



County of Erie

MARK C. POLONCARZ
COUNTY EXECUTIVE

DIVISION OF PURCHASE

STANDARD AGREEMENT

This AGREEMENT, made as of the 19th DAY OF JUNE, 2017

by and between KENYON PIPELINE INSPECTION, LLC

of 68 PARK ROAD, QUEENSBURY, NY 12804

herein after referred to as the Contractor, and the County of Erie, a municipal corporation of the State of New York, hereinafter referred to as the County:

WHEREAS, in accordance with public open competitive bidding, sealed proposals were received and publicly opened by the County of Erie, Division of Purchase

on FEBRUARY 28, 2017 at 11:00AM

for: CURED-IN-PLACE PIPE LINING

WHEREAS, the bid of the Contractor submitted in accordance therewith, was the second lowest responsible bid submitted; and

WHEREAS, a secondary contract is hereby awarded to the Contractor by the County, in accordance with the provisions therein contained; and

WHEREAS, the Notice to Bidders and Specifications make provisions for entering into a proper and suitable contract in connection therewith;

NOW, therefore, in the event that the first lowest bidder is unable to perform in whole or in part on a contract executed between the County and the first lowest bidder, the Contractor does hereby for its heirs, executors, administrators and successors agree with the County of Erie that, upon direction by the County, the Contractor shall for the consideration mentioned, and in the manner set forth in Invitation to Bid No. 217039-002, Specifications and Provisions of Law annexed hereto and forming a part of this contract, furnish the equipment and materials and perform work and services described in the Bid at the unit prices submitted in the Contractors proposal and contained herein.

_____ Paid monthly upon presentation of invoices.

 X Upon delivery, completion and approval of the
work, as per specifications.

Please refer to the Invitation to Bid (Page 1) and the Instructions to Bidders which are part of this agreement.

IN WITNESS THEREOF, the parties hereto have hereunto set their hands and seals the day and year first above written.

COUNTY OF ERIE

CONTRACTOR: KENYON PIPELINE INSPECTION, LLC

by _____
Director of Purchase

Date _____

by  _____

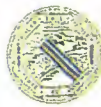
Title CEO

Date 6/30/17

APPROVED AS TO FORM

Assistant County Attorney
County of Erie, New York

Date _____



COUNTY OF ERIE
MARK POLONCARZ
COUNTY EXECUTIVE
DIVISION OF PURCHASE
INVITATION TO BID

Bids, as stated below, will be received and publicly opened by the Division of Purchase in accordance with the attached specifications. FAX bids are unacceptable. Bids must be submitted in a sealed envelope to:

County of Erie
Division of Purchase
Attention:
95 Franklin Street, Room 1254
Buffalo, New York 14202-3967

NOTE: Lower left hand corner of envelope **MUST** indicate the following:

BID NUMBER: 217039-002

OPENING DATE: February 28, 2017 TIME: 11:00 AM

FOR : ECSD No. 1, 2, 3, 4, 5, 6, 8 Cured-in-Place Pipe Lining Term Construction Contract No. 75

NAME OF BIDDER: **KENYON PIPELINE INSPECTION LLC**
68 PARK ROAD
QUEENSBURY NY 12804

If you are submitting other Invitations to Bid, each bid must be enclosed in a separate envelope.

Following EXHIBITS are attached to and made a part of the bid specifications, and part of any agreement entered into pursuant to this Invitation to Bid:

- ☒ EXHIBIT "A" - Assignment of Public Contracts
- ☒ EXHIBIT "B" - Purchases by Other Local Governments or Special Districts
- ☒ EXHIBIT "C" - Construction/Reconstruction Contracts
- ☒ EXHIBIT "D" - Bid Bond (Formal Bid)
- ☒ EXHIBIT "F" - Standard Agreement
- ☒ EXHIBIT "G" - Non-Collusive Bidding Certification
- ☒ EXHIBIT "H" - MBE/ WBE Commitment **10% MBE 2% WBE**, Prime Cont. Aff. & EEO Req.
- ☒ EXHIBIT "IC" - Insurance **Classification "A"**
- ☒ EXHIBIT "P" & EXHIBIT "PBI" - Performance Bond
- ☒ EXHIBIT "M" - Confined Space Certification & OSHA 10 Compliance Certification
- ☒ EXHIBIT "J" - New York State Certified Worker Training Program Certification
- ☒ EXHIBIT "R" - Erie County Equal Pay Certification
- ☒ EXHIBIT "I" - Table of Contents
- ☒ EXHIBIT "K" - Additional I.B. Section (IB-1 thru IB-44)
- ☒ EXHIBIT "PR" - Proposal (P-1 thru P-12) (Bidders shall complete Bid Items, Bid Total and Forms)
- ☒ EXHIBIT "N" - General Contract Conditions (GCC-1 thru GCC-78)
- ☒ EXHIBIT "O" - Specific Contract Conditions
- ☒ EXHIBIT "L" - Technical Specifications (Div. 1, 2, Appendix A)

County of Erie
DIVISION OF PURCHASE
NON-COLLUSIVE BIDDING CERTIFICATION

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

(1) the prices in this bid have been arrived at independently without collusion, consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or 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.

NOTICE

(Penal Law, Section 210.45)

IT IS A CRIME, PUNISHABLE AS A CLASS A MISDEMEANOR UNDER THE LAWS OF THE STATE OF NEW YORK, FOR A PERSON, IN AND BY A WRITTEN INSTRUMENT, TO KNOWINGLY MAKE A FALSE STATEMENT, OR TO MAKE A FALSE STATEMENT, OR TO MAKE A STATEMENT WHICH SUCH PERSON DOES NOT BELIEVE TO BE TRUE.

BID NOT ACCEPTABLE WITHOUT FOLLOWING CERTIFICATION:

Affirmed under penalty of perjury this 24th day of February, 20 17

TERMS _____ DELIVERY DATE AT DESTINATION February 28, 2017

FIRM NAME Kenyon Pipeline Inspection, LLC

ADDRESS 148 Park Rd.

Queensbury, NY ZIP 12804

AUTHORIZED SIGNATURE Joshua R. Kenyon

TYPED NAME OF AUTHORIZED SIGNATURE Joshua R. Kenyon

TITLE President TELEPHONE NO. 518-932-2510

(Rev. 1/2000)

ERIE COUNTY OFFICE BUILDING, 95 FRANKLIN STREET, BUFFALO, NEW YORK 14202 (716) 858-6395

County of Erie

DIVISION OF PURCHASE

BID SPECIFICATIONS

BID NO 217039-002

Ship to: County of Erie

Attention:

Address:

Ship Via:

Date

Required at Destination:

ITEM NO.	QUAN-TITY	U/M	CATALOG NO./DESCRIPTION	UNIT PRICE	TOTAL PRICE
			The contract is located in Erie County, New York. The successful		
			bidder will provide Cured-in-Place Pipe Lining and all associated		
			appurtenant services as further detailed in the Proposal section		
			for existing 8-inch through 21-inch diameter sanitary & storm		
			sewers in Erie County Sewer Districts No. 1,2,3,4,5,6,8.		
			Assignments will be completed on a work order basis for a		
			minimum of One Hundred Thousand Dollars (\$100,000) each.		
			The term construction contract will be in place for a period of two (2) years.		
			The County reserves the right to award to more than one Contractor.		
			A Pre-Bid Meeting is scheduled for February 7, 2017 at 2:00 PM at Erie		
			County Rath Building Room 1004, 95 Franklin Street, Buffalo, NY 14202.		
			For questions contact Erie County Div. of Sewerage Management		
			Garry Pecak P.E. 716-858-6267		

Term of contract is
March 1, 2017 - February 28, 2019

NOTE: Bid results cannot be given over the phone. All requests for bid results should be submitted in writing or faxed to:

ERIE COUNTY DIVISION OF PURCHASE

Freedom of Information Officer

95 Franklin Street, Rm. 1254

Buffalo, NY 14202

FAX #: 716/858-6465

TOTAL NET BID DELIVERED INSIDE _____

NAME OF BIDDER

Kenyon Pipeline Inspection, LLC

(Rev. 9/95)

ERIE COUNTY OFFICE BUILDING, 95 FRANKLIN STREET, BUFFALO, NEW YORK 14202 (716) 858-6395

County of Erie
DIVISION OF PURCHASE
INSTRUCTIONS TO BIDDERS (FORMAL)

1. BID SHALL BE SUBMITTED ON THESE COUNTY OF ERIE BID FORMS or bid will not be considered. Bid must be typed or printed in ink. Original autograph signatures in ink are required. Facsimile or rubber stamp signatures will not be accepted. ALL PAGES OF THIS BID DOCUMENT MUST BE RETURNED INTACT.
2. LATE PROPOSALS. Any bids received in the Erie County Division of Purchase after the date and time prescribed will not be considered for contract award.
3. EMERGENCY CLOSINGS. In the event the closing of certain County facilities and/or operations and/or services due to any flood, fire, fire drill, power failure, uncontrolled weather conditions or other cause beyond the Division of Purchase control, only bids received in the Division of Purchase prior to the date and time or postmarked as of the date prescribed will be considered for contract award.
4. ANY CHANGE IN WORDING OR INTERLINEATION BY A BIDDER OF THE INQUIRY AS PUBLISHED BY THE COUNTY OF ERIE shall be reason to reject the proposal of such bidder, or in the event that such change in the Invitation to Bid is not discovered prior to entering into a contract, to void any contract entered into pursuant to such bid.
5. THE COUNTY RESERVES THE RIGHT TO REJECT any and all bids, to accept either in whole or in part any one bid or combination of bids, as may be provided in the bid specifications, or to waive any informalities in bids. The County does not obligate itself to accept the lowest or any other proposal.
6. AWARD TO THE LOWEST RESPONSIBLE BIDDER. For the purpose of determining which bidder is the lowest qualified responsible bidder, it shall be the lowest three bidders' responsibility, within FIVE DAYS of being so notified by the Division of Purchase, to present information and documentation to the Division of Purchase, to satisfy the County that the bidder possesses sufficient capital resources, skill, judgment and experience to perform the work or deliver the material, as per bid specifications.
7. CONTRACT(S) OR PURCHASE ORDER(S) WILL BE AWARDED after due consideration of the suitability of goods and/or services bid to satisfy these specifications, the total cost of such goods and/or services including all cost elements, and the timeliness of the agreed upon delivery date.
8. This EXECUTORY CLAUSE shall be a part of any agreement entered into pursuant to this bid:

IT IS UNDERSTOOD BY THE PARTIES THAT THIS AGREEMENT SHALL BE EXECUTORY ONLY TO THE EXTENT OF THE MONIES AVAILABLE TO THE COUNTY OF ERIE AND APPROPRIATED THEREFOR, AND NO LIABILITY ON ACCOUNT THEREOF SHALL BE INCURRED BY THE COUNTY BEYOND THE MONIES AVAILABLE AND APPROPRIATED FOR THE PURPOSE THEREOF.
9. FAILURE TO MEET DELIVERY SCHEDULE as per accepted bid may result in legal action by the County of Erie to recover damages.
10. PRICES SHALL BE QUOTED F.O.B. DESTINATION AND DELIVERED INSIDE. "Tailgate delivery" will not be accepted unless specified by the County.
11. COLLECT TRANSPORTATION CHARGES WILL NOT BE PAID BY THE COUNTY. All freight, cartage, rigging, postage or other transportation charges shall be prepaid and included in the bid. There will be no additional charges for delivery.
12. NO TAXES ARE TO BE BILLED TO THE COUNTY. Bids shall not include any Federal, State, or local excise, sales, transportation, or other tax, unless Federal or State law specifically levies such tax on purchases made by a political subdivision. The County of Erie Purchase Order is an exemption certificate. Any applicable taxes from which the County is not exempt shall be listed separately as cost elements, and added into the total net bid.
13. THE SUCCESSFUL BIDDER shall comply with all laws, rules, regulations and ordinances of the Federal Government, the State of New York and any other political subdivision of regulatory body which may apply to its performance under this contract.

County of Erie

DIVISION OF PURCHASE

14. GRATUITIES, ILLEGAL OR IMPROPER SCHEMES. The County may terminate this agreement if it is determined that gratuities in the form of entertainment, gifts or otherwise were offered or given by a vendor, his agent or representative to any County official or employee with a view towards securing favorable treatment with respect to the awarding of this bid or the performance of this agreement. The County may also terminate this agreement if it is determined that the successful bidder engaged in any other illegal or improper scheme promotive of favoritism or unfairness incidental to the bidding process or the performance of this agreement. In the event that it is determined that said improper or illegal acts occurred, the County shall be entitled to terminate this agreement and/or exercise any other remedy available to it under existing law.

15. INSURANCE shall be procured by the Successful Bidder before commencing work, no later than 14 days after notice of award and maintained without interruption for the duration of the Contract, in the kinds and amounts specified in Exhibit IC, unless otherwise stipulated in these Bid Specifications. IF THE INSURANCE IS NOT PROVIDED IN ACCEPTABLE FORM WITHIN THIS PERIOD OF TIME, THEN THE DIRECTOR OF PURCHASE MAY DECLARE THE VENDOR NONRESPONSIVE AND AWARD THE CONTRACT TO THE NEXT LOW RESPONSIBLE BIDDER.

CERTIFICATES OF INSURANCE shall be furnished by the successful bidder on Erie County Standard Insurance Certificate, Exhibit IC.

16. ANY CASH DISCOUNT which is part of bid will be considered as a reduction in the bid prices in determining the award of the bid. Date of invoice must not precede date of delivery. The County policy is to pay all claims in a timely manner within the specified time. However, if for some reason payment is delayed, the County will take the discount when payment is made. The County will not pay any interest charges, nor refund discount amounts taken after the discount period. If this is unsatisfactory, please quote net.

17. CHANGES IN THE WORK. The County may, as the need arises, through the Director of Purchase, order changes in the work through additions, deletions, or modifications without invalidating the contract. Compensation, as it may be affected by any change, shall be adjusted by agreement between the contractor and County through the Director of Purchase.

18. BID OFFERING MATERIAL OTHER THAN THAT OF SPECIFIED MANUFACTURER OR TRADE NAME will be considered unless stated otherwise. The use of the name of a particular manufacturer, trade name, or brand in describing an item does not restrict a bidder to that manufacturer or specific article. However, the substituted article on which a proposal is submitted must be of such character or quality that it would serve the purpose for which it is to be used equally well as the manufacturer or brand specified. Proposals will be accepted in accordance with specifications on file or approved equal.

19. IF MATERIAL OR SERVICES OTHER THAN THOSE SPECIFIED IN THIS BID DOCUMENT ARE OFFERED, the bidder must so state and furnish at the time of bid opening, if so requested, and as part of his bid the following information in duplicate:

- (a) Complete description of the item offered, and detailed explanation of the differences between the item specified and the item offered. If, in the opinion of the Division of Purchase, sufficient detail is not presented as a part of the sealed bid to permit definitive evaluation of any substitute item, the bid will not be considered.
- (b) Descriptive literature of item offered, for evaluation.
- (c) List of installations in Erie County of the item offered.
- (d) List of other installations.

20. ANY ADDITIONAL INFORMATION for which bidder desires to add to the bid shall be written on a separate sheet of paper, attached to and submitted with the formal sealed bid, to be read at the formal opening.

21. WORKMANSHIP MUST MEET WITH THE APPROVAL OF THE DEPARTMENT HEAD(S) INVOLVED, AND SHALL BE FIRST CLASS in every respect without exception and shall be equal to the best modern practices. Materials furnished are to be new and unused. All materials furnished or work performed are to be guaranteed free from defects. Anything found defective or not meeting specifications, no matter in what stage of completion, may be rejected and shall be made good by the contractor at his own expense.

County of Erie

DIVISION OF PURCHASE

23. THIS BID IS FIRM AND IRREVOCABLE for a period of 45 days from the date and time of the bid opening. If a contract is not awarded within the 45 day period, a bidder to whom the bid has not been awarded, may withdraw his bid by serving written notice of his intention to do so upon the Division of Purchase. Upon withdrawal of the bid pursuant to this paragraph, the Division of Purchase will forthwith return the bidder's security deposit.
24. PRICES CHARGED TO THE COUNTY OF ERIE are to be no higher than those offered to any other governmental or commercial consumer. If a bidder has a New York State or a Federal GSA contract for any of the items covered in this bid or any similar items, he shall so indicate that he has said contract on these bid papers and automatically supply a copy of this contract within five days after notification of award.
25. PRICE IS FIRM. The unit prices bid shall remain firm, and any other charges bid shall also remain firm, for delivery of the equipment, material, work, or services described in this bid. No cost increase shall be charged for any reason whatsoever.
26. EXTENSION OF PRICE PROTECTION. Any contract entered into pursuant to this bid to supply the County's requirements of goods and/or services for a definite period of time as stated in the attached specifications may be extended for not more than two successive periods of equal length at the same bid price upon the mutual agreement of the successful bidder and the County. All extensions shall be submitted in writing and shall have prior approval by the County of Erie, Director of Purchase.
27. IN EXECUTING THIS BID, THE BIDDER AFFIRMS that all of the requirements of the specifications are understood and accepted by the bidder, and that the prices quoted include all required materials and services. The undersigned has checked all of the bid figures, and understands that the County will not be responsible for any errors or omissions on the part of the undersigned in preparing this bid. Mistakes or errors in the estimates, calculations or preparation of the bid shall not be grounds for the withdrawal or correction of the bid or bid security. In case of error in extension of prices in the bid, the unit price will govern.
28. ACCOUNTABILITY. The undersigned shall be fully accountable for his or its performance under this bid, or any contract entered into pursuant to this bid, and agrees that he, or its officers, will answer under oath all questions relevant to the performance thereof and to any transaction, act or omission had, done or omitted in connection therewith if called before any Judicial, County or State officer or agency empowered to investigate the contract or his performance.
29. TERMINATION OF CONTRACT:
- a. This agreement may be terminated by either party upon seven (7) days written notice, should the party fail substantially to perform in accordance with its terms, through no fault of the party initiating the termination.
 - b. At its option, the County may at any time for any reason terminate this agreement and the Contractor shall immediately cease all work under the agreement upon receipt of written notice of such termination from the County.
 - c. In the event of termination for any reason other than the fault of the Contractor, or the nonavailability of funds as provided in the above Executory Clause, the Contractor shall be paid the amount due to date of termination, and all reasonable expenses caused by such termination.
30. THE SUCCESSFUL BIDDER TO WHOM THE BID IS AWARDED SHALL INDEMNIFY AND HOLD HARMLESS the County of Erie and its agents and employees from and against all claims, damages, losses or causes of action arising out of or resulting from such vendor's performance pursuant to this bid.
31. STATUS AS AN INDEPENDENT CONTRACTOR: The successful Bidder to whom the bid is awarded and the County agree that the Bidder and its officers, employees, agents, contractors, subcontractors and/or consultants are independent contractors and not employees of the County or any department, agency or unit thereof. In accordance with their status as independent contractors, the Bidder covenants and agrees that neither the Bidder nor any of its officers, employees, agents, contractors, subcontractors and/or consultants will hold themselves out as, or claim to be, officers or employees of the County or any department, agency or unit thereof.
32. GOVERNED BY NEW YORK LAW: This Agreement shall be construed and enforced in accordance with the laws of the State of New York. In addition, the parties hereby agree that for any cause of action arising out of this Agreement shall be brought in the County of Erie.

(Rev 1/09)

ERIE COUNTY OFFICE BUILDING, 95 FRANKLIN STREET, BUFFALO, NEW YORK 14202 (716) 858-6395

County of Erie

DIVISION OF PURCHASE

To facilitate correct drawing and execution of contract, bidder shall supply full information concerning legal status:

FIRM NAME Kenyon Pipeline Inspection, LLC

ADDRESS OF PRINCIPAL OFFICE STREET 68 Park Rd

CITY Queensbury

AREA CODE 518 PHONE 926-9843 STATE NY ZIP 12804

Check one: CORPORATION X PARTNERSHIP _____ INDIVIDUAL _____

INCORPORATED UNDER THE LAWS OF THE STATE OF NY

If foreign corporation, state if authorized to do business in the State of New York:

YES _____ NO _____

TRADE NAMES: _____

ADDRESS OF LOCAL OFFICE STREET _____

CITY _____

AREA CODE _____ PHONE _____ STATE _____ ZIP _____

NAMES AND ADDRESSES OF PARTNERS:



County of Erie

MARK POLONCARZ
COUNTY EXECUTIVE

DIVISION OF PURCHASE

ASSIGNMENT OF PUBLIC CONTRACTS

GENERAL MUNICIPAL LAW - Section 109:

1. A clause shall be inserted in all specifications of contracts hereafter made or awarded by an officer, board or agency of a political subdivision, or any district therein, prohibiting any contractor, to whom any contract shall be let, granted or awarded, as required by law, from assigning, transferring, conveying, subletting or otherwise disposing of the same, or of his right, title or interest therein, or his power to execute such contract, to any other person or corporation without the previous consent in writing of the officer, board or agency awarding the contract.
2. If any contractor, to whom any contract is let, granted, or awarded, as required by law, by any officer, board or agency of a political subdivision, or of any district therein, without the previous written consent specified in subdivision one (1) of this section, assign, transfer, convey, sublet or otherwise dispose of such contract, or his right, title or interest therein, or his power to execute such contract to any other person or corporation, the officer, board or agency which let, made, granted or awarded such contract shall revoke and annul such contract, and the political subdivision or district therein, as the case may be, and such officer, board or agency shall be relieved and discharged from all liability and obligations growing out of such contract to such contractor, and to the person or corporation to which such contract shall have been assigned, transferred, conveyed, sublet or otherwise disposed of, and such contractor, and his assignee, transferee or sublessee shall forfeit and lose all monies, theretofore earned under such contract, except so much as may be required to pay his employees. The provisions of this section shall not hinder, prevent or affect any assignment by any such contractor for the benefit of his creditors made pursuant to the laws of the State.

NO ASSIGNMENT OF ANY AGREEMENT pursuant to this bid shall be made without specific prior approval, in writing, by the Erie County Director of Purchase.

(Rev. 12/01/93)



COUNTY OF ERIE

MARK POLONCARZ
COUNTY EXECUTIVE

DIVISION OF PURCHASE

PURCHASES BY OTHER LOCAL GOVERNMENTS OR SPECIAL DISTRICTS

The Erie County Legislature has adopted the following resolution for the purpose of allowing the following-named local governmental or school districts to make purchases through the County bidding procedures.

Under the following conditions, the Director of Purchase may make purchasing services available to the following 88 participants:

1. When in the opinion of the Director of Purchase it will not create any burden or hardship upon the County and the anticipated prices will not be adversely affected thereby, the Director is authorized when he deems appropriate and as may be requested by the participants to provide in any particular County bid specification that the participants in Erie County shall have the right to make purchases based upon the bids received by the County.
2. The County Purchase Director, within the limits of his time and manpower, shall disseminate relevant contract information to the participants.
3. The participants in County contracts will issue purchase orders directly to vendors within the specified contract period referencing the County contract involved and be liable for any payments due on such purchase orders.

Bidders shall take notice that as a condition of the award of a County contract pursuant to these specifications, the successful bidder agrees to accept the award of a similar contract with any of the participants in Erie County if called upon to do so. The County, however, will not be responsible for any debts incurred by participants pursuant to this or any other agreement.

Necessary deviations from the County's specifications in the award of a participant's contract, particularly as such deviations may relate to quantities or delivery point, shall be a matter to be resolved between the successful bidder and participants. All inquiries regarding prospective contracts shall be directed to the attention of:

AKRON CENTRAL SCHOOL DISTRICT, District Clerk, 47 Bloomingdale Ave., Akron, NY 14001
 AKRON VILLAGE OF, Clerk-Treasurer, 21 Main St., Akron, NY 14001
 ALDEN CENTRAL SCHOOL DISTRICT, District Clerk, 13190 Park St., Alden, NY 14004
 ALDEN TOWN OF, Town Clerk, Town Hall, 11901 Broadway, Alden, NY 14004
 ALDEN VILLAGE OF, Village Clerk, 13336 Broadway, Alden, NY 14004
 AMHERST CENTRAL SCHOOL DISTRICT, Business Manager, 4301 Main St., Amherst, NY 14226
 AMHERST TOWN OF, Highway Superintendent, Town Hall, 5583 Main St., Williamsville, NY 14221
 AMHERST TOWN OF, Town Supervisor, Town Hall, 5583 Main St., Williamsville, NY 14221
 ANGOLA VILLAGE OF, Clerk-Treasurer, 41 Commercial St., Angola, NY 14006
 AURORA TOWN OF, Town Clerk, Town Hall, 5 S. Grove St., E. Aurora, NY 14052
 BLASDELL VILLAGE OF, Clerk-Treasurer, 121 Miriam St., Blasdell, NY 14219
 BOCES, ERIE #1, Clifford N Crooks Svc. Ctr., 355 Harlem Rd. West Seneca NY 14224-1892
 BOCES, ERIE CATTARAUGUS #2, Assistant Superintendent, 3340 Baker Rd., Orchard Park, NY 14127
 BOSTON TOWN OF, Town Clerk, Town Hall, 8500 Boston State Rd., Boston, NY 14025
 BRANT TOWN OF, Town Clerk, Town Hall, Brant North Collins Rd., Brant, NY 14027
 BUFFALO BOARD OF EDUCATION, Purchasing Agent, 408 City Hall, Buffalo, NY 14202
 BUFFALO CITY OF, Division of Purchasing, 1901 City Hall, Buffalo, NY 14202
 BUFFALO SEWER AUTHORITY, General Manager, 1038 City Hall, Buffalo, NY 14202-3378
 CHEEKTOWAGA CENTRAL SCHOOL DISTRICT, 3600 Union Rd., Cheektowaga, NY 14225
 CHEEKTOWAGA-MARYVALE UNION FREE SCHOOL DIST., DIST., CLERK, 1050 MARYVALE DR., CHEEKTOWAGA, NY 14225-2386
 CHEEKTOWAGA-SLOAN UNION FREE SCHOOL DISTRICT, District Clerk, 166 Halstead Ave., Sloan, NY 14212-2295
 CHEEKTOWAGA TOWN OF, Town Hall, Broadway & Union Rds., Cheektowaga, NY 14227
 CLARENCE CENTRAL SCHOOL DISTRICT, Business Administrator, 9625 Main St., Clarence, NY 14031-2083
 CLARENCE TOWN OF, Town Clerk, 1 Town Place, Clarence, NY 14031

CLEVELAND HILL FIRE DISTRICT NO. 6, Secretary, 440 Cleveland Dr., Cheektowaga, NY 14225
 CLEVELAND HILL U.F.S.D. @ CHEEKTOWAGA, Business Manager, Mapleview Dr., Cheektowaga, NY 14225
 COLDEN TOWN OF, Deputy Town Clerk, Town Hall, S-8812 State Rd., Colden, NY 14033
 COLLINS TOWN OF, Supervisor, Town Hall, P.O. Box 420, Collins, NY 14035
 CONCORD TOWN OF, Town Clerk, Town Hall, Springville, NY 14141-0187
 DEPEW UNION FREE SCHOOL DISTRICT, District Clerk, 591 Terrace Blvd., Depew, NY 14043
 DEPEW VILLAGE OF, Village Clerk, Municipal Building, 85 Manitou St., Depew, NY 14043
 EAST AURORA VILLAGE OF, Village Clerk, Village Hall, 571 Main St., East Aurora, NY 14052
 EDEN TOWN OF, Town Clerk, 2795 East Church St., Eden, NY 14057
 EGGERTSVILLE FIRE DISTRICT, Secretary/Treasurer, 1880 Eggert Rd., Eggertsville, NY 14226-2233
 ELLWOOD FIRE DISTRICT #1, Secretary, Town of Tonawanda, 1000 Englewood Ave., Kenmore, NY 14223
 ELMA TOWN OF, Town Clerk, Town Hall, 1600 Bowen Rd., Elma, NY 14059
 ERIE COUNTY WATER AUTHORITY, Central Processing, 3030 Union Rd., Buffalo, NY 14227
 EVANS TOWN OF, Town Clerk, 42 N. Main St., Angola, NY 14006
 FARNHAM VILLAGE OF, Village Clerk-Treasurer, 526 Commercial St., Farnham, NY 14061
 FORKS FIRE DISTRICT #3, Commissioner, Town Cheektowaga, 3330 Broadway, Cheektowaga, NY 14227
 GOWANDA VILLAGE OF, Clerk/Treasurer, 27 East Main St., Gowanda, NY 14070
 GRAND ISLAND CENTRAL SCHOOL DISTRICT, District Clerk, 1100 Ransom Rd, Grand Island, NY 14072
 GRAND ISLAND TOWN OF, Town Clerk, 2255 Baseline Rd., Grand Island, NY 14072
 HAMBURG TOWN OF, Town Clerk, S-6100 S. Park Ave., Hamburg, NY 14075
 HAMBURG VILLAGE OF, Village Clerk/Treasurer, 100 Main St., Hamburg, NY 14075
 HOLLAND FIRE DISTRICT #1, Town of Holland, Holland, NY 14080
 HOLLAND TOWN OF, Town Clerk, 47 Pearl St., Holland, NY 14080
 HOPEVALE UNION FREE SCHOOL DISTRICT, District Clerk, 3780 Howard Rd., Hamburg, NY 14075
 IROQUOIS CENTRAL SCHOOL DISTRICT, Gridle Rd., Elma, NY 14059
 KENILWORTH FIRE DISTRICT #2, Commissioner, Tn. Tonawanda, 84 Hawthorne Ave., Buffalo, NY 14223
 KENMORE-TN OF TONAWANDA UNION FREE SCHOOL DISTRICT, district Clerk, 1500 Colvin Blvd., Buffalo, NY 14223
 KENMORE VILLAGE OF, Village Clerk-Treasurer, Municipal Building, Kenmore, NY 14217
 LACKAWANNA CITY OF, City Clerk, Lackawanna City Hall, 714 Ridge Rd., Lackawanna, NY 14218
 LAKE VIEW FIRE DISTRICT, Fire Commissioner, P.O. Box 145, Lake View, NY 14085
 LANCASTER TOWN OF, Town Clerk, 21 Central Avenue, Lancaster, NY 14086
 LANCASTER VILLAGE OF, Clerk-Treasurer, Municipal Building, 5423 Broadway, Lancaster, NY 14086
 MARILLA TOWN OF, Marilla Town Hall, 1740 Two Rod Rd., Marilla, NY 14102
 NEWSTEAD TOWN OF, Town Clerk, Town Hall, P.O. Box 227, Akron, NY 14001
 NIAGARA FRONTIER TRANSPORTATION AUTHORITY, 181 Ellicott St., Buffalo, NY 14205
 NORTH COLLINS TOWN OF, Town Clerk 2015 Spruce St., North Collins, NY 14111
 NORTH COLLINS VILLAGE OF, Village Clerk, 10543 Main St., North Collins, NY 14111
 ORCHARD PARK CENTRAL SCHOOL DIST, Asst. Supt. Bus. & Support Svcs, 3330 Baker Rd, Orchard Park, NY 14127
 ORCHARD PARK TOWN OF, Town Clerk, Municipal Bldg., 4295 S. Buffalo St., Orchard Park, NY 14127
 ORCHARD PARK VILLAGE OF, Clerk, Municipal Bldg., 4295 S. Buffalo St., Orchard Park, NY 14127
 SARDINIA TOWN OF, Town Clerk, Town Hall, Savage Rd., Sardina, NY 14134
 SHERIDAN PARK FIRE DISTRICT NO. 4, Secretary, 738 Sheridan Dr., Tonawanda, NY 14150
 SLOAN VILLAGE OF, Clerk Treasurer, 425 Reiman St., Sloan, NY 14212
 SNYDER VOL. FIRE DEPT., Fire Commissioner, 4531 Main Street, Snyder, NY 14226
 SOUTH LINE FIRE DISTRICT #10, Fire Commissioner, 1049 S. French Rd., S. Cheektowaga, NY 14227
 SOUTH WALES FIRE DISTRICT #1, Secretary/Treasurer, P.O.Box 94, South Wales, NY 14139
 SPRING BROOK FIRE DISTRICT #1, Secretary, P.O. Box 97, Spring Brook, NY 14140
 SPRINGVILLE VILLAGE OF, Clerk Treasurer, Village Office, 5 W. Main St., Springville, NY 14141
 SWEET HOME CENTRAL SCHOOL DISTRICT, Dir. Finance & Plant Svcs. 1901 Sweet Home Rd, Amherst, NY 14228
 TONAWANDA CITY OF, Mayor, 200 Niagara St., Tonawanda, NY 14150
 TONAWANDA CITY OF, Superintendent, 150 Fillmore Avenue, Tonawanda, NY 14150
 TONAWANDA CITY SCHOOL DISTRICT, DISTRICT CLERK, 202 BROAD ST., TONAWANDA, NY 14150-2098
 TONAWANDA TOWN OF, Town Clerk, Municipal Building, Kenmore, NY 14217
 U-CREST FIRE DISTRICT #4, Fire Commissioner, 255 Clover Place, Cheektowaga, NY 14225
 UNION FREE SCHOOL DISTRICT, Dist. Clerk, Tn. Tonawanda, 1500 Colvin Blvd., Kenmore, NY 14223
 WALDEN FIRE DISTRICT #2, 20 Pine Ridge Road, Fire Commissioner, Cheektowaga, NY 14211
 WALES TOWN OF, Town Clerk, Big Tree Rd., Wales Center, NY 14169
 WEST SENECA CENTRAL SCHOOL DIST, district Treasurer, 1397 Orchard Park Rd., W. Seneca B Y 14224-4098
 WEST SENECA FIRE DISTRICT #4, Fire Commissioner, 100 Lein Rd., West Seneca, NY 14224
 WEST SENECA FIRE DISTRICT #5, Fire Commissioner, 2801 Seneca St., West Seneca, NY 14224
 WEST SENECA TOWN OF, Town Clerk, 1250 Union Road, West Seneca, NY 14224
 WILLIAMSVILLE, CTRAL SCHOOL DIST., DIST., CLERK, 105 Casey Rd, PO Box 5000, E Amherst NY 14051
 WILLIAMSVILLE VILLAGE OF, 5565 Main St., P.O. Box 1557, Williamsville, NY 14231-1557
 WYOMING, COUNTY OF, Office of the Board of Supervisors, 143 N. Main St., Warsaw, NY 14569



County of Erie

MARK POLONCARZ
COUNTY EXECUTIVE

DIVISION OF PURCHASE

CONSTRUCTION/RECONSTRUCTION CONTRACTS

1. DISCRIMINATION. The successful bidder agrees:

(a) that in the hiring of employees for the performance of work under this contract or any subcontract hereunder, no contractor, subcontractor, nor any person acting on behalf of such contractor or subcontractor, shall by reason of race, creed, color, sex or national origin discriminate against any citizen of the State of New York who is qualified and available to perform the work to which the employment relates;

(b) that no contractor, subcontractor, nor any person on his behalf shall, in any manner, discriminate against or intimidate any employee hired for the performance of work under this contract on account of race, creed, color, sex or national origin;

(c) that there may be deducted from the amount payable to the contractor by the County of Erie under this contract a penalty of fifty dollars for each person for each calendar day during which such person was discriminated against or intimidated in violation of the provisions of the contract;

(d) that this contract may be cancelled or terminated by the County of Erie and all monies due or to become due hereunder may be forfeited, for a second or any subsequent violation of the terms or conditions of this section of the contract; and

(e) the aforesaid provisions of this section covering every contract for or on behalf of the County of Erie for the manufacture, sale or distribution of materials, equipment or supplies shall be limited to operations performed within the territorial limits of the State of New York.

(N.Y. State Labor Law Article 8 Section 220-e)

(f) Provisions of the State Law Against Discrimination also prohibit discrimination in employment because of age.

2. CONSTRUCTION, RECONSTRUCTION, OR REPAIR CONTRACTS FOR PUBLIC WORKS FACILITIES are subject to minimum wage rates, as established by the State of New York Department of Labor. The successful bidder on any contract for public works to which the provisions of the New York State Labor Law Article 8 apply agrees that:

(a) No laborer, workman or mechanic in the employ of the contractor, subcontractor or other person doing or contracting to do the whole or a part of the work contemplated by the contract shall be permitted or required to work more than eight hours in any one calendar day or more than five days in any one week except in cases of extraordinary emergency including fire, flood or danger to life or property.

(Section 220, subd. 2, N.Y. State Labor Law)

(b) Each laborer, workman or mechanic employed by the contractor, subcontractor or other person doing or contracting to do the whole or part of the work contemplated by the contract shall be paid not less than the hourly minimum rate of wage and provided supplements not less than the prevailing supplements as designated by the New York State Industrial Commission.

(Section 220, subd. 3, N.Y. State Labor Law)

Wage and supplement rates are on file in the Division of Purchase.

3. AFFIRMATIVE ACTION PROGRAM AFFECTING CONSTRUCTION CONTRACTS. The Erie County Legislature has adopted a resolution directing that County Construction Contracts require the contractor to take affirmative action to secure equal opportunity for minority group workers and to comply with the Affirmative Action Program of the County of Erie. The Legislative resolution provides that a contract for the purchase of equipment involving installation work by building trade employees shall be considered a construction contract if the number of such employees on the job site shall at any time exceed ten (10). If the contractor intends to have more than ten (10) such employees on the job site at any one time, it shall be the contractor's obligation to make a written request to the Director of the Division of Purchase

for a copy of the special conditions pertaining to affirmative action. The contractor shall not, at any time, place more than ten (10) such employees on the job site except in compliance with the said resolution and the said special conditions.

AGREEMENT TO ABIDE BY EQUAL EMPLOYMENT OPPORTUNITY
POLICY STATEMENT REQUIREMENTS

I, Joshua R. Kenyon, am the authorized representative of Kenyon Pipeline Inspection, LLC
Name of Representative Name of Contractor/Service Provider

I hereby certify that Kenyon Pipeline Inspection, LLC will abide by the equal employment
Name of Contractor/Service Provider
opportunity (EEO) policy statement provisions outlined below.

- (i) A statement that the contractor will not discriminate on the basis of race, creed, color, national origin, sex, age, disability, or marital status against any employee or applicant for employment, will undertake or continue existing programs of affirmative action to ensure that minority group members and women are afforded equal employment opportunities without discrimination and will make and document its conscientious and active efforts to employ and utilize minority group members and women in its work force on contracts relating to the Project.
- (ii) An agreement that all of contractor's solicitations or advertisements for employees will state that, in the performance of the contract relating to this Project, all qualified applicants will be afforded equal employment opportunities without discrimination on the basis of race, creed, color, national origin, sex, age, disability or marital status.
- (iii) An agreement to request each employment agency, labor union, or authorized representative of workers with which it has a collective bargaining or other agreement or understanding, to furnish a written statement that such employment agency, labor union, or representative will not discriminate on the basis of race, creed, color, national origin, sex, age, disability or marital status and that such union or representative will affirmatively cooperate in the implementation of the contractor's obligations herein.
- (iv) An agreement to comply with the provisions of the Human Rights Law (Article 15 of the Executive Law), including those relating to non-discrimination on the basis of prior criminal conviction and prior arrest, and with all other State and federal statutory constitutional non-discrimination provisions.

Blank EEO Policy Statements are available at www.efc.ny.gov/mwbe, if needed.

If contractor fails to submit to Recipient an EEO policy statement consistent with the provisions set forth above in clauses (i), (ii), (iii) and (iv) and within the timeframe required thereof, Recipient may declare this contract to be null and void.

x Joshua R. Kenyon
Contractor/Service Provider Representative

PRIME CONTRACTOR AFFIDAVIT

- According to the best of my knowledge, I certify that all the following statements are true and accurate and are made under penalty of perjury. I agree to comply with Executive order 11246, New York State Article 15-A of the Executive Law, and Erie County Local Law Nos. 1 & 5 to achieve Minority and Women Business Enterprise goals assigned to this contract.
- I understand that only Erie County/City of Buffalo certified MBE & WBE owned and operated business enterprises will be credited towards fulfillment of the MBE & WBE utilization goals on this construction project.
- I will make every good faith effort to meet the MBE/WBE utilization goals in which contained in the contract.
- I affirm that I have no direct or indirect control over any MBE/WBE which I propose to use in fulfillment of the MBE/WBE utilization goals of this contract.
- I understand that I will not meet the MBE/WBE goal through arrangements with minority/female individuals of firms, which are not certified as participating minority business enterprises or women business enterprises.
- I understand and acknowledge that I will not perform any services and functions to such an extent that the MBE/WBE owner/operator does not manage and control its company
- I will only utilize MBE & WBE subcontractors and/or suppliers who are certified with Erie County/City of Buffalo.
- I understand that I am responsible for ensuring that MBE & WBE firms are utilized in order to further utilization goals. I understand that failure to utilize MBE & WBE firms are represented herein, will constitute a material breach of contract.
- The MBE/WBE firm will perform all the work and/or supply all the material covered under the prime contractor and subcontractor agreement. If change occurs, it is the prime contractor's responsibility to notify Erie County-EEO Office within 2 weeks.
- I understand that I will not withhold any payments that I agree on with MBE & WBE upon completion of the project.
- I understand that any misrepresentation of fact in this affidavit may lead to criminal prosecution under State and Federal law.
- The percentage (%) of MBE utilization goals for this contract is 10%
- The percentage (%) of WBE utilization goals for this contract is 2%.

2/27/17
Date

Kenyon Pipeline Inspection, LLC
Name of Company

68 Park Rd, Queensbury, NY 12804
Address

518-926-9843
Telephone No.

[Signature]
Authorized Signature

Sworn to me this 24TH day of FEBRUARY 20 17

[Signature] (Signature of Notary)

GEORGIA G KENYON
NOTARY PUBLIC-STATE OF NEW YORK
No. 01KE6253719
Qualified In Warren County
My Commission Expires January 03, 2020

Kevin Mitchell

From: Kevin Mitchell <kevin@kpi sewer.com>
Sent: Monday, February 20, 2017 12:47 PM
To: 'Tim Szczepanski'
Subject: Erie County Term Contract Sub Pricing
Attachments: SKMBT_C22017022011160.pdf

Tim,

We are bidding on the, Erie County Cured in Place Pipe Lining Contract No. 75, and are looking to get some sub pricing on the attached bid items. We were hoping that you would be interested in providing pricing for these items. This contract bids on the 28th.

Feel free to contact me if you have any questions.

Thank you,

Kevin Mitchell

Project Manager
KENYON PIPELINE INSPECTION, LLC
68 Park Road
Queensbury, NY 12804
P: 518-681-1362
F: 518-348-3040
Email: kevin@kpi sewer.com



Kevin Mitchell

From: Tim <tim@northeastpaving.com>
Sent: Friday, February 24, 2017 11:57 AM
To: Kevin Mitchell
Subject: Re: Erie County Term Contract Sub Prices

Sorry was on vacation this week. Happy to look at if you are successful.

Sent from my iPhone

On Feb 24, 2017, at 11:50 AM, Kevin Mitchell <kevin@kpisewer.com> wrote:

Tim,

Have you had a chance to go over the bid items that I sent you for the Erie County Term Contract? We are going to be mailing in our bid today and were hoping to have some numbers for the items that I sent you.

Feel free to give me a call if you have any questions.

Thank you,

Kevin Mitchell

Project Manager

KENYON PIPELINE INSPECTION, LLC

68 Park Road

Queensbury, NY 12804

P: 518-681-1362

F: 518-348-3040

Email: kevin@kpisewer.com

<image001.png>

Client#: 30702

KENYOPIP

ACORD™

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

5/05/2017

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER Adirondack Trust Insurance 31 Church Street - 4th Floor PO Box 336 Saratoga Springs, NY 12866		CONTACT NAME: PHONE (A/C, No, Ext): 518 584-5300 FAX (A/C, No): 5185847306 E-MAIL ADDRESS:															
INSURED Kenyon Pipeline Inspection LLC 68 Park Rd. Queensbury, NY 12804		<table border="1"> <thead> <tr> <th>INSURER(S) AFFORDING COVERAGE</th> <th>NAIC #</th> </tr> </thead> <tbody> <tr> <td>INSURER A: Selective Insurance Company of</td> <td>12572</td> </tr> <tr> <td>INSURER B: Homeland Insurance Company of D</td> <td>14231</td> </tr> <tr> <td>INSURER C:</td> <td></td> </tr> <tr> <td>INSURER D:</td> <td></td> </tr> <tr> <td>INSURER E:</td> <td></td> </tr> <tr> <td>INSURER F:</td> <td></td> </tr> </tbody> </table>		INSURER(S) AFFORDING COVERAGE	NAIC #	INSURER A: Selective Insurance Company of	12572	INSURER B: Homeland Insurance Company of D	14231	INSURER C:		INSURER D:		INSURER E:		INSURER F:	
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INSURER C:																	
INSURER D:																	
INSURER E:																	
INSURER F:																	

COVERAGES

CERTIFICATE NUMBER:

REVISION NUMBER:

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL SUBR INSR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
A	☒ COMMERCIAL GENERAL LIABILITY ☐ CLAIMS-MADE ☒ OCCUR GEN'L AGGREGATE LIMIT APPLIES PER ☐ POLICY ☒ PRO-JECT ☐ LOC ☐ OTHER		S2188175	08/31/2016	08/31/2017	EACH OCCURRENCE \$1,000,000 DAMAGE TO RENTED PREMISES (Ea occurrence) \$500,000 MED EXP (Any one person) \$15,000 PERSONAL & ADV INJURY \$1,000,000 GENERAL AGGREGATE \$3,000,000 PRODUCTS - COMPIOP AGG \$3,000,000 \$
A	AUTOMOBILE LIABILITY ☒ ANY AUTO ☐ ALL OWNED AUTOS ☐ SCHEDULED AUTOS ☒ HIRED AUTOS ☒ NON-OWNED AUTOS		S2188175	08/31/2016	08/31/2017	COMBINED SINGLE LIMIT (Ea accident) \$1,000,000 BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$ PROPERTY DAMAGE (Per accident) \$ \$
A	☒ UMBRELLA LIAB ☒ OCCUR ☐ EXCESS LIAB ☐ CLAIMS-MADE ☐ DED ☒ RETENTION \$10000		S2188175	08/31/2016	08/31/2017	EACH OCCURRENCE \$5,000,000 AGGREGATE \$5,000,000 \$ PER STATUTE ☐ OTH-ER ☐ E L EACH ACCIDENT \$ E L DISEASE - EA EMPLOYEE \$ E L DISEASE - POLICY LIMIT \$
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? ☐ Y ☒ N (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	N/A				
B	Contractors Pollution Liability		7930049610000	11/14/2016	08/01/2017	\$2,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

Bld #217039-002. County of Erie is additional insured for general, auto and umbrella if required in written contract.

ORIGINAL DOCUMENT
FILE

MAY - 9 2017

IN LAW DEPARTMENT

CERTIFICATE HOLDER

CANCELLATION

County of Erie
 95 Franklin Street
 Buffalo, NY 14202

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

Engene S. Quirk

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New York State Insurance Fund

Workers' Compensation & Disability Benefits Specialists Since 1914

1 WATERVLIET AVENUE ALBANY, NEW YORK 12208-1649

CERTIFICATE OF WORKERS' COMPENSATION INSURANCE (RENEWED)

463416989

ADIRONDACK TRUST INSURANCE
31 CHURCH ST 4TH FLOOR
PO BOX 336
SARATOGA SPRINGS NY 12866



Scan to Validate

POLICYHOLDER KENYON PIPELINE INSPECTION LLC 68 PARK RD QUEENSBURY NY 12804		CERTIFICATE HOLDER COUNTY OF ERIE 95 FRANKLIN STREET BUFFALO NY 14202	
POLICY NUMBER A2211 263-5	CERTIFICATE NUMBER 497424	POLICY PERIOD 05/27/2017 TO 05/27/2018	DATE 5/25/2017

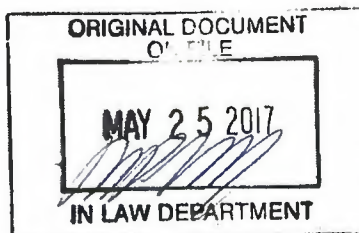
THIS IS TO CERTIFY THAT THE POLICYHOLDER NAMED ABOVE IS INSURED WITH THE NEW YORK STATE INSURANCE FUND UNDER POLICY NO. 2211263-5, COVERING THE ENTIRE OBLIGATION OF THIS POLICYHOLDER FOR WORKERS' COMPENSATION UNDER THE NEW YORK WORKERS' COMPENSATION LAW WITH RESPECT TO ALL OPERATIONS IN THE STATE OF NEW YORK, EXCEPT AS INDICATED BELOW, AND, WITH RESPECT TO OPERATIONS OUTSIDE OF NEW YORK, TO THE POLICYHOLDER'S REGULAR NEW YORK STATE EMPLOYEES ONLY.

IF YOU WISH TO RECEIVE NOTIFICATIONS REGARDING SAID POLICY, INCLUDING ANY NOTIFICATION OF CANCELLATIONS, OR TO VALIDATE THIS CERTIFICATE, VISIT OUR WEBSITE AT [HTTPS://WWW.NYSIF.COM/CERT/CERTVAL.ASP](https://www.nysif.com/cert/certval.asp). THE NEW YORK STATE INSURANCE FUND IS NOT LIABLE IN THE EVENT OF FAILURE TO GIVE SUCH NOTIFICATIONS.

THIS POLICY DOES NOT COVER THE SOLE PROPRIETOR, PARTNERS AND/OR MEMBERS OF A LIMITED LIABILITY COMPANY.

THE POLICY INCLUDES A WAIVER OF SUBROGATION ENDORSEMENT UNDER WHICH NYSIF AGREES TO WAIVE ITS RIGHT OF SUBROGATION TO BRING AN ACTION AGAINST THE CERTIFICATE HOLDER TO RECOVER AMOUNTS WE PAID IN WORKERS' COMPENSATION AND/OR MEDICAL BENEFITS TO OR ON BEHALF OF AN EMPLOYEE OF OUR INSURED IN THE EVENT THAT, PRIOR TO THE DATE OF THE ACCIDENT, THE CERTIFICATE HOLDER HAS ENTERED INTO A WRITTEN CONTRACT WITH OUR INSURED THAT REQUIRES THAT SUCH RIGHT OF SUBROGATION BE WAIVED.

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS NOR INSURANCE COVERAGE UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICY.



NEW YORK STATE INSURANCE FUND

DIRECTOR, INSURANCE FUND UNDERWRITING

VALIDATION NUMBER: 278656574

NEW YORK STATE PREVAILING WAGE

*On contracts which are subject to New York Department of Labor Prevailing Wage laws and regulations, the contractor is required to submit certified payroll record every thirty (30) days after the issuance of your first payroll under this contract. Required forms are available at the New York Department of Labor's website

<https://www.labor.state.ny.us/formsdocs/wp/pw12.pdf>.

This project's PRC# 2017000813.

In addition, if applicable, contractor is required to attach a copy of proof of completion of the OSHA 10 course to the first certified payroll submitted and on each succeeding payroll where any new or additional employee is first listed.

Records are to be submitted as directed in your award letter.

Failure to submit the legally required records will result in delayed payments.

NEW YORK STATE CERTIFIED APPRENTICESHIP
TRAINING PROGRAM CERTIFICATION

Pursuant to Erie County Local Law 2-2006 the following MUST be submitted along with supporting documentation unless the Contracting Agency has otherwise determined under Section 2f of the Erie County Rules and Regulations that the New York State Certified Apprenticeship Training Program does not apply.

TO BE FILLED OUT BY BIDDER: please check that which applies and sign below.

☐ Enclosed is a copy of the certification of approval of the New York State Certified Apprenticeship Training Program (NYSCATP) by the New York State Department of Labor which, as Bidder, will use in connection with the construction contract. Also enclosed is a written plan demonstrating how apprentices will be utilized by the Bidder as Prime Contractor or by the Subcontractor(s) to the Bidder as Prime Contractor. Such plan shall include at a minimum:

- i. An organized written plan in place that embodies the terms and conditions of employment, training and supervision of one or more apprentices;
- ii. A schedule of wages to be paid to the apprentices consistent with the skills required and approved by the New York State Department of Labor;
- iii. Equal employment and affirmative action plans; and
- iv. Demonstration that a minimum of ten percent (10%) of the Workforce of the Prime Contractor (inclusive of the workforce utilized by any Subcontractor(s) to the Bidder) shall consist of persons participating in NYSCATP.

☒ Enclosed is a detailed explanatory written statement as to the inapplicability of apprenticeship participation due to: The lack of career opportunities in NYSCATP approved by New York State Department of Labor Commissioner; OR The magnitude of the construction contract which would make use of apprentices impracticable.

Josh R. Ky
 SIGNATURE

Kemp Pipeline Inspection, LLC
 COMPANY NAME

2/24/17
 DATE

CAUTION: Be advised that Erie County Local Law 2-2006 will be enforced. All bidders must adhere to the provisions detailed on this page of this Proposal. For consideration, bidders must (1) check the appropriate box and (2) enclose the corresponding paperwork.

KENYON PIPELINE INSPECTION

68 Park Rd
Queensbury, NY 12804
518-832-4070 ph
518-348-3040 fx



February 24, 2017

Erie County Sewer District No. 3
Division of Sewerage Management
95 Franklin St
Buffalo, NY 14202

RE: Apprenticeship participation waiver request for Contract 75

To Whom It May Concern:

Kenyon Pipeline Inspection LLC hereby formally requests a waiver of the Apprenticeship program participation requirements for the prime contractor on this contract. Due to the specialized nature of the CIPP work that we perform our employees are required to have extensive specialized training. This specialized training is not offered through the NYCATP therefore we are not involved in that program.

We are working to find a subcontractor with an apprenticeship program to perform the excavation work under bid items 6 and 7 to help provide some % of the utilization goal.

Sincerely,

Jake Kenyon
CEO
Kenyon Pipeline Inspection LLC
Queensbury, NY
Tel. (518) 932-2510
Fax (518) 348-3040
joshk@kpisewer.com

CONFINED SPACE PROGRAM CERTIFICATION

This is to certify that Kenyon Pipeline Inspection, LLC has
(Company Name)

established a Confined Space Program which conforms to OSHA 29 CFR Part 1910, as it may be amended. Furthermore, it is understood that full implementation of the contractor's Confined Space Program is a requirement of this contract.

OSHA 10 COMPLIANCE CERTIFICATION

(Chapter 282 of Law of 2007, codified as Labor Law 220-h)

Contractor certifies that every worker employed in the performance of this contract has completed the OSHA 10 Safety Training Course. The Contractor will submit a copy of Proof of Completion of the OSHA 10 Safety Training Course for all workers, Contractors and Subcontractors, with the first certified payroll submitted and on succeeding certified payrolls when any new employee is on the contract. Proof of Completion may include a copy of a bona fide course completion card; a training roster, attendance record, or other documentation from the certified trainer; and/or other valid proof. A certification by the Contractor attesting that all employees have completed such course is not sufficient proof that the course has been completed.

Furthermore, it is understood that completion of the OSHA 10 Safety Training Course by all workers, contractors and subcontractors employed in the performance of this Contract is a requirement of this contract.

By: Joshua R. Kenyon
Contractor's Signature

Kenyon Pipeline Inspection, LLC
Business Name

Name: Joshua R Kenyon
Typed or Printed Name

Date: 2/24/17

Title: President

Requirements for OSHA 10 Compliance

Chapter 282 of the Laws of 2007, codified as Labor Law 220-h will take effect on July 18, 2008. The Statute provides as follows:

The advertised specifications for every contract for public work of \$250,000.00 or more must contain a provision requiring that every worker employed in the performance of a public work contract shall be certified as having completed an OSHA 10 safety training course. The clear intent of this provision is to require that all employees of public work contractors receive such training "prior to the performing any work on the project."

The Bureau will enforce the statute as follows:

All contractors and sub contractors must attach a copy of proof of completions of the OSHA 10 course to the first certified payroll submitted to the contracting agency and on each succeeding payroll where any new or additional employee is first listed.

Proof of completion may include but is not limited to:

- Copies of bona fide course completion card;
- Training roster, attendance record of other documentation from the certified trainer pending the issuance of the card.
- Other valid proof

** A certification by the employer attesting that all employees have completed such course is not sufficient proof that the course has been completed.

Any questions regarding this statute may be directed to the New York State Department of Labor, Bureau of Public Work at 518-485-5696.

Erie County Equal Pay Certification

In order to comply with Executive Order 13 dated November 6, 2014, we hereby certify that we are in compliance with federal law, including the Equal Pay Act of 1963, Title VII of the Civil Rights Act of 1964, Federal Executive Order 11246 of September 24, 1965 and New York State Labor Law Section 194 (together "Equal Pay Law"). The average compensation for female employees is not consistently below the average compensation for male employees, taking into account mitigating factors. We understand that this certification is a material component of this contract. Violation of the provisions of Executive Order 13, which is attached hereto and made a part hereof, can constitute grounds for the immediate termination of this contract and may constitute grounds for determining that a bidder is not qualified to participate in future county contracts.

We have evaluated wages and benefits to ensure compliance with the Federal Equal Pay Law.

Joshua R. Kenyon
Signature

Verification

STATE OF New York)
COUNTY OF Warren) SS:

A) Joshua R. Kenyon, being duly sworn, states he or she is the owner of (or a partner in) Kenyon Pipeline Inspection, LLC, and is making the foregoing Certification and that the statements and representations made in the Certification are true to his or her own knowledge.

B) Joshua R. Kenyon, being duly sworn, states that he or she is the Name of Corporate Officer President, of Kenyon Pipeline Inspection, LLC, Title of Corporate Officer Name of Corporation the enterprise making the foregoing Certification, that he or she has read the Certification and knows its contents, that the statements and representations made in the Certification are true to his or her own knowledge, and that the Certification is made at the direction of the Board of Directors of the Corporation.

Sworn to before me this 24th
Day of February, 20 17

PROPOSAL

TO: ERIE COUNTY DEPARTMENT OF ENVIRONMENT
AND PLANNING, ERIE COUNTY, NEW YORK
(hereinafter called the Owner)

FOR: Erie County Sewer Districts No. 1, 2, 3, 4, 5, 6, 8
Contract No. 75
Cured-in-Place Pipe Lining
Term Construction Contract

Gentlemen:

1. Pursuant to, and in accordance with the Invitation to Bid and the Instructions to Bidders relating thereto, the undersigned hereby offers to:

Furnish all materials, supplies, tools and labor required for the project, for the following unit and lump sum prices, which shall constitute the total bid for the project. In submitting this bid, the undersigned bidder understands and agrees that the bidder must furnish and provide for the respective item price bid all the necessary materials, labor, supplies, equipment, tools, transportation and all other items of whatever nature and to perform all the work necessary in accordance with the plans and specifications for said improvements. Further, that this bid is submitted with the following understanding:

That the undersigned bidder has carefully examined the plans, specifications, addenda and the form of contract and all other contract documents and has personally inspected the actual location of the work site and has determined that this bid is adequate to fully complete all scheduled improvements;

That all scheduled improvements will be completed in conformance with the plans, specifications and all other contract documents and addenda issued;

That the undersigned bidder understands the specifications and he assumes full responsibility for the ways, means and methods to accomplish the intent and performance requirements of the plans and specifications;

That the bid is based on unit and lump sum prices and where unit prices are bid, the undersigned bidder agrees to accept such unit bid prices as compensation for any additions or deductions caused by variations in unit quantities due to more accurate measurement or changes or alternations in the Work made pursuant to the contract documents;

The undersigned Bidder agrees to submit to all conditions reported, intended, or implied, both particularly and generally by the Contract at the prices herein stated for:

Contract No. 75
ECSD No. 1, 2, 3, 4, 5, 6, 8 Cured-in-Place Pipe Lining Term Construction
(Bidder to fill in Contract Number and Title) Contract No. 75

2. The undersigned Bidder also agrees as follows:

FIRST: If the Proposal is accepted to execute the Contract within fourteen (14) calendar days of date of Notice of Award of Contract, to complete each Work Order within 120 calendar days from date of Notice to Proceed, and furnish to the Owner satisfactory surety bonds each in the amount of \$500,000.00 as security for the faithful performance of the work, and for the payment of all persons performing labor and furnishing materials in connection with the work.

SECOND: To begin work within five (5) calendar days of the date of "Notice to Proceed", and to prosecute said work in such a manner as to complete all work within the number of calendar days stipulated above.

THIRD: In the event that the Contractor shall fail to complete the work within the time stated in this Contract, as the same may be modified by extensions of time granted by the Owner, the Contractor and his sureties shall at the owner's option, be liable for, and pay to the Owner, additional engineering fees and actual damages or the sum specified in the Contract as fixed, agreed liquidated damages for each calendar day for such delay until the work is completed and accepted, PROVIDED that the Owner may extend the Contract time by written order due to unforeseen conditions which may arise.

FOURTH: In submitting this Bid, the Contractor represents, as more fully set forth in the Agreement, that he has examined the Instruction 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, 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, and penalties for failure to achieve substantial completion by the dates stipulated in the Contract; and that by signing this bid waives all rights to plead any misunderstanding regarding the same.

FIFTH: The Contractor agrees to comply with the requirements of the State commission for Human Rights during the performance of this Proposal and further that:

(a) The 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 discrimination because of race, creed, color or national origin. Such action shall be taken with reference, but not be 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.

(b) The Contractor will send to each labor union or representative of workers with which he has or is bound by a collective bargaining or other agreement or understanding, a notice, to be provided by the State Commission for Human Rights, advising such labor union or representative of the Contractor's agreement under clauses (a) through (g) (hereinafter called "non-discrimination clauses"). If the Contractor was directed to do so by the contracting agency as part of the bid or negotiation of this Contract, the Contractor shall request such labor union or representative to furnish him with a written statement that such labor union or representative will not discriminate because of race, creed, color or national origin and that such labor union or representative either will affirmatively cooperate, within the limits of its legal and contractual authority, in the implementation of the policy and provisions of these non-discrimination clauses or that it consents and agrees that recruitment, employment and the terms and conditions of employment under this Contract shall be in accordance with the purposes and provisions of these non-discrimination clauses. If such labor union or representative fails or refuses to comply with such a request that it furnish such a statement, the Contractor shall promptly notify the State Commission for Human Rights of such failure or refusal.

(c) The Contractor will post and keep posted in conspicuous places, available to employees and applicants for employment, notices to be provided by the State Commission for Human Rights setting forth the substance of the provisions of clauses (a) and (b) and such provisions of the State's laws against discrimination as the State Commission for Human Rights shall determine.

(d) The Contractor will state, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, that all qualified applicants will be afforded equal employment opportunities without discrimination because of race, creed, color or national origin.

(e) The Contractor will comply with the provisions of Sections 291-299 of the Executive Law and the Civil Rights Law, will furnish all information and reports deemed necessary by the Station Commission for Human Rights under these non-discrimination clauses and such sections of the Executive Law, and will permit access to his books, records and accounts by the State Commission for Human Rights, the Attorney General and the Industrial Commissioner for purposes of investigation to ascertain compliance with these non-discrimination clauses and such sections of the Executive Law and Civil Rights Law.

(f) The Contract for the Proposed work may be forthwith canceled, terminated or suspended, in whole or in part, by the contracting agency upon the basis of a finding made by the State Commission for Human Rights that the Contractor has not complied with these non-discrimination clauses, and the Contractor may be declared ineligible for future contracts made by or on behalf of the State or a public authority or agency of the State, until he satisfies the State Commission for Human Rights that he has established and is carrying out a program in conformity with the provisions of these non-discrimination clauses. Such finding shall be made by the State Commission for Human Rights after conciliation efforts by the Commission have failed to achieve compliance with these non-discrimination clauses and after a verified complaint has been filed with the Commission, notice thereof has been given to the Contractor and opportunity has been afforded to him to be heard publicly before three members of the

Commission. Such sanctions may be imposed and remedies invoked independently of or in addition to sanctions and remedies otherwise provided by law.

(g) The Contractor will include the provisions of clauses (a) through (f) in every subcontract or purchase order in such a manner that such provisions will be binding upon each subcontractor or vendor as to operations to be performed within the State of New York. The Contractor will take such action enforcing such provisions of such subcontract or purchase order as the contracting agency may direct, including sanctions or remedies for non-compliance. If the Contractor becomes involved in or is threatened with litigation with a subcontractor or vendor as a result of such direction by the Contracting agency, the Contractor shall promptly so notify the Attorney General, requesting him to intervene and protect the interests of the State of New York.

SIXTH: The Contractor agrees:

(a) That in the hiring of employees for the performance of work under this Contract or any subcontract hereunder, no Contractor, subcontractor, nor any person acting on behalf of such Contractor or subcontractor, shall by reason of race, creed, color or national origin discriminate against any citizen of the State of New York who is qualified and available to perform the work to which the employment relates;

(b) That no Contractor, subcontractor, nor any person on his behalf, shall, in any manner, discriminate against or intimidate any employee hired for the performance of work under this Contract on account of race, creed, color or national origin;

(c) That there may be deducted from the amount payable to the Contractor by the state or municipality under this Contract a penalty of five dollars for each person for each calendar day during which such person was discriminated against or intimidated in violation of the provisions of the Contract;

(d) That this Contract may be cancelled or terminated by the state or municipality, and all monies due or to become due to become due hereunder may be forfeited, for a second or any subsequent violation of the terms or conditions of this section of the Contract.

3. The undersigned submits herewith bid security in the amount of \$10,000.00 as specified in Invitation to Bid and Instructions to Bidders, Section III, and agrees to submit such additional information as required in Instructions to Bidders, Section IX. In case this Proposal is accepted by the Owner, and the undersigned shall refuse or neglect, within fourteen (14) calendar days after date of receipt of Notice of Award, to execute and deliver an AGREEMENT in the form provided herein, or to execute and deliver a performance bond and a labor and material bond in the amounts required and in the form prescribed, the amount of bid security shall be forfeited and will be retained by the Owner as liquidated damages, such forfeiture and retention by the Owner shall not prejudice any other right or remedy of the Owner, otherwise the total amount of the bid security will be returned to the depositor in accordance with provisions set forth in the INSTRUCTIONS TO BIDDERS.

4. The undersigned agrees that he is bound by the Addenda regardless of any inconsistencies with the plans, specifications or other instructions herein.

The undersigned Bidder hereby acknowledges that he has received and considered the following Addenda to the Contract Documents:

Addendum No.

1

Date of Issue

2-15-17

5. The undersigned hereby designates as his office to which such notice of acceptance may be mailed, or delivered:

KPI LLC

68 Park Rd

Queensbury, NY 12804

The undersigned further agrees to comply with all requirements as set forth in the Form of Contract, as well as the general contract conditions.

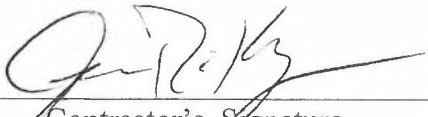
6. The Bidder furnishes the following information pertaining to previous Government Contracts:

The Bidder has () has not () participated in a previous Contract subject to the non-discrimination clause prescribe by Executive Order 11375 dated October 13, 1967. The Bidder has () has not () submitted compliance reports in connection with any such Contract as required by applicable instructions.

If the Bidder has participated in a previous Contract subject to the non-discrimination clause and has not submitted compliance report as required by applicable instructions, the Bidder shall submit a statement indicating compliance.

7. The undersigned agrees to comply with all requirements/provisions of Local Law No. 2-2006 and the Rules and Regulations as promulgated by the Commissioner of Public Works, as set forth in these Specifications.

8. By executing this Proposal, the undersigned agrees to comply with all clauses required by this Proposal and contained herein.

By: 
Contractor's Signature

Kenyon Pipeline Inspection LLC
Business Name

Name: Jason R. Kenyon
Typed or Printed Name

Date: 2-19-17

Title: CEO

Bid Item No. 1 – Cured-in-Place Pipe Lining

For furnishing all labor, materials, tools, equipment, supervision and incidentals required to line existing 8-inch, 10-inch, 12-inch, 15-inch, 18-inch, and 21-inch diameter sanitary and storm sewers as detailed on Work Orders and including all work as described in Section 01020, and in detailed in Sections 02510 and 02520, the following unit prices per linear foot of:

Item	Size Dia.	Unit	Quantity	Unit Price LF Written	Unit Price LF Figures	Total Price Figures
1A	8-inch	LF	30,000	Thirty-Two and Zero Cents	\$ 32. ⁰⁰	\$ 960,000. ⁰⁰
1B	10-inch	LF	6,000	Thirty-Two and Zero Cents	\$ 32. ⁰⁰	\$ 192,000. ⁰⁰
1C	12-inch	LF	3,000	Thirty-Six and zero Cents	\$ 36. ⁰⁰	\$ 108,000. ⁰⁰
1D	15-inch	LF	2,000	Fifty-Five and zero Cents	\$ 55. ⁰⁰	\$ 110,000. ⁰⁰
1E	18-inch	LF	1,600	Seventy-Two and zero Cents	\$ 72. ⁰⁰	\$ 115,200. ⁰⁰
1F	21-inch	LF	1,200	One Hundred and zero Cents	\$ 100. ⁰⁰	\$ 120,000. ⁰⁰
*Total for Bid Item No. 1 (Written)				One million six hundred five thousand two hundred and Zero Cents.	Dollars \$	1,605,200. ⁰⁰

Note: Sewers found to be odd sizes will be rounded up to the first larger size greater to determine unit price. For example 16-inch diameter pipe will be paid for under 1E 18-inch diameter.

Bid Item No. 2 – Reinstate Lateral Connection

For furnishing all labor, tools, materials, equipment, supervision and incidentals required to reinstate laterals after installing cure-in-place liner as described in Section 01020, and in detailed in Sections 02510 and 02520, the following unit price per lateral of:

Item	Unit	Quantity	Unit Price EA Written	Unit Price EA Figures	Total Price Figures
2 - Reinstate Lateral	EA	400	Fifty and zero Cents	\$ 50. ⁰⁰	\$ 20,000. ⁰⁰

Bid Item No. 3 – Grout Lateral Connection

For furnishing all labor, tools, materials, equipment, supervision and incidentals required to reinstate laterals after installing cure-in-place liner as described in Section 01020, and in detailed in Sections 02700, the following unit price per lateral of:

Item	Unit	Quantity	Unit Price EA Written	Unit Price EA Figures	Total Price Figures
3 - Grout Lateral	EA	10	Three hundred fifty and zero Cents	\$ 350. ⁰⁰	\$ 3,500. ⁰⁰

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Bid Item No. 4 – Cured-in-Place Spot Repair (Short Liner)

For furnishing all labor, tools, materials, equipment, supervision and incidentals required to install a Cured-in-Place spot repair up to 10 LF on existing sanitary or storm sewer including all work as described in Section 01020 and as detailed in Section 02525, the following unit price per each of:

Item	Size Dia.	Unit	Quantity	Unit Price EA Written	Unit Price EA Figures	Total Price Figures
4A	8-inch	EA	6	Two thousand and zero Cents	\$ 2,000. ⁰⁰	\$ 12,000. ⁰⁰
4B	10-inch	EA	4	Two thousand and zero Cents	\$ 2,000. ⁰⁰	\$ 8,000. ⁰⁰
4C	12-inch	EA	3	Two thousand three hundred and zero Cents	\$ 2,300. ⁰⁰	\$ 6,900. ⁰⁰
4D	15-inch	EA	2	Two thousand five hundred and zero Cents	\$ 2,500. ⁰⁰	\$ 5,000. ⁰⁰
4E	18-inch	EA	1	Three thousand two hundred and zero Cents	\$ 3,200. ⁰⁰	\$ 3,200. ⁰⁰
4F	21-inch	EA	1	Four thousand and zero Cents	\$ 4,000. ⁰⁰	\$ 4,000. ⁰⁰
*Total for Bid Item No. 4 (Written)				Thirty Nine thousand One hundred and zero Cents.		
					Dollars \$	39,100. ⁰⁰

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Bid Item No. 5 – Clean and Televis Existing Sewer

For furnishing all labor, tools, materials, equipment, supervision and incidentals required to fully clean and televise existing gravity sanitary and storm sewer as detailed on Work Orders and including all work as described in Section 01020, and Section 02510 and 02520. The unit price per linear foot:

Item	Size Dia.	Unit	Quantity	Unit Price LF Written	Unit Price LF Figures	Total Price Figures
5A	8 to 12 inch	LF	1,200	Three and zero Cents	\$ 3. ⁰⁰	\$ 3,600. ⁰⁰
5B	over 12 to 21inch	LF	1,200	Three and zero Cents	\$ 3. ⁰⁰	\$ 3,600. ⁰⁰
*Total for Bid Item No. 5 (Written)				Seven thousand two hundred and zero Cents		
					Dollars \$	7,200. ⁰⁰

Note: This Bid Item is not an addition to the Bid Item No. 1 for sewers issued to be lined. This Bid Item is for work requested on sewers not to be lined or as a means for payment for sewers determined to not be suitable for lining upon initial investigation by Contractor and subsequently removed from the lining list.

Bid Item No. 6 – Open Cut Spot Repair of Existing Sewer

For furnishing all labor, tools, materials, equipment, supervision and incidentals required to replace existing sanitary or storm pipe sewer as detailed on Work Orders and including all work as described in Section 01020, and in detailed in Section 02380, the following unit prices per linear foot of:

Item	Description	Unit	Quantity	Unit Price EA/LF Written	Unit Price EA/LF Figures	Total Price Figures
6A	Mobilization and Incidentals	EA	10	Two hundred and zero Cents	\$ 200. ⁰⁰	\$ 2,000. ⁰⁰
6B	8"-12" Dia. Sewer Repair (0' to 8' depth)	LF	30	Five hundred and zero Cents	\$ 500. ⁰⁰	\$ 15,000. ⁰⁰
6C	8"-12" Dia. Sewer Repair (8.01' to 12' depth)	LF	30	Six hundred and zero Cents	\$ 600. ⁰⁰	\$ 18,000. ⁰⁰
6D	8"-12" Dia. Sewer Repair (12.01' to 16' depth)	LF	20	One thousand and zero Cents	\$ 1000. ⁰⁰	\$ 20,000. ⁰⁰
6E	8"-12" Dia. Sewer Repair (16.01' to 20' depth)	LF	20	One thousand and zero Cents	\$ 1000. ⁰⁰	\$ 20,000. ⁰⁰
6F	15"-21" Dia. Sewer Repair (0' to 8' depth)	LF	10	One thousand Five hundred and zero Cents	\$ 1,500. ⁰⁰	\$ 15,000. ⁰⁰
6G	15"-21" Dia. Sewer Repair (8.01' to 12' depth)	LF	10	One thousand Eight hundred and zero Cents	\$ 1,800. ⁰⁰	\$ 18,000. ⁰⁰
6H	15"-21" Dia. Sewer Repair (12.01' to 16' depth)	LF	10	Two thousand and zero Cents	\$ 2,000. ⁰⁰	\$ 20,000. ⁰⁰
6I	15"-21" Dia. Sewer Repair (16.01' to 20' depth)	LF	10	Two thousand and zero Cents	\$ 2,000. ⁰⁰	\$ 20,000. ⁰⁰
6J	House Lateral Replacement Outside of Trench	LF	20	Six hundred and zero Cents	\$ 600. ⁰⁰	\$ 12,000. ⁰⁰

*Total for Bid Item No. 6 (Written) One hundred Sixty thousand and zero Cents.

Dollars \$ 160,000.⁰⁰

Bid Item No. 7 – Surface Restoration

For furnishing all labor, tools, materials, equipment, supervision and incidentals required for surface restoration after completing open cut spot repair, as described in Section 01020, and in detailed in Section 02380, the following unit prices:

Item	Description	Unit	Quantity	Unit Price SF/LF Written	Unit Price SF/LF Figures	Total Price Figures
7A	Pavement Top Course	SF	300	Ten and zero Cents	\$ 10. ⁰⁰	\$ 3,000. ⁰⁰
7B	Pavement Binder Course	SF	300	Ten and zero Cents	\$ 10. ⁰⁰	\$ 3,000. ⁰⁰
7C	Concrete Base Restoration	SF	30	Six and zero Cents	\$ 6. ⁰⁰	\$ 180. ⁰⁰
7D	Concrete Sidewalk/ Driveway Restoration	SF	60	Ten and zero Cents	\$ 10. ⁰⁰	\$ 600. ⁰⁰
7E	Asphalt Driveway Restoration	SF	60	Ten and zero Cents	\$ 10. ⁰⁰	\$ 600. ⁰⁰
7F	Reset Existing Brick Pavers/Stone	SF	30	Twenty and zero Cents	\$ 20. ⁰⁰	\$ 600. ⁰⁰
7G	Turf Restoration	SF	300	Five and zero Cents	\$ 5. ⁰⁰	\$ 1,500. ⁰⁰
7H	Concrete/ Stone Curbing Restoration	LF	10	Fifteen and zero Cents	\$ 15. ⁰⁰	\$ 150. ⁰⁰
7I	Concrete Gutter Restoration	LF	10	Twelve and Zero Cents	\$ 12. ⁰⁰	\$ 120. ⁰⁰
*Total for Bid Item No. 7 (Written)				Nine thousand Seven hundred fifty and Zero Cents		
				Dollars \$ 9,750. ⁰⁰		

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Bid Item No. 8 – Contingent Items

The following stipulated allowance shall be included in each and every bid and is to be utilized in paying for unspecified additional work:

For furnishing all labor, tools, materials, equipment, supervision and incidentals required to perform unspecified additional work, as described in Section 01020, the following allowance has been established:

*Total for Bid Item No. 8 (Written) Five Thousand Dollars
Dollars \$ 5,000.00

TOTAL AMOUNT OF BID/BASIS OF AWARD

Sum of totals for Bid Item Nos. 1, 2, 3, 4, 5, 6, 7, 8 inclusive (Written) One million Eight hundred

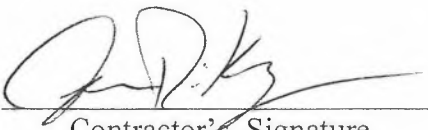
forty Nine thousand Seven hundred fifty and zero Cents Dollars \$ 1,849,750.00

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

WAIVER OF IMMUNITY CERTIFICATION

This is to CERTIFY that neither the undersigned nor any member, partner, director, or officer of the firm has refused to sign a waiver of immunity against subsequent criminal prosecution or to answer any relevant question concerning a transaction or contract with the state or any political subdivision thereof, a public authority or with a public department, agency or official of the state or of any political subdivision thereof or of a public authority, when called before a grand jury, head of a state department, temporary state commission, or other state agency, the organized crime task force in the department of law, head of a city department or other city agency, which is empowered to compel the attendance of witnesses and examine them under oath.

(CORPORATE SEAL)
(If bid is by a Corporation)

By: 
Contractor's Signature

Kenyon Pipeline Inspection, LLC
Business Name

Name: Jason R. Kenyon
Typed or Printed Name

Date: 2/24/17

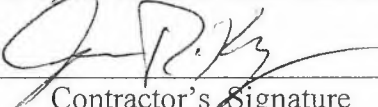
Title: CEO

**CERTIFICATION
FOR
CONTRACTS, GRANTS, LOANS, AND
COOPERATIVE AGREEMENTS
40 CFR 34**

The undersigned certifies, to the best of his or her knowledge and belief, that:

- (1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
- (2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
- (3) The undersigned shall require that the language of this certification be included in the award documents for all sub-awards at all tiers (including sub-contracts, sub-grants, and contracts under grant, loans, and cooperative agreements) and that all sub-recipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31 U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

By:  Kenyon Pipeline Inspection LLC
Contractor's Signature Business Name

Name: Jason R. Kenyon Date: 2/24/17
Typed or Printed Name

Title: CEO

UNIFORM CERTIFICATE OF ACKNOWLEDGEMENT

STATE OF NEW YORK)

: ss

COUNTY OF WARREN

On the 24TH day of FEBRUARY, in the year 2017 before me, the undersigned, personally appeared Joshua R Kenyon, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name(s) is (are) subscribed to the within instrument and acknowledged to me that he/she/they execute the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument.

Georgia G Kenyon

GEORGIA G KENYON
NOTARY PUBLIC-STATE OF NEW YORK
No. 01KE6253719
Qualified In Warren County
My Commission Expires January 03, 2020

CERTIFICATE OF EXPERIENCE

I, Jason R Kenyon, hereby certify that Kenyon Pipeline Inspection LLC has performed the following work
(Name of Bidder)
within the last five (5) years.

Owner	Amount of Contract	Type of Work	Name of Owner's Engineer In Charge of Work	Complete Mailing Address And Telephone Number of Engineer
1	2	3	4	5
Town of West Springfield	\$ 605,000.	Clean + CCTV	PH: 413-263-3242 James W. Lyons, P.E.	Town of West Springfield Dept. of Public Works 26 Central St., Ste 17 West Springfield, MA 01099-2763
Village of Port Chester	\$ 797,575	CIPP	PH: 914-631-8600 Dan Peluso	Dolph Rottfeld Engineering, P.C. 200 White Plains Rd. #3 Tarrytown, NY 10591-5833
Fort Drum	\$ 665,000	Clean + CCTV	PH: 315-523-2060 Brian O'Keefe	Public Works Supply 17400 1st St. West Fort Drum, NY 13602
Rensselaer County Sewer District	\$ 599,113	CIPP + MH Rehab	PH: 518-446-0396 Howard Create	Creight Manning Engineering 24 Linners Circle Albany, NY 12205
City of Albany Water Dept.	\$ 450,000	CIPP	PH: 518-434-5316 Justin Schiavelbein	City of Albany Dist. of Water + Water Supply 16 Enterprise Dr. Albany, NY 12204
Village of Norfolk	\$ 570,767	CIPP + MH Rehab	PH: 315-380-8342 Aaron B. Jarvis	Tisile Associates 113 Main St., PO Box 400 Canton, NY 13617

(Name of Bidder)

By

Title

Witness

Date

IMPORTANT: THIS FORM MUST BE FILLED IN BY THE BIDDER.
COMPLETE NAME, ADDRESS AND TELEPHONE
NUMBER OF EACH REFERENCE
MUST BE FURNISHED UNDER COLUMNS 4 & 5

GENERAL1. INTRODUCTIONS

The purpose of these General Contract Conditions is to set forth the general manner under which the Owner, Contractor and Engineer will execute the Contract. The provisions of the Specific Conditions of the Contract will modify the requirements of the General Conditions as hereinafter stated.

2. CONTRACT AND CONTRACT DOCUMENTS

The Plans, Specifications, Construction Terms and Conditions, and Addenda, hereinafter enumerated, shall form a part of this Contract and the provisions thereof shall be as binding upon the parties hereto as if they were herein fully set forth. The Table of Contents, Titles, Headings, Running Headlines, and Marginal notes contained herein and in said Documents are solely to facilitate references to various provisions of the Contract Documents and in no way affect, limit, or cast light on the interpretation of the provisions to which they refer. Wherever the term "Contract Documents" is used, it shall mean and include the Invitation to Bid, Instructions to Bidders, Proposal, General and Specific Contract Conditions, Contract and Bid Bonds, Plans or Drawings, Specifications, Addenda, and any and all other writings necessary to complete the project.

3. INTENT OF DOCUMENTS AND INSTRUCTIONS

The Specifications, Drawings, and any Instructions as set forth herein are complementary, are intended to cooperate and provide for, and include everything necessary for, the proper and complete orderly execution and finishing of the work. Any work shown on the drawings concerning which there is no particular specification, or the omission from both drawings and specifications of express reference to any work which obviously was intended under the Contract, shall not excuse or relieve the Contractor or Subcontractor from furnishing the same. Work or materials described in words which have a well known technical or trade meaning, shall be interpreted by such customary and recognized standard of meaning.

It is understood that except as otherwise specifically stated in the Contract Documents, all Contractors shall provide and pay for all permits, materials, labor, tools, equipment, water, light, power, transportation, superintendence, temporary construction of every nature, and all other services and facilities of every nature under his contract whatsoever necessary to execute, complete and deliver the work within the specified time.

The sum of the various bid items is intended to provide a complete contract, as proposed by the Plans and Specifications, tested and ready for use.

4. DEFINITIONS

A. The term "Subcontractor" includes only those having a direct contract with the Contractor, and it does not include one who furnished material worked to a special design according to the Drawings or Specifications or one who merely furnished material not so worked.

B. The term "Extra Work" as used herein refers to and includes work required by the Owner, which, in the judgement of the Engineer, involves changes in, or additions to, that required by the Plans, Specifications and Addenda in their present form.

C. In the performance of the work, the Owner shall be represented by any person designated by the Owner to perform the duties of the "Engineer". The Engineer will provide general services during construction in checking and directing the work.

D. Whenever they refer to the work or its performance, "directed", "required", "permitted", "ordered", "designated", "prescribed", and words of like importance shall imply the direction, requirements, permission, order, designation or prescription of the Engineer and "reviewed", "acceptable designate", "satisfactory", "in the judgement of", and words of like importance to, shall mean reviewed by, or acceptable to, or satisfactory to, or in the judgement of the Engineer.

E. All time limits stated in the Contract Documents are of the essence to the Contract.

5. PROVISIONS REQUIRED BY LAW DEEMED INSERTED

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

6. OTHER PROHIBITED INTERESTS

No official of the Owner who is authorized in such capacity and on behalf of the Owner to negotiate, make, accept, or review, or to take part in negotiating, making, accepting, or reviewing any architectural, engineering, observation, construction or material supply contract, or any subcontract in connection with the construction of the project, shall become directly or indirectly interested personally in this Contract, or in any part hereof. No officer, employee, architect, attorney, engineer or inspector of or for the Owner who is authorized in such capacity and on behalf of the Owner to exercise any legislative, executive, supervisory, or other similar functions in connection with the construction of the project, shall become directly or indirectly interested personally in this Contract, or in any part hereof, any material supply contract, subcontract, insurance contract, or any other contract pertaining to the project.

7. NOTICE AND SERVICE THEREOF

The service of any notice, letter or other communication, shall be deemed to have been made by one of the contracting parties on the other party to the Contract, when such letter, notice, or other communication has been delivered to the legal office address of the addressee, by a duly authorized representative of the addressor in person, or when such notice, letter or other communication has been deposited in any regularly maintained mail box of the United States Postal Department, in a properly addressed, postpaid wrapper. The date of such service shall be considered to be the date of such personal delivery or mailing.

The address of the Contractor noted in his bid and/or the address of his field office on or near the site of the work hereunder shall be considered as his legal address for purposes as above set forth.

The address of the Owner noted in this Contract Document shall be considered as its legal address for the purpose as above set forth.

8. MODIFICATIONS

The Contractor in entering into this contract understands that the Owner reserves the right to modify the same with respect to the arrangement, character, alignment, grade or side of the work or appurtenances whenever in its opinion it shall deem it necessary or advisable so to do. The Contractor shall and will accept such modifications when ordered in writing by the Owner through the Engineer and the same shall not vitiate or void this Contract. Any such modifications so made shall not, however, subject the Contractor to increased expense without equitable compensation, which shall be determined by the Engineer. If such modifications result in a decrease in the cost of work involved, an equitable deduction from the Contract price to be determined by the Engineer shall be made. In any event, no modifications in the work shown on the Plans and described in the Specifications shall be made, unless the nature and extent thereof has first been certified by the Owner through the Engineer in writing and sent to the Contractor.

9. QUANTITIES AND AMOUNTS OF WORK

The work shown on the Plans is to be done by the Contractor for the lump sum and unit prices bid, which prices shall constitute full compensation for all work completed under the Contract, except for any additional work ordered by the Owner and issued to the Contractor in the form of a written order by the Owner through the Engineer.

The Owner reserves the right to delete such amounts or items of work from this Contract as may be necessary to finance the project from available funds.

The work included under each bid item is described in the Detailed Specifications for each Contract.

The quality of workmanship and materials entering into the work shall conform to the requirements of the pertinent provisions and sections of these Specifications.

Changes in the work, requiring more or less of any items of work, may be made upon a written change order. When changes result in the use of more or less of any specific item, additional payment or deduction will be made in accordance with the price bid for the specific bid item. When changes result in the use of more or less of an item not specifically designated as a bid item, additional payment or deduction will be made in accordance with the price for that item as stipulated in the table of contingent items, as shown in the Form of Proposal.

10. USE OF COMPLETED PORTIONS

The Owner shall have the right to take possession of and use any completed or partially completed portion of the work, notwithstanding the time for completing the entire work or such portions which may not have expired, but taking possession and use shall not be deemed an acceptance of any work not completed in accordance with the Contract Documents. If such prior use increases the cost of or delays the work, the Contractor shall be entitled to such extra compensation or extension of time, or both, as the Engineer may determine.

Upon Occupancy by the Owner, the following procedures will apply:

1. The Engineer, with the approval of the Owner, will notify the Contractor as to what portion, or portions of the work have been accepted into Occupancy.
2. The guarantee period applicable to that portion of the work accepted into Occupancy will start as of the date of Occupancy.
3. The retained percentage applicable to that portion of the work accepted into Occupancy will remain at 5% of the value of the accepted work, until such time the Engineer and Owner deems the total project substantially complete and the Contractor submits acceptable affidavits, certificates or waivers showing no right of lien exists in connection with this portion of the work, and acceptable evidence as to the satisfaction of all claims applicable to this portion of the work.

DRAWINGS AND SPECIFICATIONS

11. CONTRACT DRAWINGS AND SPECIFICATIONS

After the Contract has been executed, the Contractor will be furnished free of cost five (5) sets of the Contract Plans and Specifications. Additional copies of the Plans and Specifications, if available, will be furnished to the Contractor at the cost of reproduction.

The Contractor shall furnish each of his subcontractors, manufacturers and materialmen, such copies of the Contract Documents as may be required for his work.

12. CHECKING PLANS

All figures and dimensions on the Drawings shall be carefully checked by the Contractor, who shall note all discrepancies. The Contractor will be held responsible for any errors not discovered before the work has been executed. In case errors are found, these shall be immediately reported to the Engineer who will instruct the Contractor as to the method of correcting them. The Contractor shall not alter Specifications, Drawings, or figures, nor make any alternations in or additions to the quantity, character or arrangements of the materials or work, whether same shall involve additional expense or not, unless same shall be agreed upon first, in writing, as provided for herein; this provision, however, shall not abridge in any way the Engineer's rights as to the interpretation of the Specifications, Plans and figures thereon. The Plans and Specifications are complementary and what is called for by either shall be as binding as if called for by both. In all cases figures dimensions shall take precedence over scaled dimensions, and the larger scale details shall take precedence over smaller scale drawings.

13. PLANS AND SPECIFICATIONS: INTERPRETATIONS

The Contractor shall keep at the site of the work, one (1) copy of the Plans and Specifications, signed and identified by the Engineer, and shall at all times give the Engineer and other representatives of the Owner access thereto.

Any thing shown on the Plans and not mentioned in the Specifications, or mentioned in the Specifications and not shown on the Plans, have the same effect as if shown or mentioned, respectively, in both. In case of any conflict or inconsistency between the Plans and Specifications, the Specifications shall govern. Any discrepancy between the Specifications and Drawings shall be submitted by the Contractor to the Engineer. The Engineer shall in all cases determine the amount of quantity of the several kinds of work and the quality of materials which are to be paid for under this Contract; he shall determine all questions in relation to the work and the construction thereof, and in all case decide every question which may arise relative to the performance of the work covered by this Contract on the part of the Contractor. Any doubt as to the meaning of these Specifications and Drawings, or any obscurity as to the wording of them, will be explained by the Engineer and all directions and explanations requisite or necessary to complete, explain or make definite any of the provisions of these Specifications and Drawings and give them due effect, will be given by the Engineer, in writing.

The Engineer will, within a reasonable time after presentation to him, make decisions, in writing, on all matters relating to the interpretation of the Contract Documents.

14. ADDITIONAL INSTRUCTIONS AND DETAIL DRAWINGS

The Contractor will be furnished additional instructions and detail drawings to carry out the work included in the Contract. The additional drawings and instructions, thus supplied to the Contractor, will coordinate with the Contract Documents and will be so prepared that they can be reasonably interpreted as part thereof. The Contractor shall carry out the work in accordance with the additional detail drawings and instructions.

15. RECORD DRAWINGS

A. The Contractor shall maintain on site one set of contract drawings for the purpose of documenting "record" conditions. Store record drawings separate from documents used for construction. Record information concurrent with construction progress and make available for periodic examination by the Engineer. Ensure that entries are complete and accurate, enabling future reference by the Owner.

B. It shall be the responsibility of the Contractor to legibly mark in red all field changes and conditions as they may occur. A complete file of record field sketches, diagrams and other changes as may become necessary during the progress of work, shall also be maintained and attached to the record drawings.

C. Examples of type of changes which could occur and information that is to be recorded:

1. Change in alignment, slopes, distances, and inverts of sewer pipes.
2. Final location of manholes including final rim and invert elevations.
3. Measured location and elevations of underground utilities and/or relocated utilities installed or encountered during the course of work.
4. Change in location, elevation, dimensions, modifications, additions to structures.
5. Changes in mechanical trades components (electrical, heating, ventilating, plumbing, instrumentation) and measured location of all utilities or trade components concealed from view with references to visible and accessible feature of the structure.
6. Final location and manufacturer information of all equipment.
7. Change in materials, such as pipe material and equipment.
8. Final wiring diagrams of all control panels, electrical panels and equipment panels including conduit sizes and wiring.
9. Final wiring diagrams of all instrumentation including conduit sizes and wiring.
10. Changes in all site improvements including topographical contours of finished grades and paved surfaces, final elevations and locations of all chambers and utilities visible in project area, paving limits, etc.
11. All other items deemed important to provide on record drawings.

D. At completion of the work, the marked up "record" drawings plus all record field sketches and diagrams shall be submitted to the Engineer for his review and use in establishing a basis for final payment.

E. Upon acceptance of the marked up record drawings by the Engineer, the Contractor shall be provided an electronic copy of the contract documents in AutoCAD format so that he may modify the file to correctly show the information of the marked up record drawings. An electronic file of the record drawing on CD and one set of prints shall be provided. Each sheet shall be signed and stamped by a Professional Engineer licensed to practice in New York State and certified as reflecting "record" conditions.

16. REFERENCED TO STANDARDS

A. Whenever reference is made to the furnishing of materials or testing thereof to conform to the standards of any technical society, organization, or body, it shall be construed to mean the latest standard, code, specification, adopted and published at the date of advertisement for bids, even though referenced has been made to an earlier standard.

B. Reference to a technical society, organization, or body may be made in the Specifications by abbreviations in accordance with the following list:

A.C.I.	for American Concrete Institute
A.G.A.	for American Gas Association
A.I.S.C.	for American Institute of Steel Construction
A.S.C.E.	for American Society of Civil Engineers
A.S.T.M.	for American Society of Testing Materials
A.S.M.E.	for American Society of Mechanical Engineers
A.W.S.C.	for American Welding Society Code
A.W.W.A.	for American Water Works Association
C.I.P.R.A.	for Cast Iron Pipe Research Association
Fed. Spec.	for Federal Specifications
A.A.S.H.O.	for the American Association of State Highway Officials
N.E.M.A.	for National Electrical Manufacturers Association
A.W.P.A.	for American Wood Preservers Association
N.B.S.	for National Bureau of Standards
C.R.S.I.	for Concrete Reinforcing Steel Institute
A.N.S.I.	for American National Standards Institute, Inc.
I.E.E.E.	for Institute of Electrical & Electronic Engineers
N.F.P.A.	for National Fire Protection Association
N.E.C.	for National Electrical Code
A.A.M.A.	for Architectural Aluminum Manufacturers Association
S.S.P.C.	for Steel Structures Painting Council
A.G.M.A.	for American Gear Manufacturers Association
A.M.C.A.	for Air Moving and Conditioning Association, Inc.
A.S.H.R.A.E.	for American Society of Heating, Refrigerating and Air Conditioning Engineers
E.T.L.	for Electrical Testing Laboratories, Inc.
J.I.C.	for Joint Industry Conference
S.M.A.C.C.N.A.	for Sheetmetal and Air Conditioning Contractors National Association
U.L.	for Underwriters' Laboratories, Inc.
U.S.A.S.I.	for United States of America Standard Institute
OSHA	Occupational Safety & Health Administration
FM	Factory Mutual Association

When no reference is made to a code, standard or specification, the Standard Specifications of the A.S.T.M. shall govern.

C. The Contractor shall, when required, furnish evidence satisfactory to the Engineer that materials and methods are in accordance with such standards where so specified.

17. SHOP DRAWINGS

A. The Contractor shall submit for review by the Engineer shop drawings for all fabricated work, manufactured items, equipment and material required to be furnished in the Contract and as required by the Specifications.

B. Transmit seven (7) copies of each required submittal. Sequentially number each submittal. Resubmittals are to have original number with an alphabetic suffix. Identify Project, Contractor, Subcontractor or Supplier, pertinent drawing sheet and detail number, and specification section number, as appropriate. Schedule the submittals to expedite the Project. Coordinate submission of related items.

C. Apply Contractor's stamp, signed or initialed certifying that review, verification of products required, field dimensions, adjacent construction work, and coordination of information, is in accordance with the requirements of the Project and Contract Documents. Stamp shall show the following information:

1. Shop Submittal Number _____
2. Deviations: None _____ As Listed _____
3. Reference Specification Number _____
4. Reference Drawing Number _____
5. Space Requirements: As Designed _____ As Listed _____
6. Representation is made to the Owner and Engineer that the Contractor has determined and verified all field measurements and quantities, field construction criteria, materials, catalog numbers and similar data, that he has reviewed and coordinated the information in each shop drawing with the requirements of the work and Contract Documents, and hereby approves this submittal.
Contractor _____
Signature _____
Date _____

D. The Contractor shall submit letter signed by company representative certifying that products and/or materials provided are in full compliance with the American Iron and Steel requirement as mandated in EPA's State Revolving Fund Programs. Shop drawings will not be reviewed until letter is provided.

1. If proposed product(s) or material(s) include iron or steel components, letter shall be as follows:

Date

Company Name
Company Address
City, State Zip

Subject: American Iron and Steel Certification for Influent Submersible Pump
Station and ORF Improvements

I, (company representative), certify that the following products and/or materials shipped/provided to the subject project are in full compliance with the American Iron and Steel requirement as mandated in EPA's State Revolving Fund Programs.

Item, Products and/or Materials:

1. XXXXX
2. XXXXX
3. XXXXX

Such process took place at the following location:

If any of the above compliance statements change while providing material to this project we will immediately notify the prime contractor and the engineer.

Signed by company representative

2. If proposed product(s) or material(s) do not include iron or steel components, letter shall be as follows:

Date

Company Name
Company Address
City, State Zip

Subject: American Iron and Steel Certification for Influent Submersible Pump
Station and ORF Improvements

I, (company representative), certify that the following products and/or materials shipped/provided to the subject project are not subject to the American Iron and Steel requirement as mandated in EPA's State Revolving Fund Program because the products and/or materials are not primarily made of iron or steel; or the products and/or materials are not lined or unlined pipes and fittings, manhole

covers and other municipal castings, hydrants, tanks, flanges, pipe clamps and restraints, valves, structural steel, reinforced precast concrete, and construction materials.

If any of the above compliance statements change while providing material to this project we will immediately notify the prime contractor and the engineer.

Signed by company representative

E. Shop drawing submittals shall include all descriptive data, performance characteristics, material specifications, spare parts list, drawings, piping diagrams, wiring schematics, and shall be complete and accurate to indicate item-by-item compliance with the Contract Documents. All catalog cuts, manufacturer's specifications, drawings, and verbal descriptions shall be clearly marked to allow identification of the specific products used. Catalog cuts showing information for more than one item on the page shall clearly indicate what items the Contractor will be supplying under this Contract by highlighting in an acceptable method to identify the item, dimensions, etc.

F. Equipment manufacturers supplying equipment for the project shall examine the Plans and Specifications pertaining to their particular equipment in order to be fully acquainted with the operating conditions to which the equipment will be subjected.

G. Shop drawings for each major component of a system or subsystem and its appurtenances shall be submitted under separate cover, but all shop drawings for equipment which is part of the same system or subsystem shall be submitted in the form of a package. If requested by the Engineer, the Contractor shall supplement his submittals(s) by such data, as required, to demonstrate that the sizes, capacities, characteristics and/or performances of each component of a system or subsystem, are consistent (compatible) with each other and with the provisions of the technical Specifications, for said system or subsystem.

H. Identify deviations from the Contract Documents and product or system limitations which may be detrimental to the successful performance of the completed work. If the submittal deviates from the requirements of the Specifications in any way, it shall be clearly marked in the submittal with the justifying reason stated for evaluation by the Engineer.

I. If the shop drawing contains any departures from the Contract requirements, request for review thereof shall be made in the Contractor's letter of transmittal. Where such departures require revisions to layouts or structural changes to the work as shown, the Contractor shall, at his own expense, prepare and submit revised layout and structural drawings for review. Such drawings shall be the same size as the Contract Drawings unless otherwise approved. Where a shop drawing is submitted as an "or equal" and the Engineer expends additional cost due to the review of the "or equal" submittal, the Contractor shall be responsible for such increased engineering costs needed to determine if the shop drawing meets the specifications. Such costs may include, but not limited to, research time by the Engineer, visitation to the product manufacturer, performance testing, demonstrations of the product at existing installations, etc. Contractor shall also furnish a listing of existing installations that the proposed

substitution may be reviewed, along with contact people at the existing installation. Paragraph 22 of the General Contract Conditions, Substitutions, shall be applicable to any "or equal" substitution.

J. Drawings for electrical equipment shall show physical dimensions and installation details and shall include elementary and connection diagrams for each control assembly and the interconnection diagrams for all equipment. The drawings shall show clearly the coordination of control work, shall identify the components external to electrical equipment, and shall define the contact arrangement and control action of the primary and final control elements.

Where electrical control equipment having internal wiring is required, the detail shop wiring diagrams for such equipment will be required, and will, in general, not be reviewed. The submittal for each item of equipment shall include an elementary diagram of the input and output elements which require connections to external equipment, and a complete step by step description of the control action of the equipment being submitted.

K. Engineer's REVIEW of the Contractor's drawings shall be considered as a gratuitous service, given as assistance to the Contractor in interpreting the requirements of the Contract, and in no way shall it relieve the Contractor of any of his responsibilities under the Contract. The Engineer shall be held blameless and shall accrue no liability for any gratuitous assistance given to the Contractor in interpreting the requirements of the Contract. Any fabrication, erection, setting or other work done in advance of the receipt of shop drawings returned by the Engineer and noted as "REVIEWED" or "REVIEWED AS NOTED," shall be entirely at the Contractor's risk. The Engineer's review will be confined to general arrangement and compliance with the Contract Drawings and Specifications only and will not be for the purpose of checking dimensions, weights, clearances, fitting, tolerances, interferences, coordination of trades, etc.

L. The review of shop drawings submitted by the Contractor shall not constitute a waiver of any of the requirements of this Contract, nor shall the Owner be compelled to accept any structures, equipment or apparatus unless it passes all the tests and requirements of these Specifications.

M. Contractor agrees that shop drawing submittals processed by the Engineer are not Change Orders; that the purpose of shop drawing submittals by the Contractor is to demonstrate to the Engineer that the Contractor understands the design concept, that he demonstrates his understanding by indicating which equipment and material he intends to furnish and install and by detailing the fabrication and installation methods he intends to use.

N. Contractor agrees that if deviations, discrepancies or conflicts between shop drawings and specifications are discovered either prior to or after shop drawing submittals is processed by the Engineer, the Design Drawings and Specifications shall control and shall be followed.

O. When a shop drawing submittal is satisfactory to the Engineer, the submittal will be stamped "REVIEWED" or "REVISED AS NOTED", be dated, and four (4) copies of the shop drawing will be returned to the Contractor by letter.

P. When a shop drawing is returned to the Contractor "REVISED AS NOTED", the Contractor shall acknowledge in writing to the Engineer that he will provide, as required, all items noted and further that these notations have been properly provided to suppliers, subcontractors, manufacturers associated with the product's shop drawing to assure compliance with the Engineer's review.

Q. When a shop drawing is deemed to be unsatisfactory to the Engineer, he will stamp thereon "REVISED AND RESUBMIT" and will return four (4) copies of the deficient shop drawing to the Contractor with the necessary corrections and changes indicated. The Contractor shall make such corrections and changes as indicated and resubmit seven (7) copies of the revised shop drawing for further review by the Engineer. The Contractor shall revise and resubmit the shop drawing as required by the Engineer, until review thereof is obtained.

R. Should a shop drawing be unacceptable to the Engineer, he will stamp thereon "NOT ACCEPTED" and will return four (4) copies of the deficient shop drawing to the Contractor. It will be the Contractor's responsibility to resubmit a shop drawing that is in compliance with the Contract Documents and that is acceptable to the Engineer.

EQUIPMENT, MATERIALS AND WORKMANSHIP

18. ALL WORK SUBJECT TO CONTROL OF ENGINEER

In the performance of the work, the Contractor shall abide by all orders, directions and requirements of the Engineer and shall perform all work to the satisfaction of the Engineer, and at such times and places, and in such manner and sequence as the Engineer, may require. The Engineer shall determine the amount, quality, acceptability and fitness of all parts of the work. Upon request, the Engineer shall confirm in writing any oral order, direction, requirement or determination.

19. MATERIALS AND WORKMANSHIP

A. The workmanship and materials of all items shall be of the best quality and shall be at all times subject to the observation, direction and general services of the Engineer or such others as he may appoint, who shall each and all have authority and be afforded facilities to visit all parts of the work and who may reject all workmanship and materials which do not conform to the Plans and Specifications, as interpreted by the Engineer. All such condemned work or material or both shall be removed, and those that are proper and acceptable shall immediately be substituted. Materials shall not be delivered so far in advance of their proposed use that they suffer damage.

B. In all cases where material and quality are not definitely specified, samples or specimens shall be submitted to the Engineer for review, except as otherwise specified.

C. The Contractor shall furnish for review, with such promptness as to cause no delay in his own work or in that of any other Contractor, all samples as required by the Specifications. The Engineer shall review such samples, with reasonable promptness, for conformance with the design and for compliance with the information given in the Contract Documents. The work shall be in accordance with reviewed samples.

Should any dispute arise as to the quality or fitness of workmanship, equipment, materials or articles, the decision shall rest with the Engineer, and shall be based upon the requirements of this Contract.

20. SOURCES OF MATERIAL

The Contractor shall, immediately after the award of the Contract, furnish the Engineer in writing the names and addresses of manufacturers or dealers from whom he intends securing his materials. Any material ordered or delivered at the site without approval is subject to rejection without further cause. No awards shall be made by the Contractors and no work under any item shall proceed until satisfactory review of the manufacturer or vendor has been given by the Engineer.

Such satisfactory review, when given, will be only on the basis of the manufacturer's experience and similar considerations specified herein, and will in no way imply that the equipment submitted will be satisfactory unless full compliance with the Plans and Specifications is demonstrated by such submitted material, to the Engineer's satisfaction.

21. STANDARD PRODUCTS

All materials, equipment and accessories shall be new and unused and shall be essentially the standard product of a manufacturer regularly engaged in the production of such material or equipment. Such items proposed under these conditions must meet all the technical requirements as stated in the Specifications.

22. MANUFACTURER PERFORMANCE AFFIDAVITS

A. When specified in individual specification Sections, provide a Performance Affidavit for the product or equipment listed.

B. By these affidavits, each manufacturer must certify to the Contractor and the Owner, jointly, that he has examined the Contract Documents and that the equipment, apparatus, process or system he offers to furnish will meet in every way the performance requirements set forth in the Contract Documents. Equipment design, manufacturing and assembly specifications are an integral part of the performance requirements.

C. Shop drawings will not be reviewed prior to the receipt by the Engineer of an acceptable performance affidavit.

D. The performance affidavit must be signed by an officer (vice president or higher) of the basic corporation, partnership, or company manufacturing the equipment, and witnessed by a notary public.

E. The performance affidavit shall be in the following format:

Addressed to: (Contractor) and (Owner)
Reference: Contract Name
Text: (manufacturer's name) has examined the Contract Documents and verifies that the (product) meets in every way the performance requirements and design specifications set forth in Section (s) _____ of the Contract Documents.
Signature: Corporate officers shall be vice president or higher.
Notary: Signature (s) must be notarized.

23. SUBSTITUTIONS

Wherever in these Specifications any material or apparatus is designated by its trade name, brand or name of manufacturer, it shall be understood that such material or apparatus is specified as a standard of quality required.

Where such items are specified by dimensions, this shall not be interpreted to preclude the furnishing of such items other than the specified dimensions where the quality, use and serviceability of the material is adjudged the same or the equal of that specified.

If two or more brands, makes of materials, devices, or equipment are shown or specified, each should be regarded as the equal of the other.

Substitutions may be made, but any substitution offered by the Contractor as equivalent shall be subject to the written review of the Engineer, before being ordered. The Contractor shall be responsible for any additional engineering costs that may arise from the Engineer's review of the substitution.

Proposed substitutions shall be subject to the provisions hereinafter specified.

1. The Contractor shall submit for each proposed substitution complete descriptive literature and performance data together with samples of the materials where feasible. Requests for substitutions shall include full information concerning differences in cost, and any savings in cost resulting from such substitutions shall be passed onto the Owner.

2. In all cases the Engineer shall be the sole judge as to whether a proposed product is acceptable and the Contractor shall have the burden of proving the same, at his own cost and expense, to the satisfaction of the Engineer. The Contractor shall abide by the Engineer's decision when proposed substitute items are judged to be unacceptable and shall in such instances furnish the item specified or indicated. No substitute items shall be used in the work without written review of the Engineer. The Contractor shall have and make no claim for an extension of the time or for damages by reason of the time taken by the Engineer in considering a substitution proposed by the Contractor or by reason of the failure of the Engineer to review a substitution proposed by the Contractor.

3. Where the approval of a substitution requires revision or redesign of any part of the work covered by this Contract, all such revision and redesign, and all new drawings and details required therefore shall be subject to the review of the Engineer and shall be provided by the Contractor at his own cost and expense. Any changes in construction work arising out of such revisions and redesign shall be performed and paid for by the Contractor.

4. The substitute equipment will be subjected to a 90 day performance test. The test will begin at the acceptance of the equipment and/or beneficial occupancy of the facility. If the equipment should fail or not perform up to the design standards, the Owner can order its replacement at no additional cost to the Owner. Upon receipt of such a request, the Contractor will immediately replace said equipment with the brand name manufacturer listed in the specifications. A guarantee attesting to his condition shall be attached to the shop drawing and signed by the Contractor.

24. CONTRACTOR'S TITLE TO MATERIALS

No materials or supplies for the work shall be purchased by the Contractor or by any subcontractor subject to any chattel mortgage or under a conditional sale or other agreement by which an interest is retained by the seller. The Contractor warrants that he has good title to all materials and supplies used by him in the work.

25. CERTIFICATES

All materials or equipment delivered to the site shall be accompanied by certificates, signed by an authorized officer of the manufacturing company, guaranteeing that the materials or equipment conform to specification requirements. Such certificates shall be immediately turned over to the Engineer. Materials or equipment delivered to the site without such certificates will be subject to rejection.

26. NAMEPLATES

Each unit of equipment shall have the manufacturer's name or trademark on a corrosion-resistant nameplate securely affixed in a conspicuous place. The manufacturer's name or trademark may be cast integrally with stamp, or otherwise permanently marked upon the item of equipment. Such other information as the manufacturer may consider necessary to complete identification shall be shown on the nameplate.

27. SAMPLES

Upon written demand of the Engineer, the Contractor shall submit to the Engineer for review, samples of materials he proposes to use. Samples shall be in duplicate, of sufficient size, number or amount to show the quality, type, range of color, finish, and texture of the material he intends to furnish under this Contract.

Each sample shall be labeled bearing the name and quality of the materials the Contractor's name, date and name of the project. A letter from the Contractor requesting review, shall accompany all such samples. Transportation charges to the Engineer must be prepaid on samples forwarded.

Samples shall be submitted in due time so as to permit proper consideration without delaying the Contractor's operation. All materials shall be furnished equal to the reviewed samples. The use of any material will be permitted only so long as its quality remains equal to the reviewed sample, and any material delivered to the site of the work, whether incorporated in the structure or not, which does not conform to the reviewed sample, will be rejected and shall be removed and replaced by acceptable materials at once at the Contractor's expense.

28. INSPECTION

The Engineer is the sole judge if it is necessary that any material or equipment be inspected at the place of manufacture.

General conditions of the Specifications provide for proper inspection and testing of materials. The selection of bureaus, laboratories, and/or agencies for such inspection and testing is subject to the approval of the Engineer. Satisfactory documentary evidence that material has passed the required inspection and testing must be furnished to the Engineer prior to its incorporation in the work, and rejected material must be promptly removed from the premises.

It must be distinctly understood that the inspection and acceptance of materials and work at the mills, shops, or at any place where material or work is in course of preparation, to facilitate the progress of the work, shall not preclude rejection at the site of the proposed work, if the material were found unsuitable.

29. TESTS

The Contractor shall furnish all tests as directed in the Specifications or Contract Documents, or whenever directed to do so by the Engineer. Such tests shall be performed at the Contractor's expense by a reliable testing laboratory approved by the Engineer prior to testing.

The Contractor's selected testing laboratory shall make all required tests on backfill compaction, the materials used in concrete, proportioning of concrete mixes, and tests on concrete as the work progresses. Four (4) copies of all test reports shall be supplied to the Engineer by the laboratory.

The Owner reserves the right to independently perform at its own expense, laboratory tests on random samples of material or performance test on equipment delivered to the site. If made, these tests will be conducted in accordance with the appropriate referenced standards or specification requirements. The entire shipment represented by a given sample, samples or pieces of equipment may be rejected on the basis of the failure of samples or pieces of equipment to meet specified test requirements. All rejected materials or equipment shall be removed from the site, whether stored or installed in the work, and the required replacements shall be made, all at no additional cost to the Owner.

Field tests of materials and equipment installed shall be made by the Contractor, at his own expense, when ordered by the Engineer. Field tests of materials on the job site will be made by the Engineer at his discretion. The Contractor shall furnish at his own expense, the materials required for field tests and reasonable labor to assist the Engineer in conducting the tests.

30. OPERATING TESTS

A. Perform field test of equipment as required in the technical specification sections.

B. Arrange for the equipment manufacturer to furnish the services of a qualified representative. The time period for the supervision and instruction from the manufacturer is stated in the technical specification sections. Where no specific duration of visit is listed, the length of time shall be such to allow the equipment representative ample time to follow the requirements outlined in the individual technical section covering the particular equipment item.

The contractor will be responsible for any additional time required for the manufacturer's representative to resolve equipment installation and/or operation problems due to a lack of coordination between the supplied equipment and the Contract Documents such as, but not limited to, dimensions, electrical problems, controls, or performance.

The manufacturer's representative shall certify installation, recommend or make adjustments and supervise field testing of equipment.

The manufacturer's representative shall provide certification of equipment compliance by submitting a written certification jointly to the Owner, Engineer, and the Contractor that the equipment supplied or manufactured by their organization has been installed and tested to their satisfaction, and that all final adjustments thereto have been made. Certification shall include date of final acceptance field test, as well as, a listing of all persons present during the tests.

C. Contractor shall furnish all labor, material and instruments to perform all preliminary field tests of equipment. Make all necessary changes, adjustments and replacements

required to comply with the requirements of the Contract Documents. Preliminary field test shall demonstrate that the equipment is installed in the location and orientation specified in the equipment manual and as specified in the Specifications or Drawings and that the equipment is prepared for operation in strict accordance with the manufacturer's recommendations.

D. Perform final acceptance tests prior to the startup of the equipment or system. Provide services of the manufacturer's representative for the final acceptance test to certify that the equipment has been installed and tested to their satisfaction. Contractor to furnish all labor, equipment, instruments, materials, fuel, lubricants, energy, water, and all other incidentals necessary for the final acceptance tests. Final acceptance tests shall consist of the following checks as a minimum:

1. That the equipment is adjusted, aligned, balanced, lubricated and properly installed.
2. That the equipment meets the specified performance requirements in every detail and performs its intended function without any unusual vibration, noise or other signs of possible malfunction.
3. Perform motor field tests to verify rotation, voltage, current, motor insulation resistance and other parameters as required.
4. Where equipment is capable of operation in more than one function, each operational mode or function shall be checked for proper performance.
5. All controls, both mechanical and electrical, shall be checked individually for proper connection and operation.
6. All equipment, systems, and controls shall be checked with both utility power source and with backup generation power source.
7. All instrumentation shall be checked for proper functionality.
8. All alarms are verified and properly transmitted through the telemetry system and/or SCADA system.

31. GENERAL ARRANGEMENT

The Contract Drawings indicate the extent and general arrangement of the work. If any departures from the Contract Drawings are deemed necessary by the Contractor to accommodate the materials and equipment he proposes to furnish, details of such departures and reasons therefore shall be submitted as soon as practicable to the Engineer for approval. No such departures shall be made except as provided for in Articles 23 and 83 of the General Contract Conditions.

32. SPARE PARTS DATA

Following review of the list of equipment, the Contractor shall furnish spare parts data for each different items of equipment listed. The data shall include a complete list of parts and supplies which may be subject to breakdown, with current unit prices and source of supply; a list of parts and supplies that are either normally furnished at no extra cost with the purchase of the equipment and a list of additional items recommended by the manufacturer to assure efficient operation for a period of 120 days at the particular installation. The foregoing shall not relieve

the Contractor of any responsibilities under any guaranty specified herein. The above shall be submitted with the Operation and Maintenance Manual submission for the equipment.

33. TOOLS AND ACCESSORIES

The Contractor shall, unless otherwise stated, furnish with each type, kind or size of equipment, one complete set of suitably marked high-grade special tools and appliances which may be needed to adjust, operate, maintain or repair the equipment. Such special tools and appliances shall be furnished in approved painted steel cases properly labeled and equipped with good grade cylinder locks and duplicate keys. All locks to be keyed to Owner's existing equipment.

Each piece of equipment shall be provided with a substantial name plate, securely fastened in place and clearly inscribed with the manufacturer's name, year of manufacturer, and principal rating data.

34. OPERATING AND MAINTENANCE MANUALS

A. Contractor shall submit operation and maintenance manuals as required by the applicable technical sections of the Contract Documents. Submit four (4) hardcopies and one (1) electronic version of the manuals for use by the Owner. All manuals shall be bound into a series of identical heavy duty three-ring binders. Electronic files shall be .pdf format submitted on compact disk.

B. Each manual shall have a title page indicating the full name of the Project, the location, the Owner, Contract Designation under which the equipment or system was provided, and the name, address and telephone number of the local representative for each piece of equipment, as well as home office information. This sheet shall also contain any necessary identifying information required for repair service.

An index should follow the title sheet and contain each section or separate title contained in the Manual. Drawings are to be listed by title and drawing number. Pages should be consecutively numbered.

A copy of the guarantee from the product manufacturer is to be provided if standard manufacturer's guarantee is required. The guarantee section shall also contain information on applying for assistance under the guarantee. Guarantee shall be signed and in effect.

C. Information shall be organized by section, each section covering a specific equipment item. Section shall be listed in a Table of Contents at the front of each volume. Each section shall contain as a minimum:

1. Section Table of Contents.
2. Descriptive data including catalog cuts, technical bulletins, diagrams,

drawings, charts, pump curves, wiring diagrams, and all other pertinent information describing the location, operation, maintenance, lubrication and other information necessary for the Owner to establish an effective operating and maintenance program.

3. Complete parts list that includes all component parts and parts diagrams for all equipment showing manufacturer's identification numbers for each part.
4. Copies of approved shop drawings, where required, to adequately describe interrelation of components within a system.
5. Complete electrical and control schematics with labeled terminations and all field changes.
6. List of special tools required for operation and maintenance.
7. List of spare parts supplied with the equipment, identified by manufacturer's part numbers.
8. Source of replacement parts and address and telephone number of the manufacturer's service representative.

D. At the end of each section, the Contractor shall include detailed maintenance and lubrication schedule for all equipment covered in the section. Schedule shall include the following, as a minimum, for each equipment item:

1. List and frequency of maintenance activities, other than lubrication.
2. Lubrication frequency and application points.
3. Lubricant type (weight of grade and recommended manufacturer) and method of application.

E. Completed manuals shall be submitted to the Engineer for review and acceptance. Incomplete or inadequate manuals will be returned to the Contractor for correction and resubmission. Manuals must be in acceptable form prior to full payment of the item or equipment.

35. EQUIPMENT INSTALLATION

The Contractor shall have on hand sufficient proper tools and machinery of ample capacity to facilitate the work and to handle all emergencies that could be encountered in work of this character. Install all equipment strictly in accordance with the recommendations of the manufacturer.

Equipment shall be erected in a neat and workmanlike manner on the foundations at the locations and elevations shown on the Plans unless directed otherwise by the Engineer during installation. All equipment shall be correctly aligned, leveled and adjusted for satisfactory operation and shall be installed so that proper and necessary corrections can be made readily between the various units.

The Contractor shall furnish, install and protect all necessary guides, track rails, bearing plates, anchor and attachment bolts and all other appurtenances needed for the installation of the devices included in the equipment specified. Anchor bolts shall be made of ample size and

strength for the purpose intended. Anchor bolts in submerged locations shall be of non-corrosive materials of the required strength.

The Contractor shall furnish all oils and greases for initial operation, and shall give to the Engineer a list of the lubricants used on each item of equipment. Insofar as possible, all lubricants shall be obtained from one manufacturer, approved by the Owner. Each item of equipment shall be tagged to show the date and the name and type of lubricant used.

36. ADDITIONAL ENGINEERING SERVICES

A. In the event that the Engineer is required to (1) provide additional engineering services as a result of substitution of materials or equipment by the Contractor, or changes by the Contractor in dimension, weight, power requirements, etc., of the equipment and accessories furnished; (2) examine and evaluate any changes proposed by the Contractor for the convenience of the Contractor; (3) provide additional engineering services as a result of Contractor's errors, omissions or failure to conform to the requirements of the Contract Documents; (4) provide additional engineering services including resident observation and inspections for any period the Contractor extends his work beyond the time of completion as stated in Article III(b) on page C-2 of the Specifications, due to the fault of the Contractor for not meeting his approved construction schedule, then the Engineer's expenses in connection with such additional services shall be paid by the Contractor to the Owner who shall reimburse the Engineer.

B. The "Engineer's Expenses" shall be computed based on the current rate schedules of the Engineer plus out-of-pocket expenditure as detailed in the agreement for engineering services between the Engineer and Owner.

SITE CONDITIONS

37. SITE INVESTIGATION

The Contractor acknowledges that he has satisfied himself as to the nature and location of the work, the general and local conditions, particularly those bearing upon transportation, disposal, handling and storage of materials, availability of labor, water, electric power, roads and uncertainties involving weather, ground water table or similar physical conditions at the site, the formation and condition of the ground, the character quality and quantity of surface and subsurface materials to be encountered, the character of equipment and facilities needed prior to and during the prosecution of the work and all other matters which can in any way affect the work or the cost thereof under this Contract. Any failure by the Contractor to acquaint himself with all the available information concerning these conditions will not relieve him from responsibility for estimating properly the difficulty or cost of successfully performing the work.

38. BORINGS

The Contractor shall perform such borings, soundings, test pit excavations seismic and geotechnical investigations as may be required to inform himself as to surface and subsurface water conditions, rock and other materials which may be encountered, prior to submitting a bid.

The Contractor acknowledges that he assumes all risk contingent upon the nature of the subsurface conditions to be actually encountered by him in performing the work covered by the contract, even though such actual conditions may be of an unusual nature, differing materially from those ordinarily encountered or may result in the Contractor performing more or less work than he originally anticipated.

The logs of any available soundings, borings, rock cores, and other subsurface data, if secured in behalf of the Owner, are, for the convenience of the Contractor, included in the Specifications. Such data (1) are made available in good faith solely for the purpose of supplementing the Contractor's own investigation, (2) have been utilized for general design purposes only and may not be indicative of all subsurface conditions that may be encountered, (3) may be inadequate for purpose of preparing a bid, (4) the data may not be accurate or complete, (5) the provided information may not be complete and that an independent soil and site investigation should be completed by the Contractor prior to bidding and (6) are in no event to be contractual considered a part of the Contract Documents. Examination of the soil samples may be made by making a request of the Engineer. 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 5, Section A of the Instructions to Bidders. The boring logs, soil samples and other subsurface information will not be interpreted by the Owner or the Engineer, or the boring contractor. The Contractor's interpretation of such data will be solely according to his own judgement and he acknowledges that he is not to rely upon the same as accurately describing the subsurface conditions which may be found to exist. It is strongly recommended the contractor complete a pre-bid site inspection to verify subsurface conditions and the available information.

39. SUBSURFACE CONDITONS FOUND DIFFERENT

Should the Contractor encounter subsurface and/or latent conditions at the site materially differing from those shown on the Plans and indicated in the Specifications, he shall immediately give written notice to the Engineer of such conditions and, before they are disturbed, the Engineer shall promptly investigate the conditions and if he finds that a change in design and/or specifications is necessary and such change is implemented, any increase or decrease of cost resulting from such changes are to be adjusted in the manner provided herein for adjustments as to extra and/or additional work and changes.

The provisions of this Section are not to be construed as an indication that, where rock excavation is not a pay item but is included in the unit bid prices for pipe and structures, there would be additional payment for rock excavation because of subsoil conditions found to be different. Where the unit bid prices for pipe and structures include the cost of rock excavation, there will be no deduction in payments or additional payments to the Contractor for rock levels found to vary from the depths indicated or implied.

Excluded from consideration under this item is rubble, masonry, rock, etc. under 1 cubic yard in size which is excavated by conventional means.

40. SURVEY

All work under this contract shall be constructed in accordance with the lines and grades shown on the Plans or as given by the Engineer. The Engineer will establish bench marks, base lines, and other principal controlling points and set grade stakes every 100 feet of improvements and at manholes (once only). The Contractor shall check such lines and grades by such means as he may deem necessary and before using them shall call the Engineer's attention to any inaccuracies.

The Contractor shall furnish and maintain, at his own expense, stakes, batter boards, etc., and give assistance including qualified helpers, as may be required by the Engineer for setting and checking line and grade. The stakes shall be of hardwood, dry and 2 inch x 2 inch x 24 inch long with pointed end. The lath shall be hardwood ½ inch x 2 inch x 4 feet long with pointed end. Materials to be used by the Engineer shall be delivered to the site of the work, where stakeout is required.

The Contractor will be responsible to provide the Owner weekly progress reports reflecting as-built conditions (including manhole stations, off set and invert elevations) for the work completed. The field checks shall be performed by a Licensed Surveyor or a Professional Engineer and the reports shall contain his original signature and stamp. The reports shall be submitted to the project engineer prior to the start of the following week's construction.

The Contractor shall provide, for use by the Engineer and/or Owner's representative, for the duration of the project a surveying level with minimum accuracy of 0.1 distance in miles and a level rod of sufficient length to obtain invert elevations for each section of proposed sewer pipe laid. All equipment shall be subject to the Engineer's review. Prior to acceptance of said equipment by the Engineer, all equipment shall be calibrated and certified, by a qualified survey equipment firm, which said equipment is in first class condition. The Contractor shall also provide the use of one man to assist in obtaining all elevations when needed.

41. REQUEST FOR SURVEYS FOR LINES AND GRADES

The Contractor shall keep the Engineer informed, a reasonable time in advance, of the times and places at which he intends to work, in order that line and grades may be furnished and necessary measurements for record and payment may be made with the minimum of inconvenience to the Engineer or delay to the Contractor. It is the intention not to delay the work for giving lines and grades, but when necessary, working operations shall be suspended for such reasonable time as the Engineer may require for his purpose. All clearing and grubbing necessary for construction stake-out is the responsibility of the Contractor.

42. PRESERVATION OF STAKES, MONUMENTS, ETC.

The Contractor shall be held responsible for the preservation of all stakes, property lines, corners, control points, and, if in the opinion of the Engineer, any items mentioned above have been destroyed or disturbed, the cost to the Engineer of replacing them shall be charged against the Contractor at the Engineer's current rate for this type of work. Payment for the above work shall be made directly to the owner who shall reimburse the Engineer.

43. DATUM OF PLANS

All land, surface and water elevations refer to the datum specified on the Construction Drawings. Bench marks will be established by the Engineer.

44. PROJECT PHOTOGRAPHS

A. The Contractor shall engage and pay for the services of a professional photographer to make photographs prior to moving on site and bi-weekly thereafter at the locations and at such stages of construction as directed by the Engineer. Upon completion of the project, a minimum of four views shall be taken as directed by the Engineer to indicate the general extent of the developed site.

B. The Contractor is responsible to take a sufficient number of preconstruction photographs so as to resolve any disputes which may arise regarding the conditions prior to and subsequent to construction. Photographs shall be submitted to Engineer for approval prior to construction work. Should Engineer deem the number, type and quality of the photographs are insufficient to properly reflect existing conditions, the Contractor shall re-take photographs until Engineer's approval is received. If a dispute arises where no preconstruction photographs were taken, the disputed area shall be restored to the extent directed by the Engineer and to the complete satisfaction of the Engineer. The Engineer may, at his option, take additional preconstruction photographs which may be used to settle disputes, but he will not be required to make these photographs available to the Contractor. Preconstruction photographs taken by the Contractor will not be considered as part of the required number of construction photographs required.

C. During the project work, photographic documentation is required for all major work activities on a bi-weekly basis or at such intervals as necessary to provide complete documentation. The progress photographs shall be taken at times spaced, as appropriate, over each activity period to provide views representative of the entire project work. A minimum of six (6) exposures per session shall be taken.

The Contractor shall provide two (2) color prints of each photograph. Photographs shall be 8x10 inches in size, and should have the following information typed on the back:

- A. Title of Project, Project Number (Consecutive)
- B. Date
- C. Location (by description or station)
- D. Description of Photograph
- E. Contractor's Name
- F. Name and Address of Photographer

The prints and other information, as directed, shall be delivered to the Engineer as soon as they have been processed. Each photograph shall be numbered in sequence. Each photograph shall be cross referenced with a map showing the photograph number and directed arrow of the shot.

45. AREA TO BE OCCUPIED BY THE CONTRACTOR

The proposed work is located on the Owner's property, within highway right-of-ways, and/or within easements obtained by the Owner. The Contractor shall confine his work within these areas. Should the Contractor occupy land outside these boundaries, it shall be at his own risk and expense.

The required easements obtained for the Project are shown on the Plans. The Contractor shall be responsible for providing, at his expense, any special easement conditions that are contained in the easements as noted in these Contract Documents. Where, within the limits of the easement, trees are required to be cut, the Contractor shall offer the resulting firewood or timber to the property owner on whose land the trees have been felled and provide proof of such offer.

Should there be an easement that the Owner is in the process of obtaining; the Contract Documents will indicate as such. No work shall commence in these areas until the easement acquisition has been completed. No additional payment will be made to the Contractor for any delay in acquisition of the easement by the Owner. Delays will be considered as an extension to the date of completion if requested by the Contractor in writing.

46. PROTECTION OF PROPERTY

A. The Contractor shall be responsible for the preservation and protection of property adjacent to the work site against damage or injury as a result of his operations under this Contract.

If it is necessary to remove any structures due to the requirements of the work, the structures removed shall be replaced so that they are equal to the original condition. The Contractor shall assume full responsibility for any damage done and shall save the Owner harmless in all respects. Adequate insurance, approved by the Owner, shall be carried by the Contractor to cover his responsibility.

Public utilities shall be protected and service maintained. If it is necessary to move any utilities, arrangements will be made by the Contractor with the utility company for said work. Permanent support for all trench crossings of exiting utilities shall be provided and shall meet with the approval of the Owner or utility company concerned.

Any damage to gas mains, gas service, water mains, water services, cross drains, culverts, sewage disposal systems, electric, guard rails, etc., shall be repaired or replaced at the Contractor's expense.

The Contractor shall include in the unit and lump sum prices bid under this contract, the cost of relocating existing utilities (above and below ground) such as sewer and water pipe lines, power poles, gas lines, etc. In cases where the utility company is required by law to relocate their own services, the Contractor shall obtain and include in his bid proposal, the utility company's cost for protection and/or relocation. It is recommended the Contractor review Division 1, Description of Bid Items, to determine the proper method to apply his costs.

B. The Contractor shall protect trees, shrubbery and other natural features or structures from being cut, trimmed or injured, unless ordered by the Engineer for clearing the site of the work. He shall prevent employees from tramping in shrubbery and vehicles from being driven through wooded lands. He shall protect trees adjacent to the work with plank walls, if necessary.

The Contractor shall provide and replant at his own expense, trees, lawns, shrubbery and other natural features destroyed or damaged. He shall conduct his operations within such limits as the Engineer directs.

C. It is the Contractor's responsibility to make himself aware of, and comply with, such safety regulations as may be required by jurisdictional agencies and shall at all times conduct his operations so as to avoid and eliminate any unsafe conditions created by his operations.

D. Where property owners express the desire to obtain timber or firewood resulting from the cutting of trees located within the limits of easements, the Contractor shall stockpile such timber or firewood, in areas designated by the property owners, adjacent to the work site. Timber, firewood and brush not claimed by property owners shall be removed by the Contractor and disposed of, off the site of the work, in the manner acceptable to the Engineer.

E. In the event of any claims for damage or alleged damage to private property as a result of work under this Contract, the contractor shall hold the owner harmless and shall be responsible for all costs in connection with the settlement of, or defense against, such claims. Prior to commencement of work in the vicinity of private property the Contractor at his own expense shall take such surveys as may be necessary to establish the existing condition of the property. Before final payment can be made, the Contractor shall furnish satisfactory evidence that all claims for damage have been legally settled or sufficient funds to cover such claims have been placed in escrow, or that an adequate bond to cover such claims has been obtained.

The Contractor agrees to comply with Industrial Code Rule 53 of the State of New York Department of Labor, relating to "Construction, Excavation and Demolition Operations at or near Underground Facilities."

F. Where, in the opinion of the engineer, relocation or replacement of utilities not shown on the drawings but encountered within the trench pay width is required for construction of the project, additional payment will be made as described below:

1. Additional payment will not be made for the relocation or replacement of sewer, water, gas, telephone, TV cable and power connections to buildings. Such service connections, though not shown on the Drawings, are an intrinsic part of the work along developed streets and their protection and relocation shall be included in the various unit bid prices.

2. Additional payment for relocation or replacement of utilities not shown on the Drawings and Documents shall only be made where, in the opinion of the Engineer, such relocation or replacement is not avoidable and is required for the construction of the project. Additional payment for relocation or replacement of utilities not shown on the Drawings and Documents will not be approved where, in the opinion of the Engineer, the proposed relocation or replacement is solely for the purpose of facilitating the Contractor's operations.

3. Limits for additional payment for relocation of utilities not shown on the Plans shall be the actual length located within the trench pay width plus two (2) feet either side, to allow for connections that have to be made outside the trench pay width.

4. Amount of additional payment for relocation or replacement of utilities not shown on the drawings shall be as follows:

a. Where work is done by a utility company, payment shall be for the actual reimbursement by the Contractor to the utility company for work within limits described in Section 3 above. No Contractor's overhead, profit, and/or other incidentals will be allowed to be added to the utility company's invoice for services.

b. Where work is done by the Contractor, payment shall be for excavation, pipe, concrete, reinforcement, steel sheet piling, at stipulate unit prices for Contingency Items, plus invoice cost of valves, pipe, cables, ducts and other appurtenances incorporated in the work for which there are no Contingent Items, and select material backfill and pavement replacement at unit bid prices, all within limits described in Section 3 above.

c. Except for the payments listed above, there will be no other additional payments for costs incurred for the relocation or replacement of utilities that are not shown on the Drawings, but, in the opinion of the Engineer, are required to be relocated or replaced. The cost of delays, the cost of pumping to lower ground water levels, and other similar expenses incurred are to be included in the bid prices in the proposal.

47. EXISTING STRUCTURES AND UTILITIES

A. The Contract Drawings show information regarding the location of existing utilities. This information is secured from existing records and field data, from reliable sources, but is not guaranteed to be entirely accurate or complete. The Contractor shall inform himself regarding the conditions. No extra payment will be allowed to the Contractor for variation in locations of structures or conditions not shown, except as outlined in Division 1, Description of Bid Items.

B. It will be necessary for the Contractor to locate all water services, gas services, water mains, gas mains, cross drains, culverts, sewers, sewer laterals, electric conduits, etc., as to depth and alignment in advance of laying. The Contractor shall excavate and uncover all underground utilities and structures to be crossed or paralleled by the proposed work a sufficient time in advance of construction to permit a change in line and grade of the proposed work if the location of the existing utility or structure should interfere with the proposed work. Where, in the opinion of the Engineer, a change in the line and grade is not practicable, interfering utilities shall be relocated.

C. Where it is necessary to install the sewer pipe lines close to water lines or between other pipe lines for short distances, the Contractor shall shore, block and protect the other mains to the satisfaction of the utility agency or municipality having ownership or jurisdiction over said pipe lines.

D. Whenever existing utilities or other underground facilities are encountered which obstruct the line or grade of the proposed pipeline, thereafter the Contractor shall notify the Engineer, and he shall make such revisions to the construction plans as may be necessary and as ordered by the Engineer, to remedy the situation. An extension of time will be allowed in proportion to the delay incurred. The Contractor shall proceed in accordance with the revised written instructions of the Engineers. A reasonable interval of time shall be allowed the Engineers for preparing such revisions. NO additional payment will be made to the Contractor for any delay resulting from preparing such revisions.

E. Access to various municipal structures shall not be obstructed by the Contractor to prohibit use of hydrants, valves, manholes, fire alarms, etc. The Contractor is to make no connections to existing water mains, or operate valves on existing mains, or otherwise interfere with the operation of the existing water distribution system, without first giving twenty-four (24) hours notice to the Owner, and securing his approval of the proposed action.

If it becomes necessary to shut off the water service, consumers so affected shall be notified at least three (3) hours before by the Contractor, and in the case of industry, provide reasonable notice considering his requirements.

48. SUPERVISION-COMPETENT WORKERS

The Contractor shall give the work his personal attention. He shall keep on the work site at all times, from the start to the final acceptance of the work, a superintendent who, in the absence of the Contractor, shall have full authority from the Contractor to execute these orders without delay and to supply materials, equipment and labor. The on-site superintendent shall be fully aware of all health and safety regulations and OSHA Standards. The superintendent shall coordinate the activities of the Contractor's employees and subcontractor to ensure proper safety measures are being followed during the construction of improvements.

The superintendent shall not be changed except with the consent of the Engineer, unless the superintendent proves to be unsatisfactory to the Contractor. The superintendent shall represent the Contractor in his absence and all directions given to him verbally or otherwise, shall be as binding as if given to the Contractor. Important verbal directions will be confirmed in

writing by the Engineer to the Contractor. Other verbal directions will be so confirmed on written request of the Contractor. The Contractor shall give efficient supervision to the work using his best skill and attention. The Engineer shall not be responsible for the acts or omissions of the superintendent or his assistants.

The Contractor shall employ only competent and efficient workmen and first class mechanics or artisans for every kind of work. Whenever, in the opinion of the Engineer, any man is unfit to perform his task, or does his work contrary to directions, or conducts himself improperly, the Contractor must remove him immediately from the project upon the Engineer's written request.

49. ENGINEER'S OBSERVERS

Duly authorized observers who shall perform their duties under the direction of the Engineer will be assigned to the work or each part thereof.

No Contractor shall refuse to allow representatives of the County Agencies, State Agencies, Federal Agencies, and other Agencies having jurisdiction over portions of the work, to gain access to the project and to make such inspections as are required.

A. All material and workmanship shall be subject to review, examination and testing by the Engineer, and other representatives of the Owner, at any and all such times during manufacture and/or construction, and at any and all places where such manufacture and/or construction are carried on.

B. The Contractor shall execute his work in the presence of an Observer and during the working hours of the day unless specifically directed otherwise, and shall afford every facility for observing and reviewing the materials and work at all times. The presence of the Observer shall in no way lessen the responsibility of the Contractor. In case any dispute arises between the Contractor and the Observer as to materials furnished or the manner of performing the work, the Observer shall have authority to reject materials or suspend the work until the question at issue can be referred to and decided by the Engineer. The Observer is not authorized to revoke, alter, enlarge, relax, or release any requirements of these Contract Documents, not to approve or accept any portion of the work, nor to issue instructions contrary to the Drawings and Specifications.

C. The Contractor shall keep a job diary listing the activities performed, the personnel on the job site and any other noteworthy items. Such diary shall be available for the review of the Owner or the Engineer.

D. If the Specifications, the Engineer's instructions, laws, ordinances, or any public authority requires any work to be specially tested or reviewed, the Contractor shall give the Engineer timely notice of its readiness for review; and if the review is by an authority other than the Engineer, of the date fixed for such review. If any work should be covered up without approval of consent of the Engineer, it shall, if required by the Engineer, be uncovered for examination and properly re-stored at the Contractor's expense.

E. At any time during the progress of the work, and up to the date of final acceptance, the Engineer shall have the right to reject any work which does not conform to the requirements of the Contract Documents, even though such work has been previously reviewed and paid for. Any omissions or failure on the part of the Engineer to reject any work or materials at the time of review, shall not be construed as an acceptance of any defective work or materials. If any work or materials shall be condemned by the Engineer as defective, or improperly done, such work shall be removed and replaced or the defects otherwise remedied in a manner satisfactory to the Engineer, and consistent with the intent of the Contract, at the expense of the Contractor.

50. STORAGE AND HANDLING OF MATERIALS

A. The Contractor shall store his equipment and materials at the job site in a manner acceptable to the Owner or Engineer, and in conformity to applicable statutes, ordinances, regulations and rulings of proper public authority. He shall not store unnecessary materials or equipment on the job site. He shall enforce the instructions of the Owner and the Engineer respecting signs, advertisements, fire and smoking.

B. The Contractor shall store his apparatus, materials, supplies, and equipment in such orderly fashion at the site of the work as will not unduly interfere with the progress of his work or the work of any other contractors.

C. The Contractor shall place upon the work of any part thereof only such loads as are consistent with the safety of that portion of work.

D. Materials stored upon streets or roads shall be so placed as to cause minimum obstruction to traffic and to the public. Materials stored upon streets or roads are subject to the approval of the agency having jurisdiction of the highway. Materials shall not be placed within 10 feet of fire hydrants. Gutters and drainage inlets shall be kept unobstructed at all times. The Contractor shall not store materials or encroach upon private property without the written consent of the owners of such private property.

51. PROTECTION OF WORK AND MATERIALS

During the progress of the work, and up to the date of final acceptance, the Contractor shall bear all risk of loss and shall be solely responsible for the care and protection of all work and materials covered by this Contract.

All work and materials shall be protected against damage, injury or loss from any cause whatsoever and the Contractor shall make good any such damage or loss at his own expense before final payment is made.

52. PROTECTION OF TRAFFIC

A. The Contractor shall inconvenient traffic as little as possible and shall provide suitable barricades, red lights, "danger" or "caution" signs at all places where the work

constitutes in any way a hazard to the public. All barricades and obstructions along public roads shall be illuminated at night and all lights for this purpose shall be kept burning from sunset to sunrise.

B. In addition, the Contractor shall provide and maintain such other warning signs and barricades in other areas as may be required for the safety of those employed in the work or visiting the site.

C. The Contractor shall provide watchmen at particularly dangerous locations such as railroads, heavily traveled roadways and similar locations, and where ordered by the Owner.

D. Access to private properties over driveways shall be maintained. Temporary structures erected by the Contractor to accomplish this shall be safe. The Contractor shall be liable for any damage ordinary resulting from the work.

E. Arrangements for traffic protection and control, detours, barricades, danger signs and warning lights shall be provided in accordance with local jurisdictional authorities' requirements and the Manual of Uniform Traffic Control Devices by New York State Department of Transportation.

53. TRAFFIC CONTROL

A. The Contractor shall maintain vehicular and pedestrian traffic and protect the public from damage to person and property, within the limits of the project, for the duration of the contract.

B. The Contractor is placed on notice that the maintenance and protection of traffic and protection of the public during construction is considered as important and as necessary of an item of work as is the actual construction itself. All work under this bid item shall be performed in accordance with the New York State Department of Transportation Standard Specification, latest revision. The Contractor shall protect the user from damage to person and property which may result directly or indirectly from a construction operation. The New York State Department of Transportation Specifications requirements of Section 107 "Legal Relations and Responsibility to Public" shall apply.

C. All existing roads, streets, sidewalks, and traffic ways shall be kept open for the passage of traffic and pedestrians during the construction period unless otherwise approved by the Owner, Engineer, or authority having jurisdiction over same.

D. When required to cross, obstruct or temporarily close an existing site road, street, sidewalk or traffic way, Contractor shall provide and maintain suitable detours or other approved temporary expedients for the accommodation of traffic. Closings shall be for the shortest time practical and passage will be restored immediately after the completion of backfill and temporary

paving or bridging. Stopping traffic for more than five minutes shall not be permitted unless specifically authorized in writing from the authority having jurisdiction.

E. Contractor shall give 48 hour notice to the fire and police departments, and school districts of his proposed operations including shutdowns.

F. Contractor shall provide, install, move, remove and maintain all signs, signals, barricades, flares, lights and all other equipment, service and personnel required to regulate and protect all traffic, and warn of hazards. All such work shall conform to the requirements of the owner or authority having jurisdiction. Remove temporary equipment and facilities when no longer needed.

G. Traffic shall be maintained over a reasonably smooth traveled way which shall be so marked by signs, delineators and/or other methods so that any person unfamiliar with conditions is able to safely ride, drive or walk day or night with a minimum of discomfort and inconvenience over all or any portion of the street under construction where traffic is to be maintained. All work shall conform to the New York State Manual of Uniform Traffic Control Devices.

H. Contractor will be responsible to prepare maintenance and protection of traffic plan with the applicable Erie County Highway Department, NYS DOT and the local Highway Department for approval. The maintenance and protection of traffic plan shall be prepared by an engineer licensed to practice in New York State.

I. Contractor shall provide the necessary traffic control equipment and flagmen for adequate traffic control where traffic is restricted to one (1) lane or where other conditions require or as required by permit conditions.

J. Contractor shall provide ingress and egress to and from intersecting streets, homes, businesses and commercial establishments including any temporary pavement. Contractor shall maintain existing bus stops, if any, so passengers are reasonably accommodated.

K. Contractor shall provide temporary markings in accordance with the New York State Manual of Uniform Traffic Control Devices, as required by the agency having jurisdiction, as shown on the plans and specifications and/or as ordered by the Engineer.

L. Contractor shall control dust and keep traveled way free from materials spilled from hauling equipment. Consult with governing authorities to establish thoroughfares which will be used for haul routes and access. Provide traffic control of haul routes to expedite traffic and to minimize interference with normal traffic.

M. Contractor must provide access to all school buses and emergency vehicles including ambulances, police cars, fire equipment, etc. traveling through or stopping at any part of construction site and will yield, at his expense, to these vehicles and cease construction activities, as necessary.

N. The Engineer and Owner shall assume no responsibility for any of the work performed by the Contractor.

54. WORK ALONG HIGHWAYS, RAILROADS, WATERWAYS, AIRPORTS, ETC.

Work along and under roads, railroads, waterways, airports, etc., shall be made in accordance with the Plans and Specifications, and in compliance with permits for the work issued by the Agency of jurisdiction, (see Paragraph 67) which permits the Contractor shall secure and pay for. The cost of any temporary structures or facilities required by the agency having jurisdiction, shall be paid for by the Contractor. The cost of all additional insurance, etc., required by the permit shall be provided by the Contractor.

Any special backfill required and pavement replacement shall be paid under the appropriate bid items, unless otherwise indicated. All other work, materials and equipment shall be included in the construction prices, and no extra will be allowed for such construction. The Contractor shall determine the general requirements of permits of controlling agencies prior to submitted a bid.

The costs of flagging, protective personnel and engineering inspection provided by a railroad, airport, highway department, etc., shall be reimbursed by the Contractor. Costs arising from damage arising from the Contractor's work shall be reimbursed by the Contractor.

55. HOURS OF WORK

It is proposed that the work shall progress on the project every work day during the week, and continuously week by week, until the job is complete, except for holidays, and such days as weather or working conditions make work impractical in the opinion of the Engineer.

Night work after 6:00 p.m. and earlier than 7:00 a.m. shall not be performed without the consent of the Engineer. Failure to abide by the stated times will deem all completed work to be "unacceptable" and not eligible for payment.

56. INCLEMENT WEATHER

Work that would be subject to damage shall be stopped during inclement, stormy or freezing weather. Only such work as will not suffer injury to workmanship or materials will be permitted. The Contractor shall carefully protect his work against damage or injury from the weather, and when work is permitted to proceed during freezing weather, he shall provide and maintain approved facilities for heating the materials and for protecting the finished work.

If, in the opinion of the Engineer, any work or materials that are damaged or injured, by reason of failure on the part of the Contractor or any of his subcontractors to protect his work, such materials shall be removed and replaced at the expense of the Contractor.

57. DUST HAZARD

If, in carrying out this Contract, a harmful dust hazard is created for which appliances or methods for the elimination of harmful dust to have been approved by the Board of Standards and Appeals, then the Contractor agrees to install, maintain and effectively operate such appliances and methods during the life of this Contract; and in case of failure of compliance of the Contractor as provided by Section 222a of the Labor Law, its Contract shall be void.

When directed by the Engineer, the contractor shall sprinkle water where directed and in such quantities and at such frequencies as may be required to control such dust and prevent it from becoming a nuisance to the surrounding area at no additional cost to the Owner. All roads must be maintained dust free at all times. Daily cleaning will be required. Any damage caused by dust from the Contractor's operation shall be remedied at his expense.

The use of any petroleum products or the use of calcium chloride for dust control is strictly prohibited.

58. ACCIDENT PREVENTION

Precaution shall be exercised at all times for the protection of persons (including employees) and property, and hazardous conditions shall be guarded against or eliminated.

The Contractor shall provide at the site, such equipment and medical facilities as are necessary to supply First-Aid Service to any of his personnel who may be injured in connection with the work. The Contractor shall promptly report in writing to the Engineer all accidents whatsoever arising out of, or in connection with, the performance of the work, whether on or adjacent to the site, which caused death, personal injury or property damage, giving full details and statements of witnesses. In addition, if death or serious injuries or serious damages are caused, the accident shall be reported immediately by telephone or messenger to both the Engineer and the Owner. If any claim is made by anyone against the contractor or a subcontractor on account of any accidents, the Contractor shall promptly report the facts in writing to the Engineer, giving full details of the claim.

59. TEMPORARY LIGHT AND POWER

Unless stated otherwise in the Contract Documents, where there is more than one Contractor on a project involving structures or buildings, it shall be the obligation and responsibility of each Prime Contractor to provide and maintain temporary facilities for furnishing light and power necessary for operations under their own Contract, and to make all necessary arrangements therefore, including all required connections, ordering the meter, and paying all fees and inspection charges. Removal of temporary facilities shall be by each Prime Contractor. The installation and meters shall remain until completion of the Project.

If, in the opinion of the Engineer, the facilities provided are inadequate, the Prime Contractors will not be permitted to proceed with any portion of the work affected thereby.

All wiring for electrical light and power shall be installed and maintained in a first class manner, as ordered or approved, and at all points securely fastened in place. Unless otherwise permitted, circuits separate from lighting circuits shall be used for all power purposes. Temporary electric shall be in conformance with the National Electrical Code.

60. TEMPORARY WATER SERVICE

Unless stated otherwise in the Contract Documents, where there is more than one Contractor on a project, involving structures and buildings, it shall be the obligation and responsibility of each Prime Contractor to provide and maintain the temporary water service on the site of work suitable for all operations under their own Contract, and to make all necessary arrangements and payments therefore.

Removal of temporary facilities shall be the responsibility of each Prime Contractor. The installation and meters shall remain until need for same by each Contractor has ceased, or until completion of the Project.

The Prime Contractor for each Contract shall provide, at his own expense, the water supply necessary for drinking purposes.

61. TEMPORARY HEATING

Unless stated otherwise in the Contract Documents, where there is more than one Contractor on a project, each Prime Contractor shall provide temporary heat as required when work under their own contract is being carried on during cold weather and to prevent damage to the work. Heat shall be furnished when and as directed by the Engineer, by means of portable or fixed units. Each Prime Contractor shall provide and pay for all fuel used in the temporary facilities and shall provide proper smoke pipes or other means to prevent smoke or smudge from marking up walls, ceilings, or other parts of equipment.

62. SANITARY REGULATIONS AND PROVISIONS

When there is more than one Contractor on a project, each Prime Contractor shall provide ample washroom and toilet facilities and drinking water supply as required for their own needs, and shall prohibit and prevent the committing of nuisances on the site of the work, or on adjoining property.

Ample washroom and toilet facilities and a drinking water supply shall be furnished and maintained in strict conformity with State and County Health Laws.

63. FIELD OFFICES

Each Contractor shall erect, furnish and maintain a field office with a telephone at a location approved by the Engineer, during the entire period of construction. He, or an authorized agent, shall be present at his office at all times while his work is in progress. Readily accessible copies of the Contract Documents, project schedule, approved shop drawings, marked up red

lined "Record" drawings showing field changes, wage rates, required OSHA and Labor Law information, and all other pertinent information shall be kept at his field office.

The Contractor, or in the case of structures and buildings, the General Contractor shall provide a separate field office at the site for use by the Engineer and the Owner's representative.

The Contractor shall submit for approval a plan of the office facility within twenty days following the signing of the Contract. The Engineer's field office shall be on site, furnished, electrified and provision made for connection of water and sewage prior to the start of any major construction work. Subject to the Engineer's approval, the Contractor may provide office space in an existing building.

The field office shall be of substantial weatherproof construction with a usable floor space of not less than 10' x 30' (a standard office trailer) and provided with at least three windows for light. Air conditioning will be provided. Drinking water and a water cooler for drinking water shall be furnished. Two (2) separate washrooms with toilet facilities shall be provided in the office, equipped with a sewer connection or septic tank, a plumbing system and hot and cold running water. A separate self contained toilet facility will be allowed as an alternate if a public sewer is not available. An approved pressure type oil heater or other suitable heating equipment which will heat the office to a temperature of 72 degrees at 0 degrees F. outside temperature shall be furnished and installed. Electric wiring and fixtures and direct line telephone shall be furnished and installed as directed by the Engineer.

The field office is identified as a place of employment by the Clean Indoor Air Act (CIAA) where smoking is not permitted.

The office shall have the following furniture:

- 1 – Reference table (30" x 60")
- 1 – Suitable office desk with drawers and locks
- 1 – Drafting table (with lamp) and drafting stool
- 4 – Chairs
- 1 – Steel supply cabinet with not less than 16 square feet of shelf space
- 1 – Four-drawer steel file cabinet with lock
- 1 – Plan holding rack
- 1 – Coat rack
- 1 – Telephone with Recorder Answering Machine
- 2 – Waste baskets
- 1 – First aid cabinet (as required by OSHA)
- 2 – Fire extinguishers (as required by OSHA)
- 1 – Electric calculator
- 1 – Photo copying machine (dry type copies), paper, toner
- 1 – Fax Machine with dedicated separate phone service
- 1 – Cellular Telephone with service one month past the completion date, available adaptors, chargers, and a total of two batteries
- 1 – Cocoa door mat 18" x 24"

The Contractor shall provide the Engineer with a cellular telephone with both a wall and car charger for the duration of the Contract. The Contractor shall provide at his own expense, for the Engineer's cellular telephone use costs for the duration of the Contract. The Contractor shall also furnish for the duration of the Contract a digital camera with the following minimum features: 10 megapixels, 12x optical zoom, 8 GB memory card, rechargeable lithium battery, USB cable and a case. The Contractor shall also furnish for the duration of the Contract a laptop computer free of miscellaneous files pictures etc., with the following minimum features:

- Intel Core i5 Processor
- Windows Operating System (Windows 7 Pro.)
- MS Office 2010
- 6 GB Ram
- 500 GB Hard Drive
- Power cord and rechargeable battery
- Optical mouse
- Optical Drive DVD±RW/CD-RW
- Internet Explorer
- Contractor to provide a Wireless Internet Card connection at his own expense compatible with the laptop for the duration of the contract.
- Inkjet Printer compatible with the laptop for the duration of the contract.
- Scanner compatible with the laptop for the duration of the contract.
- Dust Covers for all Electronic Pieces for the duration of the contract.
- Laptop case

The Contractor shall provide at his own expense, all heating, lighting, air conditioning, telephone, water, plumbing, and janitorial service for the duration of the Contract.

After the acceptance of the Contract, the building and equipment shall become the property of the Contractor. All records shall be delivered to the Owner at the completion of the job.

The Contractor shall provide and maintain a gravel, cinder or slag road to the office, and a parking area adequate for four cars adjacent to the office. Snow removal for the office parking and access road shall be included as maintenance. The Contractor shall restore, at his own expense, all areas disturbed by the field office to the satisfaction of the Engineer.

The field office shall be maintained until the final acceptance of the project.

A sign shall be furnished on the outside of the Field Office. The sign shall be 2' - 0" x 3' - 0" x 3/4" thick marine plywood with white background and black letters.

The sign shall have the words FIELD OFFICE painted across the top, and shall also contain the following information:

Engineer's Name
Engineer's Mailing Address
Telephone Number (Both Main Office/Field Trailer)

Project Name

64. PROJECT SIGN

This specification covers the fabrication and installation of a project identification sign for projects receiving funds through the New York State Clean Water State Revolving Fund Program.

The project sign shall be fabricated and erected within 21 days following the Notice to Proceed and shall be maintained by the Contractor until completion of construction and the Owner's acceptance of the work.

For projects which include greater than one funding source the information specified for CWSRF projects may be combined with other project signage requirements onto one sign, as allowed and approved by the funding agencies.

There should be one project sign per project. If the project has multiple locations, one project sign centrally located as directed by the Engineer is sufficient.

Refer to the attached figure titled "CWSRF Project Sign Elevation" for typical layout of a sign. The size and spacing of the lettering on the sign may change to accommodate the addition of other funding agencies.

A. Sign Panel

The sign panel shall be constructed of $\frac{3}{4}$ inch APA rated, A-B grade exterior plywood rabbeted into a 2"x4" nominal frame or other suitable materials and construction incapable of withstanding typical weather conditions common to the project site.

B. Fasteners

All fasteners used in the fabrication of the sign shall be rust-proof.

C. Sign Supports

The sign shall be adequately supported and braced to remain in the proper positioning and alignment, including resistance to wind loads and toppling of the sign.

D. Coating

All paint or exterior coverings used shall be exterior grade coating suitable for use on wood or the material of construction. The sign shall be prepared as follows:

- i. Sign Face: The sign face background shall be white and can consist of a minimum two coats of paint.

- ii. Supports and Trim: The supports and trim shall be white and can consist of a minimum of two coats of paint. The front facing surface of the 2" x 4" frame shall be royal blue.

D. Lettering and Emblem

The lettering shall be of the size and color as specified on the attached figure. The size and spacing of the lettering on the sign may change to accommodate the addition of other funding agencies. The emblem shall be of the size specified on the attached figure in royal blue.

E. Installation

The project sign shall be erected in the location and alignment, as directed by the Engineer, with the bottom of the sign panel a minimum of five feet above existing grade.

F. Maintenance

The Contractor shall provide any and all materials required to maintain the sign in good condition throughout the duration of the Contract.

The Contractor shall remove the project sign from the construction site upon completion of construction and Owner's acceptance of the work, or when directed by the Engineer.

65. CLEANUP

During construction of the work, the Contractor shall, at all times keep the site of the work and adjacent premises as free from material, debris and rubbish as is practical and shall remove the aforementioned from any portion of the site, if in the opinion of the Engineer such material, debris or rubbish constitutes a nuisance or is objectionable.

The Contractor shall remove from the site all of his surplus materials and temporary structures when no further need therefore develops.

"Off site disposal of construction and demolition debris shall be handled in accordance with all State and local regulations. In no case shall such debris be disposed of in water bodies, flood plains or wetlands."

At the conclusion of the work and before final payment, all equipment, tools, temporary structures, and materials belonging to the Contractor shall be promptly taken away, and he shall remove and promptly dispose of all water, dirt, rubbish, or any other foreign substances.

ADMINISTRATIVE PROVISIONS

66. ROYALTIES AND PATENTS

The Contractor shall pay all royalties and license fees, and shall assume all responsibility for damage to the owner and Engineer and defend all suits at his own expense arising through infringements of patent rights, connected with any or all of the materials, appliances, articles or systems used in the performance of this work, and shall pay all royalties on apparatus or methods installed by him.

The Contractor shall hold and save the Owner and Engineer and their officers, agents, servants and employees, harmless from liability of any nature or kind, including cost and expenses, for, or on account of, any patented or unpatented invention, process, article, or appliance manufactured or used in the performance of the Contract, including its use by the Owner, unless otherwise specifically stipulated in the Contract Documents.

67. PERMITS AND LICENSES

Permits and licenses of a temporary nature necessary for the prosecution of the work shall be secured and paid for by the Contractor unless otherwise stated in the Contract Documents. Permits, licenses and easements for permanent structures or permanent changes in existing facilities will be secured and paid for by the Owner, unless otherwise specified. The Contractor shall give all notices and comply with all laws, ordinances, rules and regulations bearing on the conduct of the work as drawn and specified. If the Contractor observes that the Contract Documents are at variance therewith, he shall promptly notify the Engineer in writing and any necessary changes shall be adjusted in the manner provided herein for adjustment as to the extra and/or additional work and changes.

In certain situations, the Owner may still be in negotiation with railroad, utilities companies, etc. In these cases, the Owner shall complete negotiations and pay the full amount necessary to procure said permits, licenses, etc. No additional payment will be made to the Contractor for any delay in acquisition of the permit, license, or easement by the Owner. Delays will be considered an extension of time if requested by the Contractor in writing.

If changes in the work or alignment or the Contractor's methods of construction require that additional permit(s) be obtained, the cost for such permits and any delays in construction associated therewith shall be borne by the Contractor.

68. LAWS, TAXES

A. The Contractor shall comply with all laws, ordinances, rules and regulations affecting the work, and shall give proper public authorities all requisite notice in connection with the work. The Contractor shall be solely responsible for any damage resulting from his neglect to obey all laws, regulations, rules and ordinances, and should he perform any work called for by the Specifications or Drawings, knowing it to be contrary to such laws, regulations, rules and ordinances, and without notifying the Engineer, in writing, and obtaining written consent to proceed, he shall bear all costs and damages arising therefrom.

B. The Contractor shall pay all taxes, applicable to the work and materials supplied under this Contract, it being understood that in no case shall any such tax be borne by the Owner.

69. HOURS AND WAGES

A. No laborer, workman, or mechanic in the employ of the Contractor, subcontractor or other person doing or contracting to do the whole or part of the work contemplated by this Contract shall be permitted or required to work more than eight hours in any one calendar day or more than five days in any one week except in case of extra-ordinary emergency as described in Section 220(2) of the New York State Labor Law.

B. The wages and supplements to be paid to laborers, workman or mechanics performing work under this Contract shall be not less than the prevailing rate of wages and supplements as defined and determined by the New York State Labor Law. On projects involving both State and Federal agencies, the Contractor shall obtain the Federal Wage rates and apply the higher rate for the trade or occupation. The prevailing rate of wages for New York State are attached to these Specifications in Appendix "A". The Contractor is responsible for all modifications to the prevailing wage rates that may occur during this course of the Contract.

C. There shall be paid each laborer or mechanic of the Contractor or subcontractor engaged in work on the project under this Contract in trade or occupation listed below, not less than the hourly wage rate set opposite the same, regardless of any contractual relationship which may be alleged to exist between the Contractor or any subcontractor and such laborers and mechanics.

D. Any laborer or mechanic employed to perform work on the project under this Contract, which work is not covered by any of the classifications, of the various State and Federal agencies, shall be paid not less than the minimum rate of wages specified herein for the classification which most nearly corresponds to the work to be performed by him and such minimum wage rate shall be retroactive to the time of initial employment of such person in such classification. In the event any dispute on that question cannot be adjusted, the information, together with the recommendations of the Owner's Engineer or its other authorized representatives, shall be referred for determination to the Owner's governing body or other duly designated official whose decision on the question shall be conclusive on the parties to the Contract with the same effect as if the work performed by such laborer or mechanic had been classified and the minimum rate specified herein.

E. The foregoing specified wage rates are minimum rates only. The Owner will not consider any claims or additional compensation made by the Contractor because of payment by the Contractor of any wage rate in excess of the applicable rates contained in this Contract. All disputes in regard to the payment of wages in excess of those specified in this Contract shall be adjusted and resolved by the Contractor.

F. Except as may be otherwise required by law, all claims and disputes pertaining to the classification of labor employed on the project under this Contract shall be decided by the

Owner's governing body or other duly designated officials, or the New York State Department of Labor.

70. POSTING MINIMUM WAGE RATES

The Contractor shall post at appropriate conspicuous points at the site of the project a schedule showing all determined minimum wage rates for the various classes of laborers and mechanics to be engaged in work on the project under this Contract and all deductions, if any, required by law to be made from unpaid wages actually earned by the laborers and mechanics so engaged. The wage rates shall be posted on a sign written in English with a bold heading stating "Prevailing Rate of Wages". The lettering of the heading shall be no smaller than 2" in height and 2" in width and the entire sign shall be weatherproof. On projects involving both State and Federal agencies the Contractor may be required to post both State and Federal Wage Rates, the higher of which shall apply in any classification.

71. PAYROLL RECORDS

The Contractor and all subcontractors will be required to furnish to the Engineer duplicate copies of all payrolls incurred as a result of work on the project. Payrolls are to be submitted on U.S. Department of Labor Payroll Form WH-347, signed by an officer of the company, no later than three days after the close of any payroll period and not in any case later than the Contractor's monthly payment estimate. Prime Contractors are required to submit certified payrolls from the issuance of the Notice to Proceed until contract close out. Negative reports shall be submitted for times when no actual work is being performed. Subcontractors are required to submit certified payrolls for only the time spent on the project.

Per the SPOTA Bill, the individual designated as the person responsible to collect certified payroll is the engineer in charge of the project. This person's name shall be posted in a conspicuous location at the project site.

The filing of certified payrolls is a condition of payment. A contractor that willfully fails to file certified payrolls shall be guilty of a Class "E" felony and subject to a civil penalty of up to \$1,000.00 per day.

Upon completion of the contract work, the prime Contractor shall be required to execute a Public Improvement Contract Certification for (PICC-2) certifying that the provisions of Section 220-a of the New York State Labor Law have been complied with and that all laborers, workman or mechanics employed by the Contractor on this project have been paid the applicable prevailing wage rates and supplements.

Upon completion of the contract work, all subcontractors to the prime Contractor shall be required to execute a Public Improvement Contract Certification form (PICC-1) certifying that the provisions of Section 220-a of the New York State Labor Law have been complied with and that all laborers, workman or mechanics employed by the subcontractor for work done on this project have been paid the applicable prevailing wage rates and supplements.

Final payment will not be issued until all forms have been properly executed by the prime contractor and subcontractors.

72. APPRENTICES

The minimum wage rates, if any, herein specified, for apprentices, shall apply only to persons working with the tools of the trade they are learning under the direct supervision of journeymen mechanics. Except as otherwise required by law, the number of apprentices in each trade or occupation employed by the Contractor or any subcontractor shall not exceed the number permitted by the applicable standards of the United States Department of Labor or in the absence of such standards, the number permitted under the usual practice prevailing between unions and the employer's associations of the respective trade of occupations.

73. COMPUTATION OF WAGES ON EIGHT HOUR DAY: OVERTIME
COMPENSATION

The wages of each laborer and mechanic engaged in work on the project under this Contract shall be computed on a basic day rate of 8 hours per day, 8 hours of continuous employment, except for lunch periods, constituting a days work when a single shift is employed, and 7 ½ hours of continuous employment except for lunch period constituting a days work when 2 or more shifts are employed. Work in excess of 8 hours per day shall be permitted upon compensation when a single shift is employed, at a minimum of 1 ½ times the basic rate of pay (i.e., the rate actually payable to the laborer or mechanic, which may be higher but not lower than the minimum wage set forth in the foregoing schedule) for all hours worked in excess of 8 hours, on any one day and when two or more shifts are employed, at a minimum of 1 ½ times the basic rate of pay for all ours worked in excess of 7 ½ hours on any one day. In addition, all laborers and mechanics shall receive compensation at a rate not less than 1 ½ times their basic rate of pay for all hours of work in excess of forty in one week when one shift is employed and all hours of work in excess of thirty-seven and one-half in one work week when two shifts are employed. The provisions of this article shall not limit agreements to the contrary, mandatory overtime compensation in excess of that stipulated herein and such extra compensation shall not constitute a claim for additional compensation under this Contract.

74. WAGE UNDERPAYMENTS AND ADJUSTMENTS

The Contractor agrees that in case of underpayment of wages to any worker on the project under this Contract by the Contractor or any subcontractor, the Owner shall withhold from the Contractor out of payments due, an amount sufficient to pay such workers the difference between the wages required to be paid under this Contract and the wages actually paid such worker for the total number of hours worked, and that the Owner may disburse such amount so withheld by it for and on account of the Contractor to the Employee to whom such amount is due. The Contractor further agrees that the amounts to be withheld pursuant to this paragraph may be in addition to the percentages to be retained by the Owner pursuant to other provisions of this Contract.

75. PAYMENT OF EMPLOYEES

The Contractor and all subcontractors shall comply with the Regulations of the Secretary of Labor made pursuant to the Anti-Kickback Act of June 30, 1940, 40 U.S.C. 276(c) and any amendments or modifications thereto. The Contractor and all subcontractors shall furnish the Owner with weekly statements of compliance. In case of subcontracts, the Contractor shall cause appropriate provision to be inserted in any subcontracts for the work which he may let to insure compliance with said Anti-Kickback Law by all subcontractors subject thereto, and the Contractor shall be responsible for the submission of all statements of compliance required of subcontractors by said Anti-Kickback Act except as the Secretary of Labor may specifically provide for reasonable limitations, variations, and exemptions from the requirements thereof.

The Contractor and each of his subcontractors shall pay each of his employees engaged in work on the project wages in full in cash and not less often than once every other week, less legally required deductions. Provided that when circumstances render payment in cash infeasible or impracticable, payment by check may be effected upon consideration that funds are made available in a local bank and checks may be cashed without charge, trade requirements, or inconvenience to the worker. In any event, records of such payment, deductions, and hours worked shall be provided each employee with each payment of wages.

76. PAYMENT BY CONTRACTORS

The Contractor shall pay (a) for all transportation and utility services not later than the 20th day of the calendar month following that in which such services are rendered, (b) for all materials, and equipment which are delivered to and properly stored at the project site or in an approved warehouse to the extent of 90 percent thereof, not later than the 15th day following each payment to the Contractor and the balance of the cost thereof not later than the 15th day following the completion of that part of the work in or on which such materials and equipment are incorporated or used, and (c) to each of his subcontractors, not later than the 7th day following each payment to the Contractor, the respective amounts all owed the Contractor on account of the work performed by his subcontractors to the extent of each subcontractor's interest thereon.

77. NOTICE TO PROCEED

Work shall be started on the Contract within 5 days of the Notice to Proceed given by the Owner. If the Contractor starts work prior to the Notice to Proceed, such action shall be deemed a waiver of such notice. No work shall proceed without Owner's approval of the Contractor's required bonds, insurance and MBE/WBE program.

78. CONSTRUCTION SCHEDULE

Within 5 days after the date of the Notice to Proceed with this Contract, the Prime (General) Contractor on the project shall submit to the Engineer for review, six copies of his own proposed construction schedule showing in detail the proposed sequence of the work, the plan and means and methods of construction to be employed, and the estimated date of starting and

completing each stage of the work in order to complete the Project within the contract time. If so required by the Engineer, the schedule shall be revised.

After review, sufficient additional copies of the reviewed schedule shall be submitted to the Engineer. The Engineer will transmit copies to each of the other Prime Contractors (should there be more than one Contract) for their use in preparing their construction schedules. They are to prepare their schedules and submit to the Engineer for acceptance. The General Contractor shall afford sufficient time in his schedule to allow the other prime contractors to coordinate and perform their work.

A. The Prime Contractor on each Contract shall adhere to the reviewed work schedule for his Contract. In the event a Contractor does not adhere to his work schedule and causes other Contractors to be damaged, the Contractor causing the delay shall save the Owner and Engineer harmless from all actions and charges of the other Contractors against the Owner or Engineer caused by said delay. The Engineer shall make such changes in the construction schedule as he may deem necessary.

B. Each Prime Contractor shall be responsible for the proper coordination of all work so as to maintain the schedules as accepted. Should any Contractor fail to adhere to any phase of the accepted schedule, he shall promptly adopt such additional means or methods of construction, including overtime, as may be required to make up lost time and complete each phase of his work in accordance with the schedule, all at no additional cost to the Owner.

C. Any additional engineering services required due to failure to complete the work according to schedule and within the time of completion allowed or required overtime to make up lost time, will be paid by the Contractor as stated in Paragraph 36 ADDITIONAL ENGINEERING SERVICES, on page GCC-19 of the General Contract Conditions.

D. Failure to progress the work in accordance with the schedule submitted and accepted by the Engineer, may at the discretion of the Engineer be construed as a failure to comply with the terms of the Contract and the owner may thereupon cancel the Contract in accordance with Paragraph 100 of the General Contract Conditions.

E. The construction schedule shall be reviewed monthly and updated if required.

79. ADDITIONAL SUBMITTALS

The Contractor shall also furnish on forms to be approved by the Owner: (a) a detailed estimate giving a complete breakdown of the Contract price, and (b) periodic itemized estimates of work done for the purpose of making partial payments thereon. As specified in paragraph 96 of the General Contract Conditions, the value employed in making up any of these schedules will be used only in determine the percent completion on the job site.

80. SUBCONTRACTING

A. The Contractor shall utilize the services of specialty subcontractors on those parts of the work which, under normal contracting practices, are performed by specialty subcontractors; provided that if the Owner shall determine that the specialty work in question has been customarily performed by the Contractor's own organization and that such organization is presently competent to perform such work, the Contractor shall be permitted to do so. Provided further, that if the Owner shall determine that the performance of any specialty work by specialty subcontractors will result in materially increased cost or inordinate delays, the requirements of this paragraph shall not apply.

B. The Contractor shall not award any work to any subcontractor without prior written approval of the Owner, which approval will not be given until the Contractor submits to the Engineer a written statement concerning the proposed award to the subcontractor, which statement shall contain such information as the Engineer may require to make recommendations to the Owner. The Owner will then notify the Engineer of its decision, who shall make such decision known to the Contractor.

C. The Contractor shall not award more than 50% of the contract work to the subcontractors without prior written approval of the Owner.

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

E. Each Prime Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to the work to bind subcontractors to the Contractor by the terms of the General Contract Conditions and other Contract Documents insofar as applicable to the work of subcontractors. The Prime Contractor has the same power with regard to terminating any subcontract that the Owner may exercise over the Contractor under any provision of the Contract.

F. Nothing contained in this Contract shall create any contractual relation between any subcontractor and the Owner.

G. Each Prime Contractor shall submit a list of all subcontractors and major suppliers to be used on this Contract prior to the start of work for approval of the Owner.

81. COORDINATION WITH OTHER CONTRACTORS

A. The Owner will provide for General Services During Construction and Resident Construction Observation on the project. Job meetings will be conducted and the Owner will be kept informed as to the progress of the project and to whether or not construction progress schedules are being met.

B. Where there is more than one Prime Contractor on a project involving structures or buildings, each Prime Contractor shall be responsible for the coordination of the entire project with the other Contractors. Cooperation will be required in the arrangement for the storage of

materials and in detailed execution of the work. Each Prime Contractor, including his subcontractors, shall keep himself informed of the progress and the detail work of other Contractors and shall notify the Engineer immediately of lack of progress or defective workmanship on the part of other Contractors, where such defective workmanship will interfere with his own operations. Failure of each Prime Contractor to keep informed of the work progressing on the site and failure to give notice of lack of progress or defective workmanship by others shall be construed as acceptance by him of the status of the work as being satisfactory for proper coordination with his own work.

C. Each Prime Contractor shall cooperate with the Engineer and other Contractors to the fullest extent to present delays and increased costs in the overall project. He shall familiarize himself with the work of other whose work affects or ties in with his own, and he shall be fully responsible for the finished result of his own work.

Extra cost caused by defective or ill-timed work or by the neglect or refusal of a Contractor to provide or complete any portion of his work at the proper time and in the proper manner, shall be borne by the Contractor at fault and at no additional cost to the Owner.

D. To insure the proper execution of his subsequent work, the Contractor shall measure work already in place, and shall at once report to the Engineer any discrepancy between the executed work and the Drawings.

E. Each Contractor shall provide all openings, chases, etc., required to fit his own work and that of the other Contractors, as shown on the Contract Drawings, or reasonably implied thereby, as confirmed or modified by shop, setting or erection drawings approved by the Engineer. Where pipes or conduits pass through slabs or walls, the sleeves or opening forms shall be provided and placed by the installer of the pipes or conduits. Where hanger inserts and similar items are required, they shall be furnished and placed by the installer of the pipe or other equipment requiring the hangers.

Any cost caused by defective, ill-timed or mislocated work shall be borne by the Contractor responsible therefore. No Contractor shall endanger any work by cutting, digging or otherwise, and no Contractor shall alter the work of any other Contractor without the consent of the Engineer and the Contractor involved.

F. In disputes between Contractors, the decision of the Engineer shall be binding upon all parties.

82. CHANGES IN THE WORK

A. The Contractor shall do such additional work, other than that designated in the estimate of quantities, as may be ordered in writing by the Engineer, to complete fully the work as planned and contemplated.

B. The Engineer shall have authority to order minor changes in the work not involving an adjustment in the Contract sum or extension of the Contract time and not

inconsistent with the intent of the Contract Documents. No change other than such minor changes shall be made unless in the form of a written order from the Engineer, countersigned by the Owner, and no claim for an addition to the contract sum shall be valid unless so ordered.

C. The Owner reserves the right at any time to contract for and perform other or additional work on or near the work covered by the contract.

D. The value of any change shall be determined by one or more of the following methods prior to the start of such additional work:

Method "A" By prices specifically named in the Proposal Section of the Specifications. Unit prices previously approved are acceptable for pricing changes of original bid items. However, when changes in quantities exceed 15 percent of the original bid quantity and the total dollar change of that bid item is over \$15,000, the unit price shall be reviewed by the owner to determine if a new unit price should be negotiated. Unit prices of new items shall be negotiated.

Method "B" By acceptance of agreed unit prices based on the estimated cost plus overhead and profit as applicable.

Method "C" By estimate of the actual cost of labor and materials plus overhead and profit, cost to be determined as the work progresses.

Method "D" By actual cost of labor and materials plus overhead and profit, cost to be determined as the work progresses.

Method "E" By estimate of the value as deductible from the reviewed detailed estimate.

Method "F" The invoiced cost for utility relocation work as furnished by the respective Utility Company and negotiated by the Owner.

Overhead shall be defined as an allowance to compensate for all costs, charges and expenses, direct or indirect, except for the actual cost of labor and material as defined following. Overhead shall be considered to include, but not be limited to all required project insurances, such as General/Personal Liability, Auto Liability, Excess Liability, Property Damage, etc., bond or bonds, field and office supervisors and assistants above the level of foreman, use of small tools and minor equipment, incidental job burdens, general office expense, preparation of cost claim estimates, back up documentation for the processing of change orders, etc. Overhead and profit cannot be applied to payroll taxes such as unemployment insurance, FICA, and workman's compensation. These costs must be added to the modification cost after overhead and profit is applied.

Actual cost of labor and material shall be defined as the amount paid for the following listed items, to the extent determined reasonable and necessary. The Contractor will be required to provide the necessary back-up documentation to substantiate claimed cost.

- Item 1 Cost of materials delivered to the job site for incorporation into the Contract work.
- Item 2 Wage paid to workmen and foremen and wage supplements paid to labor organizations in accordance with current labor agreements.
- Item 3 Premiums and taxes paid by the Contractor for worker's compensation insurance, unemployment insurance, FICA tax and other payroll taxes as required by law, not of actual and anticipated refunds and rebates.
- Item 4 Sales taxes paid as required by law.
- Item 5 Allowance for use of construction equipment (exclusive of hand tools and minor equipment), as accepted for use by the Engineer-in-charge. The rate of self-owned equipment used for periods of under one week will be based on the Rental Blue Book's published monthly rate divided by 22 days to establish a daily rate and divided again by eight hours to establish an hourly rate. Equipment used for periods of five days or more will be billed at a rate equal to 45 percent of the published monthly rate. In the alternative, the Engineer-in-charge may approve for reimbursement a rate representing the allocable costs of ownership. Self-owned equipment is defined to include equipment rented from controlled or affiliated companies. Rented equipment will be paid for at the actual cost. When, in the opinion of the Contractor, and as approved by the Engineer-in-charge, suitable equipment is not available on the site, the moving of said equipment to and from the site will be paid for at actual cost.
- Item 6 When the material furnished under Item (1) is used material, its value shall be pro-rated to the value of new material, but should be no more than its cost. When the salvage value of salvable material furnished under Item 1 exceed the cost of salvage, a suitable credit shall be given the Owner.

If the work is done directly by the Contractor, overhead in an amount of 10% may be added if method ("B"), ("C"), or ("D") is used and to the cost of the labor and materials plus overhead there may be added 10% for profit. The percentages for overhead and profit may vary according to the nature, extent and complexity of the work involved, but in no case shall exceed the percentages set forth in this paragraph. No percentages for overhead and profit will be allowed on payroll taxes or on the premium portion of overtime pay.

If the work is done by a subcontractor, subcontractor's overhead in the amount of 5% may be added to cost of labor and materials if method ("B"), ("C") or ("D") is used and to the cost of labor and materials plus overhead there may be added 10% for the subcontractor's profit. To this amount there may be added 10% for the Contractor's combined overhead and profit. No percentage for overhead and profit will be allowed on payroll taxes or on the premium portion of overtime pay.

The Owner shall determine by which of the foregoing methods the value of any changes shall be computed.

In computing the value of a change order which involves additions and deductions of work and the added work exceeds the omitted work, overhead and profit shall be computed on the amount by which the cost of additional labor and material exceeds the cost of the omitted labor and material, except no additional overhead and profit shall be allowed on value of work determined by Method "A" or Method "F".

In computing the value of a change order which involves deductions and additional of work and the omitted work exceed the added work, the Contractor will be allowed to retain the overhead and profit on the amount which the omitted work exceeds the added work, except that no overhead and profit shall be retained on value of work determined by Method "A".

The Contractor may retain overhead and profit on a change order which involves deductions only, except that no overhead and profit shall be considered on value of work determined by Method "A" or Method "F".

E. On Construction Projects which involve Federal and/or New York State grant assistance, the following additional guidance will apply to change orders:

1. For each change order not in excess of \$100,000 the Contractor shall submit sufficient cost and pricing data to the Owner to substantiate the necessity and reasonableness of costs and amount proposed, and the allowability and eligibility of costs proposed.

2. For each change order in excess of \$100,000, the Contractor shall submit to the Owner for review sufficient cost pricing data as described in the following paragraphs to substantiate the necessity and reasonableness of costs and amounts proposed, and the allowability and eligibility of costs proposed.

a. As a minimum, proposed change order costs shall be presented in a summary format acceptable to the Owner and shall be supported by a certification executed by the Contractor that proposed costs reflect complete, current and accurate cost and pricing data applicable to the date of the change order.

b. In addition to the specific elements of cost, the estimated amount of profit shall be set for the separately in the cost summary for fixed price change orders and a specific total dollar amount of profit will be set forth separately in the cost summary for cost reimbursement change orders.

c. More detailed cost data than that required by the summary format may be required by the Owner to substantiate the reasonableness of proposed change order costs when the Contractor is unable to certify that proposed change order costs are complete, current and accurate.

d. The Contractor's actual costs, direct and indirect, allowable for Federal participation shall be determined in accordance with the terms and conditions of the Contract, and the generally accepted cost principles contained in the Federal Guidelines established by the Comptroller General of the United States and the U.S. Department of Labor. Examples of costs which are not allowable under those cost principles include, but are not limited to, entertainment, interest on borrowed capital and bad debts.

e. For costs under cost reimbursement change orders, the Contractor shall have an accounting system in a manner consistent with his normal accounting procedures, which accounts for such costs in accordance with generally accepted accounting principles. This system shall provide for the identification, accumulation and segregation of allowable and unallowable change orders.

f. Change orders awarded on the basis of review of a costs element summary and a certification of complete, current and accurate cost and pricing data shall be subject to downward renegotiation or recoupment of funds where subsequent audit substantiates that such certification was not based on complete, current and accurate cost and pricing data and on costs allowable under the cost principles contained in the Federal Guidelines established by the Comptroller General of the United States and the U.S. Department of Labor at the time of change order execution.

3. Related work shall not be split into two amendments or change orders merely to keep it under \$100,000 and thereby avoid the requirement of paragraph E-2 of this Section.

83. CLAIMS FOR EXTRA COST

If the Contractor claims that any work involves extra work under the Contract, he shall give the Engineer written notice within twenty (20) days of this claim, and in any event before proceeding to execute the work; except in emergency endangering life or property, and the procedure shall then be as provided for changes in the work. No such claim shall be valid unless so made. The Contractor shall not execute the work pending the receipt of an executed change order approved by the Owner, Contractor and Engineer unless he is so instructed by the Owner. Late claims for additional cost will be rejected.

84. DEDUCTIONS FOR UNCORRECTED WORK

If, in the opinion of the Engineer, it is undesirable or inexpedient to replace any defective or damaged materials or to reconstruct or correct any portion of the work injured or not performed in accordance with the Contract Documents, the compensation to be paid to the Contractor hereunder shall be reduced by such amount as in the judgment of the Engineer shall be equitable.

85. TIME OF THE ESSENCE

Inasmuch as the provisions of this Contract relating to the time for performance and completion of the work are for the purpose of enabling the Owner to proceed with the construction of a public improvement in accordance with a predetermined program, such provisions are of the essence of the Contract.

86. DELAYS AND EXTENSION OF TIME

A. If the Contractor shall be delayed in the completion of his work by reason of unforeseen causes beyond his control and without his fault or negligence, including, but not restricted to acts of God, or the public enemy, floods, epidemics, quarantine, restrictions, strikes, riots, civil commotions, freight embargoes, or priority regulations, the period hereinafter specified for completion of his work shall be extended by such time as shall be fixed by the Engineer. Additional engineering services required during this time extension will not be assessed to the Contractor as stated in Paragraph 36, ADDITIONAL ENGINEERING SERVICES, of the General Contract Conditions.

B. No extensions of time shall be deemed a waiver by the Owner of his right to terminate the Contract for abandonment or delay by the Contractor as herein provided or relieve the Contractor from full responsibility for performance of his obligation hereunder.

C. No such extension shall be made for delay occurring more than seven days before claim therefore is made in writing to the Engineer. In the case of a continuous cause of delay, only one claim is necessary.

D. This article does not exclude the recovery of damages for delay by either party under other provisions in the Contract Documents.

E. Under no circumstances shall there be any claims for damages or reimbursement for delay of completion of the work of any Prime Contractor against the Owner, the Engineer, or any other agent or employee of the Owner.

87. CORRECTION OF DEFECTIVE OR UNCOMPLETED WORK BEFORE FINAL PAYMENT

A. The Contractor shall promptly remove from the premises all materials condemned by the Engineer as failing to conform to the Contract, whether incorporated in the work or not, and the Contractor shall promptly replace and re-execute his own work in accordance with the Contract and without expenses to the Owner and shall bear the expense of making good all work that other Contractors destroyed or damaged by such removal or replacement. Acceptance of material and workmanship by the Inspectors shall not relieve the Contractor from his obligation to supply other materials and workmanship when so ordered by the Engineer.

B. If the Contractor does not remove such condemned work and materials within ten (10) days after written notice, the Owner may remove them and may store the materials at the expense of the Contractor. If the Contractor does not pay the expense of such removal within ten (10) days time therefore, the Owner may, upon ten days written notice, sell such materials at

auction or a private sale and shall pay to the Contractor the net proceeds thereof, after deducting all the costs and expenses that should have been borne by the Contractor.

C. Neither the final certificate, nor payment, nor any provision in the Plans and Specifications shall relieve the Contractor of responsibility for faulty materials or workmanship and he shall remedy any defects due thereto and pay for any damage to other work resulting therefrom, which shall appear within a period of one year from date of final certificate. The Owner shall give notice of observed defects with reasonable promptness.

88. GUARANTEE AND MAINTENANCE, AND ONE-YEAR CORRECTION PERIOD

A. After acceptance of the work by the Owner and Engineer, 100 percent of the Contract price will be due and payable to the Contractor.

B. 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 Paragraph 88.

C. The Contractor shall, in accordance with Owner's written instructions, either correct defective work, or if it has been rejected by Owner, remove it from the site and replace it with non-defective work for a period of one (1) year from the date of issue of the Statement of Completion. If any unsatisfactory condition or damage develops within the one-year correction period 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 due to materials or workmanship which were defective, inferior, or not in accordance with the Contract, the Contractor shall within 7 days after receipt of Notification of such defects, take the necessary action 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 non-defective work. The correction of any defects in equipment, materials and workmanship which may develop during the one-year correction period as described on the Form of Guarantee shall be at the expense of the Contractor. If the Contractor delays beyond twelve (12) days from the date of said notice, the Owner may proceed to have the work done and charge the same to the Contractor and his Surety on the Performance Bond.

D. If there is a material and/or equipment failure within the one-year correction period as described on the Form of Guarantee, aside from making the necessary repairs, the Contractor shall furnish the Owner with an additional performance bond guaranteeing said workmanship and material in the full amount of the repaired item (labor, material) for an additional one year period from the acceptance of said repair work by the Owner.

E. Final payment for the work shall be retainage withheld by the Owner less any charges for corrective work or damages for defective equipment, materials and workmanship or occasioned in correcting the same.

F. The Contractor shall sign and date a written Form of Guarantee to be provided by the Owner attesting that all work performed under the Contract shall be maintained for a period of one (1) year. Such date of the Form of Guarantee shall coincide with the issuance of the date of completion.

89. SURETY BONDS

The Contractor shall furnish and pay for surety bonds each in the amount at least equal to 100 percent of the Contract price as security for the faithful performance of the Contract and for the payment to all persons performing labor and furnishing materials in connection with the Contract. The surety shall be in such form or forms as the Owner may prescribe and with such sureties as he may approve.

90. ADDITIONAL OR SUBSTITUTE BOND

If at any time the Owner shall be or become dissatisfied with any surety or sureties providing the Performance Bond, or if for any other reason such bond shall, in the Owner's opinion, cease to be adequate security to the Owner, the Contractor shall within five (5) days after notice from the Owner, substitute an acceptable bond in such form and sum signed by such other sureties, as may be satisfactory to the Owner. The premiums on such bond shall be paid by the Contractor. No further payments shall be deemed due nor be made until the new sureties shall have qualified.

91. LIENS

Neither the final payment nor any part of the retained percentage shall be come due until the Contractor delivers to the Owner a complete release of all liens arising out of this Contract, or receipts in full in lieu thereof and an affidavit which certifies so far as he has knowledge or information that the releases and receipts include all the labor and materials for which a lien could be filed; but the Contractor may, if any subcontractor refuses to furnish a release or receipt in full, furnish a bond satisfactory to the Engineer, to indemnify the Owner against any lien. Upon request of the Owner, the Contractor shall at his own expense, by bonding it or otherwise, secure the prompt discharge of any lien or liens which may be filed against the property as a result of this Contract.

92. ASSIGNMENT

Neither party to the Contract shall assign the Contract or sublet it as a whole without the written consent of the other, nor shall the Contractor assign any monies due to him hereunder, without the prior written consent of the Owner.

93. RIGHTS OF VARIOUS INTERESTS

Whenever work being done by the Owner's forces or by other Contractors is contiguous to work covered by this Contract, the respective rights of the various interests involved shall be

established by the Engineer, so as to secure the completion of the various portions of the work in general harmony.

94. NO WAIVER OR LEGAL RIGHTS

The Owner or the Engineer shall not be precluded or stopped by any measurement, estimate, or statement, made or given by them, or any agent or employee of the Owner, under any provisions or provisions of the Contract, at any time, either before or after the completion and acceptance of the project and payment thereof pursuant to any measurement, estimate, or statement, from showing the true and correct amount and character of the work performed and materials furnished by the Contractor, or from showing it any time, that any such measurement, estimate or statement is untrue or incorrectly made in any particular, or that the work or materials, or any part thereof do not conform in fact to the Specifications and Contract, and the work or materials, should the said measurements, estimates, statement or payment be found, or be known to be inconsistent with the terms of the Contract or otherwise improperly given, and the Owner shall not be precluded and stopped, notwithstanding any such measurements estimate, statement or payment in accordance therewith, from demanding and recovering from the Contractor and his surety such damages as it may sustain by reasons of his failure to comply with the terms of the Specifications and Contract, or an account of any overpayment or overpayments made on any estimate or statement. Neither the acceptance of the Engineer or any agent or employee of the Owner, nor any estimate or statement by the Engineer, for any payment of money, nor any payment, for, nor acceptance of the whole or any part of the work by the Owner, or the Engineer nor any extension of time, nor any possession taken by the Owner or its employees, shall operate as a waiver of any portion of the Contract or of any power herein reserved by the Owner or any right to damages herein provided, nor shall any waiver or any breach of the Contract be held to be a waiver of any other or subsequent breach.

95. COMPENSATION TO BE PAID TO CONTRACTOR

The Contractor will be paid the bid unit and lump sum prices for the quantities of work which he performs, under the items of work included in the Contract. The sum total for these items shall constitute full payment for the job complete, tested and ready for use.

It is understood by the parties that this agreement shall be executory only to the extent of the monies available to the County of Erie and appropriated therefore, and no liability on account thereof shall be incurred by the County beyond monies available and appropriated for the purpose thereof.

96. ESTIMATES AND PAYMENTS

A. In computing the amount of the estimates of work done, the unit prices bid will be used when the bid is on a unit price basis. On lump sum bids the Contractor shall, within three weeks after award of the Contract, prepare and submit to the Engineer for review, a breakdown of all lump sum bid prices contained in the Contract with the total prices apportioned into component parts of the various types and categories of material and labor involved in each lump

sum item. After review by the Engineer, this breakdown will be used as a basis for preparing partial estimates and establishing progress payments.

B. When the project has been completed in accordance with the Plans and Specifications, and has been accepted, payment in full will be recommended by the Engineer provided the work is accepted on or before the specified completion or any authorized extension thereof. Failure to complete the work tasks in the manner specifically described by the specification will cause for an equitable reduction in the contract's unit and/or lump sum bid price as determined by the Engineer.

In making up the final estimate, the linear measurement made along the horizontal axis of the surface of the finished work will be considered the length of the work. All estimates including the final, will be made for actual quantities of work performed and materials in place as determined by the measurement of the Engineer, and this determination as to the quantities involved in any Contract shall be accepted as final, conclusive and binding upon the Contractor.

The final certificate of completion will constitute the acceptance of the work by the Engineer except as to the work thereafter found to be defective. The date of such certificate of completion shall be regarded as the date of acceptance of the work.

C. For computation of the quantities to be paid for under the various items of this Contract, it is agreed that the planimeter shall be considered an instrument of precision and quantities computed from areas obtained by its use shall be accepted by all parties hereto as accurate.

D. The acceptance by the Contractor of final payment shall be, and shall operate as a release to the Owner, of all claims and all liability to the Contractor for all things done or furnished in connection with this work, and for each act and neglect of the Owner and others relating to or arising out of this work. No payment, however, final or otherwise, shall operate to release the Contractor or his sureties from any obligations under this Contract, the Performance Bond or the payment Bond.

E. When requesting a reduction of retainage, the Contractor will provide the Owner with a letter of consent from his surety company.

97. OWNER'S RIGHT TO WITHHOLD PAYMENTS

The Owner may withhold from the Contractor so much of any recommended payments due him as may in the judgement of the Owner be necessary:

- (a) to assure the payment of just claims then due and unpaid of any persons supplying labor or materials for the work.
- (b) to protect the Owner from loss due to defective work not remedied.

(c) to protect the Owner from loss due to injury to persons or damage to the work or property of other Contractors, subcontractors, or other caused by the act or neglect of the Contractor or any of his subcontractors. Owner shall have the right as agent for the Contractor to apply any such amounts so withheld in such manner as the Owner may deem proper to satisfy such claims or to secure such protection. Such application of such money shall be deemed payments for the account of the Contractor.

(d) a reasonable doubt that the Contract can be completed for the balance then unpaid.

(e) damage to another Contractor.

(f) to assure the payment of just claims by the Engineer for additional engineering services required for any work beyond the stated time of completion or approved time extension for this Contract.

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

98. FINAL REVIEW AND TIME OF COMPLETION

A date for final review of the work by the Engineer and Owner shall be set by the Contractor in a written request therefore, which date shall be not less than ten (10) days after the date of such request. Prior to the final review, the various items of equipment and related work shall be placed in operation by the respective Contractors whose work is involved, to satisfactorily demonstrate that the various elements of work will operate in accordance with the intent of the Plans, Specifications and approved shop drawings.

After these tests, the respective Contractors shall certify in writing to the Engineer and Owner that they have observed such tests, and that they approve of the installation and operation. The duration of the tests shall be not less than 24 hours.

The work will be deemed complete as of the date so set by the Contractor, if, upon such review the Engineer determines that no further work remains to be done at the site. However, if such review, in the opinion of the Engineer, reveals items of work still to be performed, the Contractor shall promptly perform them and then request another review. If, under any subsequent review, the Engineer determines that the work is complete, the date of completion shall be deemed to be the actual date of such subsequent review, which shall be made not less than one (1) nor more than ten (10) days after the date of the request therefore.

In the event that certain portions of the work are required to be placed in use before completion of all work included under the Contract, the Contractor shall request a review of such portions of the work so required in the same manner as specified above for final review.

During such reviews, the work shall be clean and free from materials which would interfere with the review.

In no case will the final estimate be prepared until the Contractor has complied with all the requirements set forth and the Engineer has made his final review of the entire work and is satisfied that the work has been properly and satisfactorily constructed in accordance with the requirements of the Plans and Contract Documents.

99. STATEMENT OF COMPLETION AND FINAL AFFIDAVITS AND CERTIFICATES

Upon the completion of all work whatsoever required, the Engineer shall file a written Statement of Completion with the Owner, and with the Contractor, as to the entire amount of work performed and compensation earned by the Contractor, including extra work and compensation therefore. The Contractor shall guarantee (parts, labor, materials and equipment) his work for a period of one (1) year from the date of issue of the State of Completion. The Owner, Engineer and contractor shall all sign and date the Statement of Completion attesting that all work has been completed satisfactory and the final Contract amount is correct.

The Contractor will be required to complete and submit all necessary contract closeout certifications and affidavits as required by the Owner. Such documents as the Form of Affidavit, Form of Guarantee, Engineer's Certificate, Prime Contractor Certificate (PICC-2), Subcontractor Certifications (PICC-1), Final Change Order, MBE/WBE Utilization Report, Apprenticeship Utilization Certificate, Weekly Payroll Certifications, etc., must be completed and executed by the Contractor prior to contract close-out and the release of final payment and contract retention.

100. RIGHT OF THE OWNER TO TERMINATE

A. The Owner shall have the right to terminate this Contract if:

- (1) A receiver or liquidator shall be appointed for the Contractor for any of his property, and shall not be dismissed within 20 days after such appointment; or
- (2) The Contractor fails to perform this Contract in accordance with its terms, conditions and specifications; or
- (3) The Contractor shall refuse or fail, after Notice from the Engineer, to supply enough properly skilled workmen or proper materials; or
- (4) The Contractor shall refuse or fail to prosecute the work or any part thereof with such diligences as will insure its completion within the period specified (or any duly authorized extension thereof) or shall fail to complete the work within the said period, or in accordance with his approved construction schedule as submitted to the Owner and Engineer; or
- (5) The Contractor shall fail to make prompt payment to persons supplying labor or materials for the work; or

- (6) The Contractor shall fail or refuse to regard laws, ordinances, rules and regulations or the instructions of the Engineer.

Then, and in such event, the Owner, without prejudice to any other rights or remedy it may have, may, by seven (7) days notice to the Contractor, terminate the employment of the Contractor and his right to proceed, either as to the entire work or (at the option of the Owner) as to any portion thereof as to which delay shall have occurred, and may take possession of the work, and all materials and construction equipment on the site of the work, and may thereupon call upon the surety to complete the Contract or the Owner may, at its option, proceed to complete the work, and may thereupon call upon the surety to complete the Contract or the Owner may, at its option, proceed to complete the work, either by day work or contract, and any funds retained by the Owner and any sum realized from the material and equipment reverting to the Owner shall be applied to pay for the completion of the Project. In such case, the Contractor shall not be entitled to receive any further payment until the work is completed. Nor shall the Contractor be entitled to any damages on account thereof, nor shall such termination affect the right of the Owner to recover against the Contractor or his surety damages which may arise. If the unpaid balance of the compensation to be paid the Contractor hereunder shall exceed the expense of so completing the work (including compensation for additional engineer, managerial, administrative and inspection services and any damages for delay) such excess shall be paid to the Contractor. If such expense shall exceed such unpaid balance, the Contractor and his sureties shall be liable to the Owner for such excess.

101. CONTRACTOR'S RIGHT TO STOP WORK OR TERMINATE CONTRACT

If the work shall be stopped by order of the Court or any other public authority, for a period of three months without act or fault of the Contractor or of any of his agents, servants, employees or subcontractors, the contractor may upon 10 days notice to the Owner, discontinue his performance of the work and/or terminate the Contract, in which event the liability of the Owner to the Contractor shall be determined as provided in Paragraph 100 of the General Contract Conditions except that the Contractor shall not be obligated to pay to the Owner any excess of the expense of completing the work over the unpaid balance of the compensation to be paid the Contractor hereunder.

102. REMOVAL OF EQUIPMENT AND SUPPLIES

In the case of termination of this Contract before completion from any cause whatever, the Contractor, if notified to do so by the Owner, shall promptly remove any part or all of his equipment and materials from the property of the Owner at the expense of the Contractor. Failure to remove such equipment and material shall cause the Owner the right to remove any part or all of such equipment and material at the expense of the Contractor.

103. POWER OF CONTRACTOR TO ACT IN AN EMERGENCY

In case of an emergency which threatens loss or injury of property, and/or safety of life, the Contractor will be allowed to act, without previous instructions from the Engineer, as he sees fit. He shall notify the Engineer thereof immediately thereafter.

Where the Contractor has not taken action, but has notified the Engineer of an emergency threatening injury to persons or damage to the work of any adjoining property, upon authorization from the Engineer to prevent such threatening injury or damage he shall act as instructed or authorized by the Engineer. The amount of reimbursement claimed by the Contractor on account of any such action shall be determined in the manner provided in Paragraph 82 of the General Contract Conditions for the determination of compensation to be paid for extra work.

104. CONTRACTOR'S AND SUBCONTRACTOR'S INSURANCE

A. The Contractor shall procure and maintain at his own expense, and without expense to the Owner, until final acceptance by the Owner of the work covered by the Contract, insurance for liability for damages imposed by law, of the kinds and in the amount hereinafter provided, insurance companies authorized to do such business in the State in which the project is to be performed, covering all operations under the Contract, whether performed by him or by subcontractors. Before commencing the work, the Contractor shall furnish to the Owner, a certified copy of the original policy and such number as Owner may request of a Certificate or Certificates of Insurance in form satisfactory to the Owner, showing that he had complied with this paragraph which certificate or certificates shall provide that the policies shall not be changed or cancelled until written notice has been given to the Owner.

B. Insurance shall be procured by the successful bidder before commencing work, within 15 calendar days after notice of an award, and maintained without interruption for the duration of the Contract, and at all times the Contractor may be correcting, removing or replacing defective work in accordance with Paragraph 88 in the kinds and amounts specified below:

	<u>Each Occurrences</u>
1. Commercial General Liability	\$1,000,000
-General Aggregate	\$2,000,000
-Products and Completed Operations	\$2,000,000
-Blanket Broad Form	
-Contractual	
-Broad Form Property Damage	
-X.C.U. (Explosion, Collapse, Underground Hazard)	
2. Automobile Liability, including:	\$1,000,000
-Owned	
-Hired	
-Non-Owned	

3. Excess Umbrella Liability \$5,000,000

Comprehensive General, Automobile Liability and Excess
"Umbrella" Liability shall name the County of Erie as
additional insured.

4. Workers' Compensation Statutory

5. New York Disability Statutory

6. Builders' Risk-All Risk/Installation Floater. The Policy is required. The Prime Contractors shall procure and maintain insurance against loss by fire, lightning, extended coverages, theft, vandalism and malicious mischief, collapsed and water damage, upon all work in place and all materials and equipment stored on and off the building site. This insurance shall be in an amount equal to the full insurable value (contract amount) at all times and shall include the interests of Owner, Contractor, Subcontractors, each of whom is deemed to have an insurable interest and shall be listed as an insured. The Policy must carry the County of Erie as the named insured. The Owner shall be furnished with a certified copy of the policy prior to the commencement of work.

The policies of insurance required under this Paragraph 104.B.6 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 104.B.7. 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 Paragraph 104.B.6.

7. Waiver of Rights. 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 subcontracts, agents and employees, for damages caused by fire or other perils to the extent covered by insurance provided under Paragraph 104.B.6, 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 104.B.7.
8. Owners Contractors Protective Liability Insurance. The Policy is required. The prime Contractors shall obtain insurance issued to and covering the liability for damages imposed by law upon the Contractor with respect to all work under this Contract performed for the Contractors by subcontractors and covering the liability for damages imposed by law upon the Owner with respect to all operations under this contract by the Contractor or by his subcontractors, including omissions and supervisory acts of the Owner and the Agents and employees of the insured. Such insurance shall name as an additional assured or assures the persons or corporation specified in this Contract and the

Engineers and architect of the Owner, State and Federal government agencies, and/or the agents, inspectors and employees of this or any other municipal body or public utility which may have granted permits in connection with the work. An original policy made out to the Owner shall be provided.

9. Additional Insurance. The Contractor shall have in effect and maintain at his own expense such additional insurance policies as are required by the various public agencies, railroad companies, utility companies, etc. that have jurisdiction over or adjacent to the construction site. Flood insurance for facilities above ground with a value of \$50,000 or more shall also be provided in the amount equal to the full insurable value for facilities construction within the 100 year floodplain.
10. Refer to the Specific Contract Conditions of these Specifications for any special insurance requirements.

C. Certificates of Insurance:

1. Certificate Holder shall be "County of Erie, 95 Franklin Street, Room 1034, Buffalo, New York 14202."
2. Coverage must comply with all Specifications of the Contract.
3. Certificates shall be executed by an insurance company and/or agency or broker which is licensed by the Insurance Department of the State of New York. If executed by a broker, notarized copy of authorization to bind or certify coverage must be attached.
4. All policies in which the County of Erie is named as an additional insured shall provide that:

"The insurance company or companies issuing the policies shall have no recourse against the County of Erie for payment of any premiums or for assessments under any form of policy."

"The insurance shall apply separately to each insured (except with respect to the limit of liability)."
5. All Certificate of Insurance shall be on the County of Erie Standard Insurance Certificate as shown on Page GCC-63 of the Specifications. Four (4) original copies of the Certificate of Insurance with original signatures shall be submitted to the County of Erie, Department of Environment and Planning, Division of Sewerage Management, 95 Franklin Street, Rm. 1034, Buffalo, New York 14202, within 15 calendar days after the notice of an award. Other Certificates of Insurance may be used with prior approval of the County of Erie Department of Law provided the Certificates contain the following language verbatim:

- a. "Acknowledgement: Insurance companies providing these coverages acknowledge that the named insured is entering into a contract with the County of Erie, in which the named insured agrees to defend, hold harmless and indemnify the County, its officials, employees, volunteers and those other entities named as additionally insured (Ref. General Contract Conditions Item 106) against all claims resulting from work performed, material handled and services rendered. The contractual liability coverage evidenced above covers the liability assumed under the County-Contract Agreement."
- b. "Prior to non-renewal or cancellation of these policies, the Contractor and their Insurance Carrier shall provide advance written notice to the County of Erie Department of Law and the Erie County Division of Sewerage Management, before such change shall be effective."

D. The following items are to be submitted to the Owner within 14 calendar days after notice of award:

- 1. Four (4) original Certificates of Insurance, signed and dated.
- 2. One (1) certified copy of the Builders Risk Policy (written cancellation clause).
- 3. One (1) certificate of Workers' Compensation
- 4. One (1) original policy of the Owners Contractors Protective Liability Insurance (written cancellation clause).
- 5. Four (4) original Performance Bonds.

105. OWNER'S LIABILITY INSURANCE

For the duration of this Contract, until final payment and at all times the Contractor may be correcting, removing or replacing defective work, the Contractor shall maintain insurance in the name of the Owner for the same limits of liability and containing the same specific endorsements which the Contractor places on the insurance required in Paragraph 104. This insurance shall conform to the requirements and restrictions imposed by Paragraph 104. Original and one certified copy of the policy shall be filed with the Owner, showing the County of Erie as additionally insured.

106. INDEMNITY, DEFENSE OF ACTIONS OR SUITS

The Contractor shall indemnify and hold harmless the Owner and the Engineer and their agents and employees from and against all claims, damage, losses and expenses including attorneys' fees that shall or may happen to the said work or to any part or parts thereof, or to any materials, building, equipment or other property that may be used or employed therein, or placed upon the ground, during the progress of the work, 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 there from, and (b) is caused in whole or in part by any negligent act or omission of the Contractor, and subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, regardless of whether or not it is caused in part by a party indemnified hereunder, nor shall the Owner be in any manner answerable or responsible for any injury done or damages or compensation required to be paid under any present or further law, to any person or persons whatever, whether employees of the Contractor or otherwise, or for damage to any property, whether belonging to the owner or to others occurring during or resulting from the said work. The Contractor also agrees that he will properly guard against all such injuries, damages and compensation. The Contractor also agrees that he shall at all times indemnify and save harmless the Owner, its officers and agents against all such injuries, damages and compensation arising or resulting from causes other than its neglect.

The Contractor will, at his own expense, defend, indemnify and save harmless, and make good any damage and/or physical injuries that shall be in the course of the work and construction under this Contract be done or caused to any adjacent, abutting, or overhead property, which shall include, but shall not be limited to lands, foundations, walls, buildings (abutting, under or overhead) and structures of all kinds, lessees, operators or occupants of any buildings and/or structures.

107. MUTUAL RESPONSIBILITY OF CONTRACTORS

If, through acts of neglect on the part of the Contractor, any other Contractor, or any subcontractor shall suffer loss or damage on work, the contractor agrees to settle with such other Contractor or subcontractor by agreement or arbitration, if such other Contractor or subcontractor will so settle. If such other Contractor or subcontractor shall assert any claim

against the Owner on account of any damage alleged to have been so sustained, the Owner shall notify the Contractor, who shall indemnify and save harmless the Owner against any such claims.

108. ENGINEER'S AND OWNER'S CONTROL SHALL NOT LIMIT CONTRACTOR'S RESPONSIBILITY OR RISK

The Contractor shall be solely, completely and continuously responsible, during the performance of this Contract, including such periods during which actual work may not be in process such as normal nonworking hours, holidays, Saturdays and Sundays, strikes, for the conditions of the job site, which responsibility shall include the means, methods, techniques, sequences, or procedures or construction and safety, directly or indirectly, of all persons and property involved in, related to or entering into or in the proximity of said job site whether or not such involvement, relation of entry is for performance of work or provision of services under this Contract and shall be held liable for any bodily injury, death or property damage arising, due to job site conditions, out of or contingent to the performance of all work under this Contract.

The Contractor shall take all necessary precautions to prevent the same. Neither the completion of the work nor the final payment therefore shall discharge the Contractor from his responsibility for any claims from injury to persons or property which may have arisen during the work.

The requirement herein included in Paragraph 18 of the General Contract Conditions that all work shall be subject to the control of the Engineer shall not be construed as requiring that the Engineer or Owner be responsible, in any way, for the adequacy or inadequacy of any action taken or not taken by the Contractor which affects or might affect the safety of any individual or property, either directly or indirectly, during the performance of this Contract and the Engineer shall be held blameless and shall accrue no liability for any bodily injury, death or property damage arising out of or contingent to the performance of all work under this Contract.

109. WORK IN THE VICINITY OF WATER BODIES

A. Standards of Performance

All work in the vicinity of water bodies shall meet the following minimum standards:

1. Work shall not obstruct the upstream and downstream movement of fish. Temporary culverts shall be as nearly as possible, flush with the stream bed.
2. Sufficient flow of water shall be maintained at all times to sustain aquatic life downstream.
3. Any temporary culvert or diversion channel shall provide a "V" or "dish-shaped" channel, to concentrate flow during periods of low water and facilitates the movement of fish.

4. Disturbance of the stream bed shall be kept to an absolute minimum and the stream bed shall be returned, as nearly as possible, to its original condition, or better. (Where possible, in modifying a stream bed, the centerline shall be 8" to 12" lower than the toe of the channel bank, to concentrate the flow water.)

5. Where work necessitates disturbing banks, they shall be returned to original condition, or as shown on the Drawings. All tree and brush removal shall be kept to a minimum.

6. Any dike or cofferdam required to facilitate construction shall be erected in such a manner that stream flow will not be sufficiently reduced to endanger fish life downstream and such dike or cofferdam shall be erected of materials that will not contribute substantially to the turbidity or siltation of the stream.

7. During the project, care shall be taken to prevent or reduce to a minimum any damage to the stream from pollution by debris, sediment, of other material or from the manipulation of equipment and/or materials in or near such streams. Water that has been used for washing or processing, or that contains oils and sediments that will reduce the quality of water in the stream, shall not be directly returned to the stream. Such waters will be diverted through a settling basin, or filter before going into the stream.

8. If water is taken from a stream for construction purposes, and an impounding structure is necessary, such structure shall be erected in a manner causing the least possible disturbance to the stream.

B. Permits

1. The Owner has made application for necessary stream crossing permits required for this Contract. These permits will be issued to the Contractor who is awarded this Contract upon submission of satisfactory methods and timetable for construction of the stream crossings, and to insure compliance with the above standards.

2. For stream crossings not requiring permits, compliance with the above standards, to the extent applicable, will be required for stream crossings and work adjacent to water bodies in this Contract.

C. Restrictions on Construction

The following restrictions shall apply to all stream crossings:

1. Prior to any stream channel relocation, or other work that may affect the character or location of trout or other game fish waters, the Contractor will contact the Regional Supervisor of the New York State Department of Environmental Conservation to determine whether they wish to remove the fish or perform any other work. If any fish salvage or other protective measures are deemed necessary, the Contractor will cooperate with and coordinate his work with the Department of Environmental Conservation.

2. Prior to commencement of stream crossing operations, the Contractor shall submit construction drawings of each stream crossing to the Engineer for his approval. The drawings shall show the following information:

- a) Proposed methods of construction
- b) Details of sequences of construction
- c) Proposed methods for maintaining flows during construction operations
- d) Proposed methods for preventing damage to property in the event of sudden or heavy storms

3. The Contractor shall be responsible for the preservation of all stream banks within and adjacent to the limits of work.

4. Any stream bank disturbed by the Contractor's operations will be ripped or otherwise protected at the Contractor's expense as ordered by the Engineer.

5. When the top of excavation is within ten (10) feet of the top of any stream bank, the contractor shall provide protection for the stream bank at his own expense and as approved by the Engineer.

6. Additionally, for those streams classified C and D, which will be crossed by a sewer pipeline and/or the banks will be disturbed during the course of construction, the Applicant's project specifications shall contain the following information:

a. Prior to commencing work on the stream crossing and prior to commencing work on the banks of the stream, the construction Contractor shall contact the legal Regional Supervisor of Regulation and inform him of the impending work.

b. The construction Contractor will be advised by the local Regional Supervisor of Regulation of the procedures and conditions required to be following on making the stream crossing and/or working on the banks of the stream.

110. SITE SAFETY

The Contractor agrees to indemnify and hold harmless the Owner and Engineer and any of their officers, directors and employees from any and all claims, suits or judgments based upon damage to property or injury or death to persons arising out of, or connected with the work covered by the contract, regardless how it may be caused.

The Contractor shall provide site specific health and safety and contingency plans. The Contractor's personnel both supervision and workers shall be trained in the proper health/safety procedures. All safety equipment such as harnesses, protective clothing, respiratory, air monitoring, ventilating, etc for activities associated with construction/testing of the improvements shall be provided by the Contractor. The Contractor's methods and equipment shall be in full compliance with OSHA Standards.

The contract documents assign the prime contractor sole responsibility for job safety and required compliance to all Federal, State and Local safety requirements.

111. EXPOSIVES AND BLASTING

Explosives for blasting shall be stored, handled and used in accordance with the laws, ordinances, and regulations of the State of New York and all local regulations. Blasting shall be conducted so as not to endanger persons or property; and unless otherwise permitted, shall be covered or otherwise be satisfactorily confined. The Contractor shall be responsible for and shall make good any damage of whatever nature caused by blasting or accidental explosions.

The Contractor specifically agrees to comply with Sections 760 and 765 inclusive of the General Business Law of the State of New York, as follows:

ARTICLE 36 – CONSTRUCTION AND EXCAVATION

NEAR UNDERGROUND FACILITIES (NEW)

Sec.

- 760. Definitions
- 761. Notice requirements
- 762. Location of underground facilities
- 763. Duty of excavator
- 764. Penalties and liability
- 765. Separability

Section 760. Definitions

When used in this Article, the following terms, unless the context otherwise requires, shall have the following meanings:

1. “Person” means any individual, firm, corporation, association or partnership, cooperative association, joint venture, joint stock association, business trust, their lessees, trustees or receivers, governmental unit or public authority whether or not incorporated.
2. “Excavation” means an operation for the purposes of movement or removal of earth, rock or other materials in or on the ground by use of mechanized equipment or by blasting, and including auguring, backfilling, drilling, grading, plowing in, pulling in, trenching and tunneling; provided, however, that the movement of earth by tools manipulated only by human or animal power and the tilling of soil for agricultural purposes shall not be deemed excavation.
3. “Demolition” means the wrecking, razing, rending, moving or removing of any structure.

4. "Underground facilities" means pipelines, conduits, ducts, cables, wires, manholes, vaults or other such facilities or their attachments, which have been installed underground by an operator to provide his services or materials.

5. "Excavator" means a person who is engaged in a trade or business which includes, as a normal part thereof, the carrying out of excavation or demolition; provided, however, that an individual employed by an excavator, and having no supervisory authority, other than the routine direction of employees, over an excavation or demolition, shall not himself be deemed an excavator for the purposes of this Article.

6. "Operator" means a person who operates an underground facility or facilities to furnish any of the following services or materials; electricity, gases, steam, liquid petroleum products, telephone or telegraph communications, cable television, sewage removal, traffic control systems, or water.

7. "Damage" means an impact upon or removal of support from an underground facility consequent to excavation or demotion which, according to the operating practices of the operator, would necessitate repair of such facility.

8. "Notification system" means any organization among whose purposes is the dissemination to one or more operators of notification of construction activities in a specified area.

9. "Central registry" means the place where a written master list of operators of underground facilities is maintained by the local governing body of a town or city outside the City of New York or by a county within the City of New York for the purpose of providing to excavators a single source of identification of operators of underground facilities in such town, city or county.

Effective Date. L.1974, c.818, Section 6, provided that: "This Act (adding Sections 760 to 765 and repealing Section 322-2, and adding Sections 28-a and 28-b of the Labor Law) shall take effect immediately (June 7, 1974) provided, however, that the provisions of subdivision two of Section seven hundred sixty-one, and Sections seven hundred sixty-two, seven hundred sixty-three, and seven hundred sixty-four of the General Business Law, and Section twenty of the Labor Law as added by this Act, and Section five of this Act (repealing Section 322-a) shall take effect on April First Nineteen Hundred Seventy-Five."

Legislative Findings and Declarations. L.1974, C.818, Section, effective June 7, 1974, provided that: "The Legislature hereby finds and declares that there is a need to protect underground facilities from destruction or damage, in order to prevent death or injury to workers and the public, damage to private and public property or loss of essential services to the general public, which need has not been met adequately by existing law. The Legislature accordingly further finds it necessary to provide for appropriate notices to operators of underground facilities by persons proposing to excavate near such facilities or to demolish structures near to or containing such facilities; to provide for appropriate notices to operators when underground facilities are damaged; to provide for and encourage the establishment of "one call" notification

systems wherever feasible; to provide for certain other duties to safeguard life and property; and to prescribed penalties and remedies, including injunctive remedies, for violations of such duties.”

Section 761. Notice requirements

1. The local governing bodies of each of the towns or cities outside the City of New York and the counties within the City of New York shall establish a central registry of operators having underground facilities within their respective geographical jurisdiction. Each operator of such underground facilities shall notify, in writing, such central registry when it has such underground facilities within the geographical jurisdiction of such central registry. The central registry shall compile and maintain a master list of such operators as required herein, and shall, on request, furnish excavators, with a copy of such master list. The local governing bodies may charge a fee not to exceed five dollars for each master list of operators furnished.

2. No excavator shall commence or engage in any excavation or demolition unless and until he has served timely notice as provided in this Article to operators who maintain underground facilities in the town or city outside the City of New York, or county within the City of New York in which the excavation or demolition is to take place. Such notice shall be served in accordance with the rules and regulations promulgated by the Board of Standards and Appeals pursuant to Section twenty-eight of the Labor Law.

Added L.1974, c.818, Section 4

Effective Date. Section, except for subd. 2 effective June 7, 1974, and subd. 2 effective April 1, 1975, see note under Section 760.

Rules and Regulations

The New York State Board of Standards and Appeals may promulgate a rule requiring municipalities to publish in the official newspaper a notice to excavators of the establishment of a central registry of operators of underground facilities along with the address and telephone number of such registry. 1975, Op. Atty. Gen. Mar. 13.

Section 762. Location of underground facilities

1. Upon receipt of the notification provided for by this Act and pursuant to the rules and regulations promulgated by the Board of Standards and Appeals pursuant to Section twenty-eight of the Labor Law, an operator shall advise the excavator of those of its underground facilities that will be affected by the proposed excavation or demolition.

2. The operator shall designate the location of its underground facilities in the manner and during the time period set forth in the rules and regulations promulgated by the Board of Standards and Appeals pursuant to Section twenty-eight of the Labor Law.

3. Prior to any excavation or demolition, the excavator shall verify the precise location of the underground facilities in a manner set forth in the rules and regulations promulgated by the Board of Standards and Appeals pursuant to Section twenty-eight of the Labor Law.

L.1974, c.818, Section 4.

Effective Date. Section effective April 1, 1975 see note under Section 760.

Section 763. Duty of excavator

1. An excavator engaged in excavation, or demolition shall provide support to and prevent damage to any underground facility or its protective coating in the means set forth in the rules and regulations promulgated by the Board of Standards and Appeals pursuant to Section twenty-eight of the Labor Law.

2. In the event of damage to an underground facility, the excavator shall immediately notify the operator of the facility and no backfilling shall be done by the excavator until repairs have been made by the operator. In the event of an electrical short or the escape of gas or hazardous fluids endangering life, the excavator shall immediately notify all persons who might be endangered and assist in their evacuation.

Added L.1974, c.818, Section 4.

Effective Date. Section effective April 1, 1975, see note under Section 760.

Section 764. Penalties and liabilities

1. Failure to comply with any provision of this Article shall subject an excavator or an operator to a civil penalty of up to five hundred dollars for the first violation and up to an additional five thousand dollars for each succeeding violation which occurs in connection with the entire self same excavation or demolition activity within a two month period.

2. The penalties provided for by this Article shall not apply to an excavator who damages an underground facility due to the failure of the operator to comply with any of the provisions of this article nor shall in such instance, the excavator be liable for repairs as prescribed in subdivision seven of this Article.

3. An action to recover a penalty under this Article may be brought in the Supreme Court in the judicial district in which the violation was alleged to have occurred which shall be commenced and prosecuted by the Attorney General. All monies recovered in any such action, together with the costs thereof, shall be paid into the State Treasury to the credit of the general fund.

4. An excavator or an operator who willfully and knowingly causes or participates in a violation of this Article is deemed guilty of a violation, and on conviction thereof is punishable

by a fine of not less than one hundred dollars not more than one thousand dollars for each such offense. These penalties are in addition to any civil liability.

5. Nothing in this Act shall impair, limit or reduce the statutory, common law or contractual duties or liability of any excavator excavating or demolishing in the vicinity of underground facilities.

6. Any excavator engaging in or proposing to engage in excavation or demolition in a negligent or unsafe manner, which has resulted in or is likely to result in damage to underground facilities in such a manner that life, property or the continuation of operator service is endangered, may be enjoined from such excavation or demolition or any aspect thereof upon application of the operator owning the facilities or the Attorney General made in Supreme Court having jurisdiction in the County wherein the excavation or demolition or proposed excavation or demolition is to take place. Three or more instances of damage by an excavator to underground facilities in the course of the entire self same excavation or demolition activity shall be prima facie grounds for enjoining the excavator from further performance of the excavation or demolition activity.

7. In the event that, as a result of a violation of any of the provisions of this Article by an excavator, it is necessary that an operator make any repair to or provide new support to an underground facility, the excavator shall be liable to the operator for reasonable costs to incurred.

Added L.1974, c.818, Section 4

Effective Date. Section effective April 1, 1975, see note under Section 760.

Section 765. Separability

If any provision of this Article or the application thereof to any person or circumstances is held invalid, the remainder of the Article and the application of such provision to other persons or circumstances shall not be affected thereby.

Added L.1974, c.818, Section 4.

Effective Date. Section effective June 7, 1974, see note under Section 760.

112. OSHA REQUIREMENTS FOR SHORING OF TRENCH EXCAVATIONS

The Contractor shall comply fully with OSHA 29 CFR Parts 1926, Subpart P, as it may be amended, and with the following Memoranda as issued by Louis L. Levine, Industrial Commissioner of the State of New York Department of Labor. In cases where the standards may overlap, the more stringent procedure will govern.

TO: Construction Employers in New York State
RE: Requirements for Shoring of Trench Excavations
DATE: December 8, 1971

"In the past few years, accidents involving the collapse of unshored sides of excavations such as trenches for water and sewer lines have caused serious injuries or death. The increasing frequency of this type of accident points up the need for increased emphasis to be placed on the problem by the construction industry.

Industrial Code Rule 2/3, which contains standards for the safety of construction and demolition employees, specifies detailed requirements for shoring and sheeting of trenches and similar excavations. This rule, which is promulgated by the Board of Standards and Appeals, requires shoring, sheeting or equivalent protection for an employee working in any excavation which has a bank or side more than five feet high above his footing (see Section 23.8).

The U.S. Department of Labor has also promulgated Safety and Health Regulations for Construction pursuant to the 1970 Occupational Safety and Health Act (OSHA). The standards were published in the Federal Register of April 17, 1981. Section 1518.652, General Trenching Requirements, requires that sides of trenches in unstable or soft material, four feet or more in depth shall be shored, sheeted, braced, sloped or otherwise supported by means of sufficient strength to protect employees working within them.

Under an Interim Agreement with the U.S. Department of Labor executed pursuant to Section 18(h) of OSHA, construction employers are required to comply with the most stringent rule or standard due to dual or concurrent State-Federal jurisdiction. In the case of trench shoring, the Federal rule is more stringent and must be followed. It is important to note also that under Section 17(e) of OSHA, a willful violation of any standard, rule or order promulgated pursuant to the Act causing death to any employee, shall, upon conviction, be punished by a fine or not more than \$10,000 or by imprisonment for not more than six months or by both.

It is the position of the Department of Labor that employers should be kept advised of both Federal and State laws and regulations dealing with occupational health and safety, in particular, during the life of the Interim Section 18(h) Agreement.

If a plan is submitted by the State to the U.S. Department of Labor to assume permanent and exclusive responsibility for construction safety standards and enforcement pursuant to Section 18(b) of OSHA, it is more than likely that the Board of Standards and Appeals will be required to amend Code Rule 23 requirements for trench shoring to be as effective as the Federal standards.

For further information on this subject, please contact my office or the Board of Standards and Appeals.

/s/ Louis L. Levine
Industrial Commissioner"

TO: Construction Employers in New York State
RE: Amended U.S. Department of Labor (OSHA)
Trench Shoring Standards
DATE: March 29, 1972

"On December 8, 1971, I issued a memorandum to New York State construction employers spelling out differences in State and Federal (OSHA) requirements for shoring of trench excavations under existing dual State-Federal jurisdiction.

As a result of a proceeding to amend the OSHA construction standard regarding trench shoring, published in the Federal Register on September 28, 1971, George C. Guenther, Assistant Secretary of Labor, received comments indicating that difficulties and hardships were imposed on the construction industry by the requirement to shore shallow trenches less than five feet in depth. After viewing the arguments and data, the Secretary of Labor issued an amended standard for trench shoring, which requires shoring to begin at a depth of five rather than four feet. The standard, as amended, was published in the Federal Register of February 17, 1972 (see Parts 1926.651 and 1926.652) and will be effective on March 17, 1972.

The Chairman of the Board of Standards and Appeals, Harry R. Mason, has advised me that the Board will substantially follow the amended Federal trench shoring standards in the amendment of Code Rule 23, the construction code, which is in the final stages of adoption. Existing Rule 23 requires trench shoring at a five foot depth. It is expected that the amended Rule 23 will be effective May 1, 1972, and will be available about April 1, 1972.

I bring these comments to your attention to assist you in becoming aware of the revisions in the Secretary's requirements. However, I wish to stress the point I made in my earlier memorandum: the increasing frequency of accidents resulting from the collapse of unshored sides of excavation underscores the need for increased emphasis, by the construction industry, on practices that eliminate circumstances leading to serious and fatal accidents.

If you desire any further information on this subject, please contact my office or the Board of Standards and Appeals.

/s/ Louis L. Levine
Industrial Commissioner"

113. OSHA REQUIREMENTS FOR CONFINED SPACE ENTRY

The Contractor specifically agrees to comply fully with the rules and regulations as stated in OSHA 29 CFR, Parts 1910, as it may be amended. The Contractor will establish and implement a Confined Space Program which will adhere fully with the requirements. The Contractor will be solely responsible for his established Confined Space Program and the coordination of such with his subcontractors. Where there is more than one Prime Contractor on a project, each Prime Contractor will be required to coordinate entry operations with the other Contractors when the employees of more than one contractor are working simultaneously within a Confined Space Area.

If the Owner should question a method utilized in the Contractor's Confined Space Program, the Contractor will be required to obtain a written response from OSHA which will determine if the procedure does or does not satisfy the requirements of OSHA 29 CFR Parts 1910. Failure by the Contractor to undertake the necessary steps to produce a written response from OSHA will delay the processing of the monthly payment estimate(s).

The Contractor shall complete the Confined Space Program Certification in the Proposal section when submitting their bid, certifying that the Contractor has established a Confined Space Program which conforms to OSHA 29 CFR Part 1910 and that full implementation of the Contractor's Confined Space Program is a requirement of this Contract.

114. FIELD QUALITY CONTROL

Where so designated in the Specifications for equipment items, the manufacturer or supplier will furnish the services of experienced and appropriate personnel to perform the following:

A. Field supervision during installation or inspection upon completion of installation. The manufacturer shall then file in quadruplicate with the Engineer, a certificate on the manufacturer's stationary stating that the equipment has been properly installed in accordance with the manufacturer's recommendations and that the trial operation has been satisfactory. The amount of time and the number of mandays shall be sufficient to accomplish the work as required dependent upon the type of equipment or system.

B. Equipment start-up and operating/maintenance instruction to the Chief Operator of the plant, in conjunction with plant start-up. The amount of time and the number of mandays shall be sufficient to accomplish the work as required dependent upon the type of equipment or system.

C. Follow-up assistance on maintenance and operation to assure that the Chief Operator of the plant or his designated party properly understands the required maintenance. This work is to be performed between 2 months and 6 months after the equipment or system has been accepted by the Owner and shall all be for 1 trip or 1 day minimum.

115. CROSS WITHHOLDING PROVISION

THE OWNER RESERVES THE RIGHT TO WITHHOLD MONEY FROM THE CONTRACTOR ON THIS CONTRACT FOR WORK NOT PERFORMED BY THE CONTRACTOR ON OTHER OUTSTANDING CONTRACTS WITH THE OWNER.

116. CONSTRUCTION SITE SAFETY

The Contractor is solely responsible for all site safety. The Contractor's equipment and methods of operation shall be in full compliance with OSHA Standards and satisfy all Federal, State and Local Health and Safety Regulations. The Contractor will be solely responsible for his safety program and the coordination of such with his employees and subcontractors.

SPECIFIC CONTRACT CONDITIONS

GENERAL

The following paragraphs in the Specific Contract Conditions add to, modify, delete or in other ways alter the provisions of the General Contract Conditions. All paragraphs in the Specific Contract Conditions numbered between 1 and 116 relate to the corresponding paragraph in General Contract Conditions.

9. QUANTITIES AND AMOUNTS OF WORK

Replace Item No. 9 of the General Contract Conditions with the following:

“Work under this Contract shall be completed at the assigned unit price listed for each of the Scheduled Payment Items proposed by the Contractor, and shall constitute full compensation for all work completed under the Contract. Work under this Contract shall be ordered by an authorized written Work Order. Work Orders will be assigned at a minimum amount of \$100,000 each. There is no guarantee as to the quantity of work to be performed under this contract.

The Owner reserves the right to delete or add to such amounts or items of work from this Contract as may be necessary to finance the project from available funds.

The work included under each bid item is described in the Detailed Specifications. The quality of workmanship and materials entering into the work shall conform to the requirements of the pertinent provisions and sections of these Specifications.”

11. CONTRACT DRAWINGS AND SPECIFICATIONS

Replace Item No. 11 of the General Contract Conditions with the following:

“After the Contract has been executed, the Contractor will be furnished free of cost five (5) sets of the Contract Documents. Additional copies of the Contract Documents, if available, will be furnished to the Contractor at the cost of reproduction.

The Contractor shall furnish each of his/her subcontractors, manufacturers and material persons, such copies of the Contract Documents as may be required for his/her work.

Five copies of each authorized written Work Order showing the full extent of the work will be provided to the Contractor after execution.”

12. CHECKING PLANS

Replace Item No. 12 of the General Contract Conditions with the following:

“All figures and dimensions on the authorized written Work Orders shall be carefully checked by the Contractor, who shall note all discrepancies. The Contractor will be held responsible for any errors not discovered before the work has been executed. In case errors are found, these shall be immediately reported to the Engineer who will instruct the Contractor as to the method of correcting them. The Contractor shall not alter Specifications, Drawings, or figures, nor make any alternations in or additions to the quantity, character or arrangements of the materials or work, whether same shall involve additional expense or not, unless same shall be agreed upon first, in writing, as provided for herein; this provision, however, shall not abridge in any way the Engineer’s rights as to the interpretation of the Specifications, Plans and figures thereon. The Contract Documents and authorized written Work Orders are complementary and what is called for by either shall be as binding as if called for by both. In all cases figures dimensions shall take precedence over scaled dimensions, and the larger scale details shall take precedence over smaller scale drawings.”

13. PLANS AND SPECIFICATIONS: INTERPRETATIONS

Replace Item No. 13 of the General Contract Conditions with the following:

“The Contractor shall keep at the site of the work, one (1) copy of the Contract Documents and applicable written Work Orders, signed and identified by the Engineer, and shall at all times give the Engineer and other representatives of the Owner access thereto.

Anything shown on the authorized written Work Order and not mentioned in the Specifications, or mentioned in the Specifications and not shown on the authorized written Work Order, have the same effect as if shown or mentioned, respectively, in both. In case of any conflict or inconsistency between the Work Order and Specifications, the Specifications shall govern. Any discrepancy between the Specifications and Work Order shall be submitted by the Contractor to the Engineer. The Engineer shall in all cases determine the amount of quantity of the several kinds of work and the quality of materials which are to be paid for under this Contract; he/she shall determine all questions in relation to the work and the construction thereof, and in all case decide every question which may arise relative to the performance of the work covered by this Contract on the part of the Contractor. Any doubt as to the meaning of these Contract Documents and Work Orders, or any obscurity as to the wording of them, will be explained by the Engineer and all directions and explanations requisite or necessary to complete, explain or make definite any of the provisions of these Contract Documents and give them due effect, will be given by the Engineer, in writing.

The Engineer will, within a reasonable time after presentation to him/her, make decisions, in writing, on all matters relating to the interpretation of the Contract Documents.”

15. RECORD DRAWINGS

Delete this section from the contract requirements.

63. FIELD OFFICES

Delete Item No. 63 of the General Contract Conditions in its entirety.

64. PROJECT SIGN

Delete Item No. 64 of the General Contract Conditions in its entirety.

78. CONSTRUCTION SCHEDULE

Replace Item No. 78 of the General Contract Conditions with the following:

“Within 5 days of execution of a Work Order, the Contractor on the project shall submit to the Engineer for review his/her own proposed construction schedule showing the estimated date of starting and completing each stage of the work. If so required by the Engineer, the schedule shall be revised.

The Contractor shall adhere to the reviewed work schedule. In the event a Contractor does not adhere to his/her work schedule and causes damages, the Contractor causing the delay shall save the Owner and Engineer harmless from all actions and charges of the other Contractors against the Owner or Engineer caused by said delay. The Engineer shall make such changes in the construction schedule as he/she may deem necessary.

Any additional engineering services required due to failure to complete the work according to schedule and within the time of completion allowed or required overtime to make up lost time, will be paid by the Contractor as stated in Paragraph 36 ADDITIONAL ENGINEERING SERVICES of the General Contract Conditions.

Failure to progress the work in accordance with the schedule submitted and accepted by the Engineer may at the discretion of the Engineer be construed as a failure to comply with the terms of the Contract and the owner may thereupon cancel the Contract in accordance with Paragraph 100 of the General Contract Conditions.

The construction schedule shall be reviewed monthly and updated if required.”

88. GUARANTEE AND MAINTENANCE, AND ONE-YEAR CORRECTION PERIOD

Replace paragraph F of item No. 88 with the following:

F. The liner shall be certified by the manufacturer for specified material properties. The manufacturer warrants the liner to be free from defects in raw materials for five (5) years from the date of delivery. The Contractor shall warrant the liner installation for an additional four (4) years beyond the one (1) year period included under the Performance Bond, for a total warranty of (5) years. The additional four (4) year warranty period will not require a surety bond. During the warranty period, any defects which affect the integrity or strength of the pipe shall be repaired at the Contractor's expense in a manner mutually agreed by the Owner and the Contractor.

89. SURETY BONDS

Replace Item No. 89 of the General Contract Conditions with the following:

"The Contractor shall furnish and pay for surety bonds each in the amount at least equal to \$500,000 as security for the faithful performance of the Contract and for the payment to all persons performing labor and furnishing materials in connection with the Contract. The surety shall be in such form or forms as the Owner may prescribe and with such sureties as he may approve."

SECTION 01010 – WORK UNDER THIS CONTRACTPART I – GENERAL DESCRIPTION OF WORK1.01 LOCATION OF WORK

A. The contract is located in Erie County, New York. Erie County Sewer District Nos. 1, 2, 3, 4, 5, 6, and 8. All work shall be performed within existing easements and public highway right-of ways.

1.02 SCOPE OF WORK

A. The work includes cured-in-place pipe lining and associated/appurtenant services for existing 8-inch, 10-inch, 12-inch, 15-inch, 18-inch, and 21-inch diameter sanitary and storm sewers; spot repairs that may be required at unknown locations to remove or repair obstructions to allow the cured-in-place pipe lining; re-establishment of all active lateral connections; bypass pumping of existing sewer flows; maintenance and protection of traffic; all necessary restoration and all other related work as indicated in the Contract Documents and Specifications.

B. Quantities provided in the Proposal section are anticipated quantities for the purpose of determining a low bidder. Actual quantities assigned can vary. Work will be conducted on an assigned Work Order basis over the term of this Contract as described in the following section.

1.03 WORK ORDERS

A. Individual work orders will be issued for a minimum anticipated cost of work of one hundred thousand dollars (\$100,000) based on bid unit prices. Each Work Order will include a description of the location, size, and estimated length of sewers to be lined.

B. The entire Work Order shall be completed within 120 days of the notice to proceed date stated in the Work Order. If the completion date of the Work Order extends beyond the time of this Contract, the terms of this Contract shall be extended to the completion of the Work Order.

C. In general, the County will target April and August for issuing a set of Work Orders from each Sewer District. Additional Work Orders may be issued intermittently throughout the year as needed.

PART II – PRODUCTS – NOT USED

PART III – EXECTIONS

3.01 GENERAL

A. The Contractor shall furnish all labor, tools, materials, equipment, supervision and incidentals and shall do all work as issued on the Work Orders and as described in the Contract Documents, as specified, and as directed by the Engineer, tested in place and ready for use, in accordance with the obvious and expressed intent of the Contract to secure a complete installation. In general, the work to be performed under each Bid Item is described in the following sections.

B. The quality of workmanship and materials entering into the work shall conform to the requirements of the pertinent sections, clauses, paragraphs and sentences, both directly and indirectly applicable thereto, in these Specifications, whether or not direct reference to such occurs in the Bid Items.

D. All items hereinafter listed in the Descriptions of Bid Items are described in detail in other Sections of these Specifications.

SECTION 01020 – DESCRIPTION OF BID ITEMS

PART I – BID ITEM NOS. 1A THROUGH 1F – 8-INCH TO 21-INCH DIAMETER CURED-IN-PLACE PIPE LINING

1.01 SCOPE OF WORK

A. The Contractor shall furnish all labor, tools, materials, equipment, supervision and incidentals required to rehabilitate existing 8-inch, 10-inc, 12-inch, 15-inch, 18-inch, and 21-inch diameter gravity sanitary sewer lines, manhole to manhole (total length), using cured-in-place pipe (CIPP) lining methods at the locations noted in authorized written Work Orders.

B. The Work under this Item includes, but is not limited to, the following:

1. Reviewing existing data provided by Owner to determine the Contractors ability to complete CIPP lining on the proposed section.
2. Protection of existing utilities.
3. Protection of traffic.
4. Required permits and fees.
5. Mobilization/demobilization to/from locations specified in the Work Orders.
6. Bulkheading and plugging of sewers, bypass piping, and bypass pumping systems.
7. Initial cleaning of sanitary sewers, including removal and disposal of sediment, root intrusions, and debris.
8. Internal video inspection of cleaned sanitary sewers, including preparation of video logs and recording location of all sanitary sewer lateral connections, pipe defects, and blockages prior to lining work.
9. Review of video and video logs and preparation of a report by Contractor to identify and document any necessary spot repairs or other defects that would inhibit proper lining of a sewer line section. Submit all video along with a report detailing any defect findings and recommendations to repair corresponding defects in writing for County review and approval prior to proceeding with lining work.
10. Furnishing, installing, curing, and testing new pipe liners.
11. Final video inspection of lined sanitary sewers after reinstatement of lateral connections.
12. All necessary cleaning and flushing of new cured-in-place pipe.

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13. Sealing the new liner pipe at the manhole terminations.
14. Furnishing of water for flushing, liner curing, and other operations and proper disposal of used water upon completion of work.
15. All other work items included in the Contract Documents necessary to complete the project as a whole and which is not specifically included under the other Items of the Contract shall be included under this Item.

Reinstating of active sanitary sewer lateral connections shall be measured and paid under Item 2 of this Contract. Grouting/sealing of active sanitary sewer lateral connections to the new liner, if requested by the Owner, shall be measured and paid under Item 3 of this Contract.

Sewer lines determined by the Engineer, after review of Contractor's initial video and recommendations, to require too many repairs or to otherwise not be suitable for lining will be removed from the lining list prior to Contractor ordering materials and work completed will be paid for under Bid Item 5.

1.02 MEASUREMENT AND PAYMENT – BID ITEM NOS. 1A THROUGH 1F

A. Measurement for payment shall be the linear footage of the alignment of finished work measured at grade from the center of manhole to center of manhole over the rehabilitated pipe, as directed and approved by the Engineer for payment.

B. Payment will be calculated as the product of the Scheduled Payment Item and the quantity of work completed (as approved by the Engineer) and shall constitute full payment for all work completed under this Item.

C. Payment shall be made incrementally with the following percentages applied to the amount calculated in paragraph 1.02.B at the approved completion of the corresponding tasks as follows:

- a. 25% - initial field investigation, sewerline cleaning, and submittal of pre-lining video, report, recommendations, and written confirmation that the pipe segment is suitable for CIPP lining.
- b. 50% - completion of liner installation and reinstatement of lateral connections.
- c. 15% - submittal of post-lining video.
- d. 10% - submittal of acceptable liner sample material testing results.

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PART II – BID ITEM NO. 2 – REINSTATE LATERAL CONNECTIONS TO NEW CURED-IN-PLACE PIPE LINER

2.01 SCOPE OF WORK

A. The Contractor shall furnish all labor, tools, materials, equipment, supervision and incidentals required to reinstate active sanitary sewer lateral connections to the new cured-in-place pipe liner.

B. The Work under this Item includes, but is not limited to, the following:

1. Mobilization/demobilization.
2. Protection of existing utilities.
3. Protection of traffic.
4. Required permits and fees.
5. Bulkheading and plugging of sewers, bypass piping, and bypass pumping systems not necessary under other Items.
6. Cleaning as necessary for proper reinstatement of active lateral connections.
7. Establishing a smooth edge for sanitary sewer lateral reconnections with wire wheeled brushes or other approved method.
8. All other associated/appurtenant services required to complete the work under this Item.

2.02 MEASUREMENT AND PAYMENT – BID ITEM NO. 2

A. Measurement for payment shall be the actual number of active sanitary sewer lateral connections successfully reinstated in the locations where a new cured-in-place liner has been installed, as directed by the Engineer and approved by the Engineer for payment.

B. Payment will be calculated as the product of the Scheduled Payment Item and the quantity of work completed (as approved by the Engineer) and shall constitute full payment for all work completed under this Item.

PART III – BID ITEM NO. 3 – CHEMICAL GROUTING OF ACTIVE LATERAL CONNECTIONS TO NEW CURED-IN-PLACE PIPE LINER

3.01 SCOPE OF WORK

A. The Contractor shall furnish all labor, tools, materials, equipment, supervision and incidentals required to grout/seal active sanitary sewer lateral connections to the

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new cured-in-place pipe liner along the sanitary sewer lines noted in authorized written Work Orders.

B. The Work under this Item includes, but is not limited to, the following:

1. Mobilization/demobilization.
2. Protection of existing utilities.
3. Protection of traffic.
4. Required permits and fees.
5. Bulkheading and plugging of sewers, bypass piping, and bypass pumping systems not necessary under other Items.
6. Cleaning as necessary for proper grouting of active lateral connections.
7. All means, methods, and equipment necessary to test and seal the joints between the new cured-in-place pipe liner and the active lateral connection to a minimum distance of 2'-0" up the sanitary sewer lateral.
8. Video inspection of completed work.
9. All other associated/appurtenant services necessary to complete the work under this Item.

3.02 MEASUREMENT AND PAYMENT – BID ITEM NO. 3

A. Measurement for payment shall be the actual number of active sanitary sewer lateral connections successfully grouted/sealed in place (defined as those passing final testing to insure the sealing of the joint) in the locations where a new cured-in-place liner has been installed, as directed by the Engineer and approved by the Engineer for payment.

B. Payment will be calculated as the product of the Scheduled Payment Item and the quantity of work completed (as approved by the Engineer) and shall constitute full payment for all work completed under this Item.

PART IV – BID ITEMS NO. 4A THROUGH 4F – CURED-IN-PLACE SPOT REPAIR (SHORT LINER)

4.01 SCOPE OF WORK

A. The Contractor shall furnish all labor, tools, materials, equipment, supervision and incidentals required install Cured-in-Place short liners up to 10-feet in length to repair unknown deficiencies in a sanitary or storm pipe at unknown locations discovered during inspection by the contractor and determined necessary to allow the Cured-in-Place Pipe Lining under Bid Item No. 1. Each short liner installation shall be approved in writing by the Owner/Engineer prior to commencement of work.

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B. The Work under this Item includes, but is not limited to, the following:

1. Mobilization/demobilization.
2. Protection of existing utilities.
3. Protection of traffic.
4. Required permits and fees
5. Bulkheading and plugging of sewers, bypass piping, and bypass pumping systems not necessary under other Items.
6. Cleaning as necessary for proper installation.
7. Furnishing, installing, and curing of the Short Liner.
8. Video inspection of the completed work.
9. All other associated/appurtenant services required to complete the work under this Item.

4.02 MEASUREMENT AND PAYMENT – BID ITEM NO. 4A THROUGH 4F

A. Measurement for payment shall be the actual number of short liners installed, as directed by the Engineer and approved by the Engineer for payment.

B. Payment will be calculated as the product of the Scheduled Payment Item and the quantity of work completed (as approved by the Engineer) and shall constitute full payment for all work completed under this Item.

PART V – BID ITEM NOS. 5A & 5B – CLEAN AND TELEVISION EXISTING SEWER

5.01 SCOPE OF WORK

A. The Contractor shall furnish all labor, tools, materials, equipment, supervision and incidentals required to clean existing 8-inch thru 21-inch gravity sanitary or storm sewer lines to remove dirt, grease, rocks, sand, tree roots and other deleterious materials and obstructions from the sewer in preparation of and to facilitate television inspection; internal video inspection of cleaned sanitary sewers; preparation of condition assessment report to be provided along with video. The unit price per linear foot as stated in the proposal under Bid Item No. 4 shall include but not be limited to the following:

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1. Mobilization/demobilization to/from locations specified in the Work Orders.
2. Protection of existing utilities.
3. Protection of traffic.
4. Required permits and fees.
5. Bulkheading and plugging of sewers, bypass piping, and bypass pumping systems.
6. Cleaning of sanitary sewers, including removal and disposal of sediment, root intrusions, and debris.
 7. Internal video inspection of cleaned sanitary sewers, including preparation of video logs and recording location of all sanitary sewer lateral connections, pipe defects, and blockages.
 8. Review of video and video logs and preparation of a report by Contractor to identify and document any necessary spot repairs, protruding lateral connections, or any other defects that would inhibit proper lining of a sewer line section.
 9. Submit all video along with a report detailing any defect findings and recommendations to repair corresponding defects.
 10. All other associated/appurtenant services required to complete the work under this Item.

5.02 MEASUREMENT AND PAYMENT – BID ITEM NO. 5A & 5B

A. Measurement for payment shall be the actual linear footage from the center of manhole to center of manhole along the centerline of pipe section as order by the Engineer and approved by the Engineer for payment. In cases where video inspection of an entire section is not possible due to collapse or obstruction that cannot be removed by flushing or root cutting, measurement for payment shall be the actual lineal footage televised as determined from submitted video and approved by the Engineer for payment.

B. Payment will be calculated as the product of the Scheduled Payment Item and the quantity of work completed (as approved by the Engineer) and shall constitute full payment for all work completed under this Item.

PART VI – BID ITEM NOS. 6A THROUGH 6J – OPEN CUT SEWER SPOT REPAIR (VARIOUS DEPTHS)

6.01 SCOPE OF WORK

A. The Contractor shall furnish all labor, tools, materials, equipment, supervision and incidentals required to excavate and replace 8-inch thru 21-inch diameter gravity

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sanitary sewer pipe at unknown locations discovered during inspection by the contractor and determined necessary to allow the cured in place pipe lining under Bid Item No. 1, each excavation for obstruction removal shall be approved in writing by the Engineer prior to the commencement of work.

B. The Work under this Item includes, but is not limited to, the following:

1. Mobilization/demobilization.
2. Protection of existing utilities.
3. Required permits and fees.
4. Bulkheading and plugging of sewers, bypass piping, and bypass pumping systems.
5. Saw cutting, excavation at all depths, temporary sheeting/shoring, dewatering of pipe trench, etc.
6. Removal and disposal of existing piping.
7. Furnishing and installing new polyvinyl chloride (PVC) sanitary sewer piping at all depths, including necessary pipe coupling systems to connect to existing sewer pipes.
8. Reconnection of affected sewer laterals, including new wye connections and riser pipes as needed within the spot repair.
9. Pipe bedding, select fill under paved areas, backfilling and compaction.
10. Internal video inspection, where required.
11. All necessary cleaning, flushing, and testing of repair.
12. All other associated/appurtenant services required to complete the work under this Item.

C. Payment for final surface restoration including, but not limited to, curbing, pavement, concrete, grading, and/or seeding is not included in this bid item. This restoration shall be covered and paid under Item 8 of this Contract.

6.02 MEASUREMENT AND PAYMENT – BID ITEM NO. 6A

A. Measurement for payment shall one per open cut spot repair, regardless of the final length of the spot repair.

B. Payment will be calculated as the product of the Scheduled Payment Item and the quantity of work completed (as approved by the Engineer) and shall constitute full payment for all work completed under this Item.

6.03 MEASUREMENT AND PAYMENT – BID ITEM NOS. 6B THROUGH 6J
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A. The applicable bid item shall be determined based on the depth measured as the distance from the pipe invert to the existing surface. Measurement for payment shall be the number of linear feet of pipe replaced and placed into service, as directed by the Engineer and approved by the Engineer for payment. Minimum measurement shall be ten (10) linear feet per open cut repair.

B. Payment will be calculated as the product of the Scheduled Payment Item and the quantity of work completed (as approved by the Engineer) and shall constitute full payment for all work completed under this Item.

PART VII – BID ITEM NOS. 7A THROUGH 7I – SURFACE RESTORATION AFTER OPEN CUT SEWER SPOT REPAIR

7.01 SCOPE OF WORK

A. The Contractor shall furnish all labor, tools, materials, equipment, supervision and incidentals required to restore pavement, concrete and unpaved disturbed areas to pre-construction conditions.

B. The Work under this Item includes, but is not limited to, the following:

1. Mobilization/demobilization.
2. Protection of existing utilities.
3. Protection of traffic.
4. Required permits and fees.
5. Removal and disposal of debris.
6. Surface grading, raking, compaction.
7. Road cutbacks, milling, paving, etc. as required.
8. Replacement of concrete drives, sidewalks, curbing.
9. All other associated/appurtenant services required to complete the work under this Item.

7.02 MEASUREMENT AND PAYMENT – BID ITEM NOS. 7A THROUGH 7G

A. Measurement for payment shall be the actual square feet of restoration completed as measured and agreed to by Contractor and Owner's Inspector and as governed by pay limits specified in contract documents and details.

B. Payment will be calculated as the product of the Scheduled Payment Item and the quantity of work completed (as approved by the Engineer) and shall constitute full payment for all work completed under this Item.

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7.03 MEASUREMENT AND PAYMENT – BID ITEM NOS. 7H & 7I

A. Measurement for payment shall be the number of linear feet of curbing or gutter restoration completed.

B. Payment will be calculated as the product of the Scheduled Payment Item and the quantity of work completed (as approved by the Engineer) and shall constitute full payment for all work completed under this Item.

PART VIII – BID ITEM NO. 8 – CONTINGENT ITEMS

8.01 SCOPE OF WORK

A. The Contractor shall furnish all labor, tools, materials, equipment, supervision and incidentals required to perform unspecified additional work as determined and authorized by Owner. An allowance of \$5,000 per Work Order has been established in this contract for Contingent Items.

8.02 MEASUREMENT AND PAYMENT – BID ITEM NO. 8

A. Measurement for payment shall be the actual work performed and approved for payment by Owner.

B. Total payment for this item shall be based on the preapproved negotiated costs for the type and actual amount of unspecified work performed and approved by Owner for payment.

SECTION 02380 – SPOT REPAIR OF SANITARY SEWERS

PART I – GENERAL

1.01 SCOPE OF WORK

A. Furnish all labor, materials, equipment and incidentals required, and install in the locations and to the extent shown in various Work Orders, all sanitary sewer piping, fittings, piping appurtenances, restoration, and other associated services as specified herein.

1.02 SUBMITTALS

A. The Contractor shall submit a complete set of shop drawings as specified in the General Contract Conditions (Item GCC-17). A shop drawing will be required for all fabricated and/or manufactured material items required by the specifications for this project.

PART II – PRODUCTS

2.01 POLYVINYL CHLORIDE (PVC) GRAVITY PIPE

A. Pipe

1. For pipe diameters 4" thru 15", the polyvinyl chloride (PVC) pipe shall be a single wall pipe conduit as manufactured in accordance with the latest American Society for Testing and Materials (ASTM) Specification D-3033 "Type PSP Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings" or ASTM Specification D-3034 "Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings". All pipe shall be SDR-35 or thicker single wall and the PVC Compound shall meet the requirements of the latest ASTM Specification D-1784. Pipe in compliance with these standards shall be clearly marked with pipe size (nominal), cell classification, SDR number, PVC Sewer Pipe and ASTM Designation.

B. Pipe Joints

1. The joint shall provide a permanent seal against exfiltration or infiltration. The joining technique will be with elastomeric gasket.

2. Elastomeric Gasket Joints – The critical sealing dimensions of the bell, spigot and gasket shall be in accordance with the manufacturer's standard dimensions and tolerances. The elastomeric compound shall comply in all respect with the physical requirements specified in ASTM F-477-76. The gasket shall provide an adequate compressive force against the sealing surfaces of the bell and spigot so as to effect a positive seal under all combinations of the joint tolerances. The gasket shall be the only element depended upon to make the joint flexible and watertight. The gasket material shall be oil and gasoline resistant.

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C. Pipe Fittings

1. All PVC wyes, tees and elbows shall be manufactured in classes suitable for the class of pipe with which they will be used.

D. Pipe Coupling System

1. Where new PVC piping will be connecting to existing sewers, the gaskets, clamps, shear rings, and/or other components of the coupling system shall meet the material requirements of ASTM C-1173 “Standard Specification for Flexible Transition Couplings for Underground Piping Systems”. The coupling system shall be specifically manufactured to connect the new PVC piping to the particular existing pipe material, such as Fernco, Inc. 5000 Series Strong Back (RC) Couplings, or approved equal.

2.02 DEWATERING EQUIPMENT

The Contractor shall provide all pumping equipment, pipe, stone, fabric, machinery and other necessary items required to operate and maintain the dewatering system throughout the construction of the project.

2.03 FILL AND ASSOCIATED MATERIALS

A. Earth Fill

1. Earth fill shall be fine loose material from the excavations, free from trash, frozen lumps, organic substances, rocks over 4 inches in diameter or other materials which cannot be properly compacted. Physical properties shall be such that it can be readily spread and compacted.

B. Select Granular Backfill

1. For pipe fill

a. Select granular backfill (select fill) shall be run of crusher stone or run of crusher gravel meeting the requirements of the New York State Department of Transportation Specifications, latest edition, material designation 304-2.02, Type 4.

C. Pipe Bedding Materials

1. Crushed stone for bedding pipe shall meet all the requirements of New York State Department of Transportation Specifications, latest edition, material designation

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703-0201. Pipe bedding materials shall consist of clean, durable, sharp angled fragments of rock of uniform quality. Crushed stone for bedding pipe shall be obtained from sources conforming to the requirements of the New York State Department of Transportation as to sampling, testing methods, quarry reports and any other required procedures.

D. Geotextile Fabric

1. The geotextile fabric shall be of the type appropriate for the intended use as shown on the plans or as order by the Engineer. The geotextile fabric shall be a woven or non-woven type, as specified, manufactured by Mirafi, Amoco, or equal. The Contractor's shop submittal for this item shall contain an original certification from the manufacturer, which indicates the model number of the geotextile fabric and their proposed recommendation for the fabric's use in this situation.

2.04 TEMPORARY SHEETING, SHORING AND BRACING MATERIALS

A. Wood sheeting, shoring and bracing shall be of such quality and size that it will not split. Sheeting and bracing shall be Southern Pine, a structural grade, of 1800 psi stress class, and furnished in accordance with the standard rules and grading, dressing and inspection of joints, planks, beams and stringers of the Southern Pine Association. Douglas fir or other timber of equivalent grade may be substituted. Materials may be either new or used in good condition. Where close or right sheeting is required, wood sheeting shall be tongued and grooved.

B. Steel sheeting shall be manufactured from steel conforming to ASTM Designation A-328, latest revision, and bracing buildings ASTM Designation A-36, latest edition. The sizes and types required may be indicated on the Plans, or if not so shown, steel sheeting shall have a minimum thickness of 3/8 inch in web, unless approved otherwise by the Engineer, and flange shall be as detailed by the Contractor. All necessary welding or supporting members shall be done in accordance with requirements of the American Welding Society Code.

2.05 PAVING AND SURFACING MATERIALS

A. Bituminous Macadam Pavement and Driveways

1. Unless otherwise specified herein, all bituminous macadam materials and work shall conform to the applicable requirements of the New York State Department of Transportation Standard Specifications, latest edition, for binder, top course, and temporary pavements.

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B. Crushed Stone Road, Driveways and Parking Areas

1. Road materials shall be approved, well-graded crushed gravel or well-graded crusher run stone, conforming to the requirements of the New York State Department of Transportation Specifications Section 304-2.02 (Type 2) for the bottom course and Section 302-2.03 (Option C) for the top course.

2. Finish topping material for roads, driveways and parking areas shall be No. 1A or No. 1 crushed gravel or stone (New York State Department of Transportation Specifications, latest edition, material designations 703-0201 or 703-0202) as directed and approved by the Engineer.

C. Concrete Sidewalks

1. Sidewalks shall be constructed of 4000 psi at 28 days with maximum water-cement ratio of 0.45. The minimum cement content shall be as follows:

<u>Coarse Aggregate No.</u>	<u>Lb. Per Cu. Yd.</u>
467 (1 ½ inch maximum)	517
57 (1 inch maximum)	564
67 (¾ inch maximum)	564

2. The foundation course material shall conform to the requirements of the New York State Department of Transportation Specifications, latest edition, Section 302-1.03 (Option C).

D. Concrete Road and Driveways

1. Roads and driveways shall be constructed of 4000 psi at 28 days with maximum water-cement ratio of 0.45. The minimum cement content shall be as follows:

<u>Coarse Aggregate No.</u>	<u>Lb. Per Cu. Yd.</u>
467 (1 ½ inch maximum)	517
57 (1 inch maximum)	564
67 (¾ inch maximum)	564

2. Reinforcement shall be welded wire fabric weighing not less than 65 lbs. per 100 square feet with wires equally spaced in each direction.

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3. The foundation course material shall conform to the requirements of New York State Department of Transportation Specifications, latest edition, Section 302-2.03 (Option C).

2.06 MISCELLANEOUS RESTORATION MATERIALS

A. Topsoil

1. Topsoil shall consist of friable, natural earth of loamy character, without admixture of subsoil, uniform in quality and free of refuse of any nature, hard clods, still clay sods, hard pan, pebbles larger than ¼ inch in diameter, coarse sand, noxious weeds, sticks, brush and other rubbish.

B. Grass Seed for Lawn Areas

1. Seed shall be fresh, clean, new crop seed composed to the following varieties mixed in the proportions by weight as shown, and testing the minimum percentage of purity and germination indicated:

<u>Name</u>	<u>By Weight</u>	<u>Proportion Purity</u>	<u>Germination</u>
Perennial Manhattan			
Ryegrass	40%	98%	90%
Kentucky Blue Grass	25%	85%	90%
Annual Ryegrass	20%	95%	90%
Red Fescue-Creeping	15%	95%	90%

2. Special seed mixes may be needed for shady areas or unusually dry areas. Follow recommendation of reputable seed supplier or nurseryman.

C. Grass Seed for Field Areas

1. Seed shall be fresh, clean, new crop seed composed to the following varieties mixed in the proportions by weight as shown, and testing the minimum percentage of purity and germination indicated:

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<u>Name</u>	<u>By Weight</u>	<u>Proportion Purity</u>	<u>Germination</u>
Perennial Ryegrass Manhattan or Perofine (Lolium Perenne)	50%	98%	85%
Annual Ryegrass	50%	95%	90%

D. Fertilizer

1. Fertilizer shall be mixed, of commercial quality, with a N-P-K ratio equal to 17-23-6 and 50% of the elements derived from organic sources.

E. Peatmoss

1. Peatmoss shall be horticultural grade Class A decomposed plant material; elastic and homogeneous; free of decomposed wood, sulfur, and iron; PH value of 5.9-7.0; 60% organic matter by weight; and a moisture content not exceed 15%.

F. Gravel

1. Gravel shall be washed bank gravel or river gravel ranging in size from approximately ½ inch up to and including 1 ¼ inch.

G. Hydroseed Mix

Seed shall be fresh, clean, new crop seed composed to the following varieties mixed in the proportions by weight as shown, and tested to the minimum percentage of purity and germination indicated.

<u>Name</u>	<u>By Weight</u>	<u>Proportion Purity</u>	<u>Germination</u>
Perennial Manhattan Ryegrass	65%	98%	90%
Kentucky Blue Grass	25%	85%	90%
Red Fescue			

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PART III – EXECUTION

3.01 EXCAVATION

A. General Requirements

1. The Contractor shall scrape and stockpile top soil from the work area prior to the start of excavation. The stockpile material shall be properly staked with hay bales or fabric to control erosion/loss of soil. All topsoil shall be respread in the construction area during final restoration.

2. Excavation shall be made to such widths as will give suitable room for construction of the structures, for forms, sheeting, bracing and supporting, pumping and draining; and the bottom of the excavations shall be rendered firm and dry and in all respects acceptable to the Engineer.

3. Excavation and dewatering shall be accomplished by methods which preserve the undisturbed state of subgrade soils. Subgrade soils which become soft, loose, “quick”, or otherwise unsatisfactory for support of structures as a result of inadequate excavation, dewatering or other construction methods shall be removed and replaced by concrete or granular fill as required by the Engineer at the Contractor’s expense.

4. Utility protection shall be in conformance with all rules and regulations and in no case shall be less than the requirements of the applicable utility company. The Contractor shall contact Dig Safely New York at 1-800-962-7962 prior to any excavation. No excavation shall occur prior to utility stakeouts being completed. The Contractor shall be responsible for obtaining any permits required for utility protection. The Contractor shall also be responsible for scheduling all work by the utility owners in accordance with his/her own work schedule. All damages to utilities as a result of the Contractor’s operations shall be corrected at the Contractor’s expense. The Contractor shall also refer to General Contract Conditions (GCC, Item 46) “PROTECTION OF PROPERTY”.

B. Excavation

1. Excavation shall be carried to the depth and dimensions necessary for the proper installation of all work as noted on the details included as part of this Specification. Unless specifically directed by the Engineer, excavation shall not be made below the elevations necessary to remove existing piping, place new pipe bedding material, and install new pipe, fittings, coupling systems, and other appurtenances. Where any unauthorized excavation is made below the grades indicated, the excavations shall be restored to the proper elevation with compacted, well graded granular foundation material approved by the Engineer. If deemed necessary, concrete instead of granular fill shall be used to correct unauthorized excavations.

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2. Per the direction of the Engineer, the Contractor may be required to undercut the excavation to establish a sound base for the pipe and pipe bedding material. In such instances, the contractor will excavate an additional 24 inches (minimum) below the invert of the pipe or as ordered by the Engineer. The Contractor shall then proceed to install the geotextile fabric along the trench bottom. The fabric should be placed loosely with no wrinkles or folds. Successive sheets of fabric should be overlapping the downstream sheet. Once the fabric is in place, the Contractor shall then backfill the undercut area using the structural base granular fill material to the bottom elevation of the pipe bedding material.

C. Trench Excavation

1. The Contractor shall excavate trenches to the depth necessary for proper placing of pipe. The trench width at the crown of the pipe shall be kept to a minimum, allowing only the space necessary for proper pipe laying.

2. The trench width will depend upon the depth, nature of material excavated, and method by which excavation is accomplished. In any case, sufficient clearance around the pipe shall be provided to properly lay the pipe, make the joint or install the coupling system, install the necessary fittings and other appurtenances, and to place and compact the backfill. The width of trench shall be in accordance with the details included as part of this specification.

3. Above the crown of the pipe, the trench shall be kept as narrow as practical, with sides as nearly vertical as consistent with good workmanship and safety. The trench dimensions and procedure of trench excavation shall be subject to the acceptance of the Engineer.

4. The trench shall be opened a minimum distance ahead of pipe laying as accepted by the Engineer.

5. The trench shall be braced, sheeted and dewatered, as required, to provide safe, firm and dry conditions.

6. The Contractor shall exercise care to avoid damage to existing structures, utilities, and pipes in the performance of the work. In locations where the excavation is carried beneath or adjacent to existing structures, utilities, or pipes, the Contractor shall furnish and install sheeting and bracing as necessary to support such structures, utilities or pipes in their original position, and shall be responsible for any damage caused to such utilities by this work.

7. On all excavations greater than 4'-0" in depth, the Contractor shall utilize a trench sheeting box or standard sheeting, shoring and bracing. The Contractor shall secure the services of a Professional Engineer licensed in the State of New York who shall

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observe his/her construction operation and design the proper method of sheeting, shoring, and bracing to be utilized during construction.

8. On all excavations less than 4'-0" in depth, the Contractor shall secure the services of a Professional Engineer licensed in the State of New York who shall analyze the existing conditions with the contractor's method of construction and advise him/her of the proper method to support his/her trenching operation.

9. All sheeting/shoring shall be installed in accordance to code requirements. Sheeting shall be right and continuous, and driven vertically in place ahead of the excavation by means of steam, vibratory of pneumatic hammers. Any material which stops and driving of sheet piling shall be removed by the Contractor.

10. The sheeting shall extend at least 2 feet above the surface of the ground. If, in the opinion of the Engineer, an excavation will constitute a safety hazard, the sheeting shall extend at least 4 feet above the surface of the ground.

11. As soon as sheeting is placed, if there is a space between the sheeting and the side of the trench, the space shall be backfilled with suitable material thoroughly compacted in place.

12. In general, the sheeting and bracing shall be removed as the excavation is refilled in such a manner as to avoid the caving in of the bank or disturbance of adjacent areas or structures. The voids left by the withdrawal of the sheeting shall be carefully filled by ramming or otherwise, as directed. Permission of the Engineer shall be obtained before the removal of any shoring, sheeting or bracing.

13. Such permission by the Engineer shall not relieve the Contractor from the responsibility for injury to structures, or to other property or persons, from failure to leave such sheeting and bracing in place.

14. In those instances where excavation is necessary in pavement, concrete, or other similar surfaces, a saw cut, replacement of pavement past the limits of the excavation, and other procedures shall be performed in accordance with the details included as part this specification.

15. In no instances will blasting be allowed in this Contract.

3.02 DEWATERING

A. The Contractor shall conduct a thorough on-site investigation to become familiar with the ground water conditions at the site. Further, the contractor shall refer to the

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information contained in the subsurface investigation report. Based on the Contractor's findings employ the proper procedures needed for the dewatering of the excavations and/or project site.

B. The Contractor shall investigate and become familiar with all Local, State and Federal Regulations which govern in this matter. The Contractor shall apply for and obtain the necessary discharge permits for the dewatering system at the Contractor's own expense. Determining permit requirements shall be the responsibility of the Contractor.

C. The Contractor shall examine adjacent structures and utilities, both existing and under construction, for possible settlement, movement or other adverse effects resulting from dewatering methods or water removal. Take necessary precautionary steps to protect such structures and utilities.

D. The Contractor shall assume total responsibility for site, surface and subsurface drainage. Maintain such drainage as specified herein during the life of the contract.

E. The Contractor shall supply all supervision, labor, material, equipment, including standby equipment, necessary to maintain a dry excavation as may be needed to construct the project.

F. The Contractor shall maintain groundwater in or below the bearing strata at a safe level at all times by methods which prevent loss of fines, which preserves the undisturbed state of subgrade soils and which sufficiently lowers the groundwater level in permeable strata at or below excavation and fill levels such that blowing or unstable conditions do not develop in the bottom or sides of excavation or fill areas.

G. The Contractor shall protect all adjacent structures, existing and under construction, from settlement, floatation, damage or other adverse effects resulting from water removal or dewatering methods.

H. The Contractor shall install all drains, ditching, sluiceways, pumping and bailing equipment, wicking, sumps, wells, well points, cutoff trenches, curtains, sheeting and all other equipment and structures necessary to create and maintain a dry excavation and a groundwater level at a minimum of 2 feet below excavation subgrades.

1. Observation wells or piezometers shall be provided and installed, as required, to effectively and efficiently monitor drawdown to required levels.

I. The Contractor shall direct all discharged water removed from the site to a sedimentation pond with an outfall to natural water courses, storm drains or channels.

1. Large quantities of water shall not be discharged as overland flows. Overland flow is not permitted onto private property.

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2. No unpolluted water shall be discharged to sanitary sewers.

3. Wastewater shall be disposed of in a manner satisfactory to the local Public Health Officer.

J. The dewatering operations shall cease when all pipe installations and other excavating areas have been properly backfilled and compacted, and are safe from damage, floatation, settlement and displacement.

K. If well points or wells are used, they shall be adequately spaced to provide the necessary dewatering and shall be sandpacked and/or utilize other means to prevent pumping of fine sands or silts from the subsurface. A continual check by the Contractor shall be maintained to ensure that subsurface soil is not being removed by the dewatering operation.

L. Construction of temporary facilities to dispose of water shall be incidental to the construction and shall be performed at no additional cost to the Owner.

M. Permanent piping systems shall not be incorporated in the dewatering system.

N. The Contractor shall operate and maintain dewatering and removal operations on a 24-hour basis for the time required to complete that portion of the work which requires dewatering prior to its construction and which requires protection from floatation or displacement of such work until proper backfilling and compaction is completed.

O. After groundwater levels have returned to elevations appropriate for conditions and time of year, without causing damage to the work, the Contractor shall remove all dewatering equipment and related equipment from the site and restore site to original conditions or rehabilitate site to meet requirements of Contract Documents.

3.03 BYPASS PUMPING

All bypass pumping necessary to maintain sanitary sewer service for the area shall be in accordance Section 02510, paragraph 3.01. Sanitary sewer service shall be maintained at all times during the work.

3.04 LAYING PIPE

A. Removal of existing pipe

1. The length of existing piping to be removed and replaced shall be as directed and approved by the Engineer.

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2. All existing piping (including wyes, portions of laterals, and other appurtenances) removed by the Contractor becomes the property of the Contractor. The Contractor shall be responsible for disposal of the existing piping in accordance with all applicable local, State, and Federal regulations.

3. Where existing piping is removed, a saw or other appropriate equipment shall be used to provide a straight and clean edge for the new piping and coupling systems to connect to.

B. New Pipe Installation

1. All sanitary sewer pipe shall be constructed in accordance with these Specifications.

2. All sanitary sewer pipe shall be bedded as noted on the details included as part of this Specification.

3. All pipe shall be cleaned before placing, bulkheaded when pipe laying is stopped, and otherwise constructed to secure first class work, free from defects and debris.

C. Wye Branches

The wye branches shall have approved caps or plugs factory installed on the six (6) inch branches for testing purpose. The wye branches shall be bedded and supported as noted on the details included as part of this Specification.

D. Riser Pipe

1. All riser pipes shall be constructed according to the details included as part of this Specification or as ordered by the Engineer in the field.

E. House Laterals

House laterals shall be 6 inch diameter. A coupling system shall utilized to interface between existing house lateral piping (at whatever size) and the new installations.

F. Markers

A two inch by 4 inch wood marker extending from the tee branch, wye branch, riser or lateral to a point one foot below the ground surface, at each shall be provided.

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G. Coupling Systems

1. Where new PVC pipe is being installed to replace existing, an approved coupling system shall be used that is specifically designed for the pipe sizes and materials to be encountered in the installation. The installations shall be in accordance with manufacturer's recommendations.

H. Records

The location of wye branches and riser pipes along with laterals shall be measured from the last downstream manhole and in addition, shall be located on a sketch by the use of at least two ties to existing structures, preferably the corners of the house. Such records shall identify the house and laterals by house number; the records shall be kept by the Contractor with three copies delivered to the Engineer within one day after installation. Each record of a wye branch, tee branch, riser pipe or house lateral shall be on a separate sheet. This information shall be transferred to the as-built tracings by the Contractor.

3.05 TRENCH SHORING/SHIELD

A. Unless otherwise specified on the plans, the Contractor will be required to provide and utilize a trench shield, sheeting box and/or temporary sheeting/shoring on all excavations which exceed 4'-0" in depth.

3.06 BACKFILLING

A. Requirements

1. All trenches and excavation shall be backfilled to the original surface of the ground or to such other grades as directed.
2. The method and degree of compacting backfill will be governed by the type of material and the extent to which any subsequent settlement can be permitted.

B. Placement of Fill Material

1. In all backfilling of trenches loose lumber, braces, rubbish and refuse shall be removed from the areas to be backfilled.
2. Backfilling shall be done with sound material free from waste, objectionable organic matter, rubbish, boggy or other unsuitable materials. No frozen material shall be used for backfilling.

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3. Backfilling shall begin as soon as practicable after pipelines have been installed and inspected. Material for bedding and backfill shall be as noted in this Specification (including details provided). The material shall be firmly compacted below and to points 12 inches above the crowns of conduits and pipelines. Temporary blocking shall not be allowed.

4. Backfill, in areas that are not required to be paved, shall be placed in uniform horizontal layers and shall be tamped, flooded or otherwise consolidated as the work progresses. Lumps of earth shall be broken up and if there are any stones or lumps which cannot be readily broken up, they shall be distributed throughout the mass so that all interstices are solidly filled with fine materials. No stone fragments, over 4 inches in any dimension, shall be placed in the backfill nearer than 2 feet from the pipe or conduit at any point, or from any concrete wall.

5. Backfilling over conduits and pipelines in areas that are required to be paved (in roadways, paved shoulders, aprons, driveways, sidewalks, parking areas, etc.) shall be placed carefully and tamped or compacted with suitable tools. This material shall be placed in layers approximately 6 inches thick, each layer being thoroughly tamped and compacted in place.

In lieu of 6 inch lifts or layers and compacting as described above, the Engineer may approve the use of vibratory compactor-drivers mounted on rubber tire backhoes, to compact backfill. To prevent damage from down pressure and vibration, such equipment shall not be used nearer than 3 feet to existing utilities or to the pipe or conduit that is being installed. The cost of replacement of any utilities or work damaged due to the use of vibratory compactor-drivers, shall be paid for by the Contractor. Depending on the impulse force of such vibratory compactors, the Engineer may allow lift thicknesses of 2 to 3 feet. Where, from visual observation, the Engineer concludes that the required compaction may not have been attained, the Engineer may order that the work be stopped and a density test be performed. The cost of delays caused by such interruption of work and the cost of density tests shall be paid for by the Contractor at no additional cost to the Owner.

6. Compaction Requirements for Backfill

a. Over Conduit and Pipelines in Areas that are Required to be Paved

Backfill in areas that are required to be paved, such as roadways, paved shoulders, aprons, paved gutters, driveways, sidewalks, parking areas and other paved surfaces, shall be compacted to 95 percent of standard proctor maximum density.

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3.07 COMPACTION OF MATERIALS

A. It shall be the Contractor's responsibility to properly place and compact all materials and to correct any deficiencies resulting from insufficient or improper compaction of such materials. The Contractor shall determine the type, size and weight of compactor best suited to the work at hand, select and control the lift (layer) thickness, exert proper control over the moisture content of the material, and other details necessary to obtain satisfactory results.

B. Compaction Equipment

1. The selection of compaction equipment is the Contractor's responsibility, but shall be subject to the approval of the Engineer. Generally, the following shall apply for the type of material to be compacted.

2. Sheepfoot rollers shall be used to compact clay and glacial till soils. The proper ballasted weight shall be determined such that the feet penetrate to their full length on a loose lift to be placed, and with further passes, compact the layers are required.

3. Pneumatic or vibratory rollers shall be used to compact sands and gravel. Pneumatic rollers shall have operating weights between 2,000 and 3,000 pounds per tire.

4. Smooth steel wheel, pneumatic tired or vibratory rollers shall be used to compact slag, coarse gravel or crushed stone. Smooth steel wheel rollers shall have a minimum weight of 10 tons. Where possible, rock fill shall be compacted using a self-propelled vibratory steel drum roller weighing at least 10 tons.

5. In all cases, loads shall be adjusted to give the most suitable results for the material being compacted. For heavier, or more efficient types of approved compaction equipment, the minimum number of passes required on all portions of each successive layer shall be determined by the Engineer after appropriate field tests to evaluate the efficiency of the equipment have been made. However, layer thickness shall not, under any circumstances, exceed those specified.

6. In confined areas, and adjacent to utilities, compaction shall be made using hand guided mechanical vibratory plate tampers or rollers similar to units manufactured by Kelly Jay Jackson, Ingersoll Rand, or equal.

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3.08 TESTING

A. Requirements

1. After backfilling and prior to the final acceptance of the project, the pipe repair installation will be required to be visually inspected and a deflection test be performed.

2. All sewers shall be visually inspected via lamping manhole to manhole prior to final acceptance. The lamp shall have an output of between 250 to 500 candlepower. Lamping shall be performed after the sewer has been flushed and the inside surface wet to allow for light refraction. If fifty percent (50%) of the lamp cannot be seen from the other manhole, the Contractor will be required to televise that section at his/her expense.

3.09 SITE GRADING

A. Grading in preparation for final restoration shall be performed at all locations disturbed as part of the Contractors operations to allow for final grade to match existing. During the course of grading, the subgrade shall be maintained in such condition that it will be well drained at all times. When directed, temporary drains and drainage ditches shall be installed to intercept or divert surface water which may affect the Contractor's performance of (or the condition of) the work.

B. If at the time of grading it is not possible to place any material in its proper section of the permanent structure, it shall be stockpiled in approved areas for later use. No extra payment will be made for the stockpiling or double handling of excavated material.

C. The right is reserved to make minor adjustments or revisions in lines or grades if found necessary as the work progresses.

D. All loose or protruding rocks shall be barred loose or otherwise removed to line or finished grade of slope. All cut and fill slopes shall be uniformly dressed to the slope or as directed by the Engineer.

E. Rough grading shall be stopped six inches below final grade and leveled off, and topsoil shall be placed and finished to final grade.

F. The Contractor shall replace all surface material, and restore paving, curbing, sidewalks, gutters, fences and all other items which were disturbed by the construction so that they shall be equal to the original condition.

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3.10 PAVEMENT AND CONCRETE RESTORATION

A. Sub-grade Preparation

1. After backfilling and grading is completed, the sub-grade shall be shaped and compacted to an even, firm foundation. All unsuitable sub-grade materials, including soft materials, boulders, vegetation and loose stones shall be removed and replaced with well compacted foundation material.

B. Installation of Bituminous Macadam Pavement and Driveways – Existing

1. Where existing bituminous pavements or driveways are necessarily required to be cut, the width of pavement required to be removed is shown on the details included as part of this Specification. If the Contractor should remove pavement beyond the limits shown, he/she shall replace same at his/her own expense. In all cases, the pavement will be required to be cut back one foot onto undisturbed earth on each side of the excavation.

2. All work affecting paved roads, streets or highways shall be done in a manner satisfactory to the authority having jurisdiction over the particular pavement.

3. The paving materials, quantities, and methods of placing shall be in accordance with the Specifications of the New York State Department of Transportation and the details included as part of this specification.

C. Crushed Stone Roadway, Parking Area and Driveway

1. Upon the prepared subgrade, the roadway, driveway or parking area materials shall be placed and compacted to the lines, grades and thickness specified, or as determined by field conditions and ordered in writing by the Engineer.

2. Roadways shall be constructed in two courses or lifts. The maximum subgrade thickness shall be not less than eight (8) inches and a top course thickness of not less than four (4) inches. After the courses are thoroughly compacted, No. 1 stone (New York State Department of Transportation specifications, material designation 703-02) and screenings shall be uniformly spread, either by hand or by an approved mechanical device, upon the surface and swept in by means of a gang-dragged broom of an approved type and rolled dry.

D. Concrete Sidewalks

1. Foundation

The concrete sidewalks shall be constructed on a four (4) inch compacted stone or gravel foundation course.

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2. Forms

Sidewalk forms are to be set upon the foundation course; the top of the form conforming with the walk grade. Forms shall be steel, 4 inches in height or 6 inches in height when traversing driveways and of such length and shapes as may be required to form the required walks. All inside faces shall be clean and smooth, and shall be oiled before the concrete is placed. Forms shall be held in place with pins, or other devices so that during the construction of the walk a straight and even edge shall be maintained.

3. Joints

Sidewalks shall be built with transverse construction joints 5 feet apart or as directed. Joints shall be cut through the slab. Expansion joints ½ inch in width must be cut through the slab to the foundation every 20 feet or fraction thereof and filled with a bituminous expansion joint.

4. Wire Fabric Reinforcement

Wire fabric (6x6x10 ga.) shall be used in the 6 inch thick sidewalks traversing driveways. The wire fabric shall be placed at the mid-depth point of the slab supported on wire chairs and lapped as required.

5. Placing and Finishing Concrete

After the foundation course has been satisfactorily prepared and after the approved forms are in place to grade, and the same has been checked and approved by the Engineer, the Contractor shall proceed to place the concrete. Concrete of 4000 psi shall be placed to the full depth of the form, carefully spaded, and placed to form a uniform and dense mixture, and leveled off with a template to a smooth surface level with the top of the forms. The surface shall be finished with a float and troweled by skilled workmen. After the surface has been leveled and finished and before the concrete takes its final set, the surface shall be evenly stroked with a broom to give a slightly rough and uniform finish. All outside edges, and the division marks or joints between blocks, shall all be carefully finished with an edging tool with ¼ inch radius.

6. Curing

After concrete is placed and finished, it shall be protected by applying an approved colorless curing compound. This compound shall be applied by pressure spraying at a rate of not less than 1/30 of a gallon per square yard. In lieu of the spraying compound, a covering may be used which meets with the approval of the Engineer.

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7. Protecting Work

When the concrete work is finished, the Contractor shall protect the same from the weather, trespasses, or other injurious elements for at least three days, and until the concrete has received a final set. The forms shall remain in place during this curing period. Work placed during cold weather shall be covered.

E. Concrete Driveways

1. Foundation

The concrete driveways shall be constructed on a six (6) inch compacted stone foundation course.

2. Forms

Driveway forms are to be set upon the foundation course; the top of the form conforming with the driveway grade. Forms shall be steel, 6 inches in height and of such lengths and shapes as may be required to form the required driveways. All inside faces shall be clean and smooth, and shall be oiled before the concrete is placed. Forms shall be held in place with pins, or other devices so that during the construction of the driveway a straight and even edge shall be maintained.

3. Joints

Driveways shall be built with transverse construction joints 10 feet apart or as directed. Joints shall be cut through the slab. Expansion joints ½ inch in width must be cut through the slab to the foundation every 20 feet or fraction thereof and filled with a bituminous expansion joint.

4. Wire Fabric Reinforcement

Same as specified for Section 02380-3.09.E.4.

5. Placing and Finishing Concrete

Same as specified for Section 02380-3.09.E.5.

6. Curing

Same as specified for Section 02380-3.09.E.6.

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7. Protecting Work

Same as specified for Section 02380-3.09.E.7.

3.12 UNPAVED AREA RESTORATION

A. SOIL PREPARATION

1. Topsoil shall be placed on unpaved areas disturbed during the Contractors operations. Seeding shall be furnished, planted and maintained as shown, specified and ordered. Topsoil shall be placed to a minimum depth of 6 inches (as measured after rolling and compaction).

2. All topsoil, after uniform grading, shall be thoroughly rolled to provide maximum compaction.

3. After placing the topsoil, the area shall be raked and all stones, rocks, and weeds removed. A suitable commercial fertilizer shall then be evenly applied over the area, at a rate recommended by the manufacturer, and thoroughly raked in.

B. SEEDING

1. After the topsoil has been spread and the final grades established in accordance with the Specifications, the entire area shall be fine graded by discing or tilling to a depth of four inches. After discing or tilling, the area shall be dragged with a plant float so as to develop a smooth, even surface. Power equipment may be used, but in areas that are too small for power equipment to operate, the above operations shall be done with the use of hand tools.

2. Grass seed shall be sown in two operations and at right angles to each other at the rate of two pounds per thousand square feet in each operation.

3. After the sowing of the seed, the area shall be lightly raked or dragged, and then rolled with a 200 pound roller.

4. After the raking and rolling operations are completed the entire seeding area shall be watered with a fine spray until a uniform moisture depth of 1 inch has been obtained.

5. Wooded and field areas shall be seeded with perennial rye grass at the rate of 100 lbs. per acre.

SECTION 02380 – PART III

C. HYDROSEEDING

1. Where approved by the Engineer, apply slurry at rate of 60 lb./acre dry weight of seed evenly spread in two operations and at right angles to each other. Slurry to be applied by the use of a hydraulic seeder.
2. Immediately following hydroseeding, mulch areas by means of a mulch blower at a rate of 1,200 pounds per acre on level grades, and 2,000 pounds per acre on slopes.
3. Do not seed area in excess of that which can be mulched on same day.

D. Maintenance of Seeded/Hydroseeded areas

1. Maintenance of seeded area shall consist of watering, weeding, cutting and trimming the grass, and performing any other necessary work incidental to the establishment of a good strand of grass reasonably free of weeds or other obnoxious grasses.
2. The maintenance period shall begin immediately upon the completion of the seeding operations and shall continue for a period of not less than forth-five days or until the grass has been cut twice, and if necessary at the direction of the Engineer, until an acceptable strand of grass has been established.

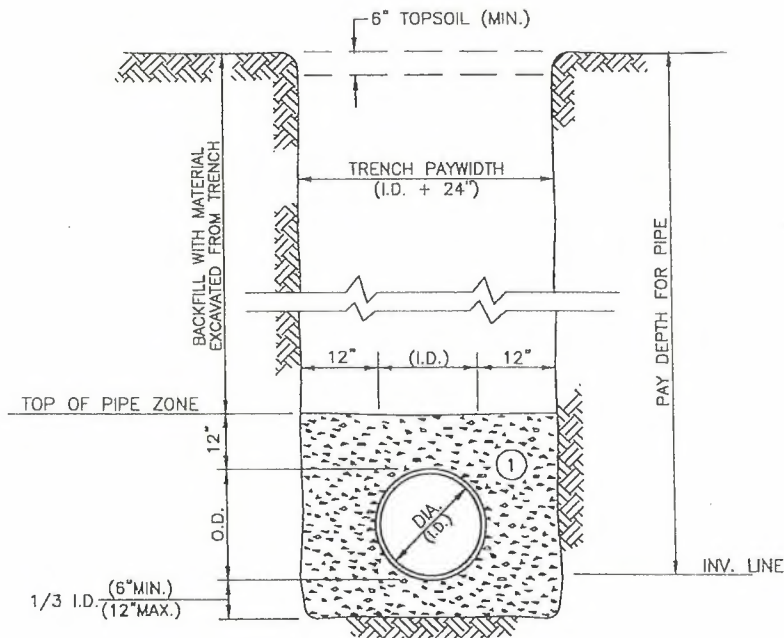
E. GRAVEL

1. Gravel shall be placed in the areas disturbed by the Contractors operations to the extent, grade, thickness and elevation necessary to match existing. The surface shall be left smooth and even.
2. Provide steel edging to separate all gravel beds from lawn or planting areas.

F. STEEL GRAVEL EDGING

1. The edging shall be placed as required to form a sharp straight edge between the gravel area and the planting area. The steel edge shall extend approximately ½ inch above the general ground surface.

UNSHEETED TRENCH DETAIL (JANUARY 2012)



NOTES:

- A. PIPE INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.
- B. TRENCHING OPERATIONS SHALL INCLUDE ALL NECESSARY DEWATERING.
- C. TRENCH DETAILS ARE ONLY SHOWN FOR PURPOSES OF MATERIAL PLACEMENT AND MAXIMUM PAY LIMITS.
- D. AN OSHA APPROVED MOVABLE PROTECTIVE TRENCH SHIELD SHALL BE USED IN ALL UNSHEETED TRENCH AREAS.

MATERIALS

PIPE BEDDING MATERIAL (NYS DOT LATEST EDITION)

- ① NO.1 CRUSHED STONE WITH A GRADATION CONFORMING WITH NYS DOT SECTION 703-02. THE CRUSHED STONE SHALL BE WELL GRADED WITH NO PARTICLES LARGER THAN 1" AND HAVING A MAXIMUM GRADATION MEETING THE LIMITS DESCRIBED IN THE SPECIFICATIONS. THE BEDDING SHALL BE COMPACTED IN 6" LIFTS WITH EQUIPMENT ACCEPTABLE TO THE PIPE MANUFACTURER.

NOTE: SLAG SHALL NOT BE ALLOWED FOR MATERIALS ①

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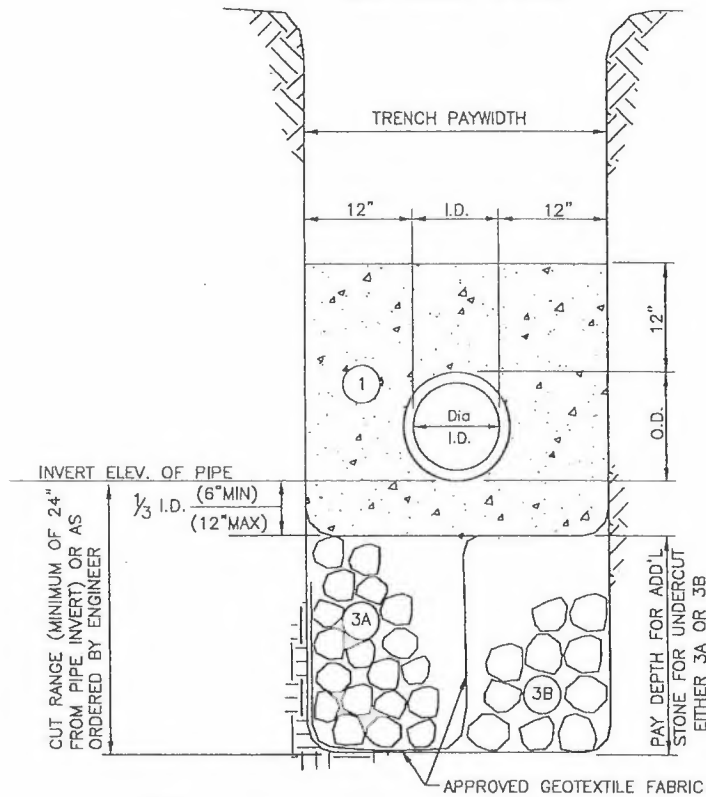
Rev. 1 5/20/93	NOTE 2: PIPE INSTALLATION
Rev. 2 2/7/94	ADDED NOTE C & D
File: d-01	Date: 3/1/91

STD.DETAIL

1

TRENCHING "UNDERCUT" DETAIL

(JANUARY 2012)



NOTE:

- A. TRENCH DETAILS ARE ONLY SHOWN FOR PURPOSES OF MATERIAL PLACEMENT AND MAXIMUM PAY LIMITS.
- B. AN OSHA APPROVED MOVABLE PROTECTIVE TRENCH SHIELD SHALL BE USED IN ALL UNSHEETED TRENCH AREAS.

MATERIALS

PIPE BEDDING MATERIAL (NYS DOT LATEST EDITION)

- ① NO.1 CRUSHED STONE WITH A GRADATION CONFORMING WITH NYSDOT SECTION 703-02. THE CRUSHED STONE SHALL BE WELL GRADED WITH NO PARTICLES LARGER THAN 1" AND HAVING A MAXIMUM GRADATION MEETING THE LIMITS DESCRIBED IN THE SPECIFICATIONS. THE BEDDING SHALL BE COMPACTED IN 6" LIFTS WITH EQUIPMENT ACCEPTABLE TO THE PIPE MANUFACTURER.

SELECT MATERIAL BACKFILL (NYS DOT LATEST EDITION)

- ③A NO. 3 RUN OF CRUSHER STONE WITH A GRADATION CONFORMING WITH NYSDOT SECTION 304-2.02 TYPE 1 AND NYSDOT SECTION 703-02. COMPACTED IN 6" LIFTS WITH APPROVED GEOTEXTILE FABRIC.

OR

- ③B NO. 4 RUN OF CRUSHER STONE CONFORMING WITH THE GRADATION NOTED IN NYSDOT SECTION 703-02, TABLE 703-4 SIZE DESIGNATION 4.

NO SLAG SHALL BE ALLOWED FOR MATERIALS ① ③A & ③B

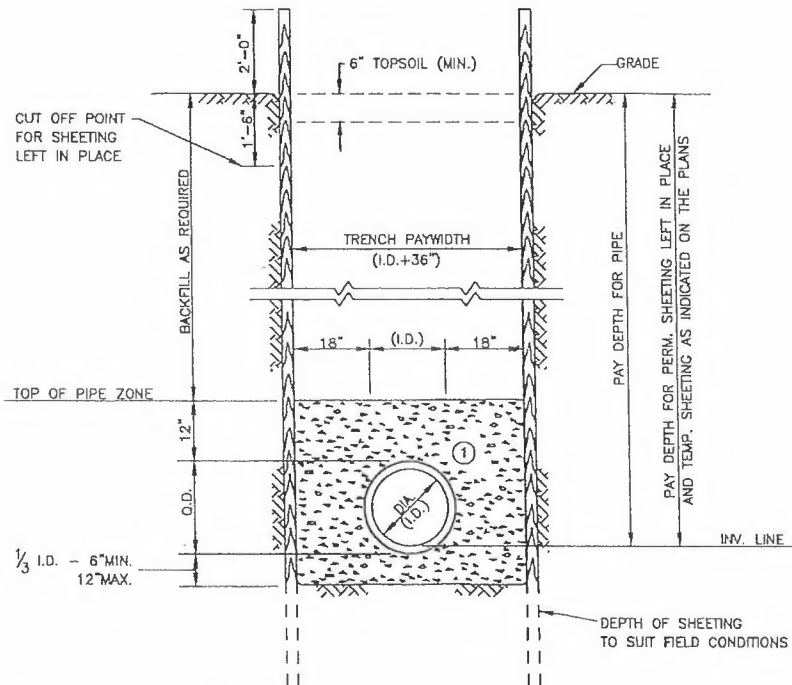
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Rev. 1	ADDED SELECT FILL
12/2001	MATERIAL 3A & 3B
Rev. 2	
File: D-01a	Date: 3/2/99

STD.DETAIL

1A

SHEETED TRENCH (JANUARY 2012)



NOTES:

1. MAINTAIN 18" BETWEEN PIPE AND INSIDE FACE OF TEMPORARY SHEETING. IF SHEETING EXTENDS BELOW PIPE INVERT AS SHOWN, WHEN PVC PIPE MATERIAL IS USED, COMPACT MATERIAL. ① BEFORE PULLING THE SHEETING.
2. SHEETED TRENCH OPERATIONS SHALL INCLUDE ALL NECESSARY DEWATERING EQUIPMENT.
3. SHEETING DRIVEN BELOW THE INVERT OF THE PIPE FOR BEDDING MATERIAL AND TOE SUPPORT WILL NOT BE CONSIDERED IN THE FORMULA FOR PAYMENT BUT SHOULD BE FIGURED BY THE CONTRACTOR IN DETERMINING HIS UNIT BID PRICE PER SQUARE FOOT OF SHEETING.
4. WHERE INDICATED ON THE PLANS OR AS ORDERED BY THE ENGINEER, TEMPORARY SHEETING WILL BE PAID FOR UNDER THE APPLICABLE BID ITEM. OTHER AREAS WHERE THE CONTRACTOR ELECTS TO USE TEMPORARY SHEETING NOT PREVIOUSLY AUTHORIZED BY THE ENGINEER SHALL BE AT HIS OPTION AND EXPENSE.

MATERIALS

PIPE BEDDING MATERIAL (NYS DOT LATEST EDITION)

- ① NO.1 CRUSHED STONE WITH A GRADATION CONFORMING WITH NYS DOT SECTION 703-02. THE CRUSHED STONE SHALL BE WELL GRADED WITH NO PARTICLES LARGER THAN 1" AND HAVING A MAXIMUM GRADATION MEETING THE LIMITS DESCRIBED IN THE SPECIFICATIONS. THE BEDDING SHALL BE COMPACTED IN 6" LIFTS WITH EQUIPMENT ACCEPTABLE TO THE PIPE MANUFACTURER.

NOTE: SLAG SHALL NOT BE ALLOWED FOR MATERIALS ①

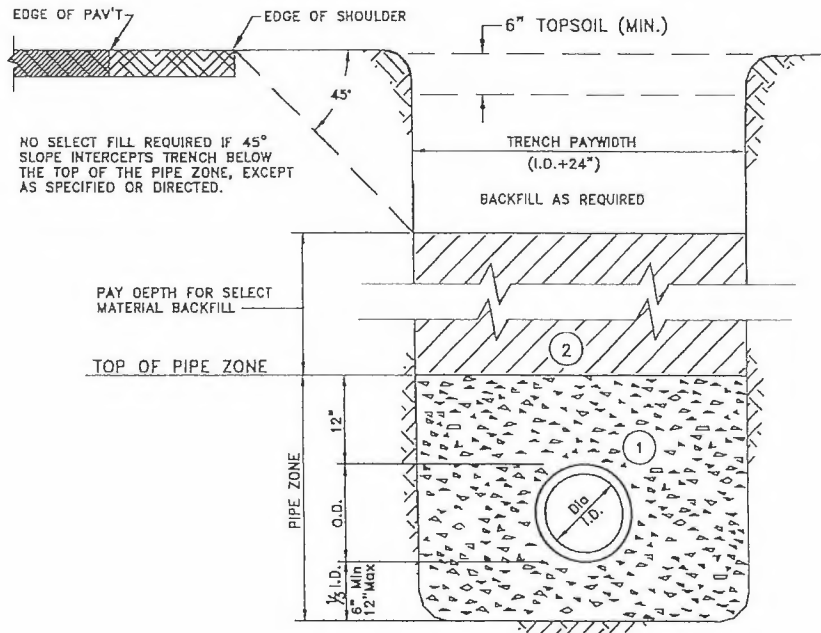
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DIVISION OF SEWERAGE MANAGEMENT

Rev. 1 2/7/94	REVISED TOPSOIL DIMENSION
Rev. 2 8/5/06	UPDATED MATERIALS TO NYS DOT LATEST EDITION
File: d-02	Date: 3/1/91

STD.DETAIL

2

SELECT BACKFILL FOR TRENCH PARALLEL TO ROADWAYS (JANUARY 2012)



NOTE:

- A. TRENCH DETAILS ARE ONLY SHOWN FOR PURPOSES OF MATERIAL PLACEMENT AND MAXIMUM PAY LIMITS.
- B. AN OSHA APPROVED MOVABLE PROTECTIVE TRENCH SHIELD SHALL BE USED IN ALL UNSHEETED TRENCH AREAS.

MATERIALS

PIPE BEDDING MATERIAL (NYSOT LATEST EDITION)

- ① NO. 1 CRUSHED STONE WITH A GRADATION CONFORMING WITH NYSDOT SECTION 703-02. THE CRUSHED STONE SHALL BE WELL GRADED WITH NO PARTICLES LARGER THAN ONE INCH AND HAVING A MAXIMUM GRADATION MEETING THE LIMITS DESCRIBED IN THE SPECIFICATIONS. THE BEDDING SHALL BE COMPACTED IN 6" LIFTS WITH EQUIPMENT ACCEPTABLE TO THE PIPE MANUFACTURER.

SELECT MATERIAL BACKFILL (NYSOT LATEST EDITION)

- ② NO. 2 RUN OF CRUSHER STONE OR NO. 2 RUN OF CRUSHER GRAVEL WITH A GRADATION CONFORMING WITH NYSDOT SECTION 304-2.02 TYPE 4 AND NYSDOT SECTION 703-02. (COMPACTED IN 6" LIFTS TO 90% DENSITY)

NO SLAG SHALL BE ALLOWED FOR MATERIALS ① & ②

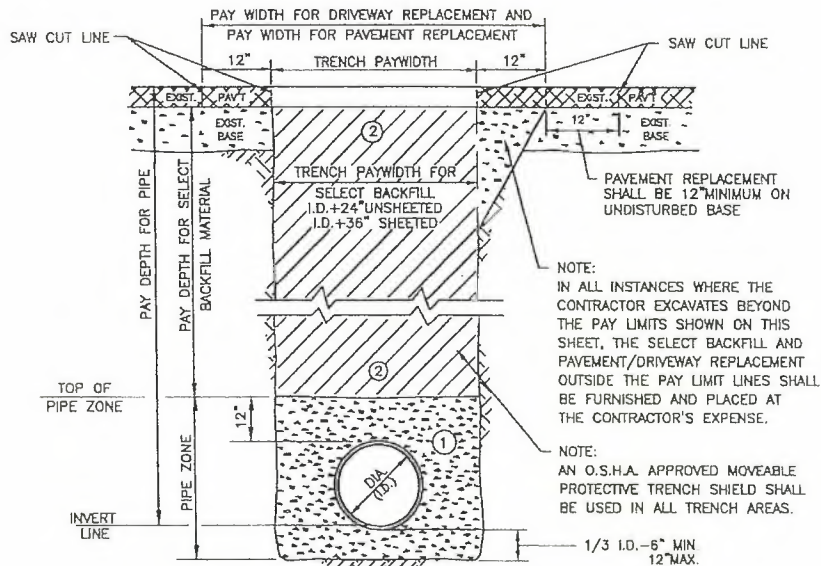
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Rev. 2	UPDATED MATERIALS TO NYSDOT
12/28/00	LATEST EDITION
Rev. 3	Updated NYS DOT Editions
12/01	
File:	d-04
Date:	3/1/91

STD.DETAIL

4

PAVEMENT AND DRIVEWAY REPLACEMENT DETAIL (JANUARY 2012)



BLACKTOP REPLACEMENT

ALL ROADS AND DRIVEWAYS SHALL BE RECONSTRUCTED WITH A MIN. 3\" COURSE OF BINDER AND A 1-1/2\" TOP COURSE. APPLICABLE HIGHWAY PERMIT CONDITIONS SHALL GOVERN.

- TEMP. PAYT.**
1. IF CONSTRUCTION IS PERFORMED BETWEEN OCTOBER 1 AND APRIL 1, THE CONTRACTOR IS REQUIRED TO PROVIDE 4\" OF COLD PATCH FOR ALL PAVEMENT CUTS.
 2. ALL OPEN CUTS WITHIN 50' OF AN INTERSECTION SHALL BE TOPPED WITH 4\" OF COLD PATCH REGARDLESS OF THE TIME OF YEAR.
 3. ALL ROAD CUTS ON HEAVILY TRAVELED ROADWAYS WILL REQUIRE 4\" OF COLD PATCH (GENERALLY STATE AND COUNTY HIGHWAYS)
 4. ALL TEMPORARY PAVEMENT PATCHES SHALL BE MAINTAINED BY THE CONTRACTOR.

- SAW CUTS**
1. PAVEMENT/DRIVEWAY CUTS BY THE CONTRACTOR WILL BE MADE WITH A SAW, PNEUMATIC SPADE OR OTHER ACCEPTED MEANS PRIOR TO EXCAVATION.
 2. FINAL PAVEMENT/DRIVEWAY RESTORATION: THE CONTRACTOR WILL BE RESPONSIBLE TO SAW CUT AN ADDITIONAL 12\" ON EACH SIDE OF THE DISTURBED TRENCH AREA, SO AS TO PROVIDE A UNIFORM STRAIGHT EDGE. THE CUT EDGE WILL THEN BE COATED WITH A BITUMINOUS SEAL COAT AND REPLACED IN THE MANNER DESCRIBED ABOVE.

CONCRETE DRIVEWAY REPLACEMENT

1. THE CONTRACTOR SHALL REMOVE ALL CONCRETE DAMAGE BY HIS OPERATION. THE EXISTING CONCRETE AT THE DAMAGED EDGE SHALL BE SAW CUT TO PROVIDE A STRAIGHT EDGE JOINT BETWEEN OLD AND NEW, WITH EXPANSION JOINT MATERIAL INSTALLED AT THE TRANSITION. THE CONTRACTOR SHALL BE REQUIRED TO RECONSTRUCT THE DRIVEWAY WITH 4000 PSI CONCRETE MATCHING THE DEPTH AND WIDTH OF THE EXISTING DRIVEWAY.

MATERIALS

PIPE BEDDING MATERIAL (NYSOT LATEST EDITION)

- ① NO.1 CRUSHED STONE WITH A GRADATION CONFORMING WITH NYSOT SECTION 703-02. THE CRUSHED STONE SHALL BE WELL GRADED WITH NO PARTICLES LARGER THAN 1\" AND HAVING A MAXIMUM GRADATION MEETING THE LIMITS DESCRIBED IN THE SPECIFICATIONS. THE BEDDING SHALL BE COMPACTED IN 6\" LIFTS WITH EQUIPMENT ACCEPTABLE TO THE PIPE MANUFACTURER.

SELECT MATERIAL BACKFILL (NYSOT LATEST EDITION)

- ② NO.2 RUN OF CRUSHER STONE OR NO.2 RUN OF CRUSHER GRAVEL WITH A GRADATION CONFORMING WITH NYSOT SECTION 304-2.02 TYPE 4 AND NYSOT SECTION 703-02. (COMPACTED IN 6\" LIFTS TO 90% DENSITY)

NOTE: SLAG SHALL NOT BE ALLOWED FOR MATERIALS ① AND ②

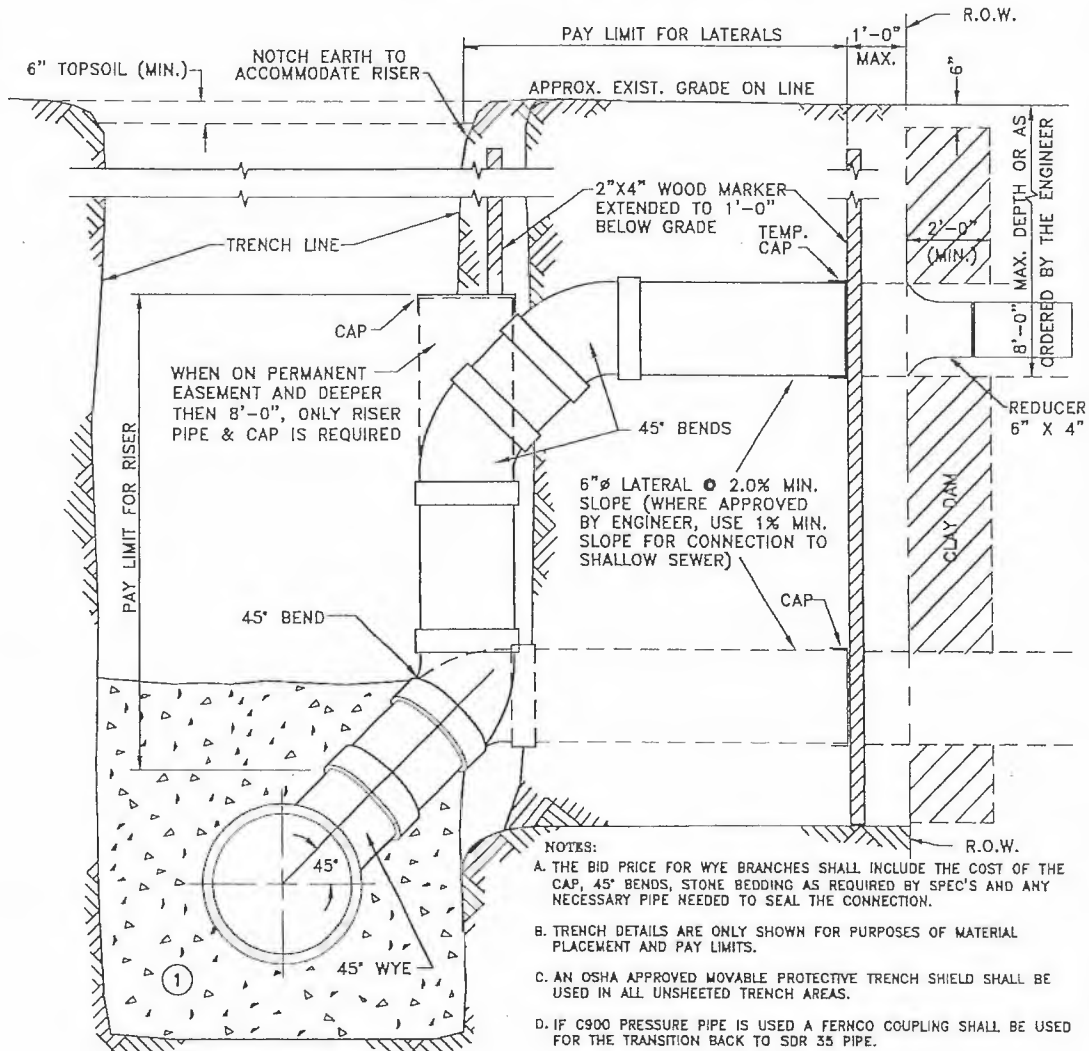
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Rev. 2	REVISED PAY LIMITS FOR TRENCH
Rev. 3 01/03/01	REVISED TITLE AND PAY WIDTH NOTE
Rev. 4 12/01	Added conc. driveway replace. note
File:	d-08
Date:	3/1/91

STD.DETAIL

8

RISER DETAIL - SDR35
(MAIN LINE LATERAL CONNECTION)
(JANUARY 2012)



- NOTES:
- A. THE BID PRICE FOR WYE BRANCHES SHALL INCLUDE THE COST OF THE CAP, 45° BENDS, STONE BEDDING AS REQUIRED BY SPEC'S AND ANY NECESSARY PIPE NEEDED TO SEAL THE CONNECTION.
 - B. TRENCH DETAILS ARE ONLY SHOWN FOR PURPOSES OF MATERIAL PLACEMENT AND PAY LIMITS.
 - C. AN OSHA APPROVED MOVABLE PROTECTIVE TRENCH SHIELD SHALL BE USED IN ALL UNSHEETED TRENCH AREAS.
 - D. IF C900 PRESSURE PIPE IS USED A FERNCO COUPLING SHALL BE USED FOR THE TRANSITION BACK TO SDR 35 PIPE.

MATERIALS

PIPE BEDDING MATERIAL (NYSDOT LATEST EDITION)

- ① NO. 1 CRUSHED STONE WITH A GRADATION CONFORMING WITH NYSDOT SECTION 703-02. THE CRUSHED STONE SHALL BE WELL GRADED WITH NO PARTICLES LARGER THAN ONE INCH AND HAVING A MAXIMUM GRADATION MEETING THE LIMITS DESCRIBED IN THE SPECIFICATIONS. THE BEDDING SHALL BE COMPACTED IN 6" LIFTS WITH EQUIPMENT ACCEPTABLE TO THE PIPE MANUFACTURER. NO SLAG WILL BE ALLOWED.

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Rev. 2	ADDED 1/8 BELL & SPIGOT LONG
1/97	SWEEP BEND
Rev. 3	ADDED NOTE D REGARDING LOCATION
12/01	OF VENTS AND CLEAN OUTS
Rev. 4	CHANGED LONG SWEEP TO NORMAL 45°
5/02	ADDED CAPS & CORRECTED PAY LIMITS
File:	d-27
Date:	3/1/91

STD.DETAIL

27

SECTION 02510 – TRENCHLESS REHABILITATION OF SANITARY SEWERS
(CURED-IN-PLACE PIPE LINING WITH A FLEXIBLE RESIN
IMPREGNATED POLYESTER FIBER FELT LINER)

PART I – GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall furnish all labor, materials, tools, equipment and perform all operations required with the installation of the cured-in-place pipe (CIPP) liner in the existing sanitary sewer pipe at the locations shown in various work orders. The installation of the flexible resin impregnated polyester fiber felt liner shall be in accordance with the manufacturer's recommendations and/or other approved methods, and shall meet or exceed ASTM F1216 standards. The scope of work shall also include complete maintenance of all wastewater flows, reopening of service wyes or tees, removal of protruding service connections, etc. When completed, the cured liner should extend from end-to-end of the section being lined in a continuous tight fitting watertight pipe-within-a-pipe and shall provide a minimum of 100 percent of the existing sewer line's original design capacity.

B. The rehabilitation of the sanitary sewer main shall be performed without the need for excavation and demolition of existing structures. The Contractor shall be able to re-establish user lateral services without excavation and minimize the disruptions to neighboring homes and traffic. Excavation for emergencies is permitted, but only as directed and approved by the Owner's Engineer.

C. Prior to ordering sewer rehabilitation materials, the Contractor shall be responsible for inspecting and confirming the inside dimension, alignment, pipe material, and condition of the existing sewer pipe segments to be lined with CIPP.

D. The Contractor shall be responsible for performing all CIPP and related work, including but not limited to traffic control, sewer flow control and bypassing, sewer line cleaning, root and protruding tap cutting, pre- and post-rehabilitation video inspection, liner installation, reopening of service connections, testing, reconstruction, and restoration. All work shall be performed in accordance with applicable Federal, State, and City/Town/Village regulations, including current OSHA safety standards.

E. The Contractor shall be responsible for odor and noise mitigation under this contract in accordance with applicable Federal, State, and City/Town/Village regulations. The Contractor shall monitor the surrounding area and minimize odors and noise that may occur due to his work activities.

F. Pipeline rehabilitation products that require bonding to the existing pipe wall for structural strength will not be allowed as the conditions of the existing pipe walls are unknown and may vary greatly. The finished CIPP wall shall have sufficient structural strength to support all dead loads, live loads and groundwater pressure imposed with the assumption

SECTION 02510 – PART I

that the existing pipe cannot share any loading or contribute to structural integrity of the liner.

G. Upon completion of the work, the Contractor shall provide the Owner with an extended performance warranty which shall guarantee the materials and workmanship for a period of five (5) years from the date of final acceptance. The warranty shall be all inclusive of all material, labor and equipment costs associated with the remedial measures necessary to correct the situation if a product failure is detected.

1.02 SUBMITTALS

A. Design Data:

1. Structural design calculations and specification data sheets listing all parameters used in the liner design and thickness calculations based on Appendix XI of ASTM F1216 for each pipe segment. The design parameters shall meet or exceed the following requirements:

Minimum CIPP Resin Requirements:

Flexure Strength	4,500 psi
Flexural Modulus	250,000 psi

Minimum Finished CIPP Wall Thickness Requirements:

8- and 10-inch Diameter Host Pipe	6 mm
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For larger diameter host pipes the Contractor shall provide for approval the proposed Minimum Finished thickness to the Engineer.

Other Required Parameters for calculating Minimum Finished Wall Thickness:

Fully deteriorated host pipe

H-20 live load = 16,000 lbs (assume live load in non-paved areas as well for maintenance vehicles)

Groundwater depth above bottom of the pipe = depth to ground surface (fully saturated soil conditions)

Pipe ovality	=	3 percent
Soil density	=	120 lbs/cu. ft.
Soil modulus	=	700 psi
Safety factor	=	2.0 minimum

SECTION 02510 – PART I

All calculations shall be prepared under and stamped by a Professional Engineer registered in New York State. Submit P.E. Certification Form for all CIPPL design data.

2. Certified test reports demonstrating that the exact resin/liner combination to be used for this project meets the requirements for initial structural properties (performed in accordance with ASTM F1216, ASTM D638, and ASTM D790) and chemical resistance (performed in accordance with ASTM F1216-Appendix X2 or ASTM D5813).

3. Certified test reports demonstrating that the exact resin and comparable liner to be used for this project has been tested for long-term flexural modulus of elasticity and long-term flexural strength (i.e. 10,000 hour creep testing performed in accordance with ASTM D2990 for design conditions applicable to this project). Load shall be equivalent to 400 psi minimum. If the liner used for testing is not the exact liner to be used on this project, submit a detailed description of the physical properties of both the liner used in the test and the liner to be used for this project to demonstrate that the two liners are comparable in terms of physical properties.

B. Shop drawings shall be submitted for all items to be furnished in accordance with the provisions of the General Conditions as supplemented. Submittals shall include information on the polyester fiber felt tubing liner, thermosetting resin, bypass pumping system, means and methods for sewer joint testing and grouting procedures, manufacturer's data for chemical sealing materials, backflow prevention devices for hydrants (if necessary), testing reports, televising records, and all other incidentals intended to be utilized.

C. Laboratory test reports and other certifications, as applicable, that the liner material meets the requirements of these specifications.

D. The Contractor shall prepare and submit a procedure outlining how they will properly notify the Property Owners in advance of the work described and, the alternate provisions which will be provided in cases of emergencies where the homeowner may lose service for an extended period of time.

E. The Contractor shall submit to the Owner a detailed description of the proposed method of installation. The submittal shall be all inclusive of all installation features, such as set-up pressures, cure time, stating the installation parameters that will be monitored, pressure temperature; type of gauges to be utilized for monitoring and location of the gauges, etc and shall also include other related incidentals such as the pre and post flushing/cleaning of the existing pipe, root removal, bypass pumping to maintain existing sewage flows, maintenance and protection of traffic, re-establishing flow from existing building connections, property owner notifications, general site clean-up, etc.

SECTION 02510 – PART I

F. The Contractor shall submit to the Owner, for approval prior to CIPP liner installation, a copy of the pre-inspection video, on DVD, and a report detailing the condition of the pre-lined pipe identifying and documenting recommended spot repairs, protruding lateral repairs, lateral connections requiring chemical grout repair, and any other defect that would inhibit proper lining of the sewer line section.

G. The Contractor shall submit to the Owner, for approval prior to CIPP liner installation, a written confirmation, stating that the sewer is clean and sound enough to ensure an effective rehabilitation lining. This submittal is required for each section of pipeline to be lined.

H. For each section to be lined a formal submittal shall be made by the Contractor to the Engineer which addresses the existing conditions such as air temperature within the pipeline to be lined, outside air temperature and hydrostatic ground water pressure. Further, the communication still identify the recommended cure temperature, water pressure and cure time and state how the cure temperature, water pressure and cure time will be monitored. All gauge monitoring shall be performed from above ground.

I. Detailed description of the bypass pumping operations and the equipment the Contractor will have onsite to accomplish the needs of the area shall be submitted.

J. Two copies of the signed and sealed required liner thickness shall be submitted.

K. The Contractor shall submit to the Owner for approval a post-inspection video showing the condition of the post-repaired, post-lined pipe segment.

L. A manufacturer's final certificate of approval that states that material and installation methods fully satisfied their requirements shall be submitted.

1.03 SITE SAFETY

The Contractor shall operate in strict accordance with all applicable OSHA standards and regulations. The Contractor's particular attention is drawn to those safety requirements involving entry into a confined space. The Contractor is responsible for on-site safety and all the equipment/supervision necessary for full compliance. Prior to entering manholes to perform sewer rehabilitation work, the Contractor shall evaluate the atmosphere in and near the sewer to determine the presence of toxic or flammable vapors and shall ventilate the rehabilitation work area as necessary to render it safe.

SECTION 02510 – PART I

1.04 PRODUCT HANDLING

All materials (polyester fiber felt liner, thermosetting resin, etc.) shall be accompanied by test reports certifying that the material conforms to the ASTM listed herein. Materials shall be shipped, stored, and handled in a manner consistent with the written recommendations of the manufacturer. Storage locations shall be approved by the Owner and Engineer. The Contractor shall test all materials for compliance with the Contract Documents prior to delivery.

1.05 SEQUENCE OF WORK

The Contractors work in the field shall be in two phases.

A. Phase I – Field Investigation

Phase I shall include all field investigation and sewer line inspections required to be performed before any approval for work under Phase II can be approved. Specifically:

1. Mobilization to the locations specified in the work order.
2. Flush and clean sanitary sewer sections. Obtain necessary permits and requirements from ECWA and/or the municipality that owns the water system before using any hydrants.
3. Set up by-pass pumping if necessary and perform a pre-lining video to detail the condition of the line and identify any pre-lining repair work that may be necessary before a successful lining procedure may be done. The Contractor shall make recommendations as to any spot repair locations that are necessary, protruding laterals that need to be cut, and on if the sewer is acceptable to line or not.
4. Owner / Engineer will review a copy of pre-lining videos, and approve or disapprove the recommendations.
5. Contractor shall submit to the Owner / Engineer a written confirmation that each section to be lined is clean and sound enough to ensure an effective lining.
6. Upon approval by the Owner / Engineer of a sewer section, the Contractor shall submit, in shop drawing form, design calculations specifically for that section.

SECTION 02510 – PART I

B. Phase II - Remedial Work and Pipe Lining

Upon approval from Owner / Engineer to continue, Phase II shall include all approved remedial and lining work. Specifically:

1. Mobilization of repair / lining crews and equipment to approved sections.
2. Set up of by-pass pumping as necessary.
3. Completing all spot repairs, protruding lateral cutting, and other recommended and approved remediation.
4. If any remedial work is done, another pre-lining video will be required.
5. Clean and video the section again to verify lateral connection locations.
6. Lining and curing the pipe.
7. Air testing on each section and taking a restrained pipe sample every other section.
8. Cutting open laterals and brushing edges smooth after liner cooling.
9. Post-lining video inspection and submission of video to Owner / Engineer for final review.

1.06 COMMUNICATION

Prior to carrying out any field work in either phase the contractor shall notify 48 hours in advance the Owner, homeowners, local municipality, local fire department, and local police department that the contractor will be beginning said work.

PART II – PRODUCTS

2.01 MATERIALS

1. This specification references American Society for Testing and Materials (ASTM) standard specifications, which are made a part hereof by such reference and shall be the latest edition and revision thereof.

2. ASTM-F-1216 Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin Impregnated Tube.

Appendices X1: Design and Consideration
 X2: Chemical Resistance Tests

SECTION 02510 – PART II

3. General Corrosion Requirements: The finished pipe liner in place shall be fabricated from materials which will be chemically resistant to withstand internal exposure to domestic/industrial sewage.

2.02 LINER

1. The material shall be fabricated to a size that when installed will neatly fit the interior of the host pipe. Allowance shall be made for circumferential stretching during inversion.

2. The minimum/maximum tube length shall be that deemed necessary by the Contractor to effectively span the distance between the access points. The contractor shall verify the lengths in the field before impregnation.

3. The lining material shall be a polyester fiber felt tubing, lined on one side with polyurethane and fully impregnated with a liquid, thermosetting resin. When the thermosetting resin is combined with a catalyst, an exothermic reaction will occur. The temperature in the line during the cure period shall be as recommended by the resin manufacturer.

4. Liner Material Test – Tests for compliance with this specification shall be made according to the applicable ASTM specification. A certificate of compliance with this specification shall be provided by the manufacturer for all materials furnished under this specification. In addition, all materials used in the construction process shall be made of the best respective kinds and to the satisfaction of the Engineer. Any materials not approved by the Engineer shall be rejected prior to the reconstruction of the sewer. These rejected materials shall then be replaced with approved materials at the Contractor's expense.

<u>Cured Liner</u>	<u>Standard</u>	<u>Results</u>
Tensile Stress	ASTM D-638	3,000 psi
Flexural Stress	Modified ASTM D-790	4,500 psi
Modulus of Elasticity	Modified ASTM D-790	250,000 psi

5. The liner shall have an initial Dimension Ratio (DR) of no more than 32.5. After installation, the Dimension Ratio and liner thickness will vary slightly as determined by the actual inside diameter of the host pipe. The liner may have an initial Dimension Ratio greater than 32.5, only if it can be proven that the material is stronger and superior to that with an SDR 32.5.

6. The Contractor shall furnish, prior to use of the lining materials, satisfactory written guarantee of his/her compliance with the manufacturer's standards for all materials and techniques being used in the inversion lining process. The Contractor shall

SECTION 02510 – PART II

provide certified test results for approval by the Engineer, from the manufacturer that the material conforms to the applicable requirements. Material not complying with the requirements shall be rejected.

PART III –EXECUTION

3.01 BYPASS PUMPING

A. The Contractor shall supply all necessary pumps, conduits and other equipment to divert the flow of sewage around the section of sewer line (manhole to manhole) in which the work is to be performed. The by-pass system shall be sufficient capacity to handle existing flows plus any additional flow that may occur during rainfall events.

B. The Contractor will be responsible for furnishing the necessary labor and supervision to set up and operate the pumping and by-pass system. If pumping is required on a 24 hour basis, all pump engines shall be manned at all times and equipped in a manner to keep the pump noise at a minimum. All bypassed sewage flow must be discharged to a sanitary sewer and shall not be allowed to enter any storm sewer line, drainage ditch, or street gutter. Sufficient pipe, hose or other approved means of flow conveyance shall be on hand to ensure that, in case of emergency, flow can bypass to the next clear manhole. The Contractor shall prepare and submit a detailed outline describing his/her proposed operation. The method must be approved by the Engineer prior to the start of construction.

C. The Contractor's pumps shall be so designed that all or any portion of the flow can be handled during normal or high flow conditions. The Contractor will be responsible for any damages encountered as a result of the bypass systems.

3.02 SEWER LINE CLEANING

A. The Contractor shall provide all necessary labor, specialty equipment, water and other incidentals to effectively clean sanitary sewer lines of various diameters. All sanitary sewer sections required to be lined shall be cleaned using mechanically powered, hydraulically propelled or high velocity sewer cleaning equipment. Selection of the equipment used shall be based on the conditions of the lines at the time the work commences. The equipment and methods selected shall be satisfactory to the Engineer. The equipment selected for cleaning shall be capable of removing dirt, grease, rocks, sand, tree roots and other deleterious materials and obstructions from the sewer lines and manholes.

B. All sewers shall be sufficiently cleaned and free of water as ordered by the Engineer, to permit in-line television inspection of joints, cracks, leaks and breaks and in preparation of the lining operation.

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C. All sludge, dirt, sand, rocks, grease, tree roots and other solid or semi-solid material resulting from the cleaning operation shall be removed at the downstream manhole of the section being cleaned. Passing material from manhole section to manhole section which could cause line stoppages, or blockages will not be permitted.

D. A collection device, as approved by the Engineer, shall be utilized to collect and remove debris from the reach being cleaned.

E. All dirt, debris, and other material removed from the sewers shall be hauled away and disposed of in a manner and place acceptable to the New York State Department of Environmental Conservation and the Engineer. All such work will be at the Contractor's expense. All materials shall be removed from the site at the end of each workday. Under no circumstances will be Contractor be allowed to accumulate debris, etc., on the work site beyond the stated time, except in totally enclosed containers meeting NYSDEC and OSHA requirements and as approved by the Engineer.

F. During all sewer cleaning operations, satisfactory precautions shall be taken to protect the sewer lines from damage that might be inflicted by the improper use of cleaning equipment. Whenever hydraulically propelled cleaning tools, which depend upon water pressure to provide their cleaning force, or any tools which retard the flow of water in the sewer line are used, precautions shall be taken to ensure that the water pressure created does not cause any damage or flooding to public or private property being served by the manhole section involved. The flow of sewage in the sewer lines shall be utilized to provide necessary pressures for hydraulic cleaning devices whenever possible. When additional quantities of water from fire hydrants are approved as necessary to avoid delay in normal working procedures the water shall be conserved and not used unnecessarily. No fire hydrant shall be obstructed in case of fire in the area served by the hydrant nor shall a hydrant be used for the purpose described unless the vacuum break is provided. The Contractor will be responsible for all permits, arrangements, and costs associated with obtaining water for this construction operation. The Contractor shall use approved backflow prevention devices if hydrants are used for water supply.

G. Contractor's personnel shall be familiar with all phases of sewer line cleaning to insure quality performance without causing damage to any of the appurtenances associated with work involved. In the event a line must be re-cleaned as ordered by the Engineer for any reasons, the Contractor shall undertake such re-cleaning, without charge to the Owner.

H. Roots shall be removed in the designated sections where root intrusion is a problem. Special precautions should be exercised during the cleaning operation to assure as complete removal as possible of visible roots from the joint or lateral area. Procedures may include the use of mechanical devices such as rodding machines, expanding root cutters and porcupines, and hydraulic procedures such as high pressure jet cleaners.

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I. Any damage caused by the Contractor's cleaning operation, shall be repaired by the Contractor at no additional cost to the Engineer or Owner.

3.03 TELEVISION INSPECTION

A. The Contractor shall provide all equipment, personnel and supplies necessary for the internal close circuit televisions (CCTV) inspection of sanitary sewers. The specifications in this section shall apply to all internal inspection of sewers under this contract.

B. Camera and Recording Equipment: The radial view video camera used for the inspection shall be one specifically designed and constructed for such inspection. Lighting for the camera shall be suitable to allow a clear picture for the entire periphery of the pipe. The camera shall be operative in 100% humidity conditions. The camera, television monitor, recorder and other components of the video system shall be capable of producing a minimum 500 line resolution video picture in living color. Picture quality and definition shall be to the satisfaction of the Owner's representative and if unsatisfactory equipment shall be removed and no payment made for unsatisfactory inspection.

C. Power Cable: The power cable attached to the camera must be of sufficient length to insure televising the entire pipe section from manhole to manhole. Any delays in television inspection or additional equipment set ups caused by insufficient length of cable will be the responsibility of the Contractor.

D. Preparation: CCTV equipment shall be set up in the preparation for television inspection. Equipment set up shall include necessary traffic control, positioning of winches, power cable hook-up, CCTV camera preparation and positioning of the CCTV camera in the manhole and proper cleaning and de water of the target sewer line to allow complete inspection of the line. **The pipeline shall be cleaned and free of all water and material that prohibits viewing the condition of the entire surface, including bottom of the pipe, during all CCTV recordings prepared and submitted for approval.**

E. Internal Inspection: The camera shall be moved through the line in either direction at a uniform rate, stopping when necessary to insure proper documentation of the sewer's condition and in no case will the television camera be pulled at a speed greater than 30 feet per minute. Manual winches, power winches, TV cable and powered rewinds or other devices that do not obstruct the camera view or interfere with proper documentation of the sewer conditions shall be used to move the camera at a uniform speed through the sewer line.

F. Whenever non-remote powered and controlled winches are used to pull the television camera through the line, telephones or other suitable means of communication shall be set up between the two manholes of the section being inspected to insure good communication between members of the crew.

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G. Measurement for location of any defects shall be above ground by means of the meter device. Marking on cable, or the like, will not be allowed. Measurement meters will be accurate to one tenths (0.1) of a foot over the length of the section being inspected. Accuracy of the measurement meters shall be checked daily by use of a walking meter, roll-a-tape or other suitable device.

H. Documentation of the television results shall be as follows:

1. Points of Significance: Points of significance as referenced in the following sections shall include, but are not limited to, ALL infiltration points, points or areas of pipe deficiency, locations of building sewer and lateral connections, protrusions, offset joints, roots, storm sewer connections, collapsed sections, presence of scale or corrosion, and other discernible features or unusual conditions. The CCTV camera shall stop at and look into all lateral connections and shall clearly show the entire perimeter of connection between each lateral and the main line sewer.

2. Television Inspection Logs and Reports: Printed location records shall be kept by the contractor and shall clearly indicate the location, in relation to adjacent manholes of each point of significance observed during the television inspection. Image captures shall be taken of each point of significance for inclusion in printed reports. A bound, printed report of each inspection, clearly showing an image, location and description of each point of significance, shall be provided along with a video recording of the inspection to Owner for review. Submitting reports as Portable Document Format (pdf) files in lieu of printing is acceptable.

3. Video Recordings: Contractor shall record the entire television inspection of each sewer line or via DVD. The recording shall include a clearly readable text overlay displaying:

- A. Prior to camera entering sewer line
 - 1. Date and time of inspection (EST)
 - 2. Contractor name
 - 3. Sewer line section ID (as provided by owner)
 - 4. Upstream and downstream manhole ID's (as provided by owner)
 - 5. Direction of recording relative to flow
- B. During entire inspection:
 - 1. Sewer line section ID.
 - 2. Camera's position station in feet relative to beginning of pipe section being inspected.

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- C. At each point of significance:
 - 1. Description of observation

The camera shall be slowed or stopped for a sufficient length of time for proper inspection of each point of significance. Proper inspection of laterals and other connecting pipes shall include focusing the camera up the connection and also televising the entire connecting perimeter. A copy of each completed inspection shall be provided to Owner. Video DVD's must be of type DVD(-) and finalized to ensure proper playback in any DVD device. Digital recordings must be in a common video format such as avi, flv, mpg, or wmv and be provided via CD, data DVD, or USB flash drive. Video recordings must be named / labeled by sewer line ID hyphen date of recording (ie. SewerLineID – YYYYMMDD). The contractor shall have all original recordings and necessary playback equipment readily accessible for review by the Owner and Engineer during the project.

I. Video Inspector Quality: The camera shall have lighting focus and clarity sufficient enough to allow clear visibility for proper evaluation of all points on infiltration, pipe deficiency, and of other points of significance as described in section H1 above. The sewer line being inspected must be free of debris and water to allow a complete inspection as stated under Section D. In the event a line must be re-inspected as ordered by the Engineer for lack of video quality, the Contractor shall undertake such re-inspection without charge to the Owner.

3.04 RECONSTRUCTION OF SANITARY SEWERS BY MEANS OF FLEXIBLE RESIN-IMPREGNATED POLYESTER FIBER FELT LINER

A. FLOW BY PASS PUMPING

The Contractor, where required, shall by-pass the sewage around the section of sewer-line to be lined. The by-pass shall be accomplished by plugging the existing upstream manhole and pumping the sewage into a downstream manhole or adjacent system. The pump and by-pass lines shall be of adequate capacity and size to handle the flow. The by-pass pumping of flow shall conform to Section 02510, Item 3.01 and shall be maintained until the section is fully cured, tested and placed back in service. Under no circumstances will the dumping of raw sewage on private property or on streets be allowed.

B. CLEANING

Prior to commencing the liner process, the Contractor shall clean the sanitary sewer that is to receive the liner. It shall be the Contractor's responsibility to clear the line of any protruding service connections, tree roots or solids that might prevent liner installation inside existing sewer. The methods used for cleaning the sewer line shall be in

SECTION 02510 – PART III

accordance with Section 02510, Item 3.02. Precautions shall be taken in removing protruding services and other obstructions so as not to cause further failure of existing pipe or service pipe which would interfere with the lining operation or the reconnection of existing services to the liner.

C. TELEVISION INSPECTION

Inspection of pipelines shall be performed by experienced personnel trained in identifying breaks, obstacles and service connections by closed circuit television. The interior of the pipeline shall be carefully inspected to determine the location of any conditions which may prevent proper installation of the liner pipe into the sewer line, and it shall be noted so that these conditions can be corrected. A video and suitable report log shall be kept for reference by the Owner.

D. EXISTING SERVICE CONNECTIONS

Service connection verification shall be conducted by the contractor as follows:

1. The Contractor shall identify and document all live service connections that are to be reconnected to the liner pipe. He/she shall utilize procedures which do not damage, block or otherwise interfere with the operation of the sewer or the ground above. Acceptable methods of the identification include television observation, combined with dye testing, magnetic detector, or an equal, as necessary.

2. The position and location of the live services shall be both logged in written record and marked on the pavement or staked in the lawn areas for field identification.

3. It is the Contractor's responsibility to determine that all live services have been located and marked so that they may be connected to the liner pipe. If the Contractor fails to connect the same to the pipe liner, the cost of damages resulting from this failure shall be borne entirely by the Contractor.

E. LINE OBSTRUCTIONS

It shall be the responsibility of the Contractor to clear the line of obstructions by conventional sewer cleaning equipment, including solids, roots, grit, scaling, etc. If inspection reveals an obstruction that, in the opinion of the Contractor, will not allow for CIPP lining of the section, then the Contractor shall immediately notify the Engineer.

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F. INSERTION OF THE LINER

1. Prior to insertion of the liner the Contractor shall insure the cleanliness of the existing sewer. All debris and obstruction shall be removed. As in Section 02510, Item 1.03, Submittals, the contractor shall submit a letter stating that the sewer is clean and sound enough to ensure an effective lining and provide information regarding cure time and temperatures for the section to be lined.

2. The polyester fiber felt liner shall be installed through the manholes and reopened leaving the bottom two-thirds as a new start. Where one section of the liner connects to another, the resin mixture used to seal the liner ends shall meet with the manufacturer's recommendation.

3. The linear shall be constructed of a material which, when installed, shall provide a jointless and continuous structurally sound liner able to withstand all imposed static, dynamic and hydrostatic loads on a long-term basis.

4. The Engineer shall approve a location where the uncured resin in the original containers and the un-impregnated line will be vacuum impregnated prior to installation. The Owner and Engineer shall approve the materials a "wet-out" procedure. A resin and catalyst system compatible with the requirements of this method shall be used. The quantities of the liquid thermosetting materials shall be per the manufacturer's standards to provide the required lining thickness.

5. A scaffold or elevated platform shall be erected at the upstream access point. The wet out liner material shall be inserted through an existing manhole or other approved access by means of an inversion process and the application of a hydrostatic head sufficient to fully extend the liner to the next designated manhole. The tube shall be inserted into the vertical inversion standpipe with the impermeable plastic membrane side out. At the lower end of the inversion standpipe, the liner tube shall be turned inside out and attached to the inversion standpipe so that leak proof seal is created. The inversion head will be adjusted to be of sufficient height to invert the liner to the next access point designated and to hold the liner snug to pipe wall and to produce dimples at side connections and flared ends at the entrance and exit access points. The use of lubricant is recommended and if used such lubricant shall be approved by the manufacturer. The manufacturer's standards shall be followed during the elevated curing temperature so as not to over stress the felt fiber and cause damage or failure of the liner prior to cure. (In certain cases, the Contractor may elect to use a Top Inversion. In this method, the liner is pre-inverted to a distance that corresponds to the minimum required inversion standpipe, the liner is attached to top ring and the standpipe is formed by the tube itself.)

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6. The Contractor shall carry out his/her operations in strict accordance with all applicable OSHA standards. Particular attention is drawn to those safety requirements involving working with scaffolding and entering confined spaces.

7. Liner Curing:

a. After inversion is completed, the Contractor shall supply a suitable heat source either through steam or water re-circulation equipment. The equipment shall be capable of delivering hot steam or water to the far end of the liner per manufacturer's recommendations, to uniformly raise the steam or water temperature in the entire liner above the temperature required to effectively cure the resin. This temperature shall be determined by the manufacturer based on the resin/catalyst system employed.

b. The heat source shall be fitted with suitable monitor to gauge the temperature of the incoming and outgoing steam or circulating water. Another such gauge shall be placed between the liner and the pipe invert at near and far access to determine the temperature of the liner during cure. All gauge monitoring shall be above ground and not in the manhole. Gauges are to be such that the gauge can be easily read with appropriate gradations. Steam or water temperature in the line during the cure period shall be as recommended by the resin manufacturer.

c. Initial cure shall be deemed to be completed when inspection indicates that the exposed portions of the liner appear to be hard and the remote temperature sensor indicates that an exothermic reaction has occurred. The cure period shall be of a duration recommended by the resin manufacturer, as modified for the process, during which time the re-circulation of the steam or water and cycling of the heat exchanger to maintain the temperature in the liner continues.

d. Before the curing begins, the pressure required to hold the flexible tube tight against the existing conduit shall be provided by the tube manufacturer. Once the cure has started and dimpling for laterals is completed, the required pressure shall be maintained until the cure has been completed. Should the pressure deviate more than 2.3 ft. of water (1 psi) from the required pressure, the installed tube shall be completely removed from the existing conduit by the Contractor and the process shall be repeated at no additional cost to the Owner. A continuous log of pressure during cure shall be maintained and provided to the Engineer.

8. Cool Down

a. The Contractor shall cool the hardened liner to a temperature below 100 degrees F. before relieving the static head in the inversion standpipe. Cool-down shall be conducted according to manufacturer's recommendations. Care shall be

SECTION 02510 – PART III

taken in the release of the static head such that a vacuum will not be developed that could damage the newly installed liner.

9. Finish

a. The finished lining shall be continuous over the entire length of an insertion run and be as free as commercially practicable from visual defects such as foreign inclusions, dry spots, pinholes and delamination. The lining shall be impervious and free of any leakage from the pipe to the surrounding ground or from the ground to the inside of the lined pipe. The surface shall be smooth and free of waviness throughout the pipe. Any defects resulting from improper installation or material defects shall be repaired by the Contractor in a manner approved by the Owner / Engineer and with no additional cost to the Owner.

10. Sealing Pipe at Manholes

a. At the terminal ends of pipe at manholes, the annular space between the liner and the existing sanitary sewer line at each manhole shall be sealed with non-shrink hydraulic cement or other approved hydraulic grout including sulfate resistance additives so as to provide a watertight seal. In cases where the CIPP liner traverses through the manhole, the sealer shall be applied between the cut edge of the liner and the existing bench/channel. Sealing material and installation method shall be submitted to and approved by the Owner / Engineer prior to start of construction.

b. Existing benches and channels within manholes shall be built up with a quick-set hydraulic cement type grout as needed to match the CIPP liner elevations. Smooth transition shall be formed between the existing surfaces and the CIPP.

G. TESTING OF THE LINER

1. The water tightness of the liner shall be gauged throughout the curing process. Once completely cured, the liner shall be subjected to a positive hydrostatic head above that of the groundwater in the presence of the Engineer. Any leaks shall be repaired and re-tested to the satisfaction of the Engineer. The Contractor shall supply a method for repair subject to the approval of the Engineer.

2. If due to broken or misaligned pipe at the access point, the lining fails to make a tight seal, the Contractor shall apply a seal at that point. A seal shall also be applied at the edge of the liner and previous manhole insert. This shall be done after the liner has been cured and the section through the manhole has been cut open. The seal shall be of a resin mixture compatible with the pipe.

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H. TESTING OF THE PIPE

After installation and reforming of the liner and before any taps are made, the Contractor shall run an air test on the sewer line to determine if it is watertight. The Contractor shall furnish all necessary equipment to conduct the test. Acceptable method is a low pressure air test. Air test procedure shall be as follows:

1. Pressurize the test section to 4.0 psi and hold above 3.5 psi for not less than 2 minutes. Add air if necessary to keep the pressure above 3.5 psi. At the end of this 2 minute saturation period, note the pressure (must be 3.5 psi minimum) and begin the test. The pressure should hold for the Minimum Test Times as specified below. If the pressure drops 0.5 psi in less than the time given below, the section of pipe shall not have passed the test, the source of the pressure loss must be corrected by the Contractor at no expense to the Owner, and the pipe must be retested.

<u>Sewer Size (Inches)</u>	<u>Minimum Test Time (Minutes)</u>
8	4
10	5
12	6
15	7
18	9
21	12

2. When the prevailing groundwater is above the sewer being tested, air pressure shall be increased 0.43 psi for each foot the water table is above the flow line of the sewer. Please note: in no case shall the starting test pressure exceed 9.0 psi to ensure worker safety.

3. If the time for the pressure to drop 0.5 psi is 25 percent or less of the time given in the table, the line shall immediately be re-pressurized to 3.5 psi and the test repeated.

4. The pressure gauge used shall be supplied by the Contractor, shall be graduated in divisions of 0.10 psi and an accuracy of 0.004 psi.

5. If a section of liner does not pass any of the testing above, the Contractor shall repair to the satisfaction of the Engineer at no additional cost to the Owner.

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I. Quality Control Tests:

1. For every other Inversion, collect as follows:

a. CIPP less than 18 inches in diameter: Collect a restrained pipe sample by placing a section of PVC pipe of the same diameter as the existing host sewer pipe on the tail end of the liner in the manhole. The length of PVC pipe shall be 30 inches plus 1.5 times the diameter of the existing sewer. Run the impregnated tube through the pipe and cure the CIPP under restrained conditions. Cut two 15-inch long cylindrical samples from the center of the restrained pipe sample. In instances when preparing a restrained pipe sample is not practical, as approved in writing by the Owner, a sample shall be fabricated from material taken from the tube and catalyst system used and cured in a clamped mold placed in the down tube when circulating heated water is used or in the silencer when steam is used.

b. In medium and large diameter applications and areas with limited access, the sample should be fabricated from material taken from the tube and the resin/catalyst system used and cured in a clamped mold placed in the downtube when circulating heated water is used and in the silencer when steam is used. This method can also be used for sizes 18 inch or less in situations where preparing samples in accordance with a. above can not be obtained due to physical constraints, if approved by the owner.

2. Label samples with the contract number, date of Installation, street location, segment number(s), and specified thickness.

3. The following tests at the following minimum frequencies will be performed by the Contractor on CIPP liners installed. The Owner may, at his discretion and cost, conduct additional testing to improve the resolution of performance test characterization. All testing shall be performed by a laboratory with an American Association for Laboratory Accreditation (A2LA) for the specific test to be performed.

a. Short-term Flexural (Bending) Properties – The initial tangent flexural modulus of elasticity and flexural yield strength measured in accordance with ASTM D790.

i. Frequency-One test per every 2 inversion shots.

D638.

b. Tensile Strength measured in accordance with ASTM

i. Frequency-One test per every 2 inversion shots.

D5813/D3567.

c. Thickness measured in accordance with ASTM

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- i. Frequency-One test per every 2 inversion shots.
- d. Long-term Flexural Modulus of Elasticity measured in accordance with ASTM D2990. Test will be performed for 10,000 hours under test conditions and loadings described below. The data points from 1,000 hours to 10,000 hours of the Long-term Flexural Modulus shall be extrapolated using a Microsoft Excel log-log scale linear regression analysis to determine the minimum service life performance of the resin tube.
 - i. Testing will be conducted at:
Temperature: 21 to 25 degrees C Relative humidity: 5 percent minimum Load: Load used in ASTM D2990 testing as submitted in accordance with paragraph 1.4.A.3
 - ii. Frequency-For each different combination of flexible tube, resin, diameter and installation method used on this project: One test per every 20 inversion shots.

J. RECONNECTION OF LINE SERVICE

After the pipeline has been successfully reformed and tested, Contractor shall reconnect each “live” sanitary service lateral connection as follows:

1. It shall be the Contractor’s responsibility to verify, by video, which service connections are live. Each existing live service connection shall be opened through the liner using a specially designed cutting machine without the need for excavation. The service laterals shall be opened to provide a capacity not less than 95% of their original flow rate. The opening from the liner to the service outlet shall be made from the interior of the liner by means of a television camera directing a cutting device. A smooth edge for reconnections shall be established with wire wheeled brushes. All lateral services reconnected shall be free of furs and frayed edges or any other restrictions preventing free flow of wastewater. In the event that an active service connection is missed, it will be the Contractor’s responsibility to reconnect said service at no additional cost to the Owner. If the opening for reestablishing a lateral connection is cut larger than the opening of the lateral or if any other damage is caused to the liner the Contractor shall, at no additional cost to Owner install a pipe patch (point repair) and reestablish the lateral connection.

2. If the Contractor must excavate to reconnect a sanitary service connection, the contractor shall notify the Engineer in writing asking for authorization to proceed with work under other methods. No excavation will take place without written approval by the Engineer.

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3. Chemical grouting or service connection lateral liners shall be used to seal the annulus between the CIPP rehabilitated main line and the host pipe around the reinstated lateral openings when specified by the Engineer.

4. All services shall be reinstated within 24 hours to minimize disturbance to private residents. If connections cannot be reinstated within this period of time, the Contractor shall obtain approval from the Engineer prior to any extension to allow additional bypass/diversion pumping.

3.05 FINAL ACCEPTANCE

After installation of the liner and reinstatement of service connections, the contractor shall perform a CCTV inspection in the presence of the Owner's Representative. A radial-view TV camera shall be used. The finished liner shall be continuous over the entire length of the installation. The liner shall be free of significant visual defects, damage, deflection, holes and the like. Cut-ins at service connections shall be neat and smooth. There shall be no visible infiltration through the liner or from behind the liner at service connections and manholes.

3.06 CLEAN-UP

After the liner installation and joint sealing has been completed and accepted, the Contractor shall clean-up the entire project area and return the ground cover to grade. All excess material and debris not incorporated into the permanent installation shall be disposed of by the contractor, in accordance with the State and Federal laws and regulations. The project area affected by the Contractor's operations shall be reinstated.

3.07 WARRANTY

A. The liner shall be certified by the manufacturer for specified material properties. The manufacturer warrants the liner to be free from defects in raw materials for five (5) years from the date of delivery. The Contractor shall warrant the liner installation for a period of (5) years. During the warranty period, any defects which affect the integrity or strength of the pipe shall be repaired at the Contractor's expense in a manner mutually agreed by the Owner and the Contractor.

B. If a liner fails to cure, the Contractor shall be required to remove the failed liner at no additional cost. The cost shall include all material, excavation, backfilling, cutting concrete. Pipe shoring, temporary pavement, permanent pavement, permits and other incidental work required to remove the liner from the existing pipe. There shall be no direct payment for this work.

SECTION 02520 – TRENCHLESS REHABILITATION OF SANITARY SEWERS
(ULTRAVIOLET LIGHT CURED-IN-PLACE PIPE LINING)

PART I – GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall furnish all labor, materials, tools, equipment and perform all operations required with the installation of the ultraviolet (UV) light cured-in-place pipe (CIPP) liner in existing sanitary sewer mains. The CIPP shall be formed by inserting a resin-impregnated flexible fabric tube into an existing sewer line, expanding the tube to fit against the existing sewer line walls, and then curing the resin using UV light. The installation of the resin-impregnated flexible fabric tube shall be in accordance with the manufacturer's recommendations and/or other approved methods, and shall meet or exceed ASTM F2019 standards. When completed, the cured liner should extend from end-to-end of the section being lined in a continuous tight fitting watertight pipe-within-a-pipe and shall provide a minimum of 100 percent of the existing sewer line's original design capacity.

B. The rehabilitation of the sanitary sewer main shall be performed without the need for excavation and demolition of existing structures. The Contractor shall be able to re-establish user lateral services without excavation and minimize the disruptions to neighboring homes and traffic. Excavation for emergencies is permitted, but only as directed and approved by the Owner's Engineer.

C. Prior to ordering sewer rehabilitation materials, the Contractor shall be responsible for inspecting and confirming the inside dimension, alignment, pipe material, and condition of the existing sewer pipe segments to be lined with CIPP.

D. The Contractor shall be responsible for performing all CIPP and related work, including but not limited to traffic control, sewer flow control and bypassing, sewer line cleaning, root and protruding tap cutting, pre- and post-rehabilitation video inspection, liner installation, reopening of service connections, testing, reconstruction, and restoration. All work shall be performed in accordance with applicable Federal, State, and City/Town/Village regulations, including current OSHA safety standards.

E. The Contractor shall be responsible for odor and noise mitigation under this contract in accordance with applicable Federal, State, and City/Town/Village regulations. The Contractor shall monitor the surrounding area and minimize odors and noise that may occur due to his work activities.

F. Pipeline rehabilitation products that require bonding to the existing pipe wall for structural strength will not be allowed as the conditions of the existing pipe walls are unknown and may vary greatly. The finished CIPP wall shall have sufficient structural strength to support all dead loads, live loads and groundwater pressure imposed with the assumption that the existing pipe cannot share any loading or contribute to structural integrity of the liner.

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G. Upon completion of the work, the Contractor shall provide the Owner with an extended performance warranty which shall guarantee the materials and workmanship for a period of five (5) years from the date of final acceptance. The warranty shall be all inclusive of all material, labor and equipment costs associated with the remedial measures necessary to correct the situation if a product failure is detected.

1.02 SUBMITTALS

B. Design Data:

1. Structural design calculations and specification data sheets listing all parameters used in the liner design and thickness calculations based on ASTM F2019 for each pipe segment. The design parameters shall meet or exceed the following requirements:

Minimum CIPP Resin Requirements:

Flexure Strength	6,500 psi
Flexural Modulus	725,000 psi

Minimum Finished CIPP Wall Thickness Requirements:

8- and 10-inch 3.5 mm
Diameter Host Pipe

12-inch 4.5 mm
Diameter Host Pipe

For larger diameter host pipes the Contractor shall provide for approval the proposed Minimum Finished thickness to the Engineer.

Other Required Parameters for calculating Minimum Finished Wall Thickness:

Fully deteriorated host pipe

H-20 live load = 16,000 lbs (assume live load in non-paved areas as well for maintenance vehicles)

Groundwater depth above bottom of the pipe = depth to ground surface
(fully saturated soil conditions)

Pipe ovality = 3 percent

Soil density = 120 lbs/cu. ft.

Soil modulus = 700 psi

Safety factor = 2.0 minimum

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All calculations shall be prepared under and stamped by a Professional Engineer registered in New York State. Submit P.E. Certification Form for all CIPPL design data.

2. Certified test reports demonstrating that the exact resin/liner combination to be used for this project meets the requirements for initial structural properties (performed in accordance with ASTM F2019, ASTM F1216, ASTM D638, and ASTM D790) and chemical resistance (performed in accordance with ASTM F1216-Appendix X2 or ASTM D5813).

3. Certified test reports demonstrating that the exact resin and comparable liner to be used for this project has been tested for long-term flexural modulus of elasticity and long-term flexural strength (i.e. 10,000 hour creep testing performed in accordance with ASTM D2990 for design conditions applicable to this project). Load shall be equivalent to 400 psi minimum. If the liner used for testing is not the exact liner to be used on this project, submit a detailed description of the physical properties of both the liner used in the test and the liner to be used for this project to demonstrate that the two liners are comparable in terms of physical properties.

B. Shop drawings shall be submitted for all items to be furnished in accordance with the provisions of the General Conditions as supplemented. Submittals shall include information on the fiberglass tubing liner, thermosetting resin, bypass pumping system, means and methods for sewer joint testing and grouting procedures, manufacturer's data for chemical sealing materials, backflow prevention devices for hydrants (if necessary), testing reports, televising records, and all other incidentals intended to be utilized.

C. Laboratory test reports and other certifications, as applicable, that the liner material meets the requirements of these specifications.

D. The Contractor shall prepare and submit a procedure outlining how they will properly notify the Property Owners in advance of the work described and, the alternate provisions which will be provided in cases of emergencies where the homeowner may lose service for an extended period of time.

E. The Contractor shall submit to the Owner a detailed description of the proposed method of installation. The submittal shall be all inclusive of all installation features, such as set-up pressures, cure time, stating the installation parameters that will be monitored, pressure temperature; type of gauges to be utilized for monitoring and location of the gauges, etc and shall also include other related incidentals such as the pre and post flushing/cleaning of the existing pipe, root removal, bypass pumping to maintain existing sewage flows, maintenance and protection of traffic, re-establishing flow from existing building connections, property owner notifications, general site clean-up, etc.

SECTION 02520 – PART I

F. The Contractor shall submit to the Owner, for approval prior to CIPP liner installation, a copy of the pre-inspection video, on DVD, and a report detailing the condition of the pre-lined pipe identifying and documenting recommended spot repairs, protruding lateral repairs, lateral connections requiring chemical grout repair, and any other defect that would inhibit proper lining of the sewer line section.

G. The Contractor shall submit to the Owner, for approval prior to CIPP liner installation, a written confirmation, stating that the sewer is clean and sound enough to ensure an effective rehabilitation lining. This submittal is required for each section of pipeline to be lined.

H. For each section to be lined a formal submittal shall be made by the Contractor to the Engineer which addresses the existing conditions such as air temperature within the pipeline to be lined, outside air temperature and hydrostatic ground water pressure. Further, the communication shall identify the recommended speed of the ultraviolet curing assembly for proper curing of the resin, installation pressure, temperature limitations, and how pressure and cure time will be monitored. All gauge monitoring shall be performed from above ground.

I. Detailed description of the bypass pumping operations and the equipment the Contractor will have onsite to accomplish the needs of the area shall be submitted.

J. Two copies of the signed and sealed required liner thickness shall be submitted.

K. The Contractor shall submit to the Owner for approval a post-inspection video showing the condition of the post-repaired, post-lined pipe segment.

L. A manufacturer's final certificate of approval that states that material and installation methods fully satisfied their requirements shall be submitted.

1.03 SITE SAFETY

The Contractor shall operate in strict accordance with all applicable OSHA standards and regulations. The Contractor's particular attention is drawn to those safety requirements involving entry into a confined space. The Contractor is responsible for on-site safety and all the equipment/supervision necessary for full compliance. Prior to entering manholes to perform sewer rehabilitation work, the Contractor shall evaluate the atmosphere in and near the sewer to determine the presence of toxic or flammable vapors and shall ventilate the rehabilitation work area as necessary to render it safe.

SECTION 02520 – PART I

1.04 PRODUCT HANDLING

All materials (fiberglass liner, thermosetting resin, etc.) shall be accompanied by test reports certifying that the material conforms to the ASTM listed herein. Materials shall be shipped, stored, and handled in a manner consistent with the written recommendations of the manufacturer. Storage locations shall be approved by the Owner and Engineer. The Contractor shall test all materials for compliance with the Contract Documents prior to delivery.

1.05 SEQUENCE OF WORK

The Contractors work in the field shall be in two phases.

A. Phase I – Field Investigation

Phase I shall include all field investigation and sewer line inspections required to be performed before any approval for work under Phase II can be approved. Specifically:

1. Mobilization to the locations specified in the work order.
2. Flush and clean sanitary sewer sections. Obtain necessary permits and requirements from ECWA and/or the municipality that owns the water system before using any hydrants.
3. Set up by-pass pumping if necessary and perform a pre-lining video to detail the condition of the line and identify any pre-lining repair work that may be necessary before a successful lining procedure may be done. The Contractor shall make recommendations as to any spot repair locations that are necessary, protruding laterals that need to be cut, and on if the sewer is acceptable to line or not.
4. Owner / Engineer will review a copy of pre-lining videos, and approve or disapprove the recommendations.
5. Contractor shall submit to the Owner / Engineer a written confirmation that each section to be lined is clean and sound enough to ensure an effective lining.
6. Upon approval by the Owner / Engineer of a sewer section, the Contractor shall submit, in shop drawing form, design calculations specifically for that section.

SECTION 02520 – PART I

B. Phase II - Remedial Work and Pipe Lining

Upon approval from Owner / Engineer to continue, Phase II shall include all approved remedial and lining work. Specifically:

1. Mobilization of repair / lining crews and equipment to approved sections.
2. Set up of by-pass pumping as necessary.
3. Completing all protruding lateral cutting, and other recommended and approved remediation.
4. If any remedial work is done, another pre-lining video will be required.
5. Clean and video the section again to verify lateral connection locations.
6. Lining and curing the pipe.
7. Air testing on each section and taking a restrained pipe sample every other section.
8. Cutting open laterals and brushing edges smooth after liner cooling.
9. Post-lining video inspection and submission of video to Owner / Engineer for final review.

1.06 COMMUNICATION

Prior to carrying out any field work in either phase the contractor shall notify 48 hours in advance the Owner, homeowners, local municipality, local fire department, and local police department that the contractor will be beginning said work.

PART II – PRODUCTS

2.01 MATERIALS

A. This specification references American Society for Testing and Materials (ASTM) standard specifications, which are made a part hereof by such reference and shall be the latest edition and revision thereof. ASTM-F-2019 Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Pulled in Place Installation of Glass Reinforced Plastic (GRP) Cured-in-Place Resin Pipe (CIPP).

B. General Corrosion Requirements: The finished pipe liner in place shall be fabricated from materials which will be chemically resistant to withstand internal exposure to domestic/industrial sewage.

SECTION 02520 – PART II

C. Tube

1. The tube material shall meet the requirements of ASTM F2019, Section 5.2.1. The tube shall be compatible with the resin system used. The tube shall be fabricated to a size that, when installed, will fit the internal circumference and the length of the existing pipe. Allowance shall be made for circumferential and longitudinal stretch during installation. The minimum length of each section shall be the distance from the manhole to the next manhole. The Contractor shall verify section lengths and inside dimensions of the existing sewer section before tube fabrication. Sewing or connecting tubes in order to attain the required length is prohibited.

2. The external foils shall be styrene resistant to protect and contain the resin used in the tube. The exterior foil shall be ultraviolet light resistant and translucent to allow visual inspection of the impregnation of the resin within the glass fibers.

3. The wall color of the interior pipe surface of the CIPP after installation shall be a light reflective color so as not to interfere with visual and/or closed circuit television (CCTV) inspection of the liner or its required properties.

D. Resin

1. The resin system shall meet the requirements of ASTM F2019, Section 5.2.4 or these provisions, whichever is more stringent.

2. The resin shall be a chemically resistant UV cured isophthalic polyester or vinyl ester thermoset resin. When cured the CIPP shall meet the structural and chemical resistance requirements of ASTM F2019.

E. Liner Material Test – Tests for compliance with this specification shall be made according to the applicable ASTM specification. A certificate of compliance with this specification shall be provided by the manufacturer for all materials furnished under this specification. In addition, all materials used in the construction process shall be made of the best respective kinds and to the satisfaction of the Engineer. Any materials not approved by the Engineer shall be rejected prior to the reconstruction of the sewer. These rejected materials shall then be replaced with approved materials at the Contractor's expense.

<u>Cured Liner</u>	<u>Standard</u>	<u>Results</u>
Flexural Stress	Modified ASTM D-790	6,500 psi
Modulus of Elasticity	Modified ASTM D-790	725,000 psi

SECTION 02520 – PART II

F. The Contractor shall furnish, prior to use of the lining materials, satisfactory written guarantee of his/her compliance with the manufacturer's standards for all materials and techniques being used in the inversion lining process. The Contractor shall provide certified test results for approval by the Engineer, from the manufacturer that the material conforms to the applicable requirements. Material not complying with the requirements shall be rejected.

PART III –EXECUTION

3.01 BYPASS PUMPING

A. The Contractor shall supply all necessary pumps, conduits and other equipment to divert the flow of sewage around the section of sewer line (manhole to manhole) in which the work is to be performed. The by-pass system shall be sufficient capacity to handle existing flows plus any additional flow that may occur during rainfall events.

B. The Contractor will be responsible for furnishing the necessary labor and supervision to set up and operate the pumping and by-pass system. If pumping is required on a 24 hour basis, all pump engines shall be manned at all times and equipped in a manner to keep the pump noise at a minimum. All bypassed sewage flow must be discharged to a sanitary sewer and shall not be allowed to enter any storm sewer line, drainage ditch, or street gutter. Sufficient pipe, hose or other approved means of flow conveyance shall be on hand to ensure that, in case of emergency, flow can bypass to the next clear manhole. The Contractor shall prepare and submit a detailed outline describing his/her proposed operation. The method must be approved by the Engineer prior to the start of construction.

C. The Contractor's pumps shall be so designed that all or any portion of the flow can be handled during normal or high flow conditions. The Contractor will be responsible for any damages encountered as a result of the bypass systems.

3.02 SEWER LINE CLEANING

A. The Contractor shall provide all necessary labor, specialty equipment, water and other incidentals to effectively clean sanitary sewer lines of various diameters. All sanitary sewer sections required to be lined shall be cleaned using mechanically powered, hydraulically propelled or high velocity sewer cleaning equipment. Selection of the equipment used shall be based on the conditions of the lines at the time the work commences. The equipment and methods selected shall be satisfactory to the Engineer. The equipment selected for cleaning shall be capable of removing dirt, grease, rocks, sand, tree roots and other deleterious materials and obstructions from the sewer lines and manholes.

SECTION 02520 – PART III

B. All sewers shall be sufficiently cleaned and free of water as ordered by the Engineer, to permit in-line television inspection of joints, cracks, leaks and breaks and in preparation of the lining operation.

C. All sludge, dirt, sand, rocks, grease, tree roots and other solid or semi-solid material resulting from the cleaning operation shall be removed at the downstream manhole of the section being cleaned. Passing material from manhole section to manhole section which could cause line stoppages or blockages will not be permitted.

D. A collection device, as approved by the Engineer, shall be utilized to collect and remove debris from the reach being cleaned.

E. All dirt, debris, and other material removed from the sewers shall be hauled away and disposed of in a manner and place acceptable to the New York State Department of Environmental Conservation and the Engineer. All such work will be at the Contractor's expense. All materials shall be removed from the site at the end of each workday. Under no circumstances will the Contractor be allowed to accumulate debris, etc., on the work site beyond the stated time, except in totally enclosed containers meeting NYSDEC and OSHA requirements and as approved by the Engineer.

F. During all sewer cleaning operations, satisfactory precautions shall be taken to protect the sewer lines from damage that might be inflicted by the improper use of cleaning equipment. Whenever hydraulically propelled cleaning tools, which depend upon water pressure to provide their cleaning force, or any tools which retard the flow of water in the sewer line are used, precautions shall be taken to ensure that the water pressure created does not cause any damage or flooding to public or private property being served by the manhole section involved. The flow of sewage in the sewer lines shall be utilized to provide necessary pressures for hydraulic cleaning devices whenever possible. When additional quantities of water from fire hydrants are approved as necessary to avoid delay in normal working procedures the water shall be conserved and not used unnecessarily. No fire hydrant shall be obstructed in case of fire in the area served by the hydrant nor shall a hydrant be used for the purpose described unless the vacuum break is provided. The Contractor will be responsible for all permits, arrangements, and costs associated with obtaining water for this construction operation. The Contractor shall use approved backflow prevention devices if hydrants are used for water supply.

G. Contractor's personnel shall be familiar with all phases of sewer line cleaning to insure quality performance without causing damage to any of the appurtenances associated with work involved. In the event a line must be re-cleaned as ordered by the Engineer for any reasons, the Contractor shall undertake such re-cleaning, without charge to the Owner.

SECTION 02520 – PART III

H. Roots shall be removed in the designated sections where root intrusion is a problem. Special precautions should be exercised during the cleaning operation to assure as complete removal as possible of visible roots from the joint or lateral area. Procedures may include the use of mechanical devices such as rodding machines, expanding root cutters and porcupines, and hydraulic procedures such as high pressure jet cleaners.

I. Any damage caused by the Contractor's cleaning operation, shall be repaired by the Contractor at no additional cost to the Engineer or Owner.

3.03 TELEVISION INSPECTION

A. The Contractor shall provide all equipment, personnel and supplies necessary for the internal close circuit televisions (CCTV) inspection of sanitary sewers. The specifications in this section shall apply to all internal inspection of sewers under this contract.

B. Camera and Recording Equipment: The radial view video camera used for the inspection shall be one specifically designed and constructed for such inspection. Lighting for the camera shall be suitable to allow a clear picture for the entire periphery of the pipe. The camera shall be operative in 100% humidity conditions. The camera, television monitor, recorder and other components of the video system shall be capable of producing a minimum 500 line resolution video picture in living color. Picture quality and definition shall be to the satisfaction of the Owner's representative and if unsatisfactory equipment shall be removed and no payment made for unsatisfactory inspection.

C. Power Cable: The power cable attached to the camera must be of sufficient length to insure televising the entire pipe section from manhole to manhole. Any delays in television inspection or additional equipment set ups caused by insufficient length of cable will be the responsibility of the Contractor.

D. Preparation: CCTV equipment shall be set up in the preparation for television inspection. Equipment set up shall include necessary traffic control, positioning of winches, power cable hook-up, CCTV camera preparation and positioning of the CCTV camera in the manhole and proper cleaning and de water of the target sewer line to allow complete inspection of the line. **The pipeline shall be cleaned and free of all water and material that prohibits viewing the condition of the entire surface, including bottom of the pipe, during all CCTV recordings prepared and submitted for approval.**

E. Internal Inspection: The camera shall be moved through the line in either direction at a uniform rate, stopping when necessary to insure proper documentation of the sewer's condition and in no case will the television camera be pulled at a speed greater than 30 feet per minute. Manual winches, power winches, TV cable and powered rewinds or other devices that do not obstruct the camera view or interfere with proper documentation of the sewer conditions shall be used to move the camera at a uniform speed through the sewer line.

SECTION 02520 – PART III

F. Whenever non-remote powered and controlled winches are used to pull the television camera through the line, telephones or other suitable means of communication shall be set up between the two manholes of the section being inspected to insure good communication between members of the crew.

G. Measurement for location of any defects shall be above ground by means of the meter device. Marking on cable, or the like, will not be allowed. Measurement meters will be accurate to one tenths (0.1) of a foot over the length of the section being inspected. Accuracy of the measurement meters shall be checked daily by use of a walking meter, roll-a-tape or other suitable device.

H. Documentation of the television results shall be as follows:

1. Points of Significance: Points of significance as referenced in the following sections shall include, but are not limited to, ALL infiltration points, points or areas of pipe deficiency, locations of building sewer and lateral connections, protrusions, offset joints, roots, storm sewer connections, collapsed sections, presence of scale or corrosion, and other discernible features or unusual conditions. The CCTV camera shall stop at and look into all lateral connections and shall clearly show the entire perimeter of connection between each lateral and the main line sewer.

2. Television Inspection Logs and Reports: Printed location records shall be kept by the contractor and shall clearly indicate the location, in relation to adjacent manholes of each point of significance observed during the television inspection. Image captures shall be taken of each point of significance for inclusion in printed reports. A bound, printed report of each inspection, clearly showing an image, location and description of each point of significance, shall be provided along with a video recording of the inspection to Owner for review. Submitting reports as Portable Document Format (pdf) files in lieu of printing is acceptable.

3. Video Recordings: Contractor shall record the entire television inspection of each sewer line or via DVD. The recording shall include a clearly readable text overlay displaying:

- A. Prior to camera entering sewer line
 - 1. Date and time of inspection (EST)
 - 2. Contractor name
 - 3. Sewer line section ID (as provided by owner)
 - 4. Upstream and downstream manhole ID's (as provided by owner)
 - 5. Direction of recording relative to flow

SECTION 02520 – PART III

- B. During entire inspection:
 - 1. Sewer line section ID.
 - 2. Camera's position station in feet relative to beginning of pipe section being inspected.
- C. At each point of significance:
 - 1. Description of observation

The camera shall be slowed or stopped for a sufficient length of time for proper inspection of each point of significance. Proper inspection of laterals and other connecting pipes shall include focusing the camera up the connection and also televising the entire connecting perimeter. A copy of each completed inspection shall be provided to Owner. Video DVD's must be of type DVD(-) and finalized to ensure proper playback in any DVD device. Digital recordings must be in a common video format such as avi, flv, mpg, or wmv and be provided via CD, data DVD, or USB flash drive. Video recordings must be named / labeled by sewer line ID hyphen date of recording (ie. SewerLineID – YYYYMMDD). The contractor shall have all original recordings and necessary playback equipment readily accessible for review by the Owner and Engineer during the project.

I. Video Inspector Quality: The camera shall have lighting focus and clarity sufficient enough to allow clear visibility for proper evaluation of all points on infiltration, pipe deficiency, and of other points of significance as described in section H1 above. The sewer line being inspected must be free of debris and water to allow a complete inspection as stated under Section D. In the event a line must be re-inspected as ordered by the Engineer for lack of video quality, the Contractor shall undertake such re-inspection without charge to the Owner.

3.04 RECONSTRUCTION OF SANITARY SEWERS BY MEANS OF PULLED IN PLACE GLASS REINFORCED PLASTIC CURED-IN-PLACE PIPE

A. FLOW BY PASS PUMPING

The Contractor, where required, shall by-pass the sewage around the section of sewer-line to be lined. The by-pass shall be accomplished by plugging the existing upstream manhole and pumping the sewage into a downstream manhole or adjacent system. The pump and by-pass lines shall be of adequate capacity and size to handle the flow. The by-pass pumping of flow shall conform to Section 02520, Item 3.01 and shall be maintained until the section is fully cured, tested and placed back in service. Under no circumstances will the dumping of raw sewage on private property or on streets be allowed.

SECTION 02520 – PART III

B. CLEANING

Prior to commencing the liner process, the Contractor shall clean the sanitary sewer that is to receive the liner. It shall be the Contractor's responsibility to clear the line of any protruding service connections, tree roots or solids that might prevent liner installation inside existing sewer. The methods used for cleaning the sewer line shall be in accordance with Section 02520, Item 3.02. Precautions shall be taken in removing protruding services and other obstructions so as not to cause further failure of existing pipe or service pipe which would interfere with the lining operation or the reconnection of existing services to the liner.

C. TELEVISION INSPECTION

Inspection of pipelines shall be performed by experienced personnel trained in identifying breaks, obstacles and service connections by closed circuit television. The interior of the pipeline shall be carefully inspected to determine the location of any conditions which may prevent proper installation of the liner pipe into the sewer line, and it shall be noted so that these conditions can be corrected. A video and suitable report log shall be kept for reference by the Owner.

D. EXISTING SERVICE CONNECTIONS

Service connection verification shall be conducted by the contractor as follows:

1. The Contractor shall identify and document all live service connections that are to be reconnected to the CIPP. He/she shall utilize procedures which do not damage, block or otherwise interfere with the operation of the sewer or the ground above. Acceptable methods of the identification include television observation, combined with dye testing, magnetic detector, or an equal, as necessary.

2. The position and location of the live services shall be both logged in written record and marked on the pavement or staked in the lawn areas for field identification.

3. It is the Contractor's responsibility to determine that all live services have been located and marked so that they may be connected to the liner pipe. If the Contractor fails to connect the same to the pipe liner, the cost of damages resulting from this failure shall be borne entirely by the Contractor.

SECTION 02520 – PART III

E. LINE OBSTRUCTIONS

1. It shall be the responsibility of the Contractor to clear the line of obstructions by conventional sewer cleaning equipment, including solids, roots, grit, scaling, etc. If inspection reveals an obstruction that, in the opinion of the Contractor, will not allow for CIPP lining of the section, then the Contractor shall immediately notify the Engineer.

F. RESIN IMPREGNATION

1. The tube shall be impregnated with resin (wet-out) in accordance with ASTM F2019, Section 6.3. The impregnation equipment shall contain devices to secure proper distribution of the resin.

2. The installer shall arrange for a location where the liner will be impregnated prior to installation. The installer shall allow the Owner or representative thereof to inspect the materials and procedures used to impregnate the tube.

3. Should the liner material be cut to pump/vacuum resin into the liner, all layers of the liner shall be sewn closed and the plastic coating sealed watertight, per manufacturer's recommended procedures.

G. INSERTION OF THE LINER

1. Prior to insertion of the liner the Contractor shall insure the cleanliness of the existing sewer. All debris and obstruction shall be removed. As in Section 02520, Item 1.03, Submittals, the contractor shall submit a letter stating that the sewer is clean and sound enough to ensure an effective lining and provide information regarding cure time and pressure for the section to be lined.

2. Insertion shall be in accordance with ASTM F2019, Sections 6.2 and 6.4.

3. The Contractor may install a pre-liner tube before installing the actual liner based on their evaluation of the host pipe and levels of groundwater infiltration. The pre-liner tube shall be of reinforced plastic formed to fit the host pipe and shall be continuous from manhole to manhole. The pre-liner tube shall be a rated gas barrier for styrene.

4. Prior to installing the tube, a 10 mil thick plastic sheet (slip sheet) shall be pulled into the host pipe to protect the tube from damage as the tube is pulled in, unless otherwise approved by the Owner's Engineer.

SECTION 02520 – PART III

5. The tube shall be pulled into place through an existing manhole or approved access point. The pulling speed shall not exceed 15 feet per minute. Care shall be exercised not to damage the tube during the pulling phase. The winch used to pull the liner into the host pipe must be capable of documenting the amount of tension used. The manufacturer's maximum pull-in tension shall not be exceeded.

6. Segments of tube that have been resin impregnated and placed in the host pipe and then are found to be too short, shall be removed without curing and properly disposed of at the Contract's expense. Removal of uncured, resin impregnated tube shall be accomplished in such a way as to not damage the host pipe and minimize the amount of resin allowed to escape. Any additional cleaning or repairs to the host pipe required subsequent to removal of the tube, as well as cleanup of all escaped resin and any odors that may result shall be the responsibility of the Contractor and completed with additional expense to the Owner.

7. The Contractor shall measure the elongation of the tube after the pull-in completion. The longitudinal elongation shall be less than 2 percent of the overall length.

H. LINER INFLATION

1. End plugs shall be used to cap each end of the liner to form an air tight seal. The end plugs shall be properly secured to prevent them from being expelled due to pressure.

2. Prior to inflation, the tube manufacturer shall provide the values for the minimum pressure required to hold the tube tight against the existing pipe walls and the maximum allowable pressure so as not to damage the tube.

3. An air compressor with sufficient capacity shall be used to expand and hold the impregnated tube tight to the host pipe wall. The air pressure shall be sufficient to produce minor dimples at lateral connections and shall not exceed the maximum allowable pressure submitted by the manufacturer.

4. The required pressure shall be maintained until the cure has been completed. Should the pressure deviate more than 2.3 ft. of water (1 psi) from the required pressure, the installed tube shall be completely removed from the existing conduit by the Contractor and the process shall be repeated at no additional cost to the Owner. A continuous log of pressure during cure shall be maintained and provided to the Engineer.

H. CURING

1. Curing shall be in accordance with ASTM F2019, Sections 6.6 and 6.7.

SECTION 02520 – PART III

2. A camera shall be located on the ultraviolet curing assembly to enable video inspection of the liner and to ensure that the liner has been properly inflated and any problems can be identified before the curing process begins.

3. A multi-lamp ultraviolet curing assembly shall be drawn through the pipe. The ultraviolet curing lights shall operate in a sufficient frequency range to ensure proper curing of the resin. The ultraviolet curing assembly shall travel through the pipe at the predetermined speed which allows cross-linking/polymerization and curing of the CIPP resin.

4. The Contractor shall submit a documented record of time, rate of travel of the ultraviolet curing assembly, and internal temperatures and pressures during the curing process for each sewer segment to the Owner.

5. The finished CIPP shall be continuous over the entire length of an insertion run and be as free as commercially practicable from visual defects such as foreign inclusions, dry spots, pinholes and delamination. The lining shall be impervious and free of any leakage from the pipe to the surrounding ground or from the ground to the inside of the lined pipe. The surface shall be smooth and free of wrinkles throughout the pipe. Any defects resulting from improper installation or material defects shall be repaired by the Contractor in a manner approved by the Owner / Engineer and with no additional cost to the Owner.

I. TRANSITION SECTIONS

1. The terminal ends of the cured liner shall be cut flush at the inlet and outlet points in the manhole or other access point. The annular space between the liner and the existing sanitary sewer line at each end shall be sealed with epoxy or resin mixture compatible with the liner/resin system, providing a watertight seal. In cases where the CIPP liner traverses through the manhole, the sealer shall be applied between the cut edge of the liner and the existing bench/channel. Sealing material and installation method shall be submitted to and approved by the Owner / Engineer prior to start of construction.

2. Existing benches and channels within manholes shall be built up with a quick-set hydraulic cement type grout as needed to match the CIPP liner elevations. Smooth transition shall be formed between the existing surfaces and the CIPP.

J. TESTING OF THE CURED PIPE

After curing is completed and the CIPP has cooled to ambient temperature and prior to reinstating any laterals the Contractor shall conduct a low pressure air test on the sewer line to determine if it is watertight. The Contractor shall furnish all necessary equipment to conduct the test. Air test procedure shall be as follows:

SECTION 02520 -- PART III

cut larger than the opening of the lateral or if any other damage is caused to the liner the Contractor shall, at no additional cost to Owner install a pipe patch (point repair) and reestablish the lateral connection.

2. If the Contractor must excavate to reconnect a sanitary service connection, the contractor shall notify the Engineer in writing asking for authorization to proceed with work under other methods. No excavation will take place without written approval by the Engineer.

3. Chemical grouting or service connection lateral liners shall be used to seal the annulus between the CIPP rehabilitated main line and the host pipe around the reinstated lateral openings when specified by the Engineer.

4. All services shall be reinstated within 24 hours to minimize disturbance to private residents. If connections cannot be reinstated within this period of time, the Contractor shall obtain approval from the Engineer prior to any extension to allow additional bypass/diversion pumping.

3.05 FINAL ACCEPTANCE

After installation of the liner and reinstatement of service connections, the contractor shall perform a CCTV inspection in the presence of the Owner's Representative. A radial-view TV camera shall be used. The finished liner shall be continuous over the entire length of the installation. The liner shall be free of significant visual defects, damage, deflection, holes and the like. Cut-ins at service connections shall be neat and smooth. There shall be no visible infiltration through the liner or from behind the liner at service connections and manholes.

3.06 CLEAN-UP

After the liner installation and joint sealing has been completed and accepted, the Contractor shall clean-up the entire project area and return the ground cover to original conditions. All excess material and debris not incorporated into the permanent installation shall be disposed of by the contractor, in accordance with the State and Federal laws and regulations. The project area affected by the Contractor's operations shall be reinstated.

3.07 WARRANTY

A. The liner shall be certified by the manufacturer for specified material properties. The manufacturer warrants the liner to be free from defects in raw materials for five (5) years from the date of delivery. The Contractor shall warrant the liner installation for a period of five (5) years. During the warranty period, any defects which affect the integrity or strength of the pipe shall be repaired at the Contractor's expense in a manner mutually agreed by the Owner and the Contractor.

SECTION 02520 – PART III

B. If a liner fails to cure, the Contractor shall be required to remove the failed liner at no additional cost. The cost shall include all material, excavation, backfilling, cutting concrete. Pipe shoring, temporary pavement, permanent pavement, permits and other incidental work required to remove the liner from the existing pipe. There shall be no direct payment for this work.

SECTION 02525 – POINT REPAIR SLIPLINING OF SANITARY SEWERS

PART I – GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall furnish all labor, materials, equipment and incidentals required to install into the existing pipe at the locations shown on the Drawings, a resin-impregnated fiberglass/polyester felt pipe repair patch using an inflatable element and hydrostatic pressure. The installation of the repair sleeve shall be accomplished in accordance with the manufacturer's recommendations and/or other approved method, to provide a hard impermeable corrosion resistant smooth wall pipe within a pipe.

B. The design, materials, method of installation and test method shall be in accordance with the design criteria published by the manufacturer or licensor as supplied to and approved by the Engineer.

C. Upon completion of the work, the Contractor shall provide the owner with an extended performance warranty which shall guarantee the materials and workmanship for a period of five (5) years from the date of final acceptance. The warranty shall be all inclusive of all costs associated with the needed remedial measures necessary to correct the situation if a product failure is detected.

D. The Contractor's method of construction shall consider all essential work tasks including by-pass pumping, sewer line cleaning, closed circuit television inspection, traffic control, etc.

1.02 RELATED WORK – NOT APPLICABLE

1.03 SUBMITTAL

A. Manufacturer's certificate verifying the composition of the epoxy resins, the woven fiberglass fabric and polyester felt.

B. Manufacturer's product design calculations for the given conditions of the point source repair.

C. A brief description of the Contractor's proposed method of installation. The submittal shall be all inclusive of all installation features and shall include related other incidentals such as the pre and post flushing/cleaning of the existing pipe, by-pass pumping to maintain existing sewage flows, maintenance and protection of traffic, re-establishing flow from existing building connections, general site clean-up, etc.

SECTION 02525 – PART I

1.04 SITE SAFETY

A. The Contractor shall operate in strict accordance with all applicable OSHA standards and regulations. The Contractor's particular attention is drawn to those safety requirements involving entry into a confined space. The Contractor is responsible for all on-site safety.

PART II – PRODUCTS

2.01 TOXICITY

A. The chemicals involved with this operation may be toxic and could be absorbed by passing through the unbroken skin, by inhalation of dust or droplets of the materials, or by swallowing. Therefore, mixing, handling and pumping of the chemicals shall be done by personnel thoroughly trained and familiar with the handling of the chemicals involved.

2.02 MATERIALS

A. The pipe insert repair tube shall be fabricated from a resin-impregnated glass fiber/polyester felt sheet to a size which when installed, will closely approximate the internal circumference of the conduit specified. The pipe insert shall be as manufactured by Econoliner-Avanti International or approved equal.

B. The reinforcement material shall be comprised to two layers of woven fiberglass fabric and one layer of polyester felt. The woven fiberglass (minimum weight 1.82 lbs/yd²) shall be stitched to each side of the sheet of polyester felt. The polyester felt (weight 1.2 lb/sq. ft.) shall be needle punched Bidim U64 felt of equivalent. The composite two layers of woven fiberglass and one layer of polyester felt shall be sown together using zig-zag stitches spaced 1" apart over the full width of the material. Sewing shall be performed using a multi-filament polyester tread. The sewing shall bind the three layers of material together uniformly.

C. The epoxy resin is a two part mixture of resin (Dow DER 353 or equal) and hardener (Dow DH 912 or equal).

D. The structural values of the pipe insert repair sleeve shall meet or exceed the following:

- Short term flexible stress 23,200 lbs./in³
- Short term flexible modules – 1,232,500 lbs/in²
- Short term tensile stress = .5 x short term properties
- Laminated thickness - .2 to .25 inches

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- Maximum design strain – 2%
- Cured Shore “D” hardness > 80
- Abrasion resistance of the same order as polyethylene pipe

E. The minimum and maximum length of the repair sleeve will be determined by the Contractor to effectively span the distance of the area to be repaired. Also the Contractor shall consult with the manufacturer to determine the correct composition of the repair sleeve to effectively fit the existing conditions and loading factors.

PART III – EXECUTION

3.01 PREPARATION

A. Site safety shall be in strict accordance with all applicable OSHA standards. The Contractor’s particular attention is drawn to those safety requirements involving entry into a confined space. The Contractor is responsible for all on-site safety.

B. The Contractor shall supply all necessary pumps, conduits and other equipment to divert the flow of sewage around the section of sewer line (manhole to manhole) in which the work is to be performed. The by-pass system shall be of sufficient capacity to handle existing flows plus any additional flow that may occur during rainfall event.

C. The Contractor will be responsible for furnishing the necessary labor and supervision to set up and operate the pumping and by-pass system. If pumping is required on a 24 hour basis, all pump engines shall be manned at all times and equipped in a manner to keep the pumps noise at a minimum. All by-passed sewage flow must be discharged to a sanitary sewer and shall not be allowed to enter any storm sewer line, drainage ditch, or street gutter. Sufficient pipe, hose or other approved means of flow conveyance shall be on hand to ensure that, in case of emergency, flow can be by passed to the next clear manhole. The Contractor shall prepare and submit a detail outline describing his proposed operation. The method must be approved by the Engineer prior to the start.

D. The Contractor’s pumps shall be so designed that all or any portion of the flow can be handled during normal or high flow conditions. The Contractor will be responsible for any damages encountered as a result of the by-pass pump system.

E. The Contractor shall provide all necessary labor and specialty equipment to effectively lean and inspect via a closed circuit television unit the section of sewer line to be repaired.

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F. All sections of sanitary sewer to be repaired shall be cleaned using mechanically powered, hydraulically propelled or high velocity sewer cleaning equipment. Selection of the equipment shall be based on the conditions of the pipe line at the time and work commences. The equipment and methods selected shall be to the satisfaction of the Engineer. The equipment selected for cleaning shall be capable of removing dirt, grease, rocks, sand, tree roots and other deleterious materials and obstructions from the sewer lines. All sludge, dirt, sand, grit and other solid or semi-solid material resulting from the cleaning operation shall be removed at the downstream manhole of the section of sewer lines being cleaned. Passing material and debris downstream will not be permitted. A collection device, as approved by the Engineer, shall be utilized to collect and remove debris from the reach being cleaned. The Contractor will be required to haul away all debris and dispose of it in a manner and place acceptable to the New York State Department of Environmental Conservation. All debris must be removed from the site at the end of each work day.

G. During all sewer cleaning operations, satisfactory precautions shall be taken to protect the sewer lines from damage that might be inflicted by the improper use of the cleaning equipment. The cost of repair of any damage caused by the cleaning operation will be the responsibility of the Contractor.

H. Once the sewerline has been cleaned, the Contractor shall inspect the fault in the pipeline using a close circuit television unit and record the necessary details. The Contractor shall determine the dimension of the fault, the length of repair and location of any building laterals. If it is determined that additional cleaning of the sewer line is required to effectively make the repair, the Contractor shall proceed accordingly at no additional cost to the Owner.

I. The Contractor shall then determine the proper size of the repair sleeve (length/diameter) to be used. The repair sleeve shall be of sufficient size to extend a minimum of 1'-0" on each side (downstream/upstream) of the damaged area.

3.02 REPAIR SLEEVE

A. The Contractor shall provide all labor, materials, and equipment necessary to fabricate and insert the repair sleeve into the damage pipe section following the recommendations of the manufacturer. The Contractor's personnel shall be totally familiar with all phases of this operation.

B. Utilizing the information obtained from the closed circuit television inspection, the Contractor shall cut the fiberglass to suit the length and diameter of the fault. Based on the manufacturer's recommendation, the Contractor shall calculate the epoxy resin quantities and mix them thoroughly. Once the desired mixture is accomplished, the resin shall be equally and totally impregnated on the reinforcement material. The Contractor shall take proper

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precautions and prepare a working surface which will protect the fiberglass repair mat and avoid the spillage of any resins to the surrounding area.

C. Once the repair sleeve material is properly prepared, the Contractor shall wrap the material on an inflatable packer and repair material shall then be carefully lowered into the pipe conduit and accurately positioned by the Contractor utilizing a closed circuit television unit. In position, the Contractor shall then pressurize the inflatable packer to expand the uncured repair material into intimate contact with the pipe walls. The Contractor shall observe the inflation of the packer using the closed circuit television unit. Regulate the pressure to suit the depth of the conduit.

D. When the inflatable packer is fully inflated, circulate pressurization water to a heating system above ground. The water temperature should be raised pursuant to the manufacture's recommendation and held for a duration to allow for the epoxy resin to sufficiently cure.

E. When the repair material has cured to a point where it has sufficient strength to support normal loads, turn off the water heating system and allow the water to cool to ambient temperature per the manufacturer's recommendations. Once fully cooled, release the inflation pressure and pump the water out of the inflatable packer or expel it using compressed air. Withdraw the inflatable packer and inspect the finished repair using the closed circuit television unit.

F. After the pipe repair has been successfully reformed and inspected, the Contractor will be responsible for all labor, materials and equipment required to reconnect each live sanitary service connection. Each service connection shall be opened through the repair sleeve. Utilizing the closed circuit television unit, the Contractor shall position a cutting device which will core through the repair sleeve. The cored area shall be equal to the pipe size of the lateral connection and shall be free of burs and frayed edges or any other restriction preventing the free flow of wastewater.

G. Upon completion, the Contractor shall remove all equipment and material from the work area. A final inspection of the premise will be made and the Contractor will be responsible for the restoration of all areas and/or items damage or disturbed by his operation.

SECTION 02700 – TESTING AND GROUTING OF SANITARY SEWERS AND LATERAL CONNECTIONS

PART I – GENERAL

1.01 SCOPE OF WORK

A. CONTRACTOR shall furnish all labor, materials, equipment and incidentals required to test and grout sanitary and storm sewers as shown, specified, and required to complete the work. The work includes, but is not limited to the following:

- 1) Sewer line cleaning
- 2) Sewer flow control
- 3) Video records and logs
- 4) Sewer pipe joint testing
- 5) Sewer pipe joint sealing
- 6) Lateral sewer connection grouting

B. The areas of work and the extent of the sewer joint testing and grouting to be performed shall be at those locations shown on the drawings, included in the specifications, or at other areas where directed by the ENGINEER.

1.02 SUBMITTALS

A. Shop Drawings: Submit for approval the following:

1. Submit detailed procedures, means, methods and equipment used in the sewer joint testing and grouting procedures for approval.
2. Submit manufacturer's data for the grouting materials used on this project.
3. Submit certificates conforming to referenced standards.

1.03 SITE SAFETY

The Contractor shall operate in strict accordance with all applicable OSHA standards and regulations. The Contractor's particular attention is drawn to those safety requirements involving entry into a confined space. The Contractor is responsible for on-site safety and all the equipment/supervision necessary for full compliance.

1.04 PRODUCT HANDLING

All materials shall be accompanied by test reports certifying that the material conforms to applicable standards. Materials shall be shipped, stored, and handled in a manner

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consistent with the written recommendations of the manufacturer. Storage locations shall be approved by the Owner and Engineer.

1.05 COMMUNICATION

Prior to carrying out any field work in either phase the contractor shall notify 48 hours in advance the Owner, local municipality, local fire department, and local police department that the contractor will be beginning said work.

PART II – PRODUCTS

2.01 MATERIALS

A. The intent of this section is to define the properties that the sealing materials must have to perform effectively in the intended application and under expected field conditions.

1. Mixing and handling of chemical sealing materials shall be in strict accordance with the manufacturer's recommendations.

B. Chemical sealing materials used in the performance of the work specified shall have the following properties and characteristics.

1. While being injected, the chemical sealant must be able to react/perform in the presence of groundwater.
2. The cured material must withstand submergence in water without degradation.
3. In place, the sealant formation should be able to withstand freeze/thaw and wet/ dry cycles without adversely affecting the seal.
4. The resultant sealant (grout) formation must prevent the passage of water (infiltration) through the sewer pipe joint.
5. The sealant material, after curing, must be flexible as opposed to brittle.
6. The sealant formation must not be biodegradable.

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7. The cured sealant must be chemically stable and resistant to the mild concentrations of acids, alkalis, and organics found in normal sewage.
8. Mixing of the component materials must be compatible with field operations and not require precise measurements of the ingredients by the field personnel.
9. Cleanup must be done without the inordinate use of flammable or hazardous chemicals.
10. Residual sealing materials must be easily removable from the sewer line to prevent reduction or blockage of the sewer flow.

C. The following chemical sealing materials will be acceptable for use on this project:

1. Acrylamide base gel sealing material:
 - a. A minimum of 10% acrylamide base material by weight in the total sealant mix. A higher concentration (%) of acrylamide base material may be used to increase strength of offset dilution during injection.
 - b. The ability to tolerate some dilution and react in moving water during injection.
 - c. A viscosity of approximately 2 centipoise which can be increased with additives and a constant viscosity during the reaction period.
 - d. A controllable reaction time from 10 seconds to 1 hour and a reaction (curing) which produces a homogeneous, chemically stable, non-biodegradable, firm, flexible gel.
 - e. The ability to increase mix viscosity, density and gel strength by the use of additives.
2. Acrylic base gel chemical sealing material:
 - a. A minimum of 10% acrylic base material by volume in the total sealant mix. A higher concentration (%) of acrylic base material may be used to increase strength or offset dilution during injection. Note: If the acrylic base material is in a 50% solution, it must comprise 25% of the total sealant mix to have 10% base material.

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- b. The ability to tolerate some dilution and react in moving water during injection.
 - c. A viscosity of approximately 2 centipoise which can be increased with additives.
 - d. A constant viscosity during the reaction period.
 - e. A controllable reaction time from 5 seconds to 6 hours.
 - f. A reaction (curing) which produces a homogeneous chemically stable, non-biodegradable, flexible gel.
3. Urethane base gel chemical sealing material:
- a. One part urethane prepolymer thoroughly mixed with between 5 and 10 parts of water by weight. The recommended mix ratio is 1 part urethane prepolymer to 8 parts of water (11 % prepolymer).
 - b. A liquid prepolymer having a solids content of 77% to 83%, specific gravity of 1.04 (8.65 pounds per gallon), and a flash point of 20 degrees F.
 - c. A liquid prepolymer having a viscosity of 600 to 1200 centipoise at 70 degrees F that can be pumped through 500 feet of ½ - inch hose with a 1000 psi head at a flow rate of 1 ounce / second.
 - d. The water used to react the prepolymer should have a pH of 5 to 9.
 - e. A cure time of 80 seconds at 40 degrees F, 55 seconds at 60 degrees F, and 30 seconds at 80 degrees F, when 1 part prepolymer is reacted with 8 parts of water only. Higher ratios give longer cure times.
 - f. A cure time that can be reduced down to 10 seconds for water temperatures of 40 degrees F to 80 degrees F when 1 part prepolymer is reacted with 8 parts of water containing a sufficient amount of gel control agent additive.
-
- g. A relatively rapid viscosity increase of the prepolymer / water mix. Viscosity increases from about 10 to 60 centipoise in the first minute for 1 to 8 prepolymer /water ratio at 50 degrees F.
 - h. A reaction (curing) which produces a chemically stable and non-biodegradable, tough, flexible gel.

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- i. The ability to increase mix viscosity, density, gel strength and resistance to shrinkage by the use of additives to the water.

PART III – EXECUTION

3.01 BYPASS PUMPING

A. The Contractor shall supply all necessary pumps, conduits and other equipment to divert the flow of sewage around the section of sewer line (manhole to manhole) in which the work is to be performed. The by-pass system shall be sufficient capacity to handle existing flows plus any additional flow that may occur during rainfall events.

B. The Contractor will be responsible for furnishing the necessary labor and supervision to set up and operate the pumping and by-pass system. If pumping is required on a 24 hour basis, all pump engines shall be manned at all times and equipped in a manner to keep the pump noise at a minimum. All bypassed sewage flow must be discharged to a sanitary sewer and shall not be allowed to enter any storm sewer line, drainage ditch, or street gutter. Sufficient pipe, hose or other approved means of flow conveyance shall be on hand to ensure that, in case of emergency, flow can bypass to the next clear manhole. The Contractor shall prepare and submit a detailed outline describing his/her proposed operation. The method must be approved by the Engineer prior to the start of construction.

C. The Contractor's pumps shall be so designed that all or any portion of the flow can be handled during normal or high flow conditions. The Contractor will be responsible for any damages encountered as a result of the bypass systems.

3.02 SEWER LINE CLEANING

A. The Contractor shall provide all necessary labor, specialty equipment, water and other incidentals to effectively clean sanitary sewer lines of various diameters. All sanitary sewer sections in which work is to be conducted shall be cleaned using mechanically powered, hydraulically propelled or high velocity sewer cleaning equipment. Selection of the equipment used shall be based on the conditions of the lines at the time the work commences. The equipment and methods selected shall be satisfactory to the Engineer. The equipment selected for cleaning shall be capable of removing dirt, grease, rocks, sand, tree roots and other deleterious materials and obstructions from the sewer lines and manholes.

B. All sewers shall be sufficiently cleaned and free of water as ordered by the Engineer, to permit in-line television inspection of joints, cracks, leaks and breaks and in preparation of the grouting operation.

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C. All sludge, dirt, sand, rocks, grease, tree roots and other solid or semi-solid material resulting from the cleaning operation shall be removed at the downstream manhole of the section being cleaned. Passing material from manhole section to manhole section which could cause line stoppages, or blockages will not be permitted.

D. A collection device, as approved by the Engineer, shall be utilized to collect and remove debris from the reach being cleaned.

E. All dirt, debris, and other material removed from the sewers shall be hauled away and disposed of in a manner and place acceptable to the New York State Department of Environmental Conservation and the Engineer. All such work will be at the Contractor's expense. All materials shall be removed from the site at the end of each workday. Under no circumstances will be Contractor be allowed to accumulate debris, etc., on the work site beyond the stated time, except in totally enclosed containers meeting NYSDEC and OSHA requirements and as approved by the Engineer.

F. During all sewer cleaning operations, satisfactory precautions shall be taken to protect the sewer lines from damage that might be inflicted by the improper use of cleaning equipment. Whenever hydraulically propelled cleaning tools, which depend upon water pressure to provide their cleaning force, or any tools which retard the flow of water in the sewer line are used, precautions shall be taken to ensure that the water pressure created does not cause any damage or flooding to public or private property being served by the manhole section involved. The flow of sewage in the sewer lines shall be utilized to provide necessary pressures for hydraulic cleaning devices whenever possible. When additional quantities of water from fire hydrants are approved as necessary to avoid delay in normal working procedures the water shall be conserved and not used unnecessarily. No fire hydrant shall be obstructed in case of fire in the area served by the hydrant nor shall a hydrant be used for the purpose described unless the vacuum break is provided. The Contractor will be responsible for all permits, arrangements, and costs associated with obtaining water for this construction operation. The Contractor shall use approved backflow prevention devices if hydrants are used for water supply.

G. Contractor's personnel shall be familiar with all phases of sewer line cleaning to insure quality performance without causing damage to any of the appurtenances associated with work involved. In the event a line must be re-cleaned as ordered by the Engineer for any reasons, the Contractor shall undertake such re-cleaning, without charge to the Owner.

H. Roots shall be removed in the designated sections where root intrusion is a problem. Special precautions should be exercised during the cleaning operation to assure as complete removal as possible of visible roots from the joint or lateral area. Procedures may include the use of mechanical devices such as rodding machines, expanding root cutters and porcupines, and hydraulic procedures such as high pressure jet cleaners.

I. Any damage caused by the Contractor's cleaning operation, shall be repaired by the Contractor at no additional cost to the Engineer or Owner.

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3.03 SEWER PIPE JOINT TESTING

A. Intent: The intent of the pipe joint testing is to identify those sewer pipe joints that are defective allowing groundwater to enter the sewer system and that can be successfully sealed by the internal pipe joint sealing process. Testing of joints which are visibly leaking (infiltrating) will be unnecessary.

B. Application: Sewer pipe joint testing shall be used to test the integrity (tightness or leakage) of individual pipe joints. Testing will not be required on building laterals or building sewers or on section of pipe between joints.

C. Equipment: The equipment used shall consist of a video camera system, joint testing device (packer), and associated test monitoring equipment. The equipment shall be constructed in such a way as to provide means for introducing a test medium, under pressure, into the void area created by the expanded ends of the joint testing device and a means for continuously measuring the actual static pressure of the test medium within the void area only.

The void pressure data shall be transmitted electrically from the testing equipment to the monitoring equipment. The method shall be by an electrical pressure transducer located at the testing equipment.

All test monitoring shall be completed above ground and in a location to allow for continuous observation of the video monitor and test monitoring equipment by the ENGINEER.

D. Test Medium: A fluid (liquid or gas) shall be used as the test medium. Both liquid and air are acceptable for use as a test medium.

E. Test Pressure: Joint test pressure shall be 3 psi higher than the groundwater pressure, if any, outside the pipe. Groundwater pressure may be determined by positioning the test device on a visibly infiltrating joint and measuring the resulting void pressure with the void pressure monitoring equipment.

In the absence of groundwater pressure data, the test pressure shall be equal to $\frac{1}{2}$ psi per vertical foot of pipe depth or 3 psi, whichever is greater.

F. Test Procedure: Each sewer pipe joint which is not visibly leaking shall be individually tested at the above-specified test pressure in accordance with one of the following procedures:

1. Liquid Test Procedure

- a. The testing device shall be positioned within the line in such manner as to straddle the pipe joint to be tested.

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- b. The testing device end elements shall be expanded so as to isolate the joint from the remainder of the line and create a void area between the testing device and the pipe joint. The ends of the testing device shall be expanded against the pipe with sufficient inflation pressure to contain the test liquid within the void without leakage past the expanded ends.
- c. Water or an equivalent liquid shall then be introduced into the void area until a pressure equal to or greater than the required test pressure is observed with the void pressure monitoring equipment. If the required test pressure cannot be developed (due to joint leakage), the joint will have failed the joint test and shall be sealed as specified herein this Section
- d. The flow rate of the test liquid shall then be regulated to a rate at which the void pressure is observed to be the required test pressure. A reading of the test liquid flow meter shall then be taken. If the flow rate exceeds $\frac{1}{4}$ gallon per minute (due to joint leakage), the joint will have failed the test and shall be sealed as specified herein this Section.

2. Air Test Procedure:

- a. The testing device shall be positioned within the line in such a manner as to straddle the pipe joint to be tested.
- b. The testing device end elements shall be expanded so as to isolate the joint from the remainder of the line and create a void area between the testing device and the pipe joint. The ends of the testing device shall be expanded against the pipe with sufficient inflation pressure to contain the air within the void without leakage past the expanded ends.
- c. Air shall then be introduced into the void area until a pressure equal to or greater than the required test pressure is observed with the void pressure monitoring equipment. If the required test pressure cannot be developed (due to joint leakage), the joint will have failed the test and shall be sealed as specified herein this Section.
- d. After the void pressure is observed to be equal to or greater than the required test pressure, the air flow shall be stopped. If the void pressure decays by more than 2 psi within 15 seconds (due to joint leakage), the joint will have failed the test and shall be sealed as specified herein this Section.

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G. Test Records: During the joint testing work, records shall be kept which include:

1. Identification of the pipe section tested;
2. Test pressure used;
3. Location (footage) of each joint and section tested;
4. A statement indicating the test results for each joint tested;
5. Two (2) copies of all records shall be supplied to the ENGINEER.

3.04 SEWER PIPE JOINT SEALING

A. Intent: It is the intent of the sewer pipe joint sealing work to seal the sewer pipe joints which have leakage rates of $\frac{1}{4}$ gallon per minute or more utilizing the internal joint sealing method. When bell cracks or chips are evident from pipe section offset, sealing may be undertaken where the offset is small enough to allow proper sealing of the sealing packer on both sides of the joint to be sealed.

B. Equipment: The basic equipment shall consist of a closed-circuit video system, necessary chemical sealant containers, pumps, regulators, valves, hoses, etc., and joint sealing packers for the various sizes of sewer pipes. The packer shall be cylindrical and have a diameter less than the pipe size and have cables attached at each end to pull it through the line. The packer device shall be constructed in a manner to allow a restricted amount of sewage to flow.

C. Joint Sealing Procedure: Joints showing visible leakage or joints that have failed the joint test specified under item 3.03 of this section shall be sealed as specified. Joint sealing shall be accomplished by forcing chemical sealing materials into or through faulty joints by a system of pumps, hoses, and sealing packers.

1. Clean sewer pipe as necessary prior to the joint sealing work.
2. Jetting or driving pipes from the surface that could damage or cause undermining of the pipelines shall not be allowed. Uncovering the pipe by excavation of pavement and soil will not be allowed.
3. The packer shall be positioned over the faulty joint by means of a measuring device and the closed circuit video camera in the line. It is important that the procedure used by the CONTRACTOR for positioning the packer be accurate.

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4. The packer ends shall be expanded using controlled pressure. The expanded ends shall seal against the periphery of the pipe to form a void area at the faulty joint. The sealant materials shall be pumped into this void area through a hose system at a controlled pressure.
5. The pumping unit, metering equipment, and the packer device shall be designed so that proportions and quantities of materials can be regulated.

D. Joint Sealing Verification: Upon completion of the sealing of each individual joint, the packer shall be deflated until the void pressure reads zero pressure, then re-inflated and the joint re-tested as specified under item 3.01 of this section. Should the void pressure not read zero, the CONTRACTOR shall clean the equipment of residual grout to produce accurate void pressure readings. Joints that fail to meet the specified test criteria shall be resealed and re-tested until the test criteria can be met.

E. Residual Sealing Material: Residual sealing materials that extend into the pipe, reduce the pipe diameter, or restrict the flow shall be removed from the joint and the interior of the pipe. The sealed joints shall be left reasonably flush with the existing pipe surface. If excessive residual sealing materials accumulate in the line, the pipe section shall be cleaned to remove the residual materials.

F. Records: Complete records shall be kept of the joint sealing performed in each pipe section. The records shall identify the pipe section in which the sealing was performed, the location of each joint sealed, the joint sealing verification results, and a post video of the completed sewer section. Two copies of all reports shall be furnished to the ENGINEER.

3.05 LATERAL CONNECTION SEALING

A. Intent: It is the intent of the lateral connection joint sealing work to seal the connection between the existing lateral sewer branch and the new sewer pipe liner utilizing the internal joint sealing method.

B. Equipment: The basic equipment shall consist of a closed-circuit video system, necessary chemical sealant containers, pumps, regulators, valves, hoses, etc., and joint sealing packers for the various sizes of sewer pipes. The packer shall have a bladder which can be inserted up the lateral pipe from inside the mainline sewer and have a diameter less than the pipe size and have cables attached at each end to pull it through the line. The packer device shall be constructed in a manner to allow a restricted amount of sewage to flow past the packer.

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C. Sealing Procedure: Lateral connection sealing shall be accomplished by forcing chemical sealing materials into or through faulty connections by a system of pumps, hoses, and sealing packers.

1. Clean sewer pipe and lateral as necessary prior to the connection sealing work.
2. Jetting or driving pipes from the surface that could damage or cause undermining of the pipelines shall not be allowed. Uncovering the pipe by excavation of pavement and soil will not be allowed.
3. The packer shall be positioned in front of the lateral sewer connection by means of a measuring device and the closed circuit video camera in the line. It is important that the procedure used by the CONTRACTOR for positioning the packer be accurate.
4. The bladder of the packer shall be inserted up into the lateral sewer a distance necessary to test and seal the connection to the new liner pipe. The packer ends shall be expanded using controlled pressure. The expanded ends shall seal against the periphery of the pipe to form a void area at the faulty joint. The sealant materials shall be pumped into this void area through a hose system at a controlled pressure.
5. The pumping unit, metering equipment, and the packer device shall be designed so that proportions and quantities of materials can be regulated.

D. Lateral Connection Sealing Verification: Upon completion of the sealing of each individual lateral connection, the packer shall be deflated until the void pressure reads zero pressure, then re-inflated and the connection re-tested as specified under item 3.03 of this section. Should the void pressure not read zero, the CONTRACTOR shall clean the equipment of residual grout to produce accurate void pressure readings. Lateral connections that fail to meet the specified test criteria shall be resealed and re-tested until the test criteria can be met.

E. Residual Sealing Material: Residual sealing materials that extend into the pipe, reduce the pipe diameter, or restrict the flow shall be removed from the connection and the interior of the pipe. The sealed areas shall be left reasonably flush with the existing pipe surface. If excessive residual sealing materials accumulate in the line, the sewer section shall be cleaned to remove the residual materials.

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F. Records: Complete records shall be kept of each lateral sealing performed. The records shall identify the sewer section in which the sealing was performed, the location of the sealed lateral, the sealing test results, and a video or picture of the completed lateral sealing that clearly shows the sealed lateral connection. Two copies of all reports shall be furnished to the ENGINEER.