GENERAL CONDITIONS

SECTION 00750

DEFINITIONS OF WORDS & TERMINOLOGY

00750.01 DEFINITIONS OF WORDS AND TERMS

Wherever the following words, or corresponding pronouns are used in this Contract, they shall have the meaning given herein:

CONTRACT, OR CONTRACT DOCUMENTS: each of the various documents referred to in the Agreement, both severally and as a whole, including all additions, deletions, modifications and interpretations incorporated therein or appended thereto by or with approval of the Owner prior to the execution of the Contract.

OWNER: the party of the first part to this Contract, or any duly authorized agents or officers empowered to act therefor.

CONTRACTOR: the party of the second part to this Contract, or the legal representatives or agents appointed by said party for the performance of the work.

ENGINEER: the firm of Barton & Loguidice, D.P.C., engaged by the Owner to provide Engineering services in connection with the work of this Contract, or its representatives duly authorized in writing to act therefor.

SURETY: the person, persons, firm or corporation who executes the Contractor's Performance Bond and Labor & Materials Payment Bond.

SUBCONTRACTOR: any person, other than employee of the Contractor, or any firm or corporation who contracts to act for or in behalf of the Contractor in performing any part of the work in connection with the Contract, exclusive of one who furnishes only materials or equipment.

PROJECT: the entire facility or improvement to which the Contract relates.

SITE: the area or areas bounded by the property lines shown on the Plans, and other areas that may be similarly designated.

SECTION 00750

DEFINITIONS OF WORDS & TERMINOLOGY

00750.01 DEFINITIONS OF WORDS AND TERMS - Continued

THE WORK: all labor, equipment and materials required, either expressly or by implication, to be furnished by the Contractor under this Contract or in connection with Change Orders or Supplemental Agreements thereto.

SUPPLEMENTAL AGREEMENT: an alteration or modification of the Contract Documents, made after execution of the Contract and agreed to in writing by the Contractor and the Owner.

CHANGE ORDER: a written order from the Owner to the Contractor directing an alteration or modification of the nature, scope or type of the work.

BOND OR PERFORMANCE BOND: the guarantee signed by the Surety, that the Contractor will complete all the work as required by the Contract.

LABOR & MATERIALS PAYMENT BOND: the guarantee, signed by the Surety, that the Contractor will pay for all Labor and Material required by the Contract.

SPECIFICATIONS: also referred to as DETAIL SPECIFICATIONS or TECHNICAL SPECIFICATIONS. The written directions, requirements, descriptions of materials, equipment, construction systems, standards and workmanship as applied to the work and specifically including Division 1 - Division 16 of the Contract Documents.

PLANS, DRAWINGS OR CONTRACT DRAWINGS: only those drawings listed as such in the Contract Documents with all Addenda thereto.

SHOP DRAWINGS, SETTING DRAWINGS, WORKING DRAWINGS, CONSTRUCTION DRAWINGS: drawings prepared, or caused to be prepared, by the Contractor, Sub-contractors, or by their equipment or material suppliers in their behalf, including standard or stock equipment drawings, necessary to the performance of the work in addition to the Contract Drawings, or as may be required by the Engineer to be submitted for review.

ADDITIONAL DRAWINGS, SUPPLEMENTARY DRAWINGS: drawings, in addition to the Contract Drawings, which may be prepared and issued by the Engineer as part of the instructions to or requests of the Contractor in connection with the work of the Contract or appertaining to changes in the work.

SECTION 00750

DEFINITIONS OF WORDS & TERMINOLOGY

00750.01 DEFINITIONS OF WORDS AND TERMS - Continued

ADDENDUM, ADDENDA: additional Contract provisions, deletions or changes issued by the Owner prior to the receipt of bids.

WRITTEN NOTICE: all written and authoritatively signed communications required in the normal conduct of the work or required to obtain compliance with the Contract provisions or preserve the rights of any party to the Contract. Written notice shall be considered as served when either delivered in person or deposited in a post-paid wrapper in a regularly maintained U.S. Mailbox and addressed to the person, firm or corporation intended to receive such notice, or to his appropriate agent, to the last business address of such known to the server. If mailed, the period of notice shall run from the time of the postal cancellation. It shall be incumbent upon each party to the Contract, and the Engineer, to advise the other parties to the Contract, and the Engineer, of any change in his business address until completion of the Contract and the expiration of all guarantee periods connected therewith.

DIRECTED, ORDERED, REQUIRED, DESIGNATED, PERMITTED, GRANTED, INSTRUCTED, CONSIDERED NECESSARY, APPROVED, SATISFACTORY, ACCEPTABLE: words referring to action or satisfaction of the Engineer, unless another meaning is specifically stated. The same shall apply to words of like import.

AS SHOWN, AS SHOWN ON THE PLANS: words referring to lines, numbers, or statements, or combinations thereof, on the Contract Drawings, unless another meaning is specifically stated.

ELEVATION: or any abbreviation of the word "elevation", followed by figures, shall refer to the distance in feet above the datum established by the Engineer for the Project.

ACT OF GOD: an earthquake, flood, excessive wind or other unusual natural occurrence. Rain, snow, wind, flood, lightning or other natural phenomenon of normal intensity for the locality shall not be included in the meaning of the term.

APPROVED EQUAL, EQUAL: in the Contract Documents or Contract Drawings wherever brand names are specified and followed by the phrase "or approved equal", this phrase shall be modified to read "or equal".

SECTION 00750

DEFINITIONS OF WORDS & TERMINOLOGY

00750.02 REFERENCES TO OTHER SPECIFICATIONS AND CODES

References in these Specifications to published specifications and codes of private and governmental technical societies and agencies shall mean the latest specification for the item or operation involved. Abbreviations of these organizations used in these Specifications may include the following:

AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
ACPA	American Concrete Pipe Association
AGA	American Gas Association
AGCA	Associated General Contractors of America
AGMA	American Gear Manufacturers Association
AISC	American Institute of Steel Construction
AMCA	American Mechanical Contractors Association
ANSI	American National Standards Institute
APWA	American Public Works Association
ARI	American Refrigeration Institute
ASA	American Standards Association
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigeration & Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWPA	American Wood Preservers Association
AWS	American Welding Society
AWWA	American Water Works Association
CEMA	Conveyor Equipment Manufacturers Association
CIPRA	Cast-Iron Pipe Research Association
FM	Factory Mutual System
HEI	Heat Exchange Institute
HI	Hydraulics Institute
IEEE	Institute of Electrical and Electronics Engineer
IPCEA	Insulated Powers Cable Electric Association
NAFM	National Association of Fan Manufacturers

SECTION 00750

DEFINITIONS OF WORDS & TERMINOLOGY

00750.02 REFERENCES TO OTHER SPECIFICATIONS AND CODES - Continued

NBC	National Building Code
NBFPU	National Board of Fire Protection Underwriters
NBCA	National Bituminous Concrete Association
NCPI	National Clay Pipe Institute
NEC	National Electrical Code
NELA	National Electrical Lamp Association
NEMA	National Electrical Manufacturers Association
NETA	National Electrical Testing Association
NFPA	National Fire Protection Association
NSWMA	National Solid Wastes Management Association
NYSDOT	New York State Department of Transportation, Standard Specifications (Construction and Materials)
NYSECC	New York State Energy Conservation Code
OSHA	Occupational, Safety and Health Act
PCA	Portland Cement Association
SAE	Society of Automotive Engineers
SMACNA	Sheet Metal & Air Conditioning Contractors National Association
SSPC	Steel Structures Painting Council
UL	Underwriter Laboratories', Inc.
USEPA	United States Environmental Protection Agency

END OF SECTION

GENERAL CONDITIONS

SECTION 00751

POWERS AND DUTIES OF ENGINEER

00751.01 RESPONSIBILITY OF THE ENGINEER

The Engineer shall decide questions which may arise as to the quality and acceptability of materials furnished, work performed, rate of progress of work, interpretation of Drawings and Specifications and all questions as to the acceptable fulfillment of the Agreement on the part of the Contractor. The duties and responsibilities of the Engineer as set forth herein shall not be extended except through written consent of the Engineer and the Owner.

A. Observation of the Work: The Engineer will make periodic visits to the site to observe the progress and the quality of the executed work. All materials and each part or detail of the work shall be subject at all times to observation by the Engineer and the Owner, and the Contractor will be held strictly to the intent of the Contract Documents in regard to quality of materials, workmanship, and the diligent execution of the Contract. Observations may be made at the site or at the source of material supply, whether mill, plant or shop. The Engineer shall be allowed access to all parts of the work and shall be furnished with such information and assistance by the Contractor as is required to make his observations and construction review.

B. Acceptability of Work: The Engineer's decision as to the acceptability or adequacy of the work shall be final and binding upon the Contractor. The Contractor agrees to abide by the Engineer's decision relative to the acceptability of the work.

C. Engineer's Decisions: All claims of the Owner or the Contractor shall be presented to the Engineer for decision which shall be final except in cases where time and/or financial considerations are involved.

D. The Engineer shall not be responsible for the Contractors or any Sub-contractor's construction means, methods, controls, techniques, sequences, procedures or construction safety or his failure to complete the work in accordance with the Contract Documents.

SECTION 00751

POWERS AND DUTIES OF ENGINEER

00751.01 RESPONSIBILITY OF THE ENGINEER - Continued

E. Oral Agreements: No oral order, objection, claim or notice by any party to the others shall affect or modify any of the terms or obligations contained in any of the Contract Documents, and none of the provisions of the Contract Documents shall be held to be waived or modified by reason of any act whatsoever, other than by a definitely agreed waiver or modification thereof in writing, and no evidence shall be introduced in any proceedings of any other waiver or modification.

00751.02 INSPECTION OF WORK

Inspection services, performed by the Engineer pursuant to this Contract, whether of material or work, and whether performed prior to, during or after completion of construction, are performed solely for the purpose of determining general conformity of the work with the Contract Plans and Specifications.

Nothing contained herein shall create, or be deemed to create:

A) any duty upon the Engineer to supervise the construction procedures and safety procedures followed by any Contractor or Sub-contractor or their respective employees or by any other persons at the job site, or

B) any liability whatsoever by the Engineer to any employees or any Contractor or Sub-contractor or to any other person.

00751.03 NO WAIVER OF RIGHTS

No inspection or approval by the Owner, the Engineer, or any of their employees, nor any order, measurement or certification by the Engineer, nor payment for, nor acceptance of the whole or any part of the work by the Owner or the Engineer, nor any order of the Owner for payment of money, nor any possession taken by the Owner, nor any extension of time shall operate as a waiver of any provision of the Contract, or of any right to damage herein provided or of any power herein reserved. Neither shall a waiver of any breach of the Contract be construed to be a waiver of any other or subsequent breach. All remedies in the Contract shall be construed

SECTION 00751

POWERS AND DUTIES OF ENGINEER

00751.03 NO WAIVER OF RIGHTS - Continued

as being cumulative, in addition to each and every other remedy herein contained. The Owner shall have any and all legal and equitable remedies and recourse which he would in any case have.

END OF SECTION

GENERAL CONDITIONS

SECTION 00752

INSURANCE, SECURITIES AND GUARANTEES

00752.01 GUARANTEES, PERFORMANCE BONDS, LABOR AND MATERIALS PAYMENT BONDS AND GUARANTEES

The Contractor shall furnish Performance and Labor and Materials Payment Bonds each in an amount not less than the full amount of the accepted bid. The Performance Bond shall guarantee faithful performance of the work in compliance with all Contract Documents. The Labor and Materials Payment Bonds shall guarantee the payment of all persons performing labor or furnishing materials in connection therewith. The Bonds shall be in a form approved by the Owner and dated the same as the executed Agreement. The Surety company or companies shall be designated by the Contractor and shall be authorized to transact business in New York State, and if this is a Federally aided project, shall appear on the U.S. Treasury Department's most current list (Circular 570 as amended). The premium for these Bonds shall be paid by the Contractor and shall be included as a part of his Bid. An Attorney-in-fact who signs Performance or Labor and Materials Payment Bonds shall file with each Bond or copy thereof a certified copy of his Power-Of-Attorney to sign such Bonds.

Cash in the form of United States currency or a certified check payable to the Owner in the full amount of the accepted Bid, deposited with the Owner, will be accepted in lieu of both Bonds. Such deposit shall serve as the Performance, and Labor and Materials Payment Bonds for all purposes specified, and the Contractor agrees that such deposit, or such portion thereof as may be required to satisfactorily complete the work, shall be forfeited to the Owner.

The Owner reserves the right to order or approve additions to, omissions from, or changes in the work without notice to the Surety.

The Contractor guarantees all the work, materials and equipment called for in the Contract against defects in materials or workmanship for a period of twelve months following the date of the Notice of Substantial Completion. Under this guarantee, the Contractor shall make good, at his own expense and without delay, any failure of any part due to poor or faulty materials, construction or installation, or to the failure of any equipment to satisfactorily perform the work required of it by the Specifications. The Contractor shall also make good any damage to any part of the Project, the environment or other property of the Owner caused by such failure.

SECTION 00752

INSURANCE, SECURITIES AND GUARANTEES

00752.01 GUARANTEES, PERFORMANCE BONDS, LABOR AND MATERIALS PAYMENT BONDS AND GUARANTEES - Continued

Any work replaced or rebuilt during the above-mentioned guarantee period shall be similarly guaranteed for a 12-month period starting from the date of acceptance of the repair, reconstruction or replacement.

The Contractor's Performance and Labor and Materials Payment Bonds specified in the above paragraph shall fully cover all guarantees specified.

00752.02 ADDITIONAL SECURITY

At any time the Owner may become dissatisfied with the Surety or Sureties who furnished the Performance Bond and the Labor and Materials Payment Bonds, or if for other reasons the Bond(s) shall, in the opinion of the Owner, cease to be adequate security to the Owner, the Contractor shall, within five days after notice from the Owner, substitute a new Bond(s) acceptable to the Owner in form, amount and Surety. The premium on such Bond(s) shall be paid by the Contractor. No payments on any Monthly Estimate shall become due and none shall be made until the new Surety shall have been approved and the Bond(s) executed and accepted.

00752.03 CONTRACTOR'S INSURANCE

The Contractor, at his own expense, shall procure and maintain until one year after the date of the Notice of Certificate of Substantial Completion or one year after the Contractor or any Subcontractor last performs any work under the Contract, even if the Project is abandoned or deferred, insurance for liability for damages required by law of the kinds and in the amounts stated herein and as may be modified by provisions in the Additional Instructions, through insurance companies authorized to operate in New York State. The insurance shall cover all operations necessary to complete the work, whether performed by the Contractor or Subcontractors. Before starting work, the Contractor shall furnish the Owner one duplicate original policy and five certificates of insurance for each and every type of insurance required.

SECTION 00752

INSURANCE, SECURITIES AND GUARANTEES

00752.03 CONTRACTOR'S INSURANCE - Continued

All liability insurance required by this Contract shall be maintained in force during the term of this Contract and until one year after the date of the Notice of Substantial Completion or one year after the Contractor or any Subcontractor last performs any work under the Contract, even if the Project is abandoned or deferred.

1. Commercial General Liability Insurance Bodily Injury & Property Damage	$1,000,000 Occurrence $2,000,000 Aggregate
2. Automobile Liability Bodily Injury & Property Damage	$1,000,000 Combined Single Limit
3. Umbrella Liability	$4,000,000 Occurrence $4,000,000 Aggregate
4. Workers Compensation & Employers Liability	Statutory

A. Additional Insured – Contractor shall name Contractor, Owner, the Engineers and any other entity required by contract as additional insured on all liability policies except Workers Compensation and Owners, Contractors Protective Liability with respect to all operations under the Contract by the Contractor, Subcontractor, including suspension and omissions of the Owner. The additional insured status shall be on a primary and non contributing basis over all other valid and collectible insurance, with respect to this Contract.

B. Additional Conditions

1. Waiver of Subrogation: The Contractor and Subcontractors waive all rights against (1) each other and any of their subcontractors, agents and employees, each of the other, and (2) the Owner, the Engineer, the Engineer's consultants, separate contractors, and any of their subcontractors, sub-subcontractors, agents and employees for damages caused by bodily injury, property damage, fire or other causes of loss to the extent covered by insurance provided under the Contract or other insurance applicable to the work, except such rights as they may have to proceeds of such insurance held by the Owner as a fiduciary. The Subcontractor shall require of the Subcontractor's sub-subcontractors, agents and employees, by appropriate

SECTION 00752

INSURANCE, SECURITIES AND GUARANTEES

00752.03 CONTRACTOR'S INSURANCE - Continued

agreements, written where legally required for validity, similar waivers in favor of the parties enumerated herein. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged.

2. Commercial General Liability (CGL):
   a. Coverage with limits of Insurance of not less than $1,000,000 each occurrence and $2,000,000 Annual Aggregate.
   b. If the CGL coverage contains a General Aggregate Limit, such General Aggregate shall apply separately to each project/location.
   c. CGL coverage shall be written on ISO Occurrence Form CG 00 01 1093 or a substitute form providing equivalent coverage and shall cover liability arising from premises, operations, independent contractors, products-completed operations, and personal and advertising injury and contractual liability.
   d. Contractor, Owner and all other parties required of the Contractor, shall be included as additional insureds on the CGL. Coverage for the additional insureds shall apply as Primary and noncontributing Insurance before any other insurance or self-insurance, including any deductible, maintained by, or provided to, the additional insureds.
   e. Contractor and Subcontractor shall maintain CGL coverage for itself and all additional insureds for the duration of the project and maintain Completed Operations coverage for itself and each additional insured for at least one year after Contractor or Subcontractor last performs any work under the Contract.

3. Auto Liability:
   a. Business Auto Liability with a combined single limit of at least $1,000,000 each accident.
   b. Business Auto coverage must include coverage for liability arising out of all owned, leased, hired and non-owned automobiles.
   c. General Contractor, Owner, Engineers and all other parties required of the General Contractor, shall be included as additional insureds on the auto policy.

SECTION 00752

INSURANCE, SECURITIES AND GUARANTEES

00752.03 CONTRACTOR'S INSURANCE - Continued

4. Umbrella Insurance:
   a. Umbrella limits must be at $4,000,000 each occurrence and $4,000,000 aggregate.
   b. Umbrella coverage for such additional insureds shall apply as primary before any other insurance or self-insurance, including any deductible, maintained by, or provided to, the additional insured other than the CGL, Auto Liability and Employers Liability coverages maintained by Contractor.

5. Workers Compensation and Employers Liability:
   Statutory for New York State. All other states Employers Liability/Insurance limits of at least $500,000 each accident for bodily injury by accident and $500,000 each employee for injury by disease.

6. Property Insurance (Builders Risk):
   The Contractor shall provide and maintain, at his own expense, such property insurance as required by Contract. Policy(s) shall provide cover for fire, extended cover including open (special) perils and theft to insure all work and materials of the Contract against loss or damage. The value of the insurance shall at all times be equal to or greater than the full value of the Contract. Insurance policies shall be in the name of the Owner and payable to the Owner. Any proceeds there to shall be retained by the Owner as security for the performance by the Contractor in making good any loss, damage or injury. Upon such satisfactory performance by the Contractor, the proceeds shall be paid by the Owner to the Contractor.

C. Owners, Contractors Protective Liability Insurance
   Owners Protective Liability Insurance at the limits stated in the Additional Instructions issued in the name of the Owner to and covering the liability for damages imposed by law upon the Owner with respect to all operations under the Contract by the Contractor or his Subcontractor, including supervisory acts and omissions of the Owner. Unless otherwise stated in the Additional Instructions, a minimum of $1,000,000 per occurrence / $2,000,000 aggregate is required.

SECTION 00752

INSURANCE, SECURITIES AND GUARANTEES

00752.03 CONTRACTOR'S INSURANCE - Continued

D. Insurance Certificates
Attached to each certificate of insurance shall be a copy of the Additional Insured Endorsement that is part of the Commercial General Liability Policy. These certificates and the insurance policies required shall contain a provision that coverage afforded under the policies will not be cancelled or allowed to expire until at least 30 days prior written notice has been given to the Contractor/Owner.

END OF SECTION

GENERAL CONDITIONS

SECTION 00753

STATUS OF CONTRACTOR

00753.01 REPRESENTATIONS OF CONTRACTOR

The Contractor warrants and represents that:

A. He is familiar with all Federal, State, County and Municipal laws, ordinances, regulations and codes pertinent to the work and those employed in connection therewith, including any special acts relating to the work or the Project.

B. He has carefully examined all the Contract Documents and the Site and has, thereby satisfied himself as to: the location and nature of the work; the quantity, quality and nature of both surface and subsurface structures and materials apt to be encountered; the quantity, quality and types of plant, equipment and other facilities necessary for the performance of the work; the general and local conditions; and all other matters which may in any way affect the work or his performance under the Contract.

C. Such work, both temporary and permanent, required under the Contract can be satisfactorily constructed and used for its intended purpose, without injury to any person or damage to any property.

D. He is financially solvent and experienced in and competent to perform the work of the Contract.

E. If a corporation foreign to the State of New York, he is aware of the provisions of Article 13 of the Business Corporation Law, with specific reference to the requirements in Section 1301 that certain corporations may not do business in this State without first obtaining a certificate of authority from the Secretary of State.

F. If a corporation, he is aware of the provisions of Article 145 of the Education Law, with specific reference to the requirements and prohibitions of Section 7209 relating to the practice of professional engineering, or the use of the word "engineer" or "engineering" in a corporate name.

SECTION 00753

STATUS OF CONTRACTOR

00753.02 ADDRESS OF CONTRACTOR

Both the address given in the bid and the Contractor's office at or near the Site, if such is established, are designated as places to either of which letter, notices, or other communications to the Contractor may be mailed or delivered. The delivery at either place, or the depositing, in a post-paid wrapper addressed to either place, in any regularly maintained U.S. Post Office Box, of any letter, notice, or other communication shall be deemed sufficient service thereof upon the Contract. If at any time during the life of the Contract, it is necessary to change either address, the Contractor shall give written notice to the Owner, the Surety and the Engineer.

Nothing herein shall act to prevent or invalidate the personal delivery in hand of any letter, notice or other communication to the Contractor.

00753.03 PATENTS

The Contractor shall pay, as part of this Contract, all costs and fees required to obtain the legal right to use patented equipment, designs, or procedures to be used, as part of the work on this Contract.

The Contractor shall defend, indemnify, keep and save harmless the Owner from all costs, damages, liabilities, judgments and expenses, including reasonable attorney fees which may in any way arise against the Owner because of the use of any patented material, equipment or process furnished or used in the performance of the work or because of the use of patented designs supplied by the Contractor and accepted by the Owner.

If any claim, suit or action at law or inequity of any kind involving any such patent is brought against the Owner, the Owner may retain from any moneys due or to become due to the Contractor an amount considered sufficient by the Owner to protect itself against loss until such action is settled and satisfactory evidence to that effect has been supplied to the Owner.

00753.04 CONTRACTOR'S OBLIGATIONS

The Contractor shall furnish all the plant, machinery, labor, equipment, material, tools, appliances, shoring, bracing and scaffolding necessary to the proper and safe completion of the work in the manner specified, shown and directed within the time specified. He shall suitably cover the work whenever necessary, and otherwise protect it from damage from any cause whatsoever.

SECTION 00753

STATUS OF CONTRACTOR

00753.04 CONTRACTOR'S OBLIGATIONS - Continued

If in the opinion of the Engineer the Contractor's procedures or appliances appear at any time, either before or during progress of the work, to be inadequate or insufficient to provide the quality of the work, or the rate of progress specified, he may order the Contractor to improve their character and increase their sufficiency, and the Contractor shall comply therewith. However, failure of the Engineer to issue such an order shall not relieve the Contractor of his obligations to secure the safety, quality or progress of the work, and the Contractor alone shall be responsible for the safety, adequacy and efficiency of his methods, plant and appliances.

00753.05 LIABILITY FOR INJURIES OR DAMAGE

The Contractor shall be solely responsible and liable for the safety and protection of all persons, including but not limited to the Owner, Engineer, Contractor and Subcontractor and their employees, suppliers and visitors, and shall be solely responsible and liable for the safety and protection of property, including but not limited to the Site and its appurtenances and equipment, and he shall be solely responsible for all physical injuries, including death, to any such persons and for all damage to any such property and its appurtenances, which occurs on account of the work, or because of any negligence, fault or default of the Contractor, a Subcontractor or any of their officers, employees or agents.

The Contractor shall have on the project site at all times, while work is in progress, at least one person skilled in safety and health procedures and familiar with State and Federal safety and health regulations whose responsibility shall be to observe methods and procedures. He shall have the duty and authority to stop and/or correct all unsafe and unhealthy conditions.

00753.06 GENERAL INDEMNIFICATION

To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, Engineer, Engineer's consultants, and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorney's fees, arising out of or resulting from performance of the Contractor's Work under this Contract, provided that any such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, the Contractor's Subcontractors, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss or expense is caused in part

SECTION 00753

STATUS OF CONTRACTOR

00753.06 GENERAL INDEMNIFICATION - Continued

by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or otherwise reduce other rights or obligations of indemnity which would otherwise exist as to a party or person described in this Paragraph.

00753.07 CONTRACTOR'S CLAIM FOR DISPUTED WORK

If the Contractor believes he or his Subcontractor or anyone directly or indirectly employed by any of them has sustained damage for disputed work, for which he claims he should be compensated, he shall give written notice to the Engineer, describing the nature and circumstances of the disputed work, within seven days after sustaining such damage. The Contractor shall also file with the Engineer, within 30 days of the date on which the alleged damage occurred, an itemized statement of the character and amounts of such damage. Unless both statements shall be filed as so required, the claim for compensation shall be considered invalid and the Contractor shall not be entitled to any payment therefor.

The Contractor shall proceed diligently with performance of the disputed work pending final resolution of his claim for damages.

During the progress of such disputed work, the Contractor shall provide to the Engineer daily records and make reports of all labor, material and equipment used in connection with such work and the cost thereof as specified in Section 00757.03.

If the Owner determines that the work in question is Contract work and not a Changed condition, he shall direct the Contractor to continue the disputed work, and the Contractor must promptly comply.

If the Owner determines that the work in question is not Contract work and is a Changed condition, he shall direct the Contractor to continue the work and shall have prepared a Change Order in accordance with Section 00757.03.

SECTION 00753

STATUS OF CONTRACTOR

00753.08 NO CLAIMS AGAINST INDIVIDUALS

No claim shall be made by the Contractor or his Subcontractor or anyone directly or indirectly employed by any of them against any officer, employee or agent of the Owner and the Engineer for, or because of, anything done or failure to be done in connection with the work.

00753.09 CONTRACTOR'S TITLE TO MATERIALS

Neither the Contractor nor any Subcontractor shall purchase any materials, equipment or supplies for work subject to any chattel mortgage or under a conditional sale agreement or other agreement by which an interest is retained by the seller. The Contractor shall obtain and maintain good and clear title to all materials and supplies used by him in the work until attachment to or incorporation in the work.

Nothing in the Contract shall be construed as vesting in the Contractor any property right in materials or equipment specified after they shall have been attached to or incorporated in the work or the ground, nor in materials and equipment for which partial payments have been made. All such materials and equipment shall become the property of the Owner upon such attachment or incorporation.

00753.10 TITLE TO OLD MATERIALS

All materials removed from existing structures or construction, and all materials or articles of intrinsic or historic value found in excavations or on the Site shall be brought to the attention of the Engineer, and if he shall so order, shall become or remain the property of the Owner, and shall be carefully preserved for future use. If not claimed by the Owner, such materials or articles shall be removed from the Site and disposed of by the Contractor at his own expense.

END OF SECTION

GENERAL CONDITIONS

SECTION 00754

CONTRACTOR'S ORGANIZATION & STAFF

00754.01 SUPERINTENDENTS, FOREMEN & AGENTS

The Contractor shall at all times, except during periods of shut-down or work suspension that have been approved or directed, have a competent superintendent, foreman or other representative on the Site, who shall see that the work is performed in accordance with the Contract Documents and directions of the Engineer given thereunder, and who shall have authority to act for the Contractor and to receive and carry out orders from the Engineer, and who shall receive materials and equipment shipped to the Contractor. The Contractor shall be responsible for the acts of his superintendents, foremen, agents and employees during the life of the Contract.

00754.02 COMPETENCY & CHARACTER OF EMPLOYEES

The Contractor shall employ only competent and skillful persons to perform the work. This provision shall apply equally to common laborers and skilled craftsmen or tradesmen.

Whenever the Engineer informs the Contractor that any person on the work is, in the Engineer's opinion, incompetent, intemperate, unfaithful, insufficiently skillful, or disorderly, or refuses to carry out the provisions of the Contract, or to stop doing unsatisfactory work when so ordered, or who uses threatening or abusive language to, or engages in offensive, hostile, or harassing conduct toward the Owner, Engineer, or any authorized representative(s) thereof, such person shall be discharged from the work by the Contractor and shall not again be employed without written consent of the Engineer.

00754.03 CONTRACTOR'S FIELD OFFICE

Unless waived by provisions within Additional Instructions, the Contractor shall provide, furnish and maintain for his own use a field office, with telephone, on the Site during the entire period of construction. The Contractor shall obtain approval of the Engineer of the type, size and location of such office, shanties or other temporary structures on the Site, prior to their erection.

SECTION 00754

CONTRACTOR'S ORGANIZATION & STAFF

00754.03 CONTRACTOR'S FIELD OFFICE - Continued

The Contractor will receive no direct payment for providing, maintaining or removing the Contractor's Field Office specified above, and compensation for same shall be included, as part of his overhead, in the prices to be paid for the various items in this Contract.

END OF SECTION

GENERAL CONDITIONS

SECTION 00755

PERMITS, TAXES, ACCESS, OTHER CONTRACTS

00755.01 LAWS, REGULATIONS & PERMITS

The Contractor shall procure at his own expense all necessary permits from the Federal, State, County, Town, municipal or other public agencies that may be involved in the work or the Project or have jurisdiction thereover, and shall serve all notices required by law or ordinance and pay all fees and charges incidental thereto. He shall at all times keep himself fully informed of all laws, ordinances and regulations which in any way affect the work, the materials, methods and equipment used in the work, the conduct of the work, and persons engaged or employed on the work, and of all orders, instructions and decrees of bodies, agencies or tribunals having any authority or jurisdiction over the work or the Project.

If the Contractor should discover any discrepancy or inconsistency in any Contract Documents relating to any permit, law, ordinance, regulation, code, order, decree or instruction, he shall immediately report the same in writing to the Engineer.

The Contractor shall at all times observe and comply with all such existing and all laws which come into existence during the execution of the Contract, as well as permits, codes, decrees, ordinances, regulations, orders and instructions, and shall cause his superintendents, foremen, employees and agents to do likewise.

00755.02 REQUIRED LEGAL PROVISIONS DEEMED INCLUDED

All clauses and provisions of law required by law to be included in the Contract shall be deemed to be included herein, and the Contract shall be interpreted, administered and enforced as though they were included. If, through oversight or otherwise, any such clause or provision is not included, or is not correctly included, the Contract shall immediately be physically amended or corrected, at the request of either party, to provide the necessary compliance.

The inclusion in the Contract Documents of any portion of any law or ordinance or code, regulation, decree, order, permit, instruction or interpretation emanating from a public body or agency, shall not be construed to mean that all such laws or legal requirements deemed necessary, in effect, or applicable to all or any portion of the work or the Contract have been included.

SECTION 00755

PERMITS, TAXES, ACCESS, OTHER CONTRACTS

00755.03 UNLAWFUL REQUIREMENTS DEEMED EXCLUDED

If the Contract Documents contain any unlawful provision not an essential part of the Contract and which shall not appear to have been a controlling or material inducement to the making of the Contract by the parties thereto, such provision shall be construed to be of no effect and shall, upon written notice by either party, be deemed stricken from the Contract without affecting the binding force of the remainder on both parties.

00755.04 TAXES

The Contractor shall pay all sales, use, excise, transportation and other taxes and fees for which he is liable under the Contract. The cost of such taxes and fees shall be included in the price, or total of several prices, given in the Bid on which the Agreement is based, and no separate payment will be made therefor.

00755.05 ACCESS TO WORK AND CONTRACTOR'S RECORDS

The Owner and the Engineer, and their employees, agents and representatives, shall have access to the work, the Site, and the premises used by the Contractor, and the Contractor shall provide and maintain safe and suitable facilities therefor. Subcontractors, and any other parties who may contract with the Owner to do work on the Site shall, for all purposes which may be required by their contracts, have the same privileges and facilities.

Whenever requested, the Contractor shall give the Engineer access to invoices, bills of lading, trip tickets, lists of employees, survey notes and other such data connected with the work.

END OF SECTION

GENERAL CONDITIONS

SECTION 00756

TIME ELEMENTS

00756.01 COMMENCEMENT & COMPLETION

The Contractor shall begin performance of the work within the time specified in the Information for Bidders, and shall substantially complete the work within the time specified in the Information for Bidders.

00756.02 TIME OF ESSENCE

Since the provisions of this Contract relating to the commencement and completion of the work are to enable the Owner to construct and place in use an improvement or facility in accordance with a pre-determined program, such provisions are of the essence of this Contract. It is agreed that the Owner will suffer damages if the work is not completed in the time specified.

00756.03 PROGRESS

The rate of progress shall be as uniform as practicable and such that all the work will be completed within the time specified, or within any time extensions that may be granted by the Owner.

The Engineer will notify the Contractor in writing if, at any time, he is of the opinion the work is unnecessarily delayed and will not be completed on time. The Contractor shall, within 10 days after receipt of such notice, take such action as will, in the opinion of the Engineer, improve the rate of progress to an extent that will insure completion of the work within the time specified. If the Contractor shall fail or refuse to take such steps within 10 days, the Owner may notify the Contractor to stop work or terminate the Contract in accordance with the provisions of Article 00760.01, OWNER'S RIGHT TO STOP WORK OR TERMINATE CONTRACT.

00756.04 APPROVED WORK SCHEDULES

Unless waived by provision in the Information for Bidders, within three weeks after award of the Contract, the Contractor shall submit to the Engineer for approval three copies of his proposed work schedule. The schedule shall show the Contractor's proposed relative order

SECTION 00756

TIME ELEMENTS

00756.04 APPROVED WORK SCHEDULES - Continued

and sequence of commencement and completion of all salient portions of the work, including the delivery and installation of equipment, and shall give the estimated dates of commencement and completion of the various portions of the work.

If more than one Contract is to be awarded on the same phase of the project, the General Contractor shall provide the Engineer with additional copies of his work schedule after the schedule shall have been approved. The Engineer will transmit these to the other Contractors for reference in the preparation of their proposed work schedules and submittal of same for approval. In such case each Contractor other than the General Contractor shall submit his proposed schedule for approval within three weeks after receipt of a copy of the General Contractor's approved schedule.

Each Contractor shall adhere to the approved schedule for his Contract. If a Contractor causes one or more other Contractors to be damaged by failing to adhere to his schedule, he shall save harmless the Owner and the Engineer from any and all actions and charges of the other Contractors against the Owner or the Engineer as the result of such failure.

If the Contractor is behind schedule any month, the Contractor shall indicate what measures it will take in the next thirty (30) days to put the work back on schedule. If the Engineer finds the revised schedule not acceptable they may require the Contractor to submit a new revised schedule.

If the Contractor fails to submit a work schedule within the time period described or any revision or update when required, the Owner may withhold payment pursuant to Section 00759.07 of the Contract until such time as the Contractor submits the required work schedule.

See also Article 01012.01, COLLATERAL WORK.

00756.05 WORK SUSPENSION

When, in the opinion of the Engineer, good cause of suspension of the work exists, the Contractor shall suspend the work or any portion thereof, upon written order of the Engineer, for such period of time as the Engineer may direct. If the reason for suspension is beyond the control of the Contractor, the time within which the work is required to be completed shall be extended by the number of calendar days the work is suspended.

SECTION 00756

TIME ELEMENTS

00756.06 TIME EXTENSIONS

Should the work be obstructed or delayed through the neglect, delay or default of any other Contractor on the Project, or by an Act of God, or by a general strike, or by delays caused by governmental authorities having jurisdiction over the work, or by delay on the part of the Owner in performing any work or furnishing any material or equipment stated in the Contract to be furnished by the Owner, or by any Supplementary Agreement or Change Order issued by the Owner, the Contractor shall have no claim for damages against the Owner or the Engineer, other than the price or prices agreed upon under Supplemental Agreement, or Change Order, but shall be entitled to such an extension of time for completion of the work as the Engineer certifies is equitable because of such obstruction, delay, Supplemental Agreement, or Change Order, provided that claim for a time extension is made by the Contractor, in writing within seven days from the end of the time when the alleged cause therefore shall have occurred. Time necessary for Shop Drawing review, for changes to meet actual conditions, and delays incurred by seasonal and weather limitations for the locality should be normally anticipated and are neither compensatory nor eligible for extensions of time. See also ARTICLE 01012.01, COLLATERAL WORK, and 00757.03, CHANGE ORDERS AND PAYMENT OR CREDIT THEREFOR.

00756.07 ENGINEERING AND INSPECTION CHARGES

When the work embraced in the Contract is not substantially completed on or before the date specified therein, or within any time extensions granted by the Owner, engineering and inspection expenses incurred by the Owner in connection with the work from the specified or extended date of substantial completion until the date of actual Substantial Completion shall be charged to the Contractor. The date of actual substantial completion shall be determined as the date of issuance of the Notice of Substantial Completion.

Supplementary Agreements or Change Orders added to the original Contract, as well as extenuating circumstances beyond the control of the Contractor, will be given due consideration by the Owner prior to assessing engineering and inspection charges against the Contractor.

In addition, should the Contractor apply for and receive dispensation to work more than eight hours per day or forty hours per week by the Industrial Commissioner, the Contractor will be charged the associated overtime premium rate for the Engineer's on-site inspection representative(s).

SECTION 00756

TIME ELEMENTS

00756.07 ENGINEERING AND INSPECTION CHARGES - Continued

Should the remaining minor punch list items not be completed within sixty (60) days of the Notice of Substantial Completion or within any time extensions granted by the Owner, the Contractor shall pay the Owner for any engineering and inspection expenses incurred by the Owner from the specified or extended date of minor punch list completion until when such punch list items are fully complete.

These additional engineering and inspection charges shall be in the form of agreed-upon damages to the Owner and shall be deducted from moneys due or to become due the Contractor.

00756.08 PER DIEM CHARGES FOR DELAY

For each calendar day or fraction thereof that any work except minor punch list items as listed on the Notice of Substantial Completion shall remain uncompleted after the Contract time specified for the substantial completion of the work in the Information For Bidders or extensions thereof granted by the Owner, the Contractor shall pay the Owner agreed-upon damages as follows, unless modified in the Additional Instructions:

Original Contract Amount		Agreed-Upon Damages
From More Than	To and Including	Per Calendar Day
$ 0	$ 25,000	$ 50
$ 25,000	$ 50,000	$ 100
$ 50,000	$ 100,000	$ 200
$ 100,000	$ 500,000	$ 300
$ 500,000	$ 2,000,000	$ 500
$ 2,000,000	$ 5,000,000	$ 600
$ 5,000,000	$10,000,000	$ 800
$10,000,000		$1,000

The date of actual Substantial Completion shall be determined as the date of issuance of the Notice of Substantial Completion.

SECTION 00756

TIME ELEMENTS

00756.08 PER DIEM CHARGES FOR DELAY - Continued

Such sums shall be in addition to engineering and inspection charges as provided for in ARTICLE 00756.07 and shall not be in the nature of a penalty, but agreed-upon damages to the Owner in such case and shall be a part of the consideration of the Contract.

The sums and charges specified above shall be deducted from moneys due or to become due the Contractor and the amount still owing, if any, shall be paid on demand by the Contractor or the Surety. Such payments shall not relieve the Contractor or the Surety from any other obligation under the Contract.

Before assessing engineering and inspection charges, or per diem charges for damages, the Owner will give due consideration to any and all Supplementary Agreements and Change Orders as well as extenuating circumstances beyond control of the Contractor including any delays due to any preference, priority or allocation order duly issued by the Government. Such charges will be assessed, however, in cases in which the Owner considers the Contractor liable as the result of slow work, inefficient operation, insufficient labor, equipment or material, the removal and replacement of poor work, or other unwarranted reasons.

END OF SECTION

GENERAL CONDITIONS

SECTION 00757

CHANGES IN THE WORK

00757.01 RIGHT TO ALTER CONTRACT

The Owner may at any time alter or modify the Contract Documents, and the Contractor shall conform to such alterations or modifications after the Owner and the Contractor shall have entered into a Supplementary Agreement in writing therefor. The Contractor shall perform no work and furnish no material in connection with the alterations or modifications, nor shall he receive any additional payment therefor, unless and until such a Supplementary Agreement has been executed, as required by law. The Owner and the Contractor agree that alterations and modifications thus made shall in no way compromise the validity or coverage of the original Contract or Bond, or the liability of the signers thereof. All work performed under any such Supplementary Agreement shall be subject to all the provisions of the original Contract not expressly altered or modified.

00757.02 MINOR CHANGES

When ordered by the Engineer, the Contractor shall make minor changes in the location of the work, installation of equipment, and other things called for in the Contract, at no additional cost to the Owner. Such minor changes shall be limited to matters that do not alter the character, quantity or cost of the work as a whole. The Engineer shall be the sole judge of what constitutes a minor change.

00757.03 CHANGE ORDERS & PAYMENT OR CREDIT THEREFOR

The Owner, without invalidating the Contract, may make changes by altering, adding to or deducting from the work the contract sum being adjusted accordingly. All such work shall be executed in conformity with the terms and conditions of the original Contract, unless otherwise provided in the order for same. Any claim for extension of time caused thereby shall be adjusted at the time of ordering such change.

No instructions, either written or verbal, shall be construed as an order for changes unless it be in the form of a Change Order, bearing the signed approval of the Owner and the signed acceptance of the Contractor, except in the case of disagreement as to value of changes, when the Contractor's signature to the order will not be mandatory. Change Order shall describe or

SECTION 00757

CHANGES IN THE WORK

00757.03 CHANGE ORDERS & PAYMENT OR CREDIT THEREFOR - Continued

enumerate the work to be performed and state the price, if any, to be added to or deducted from the Contract sum. If the nature of the work is such that a Change Order, as above, cannot be issued until the work has been advanced sufficiently to obtain exact quantities, said work will be authorized in writing by the Owner, with the accompanying statement that a Change Order will be issued when the necessary information is at hand.

Except as provided in the above paragraph, no change shall be made, unless in pursuance of a Change Order, and no claim for an addition to the Contract sum shall be valid unless so ordered. If the Contractor believes that any instructions, by drawing or otherwise, involves extra cost under his Contract, he shall give the Owner and the Engineer written notice and then proceed as indicated in Article 00753.07, Contractor's Claim for Disputed Work.

The value of any Change Order shall be determined by one or more of the following methods and in the following order:

A. By prices specifically named in the specifications or proposals.

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

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

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

E. By estimate of the value as deducible from the approved detailed estimate.

SECTION 00757

CHANGES IN THE WORK

00757.03 CHANGE ORDERS & PAYMENT OR CREDIT THEREFOR - Continued

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 by the following paragraph. Overhead shall be considered to include, but not be limited to insurance (other than as mentioned in the following paragraph) 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, etc.

Actual cost of labor and material shall be defined as the amount paid for the following items, to the extent determined reasonable and necessary.

1. Cost of materials delivered to the job site for incorporation into the Contract work.

2. Wage paid to workmen and foremen and wage supplements paid to labor organizations in accordance with current labor agreements.

3. Premiums or taxes paid by the Contractor for Worker's Compensation Insurance, unemployment insurance, FICA tax and other payroll taxes as required by law, net of actual and anticipated refunds and rebates.

4. Sales tax paid as required by law.

5. Allowance for use of construction equipment (exclusive of hand tools and minor equipment), as approved for use by the Engineer. The rate on self-owned equipment used for periods of under one week will be the Associated Equipment Distributor'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 5 days or more will be billed at a rate equal to 45% of the published monthly rate. In the alternative, the Engineer 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 rental cost.

SECTION 00757

CHANGES IN THE WORK

00757.03 CHANGE ORDERS & PAYMENT OR CREDIT THEREFOR - Continued

Gasoline, oil and grease required for operation and maintenance will be paid for at the actual cost. When, in the opinion of the Contractor, and as approved by the Engineer, 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.

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, in the opinion of the Engineer, the salvage value of salvageable material furnished under item (1) exceeds the cost of salvage, a suitable credit shall be given the Owner.

Regardless of the method used to determine the value of any change, the Contractor will be required to submit evidence satisfactory to the Engineer to substantiate each and every item that constitutes his proposal of the value of the change. The amounts allowed for overhead and profit shall not exceed the applicable percentages as established in the two following paragraphs.

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 and in the following 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 Sub-contractor, Sub-contractor'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 Sub-contractor'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. However, to the extent that the aggregate dollar value of changes under a contract exceeds $75,000, the 10% overhead applied to total costs of labor and materials incurred by the prime Contractor shall be reduced to 5%, and the combined overhead and profit of 10% applied to sub-contract billings shall be reduced to 5%. In addition, on all individual Change Orders in excess of $75,000, the overhead shall be no more than 5% of the total actual cost of labor and materials incurred by the prime Contractor, and the combined prime Contractor's overhead and profit allowance applied to Sub-contract billings shall be no more than 5%.

SECTION 00757

CHANGES IN THE WORK

00757.03 CHANGE ORDERS & PAYMENT OR CREDIT THEREFOR - Continued

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

00757.04 CORRECTION OF WORK

Any materials, plant or equipment delivered to the Site for use in the work which may be disapproved by the Engineer as unsuitable or not in keeping with the Specifications shall be immediately removed by the Contractor from the Site.

If any portion of the work is damaged in any way, or if defects or faults develop before the Inspection at Substantial Completion and issuance of a Certificate of Substantial Completion, or before the expiration of the 12-month guarantee period, the Contractor shall repair, replace or otherwise make good the damage or defects to the satisfaction of the Engineer, regardless of whether the work may have previously passed the specified inspections and tests. No additional payment will be made for such remedial work.

Failure on the part of the Engineer to condemn defective work shall not imply acceptance of the work, nor act to release the Contractor from his obligations to repair, replace or otherwise make good the work at his own expense, notwithstanding that such work may have been estimated for payment or that partial or full payments may have been made therefor.

00757.05 EMERGENCY POWERS UNIMPAIRED

The provisions of this Section 00757 shall not detract from the authority of the Contractor or the Engineer to act in case of emergency, as provided elsewhere in the Contract Documents.

END OF SECTION

GENERAL CONDITIONS

SECTION 00758

ASSIGNMENT & SUBCONTRACTS

00758.01 SUBCONTRACTS

Should the Contractor desire to subcontract any portion of the work, he shall first submit to the Engineer a statement outlining the nature and amount of the work proposed to be subcontracted and the name of the person, firm or corporation he proposes as Subcontractor. If requested by the Engineer, the Contractor shall also provide a statement as to the proposed Subcontractor's experience, financial ability, insurance certificates, or other qualifications for the nature and scope of the work proposed to be undertaken.

The proposed Subcontractor shall not enter upon the Site nor perform any work, either on or off the Site, until written approval of the Subcontractor has been granted by the Engineer and the Surety.

Subcontracts shall in no way, directly or indirectly, release, compromise or modify the responsibility of the Contractor or the Surety for the satisfactory and full completion of the work. The Owner shall not be liable to any Subcontractor for any lien on structures to be constructed as part of the work or claim on moneys due the Contractor or any other lien, claim or damages whatsoever. The approval of the Engineer and the Surety of a Subcontractor shall in no way create a contractual obligation between the Owner and the Subcontractor.

In the event a Subcontractor shall disregard the directions of the Engineer, or fail in any other way to abide by all conditions of the Contract, the Contractor shall, upon written order of the Engineer, require the Subcontractor to discontinue work under the Contract.

The Contractor shall be responsible for the coordination of all of his Subcontractors engaged upon the work, both in connection with his own work and the work of other contractors, if any, working collaterally on the Project.

The divisions or sections of the various Contract Documents and Bid Items are not intended to define portions of the work to be divided among Subcontractors, nor to influence the Contractor to award Subcontracts, nor to limit or enlarge the work performed by any trade, unless a Subcontractor experienced in providing a certain specialized type of work is specifically required in the Contract.

SECTION 00758

ASSIGNMENT & SUBCONTRACTS

00758.02 LIMIT OF SUBCONTRACTS VALUE

The Owner reserves the right to limit the total value of all Subcontracts to fifty (50) percent of the total Contract price.

00758.03 ASSIGNMENT

In accordance with the provisions of Section 109 of the General Municipal Law of the State of New York, the Contractor shall not assign, convey, transfer, sublet or otherwise dispose of this Contract, or of his right, title or interest therein, or his power to execute such Contract, to any other person or corporation without the prior written consent of the Owner.

If the Contractor shall, without such consent of the Owner, assign, convey, transfer, sublet or otherwise dispose of this Contract to any other person or corporation, the Owner may revoke and annul the Contract, in which instance the Owner shall be relieved and discharged from any and all liability and obligations to the Contractor arising from the Contract, and to the persons or corporation to which the Contract shall have been assigned, conveyed, transferred, sublet or otherwise disposed of, and the Contractor and his assignees, conveyees, transferees or sublessees shall forfeit and lose all moneys theretofore earned under such Contract, except so much as they may be required to pay his employees.

Nothing herein shall prevent an assignment by the Contractor for the benefit of his creditors made pursuant to the laws of the State of New York.

00758.04 PAYMENT

Payment to Subcontractors and/or material men, shall be in accordance with Section 106b of the General Municipal Law of the State of New York.

END OF SECTION

GENERAL CONDITIONS

SECTION 00759

PAYMENTS

00759.01 ESTIMATED QUANTITIES

The Contractor agrees that the estimated quantities given in the Bid are only for the purpose of comparing bids and that he is satisfied with and will at no time dispute the said estimates as a means of comparing the aforesaid bids, that he will make no claim for loss of profits or anticipated profits because of any difference between the said estimated quantities and the quantities of the various classes of work actually furnished or performed, that the Owner shall not be held responsible if any of the said estimated quantities should be found to not even approximate those actually measured during performance of the work, and that the Engineer may direct an increase, decrease or omission of the quantities of any class or part of the work as may be deemed necessary or desirable.

00759.02 PRICES ALL-INCLUSIVE

The price or prices herein agreed to shall be for the work complete, and shall include the furnishings of all labor, tools, plant, equipment and materials therefor, whether required directly or indirectly, unless otherwise specified.

00759.03 LUMP SUM PRICES

A lump sum price stated in the Bid for an item shall be for the work complete as shown on the Plans and described in the Specifications for the corresponding item and shall include the cost of all labor, tools, plant, equipment and materials, specified or implied, incidental to the work of the item complete and ready for the service intended.

Within three weeks after execution of the Contract, the Contractor shall submit to the Engineer for approval three copies of a detailed schedule showing the breakdown of all lump sum bid prices in the Contract. The schedule shall indicate the quantities and amount estimated for each part of the work. The schedule shall be apportioned by the Contractor for labor and for materials, if so requested by the Engineer. The Contractor shall revise the schedule until it is satisfactory to the Engineer. The approved breakdown will be used in the preparation of monthly estimates and payments to the Contractor.

SECTION 00759

PAYMENTS

00759.04 UNIT PRICES

A unit price stated in the Bid for an item of the work specified to be measured for payment by units of volume, weight, area, length or number shall be paid for each unit of the net amount of the work of the item actually performed or furnished and incorporated in the finished work in accordance with the Specifications, Plans and as directed, as measured along the payment lines specified or shown, local custom to the contrary notwithstanding. It is agreed that the planimeter shall be considered an instrument of precision for the measurement on drawings and plans of areas in connection with the estimation of quantities in cases where geometric methods would be comparatively laborious.

00759.05 MONTHLY ESTIMATES AND PAYMENTS

Unless otherwise noted in the Additional Instructions or the Specifications once each month, on a day of the month selected by him, the Engineer will make an estimate of the value of the work done during the previous month, provided such value exceeds one thousand dollars. The Engineer shall submit this Monthly Estimate to the Owner for payment. The Owner will pay the Contractor each month, within 30 days of the date of the Monthly Estimate, a sum equal to ninety-five (95) percent of the Monthly Estimate, retaining five (5) percent of each estimate until the work or major portions thereof is substantially completed.

The work will be considered Substantially Complete when the work of the Contract including all alterations or modifications (see Section 00757 - CHANGES IN THE WORK) is at least ninety-nine (99) percent complete and the estimated value of minor items to be completed is equal to or less than one (1) percent.

The Engineer will include in the Monthly Estimates the delivered cost of equipment and non-perishable materials on site and off site which have been tested or inspected by the Engineer and approved by him for incorporation in the work. Only equipment and materials for which the Contractor furnishes the Engineer receipted invoices as evidence that he has unconditional title thereto will be included. Such invoices shall be furnished the Engineer at least ten days in advance of the established date of preparation of Monthly Estimates.

SECTION 00759

PAYMENTS

00759.05 MONTHLY ESTIMATES AND PAYMENTS - Continued

The Contractor shall provide and maintain insurance for the said equipment and materials (on site and off site) as specified in 00752.03.

Payments made for materials and equipment delivered will in no way affect the Contractor's responsibilities regarding the same.

00759.06 WITHDRAWAL OF RETAINED PERCENTAGE

Pursuant to Section 106 of New York State General Municipal Law and notwithstanding any inconsistent provisions of any general, special or local law under any contract made or awarded by any political subdivision, or any officer, board or agency thereof, or of any district therein, the Contractor may, from time to time, withdraw the whole or any portion of the amount retained from payments to the Contractor pursuant to the terms of the Contract, upon depositing with the Fiscal Officer of the Political Subdivision or district therein (1) bonds or notes of the United States of America, or obligations, the payment of which is guaranteed by the United States of America, or (2) bonds or notes of the State of New York, or (3) bonds of any political subdivision of the State of New York, of a market value equal to the amount withdrawn. The Fiscal Officer of the Political Subdivision or of a district therein, from time to time shall pay the same, when and as collected, to the Contractor who deposited such obligations. When the deposit is in the form of coupon bonds, the coupons shall be delivered to the Contractor as they respectively come due. The Contractor shall not be entitled to interest or income on, or the coupons of, any obligations so deposited by him, the proceeds of which shall have been used or applied by the Political Subdivision or district therein pursuant to the terms of the Contract. The Fiscal Officer shall be entitled to charge a reasonable fee for such service.

00759.07 OWNER'S RIGHT TO WITHHOLD PAYMENTS

The Owner may withhold from the Contractor such portions of any approved payments due him as the Owner may judge necessary to:

A. Protect the Owner from loss due to defective work not remedied;

SECTION 00759

PAYMENTS

00759.07 OWNER'S RIGHT TO WITHHOLD PAYMENTS - Continued

B. Failure to provide work schedule or revisions thereto;

C. Assure the payment of just claims then due and unpaid for labor or materials;

D. Protect the Owner from loss due to injury to persons or damage to the work or property of other Contractors, Sub-contractors, or others caused by acts of neglect of the Contractor or his Sub-contractors. The Owner shall have the right as agent for the Contractor to apply moneys so withheld as the Owner may deem proper to secure such protection or satisfy such claims, and such payments shall be deemed made for the account of the Contractor.

00759.08 INSPECTION AT SUBSTANTIAL COMPLETION

The Engineer will make an Inspection of the work as soon as possible after the Contractor gives written notice that the work is substantially complete. The Contractor shall assist the Engineer, as may be required, in making the Inspection. Cost to the Contractor, if any, to assist the Engineer in making the Inspection shall be included in the appropriate bid item as selected by the Contractor and no additional payment will be made to the Contractor for his work. After making the Inspection, the Engineer will notify the Contractor in writing of the results, including particulars regarding any part of the work which, in his opinion, is incomplete or requires correction or additional cleaning. The Contractor shall make good any incomplete or defective work before again asking for another Inspection. If in the opinion of the Engineer the work is substantially complete, the Engineer shall issue in writing a Notice of Substantial Completion. Said Notice will list those minor items requiring completion before Final Payment. (See also ARTICLE 00757.04, CORRECTION OF WORK.)

00759.09 CERTIFICATE OF SUBSTANTIAL COMPLETION

Upon issuance of the Notice of Substantial Completion by the Engineer, and the submission by the Contractor of a written statement from Surety that the Performance Bond (Labor & Materials Payment Bonds included) in the amount of one hundred (100) percent of the value of the Contract is in force for a period of one year following the date of Notice of Substantial Completion, the Engineer will file a Certificate of Substantial Completion with the Owner and the Contractor, certifying that the work is substantially complete and setting forth the amount of work performed and compensation earned by the Contractor. All prior estimates of the amount and value of work performed shall be subject to correction in this certification.

SECTION 00759

PAYMENTS

00759.10 PAYMENT AT SUBSTANTIAL COMPLETION

Within 30 days after the filing of the Certificate of Substantial Completion the Owner will pay the Contractor one hundred (100) percent of the full value of the work certified therein, less twice the value of any minor work remaining to be completed and all prior payments and advances to or for the account of the Contractor, and the amount necessary to satisfy any claims, liens or judgements against the Contractor which have not been discharged.

00759.11 FINAL PAYMENT

The Contractor shall fully complete the remaining minor items within sixty (60) days of the issuance of the Notice of Substantial Completion.

Upon certification by the Engineer that the remaining items of the Contract including all corrections, alterations and/or modifications have been completed and that no repairs, renewals or replacements are required of the Contractor, or that, if required, such remedies have been effected, the Engineer shall prepare a Final Payment request recommending to the Owner payment to the Contractor of the amount retained at the time of substantial completion less any amount necessary to satisfy any claims, liens or judgements against the Contractor which have not been discharged.

Within 30 days after the receipt from the Contractor of acceptable affidavits, certificates or waivers as evidence that no right to any claim or lien exists, the Owner will pay the remainder of the Contract as indicated in the Final Payment.

See also Article 00150.06, VERIFICATION OF AMOUNTS DUE FOR WAGES AND SUPPLEMENTS.

00759.12 ACCEPTANCE OF FINAL PAYMENT

Acceptance by the Contractor of the Final Payment shall serve as a release to the Owner of all claims and of all liability to the Contractor for all things done or furnished in connection with the work, and for any and all acts of neglect of the Owner or others relating to or because of the work, except the Contractor's claim for interest upon the Final Payment, if this payment is unduly delayed. No payment whatsoever shall operate to release the Contractor or the Surety from their obligations under the Contract or Bond.

SECTION 00759

PAYMENTS

00759.13 GUARANTEE INSPECTION

On or about one year from and after the date of the Notice of Substantial Completion, the Engineer will again inspect the work. The Contractor shall assist the Engineer, as may be required, to make the one year inspection. Cost to the Contractor, if any, to assist the Engineer in making the one year inspection shall be included in the appropriate bid item as selected by the Contractor and no additional payment will be made to the Contractor for this work. The Contractor shall provide any and all repairs, renewals or replacements which may be revealed as necessary in this Guarantee Inspection and which, in the opinion of the Engineer, are the responsibility of the Contractor. Should the Contractor fail to comply with written instructions of the Engineer regarding these remedies, the Owner will cause the remedies to be made by others and will pay the cost which will be reimbursed by the Contractor and/or his Surety.

The Contractor and his Surety agree that the Contractor's Performance Bond (Labor & Materials Payment Bonds included) shall cover fully all guarantees as specified herein and in ARTICLE 00752.01.

00759.14 ACCEPTANCE OF PORTIONS OF THE WORK

The Owner reserves the right to accept for his service and use any portion of the work at any time during the life of the Contract without prejudice to the Owner in enforcing any provisions of the Contract.

The Owner may accept the portion or portions of the work which is substantially complete under the following agreed procedures:

A. The Contractor will be notified by the Engineer in advance as to what portion or portions of the work the Owner intends to accept for his use and service.

B. The retained percentage for the Substantially Completed portion or portions of work shall be released in accordance with ARTICLE 00759.09.

C. The guarantee period applicable to that portion or portions of the work shall start from the date of acceptance.

D. The remaining minor items of the portion or portions of substantially completed work shall be finished or corrected to the satisfaction of the Engineer.

SECTION 00759

PAYMENTS

00759.14 ACCEPTANCE OF PORTIONS OF THE WORK - Continued

E. The Owner will assume responsibility for maintenance, heat, utilities and insurance on accepted portion or portions of the work.

F. All applicable provisions specified in this Section for work deemed substantially complete shall apply.

00759.15 REPAIR OR REPLACEMENT OF DAMAGED, DEFECTIVE OR FAULTY WORK

If any portion of the work is damaged in any way, or if defects or faults develop before the inspection at Substantial Completion, or before the expiration of the 12-month guarantee period, the Contractor shall repair, replace or otherwise make good the damage or defect to the satisfaction of the Engineer, regardless of whether the work may have previously passed the specified inspections and tests. No additional payment will be made for such remedial work.

Failure on the part of the Engineer to condemn defective work shall not imply acceptance of the work, nor act to release the Contractor from his obligations to repair, replace or otherwise make good the work at his own expense, notwithstanding that such work may have been estimated for payment or that partial or full payments may have been made therefor.

00759.16 PAYMENT TO SUB-CONTRACTORS BY CONTRACTOR

Within fifteen calendar days of the receipt of the payment from the Owner, the Contractor shall pay the Sub-contractors, and/or material men a sum equal to the value of the work performed less any amount necessary to satisfy claims, liens or judgements that have been discharged less any amount retained as hereafter described.

A. The retained amount shall not exceed more than 5% on each payment except that 10% of each payment may be retained, if the Sub-contractor(s) and/or material men failed to provide a Performance Bond (Labor & Materials Payment Bonds included) in the full amount of the Sub-contract.

B. The Contractor shall not retain any money from Sub-contractor(s) and/or material men, after receipt of the Certificate of Substantial Completion payment.

SECTION 00759

PAYMENTS

00759.16 PAYMENT TO SUB-CONTRACTORS BY CONTRACTOR - Continued

Within fifteen calendar days of the receipt of the payment from the Contractor, the Sub-contractor(s) and/or material men shall pay each of his Sub-contractors and/or material men in same manner as the Contractor has paid the Sub-contractor(s) and/or material man.

The Owner shall not be under any obligation to see that the Contractor makes any payment to a Sub-contractor and/or material men.

END OF SECTION

GENERAL CONDITIONS

SECTION 00760

CONTRACT TERMINATION

00760.01 OWNER'S RIGHT TO STOP WORK OR TERMINATE CONTRACT

The Owner, by seven days written notice to the Contractor and without prejudice to any other rights or remedies it may have, may terminate the employment of the Contractor and his right to proceed, either as to the entire work or any portion thereof on which delay shall have occurred, and may take possession of and complete the work by contract or otherwise, as the Owner may deem expedient, in the event of any of the following:

A. If the Contractor shall refuse or fail, after being warned by the Engineer, to supply enough competent workmen, equipment or proper materials, or

B. If the Contractor shall refuse or fail to perform the work or any part thereof with sufficient diligence to insure its completion within the time specified, or shall fail to complete the work within said period, or

C. If the Contractor shall fail to promptly pay persons supplying labor or materials for the work, or

D. If the Contractor shall fail or refuse to regard laws, ordinances, permits or orders from the Engineer or otherwise substantially violate any provision of this Contract, or

E. If the Contractor shall be adjudged bankrupt or make an assignment for the benefit of creditors, or

F. If a receiver or liquidator shall be appointed for the Contractor or for any of his property and shall not be dismissed within 20 days after such appointment, or the proceedings in connection therewith shall not be stayed on appeal within the said 20 days.

If the Owner so terminates or stops the Contractor, the Contractor shall not be entitled to receive any further payment until the work is completed. If the unpaid balance of moneys to be paid the Contractor hereunder shall exceed the cost of completing the work, including the cost of

SECTION 00760

CONTRACT TERMINATION

00760.01 OWNER'S RIGHT TO STOP WORK OR TERMINATE CONTRACT - Continued

additional administrative, managerial, engineering, and inspection services and or delay, such excess shall be paid to the Contractor. If such costs exceed the unpaid balance, the Contractor and the Surety shall be liable to the Owner for the excess.

If the right of the Contractor to proceed is terminated as provided herein, the Owner may take possession of and use in completing the work such materials, plant, equipment, supplies and appliances as may be on the Site and necessary to the work, provided that the termination was not made pursuant to paragraphs "E" or "F" above.

00760.02 CONTRACTOR'S RIGHT TO STOP WORK OR TERMINATE CONTRACT

In the event the work shall be halted by order of a Court or any other public authority having jurisdiction for a period of 90 days or more without act or fault of the Contractor or any Sub-contractor, the Contractor, upon 10 days written notice to the Owner, may terminate the Contract or discontinue performance of the work. In either case the liability of the Owner to the Contractor shall be determined as provided in ARTICLE 00760.01, except that the Contractor shall not be obligated to pay to the Owner any excess of the cost of completing the work over the unpaid balance of the payments to be made to the Contractor hereunder.

00760.03 OTHER TERMINATION PROVISIONS

In addition to the provisions set forth in this Section 00760, specific references relating to termination or cancellation of the Contract are contained elsewhere herein. These include but are not limited to:

00150.03	NON-DISCRIMINATION AND LABOR PRACTICES
00752.03.A	WORKER'S COMPENSATION INSURANCE
00756.03	PROGRESS
00758.03	ASSIGNMENT

END OF SECTION

GENERAL CONDITIONS

SECTION 00761

DESCRIPTION & DELINEATION OF THE WORK

00761.01 INTENT OF PLANS AND SPECIFICATIONS

The intent of the Plans, Specifications and other Contract Documents is to provide for the work outlined and delineated therein, complete in every detail for the purpose designated. The Contractor agrees to furnish everything necessary for the work as intended, any omission in the Plans or Specifications notwithstanding.

The Contractor shall furnish all materials, tools, plant equipment and labor, except those specifically set forth herein as to be furnished by the Owner, required to construct and place in complete and satisfactory working order the work contemplated by the Contract Documents. The mention in any part of the Specifications of any specific liability, duty or responsibility of the Contractor will not be construed as a restriction, limitation or waiver of any general liability, duty or responsibility of the Contractor, such mention being merely for explanatory purposes. The Contractor shall be solely responsible for the adequacy of his plant, tools and equipment, approval of the Engineer notwithstanding.

The Contractor shall do the work in a manner judged to best promote rapid construction consistent with due regard for the safety of life and the preservation of property, the satisfaction of the Engineer, and the intent of the Contract Documents.

The Contractor shall:

a) make all necessary excavations or embankments.
b) do all clearing and grubbing.
c) place all sheeting, shoring, bracing and supports.
d) furnish all underdrains.
e) provide draining, pumping bailing, ditching and diking for surface or below ground water.
f) provide all things necessary to protect, support and maintain structures, utilities, drains, conduits, culverts, trees, fences, poles, walls, earth banks, shrubbery, sidewalks, railways, roadways and drives.
g) repair all damage done to items in (f) above.
h) do all fencing, lighting and watching.
i) drive all piles and construct all foundations.

SECTION 00761

DESCRIPTION & DELINEATION OF THE WORK

00761.01 INTENT OF PLANS AND SPECIFICATIONS - Continued

j) construct all concrete, brick, stone, tile and timber work.
k) place all iron and steel work and reinforcement.
l) lay all water pipes, sewers, drains and conduits and make all connections to or between such.
m) resurface and repave all streets, sidewalks, roads or drives open cut or damaged.
n) refill all trenches and excavations.
o) provide all fences, bridges, fills, detours and signs for maintenance of travel in public ways.
p) make all connections to or between existing structures and utilities.
q) construct all buildings and structures.
r) furnish and install equipment.
s) clean up and dispose of all rubbish and surplus materials.

00761.02 INTERPRETATION OF PLANS & SPECIFICATIONS

The Engineer shall interpret the Plans and Specifications, and any Change Orders or Supplemental Agreements. Anything shown on the Plans but not included in the Specifications, or mentioned in the Specifications but not shown on the Plans, shall have the same effect as if set forth in both. In the event of a conflict between the Plans and Specifications, the Specifications shall govern. The attention of the Engineer shall be called to any discrepancies, as required by ARTICLE 01340.06.

00761.03 CONTRACT DRAWINGS

The location, nature and many details of the work are shown on the Contract Drawings. The work shall be constructed as shown on these Plans and such other drawings as may be issued during the life of the Contract by the Engineer, or furnished by the Contractor and approved by the Engineer.

The purpose of the Contract Drawings together with other Contract Documents, is to provide Bidders with sufficient information to prepare adequate and equitable Bids and to provide an adequate and equitable basis for the Agreement. The Contract Drawings may or may not provide sufficient detail for the actual construction of all segments of the work as shown and

SECTION 00761

DESCRIPTION & DELINEATION OF THE WORK

00761.03 CONTRACT DRAWINGS - Continued

specified. The Contractor shall furnish Construction Drawings or other drawings, as specified or requested, or, as may be required to adequately delineate for his workmen all details necessary for the work.

The Contract Drawings were prepared on 24" x 36" tracings. Reduced-size prints may have been prepared for the convenience of Bidders and others. During construction, the Contractor shall obtain data and information from full-size prints in preference to reduced-size prints.

Unless otherwise stated in the Information For Bidders, the Contractor will be furnished, free of charge, three copies of the Contract Documents, including three sets of Contract Drawings. Any other copies of the Contract Documents which the Contractor may desire can be obtained by him from the Engineer at the cost of duplication thereof.

The Contractor shall keep at least one set of Specifications and one full-size set of Plans on the Site, and shall at all times give the Engineer and the Owner access thereto.

00761.04 ADDITIONAL OR SUPPLEMENTAL DRAWINGS

The Engineer may prepare Additional Drawings or Supplemental Drawings during the course of the work, in connection with minor changes, Change Orders, Supplemental Agreements, or to augment or amplify the Contract Drawings or other drawings, or as part of orders or instructions, and the Contractor shall abide by such drawings in the same manner as specified for the Contract Drawings.

Drawings required by the Contractor are discussed in Article 01340.01.

END OF SECTION

GENERAL REQUIREMENTS

SECTION 01012

COLLATERAL WORK

01012.01 COLLATERAL WORK

The Owner may award other contracts in connection with the Project, the work under which may proceed concurrently with the work of this Contract. In this event the Contractor shall coordinate his operations with those of the other contractors, and shall cooperate with them in the arrangement for the storage of materials and performance of the work.

The Contractor and his Sub-contractors shall keep themselves informed of the progress of the work of other contractors and sub-contractors and shall notify the Engineer immediately of defective workmanship or insufficient progress on the part of others, where such will interfere with his own operations. Either failure of the Contractor to keep himself informed of the progress of work under other contracts on the Site, or failure of the Contractor to give proper notice of same, shall be deemed as acceptance by him of the status of the work under other contracts as it may affect his own work.

See also ARTICLE 00756.04, APPROVED WORK SCHEDULES, and ARTICLE 00756.06, TIME EXTENSIONS.

END OF SECTION

GENERAL REQUIREMENTS

SECTION 01015

CONTRACTOR USE OF PREMISES

01015.01 AREA AVAILABLE FOR CONTRACTOR'S USE

The Contractor shall confine his operations to those portions of the Owner's property, and to the right-of-ways or easements, temporary or permanent, acquired or designated for the work of the Contract as shown on the Drawings. Private property adjacent the Site shall not be entered upon or used by the Contractor for any purpose without the written consent of the Owner thereof. A copy of such consent shall be filed with the Engineer.

When required, the Contractor shall provide and maintain fences at his own expense, along the roadways and around the grounds occupied by him for the protection of adjoining property and all persons lawfully using same. Fences shall be of materials and construction suitable in the opinion of the Engineer for their intended purpose.

All work within or abutting private property shall be performed in such ways as to create the minimum of inconvenience and disturbance to the private property and its users. Excavated materials or supplies of any kind shall not be stored on off-site public or private property without written consent of the Owner thereof, and all walks and drives shall be kept open to uninterrupted passage. A copy of each such written consent shall be filed with the Engineer.

Materials delivered upon public streets shall be neatly stored between the sidewalk and the curb or ditch line, and at least 10 feet from any fire hydrant. A passageway of at least three feet shall be preserved on the sidewalk line.

01015.02 TRAVEL NOT OBSTRUCTED

The Contractor shall not needlessly hinder or inconvenience travel on any public or private way, nor shall he wholly obstruct same without written permission of the Owner. If he is permitted to obstruct a traveled way, the Contractor shall provide plain and appropriately worded signs and adequate barricades and lighting at the nearest cross streets, and at each end of the obstructed portion, announcing such obstruction and directing traffic to and along an approved detour.

SECTION 01015

CONTRACTOR USE OF PREMISES

01015.02 TRAVEL NOT OBSTRUCTED - Continued

Unless otherwise specified or permitted, all entrances and exits of fire houses, industrial plants, commercial buildings and public buildings shall be kept open and maintained in passable condition at all times. The Contractor shall give notice to the owner of each traveled way before interfering therewith.

01015.03 CLEANING UP

The Contractor shall remove from the Site and dispose of, at his own expense, all rubbish, refuse and unused materials, as the work progresses. If such work is neglected, the Engineer will give written notice thereof to the Contractor. If the work is not performed within five days thereafter, the Owner will employ other persons to do such work, and the expense thereof shall be deducted from any monies due or to become due the Contractor.

The Contractor shall clean and leave free from obstruction all pipes, buildings, manholes and other structures. This work shall be coordinated with the Engineer's Inspection at Substantial Completion, or as directed. All rubbish, refuse, unused materials, plant and equipment shall be removed from the Site, and the entire Site shall be left in a neat condition. All equipment installed in the work by the Contractor shall be cleaned and left in a bright and new-appearing condition.

END OF SECTION

GENERAL REQUIREMENTS

SECTION 01019

SITE CONDITIONS

01019.01 PRE-BID INSPECTION & EXAMINATION

The Contractor warrants and represents that he visited the Site prior to submitting his Bid, and that he has satisfied himself as to the location and nature of the work and the quantity, quality, type and nature of both surface and subsurface structures and materials apt to be encountered.

See also 00753.01.B.

01019.02 BORINGS

Any data on subsurface conditions that may have been obtained by the Owner prior to the advertisement for bids, through test borings, test pits, seismic explorations, or other means, was obtained by the Owner for his sole use and only for his own purposes. Any such data, known or recalled as of the date of advertisement for bids, are shown on separate drawings or in separate schedules and reports which are not any part of the Contract Documents. All such data are made available to Bidders, the Contractor and other interested parties only as a convenience and without express or implied representation, assurance or guarantee that any of the information is complete, correct, or adequate or representative of a true or typical picture of subsurface conditions on the Site.

The Contractor, both during his status as Bidder and after execution of the Contract, shall satisfy himself as to the nature, character, quality and quantity of above ground and below ground conditions apt to be encountered. Any reliance on data made available by the Owner shall be at the Contractor's sole risk.

No claim whatsoever shall be made by the Contractor against the Owner or Engineer for or on account of such data available, or neglected to be made available, by the Owner or Engineer.

SECTION 01019

SITE CONDITIONS

01019.02 BORINGS - Continued

The Contractor at any time, and any holder of Contract Documents during the period between advertisement for and receipt of bids, will be permitted to make test borings, test pits, soundings or similar subsurface investigations on the Site. Prior to making these investigations the Contractor and/or any holder of Contract Documents must notify the Engineer when and where he proposes to make such investigations.

The locations where test boring samples, if any, may be examined is given in the Additional Instructions.

See also ARTICLES 00753.01.B, 00753.07, 00759.01, 01019.04 and 01019.06.

01019.03 PROTECTION OF EXISTING STRUCTURES

The Contractor shall at all times have on the Site suitable and sufficient plant and materials to adequately protect, support and sustain any and all existing structures and facilities, whether above or below ground, and shall use same as may be necessary or required to protect, support and sustain any and all such structures as may become weakened, endangered, undermined or uncovered.

He shall, at his own expense, support and sustain in their places and protect from direct or indirect damage all water, gas, steam, air or other mains or pipes, sanitary and storm water sewers and drains, conduits, subways, service connections, buildings, poles, wires, fences, pavements, sidewalks, curbs, railways, trees and other structures and property and appurtenances thereto on or in the vicinity of the Site, and shall assume all liability for damage thereto, including damage arising out of settlement or lateral movement of walls of excavations, whether occurring during performance of the work or the 12-month period of guarantee.

In the event of damage or danger to any such structure or facility the Contractor shall immediately notify the Engineer, and shall promptly repair or protect the structure as the Engineer may direct.

SECTION 01019

SITE CONDITIONS

01019.04 EXISTING STRUCTURES BELOW GROUND

The Contract Drawings show the location and character of certain existing subsurface structures and facilities apt to be encountered in excavations or located in such proximity to the work as to require precautions for their protection. The sizes, materials, locations and depths shown are only approximate, and the Contractor shall satisfy himself as to the accuracy and completeness of such information. The Contractor shall not be relieved from any of his obligations, nor be entitled to claim for damages or additional compensation, sustained or arising out of inadequacy or inaccuracy of the information given.

01019.05 ABANDONED STRUCTURES

Any structures, facilities or appurtenances therefor which are abandoned or become so by reason of the work, shall, at the Contractor's expense, be broken up and filled with approved material, if directed by the Engineer.

01019.06 LATENT SUB-SURFACE CONDITIONS

In the event that latent sub-surface conditions are found to materially differ from those on which the Plans and Specifications are based, the Contractor shall immediately notify the Engineer before they are disturbed. After prompt investigation, the Engineer will determine what changes, if any, should be made in the Plans and Specifications because of the revealed conditions, and shall instruct the Contractor accordingly. Any change in the cost of the work resulting therefrom shall be adjusted as provided in Section 00757.

01019.07 ADJUSTMENT OR CHANGES OF EXISTING STRUCTURES

If, in the opinion of the Engineer, an underground pipe or other structure requires realignment or relocation, and such realignment or relocation was not included in the Plans or Specifications, the Engineer will issue a Change Order for such work, and the Contractor shall be compensated therefor as provided in Section 00757. The Contractor shall strip or uncover and support or sustain the structure at his own expense prior to such Change Order, as part of his work under the original Contract, and he shall not be entitled to claim for damage or delay due to its presence or discovery.

SECTION 01019

SITE CONDITIONS

01019.07 ADJUSTMENT OR CHANGES OF EXISTING STRUCTURES - Continued

Wherever existing utilities come within limits of the work, the Contractor shall notify both the Engineer and the Utility before in any way disturbing same. Any work of realignment, relocation, removal or extension of the utilities shall be done as mutually agreed by the Utility, the Contractor and the Engineer. The Contractor shall maintain satisfactory drainage of the excavation at all times from revelation of the structure until completion of its realignment or readjustment. Interruption of service by utilities shall be kept to a minimum.

The Contractor shall not cause nor permit interference with or hindrance to any municipal department, individual, public service corporation, or other company in protecting its structures and facilities, nor in removing, replacing or relocating same.

01019.08 MAINTENANCE AND RESTORATION OF SERVICE

The Contractor shall, at his own expense, provide for the maintenance of flow in all water courses and all sanitary and storm sewers, drains, connections and appurtenances thereto. The contents of sewers, drains or service connections shall not be permitted to flow into excavations, sewers or other parts of the work without written permission of the Engineer, and the Contractor shall, at his own expense, immediately remove from the Site and adequately dispose of all offensive matter, in an approved manner.

The flow of water, and normal water pressure, in all water mains, conduits and service connections encountered on the Site, shall be provided for and maintained by the Contractor at his own expense. When water mains or service connections must be disturbed to the extent that service must be shut off, the Contractor shall give at least 24 hours notice to the Utility and all customers served by the lines involved. Such notice shall give the estimated times of shut-off, and restoration of service. If fire hydrants are involved, the fire department serving the area shall be similarly notified.

In the event of accidental disruption of water service, it shall be deemed an emergency, and the Contractor shall proceed with the necessary repairs immediately and continuously, giving this work priority over all other operations, until service has been satisfactorily restored. The Contractor shall give immediate notice of such break or service interruption to the Engineer, the Utility, and all customers affected, and shall supply, at his own expense, assistance in supplying

SECTION 01019

SITE CONDITIONS

01019.08 MAINTENANCE AND RESTORATION OF SERVICE - Continued

an emergency source of water when necessary by means of temporary lines, tank trucks, or other means. All lines and connections shall be restored to the satisfaction of the Engineer and the Utility.

All portions of the foregoing provisions regarding water service which are applicable to sewer, gas, telephone or other services shall apply also to maintenance and emergency repair of such services.

01019.09 POLES & POSTS ON-SITE

Poles or posts of any Utility located within the lines of the work which, in the opinion of the Engineer, will impede progress of the work, shall be supported or removed and replaced by the Contractor at his own expense and in accordance with the requirements of the Utility involved. The Contractor shall remove, relocate, replace or support all other poles and posts at his own expense and to the satisfaction of the Engineer.

The Contractor shall employ no equipment which will unduly interfere with wires or other overhead facilities.

01019.10 NOTIFICATION OF OTHER PARTIES

In addition to notices to Utilities and others required elsewhere herein, the Contractor shall give written notice of his proposed construction operations to the owners of all public and private utilities at least seven days in advance of breaking ground in any area in which a utility is located. Copies of each such notice shall be simultaneously sent to the Engineer.

END OF SECTION

GENERAL REQUIREMENTS

SECTION 01051

LAYOUT OF WORK

01051.01 INFORMATION PROVIDED BY ENGINEER

The Engineer will provide, on the Contract Drawings, sufficient information for the Contractor to establish baselines, offsets and other survey control points. Unless otherwise noted, no additional survey work will be provided by the Engineer.

01051.02 SERVICES PROVIDED BY CONTRACTOR

Unless otherwise noted in the Additional Instructions or Specification, the Contractor will establish such additional lines, grades and elevations as he deems necessary and will include the following:

A. Structures & Buildings: Corner stakes at all principal corners of exterior walls or foundations. Two bench marks in the vicinity of the structure or building.

B. Sewers: Offset grade line stakes, on one side, with stations approximately forty linear feet on centers.

C. Water Mains & Force Mains: When laid to grade, the same as for sewers. When not laid to grade, none.

D. Roads & Runways: Offset center line grade stakes, on one side, with stations approximately fifty linear feet on centers.

E. Embankments: Slope stakes on both sides at approximately one hundred linear feet on centers, with additional stakes at principal breaks in grade.

F. Tunnels & Borings: Center line and offset baseline on the surface, on starting end. Also one progress check every fifty linear feet of long tunnels.

G. Other Types of Construction: The Contractor will provide control stakes as he deems necessary to properly layout his work.

SECTION 01051

LAYOUT OF WORK

01051.02 SERVICES PROVIDED BY CONTRACTOR - Continued

H. On Traverse or Cross-country type of construction, such as pipelines and roads, a temporary center line may be required for clearing purposes.

I. The Contractor will issue a grade letter for pipeline and road construction which is to be laid or installed to a predetermined grade. All other stakes will have the information marked on a witness stake beside the hub.

The Contractor shall provide all the necessary materials for control points, including all: stakes, hubs, lath, grade boards, cleats, nails and such other materials as may be required.

The Contractor shall also provide such non-technical assistance as may be required in the establishment of marks, other than primary or basic controls, such as clearing sight lines and driving stakes.

The Contractor shall erect and establish all grade boards, batter boards and construction control lines from the information provided by the Engineer.

The Contractor shall layout the work to best suit his methods of operations, using the Engineer's information provided to assure the construction will be in the position the design anticipated.

01051.03 OBLIGATIONS OF THE CONTRACTOR

The Contractor shall carefully preserve and protect all stakes, marks, monuments and points provided or described by the Engineer, and shall reimburse the Owner for any and all additional engineering costs incurred because of the replacement or reestablishment of any such items which may be moved, removed, obliterated or destroyed due to his construction operations. When directed, the Contractor shall provide suitable barricades for the protection of points.

The Contractor shall bear the entire cost of rectifying work improperly done due to his own negligence in preserving and protecting marks, or to moving or removing same without approval of the Engineer.

SECTION 01051

LAYOUT OF WORK

01051.03 OBLIGATIONS OF THE CONTRACTOR - Continued

He shall inform the Engineer a reasonable time in advance of his operations of the times and places he proposes to work, so that lines, grades and elevations may be established and necessary measurements for record and payment may be made with the minimum of inconvenience or delay to either himself or the Engineer. No additional compensation will be paid the Contractor for any delay caused by insufficient notice.

01051.04 LINES, GRADES AND ELEVATIONS

The terms "invert" or "grade" used in the Contract Documents in connection with pipes, sewers, channels, flumes and similar structures shall mean the inside bottom of the pipe or other surface on which the liquid flows along the center line of the completed work. "Subgrade" refers to the bottom line or surface to which excavations are necessarily made to construct the work as shown or specified, exclusive of any additional depth of excavation required for any special foundation.

The term "Grade Letter" shall mean a data sheet giving the amount of cut or fill from offset stakes to the invert or grade.

All work shall be constructed in accordance with the lines and grades shown, specified or directed. The Contractor shall be responsible for maintaining alignment and grade between points provided or described on the Contract Drawings.

01051.05 MASONRY CHASES, OPENINGS AND INSERTS

If the Owner awards other contracts for collateral work on the Site, it shall be the obligation and responsibility of the General Contractor to provide all openings and chases in his work to fit both his own work and that of the other contractors. The General Contractor shall provide all openings shown on the Contract Drawings, or reasonably implied thereby, as confirmed or modified by Additional Drawings or drawings submitted by Contractors and approved by the Engineer.

Where pipes or conduits pass through slabs or walls, the sleeves or opening forms shall be provided by the installer of the pipes or conduits but shall be placed by the General Contractor.

SECTION 01051

LAYOUT OF WORK

01051.05 MASONRY CHASES, OPENINGS AND INSERTS - Continued

If hanger inserts or similar items are required, they shall be furnished by the installer of the pipe or other equipment for which the hangers are intended, but shall be placed by the General Contractor.

Any expense resulting from mislocated, defective, or ill-timed work shall be borne by the Contractor responsible therefor. No Contractor shall alter the work of another Contractor without the consent of the Engineer and knowledge of the Contractor involved, and no Contractor shall endanger any work by cutting, excavating or other operations.

01051.06 PAYMENT FOR LAYOUT OF WORK

The cost to the Contractor of providing the services and materials specified in this Section 01051 shall be included in the price, or total of prices, given in the Bid on which the Agreement is based, and no separate payment will be made therefor. Any cost to the Owner for additional engineering layout work, as set forth in ARTICLE 01051.03, will be deducted from monies due or to become due the Contractor.

END OF SECTION

GENERAL REQUIREMENTS

SECTION 01064

SAFETY AND HEALTH

01064.01 SAFETY AND HEALTH REGULATIONS

The Contractor shall comply with the U.S. Department of Labor Safety and Health Regulations for construction promulgated under the Occupational Safety and Health Act of 1970 (PL 91-596) and under Section 107 of the Contract Work Hours and Safety Standard Act (PL 91-54), latest revisions.

In order to protect the general public and the lives and health of his employees under the Contract, the Contractor shall comply with all pertinent provisions of the latest issues of the Federal Register, Bureau of Labor Standards, Safety and Health Regulations; New York State Industrial Code Rule 30 pertaining to Tunneling Operations; New York State Industrial Code Rule 23 pertaining to Trenching Operations; and the "Manual of Accident Prevention in Construction" issued by the Associated General Contractors of America, Inc., and shall maintain an accurate record of all cases of death, occupational disease, and injury requiring medical attention or causing loss of time from work, arising out of and in the course of employment on work under this Contract. In case of a conflict between the above noted authorities, the most stringent shall prevail.

The Contractor shall have on the project site at all times, while work is in progress, at least one person skilled in safety and health procedures and familiar with State and Federal safety and health regulations whose responsibility shall be to observe methods and procedures. He shall have the duty and authority to stop and/or correct all unsafe and unhealthy conditions.

01064.02 SAFETY AND FIRST AID

The Contractor shall at all times exercise caution in his operations and shall be responsible for the safety and protection of all persons on or about the Site. All hazards shall be avoided or guarded in accordance with the provisions of the Manual of Accident Prevention in Construction of the AGCA, unless such provisions contravene local law. The safety provisions of all applicable laws, codes and ordinances shall be observed.

The Contractor shall provide and maintain at the Site, at each location where work is in progress, as part of his plant, an approved first aid kit. Ready access thereto shall be provided at all times when men are employed on the work.

SECTION 01064

SAFETY AND HEALTH

01064.02 SAFETY AND FIRST AID - Continued

The Contractor shall take due precautions against infectious diseases, and shall arrange for the immediate isolation and removal from the Site of any employee who becomes ill or is injured while engaged on the work.

01064.03 DUST HAZARDS

(a) If, in the construction of the work covered by the Contract, a harmful dust hazard is created for which appliances or methods for the elimination of dust have been approved by the Board of Standards and Appeals, such appliances or methods shall be installed and maintained and effectively operated by the Contractor at his expense.

(b) The Contract shall be void and of no effect unless the Contractor complies with the provisions of this subdivision of the Contract and Labor Law Section 222-a.

END OF SECTION

GENERAL REQUIREMENTS

SECTION 01340

SUBMITTALS

01340.01 DRAWINGS FURNISHED BY THE CONTRACTOR

The Contractor shall prepare, or cause to be prepared by his suppliers or Subcontractors, and submit to the Engineer for review, Shop Drawings, Setting Drawings, Working Drawings and Construction Drawings as may be specified or directed or necessary to the performance of the work. Deviations from the drawings and specifications shall be called to the attention of the Engineer at the time of the first submission of Shop Drawings, or other drawings, for consideration. Corrections or comments made on the Shop Drawings or other drawings during review do not relieve the Contractor from compliance with the requirements of the Contract Drawings and Specifications. Approval is only for general conformance with the design concept of the Project and with information set forth in the Contract Drawings and Specifications. Contractor is responsible for dimensions to be confirmed and correlated at the job site, information that pertains solely to the fabrication process or to the means and methods of construction, coordination with the work of all trades, and performing all work in a safe and satisfactory manner. Approval does not modify Contractor's duty to comply with the Contract Documents.

Within thirty days of the execution of the Agreement, the Contractor shall submit five copies of a schedule of submittals which includes a complete list of products proposed for the work tabulated by Specification Section, including manufacturer or fabricator, model number or other identifying designation.

Shop, Setting or Working Drawings shall be submitted for each type and model of fabricated materials and equipment. They shall provide complete and accurate working dimensions, weights, assembly and sectional views, details necessary to coordinating the work, anchor bolt and installation plans and instructions, parts lists and descriptions, materials and finishes lists, lists of any tools and spare parts required, diagrams of control wiring and piping, the location, sizes and types of connections to other work or other items, and any other data required to comply with the Contract or provide the workmen and the Engineer with information necessary to complete and inspect the work.

Electrical equipment drawings and data shall show physical dimensions, installation details, elementary and connection diagrams for each motor controller, interconnection diagrams for all equipment, identification of components external to electrical equipment, the coordination of control circuits, and definition of the contract arrangement and control action of the primary and final control elements.

SECTION 01340

SUBMITTALS

01340.01 DRAWINGS FURNISHED BY THE CONTRACTOR - Continued

If the Contractor proposes to furnish and install equipment requiring a layout or arrangement materially changed from that shown on the Contract Drawings as illustrative of one acceptable arrangement, he shall submit, for review, drawings showing the proposed arrangement and the appertaining changes to wiring, piping, structures and other equipment.

Submittals such as pre-printed manufacturers' installation instructions, maintenance data, parts lists, test results, or similar informational material are not considered Shop Drawings and will not be reviewed. Any submittal not required or otherwise requested will be returned to the Contractor.

See also ARTICLE 01340.08, ADDITIONAL ENGINEERING COSTS.

01340.02 TRANSMITTAL, IDENTIFICATION AND RESUBMITTAL

The Contractor shall accompany all drawings and other data submitted to the Engineer with a letter of transmittal in duplicate. Unless otherwise specified elsewhere herein, all other correspondence with the Engineer shall also be in duplicate.

All drawings shall be suitably identified with the name of the Project, Contract Number, Contractor name, name of the equipment or materials manufacturer, specification section designation and item number (if applicable) date, and initials indicating approval of such submittal by the Contractor under the applicable specification.

The Contractor shall submit to the Engineer for review five copies of all drawings and other data, plus the number of copies he wishes returned bearing the Engineer's review stamp, comments, or request for changes, but in no case shall the total number of copies so submitted be less than six. If the Engineer makes comments or corrections, they will be noted on the drawings, or explained in a letter of transmittal, or both, and all but three copies will be returned to the Contractor for revision or other requested action. The Contractor shall make any requested revisions or additions and resubmit the drawings in the same manner as for the initial submittal. If requested by the Engineer, the Contractor shall supply additional copies of submitted data.

SECTION 01340

SUBMITTALS

01340.02 TRANSMITTAL, IDENTIFICATION AND RESUBMITTAL - Continued

The Engineer's review stamp shall indicate one of the following:

- ☐ Approved
- ☐ Approved as Noted
- ☐ Revise as Noted - Resubmit
- ☐ Rejected - Resubmit as Specified

Upon return of a submittal marked "Approved" or "Approved as Noted", the Contractor may order, ship or fabricate the materials so noted. A submittal marked "Approved as Noted" should not be resubmitted for further review. Submittals marked "Revise as Noted – Resubmit" include extensive corrections or corrections of major importance affecting other items and require the submittal to be amended and resubmitted for a final review. Submittals marked "Rejected – Resubmit as Specified" are reserved for materials or equipment which are unacceptable. The Contractor shall resubmit for materials or equipment which are acceptable and in accordance with the Specifications.

More than one resubmittal per material or equipment will be considered an additional cost to the Engineer which shall be reimbursed by the Contractor. Refer to Article 01340.08 for method of reimbursement.

01340.03 DELAY THROUGH TARDY SUBMITTAL

All submittals shall be made on such a schedule and at such time as to permit adequate review. The Contractor shall make due allowance for possible revisions and resubmittals. Delays caused by tardy submittal of drawings or data for review shall be the responsibility of the Contractor. No work covered by submitted drawings, or drawings specified to be submitted, shall be performed until such drawings and data have been reviewed.

See also ARTICLE 00756.04, APPROVED WORK SCHEDULES.

SECTION 01340

SUBMITTALS

01340.04 CONTRACTOR RESPONSIBLE FOR ACCURACY

The Contractor shall be responsible for the accuracy and completeness of the drawings and other data he submits, for their conformity to the Plans and Specifications, and for the proper fit and clearance of all construction work.

The Owner retains for the Engineer the option to refuse to review submitted data that are improperly identified or incomplete or which have not been checked by the Contractor for compliance with the Contract Documents.

01340.05 ADDITIONAL INSTRUCTIONS

The Engineer may from time-to-time issue additional instructions to the Contractor as may be necessary to amplify, augment, modify or clarify the Contract Documents. These may be in the form of drawings, specifications, interpretations, orders and instructions, and may be in connection with or made a part of a Supplemental Agreement, Change Order, or Minor Change.

See also SECTION 00757, CHANGES IN THE WORK.

01340.06 DRAWINGS TO BE CHECKED BY CONTRACTOR

The Contractor shall check all dimensions, quantities and representations in the Specifications, Contract Drawings, Additional Drawings and all Supplemental Agreements, Change Orders and Instructions, and shall immediately notify the Engineer of any and all errors, omissions, or discrepancies therein which he may find. The Contractor will not be permitted to take advantage of any such error, omission or discrepancy in any Contract Document or subsequent document, as full instructions will be provided by the Engineer in such case.

01340.07 SUBSTITUTES AND "OR-EQUAL" ITEMS

Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item, the Specification or description is intended to establish the type, function and quality required. Unless the Specification or description contains or is followed by words reading that no like, equivalent or "or-equal" item or no substitution is permitted, other items of material or equipment may be accepted by the Engineer under the following circumstances:

SECTION 01340

SUBMITTALS

01340.07 SUBSTITUTES AND "OR-EQUAL" ITEMS - Continued

"Or-Equal": If in Engineer's sole discretion an item of material or equipment proposed by Contractor is of similar quality and functionally equal to that named and sufficiently similar so that no change in related work will be required, it may be considered by Engineer as an "or-equal" item, in which case review and approval of the proposed item may, in Engineer's sole discretion, be accomplished without compliance with some or all of the requirements for acceptance of proposed equal items.

Substitute Items: If in Engineer's sole discretion an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item, it will be considered a proposed substitute item. Contractor shall submit sufficient information as provided below in advance to provide adequate time to allow Engineer to determine that the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefor. The procedure for review by the Engineer will include the following or as the Engineer may decide is appropriate under the circumstances. Requests for review of proposed substitute items of material or equipment will not be accepted by Engineer from anyone other than Contractor. If Contractor wishes to furnish or use a substitute item of material or equipment, Contractor shall first make written application to Engineer for review thereof, certifying that the proposed substitute will perform adequately the functions and achieve the results called for by the general design, be similar in substance to that specified and be suited to the same use as that specified. The application will state the extent, if any, to which the evaluation of the proposed substitute will prejudice Contractor's achievement of Substantial Completion on time, whether or not the substitute for use in the work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for work on the project) to adapt the design to the proposed substitute and whether or not incorporation or use of the substitute in connection with the work is subject to payment of any license fee or royalty. All variations of the proposed substitute from that specified will be identified in the application and available maintenance, repair and replacement service will be indicated. The application will also contain an itemized estimate of all costs or credits that will result directly or indirectly from acceptance of such substitute, including costs of redesign and claims of other contractors affected by the resulting change, all of which will be considered by Engineer in evaluating the proposed substitute. Engineer may require Contractor to furnish additional data about the proposed substitute.

SECTION 01340

SUBMITTALS

01340.08 ADDITIONAL ENGINEERING COSTS

In the event that the Contractor fails to submit acceptable Shop Drawings (i.e., Shop Drawings which are returned marked "Approved" or "Approved as Noted") within two submittals, further review of the Shop Drawings will be considered an Additional cost. Similarly, all Engineering Costs associated with the review of a substitution will be considered an Additional cost.

Additional Engineering Costs include redesign, additional Shop Drawing reviews, investigations, consultant fees and revisions to the Contract Documents required because of the proposed substitution. Additional Engineering Costs will be the total of:

a. Billing Rates Schedule
b. Direct Expenses Plus 10%
c. Consultant Fees Plus 10%

Additional Engineering Costs shall be deducted from Contractor Payments by the Owner, in accordance with the Agreement for Engineering Services between the Owner and the Engineer.

END OF SECTION

GENERAL REQUIREMENTS

SECTION 01506

WORK UNDER UNUSUAL CONDITIONS

01506.01 WORK AFTER DARK

Unless specifically required elsewhere herein, the Contractor shall perform no work after dark except in emergencies. When time permits, he shall inform the Engineer in advance of such work and shall obtain the Engineer's approval. When time does not permit advance notice to the Engineer, he shall inform the Engineer at the earliest possible moment.

The placing of concrete shall be so scheduled as to be started early enough in daylight hours to allow sufficient time for the completion of the section under construction before dark, including the work of finishers.

When, in order to minimize interference with existing structures or utilities, or maintain traffic, it may, in the opinion of the Engineer, be expedient or necessary to do work after dark, such work shall be performed by the Contractor at no additional cost to the Owner, and the Contractor shall provide adequate lighting therefor.

01506.02 WORK ON SUNDAYS OR HOLIDAYS

Unless specifically required elsewhere herein, the Contractor shall do no work on Sundays or locally recognized legal Holidays except in an emergency, and then shall confine his operations to only the work considered necessary to be performed at such time.

01506.03 WORK IN STORMS

If required by the Engineer, masonry work and the mixing and placing of concrete shall be halted during rain storms, and all fresh work shall be immediately protected with suitable coverings. The Contractor shall keep a sufficient quantity of such coverings at the Site as part of his plant and equipment.

No paving, exterior painting, fine grading, seeding or roofing shall be done during rain or snow storms.

SECTION 01506

WORK UNDER UNUSUAL CONDITIONS

01506.04 WORK IN COLD WEATHER

Certain Specifications contain provisions prohibiting the performance of certain work in cold weather, or outlining the conditions under which such work may be so performed. In the absence of specific mention elsewhere in the Contract Documents, the judgement of the Engineer shall govern in any case where temperature may adversely affect or prevent the performance of good work.

END OF SECTION

GENERAL REQUIREMENTS

SECTION 01510

SERVICES DURING CONSTRUCTION

01510.01 SANITARY FACILITIES

The Contractor shall provide on the Site, at his own expense, one or more toilets, suitably screened from public observation for the use of all persons employed on the work. They shall be provided, maintained and removed, when directed, by the Contractor, in such quantity, locations and manner as approved by the Engineer. Contents shall be removed and disposed of in a manner and at such times as shall be approved. Chemical toilets are to be preferred.

The Contractor shall not permit or condone the committance of nuisances on or about the Site. Any employee found violating these provisions shall be discharged in accordance with the provisions of ARTICLE 00754.02.

The Contractor shall comply with any and all sanitary regulations as may have been established for the locality.

If the Owner awards other contracts for collateral work on the Project, the provision of sanitary convenience shall be the responsibility of the General Contractor, and all such facilities shall be made available to other Contractors and all Subcontractors until the date of the Certificate of Substantial Completion of the General Contract. Each Contractor, however, shall be individually responsible for the acts of his employees and Sub-contractors, and for all provisions of this Section after completion of the General Contract.

01510.02 WATER

The Contractor shall provide at all times sufficient drinking water from an approved source and by approved means, for all persons having reason to be on the Site in connection with the work.

If an ample supply is owned or controlled by the Owner, and is available at or near the Site, such supply will be made available to the Contractor, subject at all times to the requirements of the Owner established therefor, and at a cost to the Contractor as determined by the current schedule of charges filed by the Utility for all customers. Permission to use the water must be obtained in writing.

SECTION 01510

SERVICES DURING CONSTRUCTION

01510.02 WATER - Continued

If water is obtained from a public or private supply not owned or controlled by the Owner, the Contractor shall make such arrangement for service with the owners thereof as they may require.

Non-potable water for other than drinking purposes may be obtained at the Site from the ground or surface sources, at the Contractor's own expense. The water must, however, be suitable for the purpose intended and shall be approved by the Engineer. The Specifications, for instance, contain requirements for water for making concrete and mortar.

If the Owner awards other contracts for collateral work on the Project, it shall be the responsibility of the General Contractor to obtain potable water for drinking purposes, and such water shall be made available to all Contractors, until the date of the Certificate of Substantial Completion for the General Contract. Each Contractor, however, shall be individually responsible for providing potable water for his own employees and his Sub-contractors after completion of the General Contract.

If the General Contractor provides water, whether potable or non-potable, for his own purposes during construction of the work, besides drinking water, such water shall be made available to other Contractors and their Sub-contractors during the life of the General Contract. Removal of temporary facilities shall be by the General Contractor, but such installation and meters shall remain until need therefor by each Contractor has ceased, or until the date of the Certificate of Substantial Completion of the General Contract. Each Contractor shall provide his own services after completion of the General Contract.

01510.03 TEMPORARY HEAT

If the Owner awards other contracts for collateral work on the Project, it shall be the obligation and responsibility of the General Contractor to provide and maintain temporary heat in all above ground structures, and in all below ground structures other than manholes and similar pipeline appurtenances, by means of portable electric, oil or gas-fired appliances. The General Contractor shall provide and pay for all fuel and electric power used by such appliances, and any wiring or connections required, and shall provide suitable smoke pipes or other devices to prevent the deposit of smoke or smudge on building components or equipment.

SECTION 01510

SERVICES DURING CONSTRUCTION

01510.03 TEMPORARY HEAT - Continued

After their installation by the Heating & Ventilating Contractor, the permanent heating system facilities may be used for temporary heating purposes, the operation thereof, and any temporary wiring or piping required and all power consumed shall be the obligation and responsibility of the General Contractor, who shall also be responsible to the Heating & Ventilating Contractor for the repair of any damage of work of the Heating & Ventilating Contract suffered as the result of use by the General Contractor.

After enclosure of all spaces to be heated, except for doors, windows and similar apertures, temporary enclosures for all apertures shall be provided. Temperatures in the entirety of such spaces shall be continuously maintained at not less than 50°F between October 15 and May 15, unless written permission is granted otherwise by the Engineer. The General Contractor shall securely install on each floor of each building near the center of the building, a suitable thermometer. Either the temporary or the permanent heating system shall be available for around-the-clock use during the season specified above.

The Owner will supply all heat after the date of the Certificate of Substantial Completion of the General Contract.

No portion of the Temporary Heat provisions herein contained shall be construed to waive or modify any provisions regarding maintenance of air or materials temperatures for the protection of the work contained elsewhere in the Contract Documents.

01510.04 TEMPORARY ELECTRIC LIGHT AND POWER

If the Owner awards other contracts for collateral work on the Project, it shall be the obligation and responsibility of the General Contractor to provide and maintain temporary facilities for furnishing light and power necessary for operations under the General Contract, and to make all necessary arrangements therefor, including all required conductors, outlets and connections, ordering the meter, paying all fees and inspection charges and pay for all power bills until the date of the Certificate of Substantial Completion of the General Contract.

SECTION 01510

SERVICES DURING CONSTRUCTION

01510.04 TEMPORARY ELECTRIC LIGHT AND POWER - Continued

The facilities shall be available to other Contractors and their Sub-contractors for their use in connection with their work. The installation and meters shall remain until need for same by each Contractor has ceased, or until the date of the Certificate of Substantial Completion of the General Contract. Each Contractor shall provide his own services after completion of the General Contract.

It shall be the responsibility of the General Contractor to provide, prior to the completion of his Contract, temporary power of proper voltage and capacity necessary to test and operate all equipment installed under this Contract.

01510.05 PAYMENT FOR SERVICES DURING CONSTRUCTION

The General Contractor will receive no direct payment for providing, maintaining or removing any of the temporary facilities or services specified in this Section 01510, and compensation for same shall be included, in the price, or total of prices, given in the Bid on which this Agreement is based, and no separate payment will be made therefor.

END OF SECTION

GENERAL REQUIREMENTS

SECTION 01568

EROSION AND SEDIMENT CONTROL

01568.01 GENERAL

The Contractor shall control erosion and sediment caused by construction activities through the use of scheduling, phased construction and restoration, berms, dikes, dams, sediment basins, fiber mats, netting, gravel, mulches, grasses, slope drains and other erosion control devices or methods.

In the event of conflict between these specification requirements and pollution control laws, rules or regulations of other Federal, State or local agencies, the more restrictive laws, rules or regulations shall apply.

01568.02 CONTROL SCHEDULE

At the pre-construction conference, or prior to the start of the applicable construction, the Contractor shall be required to submit, for acceptance, his schedules for the accomplishment of erosion and sediment control. He shall also submit, for acceptance, his proposed method of erosion and sediment control on haul roads and borrow pits and his plan for disposal of waste materials or control details for other potential sources of pollution.

The Contractor shall schedule and conduct his operations to minimize erosion of soils and to prevent silting and muddying of streams, rivers, irrigation systems, impoundments (lakes, reservoirs, etc.) and lands adjacent to or affected by the work. Construction of drainage facilities and performance of other contract work which will contribute to the control of erosion and sedimentation shall be carried out prior to earthwork operations and maintained in conjunction with earthwork operations. The area of bare soil exposed at any one time by construction operations shall not exceed the maximum acreage allowable under applicable State and Federal laws.

SECTION 01568

EROSION AND SEDIMENT CONTROL

01568.03 CONTROL MEASURES

In carrying out erosion control measures, the Contractor will be guided by, but not limited to, the following controls:

A. When borrow material is obtained from other than commercially operated sources, erosion of the borrow site shall be so controlled both during and after completion of the work that erosion will be minimized and sediment will be prevented from entering streams or other bodies of water. Waste or disposal areas and construction roads shall be located and constructed in a manner that will prevent sediment entering streams.

B. Frequent fording of live streams will not be permitted; therefore, temporary bridges or other structures shall be used wherever an appreciable number of stream crossings are necessary. Unless otherwise approved in writing by the Engineer, mechanized equipment shall not be operated in live streams.

C. When work areas or gravel pits are located in or adjacent to live streams or other bodies of water, such areas shall be separated from the main stream by a dike or other barrier to prevent entry of sediment into a flowing stream. Care shall be taken during the construction and removal of such barriers to prevent the muddying of a stream or body of water.

D. All waterways shall be cleared as soon as practicable of falsework, piling, debris or other obstructions placed during construction operations and not a part of the finished work.

Ditches which are filled, or partly inoperative shall be cleaned, stabilized, and made operative before the Contractor stops work for any day, and shall be maintained in a condition satisfactory to the Engineer for the duration of the Contract.

E. Water from aggregate washing, dewatering or other operations containing sediment shall be treated by filtration, settling basin or other means sufficient to reduce the turbidity so as not to cause a substantial visible contrast to natural conditions in the receiving waters.

SECTION 01568

EROSION AND SEDIMENT CONTROL

01568.03 CONTROL MEASURES - Continued

F. Pollutants such as fuels, lubricants, bitumens, raw sewage and other harmful materials shall not be discharged into or near rivers, streams, and impoundments or into natural or man-made channels leading thereto. Wash water or waste from concrete mixing operations shall not be allowed to enter live streams or other bodies of water.

G. All applicable regulations of environmental protection agencies, conservation agencies, and fish and wildlife agencies and statutes relating to the prevention and abatement of pollution shall be complied within the performance of the Contract.

H. Slopes exceeding 15 percent require special treatment such as water diversion berms, straw bale sediment barriers, sodding, fabric blankets or mesh, or the use of an approved mulch tacking agent over straw or hay mulch applied over seeded areas.

The erosion and sediment control features installed by the Contractor shall be acceptably maintained by the Contractor throughout the Contract period. When it becomes necessary, the Engineer will inform the Contractor of unsatisfactory construction procedures and operations insofar as erosion control, water and air pollution are concerned. If the unsatisfactory construction procedures and operations are not corrected promptly, the Engineer may suspend the performance of any or all of other construction until the unsatisfactory condition has been corrected.

01568.04 PAYMENT

Unless a specific payment item is included in the Bid, payment for Erosion and Sediment Control shall be included in the price, or total of prices, given in the Bid on which this Agreement is based, and no separate payment will be made therefor.

END OF SECTION

GENERAL REQUIREMENTS

SECTION 01577

BASIC MAINTENANCE OF TRAFFIC

01577.01 GENERAL

This work shall consist of basic maintenance and protection of traffic within the limits of and for the duration of the Contract.

01577.02 TRAVEL NOT OBSTRUCTED DURING EXCAVATION

The Contractor shall not needlessly hinder or inconvenience travel on any public or private way, nor shall he wholly obstruct same without written permission of the Owner. If he is permitted to obstruct a traveled way, the Contractor shall provide plain and appropriately worded signs and adequate barricades and lighting at the nearest cross streets, and at each end of the obstructed portion, announcing such obstruction and directing traffic to and along an approved detour.

Unless otherwise specified or permitted, all entrances and exits of fire houses, industrial plants, commercial buildings and public buildings shall be kept open and maintained in passable condition at all times. The Contractor shall give notice to the Owner of each traveled way before interfering therewith. A minimum of 24 hours notice shall also be given to local police and fire control agencies.

01577.03 BASIC MAINTENANCE AND PROTECTION OF TRAFFIC

Traffic shall be maintained over a reasonably smooth traveled way which shall be so marked by signs, delineators, guiding devices and other methods that a person who has no knowledge of conditions may safely and with a minimum of discomfort and inconvenience ride, drive or walk, day or night, over all or any portion of the highway and/or structure under construction where traffic is to be maintained.

A. Surface. Maintain the surface condition of the traveled way so it is consistent with the appropriate speed limit.

B. Drainage. Maintain the drainage facilities and other highway elements, old or new, including detours.

SECTION 01577

BASIC MAINTENANCE OF TRAFFIC

01577.03 BASIC MAINTENANCE AND PROTECTION OF TRAFFIC - Continued

C.	Bus Stops.	Maintain existing bus stops, if any, so bus passengers are reasonably accommodated.
D.	Pedestrian Traffic.	Provide adequate protection for pedestrian traffic during all phases of construction.
E.	Intersecting Highways.	Provide ingress and egress to and from intersecting highways, homes, businesses and commercial establishments.
F.	Dust Control and Spillage.	Control dust and keep the traveled way free from materials spilled from hauling equipment. This shall also apply to dust control and spilled material resulting from the Contractor's operations in the areas outside the Contract limits. The Contractor shall provide for the control of dust, as necessary, during the construction period. Dust shall be controlled by water spray, or as approved by Engineer. Exposed soils shall be graded, seeded and mulched as soon as practicable.
G.	Flagmen.	Provide the necessary traffic control equipment and flagmen for adequate traffic control on the traveled way.
H.	Repairs.	Make the necessary repairs to existing pavement and structure wearing surfaces as required to provide a reasonably smooth traveled way where vehicle operation is maintained.
I.	Responsibility to the Public.	Protect the public from damage to person and property which may result directly or indirectly from any construction operation.
J.	Snow and Ice Control.	Maintain the traveled way in such a condition and conduct operations in such a manner that snow and ice may be readily controlled by others as and when necessary, and in such a manner that proper drainage is provided for the melting of snow in the banks resulting from normal plowing. The Contractor shall not, however, be responsible for snow and ice control on the pavement or traveled way.

SECTION 01577

BASIC MAINTENANCE OF TRAFFIC

01577.04 PAYMENT

Unless a specific payment item is included in the Bid, payment for Basic Maintenance of Traffic shall be included in the price, or total of prices, given in the Bid on which this Agreement is based, and no separate payment will be made therefor.

END OF SECTION

GENERAL REQUIREMENTS

SECTION 01580

PROJECT SIGN

01580.01 GENERAL

If directed in the Additional Instructions, the Contractor shall provide and erect a project sign or signs at the project site identifying the project and the applicable funding agencies participating in the project. The project sign(s) shall also indicate the title and description of the project, Owner, Engineer and Contractor. The sign(s) shall be erected within twenty-one (21) days after the construction contract is awarded, and shall be in accordance with the specifications and detailed drawing included in the Additional Instructions.

01580.02 SIGN PANEL

Each sign panel shall be constructed of 3/4" minimum thickness marine plywood rabbetted into a 2" x 4" lumber frame. All fasteners used in the construction of each sign shall be of a rustproof nature.

01580.03 PAINTING

Each sign face shall be painted with the proper paint colors for the background, lettering and emblem as specified in the Additional Instructions. All supports, trim and the back of the sign panel, shall be painted with at least two coats of the same color paint as used for each sign face. All paint used shall be exterior grade paint, suitable for use on wood signs.

01580.04 MISCELLANEOUS

Sign(s) shall be located in a prominent position and aligned as determined by the Engineer. Adequate support for the project sign(s) shall be provided by the Contractor. The bottom edge of each sign shall be a minimum of 3 feet above grade. The project sign(s) shall be maintained in good condition by the Contractor for the duration of construction. The removal of the project sign(s) from the construction site by the Contractor shall be at the completion of construction, when ordered by the Engineer.

SECTION 01580

PROJECT SIGN

01580.05 PAYMENT

Unless a specific payment item is included in the Bid, payment for Project Sign, including fabrication, erection, maintenance and removal of each sign, shall be included in the price, or total prices, given in the Bid on which this Agreement is based, and no separate payment will be made therefor.

END OF SECTION

GENERAL REQUIREMENTS

SECTION 01590

ENGINEER'S FIELD OFFICE TRAILER

01590.01 DESCRIPTION

Unless waived by provisions within the Additional Instructions, the Contractor shall provide a field office trailer for the exclusive use of the Engineer and his assistants. The trailer shall be separate from that of the Contractor, and shall be ready for occupancy within ten days following execution of the Contract.

01590.02 FACILITIES TO BE PROVIDED

The name of the supplier and proposed layout shall be submitted to the Engineer and approved prior to delivery of the trailer.

The trailer office shall be new or in first class condition and shall be not less than 12 feet by 56 feet, excluding the tongue.

Washroom with hot water supply and toilet facilities within the trailer shall be supplied with potable water and connected to a sanitary sewage disposal system. The trailer shall be fully air conditioned. A gas or oil heat system shall be provided within the field office. A minimum of one month's fuel storage shall be provided, together with the necessary appurtenances to control heat and check fuel storage. Heating and air conditioning equipment shall be capable of maintaining an air temperature of 70°F.

An individual, unlisted, direct line telephone service shall be provided for the exclusive use of the Engineer. Telephone service, local and toll charge calls, shall be paid by the Contractor.

It shall be the responsibility of the Contractor to maintain the field office trailer and all facilities furnished with it. Maintenance shall include removal of snow, janitorial services, and adequate protection of pipes.

It shall be the Contractor's responsibility to furnish adequate heat, electric power and light to the field office trailer at his expense. Adequate lighting shall consist of a minimum, of four, two lamp, 4' fluorescent lights.

SECTION 01590

ENGINEER'S FIELD OFFICE TRAILER

01590.02 FACILITIES TO BE PROVIDED - Continued

The following office furniture and equipment shall be furnished with the trailer:

Two 8' flat top double desks with 2 sets of two drawer metal file cabinets in each desk.
1 built-in drafting table 36" x 72" with double storage cabinets underneath.
4 swivel chairs.
2 drafting stools.
1 four drawer, fireproof legal size filing cabinet with lock.
2 plan racks with space for 5 plan hangers each.
4 wall coat hooks.
2 large metal waste baskets.
1 refrigerator, minimum 2 cubic feet.

01590.03 LOCATION

The trailer shall be erected on an approved location convenient for inspection of the work, as directed by the Engineer. The field office trailer shall be moved once if directed by the Engineer.

01590.04 PAYMENT

Payment for the Engineer's Field Office Trailer, and all services to be provided with it, not included under other unit or lump sum price items shall be made at the price stated in the Bid.

END OF SECTION

GENERAL REQUIREMENTS

SECTION 01640

MATERIALS, EQUIPMENT AND WORKMANSHIP

01640.01 MATERIALS AND WORKMANSHIP - GENERAL REQUIREMENTS

All workmanship, materials, equipment and appliances shall comply in all respects with the applicable Specifications, unless specific exception is made.

All materials furnished or incorporated in the work shall be new, unused and of the quality and characteristics specified. Used materials may be furnished or incorporated in the work only under special circumstances and only with the Engineer's prior written approval. If the quality or characteristics of any material are not specifically set forth in the Contract Documents, the material used shall be that customarily used in first class work of a similar nature and character.

All workmanship in manufacture and construction not specifically covered in the Specifications shall be of the first class order and equal to that customarily used in first class work of a similar nature and character. The Contractor shall exercise special care during construction to make all structures watertight.

See also ARTICLE 00754.02 and 00753.08.

01640.02 SAMPLES, TESTS AND INSPECTIONS

All materials, equipment and workmanship shall be subject to inspection, examination and tests by the Engineer, or persons or corporations designated by him, at any and all times during manufacture or construction and at any place or places where manufacture or construction are performed.

If required by the Specifications, or if requested by the Engineer, the Contractor shall submit to the Engineer for examination, testing and approval, typical samples of materials and appliances. Samples shall be submitted sufficiently in advance of the time they are proposed to be used in the work so that neither rejections and re-submittals nor the time reasonably required for testing shall cause delay. Each unit, lot or batch of materials submitted shall be properly tagged or labeled and identified with the portion of the work for which they are intended. Transmittals shall be covered by a letter of transmittal in the manner specified for the submittal of drawings ARTICLE 01340.02.

SECTION 01640

MATERIALS, EQUIPMENT AND WORKMANSHIP

01640.02 SAMPLES, TESTS AND INSPECTIONS - Continued

All laboratory tests called for in the Specifications or requested by the Engineer shall be performed at the Contractor's expense. Documentary evidence that materials pass the required inspection and tests shall be furnished to the Engineer prior to the use of the materials in the work. Bureaus, laboratories and agencies used for the inspection and testing of materials, equipment and appliances will be selected by the Contractor, who will submit their names to the Engineer for approval prior to the performance by them of any tests.

01640.03 REMOVAL OF FINISHED WORK FOR INSPECTION

If, at any time prior to the date of the Certificate of Substantial Completion, the Engineer considers it necessary or advisable to examine any portion of the work already completed by removing or tearing out materials or coverings, or by excavating or otherwise exposing the portion of the work to be examined, the Contractor, upon receipt of a written request from the Engineer, shall promptly perform such work as is necessary so to do.

If the work in question is found to be defective, or not in conformance with the Specifications, due to the fault of or omission of the Contractor, or if any work shall be covered over without the consent or approval of the Engineer, whether or not defective, the Contractor shall bear all the expense of such removal, tearing out, excavating or exposing and of satisfactory reconstruction.

If, however, such consent or approval shall have been given, and the work exposed is found to be satisfactory and in conformance with the Specifications, the Contractor shall be compensated for the expenses of such removal, examination and reconstruction as provided in ARTICLE 00757.03.

01640.04 FIELD TESTS

The Contractor, at his own expense, shall conduct all tests specified or required by law or permit of installed equipment and materials, when ordered by and under the supervision of the Engineer. The Engineer at his own discretion may make additional field tests of materials and equipment on the Site. The Contractor shall furnish, at his own expense, the materials required for all field tests and reasonable labor and plant to assist the Engineer in conducting the tests.

SECTION 01640

MATERIALS, EQUIPMENT AND WORKMANSHIP

01640.05 MANUFACTURERS AND SUPPLIERS

Within 30 days following the execution of the Contract, the Contractor shall submit to the Engineer the name or names of the manufacturers or vendors from whom he proposes to purchase the equipment and materials specified for the work. Following approval of the manufacturer or supplier by the Engineer, the Contractor shall submit complete and detailed drawings, bulletins, specifications and other data in connection with the equipment and materials and arrangement thereof he proposes. See also ARTICLES 01340.01 through 01340.04 and 01340.06.

No award shall be made by the Contractor, and no work in connection with the equipment or materials shall proceed prior to review of the submitted data. All items of equipment of like type shall be the product of one manufacturer, unless specified otherwise or specifically permitted by the Engineer.

01640.06 EXPERIENCE AND EQUIVALENT CLAUSES

Unless otherwise specified, shown or permitted, all equipment and materials shall be the product of manufacturers who have built equipment or produced materials of a like or similar type, character, size and capacity for at least three years prior to submittal for approval and who, if requested by the Engineer, shall submit evidence thereof.

Wherever reference is made in the Contract Documents to any specific material, equipment, appliance or model, it is understood that any product considered to be equivalent by the Engineer may be used, and such reference is for the purpose of illustration and establishment of a standard. This provision is understood to hold true in all instances, use or omission of the term "or equal" notwithstanding.

01640.07 INSTALLATION OF EQUIPMENT

All equipment shall be installed in a neat and workmanlike manner as shown on the Plans or as directed, and shall be accurately leveled, aligned and adjusted for satisfactory operation and so installed that all necessary connections can be readily made.

SECTION 01640

MATERIALS, EQUIPMENT AND WORKMANSHIP

01640.07 INSTALLATION OF EQUIPMENT - Continued

The Contractor shall furnish, install and protect all necessary bearing plates, guides, rails, anchor and attachment bolts and fastenings and all other appliances and appurtenances required for the installation of all components of the equipment specified. Adequate templates and installation drawings and instructions shall be provided. Anchor bolts shall be of the size, type and material recommended by the manufacturer or directed by the Engineer.

The Contractor shall furnish all oils and greases for initial operation, and shall provide the Engineer with 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 Engineer and by the equipment manufacturers. Each piece of equipment shall bear a substantial metal or plastic nameplate, securely fastened in a convenient place inscribed with the name of the manufacturer, the year of manufacture, model number, serial number and basic rating data.

01640.08 TOOLS, ACCESSORIES AND MANUALS

Unless otherwise specified, the Contractor shall furnish for each type, model or size of equipment a complete set of any special tools and accessories, suitably identified, which may be required to adjust, operate, repair or maintain the equipment.

The Contractor shall also furnish and deliver to the Engineer five complete sets of bulletins, diagrams, parts lists, instructions, manuals and other data required for operation, maintenance and repair of the equipment.

01640.09 CARE AND PROTECTION OF THE WORK

During the life of the Contract, the Contractor shall be solely responsible for the care and protection of the work and for all materials, appliances, supplies and equipment to be used in the work, both during storage and after installation or incorporation in the work. He shall protect all materials to be used in the work, all work in progress, and all completed work from damage by flood, fire, freezing or other undesirable results of weather, accident, theft and vandalism. Any damage or loss shall be made good by the Contractor at his own expense before a Certificate of Substantial Completion will be issued.

See also ARTICLES 00759.07, 00759.08 and 00757.04.

SECTION 01640

MATERIALS, EQUIPMENT AND WORKMANSHIP

01640.10 ABSENCE OF ENGINEER

The Contractor shall perform no backfilling or covering operations of any underground portions of the work until after the Engineer or his inspector shall have inspected or tested and approved the work. If such work is covered in absence of an inspector, it shall be exposed by the Contractor for inspection as specified in ARTICLE 01640.03.

END OF SECTION

SECTION 02110

CLEARING

PART 1 - GENERAL:

1.1 DESCRIPTION:

1.1.1 Under this Section, the Contractor shall prepare and clear from the site of the work, by removal or destruction, as may be required, the following:

- Debris
- Brush
- Logs
- Trees (as indicated)
- Stumps
- Snow and Ice
- Refuse and Rubbish
- Buildings (as indicated)

1.1.2 The work also includes:

- Removal and replacement, as required, or supporting of all telephone and power posts, poles and lines within the work area.

- Any work to be performed specifically to be paid for under the Clearing Item as stated in the Information For Bidders and/or the Additional Instructions.

PART 2 - PRODUCTS

2.1 The Contractor shall furnish and install materials and equipment required.

PART 3 - EXECUTION

3.1 The Contractor shall furnish all labor, material and equipment necessary to properly construct all items under this Section in an acceptable manner.

SECTION 02110

CLEARING

PART 4 - MEASUREMENT & PAYMENT

4.1 MEASUREMENT - CLEARING:

4.1.1 Measurement for Clearing shall include the cost of all materials, equipment, labor, submittals and testing for the work indicated in this Section.

4.2 PAYMENT - CLEARING:

4.2.1 For Clearing, not included in other unit or lump sum price items, payment for Clearing will be made at the applicable price stated in the Bid.

END OF SECTION

SECTION 02220

EXCAVATION

PART 1 - GENERAL

1.1 DESCRIPTION:

1.1.1 Under this Section, the Contractor shall furnish all labor, materials and equipment for Excavation, as shown on the Plans, specified, and/or directed.

1.1.2 Excavation, in open cut, includes the loosening, removing, transporting, storage and disposal of all materials necessary to be removed for the construction and completion of all work under the Contract. Excavations shall be made to the widths and depths shown on the Plans, specified or directed.

1.1.3 Where rock is encountered, the excavations shall be done in accordance with the applicable provisions hereof.

1.2 DEFINITIONS:

1.2.1 The term "excavation" and the term "trenching" where used, shall be deemed and understood to cover the following described work, and the price bid for any and all items including "excavation", or "trenching" shall be deemed to include and cover all of the several following detailed operations:

- The loosening, removing, transporting, storage and rehandling of all materials;
- All sheeting, sheetpiling, bracing and shoring, and the placing, driving, cutting off and removing of the same;
- All diking, ditching, fluming, cofferdamming, pumping, well-pointing, bailing, dewatering and draining or otherwise disposing of water (surface and subsurface);
- The refilling of trenches, excavations and pits, and the furnishing and placing of material over trenches, excavations and pits to the original surface of the ground or to other grades as may be shown or directed;
- The compacting of all materials used in filling or refilling by rolling, ramming, watering, puddling, etc., as may be required;
- The removing and disposing of all surplus materials from all excavations in the manner specified;

- The maintenance, accommodation and protection of travel;

- The supporting and protecting of all tracks, rails, buildings, curbs, sidewalks, pavements, overhead wires, poles, trees, vines, shrubbery, pipes, sewers, conduits or other structures or property and its appurtenances, in the vicinity of the work, whether over or underground or which appear within the excavations, and the restoration of the same in case of settlement or other injury;

- All temporary bridging and fencing and the removing of same, the temporary paving of highways, roads, driveways, and the permanent repairing or replacing and relaying of pavements, curbs, gutters and sidewalks removed, disturbed, or injured, the removing and clearing away of all construction rubbish, refuse, unused materials, plant and tools from the site;

- The dressing, topsoiling, sodding and/or seeding of all unpaved areas disturbed by the Contractor within and outside the limits of the Contract as may be necessary to leave the surface in as good condition as it was previous to the commencement of the work.

1.2.2 "Earth" includes all materials, such as sand, gravel, clay loam, pavements, ashes, cinders, muck, roots, or pieces of timber, soft or disintegrated rock, not requiring blasting, barring or wedging from their original beds, and specifically excludes all ledge or bed rock, and individual boulders or masonry larger than one-half cubic yard in volume.

1.2.3 "Backfill" includes selected materials for the backfilling or refilling of all excavations and trenches up to the original surface of the ground or to other grades as may be shown or directed.

1.2.4 "Spoil" includes surplus excavated materials not required or not suitable for backfills or embankments.

1.2.5 "Embankments" include fills constructed of selected materials above the original surface of the ground.

1.2.6 "Rock" includes ledge or bedrock requiring blasting, barring or wedging from their original beds and individual boulders or masonry larger than one-half cubic yard in volume.

SECTION 02220

EXCAVATION

PART 2 - PRODUCTS

2.1 SOIL MATERIALS: Where used for general site fill, soil material shall be free of debris, roots, wood, scrap material, vegetable matter, refuse, soft unsound particles, frozen, deleterious, or objectionable materials.

2.2 CONTROLLED FILL: Provide where indicted and also within building lines and under concrete slabs and aprons. Fill to be granular fill as specified in Section 02222.

PART 3 - EXECUTION

3.1 ROCK EXCAVATION:

3.1.1 Rock excavation shall include the loosening, removing, transporting, storing and disposal of all materials requiring blasting, barring, or wedging for removal from their original beds. All pieces of ledge or bed rock and boulders or masonry larger than one-half (1/2) cubic yard in volume are included under rock excavation. Rock excavations shall be made to the widths and depths shown on the Plans or as directed by the Engineer. For concrete structures, rock shall be excavated only to the bottom of the structure unless otherwise shown or noted on drawings. All excavated rock which cannot be handled and compacted as earth shall not be mixed with other backfill or embankment materials except as specified herein or as directed.

3.1.2 Blasting:

3.1.2.1 Blasting shall be done with extreme care. All blasts in open cut shall be properly covered and protected with heavy timber chained together or approved blasting mats.

3.1.2.2 Charges shall be of such size that the excavation will not be unduly large and shall be so arranged and timed that adjacent rock upon or against which structures are to be built will not be shattered. Blasting shall be conducted in accordance with all applicable rules and regulations including, but not limited to, 12 NYCRR 23, 12 NYCRR 39, 12 NYCRR 53 and NYS Labor Law § 28-a. Where blasting occurs in highways under jurisdiction of NYSDOT or under jurisdiction of agencies adhering to the NYSDOT Standard Specification, the Provisions of NYSDOT Standard Specification Sections 107-05 and 203-3.05 shall also be adhered to. Where existing pipelines, conduits or structures have been exposed during excavation, such pipelines, conduits or structures shall be adequately protected from damage before proceeding with the blasting.

3.1.2.3 Any injury or damage to the work or to the existing pipelines, conduits, or structures shall be repaired or rebuilt by the Contractor at his own expense. Whenever the Engineer determines that further blasting may damage adjacent rock, pipelines or structures, blasting shall be discontinued and the rock removed by drilling, barring, wedging or other methods.

3.1.2.4 Danger signals shall be given before firing each blast. Blasting shall be done only by a person experienced in the handling and detonation of explosives, and shall be in conformity with all laws and regulations, imposed by public authorities.

3.1.2.5 Blasting shall not be carried on within three hundred (300) feet of any radio transmitter or radio frequency emission equipment such as high frequency welders, and blasting caps shall be kept in tightly-closed metal cans when in the vicinity of such equipment.

3.1.3 Explosives:

3.1.3.1 At no time shall an excessive amount of explosives be kept at the Site of the work. Such explosives shall be stored, handled and used in conformity with all applicable laws and regulations.

3.1.3.2 Accurate daily records shall be kept showing the amounts of explosives on hand, both at the Site and at any storage magazine, the quantities received and issued, and the purpose for which issued. Copies of all records shall be furnished to the Engineer.

3.1.3.3 The Contractor shall be responsible for any damage or injury to any persons, property or structures as a result of his blasting operations.

3.2 EXCAVATION FOR STRUCTURES:

3.2.1 Excavation shall be of sufficient size, and only of sufficient size, to give suitable room for the proper construction of structures and appurtenances, including allowances for sheeting, dewatering, and other similar work necessary for completion of the Contract.

3.2.2 Excavations for structures shall be made only to the lines and grades shown on the Plans, specified or directed.

3.2.3 In no case will under cutting excavation faces for extended footings be permitted. Not less than twelve (12) inches clearance shall be provided between excavation faces and brick or block masonry exterior wall surfaces which are to be plastered.

3.2.4 Subgrade for all concrete structures shall be undisturbed original earth, thoroughly compacted where noted on drawings. Where excavation below subgrade is ordered, it shall be a thoroughly compacted and consolidated lining, special lining or special backfill as directed and as specified in Section 02224. It shall be sufficiently stable to remain firm and intact during the surfacing of subgrade, laying reinforcing steel and placing concrete thereon.

3.2.5 Where necessary, a layer of Class "D" concrete of sufficient strength and thickness to withstand subsequent construction operations shall be installed below the specified subgrade elevation and the structural concrete deposited thereon. Subject to the approval of the Engineer, lining or special lining may be used for subsoil reinforcement if satisfactory results can be obtained thereby. Such material shall be applied in thin layers, each layer being entirely embedded in the subsoil by thorough tamping. All excess soil shall be removed to compensate for the displacement of the gravel or crushed stone and the finished elevation of any subsoil reinforced in this manner shall not be above the specified subgrade.

3.3 BACKFILLING AROUND STRUCTURES:

3.3.1 Backfilling around structures shall not be commenced until all lumber, refuse, rubbish and other similar materials are removed from the excavated area. Backfill around structures may be placed by machine, provided the work shall be done carefully to prevent damage to the structure. In no case shall backfill materials be allowed to fall directly on a structure, until at least twelve (12) inches of hand-placed material has been placed thereon and compacted.

3.3.2 Backfill around structures shall be deposited in horizontal layers not more than eight (8) inches in thickness and shall be thoroughly compacted. Compaction shall be by a vibrating tamper or other approved method and shall be to a minimum dry density of ninety-five (95) percent of the maximum dry weight density in pounds per cubic foot as determined by the AASHTO Standard Density Test or the Modified Proctor Compaction Test (ASTM D1557).

3.3.3 Backfilling shall be done immediately after work has been inspected and approved. No frozen material shall be used, nor shall backfilling be placed on or against frozen earth, debris or other deleterious matter not conducive to proper compaction. Backfill within building lines, under concrete slabs and aprons shall be granular fill as specified in Section 02222.

3.3.4 Backfilling against free standing walls shall be made against both sides at the same time. If backfill is required on one side only, the wall shall be adequately braced on the opposite side until properly cured to full strength.

3.3.5 Contractor shall take every necessary precaution during compaction of fill adjacent to foundations, walls, etc., that such items are not displaced from their proper location or damaged by compacting equipment. In the event damage or displacement occurs during or resulting from compaction of fill as specified above, the Contractor shall be responsible for correcting the same, to approval of the Engineer and at no expense to the Owner.

3.4 TRENCHING:

3.4.1 The alignment, depth and pipe subgrades of all pipe trenches shall be determined by overhead grade lines parallel to the pipe invert, or other grade control devices, installed and maintained by the Contractor.

3.4.2 Under ordinary conditions, excavation shall be by open cut from the ground surface. Where the depth of trench and soil conditions permit, tunneling may be required beneath crosswalks, curbs, gutters, pavements, concrete driveways, railroad tracks and other surface structures. No additional compensation will be allowed for such tunneling over the price bid for open cut excavation of equivalent depths below the ground surface unless such tunnel excavation is specifically provided for in unit or lump sum price items.

3.4.3 Trenches shall not be opened for more than three hundred (300) feet in advance of the completed pipe or sewer nor left unfilled for more than one hundred (100) feet in the rear thereof without consent of the Engineer. Excavation of the trench shall be fully completed at least twenty (20) feet in advance of the pipe laying or construction of the invert unless specifically permitted otherwise.

3.4.4 Width and Depth of Trenches:

3.4.4.1 The trenches in which pipelines are to be constructed, shall be excavated in all cases in such manner and to such depths and widths as will give suitable room for the pipelines which the trenches are to contain, for sheeting, pumping, dewatering, well-pointing and draining of water, and for removing the material not suitable for pipe subgrade.

3.4.4.2 Trenches for pipes shall be not less than six (6) inches wider than the hubs of the pipe in the clear on each side, measured over the hubs of the pipe. Width of trenches, measured at a point twelve (12) inches above the top of the pipe shall not exceed twelve (12) inches on each side. Width of trenches greater than specified above will be permitted in the vicinity of joints for welded steel pipe where access for the welding of joints is required.

3.4.4.3 Where, as required by loading conditions, the width of the lower portion of the trench, measured at twelve (12) inches above top of pipe, exceeds the maximum for the size of pipe, additional concrete cradle or concrete encasement shall be installed by the Contractor at his own expense.

3.4.4.4 Ledge rock, shale, boulders and large stones shall be removed to provide minimum bottom and side clearances, for the size of pipe being laid in each case, as follows:

Size of Pipe (Inches)	Minimum Clearance Below Pipe (Inches)	Minimum Clearance At Sides (Inches)
12 or smaller	4	6
15, 18, and 21	5	6
24 to 36	7	6
Over 36	9	7

Where concrete embedment or cradle is to be placed, it shall be placed directly on the rock, and the bottom clearance shall be adjusted as directed by the Engineer.

3.5 EARTH SUBGRADE PREPARATION FOR PIPES:

3.5.1 Unless otherwise permitted by the Engineer, the trench shall have a flat bottom conforming to the grade to which the pipe is to be laid.

3.5.2 Except where concrete cradle or encasement is required below the specified pipe subgrade, mechanical excavation of trenches for pipe shall not extend lower than one (1) inch above the finished pipe subgrade elevation at any point. The remainder of the trench excavation shall be made with hand tools.

3.5.3 Pipe subgrade preparation shall be performed immediately prior to installing the pipe in the trench. The trench bottom shall be accurately graded by means of hand tools in such a manner that a uniform and continuous bearing and support on solid and undisturbed ground is provided for each pipe for its entire length or between bell holes.

3.5.4 All trenches shall be so graded that the spigot end of the pipe will be accurately centered in the adjacent pipe bell when laid, without raising the pipe off the trench bottom. Regrading of a trench bottom which is too high will be permitted. Correction of a subgrade that is too low shall be done only by placing and compacting lining over the entire width of the trench and regrading.

3.5.5 The trench bottom shall be accurately graded and ready for the installation of the pipe thereon prior to excavating bell holes if and where required.

3.5.6 Each bell hole shall be excavated immediately prior to laying the pipe therefor. Bell holes shall have a length, measured at the elevation of the pipe subgrade, not in excess of nine (9) inches and shall be of sufficient size so that no part of the pipe bell will be in contact with the trench bottom or granular fill thereon.

3.6 EXCAVATION FOR CONCRETE CRADLE OR ENCASEMENT:

3.6.1 Where concrete cradle or encasement is required, the trench subgrade elevation will be determined by the required concrete section in each case. Unless otherwise authorized by the Engineer, concrete cradle or encasement shall extend across the full width of the trench as excavated, and the concrete therein shall be poured directly against vertical trench banks. In the case of concrete cradle or encasement of pipe in a sheeted trench, the concrete may be poured directly against sheeting which is to be left in place in the trench, as specified.

3.7 PIPE EMBEDMENT:

3.7.1 All pipe shall be protected from lateral displacement and possible damage resulting from superimposed backfill loads, impact or unbalanced loading during backfilling operations by being adequately embedded in suitable pipe embedment material. Except where loading or subsoil conditions require the use of concrete cradle or encasement, all pipe embedment shall be placed so as to insure adequate lateral and vertical stability of the installed pipe during pipe jointing and embedment operations. A sufficient amount of the specified pipe embedment material to hold the pipe in rigid alignment shall be uniformly deposited and thoroughly compacted on each side, and back of the bell, of each pipe laid.

3.7.2 Pipe embedment materials placed at any point below an elevation six (6) inches above the top of pipe or sewer, shall be deposited and compacted in layers not to exceed four (4) inches in uncompacted depth, and such deposition and compactions shall be done simultaneously and uniformly on both sides of the pipe. Compaction shall be by vibrating tamper or other approved

method and shall be to a minimum dry density of ninety-five (95) percent of the maximum dry weight density in pounds per cubic foot as determined by the Modified Proctor Compaction Test. All such materials shall be placed in the trench with hand tools in such a manner that they will be scattered alongside the pipe and not dropped into the trench in compact masses.

3.7.3 Concrete cradle and encasement of the class specified shall be installed where and as shown on the Plans or ordered by the Engineer. Before concrete cradle or encasement is placed, the pipe shall be braced in all directions to prevent movement or flotation.

3.8 BACKFILL ABOVE PIPE EMBEDMENT:

3.8.1 The portion of pipe trenches between the top of the pipe embedment (see paragraph 3.7) and the upper limit of backfill shall be refilled with suitable materials.

3.8.2 Where trenches are within the ditch-to-ditch or curb-to-curb limits of any street, road, driveway or other recognized traveled vehicular way, or within other limits that may be specifically shown or specified for this purpose, the backfill materials shall be deposited in the trench in horizontal layers not more than eight (8) inches in thickness, and each layer shall be compacted by vibrating tamper or other approved method and shall be to a minimum dry density of ninety-five (95) percent of the maximum dry weight density in pounds per cubic foot as determined by the Modified Proctor Compaction Test (ASTM D1557).

3.8.3 Where trenches are outside the ditch-to-ditch or curb-to-curb limits of any street, road, driveway or other recognized traveled vehicular way, and outside of other limits that may be specifically shown or specified as areas in which mechanical compaction in layers is to be performed, the backfill material may be deposited in the trench by mechanical means for the full depth of the trench between the top of pipe embedment and ground surface with no special compaction. In such case the backfill materials shall be mounded over the trench to an elevation slightly above desired finished grade to allow for settlement and compaction by natural means, and the Contractor shall return to the area during his clean-up operations to remove any excess materials remaining above finished grade or add sufficient additional backfill to bring the completed work to grade. If a hazard should be created by such excess materials, or by settlement below finished grade, prior to the performance of clean-up operations, the Contractor shall remove such excess, or add additional backfill, at the time the hazard is created or when directed.

3.8.4 Any additional material added during clean-up operations, or at any other time to prevent or remove a hazard, shall be placed in horizontal layers not more than eight (8) inches in thickness, with each layer adequately compacted by mechanical means, by the Contractor at his own expense.

3.9 REMOVAL OF WATER:

3.9.1 The Contractor shall at all times during construction provide and maintain proper and satisfactory means and devices for the removal of all water entering the excavations, and shall remove all such water as fast as it may collect, in such manner as shall not interfere with the prosecution of the work or the proper placing of pipe, masonry, concrete, structures, or other work.

3.9.2 Removal of water includes the construction and removal of cofferdams, sheeting and bracing, the furnishing of materials, equipment and labor necessary therefore, the excavation and maintenance of ditches and sluice-ways and the furnishing and operation of pumps, wellpoints, and appliances needed to maintain thorough drainage of the work in a satisfactory manner.

3.9.3 Water shall not be allowed to rise over or come in contact with any masonry, concrete or mortar, until at least twenty-four (24) hours after placement, and no stream of water shall be allowed to flow over such work until such time as the Engineer may permit.

3.9.4 Unless otherwise specified, all excavations which extend down to below the ground water elevation at the sites of structures shall be dewatered by lowering and maintaining the ground water beneath such excavations at an elevation not less than that specified herein at all times when work thereon is in progress, during subgrade preparation and the placing of the structures or pipe thereon.

3.9.5 Where an upward pressure or flow of water in combination with a fine-grained subsurface material causes a quick condition, the Contractor shall install wellpoints to stabilize the subgrade. Where wellpoints are used, the ground water table shall be continuously (day and night) maintained to an elevation of not less than twenty-four (24) inches below the excavation and when subgrade is reached the ground water shall be maintained not less than twenty-four (24) inches below the subgrade. Unless otherwise permitted by the Engineer, the ground water shall be maintained not less than twenty-four (24) inches below the subgrade until completion of the backfilling to an elevation at least twelve (12) inches above natural ground water level. Wellpoint headers, points, and other pertinent equipment shall not be placed within the limits of the excavation in such a manner or location as to interfere with the laying of pipe or trenching operations or with the excavation for and construction of other structures.

3.9.6 In areas where ground water enters the excavation but does not cause a quick condition, the ground water may be removed by any practical method which does not damage the subgrade, cause the same to become unstable or interferes with construction operations.

3.9.7 The ground water control requirements specified for wellpointing operations apply to other dewatering methods.

3.9.8 Suitable stand-by pumping equipment shall be provided to insure the maintenance of the specified lowering of the water table.

3.9.9 Water pumped or drained from excavations, or any sewers, drains, or water courses encountered in the work, shall be disposed of in a suitable and environmental manner without injury to adjacent property, the work under construction, or to pavements, roads, and drives. No water shall be discharged to sanitary sewers. Sanitary sewage shall be pumped to sanitary sewers or shall be disposed of by an approved method.

3.9.10 Any damage caused by improper handling of water shall be repaired by the Contractor at his own expense.

3.10 SHEETING & BRACING:

3.10.1 The Contractor shall furnish, place and maintain such sheeting, bracing and shoring as may be required to support the sides and ends of excavations in such manner as to prevent any movement which could, in any way, injure the pipe, sewers, masonry, or other work; diminish the width necessary; otherwise damage or delay the work; or endanger existing structures, pipes or pavements; cause the excavation limits to exceed the right-of-way limits; or to occasion a hazard to persons engaged on the project or to the general public.

3.10.2 In no case will bracing be permitted against pipes or structures in trenches or other excavations.

3.10.3 The Contractor shall be solely responsible for the safety and adequacy of all sheeting and bracing. He shall make good any damage resulting from failure of supports with no additional cost to Owner.

3.10.4 Removal of Sheeting & Bracing:

3.10.4.1 In general, all sheeting and bracing, whether of steel, timber or other material, used to support the sides of trenches or other open excavations, shall be withdrawn as the trenches or other open excavations are being refilled. That portion of the sheeting extending below the top of a pipe or sewer shall be withdrawn, unless directed, before more than six (6) inches of earth is placed above the top of the pipe or sewer and before any bracing is removed. The voids left by the sheeting shall be carefully refilled with selected material and rammed tight with tools especially adapted for the purpose, or otherwise as may be approved.

3.10.4.2 The Engineer may order the Contractor to delay the removal of sheeting and bracing, if in his judgement the installed work has not attained the necessary strength to permit placing of backfill.

3.10.5 Sheeting & Bracing Left In Place:

3.10.5.1 If, to serve any purpose of his own, the Contractor files a written request for permission to leave sheeting or bracing in the trench or excavation, the Engineer may grant such permission, in writing, on condition that the cost of such sheeting and bracing be assumed and paid by the Contractor.

3.10.5.2 The Contractor shall leave in place all sheeting, shoring and bracing which are shown on the Drawings or specified to be left in place or which the Engineer may order, in writing, to be left in place. All shoring, sheeting, and bracing shown or ordered to be left in place will be paid for under the appropriate item of the Contract. No payment allowance will be made for wasted ends or for portions above the proposed cut-off level which are driven down instead of cut-off.

3.10.5.3 In case sheeting is left in place, it shall be cut off or driven down as directed so that no portion of the same shall remain within twelve (12) inches of the finished street or ground surface.

3.10.5.4 All timber sheeting and bracing to be left in place and paid for under an item of the Contract shall be new, sound and straight, free from cracks, shakes and large or loose knots, and shall otherwise conform with National Design Specifications for Stress Grade Lumber for lumber of a minimum fiber stress of 1,200 pounds per square inch.

3.10.5.5 Steel sheeting and bracing left in place and paid for under an item of the Contract shall be new and shall conform with ASTM Des: A7, with a minimum thickness of 3/8-inch.

3.10.5.6 Sheeting and bracing left in place and paid for under an item of the Contract shall be driven as the excavation progresses and in such manner as to maintain pressure against the original ground at all times. The sheeting shall be driven vertical with the edges tight together, and all bracing shall be of such design and strength as to maintain the sheeting in its proper position.

3.11 STORAGE OF MATERIAL:

3.11.1 Any sod cut during excavation shall be removed and stored during construction so as to preserve the grass growth, and shall be replaced in position upon completion of the work.

3.11.2 Topsoil suitable for final grading shall be removed and stored on the Site separately from other excavated material, and shall be replaced in position upon completion of the work.

3.11.3 All excavation materials shall be stored in locations so as not to endanger the work, and so that easy access may be had at all times to all parts of the excavation. Stored materials shall be kept neatly piled and trimmed, so as to cause as little inconvenience as possible to public travel or to adjoining property holders. All stockpiled fill material shall be stored only in those fill areas as approved by the Engineer and the New York State Department of Environmental Conservation.

3.11.4 All excavated materials shall be kept clear of all sidewalks, driveway entrances, street crossings, and any other points that may inconvenience the public. Special precautions must be taken to permit access at all times to fire hydrants, fire alarm boxes, police and fire department driveways, and other points of public convenience.

3.11.5 Where traffic is to be maintained, at least one-half (1/2) of the street width must be kept open at all times. Approved types of bridging across trenches shall be constructed and maintained where necessary. Where conditions do not permit storage of materials, the material excavated from the first one hundred (100) feet of any opening, or from such additional length as may be required, shall be removed from the street by the Contractor, at his own cost and expense, as soon as excavated. The material subsequently excavated shall be used to refill the trench where the facility has been built, provided it be of suitable character.

3.11.6 If more material is excavated from any trench, excavation, or pit than can be refilled over the completed work or stored on the street, leaving space for traffic as herein provided, or within the limits of the right-of-way, the excess material shall be spoiled at locations selected and obtained by the Contractor. A copy of the signed agreement between the property owner and Contractor granting permission to deposit spoil shall be given to the Engineer prior to placement.

When the facility is complete, the Contractor shall, at his own cost and expense, bring back adequate amounts of satisfactory excavated materials as may be required to properly refill the trenches, excavations, or pits. If directed by the Engineer, the Contractor shall refill such trenches, excavations, or pits with special backfill or other suitable materials, and excess excavated materials shall be disposed of as spoil.

3.12 DRAINAGE:

3.12.1 All material deposited in roadway ditches or other water courses crossed by the line of trench or near a structure shall be removed immediately after backfilling is completed and the section grades and contours of such ditches or water course restored to their original condition, in order that surface drainage will be obstructed no longer than necessary.

3.12.2 Backfilling of trenches for pipes installed beneath or across roadways, driveways, walks and other traffic ways adjacent to drainage ditches and water courses shall not be done prior to the completion of backfilling to the original ground surface of the trench on the upstream side of such traffic-way in order to prevent the impounding of water at any point after the pipe has been laid, and all necessary bridges and other temporary structures required to maintain traffic across such unfilled trenches shall be constructed and maintained. All backfilling shall be done in such a manner that water will not accumulate in unfilled or partially filled trenches.

3.12.3 Where trenches are constructed in or across roadway ditches or other water courses, the backfill shall be protected from surface erosion by adequate and environmentally sound means. Where trenches cross such waterways; the backfill surface exposed on the bottom and slopes thereof shall be protected by means of stone or concrete riprap, at no additional cost to the Owner.

3.13 ADDITIONAL EXCAVATION:

3.13.1 In case the materials encountered at the locations and grades shown on the Plans or specified are not suitable, or in case it is found desirable or necessary to excavate additional materials to secure good support for the structure or pipeline, the excavation shall be carried to such additional limits as the Engineer may direct. The Contractor shall refill such additional excavated space with either lining, special lining, Class "D" or "E" concrete or other material, as the Engineer may direct. Additional excavation, lining, special backfill, concrete or other materials so ordered, will be paid for under the appropriate items of the Contract.

3.14 UNAUTHORIZED EXCAVATION:

3.14.1 Whenever excavations are carried beyond or below the lines and grades shown on the Plans, or as given or directed by the Engineer, all such excavated space shall be refilled with lining, special backfill, concrete or other materials as the Engineer may direct. Beneath structures, all such excavated space shall be refilled with Class "D" concrete. All refilling of unauthorized excavations shall be at the Contractor's own expense.

3.14.2 All material which slides, falls or caves into the established limits of excavations due to any cause whatsoever shall be removed and disposed of at the Contractor's own expense, and no extra compensation will be paid the Contractor for any materials ordered for refilling the void areas left by the slide, fall or cave-in.

3.15 DISPOSAL OF MATERIALS:

3.15.1 All spoil shall be transported and placed on the Site of the work at the locations and to the elevations and grades shown on the Plans, or if spoil areas are not shown, all spoil materials shall be disposed off the Site at appropriate locations selected and obtained by the Contractor and approved by the Engineer and the New York State Department of Environmental Conservation. No environmental sensitive areas shall be used for spoil areas. A copy of the signed agreement between the property owner and the Contractor granting permission to deposit spoil shall be given to the Engineer prior to placement.

3.15.2 The surface of all spoil placed on the Site shall be graded and dressed, and no unsightly mounds or heaps shall be left on completion of the work.

3.16 UNFINISHED WORK:

3.16.1 When for any reason the work is left unfinished, all trenches and excavations shall be filled and all roadways and sidewalks left unobstructed with their surfaces in a safe and satisfactory condition.

3.17 HAULING MATERIAL ON STREETS:

3.17.1 When it is necessary to haul material over the streets or pavements, the Contractor shall provide suitable tight vehicles so as to prevent deposits on the streets or pavements. In all cases where any materials are dropped from the vehicles, the Contractor shall clean up the same at least daily or as often as directed and keep the crosswalks, streets and pavements clean and free from dirt, mud, stone and other hauled material.

3.18 TEST PITS:

3.18.1 For the purpose of locating underground obstructions, the Contractor shall make such excavations in advance of the work as directed. Payment for the excavations of test pits will be made under an appropriate item of the Contract.

3.19 RESTORATION OF SURFACES:

3.19.1 The various types of street surface, gutters and culverts, disturbed, damaged or destroyed during the performance of the work under the Contractor, shall be restored and maintained as specified herein and as shown and directed.

3.19.2 Restoration of Property:

3.19.2.1 The Contractor shall restore all pavement, driveways, sidewalks, gutters, culverts, trees, shrubs, lawns, landscaped areas and any other public or private property damaged as a result of work under this Contract. The quality of materials and workmanship used in the restoration shall produce a condition equal to or better than the condition before the work began. If conditions are inferior before restoration, they shall be superior after restoration.

3.19.2.2 Payment for restoration of property shall be included in the applicable excavation items unless specifically provided for in other unit or lump sum price items.

3.19.3 Time of Replacement:

3.19.3.1 In general, permanent restoration of street surfaces will not be permitted until one month's time has elapsed after trenches have been completely backfilled as specified. A greater length of time, but not more than nine (9) months, may be allowed to elapse before permanent restoration of street surfaces is undertaken, if, in the opinion of the Engineer such additional time is required for complete shrinkage and settlement of the backfill.

3.19.3.2 If the Contractor is permitted to replace pavement at any time by the Engineer, it shall not relieve the Contractor of responsibility to make repairs to damage caused by settlement for a period of one year or as elsewhere specified.

3.19.4 Schedule of Operations:

3.19.4.1 A schedule of replacement operations shall be worked out by the Contractor, and approval of the Engineer shall be obtained. The program shall be adhered to unless otherwise approved by the Engineer.

3.19.5 Temporary Resurfacing & Repaving:

3.19.5.1 Immediately upon completion of refilling of the trench or excavation, the Contractor shall place a temporary pavement over all disturbed areas of the streets, driveways, alleys and other traveled places where the original surface has been disturbed by his operations. The temporary repavement shall be of a character satisfactory in all respects and safe for public travel.

3.19.5.2 The temporary resurfacing shall consist of a minimum of six inches (6") of well-graded broken stone with such additional depth as is necessary to withstand the traffic to which it is subjected. Where concrete pavements are removed, the broken stone shall be surfaced with "cold patch". The surface of the temporary repaving shall conform to the street grades. Mounding up of the material over the trench and covering the same with loose broken stone will not be considered as compliance with the above requirements.

3.19.5.3 For dust prevention, the Contractor shall treat all surfaces, not covered with cold patch, as approved by the Engineer. Use of calcium chloride and/or petroleum products for dust control is prohibited.

3.19.5.4 The temporary repavement shall be placed and maintained by the Contractor in a safe and satisfactory condition until such time as the permanent repaving is completed. The Contractor shall immediately remove and restore to a satisfactory condition any and all such resurfacing and repavements as shall become unsatisfactory and not in accordance with the terms and intent of the Specifications.

3.19.6 Preparation for Permanent Replacement:

3.19.6.1 After due notice and within the time specified, the temporary broken stone or gravel pavement shall be prepared as the base to receive the permanent pavement. It shall be brought to the required grade and cross section and thoroughly compacted before placing the permanent pavement. Service boxes, manhole frames and covers, and similar structures, within the area of pavement to be replaced and not conforming to the new work, shall be set to established grade by the Contractor at his expense, unless a specific item is included in the Contract.

3.19.7 Permanent Repaving:

3.19.7.1 The permanent and final repaving of all streets, driveways and similar surfaces where pavement has been removed, disturbed, settled or damaged by or on account of the work of the Contract shall be repaired and replaced by the Contractor, by a new and similar pavement at such time as directed. The top surface shall conform with the grade of existing adjacent pavement, and the entire replacement shall meet the current specifications of the local community for the particular types of pavement.

3.19.7.2 Concrete pavement and concrete base beneath asphalt, brick and other pavement surfacings supported by a concrete base, shall be replaced with Class "B" concrete.

3.19.7.3 Undamaged brick removed from brick pavement laid with sand or a bituminous filler may be reused in the pavement replacement. All broken and otherwise damaged brick, even though such brick were broken prior to removal, and all brick from grout filled pavement, shall be replaced with new brick of equal or better quality by and at the expense of the Contractor.

3.19.7.4 Where specified or approved by the Engineer, in writing, brick or block surfacing may be replaced by placing Class "B" concrete even with the adjacent wearing surface.

3.19.7.5 All pavement other than brick and concrete, and all gravel, crushed stone, and other types of roadway surfacings shall be replaced with new materials except where, in the opinion of the Engineer, materials salvaged from stone or gravel roadways have been removed, handled, and stored in such a manner that their original quality has been maintained, in which case such salvaged materials may be used to the extent available in the lower portion of the roadway surfacing after proper screening to remove dust and other excess fine material.

3.19.7.6 All such roadway surfacings shall be replaced to their original thickness at all points and such replacement shall in all cases conform in type, kind, and quality to the original when built. Where specifications covering the original construction are available, such specifications will apply to the replacement work. If not, the work shall be done in conformity with the State Department of Transportation Standard which conforms the closest to the type of surfacing being replaced, as determined by the Engineer.

3.19.8 Concrete Walks:

3.19.8.1 Concrete walks removed in connection with, or damaged as a result of, construction operations under the Contract shall be replaced with new construction; such walks shall be constructed of Class "B" concrete on a thoroughly compacted subgrade, shall have a vertical thickness of not less than four (4) inches (or thickness of the replaced walk where greater than four (4) inches), shall be constructed with vertical construction joints spaced not more than

twenty-five (25) feet apart, shall be provided with expansion joints spaced not to exceed fifty (50) feet apart, and shall be sloped for drainage at right angles to the longitudinal center line in the amount of approximately 1/8-inch per foot of walk width.

3.19.8.2 Walks shall be float finished, edged with an edging tool, and grooved at construction joints and at intermediate intervals not in excess of the width of the walk. The length of blocks formed by grooving tool and distances between construction and expansion joints shall be uniform throughout the length of the walk in any one location. All walks shall be cured as specified for concrete slabs in the Section headed "Cast-In-Place Concrete".

3.19.9 Curbs, Gutters & Culverts:

3.19.9.1 The Contractor shall, at his own cost and expense, permanently repair and relay all curbs, gutters, roadway and driveway culverts, where the same have been broken, injured or disturbed by the Contractor, his agents or employees, in executing any of the work covered by the Contract or by or on account of said work. He shall restore the same in a manner, to a condition and with material, either new or old as required, similar and equal to that existing before such excavations were made.

3.19.10 Maintenance & Surfaces:

3.19.10.1 The pavements, sidewalks, curbs, driveways, gutters, culverts, restored lawns, shrubs, trees, landscaped areas and any other public or private property shall be maintained in satisfactory condition during a period of one year from and after completion and acceptance of the Contract.

PART 4 - MEASUREMENT & PAYMENT

4.1 MEASUREMENT - EXCAVATION - GENERAL:

4.1.1 The quantity of Excavation - General for which payment will be made shall be the number of cubic yards actually removed, measured as the volume occupied by it (including rocks) before its removal; the maximum limits of such volumes shall not exceed those defined by the drawings, specified or ordered.

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4.2 PAYMENT - EXCAVATION - GENERAL:

4.2.1 For Excavation - General, not included in other unit or lump sum price items, will be made at the applicable price stated in the Bid and shall include the cost of all the several detailed operations incidental to the excavation. No additional payment will be made for excavation of rock, boulders, masonry or concrete encountered in the work. No payment will be made for material not excavated between the actual excavation and the maximum payment limits, if shown.

4.3 MEASUREMENT - EXCAVATION BELOW SUBGRADE:

4.3.1 The quantity of Excavation Below Subgrade, for which payment will be made, shall be the number of cubic yards (including rock) removed in accordance with the drawings, specified and/or ordered.

4.4 PAYMENT - EXCAVATION BELOW SUBGRADE:

4.4.1 For Excavation Below Subgrade, not included in other unit or lump sum price items, will be made at the applicable price stated in the Bid and shall include and cover all costs incidental to Excavation Below Subgrade when ordered. No additional payment will be made for excavation of rock, boulders, masonry, or concrete encountered in the work.

4.5 MEASUREMENT - EXCAVATION - TRENCHING:

4.5.1 The quantity for which payment will be made for Excavation - Trenching shall be the number of lineal feet, horizontal measurement, on the center line of the trench. The depth shall be measured on the center line of the trench from the invert or grade line to the original ground surface. Excavation - Trenching will be measured continuously through standard drop manholes, and no deduction will be made therefor. For other structures, deduction shall be made for length of trench occupied by the structures.

4.6 PAYMENT - EXCAVATION - TRENCHING:

4.6.1 For Excavation - Trenching, not included in other unit or lump sum price items, payment for Excavation - Trenching will be made at the price bid per lineal foot of Trenching for the various depths stated and shall include and cover all costs incidental to the trenching. No additional payment will be made for excavation of rock, boulders, masonry, or concrete encountered in the work. If so stated in the Additional Instructions, a percentage of the funds or unit amount to be retained under Excavation - Trenching will be withheld until all surface restoration is completed.

4.7 MEASUREMENT - EXCAVATION FOR STRUCTURES:

4.7.1 The quantity of Excavation for Structures for which payment will be made shall be the number of cubic yards actually removed, measured as the volume occupied by it (including rock) before its removal unless otherwise specified; the maximum limits of such volumes shall not exceed those defined upon drawings, specified and/or ordered.

4.8 PAYMENT - EXCAVATION FOR STRUCTURES:

4.8.1 For Excavation For Structures, not included in other unit or lump sum price items, payment for Excavation For Structures will be made at the applicable unit price stated in the Bid and shall include and cover the cost of all the several detailed operations incidental to the excavation. No additional payment will be made for excavation of rock, boulders, masonry, or concrete encountered in the work. No payment shall be made for material not excavated between the actual excavation and the maximum payment limits if shown.

4.9 MEASUREMENT AND PAYMENT - EXCAVATION - TEST PITS:

4.9.1 Measurement and Payment for Excavation - Test Pits, not included in other unit or lump sum price items will be made in accordance with the following schedule:

4.9.1.1 If a specific item for Excavation - Test Pits is included in the Bid, payment shall be made at the applicable unit price stated in the Bid.

Measurement of quantity shall be the actual number of cubic yards removed and replaced, measured as the volume occupied by it before its removal in accordance with the limits ordered by the Engineer.

4.9.1.2 If no specific item for Excavation - Test Pits is included in the Bid, Excavation - Test Pits shall be measured and paid for in accordance with the Section entitled - Measurement & Payment, Excavation - General.

4.9.1.3 If neither of the above two items are included in the Bid, Excavation - Test Pits shall be measured and paid for in accordance with the Section entitled - Measurement & Payment Excavation - Trenching.

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4.10 MEASUREMENT - EXCAVATION - ROCK:

4.10.1 Unless a specific item of Excavation - Rock is included in the Bid, no additional payment will be made for Rock encountered in the work.

4.10.2 If a specific item of Excavation - Rock is included in the Bid, measurement for payment shall be the actual volume of Rock excavated, measured within the limits specified or directed by the Engineer.

4.11 PAYMENT - EXCAVATION - ROCK:

4.11.1 For Excavation - Rock, not included in other unit or lump sum price items, payment for Excavation - Rock will be made at the price stated in the Bid, and shall include and cover all costs incidental to Excavation - Rock.

END OF SECTION

SECTION 02229

BORROW, PIPE ZONE BACKFILL & PIPE ZONE BEDDING

PART 1 - GENERAL

1.1 DESCRIPTION:

1.1.1 Under this Section, the Contractor shall furnish all labor, materials and equipment to place Borrow, Pipe Zone Backfill & Pipe Zone Bedding as shown on the Plans, as specified, and/or directed.

PART 2 - PRODUCTS

2.1 All granular materials shall be free from any organic or other deleterious materials.

2.2 Borrow shall consist of well graded Inorganic granular Material as shown on the Contract Drawings.

2.3 Pipe Zone Backfill shall consist of well graded sand as shown on the Contract Drawings.

2.4 Pipe Zone Bedding shall consist of foundation stone as shown on the Contract Drawings.

2.5 The Contractor shall employ an approved commercial testing laboratory at his own expense to conduct the sieve analysis, plasticity index and soundness tests prior to delivery of any of the materials to the site of the project. The Engineer may, at the Contractor's expense, require additional tests if, in his opinion, the quality of the materials has changed.

PART 3 - EXECUTION

3.1 Pipe Zone Bedding shall be used for backfilling below subgrade in trenches for pipelines or excavations for structures, provided the sides and bottom of the excavations will remain stable when wet.

3.2 Where directed by the Engineer, Borrow shall be used for backfilling excavations in streets, roads, or drives, or in areas upon which structures are to be built or where the excavated material is, in the opinion of the Engineer, unsuitable for backfilling.

3.3 Borrow, Pipe Zone Backfill and Pipe Zone Bedding shall be placed in horizontal layers not more than eight (8) inches or (12) inches in thickness and shall be so thoroughly and uniformly compacted as to prevent after-settlement. Compaction shall be by traveling vibrators or other approved method and shall be to a minimum dry density of ninety-five percent (95%) of the maximum dry weight density, as determined by ASTM D1557.

3.6 All Borrow, Pipe Zone Backfill and Pipe Zone Bedding shall be inspected and approved by the Engineer before any pipelines are laid or any forms for structures are placed.

3.7 Any settlement in the finished work due to settlement of the compacted Borrow, Pipe Zone backfill and Pipe Zone Bedding shall be made good by the Contractor at his own cost and expense.

3.8 COMPACTION TEST (BORROW, PIPE ZONE BACKFILL AND PIPE ZONE BEDDING):

3.8.1 The Contractor shall employ an approved commercial testing laboratory at his own expense to conduct the compaction tests.

3.8.2 Each layer shall be tested and approved by the Engineer before succeeding layers are placed. A minimum of one field density test shall be made each day and/or for each fifty (50) cubic yards of material placed and/or as shown or specified in the drawings.

3.8.3 The following reports in quadruplicate shall be submitted directly to the Engineer:

a. Report and Certification of Gradation.

b. Field Density Reports.

c. One optimum moisture-maximum density curve for each type of fill.

3.8.4 Based on the reports of the testing laboratory and inspection, if the subgrade or fills which have been placed and compacted are below the specified density, the Engineer will ask for additional compaction and testing at the expense of the Contractor.

PART 4 - MEASUREMENT & PAYMENT

4.1 MEASUREMENT – PIPE ZONE BEDDING AND BACKFILL:

4.1.1 The quantity of Pipe Zone Bedding and Backfill allowed for payment shall be computed by using the product of the length, depth as directed, and the actual width, but not to exceed the Maximum Payment Width as shown on the Contract Drawings, less the volume occupied by the pipe or structure, if any.

4.2 PAYMENT – PIPE ZONE BEDDING AND BACKFILL:

4.2.1 For Pipe Zone Bedding and Backfill, not included in other unit or lump sum price items, payment for Pipe Zone Bedding and Backfill will be made at the applicable price stated in the Bid.

4.3 MEASUREMENT - BORROW:

4.3.1 The quantity of Borrow allowed for payment shall be computed by using the product of the length, depth as directed, and the actual width, but not to exceed the Maximum Payment Width as shown on the Contract Drawings.

4.4 PAYMENT - BORROW:

4.4.1 For Borrow, not included in other unit or lump sum price items, payment for Borrow will be made at the applicable price stated in the Bid.

END OF SECTION

SECTION 02442

TEMPORARY LINE-STOP

PART 1 – GENERAL

1.1 DESCRIPTION:

1.1.1 Under this item Contractor shall furnish all materials, labor and equipment to properly install and set a temporary line-stop into an existing ductile iron pipe at the locations shown on the plans.

1.1.2 The design, installation and removal of the temporary line-stop shall be the Contractor's responsibility. The Contractor shall employ the services of a vendor who can demonstrate to the Engineer that he specializes in the design and installation of temporary line-stops. The vendor shall provide at least five (5) references of a project of a similar size and complexity.

1.1.3 The Contractor shall field verify pipe material, size, and cross sectional dimensions for the installation of the temporary line-stop.

1.1.4 Prior to ordering material: Excavate, dewater, expose, and clean the exterior of the main at location of each temporary line-stop. If main is heavily corroded; or if utilities will interfere with fittings, support/reaction blocking, or equipment; move location up or downstream to structurally sound pipe.

a. Caliper O.D. of all mains to determine ovality.
b. Verify wall thickness and interior condition.
c. Backfill; restore as necessary.

1.2 SUBMITTAL:

1.2.1 The Contractor shall prepare with the vendor a specific, detailed description of the proposed temporary line-stop system and submit it and the vendor's references. The submittal shall include at least five (5) references of projects of a similar size and complexity. It shall also include the resume of the proposed field crew which shall detail their work experience and familiarity with the vendor's equipment.

1.2.2 The Contractor shall submit to the Engineer detailed plans and descriptions outlining all provisions and precautions to be taken by the Contractor to insure proper installation of the temporary line-stop.

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TEMPORARY LINE-STOP

1.3 REDUCTION OF PRESSURE:

1.3.1 The entire operation of making the temporary line-stop shall be accomplished without reduction of water pressure in the main. It shall be the responsibility of the Contractor to verify pressure prior to commencing the installation.

1.4 DEWATERING:

1.4.1 Because of possible internal corrosion and deposits in mains, "bottle-tight" shut-downs may not occur. A satisfactory shutdown in one which allows the work to be accomplished safely (i.e. valve replacement, etc.) using drainage pumps to dewater excavations, with workmen wearing boots and raingear, if necessary.

1.5 PRELIMINARY FIELD INSPECTION OF MAIN:

1.5.1 Dimensional, specification, and other data regarding the existing mains have been taken from Owner's records. These data have not been verified by field inspections. The ductile iron pipe may contain dimensional and structural flaws. In addition, it is anticipated that exterior main conditions, bells, or presence of adjoining utilities may require relocation of proposed temporary line-stop. Contractor shall complete exploratory excavations as necessary to determine final appropriate location of the line-stop.

1.5.2 It is necessary to know the exact main O.D., ovality, and bore diameter before temporary line-stop fittings and plugging head sealing elements can be manufactured. The contractor shall be responsible to complete all necessary field investigations to determine this information.

1.5.3 Prior to ordering material, Contractor shall excavate at the proposed location, and caliper the header O.D. along at least four (4) diameters to determine ovality.

1.5.4 Contractor shall determine main wall thickness, uniformity, and structural integrity by means of ultrasonic testing. Data shall be taken to determine extent of internal deposits, tuberculation, etc.

SECTION 02442

TEMPORARY LINE-STOP

PART 2 - PRODUCTS

2.1 TEMPORARY LINE-STOP FITTING AND ACCESSORIES, DUCTILE IRON PIPE:

2.1.1 Fitting shall be full encirclement type, split tee. It shall consist of two halves: (1) An upper temporary line-stop flange saddle half. The interior of the saddle plate adjacent to and concentric with the O.D. of the nozzle shall be grooved to retain a gasket which shall seal the saddle plate to the exterior of the main. This gasket shall constitute the only seal between the main and the fitting. (2) A lower bottom solid half with bolting arrangement for fastening to upper half.

2.1.2 Material Drawings: Contractor shall submit to Engineer five (5) sets of drawings, furnished by manufacturers, fully and distinctly illustrated and describing the temporary line-stop fittings proposed to be furnished.

2.1.3 Temporary Line-Stop Flange: The outlet of each fitting shall be machined from a 150 lb. forged steel flange (ASTM A181 or A105) or from pressure vessel quality steel plate (ASTM A285, Grade C); flat faced and drilled per ANSI B16.5). Suitable independently operated locking devices shall be provided in the periphery of the flange to secure the completion plug.

2.1.4 Temporary Line-Stop Nozzle: The nozzle, which lies between the saddle and the flange (Section 1.7.2), shall be fabricated from steel pipe (ASTM A234). After welding and stress relief, the nozzle shall be accurately bored a follows to accommodate the Temporary line-stop plugging head:

a. Machine an internal circular shoulder to seal against the circumferential gasket carried on the plugging head.

2.1.5 Completion Plug: The completion plug shall be machined from a stress relieved carbon steel weldment. It shall contain two (2) circumferential grooves: one to receive the locking devices from the temporary line-stop flange, and the second to contain a compressible "O" ring to seal pressure tight against the bore of the flange.

2.1.6 Blind Flange: Each temporary line-stop fitting shall be closed with a blind flange. Facing and drilling of the blind flange shall be compatible with that of the temporary line-stop flange. Minimum blind flange thickness shall be that of AWWA Spec. 207, Class D.

2.1.7 Saddle Alignment Marking: Each saddle half shall be matched and marked with serial numbers, to insure proper alignment in the field.

2.1.8 Fasteners: All bolts, studs, and nuts used on temporary line-stop and drain/equalization fittings shall be of the heavy series.

2.1.9 General: Manufacturer will exercise extreme care to insure that weldments are of adequate strength, properly shaped, securely reinforced, and free from distortion that could stress the ductile iron main during installation, pressure tapping, or temporary line-stopping operations. All steel shall meet the requirements of ASTM A36, as a minimum. All weldments shall be braced and stress relieved.

2.1.10 Gaskets: Shall be molded from elastomer compounds that resist compression setting and are compatible with water in the 32 to 140 deg. F temperature range.

2.1.11 Upper temporary line-stop Flange Saddle: Shall consist of a saddle plate, a temporary line-stop flange, and a temporary line-stop nozzle. The interior of the saddle plate, adjacent to and concentric with the O.D. of the nozzle, shall be grooved to retain a gasket which shall seal the saddle plate to the exterior of the ductile iron main. This gasket shall constitute the only seal between the main and the fitting.

a. Saddle plate shall be of a minimum of 0.375" in thickness. It shall be shaped to be concentric to the outside of the ductile iron main. The smallest I.D. of the saddle and its interior rings shall exceed the O.D. of the main by a minimum of 0.250" to allow for ovality of the main.
b. A temporary line-stop nozzle of 0.375" min. wall thickness shall be securely welded to the saddle plate.
c. The temporary line-stop flange shall be securely welded to the nozzle. After welding, the assembly shall be braced, stress relieved, and bored to receive the completion plug and the circumferential gasket of the temporary line-stop machine plugging head.
d. Bolt, nut of stud, nut, and washer assemblies shall be furnished to draw the upper and lower saddles together for sealing. Bolting brackets shall be gussetted.

2.1.11 Lower Saddle Plate: Saddle plate shall be of a minimum 0.375" thickness and shall be shaped to be concentric to the outside brackets shall match upper half.

SECTION 02442

TEMPORARY LINE-STOP

PART 3 - EXECUTION

3.1 INSTALLATION OF FITTINGS, GENERAL:

3.1.1 Contractor shall power wire brush and grind the exterior of the main to remove any debris, corrosion deposits, or other surface irregularities that might interfere with proper seating and sealing of each temporary line-stop fitting against each main. Any structural defects in main, service connections, appurtenances, adjacent utilities, etc., that could interfere with the temporary line-stop installation shall be immediately reported to Engineer.

3.1.2 Inspection: Contractor shall fit upper and lower saddle plate assemblies to main, thoroughly checking for proper fit to main.

3.1.3 Assembly to Main: Under no circumstances shall Contractor attempt to force, reshape, or bend saddle plates by excessive tightening of saddle studs while temporary line-stop fitting is assembled around the main.

a. Any retrofitting shall be accomplished with the fitting removed from the main.
b. Any damage to fitting, accessories, or main shall be repaired at Contractor's expense to the satisfaction of Engineer.

3.2 ASSEMBLY OF TEMPORARY LINE-STOP FITTING, DUCTILE IRON PIPE:

3.2.1 Main Preparation: The entire periphery of the ductile iron main shall be power ground for the length of the temporary line-stop fitting.

3.2.2 Assembly of Saddle Plates: Upper and Lower saddle halves shall be drawn together by stud assemblies.

a. Saddle plates shall be bolted together in the horizontal position.

3.3 CUTTING OPERATION: Drilling equipment shall be in good condition, and equipped with power drive to insure smooth cutting, and to minimize shock and vibration. Cutting equipment shall be carbide tipped and capable of being replaced without removal from the jobsite.

3.4 TEMPORARY LINE-STOP MACHINERY: The equipment shall consist of a full size, solid plugging head attached to a carrier body. The body is advanced and retracted from the main by means of a linear actuator.

3.4.1 Plugging Head: The plugging head shall be full size and articulated with a carrier body. When completely seated the head shall lie in a perpendicular plane to the bore of the main.

3.4.2 Sealing Element: The element shall be monolithically molded from a suitable polyurethane compound. The element shall be flat in a plane perpendicular to the flow in the main and shaped so that upstream water pressure shall increase contact between the periphery of the seal and the interior of the main.

3.4.3 Deposits in Bore of Main: The plugging head shall be designed to break and dislodge tuberculation and other deposits in the bore of the main which might interfere with a satisfactory temporary line-stop.

3.5 COMPLETION:

3.5.1 Final closure shall be accomplished by insertion of a completion plug.

3.5.2 Completion Plug: Test of completion plug sealing shall be accomplished through bleed-off in machine housing.

3.5.3 Removal: Temporary valve shall be removed and installation of blind flange (1.7.5) shall be completed.

PART 4 - MEASUREMENT & PAYMENT

4.1 MEASUREMENT – TEMPORARY LINE-STOP:

4.1.1 The measurements for temporary line-stop shall include the cost of all materials, equipment, labor, submittals and testing for the work indicated in this Section.

4.2 PAYMENT – TEMPORARY LINE-STOP:

4.2.1 For temporary line-stop, not included in other unit or lump sum price items, payment for temporary line-stop will be made at the applicable price stated in the Bid.

END OF SECTION

SECTION 02449

WORK ZONE TRAFFIC CONTROL

PART 1 - GENERAL

1.1 DESCRIPTION:

1.1.1 Under this Section, the Contractor shall furnish all labor, materials and equipment for Work Zone Traffic Control as indicated on the drawings, as specified and/or directed.

1.1.2 The following items of work shall be included:

a. Furnish and install all temporary traffic signs indicated on the drawings including all labor, equipment, sign panels, posts, hardware, post anchorage and all appurtenances necessary for a complete installation.

b. Furnish and place all traffic cones indicated on the drawings including all labor, materials and appurtenances necessary for a complete installation.

c. Furnish and install all barricades indicated on the drawings including all labor, materials and appurtenances necessary for a complete installation.

d. Provide flagmen as required on the drawings.

1.1.3 The work shall be performed in accordance with Section 619 of the current edition of the New York State Department of Transportation Standard Specifications, and any engineering instruction to these Specifications issued after that date, as specified and as indicated on the Contract Drawings.

1.1.4 In addition to the requirements of this Section, all items of work in Section 01577 of these Specifications shall be provided.

PART 2 - PRODUCTS

2.1 MATERIALS:

2.1.1 Temporary traffic signs are intended for work zone traffic control during construction operations on or near the roadway. Such temporary traffic signs shall be provided in accordance with Section 619 of the current edition of the NYS Department of Transportation Standard Specifications.

2.1.2 The sign design numbers shown on the drawings refer to the size, shape, color and legend of each sign and correlate to those sign numbers as shown in the current edition of the National Manual of Uniform Traffic Control Devices and the NYSDOT Supplements.

2.1.3 Traffic cones and barricades shall be provided in accordance with Section 619 of the current edition of the NYS Department of Transportation Standard Specifications.

PART 3 - EXECUTION

3.1 INSTALLATION:

3.1.1 Temporary traffic signs, barricades and traffic cones shall be located in accordance with the current edition of the National Manual of Uniform Traffic Control Devices and the current edition of the NYSDOT Supplements and as indicated on the Contract Drawings or directed by the Engineer.

3.1.2 All temporary traffic signs, barricades and traffic cones shall be installed in strict accordance with the requirements of Section 619 of the current edition of the NYS Department of Transportation Standard Specifications and as indicated on the drawings.

PART 4 - MEASUREMENT & PAYMENT

4.1 MEASUREMENT – WORK ZONE TRAFFIC CONTROL:

4.1.1 Measurement for Work Zone Traffic Control shall include the cost of all materials, equipment, labor, submittals and testing for the work indicated in this Section.

4.2 PAYMENT – WORK ZONE TRAFFIC CONTROL:

4.2.1 For Work Zone Traffic Control, not included in other unit or lump sum price items, payment for Work Zone Traffic Control will be made at the applicable price stated in the Bid.

END OF SECTION

SECTION 02484

TOPSOIL

PART 1 - GENERAL

1.1 DESCRIPTION:

1.1.1 Under this Section, the Contractor shall furnish all labor, materials and equipment for Topsoil as shown on the Plans, as specified, and/or directed.

PART 2 - PRODUCTS

2.1 MATERIAL:

2.1.1 Topsoil for such depth as directed shall be removed from areas of the Site where excavations are to be made or embankments placed. The soil so removed shall be transported and stored in piles at convenient locations designated or approved and shall be kept separate from all other classes of excavated material. Should the Contractor fail to keep separate from other material any soil removed, he shall procure and furnish at his own expense an equivalent quantity of satisfactory topsoil.

2.1.2 The Contractor is required to process the topsoil/compost. The material shall contain no admixture of refuse or any material toxic to plant growth and shall be free from subsoil, stones, clay lumps or similar objects larger than two inches in greatest dimension. Sod and herbaceous growth such as grass and weeds need not be removed. Topsoil shall not be delivered or placed in a frozen or muddy condition.

2.1.3 Contractor to condition topsoil as necessary. Topsoil from on-site and off-site sources shall have an acidity range of pH 5.0 to 7.0 and shall contain 2 to 20% organic matter as determined by loss of ignition of moisture-free samples dried at 100 degrees C.

a. Where topsoil pH is below 5.0, lime shall be added at a rate of 2-1/2 lbs. per cubic yard of topsoil until the pH is above 5.0.

b. Where topsoil pH is above 7.0, aluminum sulfate shall be added at a rate of 2-1/2 lbs. per cubic yard of topsoil until the pH drops below 7.0.

2.2 SOIL AMENDMENTS:

2.2.1 Lime: Natural dolomitic limestone containing not less than 85 percent of total carbonates with a minimum of 30 percent magnesium carbonates, ground so that not less than 90 percent passes a 10-mesh sieve and not less than 50 percent passes a 100-mesh sieve.

2.2.2 Aluminum Sulfate: Commercial grade, in dry powder form.

2.3 SUBMITTALS:

2.3.1 The Contractor shall submit six (6) copies of a pH test and organic content test for the Engineer's review for each source of topsoil to be used.

PART 3 - EXECUTION

3.1 QUALITY ASSURANCE

3.1.1 Topsoil will be visually inspected upon delivery and material that does not comply with the Specification will be rejected.

3.2 PLACING:

3.2.1 Topsoil shall include fine grading the surface of the ground upon which topsoil is to be placed and the furnishing and placing of topsoil in the areas to be seeded or planted.

3.2.2 Depth of topsoil shall be minimum 4 inches unless otherwise shown or directed.

3.2.3 After approval by the Engineer of the fine grading of the subgrade, the topsoil shall be spread and compacted with a light roller to the lines, grades and elevations shown on the drawings, or directed by the Engineer, without unsightly variations, ridges or other depressions which will hold water. Any stone, litter or objectionable material shall be removed from the topsoil and the surface raked to true lines. Any uneven spots shall be leveled. The work shall not be performed during unsuitable weather.

PART 4 – MEASUREMENT & PAYMENT

4.1 MEASUREMENT – TOPSOIL:

4.1.1 The quantity of Topsoil for which payment will be made will be the plan view in square feet at the depths specified (6-inches unless otherwise noted) covered by topsoil. This area shall be determined based on as-built drawings of the topsoil area supplied by a NYS licensed surveyor hired by the Contractor.

SECTION 02484

TOPSOIL

4.2 PAYMENT – TOPSOIL:

4.2.1 For Topsoil, not included in other unit or lump sum price items, payment for Topsoil will be made at the applicable price stated in the Bid and shall cover all costs and expense incidental to excavating from storage, transporting, rehandling and placing in the completed work as shown, specified and directed. No payment will be made for any portion of this item until the Topsoil has been placed in final location.

END OF SECTION

SECTION 02485

SEEDING

PART 1 - GENERAL

1.1 DESCRIPTION:

1.1.1 Under this Section, the Contractor shall furnish all labor, materials and equipment for Seeding in new and disturbed areas where shown on the drawings, specified or directed by the Engineer.

PART 2 - PRODUCTS

2.1 FERTILIZER:

2.1.1 Commercial fertilizer (5-10-5) shall contain not less than five percent nitrogen, ten percent available phosphoric acid and five percent water soluble potash. The fertilizer shall be inorganic or a combination of inorganic and organic substances.

2.1.2 If, as an alternative, the Contractor wishes to substitute another fertilizer, such as 10-20-10 to 6-12-6, he may do so with the approval of the Engineer, and the rate of fertilizer to be used shall be whatever amount is required to furnish the same amount of nitrogen as would be supplied by the 5-10-5.

2.1.3 Commercial fertilizer shall be delivered in original bags of the manufacturer, showing weight, analysis and the name of the manufacturer.

2.1.4 If the commercial fertilizer is not used immediately after delivery, the Contractor shall store it in a place designated by the Engineer, in such a manner that its effectiveness will not be impaired.

2.2 SEED:

2.2.1 Grass seed shall be a mixture of the species and/or varieties specified, mixed in the proportions specified.

2.2.2 The seed shall be fresh, recleaned and of the latest crop year. It shall conform to Federal and State Standards. Each type of grass in the mixture shall meet or exceed the minimum percentage purity and germination listed for that type of grass.

2.2.3 The following lawn mixture shall be used for residential, commercial or institutional lawn areas:

Percentage By Weight	Species or Variety	Purity	Percentage Germination
45	Kentucky Bluegrass	85	70
40	Red Fescue (Commercial)	95	80
15	Red Top	95	85
100			

2.2.4 For open fields or non-developed areas, the following seed mixture shall be utilized:

Percentage By Weight	Species or Variety	Percent Germination
45	Creeping Red Fescue	85
45	Kentucky 31 Tall Fescue	85
10	Perennial Ryegrass	85
100		

2.2.5 For excessively wet areas, Reed Canary Grass shall be utilized.

2.2.6 The balance of material in an acceptable seed mixture, other than specified pure live seed shall, for the most part, consist of non-viable seed, chaff, hulls, live seeds of crop plants and harmless inert matter. The percentage of weed seed shall not exceed one percent by weight for the mixture.

2.2.7 All seed mixtures furnished under this Section shall be mixed by the vendor and shall be delivered in standard sized bags of the vendor, showing the weight, analysis and vendor's name.

2.2.8 All seed shall be properly stored by the Contractor at the site of the work and any seed damaged during storage shall be replaced.

SECTION 02485

SEEDING

2.3 MULCH:

2.3.1 Straw mulch shall consist of oats, wheat, rye or other approved crops which are free of noxious weeds. Weight shall be calculated on the basis of the straw having not more than 15% of moisture content.

PART 3 - EXECUTION

3.1 TIME FOR SEEDING:

3.1.1 Grass seed shall be sown from March 15th to May 15th or from August 15th to October 1st, unless in a favorable season, and upon written permission of the Engineer, the seeding period is extended. All seeding shall be done in a dry or moderately dry soil and at times when the wind does not exceed a velocity of five miles per hour.

3.2 PREPARATION OF SEED BED:

3.2.1 After the finished grading is completed and just before seeding, the areas to be seeded shall be loosened to a depth of two inches and raked to true lines, free from all unsightly variations, bumps, ridges and depressions which will hold water. All sticks, stones, clods, roots or other objectionable material which interfere with the formation of a fine seed bed shall be removed from the soil.

3.2.2 Commercial fertilizer shall be evenly applied at the rate of 30 lbs. per 1,000 square feet.

3.3 SEEDING:

3.3.1 Grass seed mixture shall be sown at the rate of 5 pounds per one thousand square feet.

3.3.2 The seed shall be sown by hand or by an approved machine, in such a manner that a uniform stand will result.

3.3.3 After sowing, seeded areas shall be rolled with a light lawn roller weighing not more than one hundred pounds per foot of width.

3.4 MULCHING:

3.4.1 Within three days after the seed is sown, the seeded areas shall be covered with a uniform blanket of straw mulch at the rate of one thousand pounds per acre of seeded area.

3.5 HYDROSEEDING:

3.5.1 The Contractor may substitute a hydroseeding process for hand seeding and mulching as specified above.

3.5.2 Where hydroseeding is used, the Contractor shall mix water, seed fertilizer, mulch and mulch anchorage at the following rates and apply to the prepared seed bed by means of a hand-held hose. No truck mounted spraying equipment shall be driven over the areas to be seeded. Discharge shall be in an uphill direction only.

3.5.2.1 Fertilizer - 1,000 lbs. per acre.

3.5.2.2 Seed - 250 lbs. per acre.

3.5.2.3 Mulch - 1,500 lbs. per acre.

3.5.2.4 Mulch Anchorage - 25 gal. per acre.

3.5.3 Where the mulch anchorage is provided ready mixed with the mulch, no additional mulch anchorage will be required.

3.5.4 Mulch shall be a commercial cellulose hydromulch such as "Conwed 2000", "Turf Fiber", or equal. Soil seal or mulch anchorage used shall be approved by the Engineer. An asphalt emulsion shall not be used as mulch anchorage.

3.6 MAINTENANCE AND PROTECTION:

3.6.1 The Contractor shall maintain and protect all seeded areas until final acceptance of the Seeding portion of the Contract.

3.6.2 Final acceptance will not be made until an acceptable uniform stand of grass is obtained in all newly seeded areas except that the Engineer at his discretion may accept a portion or portions of the work at various times.

3.6.3 Upon final acceptance of a seeded area by the Engineer, the Owner will assume responsibility for maintenance and protection of that area.

3.6.4 Any portions of seeded areas which are unacceptable, and which fail to show a uniform stand of grass from any cause, shall be reseeded as before except the fertilizer shall be applied at one-half the original rate. The seeding shall be repeated until the seeded areas are satisfactorily covered with grass.

PART 4 - MEASUREMENT & PAYMENT

4.1 MEASUREMENT - SEEDING:

4.1.1 The quantity of Seeding allowed for payment shall be the number of acres seeded in accordance with the plans, specified or directed.

4.2 PAYMENT - SEEDING:

4.2.1 For Seeding, not included in other unit or lump sum price items, payment for Seeding will be made at the applicable price stated in the Bid and shall include the cost of furnishing all labor, materials and equipment necessary to fertilize, seed, mulch and maintain lawn areas in accordance with the Specifications.

END OF SECTION

SECTION 02521

ASPHALTIC CONCRETE PAVING

PART 1 - GENERAL

1.1 DESCRIPTION:

1.1.1 Under this Section, the Contractor shall furnish all labor, materials and equipment for Asphaltic Concrete Paving, including accessory items of work herein described, as shown on the Plans, as specified, and/or directed.

1.1.2 All work and material shall be in accordance with the applicable requirements of the NYSDOT. Sections mentioned herein refer to those Specifications. Paragraphs in NYSDOT titled "Method of Measurement" and "Basis of Payment" shall not apply.

1.2 REFERENCES: The publications listed below and their latest revisions form a part of this Specification to the extent referenced. The publications are referred to in the text by the basis designation only.

1.2.1 State Highway Specification:

New York State Department of Transportation, Standard Specifications, Construction and Materials, (NYSDOT)

1.3 RELATED WORK SPECIFIED IN OTHER SECTIONS:

1.3.1 Excavation and filling to establish elevation of subgrade is specified in Section 02220, "Excavation".

1.4 CERTIFICATES:

1.4.1 Provide approved certification that all paving materials conform to the Specification.

PART 2 - PRODUCTS

2.1 SUBGRADE:

2.1.1 Preparation of subgrade shall be in accordance with NYSDOT Section 203 and Article 1.3.1 of this Specification.

2.2 SUBBASE:

2.2.1 Materials and methods of construction of Subbase shall be in accordance with NYSDOT Section 304, Type 2 (Item No. 304.12).

2.3 BINDER COURSE:

2.3.1 Materials and methods of construction of Binder Course shall be in accordance with NYSDOT Section 400, Type 3 (Item 403.138902).

2.4 TOP COURSE:

2.4.1 Materials and methods of construction of Top Course shall be in accordance with NYSDOT Section 400, Type 7 (Item No. 403.178902).

2.5 TESTING: The Contractor shall employ an approved commercial testing laboratory at his own expense to conduct any and all tests required prior to the delivery of materials to the site of the project and shall also perform compaction as required. The Engineer may, at the Contractor's expense, require additional tests if, in his opinion, the quality of the materials has changed.

PART 3 - EXECUTION

3.1 CONSTRUCTION DETAILS: The Contractor shall comply with details of construction as specified in NYSDOT Sections 203-3.01 thru 203-3.20, Sections 304-3.01 thru 304-3.05 and Sections 401-3.01 thru 401-3.15.

PART 4 - MEASUREMENT & PAYMENT

4.1 MEASUREMENT - SUBBASE:

4.1.1 The quantity of Subbase allowed for payment shall be computed by using the product of the length, depth as directed, and the actual width, but not to exceed the maximum pavement width as shown on the Contract Drawing, less the volume occupied by any pipes or structures.

SECTION 02521

ASPHALTIC CONCRETE PAVING

4.2 PAYMENT - SUBBASE:

4.2.1 For Subbase, not included in other unit or lump sum price items, payment for Subbase will be made at the applicable price stated in the Bid.

4.3 MEASUREMENT - BINDER COURSE AND TOP COURSE:

4.3.1 The quantity of Binder Course and Top Course, where used, shall be measured by the number of tons of compacted mixture placed in the work within the pavement limits shown or directed, as determined by certified truck scale weights.

4.4 PAYMENT - BINDER COURSE AND TOP COURSE:

4.4.1 For Binder Course and Top Course, not included in other unit or lump sum price items, payment for Base Course, Binder Course and Top Course will be made at the applicable price stated in the Bid.

END OF SECTION

SECTION 02573

SAW CUTTING ASPHALT PAVEMENT AND/OR CONCRETE PAVEMENT BASE

PART 1 - GENERAL:

1.1 DESCRIPTION:

1.1.1 Under this Section, the Contractor shall furnish all labor, materials and equipment for Saw Cutting Asphalt Pavement and/or Concrete Pavement Base as shown on the Plans, as specified, and/or directed.

PART 2 - PRODUCTS:

2.1 EQUIPMENT:

2.1.1 All equipment proposed for this work shall be approved by the Engineer prior to actual use.

PART 3 - EXECUTION

3.1 CONSTRUCTION:

3.1.1 Saw cutting of asphalt pavement and concrete pavement base shall be for removal of existing asphalt pavement sections and removal of existing cement concrete base with asphalt overlay.

3.1.2 Existing pavement and concrete road base shall be saw cut perpendicular to the roadway surface along neat lines and to the depth indicated on the plans and typical sections. After the existing asphalt pavement and/or concrete road base has been saw cut through, the Contractor may use pry bars, pneumatic tools or other methods approved by the Engineer, to pry loose the existing pavement from that pavement which is to remain. A pavement breaker, under the supervision of the Engineer, may be used to break up the pavement to be removed after the pavement has been completely saw cut through and completely free from the pavement to remain.

3.1.2 Care shall be taken not to disturb or damage saw cuts of existing pavement and curbs to remain.

3.1.3 Any existing pavements and curbs not indicated to be removed that are damaged by the Contractor's operations, shall be repaired by him to the satisfaction of the Engineer at no additional cost to the Owner.

SECTION 02573

SAW CUTTING ASPHALT PAVEMENT AND/OR CONCRETE PAVEMENT BASE

PART 4 - MEASUREMENT & PAYMENT

4.1 MEASUREMENT - SAW CUTTING ASPHALT PAVEMENT AND/OR CONCRETE PAVEMENT BASE:

4.1.1 This work shall be measured by the number of linear feet of saw cutting completed as shown on the Contract Drawings or as directed by the Engineer. No allowances will be made for saw cuts of different depths.

4.1.2 No saw cutting will be measured for payment under this Section which the Contractor may choose to do for his own convenience.

4.2 PAYMENT - SAW CUTTING ASPHALT PAVEMENT AND/OR CONCRETE PAVEMENT BASE:

4.2.1 For Saw Cutting Asphalt Pavement and/or Concrete Pavement Base, not included in other unit or lump sum price items, payment for Saw Cutting Asphalt Pavement and/or Concrete Pavement Base will be made at the applicable price stated in the Bid.

4.2.2 Any repairs made necessary by the Contractor's operations shall be done as ordered by the Engineer at no additional cost to the Owner.

END OF SECTION

SECTION 02579

COLD MILLING

PART 1 - GENERAL

1.1 DESCRIPTION:

1.1.1 Under this Section, the Contractor shall furnish all labor, materials and equipment for Cold Milling, including accessory items of work herein described, as shown on the Plans, as specified, and/or directed.

1.1.2 All work and material shall be in accordance with the applicable requirements of the NYSDOT. Sections mentioned herein refer to those Specifications. Paragraphs in NYSDOT titled "Method of Measurement" and "Basis of Payment" shall not apply.

1.2 REFERENCES: The publications listed below and their latest revisions form a part of this Specification to the extent referenced. The publications are referred to in the text by the basis designation only.

1.2.1 State Highway Specification:

New York State Department of Transportation, Standard Specifications, Construction and Materials, (NYSDOT)

PART 2 - PRODUCTS

2.1 MATERIALS: The Contractor shall comply with materials as specified in NYSDOT Sections 490-2.01 and 490-2.02.

PART 3 - EXECUTION

3.1 CONSTRUCTION DETAILS: The Contractor shall comply with details of construction as specified in NYSDOT Sections 490-3.01 and 490-3.03.

PART 4 - MEASUREMENT & PAYMENT

4.1 MEASUREMENT – MISCELLANEOUS COLD MILLING OF BITUMINOUS CONCRETE:

SECTION 02579

COLD MILLING

4.1.1 The quantity of Miscellaneous Cold Milling of Bituminous Concrete allowed for payment shall be the number of square yards computed by using the product of the length, and the actual width, but not to exceed the maximum pavement width as shown on the Contract Drawing.

4.2 PAYMENT - MISCELLANEOUS COLD MILLING OF BITUMINOUS CONCRETE:

4.2.1 For Miscellaneous Cold Milling of Bituminous Concrete, not included in other unit or lump sum price items, payment for Miscellaneous Cold Milling of Bituminous Concrete will be made at the applicable price stated in the Bid.

END OF SECTION

SECTION 02601

MANHOLES, MANHOLE FRAMES & COVERS

PART 1 - GENERAL

1.1 DESCRIPTION:

1.1.1 Under this Section, the Contractor shall furnish all labor, materials and equipment for Manholes, Manhole Frames & Covers as shown on the Plans, as specified, and/or directed.

PART 2 - PRODUCTS

2.1 DEFINITION: Standard and drop manholes shall be constructed of precast, reinforced concrete or poured in the field concrete bases, precast reinforced concrete riser sections and concentric or eccentric tapered tops, as shown on the Plans, specified, or directed.

2.2 MANHOLES:

2.2.1 If the bases are poured in the field, they shall be constructed of Class "C" concrete to a point six (6) inches above the outside top of the main sewer.

2.2.2 The barrel of manholes shall be of precast, concrete sections of approved standard design of the manufacturer, and shall conform to ASTM Des: C478 latest edition for Precast Reinforced Concrete Manhole Sections, except as may be modified herein. Precast concrete manhole risers shall have a minimum nominal inside diameter of forty-eight (48) inches, unless otherwise shown on Contract Plans.

2.2.3 Joints between precast reinforced concrete manhole sections shall be the rubber gasket type and shall conform to ASTM Des: C443 latest edition for Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets.

2.2.4 Compressive strength of concrete used in risers shall be 4000 psi, and the maximum permissible absorption shall be eight (8) percent. Riser sections shall be reinforced with either one or two lines of steel, the total area per linear foot of which shall be not less than .0025 times the inside diameter in inches or .12 in.^{2}/linear foot minimum. Tapered sections, where required, shall be of the truncated cone design, having the same wall thickness and reinforcing as the cylindrical sections.

2.2.5 The Owner reserves the rights to choose either eccentric or flat slab tops at no additional charge.

2.2.6 Cored or Cast Arch or circular openings shall be provided in the manhole sections as required to receive lateral sewers or pipelines or drop pipes in drop manholes, as required. Manhole steps shall be of the type shown on the Contract Drawings and shall be arranged and spaced as shown on the Contract Drawings.

PART 3 - EXECUTION

3.1 CONSTRUCTION:

3.1.1 Precast concrete pipe sections shall fit together readily, and all joints shall have all voids filled with cement mortar applied, both inside and outside the manhole. The top of the uppermost ring or truncated cone shall be formed to receive the manhole frame and cover, or other appurtenant casting.

3.1.2 The bench walls of standard and drop manholes shall be constructed of Class "C" concrete as shown on the drawings. The top of the bench wall shall have an increasing slope away from the channel. All channels shall be constructed to conform to the invert of the pipe and permit a smooth and uninterrupted flow through the manhole.

3.1.3 Where masonry courses are required to bring manhole frames to grade, top ring or cone sections shall have a flat surface formed to receive the first course of brick masonry.

3.1.4 Ground water test pipes shall be provided in each manhole if required on the Contract Drawings. The test pipes shall be 3/4" diameter galvanized steel with hot dip bituminous coating, nine inches long with a ninety degree elbow and threaded cap. The test pipe shall be set at an elevation of two inches above the bench wall and eight inches from the center line of the manhole steps. The pipes shall be grouted into the precast manhole wall with a non-shrink grout.

3.1.5 Manholes upon completion shall be watertight.

3.2 PIPE TO MANHOLE CONNECTIONS:

3.2.1 All other pipe materials shall be connected to manholes by means of a resilient and watertight flexible connection.

3.2.2 Resilient connectors shall conform to ASTM C923.

3.2.3 Where resilient connectors are installed, concrete used to form the manhole channel shall not be permitted under the pipe protruding through the manhole wall. Oakum or styrofoam shall fill the void under the protruding pipe to maintain the connection flexibility. The concrete channel shall meet the pipe invert as shown.

3.3 COMPLETION:

3.3.1 Manholes, in all cases, shall be completely constructed and fitted with their frames and covers as the work progresses and as each structure is reached. After the final inspection and acceptance of the pipeline or other facility served by the manholes, the Contractor shall, unless otherwise ordered, seal all covers with an approved fibrated mastic compound.

3.3.2 The Contractor shall, at his own cost and expense, reset any and all manhole frames and covers, as required, to meet the finished grade of pavements replaced by the Contractor as specified herein.

3.4 ALTERNATIVE CONSTRUCTION:

3.4.1 Manholes may be constructed of alternative materials provided such manholes are submitted to the Engineer for approval prior to construction.

3.5 MANHOLE VENTS:

3.5.1 Manholes with waterproof frames and covers shall be provided gas vents when specified, shown or as directed by the Engineer. Payment for gas vents shall be included in the unit price for waterproof frames and covers.

3.6 CASTINGS:

3.6.1 Manhole frames and covers, grates, inlets, steps and other castings shall be in accordance with ASTM Des: A48, Grade 30. They shall be equal in quality and at least equal in weight to those referred to on the Plans by the manufacturer's catalog numbers. When specified or shown, manhole covers shall have the name of the Owner in addition to the word "Sanitary Sewer" or other appropriate designation cast as shown on the Plans. Manhole frames and covers shall be supplied with eccentric cam lug locking devices, when specified or shown. All manholes, grates, manhole frames and grate frames shall be machined to provide non-rocking covers or grates.

3.7 PAINTING AND WATERPROOFING:

3.7.1 All castings shall be thoroughly cleaned and free from rust. All manholes shall be waterproofed on the outside with two coats of bituminous coal tar coating as manufactured by Koppers "Bitumastic Super Service Black", Mobil "Hi-Build Bituminous Coating" or equal.

3.8 LEAKAGE TEST:

3.8.1 All manholes shall be tested for leakage by filling the structures with water and observing the drop in the water surface elevation for a period of 24 hours.

3.8.2 Allowable leakage per 24 hour shall not exceed 0.3 gallons per foot of diameter per foot of depth.

PART 4 - MEASUREMENT & PAYMENT

4.1 MEASUREMENT - STANDARD MANHOLES

4.1.1 Measurement for which payment will be made for Standard Manholes shall be the total vertical feet from the invert of the lowest sewer to the underside of the Manhole Frame.

4.2 PAYMENT - STANDARD MANHOLES

4.2.1 For Standard Manholes, not included in other unit or lump sum price items, payment for Standard Manholes will be made at the applicable price stated in the Bid and shall include the furnishing and placing of all concrete bases and sections, concrete, pipe to manhole connections, metal reinforcement, ground water test pipe when shown or specified, brick masonry, manhole steps, pipe stubs, stoppers and specials, and all work and materials, including excavation stipulated or implied incidental to completing the Standard Manholes in accordance with the drawings and specifications, except that an additional payment will be made for manhole frames and covers.

4.3 MEASUREMENT - MANHOLE FRAMES & COVERS

4.3.1 The quantity of Manholes Frames & Covers measured for payment will be the actual number of Manhole Frames & Covers - standard, locking or waterproof placed and incorporated in the work in accordance with the Plans and/or as directed.

SECTION 02601

MANHOLES, MANHOLE FRAMES & COVERS

4.4 PAYMENT - MANHOLE FRAMES & COVERS

4.4.1 For Manhole Frames & Covers, standard, locking or waterproof, completed in place, not included in other unit or lump sum price items, payment for Manhole Frames & Covers will be made at the applicable price stated in the Bid.

END OF SECTION

SECTION 02616

DUCTILE IRON PIPE & FITTINGS

PART 1 - GENERAL

1.1 DESCRIPTION:

1.1.1 Under this Section, the Contractor shall furnish all labor, materials and equipment for Ductile Iron Pipe & Fittings as shown on the Plans, as specified, and/or directed.

1.1.2 Ductile Iron Pipe and Fittings shall include, ductile iron pipe and standard fittings with flanged, push-on or mechanical joints.

1.1.3 Related Work Specified Elsewhere:

- Clearing
- Excavation
- Lining and Special Backfill
- Topsoil
- Seeding

1.2 APPLICABLE CODES, STANDARDS AND SPECIFICATIONS:

1.2.1 Ductile Iron Pipe and Fittings shall comply with the latest edition of the applicable following standards:

a. American National Standards Institute (ANSI).
b. American Water Works Association (AWWA).

Item	ANSI/AWWA
Mechanical Joint Pipe	A21.11/C111 A21.51/C151
Mechanical Joint Fittings	A21.10/C110
Compact Fittings	A21.53/C153
Push-On Joint Pipe	A21.11/C111 A21.51/C151

Item	ANSI/AWWA
Push-On Joint Fittings	A21.10/C110
Flanged Pipe	A21.15/C115

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DUCTILE IRON PIPE & FITTINGS

	A21.51/C151
Flanged Fittings	A21.10/C110
Threaded Flanges	A21.15/C115
Cement - Mortar Lining	A21.4/C104
Installation of Ductile Iron Water Mains and Their Appurtenances	AWWA C600
Polyethylene Encasement for Ductile Iron Piping for Water and other Liquids	AWWA C105
Disinfecting Water Mains	AWWA C651

1.3 SUBMITTALS:

1.3.1 If requested by the Engineer, the manufacturer shall furnish a sworn statement that his ductile iron pipe and fittings meet the requirements set forth in the standards.

1.3.2 Pipe, fittings and joint details and catalog cuts with sufficient information to determine compliance with these Specifications.

PART 2 - PRODUCTS

2.1 QUALITY ASSURANCE:

2.1.1 All material will be inspected on delivery and immediately before being placed in the work, and such pipe or fittings as do not conform to the Specifications, will be rejected. The Contractor shall furnish all labor necessary for handling the material during inspection and shall remove all rejected items from the site of the work.

2.1.2 Defective pipe or fittings found after installation shall be removed and replaced by the Contractor at his own expense.

2.1.3 Each pipe or fitting shall have its true weight in pounds plainly marked on its exterior, and shall be weighed in the presence of the Engineer, if so required, on scales to be provided by the Contractor. Pipes and castings shall be at least the thickness required for the class shown, but may be thicker, if the Contractor prefers, subject to approval. Any pipe or casting whose weight shall be less by more than five (5) percent, than the standard weight required, may be rejected.

SECTION 02616

DUCTILE IRON PIPE & FITTINGS

2.2 MATERIAL:

2.2.1 All pipe to be furnished and installed in the work, except as otherwise specified, shall be Class 52 ductile iron cement-lined pipe. Compact ductile iron fittings shall be provided. All fittings shall be cement-lined ductile iron. Joints for all straight buried pipe shall be of the push-on self-centering, rubber-gasket type. Joints on buried fittings shall be of the mechanical joint type. Two metallic wedges, sufficient to assure electrical conductivity, shall be provided for each joint. Exposed pipe and fittings shall have flanged joints unless otherwise noted. Transition gaskets shall be provided as required at mechanical joint fittings and pipe ends when a pipe of material other than ductile iron is inserted into the mechanical joint.

2.2.2 All cement-lined ductile iron pipe shall conform in all respects to the most recent revisions of AWWA Specifications C104, C110, C110a, C111, C151 and C153. These Specifications cover ductile iron pipe, fittings, linings and joints. A double thickness cement lining shall be provided.

2.2.3 The pipe shall be made by a manufacturer experienced in producing pipe of the type, size and quality specified herein. The pipe manufacturer shall have produced pipe having a record of at least five years successful performance.

2.2.4 The nominal pipe laying length shall be, as much as practical, in full pipe lengths (18 feet minimum).

2.2.5 All ductile iron pipe and fittings shall be encased in polyethylene. The Contractor shall provide polyethylene encasement in accordance with AWWA C105. The polyethylene film shall be 8 mil, Class C tubes or sheets as required.

PART 3 - EXECUTION

3.1 INSTALLATION:

3.1.1 Proper implements, tools and facilities satisfactory to the Engineer shall be provided and used by the Contractor for the safe and convenient prosecution of the work.

3.1.2 All pipe and fittings shall be carefully handled by means of suitable equipment, in such a manner as to prevent damage to materials and protective coatings or linings. Under no circumstances shall materials be dropped or, in the case of the underground piping, dumped into the trench.

3.1.3 Pipe shall be laid on a prepared earth subgrade or special embedment as shown in the Contract Drawings, specified and directed. Selected material shall be put in the trench and tamped uniformly under the full length of pipe and up to the horizontal diameter of the pipe. Preparation of the subgrade, embedment of the pipe and backfilling shall be as specified in Section 02220. Blocking under pipe will not be used without specific approval of the Engineer.

3.1.4 Where bell and spigot pipe is utilized, the pipe shall be installed with the bell ends in the direction of laying. Except as otherwise specified, all pressure pipelines shall be laid on a flat bottom trench on a satisfactory foundation throughout the entire length. Bell holes may be dug to provide continuous support for the pipe.

3.1.5 No pipe shall be laid upon a foundation in which frost exists, nor at any time when the Engineer shall deem that there is a danger of the formation of ice, or the penetration of frost at the bottom of the excavation.

3.1.6 Where no depths, lines or grades are shown, specified or directed, the nominal depth of trench excavated shall be five (5'-0") feet. Otherwise pipe shall be laid to the lines and grades shown in the Contract Drawings, specified and directed.

3.1.7 Every precaution shall be taken to prevent foreign matter from entering the pipe while it is being placed in the line. During installation, no debris, tools, clothing or other materials shall be placed in the pipe.

3.1.8 At times when underground pipe laying is not in progress, the open ends of the pipe shall be closed by a watertight plug or other means approved by the Engineer.

3.2 CUTTING OF PIPE:

3.2.1 Cutting of pipe shall be done with pipe cutters, motor drive saws using abrasive disks, or with hand saws as required. Where machining is necessary for cut ends or for extending factory machining, it shall be done in accordance with the manufacturer's recommendations for the type of pipe and joint used.

3.2.2 The flame cutting of pipe by means of an oxyacetylene torch will not be allowed.

3.3 PIPE SUPPORTS AND JOINT RESTRAINTS:

3.3.1 Joints in interior and underground piping shall be restrained as shown or directed.

3.3.2 Restraining systems shall include Field Lok gaskets as manufactured by Griffin Pipe Products Co., or MJ restraining glands, lugs, clamps, threaded rods, rod couplings, nuts and washers as required. All units shall be constructed of corrosion resistant material.

3.3.3 Clamps shall be fabricated of not less than 1/2" x 2" barstock. Rods and bolts shall have a minimum diameter of 3/4" unless otherwise shown. Cor-ten bolts shall be used on all buried mechanical joints.

3.3.4 Structural members, pipe columns and concrete, where shown or indicated, shall also be used as means of pipe joint restraining.

3.3.5 Tie rods and nuts shall have a minimum yield strength of 70,000 psi.

3.3.6 Ferrous metal used in restraining systems for buried piping shall receive two coats of asphalt-based coating and shall be polyethylene encased in accordance with AWWA C105. Exposed systems shall be coated same as piping.

3.3.7 Pipe supports shall be as shown on the Contract Drawings.

3.4 ANCHORAGE:

3.4.1 Adequate blocking or anchorage, as shown on the Contract Drawings or as directed by the Engineer, shall be provided where abrupt changes in direction, steep slopes and dead ends occur.

3.5 MECHANICAL JOINTS:

3.5.1 Prior to assembly, the surfaces of the pipe which come into contact with the rubber gasket must be thoroughly wire brushed and wiped clean with clean rags to remove all loose rust and other foreign material. These surfaces must be clean before the joint is assembled. Just prior to slipping the gasket over the spigot end, the gasket and pipe surfaces shall be coated with an NSF approved lubricant.

3.5.2 The spigot must be centrally located in the bell, and the bolts must be tightened in such a manner that the gland is brought up toward the pipe flange evenly. Bolts must not be tightened excessively. If effective sealing is not attained with a tightening of the bolts by an average pull on the wrench, the joint shall be disassembled and reassembled after thorough cleaning.

3.5.3 Wherever it is necessary to deflect the pipe from a straight line, the maximum deflection for each joint shall not exceed 1°30' for 24" through 48" diameter pipe, 2°30' for 14" through 20" diameter pipe, 4° for 12" or smaller size pipe, or 80 percent of the manufacturer's recommendation, whichever is greater.

3.6 PUSH-ON JOINTS:

3.6.1 Push-on joints shall be assembled in accordance with the manufacturer's recommendation. Joint areas and gaskets shall be cleaned and lubricated as provided for in the mechanical joint assembly paragraphs above. Where no maximum joint deflection is shown or specified, the deflection for each joint shall not exceed 1°30' for 42" and 48" diameter pipe, 2°30' for 14" through 36" diameter pipe, 4° for 12" or smaller size pipe, or 80% of the manufacturer's recommendation, whichever is greater.

3.7 FLANGED JOINTS:

3.7.1 Flanged joints shall conform to AWWA Specification C115. They shall be firmly bolted with through, stud or tap bolts.

3.7.2 Gaskets of the best quality sheet rubber packing or other approved material shall be used on all flanged joints.

3.8 FITTINGS:

3.8.1 All fittings shall be supported independently from the pipe in such a manner that no part of the weight of the fitting is held by the pipe unless otherwise shown on the Plans or directed by the Engineer.

3.8.2 Fittings and pipe within structures shall be placed to line and grade and properly supported before joints are made. The Contractor shall furnish all the necessary pipe supports, including stirrups, rods, clamps, hangers, pipe columns and piers, necessary to sustain the pipe and fittings in a firm and substantial manner to the lines and grades given.

3.9 PRESSURE AND LEAKAGE TESTING:

3.9.1 All pipelines carrying water shall be tested for strength and tightness after installation. All testing shall conform to AWWA C600, latest revision. All leaks at joint shall be corrected in a manner satisfactory to the Engineer, and any defective pipe shall be removed and replaced with sound pieces at the expense of the Contractor, and the line again tested.

3.9.2 Prior to testing, all dirt and foreign matter shall be removed by a thorough flushing of the newly laid pipeline. The flushing velocity shall be a minimum of 2.5 ft./sec. The Contractor shall assume that the rate of flow available from the existing water system is minimal, unless otherwise stated in the Information for Bidders and shall plan his flushing operation accordingly. The Contractor shall confer with the responsible person in charge of the municipal or private water system regarding notification of water customers before commencing the flushing operations. Contractor shall be responsible for the cost of water for this flushing and testing.

3.9.3 Test Pressure: Working pressure for this project shall be 150 pounds per square inch.

3.10 CHLORINATING, TESTING (CHEMICAL AND BACTERIOLOGICAL) AND FINAL FLUSHING:

3.10.1 Before the use of water is permitted from any portion of newly constructed waterline, and before said line shall be accepted, it shall be chlorinated, tested and flushed in the presence of and as directed by the Engineer. All aspects of disinfection, flushing and testing shall be in accordance with and conform to AWWA C651, latest revision, except as modified in this Section.

3.10.2 Prior to chlorination, the pipeline shall have been flushed, pressure tested and tested for leakage in accordance with Section 3.9.

3.10.3 Liquid chlorine or sodium hypochlorite shall be used for disinfection. Calcium hypochlorite and/or other granular or tablet types of disinfection shall not be acceptable. The treated water shall be retained in the pipe at least 24 hours unless otherwise directed by the Engineer. The chlorine residual shall not be less than 25 PPM at any point in the pipe at the end of the retention period.

3.10.4 The Contractor shall be responsible for the cost of water for chlorination and final flushing.

3.10.5 Chlorination and final flushing of water mains are to be fully coordinated with the Engineer.

3.10.6 Following chlorination, all treated water shall be thoroughly flushed from the new laid pipeline at its extremities until the replacement water throughout its length shall, upon test, both chemically and bacteriologically, be proved equal to the water quality served to the public from the existing water supply system, and approved by the Public Health Authority having jurisdiction. All such tests shall be performed by a New York State certified lab, and subject to the Engineer's approval. The cost of such tests shall be at the Contractor's expense. Sampling and testing protocol shall be in accordance with AWWA C651, latest revision or the Public Health Authority having jurisdiction, whichever is more stringent.

3.10.7 The Contractor shall not be allowed to discharge chlorinated water. The Contractor shall neutralize the chlorinated water used for the disinfection of the water main to a maximum residual of 0.5 ppm with one of the following chemicals listed in the following table, or the Contractor shall make provisions for the chlorinated water to be tanked away and disposed of.

POUNDS OF CHEMICALS REQUIRED TO NEUTRALIZE VARIOUS RESIDUAL CHLORINE CONCENTRATIONS IN 100,000 GALLONS OF WATER*

RESIDUAL CHLORINE CONCEN. mg/L	SULFUR DIOXIDE (SO_2)	SODIUM BISULFATE ($NaHSO_3$)	SODIUM SULFITE (Na_2SO_3)	SODIUM THIOSULFATE ($Na_2S_2O_3$$5H_2O$)
1	0.8	1.2	1.4	1.2
2	1.7	2.5	2.9	2.4
10	8.3	12.5	14.6	12.0
50	41.7	62.6	73.0	60.0

*Except for residual chlorine concentration, all amounts are in pounds.

SECTION 02616

DUCTILE IRON PIPE & FITTINGS

PART 4 - MEASUREMENT & PAYMENT

4.1 MEASUREMENT - DUCTILE IRON PIPE & FITTINGS

4.1.1 The quantity of Ductile Iron Pipe & Fittings for which payment will be made will be the actual number of linear feet of ductile iron pipe and fittings furnished, installed and incorporated in the work, trenching, pipe bedding, and backfill as well as all other items of work not included in other unit or lump sum price items, in accordance with the Drawings, Specifications and instructions.

4.2 PAYMENT - DUCTILE IRON PIPE & FITTINGS

4.2.1 For Ductile Iron Pipe & Fittings, not included in other unit or lump sum price items, payment for Ductile Iron Pipe & Fittings will be made at the applicable price stated in the Bid.

4.3 MEASUREMENT - POLYETHYLENE ENCASEMENT:

4.3.1 The quantity of Polyethylene Encasement for which payment will be made will be the actual number of linear feet of polyethylene encasement furnished, installed and incorporated in the work in accordance with the Drawings, Specifications and instructions.

4.4 PAYMENT - POLYETHYLENE ENCASEMENT:

4.4.1 For Polyethylene Encasement, not included in other unit or lump sum price items, payment for Polyethylene Encasement will be made at the applicable price stated in the Bid.

END OF SECTION

SECTION 02617

UNDERGROUND VALVES & VALVE BOXES

PART 1 - GENERAL

1.1 DESCRIPTION:

1.1.1 Under this Section, the Contractor shall furnish all labor, materials and equipment for Underground Valves & Valve Boxes as shown on the Plans, as specified, and/or directed.

PART 2 - PRODUCTS

2.1 GATE VALVES:

2.1.1 All gate valves to be installed shall be of the non-rising stem, resilient seated type. Resilient seated gate valves for underground use shall be furnished in accordance with the requirements of the latest revision of AWWA C509, but shall meet the specific requirements and exceptions to the aforementioned specifications, which follow:

a. Resilient seated gate valves shall have mechanical joint end with accessories.

b. Resilient seated gate valves shall open by turning clockwise. The body shall be ductile or cast iron. The shaft shall be made of bronze with "O" ring seals and shall be lubricated and ready for use.

c. Operating nuts shall be 2 inches square and shall be loosely fitted on the stems.

d. All resilient seated gate valves shall be noted for 250 psi working pressure and 400 psi test pressure.

e. All iron work, after being thoroughly cleaned, shall be coated with asphaltum varnish.

2.1.2 All resilient seated gate valves shall be Mueller, Saratoga standard.

2.2 INSERTION VALVE

2.2.1 INSERTION VALVE TAPPING SLEEVE

2.2.1.1 General: The sleeve is fabricated to assure a 360° seal around the pipe under working pressures up to 150 psi. (Test pressure; 225 psi.) It is designed to accommodate the

equipment and fixtures necessary to drill and ream the pipe and install the insertion valve without any interruption in water service.

2.2.1.2 Materials: The sleeve is made of ASTM A-36 steel, epoxy coated to 10 – 12 mils.

2.2.1.3 Flange: A special flange is used that mates with the valve installation equipment and insertion valve.

2.2.1.4 Neck: The neck is manufactured to precision tolerances that assure proper alignment, support, and sealing of the valve insert.

2.2.1.5 Bolts and Nuts: High strength low alloy steel (Corten) bolts and nuts meeting AWWA standard C-111.

2.2.1.6 Gaskets: All gaskets are made of Styrene Butadiene Rubber (SBR) compounded for potable water service in accordance with ASTM D2000 3BA715. The gaskets provide a positive 360° seal on the pipe and assure a tight, durable, and resilient seal at the pipe sleeve – valve insert junction.

2.2.1.7 Coating: The sleeve is lined and coated with fusion bonded epoxy. Epoxy meets the requirements of AWWA-C213.

2.2.1.8 Armors: Heavy gauge type 304 stainless steel armor plates are used to bridge the gap between the sleeve halves.

2.2.9 Lugs: lugs on the sleeve are configured to properly align the sleeve halves during installation, provide a bolting surface, and assure a 360° seal. The lugs are designed to prevent excessive stress on the pipe.

2.2.2 INSERTION VALVE ASSEMBLY

2.2.1 General: The valve assembly, when installed in a valve sleeve, performs as a water control device with an effective shutoff of the flow of water. The valve is installed in the open position, under water pressure without any interruption of water service. The valve gives a full unobstructed full flow waterway after installation.

2.2.2.2 Insert: The insert consists of a ductile iron casting coated with SBR rubber compounded for water service with a durometer of 55 Shore A. The insert seals on the inside diameter of the valve sleeve neck and the lower half of the water main.

2.2.2.3 Valve Stem: The stem and nut assembly are in accordance with AWWA C-500-80, section 3.12.

2.2.2.4 Flange: A special flange, made of ASTM A-36 steel is used that holds the valve assembly together and acts to seal against the valve sleeve flange.

2.2.2.5 Gasket: The valve flange gasket is made of SBR rubber, compounded for water service in accordance with ASTM D2000 3BA715, with a durometer of 70 Shore A. The gasket acts as the sealing interface between the valve flange and the sleeve flange.

2.2.2.6 Bolts and Nuts: Type 304 stainless steel for corrosion protection.

2.2.2.7 Operating nuts shall be 2 inches square.

2.2.2.8 Insertion valve shall open by turning clockwise.

2.2.2.9 Insertion valve shall be a QuikValve as manufactured by Romac Industries, or approved equal.

2.3 VALVE BOXES:

2.3.1 Valve boxes shall be provided at all underground gate valves installed under this Contract. Valve boxes shall be 5-1/4" shaft size and be the two (2) piece telescopic type. The valve box length shall be as required. The castings shall be made of light grey cast iron, true to pattern and free from flaw. They shall be thoroughly coated with two coats of asphaltum varnish. Each complete valve box shall weigh about 110 pounds. Valve box shall be Bibby-Ste-Croix, or approved equal. The valve boxes shall conform to the following requirements:

a. The valve box top section shall be 17" long.

b. The valve box water cover shall have the word "Water" cast in the water cover, and an arrow with the word "Open". The arrow shall point in a clockwise direction.

c. The valve box bottom section shall be 29" long and shall be able to interlock into a round or an oval base.

d. The valve box base shall be round or oval, sized to fit 8" valves.

e. The valve box extension shall be telescopic type and shall fit and be made of the same materials as the above described valve boxes. The minimum depth of cover shall be 5.0'. Valve box extensions may be required where depth of cover exceeds 5.0'.

2.4 POLYETHYLENE ENCASEMENT:

2.4.1 All valves shall be encased in polyethylene. The Contractor shall provide polyethylene encasement in accordance with AWWA C105. The polyethylene film shall be 8 mil, Class C tubes or sheets as required. No separate payment shall be made for polyethylene encasement.

PART 3 - EXECUTION

3.1 WORK INCLUDED:

3.1.1 The work under this Section shall include, but not necessarily be limited to, the following:

- Excavation, Backfill and Clean-up
- Furnish and Install Underground Valves
- Furnish and Install Valve Boxes

3.2 INSTALLATION:

3.2.1 Each valve shall be installed in accordance with the manufacturers' recommendations or as directed.

3.2.2 Valves shall be set plumb and jointed in the same manner as that specified for jointing mechanical joint pipe. Valve boxes shall be firmly supported and shall be kept centered and plumb over the operating nut of the valve. All valve box covers shall be flush with pavement or 1" reveal in turf areas, or as directed by the Engineer.

SECTION 02617

UNDERGROUND VALVES & VALVE BOXES

PART 4 - MEASUREMENT & PAYMENT

4.1 MEASUREMENT - UNDERGROUND VALVES & VALVE BOXES

4.1.1 The quantity of Underground Valves & Valve Boxes measured for payment shall be the actual number of each furnished and installed complete, including valve, valve boxes, excavation and backfill, in accordance with the Contract Drawings and/or as ordered.

4.2 MEASUREMENT – INSERTION VALVES & VALVE BOXES

4.2.1 The quantity of Insertion Valves & Valve Boxes measured for payment shall be the actual number of each furnished and installed complete, including valve, valve boxes, excavation, restoration and backfill, in accordance with the Contract Drawings and/or as ordered.

4.3 PAYMENT - UNDERGROUND VALVES & VALVE BOXES

4.3.1 For Underground Valves & Valve Boxes, not included in other unit or lump sum price items, payment for Underground Valves & Valve Boxes will be made at the applicable price stated in the Bid.

4.4 PAYMENT – INSERTION VALVES & VALVE BOXES

4.4.1 For Insertion Valves & Valve Boxes, not included in other unit or lump sum price items, payment for Insertion Valves & Valve Boxes will be made at the applicable price stated in the Bid.

END OF SECTION

SECTION 02722

NON-PRESSURE SEWERS & SPECIALS

PART 1 - GENERAL

1.1 DESCRIPTION:

1.1.1 Under this Section, the Contractor shall furnish all labor, materials and equipment for Non-Pressure Sewers & Specials as shown on the Plans, as specified, and/or directed.

PART 2 - PRODUCTS

2.1 PIPE MATERIALS:

2.1.1 Except as otherwise specified, all pipe shall conform to the latest revisions to the following American Society for Testing and Materials (ASTM), American Water Works Association (AWWA), American Standards Association (ASA) and other specifications and designations:

Specifications		Minimum Length
Vitrified Clay Pipe - Extra and Standard Strength	ASTM Des: C700	3 feet
Vitrified Clay Pipe - National Clay Pipe Institute	Class 3300 ER 3300-67	3 feet
Cast Iron Pipe	ASA Spec. 21	12 feet
Cast Iron Soil Pipe - Extra Heavy	ASTM Des: A74	5 feet
Concrete Pipe - Unreinforced	ASTM Des: C14	4 feet

Specifications		Minimum Length
Concrete Pipe - Reinforced	ASTM Des: C76	8 feet

Asbestos-Cement Pipe	ASTM Des: C428	10 feet
Corrugated Metal Pipe	Federal Spec. QQ-C-806a	12 feet
Acrylonitrile-Butadiene-Styrene (ABS)-solid wall	ASTM Spec: D2751	12.5 feet
Acrylonitrile-Butadiene-Styrene (ABS)-composite wall	ASTM Spec: D2680	12.5 feet
Polyvinyl Chloride (PVC) 15" diameter	ASTM Spec: D3034	12.5 feet
Polyvinyl Chloride (PVC) greater than 15"	ASTM Spec. F679	20.0 feet

2.1.2 All PVC pipe shall be a minimum of SDR 35 or equivalent pipe stiffness.

2.2 TESTING:

2.2.1 All shipments of pipe shall be tested at the Contractor's expense in accordance with the provisions for testing in the applicable specifications listed above. Testing shall be by an approved testing laboratory. Specimens up to 0.5 percent of the number of each size of pipe furnished shall be tested, except that in no case shall less than two specimens be tested.

2.2.2 The Engineer may accept, in lieu of the above testing, certified manufacturer's test results.

2.2.3 The laboratory making such tests shall furnish the Engineer with three certified copies of these tests. No pipe shall be laid before test reports are approved by the Engineer.

2.3 JOINTS FOR POLYVINYL CHLORIDE PIPE:

2.3.1 Joints for polyvinyl chloride pipe shall have flexible elastomeric seals conforming to ASTM Specification D3212.

PART 3 - EXECUTION

3.1 INSPECTION OF PIPE:

3.1.1 Before pipe is lowered into the trench, the Engineer will inspect each section of pipe for roundness, dimension tolerance and physical defects. All pipe not meeting the requirements of the applicable specifications will be rejected.

3.1.2 All rejected pipe and specials shall be removed from the site and shall be replaced with pipe meeting the specifications requirements, by the Contractor at his own expense.

3.2 LOCATION AND GRADE OF SEWER LINES:

3.2.1 Sewer lines and appurtenant structures shall be located as shown on the Plans and as staked or otherwise fixed by the Engineer in accordance with the provisions of the General Requirements. The grade and alignment of each sewer shall then be determined and maintained by the use of a line parallel to the grade and line of the sewer, this line to be supported above the ground surface on batter boards spaced not to exceed 40 feet apart and rigidly anchored to, and supported by, substantial posts driven into the ground on each side of the trench. Not less than three batter boards shall be installed and maintained in proper position at all times as a check on the accuracy of the grade line. The Engineer shall be immediately notified of any misalignment of batter boards set in accordance with established cuts or elevations. The elevations of batter boards and the alignment of the grade line shall be determined from the elevations and alignment of offset points located alongside the trench, except where established directly by means of surveying instruments.

3.2.2 Other methods for establishing lines and grades may be used with prior approval of the Engineer.

3.3 SEWER PIPE INSTALLATION:

3.3.1 Special care shall be taken to lay sewer pipe to exact line and grade on a prepared earth subgrade or on special embedment, as shown, specified or directed. The pipe shall be graded and embedded as provided in the Section headed "Excavation".

3.3.2 Pipe of ABS and PVC shall be considered flexible, thermoplastic pipe and shall be installed in accordance with ASTM D2321. Pipe deflection, expressed as a percentage of the undeflected inside diameter, shall not exceed five percent (5%) after backfilling and compaction is complete. Testing to show that the installed pipe deflection is less than 5% shall be by pulling

a metal "cage" type gauge or approved equal through the pipe being tested. The Contractor shall submit the gauge to the Engineer for examination prior to deflection testing. Deflection tests shall be conducted at the Contractor's expense as directed by the Engineer. Installed pipe with deflection equal to or greater than 5% shall be excavated, removed and replaced at the Contractor's expense.

3.3.3 Blocking will not be permitted under pipe, except where the pipe is to be laid with concrete embedment.

3.3.4 Where the pipe is to be laid with concrete embedment or encasement, the pipe shall be laid to grade and supported on approved concrete or timber blocks near each end. The pipe shall be securely blocked and braced to prevent movement, and the concrete shall be poured on one side until it has risen above the invert on the other side, after which the remainder of the concrete shall be deposited on both sides. Where forms are required, they shall be set prior to the laying of pipe, and shall not be removed until the concrete has thoroughly set. Where the pipe is laid on a concrete cradle, the trench shall not be backfilled until the concrete has thoroughly set.

3.3.5 No pipe shall be laid upon a foundation in which frost exists; nor at any time when the Engineer shall deem that there is danger of the formation of ice or the penetration of frost at the bottom of the excavation.

3.3.6 When jointed in the trench, the pipe shall form a true and smooth line of sewer. Pipe shall not be trimmed except for closures, and pipe not making a good fit shall be removed. Where slight defects occur and the use of the pipe is approved by the Engineer, defects shall be placed in the top of the sewer. The interior surfaces of all pipe shall be clean when installed, and shall be kept clean until final acceptance.

3.3.7 Pipe laying shall begin at the low end of a run and proceed upgrade, and all pipe shall be laid with the bells or sockets uphill. The pipe shall be fitted together and matched so that there shall be no shoulder or unevenness along the inside bottom half of the pipe, and so that alignment and slope are correct. No pipe shall be laid until the preceding length has been completely aligned and secured.

3.3.8 The installed pipe shall not be disturbed in any manner, and its grade and alignment shall be maintained, during pipe jointing, pipe embedment, and backfilling operations, by partial embedment back of the bells.

3.3.9 Temporary bulkheads shall be placed in all open ends of sewer lines wherever pipe laying is stopped for more than eight (8) hours. The bulkheads shall be designed to prevent the entrance of dirt or debris and shall not be removed until pipe laying is resumed.

3.4 WYE OR TEE BRANCHES:

3.4.1 Wye or tee branches shall be located at the points designated by the Engineer. Wye branches shall be so installed that the lower lip of the branch is not more than two (2) inches below the outside top of the pipe. Tees shall be installed with the branch vertical. After installation, wye or tee branches shall not be covered with backfill until determination and record has been made by the Engineer of the location of each with reference to the nearest manhole downstream therefrom, and the direction in which the wye faces.

3.5 SERVICE SEWERS:

3.5.1 A service sewer extends from a wye, tee, manhole or other appurtenant structure to the end left for the sewer user.

3.5.2 Service sewers shall not be installed in the pipe trench as vertical risers except as approved in writing by the Engineer, but shall be laid on a slope not exceeding two feet vertical to one foot horizontal, and not less than 1/4-inch per foot, cut back into the trench bank in such a manner that the service sewer shall have a solid bearing on undisturbed earth as stipulated for pipe. The service sewer shall make such a horizontal angle with the sewer line that a proper connection with the wye or tee branch or slant is obtained without trimming the pipe and with no danger of jointing material being forced into the sewer. The first length of pipe shall not make a total angle with the branch or slant greater than four inches in two feet, the wye branch or slant shall be installed in such a manner as to fit the alignment of the branch service line as closely as possible.

3.5.3 The end of each service sewer shall be marked with a 2-inch x 4-inch timber extending from the invert of the pipe vertically to one (1) foot above the ground surface, or as directed. All such markers shall be securely anchored and maintained in a proper vertical position until backfilling has been completed. The top end of all such markers shall indicate the depth to invert and shall be protected until the Engineer has finished the "Completed Construction Drawings". Each service sewer shall be closed and so secured by means of suitable stoppers or end caps as to prevent leaking.

3.5.4 If specified in the Information for Bidders or shown on the drawings, the Contractor shall install in lieu of a 2x4 marker, an extra heavy cast iron cleanout, with wye, riser, cleanout fitting with threaded plug and end cap or an extra heavy cast iron cleanout and "P" trap with wye, risers, cleanout fitting with threaded plug, vent cap and end cap, as shown or specified.

3.5.5 Where vertical risers are specified or ordered by the Engineer, riser pipes shall be supported to prevent an excessive load being applied to the main sewer pipe, and encased in Class "C" concrete with a minimum thickness of six inches, as shown on the Plans, specified or directed by the Engineer.

3.6 WATER MAIN CROSSINGS:

3.6.1 When a rigid pipe sewer crosses an existing water main at a vertical separation of less than 18 inches, the sewer shall be encased in concrete for a distance of 10 feet either side of the crossing. If the vertical separation at the crossing is less than 12 inches, the water main must also be encased in concrete. The concrete encasement shall be as shown on the Contract Drawings. The Contractor may substitute mechanical-joint ductile iron pipe for concrete encasement. Payment for all work and materials required to complete each crossing shall be deemed included in the various unit prices and lump sums of the Bid.

3.7 LEAKAGE TESTS:

3.7.1 All sewers shall be tested for leakage prior to making connections with other sewers, pipes or drains unless otherwise permitted by the Engineer.

3.7.2 The initial 100 feet of sewer constructed shall be tested for leakage prior to backfilling before the Contractor will be allowed to continue laying additional sewer pipe. Other intermediate leakage tests during construction shall be made as required by the Engineer. Upon completion of the work of any sewer, it shall be tested for water-tightness and shall meet the requirements set forth below before final acceptance of the work of the Contract.

3.7.3 For infiltration or exfiltration water leakage tests, the allowable leakage per 24 hours shall not exceed 125 gallons per inch of diameter per mile of sewer.

3.7.4 If specified or shown, groundwater level measuring pipes will be installed at manholes. The groundwater level shall be measured prior to leakage testing. If the groundwater level is at least two feet above the highest section of the work being tested, infiltration methods of measurement shall be used. If there is insufficient groundwater head to perform infiltration testing, exfiltration tests will be made by maintaining a minimum of 2 feet head of water in the

section being tested. The rate of exfiltration will be calculated from the rate of water level drop in the upstream manhole.

3.7.5 All localized or spurting leaks of any volume detected in sewers or in floor or walls of appurtenant structures shall be permanently stopped. Should any leaks, defective joints or defective construction be found, they shall be promptly corrected, removed and/or replaced, in a satisfactory manner at the Contractor's expense.

3.7.6 Low pressure air tests may be used, upon the Engineer's approval, in lieu of infiltration or exfiltration water leakage tests. Such tests shall be made in accordance with ASTM C828-76T, Low Pressure Air Test of Vitrified Clay Pipe. The same general procedure may be used for any other sanitary sewer pipe material and is not limited to a maximum diameter of 12 inches. The Contractor shall perform corroborative testing under the Engineer's supervision.

3.7.7 Corroborative testing shall compare low pressure air test data versus infiltration or exfiltration water leakage test data for a minimum of three sections of sewer for each pipe size, material or conditions of installation.

3.8 FINAL INSPECTION:

3.8.1 Each section of sewer, between each pair of manholes will be inspected by the Engineer before final acceptance. Such inspection will be visual and by traversing the inside of the pipe or by looking through the sewer from manhole to manhole with the aid of reflected sunlight or by the use of an electric light, when the sewer is too small to be entered. The pipe shall be true to both line and grade, shall show no leaks, shall show no obstruction to flow, shall have no projections of connecting pipe into the sewer, shall be free from cracks and protruding joint materials, and shall contain no deposits of sand, dirt or other materials which will in any way reduce the full cross sectional area. All wall joints in manholes, junction chambers, pumping stations and elsewhere shall be tight. All finished work shall be neat in appearance and of first class workmanship. Proper stoppers and bulkheads must be in place, where required.

PART 4 - MEASUREMENT & PAYMENT

4.1 MEASUREMENT - NON-PRESSURE SEWERS:

4.1.1 The quantity of non-pressure sewer pipe furnished and installed, measured for payment will be the number of linear feet of straight pipe incorporated in the work, in accordance with the plans and orders, measured along the center line of the finished sewer less the space occupied by

specials. No deduction will be made for the space occupied by standard or drop manholes. For all structures, measurement will be to the outside face of the structure. For all service sewers, measurement will be to the face of the wye or tee service spigot less the space occupied by specials. Each special shall be considered as two feet in length in computing the deduction from straight pipe as specified above.

4.1.1.1 All wyes, tees, branches, elbows, bends, reducers and increasers will be considered specials.

4.2 PAYMENT - NON-PRESSURE SEWERS:

4.2.1 For Non-Pressure Sewers, complete in place, not included in other unit or lump sum price items, payment for Non-Pressure Sewers will be made at the applicable price stated in the Bid.

4.3 MEASUREMENT - SPECIALS:

4.3.1 The quantity of pipe specials measured for payment will be the actual number of specials placed and incorporated in the work in accordance with the Plans or orders. All wyes, tees, branches, elbows, bends, reducers and increasers will be considered specials. All adapters used for transitioning from PVC collector sewer to ductile iron service sewer including donut-type or flexible coupling-type adapters shall be paid for as part of the special.

4.4 PAYMENT - SPECIALS:

4.4.1 For Specials, not included in other unit or lump sum price items, payment for Specials will be made at the applicable price stated in the Bid.

4.5 MEASUREMENT - SERVICE SEWER CLEANOUTS:

4.5.1 The quantity of Service Sewer Cleanouts measured for payment will be the actual number of Service Sewer Cleanouts placed and incorporated in the work in accordance with the Plans or orders, and shall include connection to the service sewer, wye, riser, cap and end cap as shown or specified.

4.6 PAYMENT - SERVICE SEWER CLEANOUTS:

4.6.1 For Service Sewer Cleanouts, not included in other unit or lump sum price items, payment for Service Sewer Cleanouts will be made at the applicable price stated in the Bid.

4.7 MEASUREMENT - SERVICE SEWER CLEANOUTS & TRAPS:

4.7.1 The quantity of Service Sewer Cleanouts and Traps measured for payment will be the actual number of Service Sewer Cleanouts and Traps placed and incorporated in the work in accordance with the Plans or orders, and shall include connection to the service sewer, wye, risers, cleanout fitting with threaded plug, vent cap, end cap and "P" trap as shown or specified.

4.8 PAYMENT - SERVICE SEWER CLEANOUTS & TRAPS:

4.8.1 For Service Sewer Cleanouts & Traps, not included in other unit or lump sum price items, payment for Service Sewer Cleanouts & Traps will be made at the applicable price stated in the Bid.

END OF SECTION

SECTION 02999

TEMPORARY WATER SERVICE

PART 1 - GENERAL:

1.1 DESCRIPTION

1.1.1 Under this Item, the Contractor shall furnish all labor, materials and equipment for the temporary water service as specified on the Plans and/or established by the Engineer and Owner. The Contractor shall provide a complete, above ground or shallow bury, temporary water service by-pass system such that all customers within the project limits shall have uninterrupted water supply service.

PART 2 - PRODUCTS

2.1 The 2" by-pass main and 3/4" services shall be constructed of Polyvinyl Chloride (PVC) pipe and shall comply with the requirements of ASTM D2241 and NSF-14. All materials shall also conform to AWWA and DOH standards.

PART 3 – EXECUTION

3.1 The Contractor shall submit plans detailing the proposed temporary water service by-pass system to the Owner for review.

3.2 The temporary water supply system shall be disinfected and tested to ensure compliance to all AWWA and DOH standards prior to connecting it to residents and businesses for use.

3.3 Any damage to the temporary water supply system, including but not limited to, damage due to vandalism, freezing, accidental damage, etc. shall be replaced immediately by the Contractor at no additional cost to the Owner.

PART 4 - MEASUREMENT & PAYMENT

4.1 MEASUREMENT – TEMPORARY WATER SERVICE

4.1.1 Measurement for Temporary Water Service shall include the cost of all materials, equipment, labor, submittals and testing for the work indicated in this Section.

SECTION 02999

TEMPORARY WATER SERVICE

4.2 PAYMENT – TEMPORARY WATER SERVICE

4.2.1 For Temporary Water Service, not included in other unit or lump sum price items, payment for Temporary Water Service will be made at the applicable price stated in the Bid.

END OF SECTION

SECTION 03302

CAST-IN-PLACE CONCRETE (MINOR CONSTRUCTION)

PART 1 - GENERAL

1.1 DESCRIPTION:

1.1.1 Under this Section, the Contractor shall furnish all labor, materials and equipment for plain and reinforced Cast-In-Place Concrete (Minor Construction) work including accessory items of work herein described, as shown on the Plans, as specified, and/or directed.

1.2 APPLICABLE SPECIFICATIONS, CODES AND STANDARDS:

1.2.1 Reference to standard specifications for the following organizations is intended to specify minimum standards for quality of materials and performance of workmanship, and for standard test methods.

a. American Society for Testing and Materials (ASTM) Latest Edition.

b. American Concrete Institute (ACI) Standards, Latest Edition.

c. American Welding Society, Inc. (AWS) Publications Latest Edition.

d. Standard Specifications - Construction and Materials, New York State Department of Transportation, Latest Edition, including Addenda thereto.

PART 2 - PRODUCTS

2.1 MATERIALS:

2.1.1 All materials shown, specified or required to be incorporated in cast-in-place concrete shall be of finest quality, and shall be delivered, stored and handled so as to prevent damage.

2.1.2 Portland Cement shall be a standard brand in compliance with ASTM C150 Type I. Only one brand shall be used for exposed work. Generally, Type I cement shall be used; however, Types II or III may be employed with the approval of the Engineer or if shown, or specified.

2.1.3 Fine Aggregates shall be clean, sharp, natural sand, free from loam, clay, organic impurities or frozen materials and shall conform to ASTM C33 in all respects. Sand shall be tested for impurities in accordance with ASTM C40.

2.1.4 Coarse Aggregates shall consist of strong, clean, crushed limestone or crushed gravel, free from harmful material and meeting all of the requirements of ASTM C33. Coarse aggregate shall also comply with New York State Department of Transportation Material Designation 703-02. Crushed limestone and crushed gravel shall meet the Physical Requirements (Testing) Designation 703-0201 and 703-0202, respectively.

2.1.5 Water used in mixing concrete shall be clean and free from all acid, alkali or organic matter and shall be obtained from a public water supply unless specifically permitted otherwise by the Engineer.

2.1.6 Ready Mix Concrete shall comply with ASTM Specification C94, this Specification, and used subject to the Engineer's approval.

2.1.7 Admixtures, where shown or specified, shall be as follows:

a. Air entraining agent shall be "Daravair" or "Darex AEA" as manufactured by W.R. Grace Co., or Master Builder's "MBVR", or equal.

b. Water reducing agent shall be Sika "Plastiment", Master Builder's "Pozzolith", W.R. Grace's "WRDA", or equal.

c. High range water reducers or superplasticizers shall be Sika "Sikament-FF", W.R. Grace's "Daracem-100" or "WRDA-19", or equal.

2.1.8 Bonding Agent, where shown or specified, shall be "Dural 104" bonding compound manufactured by Dural International Corporation, "Sikadur 32 Hi Mod" by Sika Corporation, or equal.

2.1.9 Forms shall be wood, metal, or other approved materials as follows:

a. Plywood shall be Commercial Standard Douglas Fir, moisture resistant, concrete form plywood, at least 5-ply 5/8" thick.

b. Metal forms shall be as approved, and must produce surfaces equal to those specified for wood forms.

c. Form oil shall be an approved non-staining mineral oil, such as "Duogaurd II" by W.R. Meadows, or equal.

d. Form ties shall be of approved design, adjustable length and free of devices that will leave hole or depression larger than 7/8" diameter. When forms are removed no metal shall be left within 1" of finished surface.

2.1.10 Premolded Filler, where shown or specified, shall be premolded, resilient, non-extruding type, 1/2-inch thick unless shown otherwise, full depth of concrete section as manufactured by Celotex Corporation, "Fibre Expansion Joint Filler" by W.R. Meadows, or equal.

2.1.10.1 Sample of the premolded filler proposed to be used shall be submitted to the Engineer for approval.

2.1.11 Joint Sealant, where shown or specified, shall be elastomeric polyurethane sealant material, black in unexposed locations, and grey in exposed locations, and have balanced properties of elongation recovery and tensile strength, and shall be Sonneborn "Sonolastic NP1", Sika "Sikaflex 1A", or equal.

2.1.12 Protective Covering for concrete finish slabs, where shown or specified, shall be "Orange Label Sisalkraft", Polyethylene Film as manufactured by Fortifiber Corp., or equal.

2.1.13 Non-Shrink Grout, where shown or specified, shall be non-metallic, natural aggregate such as "Masterflow" as manufactured by Master Builders, "SikaGrout 212" as manufactured by Sika, or approved equal.

2.1.13.1 Non-Shrink grout shall be used under structural steel column baseplates and all equipment baseplates. All work shall be done in strict accordance with the manufacturer's recommendations. At the request of the Engineer, the manufacturer's representative shall be called to the job site for consultation regarding detailed use of the grout.

2.1.14 Liquid Hardener, where shown or specified, shall be "Lapidolith" as manufactured by Sonneborn, "Emery Top" as manufactured by L&M Construction Chemicals, Inc., or equal, and shall be compatible with later finishes.

2.1.15 Curing Compound shall be acrylic based "Kure-N-Seal" as manufactured by Sonneborn, acrylic based "CS-309", or water based "VOCOMP-20" as manufactured by W.R. Meadows, or equal.

2.1.16 Vapor Retarder, where shown or specified, shall be "Moistop" as manufactured by Fortifiber Corp. Vapor Barrier shall be "Premoulded Membrane Vaporseal" as manufactured by W.R. Meadows, or equal.

2.1.17 Perimeter Insulation, where shown or specified, shall be "Styrofoam Square Edge" as manufactured by the Dow Chemical Corporation, "Foamular 250" as manufactured by UC Industries, or equal.

2.1.18 Abrasive Grits, where shown or specified, shall be "Korundum" by Concrete Service Materials Company, or equal.

2.1.19 Metal Slab Joints, where shown or specified, shall be keyed type, minimum 18 gauge, galvanized steel by Heckmann Building Products, or equal.

2.2 SUBMITTALS: Submit the following:

2.2.1 Certificates of Compliance:

a. Cement, mill test reports

b. Aggregates, sieve analyses

2.2.2 Product Data and Samples:

a. Submit manufacturer's information for any material listed under Section 2.1 that will be incorporated into this project.

b. Submit samples as indicated in Section 2.1.

2.2.3 Concrete mix design and compressive strength results of field trial batches for each class of concrete incorporated into the work.

2.3 CONCRETE TESTING:

2.3.1 The Contractor shall employ an approved commercial testing laboratory at his own expense to provide field sampling, testing and inspection of all concrete. Continuous inspection by the approved testing laboratory shall be provided during all concrete pours. The Contractor shall maintain a record set of plans at the site showing date and amount of each pour, test results and temperature. If any portion of the work shows low test results, the Engineer may require additional testing, load tests, cored samples, and/or replacement of the faulty work, etc., at the Contractor's expense.

2.3.2 Field concrete inspection: The Contractor, thru its approved testing laboratory, shall provide a competent field concrete inspector whose minimum duties shall be as follows:

- Collect and verify with each batch of concrete, before unloading at the site, a delivery ticket on which is printed, stamped, or written, information concerning said concrete. Have available for Engineer to review if requested.
- Check each truck on arrival to make sure that the concrete is not retempered.
- Make necessary slump tests for uniformity control.
- Make air tests and yield tests as required.
- Make any and all test cylinders as may be required in the Specifications.
- Transport cylinders from the site to the laboratory.
- Notify the Engineers and/or his representative if any test results vary from the specified limits.

2.3.3 Tests:

2.3.3.1 Concrete shall be tested by an approved testing laboratory as follows:

- Standard 6" x 12" compression cylinders shall be in compliance with C-39 in sets of four and shall be moist cured. Break 2 at 7 days, and 2 at 28 days. One set shall be made for approval of each mix design, one set for first pour of 50 cubic yards or less, and one set for each additional pour of 50 cubic yards. If less than 50 cubic yards are placed in one day, one set shall be made for each day's pour.

- All test cylinders shall be cast, moist cured and broken under laboratory conditions in accordance with the ASTM C31 and ASTM C39. All four cylinders of a test shall be taken from the middle third of a single load. Each cylinder shall be properly labeled with an identifying mark, the mix proportions, air content, amount of water, slump, and the location in the structure where the concrete was placed. Test reports shall include all this information. Distribute copies of reports as requested by the Engineer. Should any results be questionable, the Engineer shall be notified immediately so that corrective measures can be taken. Any test cylinder which has broken and fails to meet requirements shall be preserved for inspection by the Engineer.

2.4 INSPECTION:

2.4.1 Before each pour, forms and reinforcing shall be inspected and approved by the Engineer. The Contractor shall give at least 24 hours notice before such an inspection is required. No pour shall be started until the Engineer has given approval. No concreting may be done in the absence of the Engineer without written permission of the Engineer.

2.5 CONCRETE MIX DESIGN:

2.5.1 The various classes of concrete shall be designated as follows:

MAXIMUM PERMISSIBLE WATER-CEMENT RATIOS FOR CONCRETE (WHEN STRENGTH DATA FROM TRIAL BATCHES OR FIELD EXPERIENCE ARE NOT AVAILABLE)

CLASS	MIN. 28-DAY COMPRESSIVE STRENGTH IN PSI*	NON-AIR-ENTRAINED CONCRETE		AIR-ENTRAINED CONCRETE	
		ABSOLUTE RATIO BY WEIGHT	US GAL. PER 94-LB. BAG OF CEMENT	ABSOLUTE RATIO BY WEIGHT	US GAL. PER 94-LB. BAG OF CEMENT
A	5,000	**	**	**	**
B	4,000	0.44	5.0	0.35	4.0
C	3,000	0.58	6.6	0.46	5.2
D	2,500	0.67	7.6	0.54	6.1
E	2,000	0.71	8.0	-	-

* 28-day strength. With most materials, water/cement ratios shown will provide average strengths greater than indicated in Section 5.4 of A.C.I. 318R-89 as being required.

** For strength above 4,500 psi (non-air-entrained concrete) and 4,000 psi (air-entrained concrete) proportions shall be established by methods of Sections 5.3 or 5.4 of A.C.I. Building Code (A.C.I. 318R-89).

Unless otherwise specified, all concrete shall be Class "B", non-air-entrained except exposed concrete which shall be air-entrained. When foundation walls or grade beams are exposed to weather above grade, the entire wall shall be considered exposed concrete.

2.5.2 Maximum size aggregates shall be used as follows unless otherwise designated by the Engineer.

1-1/2"	general work
3/4"	thin sections; heavy reinforcing; slabs
3/8"	floor toppings

2.5.3 Slump - Maximum:

Reinforced concrete - general	4"
Reinforced concrete - thin walls, columns	5"
Non-reinforced concrete	3"
Pavements, including sidewalks	3"

2.5.4 Air Content: Use an approved air entraining admixture. The entrained content shall be controlled between 4% - 6%. See Plans for concrete work requiring air entrainment.

2.5.4.1 For mixes containing coarse aggregate with a top size of 3/4" or smaller and for exposed concrete subject to frost and salt action, air contents shall be increased to the range of 5% - 7%.

PART 3 - EXECUTION

3.1 BATCHING AND MIXING:

3.1.1 The Contractor shall have available at all times sufficient approved materials such that, when once started, concreting shall be a continuous operation until the placing of the panel or section is completed. The top surface shall be generally level. When construction joints become necessary, they shall be made as hereinafter specified.

3.1.2 All concrete shall be mixed not less than 60 revolutions in the drum of a modern power mixer, at the rated speed of rotation. Mix not less than an additional 30 revolutions after the addition of any further water to the mix.

3.1.3 Transit-mixed concrete shall be transported to the job site unmixed and only after arrival at the job site shall mixing begin. All concrete shall be unloaded from the mixer within 45 minutes after completion of mixing. All concrete still remaining in the truck shall be rejected.

3.1.4 The total time interval from the time the cement makes contact with the aggregate to the complete unloading from the mixer shall not exceed 90 minutes, unless such time is extended by the Engineer. The time may be reduced in hot weather or under unusual conditions, if unsatisfactory results are obtained.

3.2 FORMWORK:

3.2.1 The Contractor shall design and construct suitable and adequate formwork in conformance with A.C.I. 347R-88. All shoring shall be properly braced to safely withstand all vertical, moving and lateral forces during the construction period. Responsibility for adequacy and safety rests with the Contractor. Materials shall be as stated in Paragraph 2.1.

3.2.2 Set forms true to line and grade and make mortar-tight. Chamfer above grade exposed joints, edges, and external corners of concrete 3/4-inch, unless otherwise indicated. Before concrete placement, coat the contact surfaces of forms with a non-staining form coating compound. Do not use mineral oil on formed surfaces to be painted. Prevent concrete damage during form removal. Concrete for footings may be placed in excavations without forms upon inspection and approval by the Engineer. Excavation width shall be a minimum of 4 inches greater than finished dimensions indicated.

3.2.3 It shall be the Contractor's responsibility to determine the time at which forms may be removed without endangering the structure, subject to the following limitations, unless documentation is provided to modify these requirements:

Footing forms - 24 hours minimum; continue curing as specified.

Wall forms - 2 days minimum for ten (10) feet high. Add one (1) day for each additional five (5) feet of height; continue curing as specified.

3.3 JOINTS FOR CONCRETE:

3.3.1 Expansion Joints:

3.3.1.1 Expansion joints shall be constructed where shown and as directed. Reinforcement, corner protection angles or other fixed items embedded or bonded into concrete shall not be run continuously through expansion joints. Reinforcement shall be discontinued 2 inches from the joint face. A slightly rounded edging shall be provided to finish neatly all edges around expansion joints.

3.3.1.2 Preformed expansion joint filler material and sealant, where shown on the drawings, shall be as specified in Paragraph 2.1.

3.3.2 Construction Joints:

3.3.2.1 The location of construction joints shall be chosen by the Contractor and shall be subject to the Engineer's approval except where specifically located on the Plans. Horizontal construction joints in walls will not be permitted.

3.3.2.2 Reinforcing shall be discontinuous through a construction joint, unless otherwise noted on drawings. As shown or specified on the drawings, additional No. 3 reinforcing bars spaced at 12-inches on center shall be placed horizontally in each construction joint at the center of the section. These bars shall be 4-feet long and shall extend 2-feet on each side of the joint. Reinforcement projecting through joint shall be kept clean. As indicated on the drawings, all construction joints shall be provided with a keyway.

3.3.2.3 As indicated on drawings, a metal keyed floor slab joint may be used.

3.3.3 Contraction (Control) Joints.

3.3.3.1 Contraction joints shall be located as shown on the drawings or as directed. Reinforcement through the joint shall be continuous as shown on the drawings and/or as directed by the Engineer.

3.3.3.2 Sawcut contraction joints (Type "A") shall be made by cutting the concrete surface and filling with the sealant material as specified under paragraph 2.1. Cutting shall be done after the surface is firm enough not to be damaged by the cutting blade. Time of cutting shall be approved by the Engineer.

3.3.3.3 Formed contraction joints (Type "B") shall be made by tooling with a 1/4-inch radius edging tool and filled with the sealant material as specified under paragraph 2.1.

3.3.3.4 Premolded Contraction Joints (Type "C") shall be "Kold-Seal Zipper Strip" by Vinylex or "Zip Cap Control Joint" by Greenstreak Products, or equal.

3.4 INSERTS AND SLEEVES:

3.4.1 The Contractor shall cooperate with all other Contractors in permitting the placing of all necessary sleeves, conduit, or inserts for hangers for their trades. The Contractor shall notify the trades of all pours in ample time for the responsible Contractor to place all embedded items, sleeves, slots, holes or chases.

3.4.2 Accurately set all slots, chases, anchor bolts, opening, etc. All inserts for hanging mechanical equipment shall be provided and set by the Contractor for the trade involved. All sleeves for piping passing through floors and walls shall be provided by the Contractor for the trade involved and set by the General Contractor.

3.4.3 All conduit which must be placed in concrete slabs shall be installed after, and above the bottom reinforcing, but before, and under the top reinforcing. Where conduit cross-overs are necessary, they shall be located so that reinforcing is not displaced from its specified position.

3.4.4 If, in the judgement of the Engineer, embedded items are located or grouped in a manner that will weaken the structure, the Contractor shall take the necessary corrective steps.

3.4.5 All inserts and sleeves where the outside diameter is greater than the spacing between the reinforcing steel, the reinforcing bars shall be warped around such inserts and sleeves. Unless shown otherwise on the drawings, provide, as a minimum, two #4 diagonal bars per face at 90 degrees to each other all around the inserts and sleeves.

3.4.6 Where openings are left in new concrete or are made in existing concrete for the insertion of wall castings, pipes or other fixtures, the space around these fixtures shall be made watertight by completely filling with a non-shrinking concrete containing an admixture of "SikaSet-C", "Anti-Hydro" Concrete Waterproofing Agent, or equal.

3.5 CONVEYING AND PLACING CONCRETE:

3.5.1 The placing or depositing of all concrete shall be done in accordance with A.C.I. 304R-89 "Guide for Measuring, Mixing, Transporting and Placing Concrete" and as modified herein.

3.5.2 Before placing concrete, all debris, water, snow and ice shall be removed from places to be occupied by concrete. Wood forms shall be wetted except in freezing weather or oiled, and the reinforcement cleaned of ice or other coatings.

3.5.3 Conveying, transporting, and placing shall be done as rapidly as practicable and without segregation, loss of ingredients, and without unnecessary rehandling. The tempering of concrete will not be permitted.

3.5.4 Spade and work the coarse aggregate away from forms and work concrete around reinforcement to avoid air pockets, voids, and honeycombed sections. The use of a mechanical vibrator is mandatory, but concrete must not be over-vibrated. Hand spading will be required in addition to mechanical vibration. Maintain spare vibrator(s) at site for use in case of breakdowns.

3.5.5 Screed all work to level surfaces at the proper elevations. Rake surfaces to provide bond for floor finishes where specified.

3.5.6 No concrete shall be deposited under water without written permission of the Engineer and then only in accordance with his directions. Proper tremie equipment and techniques must be used, should the need arise.

3.6 PROTECTION AND CURING:

3.6.1 All concrete shall be protected against injury by sun, rain, freezing, mechanical damage, or premature drying. All concrete shall be maintained above 50°F in a moist or wet condition for at least the first 7 days after placement.

3.6.2 On vertical surfaces keep forms on, or cover with burlap blankets, kept wet.

3.6.3 On horizontal surfaces and floors to receive later finishes, cover with wet burlap, wet sand, or curing paper and keep saturated. Cement finish floors shall be covered with protective covering material with lapped and sealed edges after the concrete has set sufficiently to carry worker's weight. Covering shall remain in place until floor is cleaned. Weight covering with planks as required to hold it in place.

3.6.4 Cold weather protection shall conform to A.C.I. 306R-88 "Cold Weather Concreting" except as herein modified.

3.6.4.1 Prior to pouring, it shall be the Contractor's responsibility to keep the forms free from snow, ice, mud or debris at all times, by means of covers, enclosures, live steam or heating below the forms, as necessary. Use of torches, open flames, salts, straw, hay or chemical is prohibited.

3.6.4.2 When air temperature is 40°F, or less, use only heated concrete, delivered to the forms at temperatures between 65°F and 85°F. All portions of freshly poured concrete shall be continually maintained at a temperature of not less than 50°F for seven days. Specified temperature shall be maintained by heated enclosures, insulating blankets, insulated forms, or whatever approved methods are required to attain the specified result.

3.6.4.3 Concrete shall not be poured on frozen soil. After pouring, protect against freezing and heaving of subgrade. Any frozen concrete will be rejected and removed at the Contractor's expense. Accelerating admixtures shall not be accepted in lieu of winter protection.

3.6.5 Hot weather protection shall conform to A.C.I. 305R-89 "Hot Weather Concreting" except as modified herein.

3.6.5.1 During warm dry weather special care and precautions should be taken to prevent premature setting which may cause shrinkage and surface checking. No concrete shall be placed at temperatures above 90°F without approval of the Engineer.

3.6.6 No water (except curing spray) shall be allowed to come in contact with the concrete or masonry surface for a minimum of 24 hours. Should the rising water place a stress on the concrete, proper bracing shall be provided. Loading shall not occur without prior approval by the Engineer, and proper safety precautions shall be the responsibility of the Contractor.

3.6.7 Curing compound may be used as specified in Paragraph 2.1 provided discoloration does not occur and application is in accordance with manufacturer's direction and is compatible with concrete finish.

3.7 SLABS ON GROUND:

3.7.1 Subgrade and base to be prepared as specified in Contract Documents.

3.7.2 Form depressed ribs under partitions as required by sloping gravel, or provide permanent side forms to retain gravel.

3.7.3 Trench subgrade for electric conduit as detailed on Plans. All reinforcing shall be above electric conduit.

3.7.4 Place slabs of thickness shown on Plans, vibrate, screed, float level, and finish as specified below.

3.8 CONCRETE FINISHES - FORMED SURFACES:

3.8.1 After the forms are removed, all concrete surfaces shall be inspected, and any poor joints, voids, stone pockets or other defective areas noted by the Engineer shall be repaired immediately at the Contractor's expense by cutting away the unsound area to a minimum depth of 1 inch, and refilling with mortar mixed using the same brand of cement as the original pour. Edges of the patch shall be square with the face, with feather-edging prohibited. Obtain approval of corrective action prior to repair.

3.8.2 Care shall be taken to saturate the patched area and holes shall be filled in 1/2-inch layers with a delay for an initial set to take place before the succeeding layer is applied. If, in the opinion of the Engineer, improper consolidation is too extensive, or if the structure appears weakened by the voids, complete removal of the concrete in question may be required. Patches shall be kept moist for a minimum of three days.

3.9 FLOOR AND SLAB FINISHING:

3.9.1 Finished floors and slabs shall be level to within 1/8" of finish floor elevation in ten feet. If this variation occurs, it must not be abrupt, but must taper so that the 1/8" variation takes place in not under 4 feet. Areas with drains shall have the surfaces sloped uniformly and true to the effect that no surface ponding occurs. If required by the Engineer, replace, grind or furnish underlayment to correct the variation, at the Contractor's expense. All floors and slabs shall be cured and protected as specified.

3.9.2 Under quarry tile and ceramic tile screed and float top surface of slab, after concrete has been compacted, to accurate lines and levels as required to receive these materials. Floors receiving a tile finish are indicated on the Plans.

3.9.3 Where exposed concrete finish is specified, provide a steel trowelled finish. After concrete has set sufficiently to carry the weight of the workman, float with motor-driven rubber disc machine to thoroughly compact and close any surface voids.

3.9.4 Dusting with dry cement or cement sand mixtures, to hasten drying, is prohibited. Dry time shall be controlled by controlling the water content and slump of the concrete when placed.

3.9.5 Liquid hardener, as specified in Paragraph 2.1, shall be applied to exposed concrete finish floors where shown on the Contract Drawings. Cure floors thoroughly. Hardener shall be applied in accordance with Manufacturer's directions in at least two coat application, allowing 24 hours between coats. Coverage, for each coat, shall be one gallon per 100 square feet. After final coat is complete and dry, remove surplus hardener by scrubbing and mopping with water.

3.9.6 A float finish shall be applied to all exterior concrete and those areas not intended for occupancy, such as culvert inverts, bottoms of manholes and catch basins, pads, etc. Sidewalks, walkways, or exterior ramps shall be given a broom finish, perpendicular to traffic, sufficient to leave marks without appreciable disturbance of the surface.

3.10 MISCELLANEOUS CONCRETE WORK:

3.10.1 Pour all sump pits, canopies, copings and provide all other miscellaneous concrete and cement work shown on the drawings. All such concrete shall be reinforced as shown. Provide all cement filled stair treads as detailed. Place bottoms and walls of pits and trenches monolithically.

3.10.2 Concrete Walks: Provide 4 inches thick minimum. Provide contraction joints spaced every 5 linear feet, unless otherwise indicated. Cut contraction joints 3/4-inch deep with a jointing tool after the surface has been finished. Provide 1/2-inch thick transverse expansion joints at changes in direction, where sidewalk abuts curb, steps, rigid pavement, or other similar structures. Provide a transverse slope of 1/4-inch per foot and limit variation in cross section to 1/4-inch in 5 feet unless otherwise indicated.

3.10.3 Curbs and Gutters: Provide contraction joints spaced every 10 feet maximum, unless otherwise indicated. Cut contraction joints 3/4-inch deep with a jointing tool after the surface has been finished. Provide expansion joints 1/2-inch thick and spaced every 100 feet maximum, unless otherwise indicated. Provide a broom finish.

3.10.4 Equipment Bases: Unless otherwise shown, all equipment shall be erected on bases of Class "B" concrete. Thickness shall be as noted on the Plans, but at no time shall it measure less than 1 inch.

3.10.5 Concrete Stairs, Steps and Platforms: Stairs, steps and platforms shall be formed to required profiles shown on the Plans. Place reinforcing as required. Finish of stairs and steps shall be monolithic. Where shown on Plans, provide for nosings. Exterior stairs, steps and platforms shall have a non-slip finish. Before final troweling, embed abrasive grits, as specified in Paragraph 2.1, in the surface.

PART 4 - MEASUREMENT & PAYMENT

4.1 MEASUREMENT - CAST-IN-PLACE CONCRETE (MINOR CONSTRUCTION):

4.1.1 The quantity of Cast-In-Place Concrete (Minor Construction) for which payment will be made will be the actual number of cubic yards measured in place within the lines shown, specified, or ordered.

4.2 PAYMENT - CAST-IN-PLACE CONCRETE (MINOR CONSTRUCTION):

4.2.1 For Cast-In-Place Concrete (Minor Construction), not included in other unit or lump sum price items, payment for Cast-In-Place Concrete (Minor Construction) will be made at the applicable price stated in the Bid.

END OF SECTION

SECTION 15053

FLEXIBLE PIPE COUPLINGS

PART 1 - GENERAL

1.1 DESCRIPTION:

1.1.1 Under this Section, the Contractor shall furnish all labor, materials and equipment for Flexible Pipe Couplings as shown on the Plans, as specified, and/or directed.

1.1.2 Related work specified elsewhere:

- Ductile Iron Pipe and Fittings.

1.2 SUBMITTALS:

1.2.1 Submit shop drawings and/or bulletins showing the equipment.

PART 2 - PRODUCTS

2.1 SLEEVE TYPE COUPLINGS:

2.1.1 Couplings shall be complete with middle ring, followers, gaskets, bolts and nuts. Sleeve material to be constructed of ductile iron conforming to ASTM A536.

2.2.2 Couplings shall fit the O.D. and type of the pipe to be coupled, and shall be corrosion resistant.

2.2.3 Couplings having a diameter of 12-inches or less shall be Series 441 as manufactured by Smith Blair, Style 153 as manufactured by Dresser, or approved equal. Couplings having a diameter greater than 12-inches shall be Series 441 as manufactured by Smith Blair, or approved equal.

2.2.4 Gasket Material: Plain Grade 30, unless another material is specified.

2.2.5 Bolts: Unless otherwise specified, high strength low alloy steel bolts conforming to ASTM A325.

2.2.6 Shop Coating: Blue shop coat enamel, unless another coating is specified. The lengths of pipe to be joined by sleeve type couplings shall be furnished with plain ends in accordance with American Water Works Association Specifications for steel, cast iron and ductile iron water pipe.

2.3 COUPLING HARNESSES:

2.3.1 Sleeve type couplings shall be harnessed where shown with number and size of rods indicated.

2.3.2 Rods, nuts and lugs shall be made from ASTM Des: A36 steel. Lug strength shall be equivalent to rod strength.

2.4 POLYETHYLENE ENCASEMENT:

2.4.1 All flexible couplings shall be encased in polyethylene in accordance with AWWA C105. The polyethylene film shall be 8 mil, Class C tubes or sheets, as required. No separate payment shall be made for polyethylene encasement.

PART 3 - EXECUTION

3.1 INSTALLATION AND TESTS:

3.1.1 The couplings shall be installed in accordance with the Manufacturer's instructions. Each coupling shall be tested for water-tightness or air-tightness at the pressure specified for testing the completed pipeline.

3.1.2 Testing shall take place prior to any specified field-applied coating.

PART 4 - MEASUREMENT & PAYMENT - FLEXIBLE PIPE COUPLINGS:

4.1 MEASUREMENT - FLEXIBLE PIPE COUPLINGS:

4.1.1 Measurement for Flexible Pipe Couplings shall include the cost of all materials, equipment, labor, submittals and testing for the work indicated in this Section.

SECTION 15053

FLEXIBLE PIPE COUPLINGS

4.2 PAYMENT: FLEXIBLE PIPE COUPLINGS:

4.2.1 For Flexible Pipe Couplings, not included in other unit or lump sum price items, payment for Flexible Pipe Couplings will be made at the applicable price stated in the Bid.

END OF SECTION

SECTION 15055

HYDRANT ASSEMBLY

PART 1 - GENERAL

1.1 DESCRIPTION:

1.1.1 Under this Section, the Contractor shall furnish all labor, materials and equipment for Hydrant Assembly, as shown on the Plans, as specified, and/or directed.

1.2 SUMMARY:

1.2.1 The work under this Item shall include, but not necessarily be limited to, the following:

- Excavation, Backfill and Restoration
- Hydrant
- Hydrant Extensions
- 6-Inch Gate Valve and Valve Box
- Polyethylene Encasement
- Tie Rods and Fasteners
- Lining and Special Backfill
- 6-Inch Ductile Iron Pipe and Fittings

PART 2 - PRODUCTS

2.1 HYDRANTS:

2.1.1 Hydrant shall be Saratoga Standard-Mueller Super Centurion A-423 manufactured by Mueller, or approved equal, and shall be break flange, true traffic type hydrants of the compression type. Hydrants shall conform in all respects to AWWA Specification C-502 latest edition and manufacturer's most recent improved design including hydrant extension pieces complete.

2.1.2 The hydrant main valve shall have a minimum size of 6-inches and shall be open clockwise (right). Each hydrant shall have 5-1/4 inch valve opening and be equipped with two 2-1/2 inch nozzles, one 4 inch Stortz Quick – Release connection and one 7/8" square shaped operation nut. The two 2-1/2 inch hose nozzles shall be National Standard Thread. The inlet shall be 6-inch mechanical joint type with accessories. Nozzle caps, gaskets, and chains shall be provided. Verify requirements with the Owner and the local Fire Department. All hydrants shall

open by turning to the right or clockwise. An arrow indicating the direction for opening shall be cast on the head of the hydrant.

2.1.3 Stainless steel bolts shall be used on the mechanical joint of the inlet.

2.1.4 All hydrants shall be painted per pipe schedule as shown on Contract Documents.

PART 3 - EXECUTION

3.1 HYDRANT INSTALLATION:

3.1.1 The Contractor shall construct and install hydrants in the locations shown on the Contract Drawings and/or as directed.

3.1.2 Complete hydrant installation shall include crushed stone for drainage.

3.1.3 The hydrant shall be harnessed to the 8-inch pipe using tie rods and lug fasteners as shown in the Contract Drawings.

3.1.4 Hydrants shall be installed plumb and with proper barrel length so as to locate the safety flange not more than six (6) inches, above the level of the edge of the highway on which it fronts, unless otherwise directed. The Contractor shall furnish and install, where necessary, hydrant extensions manufactured for use with the hydrants installed. Where installation of a hydrant results in the nozzles being more than six (6) inches above existing grade, the Contractor shall fill, dress and seed an access area around the hydrant as directed. The Contractor shall provide the fill material unless suitable spoil is available from the work. In cases where the finished grade in the area around the hydrant is above or below the level of the finished highway on which it fronts, the safety flange shall be no more than six (6) inches above finished grade.

3.1.5 All hydrants of the same class shall be the product of one manufacturer and shall have the name, monogram or initials of the manufacturer cast thereon. They shall be built and equipped for the type of operation shown, specified or directed. All iron work, after being thoroughly cleaned, shall be coated with asphaltum varnish or epoxy coating per the Owner.

3.1.6 Where the hydrant assembly is to be located between the existing drainage swale and right-of-way boundary, the Contractor shall install a 20-foot section of 12-inch HDPE pipe with end in the existing swale and backfill. Where an upstream culvert exists and is larger than 12 inches in diameter, install culvert with diameter equal to the existing upstream culvert.

3.1.7 Hydrants shall be set such that the bottom of the pumper nozzle is at least 18-inches above finished grade.

3.1.8 If high groundwater is encountered (located above the drain port), the Contractor shall plug all drain ports and mark or label each hydrant in which the drain ports are plugged as A.O.B.E.

PART 4 - MEASUREMENT & PAYMENT

4.1 MEASUREMENT - HYDRANT ASSEMBLY:

4.1.1 The quantities for Hydrant Assembly, measured for payment, shall be the actual number of hydrants placed and incorporated in the work in accordance with the Contract Drawings and orders. The price bid to furnish and install each hydrant shall include the cost of all materials and work incidental to providing the hydrant.

4.2 PAYMENT - HYDRANT ASSEMBLY:

4.2.1 For Hydrant Assembly, not included in other unit or lump sum price items, payment for Hydrant Assembly, will be made at the applicable price stated in the Bid.

END OF SECTION

SECTION 15064

FURNISH AND INSTALL WATER SERVICE

PART 1 - GENERAL

1.1 DESCRIPTION:

1.1.1 Under this Section, the Contractor shall furnish all labor, materials and equipment for Water Service, as shown on the Plans.

PART 2 - PRODUCTS

2.1 CORPORATION STOPS:

2.1.1 Corporation stops shall be Mueller H-15008 and shall be equipped with the standard AWWA C800-05 inlet thread.

2.1.2 The maximum size corporation stop permitted in the barrel of Gray-Iron or Ductile-Iron Pipe, without the use of service clamps, shall be as follows:

Pipe Size (inches)	4	6	8	10	12	16
Tap Size (inches)	3/4	3/4	1	1-1/2	1-1/2	2

2.1.3 Connections larger than those appearing in the above table shall be made with a service clamp.

2.1.4 All connections made in the barrel of a PVC or HPPE pipe shall be equipped with a service saddle.

2.1.5 Service clamps shall be Mueller "Single Strap Mueller Corporation Stop Thread", or equal, for services 1-inch and smaller and Mueller "Double Strap Mueller Corporation Stop Thread", or equal, for service 1-1/4 inch and larger.

2.2 COPPER TUBING

2.2.1 A continuous length of copper tubing shall be used between the corporation and curb stop, between curb stops, or between the curb stop and the blowoff, unless specifically permitted by the Engineer.

2.2.2 Copper tubing shall be seamless, Type K, soft drawn, conforming to ASTM B88, and shall be used for all general water service connections in the nominal sizes of ¾-inch, 1-inch, 1-1/2 inch and 2-inch unless otherwise specified.

2.2.3 Couplings for joining copper tubing shall be a Mueller "H15405", or approved equal.

2.3 SERVICE BOXES:

2.3.1 Service boxes used with curb stops of 1-1/4-inch size and smaller shall be Mueller "H-10314 (in turf) or Model H-10334 (in concrete walk).

2.3.2 All service boxes shall be telescopic and shall have a collapsed length of 4 feet and a fully extended length of at least 5-1/2 feet and shall be equipped with type 304 stainless steel rods and pins. Covers shall be furnished with the word "WATER" cast in and provided with a cover bolt.

2.3.3 Curb stops shall be the Mark II Oriseal type as manufactured by the Mueller Company, "H-209" compression or Model H-15219 with drain.

PART 3 - EXECUTION

3.1 The Contractor shall furnish and install copper tubing as directed or as shown on the Contract Drawings. The curb stops and boxes shall be located as shown on the Contract Drawings or as directed. All copper tubing shall be laid at a minimum depth of 5 feet from final grade. All joints shall be watertight.

3.3 HIGHWAY CROSSING:

3.3.1 All water services crossing public highways, roads or streets shall be installed by open cutting, jacking, boring or rodding. Installation by use of water jets is prohibited except by written permission of the authority having jurisdiction.

SECTION 15064

FURNISH AND INSTALL WATER SERVICE

PART 4 - MEASUREMENT & PAYMENT

4.1 MEASUREMENT – 3/4-INCH WATER SERVICE:

4.1.1 The quantity of 3/4-inch water services, for which payment will be made shall be the actual number of units placed and incorporated in the work in accordance with the Contract Drawings, specified and/or ordered.

4.2 MEASUREMENT – 3/4-INCH COPPER TUBING:

4.2.1 The quantity of 3/4-inch copper tubing furnished and laid, for which payment will be made shall be the actual number of linear feet of tubing installed and incorporated in the work in accordance with the Contract Drawings, specified and/or ordered.

4.3 MEASUREMENT – 1-INCH WATER SERVICE:

4.3.1 The quantity of 1-inch water services, for which payment will be made shall be the actual number of units placed and incorporated in the work in accordance with the Contract Drawings, specified and/or ordered.

4.4 MEASUREMENT – 1-INCH COPPER TUBING:

4.4.1 The quantity of 1-inch copper tubing furnished and laid, for which payment will be made shall be the actual number of linear feet of tubing installed and incorporated in the work in accordance with the Contract Drawings, specified and/or ordered.

4.5 MEASUREMENT – 1.5-INCH WATER SERVICE:

4.5.1 The quantity of 1.5-inch water services, for which payment will be made shall be the actual number of units placed and incorporated in the work in accordance with the Contract Drawings, specified and/or ordered.

4.6 MEASUREMENT – 1.5-INCH COPPER TUBING:

4.6.1 The quantity of 1.5-inch copper tubing furnished and laid, for which payment will be made shall be the actual number of linear feet of tubing installed and incorporated in the work in accordance with the Contract Drawings, specified and/or ordered.

SECTION 15064

FURNISH AND INSTALL WATER SERVICE

4.7 MEASUREMENT - 2-INCH WATER SERVICE:

4.7.1 The quantity of 2-inch water services, for which payment will be made shall be the actual number of units placed and incorporated in the work in accordance with the Contract Drawings, specified and/or ordered.

4.8 MEASUREMENT – 2-INCH COPPER TUBING:

4.8.1 The quantity of 2-inch copper tubing furnished and laid, for which payment will be made shall be the actual number of linear feet of tubing installed and incorporated in the work in accordance with the Contract Drawings, specified and/or ordered.

4.9 PAYMENT – 3/4-INCH WATER SERVICE:

4.9.1 For 3/4-inch Water Service, not included in other unit or lump sum price items, payment for 3/4-Inch Water Service will be made at the applicable price stated in the Bid. The payment shall include and cover the cost of furnishing and installing the corporation and curb stop with box, connection of new water and necessary appurtenances, excavation, backfilling, cleaning up the site, and the cost of all work incidental to a complete installation as specified including flushing, testing and chlorinating. copper tubing is paid for as 1-inch copper tubing.

4.10 PAYMENT – 3/4-INCH COPPER TUBING:

4.10.1 For 3/4-inch copper tubing, not included in other unit or lump sum price items, payment for 3/4-inch copper tubing will be made at the applicable price stated in the Bid. The payment shall include and cover the cost of furnishing, laying and jointing the tubing complete in place as specified including excavation, jacking, boring, rodding, backfilling, cleaning up the site, flushing, testing and chlorinating.

4.11 PAYMENT – 1-INCH WATER SERVICE:

4.11.1 For 1-inch Water Service, not included in other unit or lump sum price items, payment for 1-Inch Water Service will be made at the applicable price stated in the Bid. The payment shall include and cover the cost of furnishing and installing the corporation and curb stop with box, connection of new water and necessary appurtenances, excavation, backfilling, cleaning up the site, and the cost of all work incidentals to a complete installation as specified including flushing, testing and chlorinating. Copper tubing is paid for as 1-inch copper tubing.

4.12 PAYMENT – 1-INCH COPPER TUBING:

4.12.1 For 1-inch copper tubing, not included in other unit or lump sum price items, payment for 1-inch copper tubing will be made at the applicable price stated in the Bid. The payment shall include and cover the cost of furnishing, laying and jointing the tubing complete in place as specified including excavation, jacking, boring, rodding, backfilling, cleaning up the site, flushing, testing and chlorinating.

4.13 PAYMENT – 1.5-INCH WATER SERVICE:

4.13.1 For 1.5-inch Water Service, not included in other unit or lump sum price items, payment for 1.5-Inch Water Service will be made at the applicable price stated in the Bid. The payment shall include and cover the cost of furnishing and installing the corporation and curb stop with box, connection of new water and necessary appurtenances, excavation, backfilling, cleaning up the site, and the cost of all work incidentals to a complete installation as specified including flushing, testing and chlorinating. Copper tubing is paid for as 1-inch copper tubing.

4.14 PAYMENT – 1.5-INCH COPPER TUBING:

4.14.1 For 1-inch copper tubing, not included in other unit or lump sum price items, payment for 1-inch copper tubing will be made at the applicable price stated in the Bid. The payment shall include and cover the cost of furnishing, laying and jointing the tubing complete in place as specified including excavation, jacking, boring, rodding, backfilling, cleaning up the site, flushing, testing and chlorinating.

4.15 PAYMENT – 2-INCH WATER SERVICE:

4.15.1 For 2-inch Water Service, not included in other unit or lump sum price items, payment for 2-Inch Water Service will be made at the applicable price stated in the Bid. The payment shall include and cover the cost of furnishing and installing the corporation and curb stop with box, connection of new water and necessary appurtenances, excavation, backfilling, cleaning up the site, and the cost of all work incidental to a complete installation as specified including flushing, testing and chlorinating.

SECTION 15064

FURNISH AND INSTALL WATER SERVICE

4.16 PAYMENT – 2-INCH COPPER TUBING:

4.16.1 For 2-inch copper tubing, not included in other unit or lump sum price items, payment for 2-inch copper tubing will be made at the applicable price stated in the Bid. The payment shall include and cover the cost of furnishing, laying and jointing the tubing complete in place as specified including excavation, jacking, boring, rodding, backfilling, cleaning up the site, flushing, testing and chlorinating.

END OF SECTION

SECTION 15077

CONNECTIONS TO EXISTING WATER MAINS

PART 1 - GENERAL

1.1 DESCRIPTION:

1.1.1 Under this Section, the Contractor shall furnish all labor, materials, and equipment for Connections to Existing Water Mains as shown on the Plans, as specified, and/or directed.

1.2 WORK INCLUDED:

1.2.1 The work shall include, but not necessarily be limited to:

- Excavation and Backfill
- Piped connection to existing water mains, including couplings and other necessary appurtenances as shown on the Plans and as required to make connection.
- Cut and cap existing water main
- Testing, Cleaning, Chlorinating and Dechlorinating Water Mains
- Polyethylene Encasement for Metallic Fitting and Pipe.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 PREPARATION FOR CONNECTION:

3.1.1 The Contractor shall give the Engineer and Owner at least three (3) days notice prior to each intended connection.

3.2 CHLORINATION:

3.2.1 The pipe, valves, fittings and appurtenances to be installed shall be disinfected in accordance with AWWA Standard C651.

3.4 FINAL FLUSHING:

3.4.1 After the Contractor has installed all piping such that service can be restored, the piping shall be flushed in accordance with Section 4 of the AWWA C651.

SECTION 15077

CONNECTIONS TO EXISTING WATER MAINS

PART 4 - MEASUREMENT & PAYMENT

4.1 MEASUREMENT - CONNECTIONS TO EXISTING WATER MAINS:

4.1.1 Measurement for Connections to Existing Water Mains shall include the cost of all materials, equipment, labor, submittals and testing for the work indicated in this Section.

4.2 PAYMENT: CONNECTIONS TO EXISTING WATER MAINS:

4.2.1 For Connections to Existing Water Mains, not included in other unit or lump sum price items, payment for Connections to Existing Water Mains, will be made at the applicable price stated in the Bid.

END OF SECTION