7) Main Plant Sewer
Decommissioning Project
Remedial Plan, Volume III
Appendix D
Construction Specifications,
MPI, 9-1993

FILE COPY

PREPARED FOR

COLUMBIA MILLS, INC.
MINETTO, NEW YORK

APPENDIX D
CONSTRUCTION SPECIFICATIONS

VOLUME IV

MAIN PLANT SEWER DECOMMISSIONING PROJECT REMEDIAL PLAN

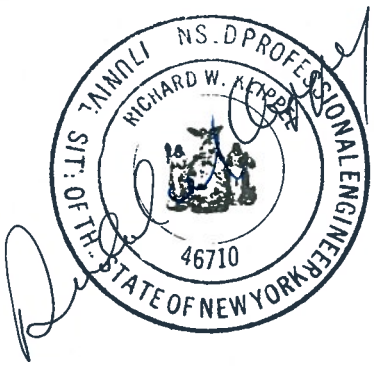
MALCOLM PIRNIE

JULY 1993
REVISED SEPTEMBER 1993

THE COLUMBIA MILLS, INC.
MINETTO, NEW YORK

SEWER DECOMMISSIONING PROJECT

NOTICE TO BIDDERS
INSTRUCTIONS TO BIDDERS
BID FORM
FORMS TO ACCOMPANY BID
AGREEMENT
GENERAL CONDITIONS
SUPPLEMENTARY CONDITIONS
SPECIFICATIONS



MALCOLM PIRNIE, INC.

7481 Henry Clay Boulevard
Liverpool, New York 13088

2 Corporate Park Drive
White Plains, New York 10602

1069-080

TABLE OF CONTENTS

TABLE OF CONTENTS
(Continued)

THE COLUMBIA MILLS, INC.
MINETTO, NEW YORK

SEWER REMEDIATION PROJECT

NOTICE TO BIDDERS

Sealed bids for the decommissioning of the Main Plant Area Sewer System at the Columbia mills site will be received at the office of Malcolm Pirnie, Inc., 7481 Henry Clay Boulevard, Liverpool, New York until 4:00 P.M. local time on October 13, 1993.

The project consists of the construction of a new gravity sewer bypass line, the removal of an existing sewer line, the cleaning and plugging of four sewer lines and the removal of two small septic tanks, the dredging of Benson Creek and the hauling of stockpiled soil. Bids shall be on a lump sum and unit price basis for this single contract. Contract Documents may be examined at the office of Malcolm Pirnie, Inc. 7481 Henry Clay Boulevard, Liverpool, New York 13088. Copies may be obtained from the office of the Engineer upon deposit of $20.00 for each set.

Neither the Owner nor the Engineer will be responsible for full or partial sets of Contract Documents, including any addenda, obtained from other sources. Bidders who return full sets of documents in good conditions within 30 days after receipt of bids will receive a full refund. Non-bidders, and bidders who obtain more than one set of documents, will receive a refund of $10.00 for the documents returned in good condition with the time limit stated above. Checks for documents shall be made payable to Malcolm Pirnie, Inc.

A mandatory prebid meeting will be held for all purposes at 10 AM on September 28, 1993 at the Route 48 Gate of the Columbia Mills plant in Minetto, NY.

Bid security shall be provided in accordance with Article 8 of the Instructions to Bidders.

Bidders shall provide proof of qualifications to perform the Work as described in Article 5 of the Instructions to Bidders.

Contract time of commencement and completion will be in accordance with Paragraph 5 of the Agreement.

The Columbia Mills, Inc.
by John Metz
Treasurer
Date: _____

Consulting Engineers:
Malcolm Pirnie, Inc.
7481 Henry Clay Blvd.
Liverpool, NY 13088
Phone: 315-457-4105
Contact: Steve Darcangelo

THE COLUMBIA MILLS, INC.
MINETTO, NEW YORK

SEWER REMEDIATION PROJECT

INSTRUCTIONS TO BIDDERS

TABLE OF ARTICLES

ARTICLE 1 - DEFINED TERMS

1.1 Terms used in these Instructions to Bidders, which are defined in the General and Supplementary Conditions, have the meanings assigned to them in the General and Supplementary Conditions. The term "Successful Bidder" means the Bidder to whom OWNER (on the basis of OWNER'S evaluation as hereinafter provided) makes an award.

ARTICLE 2 - BIDS RECEIVED

2.1 Refer to Notice to Bidders for information on receipt of Bids.

ARTICLE 3 - LOCATION AND DESCRIPTION OF PROJECT

3.1 Refer to Section 1A1 of the General Requirements for the location and description of the Project.

ARTICLE 4 - COPIES OF BIDDING DOCUMENTS

4.1 Refer to Notice to Bidders for information on examination and procurement of documents.

4.2 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.

4.3 OWNER and ENGINEER in making copies of Bidding Documents available on the above terms do so only for the purpose of obtaining Bids on the Work and do not confer a license or grant for any other use.

ARTICLE 5 - QUALIFICATIONS OF BIDDERS

5.1 Bidders shall have a minimum of 2 years experience in the kind of Work to be performed, shall have the necessary equipment therefor, and shall possess sufficient capital to properly execute the Work within the time allowed. Bids received from Bidders who have previously failed to complete work within the time required, or who have previously performed similar work in an unsatisfactory manner, may be rejected. A Bid may be rejected if Bidder cannot show that he has the necessary ability, plant and equipment to commence the Work at the time prescribed and thereafter to prosecute and complete the Work at the rate or within the time specified. A Bid may be rejected if Bidder is already obligated for the performance of other work which would delay the commencement, prosecution or completion of the Work.

5.2 As evidence of Bidder's qualifications to perform the Work, Bidder shall complete and submit with his Bid the Bidder's Qualification Statement which is bound in the Project Manual. Low Bidders may be asked to furnish additional data to demonstrate competency.

5.3 Each Bid must contain evidence of Bidder's qualification to do business in the state where the Project is located or covenant to obtain such qualification prior to execution of Agreement.

ARTICLE 6 - EXAMINATION OF CONTRACT DOCUMENTS AND SITE

6.1 Before submitting a Bid, each Bidder shall (a) examine the Contract Documents thoroughly, (b) visit the site to familiarize itself with local conditions that may in any manner affect cost, progress or performance of the Work, (c) familiarize himself with federal, state and local laws, ordinances, rules and regulations that may in any manner affect cost, progress or performance of the Work; and (d) study and carefully correlate Bidder's observations with the Contract Documents. Before submitting a Bid, Bidder will, at its own expense, make such investigations and tests as the Bidder may deem necessary to determine its Bid for performing and furnishing the Work in accordance with the Contract Documents.

6.2 Reference is made to the Supplementary Conditions for the identification of those reports of investigations and tests of subsurface and latent physical conditions at the site or those reports that otherwise may affect cost, progress or performance of the Work which have been utilized by ENGINEER in preparation of the Drawings and Specifications. OWNER will make copies of such reports available at the cost (non-refundable) of reproduction to any Bidder requesting them. These reports are not intended to constitute any explicit or implicit representation as to the nature of the subsurface and latent physical conditions which may be encountered at the site or to constitute explicit or implicit representations as to any other matter contained in any report. Such reports are not guaranteed as to accuracy or completeness and are not part of the Contract Documents.

6.3 On request, OWNER will conduct a site visit during OWNER'S normal business hours.

6.4 On request, OWNER will provide each Bidder access to the site to conduct such investigations and tests as each Bidder deems necessary for submission of his Bid.

6.5 The lands upon which the Work is to be performed, rights-of-way for access thereto and other lands designated for use by CONTRACTOR in performing the Work are identified in the Supplementary Conditions, General Requirements or Drawings.

6.6 The submission of a Bid will constitute an incontrovertible representation by the Bidder that he has complied with every requirement of this Article 6 and that the Contract Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performance of the Work.

ARTICLE 7 - INTERPRETATIONS AND ADDENDA

7.1 All questions about the meaning or intent of the Bidding Documents or the Contract Documents shall be submitted to ENGINEER in writing. In order to receive consideration, questions must be received by ENGINEER at least ten days prior to the date fixed for the opening of Bids. Any interpretations of questions so raised, which in the opinion of ENGINEER require interpretations, will be issued by Addenda mailed or delivered to all parties recorded by ENGINEER as having received the Bidding and Contract Documents for receipt not later than three days prior to the date fixed for the opening of Bids. The ENGINEER and OWNER will not be responsible for oral interpretations or clarifications which anyone presumes to make on their behalf.

7.2 OWNER may issue such additional Addenda as may be necessary to clarify, correct or change the Bidding Documents or the Contract Documents. Such Addenda, if any, will be issued in the manner and within the time period stated in Paragraph 7.1.

ARTICLE 8 - BID SECURITY

8.1 A Bid must be accompanied by a Certified Check or Bid Bond in the amount of 5% of the Bidder's maximum Bid price, satisfactory to and payable to the order of the OWNER.

8.2 Bid Bond shall be on the form bound in the project manual. Bid Bond shall be issued by a surety meeting the requirements of Paragraph 5.1 of the General Conditions.

8.3 The Bid security of the Successful Bidder will be retained until such Bidder has executed the Agreement and furnished the required contract securities, whereupon the Bid security will be returned. If the Successful Bidder fails to execute and deliver the Agreement and furnish the required contract security within 10 days of the Notice of Award, OWNER may annul the Notice of Award "and may retain from the Bid security an amount equal to the damages which OWNER may suffer by reason of such failure. Such amount not to exceed the Bid security amount".

8.4 The Bid security of any bidder whom OWNER believes to have a reasonable chance of receiving the award may be retained by OWNER until the earlier of the seventh day after the execution of the Agreement by the Successful Bidder or the sixtieth day after the Bid opening. The Bid security of other Bidders will be returned within seven days of the Bid opening.

ARTICLE 9 - CONTRACT TIME

9.1 The dates by which the Work is to be substantially completed and completed (the Contract Time) are set forth in the Agreement.

ARTICLE 10 - LIQUIDATED DAMAGES

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

ARTICLE 11 - SUBSTITUTE MATERIAL AND EQUIPMENT

11.1 Whenever it is indicated in the Drawings or specified in the Specifications 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. The procedure for submittal of any such application by CONTRACTOR and consideration by ENGINEER is set forth in Paragraph 6.3 of the General Conditions which may be supplemented in the General Requirements.

11.2 Refer to Section 1H2 of the General Requirements for the period of time after the Effective Date of the Agreement during which the ENGINEER will accept applications for substitute or "or-equal" items of material or equipment.

ARTICLE 12 - SUBCONTRACTORS AND OTHERS

12.1 All proposed subcontractors for this contract shall be identified to the owner as apart of the bid.

ARTICLE 13 - BASIS FOR BIDS

13.1 Where the Bid Form contains items that require alternative bids for materials, equipment or systems, the Bidder shall total his Bid using the lowest priced bid for a named alternative under each item. The total thus computed is for convenience only and is not to be considered a part of the Bid.

ARTICLE 14 - PREPARATION OF BID

14.1 A Bid must be made on the Bid Form bound in the Project Manual. The Bid Form shall not be separated from the Project Manual nor shall it be altered in any way.

14.2 The Bid Form must be completed in ink. Blank spaces in the Bid Form must be filled in correctly where indicated, and the Bidder must state, both in words and numerals, the prices for which he proposes to do each and every item of Work. Ditto marks shall not be used.

14.3 A Bidder shall execute his Bid as stated below.

A. A Bid by an individual shall show his name and official address.

B. A Bid by a partnership must be executed in the partnership name and signed by a partner. His title must appear under his signature and the official address of the partnership shall be shown.

C. A Bid by a corporation must be executed in the corporate name by an officer of the corporation and must be accompanied by a certified copy of a resolution of the board of directors authorizing the person signing the Bid to do so on behalf of the corporation. The corporate seal shall be affixed and attested by the secretary. The state of incorporation and the official corporate address shall be shown.

D. All names must be printed below the signature.

14.4 The Bid shall contain an acknowledgement of the receipt of all Addenda in the space provided on the Bid Form.

14.5 The address to which communications regarding the Bid are to be directed shall be shown.

14.6 In addition to the Bid Form, the following listed documents, which are bound in the Project Manual, shall be executed in the manner described in Paragraph 14.4 unless another manner is indicated.

A. Bid Security

B. Bidder's Qualification Statement.

C. Non-collusive Bidding Certification.

ARTICLE 15 - SUBMISSION OF BID

15.1 Bids shall be submitted at the time and place indicated in the Notice to Bidders.

15.2 The Bid shall be enclosed in an opague sealed envelope plainly marked on the outside with the name of the Bidder, his address, his license or registration number if applicable, the name of the Project, and the contract name or number. Bid shall be submitted with bid security and other required documents.

15.3 If the Bid is sent through the mail or other delivery system, the sealed envelope containing the Bid shall be enclosed in another envelope plainly marked on the outside with the notation "Bid Enclosed - DO NOT OPEN". Mailed Bids shall be addressed to: Malcolm Pirnie, Inc., 7481 Henry Clay Boulevard, Liverpool, New York 13088; Attention: Stephen Darcangelo.

ARTICLE 16 - MODIFICATION OR WITHDRAWAL OF BID

16.1 Withdrawal Prior to Bid Opening:

A. A Bidder may withdraw his Bid before the time fixed for the opening of Bids by communicating his purpose in writing to the OWNER. Upon receipt of such written notice, the unopened Bid will be returned to the Bidder.

16.2 Modification Prior to Bid Opening:

A. If a Bidder wishes to modify his Bid, he must withdraw his initial Bid in the manner specified in Paragraph 16.1.A and submit a new Bid.

ARTICLE 17 - OPENING OF BIDS

17.1 Bids will be opened as indicated in the Notice to Bidders.

17.2 Bids received by mail or otherwise after the time specified for the opening of Bids will not be accepted and will be returned to the Bidder unopened.

ARTICLE 18 - DISQUALIFICATION OF BIDDERS

18.1 More than one Bid for the same Work from an individual, or a firm, partnership, corporation or an association under the same or different names will not be considered. Reasonable grounds for believing that any Bidder is interested 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 is interested.

ARTICLE 19 - BIDS TO REMAIN OPEN

19.1 All Bids shall remain subject to acceptance for sixty days after the day of the Bid opening, but OWNER may, in its sole discretion, release any Bid and return the Bid security prior to that date.

ARTICLE 20 - AWARD OF CONTRACT

20.1 OWNER reserves the right to reject any or all Bids, to waive any and all informalities not involving price, time or changes in the Work "to negotiate contract terms with Successful Bidder," and the right to reject all nonconforming, nonresponsive or conditional bids.

20.2 OWNER reserves the right to reject any Bid not accompanied by specified documentation and bid security.

20.3 OWNER reserves the right to reject any Bid if it shows any omissions, alterations of form, additions not called for, conditions or qualifications, or irregularities of any kind.

20.4 OWNER reserves the right to reject any Bid that, in his sole discretion, is considered to be unbalanced or unreasonable as to the amount bid for any lump sum or unit price item.

20.5 In evaluating Bids, discrepancies between words and figures will be resolved in favor of words. Discrepancies in 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.

20.6 In evaluating Bids, OWNER will consider the qualifications of Bidders; whether or not the Bids comply with the prescribed requirements; the alternatives, if any; and the lump sum and unit prices, if requested in the Bid Form. It is OWNER'S intent to evaluate each alternative bid in accordance with the methods and criteria set forth in the Specifications. The bid award will be determined on the basis of the selection by the OWNER of the alternative(s) deemed to be in OWNER'S best interest.

20.7 OWNER may conduct such investigation as he deems necessary to assist in the evaluation of any Bid and to establish the responsibility, qualifications and financial ability of the Bidders proposed Subcontractors and other persons and organizations to do the Work in accordance with the Contract Documents. OWNER reserves the right to reject the Bid of any Bidder who does not pass any such evaluation to OWNER'S satisfaction.

20.8 OWNER reserves the right to accept any Bid deemed to be in the best interests of the Project even though the Bid chosen may result in the Award of the Contract to a Bidder whose Bid is not, on a mathematical basis alone, the low Bid.

ARTICLE 21 - CONTRACT SECURITIES

21.1 Performance Bond shall be in the form of Engineers Joint Contract Documents Committee (EJCDC) "Construction Performance Bond", 1910-28A. Payment Bond shall be in the form of EJCDC "Construction Payment Bond", 1910-28B. The amounts of and other requirements for Performance and Payment Bonds are stated in Paragraph 5.1 of the General Conditions. The requirements for delivery of Bonds are stated in Paragraph 2.1 of the General Conditions. Additional requirements may be stated in the Supplementary Conditions.

21.2 The Successful Bidder shall within five days from the date of the Notice of Award deliver to OWNER, for his review and approval, the Performance Bond and the Payment Bond he proposes to furnish at the time of the execution of the Agreement.

ARTICLE 22 - CONTRACTOR'S INSURANCE

22.1 The requirements for CONTRACTOR'S insurance are stated in Article 5 of the General Conditions and in the Supplementary Conditions. The requirements for delivery of certificates of insurance are stated in Paragraph 2.1 of the General Conditions.

22.2 The Successful Bidder shall within five days from the date of the Notice of Award deliver to OWNER, for his review and approval, the required policies of insurance. Upon approval, the policies will be returned to the Bidder and he shall submit certificates of insurance to the OWNER as stated in the General Conditions.

ARTICLE 23 - EXECUTION OF AGREEMENT

23.1 The Successful Bidder, or his authorized representative, will be required to execute the Agreement within ten days from the date of the Notice of Award.

23.2 The OWNER will prepare the documents, and will identify, in the Notice of Award, the location at which the documents will be executed.

ARTICLE 24 - NOTICE TO PROCEED

24.1 Issuance of the Notice to Proceed shall be as stated in Article 2 of the General Conditions.

ARTICLE 25 - SPECIAL REQUIREMENTS

25.1 NON-COLLUSIVE BIDDING CERTIFICATION:

A. Each Bidder shall certify to non-collusion in Bids on the "Non-Collusive Bidding Certification" provided herein. The form of certification is included as part of the Bid Form.

25.2 SPECIAL NOTICE:

A. The information and requirements included as Instructions to Bidders are neither inclusive nor exclusive and the Bidder or Contractor shall make no claim for lack of notice because information or requirements are stated elsewhere in the Contract Documents, but are not repeated herein.

B. The construction of this Project, including the letting of Contracts in connection therewith, shall conform to all applicable requirements of Federal, State and Local laws, ordinances, rules and regulations.

C. Refer to Supplementary Conditions for further Special Requirements.

25.3 PREBID CONFERENCE:

Date: September 28, 1993
Time: 10 AM
Location: The Columbia Mills, Inc.
Route 48
Minetto, New York 13115

(This Bid Form shall not be detached from the Project Manual. The entire Manual shall be returned with the executed Bid.)

BID FORM

BID FOR:

The Columbia Mills, Inc.
Sewer Decommissioning Project

BID TO:

Malcolm Pirnie, Inc.
7481 Henry Clay Boulevard
Liverpool, New York 13088
Attn: Stephen J. Darcangelo

BID FROM: _____
(Print or Type Name of Bidder)
(/A Corporation/A Partnership/An Individual/A Joint Venture/
[Bidder to strike out inapplicable terms.])

Gentlemen:

The undersigned Bidder offers and agrees, if this Bid is accepted, to enter into an Agreement with OWNER in the form included in the Contract Documents to complete all Work as specified or indicated in the Contract Documents for the Contract Price and within the Contract Time indicated in this Bid and in accordance with the Contract Documents.

Bidder declares that no person or persons other than those named herein are interested in this Bid; that this Bid is made without collusion with any other person, firm or corporation; and that no person or persons acting in any official capacity for the OWNER are directly or indirectly interested in this Bid, or in any portion of the profit thereof.

In submitting this Bid, Bidder represents, as more fully set forth in the Agreement, that he has examined the Instructions to Bidders, all of the other Bidding Documents and all of the Contract Documents; that he has examined the actual site and locality where the Work is to be performed; that he has familiarized himself with the legal requirements (federal, state and local laws, ordinances, rules and regulations); that he has made such independent investigations as he deems necessary; and that he has satisfied himself as to all

conditions affecting cost, progress or performance of the Work.

Bidder further agrees as follows: 1) that this Bid shall remain open and may not be withdrawn for the time period set forth in the Instructions to Bidders; 2) that he accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of his bid security; 3) and that, upon acceptance of this Bid, he will execute the Agreement and will furnish the required contract security and insurance certificates within the time period(s) set forth in the Instructions to Bidders.

In accordance with the above understandings and agreements, Bidder will complete the Work for the following unit prices:

(Amounts to be shown in both words and numerals. In case of discrepancy, amounts in words will govern.)

Description	Estimated Quantities	Computed Totals
ITEM 1. For Mobilization and Demobilization, the lump sum price of _____ Dollars and _____ Cents ($)	1 LS	$_____
ITEM 2. For Installation of a new 18" Diameter Sewer Line, the lump sum price of _____ Dollars and _____ Cents ($)	1 LS	$_____
ITEM 2A. For the removal of unexpected bedrock outcrops, the unit price of _____ Dollars and _____ Cents per cubic foot ($)	100	$_____

Description	Estimated Quantities	Computed Totals

Item 3. For the installation of drainage material, the lump sum price of

_____ Dollars

and _____ Cents

($) 17 cu.yd. $_____

ITEM 4. For the removal of Sewer System 1, the lump sum price of

_____ Dollars

and _____ Cents

($) 1 LS $_____

Item 4a. For the placement of excavated soil and sewer pipe in roll-off containers, the unit price of

_____ Dollars

and _____ Cents per cubic yard

($) 50 cu.yd. $_____

ITEM 5. For the cleaning and plugging of Sewer System 1, the lump sum price of

_____ Dollars

and _____ Cents

($) 1 LS $_____

Description	Estimated Quantities	Computed Totals

Item 5a. For the implementation, collection and storage of an additional rinse cycle, the unit price of

_____ Dollars

and _____ Cents per cubic yard

($ 500 gal. $_____

ITEM 6. For supplying four 20 cubic yard roll-of containers, the unit price of

_____ Dollars

and _____ Cents per week

($ 25 weeks $_____

ITEM 7. For the placement and removal of sewer sediment in the dewatering pits, the unit price of

_____ Dollars

and _____ Cents per cubic yard

($) 50 cu.yd. $_____

ITEM 8. For the cleaning and plugging of Sewer System 2A, the lump sum price of

_____ Dollars

and _____ Cents

($) 1 LS $_____

Description	Estimated Quantities	Computed Totals

Item 8A. For the implementation, collection and storage of an additional rinse cycle, the unit price of

_____ Dollars

and _____ Cents per gallon

($) 1,500 gal $_____

ITEM 9. For the cleaning and plugging of Sewer System 2B, the lump sum price of

_____ Dollars

and _____ Cents

($) 1 LS $_____

Item 9A. For the implementation, collection and storage of an additional rinse cycle, the unit price of

_____ Dollars

and _____ Cents per gallon

($) 5,700 gal $_____

ITEM 10. For the cleaning and grouting of Sewer System 3, the lump sum price of

_____ Dollars

and _____ Cents

($) 1 LS $_____

Description	Estimated Quantities	Computed Totals

Item 10A. For the implementation, collection and storage of an additional rinse cycle, the unit price of

_____ Dollars

and _____ Cents per gallon

($) 5,000 gal $_____

ITEM 11. For the Decommissioning of Sewer System 4, the lump sum price of

_____ Dollars

and _____ Cents

($) 1 LS $_____

ITEM 12. For the placement and storage of sedimentary materials in roll-off containers, the unit price of

_____ Dollars

and _____ Cents per cubic yard

($) 50 cu.yd. $_____

ITEM 13. For the removal and disposal of Tank #'s 1 and 2, the lump sum price of

_____ Dollars

and _____ Cents

($) 1 LS $_____

Description	Estimated Quantities	Computed Totals

ITEM 14. For the reseeding of affected contract area, the unit price of

_____ Dollars

and _____ Cents per square yard

($) 5000 sy $_____

ITEM 15. For dredging and transporting material from Benson Creek, the unit price of

_____ Dollars

and _____ Cents

($)per cubic yard 230 cy $_____

ITEM 16. For the transporting of UST Area 1 Soil, the unit price of

_____ Dollars

and _____ Cents

($)per cubic yard 1000 cy $_____

Bidder agrees that the work will be substantially completed and completed on or before the dates or within the number of days indicated in the agreement.

Bidder acknowledges receipt of the Addenda listed below and further acknowledges that the provisions of each Addendum have been included in the preparation of his Bid.

Addendum No.	Date Received	Addendum No.	Date Received

The following documents are attached to and made a condition of this Bid.

1.Bid Security in the amount of _____ Dollars

($_____).

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

The terms used in this Bid, which are defined in the General and Supplementary Conditions, have the meanings assigned to them in the General and Supplementary Conditions.

Respectfully submitted on _____, 19_____.

If BIDDER is:

An Individual

By _____
(Individual's Signature)

_____
(Printed or Typed Name of Individual)

Doing business as _____

License or Registration Number: _____

Business Address: _____

_____

_____

Phone No.: _____

A Partnership

By _____
(Firm Name)

_____
(Partner's Signature)

_____
(Printed or Typed Name of Partner)

License or Registration Number: _____

Business Address: _____

_____

_____

Phone No.: _____

A Corporation

By _____
(Corporation Name)

_____
(State of Incorporation)

By _____
Signature of Officer Authorized to Sign)

_____
(Printed or Typed Name and Title of Officer Authorized to Sign)

(CORPORATE
SEAL)

Attest _____
(Secretary)

License or Registration Number: _____

Business Address: _____

_____

_____

Phone No.: _____

A Joint Venture

By _____
(Signature)

_____
(Printed or Typed Name)

_____
(Address)

By _____
(Signature)

_____
(Printed or Typed Name)

_____
(Address)

(Each joint venture 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 QUALIFICATION STATEMENT

(Completion of this statement is required in advance of consideration for award of contract.)

SUBMITTED TO:

Malcolm Pirnie, Inc.
7481 Henry Clay Boulevard
Liverpool, NY 13088
Attention: Stephen J. Darcangelo

SUBMITTED FOR:

The Columbia Mills, Inc.
Sewer Decommissioning Project

SUBMITTED BY:

Name: _____
(Print or Type Name of Bidder)
(/A Corporation/A Partnership/An Individual/A Joint Venture/
[Bidder to strike out inapplicable terms.])

Address: _____

_____

Gentlemen:

The undersigned certifies under oath the truth and correctness of all statements and of all answers to questions made hereinafter.

(Note: Attach Separate Sheets as Required)

1.0 How many years has your organization been in business as a Contractor?

_____

2.0 How many years has your organization been in business under its present name?

_____

3.0 If a corporation, answer the following:

3.1 Date of incorporation:

3.2 State of incorporation:

3.3 President's name:

3.4 Vice president's name(s):

3.5 Secretary's or Clerk's name:

3.6 Treasurer's name:

4.0 If individual or partnership, answer the following:

4.1 Date of organization:

4.2 Name and address of all partners. (State whether general or limited partnership.):

5.0 If other than corporation or partnership, describe organization and name principals:

6.0 Do you plan to subcontract any part of this project? _____
If so, give details.

7.0 Has any construction contract to which you have been a party been terminated by the owner; have you ever terminated work on a project prior to its completion for any reason; has any surety which issued a performance bond on your behalf ever completed the work in its own name or financed such completion on your behalf; has any surety expended any monies in connection with a contract for which they furnished a bond on your behalf? If the answer to any portion of this question is "yes", please furnish details of all such occurrences including name of owner, architect or engineer, and surety, and name and date of project.

8.0 Has any officer or partner of your organization ever been an officer or partner of another organization that had any construction contract terminated by the owner; terminated work on a project prior to its completion for any reason; had any surety which issued a performance bond complete the work in its own name or financed such completion; or had any surety expend any monies in connection with a contract for which they furnished a bond? If the answer to any portion of this question is "yes", please furnish details of all such occurrences including name of owner, architect or engineer, and surety, and name and date of project.

9.0 List name of project, owner, architect or engineer, contract amount, percent complete and scheduled completion of the major construction projects your organization has in process on this date.

10.0 List name of project, owner, architect or engineer, contract amount, date of completion and percent of work with own forces of the major projects of the same general nature as this project (landfill projects) which your organization has completed in the past five years.

11.0 List name, address and telephone number of a reference for each project listed under Items 9.0 and 10.0, above.

12.0 List name and construction experience of the principal individuals of your organization.

13.0 List the states and categories of construction in which your organization is legally qualified to do business.

14.0 List name, address and telephone number of an individual who represents each of the following and whom OWNER may contact for a financial reference:

14.1 A surety:

14.2 A bank:

14.3 A major material supplier:

15.0 Dated at _____, this _____

day of _____, 19____.

_____
(Print or Type Name of Bidder)

By _____

_____
(Title)

(Seal, if corporation)

(Affidavit for Individual)

_____ being duly sworn, deposes and says that: all of the foregoing qualification information is true, complete, and accurate.

(Affidavit for Partnership)

_____ being duly sworn, deposes and says that:

a) he/she is a member of the partnership of _____;
b) he/she is familiar with the books of said parternship showing its financial condition; and c) all of the foregoing qualification information is true, complete, and accurate.

(Affidavit for Corporation)

_____ being duly sworn, deposes and says that:

a) he/she is _____ of _____;
(Full name of Corporation)
b) he/she is familiar with the books of said corporation showing its financial condition; and c) that all of the foregoing qualification information is true, complete, and accurate.

(Acknowledgment)

_____ being duly sworn, deposes and says that he/she is

_____ of _____;
(Name of Bidder)
that he/she is duly authorized to make the foregoing affidavit and that he/she makes it on behalf of ( ) himself/herself; ( ) said partnership; ( ) said corporation.

Sworn to before me this _____ day of _____, 19____,

in the County of _____, State of _____.

_____
(Notary Public)

My commission expires _____

(Seal)

CERTIFIED COPY OF RESOLUTION
OF
BOARD OF DIRECTORS
OF

_____
(Name of Corporation)

RESOLVED that _____,
(Person Authorized to Sign)

_____ to _____
(Title) (Name of Corporation)

be authorized to sign and submit the bid or proposal of this corporation for the following:

The foregoing is a true and correct copy of the resolution adopted by

_____
(Name of Corporation)

at a meeting of its Board of Directors held on the _____ day of

_____, 19____.

By _____

Title _____

(SEAL)

The above form must be completed if the BIDDER is a Corporation.

BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we

_____
(Insert Name, or Legal Title, of Bidder)

of _____
(Insert Address of Bidder)

as Principal, hereinafter called the Principal, and

_____
(Insert Name, or Legal Title, of Surety)

of _____
(Insert Address of Surety)

a corporation duly organized under the laws of the State of _____ as Surety, hereinafter called the Surety, are firmly bound unto Columbia Mills, Inc., Minetto, NY as Obligee, hereinafter called the Obligee, in the penal sum of

_____ Dollars
(Surety to Insert Amount)

for the payment of which sum well and truly to be made, the said Principal and the said Surety bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

NOW, THEREFORE, if the Obligee shall accept the Bid of the Principal and the Principal shall enter into a Contract with the Obligee in accordance with the terms of such Bid, and give such Bond or Bonds as may be specified in the Bidding or Contract Documents with good and sufficient surety acceptable to the Obligee, or in the event of the failure of the Principal to enter such Contract and give such Bond or Bonds, if the Principal shall pay to the Obligee the damages which the Obligee may suffer by reason of such failure not exceeding the penal amount of this bond, then this obligation shall be null and void, otherwise to remain in full force and effect.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety shall not be impaired or affected in any way by any extension of the time within which the Obligee may accept the Bid of the Principal and said Surety does hereby waive notice of any such extension.

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

_____ day of _____, 19____.

(Individual Principal)

By_____
(Individual's Signature)

_____
(Printed or Typed Name of Individual)

Doing business as_____

_____

(Partnership Principal)

By_____
(Firm Name)

_____
(Partner's Signature)

_____
(Printed or Typed Name of Partner)

(Corporate Principal)

By_____
(Corporation Name)

_____
(State of Incorporation)

By_____
(Signature of Officer Authorized to Sign)

_____
(Printed or Typed Name and Title of Officer Authorized to Sign)

(CORPORATE SEAL)

Attest_____
(Secretary)

(Joint Venture Principals)

By_____
(Signature)

_____
(Printed or Typed Name)

By_____
(Signature)

_____
(Printed or Typed Name)

(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).

(Corporate Surety)

By_____
(Corporation Name)

By_____
(Signature of Officer or Attorney-in-Fact*)

_____
(Printed or Typed Name and Title of Officer,
or Name of Attorney-In-Fact*)

(COPORATE SEAL)

Attest_____
(Secretary)

* Attach certified and effective dated copy of power of attorney showing authority of attorney-in-fact to execute in behalf of corporation.

NON-COLLUSIVE BIDDING CERTIFICATE

By submission of this Bid the undersigned, Bidder or person signing on behalf of the Bidder, certifies under the penalty of perjury that to the best of 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.

Attached hereto (if a corporate bidder) is a certified copy of resolution authorizing the execution of this certificate by the signator of this Bid in behalf of the corporate Bidder.

DATED:

_____
Bidder

By: _____

THE COLUMBIA MILLS, INC.
MINETTO, NEW YORK

SEWER DECOMMISIONING PROJECT

AGREEMENT

THIS AGREEMENT is dated as of the _____ day of _____ in the year 19_____, by and between the Columbia Mills, Inc., Minetto New York(hereinafter called OWNER) and

_____
(hereinafter called CONTRACTOR).

WITNESSETH: OWNER and CONTRACTOR, in consideration of the mutual covenants hereinafter set forth, agree as follows:

ARTICLE 1 - WORK

1.1 CONTRACTOR shall at his own cost and expense furnish all labor, services, tools, materials, equipment and incidentals necessary to perform all Work required by the Contract Documents to construct and decommission the Columbia Mills Main Sewer Project, in complete accordance with the Contract Documents. The Work under the Contract Documents is generally described in Section 1A1 of the General Requirements.

ARTICLE 2 - POINT OF DELIVERY

2.1 The place where the Goods are to be delivered is designated as:

The Columbia Mills, Inc.
Minetto, New York

ARTICLE 3 - CONTRACT DOCUMENTS

3.1 The Contract Documents are defined in the General Conditions. The Contract Documents, which comprise the entire agreement between OWNER and CONTRACTOR are attached to this Agreement and are made a part hereof.

ARTICLE 4 - ENGINEER

4.1 The Project has been designed by Malcolm Pirnie Inc., 7481 Henry Clay Boulevard, Liverpool, New York 13088, who is hereinafter called ENGINEER and who 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 completion of the Work in accordance with the Contract Documents.

ARTICLE 5 - CONTRACT TIME

5.1 The work will be substantially completed within 120 days from the date when the contract time commences to run as provided in paragraph 2.3 of the General Conditions, and completed and ready for final payment in accordance with Paragraph 14.9 of the General Conditions within 150 days from the date when the Contract time commences to run.

ARTICLE 6 - LIQUIDATED AND SPECIAL DAMAGES

6.1 Liquidated Damages:

A. OWNER and CONTRACTOR recognize that time is of the essence as to Substantial Completion and that OWNER will suffer financial loss, apart from the costs described in Paragraph 6.2.A, if the Work is not substantially completed within the time specified in Article 5 above, plus any extensions thereof allowed in accordance with Article 12 of the General Conditions. OWNER and CONTRACTOR 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 substantially 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 $100.00 for each day that expires after the time specified in Article 5 for Substantial Completion (adjusted for any extensions thereof made in accordance with Article 12 of the General Conditions) until the Work is substantially complete.

6.2 Special Damages:

A. In addition to the amount provided for liquidated damages, CONTRACTOR shall pay OWNER the actual costs reasonably incurred by OWNER for engineering and inspection forces employed on the Work for each day that expires after the time specified in Article 5 for Substantial Completion (adjusted for any extensions thereof made in accordance with Article 12 of the General Conditions) until the Work is substantially complete.

B. After Substantial Completion, if CONTRACTOR shall neglect, refuse or fail to complete the remaining Work within the Contract Time, CONTRACTOR shall pay OWNER the actual costs reasonably incurred by OWNER for engineering and inspection forces employed on the Work for each day that expires after the time specified in Article 5 for the Work to be completed and ready for final payment (adjusted for any extensions thereof made in accordance with Article 12 of the General Conditions) until the Work is completed and ready for final payment.

6.3 OWNER may deduct the amount of liquidated damages and special damages from monies due CONTRACTOR under this Agreement.

ARTICLE 7 - CONTRACT PRICE

7.1 OWNER shall pay CONTRACTOR for completion of the Work in accordance with the Contract Documents the prices stipulated in CONTRACTOR'S Bid, which Bid is attached hereto and identified as Exhibit 1 of this Agreement.

ARTICLE 8 - PAYMENT PROCEDURES

8.1 CONTRACTOR shall submit Applications for Payment in accordance with Article 14 of the General Conditions. Applications for Payment will be processed as provided in the General Conditions.

8.2 Progress Payments:

A. OWNER shall make monthly progress payments on account of the Contract Price on the basis of CONTRACTOR'S Applications for Payment as recommended by ENGINEER. CONTRACTOR'S Applications for Payment will be due on the first day of the month. All progress payments will be on the basis of the progress of the Work measured by the schedule of values provided for in Paragraph 14.1 of the General Conditions (and in the case of Work performed on the basis of unit prices, based on the number of units completed). A progress payment will not be made whenever the value of the Work completed since the last previous progress payment is less than $5,000.

1. Prior to Substantial Completion, progress payments will be in the amount of 90 percent of the Work completed, and of the materials and equipment not incorporated into the Work but suitably stored, less the aggregate of payments previously made.
2. Upon Substantial Completion, OWNER shall pay an amount sufficient to increase total payments to CONTRACTOR to 95 percent of the Contract Price, less such amounts as ENGINEER shall determine in accordance with Paragraph 14.4.D of the General Conditions.

8.3 Final Payment:

A. Upon final completion and acceptance of the Work in accordance with Paragraph 14.9 of the General Conditions and after post final inspection in accordance with specification Section 1I5, OWNER shall pay the remainder of the Contract Price as recommended by ENGINEER as provided in said Paragraph 14.9 and Specification Section 1IS.

ARTICLE 9 - INTEREST

9.1 All moneys not paid when due hereunder shall bear interest at the maximum rate allowed by law at the place of the Project.

ARTICLE 10 - CONTRACTOR'S REPRESENTATIONS

10.1 As part of the inducement for OWNER to enter into this Agreement CONTRACTOR makes the following representations:

A. CONTRACTOR has familiarized himself with the nature and extent of the Contract Documents, Work, site, locality, and with all local conditions and federal, state and local laws, ordinances, rules and regulations that in any manner may affect cost, progress, performance or furnishing of the Work.

B. CONTRACTOR has studied carefully all reports of investigations and tests of subsurface and latent physical conditions at the site or those reports that otherwise may affect cost, progress, performance or furnishing of the Work which were utilized by ENGINEER in the preparation of the Drawings and Specifications and which have been identified in the Supplementary Conditions.

C. CONTRACTOR has made or caused to be made examinations, investigations and tests and studies of such reports and related data as he deems necessary for the performance of the Work at the Contract Price, within the Contract Time and in accordance with the other terms and conditions of the Contract Documents; and no additional examinations, investigations, tests, reports, studies or similar information are or will be required by CONTRACTOR for such purposes.

D. CONTRACTOR has correlated the results of all such observations, examinations, investigations, tests, reports and studies with the terms and conditions of the Contract Documents.

E. CONTRACTOR has given ENGINEER written notice of all conflicts, errors or discrepancies that he has discovered in the Contract Documents and the written resolution thereof by ENGINEER is acceptable to CONTRACTOR.

ARTICLE 11 - DRAWINGS AND ADDENDA

11.1 The Drawings comprise a set entitled The Columbia Mills, Inc., Main Plant Area Sewer Decommissioning Project, Dated September, 1993, Title sheet, sheets 1 to 4, inclusive.

11.2 Addenda consisting of Numbers ___ to ___, inclusive.

ARTICLE 12 - MISCELLANEOUS

12.1 Terms used in this Agreement which are defined in Article 1 of the General Conditions have the meanings indicated in the General Conditions.

12.2 No assignment by a party hereto of any rights under or interests in the Contract Documents 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.

12.3 OWNER and CONTRACTOR each binds itself, its partners, successors, assigns and legal representatives to the other party hereto, and its partners, successors, assigns and legal representatives in respect of all covenants, agreements and obligations contained in the Contract Documents.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement on the day and year first written above.

This Agreement will be effective on _____, 19____.

OWNER _____ Attest _____

_____ Address for giving notices

By _____ _____

_____

[CORPORATE SEAL]

CONTRACTOR _____

_____

By _____

[CORPORATE SEAL]

Attest _____

Address for giving notices

_____

_____

License No. _____

Agent for service of process:

_____

(If CONTRACTOR is a corporation, attach evidence of authority to sign.)

GENERAL CONDITIONS

TABLE OF ARTICLES

ARTICLE 1 - DEFINITIONS

1.1 Wherever used in these General Conditions or in the other Contract Documents, the following terms have the meanings indicated which are applicable to both the singular and plural thereof.

A. Defined Terms:

1. **Addenda:** Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change, the Bidding Documents or the Contract Documents.
2. **Agreement:** The written agreement between OWNER and CONTRACTOR covering the Work to be performed; other Contract Documents are attached to the Agreement and made a part thereof as provided therein.
3. **Application for Payment:** The form accepted by ENGINEER which is to be used by CONTRACTOR in requesting progress or final payment and which is to include such supporting documentation as is required by the Contract Documents.
4. **Bid:** The offer or proposal of the Bidder submitted on the prescribed form setting forth the price(s) for the Work to be performed.
5. **Bidder:** Any person, firm or corporation submitting a Bid for the Work.
6. **Bidding Documents:** Notice to bidders or advertisement, if any, instructions to bidders, other bidding information and requirements, bidding forms and attachments, contract and bond forms, and the proposed Contract Documents, including any Addenda issued prior to receipt of Bids.

7. **Bonds:** Bid, Performance, and Payment bonds and other instruments of security.
8. **Change Order:** A written order to CONTRACTOR signed by OWNER authorizing an addition, deletion or revision in the Work, or an adjustment in the Contract Price or the Contract Time issued after the Effective Date of the Agreement.
9. **Contract Documents:** The Agreement, Addenda (which pertain to the Contract Documents), CONTRACTOR'S Bid (including documentation accompanying the Bid and any post-Bid documentation submitted prior to the Notice of Award) when attached as an exhibit to the Agreement, the Bonds, these General Conditions, the Supplementary Conditions, the Specifications, the Drawings as the same may be more specifically identified in the Agreement, together with all Modifications issued after execution of the Agreement.
10. **Contract Price:** The moneys payable by OWNER to CONTRACTOR under the Contract Documents as stated in the Agreement (subject to the provisions of Paragraph 11.7 in the case of Unit Price Work).
11. **Contract Time:** The number of days (computed as provided in Paragraph 17.2) or the date stated in the Agreement for the completion of the Work.
12. **CONTRACTOR:** The person, firm or corporation with whom OWNER has executed the Agreement. Whenever the Project is to be constructed under multiple direct contracts, the term "CONTRACTOR" shall mean the appropriate prime CONTRACTOR. Whenever a specific prime CONTRACTOR is referred to, terms such as "General CONTRACTOR", "Electrical CONTRACTOR", etc. will be used.
13. **day:** A calendar day of twenty-four hours measured from midnight to the next midnight.
14. **defective:** An adjective which when modifying the word Work refers to Work that is unsatisfactory, faulty or deficient, or does not conform to the Contract Documents or does not meet the requirements of any inspection, reference standard, test or approval referred to in the Contract Documents, or has been damaged prior to ENGINEER'S recommendation for final payment (unless responsibility for the protection thereof has been assumed by OWNER at Substantial Completion in accordance with Paragraph 14.5).
15. **Drawings:** The Drawings which show the character and scope of the Work to be performed and which have been prepared or approved by ENGINEER and are referred to in the Contract Documents.
16. **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.
17. **ENGINEER:** The person, firm or corporation named as such in the Agreement.
18. **Field Order:** A written order issued by ENGINEER which orders minor changes in the Work in accordance with Paragraph 10.2 but which does not involve a change in the Contract Price or the Contract Time.
19. **General Requirements:** Sections of Division 1 of the Specifications.
20. **Modifications:** (a) A written amendment of the Contract Documents signed by both parties, (b) a Change Order, or (c) a Field Order.

A Modification may only be issued after the Effective Date of the Agreement.

21. **Notice of Award:** The written notice by OWNER to the apparent successful Bidder stating that upon compliance by the apparent successful Bidder with the conditions precedent enumerated therein, within the time specified, OWNER will sign and deliver the Agreement.
22. **Notice to Proceed:** A written notice given by OWNER to CONTRACTOR fixing the date on which the Contract Time will commence to run and on which CONTRACTOR shall start to perform his obligations under the Contract Documents.
23. **OWNER:** For purposes of this document, The Columbia Mills, Inc. is defined as the OWNER for contract purposes. The Columbia Mills, Inc. is obligated to perform the work of this contract under terms of an Order On Consent with the New York State Department of Environmental Conservation.
    The Columbia Mills, Inc. does not acknowledge ownership of the real property upon which the work is to be performed but has written permission from other parties to carry out any work required to conform with the Order-On-Consent.
24. **Project:** The total construction of which the Work to be provided under the Contract Documents may be the whole or a part as indicated elsewhere in the Contract Documents.
25. **Project Manual:** The bound documentary information prepared for bidding and constructing the Project. 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.
26. **Resident Project Representative:** The authorized representative of ENGINEER who is assigned to the site or any part thereof.
27. **Samples:** Physical examples furnished by the CONTRACTOR to illustrate materials, equipment or workmanship, and to establish standards by which some portions of the Work will be judged.
28. **Shop Drawings:** All drawings, diagrams, illustrations, schedules and other data which are specifically prepared by or for CONTRACTOR to illustrate some portion of the Work and all illustrations, brochures, standard schedules, performance charts, instructions, diagrams and other information prepared by a manufacturer, fabricator, supplier or distributor and submitted by CONTRACTOR to illustrate material or equipment for some portion of the Work.
29. **Specifications:** Those portions of the Contract Documents consisting of written technical descriptions of materials, equipment, construction systems, standards and workmanship as applied to the Work and certain administrative details applicable thereto.
30. **Subcontractor:** An individual, firm or corporation having a direct contract with CONTRACTOR or with any other Subcontractor for the performance of a part of the Work at the site.
31. **Substantial Completion:** The Work (or a specified part thereof) has progressed to the point where, in the opinion of ENGINEER as evidenced by ENGINEER'S definitive certificate of Substantial Completion, it is sufficiently complete, in accordance with the Contract Documents, so that the Work (or specified part) can be utilized for the purposes for which it was intended; or if there be no such certificate issued, when final payment is due in

accordance with Paragraph 14.9.A. The terms "substantially complete" and "substantially completed" as applied to any Work refer to Substantial Completion thereof.

32. **Supplementary Conditions:** Modifications and additions to the General Conditions.
33. **Unit Price Work:** Work to be paid for on the basis of unit prices contained in the Contract Documents.
34. **Work:** The entire completed construction or the various separately identifiable parts thereof required to be furnished under the Contract Documents. Work is the result of performing services, furnishing labor and furnishing and incorporating materials and equipment into the construction, all as required by the Contract Documents.

ARTICLE 2 - PRELIMINARY MATTERS

2.1 Delivery of Bonds and Insurance Certificates:

A. When CONTRACTOR executes Agreement with OWNER, CONTRACTOR shall deliver to OWNER such Bonds as CONTRACTOR may be required to furnish in accordance with Article 5.

B. When CONTRACTOR executes Agreement with OWNER, CONTRACTOR shall deliver to OWNER, with a copy to ENGINEER, certificates (and other evidence of insurance requested by OWNER) which CONTRACTOR is required to purchase and maintain in accordance with Article 5, and OWNER shall deliver to CONTRACTOR certificates (and other evidence of insurance requested by CONTRACTOR) which OWNER is required to purchase and maintain in accordance with Article 5.

2.2 Copies of Documents:

A. OWNER shall furnish to CONTRACTOR up to ten copies (unless otherwise provided in the General Requirements) of the Contract Documents as are reasonably necessary for the execution of the Work. Additional copies will be furnished, upon request, at the cost of reproduction.

2.3 Commencement of Contract Time; Notice to Proceed:

A. The Contract Time 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; but in no event shall the Contract Time commence to run later than the ninetieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Agreement. A Notice to Proceed may be given at any time within thirty days after the Effective Date of the Agreement.

2.4 Starting the Project:

A. CONTRACTOR shall start to perform the Work on the date when the Contract Time commences to run, but no Work shall be done at the

site prior to the date on which the Contract Time commences to run.

2.5 Before Starting Construction:

A. Before undertaking each part of the Work, CONTRACTOR shall carefully study and compare the Contract Documents and check and verify pertinent figures shown thereon and all applicable field measurements. CONTRACTOR shall promptly report in writing to ENGINEER any conflict, error or discrepancy which he may discover and shall obtain a written interpretation or clarification from ENGINEER before proceeding with any Work affected thereby; however, CONTRACTOR shall not be liable to OWNER or ENGINEER for the failure to report any conflict, error or discrepancy in the Contract Documents, unless CONTRACTOR had actual knowledge thereof or should reasonably have known thereof.

B. Within ten days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), CONTRACTOR shall submit to ENGINEER for review and acceptance, an estimated progress schedule indicating the starting and completion dates of the various stages of the Work, a preliminary schedule of Shop Drawing submissions, and a preliminary schedule of values of the Work.

2.6 Preconstruction Conference:

A. Within twenty days after the Effective Date of the Agreement, but before CONTRACTOR starts the Work at the site, a conference will be held for review and acceptance of the schedules, referred to in Paragraph 2.5.B, to establish procedures for handling Shop Drawings and other submittals and for processing Applications for Payment, and to establish a working understanding among the parties as to the Work.

ARTICLE 3 - CONTRACT DOCUMENTS: INTENT, AND REUSE

3.1 Intent:

A. The Contract Documents comprise the entire Agreement between OWNER and CONTRACTOR concerning the Work. They may be altered only by a Modification.

B. The Contract Documents are complementary; what is called for by one is as binding as if called for by all. If, during the performance of the Work, CONTRACTOR finds a conflict, error or discrepancy in the Contract Documents, he shall report it to ENGINEER in writing at once and before proceeding with the Work affected thereby; however, CONTRACTOR shall not be liable to OWNER or ENGINEER for failure to report any conflict, error or discrepancy in the Specifications or Drawings unless CONTRACTOR had actual knowledge thereof or should reasonably have known thereof.

C. It is the intent of the Specifications and Drawings to describe a complete Project (or part thereof) to be constructed in accordance with the Contract Documents. Any Work that may reasonably be inferred from the Specifications or Drawings as being required to produce the intended result shall be supplied whether or not it is specifically called for, at no additional cost to OWNER.

D. The Specifications may describe or the Drawings may show the general arrangement of an item of material or equipment when the actual details of said arrangement will vary with the source of the material or equipment. In such cases, CONTRACTOR shall bear all direct and indirect costs to accommodate the item of material or equipment furnished, whether the item of material or equipment is furnished by a manufacturer named in the Specifications or is furnished as an approved substitute or "or equal" item of material or equipment.

E. When words in the Specifications or on the Drawings, which have a well-known technical or trade meaning, are used to describe Work, materials or equipment such words shall be interpreted in accordance with such meaning. Reference to standard specifications, manuals or codes of any technical society, organization or association, or to the code of any governmental authority, whether such reference be specific or by implication, shall mean the latest standard specification, manual or code 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. However, no provision of any referenced standard specification, manual or code (whether or not specifically incorporated by reference in the Contract Documents) shall change the duties and responsibilities of OWNER, CONTRACTOR or ENGINEER, or any of their agents or employees from those set forth in the Contract Documents. Clarifications and interpretations of the Contract Documents shall be issued by ENGINEER as provided for in Paragraph 9.3.

F. The Contract Documents will be governed by the law of the place of the Project.

3.2 Re-use of Documents:

A. Neither CONTRACTOR nor any Subcontractor, manufacturer, fabricator, supplier or distributor shall 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; and they shall not re-use any of them on extensions of the Project or any other project without written consent of OWNER and ENGINEER and specific written verification or adaptation by ENGINEER.

ARTICLE 4 - AVAILABILITY OF LANDS; PHYSICAL CONDITIONS; REFERENCE POINTS

4.1 Availability of Lands:

A. OWNER shall furnish, as indicated in the Contract Documents the lands upon which the Work is to be performed, rights-of-way for access thereto, and such other lands which are designated for the use of CONTRACTOR. Easements for permanent structures or permanent changes in existing facilities will be obtained and paid for by OWNER, unless otherwise provided in the Contract Documents. If CONTRACTOR believes that any delay in OWNER'S furnishing these lands or easements entitles CONTRACTOR to an extension of the Contract Time, CONTRACTOR may make a claim therefor as provided in Article 12. CONTRACTOR shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

4.2 Physical Conditions-Investigations and Reports:

A. Reference is made to the Supplementary Conditions for identification of those reports of investigations and tests of subsurface and latent physical conditions at the site or those reports that otherwise may affect cost, progress or performance of the Work which have been utilized by ENGINEER in preparation of the Drawings and Specifications. These reports are not intended to constitute any explicit or implicit representation as to the nature of the subsurface and latent physical conditions which may be encountered at the site or to constitute explicit or implicit representations as to any other matter contained in any report. Such reports are not guaranteed as to accuracy or completeness and are not part of the Contract Documents.

4.3 Unforeseen Physical Conditions:

A. CONTRACTOR shall promptly notify OWNER and ENGINEER in writing of any subsurface or latent physical conditions at the site or in an existing structure differing materially from those indicated or referred to in the Contract Documents. ENGINEER will promptly review those conditions and advise OWNER in writing if further investigations or tests are necessary. Promptly thereafter, OWNER shall obtain the necessary additional investigations and tests and furnish copies to ENGINEER and CONTRACTOR. If ENGINEER finds that the results of such investigations or tests indicate that there are subsurface or latent physical conditions which differ materially from those intended in the Contract Documents, and which could not reasonably have been anticipated by CONTRACTOR, a Change Order shall be issued incorporating the necessary revisions.

4.4 Reference Points:

A. OWNER shall provide engineering surveys for construction to establish reference points which in OWNER'S judgment are necessary to enable CONTRACTOR to proceed with the Work.

CONTRACTOR shall be responsible for laying out the Work (unless otherwise specified in the General Requirements), and shall protect and preserve the established reference points and shall make no changes or relocations without the prior written approval of OWNER. CONTRACTOR shall report to ENGINEER whenever any reference point is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for replacement or relocation of such reference points by professionally qualified personnel.

ARTICLE 5 - BONDS AND INSURANCE

5.1 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 CONTRACTOR'S obligations under the Contract Documents. These Bonds shall remain in effect at least until one year after the date of final payment, except as otherwise provided by law. CONTRACTOR shall also furnish such other Bonds as are required by the Supplementary Conditions. All Bonds shall be in the forms prescribed by the Bidding Documents or Supplementary Conditions and be executed by such sureties as:

1. Are licensed to conduct business in the state where the Project is located, and
2. Are named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Audit Staff Bureau of Accounts, U.S. Treasury Department.

All Bonds signed by an agent must be accompanied by a certified copy of the authority to act.

B. If the surety on any Bond furnished by CONTRACTOR is declared a 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 5.1.A, CONTRACTOR shall within five days thereafter substitute another Bond and surety, both of which shall be acceptable to OWNER.

5.2 Contractor's Liability Insurance:

A. CONTRACTOR shall purchase and maintain such comprehensive general liability and other insurance 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 such performance of the Work is by CONTRACTOR, by any Subcontractor, by anyone directly or indirectly employed by any of them, or by anyone for whose acts any any of them may be liable:

1. Claims under workers' or workmen's 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 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, including loss of use resulting therefrom;
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; and
7. Claims for damages because of bodily injury or death of any person arising out of operation of law.

B. The insurance required by Paragraph 5.2.A shall include the specific coverages and be written for not less than the limits of liability and coverages provided in the Supplementary Conditions, or required by law, whichever is greater. All such insurance shall remain in effect until final payment and at all times thereafter when CONTRACTOR may be correcting, removing or replacing defective Work in accordance with Paragraph 13.7. The comprehensive general liability insurance shall include completed operations insurance and shall include OWNER and ENGINEER and their agents and employees as additional insureds. CONTRACTOR shall maintain such completed operations insurance for at least two years after final payment and shall furnish OWNER with evidence of continuation of such insurance at final payment and one year thereafter.

5.3 Contractual Liability Insurance:

A. The comprehensive general liability insurance required by Paragraph 5.2.A shall include contractual liability insurance applicable to CONTRACTOR'S obligations under Paragraph 6.15.

5.4 Owner's Liability Insurance:

A. OWNER shall be responsible for purchasing and maintaining OWNER'S own liability insurance and, at OWNER'S option, may purchase and maintain such insurance as will protect OWNER against claims which may arise from operations under the Contract Documents.

5.5 Property Insurance:

A. Unless otherwise provided in the Supplementary Conditions, CONTRACTOR shall purchase and maintain property insurance upon the Work at the site to the full insurable value thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or as required by law). This insurance shall include the interests of the OWNER, CONTRACTOR, and

Subcontractors in the Work; shall insure against the perils of fire and extended coverage; shall include "all risk" insurance for physical loss and damage including theft, vandalism and malicious mischief, collapse and water damage, and such other perils as may be specified in the Supplementary Conditions; shall include damages, losses and expenses arising out of or resulting from any insured loss or incurred in the repair or replacement of any insured property (including fees and charges of engineers, architects, attorneys and other professionals); and shall provide that all insurance proceeds are to be paid to OWNER "as Trustee". If not covered under the "all risk" insurance or otherwise provided in the Supplementary Conditions, CONTRACTOR shall purchase and maintain similar property insurance on portions of the Work stored on or off the site or in transit when such portions of the Work are to be included in an Application for Payment. All such insurance required by this Paragraph 5.5.A shall remain in effect until the Work is substantially completed.

B. OWNER shall purchase and maintain such boiler and machinery insurance as may be required by the Supplementary Conditions or by law. This insurance shall include the interest of OWNER, CONTRACTOR and Subcontractors in the Work. OWNER shall file a copy of all policies required by this Paragraph with CONTRACTOR before an exposure to loss may occur.

C. The policies of insurance required under this Paragraph 5.5 shall provide that neither the OWNER nor the CONTRACTOR, nor their insurers, shall have any right of subrogation against any of the other parties enumerated in Paragraph 5.6. It is the intention of the OWNER and CONTRACTOR that the policies shall protect all of the enumerated parties and be primary coverage for any and all losses covered by the insurance described in Paragraphs 5.5.A and 5.5.B.

5.6 Waiver of Rights:

A. OWNER and CONTRACTOR waive all rights against each other and the Subcontractors and their agents and employees and against ENGINEER and separate contractors (if any) and their subcontractors', agents and employees, for damages caused by fire or other perils to the extent covered by insurance provided under Paragraph 5.5., or any other property insurance applicable to the Work, except such rights as they may have to the proceeds of such insurance held by OWNER as trustee. OWNER or CONTRACTOR, as appropriate, shall require similar waivers in writing by ENGINEER and from each separate contractor and each Subcontractor; each such waiver will be in favor of all other parties enumerated in this Paragraph 5.6.

5.7 Receipt and Application of Proceeds:

A. Any insured loss under the policies of insurance required by Paragraph 5.5 shall be adjusted with OWNER and made payable to OWNER as trustee for the insureds, as their interests may appear, subject to the requirements of any applicable mortgage clause and

of Paragraph 5.7.B. OWNER shall deposit in a separate account any money so received, and he 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 trustee shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within fifteen days after the occurrence of loss to OWNER'S exercise of this power. If such objection be made, OWNER as trustee shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If required in writing by any party in interest, OWNER as trustee shall upon the occurrence of an insured loss, give bond for the proper performance of his duties.

5.8 Partial Utilization - Property Insurance:

A. If OWNER finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all of the Work, such use or occupancy may be accomplished in accordance with Paragraph 14.6; provided that no such use or occupancy shall commence before the insurers providing the property insurance have acknowledged notice thereof and in writing effected the 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 cancelled or lapse on account of any such partial use or occupancy.

5.9 Certificates of Insurance:

A. All certificates of the insurance required to be purchased by CONTRACTOR pursuant to Article 5 shall be filed in accordance with Paragraph 2.1.B. Certificates shall be acceptable to OWNER and shall contain a provision that coverages afforded under the policies will not be cancelled, materially changed or renewal refused until at least thirty days' prior written notice has been given to OWNER and ENGINEER by certified mail.

5.10 Additional Bonds and Insurance:

A. OWNER may require CONTRACTOR to furnish such other Bonds and such additional insurance, in such form and with such sureties or insurers as OWNER may specify. If such other Bonds or such other insurance are specified in the Contract Documents, the premiums shall be paid by CONTRACTOR; if subsequent thereto, they shall be paid by OWNER except as otherwise provided in Paragraph 6.3.A.1 and Paragraph 13.8.B.

ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES

6.1 Supervision and Superintendence:

A. CONTRACTOR shall supervise 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, but he shall not be solely responsible for the negligence of others in the design or selection of a specific means, method, technique, sequence or procedure of construction which is indicated in and required by the Contract Documents. CONTRACTOR shall be responsible to see that the finished Work complies accurately with the Contract Documents.

B. CONTRACTOR shall keep on the Work at all times during its progress a competent resident superintendent, who shall not be replaced without written notice to OWNER and ENGINEER except under extraordinary circumstances. The superintendent will be CONTRACTOR'S representative at the site and shall have authority to act on behalf of CONTRACTOR. All communications given to the superintendent shall be as binding as if given to CONTRACTOR.

6.2 Labor, Materials and Equipment:

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. Except in connection with the safety or protection of persons or the Work or property at the site or adjacent thereto, and except as otherwise indicated in the Supplementary Conditions, all Work at the site shall be performed during regular working hours, and CONTRACTOR will not permit overtime work or the performance of Work on Saturday, Sunday or any legal holiday without OWNER'S written consent given after prior written notice to ENGINEER.

B. CONTRACTOR shall furnish all materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances and all other facilities and incidentals necessary for the execution, testing, initial operation and completion of the Work. Except as otherwise specified in the General Requirements, CONTRACTOR shall furnish all fuel, power, light, heat, telephone, water and sanitary facilities necessary for the execution, testing, initial operation and completion of the Work.

C. All materials and equipment shall be of good quality and new, except as otherwise provided in the Contract Documents. If required by ENGINEER, CONTRACTOR shall furnish satisfactory evidence (including reports of required tests) as to the kind and quality of materials and equipment.

D. All materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned in accordance with the instructions of the applicable manufacturer, fabricator, supplier or distributor, except as otherwise provided in the Contract Documents; but no provision of any such instructions will be effective to impose on ENGINEER responsibility for the means, methods, techniques, sequences or procedures of construction or for safety precautions incident thereto.

6.3 Substitutions:

A. Whenever materials or equipment are specified or described in the Drawings or Specifications by using the name of a proprietary item or the name of a particular manufacturer, fabricator, supplier or distributor, the naming of the item is intended to establish the type, function and quality required. Unless the name is followed by words indicating that no substitution is permitted, materials or equipment of other manufacturers, fabricators, suppliers or distributors may be accepted by ENGINEER if sufficient information is submitted by CONTRACTOR to allow ENGINEER to determine that the material or equipment proposed is equivalent to that named. The procedure for review by ENGINEER will be as set forth in Paragraphs 6.3.A.1 and 6.3.A.2 below and as supplemented in the General Requirements.

1. Requests for review of substitute items of material and equipment will not be accepted by ENGINEER from anyone other than CONTRACTOR. If CONTRACTOR wishes to furnish or use a substitute item of material or equipment, CONTRACTOR shall make written application to ENGINEER for acceptance thereof, certifying that the proposed substitute will perform adequately the functions and achieve the results called for by the general design, be similar and of equal substance to that specified and be suited to the same use as that specified. The application will state that the evaluation and acceptance of the proposed substitute will not prejudice CONTRACTOR'S timely achievement of Substantial Completion, whether or not acceptance of the substitute for use in the Work will require a change in the Drawings or Specifications to adapt the design to the substitute and whether or not incorporation or use of the substitute in connection with the Work is subject to payment of any license fee or royalty. All variations of the proposed substitute from that specified shall be identified in the application and available maintenance, repair and replacement service will be indicated. The application will also contain a statement that CONTRACTOR agrees to pay all costs that will result directly or indirectly from acceptance of such substitute, including costs of redesign and claims of other contractors affected by the resulting change. ENGINEER may require CONTRACTOR to furnish at CONTRACTOR'S expense additional data about the proposed substitute. ENGINEER will be allowed a reasonable time within which to evaluate the proposed substitute. ENGINEER will be the sole judge of acceptability and no substitute will be ordered or installed without ENGINEER'S prior written acceptance. OWNER may require

CONTRACTOR to furnish at CONTRACTOR'S expense a special performance guarantee or other surety with respect to any substitute.

2. ENGINEER will record time required by ENGINEER and ENGINEER'S consultants in evaluating substitutions proposed by CONTRACTOR and in making changes in the Drawings or Specifications occasioned thereby. Whether or not ENGINEER accepts a proposed substitute, CONTRACTOR shall reimburse OWNER for the charges of ENGINEER and ENGINEER'S consultants for evaluating any proposed substitute that does not meet the requirements of the Drawings and Specifications.

6.4 Concerning Subcontractors:

A. CONTRACTOR shall not employ any Subcontractor or other person or organization (including those who are to furnish the principal items of materials or equipment), whether initially or as a substitute, against whom OWNER or ENGINEER may have reasonable objection. A Subcontractor or other person or organization identified in writing to OWNER and ENGINEER by CONTRACTOR prior to the Notice of Award and not objected to in writing by OWNER or ENGINEER prior to the Notice of Award will be deemed acceptable to OWNER and ENGINEER. If OWNER or ENGINEER after due investigation has reasonable objection to any Subcontractor, other person or organization proposed by CONTRACTOR after the Notice of Award, CONTRACTOR shall submit an acceptable substitute and the Contract Price shall be increased or decreased by the difference in cost occasioned by such substitution, and an appropriate Change Order shall be issued. CONTRACTOR shall not be required to employ any Subcontractor, other person or organization against whom CONTRACTOR has reasonable objection. Acceptance of any Subcontractor, other person or organization by OWNER or ENGINEER shall not constitute a waiver of any right of OWNER or ENGINEER to reject defective Work.

B. CONTRACTOR shall be fully responsible for all acts and omissions of his Subcontractors and of persons and organizations directly or indirectly employed by them and of persons and organizations for whose acts any of them may be liable to the same extent that CONTRACTOR is responsible for the acts and omissions of persons directly employed by CONTRACTOR. Nothing in the Contract Documents shall create any contractual relationship between OWNER or ENGINEER and any Subcontractor or other person or organization having a direct contract with CONTRACTOR, nor shall it create any obligation on the part of OWNER or ENGINEER to pay or to see to the payment of any moneys due any Subcontractor or other person or organization, except as may otherwise be required by law. OWNER or ENGINEER may furnish to any Subcontractor or other person or organization, to the extent practicable, evidence of amounts paid to CONTRACTOR on account of specific Work done.

C. The Divisions and Sections of the Specifications and the identifications of any Drawings shall not control CONTRACTOR in dividing the Work among Subcontractors or delineating the Work to be performed by any specific trade.

D. All Work performed for CONTRACTOR by a Subcontractor will be pursuant to an appropriate agreement between CONTRACTOR and the Subcontractor which specifically binds the Subcontractor to the applicable terms and conditions of the Contract Documents for the benefit of OWNER and the ENGINEER and contains waiver provisions as required by Paragraph 5.6. CONTRACTOR shall pay each Subcontractor a just share of any insurance moneys received by CONTRACTOR on account of losses under policies issued pursuant to Paragraph 5.5.

6.5 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. CONTRACTOR shall indemnify and hold harmless OWNER and ENGINEER and anyone directly or indirectly employed by either of them from and against all claims, damages, losses and expenses (including attorneys' fees) arising out of 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, and shall defend all such claims in connection with any alleged infringement of such rights.

6.6 Permits:

A. Unless otherwise indicated 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 Bid. CONTRACTOR shall also pay all charges of utility service companies for connections to the Work, and OWNER shall pay all charges of such companies for capital costs related thereto.

6.7 Laws and Regulations:

A. CONTRACTOR shall give all notices and comply with all laws, ordinances, rules and regulations applicable to the Work. Except where otherwise expressly required by applicable laws, ordinances, rules and regulations, neither OWNER nor ENGINEER shall be responsible for monitoring CONTRACTOR'S compliance with any laws, ordinances, rules or regulations.

B. If CONTRACTOR observes that the Specifications or Drawings are at variance with any laws, ordinances, rules and regulations, CONTRACTOR shall give ENGINEER prompt written notice thereof, and any necessary changes shall be adjusted by an appropriate Modification. If CONTRACTOR performs any Work knowing or having reason to know that it is contrary to such laws, ordinances, rules and regulations, and without such notice to ENGINEER, CONTRACTOR shall bear all costs arising therefrom; however, it shall not be CONTRACTOR'S primary responsibility to make certain that the Specifications and Drawings are in accordance with such laws, ordinances, rules and regulations.

6.8 Taxes:

A. CONTRACTOR shall pay all sales, consumer, use and other similar taxes required to be paid by him in accordance with the law of the place of the Project.

6.9 Use of Premises:

A. CONTRACTOR shall confine construction equipment, the storage of materials and equipment and the operations of workmen to areas permitted by law, ordinances, permits, or the requirements of the Contract Documents, and shall not unreasonably encumber the premises with construction equipment or other materials or equipment.

B. During progress of the Work, CONTRACTOR shall keep the premises free from accumulations of waste materials, rubbish and other debris resulting from the Work. At the completion of the Work CONTRACTOR shall remove all waste materials, rubbish and debris from and about the premises as well as all tools, appliances, construction equipment and machinery, and surplus materials, and shall leave the site clean and ready for occupancy by OWNER. CONTRACTOR shall restore to their original condition those portions of the site not designated for alteration by the Contract Documents.

C. 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.

6.10 Record Documents:

A. CONTRACTOR shall keep one record copy of all Specifications, Drawings, Addenda, Modifications, Shop Drawings and Samples at the site in good order and annotated to show all changes made during the construction process. These shall be available to ENGINEER for examination and shall be delivered to ENGINEER for OWNER upon completion of the Work.

6.11 Safety and Protection:

A. CONTRACTOR shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. 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 Work 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 and utilities not designated for removal, relocation or replacement in the course of construction.

B. CONTRACTOR shall comply with all applicable laws, ordinances, rules, regulations and orders of any public body having jurisdiction for the safety of persons or property or to protect them 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 utilities when prosecution of the Work may affect them. CONTRACTOR shall cooperate with utility owners in the protection, removal, relocation or replacement of such utility property. All damage, injury or loss to any property referred to in Paragraph 6.11.A.2 or 6.11.A.3 caused, directly or indirectly, in whole or in part, by CONTRACTOR, any Subcontractor or anyone directly or indirectly employed by any of them 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 either of them or anyone for whose acts either of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of CONTRACTOR). CONTRACTOR'S duties and responsibilities for safety and for the 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 14.9 that the Work is acceptable.

C. Safety Representative:
   1. 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.

D. Hazardous Communication Programs:
   1. 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, ordinances, rules, or regulations.

6.12 Emergencies:

A. In emergencies affecting the safety or protection of persons or the Work or property at the site or adjacent thereto, CONTRACTOR, without special instruction or authorization from ENGINEER or OWNER, is obligated to act to prevent threatened damage, injury or loss. CONTRACTOR shall give ENGINEER prompt written notice of any significant changes in the Work or deviations from the Contract Documents caused thereby.

6.13 Shop Drawings and Samples:

A. After checking and verifying all field measurements, CONTRACTOR shall submit to ENGINEER for review and approval, in accordance with the accepted schedule of Shop Drawing submissions (see Paragraph 2.6) and the procedures specified in the General Requirements, copies of all Shop Drawings, which shall have been checked by and stamped with the approval of CONTRACTOR and identified as ENGINEER may require. The data shown on the Shop Drawings will be complete with respect to dimensions, design criteria, materials of construction and the like to enable ENGINEER to review the information as required.

B. CONTRACTOR shall also submit to ENGINEER for review and approval with such promptness as to cause no delay in Work, all Samples required by the Contract Documents. All Samples will have been checked by and stamped with the approval of CONTRACTOR, identified clearly as to material, manufacturer, any pertinent catalog numbers and the use for which intended.

C. At the time of each submission, CONTRACTOR shall in writing call ENGINEER'S attention to all deviations that the Shop Drawings or Samples may have from the requirements of the Contract Documents.

D. ENGINEER will review and approve with reasonable promptness Shop Drawings and Samples, but ENGINEER'S review and approval shall be only for conformance with the design concept of the Project and for compliance with the information given in the Contract Documents and shall not extend to means, methods, sequences, techniques or procedures of construction 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. CONTRACTOR shall make all corrections required by ENGINEER and shall return the required number of corrected copies of Shop Drawings and resubmit 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. CONTRACTOR'S stamp of approval on any Shop Drawing or Sample shall constitute a representation to OWNER and ENGINEER that CONTRACTOR has either determined and verified all quantities, dimensions, field construction criteria, materials, catalog numbers, and similar data or assumes full responsibility for doing so, and that CONTRACTOR has reviewed or coordinated each

Shop Drawing or Sample with the requirements of the Work and the Contract Documents.

E. Where a Shop Drawing or Sample is required by the Specifications, no related Work shall be commenced until the submittal has been reviewed and approved by ENGINEER.

F. ENGINEER'S review and approval of Shop Drawings or Samples shall not relieve CONTRACTOR from responsibility for any deviations from the Contract Documents unless CONTRACTOR has in writing called ENGINEER'S attention to such deviation at the time of submission and ENGINEER has given written concurrence and approval to the specific deviation, nor shall any concurrence and approval by ENGINEER relieve CONTRACTOR from responsibility for errors or omissions in the Shop Drawings or Samples.

6.14 Continuing The Work:

A. CONTRACTOR shall carry on the Work and maintain 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 CONTRACTOR and OWNER may otherwise agree in writing.

6.15 Indemnification:

A. To the fullest extent permitted by law, CONTRACTOR shall indemnify and hold harmless OWNER and ENGINEER and their agents, employees and consultants from and against all claims, damages, losses and expenses including, but not limited to attorneys' fees arising out of or resulting from the performance of the Work, provided that any such claim, damage, loss or expense (1) is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself) including the loss of use resulting therefrom and (2) is caused in whole or in part by either (a) any negligent act or omission of CONTRACTOR, any Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable regardless of whether or not it is caused in part by a party indemnified hereunder, or (b) arises out of operation of law as a consequence of any act or omission of CONTRACTOR, any Subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, regardless of whether any of them has been negligent.

B. In any and all claims against OWNER or ENGINEER or any of their agents, employees or consultants by any employee of CONTRACTOR, any Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 6.15.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 Subcontractor under workers' or workmen's compensation acts, disability benefit acts or other employee benefit acts.

C. The obligations of CONTRACTOR under Paragraph 6.15.A shall not extend to the liability of ENGINEER, his agents, employees or consultants arising out of the ENGINEER'S preparation or approval of maps, Drawings, opinions, reports, surveys, Change Orders, designs or Specifications.

ARTICLE 7 - WORK BY OTHERS

7.1 OWNER may perform additional work related to the Project by himself, or have additional work performed by utility service companies, or let other direct contracts therefor which shall contain General Conditions similar to these. CONTRACTOR shall afford the utility service companies and the other contractors who are parties to such direct contracts (or OWNER, if OWNER is performing the additional work with OWNER'S employees) reasonable opportunity for the introduction and storage of materials and equipment and the execution of work, and shall properly connect and coordinate his Work with theirs.

7.2 If any part of CONTRACTOR'S Work depends for proper execution or results upon the work of any such other contractor or utility service company (or OWNER), CONTRACTOR shall inspect and promptly report to ENGINEER in writing any patent or apparent defects or deficiencies in such work that render it unsuitable for such proper execution and results. CONTRACTOR'S failure to so report shall constitute an acceptance of the other work as fit and proper for integration with CONTRACTOR'S Work except for latent defects and deficiencies in the other work.

7.3 CONTRACTOR shall do all cutting, fitting and patching of his Work that may be required to make its several parts come together properly and integrate with such other work. CONTRACTOR shall not endanger any work of others by cutting, excavating or otherwise altering their work and will only cut or alter their work with the written consent of ENGINEER and the others whose work will be affected.

7.4 If the performance of additional work by other contractors or utility service companies or OWNER was not noted in the Contract Documents, written notice thereof shall be given to CONTRACTOR prior to starting any such additional work. If CONTRACTOR believes that the performance of such additional work by OWNER or others involves additional expense or requires an extension of the Contract Time, CONTRACTOR may make a claim therefor as provided in Articles 11 and 12 provided that the CONTRACTOR will make no claim which is barred by the provisions of Paragraph 12.3.

ARTICLE 8 - OWNER'S RESPONSIBILITIES

8.1 OWNER shall issue all communications to CONTRACTOR through ENGINEER.

8.2 In case of termination of the employment of ENGINEER, OWNER shall appoint an engineer whose status under the Contract Documents shall be that of the former ENGINEER.

8.3 OWNER shall furnish the data required of OWNER under the Contract Documents promptly and shall make payments to CONTRACTOR promptly after they are due as provided in Paragraphs 14.4.A and 14.9.A.

8.4 OWNER'S duties in respect of providing lands and easements and providing engineering surveys to establish reference points are set

forth in Paragraphs 4.1.A and 4.4.A. Paragraph 4.2.A refers to OWNER'S identifying and making available to CONTRACTOR copies of reports of investigations and tests of subsurface and latent physical conditions at the site or those reports that otherwise may affect performance of the Work which have been utilized by ENGINEER in preparing the Drawings and Specifications.

8.5 OWNER'S responsibilities in respect of purchasing and maintaining insurance are set forth in Article 5.

8.6 In connection with OWNER'S rights to request changes in the Work in accordance with Article 10, OWNER (especially in certain instances as provided in Paragraph 10.4) is obligated to execute Change Orders.

8.7 OWNER'S responsibility in respect of certain inspections, tests and approvals is set forth in Paragraph 13.3.

8.8 In connection with OWNER'S right to stop Work or suspend Work, see Paragraphs 13.5.A and 15.1. Paragraph 15.2.A deals with OWNER'S right to terminate services of CONTRACTOR under some circumstances.

ARTICLE 9 - ENGINEER'S STATUS DURING CONSTRUCTION

9.1 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 and shall not be extended without written consent of OWNER and ENGINEER.

9.2 Visits to Site:

A. ENGINEER will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. ENGINEER may make visits to the site at intervals appropriate to the various stages of construction to observe the progress and quality of the executed Work and to determine, in general, if the Work is proceeding in accordance with the Contract Documents. On the basis of such visits and on-site observations, ENGINEER will inform OWNER of the progress of the Work and will endeavor to guard OWNER against defects and deficiencies in the Work.

9.3 Clarifications and Interpretations:

A. ENGINEER will issue with reasonable promptness such written clarifications or interpretations of the Contract Documents (in the form of Drawings or otherwise) as ENGINEER may determine necessary, which shall be consistent with or reasonably inferable from the overall intent of the Contract Documents. If CONTRACTOR believes that a written clarification or interpretation justifies an increase in the Contract Price or Contract Time, CONTRACTOR may make a claim therefor as provided in Articles 11 and 12.

9.4 Rejecting Defective Work:

A. ENGINEER will have authority to disapprove or reject Work which ENGINEER believes to be defective, and will also have authority to require special inspection or testing of the Work as provided in Article 13, whether or not the Work is fabricated, installed or completed.

9.5 Project Representation:

A. If OWNER and ENGINEER agree, ENGINEER will designate a Resident Project Representative to assist ENGINEER in observing the performance of the Work. The duties, responsibilities and limitations of authority of any such Resident Project Representative and assistants will be as provided in the Supplementary Conditions. If OWNER designates another agent to represent him at the site who is not ENGINEER'S agent or employee, the duties, responsibilities and limitations of authority of such other person will be as set forth in the Supplementary Conditions.

9.6 Decisions on Disagreements:

A. ENGINEER will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. Claims, disputes and other matters relating to the acceptability of the Work or the interpretation of the requirements of the Contract Documents pertaining to the execution and progress of the Work shall be referred initially to ENGINEER in writing with a request for a formal decision in accordance with this Paragraph, which ENGINEER will render in writing within a reasonable time. Written notice of each such claim, dispute and other matter shall be delivered by the claimant to ENGINEER and the other party to the Agreement within fifteen days of the occurrence of the event giving rise thereto, and written supporting data will be submitted to ENGINEER and the other party within forty-five days of such occurrence unless ENGINEER allows an additional period of time to ascertain more accurate data. In his capacity as interpreter and judge, 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.

B. The rendering of a decision by ENGINEER pursuant to Paragraph 9.6.A with respect to any such claim, dispute or other matter (except any which have been waived by the making or acceptance of final payment as provided in Paragraph 14.9) will be a condition precedent to any exercise by OWNER or CONTRACTOR of such rights or remedies as either may otherwise have under the Contract Documents or at law in respect of any such claim, dispute or other matter.

9.7 Limitations on Engineer's Responsibilities:

A. Neither ENGINEER'S authority to act under this Article 9 or elsewhere in the Contract Documents nor any decision made by ENGINEER in good faith either to exercise or not exercise such authority shall create, impose or give rise to any duty or responsibility owed by ENGINEER to CONTRACTOR, any Subcontractor, any manufacturer, fabricator, supplier or distributor, or organization, or to any surety for or employee or agent of any of them.

B. Whenever in the Contract Documents the terms "as ordered", "as directed", "as required", "as allowed", "as approved" or terms of like effect or import are used, or the adjectives "reasonable", "suitable", "acceptable", "proper", or "satisfactory" or adjectives of like effect or import are used to describe a requirement, direction, review or judgement of ENGINEER as to the Work, it is intended that such requirement, direction, review or judgement will be solely to evaluate the Work for compliance with the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective never indicates that ENGINEER shall have authority to supervise or direct performance of the Work or authority to undertake responsibility contrary to the provisions of Paragraphs 9.7.C and 9.7.D.

C. ENGINEER will not be responsible for CONTRACTOR'S means, methods, techniques, sequences or procedures of construction, or the safety precautions and programs incident thereto, and ENGINEER will not be responsible for CONTRACTOR'S failure to perform the Work in accordance with the Contract Documents.

D. ENGINEER will not be reponsible for the acts or omissions of CONTRACTOR or of any Subcontractors, or of the agents or employees of any CONTRACTOR or Subcontractor, or of any other persons at the site or otherwise performing any of the Work.

ARTICLE 10 - CHANGES IN THE WORK

10.1 Without invalidating the Agreement and without notice to any surety, OWNER may, at any time or from time to time, order additions, deletions or revisions in the Work; these will be authorized by Change Orders. Upon receipt of a Change Order, CONTRACTOR shall proceed with the Work involved. All such Work shall be executed under the applicable conditions of the Contract Documents. If any Change Order causes an increase or decrease in the Contract Price or an extension or shortening of the Contract Time, an equitable adjustment will be made as provided in Article 11 or Article 12 on the basis of a claim made by either party.

10.2 ENGINEER may authorize minor changes in the Work not involving an adjustment in the Contract Price or the Contract Time which are consistent with the overall intent of the Contract Documents. These may be accomplished by a Field Order and shall be binding on OWNER,

and also on CONTRACTOR who shall perform the change promptly. If CONTRACTOR believes that a Field Order justifies an increase in the Contract Price or Contract Time, CONTRACTOR may make a claim therefor as provided in Article 11 or Article 12.

10.3 Additional Work performed without authorization of a Change Order will not entitle CONTRACTOR to an increase in the Contract Price or an extension of the Contract Time, except as provided in Paragraphs 10.2, 13.4.B, and except in the case of an emergency as provided in Paragraph 6.12.

10.4 OWNER shall execute appropriate Change Orders prepared by ENGINEER covering changes in the Work which are required by OWNER, or required because of unforeseen physical conditions or emergencies, or because of uncovering Work found not to be defective, or as provided in Paragraphs 11.6 and 15.1, or because of any other claim of CONTRACTOR for a change in the Contract Time or the Contract Price which is recommended by ENGINEER.

10.5 If notice of any changes affecting the general scope of the Work or change in the Contract Price is required by the provisions of any Bond to be given to the surety, it will be CONTRACTOR'S responsibility to so notify the Surety, and the amount of each applicable Bond shall be adjusted accordingly. CONTRACTOR shall furnish proof of such adjustment to OWNER.

ARTICLE 11 - CHANGE OF CONTRACT PRICE

11.1 The Contract Price constitutes the total compensation (subject to authorized adjustments) payable to CONTRACTOR for performing the Work. All duties, responsibilities and obligations assigned to or undertaken by CONTRACTOR shall be at his expense without change in the Contract Price.

11.2 The Contract Price may only be changed by a Change Order. Any claim for an increase in the Contract Price shall be based on written notice delivered to OWNER and ENGINEER within fifteen days of the occurrence of the event giving rise to the claim. Notice of the amount of the claim with supporting data shall be delivered within forty-five days of such occurrence unless ENGINEER allows an additional period of time to ascertain accurate cost data. All claims for adjustment in the Contract Price shall be determined by ENGINEER if OWNER and CONTRACTOR cannot otherwise agree on the amount involved. Any change in the Contract Price resulting from any such claim shall be incorporated in a Change Order.

11.3 The value of any Work covered by a Change Order or of any claim for an increase or decrease in the Contract Price will be determined as follows:

A. 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.

B. Where the Work involved is not covered by unit prices contained in the Contract Documents, by mutual acceptance of a lump sum.

C. 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 11.3.B, on the basis of the Cost of the Work (determined as provided in Paragraph 11.4) plus a Contractor's Fee for overhead and profit (determined as provided in Paragraph 11.5).

D. Whenever the cost of any Work is to be determined pursuant to Paragraphs 11.4.A and 11.4.B, CONTRACTOR will submit in form acceptable to ENGINEER, an itemized cost breakdown together with supporting data.

11.4 Cost of the Work:

A. The term Cost of the Work means the sum of all costs necessarily incurred and paid by CONTRACTOR in the proper performance of the Work. 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 include only the following items and shall not include any of the costs itemized in Paragraph 11.4.B.

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. 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' or workmen's compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. Such employees shall include superintendents and foremen at the site. The expenses of performing Work after 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 manufacturers' 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 all 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 the Subcontractors for Work performed by Subcontractors. If required by OWNER, CONTRACTOR shall obtain competitive bids from Subcontractors acceptable to CONTRACTOR and shall deliver such bids to OWNER who will then determine, with the advice of ENGINEER, which bids will be accepted. If a 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 shall be determined in the same manner as CONTRACTOR'S Cost of the Work. All subcontracts shall be subject to the other provisions of the Contract Documents insofar as applicable.

4. Costs of special consultants (including, but not limited to, engineers, architects, testing laboratories, surveyors, lawyers 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 workmen, 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, installation, dismantling and removal thereof--all in accordance with 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, use or similar taxes related to the Work, and for which CONTRACTOR is liable, imposed by any governmental authority.
   e. Deposits lost for causes other than CONTRACTOR'S negligence, royalty payments and fees for permits and licenses.
   f. Losses and damages (and related expenses), not compensated by insurance or otherwise, to the Work or otherwise sustained by CONTRACTOR in connection with the execution of the Work, provided they 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. If, however, any such loss or damage requires reconstruction and CONTRACTOR is placed in charge thereof, CONTRACTOR shall be paid for services a fee proportionate to that stated in Paragraph 11.5.
   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, expressage and similar petty cash items in connection with the Work.

i. Cost of premiums for additional Bonds and insurance required because of changes in the Work.

B. The term Cost of the Work shall not include any of the following:
1. Payroll costs and other compensation of CONTRACTOR'S officers, executives, principals (of partnership and sole proprietorships), general managers, engineers, architects, estimators, lawyers, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks and other personnel employed by CONTRACTOR whether at the site or in his principal or a branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 11.4.A.1 - 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. Cost of premiums for all Bonds and for all insurance whether or not CONTRACTOR is required by the Contract Documents to purchase and maintain the same (except for additional Bonds and insurance required because of changes in the Work).
5. 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.
6. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 11.4.A.

11.5 Contractor's Fee:

A. The Contractor's Fee allowed to CONTRACTOR for overhead and profit shall be determined as follows:
1. A mutually acceptable fixed fee; or.
2. If a fixed fee cannot be 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 11.4.A.1 and 11.4.A.2, the Contractor's Fee shall not exceed a total of twenty percent (ten percent for overhead and ten percent for profit).
b. For costs incurred under Paragraph 11.4.A.3, the Contractor's Fee shall not exceed a total of five percent; and if a subcontract is on the basis of Cost of the Work Plus a Fee, the maximum allowable to the Subcontractor as a fee for overhead and profit shall not exceed a total of twenty percent.
c. No fee shall be payable on the basis of costs itemized under Paragraphs 11.4.A.4, 11.4.A.5 and 11.4.B.

d. The amount of credit to be allowed by CONTRACTOR to OWNER for any such change which results in a net decrease in cost, will be the amount of the net decrease plus a deduction in Contractor's Fee by an amount equal to ten percent of the net decrease.

e. 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 11.5.A.2.a through 11.5.A.2.d, inclusive.

11.6 Cash 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 done by such Subcontractors, manufacturers, fabricators, suppliers or distributors and for such sums within the limit of the allowances as may be acceptable to ENGINEER. Upon final payment, the Contract Price shall be adjusted as required and an appropriate Change Order issued. CONTRACTOR agrees that the original Contract Price includes such sums as CONTRACTOR deems proper for costs and profit on account of cash allowances. No demand for additional cost or profit in connection therewith will be allowed.

11.7 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 established unit prices for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.

ARTICLE 12 - CHANGE OF THE CONTRACT TIME

12.1 The Contract Time may only be changed by a Change Order. Any claim for an extension in the Contract Time shall be based on written notice delivered to OWNER and ENGINEER within fifteen days of the occurrence of the event giving rise to the claim. Notice of the extent of the claim with supporting data shall be delivered within forty-five days of such occurrence unless ENGINEER allows an additional period of time to ascertain more accurate data. All claims for adjustment in the Contract Time shall be determined by ENGINEER if OWNER and CONTRACTOR cannot otherwise agree. Any change in the Contract Time resulting from any such claim shall be incorporated in a Change Order.

12.2 The Contract Time will be extended in an amount equal to time lost due to delays beyond the control of CONTRACTOR if a claim is made therefor as provided in Paragraph 12.1. Such delays shall include, but not be limited to, acts or neglect by OWNER or others performing additional work as contemplated by Article 7, or to fires, floods, labor disputes, epidemics, abnormal weather conditions, or acts of God. No extension of the Contract Time will be granted where the

delay is attributable to a Subcontractor, manufacturer, fabricator, supplier or distributor or any other party performing services or furnishing material or equipment on behalf of the CONTRACTOR unless such party's delay is attributable to one of the above enumerated causes.

12.3 The time limits concerning Substantial Completion and final completion as stated in the Contract Documents are of the essence. The provisions of this Article 12 shall not exclude recovery for damages (including compensation for additional professional services) for delay by either party, provided, however that CONTRACTOR shall not be entitled to damages for any delay occurring as a consequence of a delay in additional work being performed by others pursuant to Paragraph 7.1 hereof if the performance of said additional work was noted in the Contract Documents and the delay (by others) was not directly caused by the fault of OWNER.

ARTICLE 13 - WARRANTY AND GUARANTEE; TESTS AND INSPECTION; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

13.1 Warranty and Guarantee:

A. CONTRACTOR warrants and guarantees to OWNER and ENGINEER that all Work will be in accordance with the Contract Documents and will not be defective. Prompt notice of all defects shall be given to CONTRACTOR. All defective Work, whether or not in place, may be rejected or corrected as provided in this Article 13.

13.2 Access to Work:

A. ENGINEER and ENGINEER'S representatives, other representatives and personnel of OWNER, testing agencies and governmental agencies with jurisdictional interests will have access to 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 site safety procedures and programs so that they may comply therewith as applicable.

13.3 Tests and Inspections:

A. CONTRACTOR shall give ENGINEER timely notice of readiness of the Work for all required inspections, tests or approvals.

B. If any law, ordinance, rule, regulation, code, or orders of any public body having jurisdiction requires any Work (or part thereof) to specifically be inspected, tested or approved, CONTRACTOR (unless another party is specified in the General Requirements) shall assume full responsibility therefor, pay all costs in connection therewith and furnish ENGINEER the required certificates of inspection, testing or approval. CONTRACTOR shall also be responsible for and shall pay all costs in connection with any inspection or testing required by the Specifications in connection with OWNER'S or ENGINEER'S

acceptance of a manufacturer, fabricator, supplier or distributor of materials or equipment proposed to be incorporated in the Work, or of materials or equipment submitted for approval prior to CONTRACTOR'S purchase thereof for incorporation in the Work. The cost of all other inspections, tests and approvals required by the Contract Documents shall be paid by OWNER (unless otherwise specified).

C. All inspections, tests or approvals other than those required by law, ordinance, rule, regulation, code or order of any public body having jurisdiction shall be performed by organizations acceptable to OWNER (or by ENGINEER if so specified).

D. If any Work that is to be inspected, tested or approved is covered without written concurrence of ENGINEER, it must, if requested by ENGINEER, be uncovered for observation. Such uncovering shall be at CONTRACTOR'S expense unless CONTRACTOR has given ENGINEER timely notice of CONTRACTOR'S intention to cover such Work and ENGINEER has not acted with reasonable promptness in response to such notice.

E. Neither observations by ENGINEER nor inspections, tests or approvals by others shall relieve CONTRACTOR from his obligations to perform the Work in accordance with the Contract Documents.

13.4 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. If it is found that such Work is defective, CONTRACTOR shall bear all the expenses of such uncovering, exposure, observation, inspection and testing and of satisfactory reconstruction, including compensation for additional professional services, and an appropriate deductive Change Order shall be issued. If, however, such Work is not found to be defective, CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to such uncovering, exposure, observation, inspection, testing and reconstruction if he makes a claim therefor as provided in Articles 11 and 12.

13.5 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 finish or 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 or any other party.

13.6 Correction or Removal of Defective Work:

A. If required by ENGINEER, CONTRACTOR shall promptly, without cost to OWNER and as specified by ENGINEER, either correct any defective Work, whether or not fabricated, installed or completed, or, if the Work has been rejected by ENGINEER, remove it from the site and replace it with nondefective Work.

13.7 One Year Correction Period:

A. If, within one year after the date of Substantial Completion or such longer period of time as may be prescribed by law or 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, CONTRACTOR shall promptly, without cost to OWNER and in accordance with OWNER'S written instructions, either correct such defective Work, or, if it has been rejected by OWNER, remove it from the site and replace it with nondefective Work. If CONTRACTOR does not promptly comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, OWNER may have the defective Work corrected or the rejected Work removed and replaced, and all direct and indirect costs of such removal and replacement, including compensation for additional professional services, shall be paid by CONTRACTOR.

13.8 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, also ENGINEER) prefers to accept it, OWNER may do so. In such case, if acceptance occurs prior to ENGINEER'S recommendation of final payment, a Change Order shall be issued incorporating the necessary revisions in the Contract Documents, including appropriate reduction in the Contract Price; or, if the acceptance occurs after such recommendation, an appropriate amount shall be paid by CONTRACTOR to OWNER.

B. OWNER may require CONTRACTOR to furnish, at CONTRACTOR'S expense, a special performance guarantee or other surety prior to acceptance of defective Work.

13.9 Owner May Correct Defective Work:

A. If CONTRACTOR fails within a reasonable time after written notice of ENGINEER to proceed to correct and to correct defective Work or to remove and replace rejected Work as required by ENGINEER in accordance with Paragraph 13.6, or if CONTRACTOR fails to perform the Work in accordance with the Contract Documents

(including any requirements of the progress schedule), OWNER may, after seven days' written notice to CONTRACTOR, correct and remedy any such deficiency. In exercising his rights under this Paragraph, OWNER shall proceed expeditiously. To the extent necessary to complete corrective and 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 such access to the site as may be necessary to enable OWNER to exercise his rights under this Paragraph. All direct and indirect costs of OWNER in exercising such rights shall be charged against CONTRACTOR in an amount verified by ENGINEER, and a Change Order shall be issued incorporating the necessary revisions in the Contract Documents and a reduction in the Contract Price. Such direct and indirect costs shall include, in particular but without limitation, compensation for additional professional services required and all costs of repair and replacement of work of others destroyed or damaged by correction, removal or replacement of CONTRACTOR'S defective Work. CONTRACTOR shall not be allowed an extension of the Contract Time because of any delay in his performance of the Work attributable to the exercise by OWNER of OWNER'S rights hereunder.

ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION

14.1 Schedules:

A. At least twenty days prior to submitting the first application for a progress payment, CONTRACTOR shall (except as otherwise specified in the General Requirements) submit to ENGINEER a progress schedule, a final schedule of Shop Drawings submission and where applicable, a schedule of values of the Work. These schedules shall be satisfactory in form and substance to ENGINEER. The schedule of values shall include quantities and unit prices aggregating the Contract Price, and shall subdivide the Work into component parts in sufficient detail to serve as the basis for progress payments during construction. Upon acceptance of the schedule of values by ENGINEER, it shall be incorporated into a form of Application for Payment acceptable to ENGINEER.

14.2 Application for Progress Payment:

A. At least ten days before each application for a progress payment falls due (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

and also as ENGINEER may reasonably require. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the site or at another location agreed to in writing, the Application for Payment shall also be accompanied by such data, satisfactory to OWNER, as will establish OWNER'S title to the material and equipment and protect OWNER'S interest therein, including applicable insurance. Each subsequent Application for Payment shall include an affidavit of CONTRACTOR stating that all previous progress payments received on account of the Work have been applied to discharge in full all of CONTRACTOR'S obligations reflected in prior Applications for Payment. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

14.3 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 at the time of payment free and clear of all liens, claims, security interests and encumbrances (hereafter in these General Conditions referred to as "Liens").

14.4 Review of Applications for Progress Payments:

A. ENGINEER will, within ten days after receipt of each Application for Payment, either indicate in writing his 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. OWNER shall, within thirty days of presentation to him of the Application for Payment with ENGINEER's recommendation, pay CONTRACTOR the amount recommended.

B. ENGINEER'S recommendation of any payment requested in an Application for Payment will constitute a representation by ENGINEER to OWNER, based on ENGINEER'S on-site observations of the Work in progress as an experienced and qualified design professional and on ENGINEER'S review of the Application for Payment and the accompanying data and schedules that the Work has progressed to the point indicated; that, to the best of ENGINEER'S knowledge, information and belief, the quality of the Work is in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning Project upon Substantial Completion, to the results of any subsequent tests called for in the Contract Documents and any qualifications stated in the recommendation); and that CONTRACTOR is entitled to payment of the amount recommended. However, by recommending any such payment ENGINEER will not thereby be deemed to have represented that exhaustive or continuous on-site inspections have been made to check the quality or the quantity of the Work, or that the means, methods, techniques, sequences, and procedures of construction have been reviewed, or that any examination has been

made to ascertain how or for what purpose CONTRACTOR has used the moneys paid or to be paid to CONTRACTOR on account of the Contract Price, or that title to any Work, materials or equipment has passed to OWNER free and clear of any Liens.

C. ENGINEER'S recommendation of final payment will constitute an additional representation by ENGINEER to OWNER that the conditions precedent to CONTRACTOR'S being entitled to final payment as set forth in Paragraph 14.9 have been fulfilled.

D. ENGINEER may refuse to recommend the whole or any part of any payment if, in ENGINEER'S opinion, it would be incorrect to make such representations to OWNER. ENGINEER may also refuse to recommend any such payment, or, because of subsequently discovered evidence or the results of subsequent inspections or tests, nullify any such payment previously recommended, to such extent as may be necessary in ENGINEER'S opinion to protect OWNER from loss because:
   1. The Work is defective, or completed Work has been damaged requiring correction or replacement,
   2. Written claims have been made against OWNER or Liens have been filed in connection with the Work,
   3. The Contract Price has been reduced because of Modifications,
   4. OWNER has been required to correct defective Work or complete the Work in accordance with Paragraph 13.9,
   5. Of CONTRACTOR'S unsatisfactory prosecution of the Work in accordance with the Contract Documents, or
   6. CONTRACTOR'S failure to make payment to Subcontractors for labor, materials or equipment.

14.5 Substantial Completion:

A. When CONTRACTOR considers the entire Work ready for its intended use, CONTRACTOR shall, in writing to OWNER and ENGINEER, certify that the entire Work is substantially complete and request that ENGINEER issue a certificate of Substantial Completion. Within a reasonable time thereafter, 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 his reasons therefor. If ENGINEER considers the Work substantially complete, ENGINEER will prepare and 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 OWNER may 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 fourteen days after submission of the tentative certificate to OWNER notify CONTRACTOR in writing, stating his reasons therefor. If, after consideration of OWNER'S objections, ENGINEER considers the Work substantially complete, ENGINEER will within said fourteen 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. 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, maintenance, heat, utilities and insurance. Unless OWNER and CONTRACTOR agree otherwise in writing and so inform ENGINEER prior to his issuing the definitive certificate of Substantial Completion ENGINEER'S aforesaid recommendation will be binding on OWNER and CONTRACTOR until final payment.

B. OWNER shall have the right to exclude CONTRACTOR from the Work after the date of Substantial Completion, but OWNER shall allow CONTRACTOR reasonable access to complete or correct items on the tentative list.

14.6 Partial Utilization:

A. Use by OWNER of completed portions of the Work may be accomplished prior to Substantial Completion of all the Work subject to the following:

1. OWNER at any time may request CONTRACTOR in writing to permit OWNER to use any part of the Work which OWNER believes to be substantially complete and which may be used without significant interference with construction of the other parts of the Work. If CONTRACTOR agrees, CONTRACTOR will certify to OWNER and ENGINEER that said part of the Work is substantially complete and request ENGINEER to issue a certificate of Substantial Completion for that part of the Work. Within a reasonable time thereafter 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 his reason therefor. If ENGINEER considers that part of the Work to be substantially complete, ENGINEER will execute and deliver to OWNER and CONTRACTOR a certificate to that effect, fixing the date of Substantial Completion as to that part of the Work, attaching thereto a tentative list of items to be completed or corrected before final payment. Prior to issuing a certificate of Substantial Completion as to part of the Work, ENGINEER will deliver to OWNER and CONTRACTOR a written recommendation as to the division of responsibilities pending final payment between OWNER and CONTRACTOR, with respect to security, operation, safety, maintenance, utilities and insurance for that part of the Work which shall become binding upon OWNER and CONTRACTOR at the time of issuing the definitive certificate of Substantial Completion as to that part of the Work, unless OWNER and CONTRACTOR shall have otherwise agreed in writing and so informed ENGINEER. OWNER shall have the right to

exclude CONTRACTOR from any part of the Work which ENGINEER has so certified to be substantially complete, but OWNER shall allow CONTRACTOR reasonable access to complete or correct items on the tentative list.

2. In lieu of the issuance of a Certificate of Substantial Completion as to part of the Work, OWNER may take over operation of a facility constituting part of the Work whether or not it is substantially complete if such facility is functionally and separately useable; provided that prior to any such take over, OWNER and CONTRACTOR have agreed as to the division of responsibilities between OWNER and CONTRACTOR for security, operation, safety, maintenance, correction period, heat, utilities and insurance with respect to such facility.
3. No occupancy of part of the Work or taking over of operations of a facility will be accomplished prior to compliance with the requirements of Paragraph 5.8, in respect of property insurance.

14.7 Final Inspection:

A. Upon written notice from CONTRACTOR that the Work is complete, ENGINEER will 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 remedy such deficiencies.

14.8 Final Application for Payment:

A. After CONTRACTOR has completed all such corrections to the satisfaction of ENGINEER and delivered all maintenance and operating instructions, schedules, guarantees, Bonds, certificates or other evidence of insurance required by Paragraph 5.2.B, certificates of inspection, marked up record documents, and other documents -- all as required by the Contract Documents, and after ENGINEER has indicated that the Work is acceptable (subject to the provisions of Paragraph 14.10) CONTRACTOR may make application for final payment following the procedure for progress payments. The final Application for Payment shall be accompanied by: 1) all documentation called for in the Contract Documents, 2) consent of the surety, if any, to final payment, and 3) complete and legally effective releases or waivers (satisfactory to OWNER) of all Liens arising out of or filed in connection with the Work. In lieu of such releases or waivers of Liens and as approved by OWNER, CONTRACTOR may furnish receipts or releases in full and an affidavit of CONTRACTOR that: 1) the releases and receipts include all labor, services, material and equipment for which a Lien could be filed, and 2) that all payrolls, material and equipment bills, and other indebtedness connected with the Work for which OWNER or OWNER'S property might in any way be responsible, have been paid or otherwise satisfied. If any Subcontractor, manufacturer, fabricator, supplier or distributor fails to furnish a release or receipt in full, CONTRACTOR may furnish a Bond or other

collateral satisfactory to OWNER to indemnify OWNER against any Lien.

14.9 Final Payment and Acceptance:

A. 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 -- all as required by the Contract Documents, ENGINEER is satisfied that the Work has been completed and CONTRACTOR has fulfilled all of his obligations under the Contract Documents, ENGINEER will, within ten days after receipt of the final Application for Payment, indicate in writing his recommendation of payment and present the Application to OWNER for payment. Thereupon ENGINEER will give written notice to OWNER and CONTRACTOR that the Work is acceptable subject to the provisions of Paragraph 14.11. Otherwise, ENGINEER will return the Application 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. If the Application and accompanying documentation are appropriate as to form and substance, OWNER shall, within thirty days after receipt thereof, pay CONTRACTOR the amount recommended by ENGINEER.

B. If, through no fault of CONTRACTOR, final completion is materially delayed and if ENGINEER so confirms, OWNER shall, upon receipt of CONTRACTOR'S final Application for Payment and recommendation of ENGINEER, and without terminating the Agreement, 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 5.1, 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 his 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.

14.10 Contractor's Continuing Obligation:

A. CONTRACTOR'S obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. Neither recommendation of any progress or final payment by ENGINEER, nor the issuance of a certificate of Substantial Completion, nor any payment by OWNER to CONTRACTOR under the Contract Documents, nor any use or occupancy of the Work or any part thereof by OWNER, nor any act of acceptance by OWNER nor any failure to do so, nor the issuance of a notice of acceptability by ENGINEER pursuant to Paragraph 14.9, nor any correction of defective Work by OWNER shall constitute an acceptance of Work not in accordance with the Contract Documents or a release of

CONTRACTOR'S obligation to perform the Work in accordance with the Contract Documents.

14.11 Waiver of Claims:

A. The making and acceptance of final payment shall 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 14.7.A or from failure to comply with the Contract Documents or the terms of any special guarantees specified therein; however it shall not constitute a waiver by the OWNER of any rights in respect of 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 writing and still unsettled.

ARTICLE 15 - SUSPENSION OF WORK AND TERMINATION

15.1 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 ninety 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 allowed an adjustment in the Contract Price or an extension of the Contract Time, or both, directly attributable to any suspension if CONTRACTOR makes a claim therefor as provided in Articles 11 and 12.

15.2 Owner May Terminate:

A. Upon the occurrence of any one or more of the following events:
   1. If CONTRACTOR is adjudged a bankrupt or insolvent,
   2. If CONTRACTOR makes a general assignment for the benefit of creditors,
   3. If a trustee or receiver is appointed for CONTRACTOR or for any of CONTRACTOR'S property,
   4. If CONTRACTOR files a petition to take advantage of any debtor's act, or to reorganize under the bankruptcy or similar laws,
   5. If CONTRACTOR persistently fails 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 2.5 as revised from time to time),
   6. If CONTRACTOR repeatedly fails to make prompt payments to Subcontractors or for labor, materials or equipment,
   7. If CONTRACTOR disregards laws, ordinances, rules, regulations or orders of any public body having jurisdiction,
   8. If CONTRACTOR disregards the authority of ENGINEER, or
   9. If CONTRACTOR otherwise violates in any substantial way any provisions of the Contract Documents,

OWNER may after giving CONTRACTOR (and the surety, if any) seven days' written notice, terminate the services of CONTRACTOR, 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), 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 finish the Work as OWNER may deem expedient. In such case CONTRACTOR shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the Contract Price exceeds the direct, indirect and consequential costs of completing the Work, including compensation for additional professional services, such excess shall be paid to CONTRACTOR. If such costs exceed such unpaid balance, CONTRACTOR shall pay the difference to OWNER. Such costs incurred by OWNER will be reviewed by ENGINEER as to their reasonableness and when so approved by ENGINEER incorporated in a Change Order, provided that when exercising any rights or remedies under this Paragraph OWNER shall not be required to obtain the lowest price for the Work performed.

B. Where CONTRACTOR'S services have been so terminated by OWNER, the termination shall 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.

C. Upon seven days' written notice to CONTRACTOR and ENGINEER, OWNER may, without cause and without prejudice to any other right or remedy of OWNER, elect to terminate the Agreement. In such case, CONTRACTOR shall be paid (without duplication of any items):
   1. For completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;
   2. For 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. For amounts paid in settlement of terminated contracts with Subcontractors, manufacturers, fabricators, suppliers or distributors and others (including but not limited to fees and charges of engineers, architects, attorneys and other professionals and court and arbitration or other dispute resolution costs incurred in connection with termination of contracts with Subcontractors and manufacturers, fabricators, suppliers or distributors); and
   4. For reasonable expenses directly attributable to termination.

   CONTRACTOR shall not be paid on account of loss of anticipated profits or revenue or other economic loss or any consequential damages arising out of such termination.

15.3 Contractor May Stop Work or Terminate:

A. If, through no act or fault of CONTRACTOR, the Work is suspended for a period of more than ninety days by OWNER or under an order of court or other public authority, or ENGINEER fails to act on any Application for Payment within thirty days after it is submitted or OWNER fails for thirty 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 Agreement and recover from OWNER payment on the same terms as provided in Paragraph 15.2.C. In lieu of terminating the Agreement and without prejudice to any other right or remedy, if ENGINEER has failed to act on an Application for Payment within thirty days after it is submitted, or OWNER has failed for thirty days to pay CONTRACTOR any sum finally determined to be due, CONTRACTOR may upon seven days' written notice to OWNER and ENGINEER stop the Work until payment of all such amounts due CONTRACTOR, including interest thereon. The provisions of this paragraph are not intended to preclude CONTRACTOR from making claim under Articles 11 and 12 for an increase in Contract Price or Contract Time or otherwise for expenses or damage directly attributable to CONTRACTORS stopping Work as permitted by this paragraph.

ARTICLE 16 - DISPUTE RESOLUTION

16.1 Unless otherwise provided in the Supplementary Conditions, all claims, disputes and other matters in question between OWNER and CONTRACTOR arising out of, or relating to the Contract Documents or the breach thereof, except for claims which have been waived by the making or acceptance of final payment as provided by Paragraph 14.11, shall be decided by the courts of the jurisdiction in which the Project is located.

16.2 In the case of any dispute that is required to be referred to ENGINEER initially for decision in accordance with Paragraph 9.6, no legal proceeding shall be instituted prior to the earlier of (a) the date on which ENGINEER has rendered a decision, or (b) the tenth day after the parties have presented their evidence to ENGINEER; and no proceeding with respect to such dispute shall be made later than thirty days after the date on which ENGINEER has rendered a written decision in respect thereof.

ARTICLE 17 - MISCELLANEOUS

17.1 Giving Notice:

A. Whenever any provision of the Contract Documents requires the giving of written notice it shall be deemed to have been validly given if 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 if delivered at or sent by registered or certified

mail, postage prepaid, to the last business address known to the giver of notice.

17.2 Computation of Time:

A. When any period of time is referred to in the Contract Documents by days, it shall 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 shall be omitted from the computation.

17.3 Notice of Claim:

A. Should OWNER or CONTRACTOR suffer injury or damage to his person or property because of any error, omission or act of the other party or of any of the other party's employees or agents or others for whose acts the other party is legally liable, claim shall be made in writing to the other party within a reasonable time of the first observance of such injury or damage. The provisions of this paragraph shall not be construed as a substitute for or a waiver of the provisions of any applicable statute of limitations or repose.

B. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto, and, in particular but without limitation, the warranties, guarantees and obligations imposed upon CONTRACTOR, by Paragraphs 6.15, 13.1, 13.6, 13.9, 14.3 and 15.2 and all of the rights and remedies available to OWNER and ENGINEER thereunder, 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 law or contract, by special warranty or guarantee or by other provisions of the Contract Documents, and 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. All representations, warranties and guarantees made in the Contract Documents shall survive final payment and termination or completion of this Agreement.

17.4 Headings:

A. The Article and Paragraph headings are inserted for convenience only and do not constitute part of these General Conditions.

SUPPLEMENTARY CONDITIONS

(These Supplementary Conditions amend or supplement the General Conditions and other provisions of the Contract Documents as indicated below. All provisions which are not so amended or supplemented remain in full force and effect.)

TABLE OF ARTICLES

ARTICLE SC-1 - DEFINITIONS

SC-1.1 The terms used in these Supplementary Conditions which are defined in the General Conditions have the meanings assigned to them in the General Conditions.

Add additional definitions following Paragraph 1.1.A.34 as follows:

35. **Written Notice:** Any notice to any party of the Agreement relative to any part of this Agreement in writing and considered delivered and the service thereof completed, when posted by certified or registered mail to the said party at his last given address, or delivered in person to said party or his authorized representative on the Work. All required notices to OWNER shall be delivered to: Malcolm Pirnie, Inc., 7481 Henry Clay Boulevard, Liverpool, New York 13088, Attn: Stephen J. Darcangelo.
36. **Supplier:** Any person or organization who supplied materials or equipment for the Work, including that fabricated to a special design, but who does not perform labor at the site.
37. **On-Site Personnel:** OWNER, CONTRACTOR, Subcontractors, and ENGINEER, as well as all employees/agents of these parties who enter the site.
38. **Visitor:** All personnel on the site except On-site Personnel as defined above.
39. **Site:** The Columbia Mills Sewer Decommissioning project located on Route 48 in the Town of Minetto, New York.
40. **Work Area:** Area where Work is being performed.
41. **OWNER:** For purposes of this document, the Columbia Mills, Inc. is defined as the OWNER for contract purposes. The Columbia Mills, Inc. is obligated to perform the work of this contract under terms of an Order on Consent with the New York State Department of Environmental Conservation.

The Columbia Mills Inc. does not acknowlege Ownership of the real property upon which the work is to be performed but has written

permission from other parties to carry out any work required to conform with the Order on Consent.

ARTICLE SC-4 - AVAILABILITY OF LANDS; PHYSICAL CONDITIONS; REFERENCE POINTS

SC-4.2 Physical Conditions - Investigations and Reports:

Add new paragraphs immediately after paragraph 4.2.A of the General Conditions, which are to read as follows:

B. In the preparation of Drawings and Specifications, ENGINEER has relied upon:
   1. Subsurface data as included in the Remedial Investigation Report, Volume I, prepared by Malcolm Pirnie, Inc., submitted October 1990, revised October 1991. This data is not guaranteed as to accuracy or completeness, nor are they a part of the Contract Documents.
      a. The data listed above are available for inspection at the office of Malcolm Pirnie, Inc., 7481 Henry Clay Boulevard, Liverpool, New York 13088. Each prospective Bidder who examines the results, data, reports, and samples shall be required to sign on a sheet and give his name, and the name and address of the company he represents.
      b. Bidders are cautioned that the above-listed subsurface data have been utilized for general design purposes only and may be inadequate for the purpose of preparing a Bid. Where estimated quantities are shown in the Bid Form, such estimates are solely for the purpose of comparing Bids and are not intended to constitute an explicit or implicit representation as to the nature of the materials which may be encountered below the surface of the ground. The making available of these subsurface data to Bidders is not intended to relieve them from their responsibility to familiarize themselves with the subsurface conditions in accordance with the requirements of Article 6 of the Instructions to Bidders.

ARTICLE SC-5 - BONDS AND INSURANCE

SC-5.2 CONTRACTOR's Liability Insurance:

Add a new Paragraph immediately after Paragraph 5.2.B of the General Conditions, to read as follows:

C. The limits of liability for the insurance required by Paragraph 5.2 of the General Conditions shall provide coverage for not less than the following amounts, or greater where required by law:
   1. For Workers' Compensation, etc. under Paragraphs 5.2.A.1 and 5.2.A.2 of the General Conditions:
      a. Applicable Federal or State: Statutory
      b. Employer's Liability: Statutory
   2. For Comprehensive General Liability under Paragraphs 5.2.A.3 through 5.2.A.5 and Paragraph 5.2.A.7 of the General Conditions (including Premises-Operations, Independent CONTRACTOR's

Protection, Products and Completed Operations, Broad Form Property Damage, Contractual Liability):

a. Bodily Injury:
   $1,000,000 Each Occurrence
   $1,000,000 Annual Aggregate
   Property Damage:
   $1,000,000 Each Occurrence
   $1,000,000 Annual Aggregate
   Or Combined Single Limit of $1,000,000

b. Property Damage liability insurance shall provide Explosion, Collapse and Underground coverages.

3. For Comprehensive Automobile Liability under Paragraph 5.2.A.6 of the General Conditions:

a. Bodily Injury:
   $1,000,000 Each Person
   $1,000,000 Each Accident
   Property Damage:
   $1,000,000 Each Occurrence
   Or Combined Single Limit of $1,000,000

ARTICLE SC-6 - CONTRACTOR'S RESPONSIBILITIES

SC-6.8 Taxes

This project does not qualify as a capitol improvement project and to the Engineers knowledge does not constitute an undertaking that is exempt from sales tax levied by the State of New York. CONTRACTOR shall pay all sales taxes and include cost of such sales taxes in his bid.

ARTICLE SC-9 - ENGINEER'S STATUS DURING CONSTRUCTION

SC-9.5 Project Representation:

Add a new Paragraph immediately after Paragraph 9.5.A, which is to read as follows:

B. Resident Project Representative (RPR) is ENGINEER'S 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 on-site Work shall in general be with ENGINEER and CONTRACTOR keeping OWNER advised as necessary. RPR's dealings with Subcontractors shall only be through or with the full knowledge and approval of CONTRACTOR. RPR shall generally communicate with OWNER with the knowledge of and under the direction of ENGINEER.

1. Duties and Responsibilities to RPR:

a. 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.

b. 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.

c. Liaison:
   1) Serve as ENGINEER'S liaison with CONTRACTOR, working principally through CONTRACTOR'S superintendent and assist in understanding the intent of the Contract Documents; and assist ENGINEER in serving as OWNER'S liaison with CONTRACTOR when CONTRACTOR'S operations affect OWNER'S on-site operations.
   2) Assist in obtaining from owner additional details or information, when required for proper execution of the Work.

d. Shop Drawings and Samples:
   1) Record date of receipt of Shop Drawings and Samples, which are received at the site.
   2) Receive Samples which are furnished at the site by CONTRACTOR, and notify ENGINEER of availability of Samples for examination.
   3) Advise ENGINEER and CONTRACTOR of the commencement of any Work requiring a Shop Drawing or Sample if the submittal has not been approved by ENGINEER.

e. Review of Work, Rejection of Defective Work, Inspections and Tests:
   1) Conduct on-site observations of the Work in progress to assist ENGINEER in determining if the Work is in general proceeding in accordance with the Contract Documents.
   2) Report to ENGINEER whenever RPR believes that any Work is unsatisfactory, faulty or defective or does not conform to 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 Work that RPR believes should be corrected or rejected or should be uncovered for observation, or requires special testing, inspection or approval.
   3) Verify that tests, equipment and systems startups and operating and maintenance training are conducted in the presence of appropriate personnel, and that CONTRACTOR maintains adequate records thereof; and observe, record and report to ENGINEER appropriate details relative to the test procedures and startups.
   4) Accompany visiting inspectors representing public or other agencies having jurisdiction over the Project, record the results of these inspections and report to ENGINEER.

f. 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.

g. Modifications: Consider and evaluate CONTRACTOR'S suggestions for modifications in Drawings or Specifications and report with RPR's recommendations to ENGINEER. Transmit to CONTRACTOR decisions as issued by ENGINEER.

h. Records:
   1) Maintain at the job site orderly files for correspondence, reports of job conferences, Shop Drawings and Samples, and reproductions of original Contract Documents including all Addenda, Change Orders, Field Orders,

additional Drawings issued subsequent to the execution of the Agreement. ENGINEER'S clarifications and interpretations of the Contract Documents, progress reports, and other Project related documents.

2) Keep a record, recording CONTRACTOR hours on the job site, weather conditions, data relative to questions on Change Orders or changed conditions, list of job site visitors, daily activities, decisions, observations in general, and specific observations in more detail as in the case of observing test procedures; and send copies to ENGINEER.

3) Record names, addresses and telephone numbers of all CONTRACTORS, subcontractors and major suppliers of materials and equipment.

i. Reports:

1) Furnish 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.

2) Consult with ENGINEER in advance of scheduled major tests, inspections or start of important phases of the Work.

3) Draft proposed Change Orders, obtaining backup material from CONTRACTOR and recommend to ENGINEER Change Orders and Field Orders.

4) Report immediately to ENGINEER and OWNER upon the occurrence of any accident.

j. Payment Requests: Review applications for payment with CONTRACTOR for compliance with the established procedure for their submission and submit 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.

k. Certificates, Maintenance and Operation Manuals: During the course of the Work, verify that certificates, maintenance and operation manuals and other data required to be assembled and furnished by CONTRACTOR are applicable to the items actually installed and in accordance with the Contract Documents, and have this material delivered to ENGINEER for review and forwarding to OWNER prior to final payment for the Work.

l. Completion:

1) Before ENGINEER issues a Certificate of Substantial Completion, submit to CONTRACTOR a list of observed items requiring completion or correction.

2) Conduct final inspection in the company of ENGINEER, OWNER and CONTRACTOR and prepare a final list of items to be completed or corrected.

3) Observe that all items on final list have been completed or corrected and make recommendations to ENGINEER concerning acceptance.

2. Limitations of Authority of RPR:

RPR shall not:

a. Authorize any deviation from the Contract Documents or substitution of materials or equipment, unless authorized by ENGINEER and OWNER.
b. Exceed limitations of ENGINEER'S authority as set forth in the Agreement or the Contract Documents.
c. Undertake any of the responsibilities of CONTRACTOR, subcontractors or CONTRACTOR'S superintendent.
d. Advise on, issue directions relative to or assume control over any aspect of the means, methods, techniques, sequences or procedures of construction unless such advice or directions are specifically required by the Contract Documents.
e. Advise on, issue directions regarding or assume control over safety precautions and programs in connection with the Work.
f. Accept Shop Drawing or Sample submittals from anyone other than CONTRACTOR.
g. Authorize OWNER to occupy the Project in whole or in part.
h. Participate in specialized field or laboratory tests or inspections conducted by others except as specifically authorized by ENGINEER.

ARTICLE SC-18 - STATUTORY REQUIREMENTS

SC-18.1 This Article contains portions of certain laws and regulations which, by provision of law, ordinance, rule or regulation, are required to be included in the Contract Documents. The material included in this Article may not be complete or current. CONTRACTOR'S obligation to comply with all laws, ordinances, rules and regulations applicable to the Work is set forth in Paragraph 6.7.A. of the General Conditions.

SC-18.2 Non-Discrimination in Employment:

A. During the performance of this contract, CONTRACTOR agrees as follows:
1. CONTRACTOR will not discriminate against any employee or applicant for employment because of race, creed, color, or national origin, and will take affirmative action to insure that they are afforded equal employment opportunities without discrimation because of race, creed, color or national origin. Such action shall be taken with reference but not limited to: recruitment, employment, job assignment, promotion, upgrading, demotion, transfer, layoff or termination, rates of pay or other forms of compensation, and selection for training or retraining, including apprenticeship and on-the-job training.

SC-18.3 Compliance With Laws:

A. The CONTRACTOR shall abide by all local and State Laws or ordinances to the extend that such requirements do not conflict with Federal laws or regulations.

B. It is further understood and agreed between the parties that each and every other provision of law and clause required by law to be

inserted in this Contract shall be deemed to be inserted herein and that this Contract shall be read and enforced as though the same were included herein.

SC-18.4 Safety and Health Regulations:

A. The CONTRACTOR shall perform all Work in accordance with all applicable Federal, State and local safety and health regulations, including 29 CFR, Part 1926 ("Safety and Health Regulations for Construction," Occupational Safety and Health Administration), and 29 CFR, Part 1910 ("Safety and Health Regulations for General Industry").

B. The CONTRACTOR shall also perform all work in accordance with Hazardous Waste Site Regulations 40 CFR Part 1920 and as outlined in Section 1A5, Special Construction Conditions.

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SECTION 1A1

SUMMARY OF WORK

PART 1 - GENERAL

1.1 LOCATION AND SCOPE OF WORK

A. The Work consists of the construction of approximately 160 linear feet of a eighteen-inch diameter ductile iron pipe gravity sewer interceptor line. Included, but not limited to, are all manholes, storm drainage, dewatering operation, pipe, valves and all other appurtenances and related work required for this installation. Also included is the installation of approximately 17 cubic yards of drainage material (rip-rap) conveying the system flow from this new pipe to Benson Creek as shown.

The excavation and removal of Sewer System #1. This system is approximately 500 feet long with an average burial depth of three feet. The soil will be excavated and segregated as outlined in Section 20A1. Also included is the high pressure cleaning and plugging of the remaining section of System 1 located beneath the concrete pad.

The high pressure cleaning and plugging of Sewer Systems # 2A, 2B and 4. The rinsate generated during the cleaning operations will be placed and stored on-site in dewatering pits supplied by the Owner. Estimated rinsate quantities are given in the technical specifications. Collected sedimentary materials will also be placed in dewatering pits and then in roll-off containers. Estimated quantities of sediment is included in the technical specifications.

The cleaning and grouting of Sewer System #3 and placement of removed sedimentary materials in roll-off containers. Estimated quantities of sediment and rinsate is included in the technical specifications.

The removal and disposal of two underground septic tanks and connecting piping as outlined in the technical specifications.

The dredging of approximately 230 cubic yards of material from Benson Creek and the transporting of this material to the back of the site as shown and specified.

The transporting of approximately 1000 cubic yards of UST Area 1 material from the stockpiled area to the back of the site.

B. Summary of the Work described in the 1A Sections is an overall summary of the responsibilities of the CONTRACTOR and his relation

to the OWNER. It does not supersede the specific requirements of the other Contract Documents.

1.2 CONTRACTS

A. The Work shall be constructed under one prime contract.

1.3 WORK BY OTHERS

A. Work by Owner:

1. The owner will supply storage capacity for rinsate generated from sewer line flushing up to 12,000 gallons. It will be the Contractor's responsibility to provide suitable on-site storage capacity for any volume generated beyond 12,000 gallons.

   All rinsate generated during the sewer cleaning operations shall be stored on-site for treatment through the existing on-site ground water treatment system. The Contractor will be required to maintain storage accommodations for rinsate volumes (beyond the 12,000 gallons) for a period of four weeks.

2. All soils from sewer removal operations (system 1 & 5) shall be stored in lined, covered, Contractor supplied roll-off containers. Each sewer system is to have separate roll-offs for soils generated from removal and cleaning operations. The Contractor is responsible to provide a roll-off for Sewer System No. 1 debris; one roll-off for Sewer System No. 3 debris; and one roll-off for Sewer System No. 5 (tank removal). The Contractor shall be responsible to leave roll-offs on site for a period of four weeks following the date of substantial completion.

   All sedimentary material generated from sewer cleaning (flushing) operations is to remain in the sedimentation pit.

   Disposal of all solid waste is the responsibility of the Owner.

1.4 SEQUENCE OF WORK

A. Construct the Work in the following stages:

1. The new 18" diameter sewer line must be installed prior to the cleaning and plugging of Sewer System 1, 2A, 2B, 3 and 4. This will allow for the diversion of system flow from these sewer systems.

2. Load and transport UST Area 1 soils prior to or during the cleaning of the sewer system. This will allow for utilization of this space for aeration operations, if required.

1.5 CONTRACTORS USE OF PREMISES

A. Contractor shall have full use of the premises for storage and the operation of workmen.

B. Contractor must share use of the premise with the other contractors specified in Article 1.3.

C. Contractor shall:

1. Assume full responsibility for protection and safekeeping of products stored on or off premises.

2. Move stored products that interfere with the operations of OWNER or other contractor.

3. Obtain and pay for all additional storage or work areas required for his operation.

+ + END OF SECTION + +

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SECTION 1A3

FIELD ENGINEERING

1.1 GENERAL

A. ENGINEER will provide baselines for the project and two bench marks for use by the CONTRACTOR at the landfill site.

B. CONTRACTOR shall:
   1. Provide civil, structural or other professional engineering services specified, or required to execute CONTRACTOR'S construction methods.
   2. Develop and make all detail surveys and measurements needed for construction including slope stakes and all other working lines, elevations and cut sheets.
   3. Keep a transit and leveling instrument on the site at all times and a skilled instrument man employed or obtained whenever necessary for layout of the Work.
   4. Provide all material required for bench marks, control points, grade stakes, and other items.
   5. Be solely responsible for all locations, dimensions and levels. No data other than written orders of the ENGINEER shall justify departure from the dimensions and levels required by the Drawings.
   6. Safeguard all points, stakes, grade marks, monuments and bench marks made or established on the Work, re-establish same if disturbed and rectify all Work improperly installed because of not maintaining, not protecting or removing without authorization such established points, stakes, marks and monuments.
   7. When requested by ENGINEER, provide such facilities as may be necessary for ENGINEER to check line and grade points placed by CONTRACTOR. CONTRACTOR shall do no excavation or embankment work until all cross-sectioning necessary for determining pay quantities has been completed and checked by ENGINEER.

1.2 QUALIFICATIONS OF SURVEYOR OR ENGINEER

A. Qualified engineer or registered land surveyor, acceptable to CONTRACTOR and OWNER.

B. Registered professional engineer of the discipline required for the specific service on the Project, licensed in New York State.

1.3 RECORDS

A. Maintain a complete, accurate log of all control and survey work as it progresses.

B. On completion of the construction of the landfill, the CONTRACTOR shall prepare a certified survey showing all dimensions, locations and elevations of construction.

1.4 SUBMITTALS

A. Submit name and address of surveyor or engineer to ENGINEER.

B. On request of ENGINEER, submit documentation to verify accuracy of field engineering work.

C. When requested by ENGINEER, submit certificate signed by registered land surveyor certifying that elevations and locations of Work are in conformance with Contract Documents. Explain all deviations.

+ + END OF SECTION + +

SECTION 1A5

SPECIAL CONSTRUCTION CONDITIONS

1.1 HAZARDOUS WASTE SITE

The site of the proposed work is located on Route 48 in the Town of Minetto, New York and is contained in the New York State registry of Inactive Hazardous Waste Disposal Sites in New York State, Site #7-38-012. The potentially responsible parties at the site have entered into an Order on Consent to undertake the Remedial measures which comprise the Work. Therefore all work at the site will be subject to review and approval by the New York State Department of Environmental Conservation (NYSDEC). The Department has reviewed and approved a submittal which included the plans and specification for the Work along with a site-specific health and safety plan.

NYSDEC reserves the right to have people present at the site to review the work.

1.2 HEALTH AND SAFETY PLAN

A. Before actual construction work proceeds at the site, the CONTRACTOR shall provide the ENGINEER with a copy of the CONTRACTOR'S Health and Safety Plan for protection of his workers during the Work at the site.

B. The ENGINEER will provide the CONTRACTOR with a copy of the NYSDEC approved Health and Safety Plan governing the ENGINEER'S employees and the public. The ENGINEER, however, specifically cautions the CONTRACTOR that such Health and Safety Plan does not apply to CONTRACTOR'S personnel and that CONTRACTOR has sole responsibility for protection of his employees and those of his SUBCONTRACTOR.

C. The CONTRACTOR shall at all times insure that his personnel are working in accordance with the provisions of the CONTRACTOR's Health and Safety Plan.

D. Disregard for the provisions of this Section shall be cause for termination of Agreement without compromise or prejudice to the rights of ENGINEER or OWNER.

E. The OWNER reserves the right to suspend the Work at no additional cost to the OWNER if the CONTRACTOR does not perform the Work in accordance with the CONTRACTOR'S Health and Safety Plan.

1.3 SITE CONTROL

A. CONTRACTOR shall inform all on-site-personnel and visitors of any known hazardous substances and health hazards or any other risks that they may be exposed to prior to commencement of the Work.

B. CONTRACTOR shall include in his Health and Safety Plan a site control program as required by 20 CFR 1910.120.

C. CONTRACTOR shall limit equipment, operations and on-site personnel and visitors in accordance with the following work areas:
   1. Exclusion Zone: Functions carried out in the exclusion zone include: excavation, sewer line cleaning and plugging, backfilling, and UST removal. The outer boundary of the exclusion zones shall be clearly marked with a boundary line called the hotline. All on-site personnel and visitors entering the exclusion zone shall wear the prescribed level of personal protection equipment.
   2. Contamination Reduction Zone: This area will provide for the transfer of construction materials from clean to site-dedicated equipment, the decontamination of waste transport and excavation equipment prior to entering the Support Zone, the decontamination of on-site personnel and visitors and clothing prior to entering the Support Zone, and for the physical segregation of the Exclusion and Support Zones.
   3. Support Zones: Throughout construction, the Support Zone shall be secured against active or passive contamination from the Work. The function of the Support Zone includes:
      a. An entry area for on-site personnel and visitors, material and equipment to the Exclusion Zone of site operations;
      b. An exit area for decontaminated on-site personnel and visitors, materials and equipment from the Exclusion Zone of site operations;
      c. The housing of site special services;
      d. A storage area for clean safety and work equipment;
      e. A staging area for on-site communications, etc.;
      f. Any function that need not or cannot be performed in a hazardous or potentially hazardous area shall be performed here.

1.4 SECURITY

CONTRACTOR shall have the following responsibilities.

A. Provide and maintain active site security during the CONTRACTOR's actual operating hours.

B. Provide security identification, specific to the site, for all on-site personnel.

C. Restrict vehicular access to the Exclusion and Contamination Reduction Zone to authorized vehicles only.

D. Exclude personal vehicles from the site, except in designated parking areas within the Support Zone.

E. Maintain a log of security incidents.

F. Require all on-site personnel and visitors having access to the site to sign-in and sign-out, and keep a record of all site access.

G. Brief all approved visitors to the site on safety and security, provide them with temporary identification and safety equipment, and escort them throughout their visit.

H. Exclude visitors from the Exclusion Zone.

I. Maintain a secure site at all times throughout construction, including non-working hours. Provide lighting in accordance with the requirements of 29 CFR 1910.120.

1.5 TRAINING

A. The CONTRACTOR shall provide copies of training certificates for each employee working on the site that documents that they have received training in accordance with 29 CFR 1910.120.

B. The CONTRACTOR shall not permit on-site personnel and visitors who have not successfully completed the required training to enter either the Contamination Reduction Zone or Exclusion Zone of the site.

1.6 MEDICAL SURVEILLANCE

A. The CONTRACTOR shall maintain all medical surveillance records of CONTRACTOR personnel and make records available to the ENGINEER upon request. The CONTRACTOR shall maintain records for the period specified and to meet the criteria of 29 CFR 1910.120.

B. The CONTRACTOR in accordance with 29 CFR 1910.120, shall enroll each employee involved in the Work in a medical surveillance program, including but not limited to, an initial medical examination, annual examinations and such interim examinations required to protect or assess employee health status. The CONTRACTOR shall submit to ENGINEER, a certification of medical status for all employees of CONTRACTOR and SUBCONTRACTOR involved in the Work that, said employee is: enrolled in a medical surveillance program in accordance with 20 CFR 1910.120 and has been medically certified by a physician as

fit for the Work, including the use of a respirator. Medical status certifications shall be submitted to the ENGINEER before any CONTRACTOR or SUBCONTRACTOR employee shall be permitted to perform Work.

1.7 MONITORING

The CONTRACTOR shall have the following responsibilities.

A. Implement an air monitoring program to identify and quantify airborne levels of Hazardous Substances and particulates in order to determine the appropriate level of employee protection needed on a real-time basis at the site. Comply with the requirements of 29 CFR 1910.120.

B. Conduct air sampling for gases and vapors. Report any departures from general background to ENGINEER.

C. Conduct air sampling for airborne particulates. Report any departure from general background to ENGINEER.

D. Provide and maintain in operating condition (as specified by the instrument manufacturers) at all times, monitoring instruments, including, but not limited to: an explosimeter, and an organic vapor analyzer.

E. Monitoring equipment shall be operated by CONTRACTOR personnel trained in the use of the specific equipment provided.

F. Maintain a log of the location, time, type and value of each reading and/or sampling. Provide copies of daily log sheets to the ENGINEER for his review.

1.8 DECONTAMINATION

The CONTRACTOR shall have the following responsibilities.

A. Develop a decontamination procedure for vehicles, equipment and personnel, properly communicated to all on-site personnel and implemented before entering areas on site where potential for exposure to hazardous substances exists. Comply with requirements of 29 CFR 1910.120.

B. Decontaminate all vehicles and equipment used in the Exclusion Zone. Decontamination shall be performed in the Contamination Reduction Zone prior to leaving the site.

C. Decontamination of excavation and other equipment utilized at the site shall include, but not be limited to, the following procedures:

1. Physical removal of solid materials.
2. Complete steam cleaning.
3. Complete detergent rinse.
4. Final steam rinse.

D. Wash water will be controlled so that it does not run off the site. All disposable clothing (tyvek, gloves, etc.) and any other disposable gear will be placed in a 55-gallon drum for disposal. CONTRACTOR shall supply disposal drums for the disposal of disposable gear of other on-site personnel not employed by the CONTRACTOR. This disposed material shall become the property of the CONTRACTOR and it is his responsibility for final handling and disposal.

E. Require decontamination personnel to wear protective equipment as appropriate, as outlined in the CONTRACTOR's Health and Safety Plan.

1.9 SOIL DISPOSAL

A. Each bucket of excavated soil from within the "extent of controlled area" as shown on Sheet 2 of the Drawings will be evaluated by the ENGINEER and stockpiled according to its level (or lack of) contamination. Soil deemed "contaminated" shall be stored in 20 cubic yard or larger water-tight roll off containers lined with 10 mil plastic and covered. Clean soil will also be stored on site in a separate roll-off container and based on the analytical results the soil will either be aerated on-site, disposed of on-site or disposed of off-site, if it is found to be contaminated.

+ + END OF SECTION + +

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SECTION 1A7

PROJECT COORDINATION

1.1 GENERAL

A. All prime contractors shall coordinate their work and cooperate among themselves in every way required to assure satisfactory, expeditious completion of the Project within the Contract Time. They shall cooperate fully with all Subcontractors, manufacturers, fabricators, suppliers, distributors, installers, testing agencies, and all others whose services, materials or equipment are required to assure completion of the Work within the Contract Time.

B. Each prime contractor shall review progress schedules and installation procedures under all Sections and Contracts which may affect its work and shall coordinate the installation of all such work with the appropriate party or parties. General CONTRACTOR shall provide openings in concrete formwork and in other construction work as required to accommodate the work of other Sections and other contracts, shall assist other contractors in installing "built-in" items required for their work, and shall protect all such "built-in" items and other work of other contractors from damage.

C. Coordination meetings shall be held on a weekly basis unless it is mutually agreed by all parties that another schedule is suitable.

D. The first meeting shall be held immediately upon execution of the Contracts to allocate space requirements on site, construction plant requirements, Shop Drawing interchange among prime contractors, and future meetings. This meeting may be concurrent with preconstruction conference required by Article 2 of the General Conditions unless otherwise directed by ENGINEER.

E. Purposes of the meetings are:
   1. Establish and modify work schedules and agree upon an orderly sequence of operations acceptable to all prime contractors.
   2. Review and adjust conflicts, work arrangements, and schedules to avoid delays and work stoppages.
   3. Discuss and prepare coordination drawings prepared by each prime contractor, as required to assist and guide the others.

F. Meetings will be arranged through the ENGINEER and shall be separate from and in addition to job progress meetings. The ENGINEER will keep notes, records and write minutes of the meetings.

G. Representatives of the prime contractors at the meetings shall have the competence and authority to make any necessary decisions. Their decisions and statements shall commit the prime contractors to the agreed procedures, sequence of operations and schedules.

H. Failure to be represented at these meetings shall cause the absent prime contractor to be liable for any and all damages, delays, costs

of alterations, and other costs which result because he was not present to arrange coordination of his work with the scheduled construction activities.

I. ENGINEER will give each prime contractor notice of the time, place and tentative agenda of the meetings. If a prime contractor cannot, for compelling reasons, attend a meeting he shall give timely notice so that the meeting may be rescheduled. A prime contractor may initiate a meeting by addressing a request to the ENGINEER.

J. Where procedures have been agreed upon and coordination drawings accepted by all prime contractors concerned, it shall become binding upon them to follow the drawings and procedures, both as to time and performance.

K. If, in the opinion of a prime contractor, coordination meetings do not achieve their purpose that prime contractor shall notify the ENGINEER in writing that another prime contractor on the Project is failing to coordinate its work with the work of other contractors as directed, the ENGINEER will promptly investigate the charge. If ENGINEER finds it to be true, he will promptly issue such directions to the other contractor with respect thereto as the situation may require. The OWNER shall not, however, be liable for any damages suffered by a prime contractor by reason of the other contractor's failure to promptly comply with the directions so issued by the ENGINEER, or by reason of another contractor's default in performance. The OWNER does not guarantee the responsibility or continued efficiency of any prime contractor.

+ + END OF SECTION + +

SECTION 1A12

REFERENCE STANDARDS

1.1 GENERAL

A. When a reference standard is specified, comply with requirements and recommendations stated in that standard, except when they are modified by the Contract Documents, or when applicable laws, ordinances, rules, regulations or codes establish stricter standards. The latest provisions of applicable standards shall apply to the Work, unless otherwise specified. Reference standards include, but are not necessarily limited to, the following:
   1. American Association of State Highway and Transportation Officials.
   2. American Concrete Institute.
   3. American Gear Manufacturers Association.
   4. American Institute of Steel Construction.
   5. American Iron and Steel Institute.
   6. American National Standards Institute.
   7. American Society of Heating, Refrigerating and Air Conditioning Engineers.
   8. American Society of Mechanical Engineers.
   9. American Society for Testing and Materials.
   10. American Water Works Association.
   11. American Welding Society.
   12. Concrete Reinforcing Steel Institute.
   13. Factory Mutual Association.
   14. Institute of Electrical and Electronics Engineers.
   15. National Electrical Manufacturer's Association.
   16. National Fire Protection Association.
   17. Prestressed Concrete Institute.
   18. Underwriters' Laboratories, Inc.
   19. All other applicable standards listed in the Specifications, and the standards of utility service companies, where applicable.

+ + END OF SECTION + +

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SECTION 1A13

ABBREVIATIONS AND SYMBOLS

1.1 ABBREVIATIONS

A. Common abbreviations which may be found in the Specifications are:

alternating current	a-c	High Density Polyethylene	HDPE
Ampere	A	horsepower	hp
ante meridiem	am	hour	hr
average	avg		
		inch	in.
Bentonite Fortified Soil	BFS	inch-pound	in.-lb
biochemical oxygen demand	BOD	inside diameter	id
brake horsepower	bhp		
British thermal unit	Btu	kilovolt-ampere	kva
		kilowatt	kw
Centigrade	°C	kilowatt-hour	kwhr
company	Co		
cubic feet per minute	cfm	linear foot	lin ft
cubic feet per second	cfs	liter	l
cubic foot	cu ft		
cubic inch	cu in	maximum	max
cubic yard	cu yd	mercury	Hg
		milligram	mg
decibel	db	milligrams per liter	mg/l
degree Centigrade		milliliter	ml
(or Celsius) (say)	20°C	millimeter	mm
degree Fahrenheit (say)	68°F	million gallon	mil
diameter	diam	million gallons per day	mgd
direct current	d-c	minimum	min
dollars	$		
		National Pipe Threads	NPT
each	ea	net positive suction head	npsh
efficiency	eff	number	No.
Fahrenheit	°F	ounce	oz
feet	ft	outside diameter	od
feet per hour	fph		
feet per minute	fpm	parts per million	ppm
feet per second	fps	post meridiem	pm
figure	Fig	pound	lb
flange	flg	pounds per square foot	psf
foot-pound	ft-lb	pounds per square inch	psi
		pounds per square inch absolute	psia
gallon	gal	pounds per square inch gage	psig
gallons per minute	gpm		
gallons per second	gps	Resident Project Representative	RPR
gram	g		
Hertz	Hz		

revolutions per minute	rpm	total dynamic head	tdh
		totally-enclosed-fan-cooled	tefc
second	sec		
specific gravity	sp gr	volt	v
square	sq		
square foot	sq ft		
square inch	sq in		
square yard	sq yd		
standard	std		
standard cubic feet per minute	scfm		

1.2 ORGANIZATION ABBREVIATIONS

A. Abbreviations of organizations which may be used in these Specifications are:

ACS	American Chemical Society
ACI	American Concrete Institute
AGMA	American Gear Manufacturers Association
AIChE	American Institute of Chemical Engineers
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ANSI	American National Standards Institute
APHA	American Public Health Association
AREA	American Railway Engineering Association
ASTM	American Society for Testing and Materials
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers
AWWA	American Water Works Association
AWS	American Welding Society
DIPRA	Ductile Iron Pipe Research Association
CRSI	Concrete Reinforcing Steel Institute
EPA	Environmental Protection Agency
FM	Factory Mutual
HEW	Department of Health, Education and Welfare
HUD	Department of Housing and Urban Development
IEEE	Institute of Electrical and Electronic Engineers
IRI	Industrial Risk Insurance
ISO	Insurance Services Office
NAAMM	National Association of Architectural Metal Manufacturers
NARUC	National Association of Railroad and Utilities Commissioners
NEC	National Electric Code
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
NSF	National Sanitation Foundation
OSHA	Occupational Safety and Health Act
PCI	Precast Concrete Institute
SMACNA	Sheet Metal and Air Conditioning National Association
SSPC	Steel Structures Painting Council
UL	Underwriters Laboratories, Inc.

USGS	United States Geological Survey
USPHS	United States Public Health Service
WWEMA	Water and Wastewater Equipment Manufacturers Association
WPCF	Water Pollution Control Federation

+ + END OF SECTION + +

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SECTION 1C

MEASUREMENT AND PAYMENT

1.1 DESCRIPTION

A. The items listed below beginning with Article 1.5 and 1.6, refer to and are the same pay items listed in the Bid Form. They constitute all of the pay items for the completion of the Work. No direct or separate payment will be made for providing miscellaneous temporary or accessory works, plant, services, CONTRACTOR'S or ENGINEER'S field offices, layout surveys, job signs, sanitary requirements, testing, safety devices, approval and record drawings, water supplies, power, maintaining traffic, removal of waste, watchmen, bonds, insurance, and all other requirements of the General Conditions, Supplementary Conditions, and the General Requirements. Compensation for all such services, things and materials shall be included in the prices stipulated for the lump sum and unit pay items listed herein.

B. Each lump sum and unit bid 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.

1.2 ENGINEER'S ESTIMATE OF QUANTITIES

A. The ENGINEER'S estimated quantities for unit bid prices, as listed in the Bid Form, are approximate only and are included solely for the purpose of comparison of Bids. The ENGINEER does not expressly or by implication agree that the nature of the materials encountered below the surface of the ground or the actual quantities of material encountered or required will correspond therewith and reserves the right to increase or decrease any quantity or to eliminate any quantity as OWNER may deem necessary. CONTRACTOR will not be entitled to any adjustment in a unit bid price as a result of any change in an estimated quantity and agrees to accept the aforesaid unit bid prices as complete and total compensation for any additions or deductions caused by a variation in quantities as a result of more accurate measurement, or by any changes or alterations in the Work ordered by the OWNER, and for use in the computation of the value of the Work performed for progress payments.

1.3 ADJUSTMENT OF UNIT PRICES FOR INCREASE OR DECREASE OF ESTIMATED QUANTITIES

A. For bid items paid for on a unit price basis, increases or decreases in the quantity of an item of Work will be determined by comparing the total payable quantity of Work with ENGINEER'S estimated quantity as shown in the Bid Form.

B. If the total payable quantity of any unit price item of Work, which has an as-bid computed total value of five percent or more of the sum of the as-bid computed total values of all items bid, varies from ENGINEER'S estimate of quantity therefor by more than 25 percent, the unit price of that item will be a subject of review by ENGINEER. If warranted, an equitable adjustment will be made by means of a Change Order to credit OWNER with any reduction in cost or to compensate CONTRACTOR for any increase in cost resulting from the change in quantity. This review of the adjustment will be made at a time ENGINEER deems reasonable and proper.

C. Payment for any unit price item of Work, which has an as-bid computed total value of less than five percent of the sum of the as-bid computed total values of all items bid, will be made at the unit price bid regardless of an increase or decrease in quantity.

1.4 RELATED PROVISIONS SPECIFIED ELSEWHERE

A. Payments to CONTRACTOR: Refer to General Conditions and Agreement.

B. Changes in Contract Price: General Conditions.

1.5 BID ITEMS FOR CONTRACT No. 1 - GENERAL CONTRACT

A. Item 1 - Mobilization & Demobilization
   1. Measurement: Measurement shall be based on 50% completion at start of Work and remaining 50% at substantial completion.
   2. Payment: The lump sum bid price will be full compensation for mobilizing and demobilizing of work force.

B. Item 2 - 18" Diameter Gravity Sewer Line Installation
   1. Measurement: Measurement will be based on the estimated percentage of work undertaken toward completed installation as specified.
   2. Payment: The lump sum bid price will be full compensation for all labor, material, and equipment necessary to install the sewer line and its appurtenances. This includes, but is not limited to:
      a. The excavation, installation and backfill of the 18" D.I.P. sewer interceptor line.
      b. The installation of manholes, valves and other appurtenances, as shown and specified.
      c. All labor, materials and equipment necessary to perform dewatering operations.

Item 2A - Removal of Bedrock
1. Measurement: Measurement will be based on quantities established by the on-site ENGINEER. The quantities will be established volumetrically.

2. Payment: The unit price bid per cubic foot will be full compensation for all labor, materials and equipment necessary to remove and dispose of the bedrock encountered.

C. Item 3 - Installation of drainage material
   1. Measurement: Measurement will be based on the estimated percentage of work undertaken toward completed operation as specified
   2. Payment: The per cubic yard bid price will be full compensation for all labor, material and equipment necessary to install the drainage material as shown and specified. This includes, but is not limited to:
      a. Excavation and Installation of Filter Fabric
      b. Installation of Rip Rap
      c. Backfilling and Grading

D. Item 4 - Excavation and Removal of Sewer System #1
   1. Measurement: Measurement will be based on the estimated percentage of work undertaken toward completed operations as specified.
   2. Project: The lump sum bid price will be full compensation for all labor material and equipment necessary to excavate, remove and backfill the existing sewer system as shown and specified. This includes, but is not limited to:
      a. Excavation and removal of soil and sewer pipe.
      b. Placement of excavated material in roll-off containers.
      c. Backfill material and placement.
      d. Reseeding of affected area.

   Item 4A - Excavated Soil Placement In Roll-off Container
   1. Measurement: Measurement will be based on the total amount of soil and pipe excavated and placed in roll-off container.
   2. Payment: The unit price bid per cubic yard of soil excavated will be full compensation for all labor, materials and equipment necessary to fill each container.

E. Item 5 - Cleaning and plugging of Sewer System 1
   1. Measurement: Measurement will be based on the estimated percentage of work undertaken toward completed operations as specified.
   2. Payment: The lump sum bid price will be full compensation for all labor, material and equipment necessary to clean and decommission Sewer System 1, as specified.

   Item 5A - Collection and Storage of Rinsate
   1. Measurement: Measurement will be based on the total gallons of rinsate collected and stored.
   2. Payment: The unit price bid per gallon of rinsate collected and sotred will be full compensation for all labor, materials and

equipment necessary to collect, transfer and store generated rinsate on site.

F. Item 6 - Supply of 20 Cubic Yard Roll-Off Containers
   1. Measurement: Measurement will be based on the total amount of roll-off container used in the storage of contaminated soil.
   2. Payment: The unit price bid is based on supplying four 20 cubic yard roll-off containers and is full compensation for all labor, materials and equipment necessary to supply and place each container.

G. Item 7 - Placement and Removal of Sewer Sediment
   1. Measurement: Measurement will be based on the total amount of sewer sediment handled.
   2. Payment: The unit price bid per cubic yard of sediment placed, dewatered and removed and placed in roll-off containers will be full compensation for all labor, materials, and equipment necessary to collect, transfer, dewater, remove and place dewatered sediment in roll-off containers.

H. Item 8 - Cleaning and plugging of Sewer System 2A

   1. Measurement: Measurement will be based on the estimated percentage of work undertaken toward completed operations as specified.
   2. Payment: The lump sum bid price will be full compensation for all labor, material and equipment necessary to clean and decommission Sewer System 2A, as specified.

   Item 8A - Collection and Storage of Rinsate
   1. Measurement: Measurement will be based on the total gallons of rinsate collected and stored.
   2. Payment: The unit price bid per gallon of rinsate collected and stored will be full compensation for all labor, materials and equipment necessary to collect, transfer and store generated rinsate on-site.

I. Item 9 - Cleaning and Plugging of Sewer System 2B
   1. Measurement: Measurement will be based on the estimated percentage of work undertaken toward completed operations as specified.
   2. Payment: The lump sum bid price will be full compensation for all labor, material and equipment necessary to clean and plug Sewer System 2B as specified.

   Item 9A - Collection and Storage of Rinsate
   1. Measurement: Measurement will be based on the total gallons of rinate collected and stored.
   2. Payment: The unit price bid per gallon of rinsate collected and stored will be full compensation for all labor, materials and

equipment necessary to collect, transfer and store generated rinsate on-site.

J. Item 10 Cleaning and Grouting of Sewer System 3
   1. Measurement: Measurement will be based on the estimated percentage of work undertaken toward completed operation as specified.
   2. Payment: The lump sum bid price will be full compensation for all labor, material and equipment necessary to clean and plug Sewer System 3 as specified.

   Item 10A - Collection and Storage of Rinsate
   1. Measurement: Measurement will be based on the total gallons of rinsate collected and stored.
   2. Payment: The unit price bid per gallon of rinsate collected and stored will be full compensation for all labor, materials and equipment necessary to collect, transfer and store generated rinsate on-site.

K. Item 11 - Decommissioning of Sewer System 4
   1. Measurement: Measurement will be based on the estimated percentage of work undertaken toward completed operations as specified.
   2. Payment: The lump sum bid price will be full compensation for all labor, material and equipment necessary to clean and plug Sewer System 2B as specified.

L. Item 12 - Placement and Storage of Materials in Roll-off Containers
   1. Measurement: Measurement will be based on the total number of roll-off containers filled with sedimentary materials during the cleaning of the sewer system.
   2. Payment: The unit price bid per container will be full compensation for all labor, materials and equipment necessary to place, seal and store collected sedimentary materials on-site in a location designated by the on-site ENGINEER.

M. Item 13 - Removal and Disposal of Tank # 1 and 2
   1. Measurement: Measurement will be based on the estimated percentage of work undertaken toward completed operations as specified.
   2. Payment: The lump sum bid price will be full compensation for all labor, material and equipment necessary to excavate, remove, clean and dispose of the two underground storage tanks. Also included is the backfilling and grading of the excavation.

N. Item 14 - Seeding
   1. Measurement: Measurement shall be based on the actual surface area as calculated by the Engineer based on the required survey data under Section 1E7. No payment shall be made for material beyond the line as shown, specified or ordered by Engineer.

2. Payment: The unit price per square yard shall be full compensation for all work required for seeding as shown and specified.

O. Item 15 - Dredging of Benson Creek

1. Measurement: Measurement will be based on the volume of material dredged from specific areas, based on in-field volume calculations. No payment will be made for excavation beyond the limits shown and specified unless authorized in writing by the RPR.
2. Payment: The unit price bid per cubic yard will be full compensation for all labor, materials and equipment necessary to dredge the designated area as specified. This may include, but is not limited to:
    a) All labor and equipment necessary for dredging and transporting material;
    b) Transporting material from dredging area to the designated stockpiling area
    c) Dredging dewatering as required

P. Item 16 - Transporting UST Area 1 Soil

1. Measurement: Measurement will be based on the volume of material placed and transported from the stockpiled area to the designated area in the back of the site encompassed by the new landfill boundary.
2. Payment: The unit price bid per cubic yard will be full compensation for all labor, materials, and equipment necessary to place, transport and stockpile the designated soil pile. This may include, but is not limited to:
    a) All labor and equipment necessary to load, and transport the designated soil piles.
    b) Placement of reinforced polyethlene sheeting with a perimeter berm.

SECTION 1D1

PRECONSTRUCTION CONFERENCE

1.1 GENERAL

A. Date, Time and Location: Conference will be held after execution of the Contract and before construction is started at the site. ENGINEER will fix the date, time and location of the meeting in accordance with requirements of the General Conditions.

B. ENGINEER shall prepare agenda, preside at meeting, and prepare and distribute a transcript of proceedings to all parties.

C. CONTRACTOR(S) shall provide data required, contribute appropriate items for discussion, and be prepared to discuss all items on agenda.

1.2 REQUIRED ATTENDANCE

A. CONTRACTOR(S) and major Subcontractors.

B. OWNER'S representative.

C. ENGINEER.

D. Representatives of government agencies having any degree of control or responsibility, if available.

1.3 AGENDA

A. Agenda will include, but will not necessarily be limited to, the following:
   1. Designation of responsible personnel.
   2. Subcontractors.
   3. Coordination with other contractors.
   4. Progress schedule.
   5. Processing of Shop Drawings.
   6. Schedule of Shop Drawing submittals
   7. Processing of field decisions and Change Orders.
   8. Requirements for copies of Contract Documents.
   9. Insurance in force.
   10. Schedule of Values.
   11. Processing of progress payments.
   12. Use of premises.
   13. CONTRACTOR(S) responsibility for safety and first aid procedures.
   14. Security.
   15. Housekeeping.
   16. Field Offices.
   17. Record Drawings.

+ + END OF SECTION + +

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SECTION 1D2

PROGRESS MEETINGS

1.1 GENERAL

A. Date and Time:
   1. Regular Weekly Meetings: As mutually agreed upon by ENGINEER and CONTRACTOR.
   2. Other Meetings: On call.

B. Place: ENGINEER'S office at Project site or other mutually agreed upon location.

C. ENGINEER shall prepare agenda, preside at meetings, and prepare and distribute a transcript of proceedings to all parties.

D. CONTRACTOR shall provide data required and be prepared to discuss all items on agenda.

1.2 MINIMUM ATTENDANCE

A. CONTRACTOR:
   1. When needed for the discussion of a particular agenda item, CONTRACTOR shall require representatives of Subcontractors or suppliers.

B. ENGINEER.

C. OWNER'S representative, if required

D. NYSDEC representative, if required.

D. Others as appropriate.

E. Representatives present for each party shall be authorized to act on their behalf.

1.3 AGENDA

A. Agenda will include, but will not necessarily be limited to, the following:
   1. Transcript of previous meeting.
   2. Progress since last meeting.
   3. Planned progress for next period.
   4. Problems, conflicts and observations.
   5. Change Orders.
   6. Status of Shop Drawings.
   7. Quality standards and control.
   8. Schedules, including off-site fabrication and delivery schedules. Corrective measures, if required.
   9. Coordination between parties.
   10. Safety Concerns
   11. Other business.

+ + END OF SECTION + +

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SECTION 1E1

CONSTRUCTION SCHEDULES

1.1 GENERAL

A. Provide construction schedule which conforms to the requirements below, unless otherwise approved by ENGINEER.

B. Update schedules every two weeks unless otherwise specified or directed by ENGINEER.

1.2 CONTENT

A. Shop Drawing submittal dates and required approval dates.

B. Product delivery dates.

C. Factory and field testing dates.

D. Dates for beginning and completing each phase of the Work.

1.3 FORMAT

A. Type: Horizontal bar chart.

B. Sheet Size: 24-inches by 36-inches or 11-inches by 17-inches.

C. Time Scale: Indicate first date in each work week.

D. Organization:
   1. Group Shop Drawing submittals and reviews into a separate subschedule.
   2. Group product deliveries into a separate subschedule.
   3. Group construction work into a separate subschedule by activity.
   4. Group critical activities which dictate the rate of progress into a separate subschedule.
   5. Organize each subschedule by Specification Section number.

E. Activity Designations: Show title and related Specification Section number.

1.4 SUBMITTALS

A. Submit initial schedule at least 20 days prior to submitting first application for a progress payment but no later than 30 days after date of execution of Agreement.

B. Submit updated schedules at progress meetings. If a schedule remains unchanged from one period to the next, submit a written notice to that effect.

C. Make submittals to ENGINEER.

D. Unless otherwise specified, submit two copies of each schedule. One copy will be reviewed by the ENGINEER and returned. The other copy will be retained by the ENGINEER.

E. Attach a letter of transmittal to each submittal and include the following information in the letter:
   1. A listing of items which have changed since the last submittal.
   2. Discussion of problems causing delays, anticipated length of delays, and proposed countermeasures.

+ + END OF SECTION + +

SECTION 1E4

SHOP DRAWING PROCEDURES

1.1 GENERAL

A. Shop Drawing procedures shall conform to requirements of General Conditions and as described in this Section.

1.2 PROCEDURE

A. Submit Shop Drawings to: Malcolm Pirnie, Inc., 7481 Henry Clay Blvd, Liverpool, New York 13088. Submit additional copy to the Resident Project Representative at address provided by ENGINEER.

B. A letter of transmittal shall accompany each submittal. If data for more than one Section of the Specifications is submitted, a separate transmittal letter shall accompany the data submitted for each Section.

C. At the beginning of each letter of transmittal provide a reference heading indicating the following:
   1. OWNER'S Name: The Columbia Mills, Inc.
   2. Project Name: Sewer Remediation Project
   3. Transmittal No.: *Sequencing in order starting with No. 1*
   4. Section No.: *Corresponding to specifications*

D. If a Shop Drawing deviates from the requirements of the Contract Documents, CONTRACTOR shall specifically note each variation in his letter of transmittal and on the drawing.

E. All Shop Drawings submitted for approval shall have a title block with complete identifying information satisfactory to ENGINEER.

F. All Shop Drawings submitted shall bear the stamp of approval and signature of CONTRACTOR as evidence that they have been reviewed by CONTRACTOR. Submittals without this stamp of approval will not be reviewed by ENGINEER and will be returned to CONTRACTOR. The stamp shall contain the following minimum information:

Project Name: _____
CONTRACTOR'S Name: _____
Date: _____
----------Reference----------
Item: _____
Specifications:
Section: _____
Page No.: _____
Para. No.: _____
Drawing No.: _____ of _____
Location: _____
Submittal No.: _____
Approved By: _____

G. A number shall be assigned to each submittal by CONTRACTOR starting with No. 1 and thence numbered consecutively. Resubmittals shall be identified by the original submittal number followed by the suffix "A" for the first resubmittal, the suffix "B" for the second resubmittal, etc.

H. CONTRACTOR shall initially submit to ENGINEER a minimum of 3 copies of all submittals that are on 8-1/2-inch by 11-inch or smaller sheets, and one unfolded original and 2 prints made from that original for all submittals on sheets larger than 8-1/2-inch by 11-inch. The Resident Project Representative shall receive one copy only of each submittals which will be stamped "Preliminary - Not For Construction."

I. After ENGINEER completes his review, Shop Drawings will be marked with one of the following notations:
   1. Approved
   2. Approved as Corrected
   3. Revise and Resubmit
   4. Not Approved

J. If a submittal is acceptable, it will be marked "Approved" or "Approved as Corrected". Four prints or copies of the submittal will be returned to CONTRACTOR.

K. Upon return of a submittal marked "Approved" or "Approved as Corrected", CONTRACTOR may order, ship or fabricate the materials included on the submittal, provided it is in accordance with the corrections indicated.

L. If a Shop Drawing marked "Approved as Corrected" has extensive corrections or corrections affecting other drawings or Work, ENGINEER may require that CONTRACTOR make the corrections indicated thereon and resubmit the Shop Drawings for record purposes. Such drawings will have the notation, "Approved as Corrected - Resubmit."

M. If a submittal is unacceptable, 2 copies will be returned to CONTRACTOR with one of the following notations:
   1. "Revise and Resubmit"
   2. "Not Approved"

N. Upon return of a submittal marked "Revise and Resubmit", CONTRACTOR shall make the corrections indicated and repeat the initial approval procedure. The "Not Approved" notation is used to indicate material or equipment that is not acceptable. Upon return of a submittal so marked, CONTRACTOR shall repeat the initial approval procedure utilizing acceptable material or equipment.

O. Any related Work performed or equipment installed without an "Approved" or "Approved as Corrected" Shop Drawing will be at the sole responsibility of the CONTRACTOR.

P. Shop Drawings shall be submitted well in advance of the need for the material or equipment for construction and with ample allowance for the time required to make delivery of material or equipment after

data covering such is approved. CONTRACTOR shall assume the risk for all materials or equipment which are fabricated or delivered prior to the approval of Shop Drawings. Materials or equipment will not be included in periodic progress payments until approval thereof has been obtained in the specified manner.

Q. ENGINEER will review and process all submittals promptly, but a reasonable time should be allowed for this, for the Shop Drawings being revised and resubmitted, and for time required to return the approved Shop Drawings to CONTRACTOR.

R. It is CONTRACTOR'S responsibility to review submittals made by his suppliers and Subcontractors before transmitting them to ENGINEER to assure proper coordination of the Work and to determine that each submittal is in accordance with his desires and that there is sufficient information about materials and equipment for ENGINEER to determine compliance with the Contract Documents. Incomplete or inadequate submittals will be returned for revision without review.

S. CONTRACTOR shall furnish required submittals with complete information and accuracy in order to achieve required approval of an item within three submittals. All costs to ENGINEER involved with subsequent submittals of Shop Drawings, Samples or other items requiring approval, will be backcharged to CONTRACTOR, at the rate of 3.0 times direct technical labor cost, by deducting such costs from payments due CONTRACTOR for Work completed. In the event that CONTRACTOR requests a substitution for a previously approved item, all of ENGINEER'S costs in the reviewing and approval of the substitution will be backcharged to CONTRACTOR unless the need for such substitution is beyond the control of CONTRACTOR.

+ + END OF SECTION + +

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SECTION 1E5

SAMPLES

1.1 GENERAL

A. The submittal of Samples shall conform to the requirements of the General Conditions and to procedures described in this Section.

B. Samples and Shop Drawings which are related to the same unit of Work or Specification Section shall be submitted at the same time. If related Shop Drawings and Samples are submitted at different times, they cannot be reviewed until both are furnished to the ENGINEER.

1.2 PROCEDURE

A. CONTRACTOR shall review, approve, and submit all Samples promptly. Samples shall be identified with correct reference to Specification Section, page, article and paragraph number, and Drawing No. when applicable. Samples shall clearly illustrate functional characteristics of the product and all related parts and attachments, and full range of color, texture, pattern and material. Samples shall be furnished so as not to delay fabrication, allowing the ENGINEER reasonable time for the consideration of the Samples submitted.

B. CONTRACTOR shall submit at least three Samples of each item required for the ENGINEER'S approval. Submission of Samples shall conform to all applicable provisions under Shop Drawing Submittal and Correspondence Procedure. Two of the Samples shall be delivered to the ENGINEER'S home office unless otherwise authorized by the ENGINEER. One Sample shall be delivered to the ENGINEER'S field office. If the CONTRACTOR requires a Sample for his use he shall notify the ENGINEER in writing.

C. The CONTRACTOR shall make all corrections required and shall resubmit the required number of new Samples until approved.

1.3 SAMPLES FOR TESTS

A. CONTRACTOR shall furnish such Samples of material as may be required for examination and test. All Samples of materials for tests shall be taken according to standard methods and as required by the Contract Documents.

+ + END OF SECTION + +

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SECTION 1E7

SURVEY DATA

1.1 GENERAL

A. CONTRACTOR shall keep neat legible notes of all measurements and calculations made by him while surveying and laying out the Work.

B. CONTRACTOR shall employ the services of a licensed land surveyor for the following:
   1. Establish a horizontal grid system and vertical control for the site incorporating the provided baselines and benchmarks. Horizontal grid system shall be composed of grids with a maximum side length of 25 feet.
   2. Topographic surveys to verify thickness and slopes performed at the following times:
      a. Prior to any earthwork;
      b. Final grade of treatment pond;
      c. After subgrade preparation; and
      d. After the placement of:
         1) drainage sand;
         2) clay liner; and
         3) select sand.
   3. Layout of Perimeter berm as shown on the contract drawings.

1.2 SUBMITTALS

A. One copy of all notes and drawings shall be furnished to the ENGINEER and one copy furnished to the OWNER before any additional work is performed on the respective layer. Drawings shall be signed and sealed by a registered land surveyor. At a minimum, notes and drawings shall provide the following information:
   1. Elevations at all grid points and other points of interest.
   2. Surface areas of placed materials.

B. One copy of all additional notes shall be submitted to the ENGINEER and one copy furnished to the OWNER with other records upon final completion.

+ + END OF SECTION + +

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SECTION 1F1

TESTING LABORATORY SERVICES FURNISHED BY OWNER

1.1 GENERAL

A. The OWNER will employ and pay for a testing laboratory to perform the specified services for quality assurance for project construction.

B. Inspection, sampling and testing shall be as specified in the individual Sections.

C. The OWNER will pay for testing except for repeat testing which results from the CONTRACTOR'S negligence or failure to meet specifications.

D. CONTRACTOR shall pay for:
   1. Tests made for the CONTRACTOR'S convenience.
   2. Repeat tests required because of the CONTRACTOR'S negligence or failure to meet Specification requirements.

E. The testing laboratory is not authorized to approve or accept any portion of the Work; rescind, alter or augment the requirements of the Contract Documents; or perform any duties of the CONTRACTOR.

1.2 QUALIFICATIONS OF LABORATORY

A. Where applicable, the testing laboratory will meet "Recommended Requirements for Independent Laboratory Qualification", latest edition, published by American Council of Independent Laboratories and shall have current ELAP certification by the NYS Department of Health.

B. Testing equipment used by the laboratory will be calibrated at maximum 12 month intervals by devices of accuracy traceable to either National Bureau of Standards or accepted values of natural physical constants.

1.3 LABORATORY DUTIES

A. The testing laboratory will:
   1. Cooperate with ENGINEER and CONTRACTOR and provide qualified personnel promptly on notice.
   2. Perform specified inspections, sampling and testing of materials and methods of construction; comply with applicable standards; ascertain compliance with requirements of Contract Documents.
   3. Promptly notify ENGINEER and CONTRACTOR of irregularities or deficiencies of Work which are observed during performance of services.

4. Promptly submit 5 copies of reports of inspections and tests to ENGINEER, including:
   a. Date issued.
   b. Project title and number.
   c. Testing laboratory name and address.
   d. Date of inspection or sampling.
   e. Record of temperature and weather.
   f. Date of test.
   g. Identification of product and Specification Section.
   h. Location in Project.
   i. Type of inspection or test.
   j. Results of tests and observations regarding compliance with Contract Documents.
5. Perform additional tests and services as required by OWNER.
6. Be NYSDOH ELAP certified.

1.4 CONTRACTOR'S RESPONSIBILITIES

A. The CONTRACTOR shall:
   1. Cooperate with laboratory personnel, provide access to Work and to manufacturer's operations.
   2. Provide to laboratory, preliminary representative samples of materials to be tested, in required quantities.
   3. Furnish copies of product test reports.
   4. Furnish labor and facilities:
      a. To provide access to Work to be tested.
      b. To obtain and handle samples at the site.
      c. To facilitate inspections and tests.
   5. Notify laboratory and ENGINEER sufficiently in advance of operations to allow for assignment of personnel and scheduling of tests.
   6. Arrange with laboratory and pay for, additional samples and tests required for CONTRACTOR'S convenience.

+ + END OF SECTION + +

SECTION 1G1

TEMPORARY CONSTRUCTION FACILITIES

1.1 GENERAL

A. CONTRACTOR shall be responsible for all temporary construction facilities required for the Work. CONTRACTOR shall make all arrangements with utility service companies for temporary services and shall pay all costs associated therewith.

B. Temporary construction facilities include:
   1. Water.
   2. Electricity and Lighting.
   3. Telephone.
   4. Heat, Weather Protection and Ventilation.
   5. Fire Protection.
   6. Sanitary and First Aid Facilities.

C. CONTRACTOR shall abide by all rules and regulations of the utility service company or authority having jurisdiction.

D. Sufficient temporary heat and ventilation shall be provided to assure safe working conditions and that no damage will occur to any of the Work. In addition, all enclosed areas shall be maintained at a minimum of 50°F, unless otherwise specifically excepted in the Specifications.

E. Provide all materials, equipment and power required for temporary electricity and lighting. Include continuous power for construction site offices. Provide all outlets with circuit breaker protection and comply with ground fault protection requirements of NEC. Minimum lighting shall be 5 foot candles for open areas, 10 foot candles for stairs and shops. Provide minimum of one 300 watt lamp each 20 feet in work areas.

F. Suitably enclosed chemical or self-contained toilets shall be provided for the use of the men employed on the Work. Toilets shall be located near the Work site and secluded from observation insofar as possible. Toilets shall be serviced at regular intervals, kept clean and supplied throughout the course of the Work.

G. CONTRACTOR shall furnish and maintain a safe drinking water supply readily available to all workers.

H. CONTRACTOR shall be responsible for all utility service costs until the Work is substantially complete. Included are all fuel, power, light, heat and other utility services necessary for execution, completion, testing and initial operation of the Work.

I. CONTRACTOR shall:
   1. Maintain and operate systems to assure continuous service.
   2. Modify and extend systems as Work progress requires.

3. Completely remove temporary materials and equipment when their use is no longer required.
4. Clean and repair damage caused by temporary installations or use of temporary facilities.
5. Restore existing facilities used for temporary services to specified or to original condition.

+ + END OF SECTION + +

SECTION 1G8

USE OF OWNER'S FACILITIES

1.1 GENERAL

A. CONTRACTOR may use existing facilities, equipment or utilities for construction purposes only if the OWNER'S written permission is obtained.

B. Restore existing facilities and equipment used for temporary purposes to original condition in a manner satisfactory to OWNER.

+ + END OF SECTION + +

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SECTION 1G9

PROTECTION OF THE WORK AND PROPERTY

1.1 GENERAL

A. CONTRACTOR shall be responsible for taking all precautions, providing all programs, and taking all actions necessary to protect the Work and all public and private property and facilities from damage as specified in the General Conditions and herein.

B. In order to prevent damage, injury or loss, CONTRACTOR'S actions shall include, but not be limited to, the following:
   1. Store apparatus, materials, supplies, and equipment in an orderly, safe manner that will not unduly interfere with the progress of the Work or the Work of any other contractor or utility service company.
   2. Provide suitable storage facilities for all materials which are subject to injury by exposure to weather, theft, breakage, or otherwise.
   3. Place upon the Work or any part thereof only such loads as are consistent with the safety of that portion of the Work.
   4. Clean up frequently all refuse, rubbish, scrap materials, and debris caused by his operations, to the end that at all times the site of the Work shall present a safe, orderly and workmanlike appearance.
   5. Provide barricades and guard rails around openings, around excavations, and other hazardous areas.

C. CONTRACTOR shall not, except after written consent from proper parties, enter or occupy with men, tools, materials or equipment, privately-owned land except on easements provided herein.

D. CONTRACTOR shall assume full responsibility for the preservation of all public and private property or facility on or adjacent to the site. If any direct or indirect damage is done by or on account of any act, omission, neglect or misconduct in the execution of the Work by the CONTRACTOR, it shall be restored by the CONTRACTOR, at his expense, to a condition equal to that existing before the damage was done.

1.2 PROTECTION OF EXISTING STRUCTURES

A. Surface Structures:
   1. Surface structures are defined as all existing buildings, structures and other facilities above the ground surface. Included with such structures are their foundations or any extension below the surface. Surface structures include, but are not limited to, buildings, tanks, walls, bridges, roads, dams, channels, open drainage, piping, poles, wires, posts, signs, markers, curbs, walks and all other facilities that are visible above the ground surface.

B. Protection of Underground and Surface Structures:
   1. CONTRACTOR shall sustain in their places and protect from direct or indirect injury all underground and surface structures located within or adjacent to the Work area. Such sustaining and supporting shall be done carefully and as required by the party owning or controlling such structure. Before proceeding with the work of sustaining and supporting such structure, CONTRACTOR shall satisfy the ENGINEER that the methods and procedures to be used have been approved by the party owning same.
   2. CONTRACTOR shall assume all risks attending the presence or proximity of all underground and surface structures within or adjacent to the Work area. CONTRACTOR shall be responsible for all damage and expense for direct or indirect injury caused by his work to any structure. CONTRACTOR shall repair immediately all damage caused by his work, to the satisfaction of the owner of the damaged structure.

C. All other existing surface facilities, including but not limited to, fences, guard rails, posts, guard cables, signs, poles, markers, and curbs which are temporarily removed to facilitate installation of the Work shall be replaced and restored to their original condition at CONTRACTOR'S expense.

1.3 PROTECTION OF INSTALLED PRODUCTS AND LANDSCAPING

A. Provide protection of installed products to prevent damage from subsequent operations. Remove protection facilities when no longer needed, prior to completion of Work.

B. Control traffic to prevent damage to equipment, materials and surfaces.

C. Provide coverings to protect materials from damage.

D. Prohibit traffic of any kind across landscaped areas.

+ + END OF SECTION + +

SECTION 1G10

SECURITY

1.1 GENERAL

A. CONTRACTOR shall safely guard all Work, materials, equipment and property from loss, theft, damage and vandalism. CONTRACTOR'S duty to safely guard property shall include the OWNER'S property and other private property from injury or loss in connection with the performance of the Contract.

B. He shall employ watchmen as needed to provide the required security and prevent unauthorized entry.

C. CONTRACTOR may make no claim against the OWNER for damage resulting from trespass.

D. Party responsible for security shall make good all damage to property of OWNER and others arising from failure to provide adequate security.

E. Maintain security program throughout construction until OWNER'S acceptance and occupancy precludes need for CONTRACTOR'S security program.

+ + END OF SECTION + +

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SECTION 1G11

ACCESS ROADS AND PARKING AREAS

PART 1 - GENERAL

1.1 SITE INFORMATION

A. CONTRACTOR shall provide all temporary construction roads, walks and parking areas required during the construction and for use of emergency vehicles. Temporary roads and parking areas shall be designed and maintained by the CONTRACTOR so as to be fully usable in all weather conditions.

B. CONTRACTOR shall prevent interference with traffic and the OWNER'S operations on existing roads. He shall idemnify and save harmless the OWNER from any expenses caused by CONTRACTOR'S operations over these roads.

C. Roadways damaged by CONTRACTOR shall be restored to their original condition by the CONTRACTOR subject to approval of the OWNER or ENGINEER at the CONTRACTOR'S cost.

D. Temporary roads, walks and parking areas shall be removed by the CONTRACTOR prior to final acceptance and the ground returned to its original condition, unless otherwise required by the Contract Documents.

+ + END OF SECTION + +

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SECTION 1G12

ENVIRONMENT CONTROLS

1.1 GENERAL

A. Provide and maintain methods, equipment, and temporary construction, as necessary to provide controls over environmental conditions at the construction site and adjacent areas. Remove physical evidence of temporary facilities at completion of Work.

1.2 NOISE CONTROL

A. CONTRACTOR'S vehicles and equipment shall be such as to minimize noise to the greatest degree practicable. Noise levels shall conform to the latest OSHA standards and in no case will noise levels be permitted which interfere with the work of the OWNER or others.

1.3 DUST CONTROL

A. CONTRACTOR shall be responsible for controlling objectionable dust caused by his operation of vehicles and equipment, clearing or for any reason whatever. CONTRACTOR shall apply water and calcium chloride or use other methods subject to the ENGINEER'S approval which will keep dust in the air to a minimum.

1.4 PEST AND RODENT CONTROL

A. Provide rodent and pest control as necessary to prevent infestation of construction or storage area.
   1. Employ methods and use materials which will not adversely affect conditions at the site or on adjoining properties.

1.5 WATER CONTROL

A. Provide methods to control surface water and ground water from excavating operations to prevent damage to the Work, the site, or adjoining properties.
   1. Control fill, grading and ditching to direct water away from excavations, pits, and other construction areas; and to direct drainage to proper runoff courses so as to prevent any erosion, damage, nuisance or flooding.

B. Provide, operate and maintain equipment and facilities of adequate size to control surface water.

C. Dispose of drainage water in a manner to prevent flooding, erosion, or other damage to any portion of the site or to adjoining areas and in conformance with all environmental requirements.

1.6 POLLUTION CONTROL

A. Provide methods, means and facilities required to prevent possible contamination of soil, water or atmosphere that may occur as a result of construction activities.

B. Provide equipment and personnel, perform emergency measures required to contain any spillages of oil, fuel, chemicals or other noxious substances accidentally discharged during construction activities. If spillages occur, excavate and dispose of any contaminated earth offsite, and replace it with suitable compacted fill and topsoil.

C. Take special measures to prevent harmful substances from entering public waters.
   1. Prevent disposal of silt or other such substances in streams, or wetlands.
   2. The CONTRACTOR shall be responsible for placing hay bales, siltation screens or other erosion control measures to prevent silt-laden runoff from the stockpile area or construction operations from entering streams or wetlands.

D. Provide systems for control of atmospheric pollutants if necessary.

E. All CONTRACTOR'S equipment used during construction shall conform to all current federal, state and local laws and regulations.

1.7 EROSION CONTROL

A. Plan and execute construction and earth work by methods to control surface drainage from cuts and fills, and from borrow and waste disposal areas, to prevent erosion and sedimentation.
   1. Hold the areas of bare soil exposed at one time to a minimum.
   2. Provide temporary control measures such as berms, dikes and drains.

B. Construct fills and waste areas by selective placement to eliminate surface silts or clays which will erode.

C. Periodically inspect earthwork to detect any evidence of the start of erosion, apply corrective measures as required to control erosion.

+ + END OF SECTION + +

SECTION 1G16

CONTRACTOR'S FIELD OFFICE AND SHEDS

1.1 GENERAL

A. Provide a CONTRACTOR'S field office with the minimum facilities specified. Provide all required storage and work sheds.

B. Field Office and Furnishings:
   1. As required by CONTRACTOR but with sufficient room for project meetings.
   2. Include conference table and chairs sufficient for twelve persons.
   3. Telephone service.
   4. Desk and telephone for NYSDEC representative's use.
   5. Light and temperature as necessary.
   6. Six protective helmets for visitor's use.
   7. Exterior identifying sign.
   8. Other furnishings at CONTRACTOR'S option.

C. Provide one set of all Contract Documents in the office for ready reference at all times by interested parties.

D. Remove office and sheds upon final acceptance unless otherwise approved by ENGINEER.

+ + END OF SECTION + +

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SECTION 1G17

STORAGE OF MATERIAL

1.1 GENERAL

A. Store and protect materials in accordance with manufacturer's recommendations and requirements of Specifications.

B. CONTRACTOR shall make all arrangements and provisions necessary for the storage of materials and equipment. All excavated materials, construction equipment, and materials and equipment to be incorporated into the Work shall be placed so as not to injure any part of the Work or existing facilities and so that free access can be had at all times to all parts of the Work and to all public utility service company installations in the vicinity of the Work.

C. Materials and equipment shall be kept neatly and compactly stored in locations that will cause a minimum of inconvenience to other contractors, public travel, adjoining owners, tenants and occupants. Arrange storage in a manner to provide easy access for inspection.

D. Areas available on the construction site for storage of material and equipment shall be as shown or approved by the ENGINEER.

E. Materials and equipment which are to become the property of the OWNER shall be stored to facilitate their inspection and insure preservation of the quality and fitness of the Work, including proper protection against damage by freezing and moisture. They shall be placed in inside storage areas unless otherwise acceptable to OWNER.

F. Parking areas, buildings or other private property shall not be used for storage purposes without written permission of the OWNER or other person in possession or control of such premises.

G. CONTRACTOR shall be fully responsible for loss or damage to stored materials and equipment.

H. Do not open manufacturers containers until time of installation unless recommended by the manufacturer or otherwise specified.

1.2 UNCOVERED STORAGE

A. The following types of materials may be stored out-of-doors:
   1. Soil materials.
   2. Piping.
   3. Manholes.
   4. Steel tank.

B. Store the above materials on wood blocking so there is no contact with the ground.

1.3 COVERED STORAGE

A. All products not named above may be stored out-of-doors if covered with opaque material impervious to water and sunlight.

B. Tie down covers with rope and slope to prevent accumulation of water on covers.

C. Store material on wood blocking.

1.4 MAINTENANCE OF STORAGE

A. Maintain periodic system of inspection of stored products on scheduled basis to assure that:
   1. State of storage facilities is adequate to provide required conditions.
   2. Required environmental conditions are maintained on continuing basis.
   3. Products exposed to elements are not adversely affected.

+ + END OF SECTION + +

SECTION 1H1

TRANSPORTATION AND HANDLING OF MATERIALS AND EQUIPMENT

1.1 GENERAL

A. CONTRACTOR shall make all arrangements for transportation, delivery and handling of equipment and materials required for prosecution and completion of the Work.

B. Shipments of materials to CONTRACTOR or Subcontractors shall be delivered to the site only during regular working hours. Shipments shall be addressed and consigned to the proper party giving name of Project, street number and city. Shipments shall not be delivered to OWNER except where otherwise directed.

C. If necessary to move stored materials and equipment during construction, CONTRACTOR shall move or cause to be moved materials and equipment without any additional compensation.

1.2 DELIVERY

A. Arrange deliveries of products in accord with construction schedules and in ample time to facilitate inspection prior to installation.

B. Coordinate deliveries to avoid conflict with Work and conditions at site and to accommodate the following:
   1. Work of other contractors, or OWNER.
   2. Limitations of storage space.
   3. Availability of equipment and personnel for handling products.
   4. OWNER'S use of premises.

C. Do not have products delivered to project site until related Shop Drawings have been approved by the ENGINEER.

D. Do not have products delivered to site until required storage facilities have been provided.

E. Have products delivered to site in manufacturer's original, unopened, labeled containers. Keep ENGINEER informed of delivery of all materials to be utilized in the Work.

F. Immediately on delivery, inspect shipment to assure:
   1. Product complies with requirements of Contract Documents and reviewed submittals.
   2. Quantities are correct.
   3. Containers and packages are intact, labels are legible.
   4. Products are properly protected and undamaged.

1.3 PRODUCT HANDLING

A. Provide equipment and personnel necessary to handle products, including those provided by OWNER, by methods to prevent soiling or damage to products or packaging.

B. Provide additional protection during handling as necessary to prevent scraping, marring or otherwise damaging products or surrounding surfaces.

C. Handle products by methods to prevent bending or overstressing.

D. Lift heavy components only at designated lifting points.

E. Materials and equipment shall at all times be handled in a safe manner and as recommended by manufacturer or supplier so that no damage will occur to them. Do not drop, roll or skid products off delivery vehicles. Hand carry or use suitable materials handling equipment.

+ + END OF SECTION + +

SECTION 1H2

SUBSTITUTIONS

1.1 GENERAL

A. Requests for review of a substitution shall conform to the requirements of Article 6.3 of the General Conditions and shall contain complete data substantiating compliance of proposed substitution with Contract Documents.

1.2 CONTRACTOR'S OPTIONS

A. For materials or equipment (hereinafter products) specified only by reference standard, select product meeting that standard, by any manufacturer, fabricator, supplier or distributor (hereinafter manufacturer). To the maximum extent possible, provide products of the same generic kind from a single source.

B. For products specified by naming several products or manufacturers, select any one of the products or manufacturers named which complies with Specifications.

C. For products specified by naming one or more products or manufacturers and stating "or equal", submit a request for a substitution for any product or manufacturer which is not specifically named.

D. For products specified by naming only one product or manufacturer and followed by words indicating that no substitution is permitted, there is no option and no substitution allowed.

E. Where more than one choice is available as a CONTRACTOR'S option, select product which is compatible with other products already selected or specified.

1.3 SUBSTITUTIONS

A. During a period of 30 days after date of commencement of Contract Time, ENGINEER will consider written requests from CONTRACTOR for substitution of products or manufacturers, and construction methods (if specified).
   1. After end of specified period, requests will be considered only in case of unavailability of product or other conditions beyond control of CONTRACTOR.

B. Submit 5 copies of request for substitution. Submit separate request for each substitution. In addition to requirements set forth in Article 6.3 of General Conditions, include in request the following:
   1. For products or manufacturers:
      a. Product identification, including manufacturer's name and address.
      b. Manufacturer's literature with product description, performance and test data, and reference standards.

c. Samples, if appropriate.
d. Name and address of similar projects on which product was used, and date of installation.

2. For construction methods (if specified):
   a. Detailed description of proposed method.
   b. Drawings illustrating method.
3. Such other data as the ENGINEER may require to establish that the proposed substitution is equal to the product, manufacturer or method specified.

C. In making request for substitution, CONTRACTOR represents that:
1. CONTRACTOR has investigated proposed substitution, and determined that it is equal to or superior in all respects to the product, manufacturer or method specified.
2. CONTRACTOR will provide the same or better warranties or bonds for proposed substitution as for product, manufacturer or method specified.
3. CONTRACTOR waives all claims for additional costs or extension of time related to proposed substitution that subsequently may become apparent.

D. Proposed substitutions will not be accepted if:
1. Acceptance will require changes in the design concept or substantial revision of Contract Documents.
2. It will delay completion of the Work, or the work of other contractors.
3. It is indicated or implied on a Shop Drawing and is not accompanied by a formal request for substitution from CONTRACTOR.

E. If the ENGINEER determines that a proposed substitute is not equal to that specified, CONTRACTOR shall furnish the product, manufacturer or method specified at no additional cost to OWNER.

F. Approval of a substitution will not relieve CONTRACTOR from the requirement for submission of Shop Drawings as set forth in the Contract Documents.

+ + END OF SECTION + +

SECTION 1I1

CLEANING

1.1 GENERAL

A. Execute cleaning during progress of the Work, at completion of the Work, and as required by General Conditions.

B. Requirements of Regulatory Agencies:
   1. In addition to the requirements herein, maintain the cleanliness of the Work and surrounding premises within the Work limits so as to comply with federal, state, and local fire and safety laws, ordinances, codes and regulations.
   2. Comply with all federal, state and local anti-pollution laws, ordinances, codes and regulations when disposing of waste materials, debris and rubbish.

C. Scheduling of Cleaning and Disposal Operations:
   1. To prevent accumulation of dust, dirt, debris, rubbish and waste materials on or within the Work or on the premises surrounding the Work.

D. Waste Disposal:
   1. Dispose of all general waste materials, surplus materials, debris and rubbish off the project site at legal disposal areas. Do not remove any on-site soil from the property.
   2. Do not burn or bury rubbish and waste materials on the project site.
   3. Do not dispose of volatile or hazardous wastes such as mineral spirits, oil, or paint thinner on site.
   4. Do not discharge wastes into streams, waterways or wetlands.

E. Cleaning Materials:
   1. Use only cleaning materials recommended by manufacturer of surface to be cleaned.
   2. Use only materials which will not create hazards to health or property.

F. During Construction:
   1. Keep dust generating areas wetted down.
   2. Provide suitable containers for storage of waste materials, debris and rubbish until time of disposal.

G. When Project is Completed:
   1. Remove and dispose of all excess or waste materials, debris, rubbish, and temporary facilities from the site, structures and all facilities.
   2. Repair pavement, roads, sod, and all other areas affected by construction operations and restore them to original condition or to minimum condition specified.
   3. Maintain cleaning until acceptance by OWNER.

+ + END OF SECTION + +

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SECTION 1I2

RECORD DOCUMENTS

1.1 GENERAL

A. CONTRACTOR shall maintain and provide the ENGINEER with record documents as specified below, except where otherwise specified or modified in Divisions 2-16.

B. Maintenance of Documents:
   1. Maintain in CONTRACTOR'S field office in clean, dry, legible condition complete sets of the following: Drawings, Specifications, Addenda, approved Shop Drawings, Samples, photographs, Change Orders, other modifications of Contract Documents, test records, survey data, Field Orders, and all other documents pertinent to CONTRACTOR'S Work.
   2. Provide files and racks for proper storage and easy access. File in accordance with filing format of Construction Specification Institute (CSI), unless otherwise approved by ENGINEER.
   3. Make documents available at all times for inspection by ENGINEER and OWNER.
   4. Record documents shall not be used for any other purpose and shall not be removed from the CONTRACTOR'S office without ENGINEER'S approval.

C. Recording:
   1. Label each document "PROJECT RECORD" in 2-inch high printed letters.
   2. Keep record documents current.
   3. Do not permanently conceal any Work until required information has been recorded.
   4. Drawings: Legibly mark to record actual construction including:
      a. Topographic maps (in relation to the grid system established under Section 1E7) of:
         1) Pre-construction.
         2) Subgrade preparation.
         3) Drainage Layer
         4) a separate plan sheet for each lift of bentonite fortified soil layer showing QA test locations.
         5) Select Sand Layer.
      b. Horizontal and vertical location of underground utilities and appurtenances referenced to permanent surface improvements.
      c. Location of internal utilities and appurtenances concealed in construction referenced to visible and accessible features of structure.
      d. Field changes of dimensions and details.
      e. Changes made by Change Order or Field Order.
      f. Details not on original Drawings.
      g. Details on liner installation.
   5. Specifications and Addenda: Legibly mark up each Section to record:
      a. Manufacturer, trade name, catalog number, and supplier of each product and item of equipment actually installed.

b. Changes made by Change Order or Field Order.
c. Other matters not originally specified.

6. Shop Drawings: Maintain as record documents and legibly annotate drawings to record changes made after review.

D. Submittal:

1. Upon Substantial Completion of the Work, deliver record documents to ENGINEER. Final payment will not be made until satisfactory record documents are received by ENGINEER.
2. Accompany submittal with transmittal letter containing:
   a. Date.
   b. Project title and number.
   c. CONTRACTOR'S name and address.
   d. Title and number of each record document.
   e. Certification that each document as submitted is complete and accurate.
   f. Signature of CONTRACTOR, or his authorized representative.

+ + END OF SECTION + +

SECTION 2B

CLEARING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope: CONTRACTOR shall furnish all labor, materials, equipment and incidentals required to perform any necessary clearing and grubbing as shown or specified.

B. Related Work Specified Elsewhere:
   1. Section 2D1, Excavation and Backfill.
   2. Section 2K, Landscaping

1.2 QUALITY ASSURANCE

A. Codes and Standards: State and local laws and code requirements shall govern the hauling and disposal of trees, shrubs, stumps, roots, rubbish, debris and other matter.

PART 2 - PRODUCTS

(Part 2 omitted this Section)

PART 3 - EXECUTION

3.1 CLEARING AND GRUBBING

A. Limits of clearing shall be the areas outlined on the Contract drawings. Damage outside these limits caused by the CONTRACTOR'S operations shall be corrected at the CONTRACTOR'S expense.

B. Except as noted below, CONTRACTOR shall remove from the site and satisfactorily dispose of all trees, shrubs, stumps, roots, brush, masonry, rubbish, scrap, debris, pavement, curbs, fences and miscellaneous other structures not covered under other Sections as shown, specified or otherwise required to permit construction of the new Work.

C. CONTRACTOR shall either remove trees, stumps and other cleared and grubbed material from the OWNER'S property or mulch and spread material in a layer no more than 1/2-thick across the surface of the existing sludge landfill.

D. No cleared or grubbed material may be used in backfills or structural embankments.

E. Burning on site shall not be permitted.

F. Remove all stumps, roots, etc. which may interfere with the keying of the final cap into the existing grade or which interfere with the grading of ditches or subgrade.

3.2 TOPSOIL REMOVAL

A. Topsoil is defined as friable clay loam surface soil. Topsoil shall be substantially free of subsoil, clay lumps, stones and other objects over 2-inches in diameter, and without weeds, roots and other objectionable material.

B. Strip topsoil which is satisfactory to whatever depths are encountered, and in such manner as to prevent intermingling with the underlying subsoil or other objectionable material. Removed heavy growths of grass from areas before stripping.

C. Stockpile topsoil in storage piles in areas shown, or where otherwise approved by ENGINEER. Construct stockpiles to freely drain surface water.

+ + END OF SECTION + +

SECTION 2D1

EXCAVATION AND BACKFILL

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:
   1. CONTRACTOR shall furnish all labor, materials, equipment and incidentals required to perform all excavating, backfilling and disposing of earth materials as shown, specified, and required for the purpose of constructing structures, conduits, pipelines, roads, grading, and other facilities required to complete the Work in every respect.
   2. All temporary means needed to prevent discharge of sediment to water courses because of dewatering systems or erosion are included.
   3. No classification of excavated materials will be made. Excavation includes all materials regardless of type, character, composition, moisture, or condition thereof, except rock which is under Section 2D2.

B. Related Work Specified Elsewhere:
   1. Section 2D2, Rock Excavation.

1.2 QUALITY ASSURANCE

A. Tests:
   1. The services of a qualified testing laboratory shall be engaged by the CONTRACTOR to make tests and determine acceptability of the fill or material as listed below. The laboratory shall be acceptable to the ENGINEER.
   2. Required Tests:
      a. Select Fill Samples: Gradation, ASTM D 421 and 422.
      b. Compacted Select Fill: Compaction, ASTM D 1557 and ASTM D 1556, and ASTM D 698.
      c. Moisture Content: ASTM D2216
      d. Permeability: ASTM D2434
      e. Atterbury Limits: ASTM D4318

B. Permits and Regulations:
   1. CONTRACTOR shall obtain all necessary permits for work in roads, rights-of-way, railroads, etc. He shall also obtain permits as required by local, state and federal agencies for discharging water from excavations to rivers and streams.
   2. CONTRACTOR shall perform excavation work in compliance with applicable requirements of governing authorities having jurisdiction.

C. Reference Standards: Comply with applicable provisions and recommendations of the following except as otherwise shown or specified.

1. ASTM A 36, Structural Steel.
2. ASTM A 328, Steel Sheet Piling.
3. ASTM D421, Dry Preparation of Soil Samples for Particle-Size Analysis and determination of Soil Constants.
4. ASTM D 422, Method for Particle-Size Analysis of Soils.
5. ASTM D 698, Moisture-Density Relations of Soils, using 5.5 lb (2.5 kg) Rammer and 12-in. (304.8 mm Drop).
6. ASTM D 1556, Test Method for Density and unit weight of Soil in Place by the Sand-Cone Method.
7. ASTM D 1557, Test Method for Moisture-Density Relations of Soils and soil-aggregate, using 10.0 lb (4.54 kg) Rammer and 18-in. (457 mm) Drop.
8. ASTM D2216, Laboratory Determination of Water (Moisture) Content of Soil, Rock, and Soil Aggregate Mixtures.
9. ASTM D2922, Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
10. AISC Specifications for the Design, Fabrication, and Erection of Structural Steel for Buildings.
11. OSHA Standard, Title 29, Code of Federal Regulations, Part 1926, Section .650 (Subpart P - Excavations).

1.3 SUBMITTALS

A. Excavation Plan: Prior to start of excavation operations, submit written plan to demonstrate compliance with OSHA Standard 29 CFR 1926.650. As a minimum, excavation plan shall include:

1. Name of competent person.
2. Excavation method(s) or protective system(s) to be used.
3. Copies of "manufacturer's data" or other tabulated data if protective system(s) are designed on the basis of such data.

1.4 JOB CONDITIONS

A. Subsurface Information: Refer to Supplementary Conditions for Data on subsurface conditions. Data is not intended as a representation or warranty of continuity of conditions between soil borings nor of groundwater levels at dates and times other than date and time when measured. OWNER will not be responsible for interpretations or conclusions drawn therefrom by CONTRACTOR. Data are solely made available for the convenience of CONTRACTOR.

1. Additional test borings and other exploratory operations may be made by CONTRACTOR at no cost to OWNER.

B. Existing Structures: Shown on the Drawings are certain surface and underground structures adjacent to the Work. This information has been obtained from existing records. It is not guaranteed to be correct or complete and is shown for the convenience of the CONTRAC-

TOR. CONTRACTOR shall explore ahead of the required excavation to determine the exact location of all structures. They shall be supported and protected from injury by the CONTRACTOR. If they are broken or injured, they shall be restored immediately by the CONTRACTOR at his expense.

C. Existing Utilities: Locate existing underground utilities in the areas of Work. If utilities are to remain in place, provide adequate means of protection during earthwork operations.
   1. Should uncharted or incorrectly charted piping or other utilities be encountered during excavation, consult the ENGINEER immediately for directions as to procedure. Cooperate with OWNER and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility owner.
   2. In general, service lines to individual houses and businesses are not shown; however, CONTRACTOR shall assume that a service exists for each utility to each house or business.

D. Use of Explosives:
   1. Do not bring explosives onto site or use in the Work without prior written permission from authorities having jurisdiction. Provide copy of authorization to ENGINEER. CONTRACTOR is solely responsible for handling, storage, and use of explosive materials when their use is permitted.

E. Protection of Persons and Property: Barricade open excavations occurring as part of this Work and post with warning lights. Operate warning lights during hours from dusk to dawn each day and as otherwise required.
   1. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.

F. Dust Control: CONTRACTOR shall conduct all of his operations and maintain the area of his activities, including sweeping and sprinkling of roadways, so as to minimize creation and dispersion of dust. Calcium chloride shall be used to control serious or prolonged dust problems, subject to approval of ENGINEER.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. Select Fill:
   1. Select fill shall be placed where shown or specified below and around structures, pipelines, roads, tanks, walks, and other work.

2. Fill shall be well graded granular material or bank run gravel, free from organic matter. Not more than 70 percent by weight shall pass through a No. 40 sieve; not more than 10 percent by weight shall pass through a No. 200 sieve; and 100 percent shall pass a 6-inch square sieve.
3. Advise ENGINEER in writing of source and, if required, submit a sample of the material for approval.

B. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, crushed slag, or natural or crushed sand, approved by ENGINEER.

C. Drainage Fill: Washed, uniformly graded mixture of crushed stone, or crushed or uncrushed gravel, with 100 percent passing a 1-1/2 inch sieve and not more than 5 percent passing a No. 4 sieve.

D. General Backfill and Fill Materials: Provide approved soil materials for backfill and fill, free of clay, rock or gravel larger than 6 inches in any dimension, debris, waste, frozen materials, vegetable and other deleterious matter. Previously excavated materials meeting these requirements may be used for backfill.

PART 3 -EXECUTION

3.1 INSPECTION

A. ENGINEER will examine the areas and conditions under which excavating, filling, and grading are to be performed and notify the CONTRACTOR of conditions he may find that are detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected in an acceptable manner.

3.2 EXCAVATION

A. CONTRACTOR shall perform all excavation required to complete the Work as shown and specified. Excavations shall include earth, sand, clay, gravel, hardpan, boulders not requiring drilling and blasting to remove, decomposed rock, pavements, rubbish and all other materials within the excavation limits, except rock. Where the excavation is in rock, the rock shall be removed as specified under Section 2D2.

B. Excavations for structures and pipelines shall be open excavations. Provide excavation protection system(s) required by ordinances, codes, law and regulations to prevent injury to workmen and to prevent damage to new and existing structures or pipelines. Unless shown or specified otherwise, protection system(s) shall be utilized under the following conditions.

1. Excavation Less Than 5 Feet Deep: Excavations in stable rock or in soil conditions where there is no potential for a cave-in may be made with vertical sides. Under all other conditions, excavations shall be sloped and benched, shielded, or shored and braced.
2. Excavations more Than 5 Feet Deep: Excavations in stable rock may be made with vertical sides. Under all other conditions, excavations shall be sloped and benched, shielded, or shored and braced.
3. Excavation protection system(s) shall be installed and maintained in accordance with drawings submitted under Article 1.3 above.

C. Where the structure or pipeline is to be placed below the ground water table, well points, cofferdams or other acceptable methods shall be used to permit construction of said structure or pipeline under dry conditions. Dry conditions shall prevail until the pipelines are properly jointed. Water level shall be maintained below top of backfill at all times.

D. When excavations are made below the required grades, without the written order of the ENGINEER, they shall be backfilled with compacted gravel or concrete as directed by the ENGINEER at the expense of the CONTRACTOR.

E. Excavation shall be extended sufficiently on each side of structures, footings, etc., to permit setting of forms, installation of sheeting or the safe sloping of banks.

F. Subgrades for roadways, structures and trench bottoms shall be firm, dense, and thoroughly compacted and consolidated; shall be free from mud, muck, and other soft or unsuitable materials; and shall remain firm and intact under all construction operations. Subgrades which are otherwise solid, but which becomes soft or mucky on top due to construction operations, shall be reinforced with crushed stone or gravel. The finished elevation of stabilized subgrades shall not be above subgrade elevations shown.

H. Pipe Trench Preparation:
1. No more than 200 feet of trench may be opened in advance of pipe laying.
2. Trench width shall be minimized to greatest extent practical but shall conform to the following:
   a. Sufficient to provide room for installing, jointing and inspecting piping, but in no case wider at top of pipe than pipe barrel OD plus 2 feet.
   b. Enlargements at pipe joints may be made if required and approved by ENGINEER.
   c. Sufficient for sheeting, bracing, sloping, and dewatering.
   d. Sufficient to allow thorough compacting of backfill

adjacent to bottom half of pipe.

e. Do not use excavating equipment which requires the trench to be excavated to excessive width.

3. Depth of trench shall be as shown. If required and approved by ENGINEER depths may be revised.

I. Material Storage: Stockpile satisfactory excavated materials in approved areas, until required for backfill or fill. Place, grade and shape stockpiles for proper drainage.

1. Locate and retain soil materials away from edge of excavations.
2. Dispose of excess soil material and waste materials as specified hereinafter.

J. Where the existing material beneath the bedding material is considered unsuitable by the ENGINEER, CONTRACTOR shall remove and replace it with select backfill. The additional excavation and select backfill material, when ordered in writing by the ENGINEER, shall be included under Section 2D1.

3.3 UNAUTHORIZED EXCAVATION

A. All excavation outside the lines and grades shown, and which is not approved by the ENGINEER, together with the removal and disposal of the associated material shall be at the CONTRACTOR's expense. The unauthorized excavation shall be filled and compacted with select backfill by the CONTRACTOR at his expense. Claims and damages resulting from the CONTRACTOR's unauthorized excavation will be his sole responsibility.

3.4 DRAINAGE AND DEWATERING

A. General:

1. Prevent surface and subsurface water from flowing into excavations and from flooding adjacent areas.
2. Remove water from excavation as fast as it collects.
3. Maintain the ground water level below the bottom of the excavation to provide a stable surface for construction operations, a stable subgrade for the permanent work, and to prevent damage to the Work during all stages of construction.
4. Provide and maintain pumps, sumps, suction and discharge lines and other dewatering system components necessary to convey water away from excavations.
5. Obtain ENGINEER'S approval before shutting down dewatering system for any reason.

B. Standby Requirements for Dewatering: Provide standby equipment to insure continuity of dewatering operations.

C. Disposal of Water Removed by Dewatering System:

1. Dispose of all water removed from the excavation in such a

manner as not to endanger public health, property, or any portion of the Work under construction or completed.

2. Dispose of water in such a manner as to cause no inconvenience to the OWNER, ENGINEER, or others involved in work about the site.
3. Convey water from the construction site in a closed conduit. Do not use trench excavations as temporary drainage ditches.

3.5 SHEETING, SHORING AND BRACING

A. General:
1. Used material shall be in good condition, not damaged or excessively pitted. All steel or wood sheeting designated to remain in place shall be new. New or used sheeting may be used for temporary work.
2. All timber used for breast boards (lagging) shall be new or used, meeting the requirements for Douglas Fir Dense Construction grade or Southern Pine No. 2 Dense S3.
3. All steel work for sheeting, shoring, bracing, cofferdams etc., shall be designed in accordance with the provisions of the "Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings", of the AISC except that field welding will be permitted.
4. Steel sheet piling shall be manufactured from steel conforming to ASTM A 328. Steel for soldier piles, wales and braces shall be new or used and shall conform to ASTM A 36.
5. Maintain shoring and bracing in excavations regardless of time period excavations will be open. Carry down shoring and bracing as excavation progresses.
6. Unless otherwise shown, specified, or ordered, all materials used for temporary construction shall be removed when work is completed. Such removal shall be made in a manner not injurious to the structure or its appearance or to adjacent Work.

B. Removal of Sheeting and Bracing:
1. Remove sheeting and bracing from excavation unless otherwise ordered in writing by the ENGINEER. Removal shall be done so as to not cause injury to the Work. Removal shall be equal on both sides of excavation to ensure no unequal loads on pipe or structure.

3.6 TRENCH SHIELDS

A. Excavation of earth material below the bottom of a shield shall not exceed the limits established by ordinances, codes, laws and regulations.

B. When using a shield for pipe installation:
1. Any portion of the shield that extends below the mid-diameter of an installed rigid pipe (i.e., RCCP) shall be raised above

this point prior to moving the shield ahead for the installation of the next length of pipe.

2. The bottom of the shield shall not extend below the mid-diameter of installed flexible pipe (i.e., Steel, DI, PVC, etc.) at any time.

C. When a shield is removed or moved ahead, extreme care shall be taken to prevent the movement of pip or structures or the disturbance of the bedding for pipe or structures. Pipe or structures that are disturbed shall be removed and reinstalled as specified.

3.7 GENERAL REQUIREMENTS FOR BACKFILL, FILL AND COMPACTION

A. All backfill required for structures and trenches and required to provide the finished grades shown and as described herein shall be furnished, placed and compacted by the CONTRACTOR. Unless otherwise specified fill may be obtained from on-site sources. If additional materials are required, they shall be furnished from off-site sources at no additional cost to the OWNER. All materials used for filling and backfilling shall be clean soils of acceptable quality and shall be free from boulders, excessive clay, frozen lumps, wood, stumps, sludge or other organic matter or other deleterious materials. Excavated materials meeting these requirements may be used as backfill.

B. Backfill excavations as promptly as Work permits, but not until completion of the following:

1. Acceptance by ENGINEER of construction below finish grade including damp proofing, waterproofing, and perimeter insulation.
2. Inspection, testing, approval, and recording of locations of underground utilities.
3. Removal of shoring and bracing, and backfilling of voids with satisfactory materials. Cut off temporary sheet piling driven below bottom of structures and remove in manner to prevent settlement of the structure or utilities, or leave in place if required.
4. Removal of trash and debris.

C. Excavation shall be kept dry during backfilling operations. Backfill around structures and piping shall be brought up evenly on all sides.

D. All backfilling in pipe trenches which is below structures, other pipes, or paved areas, shall be placed in horizontal layers not exceeding 6 inches in depth and thoroughly compacted before the next layer is placed. In other pipe trenches, compacted layers shall be 6 inches up to the pipe spring line and 12 inches thereafter. All compacted layers shall have a compaction density of at least 95% Standard Proctor.

E. Where pipe is laid in rock excavation, 6 inches minimum of crushed stone or gravel fill shall be carefully placed and tamped over the rock before the pipe is laid. After laying pipe, the balance of the backfill shall be placed as described herein.

F. Prior to the installation of pipes which are to be installed in fill sections, the fill shall be placed, as described herein, until a minimum height of 2 feet above the pipe is reached, unless otherwise required in other Sections. The fill for the trench width shall be excavated, the pipe installed and backfilled. The remainder of the fill shall then be placed.

G. Unless otherwise specified or directed by ENGINEER fill shall be placed in horizontal loose lifts not exceeding 12 inches in thickness and shall be mixed and spread in a manner assuring uniform lift thickness after placing.

H. The water content of fill material shall be controlled during placement within the range necessary to obtain the compaction specified. In general, the moisture content of the fill shall be within 3 percent of the optimum moisture content for compaction as determined by laboratory tests. CONTRACTOR shall perform all necessary work to adjust the water content of the material to within the range necessary to permit the compaction specified. No fill material shall be placed when free water is standing on the surface of the area where the fill is to be placed. No compaction of fill will be permitted with free water on any portion of the fill to be compacted.

I. No fill shall be placed or compacted in a frozen condition or on top of frozen material. Fill containing organic materials or other unacceptable material shall be removed and replaced with approved fill material.

J. Compaction of fill shall be performed with equipment suitable for the type of material placed and which is capable of providing the densities required. CONTRACTOR shall select compaction equipment and submit it and his proposed procedure to the ENGINEER for approval.

K. CONTRACTOR shall repair, at his own expense, after settlement that occurs. He shall make all repairs and replacements necessary within 30 days after notice from the ENGINEER or OWNER.

3.8 SELECT FILL

A. Select fill shall be provided in the following locations:
   1. Support below and around piping and foundations.
   2. Subgrade for roads and pavements.
   3. Where shown or directed by ENGINEER.

B. Subgrade surface shall be level, dry, firm and subject to ENGINEER'S approval. Fill shall not be placed if any water is on the surface of area to receive fill. Fill shall not be placed or compacted in a frozen condition or on top of frozen material.

C. Fill shall be placed in horizontal loose lifts of 12 inches maximum thickness. It shall be mixed and spread in a manner to assure uniform lift thickness after placing.

D. Each layer of fill shall be compacted before placement of the next lift.

E. Fill containing lumps, pockets or concentrations of silt or clay, rubble, debris, wood or other organic matter shall not be placed. Fill containing unacceptable material shall be removed and disposed of.

F. The water content of the fill being compacted shall be above the bulking water content for the material. CONTRACTOR shall wet the fill materials during placement to achieve water contents needed for effective compaction.

G. Compaction of fill shall be performed with equipment suitable for the type of fill material being placed. CONTRACTOR shall select equipment which is capable of providing the densities required and shall submit the equipment to the ENGINEER for approval.

H. Select fill necessary to replace subgrade materials disturbed and softened as a result of the CONTRACTOR'S operations or to backfill unauthorized excavation shall be provided, placed and compacted at the CONTRACTOR'S expense.

3.9 UNCOMPACTED BACKFILL

A. Compaction of trench backfill above pipe embedment in locations other than those specified will not be required except to the extent necessary to prevent future settlement.

3.10 GRADING

A. General: Uniformly grade areas within limits of grading under this Section, including adjacent transition areas. Smooth subgrade surfaces within specified tolerances, compact with uniform levels or slopes between points where elevations are shown, or between such points and existing grades.

B. Compaction:
   1. After grading, compact subgrade surfaces to the depth and percentage of maximum density for each area classification.

3.11 DISPOSAL OF EXCAVATED MATERIALS

A. All spoil material (excavated material unsuitable for backfill) which is not contaminated shall be disposed of on-site at a location approved by the ENGINEER.

B. All spoil material (excavated material unsuitable for backfill) which is contaminated, as determined by the on-site ENGINEER, shall be placed in CONTRACTOR supplied roll-off containers and staged at a location determined by the on-site ENGINEER.

3.12 TEMPORARY FENCING

A. CONTRACTOR shall furnish and install a temporary fence surrounding his excavations and work area. It shall have openings only at vehicular, equipment and pedestrian access points.

B. The fence shall be a snowfence type enclosure, 48 inches tall.

3.13 FIELD QUALITY CONTROL

A. Quality Control Testing During Construction: Testing service must inspect and approve subgrades and fill layers before further construction work is performed thereon. Tests of subgrades and fill layers shall be taken as follows:

B. If, based on reports of testing service and inspection, subgrade or fills which have been placed are below specified density, provide additional compaction and testing at no additional expense to OWNER.

+ + END OF SECTION + +

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SECTION 2D2

ROCK EXCAVATION

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope: CONTRACTOR shall furnish all labor, materials, equipment, and incidentals necessary for rock excavation for construction of structures and pipelines as shown and specified. Disposal of excess and unsuitable excavated rock material is included.

B. Related Work Specified Elsewhere:
   1. Section 2D1, Excavation and Backfill.
   2. Section 2D6, Trench Excavation.

C. Definition of Rock:
   1. Rock is defined as solid ledge rock or boulders which requires drilling and blasting or jack-hammering for its removal.
   2. The following material will not be measured nor allowed for payment as rock excavation:
      a. Soft, weathered or disintegrated rock which can be removed by normal excavation equipment.
      b. Loose or previously blasted rock.
      c. Broken stone in rock fills.
      d. Any rock which may fall into the excavation trench from outside the limits of excavation specified.
      e. Boulders which can be removed without drilling and blasting.
      f. Concrete, asphalt or masonry pavements, walks and gutters.

PART 2 - PRODUCTS

(Part 2 omitted this Section)

PART 3 - EXECUTION

3.1 ROCK UNCOVERED FOR MEASUREMENT

A. Rock shall be uncovered prior to removal in sections acceptable to the ENGINEER so that it may be measured. Rock shall not be blasted or excavated before measurement is made by the ENGINEER and his approval given.

3.2 LIMITS OF ROCK EXCAVATION

A. Limits of rock excavation shall be as follows:
   1. Pipe Trenches: The width of trenches shall be established as the outside diameter of the pipe plus 2 feet -0 inches, exclusive of bells, branches, hubs, spurs or cradles. The sides of the trench shall be considered as vertical.
      a. The depth of the trench shall be established as a point 6 inches below the outside of the pipe.
      b. The length shall be equal to the laid length of pipe, measured horizontally.
      c. Additional width in pipe trenches at field joints or beyond the lines described above will be considered outside the limits described.

3.3 BLASTING

A. The CONTRACTOR must submit in writing his blasting plans and operations to the ENGINEER for review and approval prior to initiating any work.

B. All blasting operations shall be conducted in strict accordance with existing applicable ordinances and regulations relative to rock blasting and the storage and use of explosives.

C. Rock excavation adjacent to existing utilities shall be done with utmost care and only after proper notification and coordination with the utility owner and regulatory authority.

D. Blasting shall be conducted so as not to endanger persons or property nor to damage or weaken adjacent foundations, structures, sheeting, bracing, or other facility. Blasting shall be covered or otherwise suitably confined.

E. CONTRACTOR shall be wholly responsible for damage caused by his blasting, and shall repair or replace all damage immediately.

F. CONTRACTOR shall keep records of all blasts including date, location, depth, number, and diameter of drill holes, type and amount of explosive and other pertinent data. Records shall be furnished to the ENGINEER when requested.

3.4 HAND REMOVAL

A. Where hazardous conditions exist, or clearances with existing piping or structure are very small, or strong possibility of damage to persons or property exists, blasting shall not be used. CONTRACTOR shall remove rock in these areas by hand methods (no blasting).

3.5 DISPOSAL OF EXCAVATED ROCK

A. Excavated rock may be used in backfill subject to the following limitations:
   1. Pieces of rock larger than 12 inches shall not be used in backfilling pipe trenches.
   2. Rock backfill shall not be placed within two feet of the outside of pipes.
   3. The quantity of rock used in any backfill location shall not be so great as to result in voids.
   4. Rock backfill shall not be placed within 18 inches of the surface of finish grade.
   5. Excess or unacceptable rock may be disposed of on the site only where shown or approved by ENGINEER. Rock which cannot be disposed of on the site shall be removed and disposed of off the site, at the CONTRACTOR'S expense, and in compliance with all applicable federal, state and local regulations.

3.6 UNAUTHORIZED ROCK EXCAVATION

A. All rock excavation outside the limits described and which is not approved by the ENGINEER, together with its removal, disposal and refill will be at the CONTRACTOR'S expense.

B. Unauthorized excavation below pipe or foundation shall be refilled with compacted select fill or concrete, as directed by the ENGINEER. Other unauthorized excavation shall be backfilled with material as specified in Section 2D1.

+ + END OF SECTION + +

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SECTION 2D4

RIPRAP

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:
   1. CONTRACTOR shall furnish and place riprap at locations shown and specified.

B. Related Work Specified Elsewhere:
   1. Section 2D1, Excavation and Backfill.
   2. Section 2D2, Rock Excavation.

PART 2 - PRODUCTS

2.1 MATERIAL

A. Riprap shall consist of hard, durable, angular field or quarry stone. All stones shall weigh from 10 to 50 pounds each. At least fifty per cent of the stones shall weigh in excess of 20 pounds. Minimum diameter for each stone shall be 8 inches. The stones shall be free of dirt, debris, or deleterious material. Stones salvaged from excavation and meeting the above requirements may be used for riprap if approved by the ENGINEER.

PART 3 - EXECUTION

3.1 PLACING

A. Minimum total thickness of the riprap layer shall be 18 inches.

B. The stones shall be placed so that the weight of the stone is carried by the underlying material and not by the adjacent stones. On slopes, the largest of stones shall be at the bottom. Riprap shall be of proper size to form a compact solid blanket to protect the slopes.

C. Riprap shall be placed so as to conform as closely as practicable in size and character to existing riprap, if any.

D. Riprap may be placed in location by equipment, however, care shall be taken in placing to obtain a good gradation of materials so that the riprap will be firm and solid. Surfaces shall be leveled to the required alignment and slopes by hand placing the stone so as to fill large voids and to make the surface even.

+ + END OF SECTION + +

SECTION 2D6

TRENCH EXCAVATION

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:
   1. CONTRACTOR shall perform all excavating, backfilling and disposing of earth materials as shown, specified, and required for the purpose of constructing pipelines as required to complete the Work in every respect.
   2. Also included is earthwork for roads, walks, grading, structures and other facilities which are required to complete the Work as shown and specified.
   3. All necessary preparation of subgrade is included.
   4. All temporary means needed to prevent discharge of sediment to water courses caused by erosion or dewatering systems are included.
   5. No classification of excavated materials will be made. Excavation includes all materials regardless of type, character, composition, moisture, or condition thereof, except rock which is under Section 2D2.

B. Related Work Specified Elsewhere:
   1. Section 2B, Clearing.
   2. Section 2D2, Rock Excavation.

1.2 QUALITY ASSURANCE

A. Permits and Regulations:
   1. CONTRACTOR shall obtain all necessary permits for work in roads, rights-of-way, railroads, etc. He shall also obtain permits as required by local, state and federal agencies for discharging water from excavations to rivers and streams.
   2. CONTRACTOR shall perform excavation work in compliance with applicable requirements of governing authorities having jurisdiction.

B. Reference Standards: Comply with applicable provisions and recommendations of the following except as otherwise shown or specified.
   1. ASTM A 36, Specification for Structural Steel.
   2. ASTM A 328, Specification for Steel Sheet Piling.
   3. ASTM D 422, Method for particle Size Analysis of Soils.
   4. ASTM D 1556, Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
   5. ASTM D 1557, test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10-lb (4.54 kg) Rammer and 18-inch (457

mm) Drop.

6. ASTM D 2922, Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
7. AISC Specifications for the Design, Fabrication, and Erection of Structural Steel for Buildings.
8. OSHA Standard, Title 29, Code of Federal Regulations, Part 1926, Section .650 (Subpart P - Excavations).

1.3 SUBMITTALS

A. Excavation Plan: Prior to start of excavation operations, submit written plan to demonstrate compliance with OSHA Standard 29 CFR 1926.650. As a minimum, excavation plan shall include:
   1. Name of competent person.
   2. Excavation of method(s) or protective system(s) to be used.
   3. Copies of "manufacturer's data" or other tabulated data if protective system(s) are designed on the basis of such data.

1.4 JOB CONDITIONS

A. Subsurface Information: Data on subsurface conditions is included in the Supplementary Conditions. It is not intended as a representation or warranty of continuity of such conditions between soil borings. OWNER will not be responsible for interpretations or conclusions drawn therefrom by CONTRACTOR. Data is made available for the convenience of CONTRACTOR.
   1. Additional test borings and other exploratory operations may be made by the CONTRACTOR at no cost to OWNER.

B. Existing Structures: Shown on the Drawings are certain utilities and surface and underground structures located on or adjacent to the Work. This information has been obtained from existing records. It is not guaranteed to be correct or complete and is shown for the convenience of the CONTRACTOR. CONTRACTOR shall explore ahead of the required excavation to determine the exact location of all structures. They shall be supported and protected from injury by the CONTRACTOR. If they are broken or injured, they shall be restored immediately by the CONTRACTOR at no additional cost to OWNER.

C. Existing Utilities: Locate existing underground utilities in the areas of Work. If utilities are to remain in place, provide adequate means of protection during earthwork operations.
   1. Should uncharted or incorrectly charted piping or utilities be encountered during excavation, consult piping or utility owner and ENGINEER immediately for directions. Cooperate with OWNER and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility owner.
   2. In general, service lines to individual houses and businesses are not

shown; however, CONTRACTOR shall assume that a service exists for each utility to each house or business.

D. Use of Explosives:
   1. Do not bring explosives onto site or use in the Work without prior written permission from authorities having jurisdiction.
   2. CONTRACTOR is solely responsible for handling, storage, and use of explosive materials when their use is permitted.

E. Protection of Persons and Property: Barricade open excavations occurring as part of this Work and post with warning lights. Operate warning lights during hours from dusk to dawn each day and as otherwise required.
   1. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.
   2. Consult ENGINEER and obtain his approval before removing, trimming, or disturbing trees, shrubs, plants, fences, rails, walks, structures or other facilities that are encountered on the line of the excavation.

F. Dust Control: CONTRACTOR shall conduct all of his operations and maintain the area of his activities, including sweeping and sprinkling of roadways, so as to minimize creation and dispersion of dust. Calcium chloride shall be used to control serious or prolonged dust problems.

G. Roadways and Walks: Unless otherwise approved by ENGINEER, excavated material and materials of construction shall be so deposited, and the Work shall be so conducted as to leave open and free for pedestrian traffic all crosswalks, and for vehicular traffic a roadway not less than 10 feet in width. All hydrants, valves, fire alarm boxes, letter boxes, and other facilities which may require access during construction shall be kept accessible for use. During the progress of the Work CONTRACTOR shall maintain such crosswalks, sidewalks, and roadways in satisfactory condition and the Work shall at all times be so conducted as to cause a minimum of inconvenience to public travel, and to permit safe and convenient access to private and public property along the line of the Work.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. Select Fill:
   1. Select fill shall be placed where shown or specified below and around foundations, tanks, pipelines, structures, roads, and walks.
   2. Fill shall be well graded granular material or bank run gravel, free

from organic matter. Not more than 70 percent by weight shall pass through a No. 40 sieve; not more than 10 percent by weight through a No. 200 sieve; and 100 percent shall pass a 6-inch square sieve.

3. Advise ENGINEER in writing of source and, if required, submit samples of the material for approval.

B. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, crushed slag, natural or crushed sand, approved by ENGINEER.

C. Drainage Fill: Washed, uniformly graded mixture of crushed stone, or crushed or uncrushed gravel, with 100 percent passing a 1-1/2 inch sieve and not more than 5 percent passing a No. 4 sieve.

D. General Backfill and Fill Materials: Provide approved soil materials for backfill and fill, free of clay, rock or gravel larger than 6 inches in any dimension, debris, waste, frozen materials, vegetable and other deleterious matter. Previously excavated materials meeting these requirements may be used for backfill.

PART 3 - EXECUTION

3.1 INSPECTION

A. CONTRACTOR shall provide ENGINEER with sufficient time and means for ENGINEER to examine the areas and conditions under which excavating, filling, and grading are to be performed. ENGINEER will notify the CONTRACTOR of conditions detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected in a manner acceptable to ENGINEER.

3.2 EXCAVATION

A. CONTRACTOR shall perform all excavation required to complete the Work as shown and specified. Excavations shall include earth, sand, clay, gravel, hardpan, boulders and ledge not requiring drilling and blasting to remove, decomposed rock, pavements, rubbish and all other materials within the excavation limits, except rock. Where the excavation is in rock, the rock shall be removed as specified under Section 2D2.

B. Excavations for pipelines, utilities and structures shall be open excavations, shored and braced where necessary to prevent possible injury to workmen and to new and existing structures or pipelines.

C. Where the pipeline, utility or structure is to be placed below the ground water table, wellpoints, cofferdams or other acceptable dewatering methods shall be used to permit construction under dry conditions. Dry conditions

shall prevail until the pipelines are properly jointed, tested and backfilled.

E. Excavations for pipelines shall be made sufficiently wide to permit proper laying and jointing of the pipe. The trench width at the top of the pipe should not be greater than the outside diameter of the pipe barrel plus 2 feet, but shall be sufficient to allow thorough compacting of earth refill adjacent to the bottom half of the pipe. Enlargements of the trench shall be made to give ample space for required operations at pipe joints. The depth of trench shall in general be as shown, but the depth may be increased or decreased if required. The use of excavating equipment which requires the trench to be excavated to an excessive width will not be allowed. All trenches for piping 4 inches in diameter and larger, shall be excavated at least 6 inches below the bottom of the pipe and backfilled with pipe bedding material as specified under Section 2D5.

F. Material Storage: Stockpile satisfactory excavated materials in approved areas, until required for backfill or fill. Place, grade and shape stockpiles for proper drainage.
   1. Locate and retain soil materials away from edge of excavations.
   2. Dispose of excess soil material and waste materials as specified hereinafter.

G. Where the existing material beneath the bedding material is unsuitable, the CONTRACTOR shall remove and replace it with select backfill. The additional excavation and select backfill material, when ordered in writing by the ENGINEER, shall be included under Section 2D6.

H. Length of Trench: Unless otherwise directed or permitted, not more than 200 feet of trench in advance of the end of the completed pipe or structure therein shall be opened at any time. Every trench in rock shall be fully opened at least 30 feet in advance of any place where masonry or pipe is being laid.

3.3 UNAUTHORIZED EXCAVATION

A. All excavation outside the lines and grades shown and not approved by ENGINEER, together with the removal and disposal of the associated material shall be at CONTRACTOR'S expense. The unauthorized excavation shall be filled as directed by ENGINEER with select compacted backfill or concrete at the CONTRACTOR'S expense. Claims and damages resulting from CONTRACTOR'S unauthorized excavation will be his sole responsibility.

3.4 DRAINAGE AND DEWATERING

A. General:
   1. Prevent surface and subsurface water from flowing into excavations and from flooding adjacent areas.

2. Remove water from excavations as fast as it collects.
3. Maintain the ground water level below the bottom of the excavation to provide a stable surface for construction operations and to prevent damage to the Work during all stages of construction.
4. Provide and maintain pumps, sumps, suction and discharge lines and other dewatering system components necessary to convey water away from excavations. Adequate operational standby equipment shall be maintained on the site.
5. Provide approved sediment traps when water is conveyed into water courses.
6. Obtain ENGINEER'S approval before shutting down dewatering system for any reason.

B. Disposal of Water Removed by Dewatering System:
1. Dispose of all water removed from the excavation in such a manner as not to endanger public health, property, or any portion of the Work under construction or completed.
2. Dispose of water in such a manner as to cause no inconvenience to the OWNER, or others on or adjacent to the site.
3. Convey water from the excavation in a closed conduit. Do not use trench excavations as temporary drainage ditches.

3.5 SHEETING, SHORING AND BRACING

A. General:
1. Unless otherwise shown or approved excavations shall be open excavation, shored and braced or sheeted where necessary to prevent injury to workmen, structures, pipe lines and utilities.
2. All municipal, county, state and federal ordinances, codes, regulations and laws shall be observed.
3. Used material shall be in good condition, not damaged or excessively pitted. Unless otherwise approved by ENGINEER, all sheeting to remain in place shall be new. New or used sheeting may be used for temporary work.
4. All timber used for breast boards (lagging) shall be new or used, meeting the requirements for Douglas Fir Dense Construction grade or Southern Pine No. 2 Dense S3.
5. All steel work for sheeting, shoring, bracing, cofferdams etc., shall be designed in accordance with the provisions of the "Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings", of the AISC except that field welding will be permitted.
6. Steel sheet piping shall be manufactured from steel conforming to ASTM A 328. Steel for soldier piles, wales and braces shall be new or used and shall conform to ASTM A 36.
7. Maintain shoring and bracing in excavations regardless of time period excavations will be open. Carry down shoring and bracing as excavation progresses.

8. Safe and satisfactory sheeting, shoring and bracing shall be the entire responsibility of the CONTRACTOR.
9. Unless otherwise shown, specified, or ordered, all materials used for temporary construction shall be removed when work is completed. Such removal shall be made in a manner not injurious to the pipelines or structures.

B. Removal of Sheeting and Bracing: Remove sheeting and bracing from excavation unless otherwise ordered in writing by the ENGINEER. Removal shall be done so as to not cause injury to the Work.

3.6 TRENCH SHIELDS

A. Excavation of earth material below the bottom of a shield shall not exceed the limits established by ordinances, codes, laws and regulations.

B. When using a shield for pipe installation:
1. Any portion of the shield that extends below the mid-diameter of any installed rigid pipe (i.e., RCCP shall be raised above this point prior to moving the shield ahead for the installation of the next length of pipe.
2. The bottom of the shield shall not extend below the mid-diameter of installed flexible pipe (i.e., Steel, DI, PVC, etc.) at any time.

C. When using a shield for the installation of structures, the bottom of the shield shall not extend below the top of the bedding for the structures.

D. When a shield is removed or moved ahead, extreme care shall be taken to prevent the movement of pipe or structures or the disturbance of the bedding for pipe or structures. Pipe or structures that are disturbed shall be removed and reinstalled as specified.

3.7 BACKFILL AND COMPACTION

A. All backfill required for trenches and structures and required to provide the finished grades shown and as described herein shall be furnished, placed and compacted by the CONTRACTOR. Unless otherwise specified or required, fill shall be obtained from the excavated materials. All materials used for filling and backfilling shall be soil of acceptable quality, free from boulders, frozen lumps, wood, stumps, sludge, or other organic matter or other deleterious materials. Excavated materials meeting these requirements may be used as backfill.

B. Backfill excavations as promptly as Work permits, but not until completion of the following:
1. Acceptance by ENGINEER of all Work within the excavation.
2. Inspection, testing approval, and recording of locations of underground utilities, connections, branches, structures and other

facilities.

3. Removal of shoring and bracing, and backfilling of voids with satisfactory materials. Cut off temporary sheet piling driven below bottom of structures and remove in manner to prevent settlement of the structure or utilities, or leave in place if required.
4. Removal of trash and debris.

C. Excavation shall be kept dry during backfilling operations. Backfills around piping and structures shall be brought up evenly on all sides.

D. All backfill in pipe trenches which is below pipes, foundations, or paved areas shall be placed in horizontal layers not exceeding 6 inches in depth and thoroughly compacted before the next layer is placed. In other pipe trenches, layers shall be 6 inches up to the pipe spring line and 12 inches thereafter.

E. Where pipe is laid in rock excavation, 6 inches minimum of crushed stone or gravel fill shall be carefully placed and tamped over the rock before the pipe is laid. After laying pipe, the balance of the backfill shall be placed as described hereinabove.

3.8 GRADING

A. General: Uniformly grade areas within limits of grading under this Section, including adjacent transition areas. Smooth subgrade surface within specified tolerances, compact with uniform levels or slopes between points where elevations are shown, or between such points and existing grades.

B. Compaction: After grading, compact subgrade surfaces to the depth and percentage of maximum density required.

3.9 DISPOSAL OF EXCAVATED MATERIALS

A. All spoil material (excavated material unsuitable for backfill) which is not contaminated shall be disposed of on-site at a location approved by the ENGINEER.

B. All spoil material (excavated material unsuitable for backfill) which is contaminated, as determined by the on-site Engineer, shall be placed in CONTRACTOR supplied roll-off containers at a location determined by the on-site ENGINEER.

+ + END OF SECTION + +

SECTION 2G4

DEWATERING

PART 1 - GENERAL

1.1 GENERAL

A. Provide and maintain methods, equipment, and temporary construction, as necessary, to dewater areas shown on the contract drawings. Remove physical evidence of temporary facilities at completion of work.

PART 2 - PRODUCTS

(Part 2 omitted this Section)

PART 3 - EXECUTION

3.1 WATER CONTROL

A. During dewatering operations, direct drainage to proper runoff courses so as to prevent any erosion, spread of contamination, and damage or nuisance.

B. Provide, operate, and maintain equipment and facilities of adequate size to dewater the site.

C. Dispose of drainage water in a manner to prevent flooding, erosion, or other damage to any portion of the site or to adjoining areas and in conformance with all environmental requirements.

3.2 - SAMPLING REQUIREMENT

A. All dewatered sediments must pass the USEPA SW-846 Method 9095 Paint Filter Test before being placed within the landfill boundaries.

+ + END OF SECTION + +

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SECTION 2H6

MANHOLES

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope: CONTRACTOR shall furnish all labor, materials, equipment and incidentals necessary to provide all precast, cast-in-place and masonry manholes shown, specified and otherwise required to complete the Work.

B. General:
   1. Structures shall conform in shape, size, dimensions, material, and other respects to the details shown or as ordered by the ENGINEER.
   2. Cast-iron frames, grates and covers shall be the standard frame and grate or cover unless otherwise shown and shall be as specified in Section 5E11.
   3. Concrete shall be Class A except where otherwise specified and shall conform to the requirements specified under Section 3D.
   4. Inverts shall conform accurately to the size and elevation of the adjoining pipes. Side inverts shall be curved and main inverts, where direction changes, shall be laid out in smooth curves of the longest possible radius which is tangent to the center lines of adjoining pipelines.

C. Related Work Specified Elsewhere:
   1. Section 5E11, Castings.
   2. Division 15 Sections on Piping.

1.2 QUALITY ASSURANCE

A. Reference Standards:
   1. ASTM C 32, Sewer and Manhole Brick (made from Clay or Shale).
   2. ASTM C 139, Concrete Masonry Units for Construction of Catch Basins and Manholes.
   3. ASTM C 140, Sampling and Testing Concrete Masonry Units.
   4. ASTM C 207, Hydrated Lime for Masonry Purposes.
   5. ASTM C 478, Precast Reinforced Concrete Manhole Sections.
   6. AWWA C302, Reinforced Concrete Pressure Pipe, Noncylinder Type, for Water and Other Liquids.

1.3 SUBMITTALS

A. Samples: Submit for approval samples of brick, block, gaskets and all accessories required for the manholes.

B. Shop Drawings: Submit for approval Shop Drawings of design and construction details of all precast concrete.

PART 2 - PRODUCTS

2.1 PRECAST CONCRETE MANHOLES

A. Precast manholes shall conform to the details shown. Manhole bases may be precast unless cast-in-place is required by the Drawings.

B. Except where otherwise specified manhole sections shall conform to ASTM C 478.

C. Precast manhole bases shall be of approved design and of sufficient strength to withstand the loads to be imposed upon them. An approved joint shall be provided to receive the pipe sections forming the barrel.

D. Mark date of manufacture and name or trademark of manufacturer on inside of barrel.

E. Unless a larger size is required by the Drawings, the barrel of precast manholes shall be constructed of 48-inch diameter standard reinforced concrete manhole sections. The barrel shall be constructed of various lengths of pipe in combination to provide the correct height with the fewest joints. Wall sections shall not be less than 5 inches thick.

F. Joints shall be rubber and concrete using O-ring gaskets conforming with AWWA C302 or tongue and groove buttered with 1 to 2 cement brick sand mortar. For rubber ring joints, the base of the bell shall be buttered with 1 to 2 cement mortar to provide a uniform bearing for the spigot of the entering pipe.

G. A precast or cast-in-place slab or precast eccentric cone, as shown or approved, shall be provided at the top of the manhole barrel to receive the cast iron frame and cover. The slab or cone shall be of acceptable design and of sufficient strength to safely support an H-20 loading. Concrete slabs shall be not less than 6 inches thick.

H. Manhole sections shall contain manhole steps, 12 inches on centers, accurately positioned and embedded in the concrete.

2.3 MISCELLANEOUS METALS

A. Metal frames, covers, steps, toe pockets and similar required items shall be provided as shown and in accordance with 5E Series Sections on Metal Fabrications.

PART 3 - EXECUTION

3.1 LAYING MASONRY

A. Brick shall be satisfactorily wet when being laid and each brick shall be laid in mortar so as to form full bed, end and side joints in one operation. The joints shall not be wider than 3/8-inch, except when the

bricks are laid radially, in which case the narrowest part of the joint shall not exceed 1/4-inch.

B. For concrete block, the vertical keyways shall be completely filled with mortar.

C. Each grading ring shall be laid in a full bed of mortar and shall be thoroughly bonded.

3.2 PLASTERING

A. The outside of brick manholes and grading rings shall be neatly plastered with 1/2 inch of cement mortar as the Work progresses.

3.3 MANHOLE BASES

A. Precast bases shall be set on a compacted No. 1 stone foundation as shown and specified. Precast bases shall be set at the proper grade and carefully leveled and aligned.

3.4 PRECAST MANHOLE SECTIONS

A. Set sections vertical with steps and sections in true alignment.

B. Install sections, joints and gaskets in accordance with manufacturers recommendations.

C. Lifting holes shall be sealed tight with a solid rubber plug driven into hole and the remaining void filled with 1 to 2 cement-sand mortar.

3.5 GRADING RINGS

A. Grading rings or brick stacks shall be used for all precast and masonry manholes where required. Stacks shall be a maximum of 12 inches in height, constructed on the roof slab or cone section on which the manhole frame and cover shall be placed. The height of the stack shall be such as is necessary to bring the manhole frame to the proper grade.

B. Brick work shall be as specified in 2.2 and 3.1 above.

3.6 GRADING AT MANHOLES

A. All manholes in unpaved areas shall be built as shown or directed to an elevation higher than the original ground. The ground surface shall be graded to drain away from the manhole. Fill shall be placed around manholes to the level of the upper rim of the manhole frame, and the surface evenly graded on a 1 to 5 slope to the existing surrounding ground unless otherwise shown. The slope shall be covered with 4-inch of top soil, seeded and maintained until a satisfactory growth of grass is obtained.

B. Manholes in paved areas shall be constructed to meet the final surface grade. In paved areas on state Highways, all manholes shall be 1/2 inch

below final wearing surfaces. Manholes shall not project above finished roadway pavements to prevent damage from snowplows.

C. CONTRACTOR shall be solely responsible for the proper height of all manholes necessary to reach the final grade at all locations. CONTRACTOR is cautioned that ENGINEER's review of Shop Drawings for manhole components will be general in nature and CONTRACTOR shall provide an adequate supply of random length precast manhole riser sections to adjust any manhole height to meet field conditions for final grading.

3.7 MANHOLE WATERTIGHTNESS

A. All manholes shall be free of visible leakage. Each manhole shall be tested for leaks and inspected, and all leaks shall be repaired in a manner subject to ENGINEER'S approval.

3.8 FLEXIBLE PIPE JOINT AT MANHOLE BASE

A. An approved flexible joint shall be provided between each pipe entering and exiting manhole. This may be accomplished by the installation in the manhole base of the bell end of a pipe or by other means subject to approval of the ENGINEER. Joints shall be similar to the approved pipe joints. The joint into the manhole base shall be completely watertight.

+ + END OF SECTION + +

SECTION 2K

LANDSCAPING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:
   1. CONTRACTOR shall provide all labor, materials, equipment and incidentals as shown, specified and required to furnish and perform landscaping Work.
   2. The extent of the landscaping Work shall be performed as shown and as specified in schedules.
   3. The types of landscaping Work required include the following:
      a. Topsoil from off-site sources.
      b. Ground cover areas.
      c. Maintenance Work as specified until completion of the Contract.
      d. Soil amendments.
      e. Fertilizers.
      f. Miscellaneous landscape materials.
      g. Seeded areas.
      h. Guarantees.

B. Coordination:
   1. Review installation procedures under other Sections and coordinate the installation of items that must be installed with the landscaping.
   2. Notify other contractors in advance of the installation of the landscaping to provide the other contractors with sufficient time for the installation of items included in their contracts that must be installed before the landscaping.

C. Related Sections:
   1. Section 2B, Clearing.
   2. Section 2D1, Excavation and Backfill.

1.2 QUALITY ASSURANCE

A. Source Quality Control:
   1. General:
      a. Ship landscape material with certificates of inspection as required by governmental authorities.
      b. Comply with governing regulations applicable to landscape materials.
      c. ENGINEER will request inspection of delivery slips for materials to verify specified quantities of bulk deliveries of soil amendments and fertilizers.

2. Analysis and Standards: Package standard products with manufacturer's certified analysis. For other materials, provide analysis by recognized laboratory made in accordance with methods established by the Association of Official Analytical Chemists, wherever applicable or as further specified.
3. Off-Site Topsoil: Obtain topsoil from local sources or from areas having similar soil characteristics to that found at the site of the Work. Obtain topsoil only from naturally well-drained sites where topsoil occurs in depth of not less than 4-inches; do not obtain from bogs or marshes.

1.3 SUBMITTALS

A. Shop Drawings: Submit for approval the following:
1. Before delivery of off-site topsoil, written statement giving the location of the properties from which the topsoil is to be obtained, the names and addresses of the suppliers and the depth to be stripped.

B. Test Reports: Submit for approval the following:
1. Before delivery of off-site topsoil, a soil analysis made by an approved soil testing laboratory stating porosity, the percentages of silt, clay, sand and organic matter, the pH and the mineral and plant nutrient content of the topsoil. Supply topsoil with 5 percent organic matter minimum.
2. Before delivery of peat humus an analysis made by an approved laboratory stating the mechanical and chemical analysis of the peat humus proposed for use.

C. Certificates: Submit for approval the following:
1. Certificates of inspection as may be required by governmental authorities to accompany shipments, and manufacturer's or vendors certified analysis for soil amendments and fertilizer materials. For standard products submit other data substantiating that materials comply with specified requirements.
2. Certificates from seed vendors certified statement for each seed mixture required, stating botanical and common name, percentage by weight and percentages of purity, germination, and weed seed for each species.

D. Operation and Maintenance Data: Submit for approval the following:
1. Typewritten instructions recommending procedures to be established by OWNER for the maintenance of landscape Work for one full year. Submit prior to expiration of required maintenance period(s). Include moisture requirements of each type of planting and insect prevention measures including types of spray and application instructions, and special winter protection measures required for each planting.

E. Guarantee: Submit for approval a written guarantee, in the terms specified under "Guarantee" provisions of these Specifications, signed by CONTRACTOR.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Delivery of Materials:
   1. Deliver packaged materials in original, unopened containers showing weight, analysis and name of manufacturer. Protect materials from deterioration during delivery.
   2. Furnish seed in sealed, standard containers.
   3. Notify ENGINEER of delivery schedule in advance so plant material may be inspected upon arrival at job site.
   4. Remove unacceptable material immediately from project site.

B. Storage of Materials:
   1. Store and cover materials to prevent deterioration. Remove packaged materials which have become wet or show deterioration or water marks from the site. Replace at no further cost to OWNER.
   2. Seed that is wet or moldy or that has been otherwise damaged in transit or storage is not acceptable. Replace at no further cost to OWNER.

1.5 JOB CONDITIONS

A. Environmental Requirements:
   1. Proceed with and complete the Work as rapidly as portions of the site become available, working within the seasonal limitations for each kind of landscaping Work required.
   2. Do not spread seed when wind velocity exceeds 5 miles per hour.
   3. Do not plant when drought, or excessive moisture, or other unsatisfactory conditions prevail.

B. Scheduling:
   1. Plant or install materials only during normal planting seasons for each type of landscape Work required. Correlate planting with specified maintenance periods to provide maintenance until occupancy by OWNER.

1.6 ALTERNATIVES

A. Do no make substitutions. Substitutions may be allowed by ENGINEER at the varietal level only. Submit to ENGINEER proof of non-availability and proposal for use of equivalent material.

1.7 GUARANTEE

A. Guarantee lawns through the specified maintenance period, and until Final Acceptance of the Work.

B. Guarantee ground cover for a period of one year after date of Final Acceptance, against defects including death and unsatisfactory growth, except for defects resulting from unusual phenomena or incidents which are beyond CONTRACTOR's control.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Topsoil:
   1. Topsoil for landscape Work is not available at the site and shall be furnished as specified.
   2. Provide off-site topsoil as required, which is fertile, friable, natural loam, surface soil, capable of sustaining vigorous plant growth, free of any admixture of subsoil, clods of hard earth, plants or roots, sticks or other extraneous material harmful to plant growth. Supply topsoil with the following analysis:
      a. 3/4-inch Mesh: 100 percent passing.
         #4 Sieve: 90 - 100 percent passing.
         #200 Sieve: 0 - 10 percent passing.
      b. Clay content of material passing #200 sieve not greater than 60 percent, as determined by hydrometer tests.
      c. pH 5.0 to pH 6.5. If approved by ENGINEER, natural topsoil not having the hydrogen-ion value specified may be amended by CONTRACTOR at his own expense.
      d. Organic content not less than 5 percent, as determined by ignition loss.
      e. Free of pests and pest larvae.

B. Soil Amendments:
   1. Lime: Natural limestone containing not less than 85 percent of total carbonates, ground so that not less than 90 percent passes a 10-mesh sieve and not less than 50 percent passes a 100-mesh sieve.
   2. Peat Humus: Provide peat humus which is a natural product of either sphagnum moss, reed, or sedge peat, taken from a fresh water site. Supply shredded material, free from lumps, roots, stones and other extraneous foreign matter, capable of passing through a 1/2-inch screen, which can easily be incorporated with the topsoil. Supply material which has been conditioned in storage piles after excavation for at least 6 months, including one freezing and thawing period. Supply peat humus with the following analysis:
      a. Not less than 90 percent organic matter by weight on an oven dry basis.
      b. pH range 5 to 7.5.
      c. Moisture content 35 percent at time of incorporation into soil.
      d. Water absorbing ability 150 percent to 350 percent by weight.
   3. Sand: Washed of fine to medium texture.
   4. Ferrous Sulfate: Commercial grade and unadulterated.

C. Commercial Fertilizers:
   1. Hydroseeding Fertilizer:
      a. Commercial designation of 18-24-6. Provide a complete fertilizer of neutral character with a minimum of 75 percent nitrogen derived from natural organic sources.
      b. Minimum 40-50 percent of nitrogen shall be water soluble.
      c. Uniform in composition, free-flowing and suitable for application

with approved equipment.

d. Product and Manufacturer: Provide one of the following:
   1) Scotts Starter Fertilizer by Scott and Sons Incorporated.
   2) Or equal.

D. Plant Materials:
   1. Provide plant materials true to name and variety established by the American Joint Committee on Horticultural Nomenclature, Standardized Plant Names.

E. Grass Materials:
   1. Grass Seed Mixture: Provide fresh, clean, new-crop seed complying with the tolerance for purity and germination established by the Official Seed Analysts of North America. Provide seed of the grass species, proportions and minimum percentages of purity, germination, and maximum percentage of weed seed, as specified.
   2. The "Schedule of Grass Seed Requirements" is as follows:

Weight	Name of Grass	Purity	Germination	Application By per 1000 square feet
80% (minimum)	Certified Kentucky 31 Tall Fescue - Festuca arundinacia	98%	85%	8 pounds
20% (maximum)	Kentucky Bluegrass (Common) - Poa pratensis	95%	80%	2 pounds
				10 pounds

   3. Mulch:
      a. Anti-Erosion Mulch: Provide clean, seed-free salt hay or threshed straw of wheat, rye, oats or barley, free from noxious weeds. Materials which are low grade and unfit for farm use such as "U.S. Sample Grade" are acceptable.
   4. Hydromulch Adhesive:
      a. On areas and slopes graded between 1:3 and 1:5 provide 8.25 pounds of adhesive per 1000 square yards of seedbed incorporated into the hydroseed slurry.
      b. Provide the following:
         1) A non-ionic galatamannan polysaccharide that forms a colloidal dispersion. Once adhesive film is formed and has been allowed to dry or cure, its resistance to solubility increases. Adhesive film shall be biodegradable, so that it eventually is broken down by water and/or by microbial action.
         2) Color: Off-white with orange specks dispersed throughout.
         3) Viscosity: 3000 CPS +/- 500 1 percent Sol. 25 degrees C 24 hours. Brookfield Viscometer #3 Spindle, 20 rpm.
         4) pH: 6 to 7.
   5. Water: Potable

6. Anti-Desiccant: Emulsion type, film-forming agent, designed to permit transpiration but retard excessive loss of moisture from plants.
   a. Product and manufacturer: Provide one of the following:
      1) Dowax by Dow Chemical Company.
      2) Wilt-Pruf by Nursery Specialty Products, Incorporated.
      3) Or equal.
7. Erosion Control Fabric: Provide erosion control fabric fabrication from 840 denier polypropylene yarn interwoven with paper strips. Provide hold down staples 6-inches long by 1-inch wide at the throat. Provide a complete selection of manufacturer's standard biodegradable filler papers and yarns.

2.2 Mixes

A. Preparation of Planting-Soil:
1. Before mixing, clean topsoil of roots, plants, sods, tones, clay lumps, and other extraneous materials harmful or toxic to plant growth.
2. Mix specified soil amendments and fertilizers with topsoil at the rates required to produce the pH needed for that particular planting and as specified herein. Delay mixing of fertilizer if planting will not follow placing of planting soil within a few days.
3. Provide planting soil mixture proportions as follows:

Percent by Volume	Material
50 percent	Screened topsoil
40 percent	Peat Humus
10 percent	Coarse sand

4. Add 5 pounds 5-10-5 commercial fertilizer per cubic yard.
5. Mix specified planting soil proportions with 3 pounds of bonomeal per cubic yard.
6. For pit and trench type backfill, mix planting soil prior to backfilling, and stockpile at the site.
7. For planting beds, mix planting soil either prior to planting or apply on surface of topsoil and mix thoroughly before planting.
8. Mix lime with dry soil prior to mixing of fertilizer. Prevent lime from contacting roots of acid-loving plants.
9. Apply phosphoric acid fertilizer (other than that constituting a portion of complete fertilizers) directly to subgrade before applying planting soil and tilling.

PART 3 - EXECUTION

3.1 INSPECTION

A. CONTRACTOR and his installer shall examine the subgrade, verify the elevations, observe the conditions under which Work is to be performed,

and notify ENGINEER of unsatisfactory conditions. Do not proceed with the Work until unsatisfactory conditions have been corrected in a manner acceptable to ENGINEER.

3.2 PREPARATION

A. Seed Preparation:
   1. Loosen subgrade of turfbed areas to a minimum depth of 4 inches. Remove stones over 1-1/2 inches in any dimension and sticks, roots, rubbish and other extraneous matter. Limit preparation to areas which will be planted promptly after preparation.
   2. Spread topsoil to minimum depth of 6-inches after natural settlement and light rolling.
      a. Do not spread topsoil while in a frozen condition or when moisture content is so great that excessive compaction will occur nor when so dry that dust will form in the air or that clods will not break readily.
   3. Apply commercial fertilizers in the following quantities:
      a. For grass apply only at a rate sufficient to supply 1.5 pounds of nitrogen per 1000 square feet. For 5-10-5 use 30 pounds per 1000 square feet.
   4. Apply commercial fertilizers within 10 days of seeding.
   5. Apply commercial fertilizers in 2 operations. First application shall be 3/4 of total amount.
   6. Thoroughly and evenly incorporate commercial fertilizers with the soil to depth of 3 inches by discing, or other approved method.
      a. In areas inaccessible to power equipment, use hand tools.
      b. Adjacent to existing trees, adjust depth to avoid disturbing roots.
   7. Apply superphosphate for grass areas at the rate of 20 pounds per 1000 square feet and incorporate into the top 3 inches of topsoil.
   8. Spread peat humus at rate of six 18-inch by 18-inch by 36-inch bales per 1000 square feet and incorporate into top 4 inches of topsoil.
   9. Grade turfbed areas to smooth, even surface with loose, uniformly fine texture. Remove all stones and extraneous foreign material in excess of 1-inch in diameter. Roll, rake, and remove ridges, and fill depressions, as required to meet finish grades. Limit fine grading to areas which can be planted immediately after grading.
   10. Apply a second dressing of fertilizer. Use 1/4 of the total required amount.
   11. Moisten prepared turfbed areas before planting if soil is dry. Water thoroughly and allow surface moisture to dry before planting. Do not create a muddy soil condition.
   12. Restore turfbed areas to specified condition if eroded or otherwise disturbed after fine grading and prior to planting.

3.3 INSTALLATION

A. Erosion Control Fabric:
   1. Fabric to be installed on all slopes exceeding 1 on 3.
   2. Install erosion control fabric as follows:

a. Vertically down slope without stretching fabric.
b. Install hold down staples 3 per square yard minimum in center of fabric or as required to hold and shape the fabric to the contours of the slope. Install hold down staples along edges and overlaps if fabric at 9 inches on center minimum, or as required to hold and shape the fabric to the contours of the slope.
c. Lap fabric 4 inches minimum and turn edges of fabric into 8-inch deep by 16-inch wide earth trench and fill trench with earth.

3. Do not leave seeded areas unmulched for longer than 3 days. Reseed areas which remain without mulch for longer than 3 days.
4. Prevent damage or staining of construction or other plantings adjacent to mulched area.
5. Prevent foot or vehicular traffic, or the movement of equipment, over the mulched area. Reseed areas damaged as a result of such activity.
6. Water seeded areas thoroughly with a fine spray.

B. Hydroseeding Field Cover:
1. Prepare seedbed as described for turfbed under 3.2.B above.
2. Hydraulic seeding equipment shall arrive on the site empty and clean. Use hydraulic equipment with a power-driven built-in paddle agitation system with an operating capacity sufficient to agitate, suspend and homogeneously mix the following slurry:
a. 3000 gallons of water.
b. 5.6 pounds of seed (8 pounds per acre).
c. 3 - 44 pound bags of 18-24-6 starter fertilizer.
d. 21 - 60 pound bags wood fiber pulp (1800 pounds per acre).
e. 6 - 15 pound bags tackifier.
f. Depending on installation conditions encountered, as specified, add an approved hydromulch adhesive.
3. Immediately before seeding, rework the seedbed areas until they provide a finely pulverized smooth seedbed, varying not more than 1/2 inch in ten feet. All inequities and soft spots shall be corrected before seeding.
4. With water filling the tank and equipment power at 1/3 to full throttle, begin agitation and load fertilizer, seed and mulch in that order.
5. When tank is half full, add tackifier, pouring slowly into tank into the area of most agitation.
6. Continue to fill with water until all components are loaded.
7. Spray the slurry over the area covering a "marked seedbed area", using a properly chosen nozzle, to ensure correct rate of application. Start spraying with power and agitation on full, then throttle down to proper rate of application.
8. Prevent damage or staining of construction or other planting adjacent to hydro seeded areas.
9. Prevent foot or vehicular traffic, or the movement of equipment over the seeded areas. Reseed areas damaged as a result of such activity.
10. Prevent the seeded areas from drying out. After seedlings appear in about 2-3 weeks, reseed all bare spots larger than 18 inches in

diameter. Areas to be reseeded shall be hand raked to scarify the surface and seed shall be applied by cyclone spreader. Lightly rake the seed into the soil.

3.4 MAINTENANCE

A. Begin maintenance immediately after seeding.

B. Maintain turf for not less than the period stated below, and longer as required to establish an acceptable stand, as determined by ENGINEER.
   1. Grass seed lawns, not less than 60 days.
   2. If seeded in fall and not given full 60 days of maintenance, or if not considered acceptable at that time, continue maintenance the following spring until acceptable lawn is established.

3.5 CLEANUP AND PROTECTION

A. During landscape Work, store materials and equipment where directed. Keep pavements clean and Work area in an orderly condition.

B. Protect landscape Work and materials from damage due to landscape operations, operations by other contractors and trades and trespassers. Maintain protection during installation and maintenance periods. Treat, repair or replace damaged landscape Work as directed.

C. Take all precautions to insure that hydroseed slurry, is only placed on the areas designated. Completely clean any overspray on areas not designated to receive slurry, to the satisfaction of ENGINEER.

D. Remove all rubbish, equipment and rejected materials from the site.

E. Protection includes all temporary fences, barriers and signs and other Work incidental to proper maintenance.

3.6 INSPECTION AND ACCEPTANCE

A. When the landscape Work is completed, including maintenance, ENGINEER will make an inspection to determine acceptability.

B. Where inspected landscape Work does not comply with the requirements, replace rejected Work and continue specified maintenance until reinspected by ENGINEER and found to be acceptable. Remove rejected plants and materials promptly from the project site.

+ + END OF SECTION + +

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SECTION 3I

GROUT

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:
   1. CONTRACTOR shall provide all labor, materials, equipment, and incidentals as shown, specified and required to furnish and install grout.

   2. Grout shall be placed at the following locations:
      a. Tunnel grouting.
      b. Intrusion grouting.
   3. The types of grout include the following:
      a. Non-shrink, non-metallic type.

B. Classes of Ordinary Type Grout:
   1. Sika Grout 212 or equal:
      a. Tunnel and intrusion filler.

C. Related Sections:
   1. Section 20A1, Sewer System #1 Decommissioning.
   2. Section 20A2, Sewer System #2A, 2B, 3 & 4 Decommissioning.

1.2 QUALITY ASSURANCE

A. Reference Standards: Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified.
   1. ASTM C 144, Aggregate for Masonry Mortar.
   2. ASTM C 150, Portland Cement.
   3. ASTM C 109, Compressive Strength of Hydraulic Cement Mortars (using 2-in. or 50 mm. Cube Specimens).
   4. ASTM C 191, Time of Setting of Hydraulic Cement by Vicat Needle.
   5. CRD-C-588, Specifications for Non-Shrink Grout.
   6. CRD-C-619, Specification for Grout Fluidifier.

1.3 SUBMITTALS

A. Shop Drawings: Submit for approval the following:
   1. Manufacturer's specifications and installation instructions for all proprietary materials.
   2. For ordinary cement grout, submit copies of grout design mix and laboratory test reports for grout strength tests.

B. Reports and Certificates:
   1. For proprietary materials, submit copies of reports on quality control tests.
   2. For nonproprietary materials, submit certification that materials meet specification requirements.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Delivery of Materials: Grout materials from manufacturers shall be delivered in unopened containers and shall bear intact manufacturer's labels.

B. Storage of Materials: Grout materials shall be stored in a dry shelter and shall be protected from moisture.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Non-Shrink, Non-Metallic Grout:
   1. Pre-mixed non-staining cementious grout requiring only the addition of water at the job site.
   2. Product and Manufacturer: Provide one of the following:
      a. Euco N-S by The Euclid Chemical Company.
      b. Masterflow 713 by Master Builders Company.
      c. Sika Grout 212 by Sika Chemical Company.
      d. Or equal.

B. Ordinary Cement-Sand Grout: Prepare design mixes of ordinary cement grout. Mixes subject to the following limitations:
   1. Cement:
      a. Portland cement, ASTM C150, Type II; or blended hydraulic cement, ASTM C595, Type 1P.
   2. Aggregates: ASTM C33 and as herein specified.
      a. Do not use aggregates containing soluble salts or other substances such as iron sulfides, pyrite, marcasite, ochre, or other materials that can cause stains on exposed concrete surfaces.
      b. Fine Aggregate: Clean, sharp, natural sand free from loam, clay, lumps or other deleterious substances.
         1) Dune sand, bank run sand and manufactured sand are not acceptable.
      c. Coarse Aggregate: Clean, uncoated, processed aggregate containing no clay, mud, loam, or foreign matter, as follows:
         1) Crushed stone, processed from natural rock or stone.
         2) Washed gravel, either natural or crushed. Use of slag and pit or bank run gravel is not permitted.

3) Coarse Aggregate Size: Size to be ASTM C33, Nos. 7 for Class "B" grout. Coarse aggregate not permitted in Class "A" grout.

C. Water:
1. Use clean, fresh, potable water free from injurious amounts of oils, acids, alkalies or organic matter.

PART 3 - EXECUTION

3.1 INSPECTION

A. CONTRACTOR and his installer shall examine the substrate and conditions under which grout is to be placed, and notify ENGINEER in writing of unsatisfactory conditions. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to ENGINEER.

3.2 INSTALLATION

A. General:
1. Place grout as shown and in accordance with manufacturer's instructions. If manufacturer's instructions conflict with the Specifications do not proceed until ENGINEER provides clarification.
2. Drypacking will not be permitted.
3. Manufacturers of proprietary products shall make available upon 72 hours notification the services of a qualified, full time employee to aid in assuring proper use of the product under job conditions.

B. Piping Abandonment:
1. Upon completion of the cleaning/flushing of a system line and subsequent approval by the on-site Engineer the line shall be packed with Class "B" grout. The Contractor will be responsible for injecting sufficient grout into the line rendering it water tight and leak proof.

+ + END OF SECTION + +

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SECTION 5E11

CASTINGS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:
   1. CONTRACTOR shall provide all labor, materials, equipment and incidentals as shown, specified and required to furnish castings.
   2. Castings include metal items which are not a part of the miscellaneous metal fabrications or metal systems in other Sections of these Specifications.

B. Castings shall be for the following types of construction:
   1. Manholes.
   2. Catch basins.

C. Related Sections:
   1. Section 2H6, Manholes.

1.2 QUALITY ASSURANCE

A. Reference Standards: Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified.
   1. ASTM A 48, Standard Specification for Gray Iron Castings.
   2. ASTM B 26, Standard Specification for Aluminum-Alloy Sand Castings.

B. Shop Assembly:
   1. Preassemble items in the shop to the greatest extent possible, so as to minimize field splicing and assembly of units at the site. Disassemble units only to the extent necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

1.3 SUBMITTALS

A. Shop Drawings: Submit for approval the following:
   1. Fabrication and erection of all casting assemblies. Include plans, elevations, and details of sections and connections. Show anchorage and accessory items.
      a. Include setting drawings for location and installation of castings and anchorage devices.
   2. Copies of manufacturer's specifications, load tables, dimension diagrams, anchor details and installation instructions.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Gray Iron Castings: ASTM A 48, Class 30A.

B. Manhole frames with covers, gray iron cast, 24-inch diameter.

C. Manufacturer: Provide castings of one of the following:
   1. Neenah Foundry Company.
   2. Flockhart Foundry Company.
   3. Or equal.

2.2 DESIGN AND FABRICATION

A. Design round frames and covers to prevent rocking and rattling under traffic.

B. Fabricate castings true to pattern so that component parts fit together.

2.3 FINISH

A. Iron: Coat with asphaltic paint standard with the manufacturer.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Follow manufacturer's printed instructions and approved Shop Drawings.

B. Set castings accurately to required location, alignment and elevation, plumb, level, true and free of rack, measured from established lines and levels. Brace temporarily or anchor tempo-rarily in formwork.

+ + END OF SECTION + +

SECTION 15A1

BURIED PIPING INSTALLATION

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:
   1. CONTRACTOR shall provide all labor, materials, equipment and incidentals as shown, specified and required to install and test all buried piping, fittings, and specials. The Work includes, but is not limited to, the following:
      a. All types and sizes of buried piping, except those specified under other Sections.
      b. Work on or affecting existing piping.
      c. Testing.
      d. Installation of all jointing and gasketing materials, specials, flexible couplings, mechanical couplings, harnessed and flanged adapters, sleeves, tie rods, and all other Work required to complete the buried piping installation.
      e. Unless otherwise specifically shown, specified, or included under other Sections, all buried piping Work required, beginning at the outside face of structures or structure foundations and extending away from structure.

B. Coordination:
   1. Review installation procedures under other Sections and coordinate with the Work that is related to this Section.
   2. Section 15A1 specifies the installation of all buried piping materials specified in Sections 15A3 through 15A15. Coordinate with these Sections.

C. Related Sections:
   1. Section 2D1, Excavation and Backfill.
   2. Section 2D2, Rock Excavation.
   3. Division 15, Sections on Piping, Valves and Appurtenances.

1.2 QUALITY ASSURANCE

A. Requirements of Regulatory Agencies:
   1. Comply with requirements of UL, FM and other jurisdictional authorities, where applicable.
   2. Refer to the General and Supplementary Conditions regarding permit requirements for this Project.

B. Reference Standards: Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified.

1. AWWA C111, Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
2. AWWA C600 , Installation of Ductile-Iron Water Main and These Appurtenances.
3. ASCE MOP No. 37, Design and Construction of Sanitary and Storm Sewers.

1.3 SUBMITTALS

A. Shop Drawings: Submit for approval the following:
   1. Full details of piping, specials, manholes, joints, harnessing and thrust blocks, and connections to existing piping, structures, equipment and appurtenances.

B. Tests: Submit description of proposed testing methods, procedures and apparatus. Prepare and submit report for each test.

C. Certificates: Submit certificates of compliance with referenced standards.

D. Record Drawings:
   1. Submit record drawings prior to the time of Substantial Completion.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Deliver materials to the site to ensure uninterrupted progress of the Work.

B. Handle all pipe, fittings, specials and accessories carefully with approved handling devices. Do not drop or roll material off trucks. Do not otherwise drop, roll or skid piping.

C. Store pipes and fittings on heavy wood blocking or platforms so they are not in contact with the ground.

D. Unload pipe, fittings and specials opposite to or as close to the place where they are to be installed as is practical to avoid unnecessary handling. Keep pipe interiors completely free from dirt and foreign matter.

E. Inspect delivered pipe for cracked, gouged, chipped, dented or other damaged material and immediately remove from site.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Required pipe materials are listed in the Piping Schedule. Refer to applicable Sections for material specifications.

B. General:
   1. Marking Piping:
      a. Clearly mark each piece of pipe or fitting with a designation conforming to those shown on the laying schedule.
      b. Cast or paint material, type and pressure designation on each piece of pipe or fitting 4 inches in diameter and larger.
      c. Pipe and fittings smaller than 4 inches in diameter shall be clearly marked by manufacturer as to material, type and rating.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General:
   1. Install piping as shown, specified and as recommended by the manufacturer.
   2. If there is a conflict between manufacturer's recommendations and the Drawings or Specifications, request instructions from ENGINEER before proceeding
   3. All trench excavations shall be inspected by ENGINEER prior to laying pipe. Notify ENGINEER in advance of excavating, bedding and pipe laying operations.
   5. Minimum cover over piping shall be 4 feet unless otherwise shown or approved by ENGINEER.
   6. Earthwork required is specified in the applicable Sections of Division 2.
   7. Excavation in excess of that required or shown and which is not authorized by the ENGINEER shall be replaced at CONTRACTOR'S expense with approved granular material. It shall be furnished, placed and compacted in accordance with the requirements of the applicable Section of Division 2.

B. Plugs:
   1. Temporarily plug installed pipe at the end of each day's work or other interruption to the installation of any pipe line. Plugging shall prevent the entry of animals, liquids or persons into the pipe or the entrance or insertion of deleterious materials.
   2. Install standard plugs into all bells at dead ends, tees or crosses. Cap all spigot ends.
   3. Fully secure and block all plugs and caps installed for pressure testing to withstand the specified test pressure.

4. Where plugging is required for phasing of the Work or for subsequent connection of piping, install watertight, permanent type plugs.

C. Bedding Pipe: Bed pipe as specified below and in accordance with the details shown.
   1. Trench excavation and backfill, and bedding materials shall conform to the requirements of Section 2D1 or 2D6, as applicable.
   2. Where the existing bedding material is deemed unsuitable by ENGINEER, remove and replace it with approved granular materials. Payment for the additional excavation and crushed stone or gravel refill will be made at the unit prices bid in the Bid Form.
   3. Where pipe is installed in rock excavation, provide a minimum of 3 inches of crushed stone or gravel under pipes smaller than 4 inches in diameter and a minimum of 6 inches of crushed stone or gravel under pipes 4 inches in diameter and larger.
   4. Excavate trenches below the pipe bottom by an amount shown and specified. Remove all loose and unsuitable material from the trench bottom.
   5. Carefully and thoroughly compact all pipe bedding with hand held pneumatic compactors.
   6. Do not lay pipe until the ENGINEER approves the bedding condition. If a conflict exists obtain clarification from ENGINEER before proceeding.
   7. No pipe shall be brought into position until the preceding length has been bedded and secured in its final position.

D. Laying Pipe:
   1. Conform to manufacturer's instructions and requirements of the standards listed below, where applicable:
      a. Ductile Iron Pipe: AWWA C600, AWWA C105.
      b. ASCE Manual of Practice No. 37.
   2. Install all pipe accurately to line and grade shown unless otherwise approved by ENGINEER. Remove and relay pipes that are not laid correctly.
   3. Slope piping uniformly between elevations shown.
   4. Ensure that ground water level in trench is at least 6 inches below bottom of pipe before laying piping. Do not lay pipe in water. Maintain dry trench conditions until jointing and backfilling are complete and protect and keep clean water pipe interiors, fittings and valves.
   5. Start laying pipe at lowest point and proceed towards the higher elevations, unless otherwise approved by ENGINEER.
   6. Place bell and spigot pipe so that bells face the direction of laying, unless otherwise approved by ENGINEER.
   7. Excavate around joints in bedding and lay pipe so that the barrel bears uniformly on the trench bottom.
   8. Deflections at joints shall not exceed 75 percent of the amount allowed by the pipe manufacturer.

9. For copper tubing and thermoplastic piping, snake piping in trench to compensate for thermal expansion.
10. Carefully examine all pipe, fittings and specials for cracks, damage or other defects while suspended above the trench before installation. Immediately remove defective materials from site.
11. Inspect interior of all pipe and fittings and completely clean all dirt, gravel, sand, debris or other foreign material from pipe interior and joint recesses before it is moved into the trench. Bell and spigot mating surfaces shall be thoroughly wire brushed, and wiped clean and dry immediately before the pipe is laid.
12. Field cut pipe, where required, with a machine specially designed for cutting piping. Make cuts carefully, without damage to pipe or lining, and with a smooth end at right angles to the axis of pipe. Cut ends on push-on joint shall be tapered and sharp edges filed off smooth. Flame cutting will not be allowed.
13. Blocking under piping will not be permitted unless specifically approved by ENGINEER for special conditions. If permitted, conform to requirements of AWWA C600.
14. Touch up protective coatings in a satisfactory manner prior to backfilling.
15. CONTRACTOR shall notify ENGINEER in advance of backfilling operations.
16. On steep slopes, take measures acceptable to ENGINEER to prevent movement of the pipe during installation.
17. Thrust Restraint: During the installation of the pipe, thrust blocker, tied joints, or propriety restrained joint system shall be provided whereas required for thrust restraint. Thrust restraint shall conform to the applicable requirements of Article 3.2.
18. Exercise care to avoid floatation when installing pipe in cast-in-place concrete.

E. Jointing Pipe:
   1. Ductile Iron Push-On Joint Pipe:
      a. Prior to assembling the joints, the last 8 inches of the exterior surface of the spigot and the interior surface of the bell shall be thoroughly cleaned with a wire brush, except where joints are lined or coated with a special protective lining or coating.
      b. Rubber gaskets shall be wiped clean and flexed until resilient. Refer to manufacturer's instructions for procedures to ensure gasket resiliency when assembling joints in cold weather.
      c. Insert gasket into joint recess and smooth out the entire circumference of the gasket to remove bulges and to prevent interference with the proper entry of the spigot of the entering pipe.
      d. Immediately prior to joint assembly, apply a thin film of approved lubricant to the surface of the gasket which will come in contact with the entering spigot end of pipe. CONTRACTOR may, at his option, apply a thin film of lubricant to the outside of the spigot of the entering pipe.

e. For assembly, center spigot in the pipe bell and push pipe forward until it just makes contact with the rubber gasket. After gasket is compressed and before pipe is pushed or pulled all the way home, carefully check the gasket for proper position around the full circumference of the joint. Final assembly shall be made by forcing the spigot end of the entering pipe past the rubber gasket until it makes contact with the base of the bell. When more than a reasonable amount of force is required to assemble the joint, the spigot end of the pipe shall be removed to verify the proper positioning of the rubber gasket. Gaskets which have been scoured or otherwise damaged shall not be used.

f. Maintain an adequate supply of gaskets and joint lubricant at the site at all times when pipe jointing operations are in progress.

G. Backfilling:
1. Conform to the applicable requirements of Section 2D1 or 2D6.
2. Place backfill as construction progresses. Backfill by hand and use power tampers until pipe is covered by at least one foot of fill.

H. Transitions from One Type of Pipe to Another:
1. Provide all necessary adapters, specials and connection pieces required when connecting different types and sizes of pipe or connecting pipe made by different manufacturers.

3.2 WORK AFFECTING EXISTING PIPING

A. Location of Existing Piping:
1. Locations of existing piping shown should be considered approximate.
2. CONTRACTOR shall determine the true location of existing piping to which connections are to be made, and location of other facilities which could be disturbed during earthwork operations, or which may be affected by CONTRACTOR'S Work in anyway.
3. Conform to applicable requirements of Division 1 pertaining to cutting and patching, and connections to existing facilities.

B. Work on Existing Pipelines:
1. Cut or tap pipes as shown or required with machines specifically designed for this work.
2. Install temporary plugs to prevent entry of mud, dirt, water and debris.
3. Provide all necessary adapters, fittings, pipe and appurtenances required to complete the Work.

3.3 TESTING OF PIPING

A. General:
1. Test all piping except as otherwise authorized by ENGINEER.

2. Notify ENGINEER 48 hours in advance of testing.
3. Provide all testing apparatus, including pumps, hoses, gages, and fittings.
4. Unless otherwise noted, pipelines shall hold specified test pressure for two hours.
5. Repair and retest pipelines which fail to hold specified test pressure or which exceed the allowable leakage rate.
6. Unless otherwise specified, test pressures required are at the lowest elevation of the pipeline section being tested.
7. Conduct all tests in the presence of ENGINEER.
8. Advise local authorities having jurisdiction if their presence is required during testing.

B. Schedule of Pipeline Tests:
1. Test piping at the test pressure listed in the Buried Piping Schedule.
2. For piping not included in the Schedule, the ENGINEER will notify CONTRACTOR in writing of the test pressure to be used.

C. Leakage Testing:
1. Conduct leakage test for all liquid-conveying piping after satisfactory completion of pressure test.
2. Allow concrete pipe to remain full of water at least 12 hours prior to starting leakage test.
3. Allowable Leakage Rates (gallons per hour per 1,000 feet per inch diameter):
   a. Ductile iron pipe with push-on or mechanical joint: 0.1.
4. Leakage Test Procedure:
   a. Examine exposed pipe, joints, fittings and valves. Repair visible leakage or replace the defective pipe, fitting or valve.
   b. Refill the line under test to reach the required test pressure.
   c. Provide a test container filled with a known quantity of water at the start of the test. Attach the test pump suction to the test container.
   d. Pump water from the test container into the line with the test pump to hold the specified test pressure for the test period. Water remaining in the container shall be measured and the amount used during the test shall be recorded on the test report.
   e. Perform all repair, replacement, and retesting required because of failure to meet testing requirements.
   f. Leakage shall be less than rate specified above.

C. Exfiltration Testing:
1. Plug and bulkhead the section of pipe to be tested at both ends and admit water until the pipe is full.
2. Bring water level to a height of not less than 4 feet above the exterior crown of pipe at the upstream end and maintain at that level for duration of the test.
3. Measure leakage from the pipe through drop in water surface in a manhole or other column used to maintain pressure, provided the part

of the riser above the sewer where the water level is monitored is not less than 6 inches in diameter.

4. Duration of test shall not be less than 6 hours.
5. Leakage shall not exceed allowable leakage rates specified in Paragraph 3.4.D.3.

E. Low Pressure Air Testing:

1. Clean pipeline prior to beginning test.
2. CONTRACTOR shall furnish test plugs, test gauges, stop watches, air compressors, and personnel, and all required miscellaneous equipment to complete the test as directed by ENGINEER.
3. Slowly supply air to the plugged pipe installation until pressure reaches 4.0 psig. Allow a minimum of two minutes for temperature stabilization after terminal pressure is attained and then cut off air supply.
4. Determine rate of air loss by measuring the time interval for the pressure to drop from 3.5 to 2.5 psig.
5. The pipeline shall be considered acceptable when tested t an average pressure of 3.0 psig, if the total rate of air loss from any section tested in its entirety between manholes and/or cleanout structures does not exceed 2.0 cfm, or the section under test does not lose air at a rate greater than 0.0030 cfm per square foot of internal pipe surface area. If ground water elevation is above the elevation of the pipe, increase test pressures to compensate for the water pressure.

3.4 PIPING SCHEDULE

BURIED PIPING SCHEDULE

Service	Size	Material	Interior Lining	Exterior Coating	Pressure Class	Joint	Pressure Test (psig)	Remarks
NPW	18"	DI	-	BC	50	BS	5	

The following abbreviations are used in the piping schedule.

A. Service Abbreviations

Air	A	Thickened Primary Sludge	TPS
Process Air	PA	Thickened Excess Activated Sludge	TEAS
Drain	D	Non-Potable Water	NPW
Process Drain	PD	Potable Water	PW
Excess Activated Sludge	EAS	Raw Water	RW
Thermal Conditioned Sludge	TCS	Primary Sludge	PS
Force Main	FM	Service Air	SA
Fuel Oil	FO	Secondary Sludge	SS
		Spray Water	SW

B. Material Abbreviations

Cast Iron	CI	Polyvinyl Chloride	PVC
Fiberglass Reinforced Plastic	FRP	Chlorinated Polyvinyl Chloride	CPVC
Ductile Iron	DI	Polyethylene	PE
Copper	C	Acrylonitrile Butadiene Styrene	ABS
Carbon Steel	CS	Vitrified Clay	VC
Stainless Steel	SS	Prestressed Concrete Cylinder Pipe	PCCP
		Non-Prestressed Concrete Cylinder Pipe	CCP
		Reinforced Concrete Pipe	RCP

C. Lining/Coating Abbreviations

Cement Lined	CL
Glass Lined	GL
Bituminous Coated	BC
Galvanized	Galv
Plastic Lined	PL
Painted	P

D. Joint Abbreviations

Belt and Spigot	BS	Compression Flange Adapter	CFA
Flanged	Flg	Soldered	Sd
Mechanical Joint	MJ	Brazed	Bz
Grooved or Shouldered End Couplings	GSEC		
Butt Welded	BW		
Solvent Welded	SW		
Screwed Fittings	S		
Compression Sleeve Coupling	CSC		

+ + END OF SECTION + +

SECTION 15A3

DUCTILE-IRON PIPE

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:
   1. CONTRACTOR shall provide all labor, materials, equipment and incidentals as shown, specified and required to furnish ductile iron pipe and fittings.
   2. The extent of the piping is shown on the Drawings and in the schedules included in Sections 15A1 and 15A2.

B. Related Sections:
1. Section 2D1, Excavation and Backfill.
   2. Section 2D6, Trench Excavation.
   3. Section 15A1, Buried Piping Installation.

1.2 QUALITY ASSURANCE

A. Manufacturer's Qualifications:
   1. Manufacturer shall have a minimum of 5 years of experience producing ductile iron pipe and fittings, and shall show evidence of at least 5 installations in satisfactory operation.
   2. Ductile iron pipe and fittings shall be the product of one manufacturer.

B. Reference Standards: Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified.
   1. AWWA C110, Ductile-Iron and Gray-Iron Fittings, 3 in. through 48 in., for Water and Other Liquids.
   2. AWWA C111, Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
   3. AWWA C115, Flanged Ductile-Iron Pipe with Threaded Flanges.
   4. AWWA C150, Thickness Design of Ductile-Iron Pipe.
   5. AWWA C151, Ductile-Iron Pipe, Centrifugally Cast, for Water or Other Liquids.

1.3 SUBMITTALS

A. Shop Drawings: Submit for approval the following:
   1. Detailed drawings and data on pipe, fittings, gaskets and appurtenances. Submit these with Shop Drawings required under Section 15A1.

B. Certificates: Submit certificates of compliance with referenced standards.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Refer to Section 15A1.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Joints shall be as specified in piping schedules in Section 15A1. If not specified, provide flanged joints for exposed piping and push-on or mechanical joints for buried piping. Couplings shall be provided on pipe with plain or grooved ends where shown or where approved by ENGINEER.

B. Ductile-Iron Pipe and Fittings:
   1. Non-Flanged Pipe: Conform to AWWA C151 for material, pressure, dimensions, tolerances, tests, markings and other requirements.
      a. Pressure: As shown on piping schedule. If not shown, use Pressure Class (350 PSI).
      b. Thickness: (50).
      c. Push-On Joints: Conform to AWWA C111.
         1) Gaskets: Molded rubber.
         2) Strips: Each plain end shall be painted with a circular stripe to provide a guide for visual check that joint is properly assembled.
      d. Restrained Joints:
         1) Restrained joints for mechanical joint piping shall be one of the following:
         a) Push-On-Restrained Joint, as manufactured by Clow Cast Iron Pipe and Foundry Division of the Clow Corporation.
         b) Lok-Fast Joint, as manufactured by American Cast Iron Pipe Company.
         c) Or equal.
         2) Restrained joints for push-on joint piping shall be one of the following:
         a) Clow Super-lock Joint Pipe Style F-128, as manufactured by Clow Cast Iron Pipe and Foundry Division of Clow Corporation.
         b) Lok-Ring Joint, as manufactured by American Cast Iron Pipe Company.
         c) Or equal.
   2. Flanged fittings: Conform to AWWA C110.
      a. Pressure Rating: (350 PSI).
      b. Material: Cast iron or ductile-iron.
      c. Gaskets: As specified above for joints.
      d. Bolts and Nuts: As specified above for joints.
   3. Coatings and Linings:
      a. Where shown on the schedule, pipe and fittings shall be lined with a bituminous seal coated cement-mortar lining in accordance with AWWA C104.

b. Buried pipe and fittings shall be coated on the outside with a bituminous coating, approximately 1-mil thick.

C. Specials:
1. Transition Pieces:
a. Furnish suitable transition pieces (adapters) for connections to existing piping.
b. Unless shown on Drawings, CONTRACTOR shall expose existing piping to determine material, dimensions and other data required for transition pieces.

2.2 MARKING PIPING

A. Refer to Section 15A1.

2.3 SURFACE PREPARATION AND SHOP PAINTING

A. Clean and prime coat ferrous metal surfaces of piping in the shop in accordance with applicable requirements.

PART 3 - EXECUTION

3.1 INSTALLATION

A. For buried piping installation, see Section 15A1.

3.2 INSPECTION

A. CONTRACTOR shall inspect all piping to assure that piping is free from defects in material and workmanship. The compatibility of all pipe, fittings and coatings shall be verified.

+ + END OF SECTION + +

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SECTION 20A1

SEWER SYSTEM #1 DECOMMISSIONING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:

1. CONTRACTOR shall perform all excavating, removal, disposal and backfilling of the sewer system as shown, specified or required. CONTRACTOR shall also perform high pressure cleaning rinsate/sediment removal and storage of the sewer system as shown, specified or required for the purpose of decommissioning the sewer system as required to complete the Work in every respect.
2. Also included is the plugging of the remaining sections of system #1 as outlined herein.
3. Also included is earthwork for roads, walks, grading, structures and other facilities which are required to complete the Work as shown and specified.

B. Related Section:
1. Section 2B, Clearing
2. Section 2D1, Excavation and Backfill

1.2 Quality Assurance

A. Permits and Regulations:
1. CONTRACTOR shall obtain all necessary permits for work in roads, right -of-ways, railroads, etc.
2. CONTRACTOR shall perform excavation work in compliance with applicable requirements of governing authorities having jurisdiction.

B. Reference Standards: Comply with applicable provisions and recommendations of the following except as otherwise shown or specified.
1. OSHA, Confined Space Entry Procedures
2. OSHA, Health and Safety Requirement

1.3 JOB CONDITIONS

A. System 1 Access: System 1 access will be obtained following excavation and removal of the system main up to the existing concrete pad. At this point, the line will be exposed and a temporary collection sump will be installed.

B. Existing Structures: The drawings show certain utilities and surface and underground structures located on or adjacent to the Work. This information has been obtained from existing records. It is not guaranteed to be correct or complete and is shown for the convenience of CONTRACTOR. CONTRACTOR shall explore ahead of the required excavation to determine the exact location of all structures. They shall be supported and protected from injury by CONTRACTOR. If they are broken or injured, they shall be restored immediately by CONTRACTOR at no additional cost to OWNER.

C. Existing Utilities: Locate existing underground utilities in the areas of Work. If utilities are to remain in place, provide adequate means of protection during earthwork operations.
   1. Should uncharted or incorrectly charted piping or utilities be encountered during excavation, consult piping or utility owner and ENGINEER immediately for directions. Cooperate with OWNER and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility owner.

D. Use of Explosives:
   1. The use of explosives will not be permitted.

E. Protection of Persons and Property: Barricade open excavations occurring as part of this Work.
   1. Consult ENGINEER and obtain his approval before removing, trimming, or disturbing trees, shrubs, plants, fences, rails, walks, structures or other facilities that are encountered on the line of the excavation.

F. Dust Control: Conduct all operations and maintain the area of activities, including sweeping and sprinkling of roadways, to minimize creation and dispersion of dust. Calcium chloride shall be used to control serious or prolonged dust problems, subject to approval of ENGINEER.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. Backfill and Fill Material: Provide approved soil materials for backfill and fill, free of clay, rock or gravel larger than 6 inches in any dimension, debris, waste, frozen materials, vegetable and other deletrious matter. Previously excavated materials will be excavated and segregated as determined by the on-site Engineer. No excavated material will be used for backfill material.

2.2 RINSE WATER

A. CONTRACTOR shall supply a potable water source capable of flushing the system with the volume specified. This potable water shall be free of contaminants prior to introduction into the sewer system.

PART 3 - EXECUTION

3.1 INSPECTION

A. CONTRACTOR shall provide ENGINEER with sufficient time and means for ENGINEER to examine the area and conditions under which excavating, filling and grading are to be performed. ENGINEER will notify the CONTRACTOR of conditions detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected in a manner acceptable to the ENGINEER.

B. During the excavation and removal of Sewer System #1, the on-site ENGINEER will be monitoring the excavated material for the presence of volatile organic compounds. This soil screening procedure involves taking HNU (photoionization) readings of selected excavated areas as determined by the on-site ENGINEER. If soil is found and determined to be contaminated it shall be removed and placed in roll-off containers supplied by the CONTRACTOR. All other excavated materials will be placed in a separate roll-off container supplied by the Contractor. Both roll-off containers will be sampled and analyzed by the on-site ENGINEER and based on the analytical results the following disposal methods will be implemented.
    a. Analysis indicates clean - CONTRACTOR shall transport the roll-off containers to the on-site landfill boundary and stockpiled in an area designated by the on-site ENGINEER.
    b. Analysis indicates total VOC contamination > 1 part per million - CONTRACTOR shall transport roll-off containers to the aeration pad and place soil in the area designated by the on-site ENGINEER.
    c. Analysis indicates contaminated - Leave on-site until proper disposal alternatives are established.

C. Following the high pressure cleaning and removal of the sewer sediment and rinsate, the on-site ENGINEER shall visually inspect the decommissioned line verifying that the line has been cleaned per the specifications. If, upon inspection, sediment and/or rinsate still exists in the sewer section, the on-site ENGINEER may request an additional rinse cycle be applied.

3.2 EXCAVATION

A. Perform all excavation required to complete the Work as shown and specified. Excavation shall include earth, sand, clay, ground, hardpan, boulders and ledge not requiring drilling and blasting for removal, decomposed rock, pavement, rubbish and all other materials within the excavation limits, except rock. Where the excavation is in rock, the rock shall be removed as specified under Section 2D2.

B. Material Storage: Stockpile satisfactory excavated materials in approved areas, until required for backfill or fill. Place, grade and shape stockpiles for proper drainage.
   1. Locate and retain soil materials away from the edge of the excavation.
   2. Dispose of excess soil material and waste materials as specified hereinafter.
   3. Excavated soil determined to be unsuitable for backfill material and free from contamination shall be disposed of on-site at a location acceptable to the on-site ENGINEER.
   4. Excavated soil determined to be unsuitable for backfill material and found to be contaminated by the on-site ENGINEER will be placed in CONTRACTOR supplied roll-off containers and stored in a location acceptable to the on-site ENGINEER.

C. Where the ENGINEER considers the existing material beneath the bedding material unsuitable CONTRACTOR shall remove and replace it with select backfill. The additional excavation and select backfill material, where ordered in writing by the ENGINEER, will be paid for by unit prices bid or under the "charges" clause of the General Condition.

D. Length of Trench: Unless otherwise directed or permitted, not more than 200 feet of trench in advance of the end of the completed pipe therein, shall be opened at any time. Every trench in rock shall be fully opened at least 30 feet in advance of any place when pipe is being laid.

E. Limits of Excavation: The limits of excavation is defined as follows:
   1. 6 inches below the sewer line, unless otherwise instructed by the on-site ENGINEER.
   2. 2 feet wide, unless otherwise instructed by the on-site ENGINEER.
   3. Length as shown on the Contract Drawings, unless otherwise instructed by the on-site ENGINEER.

3.3 UNAUTHORIZED EXCAVATION

A. All excavation outside the line and grades shown, and not approved by the ENGINEER, together with the removal and disposal of the associated material, shall be at the CONTRACTOR's expense. The

unauthorized excavation shall be filled as directed by the ENGINEER with select compacted backfill at the CONTRACTOR's expense. Claims and damages resulting from the CONTRACTORs unauthorized excavation will be his sole responsibility.

3.4 BACKFILL AND COMPACTION

A. All backfill required for trenches and structures and required to provide the finished grades shown and as described herein, shall be furnished, placed and compacted by the CONTRACTOR. All materials used for filling and backfilling shall be soil of acceptable quality as defined previously.

B. Backfill excavations as promptly as Work permits, but not until completion of the following:
   1. Acceptance by the ENGINEER of all Work within the excavation.

3.5 GRADING

A. General: Uniformly grade areas within limits of grading shown or specified, including adjacent transition areas. Smooth subgrade surface within specified tolerances, compact with uniform levels or slopes between points where elevations are shown, or between such points and existing grades.

3.6 DISPOSAL OF EXCAVATED MATERIALS

A. Material removed from the excavation which has been sampled and analyzed and determined to be free from contamination shall be disposed of on-site at a location determined by the on-site ENGINEER.

B. Material removed from the excavation which is determined to be contaminated, shall be placed in CONTRACTOR supplied roll-off containers and stored in a location determined by the on-site ENGINEER.

C. Dispose of removed sewer pipe sections and associated excavated soil in roll-off containers on-site.

3.7 FLUSHING SYSTEM 1

A. Rinsate Volume: The rinsate volume for System 1 is calculated as the volume of water necessary to flush the main sewer system line twice. The overall volume is calculated to be 500 gallons of rinsate.

B. Rinsate Introduction: The rinsate shall be introduced into System 1 through the excavated and exposed area at the concrete pad. The rinsate will be introduced and collected at this same point.

C. Rinsate Flow Rate: The rinsate shall be introduced into System 1 at a maximum flow rate of 100 gpm. A throttle valve controlling the flow rate into the system will enable the operator to control flow (throttle or increase) for various unforeseen conditions.

D. Rinsate Collection: The rinsate shall be collected from System 1 at a temporary sump built by the CONTRACTOR at the end of the concrete pad.

E. Sediment Collection: Following the first rinse cycle of System 1 and the removal of the rinse water, the sediment shall be removed from the collection sump and placed in the sediment dewatering pit. Following dewatering operations, the sediment will be removed and placed in a roll-off container. Following the second (final) rinsate cycle, the same procedure for sediment collection shall be utilized.

F. Sediment Volume: The sediment volume for System 1 is estimated at 1 cubic yard of material. This estimate is based on the system main line being 50% full of solids.

3.8 COLLECTION AND STORAGE OF RINSATE

A. CONTRACTOR will be responsible for collecting the storing all rinsate on-site during the sewer decommissioning tasks at a location designated by the on-site ENGINEER. The storage container shall be clean and free from contamination prior to rinsate introduction. They also shall be rain tight and leak proof preventing the infiltration of rain water and any exfiltration of rinsate from the storage vessel. The Owner shall be responsible for sampling, analyzing and proper disposal of the collected rinsate.

B. Once the rinsate is properly disposed of, the CONTRACTOR will be responsible for the removal of the settled sediment from the storage vessel and placement of this sediment in a roll-off container. Following removal of all sediment, the CONTRACTOR shall decontaminate the storage vessel and remove it from the site.

3.9 COLLECTION AND STORAGE OF SEDIMENT

A. CONTRACTOR is responsible for the collection and placement of all sewer sediment in the sediment dewatering pits. Following dewatering operations and subsequent approval from the on-site ENGINEER, the sediment will be removed and placed in CONTRACTOR supplied roll-off containers. The CONTRACTOR shall cover the roll-off containers preventing the infiltration of rain water.

B. Owner shall be responsible for sampling, analyzing and proper disposal of the sewer sedimentary materials.

+ + END OF SECTION + +

SECTION 20A2

SEWER SYSTEM #2A, 2B, 3 and 4 DECOMMISSIONING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:

1. CONTRACTOR shall perform high pressure cleaning, rinsate/sediment removal and storage and plugging of the sewer systems as shown, specified or required for the purpose of cleaning and decommissioning the sewer systems as required to complete the Work in every respect.
2. Also included is earthwork for roads, walks, grading, structures and other facilities which are required to complete the Work as shown and specified.

1.2 Quality Assurance

A. Permits and Regulations:
1. CONTRACTOR shall obtain all necessary permits for work in roads, right-of-ways, railroads, etc.
2. CONTRACTOR shall perform all decommissioning work in compliance with applicable requirements of governing authorities having jurisdiction.

B. Reference Standards: Comply with the applicable provisions and recommendations of the following except as otherwise shown or specified.
1. OSHA, Confined Space Entry Procedures.
2. OSHA, Health and Safety Requirements.

1.3 JOB CONDITIONS

A. System 2A Access: System 2A can be accessed through manholes 2A-1, 2A-2, and 2B-5. This system consists of roof drains, industrial and sanitary branches which feed into 10" and 8" mains which are to be cleaned.

B. System 2B Access: System 2B can be accessed through manholes 2B-4 2B-5, and 2B-6. This system consists of roof drains, industrial, cooling water and sanitary branches which feed into an 18" and 12" main which are to be cleaned.

C. System 3 Access: System 3 can be accessed through an underground tunnel located beneath the plant area. This system consists of a concrete collection trench running inside this access tunnel.

D. System 4 Access: System 4 can be accessed through manhole 4-2. This system consists of roof drain and industrial branches which feed into an 8" main.

E. Protection of Person and Property: Barricade open manholes and excavations occurring as part of this Work.

PART 2 - PRODUCTS

2.1 RINSE WATER

A. CONTRACTOR shall supply a potable water source capable of flushing each system with the volume specified. This potable water shall be free of contaminants prior to introduction into the sewer systems.

PART 3 - EXECUTION

3.1 INSPECTION

A. CONTRACTOR shall provide ENGINEER with sufficient time and means for ENGINEER to examine the area and conditions under which the decommissioning procedures are to be performed. ENGINEER will notify the CONTRACTOR of conditions detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected in a manner acceptable to the ENGINEER.

B. Following the high pressure cleaning and removal of the sewer sediment and rinsate, the on-site ENGINEER shall visually inspect the decommissioned line verifying that the line has been cleaned per the specifications. If, upon inspection, sediment and/or rinsate still exits in the sewer section, the on-site ENGINEER may request an additional rinse cycle be applied.

3.2 FLUSHING SYSTEM 2A

A. Rinsate Volume: The rinsate volume for System 2A is calculated as the volume of water necessary to flush the main sewer system line twice. This overall volume is calculated to be 3,200 gallons of rinsate.

B. Rinsate Introduction: The rinsate shall be introduced into System 2A through manhole 2A-1. Prior to rinsate introduction sewer laterals entering MH2A-1 and MH2A-2 which are not part of the sewer main shall be plugged permanently. Also, the integrity of the 10" section shall be repaired in the location shown on the Contract Drawings.

C. Rinsate Flow Rate: The rinsate shall be introduced under pressure into System 2A at an average flow rate of 100 gallons per minute. A throttle valve controlling the flow rate into the system will enable the operator to control flow (throttle or increase) for various unforeseen conditions.

D. Rinsate Collection: The rinsate shall be collected from System 2A utilizing manhole 2B-5 as a collection sump. Prior to rinsate introduction, sewer laterals draining into MH2B-5 other than the 8" System 2A main, shall be temporarily plugged. This will create a sump in which the rinsate can be collected and pumped to a storage vessel.

E. Sediment Collection: Following the first rinsate cycle of System 2A and the removal of the rinse water, the sediment shall be removed from manholes 2A-2 and 2B-5, and placed in the sediment dewatering pits. Following dewatering operations, the sediment will be removed and placed in a roll-off container. Water shall be collected from this dewatering operation and placed in the rinsate storage container. Following the second (final) rinsate cycle, the same procedure for sediment collection shall be utilized.

F. Sediment Volume: The sediment volume for System 2A is estimated at 4 cubic yards of material. This estimate is based on the system main line being 50 percent full of solids.

3.3 DECOMMISSIONING SYSTEM 2A

A. Following the flushing, cleaning and removal of the sewer sediment and rinsate and subsequent final acceptance by the on-site ENGINEER, System 2A shall be decommissioned. This final decommissioning involves removing the temporary plugs in manhole 2B-5 and the permanent plugging of the main sewer System 2A lateral in manhole 2B-5.

3.4 FLUSHING SYSTEM 2B

A. Rinsate Volume: The rinsate volume for System 2B is calculated as the volume of water necessary to flush the main sewer system line twice. This overall volume is a calculated to be 11,600 gallons of rinsate.

B. Rinsate Introduction: An access point to System 2B has to be obtained by excavating and exposing it in the location shown on the Contract Drawing.

C. Rinsate Flow Rate: The rinsate shall be introduced into System 2B under pressure at an average flow rate of 100 gallons per minute. A throttle valve controlling the flow into the system will enable the operator to control flow (throttle or increase) for various unforeseen conditions.

D. Rinsate Collection: Access to the tunneled section of System 2B involves excavating and installing an access manhole in the location shown on the Contract Drawing. Once the access manhole is installed, a temporary sump must be installed in the 12" sewer main section below the manhole in the location shown. This will allow for a central rinsate collection sump from which the rinsate can be collected and pumped to a storage vessel.

E. Sediment Collection: Following the first rinsate cycle of System 2B and the removal of the rinsate water, the sediment shall be removed from manholes 2B-4, 2B-5 and 2B-6 and the collection sump and placed in the sediment dewatering pits. Following dewatering operations, the sediment will be removed and placed in a roll-off container. Water shall be collected from this dewatering operation and placed in the rinsate storage container. Following the second (final) rinsate cycle, the same procedure for sediment collection shall be utilized.

F. Sediment Volume: The sediment volume for System 2B is estimated at 14 cubic yards of material. This estimate is based on the systems main line being 50 percent full of solids.

3.5 DECOMMISSIONING SYSTEM 2B

A. Following the flushing, cleaning and removal of the sewer sediment and rinsate and subsequent final acceptance by the on-site ENGINEER, System 2B shall be decommissioned. The final decommissioning involves permanently plugging the excavated access point and backfilling this section to original grade. A permanent plug must also be installed at the central sump location and the newly installed access manhole shall be abandoned.

3.6 CLEANING SYSTEM 3

A. Preliminary Cleaning: Prior to the cleaning of System 3, debris located within the trench shall be removed and relocated within the access tunnel. Debris is defined as building materials (brick, wood, shingles, etc.) and other uncontaminated materials other than sediment and water.

B. Phase I Cleaning: Phase I cleaning of System #3 involves the manual removal, collection and storage of sedimentary materials confined to the drainage trench. These removed sedimentary materials will be placed in roll-off containers for on-site storage.

C. Phase I Sediment Volume: The sediment volume for System 3 is estimated at 12 cubic yards. This estimate is based on the Systems main collection trench being 50 percent full of solids.

D. Phase II Cleaning: Phase II cleaning of System 3 involves flushing the collection trench with rinse water. The rinse water would be introduced at the West end of the trench and collected at the sump located at the East end. Prior to rinsate introduction, the central sumps lateral tie-ins will be temporarily plugged allowing for no water to escape the sump area.

E. Phase II Rinsate Volume: The rinsate volume for System 3 is calculated as the volume of water necessary to flush the main collection trench once.

This overall volume is calculated to be 5,000 gallons.

F. Phase II Rinsate Flow Rate: The rinsate shall be introduced into System 2B at an average flow rate of 100 gallons per minute. A throttle valve controlling the flow into the system will enable the generator to control flow (throttle or increase) for various unforeseen conditions.

G. Phase II Rinsate Collection: The rinsate will be collected at the central sump and pumped to an on-site storage vessel.

H. Phase II Sediment Collection: Following the completion of the rinsate cycle, the remaining sediment shall be removed from the access trench and central sump and placed in the sediment dewatering pits. Following dewatering operations, the sediment will be removed and placed in a roll-off container. Water shall be collected from this dewatering operation and placed in the rinsate storage container.

I. Phase II Sediment Volume: The sediment volume for this phase is estimated at 2 cubic yards. This estimate is based on a residue of 10 percent of the original removed volume.

3.7 DECOMMISSIONING SYSTEM 3

A. Following the flushing, cleaning and removal of the sewer sediment and rinsate and subsequent final acceptance by the on-site ENGINEER, System 3 shall be decommissioned. The final decommissioning involves filling the central sump with concrete up to the bottom of the collection trench.

3.8 Flushing System 4

A. Rinsate Volume: The rinsate volume for System 4 is calculated as the volume of water necessary to flush the main sewer system line twice. This overall volume is calculated to be 1,000 gallons of rinsate.

B. Rinsate Introduction: The rinsate shall be introduced into System 4 through manhole 4-2. Prior to rinsate introduction, manhole 4-2 has to be rehabilitated to insure the health and safety of the entrant.

C. Rinsate Flow Rate: The rinsate shall be introduced under pressure into System 4 at an average flow rate of 100 gallons per minute. A throttle valve controlling the flow rate into the system will enable the operator to control flow (throttle or increase) for various unforeseen conditions.

D. Rinsate Collection: The rinsate shall be collected from System 4 at the same point in which the rinsate is being introduced. A temporary collection sump will be installed in the manhole allowing the rinsate to be collected and pumped to a storage vessel.

D. Sediment Collection: Following the first rinsate cycle of System 4 and the removal of rinse water, the sediment shall be removed from the collection sump and placed in the sediment dewatering pit. Following dewatering operations, the sediment will be removed and placed in a roll-off container. Water shall be collected from this dewatering operation and placed in the rinsate storage container. Following the second (final) rinsate cycle, the same procedure for sediment collection shall be utilized.

F. Sediment Volume: The sediment volume for System 4 is estimated at 1 cubic yard of material. This estimate is based on the system main line being 50 percent full of solids.

3.9 DECOMMISSIONING SYSTEM 4

A. Access to the System 4 outfall can be gained at manhole 4-2. This 8" lateral shall be permanently plugged at this manhole and subsequently decommissioned.

3.10 COLLECTION AND STORAGE OF RINSATE

A. CONTRACTOR will be responsible for collecting and storing all rinsate on-site during the sewer decommissioning tasks at a location designated by the on-site ENGINEER. The storage container shall be clean and free from contamination prior to rinsate introduction. They also shall be rain tight and leak proof preventing the infiltration of rain water and any exfiltration of rinsate from the storage vessel. The Owner shall be responsible for sampling, analyzing and proper disposal of the collected rinsate.

B. Once the rinsate is properly disposed of, the CONTRACTOR will be responsible for the removal of the settled sediment from the storage vessel and placement of this sediment in a roll-off container. Following removal of all sediment, the CONTRACTOR shall decontaminate the storage vessel and remove it from the site.

4.0 COLLECTION AND STORAGE OF SEDIMENT

A. CONTRACTOR is responsible for the collection and placement of all sewer sediment in the sediment dewatering pits. Following dewatering operations and subsequent approval from the on-site ENGINEER, the sediment will be removed and placed in CONTRACTOR supplied roll-off containers. The CONTRACTOR shall cover the roll-off containers preventing the infiltration of rain water.

B. Owner shall be responsible for sampling, analyzing and proper disposal of the sewer sedimentary materials.

+ + END OF SECTION + +

SECTION 20A3

TANK REMOVAL AND DISPOSAL - SYSTEM 5

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:
   1. The CONTRACTOR shall furnish all labor, materials, services and equipment necessary for the removal and disposal of those tanks as specified as part of this Contract.

B. Related Work Specified Elsewhere
   1. Section 2D1, Excavation and Backfill

1.2 QUALITY ASSURANCE

A. Applicable codes, standards and specifications
   1. New York State Bulk Petroleum Storage Regulations.
   2. National Fire Protection Association, Volume 30, "Flammable and Combustible Liquids Code".
   3. National Fire Protection Association, Volume 327, "Cleaning or Safeguarding Small Tanks and Containers".
   4. American Petroleum Institute, API-2015, "Cleaning petroleum Storage Tanks".
   5. American Petroleum Institute, API-2015A "A Guide for Controlling the Lead Hazard Associated with Tank Entry and Cleaning".
   6. American National Standards Institute, ANSI-Z28.2, "Standard Practices for Respiratory Protection".
   7. National Institute for Occupational Safety and Health, NIOSH, "Working in Confined Space".

PART 2 - EXECUTION

2.1 TANK REMOVAL

A. Prior to removal of the tanks, the CONTRACTOR will remove all free liquid product. The CONTRACTOR shall remove residual liquids and any sludges or solids form the tank and connecting lines. The CONTRACTOR will be responsible for disposal of all liquids and sludges.

B. Prior to commencing any work on the tank, the tank shall be gas freed and then tested for flammable vapors in accordance with Volume 327 of the National Fire Protection Association and all other applicable regulations.

C. The CONTRACTOR shall excavate and remove the tank, removing soil as necessary for removal of the tank and as specified in Section 2D1 - Excavation and Backfill, Paragraph 3.2A. This soil shall be stockpiled for use as backfill unless determined to be contaminated by the ENGINEER's visual observation or instrument readings. If determined to be contaminated, the soil shall be handled as specified in Section 2D1, Paragraph 3.13B, Disposal of Materials.

D. The CONTRACTOR shall disconnect piping at all tank openings. All piping shall be removed and disposed.

E. Once the tanks are removed, the ENGINEER shall visually inspect the excavation for contamination. Should contamination be present, as determined by the ENGINEER, the CONTRACTOR shall remove and dispose of the contaminated subsurface soil as directed by the on-site ENGINEER.

F. Upon completion of removal of contaminated material or if no contamination is present, as determined by the ENGINEER, the CONTRACTOR shall complete the Work and then backfill the excavation and restore the surface as specified in Section 2D1, Excavation and Backfill.

2.2 DISPOSAL OF TANK

A. After being rendered gas free, the tank shall be rendered unfit for further use by the CONTRACTOR. This shall be done by making a sufficient number (as determined by the ENGINEER) of holes or openings in the tank or by other acceptable methods as approved by the ENGINEER.

B. The CONTRACTOR shall place the tanks and piping in a temporary staging area as designated by the on-site Engineer.

C. The CONTRACTOR shall follow the guidelines published in API-2015 and 1604 for safe handling, transportation, and disposal of the tanks removed.

+ + END OF SECTION + +

SECTION 20A4

BENSON CREEK DREDGING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:
   1. The Contractor shall furnish all labor, materials and equipment necessary for the dredging, loading and transporting of excavated material from Benson Creek to the on-site industrial landfill, as shown and specified.

B. Related Work Specified Elsewhere
   1. Section 2D1, Excavation and Backfill

1.2 QUALITY ASSURANCE

A. Permits and Regulations:
   1. Contractor shall obtain all necessary permits for work in roads, right-of-ways, railroads, etc.

B. Reference Standards: Comply with the applicable provisions and recommendations of the following except as otherwise shown or specified.
   1. OSHA, Health and Safety Requirements

1.3 JOB CONDITIONS

A. Benson Creek Access: The areas in which Benson Creek can be accessed are next to the UST removal area and at the adjacent former railroad bed. A temporary access road will have to be cleared and built as shown and specified.

1.4 SUBMITTALS

A. Excavation Plan: Prior to the start of excavation operations, submit a written plan describing the excavation method to be utilized for dredging Benson Creek.

1.5 JOB CONDITIONS

A. Subsurface Information: Refer to Supplementary Conditions for data subsurface conditions. Data is not intended as a representation or warranty of continuity of conditions between soil borings nor of groundwater elevations at the dates and times other than date and times when measured.
   1. Additional test borings and other exploratory operations may be made by the Contractor at no cost to the owner.

B. Existing Structures: Shown on the Drawings are certain surface and underground structures adjacent to the work. This information has been obtained from existing records. It is not guaranteed to be correct or complete as shown for the convenience of the Contractor.

C. Protection of Persons and Property: Barricade the perimeter of Benson Creek as part of this Work and post with warning signs.

D. Dust Control: Contractor shall conduct all of his operations and maintain the area of his activities, including sweeping and sprinkling of roadways, so as to minimize creation and dispersion of dust.

2.1 POLYETHYLENE SHEETING

A. All excavated and transported material shall be placed on 10 mil reinforced polyethylene sheeting. The sheeting shall have a perimeter berm which will prevent the migration of materials from escaping the stockpiled soil.

PART 3 - EXECUTION

3.1 INSPECTION

A. The CONTRACTOR will examine the areas and conditions under which excavating, loading and hauling are to be performed and notify the ENGINEER of conditions he may find that are detrimental to the proper and timely completion of the Work. He will not proceed with the Work until unsatisfactory conditions have been corrected in an acceptable manner.

3.2 LIMITS OF EXCAVATION

A. Contractor shall perform all excavation required to complete the Work as shown and specified. Excavation shall include earth, sand, clay, gravel, hardpan, boulders not requiring drilling and blasting to remove, decomposed rock, pavement, rubbish and all other materials within the excavation limits, except rock.

B. The limits of excavation shall be as shown on the Contract Drawings. In general, the limits shall be 150' x 42' x 1' deep.

3.3 UNAUTHORIZED EXCAVATION

A. All excavations outside the lines and grades shown, and which is not approved by the Engineer, together with the removal and disposal of the associated material shall be at the Contractors expense. The

unauthorized excavation shall be filled and compacted with select backfill by the Contractor at his expense. Claims and damages resulting from the Contractor unauthorized excavation will be his sole responsibility.

3.4 TRANSPORTING OF MATERIALS

A. All dredged material shall be placed in lined dump trucks and transported to the on-site landfill boundary, as shown and specified. The material will be placed on reinforced polyethylene in a location designated by the on-site ENGINEER. The material will be sampled and analyzed by the on-site ENGINEER and based on the analysis, the following options are available:
   a. Uncontaminated - Leave on-site in the stockpiled area.
   b. Contaminated - Dispose off-site at a regulated landfill.

3.5 DRAINAGE AND DEWATERING

A. All dredged sediments must pass the USEPA SW-846 Method 9095 Paint Filter Test before being placed within the landfill boundaries. In general, material which contains free liquid cannot be placed within the landfill boundary. In the event that the dredged material does not meet these requirements then a dewatering system will have to be designed and implemented. This system is beyond the scope of this project.

3.6 TEMPORARY FENCING

A. Contractor shall furnish and install a temporary fence surrounding his excavations and work area. It shall have openings only at vehicles, equipment and pedestrian access points.

B. The fence shall be a snowfence type enclosure, 48 inches tall.

++ END OF SECTION ++

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MALCOLM PIRNIE

ENVIRONMENTAL ENGINEERS, SCIENTISTS & PLANNERS