.

D. Contract Time extensions will only be considered for events that impact Contract Times as demonstrated by acceptable claims..

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

SECTION 01380

CONSTRUCTION DOCUMENTATION

PART 1 GENERAL

1.01. SECTION INCLUDES

A. Construction photographs.

1.02. DESCRIPTION

A. Take construction record photographs prior to mobilization and periodically during the course of the Work.

B. General Contractor shall provide construction documentation in specified in this section unless otherwise noted.

1.03. CONSTRUCTION PHOTOGRAPHS

A. Digital construction photographs shall be taken at each of the major stages on construction listed below and shall be furnished to Engineer and Owner with each Application for Payment.

1. Site before mobilization.

2. Completion of hydrants and valves prior to backfilling.

3. Existing condition of each driveway.

4. Completion of work at each driveway.

5. Completion of excavations for each road crossing.

6. Testing of all piping, equipment, and systems.

7. Completion of site restoration and landscaping.

B. Views and Quantities Required - One view of each item.

C. Camera used for digital photography shall be a 6.0 megapixel or greater.

D. Electronic Copies

1. Maintain database of pictures for the entire length of the Project.

2. Each month, provide two CDs with electronic versions of all prints taken in the past month.

3. Provide two CDs with electronic versions of all prints taken in during the course of the Project (in .jpg format) with final Application for Payment.

4. All electronic copies of photos shall be in .jpg format. All electronic copies of photos shall be arranged on CDs by date and subject. Each .jpg photo file name shall include the subject description and date.

1.04. REUSE OF CONSTRUCTION DOCUMENTATION

A. All construction documentation furnished to Owner shall become the property of the Owner and cannot be copyright or otherwise protected in a manner that prevents free reuse by either the Owner and/or Engineer.

PART 2 PRODUCTS

2.01. PRINTS

A. Digital Progress Photos

1. Printer

a. Printer shall be designed to print digital photos.

b. Printer shall have a minimum 4800 x 1200 dpi resolution.

2. Color Prints

a. Paper - Single weight, smooth, photo-quality paper.

b. Finish - Smooth matte-finish.

c. Size - 8-inch x 10-inch.

d. Enclosure - Each print shall be provided in an acid-free plastic sleeve, three hole punched, for insertion into a three ring binder. Provide a suitable quantity of three-ring binders for containing all prints, labeled on the front and spine of the binder with the name and Owner's Contract number.

3. Identify each print on front, listing:

a. Name and Owner's Contract number.

b. Subject and orientation of view (for example, "Aeration Tank Foundation, looking north").

c. Date and time of exposure.

d. Contractor's numbered identification of exposure (i.e., December 2009, Photo #1).

PART 3 EXECUTION

3.01. DELIVERY OF PRINTS

A. Preconstruction photos and negatives shall accompany the first Application for Payment. This Application for Payment will not be approved without receipt of such materials.

B. Monthly construction photos (in both print and CD format) shall accompany each monthly Application for Payment. Monthly Applications for Payment will not be approved without receipt of such materials.

C. Final construction photos and negatives shall accompany the final Application for Payment. This Application for Payment will not be approved without receipt of such materials.

END OF SECTION

SECTION 01400

QUALITY CONTROL

PART 1 GENERAL

1.01. SECTION INCLUDES

A. Quality assurance and control of installation.

B. References and standards.

C. Tolerances.

D. Inspection and testing services.

E. Testing by Contractor.

F. Manufacturers' field services and reports.

1.02. QUALITY ASSURANCE/CONTROL OF INSTALLATION

A. Monitor quality control over Suppliers, manufacturers, products, services, Site conditions, and workmanship, to produce Work of specified quality.

B. Comply fully with manufacturers' instructions.

C. Verify that field measurements are as indicated on Shop Drawings and as instructed by the manufacturer.

D. If manufacturers' instructions conflict with Contract Documents, request clarification from Engineer before proceeding.

E. Comply with specified standards as a minimum quality for the Work except when code requirements or equipment manufacturer requires more stringent standards.

F. Perform Work by persons qualified to produce workmanship of specified quality.

G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion and disfigurement.

1.03. REFERENCES AND STANDARDS

A. For products and workmanship specified by association, trade, or other consensus standards, comply with requirements of the standard, except when more rigid requirements are specified and/or are required by applicable codes.

1.04. TOLERANCES

A. Monitor fabrication and installation tolerance control to produce acceptable Work. Do not permit tolerances to accumulate.

B. Comply with manufacturers' tolerances. If manufacturers' tolerances conflict with Contract Documents, request clarification from Engineer before proceeding.

C. Adjust products to appropriate dimensions; position before securing products in place.

1.05. TESTS AND INSPECTIONS

A. Contractor shall employ and pay for the services of an independent testing laboratory to perform inspections, tests, and approvals indicated in General Conditions Article 13.03.B.

B. Independent testing laboratory will:

1. Perform inspections, tests, and other services specified in the individual specification sections and as required by Engineer and Owner.

2. Perform inspecting, testing, and source quality control which may occur on or off project site, as required by Engineer or Owner.

3. Prepare and submit reports to the Engineer, in duplicate, indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents. Engineer will forward copy of report(s) to Contractor.

C. Contractor shall:

1. Cooperate with independent firm; furnish samples of materials; furnish design mix, equipment, tools, storage and assistance as requested.

2. Notify Engineer and independent firm 48 hours prior to expected time for operations requiring services.

3. Make arrangements with independent firm and pay for additional samples and tests required for Contractor's own use.

D. Retesting required because of non-conformance to specified requirements shall be performed, on instructions by the Engineer, by the same independent firm which performed the initial tests and inspections, whether employed by Owner or Contractor.

E. Costs for retesting and re-inspection will be deducted from progress payments to Contractor.

1.06. MANUFACTURERS' FIELD SERVICES

A. When additional manufacturer services are specified in other individual Specification sections, require material or product Suppliers or manufacturers to provide qualified personnel to observe Site conditions, conditions of surfaces and installation, quality of workmanship, testing and adjusting, as applicable, and to initiate instructions when necessary.

B. Report observations, Site conditions, or instructions given to applicators or installers, that are supplemental or contrary to manufacturers' written instructions.

C. Submit report to Engineer within 30 days of observation.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

SECTION 01500

TEMPORARY FACILITIES

PART 1 GENERAL

1.01. SECTION INCLUDES

A. Continuity of service.

B. Temporary Utilities - Electricity, lighting, heating, cooling, telecommunications service, water, and sanitary facilities.

C. Temporary Controls - Barriers, enclosures and fencing, protection of the Work, water control and pollution controls.

D. Construction Facilities - Access roads, parking, maintenance of traffic, and progress cleaning.

1.02. CONTINUITY OF SERVICE

A. Provide temporary equipment including pumps, piping, valves, bulkheads, electrical equipment and all system components necessary to maintain the existing facilities in service during construction.

B. Provide temporary power, instrumentation, controls, and alarms necessary to assure continued facilities operation during the alterations of existing facilities components or installation of new equipment.

C. Construction may require the closing of various gates and valves to isolate tanks, channels, and equipment. The Owner does not guarantee that the gates and valves will be completely watertight. It is the Contractor's responsibility to take whatever measures are necessary to proceed with construction in the event that valves or gates leak.

D. Provide temporary access required, including ladders, platforms, grating, walkways, and awaits which comply with OSHA laws, for necessary facilities operations.

E. Provide all line stops and temporary bypass piping and valves required to connect new piping to existing piping, unless otherwise specified.

F. No extra payment shall be made for any labor, materials, tools, equipment or temporary facilities required during construction. All costs therefore shall be considered to have been included in the Bid.

G. Provide a temporary water system in accordance with Section 02665.

1.03. TEMPORARY ELECTRICITY

A. General Contractor shall provide and pay for power service required from utility source. for Contractor operations and those of other contractors, including equipment, job trailers, etc.

1.04. TEMPORARY LIGHTING

A. General Contractor shall provide and maintain incandescent lighting for Contractor operations and those of other contractors to achieve:

1. A minimum lighting level of 2 watt/sq.ft. for construction operations.

2. 1 watt/sq.ft. lighting to exterior staging and storage areas after dark for security purposes.

B. General Contractor shall maintain lighting and provide routine repairs.

C. Permanent building lighting may not be utilized during construction.

1.05. TEMPORARY HEATING

A. Existing facilities shall not be used.

B. General Contractor shall provide and pay for heat devices and heat as required to maintain specified conditions for Contractor's construction operations.

C. General Contractor shall maintain minimum ambient temperature of 50 degrees F in areas where construction is in progress, unless indicated otherwise in individual specification sections.

1.06. TEMPORARY COOLING

A. Existing facilities shall not be used.

B. General Contractor shall provide and pay for cooling devices and cooling as needed to maintain specified conditions for Contractor's construction operations.

C. Maintain maximum ambient temperature of 80 degrees F in areas where construction is in progress, unless indicated otherwise in specifications.

1.07. TELECOMMUNICATIONS SERVICE

A. Contractor shall provide, maintain and pay for telecommunications service to its field office and for Engineer's field representative for the duration of the contract. Telephone services shall be paid for completely by Contractor including all connection fees, monthly fees (phone and internet), local and long distance usage charges, taxes and all other telecommunications services provided under this contract.

B. Provide direct line telephone services to Engineer for the duration of the contract as follows:

1. One dedicated telephone line with call waiting.

2. One dedicated fax line.

C. Provide high speed internet service to Engineer's field trailer as follows:

1. Internet service shall include modem, cables, installation, and all other equipment necessary for a complete functioning system.

2. Internet service shall be available for use within two weeks of Contractor's mobilization.

3. Coordinate all maintenance and repairs to the system for the duration of the Contract. No components shall be out of service for more than 24 consecutive hours.

D. Provide telephone equipment as follows:

1. Two DECT 6.0 cordless telephones by AT&T or equal. Phones shall be two line, pushbutton, and equipped to record and play back incoming messages using a device which can be switched into service during Engineer's absence. The answering device shall answer a call on the first ring, provide a prerecorded outgoing message, and then record the caller's incoming message.

2. One plain paper facsimile/printer/copy machine by Cannon. Provide paper and toner for the duration of the Contract. The machine shall have a minimum 100-sheet capacity and minimum of 10 programmable preset fax numbers.

3. Contractor shall be responsible for servicing the aforementioned equipment. No components shall be out of service for more than 24 consecutive hours.

1.08. CELLULAR PHONE

A. Provide, maintain, and pay for a smart phone with internet service to be exclusively used by Resident Project Representative for the duration of the contract. General Contractor shall pay for all costs associated with the use of the cellular phone, including unlimited voice, voice mail, email, text, and data plans with uninterrupted service over the entire project area and surrounding locality.

1.09. TEMPORARY WATER SERVICE

A. Provide and maintain suitable quality water service required for Contractor's construction operations and those of other contractors.

B. Extend branch piping with outlets located so water is available by hoses with threaded connections for use by all Contractors. Provide temporary pipe insulation to prevent freezing as necessary.

C. Each Contractor shall provide sufficient potable quality drinking water for workers at the project site.

D. Collect and remove wastewater from site. There are no existing sanitary sewers.

1.10. TEMPORARY SANITARY FACILITIES

A. General Contractor shall provide and maintain required sanitary facilities and enclosures for use by all persons employed at the Site. Provide at time of mobilization. Existing facilities shall not be used. There are no existing sanitary sewers.

B. General Contractor shall remove facilities from site at end of construction.

C. Facilities shall be maintained in conformance with applicable State Regulations and Local ordinances. Contents shall be removed and disposed of in satisfactory manner by General Contractor as occasion requires.

D. Each Contractor shall enforce sanitary regulations amongst employees and take precautions against infectious diseases as deemed necessary. Isolate infected employee(s) and arrange for immediate removal of such person(s) from site.

1.11. BARRIERS

A. General Contractor shall provide barriers to prevent unauthorized entry to construction areas and to protect existing facilities and adjacent properties from damage from construction operations and demolition.

B. Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing building.

C. Provide protection for plant life designated to remain. Replace damaged plant life.

D. Protect vehicles, stored materials, Site and structures from damage.

E. Supplement barriers with suitable signs, railings and night lights, as necessary to conform with governing authorities and regulations.

1.12. FENCING

A. General Contractor shall provide 6-foot high fence around construction; equip with vehicular and pedestrian gates with locks.

B. Construction - Commercial grade chain link fence.

1.13. WATER CONTROL

A. General Contractor shall grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.

B. Protect Site from puddling or running water. Provide water barriers as required to protect Site from soil erosion.

1.14. EXTERIOR ENCLOSURES

A. General Contractor shall provide temporary insulated weather-tight closure of exterior openings to accommodate acceptable working conditions and protection for products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual Specification sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.

1.15. PROTECTION OF INSTALLED WORK

A. Each Contractor shall protect his installed Work from damage and deterioration due to construction activities, traffic, birds, pests, vermin, wild-life, pets, pedestrians, visitors, vandals, dust, vapors, floods, precipitation, driving rain, wind, snow storms, melting temperatures, or freezing temperatures; provide special protection where specified in individual Specification sections.

B. Provide temporary and removable protection for installed products. Control activity in immediate work area to minimize damage.

C. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.

D. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

E. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.

F. Prohibit traffic over landscaped areas. Provide adequate barriers, directional signs, and/or guards, if necessary to provide adequate protection of landscaped areas.

G. Owner reserves right to order that additional protective measures be taken beyond those proposed by Contractors, to safeguard the existing facilities and Work at no additional cost to Owner.

1.16. SECURITY

A. General Contractor shall provide security and facilities to protect his Work and that of other contractors, including existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.

B. Coordinate security measures taken with Owner's own security program.

1.17. ACCESS ROADS

A. General Contractor shall provide and maintain temporary access roads to the staging area as follows:

1. Construct roads on Owner's property to connect public thoroughfare(s) with construction area.

2. Roads shall be free for use by all personnel involved in Project, and be adequate for transportation of persons, materials, equipment and products to construction area.

3. Maintain roads in serviceable condition, free of obstructions, potholes, ponded water, debris, accumulated snow and ice, until completion of project or until permanent access roads are installed.

B. Designated existing on-site roads may be used for construction traffic.

1.18. PARKING

A. Contractor shall coordinate parking areas with Owner.

B. Contractor shall arrange for temporary gravel surface parking areas to accommodate all construction personnel involved with Project.

C. When Site space is not adequate, General Contractor shall provide additional off-site parking.

D. Do not allow vehicle parking on existing residential streets.

E. Designate one parking space for the Engineer and identify same with appropriate signs for each space.

1.19. MAINTENANCE OF TRAFFIC

A. General Contractor shall maintain and regulate traffic within Contract Limits in accordance with applicable state, county, and local regulations, and Section 01550.

1.20. PROGRESS CLEANING

A. General Contractor shall maintain areas free of waste materials, debris, and rubbish. Maintain Site and structures in a clean and orderly condition, as follows:

1. Remove debris and rubbish from pipe chases, plenums, attics, crawlspaces, and other closed or remote spaces, prior to enclosing the space.

2. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.

3. Collect and remove waste materials, debris, and rubbish from Site weekly and dispose off site.

B. Each Contractor shall store unused tools and equipment at its yard or base of operations.

1.21. POLLUTION CONTROLS

A. Dust Control

1. Each Contractor shall execute Work by methods to minimize raising dust from construction operations.

2. Provide positive means to prevent air-borne dust from dispersing into atmosphere.

3. Wash down disturbed areas daily.

4. Implement best management practices in accordance with requirements of agencies have jurisdiction over dust control.

B. Erosion and sediment control shall be provided in accordance with the Contract Documents, the requirements of governing regulatory agencies, and Section 01564.

C. Noise Control

1. All construction equipment and tools exhibiting potential noise nuisance shall be provided with noise muffling devices.

2. Confine use of such equipment and tools between the hours of 8:00 a.m. and 5:00 p.m.

3. Implement best management practices in accordance with requirements of agencies having jurisdiction over noise control.

D. Pollutants Control - Provide methods, means and facilities to prevent contamination of soil, water and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations.

1.22. REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

A. Respective Contractors responsible for temporary utilities, facilities, and controls shall remove temporary utilities, equipment, facilities, controls, materials prior to Final Application for Payment.

B. Remove temporary barriers, enclosures, etc. in concert with completion of those segments of Work which no longer require such measures.

C. Remove temporary underground installations to a minimum depth of 2 feet. Grade site as indicated.

D. Clean and repair damage caused by installation or use of temporary work.

E. Restore existing facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

1.23. CONTRACTOR'S FIELD OFFICE

A. Provide weathertight field office with lighting, electrical outlets, heating, cooling and ventilating equipment, and equipped with sturdy furniture, drawing rack, drawing display table, and filing cabinets for Contractor's use.

1.24. ENGINEER'S FIELD OFFICE

A. Provide and maintain a weathertight field office for exclusive use of Engineer with lighting, electrical outlets (one for each wall), permanent heating, cooling and ventilating equipment, and equipped with the following sturdy furniture:

1. One standard size desk, 3-foot x 5-foot, each with rolling padded desk chair, and at least three drawers.

2. Two Drafting Tables – 39 inches x 72 inches x 36 inches high with one equipment drawer.

3. One drafting table stool.

4. Two 3-foot x 6-foot folding table.

5. One plan rack to hold a minimum of six sets of project drawings.

6. Three standard four-drawer legal-size metal filing cabinets with locks and keys.

7. Ten folding chairs.

8. One 8-foot x 30-inch folding leg table.

9. One fire extinguisher.

10. Two wastebaskets.

11. One coat rack.

12. Two tackboards, 36 inches x 30 inches.

13. One heavy-duty, metal three-hole punch.

14. One 10-inch outdoor type thermometer.

15. One rain gauge.

16. One water cooler (provide refills as required throughout Project).

17. One refrigerator, minimum of 4.0 cubic feet, with freezer minimum of 1.0 cubic feet.

18. One microwave oven, 0.8 cubic feet, 800 watt minimum.

19. Heavy-duty wall shelving 20 sq. ft. minimum.

20. One digital camera with 2.0 megapixels or greater.

B. Engineer's field office shall be ready for occupancy within 10 days following Notice to Proceed. Mobile field office trailer is acceptable if it contains the required facilities. At a minimum, provide the following:

1. Minimum Field Office Size - 720 square feet.

2. Equip windows and doors with locking devices to prevent unauthorized entry. Provide three sets of keys to Owner.

3. Provide horizontal mini-blinds for all windows.

4. Hot and cold water connected to the facilities potable water system.

5. Bathroom with elongated toilet and sink with hot and cold water.

6. Telecommunications services identified in this section.

C. Computer Workstation: Using the cash allowance stipulated on the Bid Form, provide computer workstations, printer, and networking equipment. Requirements for the computer equipment will be provided by Engineer. Submit proposed order, including price, before purchasing computer equipment.

D. Install 24-inch x 30-inch sign on outside wall as determined by Engineer. Paint sign white with blue, 3-inch high lettering, neatly arranged, to read: "Field Office, Engineer."

E. Arrange for offices to be cleaned at least once every week. Restroom supplies shall be provided for the duration of the contract.

F. Locate the office a minimum distance of 30 feet from existing and new structures as indicated on the Drawings. Engineer's office to be erected at location approved by Engineer, and shall not be disturbed, moved or interrupted without the Engineer's approval.

G. On completion of the Contract, remove the field office from the Site.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

SECTION 01550

MAINTENANCE AND PROTECTION OF TRAFFIC

PART 1 GENERAL

1.01. DESCRIPTION

A. Work Specified - The work specified shall include all labor, material, equipment, services and incidentals necessary to maintain and protect vehicular and pedestrian traffic through all construction areas.

B. Related Work Specified Elsewhere

1. Division 2 and 3 Technical Specifications

2. Section 02661 - WATER DISTRIBUTION PIPING

1.02. QUALITY ASSURANCE

A. Reference Standards - New York State Department of Transportation Standard Specifications, latest revision.

PART 2 PRODUCTS

A. Post-Mounted and Wall-Mounted Traffic Control and Informational Signs - In accordance with the FHA Manual of Uniform Traffic Control Devices, current version.

B. Traffic Control Signals - As approved by local jurisdictions.

C. Traffic Cones and Drums, Flares, and Lights - As approved by local jurisdictions.

D. Flagman Equipment - As approved by local jurisdictions.

PART 3 EXECUTION

3.01. GENERAL

A. This work shall consist of maintaining traffic and protecting the public from damage to person and property within the limits of and for the duration of the Contract.

B. All existing site roads, streets, sidewalks, and traffic ways shall be kept open for the passage of traffic and pedestrians during the construction period unless otherwise approved by the Owner, Engineer or authority having jurisdiction over same.

C. When required to cross, obstruct or temporarily close a existing site road, street, sidewalk or trafficway, Contractor shall provide and maintain suitable detours or other approved temporary expedient for the accommodation of traffic. Closings shall be for the shortest time practical, and passage shall be restored immediately after completion of backfill and temporary paving or bridging.

D. Contractor shall give 48 hours' advance notice to the fire and police departments of his proposed operations including temporary shutdowns.

E. Contractor shall provide signs, signals, barricades, flares, lights and all other equipment, service and personnel required to regulate and protect all traffic, and warn of hazards. All such work shall conform to requirements of the Owner or authority having jurisdiction. Remove temporary equipment and facilities when no longer required, restore grounds to original, or to specified conditions.

F. Traffic shall be maintained over a reasonably smooth traveled way which shall be so marked by signs, delineators, guiding devices and other methods, that a person who has no knowledge of conditions may safely, and with a minimum of discomfort and inconvenience, ride, drive or walk, day or night, over all or any portion of the street under construction where traffic is to be maintained. All work shall conform to the requirements of the current New York State Manual of Uniform Traffic Control Devices.

G. Contractor shall control dust and keep the traveled way free from materials spilled from hauling equipment.

H. Contractor shall provide the necessary traffic control equipment and flagmen for adequate traffic control on the traveled way. Flaggers shall be used where opposing traffic is restricted to one lane or where other conditions require, or as required by permit conditions.

I. Contractor shall provide ingress and egress to and from intersecting streets, homes, businesses and commercial establishments.

J. Contractor shall provide adequate protection for pedestrian traffic during all phases of construction.

K. Contractor shall maintain existing bus stops, if any, so passengers are reasonably accommodated.

L. Contractor shall make the necessary repairs to existing pavement as required to provide a reasonable smooth traveled way where vehicle operation is maintained.

M. The Contractor's responsibility to the public is to protect the public from damage to person and property, which may result directly or indirectly from any construction operation.

N. The Contractor shall provide temporary markings in accordance with provisions of the New York State Manual of Uniform Traffic Control Devices, as required by the agency having jurisdiction, as shown in the plans and specifications and/or as ordered by the Engineer

O. The Contractor shall schedule work to keep to a minimum and consistent with the physical requirements of the contract, the amount of existing pavement and/or facilities that are destroyed or substantially torn up at any one time.

P. The Contractor shall at all times conduct his operations in a manner to insure the convenience of the motorist, the pedestrians and the abutting property owners and their safety as well as the safety of his own employees.

Q. The Contractor shall furnish, install, move, remove and maintain all signs and barricades and lighting for construction barricades as shown on the plans or as ordered by the Engineer, and in accordance with the NYS Manual of Uniform Traffic Control Devices.

R. The Contractor shall provide and maintain delineation and guiding devices which shall include: delineators, barrels, flashers, railing, temporary curb of any kind, pavement markings, and other similar materials or methods acceptable to the Engineer

S. The Contractor shall construct, move or remove, as directed, temporary structures, approaches, detours, pavements and necessary appurtenances.

T. The Contractor will be responsible to prepare a maintenance and protection of traffic plan and submit the plan to the Engineer for information and the Town Highway Department and/or NYSDOT (as required) for approval. The maintenance and protection of traffic plan shall be prepared by an engineer licensed to practice in the State of New York.

3.02. PARKING CONTROL

A. Control all Contractor-related vehicular parking within the limits of the designed parking area to preclude interference with public traffic or parking, access by emergency vehicles, Owner's operations, or construction operations. Provide temporary parking facilities as may be required because of construction or operations.

B. Monitor parking of all construction and private vehicles:

1. Maintain free vehicular access to and through parking areas.

2. Prohibit parking on or adjacent to access roads, or in non designated areas.

3. Parking will not be allowed in areas which limit sight distance of passing motorists.

4. Contractor is responsible for his vehicles while on-site.

3.03. HAUL ROUTES

A. Consult with governing authorities and establish thoroughfares which will be used as haul routes and site access.

B. Provide traffic control of haul routes to expedite traffic flow and to minimize interference with normal traffic.

3.04. ADDITIONAL REQUIREMENTS

A. The Contractor shall maintain the traveled way reasonably smooth and hard at all times, and shall be well drained and free of potholes, bumps, irregularities and depressions that hold or retain water. Construction operations shall be conducted to insure a minimum of delay to traffic. Stopping traffic for more than 5 minutes shall not be permitted unless specifically authorized, in writing, by the Engineer. The necessary equipment and personnel to attain and maintain a satisfactory riding surface shall be available and used as needed at all times when work is under way and when work is temporarily suspended for any period of time. Special attention to maintenance of a satisfactory traveled way shall be given during weekends, holidays and the winter season.

B. The Contractor shall provide a sufficient number of competent flagmen in areas where traffic exists, particularly where construction equipment is operating. Each flagger shall use an orange safety vest. The vest shall be worn outside all other clothing worn by the flagger.

C. Traffic shall be maintained in accordance with the details shown in conformance with the New York State Manual of Uniform Traffic Control Devices.

D. Fencing

1. The Contractor shall completely enclose and plate all open excavations and all other potentially hazardous location, at the end of each working day by temporary fences. Fencing shall be not less than 4 feet in height, mounted in steel angles or other satisfactory means of support rigidly driven into the ground and spaced at intervals not to exceed 8 feet. A minimum of one flasher per 15 feet of fencing will be required. In areas where an excavation is to remain open in excess of 14 calendar days, rigid fencing will be required having supports at intervals not to exceed 4 feet. Snow fence, cyclone fence, or wire fabric with rectangular mesh are considered minimally acceptable fencing materials.

2. The Engineer in charge may limit, extend, include or exclude areas to be fenced as conditions warrant.

E. Where sidewalk has been removed by the Contractor, he will be responsible for establishing a temporary stabilized walk for pedestrian traffic within 24 hours after removal of the sidewalk. This sidewalk may be located in the location of the original sidewalk or adjacent to the original sidewalk, providing there is an adequate right-of-way and the new location is safe for pedestrian traffic. The minimum width of the walkway is 4 feet. No additional payment will be made for installing and/or maintaining this walkway by the Contractor.

F. All existing highway signs and supports within the contract limits are to remain and are to be maintained for the duration of the contract by the Contractor.

G. On postal routes, mailboxes serviced from motor vehicles shall be maintained by the Contractor in a usable location during construction. The Contractor should not move any mailbox which contains mail. He will advise the property owner to remove such mail before he moves the box. Before acceptance of the work, any mailbox which has been disturbed or removed shall be replaced in size, kind and type by the Contractor in a location acceptable to the property owner and the Engineer.

H. Contractor must provide access to all school buses and emergency vehicles including ambulances, police cars, fire engines, etc., traveling through or stopping at any part of the construction site. At his expense, Contractor will yield to these vehicles and cease construction activities, as necessary.

END OF SECTION

SECTION 01564

EROSION CONTROL

PART 1 GENERAL

1.01. SECTION INCLUDES

A. Installation of sedimentation and erosion control barriers.

B. Anchoring all topsoil stockpiles with straw mulch and ringing with straw bales.

C. Protection of catch basins with straw bales or silt fence rings.

D. Inspection of all erosion measures after each rainfall and at least daily during prolonged rainfall.

E. Repairing immediately any failed sedimentation and erosion control barrier.

F. Removing and disposing sediment deposits in a manner that does not result in additional erosion or pollution.

G. Removal of straw bales or silt fences after completion of construction and permanent stabilization of erosion.

H. Removal of sedimentation barriers after completion of construction.

1.02. PERFORMANCE REQUIREMENTS

A. Observe government policy established by United States Environmental Protection Agency (USEPA) Memorandum 78-1.

B. Observe requirements set forth by the Federal Highway Administration Task Force 25.

C. Conform all erosion and sedimentation control measures of “New York Guidelines for Urban Erosion and Sediment Control” published by USDA Soil Conservation Service.

D. Temporary erosion and sediment control measures shall be installed as the first step in construction and shall not be removed until permanent cover is completely established and stabilized.

1.03. PLAN

A. The Contractor shall implement his program of operations to effectively control erosion and sediment runoff in accordance with the approved Stormwater Pollution Prevention Plan, Erosion and Sediment Control Plan, and NYSDEC SPDES General Permit GP-0-10-001.

1. Requests for variations from the approved SWPPP will be submitted in writing to the project engineer prior to undertaking any actions not compliant with the SWPPP or Erosion and Sediment Control Plan.

2. Contractor shall maintain one copy of the SWPPP and erosion control-related records at the project site at all times, which shall be made available for examination

by authorized representatives of the regulatory agencies having jurisdiction over the project.

3. The erosion control records shall be arranged so as to include:

   a. Chronological completion dates for each temporary (and permanent) measure for controlling erosion and sediment.

   b. Location, type and purpose for each temporary measure to be undertaken.

   c. Dates when those temporary measures will be removed.

4. The plan shall be submitted within 10 days after the Notice to Proceed.

PART 2 MATERIAL AND PRODUCTS

2.01. MATERIALS

A. Straw Bales - Shall be securely tied and measure 14 inches by 18 inches by 30 inches long or greater.

B. Silt Fence

   1. Propex - Silt stop, Mirafi 100X or equal meeting the physical and mechanical requirements of FHA Task Force 25 specification guide for temporary silt fence.

   2. Silt fence shall be constructed using fence posts and wire fence or prefabricated units in accordance with New York guidelines for urban erosion and sediment control.

C. Stakes and Fasteners

   1. Shall be two #3 rebar or two 2-inch by 2-inch minimum hardwood stakes for each straw bale.

   2. Shall be a minimum of 2-inch by 2-inch by 48-inch hardwood post for silt fences.

D. Erosion Control Fabric - North American Green Type S75 or equal shall be used.

2.02. PRODUCTS

A. Mulch and Seeding - Mulch and seeding shall be in accordance with requirements of Tables 1 through 4 of this section.

2.03. MISCELLANEOUS BEST MANAGEMENT PRACTICES

A. Catch basin inlet protection.

B. Stone

C. Geotextiles.

D. Sump pit.

E. See Contract Drawings for specifications.

PART 3 EXECUTION

3.01. GENERAL REQUIREMENTS

A. General drawings do not show all of the necessary control measures to prevent erosion and sedimentation.

1. The Drawings only show several techniques such as straw bale and silt fence details. There are a number of control techniques discussed in this Section.

2. It is the Contractor's responsibility to design, implement and maintain erosion and sedimentation control measures which effectively prevent accelerated erosion and sedimentation.

B. Earthmoving activities shall be conducted in such a manner as to prevent accelerated erosion and sedimentation.

C. All erosion and sedimentation control measures shall be inspected by the Contractor daily and immediately after periods of rainfall.

1. Repair and/or maintenance of sedimentation and erosion control measures will be made as soon as needed.

2. The Contractor will be held responsible for the implementation and maintenance of all control measures on this site.

D. Land disturbance shall be kept to a minimum.

1. Restabilization will be scheduled immediately after any disturbance.

E. Silt fences or straw bales will be installed along the toe of all critical cut and fill slopes.

F. Catch basins shall be protected with silt fences or straw bales throughout the construction sequence and until all disturbed areas are stabilized.

G. Erosion and sedimentation control measures shall be installed prior to all construction activities.

H. Sediment removal from control structures shall be the responsibility of the Contractor.

1. Sediment shall be disposed of in a manner which is consistent with overall intent of plan and which does not result in additional erosion.

I. The erosion and sedimentation control measures described herein are intended as a general guide for the Contractor.

1. It is the Contractor's responsibility to provide any and all work necessary to prevent erosion of soil from the construction site and to provide silt fences, straw bales or other control measures as the need arises during construction at no additional cost to the Owner.

J. Remove all sedimentation and erosion control barriers after completion of construction and permanent stabilization of erosion.

3.02. DIVERSION TERRACES – NOT USED.

3.03. TRENCH BARRIERS

A. Trench barriers shall be used where the disturbed area is sloped in the direction of the pipeline, when the slope exceeds 15 percent.

B. Trench barriers shall be earth-filled sacks or piled stone, stacked to the top of the trench after installation of the sewer and prior to backfill, if backfill is delayed.

C. Trench barriers shall act as an erosion check by preventing the washout of the trench.

D. Recommended Dimensions and Materials

Height - To top of trench
Spacing - Approximately every 150 feet
Material - Earth-filled sacks or piled stones

3.04. SEDIMENT BARRIERS

A. Sediment barriers shall be used at storm drain inlets; across minor swales and ditches; and at other applications where the structure is of a temporary nature and structural strength is not required.

1. Sediment barriers are temporary berms or other barriers that are constructed to retain sediment on-site by retarding and filtering storm runoff.

B. Recommended Materials and Dimensions

1. Straw Bales

a. Bales should be bound with twine.

b. Bales should be anchored to the ground with fence posts, wood pickets, or #3 rebar. Two anchors per bale are required.

c. Bales shall be installed so that runoff cannot escape freely under the bales.

d. Height - 1.5 feet

Width - 1.5 to 3.0 feet

Cross-Sectional Area Required Per Tributary Acre - 50 square feet

2. Stone

a. Height - 1.5 to 2.0 feet (uniform top elevation) top

Width - 3 to 5 feet

Side Slopes - 3:1 or flatter

Cross-Sectional Area Required Per Tributary Acre - 20 square feet

Material - Coarse rock or stone

3. Silt Fence

a. Synthetic fabric 48 inches wide for fencing material.

b. Hardwood stakes shall be minimum 2-inch diameter or be spaced at 8 to 10 feet apart for posts.

c. Height - ±30 inches above ground.

3.05. MULCH

A. Used alone or in conjunction with other structural or vegetative erosion control measure, mulch is applied on any disturbed area which is subject to erosion, for protection of disturbed soil or newly reseeded areas.

3.06. EROSION CONTROL FABRIC

A. Erosion control fabric shall be used on slopes greater than 10 percent. Prior to installation of the erosion control fabric, the underlying layer is to be graded as shown on the Drawings.

3.07. VEGETATION

A. Temporary Vegetation

1. The planting of temporary vegetative cover shall be performed on disturbed areas where the earthmoving activities will be ceased for a period of more than 45 days.

a. The vegetation shall provide short-term rapid cover for the control of surface runoff and erosion, until permanent vegetation can be established or earthmoving activities can resume.

2. Table 2 gives recommended types of temporary vegetation, corresponding rates of applications, and planting seasons.

a. In situations where other cover is desired, the recommendations of the local and County Conservation Districts shall be followed.

B. Permanent Vegetation

1. Planting of various permanent vegetative covers shall be performed on disturbed areas where the earthmoving activities have ceased. The vegetation shall reestablish ground cover for the control of surface runoff and erosion.

2. The seed bed for permanent vegetative cover shall be prepared by using lime and fertilizer.

   a. If the time of the seeding occurs during a dry period, mulch shall be applied to conserve soil moisture.

3. Tables 3 and 4 give recommended procedures for establishing various types of permanent vegetation.

   a. The tables are differentiated by the drainage of the disturbed area.

   b. In situations where other cover is desired, the recommendations of the County Conservation Districts shall be followed.

TABLE 1

MULCH MATERIALS, RATES AND USES

MULCH MATERIAL	QUALITY STANDARDS	APPLICATION PER 1,000 SQ.FT.	RATES PER ACRE	DEPTHS OF APPLICATION
Straw	Air-dried Free from coarse	75-100 lbs. 2-3 bales	1.5-2.5 tons 90-120 bales	Lightly cover 75 to 90% of surface
Wood chips	Green or air-dried	500-900 lbs.	10-20 tons	2" - 7"

TABLE 2

TEMPORARY SEEDINGS FOR EROSION CONTROL OF CONSTRUCTION SITES

SPECIES OR MIXTURE FOR TEMPORARY COVER	PERCENT BY WEIGHT	SEEDING RATES IN LBS. PER 1,000 SQ.FT.	RECOMMENDED SEEDING DATES
Annual Rye Grass	100%	1	April 1 to June 1 and August 15 to October 15
Field Broomegrass	100%	1	March 1 to June 15 and August 15 to September 15
Sundangrass	100%	1	May 15 to August 15

TABLE 3

PERMANENT SEEDINGS FOR WELL DRAINED AREAS

SPECIES OR MIXTURE FOR PERMANENT COVER	PERCENT BY WEIGHT	SEEDING RATES IN LBS. PER 1,000 SQ.FT.	RECOMMENDED SEEDING DATES
Ryegrass	100%	1	April 1 to October 15
Tall Fescue	100%	1 to 2	April 1 to October 15
Timothy	100%	1	April 1 to October 15
Tall Fescue or Ryegrass Crownvetch(1)	66% 34%	1 to 2	April 1 to July 15
Creeping Red Fescue and Crownvetch	67% 33%	1 to 2	April 1 to May 24
Flat Pea and Tall Fescue or(2)) Ryegrass	66 (80)% 34 (20)%	1 to 2	April 1 to July 15

(1) Inoculate legume seeds - use four times the normal rate when hydroseeding.
(2) When seedings are mulched, seeding may be extended from October 15 to April 1 for dormant seedings and April 1 to September 15 for regular seedings.

TABLE 4

PERMANENT SEEDINGS FOR AREAS OF VARIABLE DRAINAGE

SPECIES OR MIXTURE FOR PERMANENT COVER	PERCENT BY WEIGHT	SEEDING RATES IN LBS. PER 1,000 SQ.FT.	RECOMMENDED SEEDING DATES
Tall Fescue Birdsfoot	67%	1 to 2	April 1 to June 15
Trefoil	33%		
Tall Fescue Birdsfoot(2) Trefoil Crownvetch(1)	55% 25% 20%	1 to 2	April 1 to June 15

(1) Inoculate legume seeds - use four times the normal rate when hydroseeding.
(2) When seedings are mulched, seeding dates may be extended from October 15 to April 1 for dormant seedings and April 1 to September 15 for regular seedings.

3.08. SPECIAL CONDITIONS

A. Prohibited Construction Practices - Prohibited construction practices include but shall not be limited to the following:

1. Dumping of spoil material into any stream corridor, any wetlands, any surface waters or at unspecified locations, even with permission of the property owner.

2. Indiscriminate, arbitrary or capricious operation of equipment in any stream corridors, any wetlands or any surface waters.

3. Pumping of silt-laden water from trenches or other excavations into any surface waters, any stream corridors, any wetlands or stormsewer.

4. Damaging vegetation adjacent to or outside of the access road or the right-of-way.

5. Disposal of trees, brush and other debris in any stream corridors, any wetlands, any surface water or at unspecified locations.

6. Permanent or unspecified alteration of the flow line of the stream.

7. Open burning of construction project debris.

B. Defective Devices - Any erosion and sediment control devices which become damaged, clogged or otherwise non-functional shall be immediately replaced by the Contractor, without additional compensation.

C. Adjustment

1. If the planned measures do not result in effective control of erosion and sediment runoff to the satisfaction of the regulatory agencies having jurisdiction over the project, the Contractor shall immediately adjust his program and/or institute additional measures so as to eliminate excessive erosion and sediment-runoff.

2. If the Contractor fails or refuses to comply promptly, the Owner may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to any such stop orders shall be made the subject of a claim for extension of time or for excess costs or damages by the Contractor.

END OF SECTION

SECTION 01600

MATERIALS AND EQUIPMENT

PART 1 GENERAL

1.01. SECTION INCLUDES

A. Products.

B. Shipping and handling.

C. Storage and protection.

D. Substitutes.

1.02. PRODUCTS

A. Do not use materials and equipment removed from existing premises, except as specifically permitted by the Contract Documents.

B. Provide interchangeable components of the same manufacturer, for components being replaced.

1.03. SHIPPING AND HANDLING

A. Arrange deliveries in accordance with the Progress Schedule.

B. Coordinate deliveries to avoid conflicts with Work, conditions at the Site, work of other contractors, work of Owner, and availability of personnel and handling equipment.

C. Transport by methods to avoid damage.

D. Deliver in manufacturer's unopened containers or packaging, dry, with identifying labels intact and legible.

E. Provide equipment and personnel for handling to prevent soiling and damage.

F. Protect sensitive equipment and finishes against impact, abrasion and other damage.

G. Promptly inspect shipments to assure compliance with requirements, correct quantities, and identify damage.

1.04. STORAGE AND PROTECTION

A. Store and protect in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive items in weather-tight, climate controlled enclosures in an environment favorable to item.

B. For exterior storage of fabricated items, place on sloped supports, above ground.

C. Provide bonded off-site storage and protection when storage and protection cannot be provided on Site.

D. Cover items subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation.

E. Store loose granular materials on solid flat surfaces in a well drained area. Prevent mixing with foreign matter.

F. Provide equipment and personnel to store items by methods that prevent soiling, disfigurement, and damage.

G. Arrange storage to permit access for inspection. Periodically inspect to assure items are undamaged and are maintained in acceptable conditions.

1.05. SUBSTITUTES

A. Submit three copies of requests for substitution to Engineer including all items required by General Conditions Article 6.05. Each submittal shall be provided with a transmittal letter stating “REQUEST FOR SUBSTITUTION” and identifying the specific item for which the substitution is being requested.

B. Limit each request to one proposed substitute item.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

SECTION 01700

CONTRACT CLOSEOUT

PART 1 GENERAL

1.01. SECTION INCLUDES

A. Closeout procedures.

B. Final cleaning.

C. Adjusting.

D. Project record documents.

E. Operation and maintenance data.

F. Warranties and bonds.

G. Spare parts and maintenance materials.

1.02. CLOSEOUT PROCEDURES

A. Contract closeout procedures shall be in accordance with GC-14.07.

1.03. RECORD DOCUMENTS

A. The following supplements the requirements of GC-6.12:

1. Recording, keep, and monitor up to date record documents of work constructed in the field. Legibly mark in red ink or red pencil to show all changes in, or directly associated with, the Work of this Contract. Keep entire set or record documents current on a day to day basis. Record documents shall be kept on hand in the Contractor's field office and shall be available for periodic examination by Engineer upon request.

2. Final Record Drawings - Provide the pipe sizes and horizontal and vertical location of all valve boxes, air release valves, curb boxes, meter pits, fire hydrants, blowoffs, corporations, fittings, and other appurtenances. The information will be provided digitally in the form of an ASCII file and consistent with the plan datum and control as shown on the Drawings. The ASCII file shall be in the following format: Point No., Northing, Easting, Elevation, Description. The Contractor will employ the services of a registered professional surveyor licensed in the State of New York to provide the information.

3. Examples of annotations that could occur are as follows:

a. Change in location or elevations of underground facilities installed under this contract.

b. Change in materials, such as pipe materials.

c. Relocation of existing underground facilities.

d. Change in elevations of finished surfaces along route of installed underground facilities.

4. Show measurement of pipeline location from edge of pavement, at a minimum of 100-foot intervals.

B. At Substantial Completion, affix Contractor's red identification stamp to front cover of each set of record documents and label them as "Record Documents." One set of record documents shall be given to Engineer no later than 14 days after the date of Substantial Completion. Engineer will either approve record documents or return them to Contractor with comments. Contractor shall resubmit record documents until Engineer has no further comments. Affix Contractor's identification stamp, together with the label "Record Documents," as follows:

1. On each Drawing, just above the Engineer's title block.

2. On each Shop Drawing, just above the preparer's title block.

3. On the front cover or front page of all other documents.

C. Final payment to Contractor will not be considered until acceptable record documents have been turned over to Owner."

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

SECTION 02030

DEMOLITION

PART 1 GENERAL

1.01. SECTION INCLUDES

A. Demolition and removal of site-related construction.

B. Demolition and removal of piping.

1.02. RELATED SECTIONS

A. Section 01010 - SUMMARY OF WORK: Work sequence and Owner's continued occupancy.

B. Section 01039 - COORDINATION AND MEETINGS

C. Section 01300 - SUBMITTALS

D. Section 01500 - CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS: Temporary enclosures, dust control, barricades, security at Owner-occupied areas, and cleanup during demolition operations.

E. Section 01700 - CONTRACT CLOSEOUT: Project record documents.

F. Section 02225 - TRENCHING: Fill material.

1.03. SUBMITTALS

A. Submit under provisions of Section 01300.

B. Shop Drawings

1. Submit proposed demolition plan together with any necessary diagrams and/or drawings, taking into account Owner's continuing occupancy and sequence of construction of the project.

2. Demolition plan shall include the following:

a. Demolition, removal, and disposition of items identified in this section.

b. Disposal locations of removed items.

c. Relocation of salvageable items.

d. Time lines and sequences of operations.

e. Location of temporary barricades, fences, and signs.

1.04. PROJECT RECORD DRAWINGS

A. Submit under provisions of Section 01700.

B. Accurately record actual locations of capped utilities and subsurface obstructions.

1.05. REGULATORY REQUIREMENTS

A. Conform to applicable codes for demolition of structures, protection of adjacent structures, dust control, runoff control, and disposal of materials.

B. Obtain required permits from authorities.

C. Notify affected utility companies before starting demolition operations and comply with their requirements.

D. Do not close or obstruct roadways, sidewalks, hydrants, and parking areas without required permits.

E. Conform to applicable regulatory procedures if a hazardous environmental condition is encountered at site or if hazardous material disposal is required.

1.06. HAZARDOUS ENVIRONMENTAL CONDITIONS

A. If an unknown unforeseeable hazardous environmental condition is encountered at the site, or if Contractor or anyone for whom Contractor is responsible creates a hazardous environmental condition, immediately:

1. Secure or otherwise isolate such condition;

2. Stop all Work in connection with such condition and in any area affected thereby; and

3. Notify Owner and Engineer (and promptly thereafter confirm such notice in writing).

B. Resume Work in connection with such condition or in any affected area only after Owner has obtained any required permits related thereto and delivered to Contractor a written notice specifying under what special conditions Work may be resumed safely.

1.07. SEQUENCING

A. Sequence demolition work to conform with provisions of Section 01010.

PART 2 PRODUCTS

2.01. FILL MATERIALS

A. Fill Material - As specified in Section 02225.

PART 3 EXECUTION

3.01. PREPARATION

A. Thirty days prior to performing any demolition, there shall be a coordination meeting between the Contractor, Owner, and Engineer to discuss the Contractor's Demolition Plan and related procedures. Items to be discussed shall be, but not limited to, dust control, sequence of work, removal of material, protection of existing equipment, access and egress of material, etc.

Demolition procedures must be coordinated with the Owner's operating personnel and operations, and adjusted accordingly, if necessary.

Following the coordination meeting, begin demolition operations after obtaining written authorization to proceed from the Owner.

B. Notify Owner and Engineer at least 48 hours in advance of intended start of demolition operations in each affected area.

C. Provide, erect, and maintain temporary barriers, signs, and security devices where required.

D. Erect and maintain temporary partitions and weatherproof closures to prevent spread of dust, odors, and noise in areas of continued Owner occupancy identified in Section 01010.

E. Protect existing structures, equipment, appurtenances, architectural features, and materials which are not to be demolished. Prevent movement or settlement of adjacent structures.

F. Protect existing site-related items such as pavements, walkways, parking areas, curbs, aprons, and landscaping features which are not to be demolished.

G. Protect existing electrical; heating, ventilating, and air conditioning; and plumbing systems, including related components, which are not to be demolished.

H. Mark location of underground utilities.

3.02. DEMOLITION REQUIREMENTS

A. Confine demolition operations to designated areas of the site.

B. Conduct operations to minimize interference with adjacent and occupied building areas. Maintain protected egress and access at all times.

C. Cease operations immediately if adjacent structures appear to be in danger. Notify Engineer. Do not resume operations until directed.

D. All materials, except rubble and non-metallic scrap, shall become the property of the Owner and be disposed of in accordance with the schedule in Article 3.04.

E. Dispose of rubble and non-metallic scrap at an off-site area in accordance with local laws.

F. Dispose of designated hazardous materials in accordance with the nature of the material, required handling and disposal procedures, regulatory requirements, and applicable permits.

3.03. DEMOLITION

A. Break up and remove slabs-on-grade, pavements, curbs, aprons, etc., and related items in designated areas.

B. Empty and remove buried tanks, meter pits, and associated piping.

C. Backfill, compact, and rough grade areas excavated, including cavities created by removal of demolished items, in accordance with Section 02225 using fill material specified in Part 2.

D. Disconnect cap, and identify utilities within demolition areas.

E. Remove designated buried sewer and storm drain piping systems, capping with concrete plugs those segments to be abandoned, and provide temporary capping of those segments to be reused.

F. Carefully disconnect support, protect, and remove hydrants and designated valves to be salvaged for Owner's future use.

G. All removed materials and equipment designated for reuse on the Project, or salvaged for Owner's future use, shall be stored at locations indicated in Article 3.04 and protected from damage and from deterioration by weather.

H. Remove and dispose of demolished materials as work progresses. Do not burn materials; do not bury materials unless otherwise specified in Article 3.04.

I. Patch and refinish existing visible surfaces which are to remain in accordance with Section 01039, and otherwise restore adjacent surfaces as specified in Article 3.04.

J. Remove temporary barricades, partitions, signs, etc.

K. Upon completion of demolition operations, leave areas in a clean condition.

3.04. SCHEDULES

A. Site-Related Construction

1. Pavements, walks, steps, curbs, aprons, and other slab-on-grade.

2. Underground tanks, vaults, meter pits.

3. Underground water piping, valves, and valve boxes.

4. Fencing, gates, signs, posts, barriers, etc.

5. Filling below-grade cavities and excavations (created by removed items) with approved material(s).

B. Piping

1. Equipment, supports, anchors, concrete pads, and associated items.

2. Piping, fittings, valves, hangers, concrete supports and associated items.

3. Meters, gages, recording instruments, and other measuring devices.

4. Disconnecting and capping of identified utilities.

5. Domestic water supply piping, fittings, valves, and supports.

6. Plumbing specialties, such as hydrants, backflow preventers, and water hammer arrestors.

END OF SECTION

SECTION 02112

PAVEMENT CUTTING

PART 1 GENERAL

1.01. SECTION INCLUDES

A. Pavement cutting.

B. Pavement scoring.

C. Pavement (concrete) breaking.

D. Pavement grinding.

E. Pavement removal and disposal.

1.02. REFERENCES

A. NYSDOT - Manual of Uniform Traffic Control Devices.

1.03. RELATED SECTIONS

A. Section 01025 - UNIT PRICE ITEMS: Requirements applicable to unit prices for the work of this section.

B. Section 01026 - LUMP SUM ITEMS: Requirements applicable to lump sum prices for the work of this section.

C. Section 01500 - CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

D. Section 01550 - MAINTENANCE AND PROTECTION OF TRAFFIC

E. Section 02110 - SITE CLEARING

F. Section 02225 - TRENCHING

G. Section 02510 - HOT MIX ASPHALT PAVING

1.04. REGULATORY REQUIREMENTS

A. Coordinate pavement cutting with utility companies.

B. Conform to applicable local and state codes for legal disposal of pavement materials.

C. Refer to Section 02110 for requirements of disposal of surplus material.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.01. PREPARATION

A. Notify local officials, Fire and Police Departments of streets to be blocked off, detours or restrictions to maintaining of traffic on a daily basis.

B. Set up barricades, warning signs and traffic direction information prior to start of pavement cutting.

C. Provide flagmen to direct traffic.

3.02. PAVEMENT CUTTING AND BREAKING

A. Pavements covering those areas to be excavated shall be broken up, removed, and then disposed of in accordance with Article 1.04 above. All paved areas shall be first cut or scored continuously along a straight line, parallel to and on each side of the centerline of the trench or excavation, at a width sufficient for the trench excavation or structure excavation.

B. Pavement cuts in concrete pavement or pavement with a concrete base shall be made by scoring or cutting the concrete with a concrete saw. The depth of the saw cut shall be to the full depth of the concrete pavement thickness. Before excavation, the concrete pavement shall then be broken up with hand operated, pneumatic paving breakers, or mechanical drop hammers designed for such purpose, providing they may be used without endangering existing utilities or causing undesirable vibrations. “Headache balls” will not be permitted for breaking up concrete pavement.

C. Pavements cuts in blacktop pavement shall be made by scoring or cutting the pavement with a concrete saw, wheel cutter, pneumatic paving breaker or drop hammer type pavement cutter. The pavement cut must be continuous, and made for the full depth of the pavement.

D. Pavement cuts in driveways shall be made in a straight alignment perpendicular or parallel to the driveway and for its full width.

E. Pavement cuts in parking areas shall be made in a straight alignment parallel to the centerline of trench.

3.03. PAVEMENT GRINDING

A. Where shown on the Contract Drawings, the Contractor shall remove a portion of an existing pavement including Portland cement concrete pavement, asphalt Portland cement concrete pavement base course, to the limits and profile specified by grinding, milling, or planing methods. This process shall yield a base upon which a final pavement course will be applied. The Contractor shall employ equipment especially designed and manufactured for the grinding, milling or planing of pavements.

B. The resulting ground, milled or planed surface shall be thoroughly cleaned and free from dust, loose pavement material or other material. The surface shall be free from gouges, large cracks and unsound, soft or broken-up areas. Gouges from lack of proper control of the grinding, milling or planing machine shall be made level and true by the use of a trueing and leveling course of asphalt concrete if allowed by the Engineer. Cracks greater than 1/4-inch shall be cleaned and filled in accordance with NYSDOT Specification 633.302 referenced above. Unsound, soft or broken-up areas shall be excavated and repaired.

C. Contractor shall dispose of all asphalt concrete removed by grinding.

END OF SECTION

SECTION 02141

REMOVAL OF WATER

PART 1 GENERAL

1.01. SECTION INCLUDES

A. Providing equipment, materials and labor required to successfully complete the work included in this section.

B. Maintaining and operating pumps and related equipment, including standby equipment, of sufficient capacity to adequately perform dewatering as required by this section.

C. Lowering the groundwater table elevation.

D. Intercepting seepage from excavation slopes.

E. Controlling groundwater flow that may adversely affect excavation or construction activities.

F. Collecting, removing and disposing of all excess groundwater.

G. Collecting, removing, and disposing of all wastewater.

H. Removing and/or disposing of spoil, excess materials, equipment, trash and debris used for or resulting from the work included in this Section.

1.02. RELATED SECTIONS

A. Refer to Article 4 of the Supplementary Conditions for identification of report on subsurface investigation.

B. Section 01025 - UNIT PRICE ITEMS: Requirements applicable to unit prices for the work of this section.

C. Section 01026 - LUMP SUM ITEMS: Requirements applicable to lump sum prices for the works of this section.

D. Section 01500 - CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

E. Section 01564 - EROSION CONTROL

F. Section 02225 - TRENCHING

1.03. REGULATORY REQUIREMENTS

A. Conform to applicable local and state codes for legal disposal of water.

B. Temporary water supplies shall meet requirements of local, state and federal regulatory agencies.

C. Conform to applicable OSHA standards.

1.04. WELLPOINT DEWATERING SYSTEM

A. If wellpoint dewatering methods are proposed by Contractor, he shall prepare a plan of dewatering system and discuss plan with Owner and Engineer. Review or comments by Owner and Engineer concerning the proposed plan shall not relieve Contractor of his responsibilities for dewatering his excavations in conformance with this section of the specifications.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.01. PREPARATION

A. Review the subsurface investigation report and become familiar with the groundwater conditions at the site. Allocate sufficient time and use appropriate procedures based on these conditions for dewatering excavations.

B. If necessary, arrange for water sampling and analysis of each water supply source which may be affected by dewatering operations and submit a copy of the results to the Engineer.

C. Examine adjacent structures and utilities, both existing and under construction, for possible settlement, movement or other adverse effects resulting from dewatering methods or water removal. Take necessary precautionary steps to protect such structures and utilities.

D. Should the drawdown of groundwater levels by removal or dewatering systems critically reduce or disrupt public or private water supplies, the Contractor shall be prepared to:

1. Provide adequate potable water to the Owners or users of the affected water supplies until groundwater levels have recovered, so as to sufficiently restore those deficient water supplies.

2. Provide to the Engineer documentation to confirm that temporary water supplies meet the requirements of local, state and federal regulatory agencies.

3.02. REMOVAL OF WATER

A. Assume responsibility for site, surface and subsurface drainage. Maintain such drainage as specified herein during the life of the contract.

B. Supply all supervision, labor, material, equipment, including standby equipment, necessary to maintain a dry excavation as may be necessary to construct the project.

C. Maintain groundwater in or below the bearing strata at a safe level at all times by methods which prevent loss of fines, which preserves the undisturbed state of subgrade soils and which sufficiently lowers the groundwater level in permeable strata at or below excavation and fill levels such that blowing or unstable conditions do not develop in the bottom or sides of excavation or fill areas.

D. Protect all adjacent structures, existing and under construction, from settlement, flotation, damage or other adverse effects resulting from water removal or dewatering methods.

E. Install all drains, ditching, sluiceways, pumping and bailing equipment, wicking, sumps, wells, well points, cutoff trenches, curtains, sheeting and all other equipment and structures necessary to create and maintain a dry excavation and a groundwater level at a minimum of 2 feet below excavation subgrades.

1. As part of any dewatering system, observation wells or piezometers shall be provided and installed, as required, to effectively and efficiently monitor drawdown to required levels.

F. Discharge water removed from the site to natural watercourses, storm drains, or channels.

1. Large quantities of water shall not be discharged as overland flow. Overland flow is not permitted onto private property.

2. Discharge water shall be removed in accordance with NYSDEC guidelines.

3. Wastewater shall be disposed of in a manner satisfactory to the local Public Health Officer.

G. Dewatering operations shall cease when all foundations, structures, pipe installations and other excavated areas have been properly backfilled and compacted, and are safe from damage, flotation, settlement and displacement.

3.03. MAINTENANCE

A. Operate and maintain dewatering and removal operations on a 24-hour basis for the time required to complete that portion of the Work which requires dewatering prior to its construction and which requires protection from flotation or displacement of such Work until proper backfilling and compaction is completed.

3.04. REMOVAL

A. After groundwater levels have returned to elevations appropriate for conditions and time of year, without causing damage to the work, remove all dewatering equipment and related equipment from the site and restore site to original conditions or rehabilitate site to meet requirements of Contract Documents.

END OF SECTION

SECTION 02161

SHEETING AND BRACING

PART 1 GENERAL

1.01. SECTION INCLUDES

A. Sheeting and bracing installation, removal, and left in place.

B. Design requirements.

C. Regulatory codes and requirements.

D. Special Conditions.

E. Materials.

1.02. RELATED SECTIONS

A. Section 01025 - UNIT PRICE ITEMS: Requirements applicable to unit prices for the work of this Section.

B. Section 01026 - LUMP SUM ITEMS: Requirements applicable to lump sum prices for the work of this Section.

C. Section 01500 - CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

D. Section 02141 - REMOVAL OF WATER

E. Section 02225 - TRENCHING

F. Section 02226 - ROCK REMOVAL

G. Section 02228 - COMPACTION

1.03. REGULATORY REQUIREMENTS

A. All sheeting and bracing including the use of mobile shields shall conform to Public Law 91-596 (Williams Steiger Act); the Occupational Safety and Health Administration Act (OSHA) of 1970 and its amendments and regulations; or to the New York State Industrial Code Rule 23, entitled "Protection in Construction, Demolition and Excavation Operations" as issued by New York State Department of Labor, Board of Standards and Appeals; whichever is the most stringent.

B. Conform to New York State Industrial Code Rule 53, entitled "Construction, Excavation and Demolition Operations at or Near Underground Facilities" as issued by the State of New York Department of Labor, Board of Standards and Appeals.

1.04. REFERENCES

A. ASTM A6/A6M - General Requirements.

B. ASTM A328 - Steel Sheet Piles.

C. NFPA - National Forest Products Association.

PART 2 PRODUCTS

2.01. MATERIALS

A. Wood - Tongue and groove, #3 Common Douglas Fir or Hemlock or Utility grade Southern Pine; NFPA grading or equal, meeting the requirements of the NFPA.

B. Steel - ASTM A36 as required by ASTM A328.

C. Trench Boxes - Fabricated steel or aluminum.

PART 3 EXECUTION

3.01. PROTECTION

A. When so designated on the drawings or stated in the specifications or to comply with local, state, or federal (OSHA) regulations, or when sloped excavations are not feasible, not possible or allowed or if excavations endanger adjacent facilities, sheeting and bracing shall be installed by the Contractor.

3.02. DESIGN REQUIREMENTS

A. All sheeting and bracing shall be designed and monitored by a professional engineer licensed in New York State.

B. Design shall include all loading conditions to which the sheeting and bracing will be subjected during construction.

C. Design sheeting and bracing systems against failure from the maximum loads that will occur during construction, including surcharge loads and additional loading due to construction equipment.

D. Design sheeting and bracing systems to enable safe construction of structures, utilities and appurtenances, and prevent excessive ground loss, displacement of adjacent foundations, and displacement of the bottom of the excavation.

3.03. INSTALLATION

A. Provide all materials, equipment and labor necessary to construct and maintain all required excavation support systems.

B. Sheeting and bracing support systems shall include, but shall not be limited to, wall support such as wood sheeting, ringwales, lagging, soldier piles, steel sheeting, trench boxes and bracing members such as stringers, wales, struts, rakers, shores, tieback anchors, etc. necessary to prevent damage to the work and for the safety of workers, the general public or adjacent property.

C. No excavation shall be performed below a line drawn down and away at a slope of two horizontal and one vertical from the nearest footing or grade beam of the existing building or as shown on the Drawings without providing sheeting, shoring and bracing to provide lateral

support for soils beneath the foundations of the building and to prevent damage to the building.

D. Design of bracing shall be such as to permit proper construction of the walls and footings and proper installation of the utilities as shown on the Drawings.

E. Sheeting shall not be driven while concrete is being placed, or within 24 hours after placement, nor during pile load testing.

F. Do not brace to concrete without written approval of the Engineer.

G. Install sheeting and bracing systems in a logical sequence as excavation operations are performed.

1. If a prefabricated mobile shield is used, the bottom of the shield shall be maintained as high as possible (preferably above the spring line of the pipe, maximum 2 feet) to prevent disturbance of the bedding material and tension forces on pipe joints.

2. Openings or troughs created by the use of a shield shall be filled and compacted in accordance with Sections 02225 and 02228.

3.04. MAINTENANCE

A. Maintain sheeting and bracing systems as functional on a 24 hour basis.

B. Provide a means of determining movement of excavation walls, and adjacent soil, buildings and structures and utilities.

1. If movement or damage occurs, immediately cease all construction activities, install temporary measures to prevent further movement or damage and notify the Engineer.

2. Movement or damage due to failure of sheeting and bracing systems shall be permanently repaired as soon as possible, at no cost to the Owner and at no additional cost for time.

3.05. REMOVAL

A. Remove sheeting and bracing as the work progresses in a manner which shall prevent damage to finished work, adjacent structures and property.

1. All voids created by removal of sheeting and bracing shall be filled and compacted in accordance to the guidelines of Sections 02225 and 02228.

B. Sheeting to be left in place shall be new and unused material. Where shown on drawings, specified or approved, sheeting shall be cut off as specified, or a minimum of 2-1/2 feet below proposed final grade.

1. Contractor may elect to leave sheeting and bracing in place (cut off as described above) if he elects to do so at his own expense and with Engineer's approval.

2. Provide to the Engineer a drawing of cut-off sheeting locations. Drawing should show site plan with dimensioned locations of sheeting, type of material remaining, and depths or elevations to top and bottom of remaining sheet.

END OF SECTION

SECTION 02205

PROTECTION OF EXISTING FACILITIES

PART 1 GENERAL

1.01. SECTION INCLUDES

A. Location of facilities.

B. Notification of owners and authorities.

C. Coordination and preparation.

D. Protection of facilities.

E. Relocation of facilities.

F. Protection of storm drains.

G. Protection of water mains near sewers.

H. Abandonment of utilities.

I. Restoration of property markers.

1.02. RELATED SECTIONS

A. General Conditions: Article 4, Paragraphs 4.02, 4.03 and 4.04; Article 6, Paragraph 6.20.

B. Section 01039 - COORDINATION AND MEETINGS: Preconstruction meeting.

C. Section 01300 - SUBMITTALS: Construction photographs.

D. Section 02225 – TRENCHING

E. Section 02161 - SHEETING AND BRACING

F. Section 02226 - ROCK REMOVAL

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.01. LOCATION OF FACILITIES

A. Prior to construction, verify location of existing underground facilities near or adjacent to project.

1. Consult with appropriate Underground Facilities Protection Organization (Dig Safely NY) and owners of facilities and arrange for field stake-out or other markings to show locations.

2. Perform exploratory excavation at key junctures and other critical points to aid in ascertaining locations.

B. Report field stake-out findings and results of exploratory excavations to Engineer if possible changes in project location or design are indicated because of suspected interferences with existing facilities. Allow Engineer sufficient time to determine magnitude of changes and to formulate instructions in that regard.

C. If location of an existing underground facility is uncertain, apply careful excavation and probing techniques during construction to locate and avoid damage to same.

3.02. NOTIFICATIONS OF OWNERS AND AUTHORITIES

A. Prior to construction, notify owners of existing facilities, including local Police and Fire Departments, of general scope, nature and planned progress schedule of the Work.

B. Notify owners of nearby underground facilities when excavating is to take place in a particular area, allowing them reasonable time to institute precautionary procedures or preventive measures which they deem necessary for protection of their facilities.

C. When existing utilities, such as sewer, water, gas, telephone or electric power are damaged or disturbed during construction, immediately notify affected utility Owner and Project Owner.

D. Notify Police and Fire Departments, including affected owners, immediately if hazardous conditions are created or have the potential for occurring, as a result of damage to an existing facility or as a result of other activities at project site. Hazardous conditions could be created from: fire, explosion, escape of gas, escape of fuel oil, gasoline or industrial fluids, downed electrical wires, and disrupted underground electrical cables.

3.03. COORDINATION AND PREPARATION

A. Discuss anticipated work schedule with local authorities and owners of utilities at preconstruction meeting, including procedures to be followed if one or more utilities are damaged or disrupted. Develop contingency plans to address Contractor's role in repair of damaged utilities.

B. Make preparations beforehand to repair and restore damaged utilities, including arrangements for standby materials and equipment to be promptly assembled at site and utilized immediately.

C. Adjust work schedules and personnel assignments as necessary to conform with requirements of utility owner whose utility is to be temporarily interrupted during construction. Cooperate with utility owner in this regard to minimize the time of interruption.

D. Make preparations for and conform to applicable requirements of New York State Industrial Code Rule 53 (as amended April 1, 1975) entitled, "Construction, Excavation and Demolition Operations at or Near Underground Facilities," issued by State Department of Labor.

3.04. PROTECTION OF FACILITIES

A. Plan and conduct construction operations so that operation of existing facilities near or adjacent to the Work, including electric, telephone, sewer, water, gas or drainage utilities, are sustained insofar as the requirements of the project will permit.

B. Protect existing facilities from damage or movement through installation of adequate support systems and use of proper equipment, including application of careful excavation and backfilling techniques in sensitive areas.

C. Existing utilities and other facilities which are damaged by the Contractor's construction operations shall be promptly repaired by Contractor to the satisfaction of the affected owner or, if he so elects, that owner will perform the repairs with his own forces. Under either arrangement, such repair work shall be done at Contractor's expense.

D. When aboveground visible facilities such as poles, wires, cables, fences, signs or structures constitute an unavoidable interference, notify Engineer and consult with affected owner regarding temporary removal and later restoration of the interfering item. Arrange with that owner to remove and later restore the interfering item to the satisfaction of the owner, subject to approval of the project Owner; or, allow affected owner to perform such work with his own forces. Under either arrangement, such work shall be done at Contractor's expense.

E. Take all necessary precautions to prevent fires at or adjacent to the work, buildings, and other facilities. No burning of trash or debris is permitted.

F. During construction, if an existing water main is damaged or breaks due to construction activity, the Contractor shall be required to repair the existing main at his expense and will be required to pay for all testing requirements stipulated by the Westchester County Department of Health (WCDOH) prior to putting the main back in service. WCDOH testing requirements and approved testing laboratories are attached at the end of this section.

3.05. RELOCATION OF FACILITIES

A. If the location or position of an existing gas or water pipe, public or private sewer or drain, conduit or structure be such as, in the opinion of Engineer, to require its removal, realignment or change, such alteration shall be without cost to the Contractor for the work of removal, realignment or change only.

B. Uncovering, supporting and sustaining such facility before its removal or before and after its realignment or change, shall be the Contractor's responsibility as part of the work of his Contract.

C. Contractor shall be entitled to extension of time for completion of entire Work as the Engineer determines that the entire Work was delayed by the removal, realignment or change of such obstruction.

3.06. PROTECTION OF STORM DRAINS

A. Where existing storm drain systems are being replaced or interrupted, provide temporary bypass pumping or piping to maintain flow around that segment of the Work such that no back-ups occur in existing systems.

B. Maintain existing catch basins, and other utility structures in their pre-work condition. Any material or debris entering same due to the Contractor's operation shall be promptly removed.

3.07. PROTECTION OF WATER MAINS NEAR STORM SEWERS

A. Where a minimum 10-foot horizontal separation or minimum 18 inch vertical separation (bottom of water pipe to top of sewer pipe) cannot be maintained between a water main and storm sewer line, one or more of the following remedies shall be incorporated in the work:

1. The sewer lines shall be encased in 4,000 psi mix concrete for a length of 10 feet on either side of the water main.

2. Both the water main and sewer line shall be constructed of pressure type joints of ductile iron pipe, and shall be pressure tested to 100 psi to assure watertightness.

3. One full length of water main shall be centered over the sewer line, so that both joints will be as far from the sewer as possible.

4. Relocate water main to obtain 18 inches minimum vertical separation.

3.08. ABANDONMENT OF UTILITIES

A. Remove existing utilities to be abandoned within limits of trench excavation, or impinging on trench limits.

B. Open ends of abandoned utilities, or those scheduled for abandonment, shall be bulkheaded by brick masonry or 4,000 psi mix concrete; or by cast iron plugs or caps in small diameter water mains.

C. Abandoned manholes and water valve casings shall be backfilled to grade with approved trench backfill material.

D. Frames, covers, grates, water valve casing, sections of water piping, hydrants (including standpipe and boot) valves and other items to be abandoned shall, if ordered by Owner, be salvaged for reuse and be delivered to Owner's property yard.

3.09. RESTORATION OF PROPERTY MARKERS

A. Property corner markers, boundary monuments, etc., disturbed or moved by the Contractor's operation shall be restored, in conformance with the property deed description, by a licensed land surveyor. Restoration of the property corner markers or boundary monuments shall be certified by said surveyor on a map prepared by him which shows the work accomplished. One copy of the map shall be given to the property owner and one copy given to the project Owner.

END OF SECTION

WESTCHESTER COUNTY DEPARTMENT OF HEALTH WATER MAIN BREAKS AND REPAIRS NOTIFICATION, DISINFECTION AND BACTERIOLOGICAL SAMPLING PROTOCOL

Notification

Pursuant to Section 5-1.23(b) of the New York State Sanitary Code, the Westchester County Department of Health must be notified by the water supplier if a water main break or repair results in a water service interruption to:

- **a minimum of 25 individuals for any time period; or**
- **15 service connections for any time period, or**
- **1% of the total number of individuals served or service connections for four hours or more**

Health Department must immediately be notified of all water main breaks or repairs involving asbestos cement pipes.

If such repair is taking place and there is a possibility of the repair taking longer than 4 hours, the Health Department should be notified regardless of the number of individuals or service connections affected, before the four hour time period has passed.

It should be noted that a water supplier may elect to institute a policy where the Health Department is notified of all water main breaks or repairs.

Disinfection and Bacteriological Testing

Bacteriological testing must be performed for all water main repairs and replacement and satisfactory results obtained prior to returning water main to service (see attached).

Repaired water mains must be disinfected and bacteriological sampling must be performed in accordance with AWWA C651-05 Section 4.7. In addition, procedures attached **must** be observed.

The only situation where satisfactory bacteriological sampling results may not be required prior to returning water main to service is if both:

- The water main repair was performed with a "wraparound" repair clamp and no replacement of water main pipe was necessary in order to repair the leak; **and**
- The water main under repair was not wholly or partially dewatered, as while the pressure in the water main may be reduced in order to install the repair clamp, a net positive pressure was maintained in the water main throughout the repair process.

For pipe with opening, trench shall be treated with hypochlorite.

Placement of Repaired Water Main In Service

When a water main repair occurs in a section of pipe that was shut down without an interruption of water service to customers, this section of pipe must remain shut down until satisfactory bacteriological sample results taken 24 hours apart are available.

Water supply should contact the Health Department to discuss disinfection procedure to be utilized and whether or not the repaired water main should remain shut down until satisfactory bacteriological samples results are accepted by the Health Department.

For water main breaks or repairs involving asbestos cement pipes (transite pipes), see additional requirements below.

ASBESTOS CEMENT WATER MAIN BREAKS

Upon discovery of a water main break involving asbestos cement pipes (transite pipes), the following procedures must be followed:

1. Isolate water main break from the remainder of the distribution system.
2. Notify customers in the area of isolation not to use water for any purpose and shut off service lines to each customer in the affected area.
3. Notify the Health Department immediately of all asbestos cement water main breaks regardless of the number of customers or service connections affected by such breaks.
4. Before repairs are made collect water samples from locations within the isolated area for asbestos testing. Sample locations should be discussed with the Health Department. Testing must be performed by an ELAP certified laboratory.
5. Pipe repairs, replacement and/or corrective measures must be discussed with and agreed to by the Health Department before such repairs, replacement and/or corrective measures can be undertaken.
6. Water service connections in the isolated area must remain shut off until repairs, replacement and/or corrective measures are completed and satisfactory asbestos water sample test results are obtained.
7. Health Department approval must be secured before water service can be restored in the isolated area.
8. Potable water must be provided by alternate means to customers in the isolated area during the water service interruption.

DISINFECTION PROCEDURES FOR EXISTING WATER MAIN REPAIRS

- *Trench treatment*. When an existing water main is opened, either by accident or by design, the excavation will likely be wet and may be badly contaminated from nearby sewers. Liberal quantities of hypochlorite applied to open trench areas will lessen the danger from this pollution. Tablets have the advantage in this situation, because they dissolve slowly and continue to release hypochlorite as water is pumped from the excavation.

- *Swabbing with hypochlorite solution*. The interior of pipe and fittings (particularly couplings and sleeves) used in making the repair shall be swabbed or sprayed with a 1 percent hypochlorite solution immediately before they are installed.

- *Flushing*. Thorough flushing is the most practical means of removing contamination introduced during repairs. If valve and hydrant locations permit, flushing toward the work location from both directions is recommended. Flushing shall be started as soon as the repairs are completed and shall be continued until discolored water is eliminated. Turbidity and color must be determined and the Health Department must be consulted prior to returning water main to service.

- *Slug chlorination*. Where practical, in addition to the procedures previously described, the section of the main in which the break is located shall be isolated, all service connections shut off, and the section flushed and chlorinated with a slug of water dosed with chlorine to a concentration of 100 mg/L for a period of not less than 3 hr. (for detailed information, see AWWA C651-05 Section 4.4.4). The dose may be increased to as much as 300 mg/L and the contact time reduced to as little as 15 min. After chlorination, flushing shall be resumed and continued until discolored water is eliminated and the chlorine concentration in the water exiting the main is no higher than the chlorine concentration in the prevailing water in the distribution system or that which is acceptable for domestic use.

- *Bacteriological samples*. Bacteriological samples following procedures below shall be taken after repairs are completed to provide verification of the procedure's effectiveness. If the direction of flow is unknown, then samples shall be taken on each side of the water main break. If positive bacteriological samples are recorded, then the situation shall be evaluated by the water supplier who can determine corrective action. Sampling shall be continued until two consecutive negative samples are recorded.

BACTERIOLOGICAL TESTS FOR EXISTING WATER MAIN REPAIRS

- After final flushing and before the water main is connected to the distribution system, two consecutive sets of acceptable samples, taken at least 24 hr apart, shall be collected from the main. Samples shall be tested for bacteriological contamination and shall show the absence of coliform organisms and the presence of chlorine residual.

- Samples for bacteriological analysis shall be collected at sample ports. No hose or fire hydrant shall be used in the collection of samples. However, if no other sampling port is available, well-flushed fire hydrants may be used with the understanding that they do not represent optimum sampling locations.

LABID: 10851: EAS INC - EASTERN ANALYTICAL SERVICES INC
4 WESTCHESTER PLAZA
ELMSFORD NY 10523-1610
MR. PAUL STASCAVAGE (914) 592 -8380

Approved for the following categories:

- Air and Emissions / Asbestos
- Air and Emissions / Fibers
- Potable Water / Asbestos
- Solid and Hazardous Waste / Asbestos in Friable Material
- Solid and Hazardous Waste / Asbestos in Non-Friable Material-TEM

LABID: 11480: 10926 AMERICA SCIENCE TEAM NEW YORK INC
117 EAST 30TH ST
NEW YORK NY 10016
MR. RAVI KRISHNAPPA (212) 679 -8600

Approved for the following categories:

- Air and Emissions / Asbestos
- Air and Emissions / Fibers
- Potable Water / Asbestos
- Solid and Hazardous Waste / Asbestos in Friable Material
- Solid and Hazardous Waste / Asbestos in Non-Friable Material-TEM

LABID: 10879: CARDNO ATC
104 EAST 25TH STREET 10TH FLOOR
NEW YORK NY 10010
MS. MILENA BONEZZI (212) 353 -8280

Approved for the following categories:

- Air and Emissions / Asbestos
- Air and Emissions / Fibers
- Potable Water / Asbestos
- Solid and Hazardous Waste / Asbestos in Friable Material
- Solid and Hazardous Waste / Asbestos in Non-Friable Material-TEM

LABID: 11506: EMSL ANALYTICAL, INC
307 WEST 38TH STREET
NEW YORK NY 10018
MR. JAMES HALL (212) 290 -0051

Approved for the following categories:

- Air and Emissions / Asbestos
- Air and Emissions / Fibers
- Potable Water / Asbestos
- Solid and Hazardous Waste / Asbestos in Friable Material and Non-Friable Material-TEM

SECTION 02225

TRENCHING

PART 1 GENERAL

1.01. SECTION INCLUDES

A. Excavating trenches for utilities.

B. Pipe foundations and bedding.

C. Backfilling and compacting.

D. Materials.

1.02. RELATED SECTIONS

A. Section 01019 - CONTRACT CONSIDERATIONS

B. Section 01400 - QUALITY CONTROL

C. Section 01500 - TEMPORARY FACILITIES

D. Section 02110 - SITE CLEARING

E. Section 02112 - PAVEMENT CUTTING

F. Section 02141 - REMOVAL OF WATER

G. Section 02161 - SHEETING AND BRACING

H. Section 02205 - PROTECTION OF EXISTING FACILITIES

I. Section 02226 - ROCK REMOVAL

J. Section 02228 - COMPACTION: Testing, backfill, compaction.

K. Section 02316 - SELECT GRANULAR MATERIALS

L. Section 02661 - WATER DISTRIBUTION PIPING

M. Section 03001 - CONCRETE

1.03. REFERENCES

A. Standard Material Specifications for gravel, sand, crushed stone and gravel-cement mixtures published by the Department of Transportation (DOT) of the State in which project is located

B. ASTM C136 - Sieve Analysis of Fine and Course Aggregates

C. ASTM D1556 - Density of Soil in Place by Sand-Cone Method

D. ASTM D1557 - Laboratory Compaction of Soil Using Modified Effort

E. ASTM D2922 - Density of Soil in Place by Nuclear Methods

F. ASTM D3017 - Water Content of Soil in Place by Nuclear Methods

G. OSHA - Occupational Safety and Health Administration

1.04. SUBMITTALS

A. Granular Materials

1. Granular materials required for filling, backfilling, bedding, subbase and other purposes shall be as shown on the Drawings. Prior to bidding, prospective contractors shall familiarize themselves with the available quantities of approved on-site and off-site materials.

2. For each on-site or off-site material proposed, furnish to Engineer for approval a certified gradation analysis at least 10 days prior to date of anticipated use of such material. Except as specified herein, only off-site approved materials shall be utilized.

3. The Engineer reserves the right to inspect proposed sources of off-site granular material and to order such tests of the materials as he deems necessary to ascertain its quality and graduation of particle size. The Contractor shall, at his own expense, engage an approved testing laboratory to perform such test, and submit certified test results to the Engineer. If similar tests of the material from a particular source were performed previously, submit results of these tests to the Engineer for consideration.

4. No granular materials shall be used on this project for fill, backfill, bedding, subbase, or other purpose until approval is obtained from the Engineer, and only material from approved sources shall be used.

B. Geotextile Fabric

1. Submit a 1 square foot sample of each geotextile to be used.

2. Submit manufacturer’s specifications of average roll characteristics for standards ASTM geotextile tests for each geotextile to be used.

1.05. FIELD MEASUREMENTS

A. Verify that survey benchmark and intended elevations for the Work are as shown on Drawings, or as provided by the Engineer.

1.06. QUANTITY FACTORS FOR VOLUME MEASUREMENT

A. The tables on the Drawings shall be used as the basis for computing volumes of excavation below subgrade, trench lining material, special pipe foundation materials, and special backfill materials when such volumes constitute the basis for payment, as established elsewhere in the Contract Documents. No deviations from the factors shown shall be allowed because of variations between the several pipe materials and classes.

B. No special computations of quantities shall be made for structures such as manholes, valve pits, catch basins, etc., which may occur in the various pipelines, but the quantities for payment noted above, where applicable to such structures, shall be computed by assuming that the appurtenant pipeline continues uninterrupted through such structure; such as for center-to-center of manholes.

1. Excavation Below Subgrade, Trench Lining Material and Special Pipe Foundations - The quantity for which payment shall be made will be computed by using the Quantity Factors based on nominal inside pipe diameter multiplied by the measured depth and by the measured length without regard to actual width or actual quantity.

2. Special Backfill Material - The maximum quantity of special backfill material for which payment shall be made will be computed by using the Quantity Factors based on nominal inside pipe diameter multiplied by the measured length and the measured height of special backfill, except that where soil or rock conditions allow steeper side slopes and narrow trench conditions (minimum width pipe O.D. plus 2 feet 0 inches), the quantity of special backfill shall be based on actual width, height, and length.

PART 2 PRODUCTS

2.01. ON-SITE MATERIALS

A. Type A, Excavated Material - Material under this classification shall be derived solely from excavations necessary to construct the project to the lines and grades specified. If the excavated material on-site is approved for reuse and is suitable, it shall be used for filling or backfilling purposes. If he so elects, the Contractor may, at his own expense, substitute other types of material in place of Type A Material, provided such substitution is approved in advance by the Engineer. All replaced or surplus material shall be disposed of as outlined in Section 02110.

1. Unclassified Excavated Material

   Type A-1 - Referred to as “excavated material” and from which all frozen material, boulders, trash and foreign debris greater than 6 inches in any dimension has been removed. Approved Type A-1 material shall be used for all backfilling except under structures.

   Type A-2 - Referred to as “select excavated material” and from which all frozen material, humus, peat, roots, vegetation, ashes, trash, debris, and rocks or stones greater than 2 inches in any dimension have been removed.

2. Classified Excavated Material - Where the Contract Documents allow the reuse of excavated on-site materials as a substitute for off-site sources of gravel or sands, the minimum requirements for each of those excavated materials shall be the same as required for the equivalent off-site material. If such materials are used, submit for approval in writing the proposed methods of excavation, location of stockpiles, quantities of required sand and gravels, estimated excavation quantities and proposed excavation limits within the accepted excavation area. Provide a demonstration at least 10 days prior to commencement of excavation that the methods will provide consistent quantity and quality of material as specified for off-site gravels and sands. The Engineer will require subsurface investigations, sampling, and testing to confirm the extent and quality of the proposed material. Cost of all investigations, sampling, and testing shall be the Contractor’s responsibility.

B. Type E - Borrow Material

1. “Borrow material” is defined as approved on-site material required for fill or backfill in excess of the quantity of available approved material designated as Type ”A” material.

2. No such borrow material shall be used on this project unless specified in the Contract Documents and except within the limits of borrow areas designated on the Drawings.

3. Approval of all borrow material must be obtained from the Engineer, and only material from approved sources shall be used.

4. Use of designated borrow areas shall be subject to the approval of the Engineer and Owner at all times. Test pits and analyses of borrow material shall be provided as required by the Engineer for each borrow area and at the expense of the Contractor. In addition, the Engineer may require full excavation and restoration plans for each borrow area. All borrow areas shall be stripped of topsoil and organic materials far enough in advance of operations that contamination of borrow material is prevented.

   a. Unclassified Borrow Material

      This material consists of a naturally occurring mixture of sand, silts, clay, gravel, deteriorated rock or other inorganic particles.

      Type E-1 - Referred to as “common borrow material”, from which all frozen material, boulders, trash or debris have been removed.

      Type E-2 - Referred to as “select borrow material” and from which all frozen material, humus, peat, roots, vegetation, ashes, trash, debris, and rocks or stones greater than 6 inches in any dimension have been removed.

   b. Classified Borrow Material - Where the Contract Documents allow the use of on-site borrow areas as a substitute for off-site sources of gravels and sands, the requirements for each of those on-site materials shall be the same as off-site sources.

      In addition, all of the requirements for “classified excavated material” (Type “E” material) must be met at least 10 days prior to the acceptance of approved borrow areas for use as a source of off-site materials (gravel or sand).

2.02. OFF-SITE MATERIAL

Within the following specifications where grain size distribution requires a maximum of 10 percent or less material capable of passing the #200 mesh sieve, the percentage of material finer (than the #200 sieve) by weight shall be determined by wet screening in accordance with ASTM Standard D-1140. It is the intent of the specifications to allow the use of granular materials from local suppliers Material Specifications shall conform to the requirements of the New York State Department of Transportation, (NYSDOT) and shall conform to the latest NYSDOT Standard Specification.

No gravel, sand, crushed stone or run-of-crusher material shall be used for this project until acceptance is obtained from the Engineer, and only material from approved sources shall be used. A certified sieve analysis from the supplier shall be submitted for the Engineer’s acceptance prior to the use of any materials specified in Article 2.02.

A. Bedding and Pipe Encasement

1. NYSDOT No. 1 Crushed Stone or Crushed Gravel - Bedding for PVC, DIP, and PCCP water main. Thoroughly washed, clean, sound, tough, hard, crushed limestone conforming to the requirements of NYSDOT Item No. 703.0201 or crushed gravel

conforming to the requirements of NYSDOT Item No. 703.0202, having the following gradation by weight:

Percent Passing	Sieve
100	1-inch
90 - 100	1/2-inch
0 - 15	1/4-inch

2. NYSDOT No. 2A Crushed Stone or Crushed Gravel – Bedding for DIP and PCCP water main. Shall be a No. 1 and No. 2 blend, thoroughly washed, clean, sound, tough, hard, crushed limestone conforming to the requirements of NYSDOT Item No. 703.0201 or crushed gravel conforming to the requirements of NYSDOT Item No. 703.0202, having the following gradation by weight:

Percent Passing	Sieve
100	1-1/2-inch
93-100	1-inch
27-58	1/2-inch
0-8	1/4-inch

3. NYSDOT Concrete Sand – Bedding for copper and polyethylene tubing. Washed, fine aggregate sand shall conform to the requirements of NYSDOT Item No. 703.07, having the following gradation by weight:

Percent Passing	Sieve
100	3/8-inch
90 - 100	No. 4
75 - 100	No. 8
50 - 85	No. 16
25 - 60	No. 30
10 - 30	No. 50
1 - 10	No. 100
0 - 3	No. 200

B. Select Backfill - NYSDOT Subbase Type 2 crusher run stone or crusher run gravel. Material shall conform to the requirements of NYSDOT Item No. 304.12, having the following gradation by weight:

Percent Passing	Sieve
100	2-inch
25 - 60	1/4-inch
5 - 40	No. 40
0 - 10	No. 200

C. Peagravel - NYSDOT Type 1A screened gravel for the annular space between the carrier pipe and the casing pipe. Screened gravel shall conform to the requirements of NYSDOT Item No. 703.0203 and have the following gradation by weight:

Percent Passing	Sieve
100	1/2-inch
90 - 100	1/4-inch
0 - 15	1/8-inch

D. Pipe Trench Special Backfill - NYSDOT subbase material 304.02, Type 4 crusher run stone or crusher run gravel. Material shall conform to the requirements of NYSDOT Item No. 304.14, having the following gradation by weight:

Percent Passing	Sieve
100	2-inch
30 - 65	1/4-inch
5 - 40	No. 40
0 - 10	No. 200

E. Follow NYSDOT Standard Specifications if gradation data varies from those listed above.

F. Recycled concrete or asphalt pavement shall not be allowed.

G. Slag of any type shall not be allowed.

H. Flowable fill shall not be allowed.

I. Type F - Gravel-Cement Mixtures

1. Shall be a mixture of 15 parts gravel to 1 part cement by weight.

2. Gravel shall be Type B-3.

3. Cement shall be Type I Portland cement.

4. Mixing of material shall be performed in an approved mixer.

5. The mixture shall be placed and compacted in accordance with Section 02228.

2.03. REQUIRED MATERIALS

A. Trench Backfill

1. In Pavement, to Subbase - Select backfill.

2. Other Areas - Type A-1 or Type B-1 bank run gravel.

B. Pipe Trench Special Backfill - NYSDOT Item No. 304.14.

C. Pipe Bedding - Per pipe type.

D. Road Construction

1. Base - NYSDOT course 304 Type 2.

2. Subbase - NYSDOT subbase course 304 Type 4.

PART 3 EXECUTION

3.01. EXAMINATION

A. Submit for approval fill materials to be reused.

3.02. PREPARATION

A. Identify required lines, levels, contours, and datum.

B. Prior to start of construction, notify the appropriate organization identified in Section 02205 (under Article 3.01), and have staked or marked all underground utilities. Utilities include water, gas, electrical, telephone, cable, storm sewer, sanitary sewers, laterals, and services. In the event such locations indicate a possible interference, or when needed to locate points of connection to existing facilities, perform exploratory excavations to determine the utilities' location and elevation. Provide the Engineer with the results of the exploratory excavations for his review. Allow the Engineer sufficient time to determine any changes required as a result of such exploratory excavations prior to start of construction.

C. Abandoned pipes and laterals shall be plugged in with 12 inches of concrete or grout.

D. Conduct the operations such that no interruptions to the existing utility system shall occur. Where existing storm drain systems are being replaced or interrupted, provide temporary bypass pumping or temporary piping to maintain flow around the work site such that no backups occur in these sewer systems.

E. Maintain existing manholes, catch basins, and other utility structures above and below grade which are to remain in their pre-work condition. Any material or debris entering same due to the operation shall be promptly removed.

F. Protect plant life, lawns, rock outcropping and other features remaining as a portion of final landscaping.

G. Protect control points, bench marks, existing structures, fences, sidewalks, paving, and curbs from excavation equipment and vehicular traffic. Preserve the control points provided by the Engineer throughout the life of the project, and accurately replace any such point, which is damaged or moved, at Contractor's expense.

H. Cut out soft areas of subgrade not capable of insitu compaction. Backfill with Type III pipe foundation and compact to density equal to or greater than requirements for subsequent backfill material.

I. Brace walls and slabs of structures to support surcharge loads and construction loads imposed by backfilling operations.

J. Maintain a stable, dry backfill area in accordance with Section 02141.

K. Remove all water, snow, ice and debris from surfaces to accept fill materials and from the backfill material. No calcium chloride or other chemicals shall be used to prevent freezing.

L. Areas to receive compacted fill shall be graded to prevent surface runoff and ponding in accordance with Section 02110.

M. No fill or backfill material may be used without approval of the Engineer.

N. No geotextile fabric may be used without approval of the Engineer.

O. Backfill operations shall be started at the lowest elevation in the area to be backfilled, and continue, in horizontal layers, upward to the limits specified.

P. Backfill material shall be within 2 percent of the optimum moisture content for that material.

Q. Any crushed gravel stockpiles which have undergone excessive particle segregation shall be reviewed and approved by the Engineer prior to placement.

3.03. TRENCH EXCAVATION

A. Trenches for underground piping, ductwork, drains, and similar utilities shall be excavated and maintained as shown on the Drawings and specified in this Section. Trench widths shall be held within the minimum and maximum limits shown on the Drawings. If a prefabricated, mobile shield is utilized in lieu of conventional sheeting and bracing in pipe trenches, the bottom of the shield shall be maintained as high as possible (preferably above the spring line of the pipe) so as to prevent disturbance of the pipe foundation material and to avoid forces which would tend to pull pipe joints apart when the shield is dragged forward. Gouged openings or troughs left by the shield shall be filled with additional pipe foundation material and thoroughly compacted. Installation of sheeting and bracing and use of mobile shields shall be in complete accordance with all details of applicable safety codes, rules and regulations including all applicable local, State, Federal, and OSHA regulations.

B. Excavation shall be such that a flat bottom trench of allowable width is established at the required subgrade elevation for subsequent installation of pipe foundation material.

C. If indicated on the Drawings, as directed by the Engineer or when required as a result of unsuitable soil conditions, trench excavation shall be carried below the required subgrade and a special pipe foundation installed in conformance with the Contract Documents. In any event, operations shall result in stable trench walls and a stable base free from standing water, consistent with trench width requirements.

D. Bedrock, boulders and cobbles greater than 6 inches shall be trimmed back or removed on each side of the trench so that no rock protrudes within 6 inches of the installed pipe. Rock shall also be trimmed back across the bottom of the trench so that no rock, boulder or cobble protrudes within 4 inches of the installed pipe.

E. In general, trenches shall not be opened for more than 50 feet in advance of installed pipe. Excavation of the trench shall be fully completed at least 5 feet in advance of pipe laying operations. No more than 40 feet of trench shall be left open overnight.

3.04. EXCAVATION CLASSIFICATION

A. All material excavated will be measured and classified as provided herein.

1. Unclassified Excavation - “Unclassified excavation” shall include all materials excavated within the authorized lines and grades prescribed in the Drawings. Unclassified excavation shall include “rock excavation” as well as “common excavation” as defined herein. Unless specifically designated otherwise in the appropriate bid items of the Bid Proposal, all excavation shall be considered to be “unclassified excavation.”

2. Common Excavation - “Common excavation” shall include all excavation except “rock excavation.” All unconsolidated and non-indurated material, rippable rock, loose rock, soft mineral matter, weathered rock or saprolite, and soft or friable shale which is removable with normal earth excavation equipment shall be considered “common excavation.” All boulders and detached pieces of solid rock or concrete or masonry less than 1 cubic yard in volume shall be classified as “common excavation.”

3. Rock Excavation - “Rock excavation” shall include all sound solid masses, layers and ledges of consolidated and indurated rock or mineral matter of such hardness,

durability and/or texture that it is not rippable or cannot be excavated with normal earth excavation equipment. Should a conflict arise as to the classification of excavation as either “common” or “rock,” the following tests shall be used in the appropriate determination:

a. Where practicable, a late model tractor mounted hydraulic ripper equipped with a one digging point of standard manufacturer’s design adequately sized for use with and propelled by a crawler-type tractor rated between 210 and 240 net fly-wheel horsepower, operating in low gear, shall be utilized. Should the suspect material not be effectively loosened or broken down by ripping in a single pass with the aforementioned ripper, the material shall be classified as “rock.”

b. In situations where inter-bedded strata of “common excavation” material and “rock excavation” material are encountered in the same excavation, the individual classification of those materials shall be made on an average percentage basis of the occurrence of those materials as measured in stratigraphic sections and as approved by the Engineer.

c. When rock is encountered in excavations, it shall be removed by jackhammering or any other method suitable and safe considering the proximity of existing utilities or facilities.

3.05. UNAUTHORIZED EXCAVATION

A. The Contractor shall not be entitled to additional compensation for unauthorized excavations carried beyond or below the lines and subgrades prescribed in the Contract Documents. The Contractor shall refill such unauthorized excavations at his own expense, and in conformance with the following provisions of this Article.

B. Should the Contractor, through negligence or for reasons of his own, carry his excavation below the designated subgrade, fill concrete or such other material as may be approved by the Engineer, as specified in Part 2, shall be furnished and placed as backfill in sufficient quantities to reestablish the designated subgrade surface. Granular material used for backfilling shall be spread and compacted in conformance with the requirements of later Articles of the section, and to the percentage compaction outline therein. The cost of any tests associated with this refilling operation shall be borne by the Contractor.

C. If the maximum widths of pipe trenches are exceeded, the installed pipes shall be fully cradled in a minimum of 6 inches of fill concrete, as specified elsewhere, and at the Contractor’s expense. Excavation below subgrade which is ordered by the Engineer because the normal subgrade has been disturbed by the Contractor’s operations shall be considered as unauthorized excavation.

3.06. MAINTENANCE OF EXCAVATIONS

A. All excavations shall be properly and legally maintained while they are open and exposed. Sufficient and suitable barricades, warning lights, flood lights, signs, etc., to protect life and property shall be installed and maintained at all times until the excavation has been backfilled and graded to a safe and satisfactory condition. All signs, markers, barricades shall conform to the requirements of the manual of Uniform Traffic Control Devices. All barricades, signs and markers shall be reflectorized.

B. To maintain traffic and safety temporary plating over trenches consisting of steel plates shall be used to temporarily bridge trench excavations. Plates shall be of size and positioned to

provide adequate bearing at plate edges, shall be securely anchored, and shall be fitted in place in a manner to minimize noise when crossed by traffic. Plates shall be of sufficient thickness to safely carry heavy traffic without detrimental deflection; however, unless otherwise specified, the minimum thickness of plates shall be 1-inch.

C. Plate edges exposed to traffic shall be feathered with asphalt mix as part of trench excavation work. Work includes surveillance and adjustment of plating over trenches which shall be provided by the Contractor during non-working hours, weekends, and holidays.

D. Additional Requirements for Support Systems for Trench Excavations

1. Excavation of material to a level no greater than 2 feet below the bottom of the members of a support system shall be permitted, but only if the system is designed to resist the forces calculated for the full depth of the trench, and there are no indications while the trench is open of a possible loss of soil from behind or below the bottom of the support system.

2. Installation of a support system shall be closely coordinated with the excavation of trenches.

3.07. PIPE FOUNDATIONS

A. All pipes, fittings or specials which are to be installed in the open trench excavation shall be properly bedded in, and uniformly supported on pipe foundations of the various types specified herein and shown on the Drawings. Flat-bottom trenches of required width shall be excavated to the necessary depth as required in the Table of Quantity Factors shown on the Drawings and maintained in accordance with this section prior to installing the foundation. Trenches shall be dewatered and all work performed in a dry trench.

B. Bedding material shall be spread in maximum of 8-inch layers to the midpoint of the pipe and each layer shall be compacted until the required total depth of the bedding has been built up. Compaction methods include hand tamping with T-bars, flat heads, shovel slicing, as well as mechanical compactors. The Contractor shall perform his bedding operations with care to maintain line and grade.

C. The pipe foundation above the midpoint of the pipe shall be spread and compacted in 12-inch layers to 12 inches above the top of the pipe. When PVC, plastic or polyethylene pipe is used, do not compact directly over pipe until the depth of backfill has reached 2 feet above the top of the pipe.

D. Type I - Normal Soil Conditions - Unless shown otherwise in the Drawings, all pipe shall be supported on Type I foundation. The trench shall be excavated from 4 to 8 inches deeper than the bottom of the pipe, depending on the diameter of the pipe. Stone bedding per pipe type as described above shall be furnished, placed and compacted in the trench for its full width such that, after the pipe has been uniformly bedded in this material, the required minimum depth of 4-inch pipe bedding material remains between pipe and undisturbed trench bottom. Suitable holes shall be provided in the trench bottom to permit adequate bedding of bells, couplings, or similar projections. The pipe bedding shall extend upward to a point 12 inches over the top of the pipe. Minimum width of pipe foundation shall be outside diameter of pipe plus 2 feet 0 inches.

E. Type II - Moderately Unstable Soil Conditions - When specifically called for on the Drawings, or when ordered by the Engineer, the pipe shall be supported on Type II foundation. The foundation shall be installed where a suitable supporting soil or rock stratum occurs within 2 feet, more or less of the bottom of the pipe. The trench shall be excavated to the depth

necessary to reach the suitable supporting stratum. Pipe trench special bedding, as ordered by the Engineer as described above, shall then be furnished and placed in the trench for its full width. The material shall be spread in 12-inch layers, and each layer shall be compacted. The pipe foundation material to be supported on Type VII foundation, geotextile fabric foundation. The crushed stone or gravel depth shall extend from the supporting stratum up to an elevation 4, 6 or 8 inches below the bottom of the pipe depending upon the pipe diameter. The bedding material shall then be installed in accordance with Type I pipe foundation requirements.

F. Type III - Unstable Soil Conditions - When specifically called for on the Drawings, or when ordered by the Engineer, the pipe shall be supported on Type III foundation. The foundation shall be installed where no suitable supporting soil or rock stratum exists within 2 feet of the bottom of the pipe. The trench shall be excavated 2 feet deeper then the bottom of the pipe. Each side of the trench shall be supported and maintained by a permanent system of tight, continuous sheeting (and bracing) which shall be driven below the trench bottom as shown and which shall extend to an elevation of at least 12 inches above the top of the pipe. Minimum plank size to be 2-inch x 12-inch tongue and groove per Section 02161.

Pipe trench special bedding material shall then be furnished and placed in the trench for its full width, and to a depth of 8 inches. The pipe foundation material to be supported on a Type VII foundation, geotextile fabric foundation. Crushed stone, special backfill material shall then be furnished and placed in the trench for its full width. All material shall be spread in layers and each layer shall be compacted until their respective total depths have been built up as required. The select backfill material depth shall extend a distance of 12 inches from the top of the compacted trench lining up to an elevation 4, 6 or 8 inches below the bottom of the pipe, depending upon the pipe diameter. Bedding material shall then be installed in accordance with Type I pipe foundation requirements. All installed sheeting below an elevation established at 12 inches above the top of the pipe shall be left in place and undisturbed. Only the cross struts and whalers shall be gradually removed as construction proceeds.

G. Type IV - Reinforced Concrete Encasement - When specifically called for on the Drawings, or when ordered by the Engineer, the pipe shall be supported on Type IV foundation. The trench shall be excavated to a depth below the bottom of the pipe equal to one-quarter of the inside diameter of the pipe or 6 inches, whichever is greater. The excavated space shall then be completely filled with, and the entire pipe encased in, concrete such that the minimum concrete encasement at any point around the outside barrel of the pipe measured 6 inches thick. The total minimum width of the concrete encasement shall equal the outside diameter of the pipe plus 12 inches and such minimum width shall be constant for the entire length of the encasement. Concrete mix, formwork, reinforcing, curing, etc., shall be in accordance with the requirements of Section 03001. Freshly placed concrete shall be maintained free from groundwater and no backfilling of the trench shall begin until initial set has taken place, but not less than 3 hours has elapsed after the encasement has been cast. Backfill a depth of 12 inches over top of concrete before beginning compaction with mechanical equipment.

H. In the event an underground pipe is shown under a base slab, the pipe shall be encased in concrete for its entire length under the slab in accordance with details shown on the Drawings. Where no detail is shown, encasement shall be formed to provide a minimum of 8 inches of concrete cover reinforced with #5 reinforcing bars spaced 12 inches each way. When the top of the pipe is within 12 inches of the bottom of the slab, the encasement shall be tied to the base slab with reinforcing. The General Contractor shall be responsible for encasement of all pipes under slabs including piping by other contracts.

I. Type V - Concrete Cradle - When specifically called for on the Drawings or when ordered by the Engineer, the pipe shall be supported on Type V foundation. The foundation shall be furnished and installed equal to the Type IV foundation, “Concrete Encasement,” except that

only that portion of the encasement at and below the horizontal diameter of the pipe shall be encased, forming a true cradle under the bottom half of the pipe. Maintain cradle free from groundwater for a period of three hours or until initial set has taken place. Complete pipe foundation in 12-inch lifts as for Type I pipe foundation.

J. Type VI - Plain Concrete Encasement - When specifically called for on the Drawings, or when ordered by the Engineer, the pipe shall be supported on Type VI foundation. The foundation shall be furnished and installed equal to the Type IV foundation, “Reinforced Concrete Encasement,” except that no steel reinforcing is required. Maintain encasement free of groundwater for a period of three hours or until initial set has taken place.

K. Type VII - Geotextile Fabric Foundation - When specifically called for on the Drawings, or when ordered by the Engineer, the pipe foundation shall be supported on a geotextile fabric foundation. The fabric to be placed on the bottom of the excavated foundation and extended upwards to the top of the Type I pipe foundation where it can then be placed flat with a minimum overlap of 6 inches. Longitudinal overlaps to be a minimum of 2 feet. Fabrics to be installed and stretched tight, have no wrinkles so that the fabric will be in tension when placing the pipe foundation material. Geotextile material to be Trevia Type S 1127 by Hoechat Corporation; Mirafi Type 500X by Celanese Corporation; or equal.

L. Type VIII - Pressure Pipe Foundation

1. Pipe and fittings shall be laid on stable foundations, free from standing water, and trimmed to shape. Type A 2 material as described above in Part 2 shall be used for pipe foundation unless otherwise shown on the Drawings. In particular, stones 2 inches or larger shall be removed from the bearing surface of the pipe foundation. At the joints, enough depth and width shall be provided to permit the pipe layer to reach entirely around the pipe so that the joints may be made in a proper manner. Pipes shall have full bearing throughout their entire length, which shall be accomplished by shaping the bottom of the ditch or adequately tamping the backfill under the pipe in accordance with minimum compaction requirements of Section 02228. When laid in tunnels, pipes shall be blocked in such a manner as to take the weight off the bells. Pipe laid in normal trench excavation shall not be laid on wood blocking. Mechanical type joints shall be tightened within the AWWA recommended torque range.

2. The following sources shall be reviewed by the Contractor for installation guidelines and requirements:

PIPE MATERIAL	SOURCES
Ductile Iron	AWWA Standard C600; Project Specification, Section 02661; Project Drawings; manufacturer’s recommendations.
PVC Pipe	ASTM Standard D2321; Project Specification, Section 02661; Project Drawings; manufacturer’s recommendations.
Copper	Project Specification, Section 02661; Project Drawings; manufacturer’s recommendations.

3. Unless otherwise shown on the Drawings, as a minimum, all pipe shall be backfilled to the springline, including hand tamping with T-bars, shovel slicing, and flatheads, and mechanically compacted and the remaining backfill placed in 12-inch lifts to 1 foot above the crown of the pipe in accordance with minimum compaction requirements of Section 02228. Backfill material within 12 inches of the pipe shall be free of stones greater than 2 inches in any dimension. Unless otherwise shown on the Drawings, the minimum total finished cover over the top of the pipe barrel of all pressure pipe shall be 5 feet.

3.08. EXPLORATORY EXCAVATIONS

A. Where shown or ordered by the Engineer, the Contractor shall excavate and backfill test pits in advance of construction to determine conditions or location of exiting facilities. The Contractor shall perform all work required in connection with excavating, stockpiling, maintaining, sheeting, shoring, backfilling, and restoring the surface for the test pits.

B. Test pits which the Contractor excavates that are not shown on the Drawings or specified or ordered shall be at the Contractor's expense.

C. No test pits will be dug prior to utility company stakeout.

D. Backfill and Fill Materials

1. Excavated materials may be used for backfill provided:

a. Material is sandy, loamy, or similar to bank run gravel.

b. Material is free from debris, hazardous materials, frozen materials, organic or other deleterious materials. Material greater than 4 inches in any direction is unacceptable. Material greater than 2 inches in any direction is unacceptable for backfill directly against the water main.

c. Maximum dry density and optimum moisture content are determined in accordance with the above.

d. Material is reviewed and deemed acceptable by the Engineer.

2. Use select granular material within 5 feet or within a 1 on 1 slope from the trench to the edge of pavement of all roadways.

E. Backfilling shall be in accordance with Articles 3.10 and 3.11 of this specification.

F. Cold patch for temporary repair shall be placed as directed by the Engineer.

3.09. GENERAL BACKFILLING REQUIREMENTS

A. Backfilling shall be started as soon as practicable and after structures or pipe installations have been completed and inspected, concrete has acquired a suitable degree of strength, and subgrade waterproofing materials have been in place for at least 48 hours. Backfilling shall be carried on expeditiously thereafter. Backfill shall be started at the lowest section of the area to be backfilled. Natural drainage shall not be obstructed at any time.

B. Backfill spaces shall be inspected prior to backfilling operations and all unsuitable materials, including sheeting, bracing forms and debris, shall be removed. No backfill shall be placed against foundation walls on structural members unless they are properly shored and braced or of sufficient strengths to withstand lateral soil pressures.

C. Backfill material shall be inspected prior to placement and all roots, vegetation, organic matter, or other foreign debris shall be removed. Stones larger than 12 inches in any dimension shall be removed or broken. Stones shall not be allowed to form clusters with voids.

D. Backfill material shall not be placed when moisture content is more than 2 percent above optimum or is otherwise too high to allow proper compaction. When material is too dry for adequate compaction, water shall be added to the extent necessary.

E. No backfill material shall be placed on frozen ground nor shall the material itself be frozen or contain frozen soil fragments when placed. No calcium chloride or other chemicals shall be added to prevent freezing. Material incorporated in the backfilling operation which is not in satisfactory condition shall be subject to rejection and removal at the Contractor's expense.

F. If the Contractor fails to stockpile and protect on-site excavated material acceptable for backfill, then the Contractor shall provide an equal quantity of acceptable off-site material at no expense to the Owner.

G. Remove surplus backfill material from site.

3.10. PIPE TRENCH BACKFILL

A. Pipe foundations, to a depth of 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. Refer to Section 02228 for density requirements. For plastic or polyethylene pipe materials, do not compact directly over pipe until the 2 feet of cover has been installed. Pipe foundations are specified in the appropriate sections covering underground piping. The remainder of the trench shall be backfilled and consolidated in accordance with Section 02228 and by one of the following methods, depending on the nature of backfill material and location of trench.

B. Procedure I - For cross-country pipelines under uncultivated areas where subsequent settlement can be tolerated:

1. Backfill material shall be placed in the trench and consolidated by packing with the backhoe bucket or other means to prevent voids. Refer to Section 02228 for density requirements. The top layer shall be thoroughly compacted mechanically and slightly mounded to allow for subsequent settlement. Maintain trench surface until completion of contract and regrade as necessary within guarantee period.

C. Procedure II - For lawns, cultivated fields, gardens and non-paved areas where minimum subsequent settlement is required: Same as for Procedure I, refer to Section 02228 for density requirements. Top of back fill shall be compacted by mechanical means and surface maintained prior to topsoil installation, fine grading, and seeding.

D. Procedure III - For streets, driveways, parking areas, highways, shoulder areas, miscellaneous type pavements, walks, curbs, gutters and other specified areas:

1. Backfill material shall be placed in layers not exceeding 12 inches thick and each layer thoroughly compacted by a backhoe mounted hydraulic or vibratory tamper, up to 2 feet under pavement (below top of subgrade). The upper 2 feet shall be compacted using hand-guided or small self-propelled vibratory or static rollers or pads in layers not exceeding 6 inches in thickness. Refer to Section 02228 for density requirements.

2. For pipelines in or across State Highways, backfill material and compaction shall conform with the Standard Specifications or specific requirements of the State in which the project is located.

3. Where a gravel-cement mixture (Type F) backfill is specified, the dry gravel and cement mixture shall be placed in the trench, in 6-inch layers and thoroughly tamped using mechanical or vibratory tampers. Water shall not be introduced to the gravel-cement mixture during placing and compacting thereof.

3.11. BACKFILL FOR STRUCTURES

A. Backfill shall be placed in layers not exceeding 8 inches thick and thoroughly compacted by mechanical means.

B. Where pipelines or conduits are to be placed on structural backfill, all backfill under the pipes shall be Size D-2 crushed stone placed in 8-inch layers and mechanically tamped, unless an alternate method of supporting such pipes is specified.

C. Hydraulic compaction by ponding or jetting will not be permitted except in very unusual conditions and then only upon written request and demonstration of its effectiveness by the Contractor and the written acceptance by the Engineer.

3.12. PERIODIC CLEAN-UP; BASIC RESTORATION

A. When work involves installation of sewers, drains, water mains, manholes, underground structures, or other disturbances of existing features in or across streets, rights-of-way, easements or private property, the Contractor shall (as the work progresses) promptly backfill, compact, grade and otherwise restore the disturbed area to a basic condition which will permit resumption of pedestrian or vehicular traffic and any other critical activity or function consistent with the original use of the land. The requirements for temporary paving of streets, walks, and driveways are specified elsewhere. Unsightly mounds of earth, large stones, boulders and debris shall be removed so that the site presents a neat appearance.

B. The Contractor shall perform the clean-up work on a regular basis and as frequently as required. Basic site restoration in a particular area shall be accomplished immediately following the installation or completion of the required facilities in that area. Furthermore, such work shall also be accomplished if partially completed facilities must remain incomplete for some time period due to unforeseen circumstances.

C. Upon failure of the Contractor to perform periodic clean-up and basic restoration of the site to the Engineer's satisfaction, the Owner may, upon five days prior written notice to the Contractor, without prejudice to any other rights to remedies of the Owner, cause such work for which the Contractor is responsible to be accomplished to the extent deemed necessary by the Engineer, and all costs resulting therefrom shall be charged to the Contractor and deducted from the amounts of money that may be due him.

3.13. TOLERANCES

A. Top Surface of Backfilling - Under Paved Areas - ±1/2 inch from required elevations.

B. Top Surface of General Backfilling - ±1 inch from required elevations.

3.14. FIELD QUALITY CONTROL

A. Field inspection and testing will be performed under provisions of Section 01400.

B. The Contractor shall designate an experienced person who shall be responsible for inspection of excavations on a daily basis, document, and maintain daily trenching and excavation logs per OSHA 29 CFR 1926.

C. Tests and analysis of fill material will be performed in accordance with ASTM D1557 and with Section 02228.

D. Compaction testing will be performed in accordance with ASTM D1556, ASTM D2922, and with Section 02228.

E. If tests indicate Work does not meet specified requirements, remove Work, replace and retest at no cost to Owner.

F. Frequency of Tests - 1,000 linear feet.

3.15. PROTECTION OF FINISHED WORK

A. Protect finished Work under provisions of Section 01500.

B. Regrade and recompact fills subjected to vehicular traffic.

END OF SECTION

SECTION 02226

ROCK REMOVAL

PART 1 GENERAL

1.01. SECTION INCLUDES

A. Removal of subsurface rock encountered during excavation, utilizing mechanical methods.

1.02. RELATED SECTIONS

A. Information Available to Bidders - Subsurface Report; bore hole locations and findings of subsurface materials.

B. Section 02205 - PROTECTION OF EXISTING FACILITIES

C. Section 02225 - TRENCHING: Trenching for underground utilities.

D. Section 03001 - CONCRETE

1.03. UNIT PRICES

A. Rock Quantity - Determined by quantity of rock indicated in the Contract Documents.

B. Determination of Unit Measurements - Identified by site measurements made by the Engineer and calculated in accordance with payment limits established in the appropriate Bid Item Description.

1.04. REFERENCES

A. Code of Federal Regulations (CFR) - U.S. Department of Labor, Occupational Safety and Health Administration (OSHA), Construction Standards and Interpretation, 29 CFR Part 1926.

B. Department of Transportation (DOT) - Title 49 (49 CFR), Parts 106, 107, 171-179, 383, and 390-399.

1.05. DEFINITIONS

A. “Rock” is defined to include all sound solid masses, layers and ledges of consolidated and indurated rock or mineral matter of such hardness, durability and/or texture that it is not rippable or cannot be excavated with normal earth excavation equipment.

B. All boulders and detached pieces of solid rock or concrete or masonry 1 cubic yard in volume or greater, shall be classified as “rock.”

C. Should a conflict arise as to the classification of the material to be removed, the following tests shall be used to aid in the determination:

1. Where practicable, a late model tractor-mounted hydraulic ripper equipped with a one digging point of standard manufacturer’s design adequately sized for use with and propelled by a crawler-type tractor rated between 210 and 240 net fly-wheel horsepower, operating in low gear, shall be utilized.

Should the suspect material not be effectively loosened or broken down by ripping in a single pass with the aforementioned ripper, the material shall be classified as "rock."

2. In situations where interbedded strata of "common excavation" material and "rock excavation" material are encountered in the same excavation, the individual classification of those materials shall be made on an average percentage basis of the occurrence of those materials as measured in stratigraphic sections as approved by the Engineer.

1.06. REGULATORY REQUIREMENTS

A. Obtain permits from authorities having jurisdiction before removal by mechanical methods is started.

1.07. SCHEDULING

A. Schedule work to avoid disruption to occupied buildings nearby.

B. Schedule work to minimize disruption of vehicular traffic in nearby public thoroughfares.

C. Coordinate schedule with local police and fire departments, including owners of nearby existing facilities.

D. Schedule Work to coordinate with concrete placement. Reference Section 03001.

1.08. SUBMITTALS

A. Submit plan of action for rock removal. As a minimum, include a site plan showing starting date, preconstruction inspection requirements, location, direction of progress, finish point, and completion schedule.

1.09. ORDER OF WORK

A. After the rock is determined, proceed with rock removal in accordance with the approved plan of action.

B. The Contractor shall schedule his operations so that all rock excavation within 100 feet of any proposed structure is completed before any structure work is started.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.01. EXAMINATION

A. Verify site conditions and location of nearby buildings, structures and other facilities, recording irregularities which exist prior to work of this section.

B. Verify locations of nearby underground utilities and structures. Reference Section 02205.

3.02. PREPARATION

A. Identify required lines, levels, contours, and datum; establish quantity of rock to be removed to meet project requirements.

3.03. ROCK REMOVAL - GENERAL

A. Allow time for Engineer to take site measurements of rock quantities to be removed.

B. Cut away rock at bottom of excavation to form level bearing surface for foundations of buildings and structures.

C. Remove shaled layers to provide sound and unshattered base for pipe bedding.

D. In utility trenches, trim rock to 4 inches below bottom of installed pipe and 12 inches wider than outside diameter of installed pipe.

E. Remove excavated materials from site.

F. Correct unauthorized rock removal in accordance with backfilling and compaction requirements of Section 02225, concrete fill, Section 03001, under direction of Engineer.

3.04. ROCK REMOVAL - MECHANICAL METHOD

A. Excavate and remove rock by mechanical methods at locations required by the Contract Documents and when trimming bottom or sides of excavation is necessary to meet project requirements.

B. Drill holes and utilize expansive tools, wedges, and/or other mechanical means, as appropriate, to fracture rock.

3.05. FIELD QUALITY CONTROL

A. Provide for Engineer's inspection of foundation bearing surfaces and cavities formed by removed rock.

END OF SECTION

SECTION 02228

COMPACTION

PART 1 GENERAL

1.01. SECTION INCLUDES

A. Compaction requirements and test methods.

B. Compact all subgrades, foundations, embankments, trench backfills, filled and backfilled material as specified.

1.02. RELATED SECTIONS

A. Section 01025 - UNIT PRICES: For the work of this Section.

B. Section 01026 - LUMP SUM ITEMS: Requirements applicable to lump sum prices for the work of this section.

C. Section 01400 - QUALITY CONTROL: Inspection and testing by laboratory services.

D. Section 02225 - TRENCHING

E. Section 02229 - PAVEMENT SUBGRADE

1.03. REFERENCES

A. ASTM D698 - Laboratory Compaction of Soil Using Standard Effort

B. ASTM D1556 - Density of Soil in Place by the Sand-Cone Method

C. ASTM D1557 - Laboratory Compaction of Soil Using Modified Effort

D. ASTM D2922 - Density of Soil in Place by Nuclear Methods

E. ASTM D3017 - Water Content of Soil in Place by Nuclear Methods

1.04. SUBMITTAL

A. Submit in writing a description of the equipment and methods proposed to be used for compaction.

1.05. QUALITY ASSURANCE

A. The Contractor shall adopt compaction methods which will produce the degree of compaction specified herein, prevent subsequent settlement, and provide adequate support for the surface treatment, pavement, structure and piping to be placed thereon, or therein, without damage to the new or existing facilities.

B. The natural subgrade for all footing, mats, slabs-on-grade for structures or pipes shall consist of firm undisturbed natural soil, at the grades shown on the Drawings.

C. After excavation to subgrade is completed, the subgrade shall be compacted if it consists of loose granular soil or if its surface is disturbed by the teeth of excavating equipment.

1. This compaction shall be limited to that required to compact loose surface material and shall be terminated in the event that it causes disturbance to underlying fine-grained soils, as revealed by weaving or deflection of the subgrade under the compaction equipment.

2. If the subgrade soils consist of saturated fine or silty sands, silts, or clay or varved clays, no compaction shall be applied.

PART 2 PRODUCTS

2.01. MATERIALS

A. Materials to be compacted shall be as specified in Section 02225 and 02229.

PART 3 EXECUTION

3.01. EXAMINATION

A. Examine spaces to be filled beforehand and remove all unsuitable materials and debris including sheeting, forms, trash, stumps, plant life, etc.

B. Inspect backfill and fill materials beforehand and remove all roots, vegetation, organic matter, or other foreign debris. Stones larger than 12 inches in any dimension shall also be removed or broken into smaller pieces.

C. No backfill or fill material shall be placed on frozen ground nor shall the material itself be frozen or contain frozen soil fragments.

D. Spaces to be filled shall be free from standing water so that placement and compaction of the fill materials can be accomplished in “dry” conditions.

3.02. PREPARATION

A. Brace walls and slabs of structures to support surcharge loads and construction loads imposed by compaction operations.

B. Proof-roll all subgrade surfaces to accept fill material in accordance with Section 02229.

C. Each layer of fill shall be compacted to the specified density the same day it is placed.

1. The moisture content of backfill or fill material shall be adjusted, if necessary to achieve the required degree of compaction.

D. Compact each lift in accordance with Table 1.

E. Match compaction equipment and methods to the material and location being compacted in order to obtain specified compaction, with consideration of the following guidelines:

1. Rubber-tired rollers are preferred for most areas to prevent bridging of softer materials.

2. Double smooth drum rollers may be used provided that careful inspection can prevent bridging.

3. Compaction roller should be lighter in weight than proof-rolling equipment, with a minimum compaction force of 350 pounds per linear inch (PLI).

4. Vibratory compaction is preferred for dry, granular materials.

5. Hand compaction equipment such as impact rammers, plate or small drum vibrators, or pneumatic buttonhead compactors should be used in confined areas.

6. Hydraulic compaction by ponding or jetting will not be permitted except in unusual conditions, and then only upon written approval by the Engineer and after a demonstration of effectiveness.

7. Backhoe-mounted hydraulic or vibratory tampers are preferred for compaction of backfill in trenches under pavements over 4 feet in depth. The upper 4 feet shall be compacted as detailed above or with hand-guided or self propelled vibratory compactors or static roller.

8. For plastic pipelines (PVC, PE or PB) do not compact directly over center of pipe until backfill has reached 2 feet above top of pipe.

TABLE 1

COMPACTION REQUIREMENTS

Construction Element	Maximum Compaction Layer Thickness (Inches)	ASTM	Minimum Compaction
I. STRUCTURES*			
a. Fill beneath foundation elements and under slabs-on-grade - hand-guided compaction	6	D1557	95%
Fill beneath foundation elements and under slabs-on-grade - self-propelled or tractor-drawn compaction	8	D1557	95%
b. Fill around structures and above footings	8	D1557	95%
II. TRENCHES**			
a. Fill under pipelines and pipe bedding	8	D1557	95%
b. Pipe sidefills and top 4 feet of pipe backfill under pavements	12	D1557	93%
c. Backfill below 4 feet under pavement	18	D1557	90%
d. Backfill under lawns, gardens and cultivated fields	24	D1557	90%
e. All other trenches***	36	D698	85%
III. EMBANKMENTS AND FILLS			
a. Fill under streets, parking lots, and other paved areas	12	D1557	92%
b. Embankments not supporting pavement or structures	18	D1557	90%
c. Rough site grading	24	D698	85%

* Where structural loads are carried by piles, caissons or other deep foundations, minimum compaction may be reduced to 92 percent.

** The first 1 foot above pipelines shall have a compacted thickness of 12 inches.

*** For cross-country pipelines, lifts may be compacted with a backhoe bucket or other means, and slightly mounded at the surface provided that regrading is performed within the guarantee period.

3.03. FIELD QUALITY CONTROL

A. Material Testing

1. The Engineer reserves the right to order testing of materials at any time during the work.

2. Testing will be done by a qualified, independent testing laboratory in accordance with this section and Section 01400.

3. The Contractor shall aid the Engineer in obtaining representative material samples to be used in testing.

4. For each material which does not meet specifications, the Contractor shall reimburse the Owner for the cost of the test and shall supply an equal quantity of acceptable material, at no additional compensation.

5. The Contractor shall anticipate these tests and incorporate the time and effort into procedure.

B. Compaction Testing

1. The Engineer reserves the right to order the qualified independent testing laboratory to conduct in-place density tests of compacted lifts.

2. Testing may be conducted for every 200 cubic yards of fill or backfill, or every 100 linear feet of trench backfill placed.

3. The Contractor shall dig test holes and provide access to all backfill areas at no additional compensation when requested by the Engineer.

4. For each test which does not meet specifications, the Contractor shall retest at his cost. If the retest does not meet specifications, the Contractor shall replace and recompact material to the specifications at no additional cost to the Owner.

5. The Contractor shall anticipate these tests and incorporate the time and effort into procedures.

6. Nuclear moisture density testing by “probe” methods will be acceptable for compacted layers not exceeding 8 inches in thickness.

    a. Nuclear “backscatter” methods will be acceptable only for testing asphalt paving layers not in excess of 3 inches in thickness.

    b. Only certified personnel will conduct nuclear testing.

    c. If the nuclear method is utilized, the results shall be checked by at least one in-place density test method described above.

C. Unacceptable Stockpiled Material - Stockpiled material may be tested according to Material Testing Materials.

D. Alternate Methods of Compaction - The Contractor may employ alternate methods of compaction if the desired degree of compaction can be successfully demonstrated to the Engineer's satisfaction.

E. Select Material - On-Site

1. Any on-site material may be used for select fill material provided it meets all the requirements of the equivalent off-site material.

2. No on-site material shall be used without prior approval of the Engineer.

F. Systematic Compaction - Compaction shall be done systematically, and no consideration shall be given to incidental coverage due to construction vehicle traffic.

3.04. PROTECTION

A. Prior to terminating work for the day, the final layer of compacted fill, after compaction, shall be rolled with a smooth-wheel roller if necessary to eliminate ridges of soil left by tractors or equipment used for compaction or installing the material.

B. As backfill progresses, the surface shall be graded so as to drain off during incidence of rain such that no ponding of water shall occur on the surface of the fill.

C. The Contractor shall not place a layer of fill on snow, ice or soil that was permitted to freeze prior to compaction.

1. These unsatisfactory materials shall be removed prior to fill placement.

END OF SECTION

SECTION 02507

TEMPORARY PAVING

PART 1 GENERAL

1.01. SECTION INCLUDES

A. Temporary paving roads, streets, driveways, and walks.

B. Schedule.

C. Compaction .

D. Maintenance.

E. Tolerances .

1.02. RELATED SECTIONS

A. Section 01025 - UNIT PRICE ITEMS: Requirements applicable to unit prices for the work of this section.

B. Section 01039 - COORDINATION AND MEETING

C. Section 01300 - SUBMITTALS

D. Section 02112 - PAVEMENT CUTTING

E. Section 02228 - COMPACTION

1.03. REFERENCES

A. New York Department of Transportation Standard Specifications, dated May 1, 2008.

B. NYSDOT - Manual of Uniform Traffic Control Devices.

1.04. COORDINATION

A. Coordinate field work under provisions of Section 01039, including maintenance of traffic , access to private driveways , and emergency vehicle access.

PART 2 PRODUCTS

2.01. TEMPORARY PAVING MATERIAL

A. Temporary paving to consist of one of the following types:

1. Type 3, Asphalt Concrete - From May through October , or when local bituminous plants are operating, the temporary paving shall be NYSDOT Type 3 asphalt concrete binder plant mix, 2 inch compacted thickness.

a. When temporary pavements are to be maintained through a winter season, then a 4-inch compacted thickness shall be placed.

2. Type 2, Cold Mix Bituminous - From November through April, or when local bituminous plants are not operating, provide cold mix bituminous surfacing NYSDOT Specification Section 405, Type 2, placed to a 4-inch compacted thickness.

PART 3 EXECUTION

3.01. EXAMINATION

A. Verify that backfill and select special backfill has been compacted and graded in accordance with Section 02228.

B. Verify that traffic controls are in place.

3.02. PREPARATION

A. Install traffic control devices in accordance with the State's Manual of Uniform Traffic Control Devices.

B. Excavate, fill, grade and compact the special backfill to a smooth, stable condition prior to placing of the temporary paving.

3.03. INSTALLATION

A. The temporary paving to match the slope, grade and alignment of the original pavement, driveway, and walk.

B. The temporary paving to match the elevation of the adjacent surface and to continue the existing drainage pattern.

C. Compact temporary paving to the Engineer's satisfaction with tandem rollers or equivalent and of sufficient size and number to compact the asphalt concrete while it is still hot and in a workable condition.

1. Rolling shall continue until all roller marks and creases are removed.

2. At the Engineer's discretion, confined area or small sections of pavement may be compacted by mechanical means.

3.04. TOLERANCES

A. Flatness - Maximum variation of 3/4-inch measured by a 10-foot straight edge.

B. Scheduled Compacted Thickness - Within 1/4-inch.

3.05. SCHEDULE

A. Place temporary paving as directed by the Engineer over all trenches and excavations in streets, driveways, and walks as soon as the backfilling and compaction operations have been completed.

1. In any event, required surfaces shall be temporarily paved by each Friday afternoon prior to the weekend shutdown of construction activity.

2. Contractor shall replace painted traffic markings in accordance with local, county, or state specifications (depending on jurisdiction).

3.06. MAINTENANCE

A. The temporary pavement to be maintained in a manner satisfactory to the Engineer, free from depressions, potholes and rough surface until its removal is required for the installation of permanent paving.

1. Install additional material to maintain a satisfactory driving, walk, and driveways surface .

2. If additional material is needed due to settling or constant use, Contractor shall replace or fill at no additional cost to the Owner.

END OF SECTION

SECTION 02510

HOT MIX ASPHALT PAVING

PART 1 GENERAL

1.01. SECTION INCLUDES

A. Asphalt concrete paving and surface sealer; top course, binder, or base course.

B. Driveways and parking areas.

C. Road shoulders.

D. Compaction.

E. Asphalt curbs.

F. Tolerances.

G. Field quality control.

1.02. RELATED SECTIONS

A. Section 01025 - UNIT PRICE ITEM: Requirements applicable to unit prices for the work of this section.

B. Section 01039 - COORDINATION AND MEETINGS

C. Section 01300 - SUBMITTALS

D. Section 01550 - MAINTENANCE AND PROTECTION OF TRAFFIC

E. Section 02112 - PAVEMENT CUTTING

F. Section 02228 - COMPACTION

G. Section 02507 - TEMPORARY PAVING

1.03. REFERENCES

A. New York State Department of Transportation (NYSDOT) Standard Specifications, current version.

B. USDOT - Manual of Uniform Traffic Control Devices.

C. NYSDOT - Manual of Uniform Traffic Control Devices (Supplement).

1.04. PERFORMANCE REQUIREMENTS

A. Paving and repaving accomplished under this contract shall meet the finished grades, elevations and profiles shown on the Drawings.

1. Where pavement replacement is being accomplished, match the sectional profiles of the existing pavement unless otherwise stated herein or shown on the Drawings.

B. All thicknesses of pavement courses described herein or shown on the Drawings are after completion of compaction.

1.05. SUBMITTALS

A. Submit under provisions of Section 01300.

B. Submit certification of plant job mix formulas that have been approved by the NYSDOT.

C. Traffic control plan in accordance with Section 01550 and the Manual of Uniform Traffic Control Devices (with the NYSDOT Supplement).

D. Tack coat material.

1.06. QUALITY ASSURANCE

A. Perform work in accordance with the NYSDOT Standard Specifications, dated January 2, 2002 as amended to date and as they apply to the following:

1. Materials and batch plant requirements.

2. Construction procedures except as modified herein.

3. Weather and seasonal limitations except as modified herein.

B. Paving work shall be performed by a qualified paving contractor or subcontractor acceptable to the Owner and Engineer.

C. Obtain asphalt concrete materials from same source throughout project.

1.07. ENVIRONMENTAL LIMITATIONS

A. Weather and Seasonal Limitations - Asphalt concrete and bituminous surface treatments shall not be placed on wet surfaces or when it is raining or when conditions prevent the proper handling, compacting or finishing of the asphalt concrete or when the surface temperature is less than specified in the following table:

NOMINAL COMPACTED LIFT THICKNESS	SURFACE TEMPERATURE MINIMUM (NOTE 1)	SEASONAL LIMITS
3" or greater	40°F	None
Greater than 1" but less than 3"	45°F	Notes 2, 3, and 5
0.1" or less	50°F	Notes 2 and 3
Bituminous surface treatments (Note 3)	70°F or greater	

NOTES:
1. All temperatures shall be measured on the surfaces (lay glass thermometer on surface and read after temperature has stabilized) where the paving is to be placed and the controlling temperature shall be the average of three temperature readings taken at locations ±25 feet apart.
2. Surface treatments shall be placed during the period of May 1 up to and including the first Saturday after Labor Day.

3. The ambient temperature shall be not less than 50 degrees F in the shade and not more than 95 degrees F.
4. Bituminous paving mixtures for curbs, driveways, sidewalks, gutters and other incidental construction shall be placed on surfaces having a temperature of 45 degrees F or greater. Installation of these items is not subject to seasonal limitations.
5. When work is halted because of weather conditions, limited tonnage enroute to the project may be placed, if permitted, and the mixture is within the temperature requirements.

1.08. COORDINATION

A. Coordinate field work under provision of Section 01039 including maintenance of traffic, access to private driveways, and emergency vehicle access.

1.09. SCHEDULING

A. Schedule the paving operations such that all paving necessary to provide safe and adequate maintenance and protection of traffic or for protection of previously laid courses is completed within the weather and seasonal limitations.

1. Such scheduling shall include expediting construction operations to permit paving before the seasonal limitations or by limiting the length of work to that which can be completed before the seasonal shut-down.

2. The cost of scheduling and sequencing of work to conform with the seasonal limitations shall be reflected in the bid prices for the related contract items.

1.10. MAINTENANCE

A. The Contractor shall maintain driving surfaces, free of ruts and potholes, for maintenance of traffic until temporary paving or permanent paving is installed.

1. All temporary paving and pavement replacement shall be maintained in a safe, drivable condition until the pavement wearing course is installed.

2. All subgrade, subbase and base courses shall also be maintained in their specific finish condition prior to placement of the next course.

B. If the Contractor fails to complete the necessary paving operations prior to weather and seasonal limitations, all temporary materials and work which become necessary as a result of such failure, such as the lowering or shimming of castings and protrusions, drainage of the roadway, providing acceptable rideability, and other work needed for the adequate maintenance and protection of traffic until paving operations can be completed the following paving season, shall be at the Contractor's expense.

C. For a period of one year after issuance of the Certificate of Substantial Completion, the Contractor shall promptly patch, maintain, repair, and/or replace any pavement that settles or becomes damaged due to settlement or defective materials or workmanship.

1. Areas to be repaired shall be cut out in a square or rectangular shape to the depth matching the top course.

2. The vertical face of asphalt to be painted with asphalt emulsion prior to placing the asphalt concrete.

3. If more than top course depth of 1-1/2 inch settlement has occurred, the pavement shall be removed to the subbase and subbase and/or binder and base course restored to proper grade before restoration of the wearing course.

4. The centerline finished grade, in any case, shall be as shown on the Contract Drawings.

PART 2 PRODUCTS

2.01. NYSDOT-OWNED ROADWAY - HOT MIX ASPHALT (HMA) PAVEMENTS

A. Base Course - The pavement base course shall be constructed of the type described below and as shown on the Drawings. Base course material shall be installed to a width and depth as shown on the Drawings.

1. Superpave - This base course shall be NYSDOT Item 402.378901, per NYSDOT Table 401-1. Final compacted thickness shall be as shown on the Drawings but not less than 3 inches. Temperature range from 225 to 300 degrees F.

B. Binder Course - The pavement binder course shall be constructed of the type described below and as shown on the Drawings. Binder course material shall be laid to a width and depth shown on the Drawings. Temperature range 250 to 325 degrees F.

1. Superpave - This binder course shall be NYSDOT Item 402.198901. Final compacted thickness shall be as shown on the Drawings, but not less than 4 inches.

C. Pavement Wearing Course (Top Course) - Pavement wearing course construction shall be of the type described below and as shown on the Drawings. The wearing course shall be constructed to a width and depth as shown on the Drawings.

1. Superpave - This wearing course shall be NYSDOT Item 402.098301. Final compacted thickness shall be as shown on the Drawings, but not less than 2.5- inch.

D. Tack Coat

1. NYSDOT - Tack coats of asphalt emulsions, Table 702 90, shall be furnished and applied in accordance with NYSDOT Specification Section “407 - Tack Coat.” Prior to placing the next course, the asphalt shall be allowed to cure per manufacturer’s recommendations.

E. Painted Traffic Markings - Contractor shall replace all markings in accordance with state specifications.

2.02. TOWN OF NORTH CASTLE- OWNED ROADWAY - HMA PAVEMENTS

A. Base Course - The pavement base course shall be constructed of the type described below and as shown on the Drawings. Base course material shall be installed to a width and depth as shown on the Drawings.

1. NYSDOT Course 304 Type 4 - This base course shall be NYSDOT Type 4, per NYSDOT Table 304-1. Final compacted thickness shall be as shown on the Drawings but not less than 12 inches.

B. Binder Course - The pavement binder course shall be constructed of the type described below and as shown on the Drawings. Binder course material shall be laid to a width and depth shown on the Drawings. Temperature range 250 to 325 degrees F.

1. Type 3, Asphalt Concrete - This binder course shall be NYSDOT Type 3 per NYSDOT Table 403-1. Item 402.198901. Final compacted thickness shall be as shown on the Drawings, but not less than 4 inches.

C. Pavement Wearing Course (Top Course) - Pavement wearing course construction shall be of the type described below and as shown on the Drawings. The wearing course shall be constructed to a width and depth as shown on the Drawings.

1. Type 7, Asphalt Concrete - This wearing course shall be NYSDOT Type 7 and/or Type 7F per NYSDOT Table 403 1. Final compacted thickness shall be as shown on the Drawings, but not less than 2.5-inch. (The “F” designation indicates that high friction course aggregates are required.) Temperature range 250 to 325 degrees F.

D. Tack Coat

1. NYSDOT - Tack coats of asphalt emulsions, Table 702 90, shall be furnished and applied in accordance with NYSDOT Specification Section “407 - Tack Coat.” Prior to placing the next course, the asphalt shall be allowed to cure per manufacturer’s recommendations.

E. Painted Traffic Markings - Contractor shall replace all markings in accordance with local and county specifications (depending on jurisdiction).

2.03. ASPHALT CURB

A. Materials shall conform to the requirements set forth Article 2.02 of this section .

2.04. SOURCE QUALITY CONTROL

A. Provide certification of state approved job mix formulas for types to be used on this project.

PART 3 EXECUTION

3.01. EXAMINATION

A. Permanent restoration of pavements shall not begin until 30 days after trench or structure backfill has been completed in accordance with the applicable specifications or until testing of the installed utility has been completed in accordance with the specifications (whichever is the longest period of time after completion of trench or structural backfill).

1. Completion of backfill shall include compaction tests to ascertain compliance with degree of compaction required as described in Section 02228.

a. Verify base conditions under provisions of Section 01039.

b. Verify that compacted subgrade existing bituminous surface is dry and ready to support paving.

c. Verify gradients and elevations of base are correct.

B. If painted traffic markings on the pavement are to be interrupted by the new pavement replacement, they are to be restored using an approved traffic paint. See paragraphs 2.01.E and 2.02.E.

C. Driveway and Parking Areas

1. Driveways and parking areas that are disturbed or damaged by the Contractor's operations shall be restored equal to a new condition.

2. Driveway or parking area aprons which do not meet the elevation of the edge of new road pavement installed under this project shall be adjusted to meet the new pavement at a slope not to exceed 1 inch per foot with top course material of the new pavement, so that the apron conforms to the elevation of the road pavement at each location.

3. New driveways or parking areas shall be constructed as described herein and as shown on the Drawings.

4. Contractor shall completely replace driveway apron from trench to the road edge of pavement if trench is within 10 feet of road edge.

D. Road shoulders to be constructed or reconstructed as described herein and as shown on the Drawings.

1. Road shoulders that are disturbed or damaged by the Contractor's operations shall be restored equal to, or to conditions superior to that which existed prior to construction.

2. Road shoulders that do not meet the elevation of the edge of new road pavement installed under this project shall be adjusted to meet the new pavement at a slope not to exceed 1-1/2 inches per foot. Paving materials shall match existing unless otherwise shown on the Drawings.

3. New road shoulders shall be constructed as described herein and as shown on the Drawings.

3.02. PREPARATION

A. Where project consists of reconstructing existing streets, lower valve boxes and existing manholes to subgrade level by removing frame and cover and brick masonry.

1. Cover valve boxes and manholes with steel plates and locate with measured ties.

2. After constructing the subbases and pavement courses, and prior to placing the final top course, recover valve boxes and manholes and raise to finished grade.

B. All existing and new manholes, frames and covers, valve boxes, curb boxes, etc., shall be raised or lowered to be 1/2 inch below the new pavement grade.

1. No manhole covers or valve box covers shall be covered with paving material, or be exposed in a depression in the pavement greater than 1/2 inch.

C. Catch basin frames and grates shall be raised or lowered to be 1 inch below the new pavement finished grade.

D. Pavement Cuts

1. Pavement cuts for final pavement replacement shall be made as described herein and in Section 02112.

2. Pavement cuts shall be made parallel to the centerline of the trench, shall be located a minimum of 12 inches outside the backfilled trench on undisturbed subgrade and shall be in a straight line for minimum length of 100 feet between manholes or between those stations where changes in direction of the installed piping were made.

3. Where a full street width overlay is to be installed the cutbacks may follow the backfilled trench alignment.

4. Loose, torn, cut, marked up or damaged pavement outside the cutback areas shall be removed and replaced at the Contractor's expense and match the proposed permanent paving.

5. Pavement cuts in driveways shall be cut back 12 inches and made in a straight alignment perpendicular or parallel to the driveway and for its full width.

6. Pavement cuts in parking areas shall be cut back 12 inches and made in a straight alignment parallel to the centerline of trench.

E. Preparation of Existing Surfaces

1. Prior to placing of hot mix asphalt, the existing pavement surfaces shall be cleaned including brooming, mechanical sweeping, and flushing with water such that no dust or foreign material remains on the existing surface and in accordance with NYSDOT Specification "402-3.05 Conditioning of Existing Surface" and "633 3.01 Cleaning Existing Pavement and/or Shoulders."

2. After cleaning of surface, all unsealed or inadequately sealed cracks and joints shall be cleaned with compressed air and then sealed as required under NYSDOT Specification "633-3.02 Cleaning, Sealing and Filling Joints and Cracks."

3. Prior to placing of hot mix asphalt, vertical faces of existing pavement, structures, curbs and gutters shall receive a tack coat as described in NYSDOT Specification "407 Tack Coat." Curbs and gutter faces to be sprayed only to the extent to be covered by the asphalt concrete.

F. All new pavement where meeting existing pavement shall be butted up against a vertical face in the existing pavement.

1. This vertical face to be cut to the depth of the new pavement.

2. Where the new pavement is an overlay, the beginning and end of the top course shall be similarly butted against a vertical face.

3. The existing pavement shall be removed for a minimum length of 2 feet, as measured parallel to the direction of paving, or greater if required to eliminate any noticeable bump or to provide adequate drainage away from structures, and to the width of new pavement.

G. Removal of Existing Pavement

1. Where shown on the Contract Drawings, the Contractor shall remove a portion of an existing pavement including Portland cement concrete paving, hot mix asphalt pavement, or to remove an asphalt concrete overlay pavement from a Portland cement concrete pavement base course, to the limits and profile specified by grinding, milling, or planing methods.

2. This process shall yield a base upon which a final pavement course will be applied.

3. The Contractor shall employ equipment especially designed and manufactured for the grinding, milling or planing of pavements.

4. In general, grinding machines are designed for removing and profiling Portland cement concrete pavement surfaces while milling and planing machines are designed for the removing of asphalt concrete pavement surfaces.

H. The resulting ground, milled or planed surface shall be thoroughly cleaned and free from dust, loose pavement material or other material.

1. The surface shall be free from gouges, large cracks and unsound, soft or broken-up areas.

2. Gouges shall be made level and true by the use of a trueing and leveling course of asphalt concrete if allowed by the Engineer.

3. Cracks greater than 1/4-inch shall be cleaned and filled in accordance with Article 3.02.

4. Unsound, soft or broken-up areas shall be excavated and repaired.

3.03. PREPARATION - TACK COAT

A. Apply tack coat in accordance with manufacturer's instructions.

B. No traffic will be allowed on the freshly applied tack coat.

3.04. PREPARATION - RESET MANHOLE FRAMES

A. Prior to placing wearing (top) course, make final adjustments of manhole frames, catch basin frames, valve boxes and any other utility structures located in the pavement in relation to finished grade.

1. Manhole frames, valve boxes, etc. to set 1/2 inch below finished grade and parallel to finished crown.

2. Catch basin frames to set 1 inch below finished grade and parallel to finished crown.

a. Bevel slope of wearing course (for 6-inch width) around catch basin frame.

3.05. INSTALLATION

A. Install Work in accordance with NYSDOT standards.

B. Place asphalt within four hours of applying tack coat.

C. Compact pavement by rolling. Do not displace or extrude pavement from position. Hand compact with vibratory pans and hand tamps in area inaccessible to rolling equipment.

D. Develop rolling with consecutive passes to achieve even and smooth finish, without roller marks.

3.06. PLACING AND COMPACTING

A. Placing mix in an appropriate ambient temperature and on a surface sufficiently warm to minimize the risk of excessive cooling before completion of rolling is of paramount importance. Holding the aggregate particles in place is solely the function of the film of asphalt. The asphalt cannot perform this function properly if the mix is too cool when rolled.

1. A thin course compresses very little under the roller and, as it cools quickly, it must be rolled as soon as possible.

2. The Contractor shall supply sufficient number of rollers to perform the required compaction while asphalt concrete is still hot and in a workable condition and coordinate speed of paver with rollers such that the degree of compaction required is obtained.

3. A high degree of densification is not the goal with this type of mix -- the aim is firm seating and contact of the aggregate particles.

4. One or two coverages (see Table 1) with a steel-wheeled roller weighing 8 to 10 tons is sufficient. Additional rolling may be excessive, causing a break in the bond of asphalt between aggregate particles, particularly after the mix has cooled.

5. When overtaken by sudden storms, the Engineer may permit work to continue up to the amount which may be in transit from the plant at the time, provided the mixture is within temperature limits specified.

B. Paving (NYSDOT) - All asphalt concrete shall be installed using self-powered units in accordance with the NYSDOT Specification “402-3.02 HMA Pavers and 402-3.06 Spreading and Finishing", except that the sixth paragraph of 402 3.06 beginning with the words “If there are less than 1,250 square meters . . .” is deleted and the following substituted:

1. A self-powered paving unit shall be provided except where hand methods are permitted by the Engineer in small areas or areas inaccessible to a paving unit. For such areas, the mixture shall be dumped, spread, screened and compacted to give the required section and compaction thickness.

2. Surface Treatment (NYSDOT) - Bituminous surface treatment to be constructed in accordance with NYSDOT “Section 410 Bituminous Surface Treatment - Single Course”, Paragraphs 410-1 through 410-3.01 G.

C. Placement of the surface course shall be carefully planned to assure that the longitudinal joints in the surface course will correspond with the edges of the proposed traffic lanes. They shall not be located within the normal wheel path of vehicular traffic.

1. When paving adjoining lanes, the asphalt concrete shall be laid such that it uniformly overlaps the adjacent lane 2 to 3 inches. The thickness of the overlap material shall be approximately 1/4 the compacted thickness of the course, so as to result in a smooth and well compacted joint after rolling. The overlapped material shall be broomed or raked back onto the adjacent hot lane so that the roller operator can

crowd the small excess into the hot side of the joint. If the overlap is excessive, the excess material shall be trimmed off so that the material along the joint is uniform. The coarse particles of aggregate in the overlap material shall be removed and wasted if deemed necessary by the Engineer.

2. Traverse joints shall be staggered a minimum of 10 feet from adjacent lanes.

D. Compaction - Asphalt concrete shall be compacted in accordance with NYSDOT Specification “402-3.07 Compaction and 402-3.09 Joints” using either option as follows:

1. Option A - Three-roller compaction train.

2. Option B - Vibratory compaction.

E. The required number of passes for either vibratory or static rollers, listed in Table 1, are minimum and may be increased by the Engineer. One pass shall be defined as one movement of the roller over any point of the pavement in either direction. Static roller passes shall continue until all ruts, ridges, roller marks or other irregularities are removed from the surface. The Engineer may alter the compaction procedures for small areas where the specified procedures are not practical.

TABLE 1

REQUIRED NUMBER OF PASSES (MINIMUM)

PAVEMENT COURSES	VIBRATORY ROLLER		STEEL-WHEEL TANDEM FINISH ROLLER
	VIBRATING PASSES (1)	STATIC PASSES (2)	STATIC PASSES
Base (open graded each lift)	4	2	5
Base (dense graded)	4	2	5
Binder (dense graded)	4	Not required	5
Top (dense graded all types)	2	Not required	2

NOTES:
(1) The required number of vibrating passes shall be reduced by 1/2 for dual vibrating drum rollers when the drums are tandem and are both in the vibrating mode.
(2) The required number of static passes may be completed by the vibratory roller operating in the static mode.

F. Unless otherwise directed by the Engineer, vibratory rollers having pneumatic drive wheels shall compact the longitudinal joint by using one of the pneumatic drive wheels to overlap the joint in two passes with the drum operating static. Unless otherwise directed by the Engineer, dual vibrating drum rollers shall compact the joint by overlapping the joints in two passes with both drums operating static.

G. To prevent adhesion of the mixture to the drum(s), the drum(s) shall be kept properly moistened with water, or water mixed with small quantities of detergent or other Department approved materials. If required to prevent pneumatic tire pickup, the pneumatic drive wheels may be coated with a fine mist spray of fuel oil or other similar material. In all instances, the surface of the pavement shall be protected from drippings of fuel oil or any other solvents used in pavings, compaction or cleaning operations.

H. If the Engineer determines that unsatisfactory compaction is being obtained or damage to highway components and/or adjacent property is occurring using vibratory compaction equipment, the Contractor shall immediately cease using this equipment and proceed with the work in accordance with the conventional static compaction procedures at no additional cost.

I. The Contractor should note that if he elects to use vibratory compaction equipment, he assumes full responsibility for the cost of repairing all damage that may occur to highway components and adjacent property or underground utilities.

J. Areas inaccessible to rollers shall be compacted using vibratory pans, making a minimum of two passes on each course. Hand tamps shall be used for small areas not otherwise compacted.

K. At the end of each work day, when placing top course material, the face of each paving lane shall be ended by the placing of a 2-inch x 4-inch or suitable sized board perpendicular to the pavement and shimmed with asphalt concrete to provide a driving surface such that the board and shim material can be easily removed and a vertical face retained for butting the start of the new pavement on the following work day.

3.07. DRIVEWAYS AND PARKING AREAS

A. Paving materials, type of paving, depth of various courses, etc., shall be as shown on the Drawings.

1. The driveways and parking areas shall be cut back 12 inches from outside disturbed or damaged areas as described above and in Section 02112.

2. The minimum depth of subbase shall be 12 inches.

3. The work shall include proper compaction of any necessary subbase, base course and paving courses, in accordance with Section 02228.

B. Bituminous surfaces shall be restored with asphalt concrete matching existing, but in no case shall be less than 2 inches of Type 3 binder and 1 inch of Type 7 top course as specified in the applicable Articles of this section.

C. Non-Bituminous Surfaces - Where shown on the Drawings, construct new driveways and parking areas or restore existing driveways and parking areas as follows:

1. Gravel surfaces shall be restored per the Contract Drawings, matching existing, but in no case shall be less than 6 inches thick. The gravel shall be graded, shaped and compacted. Loose stones shall be removed.

2. Crushed stone surfaces shall be restored matching existing stone, but in no case shall be less than 1 inch thickness of stone. Stone to be compacted with a roller.

3.08. ASPHALT CURB

A. Bituminous curb shall be constructed by use of a self-propelled automatic curber or curb machine or a paver with curbing attachments.

B. The automatic curber or machine shall meet the following requirements and shall be approved prior to its use.

1. The automatic curber or machine shall be so constructed and so operated as to consolidate the mixture to produce a dense mass free of voids.

2. The machine shall form the curb true to line and grade and to a uniform shape and texture.

3. The Engineer may permit the construction of curb by means other than the automatic curber or machine, when short sections or sections with short radii are required, or for such other reasons as may seem to him to be warranted. The resulting curb shall conform in all respects to the curb produced by the use of the machine.

C. When curb is to be placed on a bituminous pavement or other bases, they shall be thoroughly swept and cleaned using compressed air and/or other cleaning methods as necessary to provide a clean surface. The surface shall be thoroughly dried and, when directed by the Engineer, a tack coat of bituminous material as set forth in paragraph 2.02.D shall be applied. During application the Contractor shall prevent the spread of tack coat to areas outside of the area occupied by the curb.

D. Backfilling, when required, shall be performed after the curb has reached ambient temperature and shall be performed promptly so as to afford support and protection. Backfilling shall be accomplished using such methods, equipment and compaction s directed to prevent damage to the curb and to obtain satisfactory results

3.09. SEAL COAT

A. Apply seal coat to surface course in accordance New York State Department of Transportation standards.

3.10. TOLERANCES

A. Surface Tolerance - The pavement surface shall be constructed to a 1/4-inch tolerance. If, in the opinion of the Engineer, the pavement surface is not being constructed or has not been constructed to this tolerance based upon visual observation or upon riding quality, he may test the surface with a 16-foot straight edge (furnished by the Contractor) or string line placed parallel to the centerline of the pavement and with a 10-foot straight edge or string line placed transversely to the centerline of the pavement on any portion of the pavement.

1. Variations exceeding 1/4-inch shall be satisfactorily corrected or the pavement relayed at no additional cost as ordered by the Engineer.

B. Thickness Tolerance - The thickness indicated for each of the various courses of bituminous pavement is the nominal thickness. The pavement shall be so constructed that the final compacted thickness is as near to the nominal thickness as is practical, and within the tolerances specified below.

1. Material which is part of a trueing or leveling course or shim course will not be considered in pavement thickness determinations.

2. A tolerance not to exceed 1/4-inch from the nominal thickness required for the course specified under one pay item will be acceptable where the required nominal thickness is 4 inches or less. A tolerance not to exceed 1/2-inch from the nominal thickness required for the course or courses specified under one pay item will be acceptable where the required nominal thickness is over 4 inches. In addition, the sum total thickness of all bituminous mixture courses shall not vary from the total of the nominal thickness indicated on the plans by more than 1/4 inch where the total

nominal thickness is 4 inches or less; or more than 1/2-inch where the total nominal thickness is over 4 inches but not more than 8 inches; and by not more than 5/8-inch where the total nominal thickness is more than 8 inches.

3.11. FIELD QUALITY CONTROL

A. The required degree of compaction for wearing or top courses and shim course is a finished product having not more than 7 percent air voids.

3.12. PROTECTION

A. Any pavement, constructed or reconstructed, which is subsequently damaged due to activity of work under this contract, shall be removed and replaced by the Contractor at no additional cost to the Owner.

B. Protect pavement from vehicular traffic until compaction is completed.

END OF SECTION

SECTION 02524

CONCRETE CURB

PART 1 GENERAL

1.01. SECTION INCLUDES

A. Concrete curb.

B. Concrete gutter.

C. Integral concrete curb and gutter.

D. Reinforcing.

E. Replacement of existing curb.

F. Base preparation, underdrains and subgrade.

G. Placing, finishing, curing.

H. Tolerances.

1.02. RELATED SECTIONS

A. Section 01025 - UNIT PRICE ITEMS

B. Section 02225 - TRENCHING

C. Section 02980 - SITE REHABILITATION

D. Section 03001 - CONCRETE

1.03. REFERENCES

A. ASTM C309 - Liquid membrane forming compounds for curing concrete.

B. ASTM D1751 - Preformed expansion joint filler for concrete paving and structural construction.

C. NYSDOT Standard Specifications, dated May 1, 2008.

1.04. PERFORMANCE REQUIREMENTS

A. It shall be the Contractor's responsibility to perform all work within the prescribed temperature, moisture and weather limitations imposed herein, NYSDOT specifications and by Division 3 specifications.

B. Competent, experienced concrete finishers shall be employed for this work.

1.05. SUBMITTALS

A. Submit per Division 3 requirements.

B. Submit curing procedures and single-page catalog cuts of any proposed curing products.

1.06. QUALITY ASSURANCE

A. Perform work as described herein and in accordance with Division 3 specifications.

1.07. REGULATORY REQUIREMENTS

A. Construction of curbs at crosswalks shall comply with local or state requirements for access by physically handicapped persons.

B. Conform to applicable state DOT standards for constructing curbs or gutters on public property.

1.08. ENVIRONMENTAL REQUIREMENTS

A. Do not place concrete when surface is less than 40 degrees F or when temperature is 40 degrees F and falling or when surface is frozen.

1. Protect surface of freshly placed concrete from adverse weather conditions, rain, freezing and damage or defacement from vandalism.

PART 2 PRODUCTS

2.01. FORM MATERIAL

A. Forms shall be of a smooth metal of the size and shape conforming to the proposed curb dimensions.

1. Forms shall be of sufficient structural strength to hold their shape true to line and grade against all forces induced while placing and vibrating concrete.

2.02. CURING MATERIAL

A. Curing shall be either waterproof paper blankets, quilted covers, polyethylene curing covers, or clear or white pigmented membrane curing compound.

1. Selection of materials and methods shall provide protection from freezing.

B. After the seven-day cure, a protective sealer shall be sprayed on the exposed concrete surface; use Sika Corporation “Sikagard 701W,” Anti-Hydro “Clear Cure,” or equal.

1. The sealer to be applied in accordance with the manufacturer’s recommendations. Coordinate with the membrane curing compound if used.

2.03. AGGREGATE BASE

A. For projects located in New York State, aggregate base course material shall be screened gravel as described in Section 02225 or as shown on the Drawings.

B. In the event no aggregate base is specified or shown, the Contractor shall furnish and install a minimum of 6 inches of crushed stone as a base course for curb construction.

2.04. CONCRETE CURB AND GUTTER

A. Concrete shall comply with Section 03001 and shall be Mix ”E” to achieve a nominal 28-day strength of 5,000 psi, with 5 percent to 7 percent air entrainment.

2.05. REINFORCING

A. Reinforcing steel shall be provided in all curbs and gutters and shall be in accordance with the requirements of Section 03001.

2.06. PREMOULDED JOINT FILLER AND JOINT SEALANT

A. Expansion joint material shall be bituminous joint filler in accordance with ASTM D1751.

B. Joint sealant to be a grey polyurethane sealant.

1. Acceptable products are “Sika-Flex 1CSL” by Sika Corporation, “Sonolastic SL2” by Sonneborn, or equal.

PART 3 EXECUTION

3.01. EXAMINATION

A. Verify that subgrade has been properly graded and compacted to receive aggregate base course.

B. Verify that aggregate base course is properly compacted and graded to receive concrete.

C. Verify forms are correctly placed true to line and grade.

D. The finish grade and alignment of curb replacements to match existing conditions, jointing and shape that existed prior to removal, unless otherwise shown on the Drawings or specified herein.

3.02. PREPARATION

A. Prior to the start of each day’s concrete or gutter placement, the concrete curb or integral curb and gutter forms shall be placed and graded to the proper alignment and grade shown on the Drawings.

B. Forms shall be held rigidly in place and braced to withstand all forces of placing and vibrating concrete.

C. Subgrade - The subgrade, in accordance with Section 02229, shall be free of all bumps, depressions, standing water, organic material and all deleterious material and compacted to a smooth surface, parallel to the final surface.

D. Aggregate Base - Furnish and install a 6-inch aggregate base under the concrete curb or gutter or integral curb and gutter as shown on Drawings.

E. Curb Replacement - When existing curb is being replaced, the existing curb shall be removed to the nearest joint.

1. In all cases the horizontal and vertical faces of the new curb shall be flush with the face of the existing curb.

2. Grading of the new curb, gutter or integral curb and gutter shall be performed so as to continue drainage in its existing pattern.

F. Tree roots which interfere with the proposed curb alignment shall be removed to provide a 6-inch clearance between root and back edge of curb or gutter.

G. Other obstacles such as power poles or street lights which interfere with curb alignment shall remain in place and the alignment of the curb adjusted as approved by the Engineer.

3.03. INSTALLATION

A. Dimensions of the proposed curbs, gutters or integral curb and gutter are shown on the Drawings; however, all concrete curbs shall have a minimum height of 18 inches and a minimum thickness of 6 inches. Gutters shall have a minimum thickness of 6 inches.

B. All curbs and gutters shall be installed to a straight alignment parallel to the centerline of the road, or along the required radius or curvature shown on the Drawings, or along the line which existed prior to construction.

C. Reinforcing steel shall be 4 x 4 - W4.0 x W4.0 welded wire fabric or continuous #4 reinforcing bars.

D. Curbs, gutters or integral curb and gutter shall be cast in place in sections approximately 15 feet long, and provision made at each joint for expansion.

1. Expansion joints 1/2 inch in width shall be located opposite each pavement or sidewalk expansion joint.

2. Expansion joint material shall be premolded bituminous, cut to conform to the cross section of the curb and be set slightly indented.

E. The fresh concrete shall be thoroughly vibrated without damage or misalignment of the forms.

1. The vibrator shall be introduced into the concrete at 1-foot intervals for a period of at least 2 seconds for each immersion and shall vibrate at not less than 5,000 impulses per minute.

F. The final horizontal surface of curbs or gutters shall be leveled, floated and allowed to “set” slightly prior to the final finishing.

G. New or replacement concrete curbs or integral curb and gutter at crosswalks shall be constructed to the standards for access by physically handicapped persons and in accordance with the details shown on the Drawings.

3.04. FINISHES

A. The forms shall be left in place until the concrete has set sufficiently so that they can be removed without injury or marking of the curb.

1. Upon removal of the forms, the curb shall be immediately troweled or rubbed to a smooth and uniform surface. No plastering will be permitted.

B. The finish shall be smooth, free of trowel marks, uniform in texture and appearance, and within the stated tolerances.

C. The top face edge of the curb shall be finished with an edging tool having a 1 inch radius and the top back edge of the curb shall be finished with an edging tool having a 1/4 inch radius.

D. The front edge of the gutter shall be finished with an edging tool having a 1-inch radius.

3.05. CURING

A. Concrete shall be kept covered and moist for a period of seven days and protected from damage by vehicles and from freezing.

1. The curb and/or gutter shall be cured with one of the types described previously.

2. After curing is complete, the exposed concrete surfaces are to be sealed with a liquid-applied sealant.

B. Where necessary to provide vehicular access, before the curing period is completed, provide suitable bridging or plates to allow passage of vehicles without damaging the concrete curb and/or gutter.

3.06. TOLERANCES

A. Finished subgrade shall be ±1/2 inch of its proposed grade.

B. Finished top of underdrain aggregate shall be ±1/2 inch of its proposed grade.

C. Finished grade of the aggregate base course shall be ±1/4 inch of its proposed grade.

D. Finished curb, gutter or integral curb and gutter surfaces shall present a neat, uniform and continuous line with no apparent dips, high spots or bulges, or variations in line or grade greater than 1/8 inch as measured by a 10-foot straight edge.

1. Gutters shall not vary from the design grade shown on the Drawings by more than 1/8 inch in each 10-foot section.

3.07. GRADING

A. Grading in back of curbs, either new or reset, shall conform to the details shown on the Drawings.

1. When no specific details are shown, the Contractor shall backfill with compacted screened (maximum 2 inch size) gravel to driveway or walk subbase or to within 2 inches of top of curb if in lawn areas.

2. The remaining depth to be backfilled with topsoil and lawn restored per Section 02980. Slope backfilled area to drain from sidewalk to curb.

END OF SECTION

SECTION 02661

WATER DISTRIBUTION PIPING

PART 1 GENERAL

1.01. SECTION INCLUDES

A. Water main piping including fittings, accessories and materials.

B. Connection of water mains to existing piping, hydrants, valves, and meters.

C. Water services to serve domestic or fire protection.

D. Installation.

E. Installation schedule.

1.02. RELATED SECTIONS

A. Section 01039 - COORDINATION AND MEETINGS

B. Section 01300 - SUBMITTALS

C. Section 01500 - CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

D. Section 01700 - CONTRACT CLOSEOUT

E. Section 02205 - PROTECTION OF EXISTING FACILITIES

F. Section 02225 - TRENCHING

G. Section 02228 - COMPACTION

H. Section 02662 - WATER VALVES AND HYDRANTS

I. Section 02674 - PRESSURE TESTING OF WATER DISTRIBUTION SYSTEMS

J. Section 02675 - DISINFECTION OF WATER DISTRIBUTION SYSTEMS

K. Section 03001 - CONCRETE

1.03. REFERENCES

A. National Sanitation Foundation - Standard 61.

B. U.S. Environmental Protection Agency - Safe Drinking Water Act.

C. American National Standard Institute (ANSI)

D. American Water Works Association (AWWA)

E. American Society for Testing Materials (ASTM)

1. Ductile Iron and Gray Iron Pipe

a. ANSI A21.4/AWWA C104 - Cement-Mortar Lining for Ductile Iron and Gray Iron Pipe and Fittings for Water

b. ANSI A21.4/AWWA C105 - Polyethylene Encasement for Ductile Iron Piping for Water and Other Liquids

c. ANSI A21.10/AWWA C110 - Ductile Iron and Gray Iron Fittings, 3-inch through 48-inch, for Water and Other Liquids

d. ANSI A21.11/AWWA C111 - Rubber Gasket Joints for Ductile Iron and Gray Iron Pressure Pipe and Fittings

e. ANSI A21.50/AWWA C150 - Thickness Design of Ductile Iron Pipes

f. ANSI A21.51/AWWA C151 - Ductile Iron Pipe Centrifugally Cast in Metal Molds and Sand Lined Molds for Water and Other Liquids

g. AWWA C600 - Installation of Ductile Iron Water Mains and Their Appurtenances

h. ASTM A126- Gray Iron Castings for Valves, Flanges, and Pipe Fittings

2. Plastic Pipe and Fittings

a. ANSI/AWWA C900 - Poly (Vinyl Chloride) (PVC) Pressure Pipe 4 inch through 12-inch for Water

b. AWWA/C901 - Polyethylene (PE) Pressure Pipe and Tubing 1/2 inch through 3-inch for Water Service

c. AWWA C902 - Polybutylene (PB) Pressure Pipe, Tubing and Fittings, 1/2-inch through 3-inch for Water

d. ASTM D2464 - Threaded Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80

e. ASTM D2467 - Socket-Type Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80

f. ASTM D2564 - Solvents Cements for Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings

g. ASTM D2672 - Solvent Cement Joint Sockets for Belled PVC Pressure Pipe

h. ASTM F477- Elastomeric Seals, (Gaskets) for Joining Plastic Pipe

i. ASTM D1785 - Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120

j. ASTM D2581 - Polybutylene (PB) Plastics Molding and Extrusions Materials

k. ASTM D3139 - Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals

l. ASTM D3350 - Polyethylene Plastics Pipe and Fittings Materials

m. ASTM D2774 - Underground Installation of Thermoplastic Pressure Piping

n. ASTM D1784 - Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (PVC) Plastic Pipe Schedule 80

3. Copper Pipe and Tubing

a. ASTM B88 - Copper Pipe Type K

b. AWWA C800 - Underground Service Line Valves and Fittings (with Type K Copper Pipe and Tubing)

1.04. SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data - Provide data describing conformance to ANSI/AWWA/ASTM codes, materials, sizes, class, dimensions, joint type, fittings, and pipe accessories.

C. Manufacturer's Installation Instructions - Indicate special procedures required to install products specified.

D. Results of shop tests, if required.

E. Manufacturer's Certificate - Certify that products meet or exceed specified requirements.

F. Manufacturer Certified - To certify lead-free components.

1.05. PROJECT RECORD DOCUMENTS

A. Submit documents under provisions of Section 01700.

B. Submit marked-up record plans, including record location if different from plan, variations in specified depth of more than ±6 inches, record a minimum of two ties on all hydrants, bends, valves, and service connections.

C. Identify and locate on record drawings the exposed unmapped utilities or services.

D. Submit “Checklist for Water Service Connection” (found at the end of this section) for each installed service connection.

1.06. REGULATORY REQUIREMENTS

A. Conform to requirements of regulatory agencies having jurisdiction over the work.

B. Conform to permit requirements obtained by Owner and attached to these Specifications.

1.07. FIELD MEASUREMENTS

A. Prior to start of construction, verify by field measurements that existing conditions and structures are as shown on Drawings, notify Engineer of specific discrepancies or potential interferences.

B. Prior to start of construction where ordered, verify by exploratory excavations that existing underground utility locations and elevations are as shown on the Drawings or to confirm marked location and elevation of underground utilities by the organization identified in Section 02205.

C. Where connections are to be made to existing pipes, confirm the type of material and the outside dimensions of pipes.

1.08. COORDINATION AND SHUTDOWNS

A. Coordinate field work under provisions of Sections 01039 and 01500, including field engineering, maintenance of traffic, access to private driveways, and emergency vehicle access.

B. Coordinate work with local utility companies (private and municipal), including the organization identified in Section 02205 for location of existing utilities and protection thereof.

C. Coordinate shutdowns of existing systems with local authorities. Notify affected property owners and industries at least 24 hours prior to shutdown including duration of shutdown.

PART 2 PRODUCTS

2.01. DUCTILE IRON PIPE

A. Pipe material, sizes, classes, etc. shall be furnished and installed as listed herein or as shown on the Drawings.

B. For potable water applications, all linings and sealers shall conform to all applicable local, state, and federal health codes.

C. Pipe shall be ANSI A21.51/AWWA C151 - Ductile iron pipe material, thickness design conforming to ANSI A21.50/AWWA C150, Class 52, rubber gasket push-on joint and fittings with mechanical or push-on joint conforming to ANSI 21.11/AWWA C111 and ANSI A21.10/AWWA C110.

D. Pipe for New York State Route 22 crossing shall be ANSI A21.51/AWWA C151 - Ductile iron pipe material, thickness design conforming to ANSI A21.50/AWWA C150, Class 56, rubber gasket push-on joint and fittings with mechanical or push-on joint conforming to ANSI 21.11/AWWA C111 and ANSI A21.10/AWWA C110.

E. Ductile iron pipe shall have cement mortar linings for potable water which shall conform to ANSI A21.4/AWWA C104 as follows:

1. Double Thickness - Linings shall consist of cement mortar, centrifugally applied and shall not be less then 1/8 inch for 3 inches to 12 inches inclusive, 3/16 inch or 14 inches to 24 inches inclusive, and 1/4 inch for 30 inches to 54 inches inclusive. The inside shall be given a seal coat of asphalt material as described in ANSI A21.4/AWWA C104.

F. Protective coatings for ductile iron pipe potable water pipes shall be an asphaltic coating approximately 1 mil thick and conform to requirements of ANSI 21.51/AWWA C151.

G. All mechanical joint pipe and fittings shall be furnished with ductile iron retainer glands.

H. Push-on joints shall provide the following maximum deflections:

PIPE SIZE	MAXIMUM DEFLECTION
4” through 12”	5°
16” through 18”	3°
24” through 36”	1.5°

I. Manufacturers shall be:

1. American Pipe Product.

2. U.S. Pipe Product.

3. Griffin Pipe Product.

4. McWane Group (Clow or Atlantic States).

5. Or equal.

J. Where shown on the Drawings or described herein, provide ductile iron pipe with polyethylene sleeve encasement conforming to ANSI 21.5/AWWA C105.

1. The encasement shall be a continuous 8-mil thick polyethylene sleeve.

2. The joints in the sleeve shall be overlapped a minimum of 12 inches and taped with a 2-inch wide polyethylene adhesive tape wrapped a minimum of three times around the pipe to secure the tube of polyethylene to the pipe.

K. Restrained joint pipe and fittings shall conform to ANSI 21.11/AWWA C111. Manufacturers shall be:

1. American Pipe Product - Flex-Ring.

2. U.S. Pipe Product - TR Flex.

3. Griffin Pipe Product - SNAP-LOCK.

4. McWane Group (Clow or Atlantic States).

2.02. PVC PIPE

A. PVC Pipe - ANSI/AWWA C900 PVC pipe material conforming to ASTM D1784 minimum Class 150 psi (DR 18), inside nominal diameter of 12 inches, push-on joint conforming to ASTM D3139 with elastomeric gaskets conforming to ASTM F477.

B. Fittings for use on PVC pressure pipe of 4-inch nominal inside diameter or greater shall be ductile iron with mechanical joints as described in ANSI 21.10/AWWA C110. The coatings and linings of the fittings shall be as specified for ductile iron pipe.

C. Mechanical joints for fittings shall be supplied with rubber gasket joints in conformance with ANSI 21.11/AWWA C111.

D. If required, supply flange joints for use in meter pits or valve manholes in conformance with ANSI 21.11/AWWA C11.

2.03. COPPER SERVICE PIPE

A. Copper Pipe - ASTM B-88, Type K material for underground service, nominal inside diameter 1 inch, 1-1/4 inch, 1-1/2 inch, and 2 inches.

B. **All service piping and fittings shall be lead-free.**

C. Fitting shall be flare-type fittings in conformance with AWWA C800.

D. Joints - Copper joints shall be thoroughly cleaned and the end of pipe uniformly flared by a suitable tool to the bevel of the fitting used. Wrenches shall be applied to the bodies of the fittings where the joint is being made and, in no case to a joint previously made.

2.04. PIPE ACCESSORIES

A. Fittings - Same materials, class, coatings and linings as pipe unless under Article 2.01 it was specifically described otherwise. Fittings molded or formed to suit pipe size and end design and in required tee, bends, elbow, couplings, adapters, and other configurations.

B. Where piping is to be installed, above ground or within structures provide adequate supports and bracing by means of hangers, brackets or concrete supports as may be required by the location.

C. Hangers and supports shall be as manufactured by Anvil International, Providence, RI; Basic Engineering (BE), Pittsburgh, PA; or equal. They shall have stainless steel support rods, stainless steel mounting hardware, fasteners and beam clamps.

D. Pipe openings in walls shall be precast or core drilled and completely sealed against water seepage with a mechanical type seal consisting of interlocking synthetic rubber links and nuts with pressure plates wider at ends, the seal shall be link seal manufactured by Thunderline Corporation, Wayne MI, or equal.

2.05. IDENTIFICATION

A. Each pipe length and fitting shall be clearly marked with:

1. Manufacturer's name and trademark.

2. Nominal pipe size and class.

3. Material designation.

PART 3 EXECUTION

3.01. EXAMINATION

A. Contractor shall verify all existing conditions.

B. The drawings and specifications may contain information relating to conditions below the ground surface at the site of proposed work, but such information is furnished without guarantee as to it being complete or correct. The Contractor shall assume all risk and responsibilities and shall complete the work in whatever manner and under whatever conditions he may encounter or create without extra cost to the Owner. Location of existing underground facilities at or contiguous to the site is based upon information and data furnished to the Engineer by owners of such underground facilities or others, and Owner and Engineer do not assume responsibility for the accuracy or completeness thereof. The Contractor shall perform exploratory excavations in advance of this work to verify the location, depth, size, and material of existing utilities which may interfere with the work to be performed under this contract. All damage to existing utilities shall be the Contractor's cost to repair or replace.

C. Verify that trench cut, excavated base and pipe bedding are ready to receive pipe and that excavations and pipe bedding dimensions and elevations are as shown on Drawings.

D. All pipe or fittings which have been damaged in transit or which are obviously deformed or refinished in any way shall be rejected, marked, and removed from the site of the work. Any pipe or fitting which the Engineer suspects is improper for the job shall be temporarily rejected, marked, and set aside for subsequent investigation to determine its conformity with the specifications.

E. All pipe fittings and specials shall be carefully inspected in the field before lowering into the trench. Cracked, broken, warped, out-of-round, damaged pipe joints including damaged pipe lining or coatings or specials, as determined by the Engineer, shall be culled out and not installed. Such rejected pipe shall be clearly tagged in such manner as not to deface or damage it, and the pipe shall then be removed from the job site by the Contractor at his own expense.

3.02. PREPARATION

A. The Contractor shall have on the job site with each pipe laying crew, all the proper tools, gauges, pipe cutters, lubricants, etc. to handle, cut and join the pipe.

B. Flat-bottom trenches of required width shall be excavated to the necessary depth as required and maintained in accordance with Section 02225.

C. Prior to installing the pipe foundation material, trenches shall have all water removed and all work performed in a dry trench.

D. All pipes, fittings and specials which are to be installed in the open trench excavation shall be properly bedded in an uniformly supported on pipe foundations of the type specified in Section 02225 and shown on the Drawings. In particular, stones 2 inches and larger shall be removed from the bearing surface of the pipe foundation.

E. Pipe foundation bedding material shall be spread in maximum 8-inch layers and each layer shall be compacted up to the spring line of the pipe.

F. Compaction methods include hand tamping with T-bars, flat heads, shovel slicing as well as mechanical compactors.

G. The Contractor shall perform his bedding operations with care to maintain line and grades.

H. Suitable holes or depressions shall be provided in the pipe bedding to permit adequate bedding of bells, couplings, or similar pipe projections.

3.03. LINES AND GRADES

A. The Contractor shall furnish all labor, materials, surveying instruments, and tools to establish and maintain all lines and grades. The Contractor shall have personnel on duty or on standby call, at all times, who are qualified to check line and grade of water mains as they are installed.

B. Other control lines necessary for locating the work are shown on the Drawings.

C. During construction, the Contractor shall provide the Engineer, at his request, all reasonable and necessary materials, opportunities, and assistance for setting stakes and making measurements, including the furnishing of one or two rodmen or chainmen as needed at intermittent times.

D. The Contractor shall carefully preserve bench marks, reference points and stakes established by the Engineer or Owner, and in case of willful or careless destruction by his own operations he will be charged with the resulting expense to reestablish such destroyed control data and shall be responsible for any mistakes or delay that may be caused by the unnecessary loss or disturbance of such control data.

E. The Contractor may use laser equipment to assist in setting the pipe provided he can demonstrate satisfactory skill in its use.

F. The use of string levels, hand levels, carpenter's levels or other relatively crude devices for transferring grade or setting pipe are not to be permitted.

3.04. TOLERANCES

A. Pipes shall be laid to the lines and grades shown on the Drawings.

B. Minimum depth of cover shall be maintained as shown on the Drawings or as described herein.

3.05. INSTALLATION

A. Installation of ductile iron pipe or plastic pipe to be in conformance with AWWA C600 or ASTM D2774, respectively, except as modified in this section or referenced sections or as shown on the Drawings.

B. The Contractor shall furnish slings, straps and/or approved devices to provide satisfactory support of the pipe when it is lifted. Transportation from storage areas to the trench shall be restricted to operations which can cause no damaged to the pipe or lining or castings.

C. The pipe shall not be dropped from trucks onto the ground or into the trench.

D. Each pipe section shall be placed into position in the trench on the pipe bedding in such manner and by such means required to cause no injury to the pipe, persons or to any property.

E. The method of laying and jointing the pipe shall be in accordance with the recommendations of the manufacturer and as approved by the Engineer. Each pipe shall be aligned with that already in place, forced home completely with horizontal axial movement and held securely in position. The bell of each pipe length to be laid in the same direction the installation is proceeding.

F. At the joints, enough depth and width shall be provided to permit the pipe layer to reach entirely around the pipe so that the joints may be made in accordance with the manufacturer's recommendations. Mechanical type joints shall be tightened within the AWWA recommended torque range.

G. Pipes, fittings, and specials shall be firmly bedded in the pipe foundation and shall have full bearing throughout their entire length, which shall be accomplished by combination of shaping the bedding and adequately compacting the pipe bedding and backfill under and around the pipe to the spring line of the pipe. The remaining backfill placed in 12 inch lifts to 1-foot above the crown of the pipe in accordance with Table 1 of Section 02228. The remaining backfill installed in accordance with Sections 02225 and 02228.

H. When laid in tunnels, pipes shall be blocked in such a manner as to take the weight off the bells. Pipe laid in normal trench excavation shall not be laid on wood blocking.

I. Backfill material within 12 inches of the pipe shall be free of stones greater than 2 inches in any dimension.

J. Unless otherwise shown on the Drawings, the minimum total finished cover over the top of the pipe barrel of all pressure pipe shall be 4.5 feet.

K. Refer to Section 02225 for other installation guidelines and requirements.

L. To deflect a pipe joint, first join the pipe in the proper manner and then deflect the pipe within the allowable deflection recommended by the manufacturer.

M. Installation of polyethylene sleeves to be performed in accordance with the manufacturer's instructions and ANSI A21.4/AWWA C105.

N. Install magnetic locating tape, trace wire, minimum 2 inches wide with the words "Water Line Below" along the centerline of the installed water main for the entire length at a maximum depth of 2 feet 0 inches below finished grade.

O. For each pipe entering or leaving a manhole or underground structure, at least one pipe joint shall be located within 4 feet of the outside face of the wall, and preferably at the 2-foot point.

P. For ductile iron pipe installations, install three bronze wedges in each joint of pipe, fittings and specials.

3.06. CONNECTIONS TO EXISTING PIPES

A. Connections to existing water mains shall be by dry connection by inserting a tee with coupling or wet connection by tapping sleeve and valve and where shown on the Drawings.

B. Contractor to verify outside dimension of existing water main.

C. Couplings to be ductile iron fittings, Smith Blair Model 441, or equal with stainless steel bolts and nuts. The couplings shall receive two coats of coal tar epoxy paint on all exterior surfaces prior to installation.

3.07. BRACING AND BLOCKING

A. All bends, tees, crosses, plugs, etc., shall be braced and blocked with wood and then anchored with concrete thrust blocks so that there will be no movement of the pipe in the joints due to the internal or external pressures.

B. The concrete shall be placed around the fittings and completely fill the space between the fittings and walls of the trench, from 6 inches below the fittings of pipe to 12 inches above the fittings and in accordance with the dimensions and details shown on the Drawings.

C. The anchor concrete shall be so placed that the bell and spigot joints or other joints may be tightened, if necessary.

D. Steel ties to be used only where shown on the Drawings.

E. Prior to installation of the concrete anchor, the Contractor shall wrap all fittings with a minimum of 8-mil thick polyethylene.

F. Refer to details shown on the Drawings.

G. Cast-in-place concrete used in constructing concrete thrust blocks shall conform to requirements specified in Section 03001.

H. Measuring, mixing, transporting and placing of concrete shall conform to American Concrete Institute (ACI) Publication 304.

I. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.

J. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

3.08. TEMPORARY PLUGGING

A. At all times when pipe laying is not actually in progress, the open ends of the pipes shall be closed temporarily with pipe plugs or by other means such that there is no possibility of any water or foreign material entering the line. If water is in the trench when work is resumed, the plugs shall not be removed until the water has been removed and work can proceed in a dry stable trench.

3.09. CLEANING PIPELINE

A. At the conclusion of the work, the Contractor shall thoroughly clean all new pipes by flushing with water or other means to remove all dirt, stones, pieces of wood, etc., which may have entered during the construction period.

1. Pipes shall be flushed at a minimum rate of 2.5 feet per second for a suitable duration.

2. If, after this cleaning, any obstructions remain, they shall be corrected to the satisfaction of the Engineer.

B. Where required, the Contractor shall use mechanical methods to clean pipes when flushing does not remove all obstructions or material.

3.10. PRESSURE TESTING AND FLUSHING

A. Pressure testing and flushing of the water mains shall be performed in accordance with Section 02674.

B. Any section of pipe that fails the pressure test shall be dug up and replaced or permanently repaired as approved by the Engineer. All repairs and/or replacements shall be the Contractor's cost. The replaced or repaired section shall then be retested.

3.11. DISINFECTION

A. Disinfection of water mains shall be performed in accordance with Section 02675.

3.12. ENCASEMENT

A. Where shown on the Drawings, pipes shall be encased in concrete; details and requirements for encasement of pipes are described in Section 02225 and shown on the Drawings.

B. Requirements for encasement of pipes 10 inches and smaller, shown under a base slab, are described in Section 02225.

C. Where shown on the Drawings, pipes shall be encased in a polyethylene sleeve.

1. Damage to wrapping during pipe laying or backfilling operations shall be repaired with additional sleeve material and adhesive tape.

3.13. SERVICE CONNECTIONS

A. When shown on the Contract Drawings, or ordered by the Engineer, water services shall be furnished and installed, and to the extent shown or ordered by the Engineer.

B. The Contractor shall verify location of each new water service with each property owner as follows. The Contractor shall coordinate with each property owner of the planned location of the water service and connection to the existing curb stop at least two weeks before installation. At that time, the Contractor shall also furnish to each property owner a stake with a card attached to read as follows:

IMPORTANT NOTICE

A water main will be constructed on your street shortly. A water service will be installed from the water main to the edge of the street right-of-way or permanent easement to serve your property or house as applicable.

Please drive this stake with attached card in the area where you want the new water service to be located. Consult your plumber should you require advice on this location.

While all service connections must be installed by the wet tap method after pipe testing and disinfection, the homeowner must designate a service location prior to pipe installation to permit proper scheduling.

Please be patient with the construction, as your street and property will be restored after the installation of the water main system

Thank you for your cooperation.

(Name, address and telephone number of Contractor)

C. If curb stop is not located within the road right-of-way, Contractor, property owner, Town, and Engineer shall coordinate new curb stop location.

D. Corporations shall be installed in the "run" of the water main at the required locations or, if the pipe is required to be tapped to receive special saddles, such fittings shall be located at the required locations and installed as specified, and in a manner satisfactory to the Engineer. The requirements for proper pipe foundation, bedding, joint assembly, etc., shall be observed when installing the water services. All corporation installations shall be "wet" taps.

E. After installation, water services shall be thoroughly flushed and shall not be backfilled until the installation has been observed and approved by the Engineer and their location has been measured and recorded by the Contractor on a standard form (see the form at the end of this section) provided by the Engineer, and such record shall then be transmitted to the Engineer with the record drawings.

3.14. VALVES AND HYDRANTS

A. Valves and hydrants to be installed on this project are specified in Section 02662.

B. Valve and hydrant details for connection to the water main are shown on the Drawings.

C. Refer to Drawings for locations of valves and hydrants to be installed on this project.

3.15. QUANTITY FACTORS

A. The tables shown on the Contract Drawings shall be used as the basis for computing volumes of excavation below subgrade, trench lining material, special pipe foundation materials, and special backfill materials when such volumes constitute the basis for payment to the Contractor, as established elsewhere in the Contract Documents. No deviations from the factors shown shall be allowed because of variations between the several pipe materials and classes.

B. No special computations of quantities shall be made for structures such as meter manholes, valve pits, etc., which may occur in the various pipelines but the quantities for payment noted above, where applicable to such structures, shall be computed by assuming that the appurtenant pipeline continues uninterrupted through such structure; such as from center-to-center of manholes.

3.16. INSTALLATION SCHEDULE

Road	From Station	To Station	Notes
Evergreen Row	Tank	0+00 / 54+30	To completed first
North Lake Road	0+00	24+00	Also included 13+00 - 36+60 on C007 and C008
Pond Lake	0+00	23+42	Dry tap connection at 8-inch CIP along Long Pond Road
Oak Ridge	0+00	4+81	
North Lane	0+00	13+00	
North Ridge	0+00	4+50	
Fox Ridge Road	0+00	24+00	
Fox Ridge Court	0+00	4+55	
Elm Place	0+00	6+24	
Dogwood Drive	0+00	5+83	
Long Pond Road	25+00	32+50	Use dry tap from Pond Lane
Upland Lane	2+00	5+00	Existing water main needs to be located

Road	From Station	To Station	Notes
Maple Way	0+00	18+00	
Windmill Road	0+00	4+75	
Spruce	0+00	4+68	
Spruce Hill Road	0+00	18+40	
Long Pond Road	32+00	51+64	Tie into existing water supply
Long Pond Road	0+00	25+00	
Mill Lane	0+00	5+04	Tie into stub at Pond Lane
Windmill Road	10+25	25+00	
Windmill Road	4+75	10+25	In same trench as existing water main
Upland Lane	9+00	25+05	Connect to proposed stub at North Lane
Hardscrabble Circle	0+00	15+95	
Upland Lane	5+00	9+00	Installed in existing pipe trench
Thornwood	0+00	34+10	Tie into Fox Ridge Road
Windmill Road	25+00	55+00	
Windmill Road	55+00	85+52	
Service easement	0+00	4+25	6-inch DIP
Long Pond Court	0+00	4+90	6-inch DIP
Windmill Place	0+00	22+23	

(continued)

Job No. _____
Contract No. _____
Contractor: _____
_____

CHECKLIST FOR WATER SERVICE CONNECTION
(To Be Completed by Contractor)

Date:_____

Street: _____ House No.: _____

Name:_____

Describe Location if No House Number:_____

Item	Yes	No	Location Sketch
1. Connection to Water Main:			
(a) Tapped directly into pipe barrel			
(b) Saddle			
2. Service Pipe Installed:			
(a) Using copper pipe			
(b) Curb stop installed			
(c) Curb box installed			
3. Connection to House Line:			
4. Diameter of Service Connection:			
5. Diameter of Water Main:			
6. Depth of Curb Stop:			
7. Station of Tap:			

CHECKED AND APPROVED

_____
Contractor's Representative

INSTRUCTIONS:
Complete every space accurately.
Show house, street, and water main.
Show two permanent radius ties to curb stop.
Show North arrow.
Show diameter of main.
Copies for Owner, field and office.

END OF SECTION

SECTION 02662

WATER VALVES AND HYDRANTS

PART 1 GENERAL

1.01. SECTION INCLUDES

A. Furnishing the several types of valves, stops, and backflow preventers.

B. Hydrants.

C. Valve operators.

D. Valve boxes.

E. Sampling stations.

F. Installation.

G. Testing and disinfection.

1.02. RELATED SECTIONS

A. Section 01025 - UNIT PRICE ITEMS (BID ITEM DESCRIPTIONS)

B. Section 01039 - COORDINATION AND MEETINGS

C. Section 01300 - SUBMITTALS

D. Section 01500 - CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

E. Section 01700 - CONTRACT CLOSEOUT

F. Section 02225 - TRENCHING

G. Section 02661 - WATER DISTRIBUTION PIPING

H. Section 02674 - PRESSURE TESTING OF WATER DISTRIBUTION SYSTEMS

I. Section 02675 - DISINFECTION OF WATER DISTRIBUTION SYSTEM

1.03. REFERENCES

A. ANSI/AWWA C500 - Gate Valves for Water and Sewerage Systems

B. ANSI/AWWA C502 - Dry Barrel Fire Hydrants

C. ANSI/AWWA C504 - Rubber Seated Butterfly

D. ANSI/AWWA C506 - Backflow Prevention Devices - Reduced Pressure Principle and Double Check Valve Types

E. ANSI/AWWA C507 - Ball Valves 6 inches through 48 inches

F. ANSI/AWWA C508 - Swing Check Valves for Waterworks Service 2 inches through 24 inches NPS

G. ANSI/AWWA C509 - Resilient-Seated Gate Valves for Water and Sewerage Systems

H. ANSI/AWWA C540 - Power-Activating Device for Valves and Sluice Gates

I. ANSI/AWWA C550 - Protective Interior Coatings for Valves and Hydrants

J. ASTM A126 - Gray Iron Castings

K. ASTM A48 - Gray Iron Castings for Valves, Flanges and Pipe Fittings

1.04. DESIGN REQUIREMENTS

A. The design working pressure shall be 200 psig for valves 12 inches NPS in diameter and smaller.

B. The design working pressure shall be 150 psig for valves 16 inches NPS in diameter and larger.

C. Valves shall be designed for normal cold water use.

D. Gate valves shall be designed to be leak-tight with full pressure on either face with no pressure on the opposite face.

E. Resilient seated gate valves shall be designed to be leak-tight with full pressure on either face with no pressure on the opposite face.

F. Hydrants shall be designed for a 300 psig test pressure and 150 psig working pressure.

G. All service line valves, corporations, and curb stops shall be lead-free.

1.05. SUBMITTALS

A. Submit under provisions of Section 01300.

B. Submit shop drawings of types of valves, hydrants and appurtenances proposed for the project including conformance to ANSI/AWWA codes and related details for field assembly, operations and maintenance.

C. Manufacturer's Installation Instructions - Indicate special procedures required to install Products specified.

D. Results of shop tests, if required.

E. Manufacturer's Certificate - Certify that products meet or exceed specified requirements.

1.06. PROJECT RECORD DOCUMENTS

A. Submit documents under provisions of Section 01700.

B. Record location of valves and hydrants with a minimum of two ties to permanent objects.

C. Record Drawings - Provide the pipe sizes and horizontal and vertical location of all valve boxes, ARVs, curb boxes, meter pits, fire hydrants, blowoffs, corporations, fittings, and other appurtenances. The information will be provided digitally and consistent with the plan datum and control as shown on the Drawings. The Contractor will employ the services of a registered professional surveyor licensed in the State of New York to provide the information.

1.07. REGULATORY REQUIREMENTS

A. Conform to applicable code for materials and installation of the work of this section.

B. All sheeting and bracing including the use of mobile shields shall conform to Public Law 91-596 (Williams Steiger Act). Occupational Safety and Health Administration Act (OSHA) of 1970 and its amendments and regulations or to the New York State Industrial Code Rule 23, entitled, "Protection in Construction, Demolition and Excavation Operations" as issued by New York State Department of Labor, Board of Standards and Appeals, whichever is the most stringent.

C. Conform to New York State Industrial Code Rule 53, entitled "Construction, Excavation and Demolition Operations at or Near Underground Facilities" as issued by the State of New York Department of Labor, Board of Standards and Appeals.

D. Conform to requirements of permits obtained by Owner.

1.08. FIELD MEASUREMENTS

A. Verify by field measurements and exploratory excavations that existing pipe outside diameter (for tapping sleeve and valve installations) and facilities locations and elevations are as indicated and/or as shown on Drawings. Notify Engineer of specific differences.

1.09. COORDINATION

A. Coordinate work under provisions of Sections 01039 and 01500.

PART 2 PRODUCTS

2.01. MATERIALS

A. Valve size, type of valve, joint type, class, lining, coatings shall be installed as listed herein or as shown on Drawings.

B. Valves shall be of standard manufacturer and of highest quality, both as to material and workmanship, conforming to the latest edition of AWWA standards specified.

C. All valves and hydrants shall have the manufacturer's name monogrammed or initialed by the manufacturer thereon and shall be identified by catalog numbers.

D. All valves shall be provided with hub, spigot, mechanical joint, flange or screwed ends as described herein or shown on the drawings.

E. Valves 2 inches in nominal diameter and smaller shall be all brass or bronze.

F. Valves over 2 inches in nominal diameter shall be iron bodied, fully brass or bronze mounted.

G. All surface forming joints or bearing surfaces shall be machined to a perfect fit.

H. All disc and seat rings shall be carefully and thoroughly secured in place with the iron castings machined where the rings are bare and the backs of the rings machined all over.

I. After the rings have been fastened securely in place, the front shall be machined all over to a perfectly true and smooth bearing surface.

J. All valves with non-rising stems shall have valve position indicators.

K. Valves shall open counterclockwise (left) unless otherwise specified.

2.02. GATE VALVES

A. Gate valves 2 inches and smaller shall be bronze gate valves, double wedge disc, screwed bonnet, screwed ends, 125-lb. rating, and shall be repackable under pressure in full open position.

B. All gate valves 2 inches and smaller shall be Stockham Figure 107; Lunkenheimer Figure 2127; or equal.

C. All underground gate valves shall be non-rising stems, 2 inch operating nuts, O-ring seal and shall open counterclockwise (left).

1. Underground gate valves shall be of the iron body, bronze mounted type conforming to AWWA Standard C500.

2. Mechanical joint type designed for underground use at 150 psi.

3. Underground gate valves shall be Mueller or equal.

D. All buried gate valves 16-inch and larger used on potable or non-potable water line shall be furnished with a bypass (ref. Table 8, AWWA C500) to relieve seat pressure during operation.

1. All necessary accessories for bypass valve, including valve box and operator shall be provided.

2.03. RESILIENT SEATED GATE VALVES

A. Resilient seated gate valve shall conform to all applicable provisions of Articles 2.01 and 2.02 of this section.

B. All resilient seated gate valves shall provide a full pipe opening when fully opened.

C. Resilient seated gate valves shall conform to AWWA Standard C509.

D. All resilient seated gate valve shall be as manufactured by Mueller.

2.04. BACKFLOW PREVENTER

A. Reduced pressure zone backflow preventers shall be supplied where shown on the Contract Drawings.

B. The backflow preventers shall consist of two spring-loaded check valves and a spring-loaded diaphragm-actuated, differential pressure relief valve located in the zone between the check valves.

C. The unit shall include properly located test cocks and operation shall be completely automatic. The total headloss shall not exceed 10 psi at AWWA rated flow.

D. All parts shall be manufactured from corrosion-resistant materials.

E. A continuous discharge from the relief valve opening shall provide a visual inspection of need of repair.

F. Manufacturers - Reduced pressure zone backflow preventers shall be listed on approved list of New York State Department of Health Technical Reference PWS-14 latest edition.

2.05. CORPORATION STOPS

A. Corporation stops shall be lead free and of brass or bronze construction and shall be installed by the wet method, connecting service line to water mains, with water main at or near operating pressure when corporation stops are installed.

B. Corporation stops shall be installed by experienced tradesmen using the proper tools especially designed for a wet-tap connection.

C. Corporation stops shall be installed in complete accordance with the pipe manufacturer's recommendations for tapping and installing corporation stops.

D. Saddles shall be used where recommended by the pipe manufacturer or as ordered by the Engineer, and such saddles shall be approved for use with the pipe by the pipe manufacturer. Threads of service saddle shall be compatible with the corporation stop specified. Saddles shall be of double strap design. Contractor shall verify diameter and pipe material ahead of time. Saddles shall be made of either brass or bronze and shall be as manufactured by Mueller Company, Ford Meter Box Company, or equal. All saddles shall be field wrapped with a polyethylene sheet.

E. Where saddles are used, or for other reasons the main cannot be tapped wet, the Engineer may approve visual inspection of such connections after they have been pressurized.

F. Buried corporation stops shall be Model H-15000 as manufactured by Mueller Company, or Model F-600 as manufactured by Ford Meter Box Company, or equal. Corporation stops located within pits or vaults shall be Model H-10045 or H-9992 with I.P. outlet as manufactured by Mueller Company, or Model F800 or F1600 with I.P. outlet as manufactured by Ford Meter Box Company, or equal.

2.06. CURB STOPS

A. Curb stops shall be of brass or bronze construction and two rubberized O-ring seals to provide pressure-tight seal. Curb stops shall be Figure H-15204 as manufactured by Mueller-Oriseal, B22 as manufactured by Ford Meter Box Company, Hayes, Nuseal, or equal.

B. Curb boxes shall be 2-1/2-inch shaft size two-piece screw type. They shall be adjustable from 48-inch to 72-inch. Curb boxes shall be constructed of cast iron and thoroughly coated with two coats of asphaltum varnish.

C. Curb box top section shall include a water cover which shall be of the "old style" with the word "Water" cast into it and shall include a brass pentagon screw.

D. Curb box rods shall be supplied with a hole in the "U" portion for the insertion of a brass pin. Pins shall be supplied and shall be made of brass.

E. Curb boxes shall be as manufactured by Mueller or equal.

2.07. WRENCH OPERATOR

A. Wrench for wrench-operated valves located above ground shall be of bronze or cast iron, and shall be of suitable size and length to facilitate an effortless operation. One such wrench shall be provided for each valve on the project requiring wrench operation.

B. Wrenches for wrench-operated valves located underground shall be of tee handle type and shall be of suitable length to enable operation of all such valves on the project. Two wrenches compatible with each type of operating nut on all valves used throughout the project shall be provided.

2.08. VALVE BOXES

A. Valve boxes shall be provided for all buried valves unless they are housed in valve chambers.

B. Valve boxes shall be made of good quality cast iron and shall be of the sectional adjustable type. The long section shall be a minimum of 5 inches in inside diameter and fit around the stuffing box of the valve; or over the valve operator, if a two-section box is used; or to fit a circular or oval-base section if a three-section box is used.

C. The upper section shall be arranged to screw on over the adjoining long section and shall also be full diameter. Screw-type valve boxes shall be used unless otherwise specified. Valve boxes shall be provided with cast iron lids or covers.

D. Lids or covers shall be marked for the service for which the valve is used by casting words such as "WATER" for potable water system, "GAS", etc. An arrow shall be provided on the cover to indicate the direction in which the valve is turned to open; this arrow shall be labeled with the word "OPEN".

E. The overall length of each valve box shall be sufficient to permit the top of the box to be set flush with the established finished grade. In asphalt concrete pavements, the top of the box to be set 1/2-inch below finished grade. Asphalt concrete to be compacted 12 inches wide around the upper section for a depth of 12 inches below finished grade.

F. Valve boxes shall be set truly vertical and fully supported until sufficient backfill has been placed and compacted to ensure vertical alignment of the box.

2.09. VALVE DIRECTORY

A. A valve directory shall be provided listing all valve numbers, the valve function, and location. The directory shall be prepared and delivered to the Owner after approval by the Engineer in a digital spreadsheet able to be opened with Microsoft Excel.

1. Buried valves shall be included in valve directory with a description of their functions and locations. Coordinates (Northings and Eastings) number of turns open/close and model number.

2.10. HYDRANTS

A. All hydrants shall be of the compression or gate type conforming to the latest specifications of the ANSI/AWWA C502, and shall be of a make that has been adopted by the Owner as a standard.

B. Hydrants shall be of heavy, anti-freeze compression action type with positive automatic type drain.

C. All hydrants shall breakaway at ground level upon severe impact without flooding the area.

D. Hydrants shall be supplied with 6-inch mechanical joint inlet connection.

E. Hydrants shall have a minimum 5-1/4-inch diameter valve opening. They shall be equipped with two 2-1/2-inch hose nozzles and one 4-1/2-inch steamer nozzle. The pipe threads shall be National Standard Thread.

F. Operating nuts shall be 1-1/8-inch pentagon nuts.

G. Hydrant barrels shall be painted factory yellow and in accordance with the Town of North Castle standards.

H. Hydrants designated with plugged drain hole shall be factory yellow with a red cap.

I. Caps shall be furnished with non-kinking chains.

J. Hydrants shall open counter-clockwise.

K. Hydrants shall be designed for 300-lb. test pressure and 150-lb. working pressure.

L. Hydrants shall be Mueller Centurion in accordance with the Town of North Castle standards.

2.11. TAPPING SLEEVES AND VALVES

A. Tapping sleeves and valves shall be provided where shown on the Contract Drawings.

B. Tapping sleeves shall be compatible with the pipe encountered so that a watertight connection will be made.

C. The sleeve shall be adequate to provide reinforcement of the pipe being tapped and protect this pipe against all strains resulting from either tapping the pipe or connecting to the pipe.

D. Tapping valves used shall conform to Article 2.02.

E. Tapping sleeves and tapping valves for this project shall be Models H-615 and H-687, respectively, as manufactured by Mueller Company or equal.

F. The tapping contractor shall have a minimum of five years' experience in performing taps.

G. After the sleeve has been installed, but prior to making the tap, the sleeve shall be subjected to a hydrostatic test equal to the maximum line pressure. There shall be no observed leakage from the sleeve.

2.12. SAMPLING STATIONS

A. Sampling stations shall be with a 1-inch FIP inlet and a 3/4-inch hose or unthreaded nozzle.

B. All stations shall be enclosed in a lockable, non-removable, aluminum-cast housing. When opened, the station shall require no key for operation, and the water will flow in an all-brass waterway.

C. All working parts will also be of brass and be removable from above ground with no digging. A copper vent tube will enable each station to be pumped free of standing water to prevent freezing and to minimize bacteria growth.

D. The exterior piping will be galvanized.

E. Sampling Stations shall be model Eclipse 88, as manufactured by Kupferle Foundry, St. Louis, MO.

PART 3 EXECUTION

3.01. EXAMINATION

A. Verify that trench cut, excavated base and valve bedding is ready to receive work and valve bedding dimensions and elevations are as indicated on Drawings.

B. All valves, hydrants, stops and appurtenances shall be carefully inspected in the field before lowering into the trench. Cracked, broken, warped, out-of-round, damaged joints, including damaged linings or coatings, or otherwise defective valves, hydrants and stops, as determined by the Engineer, shall be culled out and not installed. Such rejected material shall be clearly tagged in such manner as not to deface or damage it, and the material shall then be removed from the job site by the Contractor at his own expense.

C. For tapping sleeve and valve connections, the Contractor, prior to making any connections, shall verify the material and outside diameter of the existing water main.

D. The Contractor shall have on the job site all the proper tools, gauges, pipe cutters, lubricants, etc., to properly install valves, hydrants, etc.

3.02. PREPARATION

A. Prior to installing the foundation, trenches shall have all water moved and all work performed in a dry stable trench.

B. All valves, hydrants, etc. which are to be installed in the open trench excavation shall be properly bedded in, and uniformly supported on pipe foundations of the various types specified in Section 02225 and shown on the Contract Drawings.

C. Flat-bottom trenches of required width shall be excavated to the necessary depth as required and maintained in accordance with Section 02225.

D. Bedding material shall be spread in maximum of 8-inch layers for the pipe foundation and each layer shall be compacted until the required total depth of bedding has been built up.

E. Suitable holes or depressions shall be provided in the bedding to permit adequate bedding of bells, couplings or similar joint projections.

F. Compaction methods include hand tamping with T-bars, flat heads, shovel slicing, as well as mechanical compactors.

G. The Contractor shall perform his bedding operations with care to maintain line grade and proper depth of valve and hydrants.

3.03. LINES AND GRADES

A. Easement and property line and other control lines necessary for locating the work are shown on the Drawings.

3.04. TOLERANCES

A. Valves and hydrants shall be laid to the lines and grades shown on the Drawings.

3.05. INSTALLATION

A. The Contractor shall furnish slings, straps, and/or approved devices to provide satisfactory support of the valves or hydrants when lifted. Transportation from storage areas to the trench shall be restricted to operations which can cause no damaged to the coating or lining or castings.

B. The valves or hydrants shall not be dropped from trucks onto the ground or into the trench.

C. All valves shall be installed in accordance with the specifications for the pipe to which they are to be connected and as previously described for individual types of valves.

D. Joints of valves shall be made up in accordance with the Contract Drawings and/or as described under the appropriate pipe joint descriptions found in other sections of these specifications.

E. The valves shall be so located that they are accessible for operating purposes and shall bear no stresses due to loads from the adjacent pipe.

F. All valves shall be inspected before installation, and they shall be cleaned and well lubricated before being installed in the line.

G. Hydrants shall be set at locations specified on the Contract Drawings and shall be of such length that, with the frost ring at the ground surface grade, there shall be 5 feet of cover over the connecting pipe.

H. Hydrants shall be set so that the barrel is truly vertical, and shall be properly backfilled so that the barrel will remain truly vertical.

I. They shall be placed with 3 cubic feet of crushed stone pocket to provide drainage for the hydrant.

3.06. PRESSURE AND LEAKAGE TEST

A. All installed valves, hydrants and appurtenances shall be subjected to the pressure and leakage test as described under Section 02674.

3.07. DISINFECTION OF WATER VALVES AND HYDRANTS

A. All installed valves, hydrants and appurtenances shall be subjected to the flushing, sterilization and coliform tests described under Section 02675.

END OF SECTION

SECTION 02665

TEMPORARY BYPASS WATER SYSTEM

PART 1 GENERAL

1.01. SECTION INCLUDES

A. All materials furnished for use as temporary bypass pipe, service hose, connections, and related appurtenances that come into contact with drinking water are to be certified for conformance with American National Standards Institute/National Sanitation Foundation Standard 61 (ANSI/NSF Standard 61) by an ANSI approved third-party certification program or laboratory. All materials shall be fully adequate to withstand the required water pressure and all other conditions of use, and shall provide adequate water tightness before being put into service.

1.02. RELATED SECTIONS

A. Section 01025 - UNIT PRICE ITEMS: Requirements applicable to unit prices for work of this section.

B. Section 01039 - COORDINATION AND MEETINGS

C. Section 01300 - SUBMITTALS

D. Section 02225 - TRENCHING

E. Section 02661 - WATER DISTRIBUTION PIPING

F. Section 02662 - WATER VALVES AND HYDRANTS

G. Section 02675 - DISINFECTION OF WATER DISTRIBUTION SYSTEMS

1.03. REFERENCES

A. American National Standard Institute (ANSI)

B. American Water Works Association (AWWA)

C. American Society for Testing Materials (ASTM)

D. Ductile Iron and Gray Iron Pipe

1. ANSI A21.4/AWWA C104 - Cement-Mortar Lining for Ductile Iron and Gray Iron Pipe and Fittings for Water

2. ANSI A21.4/AWWA C105 - Polyethylene Encasement for Ductile Iron Piping for Water and Other Liquids

3. ANSI A21.10/AWWA C110 - Ductile Iron and Gray Iron Fittings, 3-inch through 48-inch, for Water and Other Liquids

4. ANSI A21.11/AWWA C111 - Rubber Gasket Joints for Ductile Iron and Gray Iron Pressure Pipe and Fittings

5. ANSI A21.50/AWWA C150 - Thickness Design of Ductile Iron Pipes

6. ANSI A21.51/AWWA C151 - Ductile Iron Pipe Centrifugally Cast in Metal Molds and Sand Lined Molds for Water and Other Liquids

7. AWWA C600 - Installation of Ductile Iron Water Mains and Their Appurtenances

8. ASTM A126- Gray Iron Castings for Valves, Flanges, and Pipe Fittings

E. Plastic Pipe and Fittings

1. ANSI/AWWA C900 - Poly (Vinyl Chloride) (PVC) Pressure Pipe 4 inch through 12-inch for Water

2. AWWA/C901 - Polyethylene (PE) Pressure Pipe and Tubing 1/2 inch through 3-inch for Water Service

3. AWWA C902 - Polybutylene (PB) Pressure Pipe, Tubing and Fittings, 1/2-inch through 3-inch for Water

4. ASTM D2464 - Threaded Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80

5. ASTM D2467 - Socket-Type Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80

6. ASTM D2564 - Solvents Cements for Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings

7. ASTM D2672 - Solvent Cement Joint Sockets for Belled PVC Pressure Pipe

8. ASTM F477- Elastomeric Seals, (Gaskets) for Joining Plastic Pipe

9. ASTM D1785 - Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120

10. ASTM D2581 - Polybutylene (PB) Plastics Molding and Extrusions Materials

11. ASTM D3139 - Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals

12. ASTM D3350 - Polyethylene Plastics Pipe and Fittings Materials

13. ASTM D2774 - Underground Installation of Thermoplastic Pressure Piping

14. ASTM D1784 - Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (PVC) Plastic Pipe Schedule 80

F. Copper Pipe and Tubing

1. ASTM B88 - Copper Pipe Type K

2. AWWA C800 - Underground Service Line Valves and Fittings (with Type K Copper Pipe and Tubing)

G. AASHTO H20.

1.04. SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data - Provide data describing conformance to ANSI/AWWA/ASTM codes, materials, sizes, class, dimensions, joint type, fittings, and pipe accessories.

C. Manufacturer's Installation Instructions - Indicate special procedures required to install products specified.

D. Results of shop tests, if required.

E. Manufacturer's Certificate - Certify that products meet or exceed specified requirements

PART 2 PRODUCTS

2.01. MATERIAL

A. Temporary bypass pipe must be drawn from water main equipment stocks that are dedicated exclusively for use in pipe projects involving fresh potable water.

B. Temporary bypass pipe shall be PVC, HDPE, or steel having a minimum working pressure rating of 200 pounds per square inch with restrained couplings in accordance with Section 02661.

C. Water service hose to be used for connection from the temporary bypass pipe to the building/ residence shall have a minimum working pressure rating of 200 lbs. per square inch and be made of a material that will not have an adverse effect on the taste or odor of the water.

2.02. BULKHEAD (TEMPORARY LINE CAP)

A. Bulkhead (temporary line cap) shall consist of a bolted sleeve-type pipe coupling with steel end cap capable of sliding over the cut end of the water main pipe.

2.03. TEMPORARY FIRE HYDRANT

A. Temporary fire hydrant shall consist of a 4-inch by 4-inch tee or 4-inch 90-degree bend, with a butterfly valve connected to the end of the tee or bend, and an operating nut to control the valve. Temporary fire hydrant shall be equipped with a 4-1/2-inch diameter national standard threaded nozzle with hydrant cap installed.

2.04. HIGH PERFORMANCE ASPHALT

A. High performance asphalt shall be composed of laboratory approved aggregates, plant mixed with QPR 2000 liquid blend from U.S. Pro-Tec, Inc., or approved equivalent. The mix ratio shall be 110 pounds of asphalt blend per 2,000 lbs. of high performance asphalt material. The asphalt blend shall not be heated above 300 degrees F. Aggregate shall be crushed limestone per ASTM C136 and shall conform to the following:

1. Sieve Size - Percent passing by weight.

2. 3/8 inch - 90 to 100.

3. No. 4 - 20 to 55.

4. No. 8 - 5 to 30.

5. No. 16 - 0 to 10.

6. No. 50 - 0 to 5

B. The mix shall be produced through conventional asphalt plant methods under the direction of a representative of the asphalt blend manufacturer. Before use, the final mix shall be approved by the representative of the asphalt blend manufacturer.

PART 3 EXECUTION

3.01. PREPARATION

A. Two weeks prior to the bypass work, a coordinating conference/meeting shall be held with the Owner, Engineer, Contractor, and the Westchester County Department of Health.

B. One week prior to bypass work, the Contractor shall deliver “door hanger” notices supplied by the Town of North Castle to each affected residence and business.

3.02. INSTALLATION

A. Temporary bypass system shall include temporary bypass pipe, hoses, connections and related appurtenances necessary to maintain a continuous supply of water. Temporary bypass system shall be maintained in a safe and operative condition at all times.

B. For protection of the work and the public, flashers and barricades shall be installed at locations as directed by the project manager. The flashers and barricades shall be maintained in proper operating condition.

C. Where required, the Contractor shall install bulkheads (temporary line caps) on the existing water main to keep the section of the existing water main pressurized and capable of supplying a continuous flow of water. The bulkheads shall be fitted with a bolted sleeve type pipe coupling having a steel end cap and outlet fitting so that the temporary bypass pipe can be fed through the end of the bulkhead. The coupling shall be slid over the end of the water main, and braced or restrained so that it will support normal operating line pressure.

D. To prevent contamination, open cut water main ends that are left unattended shall be wrapped by a double layer of polyethylene plastic and tightly tied or covered with a water tight plug. All fire hydrant nozzles shall be capped when not in use.

E. Valves shall be installed on the temporary bypass pipe at all appropriate locations; valve spacing should generally not exceed 800 feet.

F. Temporary bypass pipe crossing streets and sidewalk access ramps shall be installed in a trench and shall not block or otherwise impede access to any sidewalk access ramp. The existing pavement shall be saw cut and excavated to a depth sufficient to contain the temporary bypass pipe. The Contractor shall maintain uninterrupted accessibility to sidewalk access ramps at all times.

G. Temporary bypass pipe in other areas may also be required to be installed in a trench as required in the contract documents and as directed by the project manager.

H. To minimize interference with vehicle and pedestrian traffic, whenever temporary bypass pipe crosses a driveway or sidewalk, the temporary bypass pipe shall be covered with a mound of high performance asphalt material, or suitable ramps.

I. After completion of the water main work and restoration of the supply of water back to the water main, the Contractor shall remove all temporary bypass pipe and related appurtenances. The street, sidewalks and adjacent property shall be restored to a neat and orderly condition.

3.03. DISINFECTION

A. All bypass pipes shall be disinfected per the requirements of, the Westchester County Department of Health and the contract documents.

B. Disinfection of water mains shall be performed in accordance with Section 02675.

3.04. TEMPORARY WATER SERVICE CONNECTION AND RESTORATION OF SERVICE

A. The Contractor shall make all connections to the customer's water service line on a day and at a time that is convenient to the customer.

B. Connection from the temporary bypass pipe to the water service line shall be made inside the building at the meter, outside at the hose bib, or any suitable area not directly in the street.

C. Hose shall be run into the building through a window, or a temporary opening shall be made in the building wall of a size just large enough to pass the hose through. Dryer vents are not to be used. The opening shall be secured to prevent any access by unauthorized individuals, and shall be completely sealed to prevent access by rodents, water intrusion, and to minimize heat loss.

D. Hose connection made at the hose bib shall be done by connecting a 2 hose Y-adaptor with dual shutoff capable of allowing independent use of two hoses from one faucet.

E. If access into the building is impossible or impractical, and the hose bib is not accessible, the connection shall be made to the water service line in any suitable area not directly in the street. The Contractor shall excavate, expose and cut the water service line, and connect the hose. The Contractor shall either backfill excavated area or install orange construction fencing with flashers around the excavated area. If the area where the excavation is made is paved, the Contractor shall cover the excavation with heavy gauge steel plates capable of supporting an AASHTO H20 highway loading.

F. The Contractor shall make satisfactory arrangements with the customer so that stop and waste valves shall be accessible at all times.

G. After completion of the water main work, the Contractor shall clear the water service lines by back flushing with potable water. The Contractor shall disconnect the hose, restore the water service line back to normal conditions, and restore water flow. Access points shall be properly restored to pre-construction status. Temporary openings into buildings/residences shall be permanently repaired using a material and method acceptable to the project manager.

H. When temporary bypass is used during a water main cleaning and lining project, and the situation arises where a building is boarded-up and arrangements cannot be made to backflush the building's water service after the water main has been lined, the project manager may direct the Contractor to excavate the service at the location where the service

is connected to the water main, disconnect the service and clean out any cement mortar that may have accumulated in the service at this location. Once cleaned out, the service shall be reconnected to the water main, the excavation backfilled and the surface restored.

3.05. TEMPORARY FIRE HYDRANTS

A. Temporary fire hydrants shall be installed where indicated on the plans or as directed by the project manager. Temporary fire hydrants shall be required on temporary bypass pipe which is 4 inch in diameter or larger in size. The pipe threads shall be protected with a hydrant cap when not in use. Temporary fire hydrants shall be serviceable at all times. Hydrants are subject to inspection at any time by either the water bureau or the Town of North Castle fire department. If they are found to be unserviceable, immediate correction shall be made.

3.06. HIGH PERFORMANCE ASPHALT

A. High performance asphalt material shall be used for all trenches used in burying temporary bypass pipe, for covering temporary bypass pipe that crosses a driveway or sidewalk, and for forming a ramp over edges of steel road plates.

B. High performance asphalt material shall be compacted with the use of a plate tamper to provide for an asphalt patch that is both cohesive and firm, and that adheres tightly to the existing asphalt pavement. The high performance asphalt material shall be maintained at all times in a reasonably smooth and hard condition. The high performance asphalt surface shall be well drained, free of potholes, bumps, irregularities and depressions. The Contractor shall provide extra maintenance of the high performance asphalt material on holidays, weekends and during the winter season.

3.07. 24-HOUR MAINTENANCE

A. The Contractor shall be responsible for maintenance and repair of the temporary bypass system. The Contractor shall be equipped to make all repairs necessary, at the project site, for the duration of the installation. The bureau of water shall be provided with a 24-hour emergency telephone number at which the Contractor may be reached, in case it is necessary to make any repairs.

END OF SECTION

SECTION 02674

PRESSURE TESTING OF WATER DISTRIBUTION SYSTEMS

PART 1 GENERAL

1.01. SECTION INCLUDES

A. Pressure testing of all water systems installed under this project.

B. Test requirements.

C. Required replacement or repair if test fails.

D. Project records.

1.02. RELATED SECTIONS

A. Section 01025 - UNIT PRICE ITEMS: Requirements applicable to unit prices for the work of this section.

B. Section 01700 - CONTRACT CLOSEOUT

C. Section 02661 - WATER DISTRIBUTION PIPING

D. Section 02662 - VALVES AND HYDRANTS

E. Section 02675 - DISINFECTION OF WATER DISTRIBUTION SYSTEMS

1.03. REFERENCES

A. AWWA C600 - Installation of Ductile Iron Water Mains and Their Appurtenances.

B. AWWA C151 - Ductile Iron Pipe.

1.04. TEST REQUIREMENTS

A. All water mains shall be tested in accordance with AWWA Standard C600. The following procedure shall be used:

1. All newly laid pipe or any valved section thereof, shall be subjected to a hydrostatic pressure 50 percent in excess of the working pressure at any point on the section being tested, but in no case less than 150 lbs per square inch for a period of 2 hours.

2. The Contractor shall accomplish the required tests on the pipeline by individually testing each component section of the installed main. The maximum length of section permitted to be tested at any one time will be approximately 1 mile, and normally will be less.

B. Test Pressure Restrictions - Test pressure shall:

1. Not be less than 150 psi at the highest point along the test section.

2. Not exceed pipe or thrust restraint design pressures.

3. Be of at least two-hour duration.

4. Not vary by more than ±5 psi.

5. Not exceed twice the rated pressure of the valves when the pressure boundary of the test section includes closed gate valves.

C. Leakage Test

1. All leakage test shall be conducted concurrently with the pressure test.

2. Leakage Defined - Leakage shall be defined as the quantity of water that must be supplied into the newly laid pipe, or any valved section thereof, to maintain pressure within 5 psi of the specified test pressure throughout the duration of the test after the pipe has been filled with water.

3. The rate of leakage shall not exceed 11.65 gallons per day, per mile of pipe, per inch of nominal pipe diameter based on a test pressure of 150 psi. For the allowable leakage in gallons per hour (gph) for other test pressures refer to Table 4.A of AWWA C600, a copy of which is at the end of this section, including the basic formula for calculating the allowable leakage.

1.05. PROJECT RECORD DOCUMENTS

A. Submit documents under provisions of Section 01700.

B. Attached to the end of this section is a “Flushing and Testing of Water Lines Tabulation Sheet” for recording data for flushing and testing of water mains. Engineer shall fill out form at the time of testing and both Contractor and Engineer shall sign upon completion.

C. Attached to the end of this section is a “Water Pressure Test” form (Form WPT-1) for recording data for pressure testing. Engineer shall fill out the form and submit to the Westchester County Department of Health.

1.06. REGULATORY REQUIREMENTS

A. Submit proof of testing as required by local, county, or state agencies.

1.07. FIELD MEASUREMENTS

A. Measure length of test section.

B. Measure quantity of water used to maintain test pressure during test period.

C. Measurements required to complete the Flushing and Testing of Water Lines Tabulation Sheet.

1.08. COORDINATION

A. Provide 48-hour notice to the Owner of local water department and the Westchester County Department of Health when water for flushing, testing and disinfection is required.

B. Owner of existing water system to operate all valves and hydrants unless Contractor has been specifically authorized to operate systems valves and hydrants by Owner.

PART 2 PRODUCTS

2.01. WATER SUPPLY

A. Owner shall supply water at no cost to the Contractor for initial tests. Additional water needed due to failure of test shall be Contractor's responsibility.

B. All water for flushing and disinfection shall be furnished and disposed of in accordance with all federal, state, and local requirements by the Contractor at his expense.

PART 3 EXECUTION

3.01. EXAMINATION

A. Backfilling of the water main trench to ground surface or road surface shall be in place and completed except for final paving for seven calendar days or as approved by the Engineer prior to start of testing of each section of water main.

3.02. PREPARATION

A. The Contractor shall supply all plugs, pumps, weirs, gauges, etc., necessary to conduct the tests, including means to accurately measure the quantity of water used to maintain test pressure during the test period.

B. Flush all piping systems with water prior to testing.

3.03. TESTING

A. Pressure and leakage tests shall be conducted on all water main pipes.

B. The Engineer shall witness all tests.

C. All test results shall be recorded on the Flushing and Testing of Water Lines Tabulation Sheet and Form WPT-1 attached at the end of this section.

D. Pressurization - Each valved section of pipe shall be filled with water slowly and the specified test pressure, based on the elevation of the lowest point of the line or section under test and corrected to the elevation of the test gauge, shall be applied by means of a pump connected to the pipe.

E. Air Removal - Before applying the specified test pressure, air shall be expelled completely from the pipe and valves.

F. All pressure testing results shall be recorded on Form WPT-1.

G. Examination - All exposed pipe, fittings, valves, and joints shall be examined carefully during the test. Any damaged or defective pipe, fittings, or valves that are discovered following the pressure test shall be repaired or replaced with sound material and the test shall be repeated.

H. All visible leaks, regardless of the amount, shall be repaired.

I. If the section being tested fails to pass the pressure or leakage test, the Contractor shall determine the source or sources of leakage, and he shall permanently repair or replace all defective materials and/or workmanship at his own expense. The extent and type of repair

as well as results, shall be subject to the approval of the Engineer. The completed pipe installation shall then be retested and required to meet the pressure and leakage requirements of the test.

J. Testing and retesting shall be completed prior to final paving and prior to disinfection of the water main system.

3.04. WATER SERVICES

A. Water services to be installed after completion of disinfection of the water mains.

B. Services to be tested, prior to backfilling by flushing the service pipe thoroughly and by observing for any leaks along the pipe, or at corporation and curb stops.

(continued)

FLUSHING AND TESTING OF WATER LINES
TABULATION SHEET

Job No. _____ Location _____

Contract No. _____ Contractor _____

Project _____

FLUSHING

Date _____ Weather _____ Temperature _____

Section Flushed _____ ft. of ____-inch diameter pipe

Line Flushed _____ hrs. _____ min. @ _____gal/min

Line Flushed Through _____ Hydrant _____ -inch tap

Method of Measuring Flow _____

PRESSURE AND LEAKAGE TESTING

Date _____ Weather _____ Temperature _____

Section Tested _____

___ ft. of ___-inch diameter ____ pipe in ___-ft. laying lengths

Time Started _____ Time Finished _____ Elapsed Time _____

Test Pressure: Start _____ psi Finish _____ psi

Allowable leakage, as calculated _____ gallons Actual leakage _____ gallons

Pass ____ Fail ____

$$L = \frac{SD\sqrt{P}}{133{,}200^*}$$

where:

L = Allowable leakage in gallons/hour
S = Length of pipe tested (linear feet)
D = Nominal diameter of pipe (inches)
P = Average pressure during test, psi

*Refer to C600 for additional allowance leakage against closed metal-seated valves.

Owner's Representative _____

Contractor's Representative _____

Table 4.A Hydrostatic testing allowance per 1,000 ft of pipeline*—*gph*†

Avg. Test Pressure *psi*	Nominal Pipe Diameter—*in.*																	
	3	4	6	8	10	12	14	16	18	20	24	30	36	42	48	54	60	64
450	0.43	0.57	0.86	1.15	1.43	1.72	2.01	2.29	2.58	2.87	3.44	4.30	5.16	6.02	6.88	7.74	8.60	9.17
400	0.41	0.54	0.81	1.08	1.35	1.62	1.89	2.16	2.43	2.70	3.24	4.05	4.86	5.68	6.49	7.30	8.11	8.65
350	0.38	0.51	0.76	1.01	1.26	1.52	1.77	2.02	2.28	2.53	3.03	3.79	4.55	5.31	6.07	6.83	7.58	8.09
300	0.35	0.47	0.70	0.94	1.17	1.40	1.64	1.87	2.11	2.34	2.81	3.51	4.21	4.92	5.62	6.32	7.02	7.49
275	0.34	0.45	0.67	0.90	1.12	1.34	1.57	1.79	2.02	2.24	2.69	3.36	4.03	4.71	5.38	6.05	6.72	7.17
250	0.32	0.43	0.64	0.85	1.07	1.28	1.50	1.71	1.92	2.14	2.56	3.21	3.85	4.49	5.13	5.77	6.41	6.84
225	0.30	0.41	0.61	0.81	1.01	1.22	1.42	1.62	1.82	2.03	2.43	3.04	3.65	4.26	4.86	5.47	6.08	6.49
200	0.29	0.38	0.57	0.76	0.96	1.15	1.34	1.53	1.72	1.91	2.29	2.87	3.44	4.01	4.59	5.16	5.73	6.12
175	0.27	0.36	0.54	0.72	0.89	1.07	1.25	1.43	1.61	1.79	2.15	2.68	3.22	3.75	4.29	4.83	5.36	5.72
150	0.25	0.33	0.50	0.66	0.83	0.99	1.16	1.32	1.49	1.66	1.99	2.48	2.98	3.48	3.97	4.47	4.97	5.30
125	0.23	0.30	0.45	0.60	0.76	0.91	1.06	1.21	1.36	1.51	1.81	2.27	2.72	3.17	3.63	4.08	4.53	4.83
100	0.20	0.27	0.41	0.54	0.68	0.81	0.95	1.08	1.22	1.35	1.62	2.03	2.43	2.84	3.24	3.65	4.05	4.32

*If the pipeline under test contains sections of various diameters, the testing allowance will be the sum of the testing allowance for each size.

†Calculated on the basis of Eq 1.

END OF SECTION

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WATER PRESSURE TEST

DATE:

LOCATION: _____

DESCRIPTION: _____

CONTRACTOR: _____

SECTION TESTED: FROM _____ TO _____
(sta) (sta)

LENGTH TESTED: _____ LF PIPE DIAMETER: _____

TYPE PIPE: _____ TYPE JOINTS: _____

DURATION OF TEST: _____ *MINIMUM OF 2 HOURS

TYPE OF APPURTENANCES ON TESTED SECTION (list) :

_____

_____

_____

W = _____ WHERE W = WORKING PRESSURE (LB/IN²)

L = _____ WHERE L = ALLOWABLE LOSS IN (GAL/HR)

N = _____ WHERE N = LENGTH OF PIPE BEING TESTED (FT)

D = _____ WHERE D = DIAMETER OF PIPE IN (INCHES)

P = _____ P = AVERAGE TEST PRESSURE IN (LB/IN²)

FORMULA: $L = \frac{ND\sqrt{P}}{148{,}000}$ $P = 1.25 \times W$

*TEST	TIME	PRESSURE (PSI)
START		
STOP		

PRESSURE DROP LB/IN² : _____

WATER ADDED GAL/HR : _____

ALLOWABLE LOSS GAL/HR : _____

ACTUAL < ALLOWABLE % : _____ PASS ☐ FAIL ☐

REMARKS:	Certified

Initials: _____

_____ _____

Professional Engineer Date

Form WPT-1

SECTION 02675

DISINFECTION OF WATER DISTRIBUTION SYSTEMS

PART 1 GENERAL

1.01. SECTION INCLUDES

A. Disinfection of all pipes, fittings, valves and hydrants.

B. Sampling tests of residual chlorine content.

C. Flushing of water distribution system and its disposal of spent chlorine solutions.

D. Sampling tests of total coliform.

E. Project records.

1.02. RELATED SECTIONS

A. Section 01025 - UNIT PRICE ITEM: Requirements applicable to Unit Prices for the work of this section.

B. Section 01700 - CONTRACT CLOSEOUT

C. Section 02661 - WATER DISTRIBUTION PIPING

D. Section 02662 - WATER VALVES AND HYDRANTS

E. Section 02674 – PRESSURE TESTING OF WATER DISTRIBUTION SYSTEMS

1.03. REFERENCES

A. AWWA C651 - Disinfecting Water Mains.

B. County and New York State Department of Health regulations.

1.04. DISINFECTION

A. All pipe and fittings, valves and hydrants connected to and forming part of a potable water supply system shall be disinfected in full accordance with both the requirements of AWWA Standard C651 and the State (or County) Department of Health having jurisdiction over project and as modified herein.

B. Disinfection shall be done by the continuous feed method (per AWWA C651).

C. The Contractor shall bear all costs of flushing, disinfection and coliform testing.

1.05. SUBMITTALS

A. Disinfection plan, which shall include location of taps, sampling points, and schedule. Plan shall describe the method and rate of chlorine addition and the anticipated flow through the main being disinfected.

1.06. PROJECT RECORD DOCUMENTS

A. Submit documents under provisions of Section 01700.

B. Attached to the end of this section is a Disinfection, Testing, and Flushing of Water Mains Tabulation Sheet. Engineer shall fill out form at the time of testing and both Contractor and Engineer shall sign upon completion.

1.07. REGULATORY REQUIREMENTS

A. Submit proof of testing and disinfection as required by county and/or state Health Departments.

B. Dispose of chlorinated water in accordance with the requirements of the state and local agencies with jurisdiction over the release of potential contaminants to the environment.

1.08. FIELD MEASUREMENTS

A. Measurements required to complete the tabulation sheet.

B. Measurements required by county and/or state Health Departments.

1.09. COORDINATION

A. Provide 48-hour notice to local Water Department (Owner) and the Westchester County Department of Health when water for flushing and disinfection is required.

B. Owner of existing water system to operate all valves and hydrants unless Contractor has been specifically authorized to operate water system valves and hydrants.

PART 2 PRODUCTS

2.01. WATER SUPPLY

A. Owner shall supply water at no cost to the Contractor for initial tests. Additional water needed due to failure of test shall be Contractor's responsibility.

B. All water for flushing and disinfection shall be furnished and disposed of in accordance with all federal, state, and local requirements by the Contractor at his expense.

PART 3 EXECUTION

3.01. EXAMINATION

A. All pressure and leakage tests of the water system shall be completed prior to start of disinfection. See Section 02674.

3.02. PREPARATION

A. Contractor to employ methods to prevent contaminating materials from entering the water mains during storage, construction, or repair.

B. All piping systems, valves and hydrants shall be thoroughly flushed of any dirt or contaminating materials that may have entered the water system.

C. Mechanical methods shall be used to clean the mains if the dirt or debris will not be removed by the flushing operations.

3.03. DISINFECTION

A. The continuous feed method shall be used for chlorine application.

B. The introduction of solid hypochlorite (granules) directly into the system is prohibited.

C. Injection point shall be within 10 feet of the water source.

D. The new water main shall be filled with not les than 50 mg/L nor more than 100 mg/L of available chlorine and retained in the system for not less than 24 hours.

1. When filling water main with chlorinated water, each hydrant (in consecutive order) shall be flushed until the required residual is measured.

E. At the end of the 24-hour period, the disinfected water shall contain no less than 25 mg/L available chlorine throughout the system.

F. Disinfection shall be repeated as often as necessary at the Contractor's cost until the minimum residual chlorine of 25 mg/L has been maintained.

3.04. FLUSHING AND DISPOSAL

A. The chlorine solution shall be thoroughly flushed out prior to testing for total coliform.

B. The Contractor shall dispose of the spent chlorine solutions in a manner acceptable to the Owner and regulatory agencies and where its effects will not be detrimental to animal, plant or fish life. Dechlorination shall be utilized when discharging to the environment.

3.05. TOTAL COLIFORM TESTING

A. After final flushing and before the water main is placed in service, a water sample or samples shall be collected from the new main. At least one set of samples shall be collected from every 1,200 feet of the new water main, plus one set from the end of the line, and at least one set from each branch. All samples shall be tested for bacteriological quality, showing the absence of coliform organisms, in accordance with the local and/or state Health Department procedures.

B. Analyses shall be performed by state-certified laboratories.

1. Engineer shall accompany Contractor and witness delivery of all samples to the laboratory.

C. If the initial disinfection fails to produce satisfactory bacteriological results, the new main may be reflushed and shall be resampled at Contractor's cost. If check samples also fail to produce acceptable results, the Contractor shall repeat all disinfection procedures until satisfactory results are obtained.

D. After approval from the County Health Department and the Owner, the water mains shall be placed in service.

3.06. SERVICES

A. After construction of services but prior to connection to home or commercial service line, the service shall be thoroughly flushed to remove any contaminant and to disinfect the new service.

(continued)

DISINFECTION, TESTING, AND FLUSHING OF WATER MAINS
TABULATION SHEET

Date _____ Weather _____ Temperature _____

Section Tested _____ _____ ft. of ___-inch diameter pipe

Discharge Rate _____ gal/min; Application of ___% hypochlorite solution @ gal/min

_____ mg/L initial total chlorine residual @ end of line at _____ (time)

_____ mg/L initial total chlorine residual @ end of 24 hours at _____ (time)

Method of measuring chlorine residual _____

Line flushed at _____ gal/min for _____ hours _____ min. on _____ (date)

Bacteria sample collected at _____ (location) at _____ (time/date)

Bacteria sample results _____ meet _____ do not meet state and/or county drinking water standards for total coliform.

Line Ready for Service on _____ (date) _____ (time)

Line Put Into Service on _____ (date) _____ (time)

Owner's Representative _____

Contractor's Representative _____

END OF SECTION

SECTION 02980

SITE REHABILITATION

PART 1 GENERAL

1.01. SECTION INCLUDES

A. Site rehabilitation of lawns, existing cultivated or landscape items such as trees, shrubs, hedges, saplings, vines, ground cover vegetation, gardens, etc.

B. Restoration of uncultivated lands.

C. Topsoil, fertilizer, seeding, mulching and planting.

D. Site rehabilitation of walls, terraces, fences, ditches, drains, culverts, drives, posts, patios, outdoor recreational equipment, garden decorations and appurtenances, small structures, and all other artificial features.

E. Site modifications and development to meet new conditions.

F. Removal and disposal of all excess materials, equipment, trash and debris used for, or resulting from, the work included in this section.

1.02. RELATED SECTIONS

A. Section 01025 - UNIT PRICE ITEM: Requirements applicable to unit prices for work of this section.

B. Section 01039 - COORDINATION AND MEETINGS

C. Section 01300 - SUBMITTALS

D. Section 02110 - SITE CLEARING

E. Section 02225 - TRENCHING: Basic site restoration.

F. Section 02510 - HOT MIX ASPHALT PAVING

1.03. REFERENCES

A. The American Association of Nurserymen Standards - ANSI Standard 2-60.1, “Nursery Stock.”

B. Soil Conservation District of the Department of Agriculture.

1.04. QUALITY ASSURANCE

A. Areas and Features to be Restored

1. All areas, including natural features occurring thereon, which are damaged or disturbed by the Contractor’s operations, shall be restored, repaired or replaced to the same or superior condition which existed prior to construction or as modified herein or as shown on the Drawings.

2. Artificial features shall be restored equal to a new condition or as modified herein or as shown on the Drawings.

1.05. SUBMITTALS

A. Submit under provisions of Section 01300.

B. Submit the source nursery for all plantings.

C. Topsoil - Submit sieve analysis and characteristics of topsoil as listed in Part 2.

D. Seed mixture data.

1.06. QUALIFICATIONS

A. All planting material to be furnished from a nursery which meets the requirements of the American Association of Nurserymen.

1.07. PACKING AND SHIPPING

A. All seed furnished for this project shall be delivered in standard size unopened bags of the vendor, showing weight, mixture, vendor's name and guaranteed analysis.

1.08. STORAGE

A. Seed shall be properly stored in dry conditions at the site of the work.

1. Any seed damaged or spoiled during storage shall be replaced by the Contractor.

1.09. ENVIRONMENTAL CONDITIONS

A. Topsoil shall not be delivered or placed in a frozen or muddy condition.

B. Seeding is to be done on dry or moderately dry soil.

1. Seeding is to be done when the wind velocity does not exceed 5 miles per hour.

1.10. SCHEDULE

A. The Contractor is advised to do all seeding during the periods of May 1st to June 15th, or August 15th to October 1st.

1. Seeding may be conducted under unseasonable conditions without additional compensation, and at the option and full responsibility of the Contractor.

1.11. GUARANTEE

A. Any new, reestablished, replaced or disturbed plant material that fails to respond properly within the one-year guarantee period shall be replaced as specified above at the Contractor's expense.

PART 2 PRODUCTS

2.01. MATERIAL

A. Topsoil

1. Topsoil shall be natural, fertile, friable agricultural soil capable of sustaining healthy vegetative growth.

2. Topsoil shall meet the following gradation requirements free of stones, roots, sticks and other foreign substances:

GRAIN DIAMETER	SIEVE SIZE	PERCENT PASSING BY WEIGHT
6.3 mm	6.3 mm	100
4.75 mm	No. 4	60-85
.075 mm	No. 200	20-45
.002 mm	--	7-27

a. Topsoil shall contain less than 52 percent sand.

3. The pH of topsoil shall be between 5.0 and 7.0.

4. Topsoil shall contain no less than 6.0 percent organic matter.

5. Topsoil may be from previously excavated, stockpiled and protected materials, provided the materials meet the requirements for topsoil.

B. Fertilizer

1. General Fertilizer

a. Fertilizer shall be a complete, partially organic, commercial 10-6-4 fertilizer.

b. All fertilizer shall contain a minimum of 10 percent nitrogen, 6 percent available phosphorous and 4 percent potash.

c. Other commercially available fertilizers, such as 20 10-10 and 12-6-6, may be utilized provided that spreading rates are adjusted to provide the aforementioned minimum requirements for nitrogen.

2. Plant Fertilizer - As recommended by local Soil Conservation District of the Department of Agriculture for the type(s) of soil(s) and plant(s).

C. Seed

1. All seed shall be fresh, recleaned and of the latest crop year.

2. Each component shall meet or exceed the minimum state and federal requirements for purity and germination for that component.

3. The weed content of each component shall not exceed 0.1 percent.

4. The following seed mixture is suggested for lawns or cultivated (landscape) areas:

PERCENT BY WEIGHT	VARIETY	PURITY	GERMINATION
50	Kentucky Blue Grass	85%	80%
20	Red or Chewing Fescue	97%	80%
30	Red Top	92%	90%

a. Variations may be recommended by qualified personnel, but shall not be used without approval by the Engineer.

5. For uncultivated areas furnish perennial rye grass seed.

D. Mulch for Tree or Shrub Plantings - Mulch shall consist of dry, clean, hardwood chips.

E. Mulch for Seeded Areas - Mulch shall be oat, wheat or rye straw, or hay, free from noxious weeds and other materials which may interfere with the establishment of a healthy stand of grass.

F. Plantings - Trees, shrubs, vines, ground cover and other vegetation to be replaced or installed new as specified which meet the requirements of the American Association of Nurserymen.

1. Classifications of plants, dimensions, planting procedures, etc., shall conform to ANSI Standard Z 60.1, “Nursery Stock.”

G. Peat Moss - As recommended by the supplier of nursery stock.

H. Metal Edging

1. Edging shall be 3/16-inch thick by 4-inches high steel in 16- and 20-foot lengths.

a. Secure edging with 16-inch long tapered steel stakes at 30 inches on center.

b. All steel materials shall be painted with one coat of epoxy primer and two coats of epoxy finish.

I. Weed Barrier - Weed barriers shall consist of two plies of 6-mil thick black polyethylene film.

J. Stones

1. All stones used for landscape surfacings shall be between 2 and 4 inches in maximum dimension and average to about 3 inches.

a. Stones shall be well-rounded.

2. All stones used for mowing strips shall be a washed crushed stone, size 1/2-inch to 1-inch size.

K. Tree Wrapping - Wrapping for trees shall be 8 ounce first quality burlap.

L. Asphalt Paving - Shall be furnished and installed in accordance with Section 02510.

PART 3 EXECUTION

3.01. EXAMINATION

A. Determine that surface area is ready for fine grading and/or to receive topsoil and seeding or plantings.

1. Remove trash, debris, large stones and other foreign materials from surface areas to be restored or rehabilitated.

2. Topsoil shall be free of frozen fragments, debris, large stones, and other foreign materials.

3.02. PREPARATION

A. Fine Grading - 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.

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

3.03. INSTALLATION

A. Areas to be Developed

1. When the project site is to be modified and developed to meet new conditions, the Contractor shall perform all required grading, topsoiling, fertilizing, seeding, planting, mulching and maintenance of areas, all in accordance with the Drawings and as specified herein.

2. Unless shown otherwise on the Drawings, the entire unpaved area within the grading limits and within the overall areas excavated and backfilled shall be so developed.

3. New landscaping work and artificial features, if any, are shown on the Drawings and specified elsewhere.

B. The Contractor shall reestablish all existing cultivated or landscape items, trees, shrubs, vines and ground covers as practicable.

1. He shall provide additional or modify existing vegetation, as shown on the Drawings.

2. Existing trees, plants, shrubs, saplings, ground cover, vines, etc., which are disturbed or damaged by the Contractor’s operations shall be replaced with new plant materials.

3.04. TOPSOILING

A. Topsoil shall be furnished and spread in the required areas to a depth of approximately 4 inches.

1. Stockpiled topsoil may be used if it is acceptable to the Engineer.

2. 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.

B. The soil shall be uniformly compacted with a light hand roller to a final depth of not less than 2 inches.

1. 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.

2. Any irregularities shall be corrected before the fertilizer and seed are placed.

3. Any subsequent settlement or displacement of the topsoil shall be restored to an acceptable condition at the Contractor's expense.

3.05. FERTILIZING

A. The fertilizer shall be uniformly spread by a mechanical spreader at the rate of 25 lbs. per 1,000 square feet.

1. The fertilizer shall be incorporated into the upper 2 inches of topsoil immediately after spreading.

2. Other commercial fertilizers, such as 20-10-10 or 12 6-6 may be used at rates adjusted to provide the same quantity of nitrogen per 1,000 square feet.

3.06. SEEDING

A. Seed shall be applied at a rate of not less than 5 lbs. per 1,000 square feet using a mechanical spreader.

1. Upon completion of the seeding, the area shall be raked lightly and rolled with a light hand roller.

B. The process of spraying grass seeds, water, fertilizer and mulch known as hydro-seeding or hydro-mulching may be utilized provided that water hazards are minimized.

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.

3. The mulch may be a wood fiber material compatible with the spray equipment.

3.07. PLANTING

A. All new plant materials which are to replace existing plant materials shall be of the same genus and species as the original, and shall be placed in the same location as the item being replaced.

1. The size of the new plant materials shall, if practical, match that of the item being replaced, consistent with normally available sizes from nursery stock.

2. 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.

3. The Contractor shall, as soon as practicable, water and maintain all reestablished, replaced or disturbed plant materials until final acceptance of total.

B. Plant shall be set plumb and true.

1. Shape area around saucer to form drainage grades as shown on the Drawings.

C. Install wooden posts, guy wires and hose section for protection as shown on the Drawings.

1. Provide three guy wires per planted item.

D. For all trees of 2-inch caliber or larger, wrap with tree wrap.

1. Begin at base of tree and work upward to the first branches.

2. Tie the burlap wrap with cord (no synthetic cord nor wire) at 2-foot intervals and at the bottom and top.

E. Place weed barriers on prepared subgrade at depth shown on the Drawings.

1. Turn up weed barrier at all edges and corners.

F. Place washed stone over weed barriers to the specified depths.

1. Rake stone to produce a smooth, uniform surface.

G. Install metal edging such that the top edge projects 1/4 inch above surrounding soil and stone.

3.08. MULCHING AND PROTECTION

A. The Contractor shall protect and maintain seeded areas to assure a full even stand of grass.

1. Immediately after seeding and rolling, the Contractor shall apply oat, wheat or rye straw, or hay, free from noxious weeds, as a mulch, to a loose depth of about 1 inch.

2. The Contractor shall perform all watering 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.

3.09. MAINTENANCE

A. Any portion of seeded areas failing to produce a full uniform stand of grass from any cause, shall be reseeded at full rate and refertilized at one-half rate and protected and maintained until such a full stand has been obtained.

B. Plantings to be maintained for one year.

3.10. RESTORATION OF UNCULTIVATED LANDS

A. Areas of uncultivated land shall be restored as follows:

1. The disturbed surfaces shall be rough-graded to the original elevations (±1 inch) and general appearance which existed prior to construction (or to the new elevations and grades which are required), all debris, loose stones over 1 inch, boulders, etc., being removed in the process.

2. The surface shall then be seeded with perennial rye grass, being spread at the rate of 1 lb. per 800 square feet.

3. The area need not be raked or rolled after completion of seeding.

3.11. SPECIAL CONDITIONS

A. Damaged Trees - Vegetation which has been damaged by site preparation activities and deemed non-functional by the Owner or engineer, shall be replaced by the Contractor with vegetation of the same caliper, genus and species at no additional compensation to the Contractor.

END OF SECTION

SECTION 03001

CONCRETE

PART 1 GENERAL

1.01. SECTION INCLUDES

A. All concrete structures.

B. Sidewalks.

C. Concrete mixes.

D. Concrete testing.

E. Concrete curing and protection.

F. Bonding agent.

G. Concrete slab sealer.

H. Saw cutting concrete and repair to exposed steel reinforcement.

I. Leakage testing.

J. Non-shrink grout.

K. Chemical adhesive system to install dowels and bolts.

L. Foundation dampproofing.

M. Waterstops.

N. Joint filler and sealant.

O. Restrictions regarding embedments in concrete.

1.02. REFERENCES

A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

ACI 201.1	Guide for Conducting a Visual Inspection of Concrete in Service
ACI 211.1	Selecting Proportions for Normal, Heavyweight, and Mass Concrete
ACI 301	Specifications for Structural Concrete
ACI 302.1	Guide for Concrete Floor and Slab Construction
ACI 304	Measuring, Mixing, Transporting and Placing Concrete
ACI 305	Hot Weather Concreting
ACI 306	Cold Weather Concreting
ACI 308	Guide to Curing Concrete

ACI 309	Guide for Consolidation of Concrete
ACI 315	Details and Detailing of Concrete Reinforcement
ACI 315R	Manual of Engineering and Placing Drawings for Reinforced Concrete Structures
ACI 318	Building Code Requirements for Structural Concrete
ACI 347	Recommended Practice for Concrete Formwork
ACI 350	Code Requirements for Environmental Engineering Concrete Structures

B. American Society for Testing and Materials (ASTM)

ASTM A185	Steel Welded Wire Reinforcement, Plain, for Concrete
ASTM A497	Steel Welded Wire Reinforcement, Deformed, for Concrete
ASTM A615	Deformed and Plain Billet Steel Bars for Concrete Reinforcement
ASTM C31	Making and Curing Concrete Test Specimens in the Field
ASTM C33	Concrete Aggregates
ASTM C39	Compressive Strength of Cylindrical Concrete Specimens
ASTM C88	Soundness of Aggregates
ASTM C94	Ready-Mixed Concrete
ASTM C136	Sieve Analysis of Fine and Coarse Aggregates
ASTM C143	Test Method for Slump of Hydraulic-Cement Concrete
ASTM C150	Portland Cement
ASTM C172	Sampling Freshly Mixed concrete
ASTM C231	Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C260	Air-Entraining Admixtures for Concrete
ASTM C309	Liquid Membrane Forming Compounds for Curing Concrete
ASTM C494	Chemical Admixtures for Concrete
ASTM C595	Specification for Blended Hydraulic Cements
ASTM C618	Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
ASTM C989	Ground Granulated Blast-Furnace Slag for Use in Concrete

1.03. SUBMITTALS

A. Submit Concrete Mix Designs - Concrete mixes used on this project shall be either established mixes verified by "Field Test Data" or new custom laboratory designed "Trial Mixtures." Requirements for either option are as follows.

All data shall be dated within the last 12 months. Partial submittal will not be reviewed.

1. List amount and sources of mix ingredients:

a. Cement.

b. Pozzolans (fly ash and slag).

c. Fine aggregate.

d. Coarse aggregate.

e. Water.

f. Admixtures (including fibers).

2. Strength Test Reports - The average strengths shall be higher than the required average compressive strengths (f'cr) as per ACI 301, paragraph 4.2.3.3.

3. Typed letter signed by an official from concrete supplier stating that all ingredients for proposed mix(es) are identical and from the same source as ingredients used for concrete in provided strength test reports.

4. Certified tests of fine and coarse aggregates meeting requirements in Part 2 of this specification.

5. Certified statement from source of fine and coarse aggregates pertaining to history of alkali-aggregate reactivity (ASR) or State DOT confirmation that ASR issues are not evident at the aggregate source.

6. Certified mill test of cement and fly ash or slag.

7. Certified test for amount of water-soluble chloride ion (CL-) in concrete.

8. One-page admixture catalog cuts.

B. Submit one-page catalog cut for bonding agent.

C. Submit one-page catalog cut for retarding admixture.

D. Submit one-page catalog cut for surface-applied hot weather evaporation reducer.

E. Submit a written statement regarding Contractor's anticipated curing procedures.

F. Reinforcing Steel - Submit shop drawings in accordance with ACI 301, ACI 315 and ACI 315R, as modified below.

1. Drawings shall be clearly drawn and show enough details to locate every bar without the need to refer to the Contract Drawings. All construction and control joints must be shown. Photocopies of Contract Drawings, in whole or in part, will not be acceptable.

2. No fabrication shall commence until shop drawings are approved. All bars shall be shop fabricated.

G. Submit catalog cuts for non-shrink grout.

H. Submit catalog cuts for chemical adhesive system used to install dowels and bolts into hardened concrete and masonry.

I. Submit catalog cuts for joint filler and sealant.

J. Submit catalog cut for slab sealer.

K. Submit catalog cuts for waterstops and waterstop accessories, clearly indicating which item(s) are to be used.

L. If concrete repairs are needed, the Contractor shall submit proposed repair products and procedures specified in Part 3 of this specification.

M. Submit special requests for embedment of conduit, etc. Reference restrictions in Part 3 of this specification.

1.04. COORDINATION

A. Coordinate all concrete placements with work (general, civil, architectural, structural, mechanical, electrical, plumbing, HVAC, etc.) indicated in all specifications and on all Contract Drawings.

B. Coordinate the installation of all cast-in (embedded) items (i.e., grating frames, access hatches, anchor rods, etc.) prior to start of concrete placement. Post-installation of cast-in (embedded) items will not be allowed.

C. Contractor shall receive approval on anticipated curing and protection procedures prior to placement of all concrete.

D. Coordinate all concrete placements with testing and inspection requirements specified herein.

1.05. QUALITY ASSURANCE

A. The concrete batch plant providing concrete to this project shall be certified by the NYSDOT.

B. Bar Identification and Mill Test Reports - All reinforcing bars shall have the manufacturer's mill marking rolled into the bar which shall indicate the producer, size, type, and grade.

C. Concrete testing shall be performed prior to and during placement.

PART 2 PRODUCTS

2.01. CONCRETE

A. Concrete Classes and Their Use

1. Mix A - All general uses not otherwise specified or provided for below.

2. Mix C - Concrete fill topping (not exposed to flowing water) and pipe supports and encasements.

3. Mix D - Concrete thrust blocks (below grade).

4. Mix E - Sidewalks, curbs, bench walls, exterior slabs.

Mix	28-Day Compressive Strength (psi)	Coarse Aggregate Size per ASTM C33	Minimum Total Cementitious Content (lbs/CY)	Maximum Water/ Cement Ratio (w/c)(1)	Air Content %(2)	Maximum Water-Soluble Chloride Ion (CL^-)
A	4,000	#57	550	0.44	6.0	0.30
C	4,000	#7	550	0.44	7.0	0.30
D	3,000	#57	450	0.50	--	--
E	5,000	#57	600	0.40	6.0	0.15

(1) These maximum water/cement ratios shall be considered for selection of supplier's mix designs. The water/cement ratio specified in the approved mix designs shall be the maximum used in production.
(2) Tolerance for air content is +1-1/2 percent.

B. All concrete exposed to weather or freezing temperatures shall be air-entrained as specified in the above chart.

C. Without plasticizers, concrete slump for flatwork shall not exceed 3 inches. Wall concrete, columns, deep beams, and other vertical placements (without plasticizers) shall be placed with a maximum slump of 4 inches.

2.02. MATERIALS

A. Cement shall be Portland cement Type I or Type II and shall conform to ASTM C150.

B. Pozzolans

1. Fly ash shall meet the requirements of ASTM C618 Class F, except as modified below:

a. Loss of Ignition, Maximum - 5.0 percent.

b. Maximum Retained on #325 Sieve - 30 percent.

A blend of Portland cement and fly ash shall be between 15 to 25 percent of total cementitious content.

2. Blastfurnace slag shall meet the requirements of ASTM C989 and be specifically manufactured to produce higher concrete strengths and provide greater resistance to chloride penetration and sulfate attack.

A blend of Portland cement and ground iron blastfurnace slag shall contain no more than 50 percent slag. The resulting blend of cementitious material shall meet the requirements of ASTM C595.

C. Aggregates

1. Fine Aggregate (Sand)

a. Natural or manufactured siliceous sand.

b. Quantity of deleterious substances as approved by State DOT or as limited by Table 1 of ASTM C33.

c. Graded within the limits of ASTM C33.

2. Coarse Aggregate

a. Crushed stone or crushed gravel.

b. Quantity of deleterious substances as approved by State DOT or as limited by Table 3 of ASTM C33 for Class 3S aggregates.

c. Graded within the limits of ASTM C33.

3. Five cycle soundness tests for fine and coarse aggregates shall meet the requirements of ASTM C33.

PERCENT LOSS

	MAGNESIUM SULFATE	SODIUM SULFATE
Fine aggregate(1)	15	10
Coarse aggregate(2)	18	12

(1) If provided, results of soundness tests exceed these limits, it would be acceptable to provide a certified letter attesting to the favorable performance of the fine aggregates as outlined in ASTM C33, Article 8.
(2) Soundness tests for coarse aggregates do not need to be provided if they are approved by State DOT for use with concrete. Submit verification of such.

4. Source of fine and coarse aggregates shall not have a history pertaining to alkali-aggregate reactivity. In the event that aggregate source with potential alkali-aggregate reactivity is unavoidable, at least two of the following measures shall be taken to minimize this reaction:

a. Provide low alkali cement (<0.60 percent alkalies).

b. Use lithium-based additives.

c. Test aggregates to show non-reactive.

d. Use fly ash or slag.

D. Mixing Water - Clear and potable.

E. Acceleration admixtures are only allowed to shorten cold weather protection periods.

2.03. ADMIXTURES

A. General - Admixtures other than those specified may only be used after written approval by the Engineer.

B. Admixtures shall be as manufactured by BASF Chemical Company; Sika Corporation; The Euclid Chemical Company; W.R. Grace, Inc.; or equal.

C. Air Entrainment Admixture - All concrete requiring air entrainment shall contain an air entrainment admixture meeting the requirements of ASTM C260.

D. Water Reducing Admixture - All concrete shall contain a water reducing admixture that meets the requirements of ASTM C494 Type A (water reducing) or Type F (superplasticizer). This admixture shall not contain chlorides.

E. Retarding Admixture - If air temperatures are expected to exceed 85 degrees F during the placement and/or finishing of any flatwork, a retarding admixture shall be used that meets the requirements of ASTM C494 Type D.

F. Evaporation Reducer - For all concrete flatwork during hot and/or windy weather conditions, apply to freshly placed concrete prior to finishing. Use BASF Chemical Company "Confilm," L&M Construction Chemicals "E-Con," Conspec (by Dayton Superior) "Aquafilm," or equal.

2.04. OTHER PRODUCTS

A. Bonding Agent - When placing freshly-mixed concrete against existing hardened concrete, use a corrosion inhibiting, non-vapor barrier, extended open time bonding compound.

Use Sika Corporation "Armatec 110 EpoCem," The Euclid Chemical Company "Duralprep A.C.," Larsen Products Corporation "Weld-Crete," or equal.

B. Liquid curing compound shall only be used during cold weather conditions and curing of foundation wall strip footings. When allowed, use a dissipating, VOC-compliant, water-based membrane forming with fugitive dye, conforming to ASTM C309, Type 1-D. Curing compound shall be applied at twice the manufacturer's recommended application rate.

C. Slab sealer shall be Sika Corporation "Sikagard 701W," Euclid Chemical Company "Super Aqua Cure Vox," V-Seal "Industra-Seal 100+," or equal.

D. Waterstop material shall be PVC 6-inch x 3/8-inch ribbed center bulb waterstop No. CR-6380 by "Wirestop" of Paul Murphy Plastics Company; No. RB6-38 by "Vinylex;" No. 705 by "Greenstreak;" or equal.

For expansion joints, use PVC 9-inch by 3/8-inch ribbed center bulb (nominal 1 inch in diameter) waterstop.

E. Where shown on the Drawings and where new concrete is cast against existing concrete, use a premolded 1-inch by 3/4 inch bentonite self-adhering waterstop strip which expands on contact with water, applied with primer adhesive. The bentonite waterstop material shall meet the requirements of ASTM D217. Waterstop and adhesive shall be "Waterstop-RX" and "CetSeal" by CETCO Building Materials Group; "Swellstop" and "Swellstop Primer" by Greenstreak; or equal.

F. Expansion and isolation joint filler shall be preformed, closed cell, high grade polyethylene or non-extruding PVC, such as "Expansion Joint Filler" by BASF Chemical Company; "Plastic Expansion Board" by Westec Barrier Technologies; "Deck-O-Foam" by W.R. Meadows, Inc.; or equal.

1. Joint fillers shall be held back for sealants.

2. The joint filler shall be compatible as a back-up material, with regard to the sealant not bonding to or being stained by the backup.

G. Sealant for expansion joints in concrete structures designed for submerged conditions to either contain or hold out liquids (including groundwater) such as tankage, basements, flow channels, galleries, etc. shall be a two-component NSF approved polyurethane material.

Use Sika Corporation "Sikaflex-2c," The Euclid Chemical Company "Eucolastic II," or equal.

H. Wall dampproofing shall be a heavy duty fibrated asphalt emulsion per ASTM D1227, Type II applied over an asphalt primer per ASTM D41.

I. Non-Shrink Grout Shall be a fluid or flowable non gas liberating cement base product which is manufactured premixed, requiring only the addition of water at the job site. All components shall be inorganic.

Non-shrink grout (mixed as a plastic state) shall have a minimum compressive strength of 5000 psi in 7 days and 7000 psi in 28 days.

J. After material sources have been established and approved, these sources shall not be changed for the duration of the project.

PART 3 EXECUTION

3.01. CONCRETE COVER

A. Clear concrete cover not indicated on Drawings shall conform to ACI 318 and ACI 350, as applicable. However, in no case shall the clear cover be less than 1-1/2 inches.

B. Contrary to the practice permitted by CRSI, the use of brick or CMU block supports for reinforcement shall not be permitted. Only special made wire bar supports or special cast, precast concrete blocks shall be allowed.

C. All metal and plastic bar supports bearing on grade shall have continuous runners to prevent settlement during construction activities.

3.02. PREPARATION, MIXING, AND HANDLING OF CONCRETE

A. Batch Plant Requirements - Measurement of materials at the batch plant shall be in accordance with ASTM C94.

B. Mixing Methods - All concrete shall be ready mixed to meet the requirements of ASTM C94.

A written delivery slip or ticket, prepared and signed by the plant operator shall be made out at the proportioning plant for each truck load batch. Each slip shall show the following information:

1. Truck number

2. Date and time truck is batched

3. Ticket number

4. Mix designation of concrete (per paragraph 2.01.A)

5. Cubic yards of concrete

6. Cement brand, type and weight in pounds

7. Weight in pounds of each size and type of aggregate

8. Admixtures, brand and weight in pounds and ounces

9. Moisture content of fine and coarse aggregates

10. Water added to the batch at the plant

11. Water added to the batch during transport

12. Water added to the batch at the job site

The driver shall record the number of gallons of water added during transport and at the job site. In no case shall the w/c ratio be exceeded.

Any truck delivering concrete to the job site without a delivery slip will be rejected and shall immediately depart from the job site.

C. Heating and Cooling of Materials - The batch plant shall be equipped to heat aggregates and water, or cool water with ice, and cool aggregates by shading and/or spraying with cool water to obtain acceptable concrete delivery temperatures in the range of 55 to 85 degrees F. Aggregates shall not contain ice or have frozen lumps nor shall they be heated to a temperature over 120 degrees F.

3.03. EMBEDMENTS IN CONCRETE

A. Install and secure all cast-in components in accordance with manufacturer's recommendations, prior to concrete placement.

B. Embed no pipes other than electrical conduit in structural concrete.

Obtain approval from Engineer for any variation from the following requirements unless shown on the Drawings. Make request in writing accompanied by suitable sketch.

1. Do not cut or displace any reinforcement.

2. Do not place conduit between concrete surfaces and reinforcement.

3. Restrict O.D. of conduit to 1/4 of slab thickness. Keep within middle half of that thickness.

4. Place parallel conduits apart at least six times O.D. of conduit being used.

5. Conduits that cross must be bent such that they cross between 45 and 90 degrees from each other.

6. Conduits that cross can touch each other, but no more than three conduits can cross at any given location.

7. Do not embed conduit in beams.

3.04. CONCRETE PLACEMENT

A. The Contractor shall notify the Engineer (and Special Inspector when required) a minimum of 48 hours in advance of placement to allow sufficient time for inspection and for any corrective measures which are subsequently required.

B. Concrete shall be placed in accordance with ACI 304 and ACI 318.

C. Concrete shall be placed and vibrated in lifts not exceeding 30 inches.

D. Curing and protection of the concrete shall begin immediately after completion of the finishing operation.

E. Adjacent concrete placements (sections) shall not be placed any sooner than three days since newly cast sections.

3.05. CURING AND PROTECTION

A. All freshly placed concrete shall be protected from adverse weather elements, and from defacement. As soon as the concrete has been placed and horizontal top surfaces have received their required finish, provision shall be made for providing sufficient water for hydration and preventing loss of moisture from the concrete for at least a seven day period.

B. For the first 24 hours after concrete finishing, no work shall commence nor shall any material be placed on the newly cast concrete. The exposed concrete surfaces shall be protected from any potential damage with plywood or other means for the remaining six days of the curing period.

C. Interruptions, not to exceed a total of four hours are permitted for the purpose of layout or other required construction needs as long as the surface is not allowed to completely dry. Be prepared to spray the exposed surface every 15 to 30 minutes.

D. Slabs and Other Flatwork

1. After finishing and immediately after the concrete surface has hardened enough to prevent dilution of the cement paste, spray the surface with water to provide continuous moist curing for at least the first 24 hours.

2. After the initial 24 hour period, soak with water and cover for an additional six days with waterproof paper or white polyethylene blankets. Wet burlap coverings may be used if the burlap is kept wet by continuous sprinkling with water. Lap the cover material at least 12 inches, covering the top and sides of the concrete.

3. If cover material is not used, the concrete surfaces shall be kept continuously wet by spraying or other approved methods.?

E. Strip Footings (Note: Strip footings include footings of foundation frost walls.)

1. After finishing, apply curing compound at twice the manufacturer's recommended application rate.

2. Curing compound shall be applied to and seamlessly cover all exposed surfaces.

F. In hot weather conditions (defined in ACI 305), provide curing procedures as outlined above along with additional provisions required by ACI 305.

G. In cold weather conditions (defined in ACI 306) where heated enclosures are provided and when continuous moist curing of walls and slabs is not practical, use liquid membrane forming curing compounds with fugitive dye, applied at twice the manufacturer's standard rate of application.

H. For the first 24 hours after concrete finishing, no work shall commence nor shall any material be placed on newly cast concrete. The exposed concrete surfaces shall be protected from any potential damage with plywood or other means for the remaining six days of the curing period.

3.06. SEALING OF CONCRETE

A. The concrete surfaces identified in the Finish Schedule shall be sealed as follows:

1. The first coating shall be applied as soon as possible after finishing and curing, and the second coating shall be applied near project completion after installation of all equipment and piping and after completion of other related construction activities.

2. Apply sealer in accordance with manufacturer's recommendations.

3.07. BITUMINOUS WALL DAMPPROOFING

A. Comply with manufacturer's printed recommendations for preparation of wall surface.

B. Clean surfaces of soil, debris, and all foreign matter. Allow cleaned surfaces to dry.

C. Apply a uniform coating of asphalt primer per manufacturer's recommendations.

D. Provide continuous uniform dampproofing coating, 3/32 inch minimum dry thickness. Apply dampproofing by brush.

E. Dampproof vertical wall surfaces to within 4 inches of finished grade at top of walls. At bottom of walls, extend dampproofing across horizontal projection of footing and down face of footing approximately 2 inches.

F. Apply bituminous primer and dampproofing.

3.08. TESTING FOR QUALITY ASSURANCE

A. The Contractor shall hire and pay for the services of an independent testing laboratory to perform the testing for quality assurance.

B. This testing shall consist of calculation of w/c ratio; measuring slump; air content; and tests for the compressive strength. Four 6-inch by 12-inch cylinders shall be made with 1 cylinder to be tested at 7 days, 2 cylinders to be tested at 28 days, and 1 cylinder to be tested at 56 days if the 28-day strengths are inadequate. These test results will be used by the Contractor to assist his control of quality.

C. The Contractor shall schedule and provide 48 hours' notice to the independent testing laboratory. The Contractor shall provide free access to work and cooperate with the testing laboratory.

D. In general, testing shall be required for each placement in excess of 5 cubic yards.

E. Copies of all test reports shall be mailed directly to the Owner and Engineer by the testing laboratory as soon as they become available.

F. The Contractor shall accept all test results reported by the testing laboratory. Any disputed results shall be validated by an independent testing laboratory hired by the Contractor at their expense.

3.09. REPAIR AT SAW CUTS TO CONCRETE

A. After saw cutting concrete, repair exposed rebar as follows:

1. Chip back concrete around rebar end with maximum 20-lb. chipping hammer.

2. Cut off exposed rebar minimum 1-1/2 inches past concrete surface.

3. Coat area with bonding agent and patch hole with non-shrink grout.

END OF SECTION

SECTION 03481

PRECAST CONCRETE VAULTS

PART 1 GENERAL

1.01. SECTION INCLUDES

A. Factory design and manufacture of precast concrete vault sections and accessories.

B. Quality assurance and control.

C. Field installation of vaults.

D. Waterproofing of vaults.

E. Installation of frames, hatches, and fall protection.

F. Ladders and safety devices.

1.02. RELATED SECTIONS

A. Section 03001 - CONCRETE

1.03. REFERENCES

A. American Concrete Institute

1. ACI 301 - Specifications for Structural Concrete Buildings

2. ACI 315 - Details and Detailing of Concrete Reinforcement

3. ACI 315R - Manual of Engineering and Placing Drawings for Reinforced Concrete Structures

4. ACI 318 - Building Code Requirements for Structural Concrete

5. ACI 350 - Environmental Engineering Concrete Structures

B. American Society for Testing and Materials

1. ASTM C150 - Portland Cement

2. ASTM C207 - Hydrated Lime for Masonry Purposes

3. ASTM C478 - Precast Reinforced Manhole Sections

4. ASTM C858 - Underground Precast Concrete Utility Structures

5. ASTM C913 - Precast Concrete, Water, and Wastewater Structures

C. Concrete Reinforcing Steel Institute - CRSI 63, Recommended Practice for Placing Reinforcing Bars

1.04. DESIGN

A. All vaults shall be designed by a licensed professional engineer registered in the State of New York and engaged by the manufacturer. All dead loads, live loads, flotation, erection, temperature and anchorage stresses shall be considered.

B. The calculations and drawings shall be prepared in a neat and legible manner, sealed by the licensed professional engineer performing the calculations.

C. For design, groundwater shall be assumed at the top of the vault and the design shall provide for a 15 percent factor of safety against floatation.

D. All vaults shall be designed for H-20 wheel load.

1.05. SUBMITTALS

A. Submit evidence that shows current PCI and/or NYSDOT certification.

B. Submit shop drawings of wall sections and bases proposed for this project, include joint design and related details for field assembly.

C. Submit certification of conformance with Contract Documents and ASTM C858.

D. Submit catalog cut and installation details for aluminum hatches with fall protection grates, ladders with safety devices, and waterproofing systems.

E. The sealed calculations shall include a summary page to list all design loads, material specifications, and design criterion used in the calculations.

F. Under a separate submittal, provide two file copies of calculations for each vault indicating each load and load combination. Other than the summary page, calculations will not be reviewed by the Owner's Engineer; calculations will not be returned to the Contractor.

1.06. QUALITY ASSURANCE

A. Manufacturer shall be a PCI-and/or NYSDOT-certified plant for production of precast vaults as specified herein.

B. Aggregate used in producing concrete shall be from NYSDOT-approved sources.

1.07. QUALITY CONTROL INSPECTION

A. The quality of all materials, the process of manufacture and the finished sections shall be subject to inspection by the Engineer. Such inspection may be made at the place of manufacture, and or on the work site after delivery.

B. All sections shall be inspected for general appearance, dimensions, soundness, etc. The surface shall be dense, close-textured and free of honeycomb, cracks, roughness, exposure of reinforcement, damaged joints, or other irregularities.

C. All sections which have been damaged after delivery will be rejected, or if already installed, shall be repaired or removed and replaced entirely at the Contractor's expense.

D. Rejected sections shall be tagged as such, segregated from other sections, and removed from the job site.

PART 2 PRODUCTS

2.01. CONCRETE

A. Minimum 28-Day Compressive Strength - 4500 psi.

2.02. REINFORCEMENT

A. Reference Section 03001.

2.03. PRECAST OR CAST-IN-PLACE CONCRETE BASES

A. Design and manufacture of precast concrete bases shall conform to the requirements of this section and ASTM C858. Cast-in-place concrete bases shall conform to Section 03001.

B. Bases shall conform to the dimensions indicated on the Drawings or as required by design. The horizontal joint at the top of the base shall be compatible with that of the precast wall section.

C. Sumps shall be built into the floors where shown on the Drawings. Floors shall be sloped to the sump. Minimum slab thickness below sumps shall be 4 inches.

2.04. PRECAST CONCRETE WALLS

A. Design and manufacture of precast concrete walls shall conform to the requirements of this section and ASTM C858.

B. All tongue-and-groove joints in the precast wall, including the joint at the top of the base, shall be made up using gaskets. Joints may also be made up using butyl joint sealant rope material in lieu of the gasket.

The precast sections shall be provided with a special groove to receive and hold the gasket in position during joint assembly.

C. After joint assembly, the gap between sections shall be packed on the inside and outside with “Masterflow 713” by Master Builder; “Five Star Grout” by U.S. Grout Corp.; or equal, and shall be troweled smooth so that no projections remain on the inside. There shall be concrete to concrete bearing between the various sections. The gasket shall not support the weight of the section.

2.05. PRECAST CONCRETE SLAB TOPS

A. Precast reinforced concrete slab tops shall be manufactured in accordance with ASTM C858. Openings and frames shall be provided for hatches where shown. Slab tops shall be set in a full bed of mortar.

B. Slab tops shall be crowned or sloped to drain, minimum 1/4 inch per foot.

C. Exposed concrete slab tops shall receive a non-slip broom finish per Section 03001.

2.06. PIPE SEALS

A. Where polyethylene, plastic or PVC pipe is utilized, connections between vault and pipes shall be made with flexible rubber sleeves with stainless steel straps and bolts. Provide an elastomeric waterstop gasket where sleeve sizes are not commercially available.

B. The annular space around the pipe wall or sleeve shall be packed with “Masterflow 713” by Master Builders, “Five Star Grout” by U.S. Grout Corp.; or equal. Before the grout has set, the Contractor shall recheck invert elevations of the pipe.

C. For steel or ductile iron pipe, provide a pipe sleeve sized to accept the pipe plus link seal.

2.07. HATCHES

A. Hatches shall be of the size and type shown on the Contract Drawings and as described herein.

1. Aluminum single leaf, watertight gasketed floor hatch. Floor hatch shall be furnished with flush stainless steel hinges, aluminum stiffeners, and lockable slam latch. Hatches shall have extended aluminum frame to match concrete thickness with continuous anchor and shall be constructed of 1/4 inch minimum aluminum diamond pattern plate design.

2. Hatches shall be provided with an auto-lock, hold-open device and torsion spring assembly. All hardware, including all parts of the latch and lifting mechanism assemblies, hold-open arms and guides, and all brackets, hinges, pins and fasteners shall be stainless steel or bronze.

3. The hatches shall be designed for an H-20 wheel load. A 1-inch drain coupling shall be provided in hatch frame. Contractor to extend drain to exterior of structure or to sump pit.

4. Aluminum hatch shall be Bilco “PCM” or as manufactured by Washington Aluminum Company or equal.

B. At all hatches, provide a hinged aluminum grate fall-through protection system.

2.08. LADDER

A. Where shown on Drawings, provide ladder rungs made of cast iron or polypropylene with steel reinforcement. Rungs shall be either cast in place or drilled and adhesive grouted in the shop. Rungs are equally spaced at a maximum 12-inch spacing from the top of the base slab to the top of the top slab.

B. Install ladder rungs so that the distance from the rungs to the finished wall is 7 inches.

C. Provide aluminum ladder safety post as manufactured by Bilco, U.S.F. Fabrications, or equal.

2.09. OPENINGS AND INSERTS

A. All openings required in the concrete shall be reinforced with additional diagonal bars tied to each layer of wall or slab reinforcement.

B. Any required inserts and wall openings shall be coordinated with mechanical requirements prior to casting the units.

2.10. WATERPROOFING

A. Around the exterior of all wall joints, apply the “Bituthene” primer and membrane waterproofing system by W.R. Grace Company, or equal.

B. Exterior wall surfaces shall be waterproofed using manufacturer's standard two-coat system, specifically designed to waterproof the exterior of concrete surfaces in a below-grade submerged condition.

C. For the top slab and above-grade exposed side walls, the concrete shall be sealed with two coats of a Type E finish per Section 03001.

PART 3 EXECUTION

3.01. EXAMINATION

A. Verify that subgrade elevations for vault base is correct, excavation is dewatered, and subgrade is precompacted.

B. Verify that rejected units have been removed from site.

3.02. PREPARATION

A. Provide foundation mat of run-of-crusher stone to support base. Mat shall be 6 inches minimum depth and shall bear on sound undisturbed earth; excavate and remove subgrade material as necessary to reach sound subgrade.

B. Stone subgrade mat shall be a minimum of 1 foot greater than the footprint of the vault base, and shall be compacted to a uniform, level surface.

3.03. INSTALLATION

A. Vault shall be accurately located and uniformly supported on the foundation mat in a level position.

B. Install wall sections in properly oriented position; follow manufacturer's instructions for joining together each section using the gaskets. Pack joints with grout.

C. Units shall be laid-up plumb and level.

D. The Contractor is responsible for the integrity of all materials and protection against flotation during the installation and backfilling process.

3.04. WATERPROOFING

A. All exterior below-grade wall joints shall be sealed using a membrane waterproofing system. Next, all below-grade wall surfaces shall be waterproofed, applied per manufacturer's instructions.

B. After installation is complete, the cover slab shall be sealed as specified above.

3.05. BACKFILLING

A. Backfill, being careful to provide full support under connecting pipes using compacted bedding material.

B. All visible leaks shall be sealed in an approved manner.

END OF SECTION

SUBSURFACE INVESTIGATION

FOR

WATER DISTRICT NO. 2 DISTRIBUTION SYSTEM REPLACEMENT
TOWN OF NORTH CASTLE, NEW YORK

GHD, CSI
One Remington Park Drive
Cazenovia, New York 13035

2014

SUBSURFACE INVESTIGATION

FOR

WATER DISTRICT NO. 2 DISTRIBUTION SYSTEM REPLACEMENT
TOWN OF NORTH CASTLE, NEW YORK

These documents are **NOT** part of the Contract Documents. GHD neither represents that the site conditions will be the same as in the attached documents, nor considers the attached documents as being comprehensive and actual description of the site conditions. The Contractor shall be responsible for performing the work required under this contract based on the existing conditions at the site.

GeoLogic NY, Inc.
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SUBSURFACE REPORT
WATER DISTRICT NO. 2
WATER DISTRIBUTION SYSTEM REPLACEMENT
NORTH CASTLE, NEW YORK

Prepared For:

GHD Consulting Engineers, LLC

Prepared By:

GeoLogic NY, Inc.

January 2014
Project No. 213119-D

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APPENDICES

GeoLogic
GeoLogic NY, Inc. P.O. Box 350 • 37 Copeland Ave. • Homer, NY 13077 • 607.749.5000 • Fax: 607.749.5063

SUBSURFACE REPORT
Water District No. 2
Water Distribution System Replacement
North Castle, New York

1. INTRODUCTION

This report is an instrument of service of GeoLogic NY, Inc. (GeoLogic). This report presents the results of subsurface drilling activities completed on January 23, 2014 for the Water District No. 2, North Castle, New York. The scope of services completed was mutually agreed upon by GeoLogic and GHD and was outlined in our Task Order of November 14, 2013. The services completed included providing personnel and equipment to advance soil borings and obtain soil samples.

1.1. Purpose

The purpose of the work was to evaluate soil, bedrock and groundwater conditions at various locations.

1.2 Scope of Services

The services provided by GeoLogic are outlined below:

Provided equipment and personnel to advance borings and collect soil and samples. The borings were logged and the soils and rock were visually classified;

Submitted the findings of the sampling in a report.

The site fieldwork was performed between January 21 and January 23, 2014.

2. METHODOLOGY

2.1 Methodology

Soil borings were advanced using 3 1/4 inch I.D. hollow stem augers and roller bit.

Representative samples of the overburden were obtained by driving a 2 inch O.D. split spoon sampler into the soil, through and beneath the augers, using a 140 pound hammer free-falling 30 inches (ASTM D 1586). Borings were backfilled upon completion.

Probe Rods were driven for P-1 – P-21 and P-X to predetermined depths of 6.0 feet.

3. FINDINGS

3.1. Site Specific Geologic and Hydrogeologic Conditions

The locations of the borings were selected by a representative of GHD Consulting Engineers. The borings were selected to evaluate subsurface conditions for the design of a water distribution system replacement.

The soils at the sites were variable; fill was encountered in B-1 and B-3 underlain by brown sand, silt, and gravel. B-2, B-5 and B-6 generally consisted of a brown sand, silt and gravel unit. Auger refusal was encountered in B-6 at a depth of 7.5 feet below ground surface. No soil samples were obtained for P-1 – P-21 and P-X. Refusal was encountered before the predetermined depth of 6.0 feet was reached at P-3, P-5, P-6 and P-12.

Upon completion, no groundwater was observed in borings B-1, B-3, B-5, and B-6. In boring B-2, with augers at 8.0 feet below ground surface, groundwater was encountered at a depth of 4.8 feet bgs.

The material descriptions and observations are presented on the attached Subsurface Logs.

4. CONCLUSIONS

GeoLogic has completed subsurface investigative work for the Water District No. 2, North Castle, New York. The conclusions reached in this report are based solely on the observations made and data collected during the course of the study. Should additional information pertaining to the site become available, GeoLogic should be afforded an opportunity to review the information and to make additional conclusions and recommendations as necessary.

The soils at the sites were variable; fill was encountered in B-1 and B-3 underlain by brown sand, silt, and gravel. B-2, B-5 and B-6 generally consisted of a brown sand, silt and gravel unit. Auger refusal was encountered in B-6 at a depth of 7.5 feet below ground surface. No soil samples were obtained for P-1 – P-21 and P-X. Refusal was encountered before the predetermined depth of 6.0 feet was reached at P-3, P-5, P-6 and P-12.

Upon completion, no groundwater was observed in borings B-1, B-3, B-5, and B-6. In boring B-2, with augers at 8.0 feet below ground surface, groundwater was encountered at a depth of 4.8 feet bgs.

The Subsurface Logs attached to this report present the observations and mechanical data collected at the site, supplemented by classification of material removed from the borings as determined through visual identification.

It is cautioned that the materials removed from the borings represent only a fraction of the total volume of the deposits at the site and may not necessarily be representative of the subsurface conditions between adjacent borings or between the sampled intervals.

The data presented on the Subsurface Logs together with the recovered samples will provide a basis for evaluating the character of the subsurface conditions relative to the project.

The evaluation must consider all the recorded details and their significance relative to each other. Often the analysis of probe hole data indicate the need for additional testing or sampling procedures to more adequately evaluate the subsurface conditions. Any evaluation of the contents of this report and the recovered samples must be performed by knowledgeable Professionals.

5. LIMITATIONS

In conducting and preparing this work, GeoLogic observed the ordinary standard of care normally exercised by other consultants at the same time and under similar conditions. No other warranty, expressed or implied is intended.

The conclusions reached in this report do not represent scientific certainties, but rather are probabilities based on our professional judgment. The conclusions made in this report are based solely on the scope of services described herein, and the information obtained during the course of the work.

The observations and data contained in this report are only indicative of the conditions at the date, time and location they were made. Environmental conditions are inherently transient; therefore, variation with time and location should be expected.

Respectfully Submitted,

GeoLogic NY, Inc.

Forrest Earl
President/Principal Hydrogeologist

FILE: 213119-D/REPORT/DRILLING REPORT

APPENDIX A

SUBSURFACE LOGS

GeoLogic NY, Inc.
P.O. Box 350
Homer, New York 13077
(607) 749-5000

KEY TO SUBSURFACE LOG

Boring No.: B-1
Project No.: 209001
Date Started: 1/31/10
Date Completed: 1/31/10

Sheet 1 of 1

Project:
Location:

Reference Elevation: 100.0

Depth (ft.)	Sample No.	Type	SPT Blows	N-Value	Recovery (ft.)	PID Reading (ppm)	MATERIAL DESCRIPTION	REMARKS
0							Ground Surface	Water level at 2.0'
								with augers at 7.5'.
1	1	ss	1 2 2 1	4	2.0	32	Brown SILT, Some fine-coarse Sand, trace clay, moist-loose	At completion water level at 2.2'
								with augers at 10.0'.
2	2						Gray SHALE, medium hard weathered, thin bedded, some fractures	Run #1: 3.0'-5.0' 95% Recovery, 50% RQD

1 2 3 4 5 6 7 8 9 10

TABLE I

Identification of soil type is made on basis of an estimate of particle sizes, and in the case of fine-grained soils also on basis of plasticity.

Soil Type		Soil Particle	
Boulder		> 12"	
Cobble		12" - 3"	
Gravel	- Coarse	3" - 3/4"	Coarse Grained
	- Fine	3/4" - #4	(Granular)
Sand	- Coarse	#4 - #10	
	- Medium	#10 - #40	
	- Fine	#40 - #200	
Silt-Non Plastic (Granular)		< #200	Fine Grained
Clay-Plastic (Cohesive)			

TABLE II

The following terms are used in classifying soils consisting of mixtures of two or more soil types. The estimate is based on weight of total sample.

Term	Percent of Total Sample
"and"	35 - 50
"some"	20 - 35
"little"	10 - 20
"trace"	1 - 10

(When sampling gravelly soils with a standard split spoon, the true percentage of gravel is often not recovered due to the relatively small sampler diameter.)

TABLE III

The relative compactness or consistency is described in accordance with the following terms.

Granular Soils		Cohesive Soils	
Term	**Blows per Foot, N**	**Term**	**Blows per Foot, N**
Loose	< 11	Very Soft	< 2
Firm	11 - 30	Soft	2 - 4
Compact	31 - 50	Medium	4 - 8
Very Compact	> 51	Stiff	8 - 15
		Very Stiff	15 - 30
		Hard	>30

(Large particles in the soils will often significantly influence the blows per foot recorded during the Penetration Test.)

TABLE IV

Stratified Soils	
Descriptive Term	**Thickness**
Parting	- 0" - 1/16"
Seam	- 1/16" - 1/2"
Layer	- 1/2" - 12"
Stratum	- >12"
Varved Clay	- Alternating seams or layers of sand, silt & clay
Pocket	- small, erratic deposit, usually <12"
Lens	- lenticular deposit
Occasional	- one or less per foot of thickness
Frequent	- more than one per foot of thickness

TABLE V

Rock Classification Terms		
Term		**Meaning**
Hardness	Soft	Scratched by fingernail
	Medium Hard	Scratched easily by penknife
	Hard	Scratched with difficulty by penknife
	Very Hard	Cannot be scratched by penknife
Weathering	Very Weathered	Judged from the relative amounts of disintegration,
	Weathered	iron staining, core recovery, clay seams, etc.
	Sound	
Bedding	Laminated	Natural breaks in Rock Layers <1"
	Thin bedded	1"-4"
	Bedded	4"-12"
	Thick bedded	12"-36"
	Massive	>36"
(Fracturing refers to natural breaks in the rock oriented at some angle to the rock layers.)		

GENERAL INFORMATION & KEY TO SUBSURFACE LOGS

The information presented in the following defines some of the procedures and terms used on the Subsurface Logs to describe the conditions encountered.

1. The figures in the Depth column define the scale of the Subsurface Log.
2. The Sample No. is used for identification on sample containers.
3. The sample column shows, graphically, the depth range from which a sample was recovered. (ss – split spoon; core – rock core; st – shelby tube; dp – direct push). If not shown as a separate column, the sample type should be referenced in the Remark column or in the footnote.
4. Blows on Sampler - shows the results of the "Penetration Test", recording the number of blows required to drive a split spoon sampler into the soil. The number of blows required for each six inches of penetration is recorded. The first 6 inches of penetration is considered to be a seating drive. The number of blows required for the second and third 6 inches of penetration is termed the penetration resistance, N. The outside diameter of the sampler, the hammer weight and the length of drop are noted at the bottom of the Subsurface Log.
5. Recovery shows the length of the recovered soil sample for the sample device noted.
6. All recovered soil samples are reviewed in the office by an experienced technical specialist or geologist, unless noted otherwise. The visual descriptions are made on the basis of a combination of the field descriptions and observations and the sample as received in the office. The method of visual classification is based primarily on the Unified Soil Classification (ASTM D 2487-83) with regard to the particle size and plasticity. (See Table I). Additionally, the relative portion, by weight, of two or more soil types is described for granular soils in accordance with "Suggested Methods of Test for Identification of Soils" by D.M. Burmister, ASTM Special Technical Publication 479, June 1970. (See Table II) The description of the relative soil density or consistency is based upon the penetration records as defined on Table No. III. The description of the soil moisture is based upon the relative wetness of the soil as recovered and is described as damp, moist, wet and saturated. Water introduced in the boring either naturally or during drilling may have affected the moisture condition of the recovered sample. Special terms are used as required to describe materials in greater detail; several such terms are listed in Table IV. When sampling gravelly soils with a standard two-inch diameter split spoon, the true percentage of gravel is often not recovered due to the relatively small sampler diameter. The presence of boulders and large gravel is sometimes, but not necessarily, detected by an evaluation of the casing/hollow stem augers and samplers blows or through the "action" of the drill rig.
7. The description of the rock shown is based on the recovered rock core and the field observations. The terms frequently used in the description are included in Table V.
8. The stratification lines represent the approximate boundary between soil types, and the actual transition may be gradual.
9. Miscellaneous observations and procedures noted in the field are shown in this column, including water level observations. It is important to realize the reliability of the water level observations depends upon the soil type (water does not readily stabilize in a hole through fine grained soils), and that drill water used to advance the boring may have influenced the observations. The groundwater level typically will fluctuate seasonally. One or more perched or trapped water levels may exist in the ground seasonally. All the available readings should be evaluated. If definite conclusions cannot be made, it is often prudent to examine the conditions more thoroughly through test pit excavations or monitoring wells.
10. The length of core run is defined as the length of penetration of the core barrel. Core recovery is the length of core recovered divided by the core run. The RQD (Rock Quality Designation) is the total pieces of NX core exceeding 4 inches in length divided by the core run. The size of the core barrel used is also noted at the bottom of the subsurface log.

The Subsurface Logs attached to this report present the observations and mechanical data collected at the site, supplemented by classification of material removed from the borings as determined through visual identification. It is cautioned that the materials removed from the borings represent only a fraction of the total volume of the deposits at the site and may not necessarily be representative of the subsurface conditions between adjacent borings or between the sampled intervals. The data presented on the Subsurface Logs together with the recovered samples will provide a basis for evaluating the character of the subsurface conditions relative to the project. The evaluation must consider all the recorded details and their significance relative to each other. Often analyses of boring data indicate the need for additional testing or sampling procedures to more accurately evaluate the subsurface conditions. Any evaluation of the contents of this report and the recovered samples must be performed by knowledgeable Professionals.

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SUBSURFACE LOG

Water District No. 2

41 Windmill Road

North Castle, New York

Boring No: : B-1
Project No.: : 213119-D
Date Started: : 01/23/14
Date Completed: : 01/23/14

Depth (ft)	Sample No.	Blow Count	N-Value	Recovery (ft)	DESCRIPTION	REMARKS
0	1	2 3 6 4	-	1.0	Topsoil 0.4' FILL: Brown fine-medium SAND, Some Silt, cobbles, moist	
2	2	4 4 6 3	10	1.0	similar	
4	3	9 6 4 4	10	1.0		
6	4	4 8 4 6	12	0.5		
8	5	7 11 10 10	21	1.0		
10	6	7 6 6 4	12	-		No free water observed. Backfilled with auger cuttings and crushed stone. Caved at 5.0'.
12					BORING TERMINATED AT 12.0'	
14						

Sampling Method: ASTM D-1586, unless otherwise noted.
Notes: 3 1/4" ID Hollow Stem Augers
Visually Classified by: Driller
File: 213119-D/tech/B-1

GeoLogic
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SUBSURFACE LOG

Water District No. 2
North Lane
North Castle, New York

Boring No: : B-2
Project No.: : 213119-D
Date Started: : 01/23/14
Date Completed: : 01/23/14

Depth (ft)	Sample No.	Blow Count	N-Value	Recovery (ft)	DESCRIPTION	REMARKS
0	1	1 1 4 8	5	1.0	Topsoil 0.3' Brown fine-medium SAND, little fine gravel, moist	
2	2	3 4 3 9	7	1.0	Black fine SAND, Some Silt, trace organics, moist	
4	3	3 3 5 6	8	1.4	Brown SILT, fine SAND, moist	
6	4	10 13 19 15	32	1.5	similar	
8	5	10 12 11 13	23	0.5	similar with Cobbles	With augers at 4.0', water first encountered at 5.0'. Upon completion, with augers at 8.0', water level at 4.8'.
10	6	12 14 15 10	29	1.5	Brown fine SAND and SILT with possible decomposed Rock fragments, wet	Backfilled with auger cuttings and crushed stone. Caved at 3.0', dry.
12					BORING TERMINATED AT 12.0'	
14						

Sampling Method: ASTM D-1586, unless otherwise noted.
Notes: 3 1/4" ID Hollow Stem Augers
Visually Classified by: Driller
File: 213119-D/tech/B-2

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607-749-5000 / 607-749-5063 (fax)

SUBSURFACE LOG

Water District No. 2
Windmill Road
North Castle, New York

Boring No: : B-3
Project No.: : 213119-D
Date Started: : 01/23/14
Date Completed: : 01/23/14

Depth (ft)	Sample No.	Blow Count	N-Value	Recovery (ft)	DESCRIPTION	REMARKS
0	1	1 2 3 3	5	1.5	Topsoil 0.4' FILL: Brown fine SAND, Some Silt and CLAY, little fine gravel, moist	
2	2	2 3 3 3	6	0.5	similar	
4	3	5 6 7 6	13	1.2	similar	
6	4	6 7 22 18	29	1.4	similar FILL: Brown fine-coarse SAND, SILT, COBBLES, damp	
8	5	6 8 10 10	18	-	FILL: Brown SILT and CLAY, Some fine Sand and Gravel, moist	
10	6	15 18 26 24	44	-		No free water observed. Backfilled with auger cuttings. Caved at 5.5'.
12					BORING TERMINATED AT 12.0'	
14						

Sampling Method: ASTM D-1586, unless otherwise noted.
Notes: 3 1/4" ID Hollow Stem Augers
Visually Classified by: Driller
File: 213119-D/tech/B-3

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SUBSURFACE LOG

Water District No. 2

North Castle, New York

Boring No: : B-4
Project No.: : 213119-D
Date Started: :
Date Completed: :

Depth (ft)	Sample No.	Blow Count	N-Value	Recovery (ft)	DESCRIPTION	REMARKS
0					**BORING DELETED AS PER GHD**	
2						
4						
6						
8						
10						

Sampling Method: ASTM D-1586, unless otherwise noted.
Notes: 3 1/4" ID Hollow Stem Augers
Visually Classified by: Driller
File: 213119-D/tech/B-4

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SUBSURFACE LOG

Water District No. 2
Thornwood Road
North Castle, New York

Boring No: : B-5
Project No.: : 213119-D
Date Started: : 01/23/14
Date Completed: : 01/23/14

Depth (ft)	Sample No.	Blow Count	N-Value	Recovery (ft)	DESCRIPTION	REMARKS
0	1	2 14 25 25	39	1.0	Topsoil 0.4' Brown fine-medium SAND, little silt, moist	
2	2	14 27 30 30	57	1.0	similar	
4	3	50/.0	-	-	Brown fine-medium SAND, little gravel, moist	
	CR1	-	-	-	Core Run #1, 4.5' - 5.5' 0.4' Recovery BOULDER	
6	4	5 6 6 7	12	1.5	Brown SILT, fine SAND, moist	
8	5	14 20 24 40	44	1.5	Brown fine-coarse SAND, SILT and COBBLES, damp	
10	6	12 14 16 16	30	-		No free water observed. Backfilled with auger cuttings.
12					BORING TERMINATED AT 12.0'	
14						

Sampling Method: ASTM D-1586, unless otherwise noted.
Notes: 3 1/4" ID Hollow Stem Augers/Roller Bit
Visually Classified by: Driller
File: 213119-D/tech/B-5

GeoLogic
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SUBSURFACE LOG

Water District No. 2

Upland Lane

North Castle, New York

Boring No: : B-6
Project No.: : 213119-D
Date Started: : 01/22/14
Date Completed: : 01/22/14

Depth (ft)	Sample No.	Blow Count	N-Value	Recovery (ft)	DESCRIPTION	REMARKS
0					Topsoil 0.3'	
	1	2 3 6 11	9	1.5	Brown fine-medium SAND, little silt, moist	
2					similar	
	2	9 4 4 4	8	1.4		
4					Brown fine-medium SAND, little gravel, moist	
	3	2 2 2 4	4	1.0		
6	4	50/.4	-	-		No free water observed. Backfilled with auger cuttings. Caved at 2.4'.
					AUGER REFUSAL AT 7.5'	
8						
10						

Sampling Method: ASTM D-1586, unless otherwise noted.
Notes: 3 1/4" ID Hollow Stem Augers
Visually Classified by: Driller
File: 213119-D/tech/B-6

GeoLogic
PO Box 350, Homer, NY 13077
607-749-5000 / 607-749-5063 (fax)

SUBSURFACE LOG - DIRECT PUSH

Water District No. 2

Evergreen Row

North Castle, New York

Boring No: : P-1
Project No.: : 213119-D
Date Started: : 01/22/14
Date Completed: : 01/22/14

Depth (ft)	Sample No.	N	DESCRIPTION	REMARKS
0			Drove Probe Rod	
	1	4	No Soil Sampling	
1				
	2	8		
2				
	3	32		
3				
	4	34		
4				
	5	13		
5				
	6	14		No free water observed.
6			BORING TERMINATED AT 6.0'	
7				
8				

Visually Classified by: N/A

File: 213119-D/tech/P-1

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SUBSURFACE LOG - DIRECT PUSH

Water District No. 2

Evergreen Row

North Castle, New York

Boring No: : P-2
Project No.: : 213119-D
Date Started: : 01/21/14
Date Completed: : 01/21/14

Depth (ft)	Sample No.	N	DESCRIPTION	REMARKS
0			Drove Probe Rod	
	1	3	No Soil Sampling	
1				
	2	7		
2				
	3	7		
3				
	4	8		
4				
	5	9		
5				
	6	25		No free water observed.
6			BORING TERMINATED AT 6.0'	
7				
8				

Visually Classified by: N/A

File: 213119-D/tech/P-2

GeoLogic
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SUBSURFACE LOG - DIRECT PUSH

Water District No. 2

46 Evergreen Row

North Castle, New York

Boring No: : P-3
Project No.: : 213119-D
Date Started: : 01/21/14
Date Completed: : 01/21/14

Depth (ft)	Sample No.	N	DESCRIPTION	REMARKS
0			Drove Probe Rod	
			No Soil Sampling	
	1	2		
1				
	2	7		
2				
	3	150/.5		
			PROBE REFUSAL AT 2.5'	No free water observed.
			AUGER REFUSAL AT 2.7'	
3				
4				

Visually Classified by: N/A

File: 213119-D/tech/P-3

GeoLogic
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607-749-5000 / 607-749-5063 (fax)

SUBSURFACE LOG - DIRECT PUSH

Water District No. 2

24 Fox Ridge Road

North Castle, New York

Boring No: : P-4
Project No.: : 213119-D
Date Started: : 01/21/14
Date Completed: : 01/21/14

Depth (ft)	Sample No.	N	DESCRIPTION	REMARKS
0	1	4	Drove Probe Rod No Soil Sampling	
1	2	16		
2	3	15		
3	4	9		
4	5	4		
5	6	4		No free water observed.
6			BORING TERMINATED AT 6.0'	
7				
8				

Visually Classified by: N/A

File: 213119-D/tech/P-4

GeoLogic
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SUBSURFACE LOG - DIRECT PUSH

Water District No. 2

Evergreen Row

North Castle, New York

Boring No: : P-5
Project No.: : 213119-D
Date Started: : 01/21/14
Date Completed: : 01/21/14

Depth (ft)	Sample No.	N	DESCRIPTION	REMARKS
0			Drove Probe Rod No Soil Sampling	
	1	5		
1				
	2	5		
2				
	3	100/.5		
			PROBE REFUSAL AT 2.5'	No free water observed.
			AUGER REFUSAL AT 2.6'	
3				
4				

Visually Classified by: N/A

File: 213119-D/tech/P-5

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SUBSURFACE LOG - DIRECT PUSH

Water District No. 2

43 North Lake Road

North Castle, New York

Boring No: : P-6
Project No.: : 213119-D
Date Started: : 01/21/14
Date Completed: : 01/21/14

Depth (ft)	Sample No.	N	DESCRIPTION	REMARKS
0	1	4	Drove Probe Rod No Soil Sampling	
1	2	75		
2	3	150/.5		
			PROBE REFUSAL AT 2.5' With augers down, SAND, GRAVEL, COBBLES, dense, dry	
3				
4				
5				No free water observed.
			AUGER REFUSAL AT 5.5'	
6				

Visually Classified by: N/A

File: 213119-D/tech/P-6

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SUBSURFACE LOG - DIRECT PUSH

Water District No. 2

2 Elm Place

North Castle, New York

Boring No: : P-7
Project No.: : 213119-D
Date Started: : 01/21/14
Date Completed: : 01/21/14

Depth (ft)	Sample No.	N	DESCRIPTION	REMARKS
0			Drove Probe Rod	
	1	4	No Soil Sampling	
1				
	2	4		
2				
	3	7		
3				
	4	21		
4				
	5	38		
5				
	6	74		No free water observed.
6			BORING TERMINATED AT 6.0'	
7				
8				

Visually Classified by: N/A

File: 213119-D/tech/P-7

GeoLogic
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SUBSURFACE LOG - DIRECT PUSH

Water District No. 2

13 Fox Ridge Road

North Castle, New York

Boring No: : P-8
Project No.: : 213119-D
Date Started: : 01/21/14
Date Completed: : 01/21/14

Depth (ft)	Sample No.	N	DESCRIPTION	REMARKS
0	1	3	Drove Probe Rod No Soil Sampling	
1	2	8		
2	3	16		
3	4	14		
4	5	17		
5	6	15		No free water observed.
6			BORING TERMINATED AT 6.0'	
7				
8				

Visually Classified by: N/A

File: 213119-D/tech/P-8

GeoLogic
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SUBSURFACE LOG - DIRECT PUSH

Water District No. 2

Thornwood Road

North Castle, New York

Boring No: : P-9
Project No.: : 213119-D
Date Started: : 01/21/14
Date Completed: : 01/21/14

Depth (ft)	Sample No.	N	DESCRIPTION	REMARKS
0	1	6	Drove Probe Rod No Soil Sampling	
1	2	7		
2	3	6		
3	4	6		
4	5	4		
5	6	2		No free water observed.
6			BORING TERMINATED AT 6.0'	
7				
8				

Visually Classified by: N/A

File: 213119-D/tech/P-9

GeoLogic
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SUBSURFACE LOG - DIRECT PUSH

Water District No. 2

32 Thornwood Road

North Castle, New York

Boring No: : P-10
Project No.: : 213119-D
Date Started: : 01/23/14
Date Completed: : 01/23/14

Depth (ft)	Sample No.	N	DESCRIPTION	REMARKS
0			Drove Probe Rod	
	1	9	No Soil Sampling	
1				
	2	15		
2				
	3	18		
3				
	4	17		
4				
	5	16		
5				
	6	14		No free water observed.
6			BORING TERMINATED AT 6.0'	
7				
8				

Visually Classified by: N/A

File: 213119-D/tech/P-10

GeoLogic
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607-749-5000 / 607-749-5063 (fax)

SUBSURFACE LOG - DIRECT PUSH

Water District No. 2

24 Windmill Place

North Castle, New York

Boring No: : P-11
Project No.: : 213119-D
Date Started: : 01/21/14
Date Completed: : 01/21/14

Depth (ft)	Sample No.	N	DESCRIPTION	REMARKS
0			Drove Probe Rod	
	1	3	No Soil Sampling	
1				
	2	8		
2				
	3	18		
3				
	4	27		
4				
	5	15		
5				
	6	50		No free water observed.
6			BORING TERMINATED AT 6.0'	
7				
8				

Visually Classified by: N/A

File: 213119-D/tech/P-11

GeoLogic
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SUBSURFACE LOG - DIRECT PUSH

Water District No. 2

Windmill Road

North Castle, New York

Boring No: : P-12
Project No.: : 213119-D
Date Started: : 01/22/14
Date Completed: : 01/22/14

Depth (ft)	Sample No.	N	DESCRIPTION	REMARKS
0			Drove Probe Rod	
			No Soil Sampling	
	1	2		
1				
	2	4		
2				
	3	7		
3				
	4	7		
4				
	5	9		No free water observed.
5	6	100/.1		
			PROBE REFUSAL AT 5.1'	
6				

Visually Classified by: N/A

File: 213119-D/tech/P-12

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SUBSURFACE LOG - DIRECT PUSH

Water District No. 2

Long Pond Road

North Castle, New York

Boring No: : P-13
Project No.: : 213119-D
Date Started: : 01/22/14
Date Completed: : 01/22/14

Depth (ft)	Sample No.	N	DESCRIPTION	REMARKS
0	1	6	Drove Probe Rod No Soil Sampling	
1	2	10		
2	3	8		
3	4	21		
4	5	24		
5	6	18		No free water observed.
6			BORING TERMINATED AT 6.0'	
7				
8				

Visually Classified by: N/A

File: 213119-D/tech/P-13

GeoLogic
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SUBSURFACE LOG - DIRECT PUSH

Water District No. 2

Valley Lane

North Castle, New York

Boring No: : P-14
Project No.: : 213119-D
Date Started: : 01/22/14
Date Completed: : 01/22/14

Depth (ft)	Sample No.	N	DESCRIPTION	REMARKS
0			Drove Probe Rod	
	1	3	No Soil Sampling	
1				
	2	4		
2				
	3	4		
3				
	4	5		
4				
	5	5		
5				
	6	12		No free water observed.
6			BORING TERMINATED AT 6.0'	
7				
8				

Visually Classified by: N/A

File: 213119-D/tech/P-14

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SUBSURFACE LOG - DIRECT PUSH

Water District No. 2

Valley Lane

North Castle, New York

Boring No: : P-15
Project No.: : 213119-D
Date Started: : 01/22/14
Date Completed: : 01/22/14

Depth (ft)	Sample No.	N	DESCRIPTION	REMARKS
0			Drove Probe Rod	
	1	4	No Soil Sampling	
1				
	2	8		
2				
	3	40		
3				
	4	22		
4				
	5	20		
5				
	6	24		No free water observed.
6			BORING TERMINATED AT 6.0'	
7				
8				

Visually Classified by: N/A

File: 213119-D/tech/P-15

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SUBSURFACE LOG - DIRECT PUSH

Water District No. 2

Long Pond Road

North Castle, New York

Boring No: : P-16
Project No.: : 213119-D
Date Started: : 01/22/14
Date Completed: : 01/22/14

Depth (ft)	Sample No.	N	DESCRIPTION	REMARKS
0			Drove Probe Rod	
	1	4	No Soil Sampling	
1				
	2	4		
2				
	3	5		
3				
	4	8		
4				
	5	9		
5				
	6	12		No free water observed.
6			BORING TERMINATED AT 6.0'	
7				
8				

Visually Classified by: N/A

File: 213119-D/tech/P-16

GeoLogic
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SUBSURFACE LOG - DIRECT PUSH

Water District No. 2

2 Spruce Hill Road

North Castle, New York

Boring No: : P-17
Project No.: : 213119-D
Date Started: : 01/22/14
Date Completed: : 01/22/14

Depth (ft)	Sample No.	N	DESCRIPTION	REMARKS
0	1	3	Drove Probe Rod No Soil Sampling	
1	2	1		
2	3	4		
3	4	15		
4	5	24		
5	6	35		No free water observed.
6			BORING TERMINATED AT 6.0'	
7				
8				

Visually Classified by: N/A

File: 213119-D/tech/P-17

GeoLogic
PO Box 350, Homer, NY 13077
607-749-5000 / 607-749-5063 (fax)

SUBSURFACE LOG - DIRECT PUSH

Water District No. 2

3 Windmill Road

North Castle, New York

Boring No: : P-18
Project No.: : 213119-D
Date Started: : 01/22/14
Date Completed: : 01/22/14

Depth (ft)	Sample No.	N	DESCRIPTION	REMARKS
0			Drove Probe Rod	
	1	4	No Soil Sampling	
1				
	2	12		
2				
	3	19		
3				
	4	12		
4				
	5	14		
5				
	6	14		No free water observed.
6			BORING TERMINATED AT 6.0'	
7				
8				

Visually Classified by: N/A

File: 213119-D/tech/P-18

GeoLogic
PO Box 350, Homer, NY 13077
607-749-5000 / 607-749-5063 (fax)

SUBSURFACE LOG - DIRECT PUSH

Water District No. 2

19 Windmill Road

North Castle, New York

Boring No: : P-19
Project No.: : 213119-D
Date Started: : 01/22/14
Date Completed: : 01/22/14

Depth (ft)	Sample No.	N	DESCRIPTION	REMARKS
0			Drove Probe Rod	
	1	4	No Soil Sampling	
1				
	2	25		
2				
	3	34		
3				
	4	17		
4				
	5	14		
5				
	6	10		No free water observed.
6			BORING TERMINATED AT 6.0'	
7				
8				

Visually Classified by: N/A

File: 213119-D/tech/P-19

GeoLogic
PO Box 350, Homer, NY 13077
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SUBSURFACE LOG - DIRECT PUSH

Water District No. 2

1 Mill Lane

North Castle, New York

Boring No: : P-20
Project No.: : 213119-D
Date Started: : 01/22/14
Date Completed: : 01/22/14

Depth (ft)	Sample No.	N	DESCRIPTION	REMARKS
0			Drove Probe Rod	
	1	3	No Soil Sampling	
1				
	2	8		
2				
	3	10		
3				
	4	15		
4				
	5	4		
5				
	6	4		No free water observed.
6			BORING TERMINATED AT 6.0'	
7				
8				

Visually Classified by: N/A

File: 213119-D/tech/P-20

GeoLogic
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SUBSURFACE LOG - DIRECT PUSH

Water District No. 2

Windmill Road

North Castle, New York

Boring No: : P-21
Project No.: : 213119-D
Date Started: : 01/21/14
Date Completed: : 01/21/14

Depth (ft)	Sample No.	N	DESCRIPTION	REMARKS
0			Drove Probe Rod	
	1	9	No Soil Sampling	
1				
	2	23		
2				
	3	7		
3				
	4	9		
4				
	5	27		
5				
	6	11		No free water observed.
6			BORING TERMINATED AT 6.0'	
7				
8				

Visually Classified by: N/A

File: 213119-D/tech/P-21

GeoLogic
PO Box 350, Homer, NY 13077
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SUBSURFACE LOG - DIRECT PUSH

Water District No. 2

40 Windmill Road

North Castle, New York

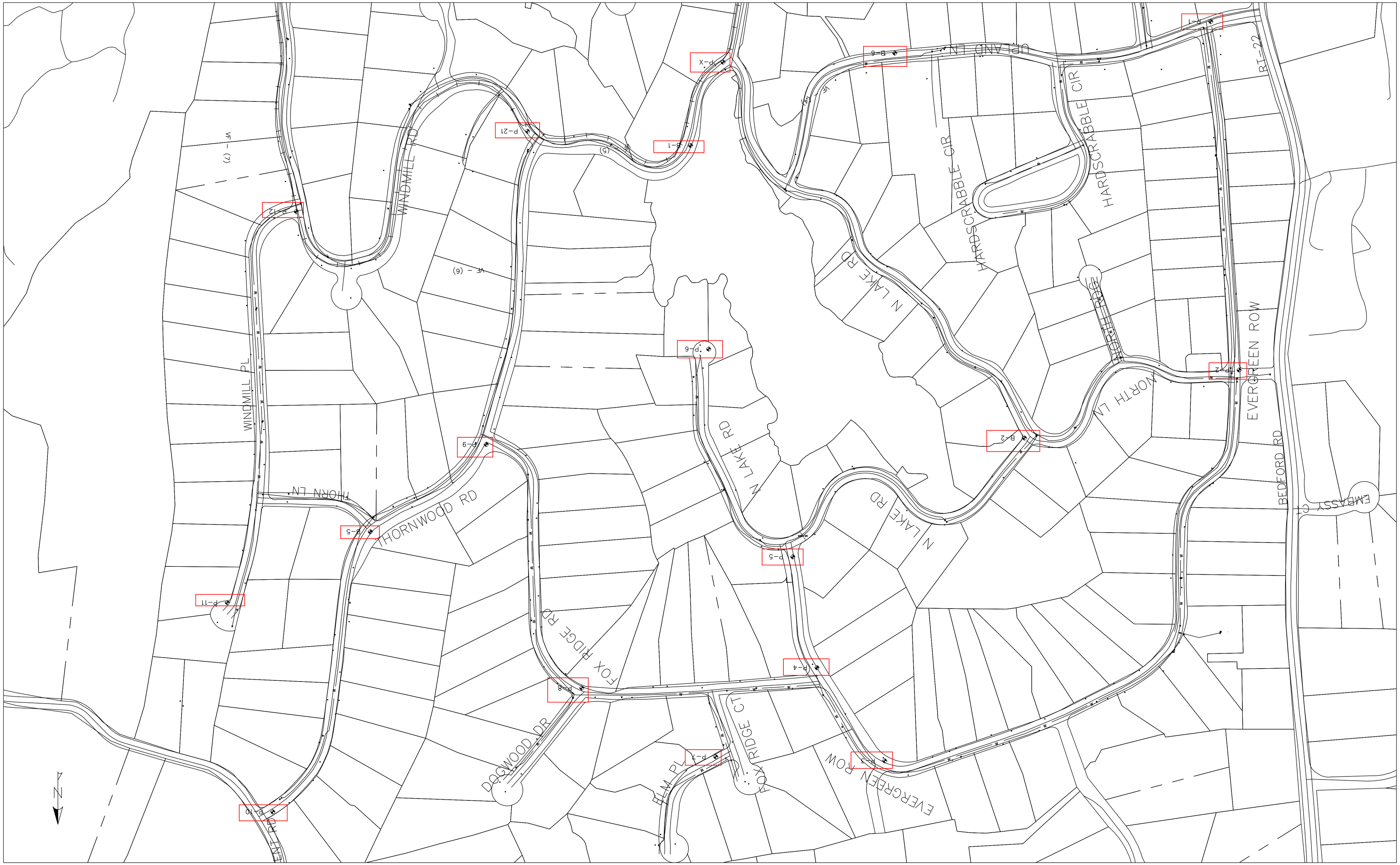
Boring No: : P-X
Project No.: : 213119-D
Date Started: : 01/22/14
Date Completed: : 01/22/14

Depth (ft)	Sample No.	N	DESCRIPTION	REMARKS
0	1	6	Drove Probe Rod No Soil Sampling	
1	2	16		
2	3	22		
3	4	25		
4	5	16		
5	6	14		No free water observed.
6			BORING TERMINATED AT 6.0'	
7				
8				

Visually Classified by: N/A

File: 213119-D/tech/P-X

APPENDIX B
BORING LOCATION PLANS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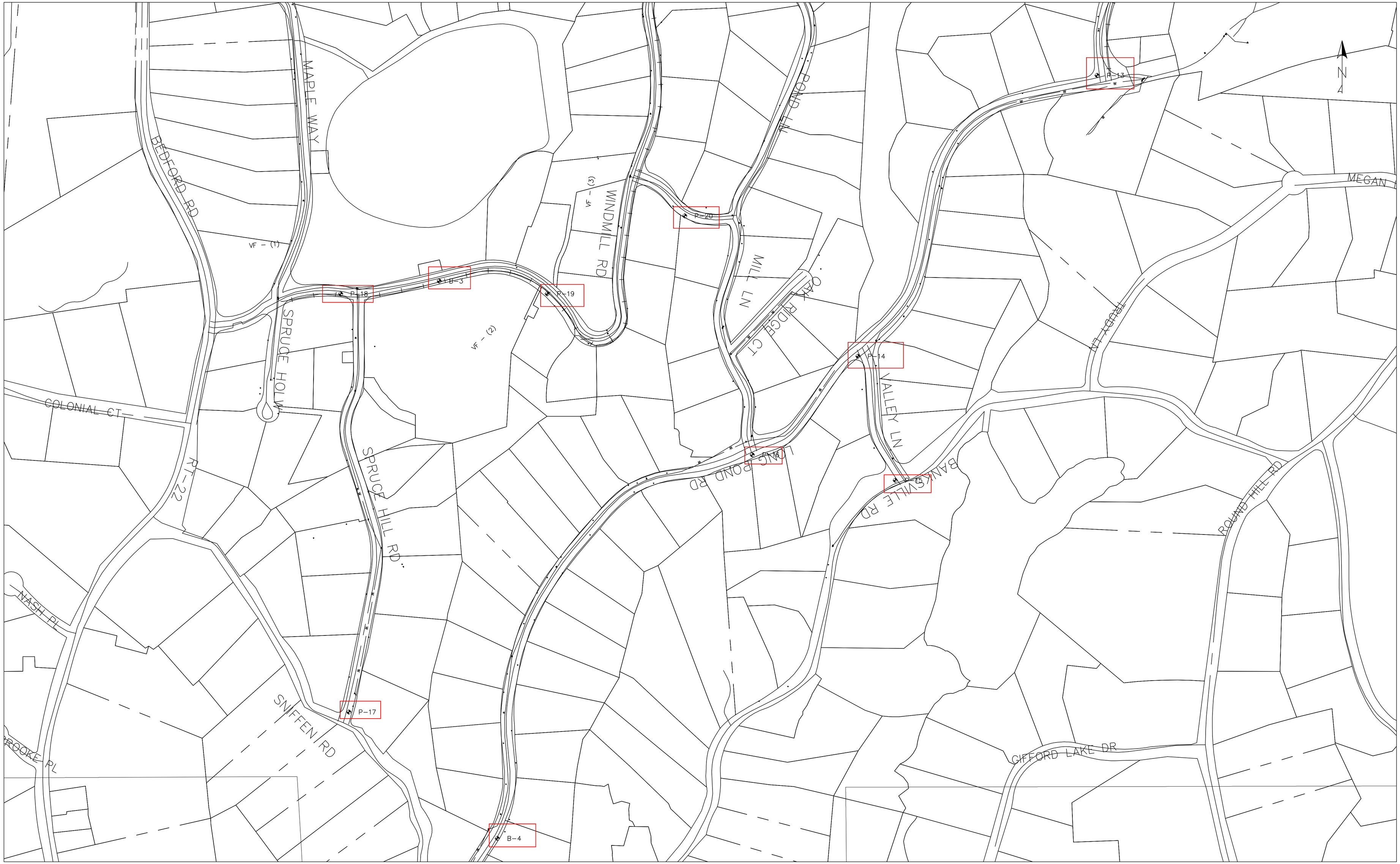
WINDMILL PL
THORN LN
THORNWOOD RD
FOX RIDGE RD
DOGWOOD DR
ELM PL
FOX RIDGE CT
N LAKE RD
N LAKE RD
N LAKE RD
HARDSCRABBLE CIR
HARDSCRABBLE CIR
UPLAND LN
NORTH LN
EVERGREEN ROW
EVERGREEN ROW
BEDFORD RD
EMBASSY CT
RT-22
VF - (7)
VF - (6)
(5)
P-21
P-X
P-1
B-6
B-7
B-12
P-6
B-9
B-5
P-11
P-5
B-2
P-4
P-8
P-X
P-3
B-10
N


MAPLE WAY
BEDFORD RD
VF - (1)
P-18
B-3
P-19
VF - (2)
VF - (3)
WINDMILL RD
P-20
MILL LN
OAK RIDGE CT
POND HILL RD
P-13
N
MEGAN
P-14
VALLEY LN
BANGSVILLE RD
LONG POND RD
P-16
ROUND HILL RD
SPRUCE HOLLOW
SPRUCE HILL RD
COLONIAL CT
RT-22
NASH PL
SNIFFEN RD
P-17
BROOKE PL
B-4
GIFFORD LAKE DR